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A REVISION OF THE EPILACHNINE OF THE WESTERN HEMISPHERE (COLEOPTERA

GORDON, R.D. 1 OF 5

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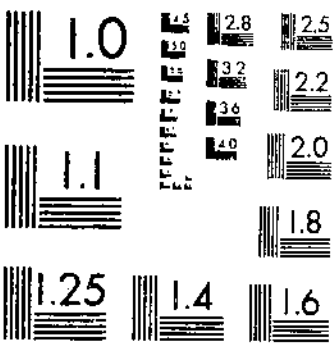

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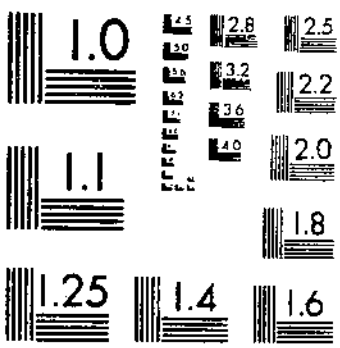

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A REVISION OF THE EPILACHNINAE OF THE WESTERN HEMISPHERE (Coleoptera: Coccinellidae)

By Robert D. Gordon

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Contents

	Page
Present location of types	2
Valid taxa of Epilachninae	3
Zoogeographic considerations	7
Morphological characters	10
Biology	14
Subfamily Epilachninae	16
Key to tribes of Epilachninae	17
Tribe Epilachnini	17
Key to genera of Epilachnini	17
Genus *Tozotoma* Weise	18
Genus *Epilachna* Chevrolat	37
Epilachna flavofasciata group	48
Epilachna dorsigera group	56
Epilachna deuterea group	59
Epilachna v-pallidum group	65
Epilachna albovittata group	69
Epilachna obliqua group	75
Epilachna discolor group	76
Epilachna cruciata group	77
Epilachna patricia group	78
Epilachna fenestrata group	85
Epilachna vittigera group	92
Epilachna approximata group	112
Epilachna angustata group	116
Epilachna latimargo group	118
Epilachna satipensis group	122
Epilachna quirozensis group	124
Epilachna azurea group	127
Epilachna holmgreni group	131
Epilachna amplipunctata group	132
Epilachna borealis group	132
Epilachna cordula group	144
Epilachna axillaris group	145
Epilachna mutabilis group	152
Epilachna basalis group	158
Epilachna varivestis group	160
Epilachna mexicana group	165
Epilachna plagiata group	169
Epilachna abrupta group	172
Epilachna nigrocincta group	173
Epilachna calligrapta group	175
Epilachna olivacea group	177
Epilachna patula group	180
Epilachna staudingeri group	186
Epilachna cacica group	190
Genus *Dira* Mulsant, new status	199
Tribe Madaini, new tribe	206
Key to genera of Madaini	206
Genus *Pseudodira*, new genus	207
Genus *Lorma*, new genus	207
Genus *Malata*, new genus	213
Genus *Mada* Mulsant, new status	217
Genus *Damatula*, new genus	236
Literature cited	241
Index of names	245

as they appeared on the labels with obvious errors being corrected. The only exception to this is in regard to the State or department name, which usually did not appear on the label but has been added in most instances.

For spelling and location of place names, the following references were consulted: Gazetteers of the U.S. Board on Geographic Names; "Times Atlas," "National Geographical Atlas," "American Geographical Society Index to Map of Hispanic America," "Times Index-Gazetteer of the World," and "AAF Aeronautical Charts." If the locality could not be found in these references, the name was then submitted to the Geographic Names Division, Defense Mapping Agency, Topographic Center, Washington, D.C. Often a place name occurred more than once within a country and the label did not indicate as to which State or department it was in. In these instances the most likely locality has been arbitrarily selected based on where the collector usually worked, the route of the expedition, or the type of locality, such as highland plateau or lowland.

All the morphological terms used here have been defined in other papers on the Coccinellidae and are generally accepted by workers in this family. The terminology used to describe male genitalia is based on that proposed by Lal and Kanakavalli (*1960*). Body length is always measured from the anterior margin of the pronotum to the apex of the elytron, and width is measured across the widest part of the body, which is usually at or anterior to the middle of the elytra.

Characters that can be included in the generic or group description are usually not discussed again under the specific heading. The basic specific characters are form, color, size, pubescence, postcoxal line, terminal abdominal sterna, and genitalia. These are usually described for each species.

The type locality and depository are given if known, and in the case of the Mulsant types, the collection or collections from which he received specimens are listed, if of importance, after the type locality. These are usually important as they indicate where the type may presently be deposited.

In South America certain political changes have occurred that have a direct bearing on the type localities of some species. The species described by Mulsant as being from Colombia are often found only in present-day Venezuela. Colombia included Venezuela from 1821 to 1829, and in all instances where species are now known only from Venezuela, that country is here considered the type locality.

Present Location of Types

Determining the present location of type material of previous authors has been a necessary and time-consuming part of this revision. In most instances it has been possible to find specimens that may be recognized as type material with little doubt, but sometimes no specimens recognizable as type material could be found. Lectotypes have been designated where possible in all instances involving Mulsant names and names proposed by older authors. Crotch designated, or at least labeled, a specimen as "Type" and these are here designated lectotypes. Since Weise and Gorham did not always designate a holotype where more than one specimen is in the type series, a lectotype is here designated.

The most important repository of type material (number of types in a single collection) is the Crotch collection at Cambridge University, England. In addition to the species described by Crotch himself, many of the Mulsant types are preserved at Cambridge as well as those of such authors as Guerin and Chevrolat. Since Mulsant apparently returned specimens, from which he described new species, to the collection from which they came, it is vitally important to know where these collections are now deposited. Crotch acquired the Coccinellidae from the Reiche, Chevrolat, and Guerin collections in which there was a great deal of Mulsant type material. In most cases the original specimens were labeled "Type" by Crotch and often bear a small printed label as "Chevr." or "Guer."

A REVISION OF THE EPILACHNINAE OF THE WESTERN HEMISPHERE (Coleoptera: Coccinellidae)

By ROBERT D. GORDON, *Systematic Entomology Laboratory, Northeastern Region, Agricultural Research Service*

A review of the Western Hemisphere *Epilachna* was undertaken by Gerhard Dieke as a continuation of his 1947 work on Old World *Epilachna*. This work was terminated by his death in 1965, and his wife presented his collection, library, and notes to the U.S. National Museum of Natural History, Washington, D.C. Dr. Dieke had seen some of the necessary types at Cambridge, England, Stockholm, Sweden, and Lyon, France. In addition, he was able to do some extremely valuable collecting in Peru and Bolivia. Dieke's (*1974*)[1] work on *Epilachna* (sens. lat.) of Asia, Europe, and Australia was the first comprehensive review of the genus for any part of the world. He used male and female genitalia, and for the first time made it possible to accurately identify species of this genus. This revision of the Western Hemisphere Epilachninae is presented in the same general format.

The subfamily Epilachninae in the Western Hemisphere is a large group of coccinellid species, with the genus *Epilachna* containing most of them. As far as is known they are all phytophagous in their feeding habits, although, as indicated under Biology, the host plant and manner of feeding are unknown for most species.

The subfamily is primarily tropical and members are found in all the tropical regions of the world. This study pertains only to the New World genera and species, which appear to be distinct from the Old World genera and species.

The classification of the Epilachninae began with Mulsant (*1850*). Prior to this only scattered descriptions had appeared. Mulsant described each species rather thoroughly and attempted to group them. He treated them all as *Epilachna* but proposed the subgenera *Mada, Dira,* and *Cleta.* The first two are here raised to generic rank. Crotch (*1874*) reviewed the genus *Epilachna,* treating it as proposed by Mulsant and adding several new species. Between 1895 and 1926, Julius Weise published several papers in which he described many new species and two new genera, *Toxotoma* and *Solanophila.* Gorham (*1897*) described several new species of *Epilachna.* Since 1926 two catalogs have appeared (Korschefsky *1931;* Blackwelder *1945*), but very little other work has been done on the Western Hemisphere Epilachninae. In fact, the classification prior to this bulletin has remained essentially unchanged since Mulsant's work in 1850.

None of the previous authors used male or female genitalia to separate species except Weise, who examined the male genitalia of *Epilachna azurea* and *E. passiva.* It has been nearly impossible to correctly identify a Central or South American species of Epilachninae because of a lack of keys and illlustrations.

In this bulletin, keys to genera and species are included as well as habitus views of most species, line drawings of the male genitalia, and photographs of the female genitalia. The keys to species are mostly artificial and do not reflect phylogenetic relationships. Data from all specimens examined are recorded under the heading "Specimens Examined," and the localities are plotted on distribution maps except where the locality could not be found or where the only place listed was the name of the country. When the locality could not be found, it has been listed either before the State or department or before the country. The data for each specimen have been recorded nearly

[1] The year in italic after the author's name indicates the reference in Literature Cited, p. 241.

When it is certain that at least some of the original type material is now in the Crotch collection, the lectotype is designated from that material unless Mulsant specifically indicated that the type was in another collection, such as that of Dejean.

The Dejean collection in the Museum d'Histoire Naturelle, Lyon, France, contains a large number of coccinellid types although relatively few epilachnines. In most cases where Mulsant described a species from material in the Dejean collection, he used the manuscript name proposed by Dejean and so stated after the description. Mulsant specifically indicated that the Dejean specimen or specimens are to be considered as the "type" or "types." In this bulletin the lectotype is selected from the Dejean material.

Weise described many species of Epilachninae and his type specimens are known to be in the Museum für Naturkunde der Humboldt Universität, Berlin, and in the Naturhistoriska Riksmuseum, Entomologia, Stockholm. The only Weise material at Stockholm is that used in his last (*1926*) paper dealing with South American Epilachninae, and all species listed at that time are presently there. As far as is known, the remainder of Weise's types of Western Hemisphere Epilachninae should be in Berlin. F. Hieke has been able to find many of these specimens there and has loaned them to me, but there are several Weise species of which there is no longer any type material extant, or at least not in the Berlin museum. The Berlin museum is also the repository of the Erichson types of Peruvian Epilachninae, but unfortunately these were on loan to another specialist and not available.

The Korschefsky collection in the U.S. National Museum of Natural History contains few types but is very important because of the many specimens obtained from Weise or identified by Weise. There are also examples of Erichson species compared directly with the Erichson types by either Korschefsky or Weise, and it has been possible to establish what these species are in most instances where type material has been lost or is not available.

The collection in the Museum National d'Histoire Naturelle, Paris, proved to be unexpectedly rich in type material. In addition to the Sicard types, types of species described by Mulsant and stated by him to be in the Dupont collection were also found, usually in the Sicard collection. These specimens bear a "Type" label and also a label "coll. Mniszech." Apparently the Dupont coccinellids were first acquired by Mniszech and then by Sicard. Also in the Paris museum general collection were found specimens of Coccinellidae labeled "Muls. auct. det." or "Mulsant det." These specimens have been found to correspond to the species listed by Mulsant (*1850*) as being in the Paris museum collection and are almost certainly types as the label data correspond to the published data.

The British Museum (Natural History) contains the type material of H. S. Gorham, J. Brèthes, and C. O. Waterhouse. Apparently most of the type material that Mulsant stated to be from Buquet is also in the British Museum, at least the Epilachninae.

It has not been possible to locate the type of *Epilachna* (*Mada*) *pertyi* Crotch, nor has any specimen been seen that has been identified as *pertyi*. Since the description is entirely inadequate for recognizing the species, *pertyi* has not been included here. Somewhat the same situation exists for *E. nigripes* Weise and *E. divisa* (Weise), but here the descriptions are adequate and the species are included here.

Undoubtedly many Epilachninae species in the Western Hemisphere remain undescribed, and biological work is needed to help solve some of the complexes that now occur, such as the *flavofasciata* group and the *azurea* group. In this respect this publication should perhaps be considered an introduction to the systematics of the Epilachninae in the New World.

Valid Taxa of Epilachninae

The subfamily Epilachninae in the Western Hemisphere is here divided into tribes, genera, species groups, and species as follows:

Tribe Epilachnini

Genus *Toxotoma* Weise

T. venusta (Erichson)

T. nunenmacheri, n. sp.
T. opacula (Crotch)
T. townsendi, n. sp.
T. locotalis, n. sp.
T. weyrauchi, n. sp.
T. huanucoi, n. sp.
T. banosi, n. sp.
T. soukupi, n. sp.
T. rosae, n. sp.
T. rugulosa Weise
T. cuzcoensis, n. sp.
T. imitator, n. sp.
T. leechi, n. sp.
T. andicola Weise
T. tridentata, n. sp.
T. forsteri Mader
T. orbicula, n. sp.
T. murilloi, n. sp.
T. haywardi, n. sp.
T. mimetica, n. sp.
T. chapini, n. sp.
T. longicrura, n. sp.
T. chacoi, n. sp.
T. gentilis, n. sp.
T. humboldti (Mulsant), n. comb.
T. opulenta (Weise), n. comb.
T. pulchra (Weise), n. comb.
T. pilifera (Weise), n. comb.
T. jujuyi, n. sp.
T. hiekei, n. sp.
T. guerini, n. sp.
T. disparans, n. sp.

Genus *Epilachna* Chevrolat

E. flavofasciata group
E. flavofasciata (LaPorte)
E. dives Erichson
E. fausta Erichson
E. riveti (Sicard)
E. austrina, n. sp.
E. eusema (Weise)
E. ecuadorica, n. sp.
E. octoverrucata Mulsant

E. dorsigera group
E. dorsigera Erichson
E. sellata Weise
E. cuscoi, n. sp.
E. transverselineata (Mader), n. comb.

E. deuterea group
E. deuterea, n. sp.
E. tritea, n. sp.
E. ovaloides, n. sp.
E. parvicollis Casey
E. viridilineata viridilineata Crotch
E. viridilineata rossi, n. ssp.
E. sexmaculata Kirsch
E. hektea, n. sp.
E. obtusiforma, n. sp.

E. v-pallidum group
E. v-pallidum v-pallidum Blanchard
E. v-pallidum angulata, n. ssp.
E. orthostriata, n. sp.
E. tetartea, n. sp.
E. forsteri (Mader), n. comb.
E. peruviana Crotch

E. albovittata group
E. albovittata (Weise)
E. aureola, n. sp.
E. lorata Weise
E. emerita, n. sp.
E. consularis Mulsant
E. bistrispilota, n. sp.
E. pseudospilota, n. sp.
E. striola (Weise)
E. persimilis Crotch

E. obliqua group
E. obliqua, n. sp.

E. discolor group
E. discolor Erichson

E. cruciata group
E. cruciata Mulsant

E. patricia group
E. patricia Mulsant
E. weisei (Sicard)
E. consimilis, n. sp.
E. simplex, n. sp.
E. convergens Crotch
E. viridinitens Crotch
E. reichei, n. sp.
E. ambigua (Mader), n. comb.
E. bizonata Crotch
E. fuscopilosa (Weise)

E. fenestrata group
E. incaorum, n. sp.
E. zischkai (Mader), n. comb.
E. manni, n. sp.
E. bourcieri Mulsant
E. simulans, n. sp.
E. fenestrata Erichson
E. schunkei, n. sp.

E. aureopilosa, n. sp.
E. oviforma, n. sp.
E. punctatissima (Weise)
E. eximia, n. sp.
E. vittigera group
E. chigata, n. sp.
E. narinoi, n. sp.
E. pemptea, n. sp.
E. monovittata, n. sp.
E. univittata Crotch
E. cushmani, n. sp.
E. divisa (Weise)
E. vittigera Crotch
E. freudei (Mader), n. comb.
E. taeniola, n. sp.
E. caucaensis (Weise)
E. discoidea Erichson
E. honesta (Weise)
E. ignobilis (Weise)
E. strictanotata, n. sp.
E. fenestroides, n. sp.
E. nana, n. sp.
E. bonplandi Mulsant
E. harringtoni, n. sp.
E. bolivicola (Mader), n. comb.
E. korschefskyi, n. sp.
E. adnexa (Mader), n. comb.
E. bistriguttata Mulsant
E. conjuncta, n. sp.
E. bistrisignata (Mader), n. comb.
E. geometrica (Weise)
E. ostensa (Weise)
E. ostensoides, n. sp.
E. olmosi, n. sp.
E. divisoides, n. sp.
E. approximata group
E. approximata Crotch
E. aequatorialis, n. sp.
E. gnoma, n. sp.
E. dubia Crotch
E. soachae, n. sp.
E. hybridula, n. sp.
E. aculata, n. sp.
E. angustata group
E. paracuta, n. sp.
E. angustata Mulsant
E. kraatzi, n. sp.
E. latimargo group
E. latimargo (Weise)
E. bituberculata Waterhouse
E. walteri (Sicard)
E. jarugui, n. sp.
E. inserta (Weise)
E. satipensis group
E. satipensis, n. sp.
E. woytkowskii, n. sp.
E. furcata, n. sp.
E. quirozensis group
E. quirozensis, n. sp.
E. latreillei, n. sp.
E. buckleyi Crotch
E. peltata Erichson
E. azurea group
E. azurea (LaPorte)
E. lepida Erichson
E. confixa, n. sp.
E. languida (Weise)
E. pretiosa (Mader), n. comb.
E. bisbivittata, n. sp.
E. holmgreni group
E. holmgreni (Weise)
E. amplipunctata group
E. amplipunctata, n. sp.
E. borealis group
E. borealis (Fabricius)
E. tredecimnotata (Latreille)
E. discincta Weise
E. pocohantae, n. sp.
E. boraustralis, n. sp.
E. kraussi, n. sp.
E. paenulata (Germar)
E. cordula group
E. cordula (Weise)
E. axillaris group
E. axillaris Mulsant
E. stolata Mulsant
E. radiata (Guérin)
E. picticipennis Crotch
E. fryii Crotch
E. cinctipennis Crotch
E. madida Mulsant
E. praecipua, n. sp.
E. nigrovittata Crotch
E. mutabilis group
E. mutabilis Crotch
E. pachiteensis (Weise)
E. pastica (Weise)
E. pseudostriata, n. sp.
E. propinqua (Weise)
E. callangae, n. name
E. clandestina Mulsant

E. basalis group
E. parastriata, n. sp.
E. basalis (Weise)
E. sexlineata (Weise)
E. mandibularis, n. sp.
E. varivestis group
E. varivestis Mulsant
E. varipes Mulsant
E. mexicana group
E. mexicana (Guérin)
E. plagiata group
E. plagiata Gorham
E. erichsoni Crotch
E. tumida Gorham
E. abrupta group
E. abrupta Gorham
E. nigrocincta group
E. nigrocincta Mulsant
E. vincta Crotch
E. calligrapta group
E. pseudograpta, n. sp.
E. calligrapta Gorham
E. olivacea group
E. olivacea Mulsant
E. obscurella Mulsant
E. aubei Mulsant
E. vulnerata Gorham
E. patula group
E. patula Mulsant
E. modesta Mulsant
E. difficilis Mulsant
E. tenebricosa Mulsant
E. vanpatteni Gorham
E. gorhami, n. sp.
E. championi, n. sp.
E. godmani, n. sp.
E. staudingeri group
E. circumcincta Mulsant
E. furtiva, n. sp.
E. staudingeri (Weise)
E. mammifera, n. sp.
E. conifera, n. sp.
E. corniventris, n. sp.
E. cacica group
E. spreta Mulsant
E. cacica (Guérin)
E. marginella (Fabricius)
E. velutina (Olivier)
E. concolor Mulsant
E. darlingtoni, n. sp.
E. pseudorealis, n. sp.
E. velata Erichson
E. extrema Crotch
E. merae, n. sp.
E. nigripes Weise
Genus *Dira* Mulsant, n. status
D. clarkii (Crotch), n. comb.
D. obscurocincta (Klug), n. comb.
D. subcincta (Mulsant), n. comb.
D. richteri, n. sp.
D. tomentosa (Mulsant), n. comb.
D. gossypioides, n. sp.
D. gossypiata (Mulsant), n. comb.
D. nucula (Weise), n. comb.
D. inexculta, n. sp.
Tribe Madaini, n. tribe
Genus *Pseudodira*, n. genus
P. clypealis, n. sp.
Genus *Subcoccinella* Huber
S. vigintiquatuorpunctata (L.) (see p. 206)
Genus *Lorma*, n. genus
L. nevermanni, n. sp.
L. specca, n. sp.
L. apicalis, n. sp.
L. rufoventris (Mulsant), n. comb.
L. glaucina (Mulsant), n. comb.
L. haliki, n. sp.
L. imitator, n. sp.
L. sicardi, n. sp.
L. sopita, n. sp.
L. paprzyckii, n. sp.
L. batesi (Crotch), n. comb.
Genus *Malata*, n. genus
M. mitis (Mulsant), n. comb.
M. burgdorfi, n. sp.
M. apatela, n. sp.
M. delphinae (Gorham), n. comb.
M. diekei, n. sp.
M. pseudomitis, n. sp.
Genus *Mada* Mulsant, n. status
M. fraterna (Mulsant), n. comb.
M. pseudofraterna, n. sp.
M. amydra, n. sp.
M. cayennensis, n. sp.
M. concentrica (Weise), n. comb.
M. desarmata (Mulsant), n. comb.
M. deyrollei, n. sp.
M. synemia, n. sp.
M. amazona (Weise), n. comb.
M. spinula, n. sp.
M. santaremae, n. sp.

M. xpada, n. sp.
M. gounellei, n. sp.
M. circumflua (Mulsant), n. comb.
M. flavomarginata, n. sp.
M. contempta (Mulsant), n. comb.
M. zonula (Mulsant), n. comb.
M. virgata (Mulsant), n. comb.
M. inepta (Gorham), n. comb.
M. adusta, n. sp.
M. polluta (Mulsant), n. comb.
M. amplexata (Mulsant), n. comb.
M. lineatopunctata (Germar), n. comb.
M. rabauti, n. sp.
M. dissita, n. sp.
M. elegans, n. sp.
M. circumducta (Mulsant), n. comb.
M. insolitaphallus, n. sp.
M. nexophallus, n. sp.
M. pseudodamata, n. sp.
M. azyoides, n. sp.

Genus *Damatula*, n. genus
D. carnegiana, n. sp.
D. fairmairei (Mulsant), n. comb.
D. earina, n. sp.
D. yurimagi, n. sp.
D. porioides (Weise), n. comb.
D. smarti, n. sp.
D. disjuncta, n. sp.
D. schwarzi, n. sp.
D. colombiana, n. sp.

Zoogeographic Considerations

The subfamily Epilachninae is distributed throughout the tropical regions of the world with nearly all the species found between the 30° lines of latitude. The map of the world distribution of the Epilachninae (map 1) shows that a large part of the area north of the equator between the 30° and approximately the 45° line is shaded. This is deceiving as only two species (*E. varivestis* and *E. borealis*) in North America and less than 10 species (including *E. niponica* Lewis, *E. chrysomelina* (F.), and *Henosepilachna admirabilis* (Crotch)) in the Old World actually occur above the 30° line. These are all widespread species with an obvious tolerance for extremes of climate and also, where known, there is a wide range of host plants, although these plants are nearly always members of the Cucurbitaceae.

In the New World the Epilachnini may be divided into four large groups based on the type of distribution. The *E. borealis* group extends from northeastern North America to northern Argentina and Uruguay and the members all seem to feed on cucurbits. The endemic Mexican and Central American species of *Epilachna* are rather diverse but are definitely distinct morphologically from the South American species of *Epilachna*. The typical species of the tribe Epilachnini are nearly all restricted to the Andean region of South America and form the bulk of the known species in the subfamily, whereas the *cacica* group of *Epilachna*, the genus *Dira*, and all the Madaini are predominantly eastern with only a few Andean species.

The genera *Dira* and *Pseudodira* are morphologically intermediate between the Epilachnini and the Madaini and are probably derived from the *cacica* group of *Epilachna*. Members of the genus *Dira* are practically excluded from the Andean region except Bolivia and northern Argentina. A single species, *D. nucula*, is presently known from Peru. This genus, except *D. obscurocincta*, is composed of species with restricted distribution, many of which are Brazilian. *D. obscurocincta* is the only widespread member of the genus, and although most of the records are from Brazil, several localities in northern Argentina and Bolivia are represented. Any analysis of this distribution pattern is difficult because of a nearly complete absence of host data, but *Dira* shows a great diversity in distribution, indicating several migrations. The lack of a definite pattern of distribution would also indicate that the migrations occurred rather early in the development of the New World epilachnine fauna.

The degree to which the Epilachnini distribution is tied to the host plant distribution is uncertain because of the lack of host data. Because of this it is impossible to venture a guess as to the importance of competition in affecting the present distribution of species. If some species prove to be host specific, and

they almost certainly will, then the competition factor may be extremely important. The significance for such omnivorous feeders as *E. paenulata* or *E. cacica* would, of course, be negligible.

From the available data (see discussion under Biology), climatic factors such as temperature and humidity would appear to be of more importance in limiting distribution than are the host plants, at least in the case of the Epilachnini.

In spite of the paucity of available host data, enough information can be gleaned from the distribution of the known host plants and from the occurrence of the beetles themselves to give a good indication of the origin and migration routes.

The center of speciation of the Epilachnini in the Western Hemisphere appears to be the Andean region of South America. The greatest number of species presently known is in central and southern Peru centering around Cuzco. This area is part of the Intercordilleran Belt as defined by Marsters (*1912*), also referred to as the Highland Plateau. This "belt" lies between the eastern and western ranges of the Andes and extends from central Bolivia in a nearly unbroken line into Ecuador. Judging by the number of species now known from this area, climatic conditions here must be more nearly ideal for the development of the Epilachnini than anywhere else in the Western Hemisphere. The distribution maps show a great concentration of species in the Highland Plateau with a few remnants of probable early migrations into eastern South America still surviving.

It is generally agreed that the Andean uplift occurred in the late Cretaceous period, and it may be assumed that the appearance of the epilachnine ancestor occurred in the Eocene or Oligocene era. This corresponds with the known fossil record of certain groups of insects, indicating they have existed essentially as we know today from Miocene times.

The place of origin of the world Epilachnini is open to question, but if the group did originate in tropical America, then the deduced ancestor would probably be a small spotted form resembling *E. quirozensis* and inhabiting south-central Peru. This assumption is based on the fact that there are more species known from this area than anywhere else in the New World, and the distribution of groups shows a pattern of migration from the Andean center.

The genus *Dira* and the *cacica* group of *Epilachna* are examples of the oldest migrations of Andean species into southern and coastal Brazil. Several species have evolved in each group since then, and both *Dira* and the *cacica* group are now well represented in Brazil. With the exception of *E. cacica* itself and *D. obscurocincta*, both *Dira* and the *cacica* group are composed of species having widely disjunct distributions, indicating relatively ancient migrations. *E. velutina* in French Guiana and *E. darlingtoni* in Colombia are good examples of this disjunct distribution (map 40).

A group exhibiting the type of distribution typical of the genus *Epilachna* at the present time is the *albovittata* group (map 12) composed of nine species. *E. consularis* is the northernmost representative, known from Bogota, Colombia, and apparently well separated, at least in terms of distance, from its nearest relatives in southern Ecuador. The group extends rather continuously down the Andes from Colombia to northern Argentina and has no known representatives elsewhere. If members of this group did migrate into Brazil at some favorable period in geological history, they were not able to survive subsequent changes in conditions.

The *flavofasciata* group is another closely knit group of species like the *albovittata* group found along the Andean chain from Venezuela to northern Argentina with a single widely disjunct species (*E. austrina*) found near Sao Paulo, Brazil (map 7). The distribution would indicate a relatively old migration, but there has been no evolution of other species in Brazil.

E. cacica exhibits a unique distribution pattern in that it has migrated from the Peruvian Andes along the Amazon nearly to the Atlantic and has apparently succeeded in crossing the inhospitably hot and arid area of northern Argentina and may exist there at present (map 40). *E. cacica* and *E. paenulata* (map 28) are the only members of the *Epilachna* genus known to occur in this area at the present time. Distribution of most species or

groups across northern Argentina is necessarily disjunct because of the arid effect of Patagonia and the heat of the Amazon region (see Smith, *1962*).

One of the best examples of speciation along the Andean chain with a south Brazilian element is the *staudingeri* group (map 39) containing five species endemic to the Andes from Ecuador to northern Argentina and a single species found only in southern Brazil.

The *axillaris* and *mutabilis* groups, which are very closely allied, are also Andean with the *axillaris* group predominant in Venezuela, Colombia, and Ecuador (map 29) and the *mutabilis* group predominant from central Peru to southern Bolivia (map 30). Here is another example of an ancient migration into Brazil and the subsequent isolation of a single species (*E. clandestina*) in the southern coastal States of Brazil. This is one of the few instances where a member of the genus is known from as far north along the Atlantic coast as Pernambuco. When this northern coastal distribution occurs, it is always restricted to the area of the coastal rain forest.

The present distribution of the genus *Epilachna* in Central America and Mexico corresponds closely to the region of Tropical Highlands as defined and illustrated by West (*1964*). This is not surprising as the genus shows a distinct preference for just such a region in South America as discussed here. The Tropical Highlands are characterized by cool temperatures, moderate rainfall, and temperate forests with tropical cloud forests on the higher slopes. This region extends as far south as western Panama with a wide break between south-central Honduras and north-central Costa Rica and essentially marks the southern limit of the distribution of the Central American species of *Epilachna*. A few species, such as *E. kraussi* and *E. pseudorealis*, are found in both Colombia and Panama, but these are rare instances. *E. kraussi* is a member of the wide-ranging *borealis* group and *pseudorealis* is a member of the distinctive *cacica* group. *E. mexicana* occurs in both Central America and in Colombia and Venezuela, but the South American populations have probably been introduced from Mexico or Central America although there is no direct evidence to support this assumption. The ubiquitous *E. tredecimnotata* occurs almost continuously from Arizona to Colombia and Venezuela.

Central and eastern Panama and extreme northwestern Colombia are nearly unbroken Tropical Lowlands, as defined by West (*1964*), and form an effective barrier to the migration of *Epilachna* species. This region is primarily responsible for the present isolation and consequent divergence of the Central American members of this genus. The reason for the occurrence of this disjunct group of species in Mexico and Central America may perhaps be attributed to two factors—the route of migration through Panama is very narrow and the climatic factors have been favorable for the spread of *Epilachna* only at intervals in the past rather than continuously. Members of the genus *Epilachna* probably invaded Central America in a series of different migrations over a long period; the last opportunity for invasion occurred a long time ago. Colombia and Nicaragua were separated until relatively recently (probably in the late Miocene or Pliocene) by ocean waters, which effectively prevented exchange of organisms. It is not known exactly when the land bridge, which is now Panama and Costa Rica, was formed, but it is virtually certain that land animals and plants spread across it during Upper Cretaceous times. Members of the Epilachninae probably migrated across the bridge in successive waves during favorable climatic conditions since the Eocene.

The *nigrocincta* group and *E. abrupta* are particularly indicative of the divergence of the Central American *Epilachna* from the South American species. Morphological differences that have arisen in the antenna, claw, and maxilla are highly unusual in Western Hemisphere species of *Epilachna*. The *olivacea* and *patula* groups are also distinctive in the type of male genitalia and obviously different from their South American relatives. The *borealis* group reaches its highest development in Mexico and Central America although it is not particularly associated with the Tropical Highlands. As indicated under Biology, the *borealis* group is made up of species feeding

primarily on cucurbits, and the members are apparently much more tolerant of extremes of climate than are most *Epilachna*.

As would be expected, the Madaini do not exhibit the same degree of difference between the South American and Central American species as do the Epilachnini since they are not restricted to high altitudes. Many South American species of Madaini are known from lowland areas and many of the Central American species are found in the same type of habitat. *Mada amydra* from Panama and *M. pseudofraterna* from French Guiana are very closely related and could not have been separated for any great length of time. In spite of the general similarity of members of the Madaini from the two regions, a group of species (genus *Malata*) has evolved in Mexico and Central America and is not represented in South America.

Morphological Characters

The following discussion of the various morphological details of members of the subfamily is based on the type species of *Epilachna, E. borealis*. Deviations from the typical form are discussed under each heading.

The size range is rather large for the subfamily, from about 3.6 to 11 mm. in length. Male specimens are nearly always smaller than the females, particularly in *Epilachna*, and the sexes can usually be distinguished on size alone.

Form.—The form is extremely variable throughout the subfamily. *E. borealis* (fig. 262) is regularly oval with the lateral margin of the elytron rounded from humeral angle to apex, the lateral margin distinctly explanate but not extremely so, and moderately convex in lateral view. The triangular or cordate form may have the lateral margin pinched medially as in *E. sellata* (fig. 141) or straight as in *E. flavofasciata* (fig. 128). Other variations are the elongate, oval form as in *Toxotoma venusta* (fig. 109); the elongate, apically pointed form of *E. kraatzi* (fig. 241); the small oval shape of *E. fenestrata* (fig. 192); the extremely gibbous form of *E. tumida* (fig. 324) and the tubercular condition of *E. bituberculata* (fig. 243); the nearly round, convex form of *E. cacica* with lateral margin of elytron barely perceptibly explanate (fig. 351); the round, slightly elongate form of *E. patula* (fig. 336); the round, convex form of most members of the Madaini as exemplified by *Mada zonula* (fig. 377); and the elongate, abruptly narrowed form of *Mada lineatopunctata* (fig. 381). The degree of explanation of the lateral margin of the elytron is extremely variable, ranging from the wide extreme exhibited by *E. latimargo* (fig. 242) to the condition found in the *cacica* group and the genus *Dira* as well as nearly all members of the Madaini in which the explanation is barely or not at all perceptible. These examples cover the major types of form in the subfamily, but nearly every possible degree of variation of these types can be found.

Color.—The major types of dorsal color pattern are the *E. borealis* type (fig. 262) with several dark spots on a lighter background; the *E. flavofasciata* type (fig. 128) with pale transverse bands on a dark background; the *E. azurea* type (fig. 253) with pale spots on a dark background; the *E. sellata* type (fig. 141) with the central area of the elytra pale, surrounded by dark border; the *E. basalis* type (fig. 305) with longitudinal dark vittae on a light background; the *E. pocohantae* type with the dorsal surface completely immaculate, pale; the *E. obscurella* type (fig. 333) with the dorsal surface completely dark in color; and the *Mada zonula* type (fig. 377) where the dorsal color pattern consists of concentric rings of contrasting color. All known color patterns in the Epilachninae may be derived from one or the other of the major types listed here. The ventral surface is uniformly dark, usually black in most species of the Epilachnini except the *borealis, cacica,* and related groups. Conversely, members of the Madaini are, with a few exceptions, predominantly pale beneath with perhaps a small area of the ventral surface black or dark.

Head.—The surface is finely punctured and pubescent. The distance between the eyes at

the narrowest point is about four times the width of the eye when observed in frontal view. The inner margin of the eye is slightly sinuate, the gena is slightly encroaching on the eye opposite the antennal insertion, and the eye is finely faceted. The antenna is inserted in a deep fossa opposite the center of the eye, and the distance between the antennal bases is a little more than twice the diameter of an eye. The clypeal margin is broadly, weakly emarginate, about as wide as the distance between antennal bases, and on a slightly higher plane than the base of the labrum (fig. 1).

The genus *Toxotoma* has the clypeus on a distinctly higher plane than the base of the labrum (fig. 5), and some members of the genus *Epilachna* also have a noticeable change of plane as in *E. aureola* (fig. 2). The 11-segmented antenna is rather uniform in most members of the subfamily. *E. borealis* has a long, slender antenna with a loose club (fig. 10); *E. staudingeri* has a slender antenna with club segments feebly produced on the inner margin (fig. 11); *E. abrupta* has a shortened, compact antenna, segments 4–8 wider than long, and inner margin of club segments feebly produced (fig. 12); *E. obscurella* has the club compact and inner margin of the segments strongly produced (fig. 13); *Dira obscurocincta* has a compact antenna with basal segment large and the inner margin of club segments strongly produced (fig. 14); *Damatula carnegiana* has the apical segment of the club truncate (fig. 15). The labrum is more variable than any other mouthpart except the mandible and is often characteristic of a group of species.

The major types are the *E. borealis* type (fig. 16) with the apex nearly truncate, about twice as wide as long, and with an anterior fringe of setae easily visible on a dissected specimen; the *E. flavofasciata* type (fig. 17) with apex feebly arcuate, a large, pale area in apical one-half lacking setae; the emarginate, almost bilobed type found in *E. angustata* (fig. 18); the *E. patricia* type (fig. 19) with the apical margin emarginate and a strong dorsal carina near the base; the *Damatula carina* type (fig. 9) with apex broadly emarginate and about five times as wide as long; and the *Toxotoma* type as exemplified by *T. venusta* (fig. 5), in which the labrum is deeply emarginate or concave anteriorly.

The basic type of mandible in the Epilachninae does not have the basal tooth found in other subfamilies of the Coccinellidae and has three major teeth in apical one-half. Often minor teeth are present on the margins of the major teeth and on the inner margin of the mandible below the third tooth. In some instances the mandible is useful in separating species, but its form is usually a group character rather than a specific character. The mandible is difficult to remove for examination without completely dissecting the head, and no attempt has been made here to illustrate the mandible of every species of the Epilachninae. There is some intraspecific variation caused by wearing of the mandible and sometimes a tooth is broken off. Possibly some of the differences in the mandible structure are associated with the type of host plant, but lack of data prevents any speculation in this area.

The most highly developed type of mandible is found in the genus *Toxotoma,* where it is thick, robust, and obviously a grinding, crushing organ. The *T. cuzcoensis* type of mandible (fig. 20) is extremely thick, bifid at the apex with the lower tooth with several minor teeth on the lower margin, the second major tooth is bifid, the lower tooth serrate, and the third major tooth smaller and close to the second tooth; the *T. jujuyi* type (fig. 21) is simple with the apical tooth bifid, lower part much longer than upper, no minor teeth present, and second and third major teeth close together, appearing as a single bifid tooth.

The type of mandible found in members of the genus *Epilachna* is usually not as robust as in the *Toxotoma* type (except the *basalis* group) and is based on the following major types:

The *E. borealis* type (fig. 22) with apical tooth bifid or feebly trifid, lower part with minor teeth on lower margin, second and third major teeth large, simple, extending to middle of mandible, inner margin of mandible below third tooth serrate; the *E. varivestis* type (fig. 23), which is basically like the *E. borealis* type but with apical tooth very blunt; the *E. patricia* type (fig. 24) in which the major

teeth are grouped in apical one-third and the inner margin of the mandible below the third tooth is not serrate; the *E. obscurella* type (fig. 25) with the lower surface of the second and third major teeth with small, pointed dentules; the *E. basalis* type (figs. 26, 26*a*), which is extremely thick, the apical tooth bifid, apex of lower part nearly truncate, second major tooth broad, truncate, third major tooth with apex feebly bifid; the *Dira obscurocincta* type (fig. 27), which has the lower margin of the three major teeth and inner margin of the mandible below the third tooth densely denticulate with minor teeth; the *Lorma haliki* type (fig. 28) with apical tooth strongly trifid, and inner margin below the third tooth with several strong minor teeth; and the *Mada polluta* type (fig. 29) with apex strongly trifid, second and third teeth strong, simple, and no minor teeth present. The mandible types discussed here are the basic ones found in the subfamily, at least in the Western Hemisphere. Some of the variations on these types are illustrated as follows: *Toxotoma murilloi* (fig. 30), *Epilachna lorata* (fig. 31), *E. angustata* (fig. 32), *E. vittigera* (fig. 33), *E. orthostriata* (fig. 34), *E. abrupta* (fig. 35), *E. tumida* (fig. 36), *E. mexicana* (fig. 37), *E. pastica* (fig. 38), *E. flavofasciata* (fig. 39), *E. cruciata* (fig. 40), *E. fenestrata* (fig. 41), *E. staudingeri* (fig. 42), *E. cacica* (fig. 43), *E. nigrocincta* (fig. 44), *E. vincta* (fig. 45), *E. difficilis* (fig. 46), *Malata mitis* (fig. 47), and *Damatula carnegiana* (fig. 48).

The maxilla is rather constant in the subfamily and the type found in *E. borealis* (fig. 49) is rather typical. The shape of the lacinia is subject to some variation as illustrated by the broad, rounded form found in *E. difficilis* (fig. 50), the short, narrow form found in *T. cuzcoensis* (fig. 51), and the extremely short, insignificant form found in *E. nigrocincta* (fig. 52). The *nigrocincta* group has aberrant maxilla also in that the apical segment of the palpus is not strongly securiform and the galea and lacinia are not densely pubescent. The labium as illustrated for *E. borealis* (fig. 53) is basically the same for the entire subfamily. The labium is typically oval with apex produced and the palpus inserted medially, and the apical segment of the palpus noticeably shorter than the second segment. Some variations of this basic type are as follows: The *E. flavofasciata* type (fig. 54) with apex of labium feebly produced, the apical segment of the palpus slender, longer than second segment; the *T. cuzcoensis* type (fig. 55), which is similar to that of *E. flavofasciata* but has the basal segment of the palpus more than one-half as long as the second segment; the *E. nigrocincta* type (fig. 56) with the apex of the labium strongly produced, narrow; the *Dira obscurocincta* type (fig. 57) with the palpus short, wide, apex of terminal segment broadly rounded, terminal segment longer than second segment; and the *Malata mitis* type (fig. 58) with the palpus inserted subterminally and the terminal segment of the palpus small, about one-half as long as the second segment.

Pronotum.—The surface of the pronotum is pubescent and punctured; the punctures are always denser along the lateral margin than on the disk. The discal area is usually shining and without alutaceous sculpture, whereas the lateral one-fourth is dull and alutaceous, sometimes strongly so. The anterior margin is strongly emarginate posterior to the head and the anterolateral angle is rounded and projecting. The lateral margin is broadly explanate; a lateral bead extends from the apical angle to the basal angle. The basal margin has no bead and is evenly rounded except for a feeble emargination near the posterolateral angle on each side.

Elytron.—The surface of the elytron is always punctured, usually with a dual system of punctures, the small punctures more or less regularly spaced with the large punctures irregularly scattered throughout. Several species, including *E. borealis*, have only a single size of puncture regularly spaced. The area between the punctures is usually smooth and shining but often will have fine, reticulate lines or even be strongly alutaceous (*T. venusta*) or rugose (*T. rugulosa*). Pubescence is always present, usually short, slightly appressed but may be erect (*T. pilosula*) or so short as to make the elytron appear glabrous (*Mada lineatopunctata*). The usual color of the pubescence is a grayish white, but it may be yellow (*E. emerita*), or rusty red (*E.*

pseudospilota), or reddish brown. The humeral callus is nearly always strongly raised and distinctly visible in *Epilachna* and *Toxotoma*, but it is rounded and not at all prominent in members of the *cacica* group, the genus *Dira*, and nearly all species of Madaini.

The epipleuron varies with the shape of the elytron and degree of explanation of the lateral margin. *E. borealis* has the epipleuron evenly rounded laterally, not strongly widened anterior to middle (fig. 59); *E. fenestrata* has the epipleuron similar to that of the *E. borealis* type but even less strongly widened anterior to the middle (fig. 60); *E. flavofasciata* has the lateral margin slightly pinched and the area anterior to the middle strongly widened, more than twice as wide as the area immediately posterior to the middle (fig. 61); *Dira obscurocincta* has the lateral margin quite strongly rounded (fig. 62); and *Lorma haliki* has the epipleuron strongly, evenly rounded, the lateral margin strongly descending, and depressions present for apices of the middle and hind femora (fig. 63).

Prosternum.—The prosternum is short and the intercoxal protuberance narrow, with bluntly rounded or nearly truncate apex.

Mesosternum.—The mesosternum is short, the anterior margin has a small notch for reception of the prosternal process, and the distance between the mesocoxae is more than twice the distance between the procoxae.

Metasternum.—The metasternum has the anterior intercoxal projection truncate or feebly rounded and the midline distinct. The postcoxal line behind the mesocoxa reaches the lateral margin of the metasternum at the midpoint.

Legs.—The legs are described in the various generic descriptions (figs. 64–79). *Epilachna* and *Toxotoma* have tarsal claws of the *E. borealis* type (fig. 80); a few species have a suggestion of a basal angulation, and the second tooth is more slender as in *E. abrupta* (fig. 81). The *E. nigrocincta* group, however, has a claw with the second tooth broad, rising at the base of the claw (fig. 82). *Dira obscurocincta* has a claw with a small but distinct basal angulation (fig. 83). Members of the Madaini show the most diversity in types of claws. The genus *Lorma* has a claw with the basal angulation barely perceptible as typified by *L. haliki* (fig. 84). The claw of *Mada* has a strong basal angulation, appearing trifid as in *M. polluta* (fig. 85). *Malata* has the second tooth of the claw broad, rising nearly at base, no basal angulation present, and the second teeth on the two opposing claws touching each other or nearly so as in *M. mitis* (fig. 86). *Damatula* has claws with a distinct angulation but not so strong as in *Mada*. This type is exemplified by the claw of *D. schwarzi* (fig. 87) and *D. carnegiana* (fig. 88).

Abdomen.—The abdomen of all epilachnines has six visible sterna; the sixth protrudes from under the fifth and is clearly visible. The surface of each sternum is distinctly, evenly punctured and pubescent. The postcoxal line behind the metacoxa on the first abdominal sternum is of some importance in separation of genera and species. In the basic *Epilachna* type the line extends beyond the middle of the sternum and is complete as in *E. borealis* (fig. 89); the line may be of the *E. borealis* type and be incomplete and directed toward the base of abdomen as in *E. pastica* (fig. 90); incomplete and not extending beyond the middle of the sternum as in *E. vittigera* (fig. 91); complete with the lower part flattened as in *E. fenestrata* (fig. 92); incomplete, rounded, extending nearly four-fifths the distance to the hind margin of the sternum as in *E. difficilis* (fig. 93); extremely incomplete as in *E. vincta* (fig. 94); and incomplete with the line directed toward the lateral margin of the abdomen as in *E. cacica* (fig. 95). In *Toxotoma* the postcoxal line is incomplete as in *T. murilloi* (fig. 96) or incomplete and extremely indistinct as in *T. cuzcoensis* (fig. 97).

Members of the Madaini and the genus *Dira* have the postcoxal line distinctly incomplete, always extending well beyond the middle of the sternum and often to the posterior margin of the sternum. The line may be rounded as in *Dira obscurocincta* (fig. 98); V-shaped as in *Pseudodira clypealis* (fig. 99); abruptly angulate, extending to the hind margin of the sternum, and the outer part of the line evenly curved as in *Damatula carnegiana* (fig. 100); angulate but not abruptly so and outer part of line evenly curved as in *Damatula sch-*

warzi (fig. 101); or angulate but not abruptly so, not entirely reaching the hind margin of the sternum, and outer part of the line recurved slightly then curved outward as in *Lorma haliki* (fig. 102). The postcoxal line has been observed to vary considerably in specimens of the same species, particularly in the Madaini and in the *axillaris* and *mutabilis* groups of *Epilachna*.

The hind margin of the fifth sternum in the male or female or both may be notched, broadly emarginate, or feebly emarginate medially. This is particularly true of members of the genus *Toxotoma* and a few species of *Epilachna* but extremely rare in the Madaini. The hind margin of the sixth sternum is nearly always notched or emarginate in the male and usually so in the female. The notch may be very deep as in males of *E. flavofasciata* or simply a feeble emargination as in males of *E. borealis*. Females often have the apex of the sixth sternum truncate as in *E. flavofasciata* (fig. 1227) or produced as in *T. hayuardi* (fig. 1193).

As a rule, the members of the Madaini, both males and females, show much less modification of the sixth sternum and tergum than do members of the Epilachnini. The hind margin of the sixth tergum in the Epilachnini is usually entire and convex, but several species have deep notches as in *E. flavofasciata* (fig. 1228) or more shallow notches as in *E. patricia* (fig. 565).

Males and females in species of Epilachnini usually may be separated by differences in the apical abdominal sterna. If there is a difference between the sexes, the male almost invariably has the deepest notch or emargination of the sixth sternum, whereas the female often has no notch or emargination or has a shallower notch than the male. The fifth sternum in the male is usually truncate or emarginate and truncate or produced medially in the female. If the apex of the abdomen is bent upward toward the elytron, the specimen will usually be a female. Since the male has the sclerotized genitalia within the abdomen, this rarely happens in that sex.

Genitalia.—The male genitalia are the single best means of determining the species in the Epilachninae. In this bulletin the genitalia are the primary criterion for defining the various groups within the genus. Since the genitalia are described under the group headings, a detailed discussion will not be given here.

The female genital plate is useful as a diagnostic character for both groups and species. The plate is always a relatively short, broad structure with the stylus usually but not always visible. In some instances the stylus is simply concealed in the plate at the very apex and can be seen in apical view, but in several instances such as in the genus *Dira*, the stylus seems to be completely missing (fig. 1836). As discussed by Dieke (*1947*), the genital plates are the divided ninth sternum, which is enclosed on each side by the divided ninth tergum. The 10th tergum also lies between the two parts of the ninth tergum and this combination of the ninth sternum, ninth tergum, and 10th tergum is herein referred to collectively as the female genitalia. The female genitalia are enclosed dorsally and ventrally by the sixth tergum and sixth sternum, respectively.

The inner parts of the female genitalia are the ovaries, oviducts, vagina, bursa copulatrix, and receptaculum seminis. In many groups of the Coccinellidae these structures, the receptaculum seminis in particular, are of value in separating genera and even species, but in the Epilachninae the receptaculum seminis is small, difficult to find, and does not seem to differ to any great degree. The sperm duct is extremely short and the receptaculum is small, sausagelike, sometimes with an accessory gland present as illustrated by *E. sexmaculata* (fig. 105) or without a gland as in *E. quirozensis* (fig. 106), *E. cacica* (fig. 107), and *T. cuzcoensis* (fig. 108).

Biology

Biological data, except for *E. borealis* and *E. varivestis*, are almost nonexistent for the Western Hemisphere Epilachninae. In the following list are summarized the known host plants and the families to which they belong. Most of the information was taken from the specimen labels and much of it may reflect accidental occurrence or the host plant may

be incorrectly identified. Some of the data are from Hayward (*1942*) and Bosq (*1943*).

Epilachna *species*	*Host plants*
flavofasciata	*Solanum nigrum* L.; "potato" (Solanaceae)
dives	*Solanum* sp. (Solanaceae)
eusema	*Solanum granuloso-leprosum* Dunal (Solanaceae)
austrina	*Solanum* sp. (Solanaceae)
dorsigera	*Nicotiana* sp. (Solanaceae)
deuterea	*Solanum hyporhodion* K. & B. (Solanaceae)
cruciata	*Cestrum diurnum* L. (Solanacene)
orthostriata, *sexmaculata*, *weisei*	*Solanum* sp. (Solanaceae)
fenestroides	*Baccharis* sp. (Compositae)
zischkai	*Solanum* sp. (Solanaceae)
freudei	on composite?
conjuncta	*Solanum* sp. (Solanaceae)
incaorum	*Nicotiana tomentosa* R. & P. (Solanacene)
tredecimnotata	*Cyclanthera* sp., squash, "wild cucurbit," "native ground vine," and watermelon (Cucurbitaceae)
paenulata	*Cayaponia ficifolia* Cogn. (Cucurbitaceae)
mexicana	*Solanum* sp. (Solanaceae)
abrupta	*Solanum torum* Sw. (Solanaceae)
cacica	*Cayaponia triloba* Grisch. (Cucurbitaceae)
Dira obscurocincta	*Aristolochia argentina* Gris. (Aristolochiaceae)

In addition to the specific host data, Hayward (*1942*) and Bosq (*1943*) listed both *E. cacica* and *E. paenulata* as feeding on "melons," "zapallos" (*Cucurbita maxima*), and "sandias." Hayward and Bosq also recorded *E. patricia* and *E. eusema* as feeding on various species of Solanaceae. From the available data it would appear that many species of *Epilachna* are not at all host specific in their feeding habits, although a species does seem to feed only on a certain family of plants. *E. deuterea* may be an exception to this as the only host data available indicate that it feeds on *Solanum hyporhodion*, which is found only in coastal Venezuela, approximately the same area from which *E. deuterea* is known. With the exception of *S. hyporhodion*, nearly all the host plants are widespread and of little value as indicators. The record of *E. fenestroides* on *Baccharis* (Compositae) is apparently valid, although unusual in view of what is known of the host plant preference of other members of the genus. No host data are available for any member of the Madaini, but the record of *Dira obscurocincta* feeding on *Aristolochia argentina* may indicate the area in which to look.

Members of the Madaini feed, at least in general, on different host plants than do the members of the Epilachnini. The basic distribution patterns of the two tribes are not the same; one is primarily Andean and the other is primarily Brazilian and Central American. They are also different morphologically (mandibles and legs).

There may be a correlation between the habit of feeding on cucurbitaceous plants and the widespread species of *Epilachna*. E. *borealis, tredecimnotata, paenulata,* and *cacica* are all widely distributed, at least in comparison with most species of *Epilachna,* and all feed on cucurbits. No solanaceous feeding species of *Epilachna* is as widely distributed as are some of the cucurbit feeders.

E. abrupta has been taken feeding on *Solanum torum,* which is found throughout southern Mexico, Central America, the West Indies, and northern South America, and yet *E. abrupta* is known only from a limited area in Costa Rica and Panama. There are several similar examples. In many or perhaps most instances other limiting factors are more important than the plant host in determining the distribution of *Epilachna* species. The widespread species have invariably been recorded as feeding on a variety of plants and are obviously far from being host specific.

Brannon (*1937*) summarized the feeding habits, life history, and food plants of the squash beetle (*E. borealis*). He listed several host plants on which *borealis* completed its life cycle: *Cucurbita maxima* Duchesne, *Citrullus vulgaris* Schrad, *Cucumis sativus* L., *Cucumis melo* L., *Cucumis colocynthus* Schrad, *Langenaria vulgaris* Ser., and *Cucurbita moschata* Duchesne. The larvae feed entirely on the undersurface of the leaves, whereas the adults usually feed on the upper surface. Brannon also mentioned that the adult marks out feeding areas with its mandibles and feeds

inside these areas, seeming to prefer the resulting wilted area. The life history of *E. borealis* is probably similar to that of all the species in the *E. borealis* group and perhaps other groups as well.

E. varivestis feeds on members of the Leguminosae and is apparently unique in this respect in the New World. Unlike *E. borealis, E. varivestis* has been introduced into the Eastern United States and consequently causes far more damage than the native *E. borealis*. The preferred host plants of *E. varivestis* are beans of the genus *Phaseolus*, in particular varieties of *P. vulgaris* and *P. lunatus*. It can survive and develop on other plants, such as cowpea, soybean, hyacinth-bean and beggarweed (*Desmodium*). Chittenden and Marsh (*1920*) and White (*1941*) described the biology and summarized most of the information in the many publications on the subject. The actual method of feeding is different from that of *E. borealis* in that both adult and larva feed on the undersurface of the leaf giving the foliage a lacelike appearance.

The larvae of all known Epilachninae species are distinguished from larvae of other Coccinellidae by the presence of long branched spines on the dorsal and lateral surfaces. A description with illustration of the larva of *E. varivestis* by Chittenden (*1924*) may be taken as typical for members of this subfamily.

Subfamily EPILACHNINAE

Epilachniens Mulsant, 1846, p. 190.—Mulsant, 1850, pp. 696–697.
Epilachnini Costa, 1849, p. 69.—Weise, 1899, p. 214.—Casey, 1899, p. 102.
Trichosomides Mulsant, 1850, p. 696 (in part).
Epilachninae Ganglbauer, 1899, p. 947.—Korschefsky, 1931, pp. 16–17.—Blackwelder, 1945, p. 440.

Dorsal surface pubescent. Head retracted under pronotum so that hind margin of eye is usually covered by pronotum. Eye oblique, finely faceted, inner margin broadly, feebly curved. Labium with palpal insertion median or subterminal. Last segment of maxillary palpus securiform. Mandible without basal tooth but with several teeth of varying types in apical one-half. Antenna inserted in depression on inner side of eye, 11-segmented, first segment more than twice as long as second segment, third segment slender, slightly longer than second segment, last three segments forming a loose club, inner margins of all three terminal segments produced appearing slightly serrate. Pronotum narrower than elytron, usually narrowed toward apex, apical margin broadly emarginate with anterolateral angle produced extending forward slightly. Prosternal projection narrow, apex truncate or bluntly rounded. Mesosternum with triangular notch medially on anterior margin for reception of prosternal projection. Tarsus four-segmented; first and second segments broad, flattened ventrally, ventral surface densely pubescent, first segment enclosing base of second segment with apex broadly rounded, second segment enclosing base of third segment with apex truncate or feebly emarginate; third and fourth segments slender, sparsely pubescent, third segment partially concealed, fourth segment nearly three times as long as third. Female genital plate short, broad, stylus visible or not.

This subfamily is widely distributed, especially in the tropical areas of the world. The subfamily description is somewhat general since only the New World fauna has been studied in detail here. Dissection of several African and Asian species and reference to Dieke (*1947*) indicate that most of the Old World species will fit the subfamily description given here.

The subfamily synonymy given here includes only those references of specific importance so far as Western Hemisphere species are concerned. For more complete references up to 1932, see Korschefsky (*1931*).

In addition to morphological characters, the Epilachninae species are also unique in the Coccinellidae because of their phytophagous habits. Based on available data they are plant feeders. The only other coccinellid group known to have anything but predaceous habits are the Psylloborini, which feed on fungi spores.

Key to Tribes of Epilachninae

Apex of tibia with at least one distinct, pointed spur (fig. 64); all legs slender with tarsi received in tibial grooves; epipleuron descending externally or not, never with depressions for apices of femora; form variable ..... Epilachnini (p. 17)

Apex of tibia with or without spurs; anterior tibia short, wide (fig. 77); middle and hind tibiae with tarsi not received in tibial grooves; epipleuron always descending externally, nearly always with distinct depressions for apices of femora; small, form round, convex ..... Madaini (p. 206)

Tribe EPILACHNINI

Epilachnini Costa, 1849, p. 69.—Weise, 1899, p. 214.—Casey, 1899, p. 102.

Form usually oval, cordate, or elongate-oval, widest anterior to middle of elytra, lateral margin of elytron usually distinctly explanate. Legs with tibiae slender, nearly as long as femur and trochanter combined, tarsus received in tibial grooves (except middle and hind legs of *Dira*), anterior tibia with one or two large, pointed spurs at apex on inner margin, middle and hind tibiae each with two pointed spurs. Epipleuron flat or descending externally, usually wider anterior to middle than posterior to middle, no depressions for apices of middle and hind femora present. Postcoxal line often complete or nearly so (except *cacica* group and genus *Dira*), rounded, not angulate.

The *cacica* group and the genus *Dira* are not typical of the Epilachnini in many ways. They have a rounded form, lateral margin of elytron barely perceptibly explanate, and male genitalia highly distinctive for each group. These two groups are apparently intermediate between the Epilachnini and the Madaini. When more information becomes available, particularly biological data, the *cacica* group may prove to be a valid genus and may, along with the genus *Dira*, be placed in a separate tribe. The *cacica* group resembles the rest of the Epilachnini in that all legs have the tarsi received in tibial grooves. In *Dira* the middle and hind legs are of the type found in *Mada* and related genera, but the anterior tibia is of the *Epilachna* type as are the apical spurs found on all tibiae.

The tribal name Epilachnini was proposed by Costa in 1849 for two species, *E. chrysomelina* (F.) and *E. argus* Fourcroy, both Old World species. Authors who have used the name since have invariably used it in connection with species or groups of species that are typically epilachnine as treated here. The definition of the tribe as described here is sufficiently flexible to include the Old World species of *Epilachna, Henosepilachna, Afidenta,* and genera of similar appearance.

Key to Genera of Epilachnini

1. Form nearly round, convex (fig. 362); middle and hind tibiae without grooves for reception of tarsi (fig. 75); postcoxal line incomplete, extending more than three-fourths distance to hind margin of first abdominal sternum ..... *Dira* Mulsant (p. 199)

   Form oval, cordate, or elongate, not round; middle and hind tibiae with grooves for reception of tarsi (fig. 67); postcoxal line usually complete or nearly so, almost never extending more than three-fourths distance to hind margin of first abdominal sternum 2

2. Labrum with anterior margin concave, usually strongly so (fig. 5); mandible large, robust, extending well beyond labrum, apex bifid, lower tooth longer than upper, apices of both bluntly rounded or truncate (figs. 5–7) ..... *Toxotoma* Weise (p. 18)

   Labrum with anterior margin straight or emarginate, rarely concave (figs. 1–4); mandible small, at least partially concealed beneath labrum, often bifid but lower tooth not longer than upper, apices of apical teeth sharp, frequently with minor teeth present (figs. 21–26*a*) ..... *Epilachna* Chevrolat (p. 37)

Genus TOXOTOMA Weise

Toxotoma Weise, 1899, p. 257.—Korschefsky, 1931, p. 17.—Blackwelder, 1945, p. 440. Type-species: *Epilachna venusta* Erichson, by subsequent designation of Korschefsky (*1931*), p. 17.

Labrum with anterior margin concave, often appearing bilobed (figs. 5–7), not concealing mandible, on a lower plane than clypeus and separated from clypeus by strong, curved depression. Mandible large, robust, apex broad, bifid, lower tooth longer than upper, apices of both teeth rounded or nearly truncate, inner margin of mandible with at least two teeth which may be sharp or bluntly rounded (figs. 5–7). Femur and tibia of all legs (especially hind legs) long, slender, apex of femur usually extending beyond lateral margin of elytron, apices of middle and hind tibiae always with two sharp spurs, apex of anterior tibia with one or two spurs. Genitalia robust, phallobase either long with basal lobe laterally compressed as in *venusta* (fig. 377*a*) or short, thick, bent upward before apex as in *T. cuzcoensis* (fig. 402); sipho short, stout, with apical tooth or projection directed either anteriorly or ventrally (figs. 379*a*, 403).

All known *Toxotoma* species have these characters. In addition, all but a few species have several characters that are of value in recognizing the genus. These are as follows: Form elongate, narrow, convex across elytra; pubescence on elytra shorter and stiffer than on pronotum; elytron dark blue with two yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third; surface of elytron dull, strongly alutaceous; punctation on elytron not dual, punctures very fine, nearly invisible; abdomen with hind margin of sixth sternum strongly, widely emarginate, usually with a median tooth present in the female. Most of the characters in this last group may also be found in one or more species of *Epilachna*. Of the characters in the generic description, the form of the mandible is approached by a few *Epilachna* species, and the *albovittata* group of *Epilachna* has the *Toxotoma* type of male genitalia. As may be seen, *Toxotoma* is not strikingly different from *Epilachna*, but they are here considered to be two valid genera based on the combination of characters given here.

The group of species of the *T. venusta* type are peculiar in that all members have two sharp spurs at the apex of the anterior tibia (fig. 68), a character not observed anywhere else in the subfamily. The rest of the *Toxotoma* species have a single spur as in *Epilachna*. It is not certain what the significance of this character may be, but possibly two genera are involved here rather than one genus.

T. rosae and *T. rugulosa* having the *T. venusta* type of color pattern are aberrant in that the surface of the elytron is shining rather than dull. The Bolivian species with the *T. pilifera* type of color pattern have the elytron with a dual system of punctures and long, erect elytral pubescence. The body form varies from the *T. venusta* type to an oval, nearly round form as in *T. orbicula* or to oval with the posterior one-third strongly narrowed as in *T. murilloi*. The typical spotted form is common in Peru, and the *T. pilifera* type of color pattern becomes predominant in Bolivia and Argentina.

The male genitalia offer a convenient means of dividing the genus into groups. The long phallobase with laterally compressed basal lobe (associated with females in which the sixth sternum is nearly divided by the median emargination) is found in the group of species beginning with *T. venusta* and ending with *T. weyrauchi*. *T. huanucoi* has the phallobase short, stout, not thickened before the apex, and only slightly bent upward apically; *T. rugulosa* and *T. rosae* also fall in this category. The group of species beginning with *T. cuzcoensis* and ending with *T. leechi* has the basal lobe thickened, bulbous before the apex, abruptly bent upward to the apex, and the ventral surface with a median carina. *T. tridentata* and *T. forsteri* have the same basic type of genitalia as *T. cuzcoensis*, but the basal lobe is constricted before the apex and the median carina is lacking. The group of species beginning with *T. orbicula* and ending with *T. gentilis* has the basal lobe in ventral view broadly widened before the apex, median carina lacking, and the lateral apical angle prominent and rounded except in *T. gentilis*. The

group of species beginning with *T. pulchra* and ending with *T. jujuyi* has the phallobase elongate, laterally compressed, wide basally, and narrowed toward the apex. The sipho has the apical tooth directed anteriorly and the orifice is large and oval.

Both sexes of *Toxotoma* have distinctive genitalia. The difficulty often is in correctly associating males and females. In several instances, particularly in the *T. pilifera* group, it has not been possible to associate the two sexes with certainty. When this has happened, only the male has been described, leaving the female until such a time as correctly associated material becomes available. Species are described here based only on females, but only in cases where there is good reason to believe them distinct from any of the species known from males only.

Genitalia, particularly of the male, must be examined to correctly determine the identity of almost any specimen of *Toxotoma*.

Even less is known about the biology and species distribution of this genus than is known about *Epilachna*. Many species are as yet undescribed, and large series of adults and larvae taken in association with the host plant are needed to further clarify the classification of *Toxotoma*.

The range of the genus appears to be limited to the Andean region of South America with most of the species occurring in Peru. Species are known from Ecuador and Colombia south to northern Argentina. All specimens examined with altitude data were collected at high altitudes.

Weise (*1899*) erected the genus *Toxotoma* for *E. venusta* Erichson, *E. opacula* Crotch, and *T. andicola* Weise. In 1901 Weise added the species *E. rugulosa*. Since then only *T. forsteri* Mader has been described. As a result of this study, *E. pilifera* (Weise), *E. pulchra* (Weise), *E. humboldti* Mulsant, and *E. opulenta* (Weise) are transferred to *Toxotoma*. With the 24 new species described herein the *Toxotoma* species now total 33.

Key to Species of *Toxotoma*

1. Elytron bluish black with two yellow spots as in figure 109, if four yellow spots present, see *disparans* 2
   Elytron not as described above, either with single large, median orange area reaching suture or with single orange or yellow area not reaching suture 30
(1) 2. Abdomen with median area of sterna 2–4 yellow, occasionally with entire abdomen yellow or brownish yellow 3
   Abdomen with sterna completely black or dark brown to piceous 6
(2) 3. Abdomen with hind margin of fifth sternum deeply triangularly emarginate (only female known) ..... *mimetica*, n. sp. (p. 31)
   Abdomen with hind margin of fifth sternum truncate or weakly emarginate 4
(3) 4. Yellow spots on elytron small, 1 mm. or less in diameter (fig. 120) ..... *orbicula*, n. sp. (p. 29)
   Yellow spots on elytron large, 1.25 mm. or more in diameter 5
(4) 5. Form broad medially, abruptly narrowed in apical one-fourth, yellow spots on elytron 1.50–2.10 mm. in diameter ..... *longicrura*, n. sp. (p. 32)
   Form oval, narrowed evenly from middle of body to apex, yellow spots on elytron about 1.25–1.50 mm. in diameter ..... *chapini*, n. sp. (p. 31)
(2) 6. Surface of elytron shining, rugulose or not 7
   Surface of elytron dull, strongly alutaceous 10
(6) 7. Length 7.80 mm. or less ..... *pulchra* (Weise), n. comb. (p. 34)
   Length 7.50 mm. or more 8
(7) 8. Labrum weakly emarginate; mandible with apical teeth small, bluntly rounded ..... *disparans*, n. sp. (p. 36)
   Labrum broadly, strongly concave; mandible large, apical teeth nearly truncate 9
(8) 9. Labrum with apex concave, lower margin not produced farther than upper margin, appearing bilobed; distance from base of labrum to apex of mandible equal in length to first three segments of antenna (fig. 6) ..... *rosae*, n. sp. (p. 25)
   Labrum with apex concave, lower margin produced much farther than upper margin, not appearing bilobed; distance from base of labrum to apex of mandible equal in length to first five antennal segments (fig. 7) ..... *rugulosa* Weise (p. 26)
(6) 10. Males 11
   Females 21

(10) 11. Male genitalia with long, slender phallobase, basal lobe laterally compressed as in figure 383*a* 12
Male genitalia not as described above 15
(11) 12. Species known only from Ecuador ..... *opacula* (Crotch) (p. 22)
Species known only from Peru or Bolivia 13
(12) 13. Male genitalia with basal lobe bulbous before apex, apex blunt, nearly truncate in ventral view (fig. 377*a*) ..... *venusta* (Erichson) (p. 21)
Male genitalia not as described above 14
(13) 14. Male genitalia with apex of basal lobe truncate, anterolateral angle produced, abrupt (fig. 380*a*) ..... *nunenmacheri*, n. sp. (p. 22)
Male genitalia with apex of basal lobe trifid, median projection pointed (fig. 368*a*) ..... *townsendi*, n. sp. (p. 23)
(11) 15. Species known only from Ecuador 16
Species known only from Peru 17
(15) 16. Mandible with outer margin angulate medially ..... *banosi*, n. sp. (p. 24)
Mandible with outer margin strongly, evenly rounded throughout ..... *haywardi*, n. sp. (p. 30)
(15) 17. Male genitalia not thickened or bulbous before apex in lateral view (fig. 390) ..... *huanucoi*, n. sp. (p. 24)
Male genitalia not as described above 18
(17) 18. Male genitalia with apex of basal lobe irregularly trifid in ventral view, anterolateral angle projecting, median projection abruptly narrowed before apex (fig. 404) ..... *imitator*, n. sp. (p. 27)
Male genitalia not as described above 19
(18) 19. Male genitalia with basal lobe similar to that of *imitator* but with anterolateral angle rounded, not projecting (fig. 401) ..... *cuzcoensis*, n. sp. (p. 26)
Male genitalia not as described above 20
(19) 20. Male genitalia with basal lobe trifid, widest at apex, anterolateral angle strongly projecting, median projection strong, simple (fig. 407) ..... *leechi*, n. sp. (p. 27)
Male genitalia with apex of basal lobe trifid, much narrower than rest of lobe (fig. 410) ..... *tridentata*, n. sp. (p. 28)
(10) 21. Female sixth sternum nearly completely divided by median emargination as in figure 1146 22
Female with sternum not as described above 23
(21) 22. Species known only from Ecuador ..... *opacula* (Crotch) (p. 22)
Species known only from Peru or Bolivia ..... *venusta* (Erichson) (p. 21)
(21) 23. Female genital plate rectangular with posteromedian angle notched (fig. 1151); Bolivia ..... *locotalis*, n. sp. (p. 23)
Female genital plate not as described above 24
(23) 24. Species known only from Ecuador ..... *haywardi*, n. sp. (p. 30)
Species not known from Ecuador 25
(24) 25. Female genital plate oval, lateral margin sinuate, narrowed posteriorly (fig. 1155) ..... *weyrauchi*, n. sp. (p. 24)
Female genital plate not as described above 26
(25) 26. Female genital plate elongate, posteromedian angle abrupt, posterior margin angled upward, posterolateral angle obsolete (fig. 1174) ..... *cuzcoensis*, n. sp. (p. 26)
Female genital plate not as described above 27
(26) 27. Female genital plate elongate, inner margin angled inward toward apex, outer margin slightly sinuate (fig. 1177) ..... *leechi*, n. sp. (p. 27)
Female genital plate not as described above 28
(27) 28. Female genital plate nearly round, posterolateral angle projecting slightly (fig. 1181) ..... *andicola* Weise (p. 28)
Female genital plate not as described above 29
(28) 29. Female sixth sternum broadly emarginate with feeble median tooth (fig. 1156) ..... *huanucoi*, n. sp. (p. 24)
Female sixth sternum with large median tooth, tooth extending well beyond lateral projection (fig. 1160) ..... *soukupi*, n. sp. (p. 25)
(1) 30. Elytron with median area orange or yellow, completely bordered with bluish black 31
Elytron with median orange area reaching suture, joining orange area on opposite elytron 32
(30) 31. Species known only from Bolivia ..... *forsteri* Mader (p. 29)
Species known only from Colombia ..... *murilloi*, n. sp. (p. 30)
(30) 32. Males 33
Females 39
(32) 33. Male genitalia with basal lobe widened from base to apex in ventral view, median apical projection bluntly rounded (fig. 449) ..... *guerini*, n. sp. (p. 36)
Male genitalia not as described above 34

(33) 34. Male genitalia in ventral view widest at anterolateral angle, angle strongly projecting (fig. 428) ..... *chacoi*, n. sp. (p. 32)
Male genitalia not as described above 35
(34) 35. Male genitalia with lateral margin of basal lobe sinuate, anterolateral angle abrupt, median projection long, slender (fig. 431) ..... *gentilis*, n. sp. (p. 33)
Male genitalia not as described above 36
(35) 36. Male genitalia with basal lobe gradually narrowed from widest point anterior to middle to pointed apex (fig. 443) ..... *pilifera* (Weise), n. comb. (p. 35)
Male genitalia not as described above 37
(36) 37. Male genitalia with basal lobe as in *pilifera* except not as strongly narrowed and with rounded anterolateral angle just before apex (fig. 446) ..... *jujuyi*, n. sp. (p. 35)
Male genitalia not as described above 38
(37) 38. Male genitalia with basal lobe widest across anterolateral angle, angle rounded (fig. 437) ..... *opulenta* (Weise), n. comb. (p. 33)
Male genitalia with basal lobe widest behind anterolateral angle, angle feeble, abrupt (fig. 434) ..... *humboldti* (Mulsant), n. comb. (p. 33)
(32) 39. Length more than 8 mm.; female genital plate extremely elongate, sinuate (fig. 1223); Bolivia ..... *hiekei*, n. sp. (p. 36)
Length less than 8 mm.; female genital plate not as described above 40
(39) 40. Female genital plate elongate, slender, rounded on inner margin, sinuate on outer margin (fig. 1216) ..... *pilifera* (Weise), n. comb. (p. 35)
Female genital plate not as described above 41
(40) 41. Female genital plate with anterolateral angle abrupt (fig. 1208) ..... *opulenta* (Weise), n. comb. (p. 33)
Female genital plate with anterolateral angle rounded (fig. 1219) ..... *jujuyi*, n. sp. (p. 35)

Descriptions of *Toxotoma* Species

Toxotoma venusta (Erichson)

(Figs. 109, 377*a*–379*a*, 1142–1145; map 2)

Epilachna venusta Erichson, 1847, p. 184.—Mulsant, 1853, p. 167.
Toxotoma venusta: Weise, 1899, pp. 257–258.—Korschefsky, 1931, p. 17.—Blackwelder, 1945, p. 440.

Male.—Length 7.81 mm., width 5.68 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron feebly rounded from humeral angle to apex. Color black; mouthparts yellow to reddish black; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with two small, yellow spots, anterior spot posterior to and inside callus, posterior spot near lateral margin at apical one-third (fig. 109). Punctation on elytron fine, nearly invisible, punctures separated by two to five times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, short on elytron. Postcoxal line indistinct, incomplete medially, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum deeply emarginate medially, sixth sternum strongly, deeply notched; sixth tergum weakly emarginate. Genitalia with basal lobe compressed laterally, curved gently from base nearly to apex, apex curved upward, bluntly pointed, in ventral view lateral margin thickened before apex, apex nearly truncate; paramere curved downward, apex strongly widened (figs. 377*a*, 387*a*); sipho short, robust, constricted before middle, ventral tooth at apex sharp, orifice dorsal, subterminal (fig. 379*a*).

Female.—Similar to male except abdomen with hind margin of fifth sternum broadly emarginate; sixth sternum with wide, deep notch, nearly completely dividing sternum (fig. 1142); sixth tergum entire, strongly convex (fig. 1143). Genitalia with 10th tergum entire, convex (fig. 1144); genital plate with inner margin slightly emarginate anteriorly, lateral margin strongly curved, all angles rounded, stylus visible (fig. 1145).

Variation.—Length 7.30–9.15 mm., width 5.25–6 mm. One specimen examined had posterior spot on elytron extremely reduced in size, obscure, and invisible except under adequate magnification.

Type Locality.—Peru.

Type Depository.—MNHUB,[2] Berlin.

[2] For meaning of abbreviations, see under Acknowledgments.

Discussion.—This is one of the *Toxotoma* species in which more than one or two specimens were available for study. As is usual in the species with this type of color pattern, both male and female genitalia are distinctive and must be examined to accurately identify the species. The unique male type bearing the following labels was loaned by the MNHUB: "Peru m. Philippi"; "4505"; "Type" (orange paper); "venusta Er."; "Toxotoma venusta Er., det. R. Korschefsky 1939"; "Zoolog. Mus. Berlin."

Specimens Examined.—Total nine. PERU: "Peru." Huanuco: N. Chinchao, 1950 m. alt., VIII–18–1951, *Solanum* (?) sp., G. H. Dieke. Pasco: Oxapampa, 1600 m., 15–3–1940, Weyrauch; Oxapampa, Korschefsky collection. (MNHUB) (USNM).[3]

Toxotoma nunenmacheri, new species

(Figs. 380*a*–382*a*; map 2)

Male.—Length 8.30 mm., width 5.62 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with a greenish tinge near lateral margin, two yellow spots present, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third. Punctation on elytron distinct, punctures large, separated by one to two times their diameter. Surface of elytron dull, alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line indistinct, nearly obsolete, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum emarginate medially; sixth sternum notched; sixth tergum emarginate. Genitalia of the *venusta* type; basal lobe laterally compressed, curved downward nearly to apex, abruptly bent upward before apex, in ventral view narrowed before apex, apex feebly emarginate; paramere curved downward, slightly widened apically (figs. 380*a*, 381*a*); sipho with apical, ventral tooth small, orifice dorsal, subterminal (fig. 382*a*).

Female.—Not known.

Holotype.—Male. PERU: *Cuzco:* Vilcanota, Nunenmacher collection (CAS).

Discussion.—The genitalia of this species are closest to those of *venusta*, but the lateral margin of the basal lobe is not bulbous before the apex as in *venusta*, and the ventral projection of the sipho is small, not large and sharply pointed as in *venusta*. In addition to the genitalia, the distinct elytral punctures of *nunenmacheri* are unusual in the group of species related to *venusta*.

Toxotoma opacula (Crotch)

(Figs. 110, 383*a*–385*a*, 1146–1149; map 2)

Epilachna opacula Crotch, 1874, p. 67.
Toxotoma opacula: Weise, 1899, p. 257 (as a synonym of *venusta* Erichson).—Korschefsky, 1931, p. 17.—Blackwelder, 1945, p. 440.

Male.—Length 9.49 mm., width 6.63 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron nearly straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–7 yellow, 8–11 piceous; elytron bluish black with two small yellowish-orange spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third (fig. 110). Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, densely alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line obsolete. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum wide, hind margin protuberant, anterior margin broadly emarginate; sixth sternum notched; sixth tergum notched. Genitalia of the *venusta* type; basal lobe laterally compressed, curved downward to apical one-fourth, gently bent upward to blunt apex, in ventral view abruptly constricted before apex, lateral apical angle acute, apex pointed; paramere slender, curved downward, not widened apically (figs. 383*a*, 384*a*); sipho short, stout, apex truncate, orifice dorsal, subterminal (fig. 385*a*).

[3] Throughout this bulletin all information pertaining to material examined is given essentially as it appeared on the insect labels.

Female.—Similar to male except abdomen with hind margin of fifth sternum emarginate medially; sixth sternum widely, deeply emarginate without median tooth (fig. 1146), sixth tergum with shallow notch (fig. 1147). Genitalia with 10th tergum strongly, broadly emarginate (fig. 1148); genital plate triangular, anterior margin slanting posteriorly, inner margin sinuate, stylus visible on anteromedian angle (fig. 1149).

Variation.—Length 8.30–9.96 mm., width 5.93–6.75 mm. One specimen has lateral margin of elytron feebly pinched medially.

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The male genitalia are similar to those of *venusta*; the main difference is that the lateral apical angle of the basal lobe is nearer the apex and more sharply pointed in *opacula*. The female genitalia are strikingly different from those of *venusta*.

Specimens Examined.—Total five. ECUADOR: *Tungurahua:* Banos, IV–12–1939, W. MacIntyre; Runtun, XI–22–1938, F. M. Brown. (CAS) (UCCC) (USNM).

Toxotoma townsendi, new species

(Figs. 111, 386*a*–387*a*, 388; map 2)

Male.—Length 8 mm., width 5.76 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark bluish black with two large, yellowish-orange spots, anterior spot near suture anterior to middle, posterior spot near lateral margin on apical one-third (fig. 111). Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter on elytron. Postcoxal line incomplete, indistinct, reaching middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum wide, anterior margin convex, posterior margin broadly concave; sixth sternum emarginate; sixth tergum emarginate. Genitalia with basal lobe laterally compressed, curved, and angled upward in apical one-fourth, in ventral view abruptly narrowed at about apical one-fourth, small lateral tooth before apex, apex pointed; paramere curved, narrowed toward apex (figs. 386*a*, 387*a*); sipho short, robust, ventral tooth at apex sharp, dorsal projection blunt, orifice dorsal, subterminal (fig. 388).

Female.—Not known.

Holotype.—Male. PERU: Cajamarca: Rio Charape, 12–16 Sept. '11, C.H.T. Townsend collector (USNM 71623).

Discussion.—The abdomen with the broad fifth sternum and the concave hind margin of the fourth sternum in addition to the male genitalia should distinguish this species.

Toxotoma locotalis, new species

(Figs. 1150, 1151; map 2)

Female.—Length 9.74 mm., width 7.05 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with two large, yellow spots, anterior spot round, posterior to and inside callus, posterior spot transversely oval on apical one-third. Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Abdomen with hind margin of fifth sternum broadly, weakly concave; fifth sternum concave, feebly emarginate medially; sixth sternum deeply notched, sternum nearly completely divided; sixth tergum entire, convex (fig. 1150). Genitalia with genital plate rectangular, notched on posteromedian angle (fig. 1151).

Male.—Not known.

Holotype.—BOLIVIA: *Cochabamba:* Locotal, VIII–2–1951, on vegetation, G. H. Dieke (USNM 71624).

Discussion.—The combination of the large size, large elytral spots, and form of the genital plate distinguish *locotalis*. This is the only

species with the color pattern of typical *Toxotoma* thus far seen from anywhere except Peru or Ecuador.

Toxotoma weyrauchi, new species

(Figs. 112, 1152–1155; map 2)

Female.—Length 9.78 mm., width 6.78 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellowish brown to piceous; antenna with basal segment black, segments 2–8 brown, 9–11 piceous; elytron dark blue with two yellow spots, anterior spot slightly elongate, posterior to and inside callus, very near callus, posterior spot nearly round, near lateral margin on apical one-third (fig. 112). Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum broadly concave, weakly emarginate medially; sixth sternum deeply, widely notched, sternum nearly completely divided (fig. 1152); sixth tergum entire, convex (fig. 1153). Genitalia with hind margin of 10th tergum nearly truncate, feebly convex (fig. 1154); genital plate with inner margin evenly rounded, lateral margin broadly produced medially, narrowed toward base, all angles rounded (fig. 1155).

Male.—Not known.

Holotype.—PERU: *Pasco:* Oxapampa, I–10–1955, Weyrauch (USNM 71625).

Toxotoma huanucoi, new species

(Figs. 113, 389–391, 1156–1159; map 3)

Male.—Length 7.64 mm., width 5.53 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex, feebly rounded medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow; 9–11 piceous; elytron dark blue with two small, yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin at apical two-thirds (fig. 113). Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with fourth sternum strongly convex medially, hind margin broadly concave; fifth sternum with anterior margin strongly convex medially, hind margin broadly concave; sixth sternum broadly concave, notched medially; sixth tergum feebly emarginate. Genitalia with basal lobe broad basally, narrowed and angled downward to apical one-fourth, apex slightly curved upward, in ventral view narrow at base, widened to apex, lateral margin slightly sinuate, apex with lateral angle broadly rounded, median carina extending outward in median process; paramere broad, curved downward, widened at apex (figs. 389, 390); sipho short, stout, apex with sharp, ventral tooth, orifice dorsal, subterminal (fig. 391).

Female.—Similar to male except abdomen with hind margin of fifth sternum broadly concave, weakly emarginate; sixth sternum broadly, arcuately emarginate with small, blunt tooth at center of emargination (fig. 1156); sixth tergum entire, convex (fig. 1157). Genitalia with 10th tergum weakly convex (fig. 1158); genital plate elongate-oval, anterior angle produced, slightly notched before posteromedian angle, outer angle nearly obsolete (fig. 1159).

Variation.—Length 7.25–9.25 mm., width 5.83–6.98 mm.

Holotype.—Male. PERU: *Huanuco:* N. Chinchao, 1950 m. alt., VIII–18–1951, *Solanum* (?) sp., G. H. Dieke. (USNM 71626).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—10. PERU: Same data as holotype; *Huanuco:* Monson Valley, Tingo Maria, XII–11–1954, E. I. Schlinger and E. S. Ross collectors. (CAS) (USNM).

Toxotoma banosi, new species

(Figs. 392–394; map 3)

Male.—Length 7.95 mm., width 6.28 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron rounded

from humeral angle to apex, nearly straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark greenish blue with two small yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third. Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum broadly concave; sixth sternum notched; sixth tergum broadly, strongly notched. Genitalia with basal lobe thickened before apex, angled upward and outward to apex, apex slender, curved upward, in ventral view lateral apical angle abrupt, median projection strong; paramere very slender, slightly sinuate, feebly widened at apex (figs. 392, 393); sipho short, stout, apex with ventral tooth large, blunt, orifice dorsal, subterminal (fig. 394).

Female.—Not known.

Holotype.—ECUADOR: *Tungurahua:* Banos, IV–12–1939 (USNM 73288).

Paratype.—ECUADOR: "Equateur." (MNHUE).

Discussion.—The male genitalia of *banosi* resemble those of *huanucoi,* but the median projection of the basal lobe is elongate and curved upward in *banosi* and short, blunt, and not curved in *huanucoi.*

Toxotoma soukupi, new species

(Figs. 114, 1160–1163)

Female.—Length 8.41 mm., width 5.47 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron slightly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark greenish blue with two yellowish-orange spots, anterior spot anterior to middle of elytron, closer to suture than lateral margin, posterior spot near lateral margin on apical one-third (fig. 114). Punctation on elytron very fine, nearly invisible, punctures separated by one to five times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line complete, indistinct, reaching middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum broadly concave, feebly emarginate medially; sixth sternum broadly, arcuately emarginate with large median tooth longer than depth of emargination (fig. 1160); sixth tergum emarginate medially (fig. 1161). Genitalia with 10th tergum strongly convex (fig. 1162); genital plate elongate, inner margin sinuate with notch near posteromedian angle, lateral margin straight medially, all angles rounded (fig. 1163).

Male.—Not known.

Holotype.—Female. PERU: J. Soukup (MCZ).

Discussion.—The extremely strong tooth on the sixth sternum and the shape of the genital plate will separate *soukupi* from any presently known *Toxotoma* species.

Toxotoma rosae, new species

(Figs. 115, 395–397, 1164–1166; map 3)

Male.—Length 7.60 mm., width 5.81 mm. Form elongate-oval, widest anterior to middle of elytra, lateral margin of elytron slightly pinched. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with two large yellow spots, anterior spot nearly round, posterior to and inside callus, posterior spot transversely oval, near lateral margin on apical one-third (fig. 115). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to two times their diameter with tiny punctures at bottom. Surface of elytron shining, finely reticulate. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave, raised medially; fifth sternum wide, anterior margin strongly convex, posterior margin broadly concave; sixth sternum

notched medially; sixth tergum feebly emarginate medially. Genitalia with basal lobe concave dorsally, in lateral view stout, broad, abruptly bent upward at apex, in ventral view widened from base to apical one-fourth, lateral margin with blunt tooth at apical one-fourth, curved inward then out to abrupt apical angle, median carina extending out into stout projection at apex; paramere sinuate, widened apically (figs. 395, 396); sipho short, stout, base pronounced, strongly curved, apex with ventral tooth pronounced, sharp (fig. 397).

Female.—Similar to male except abdomen with hind margin of fourth sternum broadly, feebly concave; fifth sternum concave, projecting slightly medially; sixth sternum widely, arcuately emarginate with strong median tooth (fig. 1164); sixth tergum emarginate (fig. 1165). Genitalia with 10th tergum strongly convex; genital plate narrow, elongate, apical one-fourth narrowed and angled inward (fig. 1166).

Variation.—Length 7.60–8.40 mm., width 5.81–6.45 mm.

Holotype.—Male. PERU: *Cuzco:* Sta. Rosa, Convencion, 1936, Jaroslav Soukup. (USNM 71627).

Other Specimen.—Female. PERU: Lima ?: Soukup. (USNM).

Discussion.—This is one of the few *Toxotoma* species with the elytra not dull and opaque, resembling *rugulosa* in this respect. See discussion under *rugulosa*.

Toxotoma rugulosa Weise

(Figs. 116, 398–400, 1167–1170; map 3)

Toxotoma rugulosa Weise, 1901, p. 273.—Korschefsky, 1931, p. 17.—Blackwelder, 1945, p. 440.

Female.—Length 8 mm., width 5.81 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron slightly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark bluish black with two yellow spots, anterior spot posterior to and inside callus, posterior spot near lateral margin on apical one-third (fig. 116). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to two times their diameter, small punctures present on bottom. Surface of elytron shining, finely reticulate, and strongly rugulose. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly concave; sixth sternum widely, arcuately emarginate with strong, pointed, median tooth (fig. 1167); sixth tergum convex, entire (fig. 1168). Genitalia with 10th tergum weakly emarginate medially (fig. 1169); genital plate elongate with apex narrowed, abruptly angled inward, all angles rounded, posterior margin strongly convex (fig. 1170).

Male.—Similar to female except male genitalia similar to those of *rosae*, lateral margin of basal lobe abruptly narrowed at apical one-fourth, anterolateral angle abrupt; paramere slender, slightly sinuate (figs. 398, 399); sipho as in *rosae* except a series of small teeth present on ventral margin before apex (fig. 400).

Variation.—Length 8–8.60 mm., width 5.81–6.71 mm. Ground color of elytron varies from bluish black to greenish black and surface is more strongly rugose in some individuals than in others.

Type Locality.—Peru.

Type Depository.—Not known.

Discussion.—The type of *rugulosa* is apparently no longer in the MNHUB and could not be located. The specimens described here are closest to matching the description of *rugulosa* of any specimens examined with the possible exception of *rosae*. The strongly rugose elytron of these specimens makes it more likely that they are *rugulosa* than the specimens described here as *rosae*.

Specimens Examined.—Total 10. PERU: "Peru." *Cuzco:* Santa Ana, 3000 ft., 4 August, 1911, Yale Peruv. Exp. *Junin:* Chanchamayo, Korschefsky collection. (CAS) (USNM).

Toxotoma cuzcoensis, new species

(Figs. 117, 401–403, 1171–1174; map 3)

Male.—Length 7.68 mm., width 5 mm. Form elongate, oval, convex, widest anterior to middle of elytra, lateral margin of elytron nearly straight medially. Color black; mouth-

parts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron dark blue with two large yellow spots, anterior spot posterior to callus extending to near suture, posterior spot near lateral margin on apical one-third (fig. 117). Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum broadly concave; sixth sternum notched; sixth tergum emarginate. Genitalia with basal lobe strongly enlarged, bulbous before apex, abruptly curved upward to apex, in ventral view lateral margin abruptly angulate at apex, median projection angulate, bluntly pointed; paramere sinuate, widened apically (figs. 401, 402); sipho short, stout, orifice dorsal, subterminal (fig. 403).

Female.—Similar to male except hind margin of fifth sternum broadly emarginate medially; sixth sternum broadly, arcuately emarginate with short, blunt median tooth (fig. 1171); sixth tergum with strong emargination (fig. 1172). Genitalia with 10th tergum emarginate medially (fig. 1173); genital plate elongate, posteromedian angle abrupt, posterior margin angled upward, posterolateral angle obsolete, apex narrow, inner margin narrowed before apex (fig. 1174).

Variation.—Length 7.38–9 mm., width 4.59–5.60 mm. Yellow spots on elytron are slightly larger on some individuals than on others.

Holotype.—Male. PERU: *Cuzco:* Machu Picchu Pueblo, III–22–1947, J. C. Pallister (AMNH).

Allotype.—Female. Same data as holotype (AMNH).

Paratypes.—Total 116. PERU: Same data as holotype. *Cuzco:* Cuzco, Nunenmacher collection; Huadquina, 5000 ft., 24 July, 1911, Yale Peru. Exp.; Lucma, 7000 ft., 24 August, 1911, Yale Peruv. Exp.; Machu Picchu, XII–1947, W. K. Weyrauch; Machu Picchu, 29–I–1952, 2300 m., F. Monros, Machu Picchu Pueblo, March 20, 1947, alt. 6491 ft., J. C. Pallister; Madre d. Dios. *Puno*: Ocabamba, Staudinger. (AMNH) (CAS) (IML) (USNM).

Discussion.—The large elytral spots and elongate, narrow form along with both male and female genitalia distinguish this species. This is apparently a fairly common species in the vicinity of Machu Picchu and is one of the few *Toxotoma* species available for study in large numbers.

Toxotoma imitator, new species

(Figs. 404–406; map 3)

Male.—Length 8 mm., width 5.10 mm. Description as for *cuzcoensis* except differences as given here. Elytron dark greenish blue, narrow area between anterior and posterior spots dull black, both spots smaller than in typical *cuzcoensis*. Genitalia with basal lobe in ventral view with lateral angle before apex produced, appearing bluntly toothed, wider, more strongly and abruptly widened apically than in *cuzcoensis* (figs. 404, 405); sipho as in *cuzcoensis* (fig. 406).

Female.—Not known.

Variation.—Length 7.33–8 mm., width 5–5.15 mm.

Holotype.—PERU: *Cuzco:* Sta. Rosa, Convencion, 1936, Jaroslav Soukup (USNM 71628).

Paratypes.—Total one. PERU: *Cuzco:* Same data as holotype (USNM).

Discussion.—*T. imitator* resembles *cuzcoensis* closely, but the small elytral spots, dull black area on the elytron, and the strong, lateral projection of the basal lobe of the male genitalia separate *imitator*.

Toxotoma leechi, new species

(Figs. 118, 407–409, 1175–1177; map 4)

Male.—Length 7.76 mm., width 4.96 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with two small, yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third (fig. 118). Pronotum narrow with lateral

margin feebly explanate. Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line nearly obsolete, a trace visible at base. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum concave, feebly emarginate medially; sixth sternum triangularly emarginate medially; sixth tergum weakly emarginate. Genitalia with basal lobe thickened, bulbous before apex, abruptly curved upward to apex, apex bent outward, in ventral view lateral margin with apical angle produced, strong median carina extending from bulbous area to base of bluntly pointed median projection; paramere not widened apically (figs. 407, 408); sipho short, stout, strongly curved in apical one-third, orifice dorsal, subterminal (fig. 409).

Female.—Length 9.18 mm., width 5.39 mm. Similar to male except hind margin of fifth sternum feebly, broadly concave; sixth sternum widely, arcuately emarginate with short, blunt, median tooth (fig. 1175); sixth tergum emarginate medially. Genitalia with 10th tergum strongly convex (fig. 1176); genital plate elongate, inner margin angled inward toward apex, outer margin slightly sinuate (fig. 1177).

Variation.—Length 6.74–8.90 mm., width 4.39–5.57 mm.

Holotype.—PERU: *Huanuco:* E. side Carpish Mts., 2800 m., 40 mi. SW. Tingo Maria, X–17–1954 (CAS).

Allotype.—Female. Same data as holotype (CAS).

Paratypes.—Total eight. PERU: *Huanuco:* Same data as holotype; n. Chinchao, VIII–18–1951, Solanum (?) sp., G. H. Dieke. (CAS) (USNM).

Discussion.—*T. leechi* resembles *cuzcoensis,* but the elytral spots are smaller and the form is narrower and more elongate than in *cuzcoensis.* The male genitalia are different in the form of the apex of the basal lobe.

Toxotoma andicola Weise

(Figs. 1178–1181)

Toxotoma andicola Weise, 1899, p. 257.—Korschefsky, 1931, p. 17.—Blackwelder, 1945, p. 40.

Female.—Length 7.94 mm., width 5.41 mm. Description as for *tridentata* with differences discussed here. Abdomen with hind margin of sixth sternum broadly, feebly emarginate, a weak, blunt, median projection present (fig. 1178); sixth tergum emarginate medially (fig. 1179). Genitalia with 10th tergum entire, convex (fig. 1180); genital plate nearly round, posterolateral angle projecting slightly (fig. 1181).

Male.—Not known.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—The unique female type is the only specimen of *andicola* examined. At least the females of this species should be easily recognized by the nearly round genital plate, which does not resemble closely that of any known species of *Toxotoma.* The type bears the following labels: "Peru, Staud." (green paper); "Toxotoma andicola Ws."

Toxotoma tridentata, new species

(Figs. 410–412, 1182–1184; map 4)

Male.—Length 7.44 mm., width 5 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark bluish green with two yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third. Pronotum narrow, lateral margin feebly explanate. Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line obsolete. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum with hind margin concave medially; sixth sternum strongly emarginate medially; sixth tergum emarginate medially. Genitalia with basal lobe thickened, bulbous before apex, abruptly bent upward to apex, in ventral view narrowed before apex, lateral margin arcuate, lateral apical angle acutely projecting, median projection short, blunt; paramere not widened at apex (figs. 410, 411); sipho short, stout, laterally

compressed before apex, orifice dorsal, subterminal (fig. 412).

Female.—Similar to male except abdomen with hind margin of fifth sternum broadly emarginate; sixth sternum widely, arcuately emarginate with distinct, sharp, median tooth (fig. 1182); sixth tergum with abrupt, shallow, median emargination (fig. 1183). Genitalia with 10th tergum truncate, feebly emarginate medially; genital plate elongate, inner margin narrowed toward apex, lateral margin feebly sinuate (fig. 1184).

Variation.—Length 7.44–8 mm., width 5–5.10 mm.

Holotype.—Male. PERU: *Cuzco:* Callanga, II, 10–III,17,1953, Woytkowski (USNM 71629).

Allotype.—Female. Same data as holotype (USNM).

Paratype.—Total one. Same data as holotype (USNM).

Discussion.—The male genitalia of *tridentata* are similar to those of *leechi*, but the apex of the basal lobe in *tridentata* is sharply constricted before the apex and the apex is much narrower than in *leechi*, appearing tridentate.

Toxotoma forsteri Mader

(Figs. 119, 413–415, 1185–1188; map 4)

Toxotoma fosteri Mader, 1958, p. 1.

Male.—Length 7.94 mm., width 5.39 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron slightly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with large, elongate orange spot occupying median area, spot oval, slightly constricted medially (fig. 119). Punctation on elytron very fine, nearly invisible, punctures separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Pronotum narrow, lateral margin feebly explanate. Postcoxal line nearly obsolete, short basal part visible. Abdomen with hind margin of fourth sternum nearly truncate; fifth sternum broadly emarginate medially; sixth sternum with triangular notch. Genitalia of the *tridentata* type; basal lobe thickened, bulbous before apex, abruptly bent upward to apex, in ventral view apical one-sixth narrow, lateral apical angle slightly projecting, bluntly rounded, median projection strong, blunt; paramere sinuate, feebly widened at apex (figs. 413, 414); sipho short, stout, orifice dorsal, subterminal (fig. 415).

Female.—Similar to male except abdomen with hind margin of fifth sternum feebly emarginate medially; sixth sternum with broad, deep, median emargination with strong median tooth (fig. 1185); sixth tergum weakly emarginate (fig. 1186). Genitalia with 10th tergum nearly truncate, feebly emarginate (fig. 1187); genital plate elongate, inner margin slightly produced medially, anterolateral angle abrupt (fig. 1188).

Type Locality.—Bolivia: *Cochabamba:* Yungas de Arepucho Sihuencas, 2200–2500 m.

Type Depository.—ZSBS.

Discussion.—The dorsal color pattern of *forsteri* is thus far unique in *Toxotoma*, except for that of *murilloi*. The male genitalia place it near *tridentata*, which has a typical *Toxotoma* color pattern. The holotype female and a single female paratype have been examined as well as a male in the USNM collection.

Specimens Examined.—Total three. BOLIVIA: *Cochabamba:* Types; Br. Ichilo R., Rain Forest, Oct. 15–16, 1966, B. and K. Burks. (FM) (USNM) (ZSBS).

Toxotoma orbicula, new species

(Figs. 120, 416–418; map 4)

Male.—Length 7 mm., width 6.05 mm. Form oval, rounded, widest anterior to middle of elytra, lateral margin of elytron arcuately rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment piceous, segments 2–8 yellow, 9–11 piceous; abdomen with median area of sterna 2–5 yellow; elytron dark blue with two yellow spots, anterior spot posterior to and inside callus, posterior spot near lateral margin on apical one-third (fig. 120). Punctation on elytron fine, distinct, punctures separated by one to two times their diameter. Surface of elytron feebly shining, densely reticu-

late, two systems of reticulation present, coarse lines of reticulation between punctures with secondary network of fine lines radiating out from coarse lines. Pubescence grayish white, hair on elytron as long as on pronotum. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly concave; sixth sternum emarginate medially; sixth tergum emarginate medially. Genitalia with basal lobe thickened, bulbous before apex, angled upward and outward to apex, in ventral view lateral margin strongly, widely produced, apical angle broadly rounded; paramere sinuate, widened toward apex (figs. 416, 417); sipho short, stout, orifice dorsal, subterminal (fig. 418).

Female.—Not known.

Holotype.—Male. PERU: *Huanuco:* n. Chinchao, VIII–18–1951, *Solanum* (?) sp., G. H. Dieke (USNM 71630).

Discussion.—*T. orbicula* is easily distinguished from any known species of *Toxotoma* by its round form, feebly shining and densely reticulate elytron, and the yellow area of the abdomen.

Toxotoma murilloi, new species

(Figs. 121, 419–421, 1189–1192; map 4)

Male.—Length 7.29 mm., width 6 mm. Form oval, rounded, widest anterior to middle of elytra, lateral margin of elytron broadly rounded from humeral angle to apex, narrowed strongly in apical one-fourth. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–7 yellow, 8–11 piceous; abdomen with median area of sterna 1–5 yellow; elytron yellow, completely margined with dark blue, margin widest near scutellum and at apical angle (fig. 121). Punctation on elytron very fine, nearly invisible, punctures separated by one to two times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum concave, feebly emarginate medially; sixth sternum notched; sixth tergum strongly emarginate. Genitalia of the *orbicula* type; basal lobe slightly thickened before apex, angled outward and upward to apex, in ventral view widened gradually toward apex, lateral apical angle strongly projecting, rounded, median projection wide, blunt; paramere sinuate, widened before apex, apex narrowed (figs. 419, 420); sipho short, stout, lower margin bulbous before apex, orifice dorsal, subterminal (fig. 421).

Female.—Similar to male except abdomen with hind margin of fifth sternum emarginate medially; sixth sternum truncate with feebly blunt, median projection (fig. 1189); sixth tergum emarginate (fig. 1190). Genitalia with 10th tergum narrowed apically, hind margin feebly convex (fig. 1191); genital plate elongate, oval, anterior angles obsolete, posteromedian angle abrupt (fig. 1192).

Variation.—Length 5.85–8.10 mm., width 4.75–6.6 mm.

Holotype.—Male. COLOMBIA: *Cundinamarca:* San Bernardo, Murillo (USNM 71631).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total 25. COLOMBIA: *Cundinamarca:* Same data as holotype; El Colegio, 4–III–40, Murillo; nr. El Colegio, 4–V–41, Murillo; Tequendama, El Colegio, May 4, 1941, Murillo; Finca Bella Vista, Sasaima, 29–V–1965, P. R. Craig. (CAS) (USNM).

Discussion.—This is the only species of *Toxotoma* thus far recorded from Colombia. The dorsal color pattern is distinctive as are the broadly rounded form and genitalia.

Toxotoma haywardi, new species

(Figs. 122, 1193–1196; map 4)

Female.—Length 8.15 mm., width 5.94 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex, narrowed apically. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with two yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third (fig. 122). Punctation on elytron very fine, nearly invisible, punctures

separated by one to four times their diameter. Surface of elytron dull, strongly alutaceous. Pubescence grayish white, long on pronotum, shorter and stiffer on elytron. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum broadly emarginate medially; sixth sternum strongly convex, entire, a small, blunt projection medially (fig. 1193); sixth tergum emarginate (fig. 1194). Genitalia with 10th tergum convex, entire (fig. 1195); genital plate with anterior angles rounded, outer margin strongly angled inward at midpoint, angled downward and joining inner margin in basal projection (fig. 1196).

Male.—Not known.

Holotype.—Female. ECUADOR: *Tungurahua:* Banos, 1800 m., 8–IV–1958, leg. W. Weyrauch (IML).

Paratype.—Total one. Same data as holotype. (IML).

Discussion.—The convex sixth abdominal sternum and strongly narrowed genital plate are unlike those of any known species of *Toxotoma.* This species is named for Kenneth Hayward of the Instituto Manuel Lillo, who has contributed so many specimens for this study.

Toxotoma mimetica, new species

(Figs. 123, 1197–1200; map 5)

Female.—Length 7.63 mm., width 5.69 mm. Form elongate-oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; median area of abdominal sterna 2–5 yellow; elytron dark blue with two small, yellow spots, anterior spot posterior to and inside of callus, posterior spot near lateral margin on apical one-third (fig. 123). Punctation on elytron distinct, not dual, punctures separated by their diameter or less. Surface of elytron feebly shining, densely reticulate. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line distinct, complete, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum broadly, triangularly emarginate; sixth sternum with hind margin feebly concave with a distinct, sharp median projection (fig. 1197); sixth tergum emarginate (fig. 1198). Genitalia with 10th tergum entire, convex (fig. 1199); genital plate elongate, oval, anterior angles rounded, posterior margin drawn out in strong projection (fig. 1200).

Male.—Not known.

Holotype.—PERU: Lima: (USNM 71632).

Paratype.—Total one. PERU: *Junin,* Utcuyacu, 1600–3000 m, Mar. 4, 1948, F. Woytkowski. (AMNH).

Discussion.—The shape of the genital plate places this species near *chapini,* but the triangularly emarginate fifth sternum, entire 10th tergum, and sharp projection on sixth sternum as well as the larger and more elongate form distinguish *mimetica.*

Toxotoma chapini, new species

(Figs. 422–424, 1201–1204; map 5)

Male.—Length 6.41 mm., width 5.23 mm. Form oval, round, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color piceous; mouthparts yellow to piceous; antenna with basal segment piceous; segments 2–8 yellow, 9–11 piceous; pronotum black, obscurely piceous laterally; abdomen with median area of sterna 3–5 yellowish brown; elytron dark blue with bronze tinge and two large yellow spots, anterior spot posterior to callus, posterior spot nearer lateral margin than suture on apical one-third. Punctation on elytron distinct, not dual, punctures separated by their diameter or less. Surface of elytron shining, finely reticulate. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum wide, hind margin concave; sixth sternum broadly emarginate; sixth tergum emarginate medially. Genitalia of the *orbicula* type; basal lobe thickened before apex, angled upward to a point, in ventral view lateral apical angle broadly rounded, strongly projecting, median projection strong, bluntly pointed; paramere

sinuate, narrowed to apex in apical one-fourth (figs. 422, 423); sipho short, stout, ventral tooth directed downward, orifice dorsal, subterminal (fig. 424).

Female.—Similar to male except hind margin of fifth sternum feebly emarginate; sixth sternum truncate medially with feeble median projection (fig. 1201); sixth sternum with median emargination (fig. 1202). Genitalia with 10th tergum narrowed toward apex, apical margin faintly emarginate (fig. 1203); genital plate elongate, anterior angles rounded, inner margin excised in basal one-half, posterior margin produced into blunt projection (fig. 1204).

Variation.—Length 6.41–6.90 mm., width 5.23–5.43 mm. Yellow area on abdomen is more pronounced on paratype and allotype, occupying all median area except first sternum and hind margin of fifth sternum.

Holotype.—Male. PERU: *Cuzco:* Machu Picchu, 2100 m., leg. Weyrauch (USNM 71633).

Allotype.—Female. PERU: *Cuzco:* Huadquina, 5000 ft., 24 July, 1911, Yale Peruv. Exp. (USNM).

Paratypes.—Total two. PERU: Same data as allotype. *Pasco:* Oxapampa, Nunenmacher collection. (CAS) (USNM).

Discussion.—The male genitalia of this species are very similar to those of *longicrura.* See comments under that species. The lighter color, particularly of the abdomen, should separate *chapini* from *pulchra,* but the genitalia must be examined to be certain.

Toxotoma longicrura, new species

(Figs. 425–427; map 5)

Male.—Length 6.23 mm., width 5.26 mm. Form oval, broad, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex, strongly narrowed in apical one-fourth. Color piceous; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; pronotum black, obscurely piceous laterally; abdomen with median area yellowish brown; elytron dark blue with two large, yellow spots, anterior spot covering inner one-third of callus, extending nearly to suture and posteriorly to middle of elytron, posterior spot on apical one-third nearly reaching both suture and lateral margin. Punctation on elytron fine, indistinct, punctures separated by one or two times their diameter. Surface of elytron feebly shining, strongly reticulate. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, distinct, extending three-fourths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fourth sternum broadly concave; fifth sternum wide, broadly concave, weakly emarginate medially; sixth sternum triangularly notched; sixth tergum broadly notched. Genitalia of the *orbicula* type; basal lobe strongly angled downward in basal one-half, thickened before apex, angled upward to apex, in ventral view lateral apical angle broadly produced, rounded, median projection broad, blunt; paramere sinuate, apex not widened (figs. 425, 426); sipho short, stout, orifice dorsal, subterminal (fig. 427).

Female.—Not known.

Holotype.—PERU: *Cajamarca:* Rio Charape, 13 Sept. '11, CHT Townsend collector (USNM 71634).

Discussion.—The male genitalia of *longicrura* are very similar to those of *chapini.* In *chapini* the paramere is strongly narrowed at the apex and the median projection of the basal lobe is slender. *T. longicrura* has the paramere not narrowed apically and the median projection of the basal lobe is broad and blunt. This species is broad in form, tapering abruptly in apical one-fourth, and the elytral spots are extremely large. In *chapini* the form is round, slightly oval, not tapering abruptly, and the elytral spots are small.

Toxotoma chacoi, new species

(Figs. 428–430; map 5)

Male.—Length 6.31 mm., width 4.74 mm. Description as for *pilifera* with differences discussed here. Genitalia of the *orbicula* type; basal lobe thickened, slightly bulbous before apex, angled upward and outward to apex, in ventral view gradually widened from base toward apex, abruptly widened at lateral apical angle, angle strongly produced, abruptly curved, median projection stout, blunt; paramere curved downward, widened at apical one-

third, tapered to blunt point in apical one-fifth (figs. 428, 429); sipho short, stout, apical projection sharp, directed downward, base with long, shoelike process, orifice dorsal, subterminal (fig. 430).

Female.—Not known.

Holotype.—BOLIVIA: *Cochabamba:* "Peru," Chaco, Staudinger, Korschefsky collection (USNM 71635).

Paratype.—Total one. BOLIVIA: "Peru," Chaco? (PM).

Discussion.—This species has exactly the same appearance as *pilifera*, but the male genitalia are entirely different, resembling those of *orbicula* and *murilloi*. The label states that it was collected in Peru, Chaco, which is now in Bolivia.

Toxotema gentilis, new species

(Figs. 431–433)

Male.—Length 7.41 mm., width 5.71 mm. Description as for *pilifera* with differences discussed here. Genitalia with basal lobe not thickened, angled downward to midpoint, then slightly upward to pointed apex, in ventral view widened from base to apical one-third, lateral margin produced at apical one-third, lateral margin straight to abrupt apical angle in apical one-fourth, median projection long, blunt; paramere sinuate, wide, not widened apically (figs. 431, 432); sipho short, stout, apical tooth sharp, diregted downward, base with long, shoelike process (fig. 433).

Female.—Not known.

Holotype.—Male. BOLIVIA: Staudinger (MNHUB).

Discussion.—*T. gentilis* is another species resembling *pilifera* except the male genitalia are somewhat like those of *imitator*. The type of *gentilis* is noticeably larger than specimens of *pilifera* and this may be of value in separating the two species.

Toxotoma humboldti (Mulsant), new combination

(Figs. 434–436)

Epilachna humboldti Mulsant, 1850, pp. 724–725.—Crotch, 1874, p. 56.—Weise, 1895, p. 122.—Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 6.75 mm., width 4.81 mm. Description as for *pilifera* except differences as noted here. Genitalia with basal lobe thick at base, upper margin angled downward and narrowed toward apex, in ventral view lateral apical angle abruptly produced, median carina narrow; paramere slightly widened apically (figs. 434, 435); sipho short, stout, ventral tooth sharp, projecting forward, orifice dorsal, subterminal (fig. 436).

Type Locality.—"Haut-Perou" (Bolivia).

Type Depository.—UCCC (lectotype here designated).

Discussion.—Mulsant (*1850*) listed material from the Paris museum and Guerin collections after his description of *humboldti*. The female specimen in the Paris museum bearing the following labels is apparently the specimen Mulsant examined. "Museum Paris, Bolivie, (Yungas), D'Orbigny 1834"; "Epilachna humboldti Muls., auct det." The first specimen under the name *humboldti* in the Crotch collection, a male bearing the following labels, is apparently another of the original type specimens: "TYPE Humboldti ex. Muls" (the word type crossed); "Guer." Since the specimen in the Crotch collection is a male and bears both Mulsant and Guerin labels, this specimen is here designated lectotype. At present there is no way of determining whether or not the female specimen in the Paris museum is the same species as the UCCC specimen.

Toxotoma opulenta (Weise), new combination

(Figs. 437–439, 1205–1208; map 5)

Solanophila opulenta Weise, 1902, pp. 163–164.
Epilachna opulenta: Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 5.65 mm., width 4.51 mm. Description as for *pilifera* with differences as described here. Elytron with orange spot smaller than on *pilifera*, occupying discal one-third of elytron. Genitalia with basal lobe in ventral view gradually widened from base to apical angle, angle rounded, median apical projection short, blunt; paramere slender, feebly widened apically (figs. 437, 438); sipho short, robust, bulbous before apex, apical tooth directed ventrally, pointed, orifice dorsal, subterminal (fig. 439).

Female.—Similar to male except abdomen

with hind margin of sixth sternum emarginate with strong tooth at center of emargination (fig. 1205); sixth tergum notched (fig. 1206). Genitalia with 10th tergum convex, entire (fig. 1207); genital plate slightly narrowed posteriorly, posterior margin obsolete, strongly projecting, stylus visible (fig. 1208).

Variation.—Length 5.65–6.38 mm., width 4.51–4.91 mm.

Type Locality.—Peru: Marcapata.

Type Depository.—Not known.

Discussion.—The type or types of *opulenta* cannot be found in the MNHUB. The specimens described here are in the Sicard collection at the Paris museum and it is possible that they are part of the original type series as they are from Marcapata and came from Staudinger. They match Weise's description and are very likely the species he named *opulenta*. The genitalia of *opulenta* are distinctive in both sexes as usual in *Toxotoma*, and the elytral orange spot is noticeably smaller and more nearly round than in other members of the *pilifera* group.

Specimens Examined.—Total three. PERU: *Cuzco:* Marcapata, Staudinger. (PM).

Toxotoma pulchra (Weise), new combination

(Figs. 124, 440–442, 1209–1212; map 5)

Solanophila pulchra Weise, 1899, p. 262.
Epilachna pulchra: Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 5.69 mm., width 4.31 mm. Form oval, round, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark blue with two large yellow spots, anterior spot posterior to callus, posterior spot occupying most of apical one-third (fig. 124). Punctation on elytron distinct, not dual, punctures separated by their diameter or less. Surface of elytron shining, reticulate. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fourth sternum feebly, broadly concave; fifth sternum broadly concave; sixth sternum notched medially; sixth tergum broadly notched. Genitalia with basal lobe thick at base, upper margin angled downward and narrowed toward apex, in ventral view lateral apical angle not strongly produced, rounded and angled toward median projection, median carina broad, extending from siphonal orifice to short, blunt median projection; paramere slender, curved downward, not widened apically (figs. 440, 441); sipho short, stout, thickened apically, ventral tooth sharp, projecting forward, orifice large, oval, dorsal, subterminal (fig. 442).

Female.—Similar to male except abdomen with hind margin of fourth sternum truncate; fifth sternum feebly emarginate medially; sixth sternum arcuately emarginate with blunt, weak, median tooth (fig. 1209); sixth tergum notched (fig. 1210). Genitalia with 10th tergum strongly convex, entire (fig. 1211); genital plate elongate, triangular, anterior angles abrupt, base drawn out to blunt point (fig. 1212).

Variation.—Length 4.78–7.30 mm., width 4.10–5 mm. Elytral spots are larger on some specimens and vary from yellow to orange.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—Weise described *pulchra* as a member of the genus *Solanophila* in the same paper in which he described *Toxotoma* as a new genus. The shining surface and round form cause *pulchra* to resemble some of the small species of *Epilachna* (*Solanophila*), but the mandibles and genitalia place it in *Toxotoma*. The small size and shining elytra separate *pulchra* from all other known species of *Toxotoma* except *chapini*, which has male genitalia of a different type. The female type of *pulchra* bears the following labels: "Callanga, Peru" (green paper); "pulchra Ws"; "TYPE" (red paper); "Zoolog. Mus. Berlin."

Specimens Examined.—Total 27. PERU: *Cuzco:* "Cuzco"; Lucma, 7000 ft., 4, 25, August 1911, Yale Peruv. Exp.; Machu Picchu ruins, Feb. 21, 1947, alt. 9500 ft., J. C. Pallister; Ocobamba, coll. Kraatz, Korschefsky collection. (AMNH) (CAS) (USNM).

Toxotoma pilifera (Weise), new combination

(Figs. 125, 443–445, 1213–1216; map 6)

Epilachna pilifera Weise, 1895, p. 122.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 442.
Solanophila pilifera: Weise, 1906, p. 228.

Male.—Length 6.78 mm., width 4.92 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark bluish black with broad, median orange band extending from lateral margin to suture (fig. 125). Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by one to two times their diameter. Surface of elytron shining, finely reticulate. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line incomplete, indistinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum nearly truncate; sixth sternum notched; sixth tergum notched. Genitalia with basal lobe laterally compressed near base, upper margin angled downward nearly to apex, apex abruptly bent upward, in ventral view gradually widened nearly to apex, narrowed before apex, carinate medially; paramere slender, curved downward, not widened at apex (figs. 443, 444); sipho short, stout, slightly thickened before apex, apical projection sinuate, slightly bent downward, orifice large, oval, dorsal, subterminal (fig. 445).

Female.—Similar to male except abdomen with hind margin of sixth sternum widely emarginate with sharp median tooth (fig. 1213); sixth tergum notched (fig. 1214). Genitalia entire, convex (fig. 1215); genital plate elongate, outer margin straight, inner margin curved toward outer margin in basal one-third, margins meeting at base (fig. 1216).

Variation.—Length 6.68–6.89 mm., width 4.30–4.41 mm. Width of orange band on elytron varies slightly in some specimens.

Type Locality.—Bolivia; Chaco.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—The type series of *pilifera*, composed of 27 specimens, has been examined. The first specimen in the series, a female bearing the following labels, is here designated as lectotype; "'Chaco, Bolivia" (green paper); "pilifera ws." The series is composed of seven species, only five specimens of which are *pilifera*, the others belonging to related species in the *pilifera* group and a few are *Epilachna sellata*. The male and female genitalia are distinctive and must be used to separate *pilifera* from species of the same group. The sipho is of the type found in *pulchra* and the phallobase is also somewhat similar to that of *pulchra*. The external appearance of members of this group is so uniform that it is usually impossible to associate females with males unless they are from a series of specimens collected at the same place at the same time.

Specimens Examined.—Total nine. BOLIVIA: "Bolivie." "Bolivia." *Cochabamba:* Staud.; Yungas de la Paz, Heyne V.; Yungas de la Paz, 1000 m., H. Rolle: Chaco, "Peru." Peru: *Junin:* Chanchamayo, A. Heyne T. (CAS) (MNHUB) (PM) (USNM) (ZSBS).

Toxotoma jujuyi, new species

(Figs. 126, 446–448, 1217–1219; map 6)

Male.—Length 7.31 mm., width 5.71 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with broad, median orange band extending to suture (fig. 126). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than two times their diameter. Surface of elytron shining, finely reticulate. Pubescence grayish white, as long on elytron as on pronotum. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum weakly emarginate medially; sixth sternum notched; sixth tergum deeply notched. Genitalia with basal lobe compressed laterally, upper margin curved downward nearly to apex, apex gently curved

upward, in ventral view narrowed gradually toward apex, tip blunt; paramere slender, curved downward (figs. 446, 447); sipho short, blunt, apical tooth not ventral, directed forward (fig. 448).

Female.—Similar to male except sixth sternum widely, arcuately emarginate, a small, blunt median tooth present (fig. 1217); sixth tergum deeply notched (fig. 1218). Genitalia with 10th tergum entire, truncate medially; genital plate with apical angles rounded, narrowed toward base, inner and outer margins meeting at base (fig. 1219).

Variation.—Length 7.43–8.05 mm., width 5.54–6.20 mm.

Holotype.—Male. ARGENTINA: *Jujuy:* Laguna de Yala, I–1948, Monros and Willink (IML).

Allotype.—Female. Same data as holotype (IML).

Paratypes.—Total 51. ARGENTINA: Same data as holotype. *Jujuy:* 14–IX–1903, C. Bruch. (IML) (MNHUB) (USNM).

Discussion.—*T. jujuyi* is the only species of *Toxotoma* thus far known from Argentina. The genitalia must be examined in order to separate *jujuyi* from the Bolivian species having the same type of color pattern. The male genitalia are closest to those of *pilifera.*

Toxotoma hiekei, new species

(Figs. 1220–1223; map 6)

Female.—Length 8.42 mm., width 6.18 mm. Description as for *pilifera* with differences as discussed here. Abdomen with hind margin of sixth sternum widely emarginate, median tooth stout, prominent (fig. 1220); sixth tergum feebly emarginate medially (fig. 1221). Genitalia with 10th tergum feebly convex, nearly truncate, entire (fig. 1222); genital plate extremely elongate, inner and outer margins sinuate, apex narrowed (fig. 1223).

Male.—Not known.

Variation.—Length 8.31–8.44 mm., width 6.15–6.20 mm.

Holotype.—Female. BOLIVIA: S. Antonio (MNHUB).

Paratypes.—Total five. BOLIVIA: "Bolivia"; *Cochabamba:* Yungas de la Paz, 1000 m., H. Rolle; Chaco; "Chaco." (MNHUB) (PM).

Discussion.—The large size and distinctive female genitalia separate *hiekei* from any known member of the *pilifera* group. The large size of *hiekei* makes it unlikely that this is the female of any of the species presently known only from male specimens.

This species is named for F. Hieke of the MNHUB, who has made available the Weise types.

Toxotoma guerini, new species

(Figs. 449, 450)

Male.—Length 6.87 mm., width 5.38 mm. Description as for *pilifera* except differences as noted below. Genitalia with basal lobe long, constricted medially, narrowed to blunt apex, in ventral view gradually widened from base to apical angle, apical angle abrupt, median projection stout, blunt; paramere slender, not widened apically (figs. 449, 450); sipho lost.

Female.—Not known.

Holotype.—Male. BOLIVIA (UCCC).

Paratype.—Total one. Locality label illegible. (UCCC).

Discussion.—The two type specimens are the second and third specimens after the name *humboldti* in the Crotch collection. The holotype bears the label "Humboldti, Bolivia D," and the paratype bears an illegible data label plus a second label "Chevr." The male genitalia are very distinctive, quite different from those of any other known member of *Toxotoma.*

Toxotoma disparans, new species

(Figs. 127, 1225–1226; map 6)

Female.—Length 7.58 mm., width 5.71 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with four small yellow spots, anterolateral spot near lateral margin posterior to callus, anteromedian spot posterior to callus and between callus and suture, posterolateral spot on apical one-third near lateral margin, posteromedian spot very small, indistinct, near suture on apical one-third (fig. 127). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of

elytron distinctly, finely reticulate. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line complete, indistinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum deeply notched medially (fig. 1225); sixth tergum feebly emarginate. Genitalia with genital plate triangular, posteromedian angle with rectangular emargination, anterior angles abrupt, stylus visible on anteromedian angle (fig. 1226).

Male.—Not known.

Holotype.—Female. PERU: *Cuzco:* Sta. Rosa, Convencion, 1936, Jaroslav Soukup (USNM 71636).

Discussion.—This species does not have the mandibles as robust or the labrum as distinctly emarginate as do most species of *Toxotoma*. The labrum is distinctly separated from the clypeus however, and the female genitalia appear to be more like those found in *Toxotoma* than in *Epilachna*. The female genital plate is thus far unique in the genus. Because of the lack of a male, *disparans* is placed at the end of the species list. The smooth, shining elytron is also distinctive, resembling only *rugulosa* and *rosae* in this respect. No other presently known species of *Toxotoma* has four yellow spots on the elytron.

Genus EPILACHNA Chevrolat

Epilachna Chevrolat, 1837, p. 460.—Hope, 1840, p. 157.—Mulsant, 1850, p. 700.—Crotch, 1874, p. 53.—Korschefsky, 1931, pp. 17–18.—Blackwelder, 1945, p. 440. Type-species: *Coccinella borealis* F., by subsequent designation of Hope (*1840*).

Solanophila Weise, 1898*a*, p. 99.—Korschefsky, 1931, p. 18.—Blackwelder, 1945, p. 440.—Dieke, 1947, pp. 7–8.—Li and Cook, 1961, pp. 33–34. Type-species: *Solanophila gibbosa* Weise, by subsequent designation of Li and Cook (*1961*).

Afissa Dieke, 1947, p. 106.—Li and Cook, 1961, pp. 33–34. Type-species: *Coccinella flavicollis* Thunberg, by original designation.

Labrum usually truncate or feebly emarginate, sometimes strongly emarginate, usually concealing at least basal one-third of mandible. Mandible with apex usually trifid, sometimes bifid, apical teeth pointed (except in *basalis* group), usually with two large teeth and several minor teeth or dentules below apex. Apex of anterior tibia with single sharp spur, apices of middle and hind tibiae each with two sharp spurs. All tibiae with grooves for reception of tarsi.

Epilachna is a large, widespread genus with many distinct groups of species. The Western Hemisphere groups are discussed under group headings. The generic synonymy involving *Solanophila* Weise and *Afissa* Dieke is adequately discussed by Dieke (*1947*) and Li and Cook (*1961*) and these discussions are not repeated here. A worldwide study of the subfamily at the generic level would possibly produce further changes in generic names, but since the type species of *Epilachna* is *E. borealis* (F.), a Western Hemisphere species, it is unlikely that any future changes will affect the genus in the New World.

Fabricius described *Coccinella borealis* in 1775, the first described species of what later became the genus *Epilachna*. Chevrolat (*1837*) established the genus by publishing a list of species belonging to the genus in the Dejean catalog. The name *Epilachna* appears in volumes bearing the date 1833, but, as pointed out by Barber and Bridwell (*1940*), the actual date of publication of pages 385–466 was 1837. Hope (*1840*) designated *borealis* as the type of the genus.

Several scattered descriptions of New World species were published after 1775 and by 1846 the total was 20. Erichson (*1847*) added 12 species from Peru and Mulsant (*1850*) described 52 species. Crotch (*1874*) described 27 species. Since 1874 the chief contributions have been made by Weise (42 species) and Gorham (10 species). In this publication most of Mulsant's proposed subgenera are recognized as valid genera. After the transfer of species from *Epilachna* to these genera and the necessary new synonymy involved in *Epilachna*, 112 names of previous authors remain recognized as valid and 76 species and subspecies are described here for the first time, totaling 188 New World species of *Epilachna*.

Key to Species of *Epilachna*

1. Species occurring in Central America, North America, and Cuba 162
   Species occurring in South America 2

(1) 2. Body nearly round, convex, humeral callus feebly protuberant as in figure 351; postcoxal line strongly incomplete, lateral end directed toward lateral margin of abdomen (fig. 95); color pattern usually a ringed or zonate pattern (*cacica*) or one solid color (*concolor*); male genitalia with basal lobe simple, paramere curved downward, longer than basal lobe (fig. 930); posterolateral angle of female genital plate fused to ninth tergum (fig. 1803) ..... *cacica* group (p. 190)
   Body elongate, humeral callus distinctly protuberant; postcoxal line complete or incomplete but outer end directed toward base of abdomen (fig. 92); color pattern variable, rarely ringed or zonate; male genitalia not as described above, basal lobe nearly always longer than paramere; posterolateral angle of female genital plate not fused to ninth tergum 3

(2) 3. Male with strong conical or hornlike protuberance on metasternum anterior to hind coxa; genitalia with basal lobe a long tube, trabes shorter than basal piece (fig. 913); female with metasternum anterior to hind coxa convex, on higher plane than midline ..... *staudingeri* group (p. 186)
   Male and female with metasternum anterior to hind coxa flat or feebly convex, on same plane as midline; male genitalia not as described above 4

(3) 4. Labrum deeply emarginate anteriorly, no dorsal carina present (fig. 18); form usually slender, tapered posteriorly (fig. 241); Venezuela, Colombia ..... *angustata* group (p. 116)
   Labrum not emarginate or feebly so, if deeply emarginate then dorsal carina present; form usually oval 5

(4) 5. Labrum deeply emarginate anteriorly with dorsal carina near base (fig. 19) ..... *patricia* group (p. 78)
   Labrum not emarginate or feebly so, never with dorsal carina near base 6

(5) 6. Elytron yellow with an uneven, broad, brownish-yellow vitta on middle of elytron, vitta with large, dark punctures confluent or separated by one to two times their diameter (fig. 261) ..... *amplipunctata*, n. sp. (p. 132)
   Species not agreeing with above description 7

(6) 7. Form cordate, gibbous, strongly narrowed posteriorly, tapering to pointed apex, lateral margin of elytron strongly explanate; elytron black with two yellow spots, outer spot narrow, elongate, inner spot small, irregularly oval (fig. 260); length 9 mm. or more ..... *holmgreni* (Weise) (p. 131)
   Species not agreeing with all above statements, if form is similar then length much less than 9 mm 8

(7) 8. Elytron with a blood-red, median tubercle (fig. 243) ..... *bituberculata* Waterhouse (p. 119)
   Elytron without a tubercle 9

(8) 9. Elytron with lateral margin strongly explanate, about one-fifth width of elytron; median area of elytron yellow with irregular, median black band extending from lateral margin beyond middle of elytron (fig. 242) ..... *latimargo* (Weise) (p. 119)
   Species not agreeing with above description 10

(9) 10. Elytron yellow with apical black spot and angulate black mark extending from base to middle then abruptly outward to lateral margin (fig. 153) ..... *v-pallidum angulata*, n. ssp. (p. 67)
   Species not agreeing with above statements 11

(10) 11. Elytron black with large, irregular yellow area near lateral margin, yellow area appearing to be two connected spots (fig. 255) ..... *confixa*, n. sp. (p. 129)
   Species not agreeing with above statements 12

(11) 12. Surface of elytron dull, densely microreticulate, bluish black with three transverse orange bands (fig. 285), or with median area orange with median bluish-black spot (fig. 286) ..... *fryii* Crotch (p. 149)
   Species not agreeing with above statements 13

(12) 13. Elytron orange, bordered with black, an oblique, transverse median band and elongate projection from base across callus present (fig. 280); Venezuela ..... *axillaris* Mulsant (p. 146)
   Species not agreeing with all above statements 14

(13) 14. Elytron orange, bordered with black, an elongate, black projection from base across callus present (fig. 281), or elongate projection continued to apical one-third, widest at apex (fig. 282); Venezuela ..... *stolata* Mulsant (p. 147)
   Species not agreeing with all above statements 15

(14) 15. Elytron yellow, triangular median spot, triangular anteromedian spot, elongate sutural spot from base nearly to middle, sutural spot on apical one-third and narrow lateral border black (fig. 283); Colombia ..... *radiata* (Guérin) (p. 147)
Species not agreeing with all above statements 16

(15) 16. Elytron yellow, large median spot, irregular sutural spot behind scutellum black, lateral border black with large projection over callus, small median projection and apical one-fifth black (fig. 284); Colombia ..... *pictipennis* Crotch (p. 148)
Species not agreeing with all above statements 17

(16) 17. Elytron black with elongate, yellow, longitudinal spot between callus and scutellum, transverse yellow band anterior to middle and obliquely transverse, yellow band on apical one-third (fig. 287) ..... *cinctipennis* Crotch (p. 149)
Species not agreeing with all above statements 18

(17) 18. Elytron yellow with large median spot on suture, broad basal margin, narrow lateral border, inward median projection from lateral margin and spot on apical one-third black (fig. 279), apical spot may be connected to inward projection of lateral border; Colombia ..... *cordula* (Weise) (p. 144)
Species not agreeing with above statements 19

(18) 19. Elytron yellowish brown to dark brown with lateral margin narrowly black (fig. 297) or with wide black border (fig. 296); punctation on elytron not dual ..... *pastica* (Weise) (p. 154)
Species not agreeing with above statements 20

(19) 20. Elytron black with elongate basal spot, irregular postmedian spot, small apical spot, and narrow, elongate lateral spot yellow (fig. 295), or postmedian spot connected to apical spot along suture (fig. 294), narrow lateral spot may be continuous from outside callus to apical spot (fig. 293); length 9.30–12.10 mm.; Ecuador, Peru 21
Species not agreeing with above statements 22

(20) 21. Male genitalia with apex of sipho abruptly bent upward, apical one-fifth nearly vertical (fig. 823); known only from Peru (Huanuco: Pachitea) ..... *pachiteensis* (Weise) (p. 153)
Male genitalia with apex of sipho gently curved upward, not vertical in apical one-fifth (fig. 821); known from Ecuador and Peru (Junin: Chanchamayo) ..... *mutabilis* Crotch (p. 152)

(20) 22. Elytron with black scutellar spot, completely bordered with yellow, disk brownish yellow (fig. 301), or brown with pale spot behind middle (fig. 302), or entirely black (fig. 303); eastern Brazil ..... *clandestina* Mulsant (p. 157)
Species not agreeing with above statements 23

(22) 23. Elytron entirely black except lateral margin narrowly yellow (fig 304) 24
Elytron not as described above 25

(23) 24. Length 9.75 mm. or more ..... *pseudostriata*, n. sp. (p. 155)
Length 8.75 mm. or less ..... *parastriata*, n. sp. (p. 158)

(23) 25. Leg entirely yellow or at least apical one-half of femur and entire tibia and tarsus yellow; elytron with five or six yellow spots on black or brown background (figs. 314, 316); Colombia, Venezuela ..... *mexicana* (Guérin) (p. 165)
Species not agreeing with all above statements 26

(25) 26. Species with epipleuron entirely yellow or brown, or epipleuron bicolored 151
Species with epipleuron black or at least entirely dark colored, never bicolored 27

(26) 27. Legs entirely yellow or at least apical one-half of femur and entire tibia and tarsus yellow; elytron usually with dark spots on pale background ..... *tredecimnotata* (Latreille) (p. 135)
Species with legs entirely black or at least very dark colored 28

(27) 28. Elytron yellow or orange, bordered with black, four irregular black marks present (fig. 244) ..... *walteri* (Sicard) (p. 120)
Elytron not as described above 29

(28) 29. Elytron yellow, bordered with black, two black spots in transverse row medially, spots sometimes tend to coalesce 30
Elytron not as described above 32

(29) 30. Basal black border of elytron wide, covering callus; length usually more than 8 mm 31
Basal black border of elytron narrow, small inward extension of border covering callus (fig. 213); length usually less than 8 mm ..... *taeniola*, n. sp. (p. 100)

(30) 31. Lateral margin of elytron rounded from humeral angle to apex (fig. 146) ..... *ovaloides*, n. sp. (p. 61)
Lateral margin of elytron straight or slightly pinched medially (fig. 128) ..... *flavofasciata* (LaPorte) (p. 48)

(29) 32. Elytron entirely black ..... *bourcieri* Mulsant (p. 88)
Elytron not entirely black 33
(32) 33. Elytron with punctures deep, dense, separated by their diameter or less; either with no color pattern (fig. 195), or with two small pale spots and long, paler spot near lateral margin (fig. 196); Argentina; length 5–6 mm ..... *punctatissima* (Weise) (p. 91)
Species not agreeing with all above statements 34
(33) 34. Elytron yellow, bordered with black, wide median band and small apical projection black, callus covered by projection from black basal border (fig. 212); Colombia ..... *taeniola*, n. sp. (p. 100)
Species not agreeing with all above statements 35
(34) 35. Elytron black with single yellow mark extending from near base between callus and scutellum obliquely posteriorly to just behind middle, then abruptly outward nearly to lateral margin (fig. 162) ..... *emerita*, n. sp. (p. 72)
Elytron not as described above 36
(35) 36. Elytron yellow, bordered with black, incomplete transverse band medially, vitta extending from basal border to median band and small, apical black spot present (fig. 231); length 5.90–6.53 mm.; Peru ..... *ostensa* (Weise) (p. 109)
Species not agreeing with all above statements 37
(36) 37. Elytron yellow, bordered with black, color as described for *ostensa* except transverse median band often complete and apical spot connected to median band (figs. 232, 233) ..... *ostensoides*, n. sp. (p. 110)
Elytron not as described above 38
(37) 38. Elytron black with single yellow spot between scutellum and callus (fig. 211) ..... *freudei* (Mader) (p. 99)
Elytron not as described above 39
(38) 39. Elytron black with two elongate, oblique, yellow marks (fig. 189); or yellow with incomplete, obscure, median band extending from lateral border toward suture (fig. 187), or entirely yellow except for dark lateral and basal border and short extension of border along suture (fig. 188); Peru ..... *incaorum*, n. sp. (p. 86)
Species not agreeing with above statements 40
(39) 40. Elytron yellow, bordered with black, transverse (sometimes incomplete) median band, apical one-sixth of elytron and humeral projection black (fig. 173); Venezuela ..... *cruciata* Mulsant (p. 77)
Species not agreeing with all above statements 41
(40) 41. Elytron yellow, bordered with bluish black, yellow area divided into four subequal areas by narrow bluish-black lines, transverse line not wider than sutural border (fig. 147); Peru ..... *viridilineata viridilineata* Crotch (p. 63)
Species not agreeing with all above statements 42
(41) 42. Elytron yellow, bordered with bluish black, yellow area divided into four subequal areas by wide bluish-black lines, transverse discal line much wider than sutural border, posterior two yellow spots usually not completely divided (fig. 148); Ecuador ..... *viridilineata rossi*, n. sp. (p. 63)
Species not agreeing with all above statements 43
(42) 43. Elytron with three pale spots on dark background (see also *korschefskyi*) 44
Elytron not as described above 51
(43) 44. Length less than 5.50 mm 45
Length 6 mm. or more 46
(44) 45. Elytron with two posterior yellow spots, one anterior yellow spot (fig. 226) ..... *bistriguttata* Mulsant (p. 107)
Elytron with two anterior spots, one posterior spot (fig. 228) ..... *conjuncta*, n. sp. (p. 108)
(44) 46. Length 9 mm., or more; elytron with anterior spot elongate, near suture, two posterior spots in transverse row at apical one-third of elytron (fig. 163); Peru ..... *emerita*, n. sp. (p. 72)
Species not agreeing with all above statements 47
(46) 47. Length about 7.50 mm.; pubescence rusty gold; posterior spot transverse (fig. 186); Peru ..... *fuscopilosa* (Weise) (p. 84)
Species not agreeing with all above statements 48
(47) 48. Length about 10.45 mm.; anterior two spots on elytron elongate-oval, posterior spot wide, transverse (fig. 165); Colombia ..... *consularis* Mulsant (p. 72)
Species not agreeing with above statements 49
(48) 49. Species with two anterior spots, one posterior spot 50
Species with two posterior spots, one anterior spot (fig. 229); Bolivia ..... *bistrisignata* (Mader) (p. 108)

(49) 50. Elytron with large, pale yellow, elongate-oval spots on bluish-black background (fig. 149) ... *sexmaculata* Kirsch (p. 64)
Elytron with spots small, round, on black background (fig. 166); Bolivia *bistrispilota*, n. sp. (p. 73)

(48) 51. Elytron with dark transverse bands on pale background ... 52
Elytron not as described above ... 53

(51) 52. Length 6.50–8.50 mm.; elytron bordered with black, median yellow area divided by transverse, median black band, transverse band sometimes not reaching suture (figs. 182, 183); Colombia ... *reichei*, n. sp. (p. 83)
Length 9.50–12.10 mm.; elytron reddish brown with two or three black, transverse bands (fig. 289); Venezuela ... *madida* Mulsant (p. 150)

(51) 53. Elytron vittate ... 54
Elytron not vittate ... 68

(53) 54. Elytron with pale vittae on dark background ... 55
Elytron with dark vittae on pale background ... 57

(54) 55. Pubescence grayish white; elytron with two yellow vittae extending nearly to apex (fig. 235) ... *divisoides*, n. sp. (p. 111)
Pubescence dense, golden brown; elytron with two yellow vittae ending on apical one-third ... 56

(55) 56. Lateral margin of elytron rounded from humeral angle to apex (fig. 159); Argentina ... *albovittata* (Weise) (p. 70)
Lateral margin of elytron pinched behind humeral angle (fig. 160); Peru, Ecuador ... *aureola*, n. sp. (p. 70)

(54) 57. Elytron dark yellow, margined with black, black median vitta extending from callus nearly to apex and short, elongate spot between median vitta and lateral border (fig. 230); length 4.85–5.66 mm ... *geometrica* (Weise) (p. 109)
Species not agreeing with above statements ... 58

(57) 58. Elytron with two vittae, lateral vitta complete from base to suture at apex, median vitta short, reaching middle of elytron (fig. 259) ... *bisbivittata*, n. sp. (p. 130)
Elytron with one vitta ... 59

(58) 59. Elytron with vitta abruptly enlarged medially, nearly reaching sutural border on disk (fig. 184) ... *ambigua* (Mader) (p. 83)
Elytron not as described above ... 60

(59) 60. Elytron with vitta becoming attenuated posteriorly, only faintly visible on apical one-half (fig. 168); pubescence yellow ... *striola* (Weise) (p. 74)
Elytron not as described above, pubescence usually grayish white (except *ecuadorica*) ... 61

(60) 61. Length 8 mm. or more ... 62
Length less than 8 mm ... 64

(61) 62. Pubescence brownish yellow; Ecuador ... *ecuadorica*, n. sp. (p. 55)
Pubescence grayish white; not known from Ecuador ... 63

(62) 63. Body feebly convex; large punctures on elytron separated by their diameter or less; Peru ... *v-pallidum* Blanchard (p. 66)
Body strongly convex; large punctures on elytron separated by their diameter or less; Bolivia ... *orthostriata*, n. sp. (p. 67)

(61) 64. Form strongly convex; length 6 mm.; Ecuador ... *univittata* Crotch (p. 97)
Form not strongly convex; length nearly always more than 6 mm.; if species from Ecuador then length 6.38 mm. or more ... 65

(64) 65. Elytron with yellow area twice as wide as black median vitta or lateral border ... *divisa* (Weise) (p. 98)
Elytron with yellow areas rarely wider than median vitta ... 66

(65) 66. Lateral margin of elytron broadly explanate, about 0.5 mm. in width (fig. 202); Ecuador ... *monovittata*, n. sp. (p. 96)
Lateral margin of elytron weakly explanate, 0.3 mm. or less in diameter; Peru, Bolivia ... 67

(66) 67. Elytron with median vitta wider than yellow areas (fig. 204); marked disparity in size between large and small punctures on elytron ... *cushmani*, n. sp. (p. 97)
Elytron with median vitta narrower than yellow areas (fig. 206); often with partial or complete median, transverse band (fig. 205); disparity in size between large and small punctures on elytron slight ... *vittigera* (Crotch) (p. 98)

(53) 68. Elytron with four pale spots on dark background ... 69
Elytron not as described above ... 75

(68) 69. Spots not arranged in transverse rows (fig. 245); Colombia ..... *inserta* (Weise) (p. 121)
Spots arranged in transverse rows 70
(69) 70. Pubescence grayish white 71
Pubescence yellow 73
(70) 71. Body abruptly narrowed in apical one-half; spots on elytron slightly elongate (fig. 200); length 8–9.43 mm.; Colombia ..... *narinoi*, n. sp. (p. 95)
Species not agreeing with all above statements 72
(71) 72. Length 8 mm. or more ..... *v-pallidum* Blanchard (p. 66)
Length less than 8 mm ..... *vittigera* Crotch (p. 98)
(70) 73. Body broad, rounded; elytron with anteromedian obliquely oval (fig. 171) *obliqua*, n. sp. (p. 75)
Species not agreeing with above statements 74
(73) 74. Male genitalia with basal lobe broad, flattened dorsoventrally before apex (fig. 553); female genital plate nearly square (fig. 1366) ..... *persimilis* Crotch (p. 74)
Male genitalia with basal lobe nearly straight in ventral view, abruptly narrowed at apical one-fourth (fig. 686); female genital plate oval (fig. 1538) ..... *olmosi*, n. sp. (p. 111)
(68) 75. Elytron with median area pale, completely bordered with black or at least a dark color 76
Elytron not as described above 84
(75) 76. Elytron with rectangular, median area yellow, posterior margin truncate, anterior margin nearly truncate (fig. 130); length 7.25 mm. or more; lateral margin of elytron straight or slightly pinched medially ..... *flavofasciata* (LaPorte) (p. 48)
Species not agreeing with all above statements 77
(76) 77. Body strongly narrowed in apical one-half; elytron usually with obscure, dark, median spot, lateral margin of yellow area emarginate (fig. 251); length 7.63–8.33 mm.; Ecuador ..... *buckleyi* Crotch (p. 125)
Species not agreeing with all above statements 78
(77) 78. Elytron with posterior margin of yellow area truncate, anterior margin rounded, extending to callus (fig. 209); length 5.30–6.60 mm.; Bolivia ..... *freudei* (Mader) (p. 99)
Species not agreeing with all above statements 79
(78) 79. Elytron with black border narrow, short, black projection covering callus, obscure pale-yellow area between callus and scutellum ..... *caucaensis* (Weise) (p. 101)
Elytron not as described above 80
(79) 80. Length 6.15 mm. or less 81
Length 6.25 mm. or more 82
(80) 81. Median area of elytron yellow, no trace of transverse median band present (fig. 237); Ecuador ..... *dubia* Crotch (p. 114)
Median area of elytron orange, slightly emarginate with black along lateral margin (fig. 238); Colombia ..... *soachae*, n. sp. (p. 115)
(80) 82. Length 7.50 mm. or more; male genitalia of the *satipensis* type ..... *furcata*, n. sp. (p. 123)
Length 7.50 mm. or less; male genitalia of *quirozensis* or *fenestrata* types 83
(82) 83. Male genitalia of *quirozensis* type (figs. 749–751); Ecuador ..... *latreillei*, n. sp. (p. 125)
Male genitalia simple, of *fenestrata* type (figs. 611–613); Colombia ..... *eximia*, n. sp. (p. 92)
(75) 84. Elytron with discal area or large median area pale, bordered with black or at least a dark color, pale area extending to suture and forming a large central spot in conjunction with pale area on opposite elytron (figs. 140, 252, etc.) 85
Elytron not as described above 94
(84) 85. Yellow or orange area of elytron with paler, irregular mark or two very pale, discrete spots (see also *pretiosa*) 86
Elytron not as described above 87
(85) 86. Form oval, lateral margin of elytron rounded from humeral angle to apex (fig. 172) ..... *discolor* Erichson (p. 76)
Form cordate, lateral margin of elytron straight or slightly pinched medially (figs. 139–140); elytron sometimes with two pale, discrete spots ..... *dorsigera* Erichson (p. 57)
(85) 87. Elytron bluish black with orange discal spot which, in conjunction with spot on opposite elytron, forms heart-shaped median spot (fig. 252); lateral margin of elytron strongly explanate, body narrowed in apical one-half; Peru ..... *peltata* Erichson (p. 126)
Species not agreeing with above description 88
(87) 88. Length 7 mm. or less 89
Length more than 8 mm 92

(88) 89. Posterior margin of orange area on elytron truncate, apical one-sixth black as in figure 214 90
Posterior margin of orange area of elytron rounded or emarginate, apical one-twelfth of elytron black 91
(89) 90. Anterior margin of orange area on elytron truncate (fig. 216) .... *strictanotata*, n. sp. (p. 103)
Anterior margin of orange area of elytron emarginate along suture (fig. 214) .... *discoidea* Erichson (p. 101)
(89) 91. Form broad, rounded; basal black border wide, completely covering callus *honesta* (Weise) (p. 102)
Form narrow, elongate, narrowed in apical one-fourth; basal black border narrow, not completely covering callus (fig. 215) .... *ignobilis* (Weise) (p. 102)
(88) 92. Elytron with black lateral border extremely narrow, not covering callus; lateral margin of elytron slightly rounded medially .... *parvicollis* Casey (p. 62)
Species not agreeing with all above statements 93
(92) 93. Basal one-fourth of elytron bluish black (fig. 141); Argentina, Bolivia .... *sellata* Weise (p. 58)
Basal one-eighth of elytron bluish black (fig. 142); Peru .... *cuscoi*, n. sp. (p. 58)
(84) 94. Elytron with pale, transverse bands on dark background 95
Elytron with two pale spots on dark background, posterior spot occasionally transverse but never both spots transverse 110
(94) 95. Elytron with one transverse band 96
Elytron with two transverse bands 97
(95) 96. Elytron with single orange band anterior to middle (fig. 290) .... *madida* Mulsant (p. 150)
Elytron with single orange band at apical one-third .... *lorata* Weise (p. 71)
(95) 97. Pubescence dense, rusty gold .... *riveti* (Sicard) (p. 53)
Pubescence grayish white 98
(97) 98. Surface of elytron dull, rugose or densely alutaceous, or reticulate 99
Surface of elytron shining, smooth or finely reticulate, if somewhat densely reticulate, then surface still shining 104
(98) 99. Length about 10 mm .... *obtusiforma*, n. sp. (p. 65)
Length 9 mm. or less 100
(99) 100. Elytron with transverse bands reaching suture (fig. 185) .... *bizonata* Crotch (p. 84)
Elytron with transverse bands not reaching suture 101
(100) 101. Length less than 7 mm.; lateral margin of elytron strongly rounded, strongly explanate (fig. 201) .... *pemptea*, n. sp. (p. 95)
Length 8 mm. or more; lateral margin of elytron variable 102
(101) 102. Pronotum with anterolateral angle narrowly yellow .... *chigata*, n. sp. (p. 94)
Pronotum with anterolateral angle black 103
(102) 103. Postcoxal line complete, distinct; elytron with transverse bands narrowly connected along suture (fig. 158); Peru .... *peruviana* Crotch (p. 68)
Postcoxal line indistinct, obsolete medially; elytron with transverse bands not connected along suture; Ecuador .... *hektea*, n. sp. (p. 64)
(98) 104. Abdomen with hind margin of sixth tergum deeply notched (fig. 1228) .... *flavofasciata* (LaPorte) (p. 48)
Abdomen with hind margin of sixth tergum entire or feebly emarginate 105
(104) 105. Species known only from Venezuela 106
Species not known from Venezuela 107
(105) 106. Anterior yellow band not approaching callus (fig. 145) .... *tritea*, n. sp. (p. 61)
Anterior yellow band reaching callus or nearly so (fig. 144) .... *deuterea*, n. sp. (p. 60)
(105) 107. Elytron with pale, yellow, wide bands on black background, bands irregular (figs. 182, 183); Colombia .... *reichei*, n. sp. (p. 83)
Elytron not as described above; not known from Colombia 108
(107) 108. Elytron with lateral margin slightly pinched medially; form elongate; anterior yellow band on elytron angled forward, posterior margin concave (fig. 155); Ecuador .... *tetartea*, n. sp. (p. 67)
Elytron not as described above; not known from Ecuador 109
(108) 109. Lateral margin of elytron straight medially, transverse yellow bands narrow on black background (fig. 143) .... *transverselineata* (Mader) (p. 59)
Lateral margin of elytron rounded from humeral angle to apex, transverse yellow bands wide on greenish-black background (fig. 180) .... *viridinitens* Crotch (p. 82)
(94) 110. Species large, usually more than 8 mm. in length; elytral spots small, widely separated 111
Species small, usually less than 7 mm. in length; elytral spots large, narrowly separated 122
(110) 111. Pubescence mostly yellow or rusty red 112
Pubescence grayish white 113

(111) 112. Pubescence yellow except on yellow markings of elytron where it is white ..... *emerita*, n. sp. (p. 72)
Pubescence dense, rusty red ..... *pseudospilota*, n. sp. (p. 73)
(111) 113. Surface of elytron rugose, dull ..... *peruviana* Crotch (p. 68)
Surface of elytron shining, finely reticulate 114
(113) 114. Male genitalia of *v-pallidum* type; form strongly narrowed in apical one-half (fig. 156); sixth tergum convex, entire ..... *forsteri* (Mader) (p. 68)
Male genitalia not of *v-pallidum* type; form not strongly narrowed in apical one-half; sixth tergum usually notched or weakly emarginate 115
(114) 115. Abdomen with hind margin of sixth tergum notched; male genitalia simple, small; female genital plate somewhat rectangular as in figure 1270 116
Abdomen with hind margin of sixth tergum rarely notched, usually weakly emarginate or entire; male genitalia large, robust, heavily sclerotized; female genital plate with lateral margin sinuate, strongly narrowed in basal one-half as in figure 1605 119
(115) 116. Elytron with posterior yellow spot nearly round, occupying most of posterior one-third (fig. 136); Argentina and Bolivia ..... *eusema* (Weise) (p. 55)
Elytron with posterior spot usually small, or if large then transverse, less than half of posterior one-third; Peru and north 117
(116) 117. Elytron with anterior spot near scutellum, posterior spot on elytron not appearing transverse except in *fausta*; Peru 118
Elytron with anterior spot not nearer scutellum than callus, usually with both spots somewhat transverse; Ecuador, Colombia, Venezuela ..... *flavofasciata* (LaPorte) (p. 48)
(117) 118. Posterior spot on elytron usually transversely oval (fig. 134); male genitalia with pronounced dorsal carina on basal lobe (fig. 470) ..... *fausta* Erichson (p. 53)
Posterior spot on elytron round or nearly so (fig. 133); male genitalia without dorsal carina on basal lobe ..... *dives* Erichson (p. 52)
(115) 119. Species known only from Colombia ..... *azurea* (LaPorte) (p. 127)
Species not known from Colombia 120
(119) 120. Species known only from Ecuador ..... *languida* (Weise) (p. 129)
Species not known from Ecuador 121
(120) 121. Species known only from Peru ..... *lepida* Erichson (p. 128)
Species known only from Bolivia, sometimes with median area of elytron orange (figs. 257, 258) ..... *pretiosa* (Mader) (p. 130)
(110) 122. Elytron with anterior spot smaller than posterior spot; lateral margin of elytron straight medially (fig. 136); male genitalia of *flavofasciata* type; Argentina and Bolivia ..... *eusema* (Weise) (p. 55)
Species not agreeing with all above statements 123
(122) 123. Elytron with yellow spots surrounded by dark-brown background, yellow vitta present along lateral margin (fig. 224) ..... *korschefskyi*, n. sp. (p. 106)
Elytron not as described above 124
(123) 124. Posterior one-half of body strongly narrowed to pointed apex (fig. 240); Colombia ..... *aculata*, n. sp. (p. 115)
Posterior one-half of body not strongly narrowed; Colombia and elsewhere 125
(124) 125. Elytron with teardrop-shaped black mark extending posteriorly from median band ..... *adnexa* (Mader) (p. 107)
Elytron not as described above 126
(125) 126. Elytron with distinct, discrete dark mark on posterior pale spot in apical one-third 127
Elytron without dark mark on posterior pale spot 129
(126) 127. Elytron with black mark on posterior spot large, elongate, with tendency to connect with transverse median band (fig. 225) ..... *adnexa* (Mader) (p. 107)
Elytron with black mark on posterior spot small, round, showing no tendency to connect with transverse median band 128
(127) 128. Body about 1.5 mm. longer than wide (fig. 222); length more than 6 mm. (see also *freudei*) ..... *harringtoni*, n. sp. (p. 105)
Body less than 1 mm. longer than wide (fig. 223); length less than 6 mm ..... *bolivicola* (Mader) (p. 106)
(126) 129. Pubescence golden brown except on elytral spots where it is white ..... *aureopilosa*, n. sp. (p. 90)
Pubescence grayish white or yellow 130
(129) 130. Elytron with two triangular yellow spots, posterior spot larger than anterior and often with small, black, subapical spot (fig. 207), two spots may be narrowly joined near suture or completely separated and posterior spot reduced in size (fig. 208) ..... *freudei* (Mader) (p. 99)
Elytron not as described above 131

(130) 131. Lateral margin of elytron strongly explanate, one-fourth or more width of elytron 132
Lateral margin of elytron narrowly explanate, considerably less than one-fourth width of elytron 133

(131) 132. Length less than 6 mm ..... *nana*, n. sp. (p. 104)
Length more than 6 mm ..... *bonplandi* Mulsant (p. 104)

(131) 133. Species known only from Colombia 134
Species not known from Colombia (except *hybridula*) 136

(133) 134. Male genitalia simple, of *fenestrata* type ..... *eximia*, n. sp. (p. 92)
Male genitalia not of *fenestrata* type 135

(134) 135. Elytron with pale spots yellow, widely separated (fig. 236) ..... *gnoma*, n. sp. (p. 114)
Elytron with pale spots orange, narrowly or incompletely separated (fig. 238) *soachae*, n. sp. (p. 116)

(133) 136. Male genitalia of *approximata* type except sipho which is long, slender, lacking dorsal flattened area (fig. 709) ..... *hybridula*, n. sp. (p. 116)
Male genitalia not of *approximata* type, or if of this type, then sipho also as found in *approximata* (fig. 694) 137

(136) 137. Species known only from Bolivia 138
Species not known from Bolivia 141

(137) 138. Elytron with yellow spots large, median transverse band no wider than dark sutural border (fig. 190) ..... *zischkai* (Mader) (p. 87)
Elytron with yellow spots separated by median transverse band distinctly wider than dark sutural border 139

(138) 139. Male genitalia simple, of *fenestrata* type 140
Male genitalia of *vittigera* type with apex of basal lobe abruptly bent upward (figs. 674, 675) ..... *conjuncta*, n. sp. (p. 108)

(139) 140. Male genitalia with basal lobe gradually narrowed from base to apex and broadly curved upward in lateral view (fig. 592); female with hind margin of 10th tergum truncate (fig. 1420) ..... *manni*, n. sp. (p. 87)
Male genitalia with basal lobe abruptly narrowed before apex, narrowed part curved upward in lateral view (fig. 601); female with hind margin of 10th tergum convex (fig. 1432) ..... *fenestrata* Erichson (p. 89)

(137) 141. Species known from Ecuador 142
Species known from Peru 144

(141) 142. Length less than 6 mm ..... *aequatorialis*, n. sp. (p. 113)
Length 6 mm. or more 143

(142) 143. Form broad anterior to middle, narrowed strongly in apical one-third, spots on elytron dark red ..... *jarugui*, n. sp. (p. 120)
Form regularly oval; spots on elytron yellow ..... *approximata* Crotch (p. 113)

(141) 144. Form regularly oval (fig. 194); length about 7.58 mm.; punctation on elytron not dual; female genital plate with posterolateral angle strongly produced, all angles rounded, stylus visible (fig. 1445) ..... *oviforma*, n. sp. (p. 91)
Species not agreeing with above statements 145

(144) 145. Male genitalia of *quirozensis* type (figs. 746–748); spots on the elytron orange or nearly red ..... *quirozensis*, n. sp. (p. 124)
Male genitalia not of *quirozensis* type; spots on elytron orange or yellow 146

(145) 146. Male genitalia of *vittigera* type (figs. 653–655); spots on elytron yellow *fenestroides*, n. sp. (p. 104)
Male genitalia not of *vittigera* type 147

(146) 147. Male genitalia of the *satipensis* type (figs. 737–739); length usually over 7 mm.; spots on elytron orange 148
Male genitalia of *fenestrata* type (figs. 603, 604); spots on elytron yellow 149

(147) 148. Elytron with two orange spots widely separated by transverse median band (fig. 246) ..... *satipensis*, n. sp. (p. 122)
Elytron with two orange spots narrowly or incompletely separated by median band (fig. 247) ..... *woytkowski*, n. sp. (p. 123)

(147) 149. Form elongate, oval (fig. 193); hind margin of sixth abdominal sternum extremely convex in both sexes (fig. 1434) ..... *schwinkei*, n. sp. (p. 90)
Form oval, lateral margin of elytron rounded; hind margin of sixth abdominal sternum emarginate in male, weakly convex or emarginate in female 150

(149) 150. Hind margin of female sixth abdominal sternum emarginate (fig. 1426); male genitalia with basal lobe narrowed before apex and apex curved upward in lateral view (fig. 598), in ventral view basal lobe gradually narrowed to blunt apex (fig. 597) ..... *simulans*, n. sp. (p. 88)

Male genitalia with basal lobe abruptly narrowed before apex, narrowed part curved upward in lateral view (fig. 601); female with hind margin of 10th tergum convex (fig. 1432) ..... *fenestrata* Erichson (p. 89)

(26) 151. Species with vittate elytron 152

Species with elytron not vittate 157

(151) 152. Lateral margin of elytron yellow or reddish brown, never black ..... *callangae*, n. name (p. 156)

Lateral margin of elytron black 153

(152) 153. Mandible short, wide (figs. 26, 26*a*); length usually less than 8.50 mm 154

Mandible normal, of *borealis* type (fig. 22); length usually more than 8.50 mm 156

(153) 154. Elytron with short vitta nearest suture not reaching base of elytron (fig. 305); Peru 155

Elytron with short vitta nearest suture reaching base of elytron (fig. 306); Bolivia ..... *sexlineata* (Weise) (p. 159)

(154) 155. Mandible with two blunt, apical teeth, often appearing as single truncate tooth ..... *basalis* (Weise) (p. 159)

Mandible with three sharp apical teeth ..... *mandibularis*, n. sp. (p. 160)

(153) 156. Elytron with two short, black vittae and long, black vitta near lateral margin nearly reaching sutural border at apex (fig. 299) ..... *propinqua* (Weise) (p. 155)

Elytron with one short, black vitta on disk and long, black vitta near lateral margin that may or may not reach sutural border at apex (fig. 292) ..... *nigrovittata* Crotch (p. 151)

(151) 157. Elytron black with four elongate, yellow spots (fig. 291) ..... *praecipua*, n. sp. (p. 151)

Elytron not as described above 158

(157) 158. Elytron entirely black except pale lateral and basal borders (fig. 276); length 9.40 mm. or more ..... *kraussi*, n. sp. (p. 142)

Elytron not as described above; length usually less than 9.40 mm 159

(158) 159. Elytron with eight dark spots on pale background (fig. 277) ..... *paenulata* (Germar) (p. 143)

Elytron with less than eight dark spots on elytron or not as described above 160

(159) 160. Elytron with seven dark, elongate spots (fig. 275); male genitalia with sipho long, slender, strongly curved (fig. 789) ..... *boraustralis*, n. sp. (p. 141)

Elytron and sipho not as described above 161

(160) 161. Elytron almost completely yellow; epipleuron entirely yellow ..... *austrina*, n. sp. (p. 54)

Elytron with seven dark, usually round spots (fig. 263), or with variations as discussed under *tredecimnotata* (figs. 264–273) ..... *tredecimnotata* (Latreille) (p. 135)

(1) 162. Tarsal claw with lower tooth arising at base (fig. 82); maxilla with lacinia reduced to short projection (fig. 52); postcoxal line short, incomplete ..... *nigrocincta* group (p. 173)

Species not agreeing with all above statements 163

(162) 163. Antenna with segments 4–8 short, compact, at least as wide as long (fig. 12); elytron yellow with black border or also with median, transverse black band (figs. 325, 326); Costa Rica, Panama ..... *abrupta* Gorham (p. 172)

Species not agreeing with all above statements 164

(163) 164. Form nearly round, humeral callus reduced, lateral margin of elytron feebly explanate; elytron black with yellow lateral border (fig. 356); postcoxal line directed toward lateral margin of elytron (*cacica* group) ..... *pseudorealis*, n. sp. (p. 196)

Species not agreeing with all above statements 165

(164) 165. Form in lateral view gibbous; elytron black with elongate red, discal spot (fig. 324); length 10–11.30 mm.; Costa Rica, Panama ..... *tumida* Gorham (p. 171)

Species not agreeing with all above statements 166

(165) 166. Dorsal surface entirely black, covered with greenish-gray pubescence; length 7.33–9.45 mm ..... *olivacea* Mulsant (p. 177)

Species not agreeing with all above statements 167

(166) 167. Dorsal surface black, covered with grayish-yellow pubescence; several piceous spots usually present caused by areas of brownish piceous pubescence; length 6–7.22 mm ..... *obscurella* Mulsant (p. 178)

Species not agreeing with all above statements 168

(167) 168. Elytron red except narrow lateral and basal border black (fig. 334); punctation on elytron not dual, fine, punctures separated by less than their diameter ..... *aubei* Mulsant (p. 179)
Species not agreeing with all above statements 169
(168) 169. Elytron dark red bordered with black, two irregular, transverse black bands present, anterior band behind callus, posterior band at apical one-third (fig. 335); Mexico ..... *vulnerata* Gorham (p. 180)
Species not agreeing with all above statements 170
(169) 170. Length about 5–7.10 mm.; form round, slightly elongate, lateral margin of elytron feebly explanate; male genitalia with basal lobe simple, curved upward before apex, sipho broadly curved, apex blunt, orifice with setigerous membrane (fig. 890); female genital plate square or rectangular, usually with posteromedian angle notched as in figure 1757 ..... *patula* group (p. 180)
Species not agreeing with all above statements 171
(170) 171. Elytron black with seven orange spots arranged in two rows of three spots each and single apical spot (fig. 313) ..... *varipes* Mulsant (p. 165)
Elytron not as described above 172
(171) 172. Elytron a uniform brownish red with no markings ..... *pocohantae*, n. sp. (p. 141)
Elytron not as described above 173
(172) 173. Elytron yellowish red with dark anterior and median bands of coalesced spots appearing as uneven, transverse bands, dark spot on apical one-third (fig. 274) ..... *discincta* Weise (p. 140)
Elytron not as described above 174
(173) 174. Species occurring in eastern United States to central Texas 175
Species occurring from United States west of Great Plains south to Panama 176
(174) 175. Black spots on elytron large as in figure 262, median discal spot reaching suture ..... *borealis* (F.) (p. 133)
Black spots on elytron small (fig. 308), median discal spot not reaching suture ..... *varivestis* Mulsant (p. 161)
(174) 176. Elytron with five or six yellow spots on black background (figs. 314, 316), yellow spots sometimes coalesced as in figures 317, 319; length 7.70–10.58 mm ..... *mexicana* (Guérin) (p. 165)
Species not agreeing with above statements 177
(176) 177. Form broadly oval, lateral margin of elytron strongly rounded from humeral angle to apex; elytron usually black with two large orange or red spots, spots sometimes coalesced; length 8.65 mm. or more 178
Species not agreeing with above statements 179
(177) 178. Apex of basal lobe of male genitalia notched (fig. 859); female genital plate not notched on inner margin (fig. 1719) ..... *erichsoni* Crotch (p. 170)
Apex of basal lobe of male genitalia not emarginate (fig. 856); female genital plate notched near base (fig. 1715) ..... *plagiata* Gorham (p. 170)
(177) 179. Elytron entirely black except lateral margin yellow or orange and basal margin narrowly reddish brown (fig. 276) ..... *kraussi*, n. sp. (p. 142)
Elytron not black, or if black, then lateral margin also black 180
(179) 180. Elytron entirely black or nearly so 181
Elytron usually pale with black spots or markings 182
(180) 181. Elytron entirely black ..... *mexicana* (Guérin) (p. 165)
Elytron black with narrow basal border pale ..... *tredecimnotata* (Latreille) (p. 135)
(180) 182. Elytron reddish brown, completely bordered with black, lateral border very wide, a projection from lateral border extending inward at midpoint (fig. 331) ..... *pseudograpta*, n. sp. (p. 176)
Elytron not agreeing with above description 183
(182) 183. Elytron yellow with lateral margin paler yellow, seven dark spots present (fig. 332); pronotum black ..... *calligrapta* Gorham (p. 176)
Elytron not as described above; pronotum not entirely black 184
(183) 184. Elytron with small dark spots on pale background (fig. 308); male genitalia with apex abruptly bent upward in lateral view (fig. 848); sipho slender, apex slightly thickened, orifice without setigerous membrane (fig. 849); distributed over most of United States except Pacific coast and Great Plains ..... *varivestis* Mulsant (p. 161)
Elytron with large dark spots on pale background (fig. 263), or with elytral variations as in figures 264–273; male genitalia with apex curved upward in lateral view (fig. 779); sipho robust, compressed laterally, apex slender, elongate, orifice with setigerous membrane (fig. 780) ..... *tredecimnotata* (Latreille) (p. 135)

Epilachna flavofasciata Group

Length approximately 5.50–11 mm. Form cordate with lateral margin of elytron straight or pinched medially. Epipleuron slightly descending externally, twice as wide posterior to humeral angle as in apical one-half (fig. 61). Color black, elytron bluish black with yellow spots or transverse bands (except *austrina*). Labrum nearly twice as wide as long (fig. 54); mandible with three major teeth, apical tooth trifid, ventral margin of second tooth with a row of minor teeth, inner margin of mandible serrate below third tooth (fig. 39). Abdomen of male with hind margin of sixth sternum weakly to strongly emarginate; sixth tergum deeply, triangularly notched. Abdomen of female with hind margin of sixth sternum feebly emarginate or truncate; sixth tergum notched as in male. Male genitalia simple, small, phallobase approximately equal in length to length of fourth and fifth abdominal sterna; basal lobe longer than paramere, angled upward before apex; trabes slightly longer than basal piece (fig. 452); sipho slender, less than twice as long as phallobase (fig. 453). Female genital plate slightly elongate, subrectangular to oval, stylus visible. The distribution of the group is Andean, extending from Venezuela to northern Argentina with a single species in southern Brazil.

E. ecuadorica and *octoverrucata* are not typical members of this group in that the form is broad and flat and the epipleuron is extremely broad and strongly descending externally. With the exception of *E. ecuadorica* and *E. octoverrucata*, the *flavofasciata* group is a closely knit unit within *Epilachna*.

Key to Species of *Epilachna flavofasciata* Group

1. Elytron yellow with a black, median vitta (fig. 137) ..... *ecuadorica*, n. sp. (p. 55)
   Elytron not vittate 2
2. Dorsal pubescence rusty gold or brownish yellow (see also *octoverrucata*) ..... *riveti* (Sicard) (p. 53)
   Dorsal pubescence grayish white 3
3. Elytron yellow with narrow, piceous, lateral border (fig. 135); Brazil ..... *austrina*, n. sp. (p. 54)
   Elytron bluish black with two yellow markings; Andean region 4
4. Elytron with posterior yellow spot nearly round, occupying most of posterior one-third (fig. 136); Argentina and Bolivia ..... *eusema* (Weise) (p. 55)
   Elytron with transverse, yellow bands or posterior spot small, usually occupying less than half of posterior one-third; Peru and north 5
5. Elytron with anterior spot near scutellum, yellow spots on elytron not appearing as transverse bands (figs. 133, 134); Peru 6
   Elytron usually with two distinct, transverse yellow bands (fig. 128), or with variations as in figures 129–132; Ecuador, Colombia, Venezuela ..... *flavofasciata* (LaPorte) (p. 48)
6. Posterior spot on elytron usually transversely oval (fig. 134); male genitalia with pronounced dorsal carina on basal lobe ..... *fausta* Erichson (p. 53)
   Posterior spot on elytron round or nearly so (fig. 133); male genitalia without dorsal carina on basal lobe ..... *dives* Erichson (p. 52)

Descriptions of Species in *Epilachna flavofasciata* Group

Epilachna flavofasciata (LaPorte)

(Figs. 128–132, 451–463, 1227–1250; map 7)

Coccinella flavofasciata LaPorte, 1840, p. 524.—Guérin, 1844, p. 319.

Coccinella humeralis Latreille, 1809, p. 229 (not Schaller, 1783).—Guérin, 1844, p. 320.

Coccinella (Epilachna) proteus Guérin, 1844, p. 319.

Coccinella (Epilachna) equestris Guérin, 1844, p. 319.

Epilachna flavofasciata: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Epilachna humeralis: Mulsant, 1850, p. 715.—Weise, 1893, p. 96.—Korschefsky, 1931, p. 62.

Epilachna proteus: Mulsant, 1850, p. 713.—Crotch, 1874, p. 58.—Weise, 1893, p. 26.

Epilachna equestris: Mulsant, 1850, p. 714.

Epilachna proteus var. *A. consularis* Mulsant, 1850, p. 714 (not Mulsant, 1850, p. 712).—Weise, 1893, p. 96.—Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Epilachna flavofasciata Mulsant, 1850, p. 714 (not LaPorte, 1840, p. 524).—Weise, 1893, p. 96.—Blackwelder, 1945, p. 441.

Epilachna proteus var. *blanda* Mulsant, 1850, p. 714.—Weise, 1893, p. 96.
Epilachna variabilis Crotch, 1874, p. 55.—Weise, 1893, p. 213.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442. NEW SYNONYMY.
Epilachna inconstans Crotch, 1874, p. 56. NEW SYNONYMY.
Epilachna humeralis ab. *suturalis* Weise, 1893, p. 96.—Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.
Solanophila proteus: Weise, 1898*c*, pp. 127–128.
Solanophila humeralis ab. *cincta* Weise, 1898*c*, p. 127.—Weise, 1899, p. 260.—Weise, 1910, p. 56.—Sicard, 1910, p. 385.
Solanophila blanda: Weise, 1898*d*, p. 128.
Solanophila flavofasciata: Weise, 1898*c*, p. 128.
Solanophila passiva Weise, 1899, pp. 261–262. NEW SYNONYMY.
Epilachna passiva: Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.
Solanophila fausta var. *bifasciata* Sicard, 1910, p. 384.
Epilachna fausta ab. *bifasciata:* Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 8.78 mm., width 6.43 mm. Form cordate, flattened dorsoventrally, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two transverse, yellow bands not reaching lateral or sutural margins, anterior band obliquely angled posteriorly toward suture, posterior band wider than anterior, slightly widened toward suture (fig. 128). Punctation on elytron dual, small, punctures very fine, scarcely visible, separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron dull, densely, finely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, weakly emarginate; sixth sternum notched; sixth tergum deeply, narrowly notched. Genitalia extremely small for size of body, simple, basal lobe slender, narrowed from base to pointed apex, feebly curved upward in apical one-third; paramere slightly curved downward with upper and lower margins nearly parallel; trabes slightly less than two times length of basal piece (figs. 451, 452); sipho slender, broadly curved upward before apex, apex rounded, orifice dorsal, subterminal (fig. 453).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate (fig. 1227); sixth tergum deeply notched (fig. 1228). Genitalia with 10th tergum convex, entire (fig. 1229); genital plate with all angles rounded, lateral margin broadly produced anterior to middle, stylus visible (fig. 1230).

Variation.—Length 6.71–10.53 mm., width 5.49–7.49 mm. Lateral margin of elytron usually feebly pinched medially but may be straight. Humeral angle more rounded in some specimens giving them appearance of having rounded elytral margins. Elytral color pattern variable. Form described here regarded as typical, but some specimens from Colombia have elytral bands transverse, not oblique, with anterior band subequal to posterior band, or both bands may be reduced to transversely elongate spots as in some specimens from Colombia, Boyaca (fig. 129), and Venezuela (*proteus* Guérin). Entire elytron except for narrow black border or margin may be yellow, basal and apical borders usually wider (fig. 130), or two yellow bands may be narrowly united near suture (fig. 131). This form also occurs with two small black spots representing division between bands (*humeralis* Latreille). Most specimens observed from Ecuador had yellow bands wide with margin rather ragged (fig. 132), but a series from near Cuenca had bands very narrow. A few specimens from Ecuador have two yellow bands each divided into two spots, giving color pattern of *octoverrucata.* Male genitalia variable and examples from specimens collected together and apparently conspecific show as much variation as do specimens collected at different localities. In lateral view basal lobe varies from extremely slender with apex feebly angled upward to wider with apex distinctly curved upward in apical one-third; paramere varies from nearly straight with margins parallel to very wide, strongly curved, margins parallel (figs. 454–463). Male sixth sternum may be feebly or strongly emarginate. Female sixth sternum may be truncate medially or have feeble median emargination

(figs. 1231–1236); sixth tergum has width of notch somewhat variable (figs. 1237–1240). Female genital plate may have anteromedian angle strongly produced and posterior margin may be feebly emarginate (figs. 1246–1250); 10th tergum varies in degree of convexity (figs. 1241–1245).

Type Locality.—Of *flavofasciata,* Colombia; of *humeralis,* Lima, Peru; of *proteus,* Colombia; of *equestris,* Colombia; of *blanda,* Colombia; of *variabilis,* Peru; of *inconstans,* Ecuador; of *suturalis,* Colombia; of *cincta,* Colombia; of *passiva,* Colombia; of *bifasciata,* Ecuador.

Type Depository.—Of *flavofasciata,* unknown; of *humeralis,* DLM (lectotype here designated); of *equestris,* DLM; of *blanda,* unknown; of *variabilis,* UCCC (lectotype here designated); of *inconstans,* UCCC; of *suturalis,* MNHUB (lectotype here designated); of *cincta,* MNHUB (lectotype here designated); of *passiva,* unknown; of *bifasciata,* PM.

Discussion.—The complex here included under the name of *flavofasciata* is a difficult group to define. It appears to be a rapidly evolving, fluid group and specimens from each locality have a slightly different and usually distinctive appearance. Since the male and female genitalia appear to be variable within series and no geographic trend can be detected, I believe that the group may best be treated as a single species with many superficially distinct populations.

Coccinella humeralis Latreille (1809) is the oldest available name for this species, but it is preoccupied by *Coccinella humeralis* Schaller (*1783*). The next available name is *Coccinella flavofasciata* LaPorte (*1840*). Although type material of *flavofasciata* could not be located, LaPorte's description is clear and leaves little doubt that this is the species he had. Guérin (*1844*) described *proteus* and his description is full of inconsistencies, which Weise (*1898d*) noted. Guérin had several species before him and he included *Coccinella humeralis* and *C. quadriplagiata* of Latreille, two quite different species, as varieties of *proteus.* Guérin conceived *proteus* as a variable species and he was followed in this by Mulsant (*1850*), who described in more detail the various forms than Guérin did. The type and much of the material seen by Guérin and Mulsant went to the Crotch collection. The material labeled "*proteus* Guerin" in that collection is a mixture of several not always closely related species. Species represented are *ovaloides, tetartea, dives, lepida,* and *flavofasciata.* Guérin, when describing the typical form, erred in saying that it had on each elytron "four" more or less large rounded spots of a vivid yellow ocher. He must have meant two spots on each elytron or four on both combined; otherwise what follows in the next paragraph of his description would be senseless. Weise (*1898d*) made much of this mistake and insisted that the exact wording of the text had to be taken as the definition of *proteus* Guérin rather than the type specimen, and resurrected *Epilachna humeralis* Latreille as the name to be applied to this species. In both arguments he violated the rules of zoological nomenclature. The type of *proteus* can not be distinguished from *flavofasciata* and is here treated as a simple synonym.

Mulsant (*1850*) used the name *flavofasciata* but did not refer to LaPorte's usage of it and may have overlooked it. Authors after 1850 credited Mulsant with the name *flavofasciata* until Korschefsky (*1931*) listed LaPorte as the author. Although both Mulsant and LaPorte were describing the same species, they used different type specimens and *flavofasciata* Mulsant is a synonym of *flavofasciata* LaPorte.

Type material of *proteus* ab. *cincta* and *proteus* ab. *suturalis* was examined and found to be simply a color form of *flavofasciata* in both instances.

Under the name *inconstans* in the Crotch collection are 21 specimens, some of which are *flavofasciata* and some *octoverrucata.* Under the name *variabilis* in the Crotch collection are five specimens, three of which are *flavofasciata* and two are *octoverrucata.* It is likely that these specimens are from Colombia rather than Peru as stated by Crotch (*1874*), as both *octoverrucata* and *flavofasciata* appear not to occur south of Ecuador.

Weise (*1899*) described *Solanophila passiva* and compared it with *dives.* He used male genitalia, which he described as of the *flavofasciata* type. The specimens under this name in the MNHUB were examined and apparently the type or types of *passiva* are no longer

there. Weise discussed male genitalia but the two specimens in the MNHUB are both females, one of which is *azurea* and the other is *dives*. Since the type locality of *passiva* is Colombia and according to the original description the anterior spot on the elytron is not close to the suture, *passiva* is here regarded as a synonym of *flavofasciata* with the color pattern resembling that of the form named *proteus*.

It is possible that the type of *humeralis* Latreille may not have been collected in Lima, Peru, as stated by Latreille. The *humeralis* color pattern is not at all uncommon in specimens of *flavofasciata* from Colombia and has not been seen in any Peruvian specimens. If the type of *humeralis* is actually from Peru, then the name would apparently have to be placed in synonymy with *dives* instead of *flavofasciata*. Since *humeralis* is a preoccupied name, it is not a critical point as to which species it should be placed under.

The following lectotypes are here designated and label data listed: *humeralis*, *"Epilachna humeralis* Latreille, in Perou, D. Bonpland"; *proteus*, "TYPE," "proteus N. Gr., Guer"; *suturalis*, "Columb.," "humeralis v. suturalis M.D. 93.96"; *cincta*, "columb.," "humeralis v. cincta Ws."

The specimens examined from Bocono and La Grita, Venezuela, are smaller and have the elytral punctation, particularly the large punctures, denser and more distinct than typical *flavofasciata*. Although no differences in genitalia are apparent, these specimens may prove to be another species. Because of the complex nature of the group it is thought best not to consider them as separate species until more evidence becomes available.

Specimens Examined.—Total 796. "Sud-Amerika." COLOMBIA: "Colombia"; "Colum."; "Columbien"; Colombia, Felipe Ovalle, Q.; Colomb., H. Rolle; Columb., Moritz; Columb., G. Reineck. *Amazonas:* Rio Cotuhe, June 13, 1946, L. Richter. *Antioquia:* Durania, Jan. 1944, Gallego; Ebejico, 1943, Gallego; Medellin, H. Daniel; V. Medellin, Jun. 1945, Gallego; Montebello, Aug. 1944, Gallego. *Boyaca:* Arcabuco, 2200–3000 m., III–28–48, L. Richter; Duitama, 21–III–41, 21–IV–41, 21–V–41, Murillo; Ltota, 29–V, E. A. Chapin; Oicata, Alt. 2500 m., 15–V–39, Murillo; Paipa, May 30, 1946, E. A. Chapin. *Caldas:* Manizales, Oct. 1954, D. Rios C.; Playarrica, Manizales, on *Solanum nudiflorum;* Salento, 14–VII–39, Murillo; Villamaria, 22–X–59, R. F. Ruppel. *Cauca:* "Cauca"; Cauca, Korschefsky collection; Cauca, Kraatz. *Cundinamarca:* Anolaima, 6–IV–40, 19–V–41, Murillo; Bogota; Bogota, 1898; Bogota, 10–I–1947; Bogota, B. Guevara; Bogota, Muzo; Bogota, XII–96, Burger S.; Bogota, 10–I–1947, L. Richter; 10 mi. W. Bogota, 2500 m., III–10–55, E. I. Schlinger and E. S. Ross; Bogota, 2640 m., Feb. 13–14, '42, Chapin; Bogota, 3000 m., 10–I–47, L. Richter; Bogota, Boqueron, 2600 m., 1–XII–96, Burger S.; Choachi, V–40, Murillo; Gacheta, 20–II–42, Murillo; Guasca-Gacheta, Feb. 20, 1942, Chapin; Parano de Guasca, 3400 m., March 4, 1948, L. Richter; Junin, 18–II–42, F. R. Fosberg; Parana above Pacho, 25–II–42, Chapin; Sabana; S. Antonio; San Miguel, 2800 m., March 11, 1948, L. Richter; Salto de Tequendama, alt. 2400 m., 8–III–'39, Murillo; Santa Fe de Bogota, Korschefsky collection; Soacha, alt. 1520 m., 22–XI–39, 18–II–40, 30–IV–41, Murillo; Sueva 3–III–40, Murillo; Tequendama, El Colegio, May 4, 1961. *Tolima:* Ibague. Valle del Cauca: Cali Valle, B. Losada S.; 6 mi. W. Cali Valle, 1630 m., III–20–1955, E. I. Schlinger and E. S. Ross; Cali District Western Cordillera, alt. 6500, I–24–1935, Herbert F. Schwarz; Pichinde; Bet. Queremal and Buenaventura, alt. 3500–4000 ft., Feb. 3, 1935, Severo Quintero. ECUADOR: *Azuay:* Lago Zurucuchu, 11 mi. W. of Cuenca, II–16–1955, E. I. Schlinger and E. S. Ross; *Imbabura:* N. Gonzalez, 3300 m., VII–28–1956, Solanum sp., G. H. Dieke. *Loja:* "Loja," 11–X–05, Korschefsky collection. *Napo Pastaza: Canelos. Pichincha:* E. Chiriboga, 2000 m., Solanum sp., G. H. Dieke; Nanegalito, Aug. 21, 1957, G. Merino; Santa Ines, R. Haensch S. *Santiago Zamora:* Macas. *Tungurahua:* Ambato. VENEZUELA: "Venezuela"; Venezuela, H. Rolle; "Paramo de Muenchias." *Merida:* "Merida"; Merida, Staudinger, Korschefsky collection; Cr. Merida, 1550 m., 23–VI–54, C. J. Rosales; Cr. Mucubaji, 3600 m., 4–IV–53, C. J. Rosales; La Mucuy, 8–IV–1956, 10–IX–56, C. J. Rosales; LaMucuy, 2300 m., 5–V–60, C. J. Rosales; Paramo La Negra, 22–XII–59; Paramo La Negra

Edo., 23–III–59, Lozano; Sto. Domingo, 19–V–1965, N. Angeles; Timotes, 16–V–1949, F. Fernandez V. *Portugesa:* Est. Portuguesa, 7 km. N. of Biscucuy, Bocono-Biscucuy Road, elev. 600 m., 15–IX–1957, Borys Malkin. *Tachira:* La Grita, 25–IX–48; La Grita, 1400 m., 2–IV–53, 10–I–55, C. J. Rosales; Paramodel Rosal, 2480 m., 4–XII–64, N. Angeles and R. Vegas: Pregonero, La Grita, 21–IX–66, C. J. Rosales and J. Salcedo. *Trujillo:* Bocono, 25–IV–1948, P. Guagliumi; Bocono, 13–VIII–64, E. Osuna and M. Gelbea. (AMNH) (CAS) (CM) (MCZ) (MNHUB) (USNM) (V) (ZSBS).

Epilachna dives Erichson

(Figs. 133, 464–468, 1251–1254; map 7)

Epilachna dives Erichson, 1847, p. 184.—Mulsant, 1853, p. 165.—Crotch, 1874, p. 55.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 8.25 mm., width 6.68 mm. Form cordate, convex, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow to piceous; elytron bluish black with two round, yellow spots, anterior spot between callus and suture, anterior margin of spot level with posterior margin of callus, posterior spot on apical one-third, slightly closer to suture than lateral margin (fig. 133). Punctation on elytron dual, small punctures fine, separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron dull, densely, strongly reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum deeply notched. Genitalia of the *flavofasciata* type; basal lobe slender, feebly curved upward before apex; paramere wide, slightly curved downward, apex nearly truncate (figs. 464, 465); sipho slender, gently curved upward in apical one-half, orifice dorsal, subterminal (fig. 466).

Female.—Similar to male except abdomen with hind margin of sixth sternum weakly emarginate (fig. 1251); sixth tergum notched (fig. 1252). Genitalia with 10th tergum nearly truncate (fig. 1253); genital plate with all angles rounded, stylus visible (fig. 1254).

Variation.—Length 7.25–10.83 mm., width 5.76–8.19 mm. Elytral spots may be small (less than 1 mm. in diameter) or large (up to 3 mm. in diameter) and vary from round to triangular. A series from Rioja, San Martin, Peru, is apparently teneral with elytron pale brown and elytral spots slightly paler yellowish brown. Female sixth sternum may have distinct, shallow emargination, or be convex, entire. Male genitalia are variable, much as in *flavofasciata,* paramere may vary from that described here to one more slender with apex slightly widened, and basal lobe is often longer and more strongly narrowed (figs. 467, 468).

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—*E. dives* may well be only a subspecies or variation of *flavofasciata,* but biological data are needed to determine what the relationship may be. No Peruvian specimens have been seen with transverse elytral bands. The Peruvian specimens are noticeably more convex in lateral view than specimens of *flavofasciata* from Ecuador and Colombia. The anterior elytral spot in *dives* is nearly always closer to the scutellar angle than in those specimens of *flavofasciata* with reduced bands. The type or types of *dives* were not available, but in the Korschefsky collection there is a specimen compared with the type by Korschefsky.

Specimens Examined.—Total 76. PERU: "Peru." *Amazonas:* Guayabamba, 70 km. E. of Chachapayas, Aug. 16, 1936, F. Woytkowski. *Cajamarca:* Rio Charape, 12–16 Sept. 1911, C. H. T. Townsend; Rio Huallaga, VII–12–25, H. Bassler collection; Upper Rio Huallaga, I–6–26, H. Bassler collection; Sinchono, Cordillera Azul, 1300 m.; W. slope Cordillera Azul, V–17–1947, J. C. Pallister. *Cuzco:* Vilcanota, Korschefsky collection. *Division:* 1281–1300 m., II–47, II–48, W. Weyrauch. *Huanuco:* Chinchao, 1850 m. alt., Solanum sp., VIII–15–1951, G. H. Dieke; F. Sinchono, VIII–3–1947, Schunke; Pozuzo, Korschefsky collection. *Junin:* Chanchamayo, Korschefsky collection. *San Martin:* Almirante, 55 km. W. of Rioja, Dec. 15, 1936, F. Woytkowski; Rio

Seco, 27 km. W. of Rioja, Sept. 21, 1936, F. Woytkowski. (AMNH) (USNM).

Epilachna fausta Erichson

(Figs. 134, 469–471, 1255–1258; map 7)

Epilachna fausta Erichson, 1847, p. 184.—Mulsant, 1853, p. 166.—Crotch, 1874, p. 54.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Epilachna pruinosa Erichson, 1847, p. 184.—Mulsant, 1853, p. 166.—Crotch, 1874, p. 54.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442. NEW SYNONYMY.

Solanophila pruinosa: Weise, 1899, p. 258.

Male.—Length 8.50 mm., width 6.56 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron slightly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two yellow spots, anterior spot elongate, oval, between scutellum and callus and parallel to suture, posterior spot on apical one-third, transversely oval (fig. 134). Punctation on elytron dual, small punctures fine, separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron finely, densely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum deeply, narrowly notched. Genitalia of *flavofasciata* type; basal lobe narrowed from base to apex, curved upward in apical one-third, upper margin laterally flattened, forming a carina in basal one-third; paramere slightly widened apically (figs. 469, 470); sipho gently curved upward in apical one-half, orifice dorsal, subterminal (fig. 471).

Female.—Similar to male except abdomen with hind margin of sixth sternum weakly emarginate (fig. 1255); sixth tergum notched (fig. 1256). Genitalia with 10th tergum convex, entire (fig. 1257); genital plate with all angles rounded, posteromedian angle produced, stylus visible (fig. 1258).

Variation.—Length 7.52–10.38 mm., width 5.78–7.71 mm. Posterior spot may be reduced to small spot near lateral margin (*pruinosa*) and elytral surface may be somewhat shining in some specimens.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—*E. fausta* may be a subspecies or variation of *flavofasciata*, but the male genitalia were rather consistent in the specimens examined and the elytral color pattern did not vary to a great extent except the reduction of the posterior spot. As with *dives*, *fausta* is maintained as a valid species pending the acquisition of biological data. Types of *fausta* and *pruinosa* were not available, but in the Korschefsky collection are specimens of each compared with the type by Korschefsky. *E. pruinosa* is apparently only a form of *fausta* having the posterior spot small and near the lateral margin; the male and female genitalia of the two forms are indistinguishable. The male genitalia with the dorsal carina on the basal lobe and the elongate anterior spot on the elytron separate *fausta* from other members of the *flavofasciata* group.

Specimens Examined.—Total 82. PERU: "Peru." *Cuzco:* Huadquina, Rio Urubamba, 1500 m., VII–1948, Weyrauch; Machu Picchu Pueblo, alt. 6491 ft., March 21, 1947, J. C. Pallister. *Huanuco:* Rio Huallaga, F. 6037, XII–12–25; Upper Rio Huallaga, F. 6075, I–11–26. *Junin:* Chanchamayo, XI–4–1961, J. Schunke; Chanchamayo, alt. 1300 m., IX–25–1961, IX–30–1961, X–11–1961, X–14–1961, XI–5–1961, XI–20–1961; Chanchamayo, La Merced, Carl O. Schunke. *Pasco:* Oxapampa, Korschefsky collection. (AMNH) (USNM).

Epilachna riveti (Sicard)

(Figs. 472–474, 1259–1262; map 7)

Solanophila riveti Sicard, 1910, p. 384.

Epilachna riveti: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 8.24 mm., width 6 mm. Form cordate, dorsoventrally flattened, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large, transversely elongate, yellow bands. Punctation on elytron dual, small punctures separated by

their diameter or less, large punctures indistinct, separated by one to three times their diameter. Surface of elytron finely alutaceous. Pubescence dense, rusty gold. Postcoxal line indistinct, complete, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum shallowly notched; sixth tergum deeply notched. Genitalia of the *flavofasciata* type (figs. 472–474).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate (fig. 1259); sixth tergum deeply notched (fig. 1260). Genitalia with 10th tergum convex, entire (fig. 1261); genital plate with all angles rounded, posterolateral angle broadly produced, lateral and inner margins straight, stylus visible (fig. 1262).

Variation.—Length 7.10–10.21 mm., width 5.41–7.39 mm.

Type Locality.—Ecuador: Montagne du Chaud Nanegal, Rio Gallabomba.

Type Depository.—PM (lectotype here designated).

Discussion.—The extremely flattened form and distinctive rusty-gold pubescence distinguish *riveti* from the rest of the *flavofasciata* group. A specimen from the type series in the Paris museum bearing the following label is here designated lectotype: "Montagne du Chaud Namegal, Rio Gallabomba."

Specimens Examined.—Total 14. ECUADOR: "Ecuador"; Ecuador, ex. coll. Fruhstorfer. *Napo Pastaza:* Papallacta, R. Haensch S. *Tungurahua:* Banos, R. Haensch S. (CAS) (MCZ) (USNM).

Epilachna austrina, new species

(Figs. 135, 475–477, 1263–1266; map 7)

Male.—Length 7.91 mm., width 6 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color yellow; mouthparts piceous to yellow; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; pronotum, head, and legs black; ventral surface except epipleuron piceous to black; elytron pale yellow with narrow piceous border beginning at callus and extending along base to suture and posteriorly along suture in basal one-sixth (fig. 135). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum weakly, triangularly emarginate; sixth tergum deeply notched. Genitalia of the *flavofasciata* type (figs. 475–477).

Female.—Similar to male except abdomen with hind margin of sixth sternum feebly emarginate (fig. 1263); sixth tergum notched (fig. 1264). Genitalia with 10th tergum rounded, convex (fig. 1265); genital plate elongate, inner margin feebly emarginate, lateral margin broadly produced medially, stylus visible (fig. 1266).

Variation.—Length 7.08–9.48 mm., width 5.49–7 mm. Pronotum may have lateral margin broadly yellow and propleuron is often entirely yellow. Piceous basal and sutural border on elytron may be only slightly darker than the rest of the elytron.

Holotype.—Male. BRAZIL: *Sao Paulo:* Campinas, F. C. Camargo (USNM 71637).

Allotype.—Female. BRAZIL: *Sao Paulo:* Campos de Jordao, May 23–31, '40, H. L. Parker (USNM).

Paratypes.—Total 102. BRAZIL: Same data as holotype; same data as allotype; "Brazil"; Brazil, V. Olf. *Sao Paulo:* "S. Paulo"; Campinas de Jordao, 16–IX–1940, H. L. Parker; S. Paulo, Campos de Jordao, Osw. Guilhermo; Campos Jordao, S. Paulo, XII–1942, Halik; S. Antonio, Est. de Sao Paulo, I–20–41, H. L. Parker; Sud-Brasil, Korschefsky collection; V. Monte Verde, M. Gerais, 27–II–1964, Halik. URUGUAY: *Canelones:* Montevideo, V–24, '31, H. L. Parker, on *Solanum.* (CAS) (MNHUB) (USNM).

Discussion.—The male genitalia are not distinguishable from those of *flavofasciata,* but the yellow elytron, disjunct distribution, weakly notched sixth sternum of male, and elongate female genital plate distinguish *austrina* from other members of the *flavofasciata* group. The only known link between *austrina* from coastal Brazil and Uruguay and the rest

of the group from the Andean region is *eusema*, found in Argentina and southern Bolivia.

Epilachna eusema (Weise)

(Figs. 136, 478–480, 1267–1270; map 7)

Solanophila eusema Weise, 1904a, p. 193.
Epilachna eusema: Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.
Solanophila perdubia Weise, 1926, p. 4. NEW SYNONYMY.
Epilachna perdubia: Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 6 mm., width 4.80 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two yellow spots, anterior spot small, elongate, near and parallel to suture, posterior spot large, nearly touching suture at apical one-third (fig. 136). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence yellowish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate medially; sixth tergum notched medially. Genitalia with phallobase small; basal lobe subequal in length to paramere, gradually narrowed toward apex and curved upward before apex in lateral view; paramere widened apically, slightly curved downward (figs. 478, 479); sipho gradually curved upward in apical one-third, apex not widened, orifice dorsal, subterminal (fig. 480).

Female.—Similar to male except hind margin of sixth sternum convex, entire (fig. 1267); sixth tergum notched as in male (fig. 1268). Genitalia with 10th tergum faintly emarginate medially (fig. 1269); genital plate with lateral margin arcuately rounded, inner margin straight, stylus visible (fig. 1270).

Variation.—Length 5.65–7 mm., width 4.20–5.68 mm. Shape of elytral spots is constant, but size is variable. Posterior spots may coalesce at suture in some individuals, and anterior spot will occasionally be more elongate, extending much nearer posterior spot than in typical form.

Type Locality.—Argentina: Province of Tucuman (*eusema*); Bolivia: Mojos (*perdubia*).

Type Depository.—Of *eusema*, not known; of *E. perdubia*, NREA.

Discussion.—The arrangement and shape of the elytral spots are characteristic in this species. It is apparently not uncommon in Argentina and a few specimens have been seen from Bolivia and southern Peru. No type material of *eusema* has been found, but there is no doubt as to the identity of this species. The unique female type of *perdubia* in the NREA collection has been examined and found to be conspecific with *eusema*. The type of *perdubia* bears the following labels: "Mojos, Boliv."; "N. Holmgren"; "perdubia" (handwritten, purple ink); "TYPUS" (red paper); "243,70" (pink paper); "Riksmuseum, Stockholm" (green paper).

Specimens Examined.—Total 64. ARGENTINA: *Jujuy:* "Jujuy." *Santiago del Estero:* Salta, Metan. *Tucuman:* Parque, Aconquija, X–9–28; San Javier, V–40; San Javier, V–1940; Foot Hills, San Javier, XI–20–1929, I–4–1930, III–24–1930, H. A. Jaynes; Tucuman, 12–VI–1927, H. E. Box; Tucuman, XII–44, Golbach; Tucuman, II–26–46, P. A. Berry; Tucuman, Tapia, 600 m., 3–4–1903, C. A. Baer. BOLIVIA: *La Paz:* Calisaya, Rio Boopi, G. L. Harrington; Coroico, Korschefsky collection. PERU: *Cuzco:* Callanga, 1300 m., II, 10–III, 17, 1953, Woytkowski. *Puno:* "Puno." (CAS) (IML) (USNM).

Epilachna ecuadorica, new species

(Figs. 137, 481–483; map 8)

Male.—Length 8.95 mm., width 7.49 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts brown to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow bordered with black, a broad, irregular, black vitta extending from base inside callus to apical one-seventh (fig. 137). Punctation on elytron dual, small punctures separated by their diameter or less, large

punctures separated by less than to three times their diameter. Pubescence brownish yellow. Tarsal claw with feeble basal angulation. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum notched; sixth tergum notched. Genitalia with basal lobe longer than paramere, simple, lower margin angled upward in apical one-third to bluntly pointed apex (figs. 481, 482); sipho slender, apex slightly thickened, orifice dorsal, subterminal (fig. 483).

Female.—Not known.

Holotype.—Male. ECUADOR: *Loja:* "Env. de Loja, Equateur" (PM).

Discussion.—This species is of uncertain affinities within the genus. The deeply notched terminal sterna and genitalia are of the *flavofasciata* type, but the rounded form, color pattern, and general fascies are not typical of this group. The combination of large size, vittate elytron, brownish-yellow pubescence, and simple male genitalia distinguishes *ecuadorica* from any presently described species of *Epilachna.*

Epilachna octoverrucata Mulsant

(Figs. 138, 484–486)

Epilachna octoverrucata Mulsant, 1850, p. 718.—Crotch, 1874, p. 57.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 8.10 mm., width 7.05 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron with four yellow spots arranged in two transverse rows (fig. 138). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to five times their diameter. Surface of elytron finely reticulate. Pubescence brownish yellow. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum deeply notched. Genitalia simple, paramere narrowed toward apex (figs. 484, 485); sipho slender, apex slightly thickened, orifice dorsal, subterminal (fig. 486).

Female.—Not known.

Type Locality.—Colombia (Buquet).

Type Depository.—BMNH (lectotype here designated).

Discussion.—The male specimen in the BMNH bearing the following labels is considered to be type material and is here designated lectotype: "Type" (red and white disk); "octoverrucata Muls., Colombie" (green paper); "named by Mulsant." The broad, flattened form and brownish-yellow pubescence of *octoverrucata* are much as in *ecuadorica* and are not typical of the *flavofasciata* group. The only species of *Epilachna* known from Colombia with which *octoverrucata* might be confused is *reichei,* which has the same color pattern but is smaller and has the lateral margin of the elytron pinched.

Specimens Examined.—Total one. COLOMBIA: The lectotype.

Epilachna dorsigera Group

Length approximately 8–12.50 mm. Mandible of *flavofasciata* type. Color black, elytron usually entirely yellow or orange except for a narrow bluish-black basal and lateral border. Lateral margin of elytron usually pinched medially; epipleuron strongly widened anterior to middle. Male genitalia simple, phallobase approximately equal in length to abdominal sterna 3–5; basal lobe longer than paramere, not or only slightly angled upward before apex, in ventral view abruptly narrowed just before apex; trabes nearly three times as long as basal piece (figs. 487, 488); sipho slender, more than twice as long as phallobase (fig. 489). The distribution is primarily Peruvian with a single species occurring in Bolivia and northern Argentina.

E. transverselineata is not a typical member of this group in that the sixth sternum of the female is broadly emarginate with a median tooth and the sipho of the male genitalia is only slightly longer than the phallo-

base. The *dorsigera* group is similar to the *flavofasciata* group with the only apparent differences being the larger male genitalia and color pattern.

Key to Species of *Epilachna dorsigera* Group

1. Elytron black with two transverse, yellow bands (fig. 143) ..... *transverselineata* (Mader), n. comb. (p. 59)
   Elytron without transverse bands 2
2. Median yellow or orange area of elytron with obscure paler areas, bluish-black border narrow, not or slightly wider basally or apically than on lateral margin (figs. 139, 140) *dorsigera* Erichson (p. 57)
   Median area of elytron yellow or orange without pale areas, bluish-black border much wider at base and apex than on lateral margin (fig. 141) 3
3. Basal one-fourth of elytron bluish black; Argentina and Bolivia (fig. 141) ..... *sellata* Weise (p. 58)
   Basal one-eighth or less of elytron bluish black; Peru (fig. 142) ..... *cuscoi*, n. sp. (p. 58)

Descriptions of Species in *Epilachna dorsigera* Group

Epilachna dorsigera Erichson

(Figs. 139–140, 487–489, 1271–1276; map 8)

Epilachna dorsigera Erichson, 1847, p. 184.—Mulsant, 1853, pp. 165–166.—Crotch, 1874, p. 54 (as a synonym of *E. dives* Erichson).—Korschefsky, 1931, p. 61 (as a synonym of *dives*).—Blackwelder, 1945, p. 441.

Male.—Length 9.39 mm., width 6.91 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron brownish yellow with lateral and basal margins bluish black, black margin extending over callus and along suture just posterior to scutellum, two pale-yellow spots present, one on anterior one-half, one on posterior one-half (fig. 139). Punctation on elytron not noticeably dual, punctures separated by less than their diameter. Surface of elytron finely reticulate, shining. Pubescence grayish white. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly concave; sixth sternum notched; sixth tergum strongly notched. Genitalia with basal lobe gently angled upward and outward before apex; paramere slightly narrowed anterior to middle, apex slightly widened (figs. 487, 488); sipho long, slender, straight before apex, orifice dorsal, subterminal (fig. 489).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum nearly truncate medially (fig. 1271); sixth tergum notched (fig. 1272). Genitalia with 10th tergum convex, entire (fig. 1273); genital plate slightly elongate, all angles rounded, anterior margin strongly rounded, stylus visible (fig. 1274).

Variation.—Length 8.24–10.47 mm., width 6–7.76 mm. Elytral color pattern is quite variable, series of specimens from Pilco, Peru, has elytron yellow, bordered with black, and extremely pale-yellow, obscurely elongate spot on disk (fig. 140). Specimens from Machu Picchu and Abancay, Peru, range from pale form through typical form to specimens in which black border extends inward as far as outer margin of pale spots. Male and female from Carpish Mountains have elytron entirely bluish black with two small yellow spots arranged as in *dives*. Male genitalia varied only slightly in specimens examined, but shape of female genital plate varied from specimen to specimen; females from same series exhibited same degree of variation found in specimens from different localities (figs. 1275, 1276). Female sixth sternum varied from truncate to feebly emarginate.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—In spite of the variable color pattern, *dorsigera* is likely to be confused only with *discolor*, which has an oval form and entirely different genitalia. The type or types were not available, but in the Korschefsky collection is a specimen compared with the

type by Korschefsky. There is little doubt as to the identity of this species.

Specimens Examined.—Total 70. PERU: *Apurimac:* Abancay, alt. 2400 m., XII–1–1947, W. Weyrauch; Abancay, 2460 m., X–11–1947, on Nicotiana sp., Weyrauch. *Cuzco:* 40 mi. W. of Cuzco (subtropical cyn.), III–4–51, Ross and Michelbacher; Machu Picchu, III–1936, Jaroslav Soukup; Machu Picchu, 2000 m., XI–20–1940, W. K. Weyrauch; Machu Picchu Pueblo, March 22, 1947, J. C. Pallister; Pilco, 2800 m., I–14–20–1953, Woytkowski. *Huanuco:* E. side Carpish Mts., 2800 m., 40 mi. S. W. Tingo Maria, X–17–1954, E. I. Schlinger and E. S. Ross. *Junin:* Chanchamayo, Korschefsky collection; Perene, Korschefsky collection; Ulcuyacu, Tarma, 1600–3000 m., Mar. 5, 1948, F. Woytkowski. *Pasco:* Oxapampa, Korschefsky collection; Oxapampa, 1800 m., 10–I–1955, Weyrauch. (AMNH) (CAS) (USNM).

Epilachna sellata Weise

(Figs. 141, 490–492, 1277–1280; map 8)

Epilachna sellata Weise, 1895, p. 123.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 9 mm., width 6.85 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with large, median, yellow spot, anterior margin of spot beginning at suture at basal one-fourth, outer corner rounded, angling posterolaterally nearly to lateral margin, posterolateral angle abrupt, posterior margin truncate, joining suture at apical one-third (fig. 141). Punctation on elytron not noticeably dual, punctures separated by less than their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending to within one-third the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum deeply notched. Genitalia with basal lobe slender, lower margin gradually curved upward to blunt point, in ventral view abruptly narrowed to blunt point in apical one-fifth; paramere nearly straight, upper and lower margins parallel (figs. 490, 491); sipho long, slender, straight in apical two-thirds, apex slightly curved upward, orifice dorsal, subterminal (fig. 492).

Female.—Similar to male except abdomen with hind margin of sixth sternum feebly emarginate (fig. 1277); sixth tergum strongly notched (fig. 1278). Genitalia with 10th tergum convex (fig. 1279); genital plate with inner margin straight, outer margin curved, posterior margin broadly produced, stylus visible at center of apical margin (fig. 1280).

Variation.—Length 8.10–9.68 mm., width 6.33–7.30 mm.

Type Locality.—Bolivia: Chaco.

Type Depository.—MNHUB.

Discussion.—The unique type, a female bearing the following labels, has been examined: "Chaco, Bolivia" (green paper, handwritten); "sellata ws" (white paper, handwritten). *E. sellata* resembles *cuscoi*, n. sp., quite closely in external appearance; genitalia should be examined for an accurate determination (see remarks under *cuscoi*).

Specimens Examined.—Total 42. ARGENTINA: *Salta:* San Lorenzo, 31–I–1948, Monros and Willink. BOLIVIA: "Bolivia." *La Paz:* La Paz, H. Clemens. PERU: Peru, Gehr. W. Müller, Vermacht 1909. (IML) (USNM) (ZSBS).

Epilachna cuscoi, new species

(Figs. 142, 493–495, 1281–1282; map 8)

Male.—Length 9.80 mm., width 7.55 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron pinched medially. Color as described for *sellata* except yellow discal spot much larger, occupying all elytron except basal one-seventh, a narrow lateral margin and apical one-sixth (fig. 142). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Area between punctures finely reticulate. Pubescence grayish white. Postcoxal line nearly complete, distinct, extending to within one-third the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum

broadly notched; sixth tergum deeply, strongly notched. Genitalia as described for *sellata* except basal lobe in ventral view gradually narrowed before apex, lateral angle obsolete, apex blunt (figs. 493, 494); sipho as in *sellata* except apex thickened (fig. 495).

Female.—Length 11 mm., width 8.05 mm. Similar to male except abdomen with hind margin of sixth sternum broadly, weakly emarginate; sixth tergum deeply notched. Genitalia with 10th tergum feebly convex medially, margin obliquely descending laterally (fig. 1281); genital plate as described for *sellata* except stylus close to anteromedian angle, posterior margin rounded (fig. 1282).

Variation.—Length 9.53–11 mm., width 7.10–8.05 mm. Punctation is less noticeably dual on allotype than on other specimens.

Holotype.—Male. PERU: *Cuzco:* Callanga. 1300 m., II, 10–III, 17, 1953, Woytkowski (USNM 71638).

Allotype.—Female. Same data as holotype (USNM).

Paratype.—Total one. PERU: Same data as holotype. (USNM).

Discussion.—This species is closely allied to *sellata* and may be separated externally only on the relatively larger size and larger yellow spot on the elytron. The male genitalia are the only certain means of separating the two species.

Epilachna transverselineata (Mader), new combination

(Figs. 143, 143*a*, 496–498, 1283–1286; map 9)

Solanophila transverselineata Mader, 1958, p. 4.

Male.—Length 9.46 mm., width 8 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two yellow, transverse bands present, extending from near suture nearly to lateral margin, posterior band angled forward toward suture (fig. 143). Punctation on elytron not obviously dual, punctures separated by less than their diameter. Pubescence brownish yellow. Tarsal claw with small basal projection. Postcoxal line obsolete. Abdomen with hind margin of fifth sternum emarginate medially; sixth sternum notched; sixth tergum emarginate. Genitalia with basal lobe slender, angled upward to blunt apex, slightly humped on dorsal surface, fine setae present dorsally; paramere narrow at base, widened apically; trabes slightly longer than basal piece (figs. 496, 497); sipho slender, straight before apex, orifice dorsal, terminal (fig. 498).

Female.—Length 11.05 mm., width 9.15 mm. Similar to male except hind margin of fifth sternum truncate; sixth sternum broadly, deeply emarginate with a prominent tooth at center of notch (fig. 1283); sixth tergum strongly convex, emarginate medially (fig. 1284). Genitalia with 10th tergum convex, entire (fig. 1285); genital plate elongate, oval, narrowed toward posterior end (fig. 1286).

Variation.—Length 9.46–12.19 mm., width 8–9.15 mm. Posterior yellow band on elytron may be straight rather than angled forward (fig. 143*a*).

Type Locality.—Bolivia: *Cochabamba;* Yungas de Arepucho, Chacisacha, ca. 1700 m.

Type Depository.—ZSBS.

Discussion.—The toothed sixth sternum of the female, brownish-yellow pubescence, and narrow elytral bands separate *transverselineata* from related species. The type specimen has been examined.

Specimens Examined.—Total 12 BOLIVIA: *Cochabamba:* Yungas de Arepucho, Chacisacha, ca. 1700 m., 24–9–53. PERU: "Peru," J. Soukup. *Cuzco:* Lucma, 7000 ft., 25 August, 1911, Yale Peruv. Exp. (FM) (USNM) (ZSBS).

Epilachna deuterea Group

Length approximately 6–11 mm. Mandible of *flavofasciata* type. Color pattern variable. Lateral margin of elytron usually feebly rounded from humeral angle to apex, sometimes straight medially; epipleuron twice as wide anterior to middle as posterior to middle.

Male genitalia simple, basal lobe longer than paramere, usually laterally compressed (fig. 499). Female genital plate wide, rounded apically, posterior margin produced, usually strongly so (fig. 1290). Distribution centered in Venezuela and Colombia with species extending to southern Peru and Bolivia.

The *deuterea* group is not closely knit; *deuterea, tritea,* and *ovaloides* are closely allied and the rest of the species are placed here only because of a slightly similar type of male genitalia and the produced female genital plate.

Key to Species of *Epilachna deuterea* Group

1. Elytron with transverse yellow or orange bands on a dark background 2
   Elytron without transverse bands 5
2. Species with bands on elytron broad, often as wide as intervening black area; Venezuela 3
   Species with bands on elytron narrow, much narrower than intervening black area; not known from Venezuela 4
3. Anterior yellow band on elytron reaching callus or near so (fig. 144) ..... *deuterea*, n. sp. (p. 60)
   Anterior yellow band not approaching callus (fig. 145) ..... *tritea*, n. sp. (p. 61)
4. Length 9 mm. or more; width of transverse band on elytron 1 mm. or more (fig. 151) ..... *obtusiforma*, n. sp. (p. 65)
   Length 8.50 mm. or less; width of transverse band on elytron about 0.5 mm. (fig. 150) ..... *hektea*, n. sp. (p. 64)
5. Elytron yellow, completely bordered with black, two black spots present in a transverse row medially (fig. 146) ..... *ovaloides*, n. sp. (p. 61)
   Elytron not as described above 6
6. Elytron reddish brown with no dark sutural border ..... *parvicollis* Casey (p. 62)
   Elytron not as described above 7
7. Elytron bluish black with three distinct, discrete yellow spots (fig. 149) ..... *sexmaculata* Kirsch (p. 64)
   Elytron not as described above 8
8. Elytron yellow, bordered with bluish-black yellow area divided into four subequal areas by narrow bluish-black lines, transverse discal line not wider than sutural border (fig. 147) ..... *viridilineata viridilineata* Crotch (p. 63)
   Elytron yellow, bordered with bluish black as above, transverse discal line much wider than sutural border, posterior two yellow spots usually not completely divided (fig. 148) ..... *viridilineata rossi*, n. sp. (p. 63)

Descriptions of Species in *Epilachna deuterea* Group

Epilachna deuterea, new species

(Figs. 144, 499–501, 1287–1290; map 9)

Male.—Length 10 mm., width 8.28 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two broad yellow bands, first band near base, second band on apical one-half (fig. 144). Punctation on elytron dual, small punctures fine, nearly obsolete, separated by one to four times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Tarsal claw with a small basal projection. Postcoxal line obsolete. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with basal lobe straight, slender, pointed, fine setae present on dorsal surface; paramere slightly curved downward, narrowed at apex (figs. 499, 500); sipho short, straight before apex, orifice dorsal, subterminal (fig. 501).

Female.—Length 10.80 mm., width 8.75 mm. Similar to male except hind margin of fifth sternum convex; sixth sternum emarginate (fig. 1287); sixth tergum entire, convex (fig. 1288). Genitalia with 10th tergum feebly emarginate, pigmentation lacking medially (fig. 1289); genital plate with posteromedian angle obsolete, posterolateral angle extremely prolonged (fig. 1290).

Variation.—Length 9.60–11 mm., width 8.10–8.88 mm.

Holotype.—Male. VENEZUELA: El Junquillo, Km. 20, on *Solanum belinum*, Birk, 4–1–1937 (USNM 71639).

Allotype.—Female. VENEZUELA: *Zulia:* Maracaibo (USNM).

Paratypes.—Total 45. VENEZUELA: Same data as allotype. *Aragua:* Colonia Tovar, 16–VIII–1966, A. D. Ascoli; Colonia Tovar, 1800 m., 14–VII–64, P. J. Salinas and C. J. Rosales. *Distrito Federale:* Caracas, 22–VI–67, R. G Oakley; Caracas; El Junzuito, 25–II–29, C. H. Ballou; El Junzuito, III–25–39, C. H. Ballou, *Solanum hypornodium* Bouche; El Junzuito, 28–V–1950, F. Fernandes; El Junzuito, 20–X–51, C. J. Rosales. *Miranda:* Agua Fria, 23–I–49, F. Fernandes. *Trujillo:* Cr. La Puerto, 1700 mm., 21–IX–54, C. J. Rosales. (USNM) (V) (ZSBS).

Discussion.—*E. deuterea* resembles *flavofasciata*, but the elytron is not pinched and the sixth tergum is not notched in *deuterea*. This species is quite close to *tritea*, n. sp. See remarks under *tritea*.

Epilachna tritea, new species

(Figs. 145, 502–504, 1291–1294; map 9)

Male.—Length 9.15 mm., width 7.67 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron broadly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black; segments 2–8 yellow, 9–11 piceous; elytron black with two yellow bands, first band anterior to middle of elytron, borders curved, second band on apical one-third, oval (fig. 145). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures broad with minute punctures on bottom, separated by one to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Tarsal claw with small basal projection. Postcoxal line obsolete. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe slender, compressed laterally, angled upward slightly in apical one-fourth; paramere narrowed at apex (figs. 502, 503); sipho long, slender, orifice dorsal, subterminal (fig. 504).

Female.—Length 10.83 mm., width 9.75 mm. Similar to male except abdomen with hind margin of fifth sternum slightly convex; sixth sternum emarginate (fig. 1291); sixth tergum entire, convex (fig. 1292). Genitalia with 10th tergum convex (fig. 1293); genital plate with apical margin angulate, lateral margin sinuate, posterolateral angle with a short, curved process (fig. 1294).

Variation.—Length 9.15–10.83 mm., width 7.67–9.75 mm.

Holotype.—Male. VENEZUELA: *Merida:* Merida (AMNH).

Allotype.—Female. Same data as holotype (AMNH).

Paratypes.—Total 42. VENEZUELA: *Lara:* Cubito, 1500–1700 m., 29–VIII–68, J. R. Reguena, R. Casares, and J. B. Teran. *Merida:* Same data as holotype; Carbonera, 22–11–1964, J. and B. Bechyne; Carc Barinas, Apartaderos, 1000 m., 10–V–63, Fred Kern. *Trujillo:* Cr. La Puerta, 1700 m., 21–IX–54, C. J. Rosales. (AMNH) (USNM) (V).

Discussion.—This species resembles *deuterea*, but the yellow bands on the elytron are smaller and more oval, the lateral margin of the elytron is more strongly explanate and rounded from the humeral angle to the apex, and the large punctures on the elytron are denser and have minute punctures at the bottom. Both male and female genitalia are distinctive.

Epilachna ovaloides, new species

(Figs. 146, 505–507, 1295–1298; map 9)

Male.—Length 9.68 mm., width 8.25 mm. Form broadly oval, widest anterior to middle of elytron, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark yellow completely bordered with black, border widest at base near scutellum and at apical angle, two black spots present in a transverse band at middle of elytron (fig. 146). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to two times their diameter, broad, minute punctures present on bottom. Surface of elytron finely reticulate. Pubescence grayish white. Tarsal claw with a small basal projec-

tion. Postcoxal line obsolete. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe slender, compressed laterally, lower margin angled upward in apical one-fourth, fine setae present on upper surface; paramere narrowed at apex (figs. 505, 506); sipho long, slender, straight before apex, orifice dorsal, subterminal (fig. 507).

Female.—Length 9.69 mm., width 7.51 mm. Similar to male except abdomen with hind margin of fifth sternum slightly convex; sixth sternum deeply emarginate (fig. 1295); sixth tergum entire, convex (fig. 1296). Genitalia with 10th tergum convex (fig. 1297); genital plate with anterolateral angle rounded, posterolateral angle produced (fig. 1298).

Variation.—Length 7.87–10.92 mm., width 6.48–9 mm. Two spots on elytron, especially inner spot, are very faint, almost absent in a few specimens.

Holotype.—Male. COLOMBIA: *Cundinamarca:* Soacha, 22–XI–39, alt. 2520 m., Murillo (USNM 71640).

Allotype.—Female. Same data as holotype.

Paratypes.—Total 75. COLOMBIA: "Colombia." *Caldas:* Salento, 14–VII–39, Murillo. *Cundinamarca:* Same data as holotype; Arauquita, 25–VII–44, P. R. Fosberg; Bogota; Bogota-Muzo, Burger S.; Choachi, Bogota, 2900 m., I–10–1947, L. Richter; nr. El Colegio, 4–V–41, 4–III–40, Murillo; Fusagasuga, Korschefsky collection; Fusagasuga, 2200, 10–XII–96, Burger S.; Pacho, 2200 m., 27–III–97, Burger S.; Salto de Tequendama, alt. 2400 m., 8–III–'39, 20–VII–1940, Murillo; Soacha, alt. 2520 m., 22–XI–'39, 18–II–40, Murillo. *Tolima:* Canon del Monte, 1700 m., 1909, Korschefsky collection. (AMNH) (CM) (MNHUB) (USNM) (ZSBS).

Discussion.—*E. ovaloides* agrees with the description of *humeralis* Latreille except for the rounded lateral margin of the elytron. It can be distinguished from *humeralis* by the oval form, entire sixth tergum, and presence of coarse elytral punctures. Structurally *ovaloides* is close to *tritea* but the elytral color patterns are different.

Epilachna parvicollis Casey

(Figs. 1299–1302; map 10)

Epilachna parvicollis Casey, 1899, p. 168.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Female.—Length 10 mm., width 8.61 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron not strongly emarginate, nearly straight medially. Color black; mouthparts piceous to yellow; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; median area of metasternum and abdomen piceous; elytron light reddish brown with explanate portion of lateral margin black, an obscure, irregularly transverse, piceous spot extending from lateral margin just behind middle, a second piceous spot present on disk at midpoint. Punctation on elytron dual, small punctures indistinct, separated by less than to three times their diameter, large punctures coarse, separated by their diameter or less, fine punctures present at bottom of large punctures. Pubescence grayish white. Postcoxal line complete, distinct, not extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum with a small, triangular notch and a feeble, longitudinal suture (fig. 1299); sixth tergum convex, entire (fig. 1300). Genitalia with 10th tergum convex, entire (fig. 1301); genital plate slightly narrowed basally, pigment lacking on posteromedian angle, appearing ragged and posterolateral angle appearing produced, stylus visible (fig. 1302).

Male.—Not known.

Variation.—Length 9.60–10 mm., width 8.48–8.61 mm. Second specimen in type series has discal spot on elytron completely lacking.

Type Locality.—Bolivia.

Type Depository.—USNM (lectotype here designated).

Discussion.—The absence of a male specimen of *parvicollis* makes the placement of the species uncertain. It is tentatively placed near *ovaloides* but does not fit into the group very well. The presence of the obscure elytral spots suggests that some specimens will have a transverse band present. Casey had two specimens of *parvicollis*. The female bearing the

following labels is here designated as lectotype: "Bolivia"; "Casey bequest 1926"; "TYPE USNM 35582"; "parvicollis Csy."

Specimens Examined.—Total three. BOLIVIA: "Bolivia." *Cochabamba:* San Antonio. (PM) (USNM).

Epilachna viridilineata viridilineata Crotch

(Figs. 147, 508–510, 1303–1306; map 10)

Epilachna viridilineata Crotch, 1874, p. 55.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 7.40 mm., width 5.50 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; head and pronotum greenish black; mouthparts piceous to yellow; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, completely margined with greenish black and divided into four unequal areas by a line starting from base near callus and branching to right and left medially until the branches reach suture and margin, respectively, the posterior area divided by a line extending from outer branch to suture before apex (fig. 147). Punctation on elytron dual, small punctures separated by their diameter, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line incomplete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum emarginate medially; sixth sternum notched; sixth tergum feebly, broadly emarginate. Genitalia with basal lobe longer than paramere, gradually curved upward toward apex, apex bluntly rounded, a line of setae present anterolaterally; paramere narrowed at apex (figs. 508, 509); sipho short, apex thickened, orifice dorsal, subterminal (fig. 510).

Female.—Similar to male except hind margin of fifth sternum truncate; sixth sternum feebly, broadly emarginate with a longitudinal suture (fig. 1303); sixth tergum truncate (fig. 1304). Genitalia with 10th tergum strongly convex, weakly pigmented (fig. 1305); genital plate elongate, posterolateral margin strongly produced (fig. 1306).

Variation.—Length 7–8 mm., width 5.10–6.05 mm.

Type Locality.—Peru or Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—This species and *rossi*, n. ssp., may be distinguished on elytral color pattern alone. See remarks under *rossi*. Twelve specimens in addition to the type are present in the Crotch collection. Two of these are labeled "Ecuador"; the others have no data, but Crotch (*1874*) listed specimens from Peru. The specimen bearing the type label has no data.

Specimens Examined.—Total 18. ECUADOR: Ecuador. *Loja:* "Loja"; Loja, Dr. Ohaus. PERU: *Piura:* R. Chau. (AMNH) (UCCC) (USNM).

Epilachna viridilineata rossi, new subspecies

(Figs. 148, 1307–1310; map 10)

Male.—Length 8.43 mm., width 6.68 mm. Description as for *viridilineata* with the following differences: Lateral margin of elytron slightly pinched medially. Elytron with lines dividing the yellow areas broad, strong, line dividing posterior yellow area incomplete, not reaching median line (fig. 148). Abdomen with hind margin of sixth sternum strongly notched. Genitalia with paramere very slender, straight in apical three-fourths.

Female.—Similar to male except hind margin of sixth sternum broadly emarginate (fig. 1307); sixth tergum with hind margin broadly, deeply emarginate (fig. 1308). Genitalia with 10th tergum truncate medially (fig. 1309); genital plate with lateral margin strongly sinuate, stylus visible (fig. 1310).

Variation.—Length 8.43–9.35 mm., width 6.68–7.75 mm.

Holotype.—Male. ECUADOR: *Chimborazo:* 30 mi. SW. of Alausi, 2500 m., II–14–55, E. I. Schlinger and E. S. Ross collectors (CAS).

Allotype.—Female. Same data as holotype (CAS).

Paratypes.—Total 14. ECUADOR: Same data as holotype; Macas. (CAS) (USNM).

Discussion.—On the basis of available specimens it would appear that the elytral color pattern is sufficient to distinguish *rossi* and *viridilineata*. In addition to color, *rossi* is considerably larger and the female genitalia and sixth sternum and tergum show distinct dif-

ferences. The male genitalia are nearly identical except for the slightly narrower paramere of *rossi*.

Epilachna sexmaculata Kirsch

(Figs. 149, 511–513, 1311–1314; map 10)

Epilachna sexmaculata Kirsch, 1876, p. 125.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 7.80 mm., width 5.85 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron feebly rounded medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark greenish blue with three pale-yellow spots, anterior spot elongate-oval, near and parallel to suture, median spot elongate-oval, near lateral margin behind callus, posterior spot slightly elongate, on apical one-third slightly nearer suture than margin (fig. 149). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures with alutaceous sculpture at bottom, separated by less than two times their diameter. Surface of elytron densely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe long, slender, gradually curved upward toward apex, upper margin slightly bent downward just before apex; trabes shorter than paramere; paramere slender, lower margin sinuate, narrowed at apex (figs. 511, 512); sipho slender, apex sinuate, curved upward, orifice dorsal, subterminal (fig. 513).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum faintly, broadly emarginate, longitudinal suture present (fig. 1311); sixth tergum convex, faintly emarginate (fig. 1312). Genitalia with 10th tergum small, convex, lightly pigmented (fig. 1313); genital plate pear-shaped, posterolateral angle strongly produced, stylus visible (fig. 1314).

Variation.—Length 6.10–9 mm., width 4.30–6.50 mm.

Type Locality.—Peru.

Type Depository.—Dresden museum, type destroyed during World War II.

Discussion.—Although the type has been destroyed, there is no doubt as to the identity of this species. It is easily recognized by the color pattern and shape, and Korschefsky, who must have seen the type, had an identified specimen in his collection.

Specimens Examined.—Total 27. PERU: *Cuzco:* Rio Urubamba, VII–16–1951, *Solanum* sp., G. H. Dieke; San Miguel, 6000 ft., 24 July 1911, Yale Peruv. Exp; Callanga, W. Horn. *Pasco:* Oxapampa. (CAS) (USNM).

Epilachna hektea, new species

(Figs. 150, 514–516, 1315–1318; map 10)

Male.—Length 8.18 mm., width 6.46 mm. Form oval, elongate, narrowed posteriorly, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; pronotum lacking yellow at anterolateral angle; elytron black with two narrow, transverse, orange bands, anterior band interrupted at outer one-third, posterior band extending from near lateral margin one-half the distance to suture, indistinct (fig. 150). Punctation on elytron dual, small punctures fine, dense, separated by their diameter or less, large punctures broad, shallow, separated by their diameter or less, with many fine punctures at bottom. Surface of elytron dull, densely, finely reticulate. Pubescence grayish white. Postcoxal line indistinct, obsolete medially. Abdomen with hind margin of fifth sternum broadly feebly emarginate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, laterally flattened in apical one-third, angled gently upward to blunt point; paramere broad, widest at middle (figs. 514, 515); sipho straight before apex, apex bent downward, rounded, orifice dorsal, subterminal (fig. 516).

Female.—Length 8.15 mm., width 6.46 mm. Similar to male except both orange bands on elytron complete, very narrow, bands not

reaching either sutural or lateral margin. Abdomen with hind margin of fifth sternum feebly produced medially; sixth sternum notched (fig. 1315); sixth tergum convex, entire (fig. 1316). Genitalia with 10th tergum narrow, convex (fig. 1317); genital plate strongly narrowed posteriorly, inner margin ragged, anterior angles rounded, posteromedian angle obsolete, posterolateral angle produced, stylus visible (fig. 1318).

Holotype.—Male. ECUADOR: "Ecuad." (UCCC).

Other Specimen.—Female. ECUADOR: *Tungurahua:* 6700 ft. (USNM).

Discussion.—Because of the possibility that the two specimens described here are not conspecific, the female is not designated as allotype. The holotype is the third specimen in the type series of *bizonata* Crotch. The bands on the elytron of the holotype are obviously remnants of complete bands such as those on the female. The male genitalia are slightly similar to those of *tritea*, n. sp., and unlike the *chigata* type in spite of the external resemblance to *chigata*. The female genital plate bears a resemblance to that of *convergens*.

Epilachna obtusiforma, new species

(Figs. 151, 1319–1321; map 10)

Female.—Length 10 mm., width 7.51 mm. Form oval, widest anterior to middle of elytron, lateral margin of elytron weakly emarginate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–7 yellow, 8–11 piceous; anterolateral margin of elytron not yellow, elytron black with two transverse orange bands extending within 0.25 mm. of suture, anterior band slightly produced posteriorly near suture (fig. 151). Punctation on elytron dual, small punctures dense, separated by their diameter or less, large punctures broad, shallow, separated by their diameter or less, with many very fine punctures at bottom. Surface of elytron dull, densely, finely reticulate. Pubescence grayish white. Postcoxal line indistinct, obsolete medially. Abdomen with hind margin of fifth sternum truncate; sixth sternum emarginate, longitudinal suture present (fig. 1319); sixth tergum convex, entire. Genitalia with 10th tergum narrow, strongly convex, entire (fig. 1320); genital plate elongate, irregularly triangular, posteromedian angle obsolete, inner margin curved, stylus visible only in apical view (fig. 1321).

Male.—Not known.

Holotype.—Female. ECUADOR: *Napo Pastaza:* Coca, R. Haensch S., Korschefsky collection (USNM 71641).

Paratype.—Total one. ECUADOR: *Tungurahua:* Banos, R. Haensch S., Korschefsky collection (USNM).

Discussion.—The large size, truncate sixth sternum, shape of genital plate, and oval form distinguish *obtusiforma* from any presently described species with the *bizonata* type of color pattern. The placement within the genus is uncertain and the species is here placed near *bizonata* pending discovery of males.

Epilachna v-pallidum Group

Length approximately 8–10.50 mm. Mandible with three major teeth, first tooth bifid, few or no minor teeth present (fig. 34). Form and color variable. Male genitalia with basal lobe laterally compressed, strongly, abruptly curved upward to rounded apex (fig. 517); sipho S-shaped (fig. 518). Female genital plate elongate, produced posteriorly (fig. 1324). The distribution is mainly in Bolivia and southern Peru with a single species occurring in Ecuador.

Species of this group have very similar male genitalia. The external color pattern and form are different for most of the species, and the female genital plates also offer good characters for species separation.

Key to Species of *Epilachna v-pallidum* Group

1. Elytron yellow, completely bordered with bluish black, with a median, bluish-black vitta 2
   Elytron not vittate 3
2. Form strongly convex; large punctures on elytron separated by one to three times their diameter; Bolivia ..... *orthostriata*, n. sp. (p. 67)
   Form feebly convex; large punctures on elytron separated by their diameter or less; Peru ..... *v-pallidum v-pallidum* Blanchard (p. 66)
3. Elytron with four elongate, usually distinctly separated, yellow spots (fig. 152) ..... *v-pallidum v-pallidum* Blanchard (p. 66)
   Elytron with less than four yellow spots 4
4. Elytron yellow, completely bordered with bluish black, a small black apical spot and an angulate black mark present extending from base to midpoint (fig. 153) ..... *v-pallidum angulata*, n. ssp. (p. 67)
   Elytron with two pale spots on dark background 5
5. Anterior yellow spot on elytron transverse, angled forward from near lateral margin to near suture (fig. 155); Ecuador ..... *tetartea*, n. sp. (p. 67)
   Anterior yellow spot on elytron not angled forward; not known from Ecuador 6
6. Surface of elytron finely reticulate between punctures, shining; Bolivia ..... *forsteri* (Mader), n. comb. (p. 68)
   Surface of elytron rugose, dull; Peru ..... *peruviana* Crotch (p. 68)

Descriptions of Species in *Epilachna v-pallidum* Group

Epilachna v-pallidum v-pallidum Blanchard

(Figs. 152, 517–518, 1322–1324; map 11)

Epilachna v-pallidum Blanchard, 1846, p. 214.—Mulsant, 1850, p. 703.—Crotch, 1874, p. 58.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Solanophila v-pallidum ab. *flavoquadrivittata* Mader, 1958, p. 2. NEW SYNONYMY.

Male.—Length 9 mm., width 6.85 mm. Form cordate, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; elytron bluish black with four elongate, yellow spots (fig. 152). Punctation on elytron dual, small punctures separated by their diameter, large punctures dense, separated by their diameter or less. Pubescence grayish white. Postcoxal line incomplete, extending less than one-half distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially, sixth sternum distinctly notched medially, sixth tergum entire, faintly emarginate. Genitalia with basal lobe strongly curved upward, compressed laterally, apex broader than median part; paramere broad, shorter than basal lobe; trabes short, narrow medially, abruptly widened apically, apex nearly truncate (fig. 517); sipho long, slender, curved in an S-shape, apex bluntly rounded, orifice dorsal, subterminal (fig. 518).

Female.—Similar to male except abdomen with posterior margin of fifth sternum truncate; sixth sternum deeply notched (fig. 1322); sixth tergum convex, entire (fig. 1323). Genitalia with 10th tergum truncate medially (fig. 1324); genital plate pear-shaped, stylus visible, inner margin ragged posteriorly (fig. 1324).

Variation.—Length 8.50–9.50 mm., width 6.85–7.10 mm. Some specimens have yellow spots connected giving elytron a vittate appearance (ab. *flavoquadrivittata* Mader).

Type Locality.—"Province of Santa Cruz (Bolivia)."

Type Depository.—PM (lectotype here designated).

Discussion.—The specimens with the spots connected have the same appearance as *orthostriata* but are not nearly as convex in form. The single specimen in the Paris museum collection, a male bearing the following labels, is here designated lectotype: "Museum Paris, Bolivie (Yangas), D'Orbigny 1834"; "'Epilachna v-pallidum Blanch., Mulsant vidit."

Specimens Examined.—Total 19. BOLIVIA: "Bolivia." *Cochabamba:* 2600 m., 15–9–53, W. Forster; Yungas; Yungas de Arepucho Sihuencas, 2500 m., 19–9–53, W. Forster; Yungas de Corani, 2500 m., 29-9-53, W. Forster. PERU: "Peru," J. Soukup. (BMNH) (CAS) (FM) (PM) (USNM).

***Epilachna v-pallidum angulata*, new subspecies**

(Figs. 153, 519–521; map 11)

Male.—Similar to *v-pallidum v-pallidum* with the following differences: Length 8.30 mm., width 6.81 mm. Bluish-black markings on elytron reduced, median vitta reaching only to middle of elytron, median band extending from lateral margin to vitta, forming a sharp angle, a small elongate spot near apex (fig. 153). Genitalia with basal lobe narrowest at apex, abruptly carinate below at base, trabes narrow medially, expanded apically (figs. 519–521).

Female.—No apparent genitalic differences from *v-pallidum v-pallidum* sensu strictu.

Variation.—Length 8.91–10 mm., width 6.75–6.90 mm.

Holotype.—Male. PERU: Cuzco: Lucma, 7000 ft., 7 August, 1911, Yale Peruvian Exp. (USNM 71642).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total four. Same data as holotype (USNM).

Discussion.—The differences observed in the male genitalia are the basis for erecting this subspecies of *v-pallidum*, but it is possible that the change in elytral color pattern may follow a geographic pattern from Bolivia north into Peru. The color pattern in *angulata* is derived by a reduction of the bluish-black area of typical *v-pallidum*.

***Epilachna orthostriata*, new species**

(Figs. 154, 522–523, 1325–1328; map 11)

Male.—Length 9 mm., width 7 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron yellow, surrounded with bluish-black margin, bluish-black median vitta extending from base nearly to apical margin (fig. 154). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to three times their diameter. Pubescence grayish white. Postcoxal line incomplete, indistinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum notched; sixth tergum faintly emarginate medially. Genitalia similar to *v-pallidum*, basal lobe more strongly curved; paramere wider, apex broadly rounded (fig. 522); sipho long, slender, S-shaped (fig. 523).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate, sixth sternum deeply notched medially (fig. 1325); sixth tergum convex, entire (fig. 1326). Genitalia with 10th tergum convex, narrowly pigmented (fig. 1327); genital plate with posterolateral angle produced, pointed stylus visible (fig. 1328).

Variation.—Length 8–10.50 mm., width 6.10–7.60 mm.

Holotype.—Male. BOLIVIA: *Cochabamba:* San Antonio Rd., VIII–6–1951, Solanum (?) sp., G. H. Dieke (USNM 71643).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total 30. Same data as holotype. (USNM).

Discussion.—This species is distinct from any other vittate species (except the vittate form of *v-pallidum*) by its large size and details of the male genitalia. The male genitalia are very similar throughout the *v-pallidum* group and external characters are usually sufficient to separate the species.

***Epilachna tetartea*, new species**

(Figs. 155, 524, 1329–1330; map 11)

Male.—Length 8.20 mm., width 6.30 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron slightly pinched medially. Color greenish black; mouthparts yellow to piceous; antenna yellow, club piceous; elytron greenish black with two yellow bands, the anterior band extending from near margin obliquely forward to near suture, posterior margin of band concave, the posterior band, transverse, extending from near margin to near suture, gradually widened from outer margin to suture (fig. 155). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures

dense, separated by their diameter or less. Pubescence grayish white. Postcoxal line indistinct, incomplete, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate, sixth sternum notched, sixth tergum with posterior margin entire, faintly emarginate medially. Genitalia similar to *v-pallidum*, basal lobe less strongly curved, apex definitely narrower than preceding part (fig. 524); sipho as in *v-pallidum*.

Female.—Similar to male except abdomen with posterior margin of fifth sternum truncate, sixth sternum deeply notched (fig. 1329), sixth tergum convex, entire. Genitalia with 10th tergum convex, narrowly pigmented (fig. 1330); genital plate irregularly oval with long narrow process at outer basal angle, stylus present (fig. 1330).

Variation.—Length 8.10–10 mm., width 3.25–6.66 mm. Overall shape is more abruptly triangular with elytral margins more broadly reflexed in two of paratypes. Posterior margin of anterior elytral band is not always as obviously concave as in type.

Holotype.—Male. ECUADOR: *Tungurahua:* Pundoa, 2800 m., XI–7–1939, W. M. MacIntyre collector (AMNH).

Allotype.—Female. ECUADOR: *Tungurahua:* Pundoa, Banos, 2300 m., VII–1–1939, W. MacIntyre (AMNH).

Paratypes.—Total four. ECUADOR: *Tungurahua:* Same data as holotype; Banos, VI–1936, W. M. MacIntyre; Pundoa, near Banos, 2800 m., 8–VI–37, E. Brundage. (AMNH) (USNM).

Discussion.—*E. tetartea* closely resembles *flavofasciata* in shape and coloration, but the male genitalia place it in the *v-pallidum* group. The obliquely slanted anterior band on the elytron makes it possible to recognize *tetartea* without dissection.

Epilachna forsteri (Mader), new combination

(Figs. 156, 525–526; map 11)

Solanophila forsteri Mader, 1958, p. 2.

Male.—Length 9.24 mm., width 7.31 mm. Form cordate, widest posterior to humeral angle, narrowed to blunt apex in apical one-half, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9-11 piceous; elytron purplish black with two large, round, yellow spots, anterior spot just inside callus, posterior spot on apical one-third (fig. 156). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by their diameter or less, bottom of large punctures with dense, small punctures present. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, emarginate medially; sixth sternum notched; sixth tergum convex, truncate. Genitalia of the *v-pallidum* type; basal lobe longer than paramere, strongly curved upward; paramere not widened at apex (fig. 525); sipho slender, curved in an S-shape, apex bluntly pointed, orifice dorsal, subterminal (fig. 526).

Female.—Not known.

Type Locality.—Bolivia: La Paz: Sarampiuni, San Carlos, 1000 m., 15–9–50.

Type Depository.—ZSBS.

Discussion.—The unique male type has been examined. *E. forsteri* resembles *lepida* and *azurea* in external appearance. In addition to the entirely different type of male genitalia, *forsteri* is much more strongly narrowed posteriorly and the sixth tergum is not notched or emarginate as it usually is in members of the *azurea* group. The elytral color pattern and the strongly narrowed posterior one-half of the body distinguish *forsteri* from other members of the *v-pallidum* group.

Specimens Examined.—Total one. The unique type.

Epilachna peruviana Crotch

(Figs. 157–158, 527–528, 1331–1334)

Epilachna peruviana Crotch, 1874, p. 57.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Female.—Length 8.78 mm., width 6.89 mm. Form cordate, elongate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; a tenna with basal segment black, segments 2–8 yellow, 9–11 piceous;

elytron dull bluish black with two yellow spots, anterior spot posterior to and inside of callus, posterior spot on apical one-third nearly touching suture (fig. 157). Punctation on elytron indistinct, dual, surface of elytron rugose, dull. Pubescence grayish white. Postcoxal line complete, distinct, extending one-half the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex medially; sixth sternum deeply notched (fig. 1331); sixth tergum entire, broadly convex (fig. 1332). Genitalia with 10th tergum narrow, convex (fig. 1333); genital plate elongate, base strongly produced (fig. 1334).

Male.—Similar to female except genitalia of the *v-pallidum v-pallidum* type (figs. 527, 528).

Variation.—Second specimen in type series has elytron with spots expanded into two transverse bands (fig. 158).

Type Locality.—Peru (Fry).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The elytral color pattern (both types) is similar to that found in the *flavofasciata* group. The entire sixth tergum and genital plate with the base produced in the female, as well as the male genitalia, separate *peruviana* from the *flavofasciata* group and place it in the *v-pallidum* group.

The female type bears the following labels: "Peru" (handwritten); "TYPE, peruviana" (handwritten); "TYPE" (blue paper, handwritten). The other specimen in the type series is labeled "Peru." The specimens in the BMNH are also types and are labeled "TYPE."

Specimens Examined.—Total seven. PERU: "Peru"; Peru, Fry coll. (BMNH) (UCCC).

Epilachna albovittata Group

Length approximately 5–11.20 mm. Mandible visible beyond labrum, three major teeth grouped near apex, first tooth strongly tridentate, minor teeth present on inner margin of second tooth, inner margin of mandible finely serrate below third tooth (fig. 31). Color and form variable. Lateral margin of elytron usually rounded from humeral angle to apex, sometimes straight. Male genitalia short, robust, resembling those of members of the genus *Toxotoma;* basal lobe longer than paramere, broad in ventral view, narrowed before apex; trabes slightly longer than basal piece (figs. 529, 530); sipho short, blunt, with sharp tooth on ventral margin at apex (fig. 531). The distribution of the group is along the Andean chain from Colombia to northern Argentina.

These species form a distinctive group based on the male genitalia. The male genitalia are of the *Toxotoma* type, but the mouthparts and legs are typical of *Epilachna.*

Key to Species of *Epilachna albovittata* Group

1. Elytron vittate 2
   Elytron not vittate 4
2. Elytron with median, incomplete, black vitta on yellow background (fig. 168) ..... *striola* (Weise) (p. 74)
   Elytron with two yellow vittae on dark background 3
3. Lateral margin of elytron strongly pinched behind humeral angle (fig. 160); Ecuador, Peru ..... *aureola*, n. sp. (p. 70)
   Lateral margin of elytron rounded from humeral angle to apex (fig. 159); Argentina ..... *albovittata* (Weise) (p. 70)
4. Length 7 mm. or less; elytron with four regular, subequal, yellow spots (fig. 169) ..... *persimilis* Crotch (p. 74)
   Length 8 mm. or more; elytron never with four spots 5
5. Elytron with three yellow spots or markings on dark background 6
   Elytron not as described above 8
6. Anterior spot on elytron extremely elongate near suture, two small spots in transverse row on apical one-third (fig. 163) ..... *emerita*, n. sp. (p. 72)
   Elytron not as described above 7

7. Form strongly convex; posterior spot small, round, near lateral margin (fig. 166); Bolivia ..... *bistrispilota*, n. sp. (p. 73)
   Form feebly convex, posterior spot transverse, wide (fig. 165); Colombia ..... *consularis* Mulsant (p. 72)
8. Elytron with two yellow or orange spots 9
   Elytron with single yellow or orange spot or mark 10
9. Pubescence rusty red ..... *pseudospilota*, n. sp. (p. 73)
   Pubescence yellow or white 11
10. Pubescence entirely white ..... *lorata* Weise (p. 71)
    Pubescence yellow except white on yellow markings of elytron ..... *emerita*, n. sp. (p. 72)
11. Pubescence yellow except white on elytral markings; elytron black with yellow mark beginning at base, extending posteriorly beyond middle, then abruptly outward nearly to lateral margin (fig. 162) ..... *emerita*, n. sp. (p. 72)
    Pubescence white; elytron greenish or bluish black with transverse orange band on apical one-third (fig. 161) ..... *lorata* Weise (p. 71)

Descriptions of Species in *Epilachna albovittata* Group

Epilachna albovittata (Weise)

(Figs. 159, 529–531, 1335–1338; map 12)

Solanophila albovittata Weise, 1906, p. 228.
Epilachna albovittata: Korschefsky, 1931, p. 54.—Blackwelder, 1945, p. 440.

Male.—Length 8 mm., width 6.33 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two yellow vittae, outer vitta extending from behind callus to apical one-fourth, inner vitta extending from near base parallel to suture to apical one-fourth, outer margin of vitta narrowed medially (fig. 159). Punctation on elytron strongly dual, small punctures separated by their diameter or less, large punctures separated by their diameter or less. Surface elytron finely, indistinctly reticulate. Pubescence dense, golden brown. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly emarginate medially; sixth tergum deeply notched medially. Genitalia with basal lobe short, robust, longer than paramere, lower margin obliquely angled upward to apex, apex pointed, hooked downward; paramere curved downward, narrowed at apex (figs. 529, 530); sipho short, robust, apex sharply pointed, bent downward, orifice dorsal, subterminal (fig. 531).

Female.—Similar to male except hind margin of fifth sternum slightly convex; sixth sternum strongly emarginate medially with longitudinal suture (fig. 1335); sixth tergum strongly emarginate medially (fig. 1336). Genitalia with 10th tergum convex (fig. 1337); genital plate with lateral margin straight, inner margin curved, stylus visible (fig. 1338).

Variation.—Length 8–9.50 mm., width 6.33–7.68 mm.

Type Locality.—Argentina, "Prov. Salta."

Type Depository.—Not known.

Discussion.—*E. albovittata* is easily recognized by the elytral color pattern and dense golden-brown pubescence. No type material has been located, but there is little doubt as to the identity of the species, which seems to be not uncommon in Argentina. The male genitalia, especially the sipho, are of the *Toxotoma* type.

Specimens Examined.—Total 49. ARGENTINA: *Jujuy:* "Jujuy." *Salta:* El Quemada, Apr. 1926; San Lorenzo, 31–I–1948, Monros and Willink. *Tucuman:* Tafi, Siambon, XII–1946, D. Olea; Tucuman, 2–XI–60, Molle. (IML) (USNM).

Epilachna aureola, new species

(Figs. 160, 532–534; map 12)

Male.—Length 8.23 mm., width 6.63 mm. Form broad, cordate, widest posterior to humeral angle, lateral margin of elytron feebly explanate, strongly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron greenish black with two yellow vittae, outer vitta extending

from near base outside of callus to apical one-third, inner vitta extending from near base at scutellum to apical one-third, apex of vitta curved outward (fig. 160). Punctation on elytron dual, small punctures fine, separated by their diameter or less, large punctures separated by less than to three times their diameter. Pubescence dense, more so on pronotum, golden brown. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum abruptly, shallowly notched; sixth tergum emarginate. Genitalia with basal lobe slightly longer than paramere, robust, in ventral view apex with lateral angle abrupt, median projection strong, blunt; paramere slender, slightly narrowed apically (figs. 532, 533); sipho short, stout, ventral tooth present at apex, orifice dorsal, subterminal (fig. 534).

Female.—Not known.

Holotype.—Male. PERU: *Junin:* 2200 m., Llama, VI–11–1956, W. Weyrauch 6746 (USNM 71644).

Paratype.—Total one. ECUADOR: *Loja:* Loja, 10–X–1899, Ernesto Witt leg., Korschefsky collection. (USNM).

Discussion.—*E. aureola* and *albovittata* are superficially very similar. The pinched elytron, abrupt notch on the male sixth sternum, and the male genitalia separate *aureola* from *albovittata.*

Epilachna lorata Weise

(Figs. 161, 161*a*, 535–537, 1339–1342; map 12)

Epilachna lorata Weise, 1895, p. 121.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 442.
Solanophila lorata ab. *postsignata* Mader, 1950, p. 40.
Solanophila lorata ab. *inscripta* Mader, 1958, p. 3.

Male.—Length 8.62 mm., width 6.95 mm. Form cordate, widest just posterior to humeral angle, margin of elytron broadly explanate at humeral angle, straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron greenish black with orange spot posterior to callus and orange, obliquely transverse band at apical one-third, band not extending to either sutural or lateral margin (fig. 161). Punctation on elytron dual, small punctures separated by their diameter or less, larger punctures separated by one to six times their diameter. Pubescence white. Postcoxal line complete, indistinct, reaching beyond middle of first abdominal sternum. Abdomen with fifth sternum faintly emarginate medially; sixth sternum notched medially; sixth tergum with posterior margin faintly emarginate medially. Genitalia with basal lobe longer than paramere, widened at apical one-third, apex narrowed, curved upward; paramere slender (figs. 535, 536); sipho short, flattened dorsally, orifice dorsal, subterminal, apex bent downward, pointed (fig. 537).

Female.—Similar to male except abdomen with posterior margin of fifth sternum truncate; sixth sternum with blunt projection medially (fig. 1339); sixth tergum emarginate medially (fig. 1340). Genitalia with posterior margin of 10th tergum truncate, sides parallel (fig. 1341); genital plate irregularly oval, stylus visible (fig. 1342).

Variation.—Length 8.50–9.62 mm., width 6.85–7.43 mm. Background color of elytron varies from greenish black to bluish black and apical band varies from dark orange to yellow. Orange spot behind callus may be absent (fig. 161*a*). In some specimens apical band may be widened near suture.

Type Locality.—Bolivia.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—This is apparently a fairly common species in Bolivia. The characteristic greenish or bluish-black elytron and dorsal color pattern as well as the broadly explanate margin of the elytron make this an easily recognizable species. The male genitalia approach the *Toxotoma* type.

According to Article 45 of the International Rules the names *postsignata* Mader and *inscripta* Mader have no standing.

Specimens Examined.—Total 53. BOLIVIA: *Cochabama:* Chapare, El Limso, 200 m., 17–19–1958, Monros and Wygodzinsky; Yungas de Palmar, 2000 m., Zischka, 12–2–57. *La Paz:* Incachaca, alt. 2500 m., J. Steinbach. (CM) (FM) (IML) (USNM).

Epilachna emerita, new species

(Figs. 162–164, 538–540, 1343–1346; map 12)

Male.—Length 9.29 mm., width 7.42 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with yellow vitta extending from near base between callus and scutellum obliquely posteriorly to near suture posterior to middle, then widened and abruptly bent outward nearly to lateral margin (fig. 162). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to three times their diameter. Surface of elytron finely reticulate. Pubescence yellow except on yellow areas of elytron where it is white. Postcoxal line incomplete, distinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum deeply, strongly notched, lateral margin of notch thickened, protuberant; sixth sternum notched; sixth tergum deeply notched. Genitalia of the *Toxotoma* type; basal lobe longer than paramere, narrowed medially, apex curved upward, pointed, in ventral view apex trifid, lateral angle rounded, median projection bluntly pointed; paramere narrow, not widened apically; trabes short, not longer than basal piece (figs. 538, 539); sipho short, robust, apex pointed, orifice dorsal, elongate (fig. 540).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum notched, longitudinal suture present (fig. 1343); sixth tergum notched (fig. 1344). Genitalia with 10th tergum entire, feebly convex (fig. 1345); genital plate narrowed posteriorly, stylus near posterolateral angle, anterior margin weakly emarginate near anteromedian angle (fig. 1346).

Variation.—Length 9.29–11.10 mm., width 7.42–8.47 mm. Yellow vitta on elytron may be incomplete. A form occurs in which vitta is broken just behind midpoint and transverse part is represented by two spots (fig. 163). Another form occurs in which markings on elytron consist of elongate spot at base near scutellum and round spot on apical one-third near lateral margin (fig. 164).

Holotype.—Male. PERU: *Cuzco:* Machu Picchu, 29–I–1952, 2000 m., F. Monros (IML).

Allotype.—Female. Same data as holotype (IML).

Paratypes.—Total five. PERU: *Cuzco:* Same data as holotype; Machu Picchu Pueblo, March 20, 1947, alt. 6491 ft., J. C. Pallister coll.; Torontoy, 7000 ft., 3 Sept. 1911, Yale Peruv. Exp. (AMNH) (IML) (USNM).

Discussion.—This species is one of the most easily recognized *Epilachna*. Both male and female genitalia are highly distinctive as are the typical color pattern and presence of yellow pubescence. The male genitalia place *emerita* near *albovittata* and allies.

Epilachna consularis Mulsant

(Figs. 165, 541–542, 1347–1350; map 12)

Epilachna consularis Mulsant, 1850, pp. 712–713.—Crotch, 1874, p. 58.—Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 10.46 mm., width 8 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron feebly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron bluish black with three yellow spots, anterior two spots elongate, outer spot elongate-oval, near lateral margin immediately behind and outside callus, inner spot irregularly triangular, inner margin parallel to suture, anterior to middle, posterior spot transverse on apical one-half, gradually widened from margin to suture, anterior and posterior margins of spot sinuate (fig. 165). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Surface of elytron finely reticulate, shining. Pubescence yellowish white. Postcoxal line complete, indistinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum notched; sixth tergum notched. Genitalia in ventral view with basal lobe shorter than paramere, apex with lateral angle rounded,

median projection strong, bluntly pointed; paramere slender, slightly narrowed apically (fig. 541); sipho short, stout, apex blunt, upper margin narrowed in apical one-half (fig. 542).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum notched (fig. 1347); sixth tergum notched (fig. 1348). Genitalia with 10th tergum feebly emarginate (fig. 1349); genital plate slightly elongate, all angles rounded, base with small, unpigmented area, stylus visible (fig. 1350).

Variation.—Length 10.46–12.10 mm., width 8–8.78 mm.

Type Locality.—Colombia (Buquet, Guerin, Hope, Reiche).

Type Depository.—UCCC (lectotype here designated).

Discussion.—This is another member of the *albovittata* group. It is easily separated from other members of the group by the elytral color pattern and yellowish-white pubescence. It is the only one thus far recorded from Colombia. *E. consularis* has the facies of the *flavofasciata* group, but the mandibles and genitalia are typical of the *albovittata* group. The single female in the Crotch collection bearing the following labels is here designated lectotype: "consularis, N. Gren. Dey T"(green paper); "TYPE"; "TYPE" (blue paper).

Specimens Examined.—Total two. COLOMBIA: "N. Gren." *Cundinamarca:* Bogota. (UCCC) (USNM).

Epilachna bistrispilota, new species

(Figs. 166, 543–545, 1351–1354; map 12)

Female.—Length 9 mm., width 7.42 mm. Form oval, extremely convex, widest at middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with three yellow spots, first spot near lateral margin posterior to callus, second spot near base between scutellum and callus, third spot near lateral margin at apical one-third (fig. 166). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct medially, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched, longitudinal suture present (fig. 1351); sixth tergum weakly notched (fig. 1352). Genitalia with 10th tergum convex, entire (fig. 1353); genital plate with all angles and inner margin rounded, stylus visible (fig. 1354).

Male.—Similar to female except abdomen with fifth sternum broadly, feebly emarginate; sixth sternum notched; sixth tergum notched. Genitalia with basal lobe longer than paramere, robust, curved upward before apex, apex bent downward, in ventral view anterolateral angle abrupt, median projection bluntly pointed; paramere slightly sinuate (figs. 543, 544); sipho short, robust, apex with ventral tooth prominent, orifice dorsal, subterminal (fig. 545).

Variation.—Length 8.61–9 mm., width 7.30–7.42 mm.

Holotype.—Female. BOLIVIA: *La Paz:* Calisaya, Rio Boopi, G. L. Harrington (USNM 71645).

Allotype.—Male. BOLIVIA: *Cochabamba* (PM).

Paratypes.—Total four. BOLIVIA: *Cochabamba. La Paz:* Chaco. (PM).

Discussion.—The male genitalia place this species in the *albovittata* group, but the three-spotted elytron and convex form are not typical of the group.

Epilachna pseudospilota, new species

(Figs. 167, 546–548, 1355–1358; map 12)

Male.—Length 8.60 mm., width 7.41 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron rounded from humeral angle to apex, form slightly flattened dorsoventrally. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two yellow spots, anterior spot elongate, near scutellum and parallel to suture, posterior spot small, nearly round, near lateral margin on apical one-third (fig. 167). Punctation on elytron dual, small punctures separated by their diameter or less, large

punctures separated by one to two times their diameter. Pubescence dense, rusty red. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate medially; sixth sternum notched; sixth tergum notched. Genitalia with basal lobe longer than paramere, lower margin abruptly angled upward in apical one-third, apex curved outward and downward, pointed, in ventral view lateral apical angle rounded, apical one-fourth gradually narrowed to median, apical projection; paramere feebly sinuate, not widened apically (figs. 546, 547); sipho short, robust, feebly pinched medially, ventral tooth at apex, orifice dorsal, subterminal (fig. 548).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum notched (fig. 1355); sixth tergum notched (fig. 1356). Genitalia with 10th tergum convex, entire (fig. 1357); genital plate with all angles rounded, inner margin arcuate, anterior margin feebly emarginate above visible stylus (fig. 1358).

Holotype.—Male. BOLIVIA: *LaPaz:* Chaco (PM).

Allotype.—Female. BOLIVIA: *LaPaz:* Chaco, coll. V. de Poll (PM).

Discussion.—*E. pseudospilota* has the external appearance of one of the variations of *emerita* and the male genitalia are very much like those of *bistrispilota.* The dense rusty-red pubescence of *pseudospilota* will separate this species from *emerita.*

Epilachna striola (Weise)

(Figs. 168, 549–551, 1359–1362; map 12)

Solanophila striola Weise, 1902, p. 162.
Epilachna striola: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Female.—Length 9.75 mm., width 7.20 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially, abruptly angled toward apex in apical one-third. Color black; mouthparts brown to piceous; antenna with basal segment black, segments 2–5 brown, 6–11 piceous; elytron yellow with all margins and a median vitta dark greenish blue, vitta extending from base at callus posteriorly beyond middle, faint traces of vitta on apical one-third (fig. 168). Punctation on elytron dual, small punctures separated by their diameter, large punctures separated by one to five times their diameter. Surface of elytron coarsely reticulate. Pubescence yellow. Postcoxal line complete, indistinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched (fig. 1359); sixth tergum emarginate (fig. 1360). Genitalia with 10th tergum rectangular (fig. 1361); genital plate with posterior margin rounded, posterior one-fifth produced, stylus visible (fig. 1362).

Male.—Similar to female except abdomen with hind margin of sixth sternum notched, sixth tergum notched. Genitalia with basal lobe longer than paramere, robust, narrowed in apical one-fifth, apex curved upward, in ventral view anterolateral angle abrupt, median projection stout, bluntly pointed; paramere slender, narrowed apically (figs. 549, 550); sipho short, robust, apex with ventral tooth angled anteriorly, orifice dorsal, subterminal (fig. 551).

Variation.—Length 8.47–9.74 mm., width 6.61 mm.

Type Locality.—Peru: Marcapata.

Type Depository.—MNHUB.

Discussion.—Superficially *striola* resembles *bisbivittata,* but the yellow pubescence and angulate apex of the elytron distinguish *striola.* The unique female type has been examined and bears the following label: "Marcapata, Peru, Staud."

Specimens Examined.—Total three. PERU: *Cuzco:* Marcapata, Staud.; Marcapata, Thal. Nofl. d. Madre de Dios, 3000 m., Garlepp S.V. (PM) (USNM).

Epilachna persimilis Crotch

(Figs. 169–170, 552–554, 1363–1366; map 12)

Epilachna persimilis Crotch, 1874, p. 56.—Weise, 1895, p. 120.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 6.50 mm., width 5.05 mm. Form cordate, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to pice-

ous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with four yellow spots, anterolateral spot round, near suture posterior to callus, anteromedian spot elongate, parallel to and near suture, posterolateral spot round, near margin at apical one-third, posteromedian spot slightly elongate, near suture (fig. 169). Punctation on elytron dual, small punctures separated by less than their diameter, large punctures separated by one to three times their diameter. Pubescence yellow except on elytral spots where pubescence is short, white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum broadly emarginate; sixth tergum notched. Genitalia with trabes shorter than phallobase; basal lobe broad, flattened dorsoventrally at apex, abruptly narrowed before apex, tip blunt; paramere slightly widened apically (figs. 552, 553); sipho short, robust, apex pointed, orifice dorsal (fig. 554).

Female.—Similar to male except sixth abdominal sternum with hind margin truncate (fig. 1363); sixth tergum notched as in male (fig. 1364). Genitalia with 10th tergum convex (fig. 1365); genital plate nearly square, stylus visible (fig. 1366).

Variation.—Length 5–6.95 mm., width 4–5.55 mm. All four spots on elytron may be extremely elongate, two sutural spots with lateral margins parallel, two near outer margin elongate-oval (fig. 170). Typical form described here is intermediate between form with elongate spots and specimens in which elytral spots are all reduced in size and nearly uniformly round. Elytral pubescence varies from sparse to dense.

Type Locality.—Peru.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The variation discussed here seems to be correlated to some degree with the geographical distribution. The smallest specimens (from Peru) have the elytral pubescence dense and the spots reduced. The larger specimens have the elytral pubescence sparse with the spots elongate and are from Ecuador. The pubescence is distinctly yellow, not a rusty gold as in *fuscopilosa;* this along with the male genitalia distinguishes *persimilis* from the other species with four spots on each elytron. The male type of *persimilis* bearing the following labels has been examined: "Peru" (handwritten); "TYPE, persimilis" (handwritten); "TYPE" (blue paper, handwritten).

Specimens Examined.—Total 44. ECUADOR: *Loja:* 12–IV–1956, M. A. Cevallos. PERU: *Cajamarca:* Cascas, n. Trujillo, II–1942, W. K. Weyrauch. *Huanuco:* Cordillera Azul, Sinchono, W. K. Weyrauch. *Junin:* Llama, VI–12–1956, W. Weyrauch. *Lambayeque:* Olmos, 21 mi. E., I–18–1955, E. I. Schlinger and E. S. Ross; Olmos, 28 mi. E., I–19–1955, E. I. Schlinger and E. S. Ross. (CAS) (MNHUB) (USNM).

Epilachna obliqua Group

Mandible extending well beyond labrum, with three major teeth, first tooth bifid. Labrum short, slightly concave. Genitalia of male similar to genitalia of *albovittata* type except phallobase strongly compressed laterally (fig. 555).

This species belongs near the *albovittata* group, but since the male genitalia are sufficiently different, *obliqua* is here placed in a separate group.

Description of Species in *Epilachna obliqua* Group

***Epilachna obliqua*, new species**

(Figs. 171, 555–557)

Male.—Length 6.80 mm., width 5.48 mm. Form oval, widest at center of elytra, elytron nearly as wide as long, lateral margin strongly rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron greenish black with four yellow spots, anterolateral spot elongate, near lateral margin of elytron posterior to cal-

lus, anteromedian spot obliquely oval, axis from humeral callus posteriorly toward suture, posterolateral spot round, near suture at apical one-third, posteromedian spot rectangular, parallel to and nearly reaching suture (fig. 171). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Pubescence yellow except on elytral spots where pubescence is white. Postcoxal line complete, indistinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum notched medially; sixth sternum notched medially; sixth tergum faintly emarginate medially. Genitalia with basal lobe compressed laterally, apex curved upward, in ventral view a tooth present on each side immediately before truncate apex; paramere slender, not widened apically (figs. 555, 556); sipho short, robust, apex blunt with small ventral tooth, orifice dorsal, subterminal (fig. 557).

Female.—Not known.

Holotype.—Male. PERU: Vic. Sani Beni, 840 m., a.s.l., IV–20–1935, F. Woytkowski (USNM 71646).

Discussion.—This species is unlike any other with four spots on each elytron. The notched fifth abdominal sternum and male genitalia distinguish that sex immediately. The male genitalia are of the type found in *Toxotoma*, but the mandibles and legs are of the *Epilachna* type. The type locality cannot be found.

Epilachna discolor Group

The single species in this group has the mandible of the *flavofasciata* type and genitalia of the *albovittata* type except for the sipho, which is rounded and bent upward at the apex, and the absence of the ventral tooth found in *albovittata* and allies (fig. 560).

Description of Species in *Epilachna discolor* Group

Epilachna discolor Erichson

(Figs. 172, 558–560, 1367–1370; map 8)

Epilachna discolor Erichson, 1847, p. 184.—Mulsant, 1853, p. 165.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Epilachna boliviana Weise, 1895, p. 123.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 441. NEW SYNONYMY.

Solanophila discolor: Weise, 1899, p. 263.

Male.—Length 8.30 mm., width 6.30 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron brownish yellow with greenish-black basal and apical margins and a pale-yellow, hourglass-shaped spot on middle (fig. 172). Punctation on elytron not noticeably dual, coarse punctures separated by less than their diameter. Surface of elytron between punctures reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum broadly emarginate; sixth tergum feebly, weakly emarginate. Genitalia with basal lobe flattened dorsoventrally in apical one-half, concave dorsally, convex ventrally, in ventral view apex with lateral angle abrupt, a strong, blunt process projecting from middle, orifice for sipho median, elongate-oval; trabes shorter than basal piece; paramere gradually curved near base, margins parallel (figs. 558, 559); sipho short, evenly curved, apex thickened, orifice dorsal, subterminal (fig. 560).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum truncate with feeble median projection (fig. 1367); sixth tergum broadly convex (fig. 1368). Genitalia with 10th tergum narrow, convex (fig. 1369); genital plate narrowed posteriorly, posteromedian angle slightly emarginate (fig. 1370).

Variation.—Length 7.50–9.50 mm., width 5.50–6.73 mm. Lateral margin of elytron may

be slightly pinched and basal greenish-black border varies from narrow line to broad band occupying one-third of elytron. Lateral greenish-black border also varies from narrow line to distinct, broad border. Pale median spot on elytron is nearly same color as surrounding area in some specimens and spot may be oval rather than hourglass-shaped.

Type Locality.—Of *discolor*, Peru; of *boliviana*, Bolivia, Chaco.

Type Depository.—MNHUB (lectotype of *boliviana* here designated).

Discussion.—The elongate, oval form and the presence of the pale spot on the elytron should characterize most specimens of *discolor*. The male genitalia are unlike those of any species of *Epilachna* presently known. The type series of *boliviana* is composed of seven specimens, all females. The first specimen bearing the following labels is here designated as lectotype: "Chaco Bolivia"; "boliviana ws." *E. boliviana* appears to be synonymous with *discolor* upon examination of type specimens.

Specimens Examined.—Total 31. BOLIVIA: "Bolivia," J. Antonio; "Bolivia," Staudinger. *Cochabamba:* Chaco. PERU: "Peru," Staudinger, R. Korschefsky, cum type. comp. *Cuzco:* Machu Picchu, III–1936, Jaroslav Soukup; Machu Picchu, XI–20–1940, 2000 m., W. K. Weyrauch; Machu Picchu Pueblo, 6491 ft., III–22–1947, J. C. Pallister; Pilco, I, 14–20, 1953, 2800 m., Woytkowski. *Junin:* Chanchamayo, XI–4–1961, alt. 1300 m., J. Schunke. *Pasco:* Oxapampa, Korschefsky collection; Oxapampa. *Piura:* Huancabamba. (AMNH) (CAS) (MNHUB) (USNM).

Epilachna cruciata Group

Mandible extending beyond labrum, with three major teeth, first tooth bifid with minor teeth on inner margin of each branch, second and third teeth slender (fig. 40). Lateral margin of elytron feebly rounded. The male genitalia with the simple basal lobe, short trabes (figs. 561, 562), and short sipho ending in an enlarged, downward directed apex (fig. 563) do not seem to be closely allied to any known species of *Epilachna*. *E. cruciata* is here placed in a group by itself.

Description of Species in *Epilachna cruciata* Group

Epilachna cruciata Mulsant

(Figs. 173, 561–563, 1371–1378; map 13)

Epilachna cruciata Mulsant, 1850, p. 708.—Crotch, 1874, p. 59.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 8 mm., width 6.32 mm. Form cordate, widest just posterior to humeral angle, elytron slightly pinched. Color black; narrow anterolateral angle of pronotum yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, external and sutural margins and apical angle black, a black triangular humeral spot extending from margin, covering callus, a black median band extending from outer margin nearly to suture (fig. 173). Punctation on elytron dual, small punctures very fine, separated by one to two times their diameter, larger punctures separated by one to two times their diameter. Postcoxal line complete, distinct, extending two-thirds the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum convex, entire; sixth tergum with posterior margin broadly convex, entire. Genitalia with basal lobe slightly longer than paramere, straight, narrowing suddenly to blunt point; paramere slender, nearly straight (figs. 561, 562); sipho short, widened and bulbous at tip, orifice dorsal, subterminal (fig. 563).

Female.—Similar to male except abdomen with hind margin of fifth sternum slightly produced medially; sixth sternum convex, entire, longitudinal suture present (fig. 1371). Genitalia with 10th tergum arcuately rounded, an internal V-shaped area lacking pigment (fig. 1372); genital plate with inner margin gently

curved, lateral margin sinuate, stylus visible (fig. 1373).

Variation.—Length 7.50–10 mm., width 6–7.78 mm. Median band on elytron may or may not extend from outer margin to suture. Among specimens examined were many teneral individuals that had markings brown rather than black and humeral spot not covering callus.

Type Locality.—Colombia (Dejean). Colombia included Venezuela from 1821 to 1829.

Type Depository.—DLM (lectotype here designated).

Discussion.—*E. cruciata* is a relatively common species in Venezuela, and the only species with which it might be confused is *flavofasciata*. The male and female genitalia of these two species are different, and most specimens of *cruciata* observed have had the humeral black spot completely covering the callus but never extending in as far as the suture. This pattern has not been seen in any specimen of *flavofasciata*. The first of two specimens in the Dejean collection bearing the following label is here designated lectotype: "Colombia, Klug."

Specimens Examined.—Total 230. VENEZUELA: "Venezuela"; "Chevr."; "Guer."; Venezuela, 22–V–51; Venezuela, 25–VII–65, C. J. Rosales; Venezuela, 450 m., 13–VII–66, F. Fernandez Y. and J. C. Marin; "Columb.," Korschefsky collection; "Colum."; "Columb.," Kraatz; San Antonia, July 14, 1967, R. G. Oakley; Santa Lucia, V–22, L. R. Reynolds. *Anzoategui:* Rio Neveri Los Naranjos, 1000 m., 10° 10′ N. 64° 26, 27–VIII–1966, L. J. Joly T. *Aragua:* Rancho Grande, 6–10–1948, F. Fernandes Y. and Salas; Rancho Grande, 1100 m., 3–6–1936, 5–V–51, 12–11–1951, 11–XI–1952, F. Fernandes Y., J. and B. Bechyne and J. Gonzalez; Rancho Grande, 1500 m., 20–X–68, J. and B. Bechyne; Rancho Grande nr. Maracay, V–25–1948; Fila de Tiara, El Limon, 450 m., 13–VII–66, C. J. Rosales; Fila de Tiara, 1360 m., 19–V–63; El Limon, 450 m., 22–V–51; Maracay, 450 m., 15–VII–1963, J. C. Marin. *Bolivar:* Kanarakuni, Alto Caura, 450 m., 6–18–X–1964, J. Bechyne. *Carabobo:* Barbula, 1460 m., 12–2–1964, Joly; Cuesta Yuma, 17–XI–1951, F. Fernandes Y. *Distrito Federale:* CA., 800 m., 12–1–1966; Caracas; Caracas, 14–VI–38, A. S. Müller; Caracas, 1948, G. Vivas B.; Caracas, 8–1–1966, Garcis E.; Caracas Valley, V–6–22; El Valle, 24–VI–1960; El Valle on Cestrum diurnum, Jun. 14, '38, A. S. Müller; Hacienda El Limon La Conchita, 850 m., 10° 28′ N. 67° 16′ O; Hacienda El Limon La Conchita, 850 m., 10° 28′ N. 67° 16′ 0, 25–11–1968, L. J. Joly T.; Hd. El Limon Los Llanadas, 600 m., 9–11–1910, J. L. Garcia; Laguaira, W. Robinson; Pico del Avila, 29–8–1965, J. and B. Bechyne; Serrania El Avila, 1500 m., Los Vinodos, 16–VII–1950. *Merida:* "Merida"; Merida, Korschefsky collection; Merida, S. Briceno. *Miranda:* Taica, 28–12–1963, I. Ramirez. *Monagas:* Caripe, 850 m., 8–VIII–1966, F. Fernandes Y. and C. J. Rosales. *Trujillo:* Trujillo, 12–VIII–64, E. Osuna and M. Gelbes. (AMNH) (CAS) (MCZ) (UCCC) (USNM) (V) (ZSBS).

Epilachna patricia Group

Length approximately 5.95–10 mm. Mandible extending beyond labrum, three major teeth grouped in apical one-third, first tooth bifid, lower branch with several minor teeth at apex, upper branch with few minor teeth laterally, second tooth with minor tooth at apex (fig. 24). Labrum emarginate apically, a strong, arcuate carina on upper margin near base (fig. 19). Lateral margin of elytron straight or slightly pinched medially. Color black with yellow markings on elytron. Male genitalia simple; basal lobe longer than paramere; trabes nearly as long as phallobase (fig. 565). Female genital plate subtriangular, posterolateral angle produced (fig. 1377). The distribution of species is along the Andean chain from Colombia to northern Argentina.

E. fuscopilosa, ambigua, and *bizonata* are not typical members of this group in that they lack the typical labrum; their exact position is uncertain. The rest of the species form a tight group based on male and female genitalia and the carinate, emarginate labrum.

Key to Species of *Epilachna patricia* Group

1. Pubescence rusty gold ... *fuscopilosa* (Weise) (p. 84)
   Pubescence grayish white or yellowish white ... 2
2. Elytron with four yellow spots ... 3
   Elytron without four yellow spots ... 5
3. Posterior two spots on elytron narrowly connected (fig. 176) ... *consimilis*, n. sp. (p. 81)
   Posterior two spots on elytron not connected ... 4
4. Length usually 7 mm. or more; Colombia ... *reichei*, n. sp. (p. 83)
   Length usually 7 mm. or less; Argentina, Bolivia, Peru ... *patricia* Mulsant (p. 79)
5. Elytron with two transverse, yellow bands ... 6
   Elytron without transverse bands ... 9
6. Transverse bands on elytron broad, irregular, often connected along suture (figs. 182, 183); Colombia ... *reichei*, n. sp. (p. 83)
   Transverse bands narrow, regular, not connected along suture; not known from Colombia ... 7
7. Transverse bands on elytron reaching suture (fig. 185) ... *bizonata* Crotch (p. 84)
   Transverse bands on elytron not reaching suture ... 8
8. Length 8 mm. or more ... *viridinitens* Crotch (p. 82)
   Length 7 mm. or less ... *convergens* Crotch (p. 81)
9. Elytron yellow, bordered with black, an irregular, median black vitta present (fig. 184) ... *ambigua* (Mader), n. comb. (p. 83)
   Elytron with one or two pale spots on dark background ... 10
10. Elytron with one yellow spot near suture on apical one-third (fig. 175) ... *weisei* (Sicard) (p. 80)
    Elytron with two large, irregular, transverse yellow spots (fig. 177) ... *simplex*, n. sp. (p. 81)

Descriptions of Species in *Epilachna patricia* Group

Epilachna patricia Mulsant

(Figs. 174, 564–566, 1374–1380; map 13)

Epilachna patricia Mulsant, 1850, p. 717.—Crotch, 1874, p. 56.—Weise, 1895, p. 121.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Epilachna archidonae Crotch, 1874, p. 56.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440. NEW SYNONYMY.

Epilachna bang-haasi Weise, 1895, p. 120.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440. NEW SYNONYMY.

Male.—Length 7 mm., width 5.40 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with four yellow spots, anterolateral spot near margin of elytron posterior to callus, anteromedian spot near suture parallel to outer spot, posterolateral spot near margin at apical one-third, posteromedian spot near suture parallel to outer spot (fig. 174). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Postcoxal line indistinct laterally, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum notched medially. Genitalia with trabes longer than phallobase; basal lobe slightly longer than paramere, bent upward at apical one-third, in ventral view slightly widened medially, narrowed gradually to blunt apex; paramere widened apically (figs. 564, 565); sipho long, slender, apex thickened, orifice dorsal, subterminal (fig. 566).

Female.—Similar to male except hind margin of sixth abdominal sternum slightly less deeply notched (fig. 1374); sixth tergum as in male (fig. 1375). Genitalia with 10th tergum with hind margin convex (fig. 1376); genital plate subtriangular with apical corners rounded and a process at basal corner, stylus visible (fig. 1377).

Variation.—Length 5.95–7.28 mm., width 4.75–5.97 mm. Three specimens from Rio Charape, Peru, are tentatively placed here. These specimens have elytron more densely punctured and definitely bluish black. Female genital plate is elongate, not produced posterolaterally, slightly narrowed posteriorly (fig.

1378), and female sixth sternum is distinctly emarginate (fig. 1379). Genital plates in some specimens from Bolivia otherwise identical with type have posterolateral angle not strongly produced (fig. 1380).

Type Locality.—Of *patricia,* "l'île de Santa Cruz" (Bolivia) PM; of *archidonae,* Bolivia; of *bang-haasi,* Chaco, Bolivia.

Type Depository.—Of *patricia,* PM (lectotype here designated); of *archidonae,* UCCC; of *bang-haasi,* MNHUB (lectotype here designated).

Discussion.—*E. patricia* resembles *octoverrucata* and *persimilis* in appearance, but both male and female genitalia are distinctive and the distribution of *patricia* apparently does not overlap that of the other two species. The three specimens from Rio Charape, Peru, are placed here but may be an undescribed species as the shape of the female genital plate is not at all typical of *patricia;* unfortunately all three are females. The type of *archidonae* Crotch has been examined and found to be conspecific with that of *patricia.* The female specimen of *patricia* in the Paris museum collection bearing the following labels is here designated lectotype: "Museum Paris, Santa Cruz de la Sierra, D'Orbigny 1834"; "Epilachna patricia Mulsant, auct. det." An examination of the type series of *bang-haasi* Weise from the Humboldt museum has shown this species to be a synonym of *patricia.* The first specimen in the series labeled "Chaco, Bolivia," bearing the name label is here designated as lectotype. There are five specimens in the series, all from Bolivia. The female type of *archidonae* from the Crotch collection bearing the following labels has been examined: "Boliviae T." (green paper, handwritten); "TYPE, archidonae"; "TYPE" (blue paper). Two other specimens are in the type series.

Specimens Examined.—Total 20. ARGENTINA: *Salta:* Salta, XII–18–40, Parker. *Tucuman:* El Clavillo, 3500 m., 30–XI–1946, Golbach. BOLIVIA: "Bolivia"; "Boliviae"; Bolivia, Korschefsky collection; Yhancaroinza, April 22, May 22, G. L. Harrington. *Cochabamba:* Yanachi, So. Yungas, M. Cardenas. *La Paz:* Bez. S—Yungas Chulumani, 125 km. osti. V. La Paz, 1600–2000 m., IX–X–1916, Ch. Bock. PERU: *Cajamarca:* Rio Charape, 12–16 Sept. '11, C.H.T. Townsend. (IML) (PM) (UCCC) (USNM).

Epilachna weisei (Sicard)

(Figs. 175, 567–569, 1381–1384; map 13)

Solanophila weisei Sicard, 1912*c*, p. 129.
Epilachna weisei Sicard: Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 67.

Male.—Length 6.90 mm., width 5.53 mm. Form cordate, widest posterior to humeral angle, margin of elytron broadly explanate, straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron with posterior yellow spot near suture at apical one-third (fig. 175). Punctation on elytron dual but with no clear distinction between large and small punctures, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence pale yellow. Postcoxal line complete, indistinct, reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum projecting slightly medially; sixth sternum entire, rounded; sixth tergum notched medially. Genitalia with trabes longer than phallobase; basal lobe slightly longer than paramere, curved upward toward apex, group of setae present on upper surface; paramere slightly widened apically (figs. 567, 568); sipho long, slender, apex thickened, curved upward (fig. 569).

Female.—Similar to male except abdomen with posterior margin of sixth sternum weakly emarginate (fig. 1381); sixth tergum notched medially (fig. 1382). Genitalia with posterior margin of 10th tergum broadly, arcuately rounded (fig. 1383); genital plate irregularly triangular with distinct basal process (fig. 1384).

Variation.—Length 6.90–7.95 mm., width 5.53–6.10 mm.

Type Locality.—Bolivia.

Type Depository.—Deutsche Entomologisches Museum de Berlin-Dahlem.

Discussion.—This species is the only known *Epilachna* in this size range with a single apical spot on each elytron. *E. weisei* closely resembles *patricia* in both male and female genitalia, but the punctation on the elytron and the overall shape are very much as in *lorata.* The elytron is more strongly explanate,

particularly at the humeral angle, in *weisei* than in *patricia*, and the female genital plate has the basal process more pronounced in *weisei*.

Specimens Examined.—Total eight. BOLIVIA: *Cochabamba:* Cochabamba, 2000 m., San Antonio Rd., VIII–6–1951, *Solanum* sp., G. H. Dieke. *La Paz:* Incachaca, alt. 2500 m., J. Steinbach. (CM) (PM) (USNM).

Epilachna consimilis, new species

(Figs. 176, 1385–1388; map 13)

Female.—Length 7.29 mm., width 5.68 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron feebly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron greenish black with four large yellow spots, anterolateral spot near margin posterior to callus, anteromedian spot near suture just before middle of elytron, posterior two spots in transverse row on apical one-third, narrowly connected (fig. 176). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to two times their diameter. Surface of elytron finely reticulate. Pubescence reddish gold. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex; sixth sternum weakly emarginate, an incomplete longitudinal suture present (fig. 1385); sixth tergum weakly notched (fig. 1386). Genitalia with 10th tergum weakly emarginate (fig. 1387); genital plate irregularly triangular, anteromedian angle rounded, slightly produced, stylus visible (fig. 1388).

Male.—Not known.

Holotype.—Female. PERU: *Cajamarca:* Huascaray, 21 Sept. 11, CHT Townsend collector (USNM 71647).

Discussion.—*E. consimilis* most nearly resembles *octoverrucata* in shape and dorsal color pattern, but the reddish-gold pubescence and female genitalia distinguish *consimilis*. The posterior two spots on the elytron are connected on the specimen described here, but probably they will be separate in at least some specimens when more become available.

Epilachna simplex, new species

(Figs. 177, 570–572, 1389–1390; map 13)

Male.—Length 6 mm., width 4.90 mm. Form cordate, widest just posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two transverse yellow spots, anterior spot directed slightly backward from humerus toward suture, inner margin rounded, posterior margin convex, posterior spot the shape of an inverted heart (fig. 177). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Pubescence yellowish white. Postcoxal line indistinctly complete, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate medially; sixth tergum convex, entire. Genitalia with phallobase small; basal lobe longer than paramere, gradually curved upward in lateral view, two to four setae present medially on each side; paramere constricted medially, curved downward at apex (figs. 570, 571); sipho straight before apex, orifice dorsal, subterminal (fig. 572).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum convex with longitudinal suture; sixth tergum notched (fig. 1389). Genitalia with 10th tergum strongly convex (fig. 1390); genital plate triangular with posterolateral angle produced, curved inward, stylus visible (fig. 1390).

Variation.—Length 6–7.20 mm., width 4.90–5.65 mm.

Holotype.—Male. PERU: *Cuzco:* Torontoy, 7000 ft., 3 Sept. 1911, Yale Peruv. Exp. (USNM 71648).

Allotype.—Female. PERU: Lima?, Soukup coll. (USNM).

Paratypes.—Total seven. Same data as holotype. (USNM).

Discussion.—The dorsal color pattern is sufficient to separate *simplex* from its allies.

Epilachna convergens Crotch

(Figs. 178–179, 573–575, 1391–1394; map 14)

Epilachna convergens Crotch, 1874, p. 57.—Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 6.78 mm., width 5.61 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow with two transverse yellow bands, anterior band extending diagonally from near lateral margin posterior to callus nearly to suture anterior to middle, posterior band straight, not touching sutural or lateral margins (fig. 178). Punctation on elytron dual, small punctures only slightly smaller than large punctures, separated by their diameter or less, large punctures separated by less than to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate; sixth tergum emarginate. Genitalia with basal lobe slender, evenly curved from base to apex, laterally compressed at base, widened nearly to apex, apex with bluntly pointed median projection; paramere slender, slightly curved downward, not widened apically (figs. 573, 574); sipho with apex thickened, orifice dorsal, subterminal (fig. 575).

Female.—Similar to male except abdomen with hind margin of sixth sternum truncate medially (fig. 1391); sixth tergum strongly convex, weakly emarginate medially (fig. 1392). Genitalia with 10th tergum narrow, convex (fig. 1393); genital plate triangular, posterolateral margin feebly produced (fig. 1394).

Variation.—Length 6.72–7.70 mm., width 5.27–6.05 mm. Anterior band on elytron may be darker yellow than in type and more transverse, less strongly angled posteriorly (fig. 179).

Type Locality.—Peru.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The small size and elytral color pattern should distinguish this species. The male type from the Crotch collection bears the following labels: "TYPE" (blue paper, printed); "PERU" (handwritten); "TYPE, convergens" (handwritten). In addition to the type there are two specimens and the elytron of a third in the type series. All specimens except the type are labeled "Ecuador."

Specimens Examined.—Total 13. ECUADOR: "Ecuador." PERU: Lambayeque: 15 mi. E. of Olmos, 700 m., I–20–55, E. I. Schlinger and E. S. Ross; 28 mi. E. Olmos, 2000 m., I–19–1955, E. I. Schlinger and E. S. Ross. (CAS) (UCCC) (USNM).

Epilachna viridinitens Crotch

(Figs. 180, 1395–1398)

Epilachna viridinitens Crotch, 1874, p. 55.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Female.—Length 8.38 mm., width 6.64 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron greenish black with two broad, transverse yellow bands, anterior band posterior to callus, slightly wider near lateral margin, not touching lateral margin or suture, posterior band on apical one-third, not touching lateral margin or suture (fig. 180). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending one-half the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched (fig. 1395); sixth tergum weakly emarginate (fig. 1396). Genitalia with 10th tergum convex, entire (fig. 1397); genital plate elongate, anteromedian angle broadly produced, inner margin straight in apical one-half, angled toward outer margin in basal one-half, basal one-fourth of plate narrow, produced, stylus visible (fig. 1398).

Male.—Not known.

Type Locality.—Peru.

Type Depository.—UCCC.

Discussion.—The unique female type bears the following labels: "TYPE" (blue paper, printed); "Peru" (white paper, handwritten); "TYPE, viridinitens" (white paper, handwrit-

ten). This was the only specimen of this species observed.

The color pattern is like that of *flavofasciata*, but the oval form, greenish-black elytron, weakly emarginate sixth tergum, and the distinctively shaped genital plate distinguish *viridinitens*. This species is difficult to characterize, especially in the absence of male specimens, but perhaps it belongs near *convergens*.

Specimens Examined.—Total one. PERU. The unique type. (UCCC).

Epilachna reichei, new species

(Figs. 181–183, 576–578, 1399–1402; map 14)

Male.—Length 7.43 mm., width 6.40 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron slightly pinched medially, broadly explanate. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–4 yellow, 5–11 piceous; elytron with four yellow spots, anterolateral spot near margin of elytron posterior to callus, anteromedian spot near suture slightly posterior to outer spot, posterolateral spot near margin at apical one-third, posteromedian spot near suture slightly anterior to outer spot (fig. 181). Punctation on elytron dual, small punctures separated by their diameter, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, weakly emarginate medially; sixth tergum emarginate medially. Genitalia with basal lobe longer than paramere, slender, narrowed before apex, apex blunt; paramere narrowed toward apex (figs. 576, 577); sipho long, slender, orifice subterminal (fig. 578).

Female.—Similar to male except hind margin of sixth abdominal sternum nearly truncate (fig. 1399); sixth tergum emarginate medially (fig. 1400). Genitalia with 10th tergum rounded, hind margin faintly emarginate medially (fig. 1401); genital plate with outer margin straight, inner margin evenly curved from anterior angle to blunt basal point (fig. 1402).

Variation.—Length 6.50–8.50 mm., width 5.25–6.75 mm. Arrangement of yellow spots on elytron ranges from typical form as described here to form in which spots are united, forming anterior and posterior bands. Yellow bands may be narrowly united along suture or completely separated from each other (figs. 182, 183).

Holotype.—Male. COLOMBIA: *Valle del Cauca:* Mares above Cali, 2088 m., 5–III–22, Chapin (USNM 71649).

Allotype.—Female. Same data as holotype.

Paratypes.—Total 139. COLOMBIA: *Tolima:* Carmen. *Valle del Cauca:* Valle del Cauca, X–28–44; Cali, 1938, F. W. Furry; Cali, 5–III–42, Murillo; Cali District Western Cordillera, alt. 4900 ft., Jan. 27, 1935, Herbert F. Schwarz; Cali District Western Cordillera, alt. 6200 ft., Jan. 27, 1935, Herbert F. Schwarz; Cali District Western Cordillera, alt. 6500 ft., I–24–1935, E. I. Huntington; El Antonio, 5–7–08, 12–7–08; Mares above Cali, 2088 m., 5–III–42, Chapin; Mari Lopez, Cauca Valley; S. Antonio. ECUADOR: Ecuador, Baron. (AMNH) (CAS) USNM).

Discussion.—This species is apparently fairly common in southern Colombia. The small size with four-spotted color pattern of *reichei* resembles that of *patricia* superficially. The genitalia of the two species are different, however, and their ranges apparently do not overlap.

Epilachna ambigua (Mader), new combination

(Figs. 184, 579–581, 1403–1406; map 14)

Solanophila ambigua Mader, 1958, p. 2.

Female.—Length 7 mm., width 5.71 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron broadly explanate, straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, completely bordered with black, a median black vitta present, vitta widened medially (fig. 184). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than two times their diameter. Pubescence grayish white. Postcoxal line complete, extending slightly beyond middle of first abdominal sternum. Abdomen with apex of fifth sternum truncate; sixth ster-

num broadly, feebly emarginate, longitudinal suture present (fig. 1403); sixth tergum entire, convex (fig. 1404). Genitalia with 10th tergum broadly, weakly emarginate (fig. 1405); genital plate with inner margin rounded, posterior margin truncate, stylus visible (fig. 1406).

Male.—Similar to female except genitalia with basal lobe shorter than paramere, gradually curved upward to blunt apex, upper margin slightly sinuate before apex; paramere feebly widened apically (figs. 579, 580); sipho with apex straight, orifice dorsal, subterminal (fig. 581).

Variation.—Length 6–7 mm., width 5.61–5.71 mm.

Type Locality.—Bolivia: Yungas de Corani, 2500 m.

Type Depository.—ZSBS.

Discussion.—*E. ambigua* most nearly resembles *vittigera* Crotch in dorsal color pattern but is easily separated by the widened vitta on the elytron and the genitalia. The type specimen has been examined.

Specimens Examined.—Total three. BOLIVIA: *Cochabamba:* Yungas de Corani, 2500 m., 30–9–53, leg. W. Forster. (ZSBS).

Epilachna bizonata Crotch

(Figs. 185, 1407–1410)

Epilachna bizonata Crotch, 1874, p. 61.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 441.

Female.—Length 9 mm., width 7.10 mm. Form cordate, widest posterior to humeral angle, narrowed in posterior one-third, lateral margin rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterolateral angle of pronotum narrowly yellow; elytron black with two transverse orange bands extending from near lateral margin and reaching suture, anterior band in front of middle, widened toward suture, extending slightly posteriorly along suture, posterior band behind middle, slightly wider at suture than at lateral margin (fig. 185). Punctation on elytron dense, dual, small punctures separated by their diameter or less, large punctures separated by their diameter or less. Surface of elytron dull, densely, finely reticulate between punctures. Pubescence grayish white. Postcoxal line complete, distinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum strongly, bluntly projecting medially, median area pale; sixth sternum feebly emarginate, longitudinal suture present (fig. 1407); sixth tergum broadly, feebly emarginate (fig. 1408). Genitalia with 10th tergum narrowed medially, posterior one-half projecting, rounded (fig. 1409); genital plate with all angles rounded, posteromedian angle obsolete, inner margin strongly curved, stylus visible (fig. 1410).

Male.—Not known.

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The type series of *bizonata* is composed of three specimens, each belonging to a different species. The first specimen bearing Crotch's type label and the label "Ecuad." is described here. The elytral color pattern is of the type found in such species as *viridinitens* and *convergens,* and because of this, *bizonata* is here retained in this group. The genital plate is not exactly typical of the group, however, and when males become available, *bizonata* will probably be transferred to another group. In form and elytral color pattern *bizonata* most nearly resembles *chigata,* n. sp., and *obtusiforma,* n. sp. The genital plates are different in all three species and the coarse elytral punctures of *bizonata* are much denser and not as large as in *chigata.* The narrowed posterior one-half of *bizonata* distinguishes it from the much more oval form of *obtusiforma,* and *bizonata* has the orange elytral bands reaching the suture, whereas no one of the related species has this appearance.

Specimens Examined.—Total one. ECUADOR: "Ecuad." (the type).

Epilachna fuscopilosa (Weise)

(Figs. 186, 582–584; map 14)

Solanophila fuscopilosa Weise, 1902, p. 163.
Epilachna fuscopilosa: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 7.45 mm., width 5.98 mm. Form cordate, widest anterior to middle of

elytra, lateral margin of elytron rounded from humeral angle to apex, barely perceptibly explanate. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with yellow markings, a large obliquely oval spot near outer margin posterior to humeral callus, a small, nearly square spot almost touching suture parallel to outer spot, a round posterolateral spot at apical one-third narrowly united to posteromedian spot near suture (fig. 186). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Pubescence dense, long, rusty gold except on elytral spots where pubescence is short, white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum notched medially. Genitalia with trabes shorter than phallobase; basal lobe longer than paramere, slightly curved upward in lateral view, in ventral view narrow parallel-sided, tapering to a point at apical one-fourth; paramere slender, not expanded apically (figs. 582, 583); sipho slender, apex bulbous, orifice distal (fig. 584).

Female.—Not known.

Variation.—Variation described here is taken from Weise (*1902*). Length 7–8.30 mm. Two sutural spots may touch suture and two posterior spots may not be connected (typical form).

Type Locality.—Peru: Marcapata.

Type Depository.—Unknown, not in MNHUB.

Discussion.—The description here was taken from a single male in the Korschefsky collection labeled "*Solanophila fuscopilosa* Ws., R. Korschefsky cum typ. comp." The specimen matches Weise's description of his *var. a* of *fuscopilosa* and is from the type locality. Dr. Hieke informed me that no specimens of *fuscopilosa* are present in the MNHUB; thus the type series of *fuscopilosa* must be considered at least temporarily lost. There seems to be little doubt that the specimen described here is the same species Weise described. The larger size, rounded lateral margin of elytron, and rusty-gold pubescence distinguish *fuscopilosa* from *persimilis*, which it most nearly resembles.

Specimens Examined.— Total three. PERU: *Cuzco:* Marcapata, Staudinger; Marcapata, Thal Nofl. d. Madre de Dios, 3000 m., Garlepp S. V. (PM) (USNM).

Epilachna fenestrata Group

Length approximately 4.25–7.50 mm. Mandible extending beyond labrum, exposed part three times length of labrum, three major teeth grouped in apical one-third, first tooth trifid, second and third teeth simple (fig. 41). Labrum short, apex emarginate and concave. Color black, usually with two yellow spots of variable size on each elytron. Lateral margin of elytron rounded from humeral angle to apex; epipleuron slightly wider anterior to middle than posterior to middle (fig. 60). Male genitalia simple; basal lobe narrowed toward apex, curved upward before apex (figs. 600, 601); sipho slender, apex slightly thickened, blunt (fig. 602). Female usually with sixth sternum and tergum strongly convex, entire. Female genital plate elongate, narrowed posteriorly, lateral margin bluntly produced in apical one-half, sinuate in basal one-half, lacking pigment medially, stylus visible (fig. 1433). The distribution is primarily in Bolivia, but species occur in southern and central Peru.

E. aureopilosa, oviforma, punctatissima, and *eximia* are not typical members of this group and are placed here only because the elytral color pattern is similar to that of *fenestrata* and they appear to be closer to this group than to any other defined here. The rest of the species in the *fenestrata* group are closely allied to one another in size, shape, and male and female genitalia.

Key to Species of *Epilachna fenestrata* Group

1. Elytron black with two elongate, oblique yellow marks (fig. 189), or yellow with incomplete, obscure median band extending from lateral border toward suture (fig. 187); or entirely yellow except for dark lateral and basal border and short extension of border on suture (fig. 188) *incaorum*, n. sp. (p. 86)
   Elytron not as described above 2
2. Large punctures on elytron deep, dense, separated by less than their diameter; Argentina ..... *punctatissima* (Weise) (p. 91)
   Large punctures on elytron shallow, usually separated by more than their diameter; not known from Argentina 3
3. Pubescence dense, golden brown ..... *aureopilosa*, n. sp. (p. 90)
   Pubescence yellow or grayish white 4
4. Elytron entirely black ..... *bourcieri* Mulsant (p. 88)
   Elytron not entirely black 5
5. Elytron orange, bordered with black (fig. 197) ..... *eximia*, n. sp. (p. 92)
   Elytron with two pale spots on dark background 6
6. Yellow spots occupying nearly all of elytron, transverse band separating spots narrower than lateral border (fig. 190) ..... *zischkai* (Mader), n. comb. (p. 87)
   Yellow spots smaller than in *zischkai*, transverse band separating spots wider than lateral border 7
7. Length 7 mm. or more ..... *oviforma*, n. sp. (p. 91)
   Length less than 7 mm 8
8. Form elongate, nearly parallel-sided (fig. 193); hind margin of sixth abdominal sternum extremely convex in both sexes (fig. 1434) ..... *schunkei*, n. sp. (p. 90)
   Form oval, lateral margin of elytron rounded; hind margin of sixth abdominal sternum usually emarginate in male, usually convex in female 9
9. Lateral margin of elytron strongly explanate, about 0.5 mm. wide (fig. 198); spots on elytron orange; Colombia ..... *eximia*, n. sp. (p. 92)
   Lateral margin of elytron weakly explanate, about 0.3 mm. wide; not known from Colombia 10
10. Hind margin of female sixth abdominal sternum emarginate (fig. 1426); male genitalia with basal lobe narrowed before apex and apex curved upward in lateral view (fig. 598), in ventral view basal lobe gradually narrowed to blunt apex (fig. 597) ..... *simulans*, n. sp. (p. 88)
    Male genitalia and female sixth abdominal sternum not as described above 11
11. Male genitalia with basal lobe gradually narrowed from base to apex and broadly curved upward in lateral view (fig. 592); female with hind margin of 10th tergum truncate (fig. 1420) ..... *manni*, n. sp. (p. 87)
    Male genitalia with basal lobe abruptly narrowed before apex, narrowed part curved upward in lateral view (fig. 601); female with hind margin of 10th tergum convex (fig. 1432) ..... *fenestrata* Erichson (p. 89)

Descriptions of Species in *Epilachna fenestrata* Group

Epilachna incaorum, new species

(Figs. 187–189, 585–587, 1411–1414; map 14)

Male.—Length 5.35 mm., width 4.35 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle yellowish brown; mouthparts yellow to piceous; antenna with basal segment brown, segments 2–10 yellowish brown, 11 piceous; elytron black with two yellow spots incompletely divided by an oblique black band (fig. 187). Punctation on elytron not dual, punctures separated by their diameter or less. Pubescence grayish white. Postcoxal line complete, distinct, extending three-fourths the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum convex, entire; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, apex slightly curved upward; paramere narrow, straight (figs. 585, 586); sipho curved from base to apex, apex thickened, abruptly turned upward, orifice dorsal, subterminal (fig. 587).

Female.—Similar to male except hind margins of sixth sternum and tergum less convex (figs. 1411, 1412). Genitalia with hind margin of 10th tergum nearly truncate medially (fig. 1413); genital plate emarginate medially on lateral margin, posteromedian angle emarginate, stylus visible (fig. 1414).

Variation.—Length 4.35–5.85 mm., width

3.65–4.78 mm. Color pattern on elytron ranges from completely undivided spot (fig. 188), to form with median band extending one-half distance to suture (typical), to form with spots completely divided but indistinctly so near suture, and finally to form with spots completely and distinctly divided (fig. 189).

Holotype.—Male. PERU: *Cuzco:* Machu Picchu, 1950–2100 m. alt., *Nicotiana tomentosa,* VII–16–1951, G. H. Dieke (USNM 71650).

Allotype.—Female. Same data as holotype except alt. 1950-2400 m. (USNM).

Paratypes.—Total 89. PERU: *Cuzco:* Same data as holotype; same data as allotype; Machu Picchu, alt. 7500 ft., 2–12–50. (AMNH) (USNM).

Discussion.—This species is easily recognized and not likely to be confused with any other species of *Epilachna.* The variations in elytral color appear to be associated with the age of the specimens. The completely hardened, mature specimens have the elytral spots completely divided, whereas the more teneral specimens have the spots undivided. Most of the specimens were taken by Dieke on *Nicotiana tomentosa.* This is one of the few instances where host data are available for a species of *Epilachna.*

Epilachna zischkai (Mader), new combination

(Figs. 190, 588–590, 1415–1418; map 14)

Solanophila zischkai Mader, 1950, p. 38.

Male.—Length 5.43 mm., width 4.30 mm. Form oval, widest anterior to middle of elytron, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large yellow spots narrowly separated medially, spots not reaching lateral or sutural margins, posterior spot slightly larger (fig. 190). Punctuation on elytron dual, small punctures separated by less than their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum emarginate medially; sixth tergum entire, convex. Genitalia with basal lobe simple, longer than paramere, apex curved upward in lateral view; paramere narrowed apically, curved upward toward apex (figs. 588, 589); sipho evenly curved nearly to apex, apex enlarged, orifice dorsal, subterminal (fig. 590).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum weakly emarginate medially (fig. 1415); sixth tergum strongly convex, entire (fig. 1416). Genitalia with 10th tergum nearly truncate, sides obliquely descending (fig. 1417); genital plate with anteromedian angle projecting, posteromedian angle with pigment nearly absent, stylus visible (fig. 1418).

Variation.—Length 4.50–5.80 mm., width 3.30–4.50 mm.

Type Locality.—Bolivia: Yungas de Palmar, 2,000 m.

Type Depository.—FM (lectotype here designated).

Discussion.—A cotype male in the Frey Museum collection bearing the following labels is here designated as lectotype: "Bolivia, 2000 m."; "Yungas de Palmar"; "Zischka"; "Cotypus" (red paper); "zischkai M."

Specimens Examined.—Total 33. BOLIVIA: *Cochabamba:* Type series with data as listed here; 1850 m. alt., Locotal, VIII-2-1951, *Solanum* sp., G. H. Dieke; 2000 m. alt., San Antonio Rd., VIII-6-1951, *Solanum* (?) sp., G. H. Dieke. (FM) (USNM).

Epilachna manni, new species

(Figs. 191, 591–593, 1419–1421; map 15)

Male.—Length 6.15 mm., width 4.93 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color as in *zischkai,* yellow spots on elytron reduced, surrounding black area more apparent, anterior spot larger than posterior spot (fig. 191). Punctation on elytron dual, small punctures on elytron separated by one to two times their diameter. Pubescence grayish white. Postcoxal line complete, indistinct, reaching slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum emarginate medially; sixth tergum entire,

convex. Genitalia of the *zischkai* type; phallobase longer; basal lobe longer, more strongly curved upward at apex (figs. 591, 592); sipho not as strongly curved, shorter (fig. 593).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum entire, convex (fig. 1419). Genitalia with 10th tergum truncate, sides obliquely descending (fig. 1420); genital plate as in *zischkai*, posteromedian angle produced much more strongly (fig. 1421).

Variation.—Length 5.50–6.75 mm., width 4.50–5.30 mm. Some specimens have elytral punctation apparently much more dense than that described here; punctures often contiguous. These specimens are usually teneral. Spots on elytron are slightly reduced in size on a few individuals.

Holotype.—Male. BOLIVIA: La Paz: Pongo de Quime, July, W. M. Mann, Mulford Bio. Exp. 1921–22 (USNM 71651).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total 24. Same data as holotype. (USNM).

Discussion.—This species most nearly resembles *zischkai* from which it may be separated by the larger average size, large anterior spot on the elytron, and the male and female genitalia.

Epilachna bourcieri Mulsant

(Figs. 594–596, 1422–1425; map 15)

Epilachna bourcieri Mulsant, 1850, p. 725.—Crotch, 1874, p. 58 (as a synonym of *E. quadriplagiata* (Latreille)).—Weise, 1895, p. 123.

Epilachna quadriplagiata ab. *bourcieri:* Korschefsky, 1931, p. 66.

Epilachna bonplandi ab. *bourcieri:* Blackwelder, 1945, p. 441.

Male.—Length 5.30 mm., width 4.10 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to two times their diameter, broad, shallow. Surface of elytron with fine, reticulate sculpture, large shallow punctures alutaceous. Pubescence grayish white. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of first sternum faintly emarginate; sixth sternum triangularly notched medially; sixth tergum entire, convex. Genitalia of the *zischkai* type; basal lobe widest at middle, gradually narrowed from middle to apex (figs. 594, 595); sipho as in *zischkai* (fig. 596).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum weakly emarginate medially (fig. 1422); sixth tergum entire, convex (fig. 1423). Genitalia with 10th tergum convex (fig. 1424); genital plate with anterolateral angle rounded, produced, posterior margin obliquely descending from outer angle to inner angle, stylus visible (fig. 1425).

Variation.—Length 6.15–6.65 mm., width 4.93–5.28 mm.

Type Locality.—Santa Cruz (Bolivia, voyage of d'Orbigny) (PM).

Type Depository.—PM (lectotype here designated).

Discussion.—The male and female genitalia place *bourcieri* in the group of species having the *fenestroides* type of dorsal color pattern. The solid black dorsal surface and presence of alutaceous sculpture in the large elytral punctures will distinguish this species. It appears to resemble *zischkai* most closely in everything except the elytral color pattern. A female specimen in the Paris museum bearing the following labels is here designated lectotype: "Museum Paris, Bolivie (Yungas), D'Orbigny 1834," "Epilachna bourcieri Muls., auct. det."

Specimens Examined.—Total 11. BOLIVIA: "Bolivia." *Cochabamba:* Chacao; Yungas. *La Paz:* La Paz, 1928, H. Clemens; Yungas de La Paz, Heyne V. (CAS) (MNHUB) (USNM).

Epilachna simulans, new species

(Figs. 597–599, 1426–1429)

Male.—Length 5.80 mm., width 4.38 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts piceous; elytron black with two small yellow

spots, anterior spot posterior to callus, nearly round, slightly lengthened transversely, posterior spot on apical one-third, oval, axis oblique from near suture toward lateral margin. Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line subcomplete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum slightly emarginate; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, straight, in lateral view the dorsal surface slightly sinuate, abruptly turned upward at apex; paramere with dorsal and ventral margins straight in lateral view (figs. 597, 598); sipho continuously curved from base to apex, apex enlarged, orifice dorsal, subterminal (fig. 599).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum emarginate medially (fig. 1426); sixth tergum entire, strongly convex (fig. 1427). Genitalia with 10th tergum broadly convex (fig. 1428); genital plate with anterior angles broadly rounded, a blunt median projection on lateral margin, stylus visible (fig. 1429).

Variation.—Length 5.80–6 mm., width 4.38 to 4.60 mm.

Holotype.—Male. PERU: Korschefsky collection (USNM 71652).

Allotype.—Female. Same data as holotype.

Discussion.—The color pattern is indistinguishable from that of *fenestrata*, and genitalia should be examined to separate the two species. The female genital plates are nearly identical in the two species, but the sixth sternum is distinctly emarginate medially in *simulans* and entire in *fenestrata*.

Epilachna fenestrata Erichson

(Figs. 192, 600–602, 1430–1433; map 15)

Epilachna fenestrata Erichson, 1847, p. 183.—Mulsant, 1853, p. 165.—Crotch, 1874, p. 55.—Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 5.52 mm., width 4.50 mm. Form oval, widest anterior to middle of elytron, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron with color pattern as in *simulans* (fig. 192). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence yellowish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum slightly emarginate medially; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, in lateral view constricted at apical one-third, apex broadly and strongly curved upward; paramere narrowed apically, curved upward slightly near apex (figs. 600, 601); sipho curved from base to apex, orifice dorsal; subterminal (fig. 602).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum convex, entire (fig. 1430); sixth tergum convex, entire (fig. 1431). Genitalia with 10th tergum convex (fig. 1432); genital plate with anterior angles broadly rounded, a blunt median projection on lateral margin (fig. 1433).

Variation.—Length 5.05–6.30 mm., width 3.90–5.10 mm. Size of yellow spots on elytron ranges from maximum diameter of 2 mm. to minimum of 1.05 mm. Larger spots occupy nearly all elytral area but never reach any margin.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—The type was not available for examination, but there are specimens identified as *fenestrata* in the Korschefsky collection and these are accepted here as being that species.

Specimens Examined.—Total 34. BOLIVIA: "Yungas de la Boliver." *La Paz:* Callisaya, V–25, G. L. Harrington; Calisaya, Rio Boopi, G. L. Harrington; Yungas de la Paz; Yungas de la Paz, 1000 m., H. Rolle, Berlin, S.W.11. PERU: "Peru"; Peru, Korschefsky collection. *Cuzco:* Callanga, Korschefsky collection; Callanga, 1300 m., II, 10–III, 17, 1953, Woytkowski; Pampaconas R., Aug. 1911, Yale Peruv. Exp; Quiroz, Woytkowski. *Junin:* Chanchamayo, alt. 1300 m., IX–15–1961, J. Schunke. (CAS) (USNM).

Epilachna schunkei, new species

(Figs. 193, 603, 603*a*, 604, 1434–1437; map 15)

Male.—Length 6.30 mm., width 4.90 mm. Form elongate, widest at middle of elytra, lateral margin of elytron straight in median one-third. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two yellow spots, anterior spot posterior to callus and closer to margin than suture, posterior spot on apical one-third and slightly nearer margin than suture (fig. 193). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending to basal one-third of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum truncate; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, in lateral view tapered toward weakly turned up apex; paramere nearly straight (figs. 603, 603*a*); sipho curved from base to apex, orifice dorsal, subterminal (fig. 604).

Female.—Similar to male except hind margin of fifth sternum more convex; sixth sternum strongly convex, entire (fig. 1434); sixth tergum strongly convex, entire (fig. 1435). Genitalia with 10th tergum feebly convex (fig. 1436); genital plate narrowed posteriorly, stylus present (fig. 1437).

Variation.—Length 6.30–7.25 mm., width 4.90–5.50 mm.

Holotype.—Male. PERU: *Junin:* Chanchamayo, La Merced, Carl O. Schunke (USNM 71653).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total six. PERU: *Junin:* Same data as holotype. Vic. Sani Beni, 840 m. a.s.l., VI-13-1935, VI-9-1935, VI-22-1935, F. Woytkowski. (UK) (USNM).

Discussion.—The comparatively large size, elongate, parallel-sided form, spots on elytron nearer margin than suture, and the extremely convex hind margin of the sixth sternum in both sexes distinguish this species. The genitalia are also distinctive.

Epilachna aureopilosa, new species

(Figs. 605–607, 1438–1441)

Male.—Length 6 mm., width 4.97 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded, slightly straighter medially. Color black; mouthparts brown to piceous; antenna with basal segment black, segments 2–8 brown, 9–11 piceous; elytron black with two large yellow spots, both closer to margin than suture, anterior spot behind callus, posterior spot slightly smaller, on apical one-third. Punctation on elytron not noticeably dual, punctures separated by less than their diameter. Pubescence dense, golden brown except on spots on elytron where it is grayish white. Postcoxal line complete, distinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum deeply notched medially; sixth tergum entire, convex. Genitalia with basal lobe longer than paramere, straight, narrowed to a blunt point at apical one-fourth in ventral view; paramere not widened apically, curved downward (figs. 605, 606); sipho straight before apex, tip enlarged, orifice dorsal, subterminal (fig. 607).

Female.—Similar to male except hind margin of fifth sternum nearly truncate; sixth sternum less strongly notched (fig. 1438); sixth tergum entire, convex, (fig. 1439). Genitalia with 10th tergum nearly truncate, sides obliquely descending (fig. 1440); genital plate elongate-oval, stylus visible (fig. 1441).

Variation.—Length 6–7.10 mm., width 4.97–5.60 mm.

Holotype.—Male. PERU: Vic. Sani Beni, 890 m. a.s.l., IV–12–1935, F. Woytkowski (KSU).

Allotype.—Female. PERU: Vic. Sani Beni, 840 m. a.s.l., VI–12–1935, F. Woytkowski (KSU).

Paratypes.—Total five. PERU: Same data as holotype and allotype except additional dates; VI–11–1935, IV–22–1935, IV–26–1935. (UK) (USNM).

Discussion.—This species is recognized rather easily by the intense golden brown of the dorsal pubescence. It is the only known species in this size range with two spots on the elytron having this characteristic. The type

locality, Sani Beni, cannot be found on available maps.

Epilachna oviforma, new species

(Figs. 194, 1442–1445; map 15)

Female.—Length 7.58 mm., width 6.05 mm. Form regularly oval, widest at middle of elytra, lateral margin distinctly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron black with two yellow spots, anterior spot posterior to callus, posterior spot on center of elytron on apical one-third (fig. 194). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron distinctly reticulate. Pubescence yellowish white. Postcoxal line incomplete, obsolete medially. Abdomen with hind margin of fifth sternum truncate; sixth sternum deeply notched (fig. 1442); sixth tergum convex, entire (fig. 1443). Genitalia with 10th tergum convex, feebly emarginate medially (fig. 1444); genital plate with posterolateral angle strongly produced, all angles rounded, stylus visible (fig. 1445).

Male.—Not known.

Holotype.—Female. PERU: *Huanuco:* E. side Carpish Mts., 2800 m., 40 mi. SW. Tingo Maria, X–17–1954, E. I. Schlinger and E. S. Ross collectors (CAS).

Discussion.—The placement of this species in the genus is uncertain as no males are available. The female genital plate is unlike that of any known species of *Epilachna*. In addition to genitalia, the elytral color pattern, oval form, and yellowish pubescence will help to distinguish *oviforma* from other Neotropical *Epilachna*.

Epilachna punctatissima (Weise)

(Figs. 195–196, 608–610, 1446–1449; map 16)

Solanophila punctatissima Weise, 1904*a*, p. 193.
Solanophila punctatissima ab. *tetraspila* Weise, 1922, p. 33.
Epilachna punctatissima: Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.
Epilachna punctatissima ab. *tetraspila:* Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 5.57 mm., width 4.08 mm. Form elongate-oval, widest anterior to middle of elytra, narrowing toward apex, lateral margin of elytron rounded from humeral angle to apex. Color black; anterior and lateral margins of pronotum, entire propleuron and epipleuron reddish brown; mouthparts brown to piceous; antenna with basal segment black, segments 2–8 brown, 9–11 piceous; elytron reddish brown (fig. 195). Punctation on elytron dual, small punctures fine, separated by less than their diameter, large punctures coarse, dense, separated by less than their diameter. Surface of elytron finely reticulate. Pubescence dense, grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly, broadly concave medially; sixth sternum broadly emarginate. Genitalia with basal lobe angled downward to middle, gently curved upward toward apex, a group of setae on upper surface; paramere slightly sinuate, widened toward apex (figs. 608, 609); sipho short, robust, orifice dorsal, subterminal (fig. 610).

Female.—Similar to male except hind margin of fifth sternum strongly produced medially; sixth sternum convex, entire, with longitudinal suture (fig. 1446); sixth tergum broadly, feebly convex (fig. 1447). Genitalia with 10th tergum broadly convex (fig. 1448); genital plate transversely oval, all angles rounded, stylus visible (fig. 1449).

Variation.—Length 5–5.95 mm., width 3.68–4.47 mm. Black area of pronotum may be reduced to elongate spot on disk. Color pattern on elytron varies from that described here to form in which there are two distinct, yellow spots and lateral and apical one-third of elytron yellow, anterior spot posterior to and between callus and scutellum, posterior spot behind middle near suture (ab. *tetraspila*) (fig. 196). All degrees of variation exist between forms described here.

Type Locality.—Of *punctatissima*, Argentina, Prov. Catamarca; of *tetraspila*, Argentina, Prov. Tucuman.

Type Depository.—Of *punctatissima*, MNHUB; of *tetraspila*, NREA.

Discussion.—The unique male type of *punctatissima* bearing the following labels has been examined: "Rep. Argentina, Prov. Catamarca,

1897, C. Bruch." The name *tetraspila* was proposed by Weise as an aberration of *punctatissima* and is not available (Article 45, International Rules). The unique type of *tetraspila* bearing the following labels has been examined: "Argentina, Prov. Tucuman, 21–11–1908, C. Bruch"; "TYPUS" (red paper); "Solanophila punctatissima ab. tetraspila"; "240, 70" (pink paper); "Riksmusem Stockholm" (green paper). The dense, coarse elytral punctures and obscure maculation distinguish *punctatissima* from the other small, maculate species in the *approximata* group.

Specimens Examined.—Total four. ARGENTINA: "Argentina." *Catamarca:* "Catamarca." *Salta:* "Salta." (CAS) (USNM).

Epilachna eximia, new species

(Figs. 197–198, 611–613, 1450–1452; map 16)

Male.—Length 6.38 mm., width 5.63 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron extremely broadly explanate in anterior one-half, rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with large orange spot, spot occupying all of elytron except narrow sutural, apical, and basal margins and broad lateral margin (fig. 197). Punctation on elytron dual, small punctures widely scattered, large punctures dense, separated by less than their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum deeply notched medially; sixth tergum broadly emarginate medially. Genitalia with basal lobe longer than paramere, narrowed medially in lateral view, gradually curved upward from middle to apex, a row of setae present medially on each side; paramere strongly widened apically (figs. 611, 612); sipho abruptly curved at basal one-third, nearly straight to apex, apex slightly bent downward, orifice dorsal, subterminal (fig. 613).

Female.—Similar to male except orange spot on elytron narrowly divided in half by black band (fig. 198). Abdomen with hind margin of fifth sternum convex; sixth sternum convex with a median longitudinal suture; sixth tergum with hind margin nearly truncate (fig. 1450). Genitalia with 10th tergum broadly and shallowly emarginate (fig. 1451); genital plate short, all angles rounded, stylus visible (fig. 1452).

Variation.—Length 6–7 mm., width 4.80–5.80 mm. Holotype has no trace of median black band dividing spot on elytron. Allotype has spot narrowly but completely divided on left elytron with black band incomplete medially on right elytron. Paratype has spot on each elytron broadly and distinctly divided by black band. (fig. 198.)

Holotype.—Male. COLOMBIA: *Santander:* Bucaramanga, 1018 m., April 15, 1941, Murillo No. 5431 (USNM 71654).

Allotype.—Female. Same data as holotype.

Paratype.—Total one. Same data as holotype.

Discussion.—The male genitalia are distinctive, and, in addition, the extremely explanate margin of the elytron will help to distinguish this species.

Epilachna vittigera Group

Length approximately 5–9.50 mm. Mandible short, usually extending only slightly beyond labrum, three major teeth in apical one-half, first tooth bifid with a minor projection on lower margin, second and third teeth each with a minor tooth on lower margin, a minor tooth on inner margin of mandible below third tooth (fig. 33). Labrum with apex feebly emarginate. Color pattern of elytron variable, pronotum always with anterolateral angle narrowly yellow. Lateral margin of elytron usually straight medially, sometimes rounded from humeral angle to apex; shape of epipleuron highly variable. Male genitalia with basal lobe longer than paramere, a group of setae on each side of middle, apex abruptly, finely recurved, pointed (fig. 630); sipho slender, apex usually blunt, not thickened (fig.

631). Female genital plate transverse-oval, stylus usually not visible or visible only in apical view (fig. 1474). The distribution is primarily in Peru, with species extending into Ecuador, southern Colombia, and northern Bolivia. *E. geometrica, ostensa, ostensoides, olmosi,* and *divisoides* are not typical members of this group, but they are placed here because the male genitalia seem to be closer to those in the *vittigera* group, and because the female genital plate, where known, is of the *vittigera* type. This is the largest group in the genus and is more diverse in color pattern and form than most of the other groups.

Key to Species of *Epilachna vittigera* Group

1. Elytron black with four yellow spots 2
   Elytron not as described above 3
2. Form strongly narrowed posteriorly; length 8 mm. more ..... *narinoi*, n. sp. (p. 95)
   Form elongate, oval; length less than 6.25 mm ..... *olmosi*, n. sp. (p. 111)
3. Elytron black with two transverse, yellow or orange bands 4
   Elytron not as described above 5
4. Length less than 7 mm ..... *chigata*, n. sp. (p. 94)
   Length more than 8 mm ..... *pemptea*, n. sp. (p. 95)
5. Elytron with vittate color pattern 6
   Elytron not vittate 12
6. Median vitta not connected at either end, short vitta or small spot between median vitta and lateral margin medially (fig. 230) ..... *geometrica* (Weise) (p. 109)
   Median vitta connected at least basally, short outer vitta or spot not present 7
7. Form convex; length 6 mm.; Ecuador ..... *univittata* Crotch (p. 97)
   Form not strongly convex; length nearly always more than 6 mm.; if from Ecuador, then length 6.38 mm. or more 8
8. Elytron with yellow areas twice as wide as black median vitta or lateral border ..... *divisa* (Weise) (p. 98)
   Elytron with yellow areas rarely wider than median vitta, never twice as wide 9
9. Median vitta extending to sutural border near apex (fig. 235); punctation on elytron not dual ..... *divisoides*, n. sp. (p. 111)
   Median vitta of elytron not reaching sutural border at apex; punctation on elytron usually dual 10
10. Yellow areas of elytron wider than median vitta (fig. 205), elytron often with partial or complete transverse band medially (fig. 206) ..... *vittigera* Crotch (p. 98)
    Yellow areas of elytron usually narrower than median vitta, never wider, never with transverse median band 11
11. Lateral margin of elytron broadly explanate, about 0.5 mm. in width (fig. 202); Ecuador ..... *monovittata*, n. sp. (p. 96)
    Lateral margin of elytron narrowly explanate, about 0.3 mm. in width (fig. 204) ..... *cushmani*, n. sp. (p. 97)
12. Elytron with two triangular yellow spots, posterior spot larger than anterior and often with small, black, subapical spot (fig. 207), two spots may be narrowly joined near suture, or completely separated and posterior spot reduced in size (fig. 210) ..... *freudei* (Mader), n. comb. (p. 99)
    Elytron not as described above 13
13. Elytron black with single yellow spot near base (fig. 211) ..... *freudei* (Mader), n. comb. (p. 99)
    Elytron not as described above 14
14. Elytron with two orange or yellow spots on black background 15
    Elytron not as described above 25
15. Lateral margin of elytron strongly explanate, one-fourth or more width of elytron 16
    Lateral margin of elytron narrowly explanate, considerably less than one-fourth width of elytron 17
16. Length less than 6 mm ..... *nana*, n. sp. (p. 104)
    Length more than 6 mm ..... *bonplandi* Mulsant (p. 104)
17. Length 7.50 mm. or more; posterior yellow spot usually with short, black projection extending from lateral border (fig. 212), occasionally with black projection absent and median band reduced to two spots (fig. 213) ..... *taeniola*, n. sp. (p. 100)
    Length 7 mm. or less; color pattern not as described above 18
18. Lateral margin of elytron distinctly bordered with yellow (fig. 224) ..... *korschefskyi*, n. sp. (p. 106)
    Lateral margin of elytron not yellow 19
19. Length 5.25 mm. or less ..... *conjuncta*, n. sp. (p. 108)
    Length 5.60 mm. or more 20

20. Elytron with a teardrop-shaped black mark extending posteriorly from transverse median band ..... *adnexa* (Mader), n. comb. (p. 107)
Elytron without a teardrop-shaped mark 21
21. Elytron with unattached black mark on posterior spot 22
Elytron with no black mark on posterior spot 24
22. Elytron with black mark on posterior spot large, elongate, with tendency to connect to transverse median band (fig. 225) ..... *adnexa* (Mader), n. comb. (p. 107)
Elytron with black mark on posterior spot small, round, showing no tendency to connect with transverse median band 23
23. Body about 1.5 mm. longer than wide (fig. 222); length more than 6 mm ..... *harringtoni*, n. sp. (p. 105)
Body less than 1 mm. longer than wide (fig. 223); length less than 6 mm *bolivicola* (Mader), n. comb. (p. 106)
24. Known only from Peru (Junin) ..... *fenestroides*, n. sp. (p. 104)
Known only from Bolivia (Cochabamba) ..... *freudei* (Mader), n. comb. (p. 99)
25. Elytron with three pale spots on dark background 26
Elytron not as described above 28
26. Length 6.20 mm. or more ..... *bistrisignata* (Mader), n. comb. (p. 108)
Length less than 5.75 mm 27
27. Elytron with two posterior spots, one anterior spot (fig. 226) ..... *bistriguttata* Mulsant (p. 107)
Elytron with two anterior spots, one posterior spot (fig. 228) ..... *conjuncta*, n. sp. (p. 108)
28. Elytron with single large, median, yellow or orange area 29
Elytron yellow with irregular black markings 33
29. Elytron with sutural margin bordered with black, disk orange with small area near scutellum obscurely yellow; Colombia ..... *caucaensis* (Weise) (p. 101)
Elytron with yellow or orange area reaching sutural margin 30
30. Posterior margin of orange area on elytron truncate, apical one-sixth of elytron black 31
Posterior margin of orange area on elytron rounded or emarginate, apical one-twelfth of elytron black 32
31. Anterior margin of orange area on elytron truncate (fig. 216) ..... *strictanotata*, n. sp. (p. 103)
Anterior margin of orange area on elytron emarginate along suture (fig. 214) .. *discoidea* Erichson (p. 101)
32. Form broad, rounded; basal black border wide, completely covering callus ..... *honesta* (Weise) (p. 102)
Form narrow, elongate, narrowed in apical one-fourth; basal black border narrow, not completely covering callus (fig. 215) ..... *ignobilis* (Weise) (p. 102)
33. Form elongate, nearly parallel-sided, about 1.75 mm. longer than wide (fig. 232) . *ostensoides*, n. sp. (p. 110)
Form oval, rounded, about 1 mm. longer than wide (fig. 231) ..... *ostensa* (Weise) (p. 109)

Descriptions of Species in *Epilachna vittigera* Group

Epilachna chigata, new species

(Figs. 199, 614–616, 1453–1455; map 16)

Male.—Length 8.15 mm., width 6.55 mm. Form ovate, widest posterior to humeral angle, lateral margin of elytron rounded from humeral angle to apex, strongly explanate, narrowed posteriorly. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 7–11 piceous; anterolateral angle of pronotum yellow; elytron black with two transverse orange bands not touching suture or margin, anterior band in front of middle, inner end slightly produced posteriorly, posterior band angled slightly forward (fig. 199). Punctation on elytron dual, small punctures dense, separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron dull, finely, densely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending well beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum deeply notched; sixth tergum broadly, weakly emarginate. Genitalia with basal lobe longer than paramere, upper margin strongly curved downward in basal one-half with group of setae anterior to middle on each side, lobe curved upward before apex, apex reflexed, in ventral view lobe narrow at base, widened medially, evenly narrowed to blunt point in apical one-half; paramere slender, slightly widened apically; trabes as long as paramere (figs. 614, 615); sipho evenly curved, slightly angled upward before apex, apex bluntly rounded with barely perceptible ventral tooth, orifice dorsal, elongate, well back of apex (fig. 616).

Female.—Length 8.41 mm., width 6.86 mm. Similar to male except abdomen with hind margin of fifth sternum triangularly produced; sixth sternum emarginate, lacking pigment medially (fig. 1453); sixth tergum broadly convex, entire. Genitalia with 10th tergum rounded, truncate medially (fig. 1454); genital plate transverse, all angles rounded, posterior margin nearly truncate, stylus visible only in apical view (fig. 1455).

Holotype.—Male. ECUADOR: *Tungurahua,* 6700 ft. (USNM 71655).

Other Specimen.—Female. ECUADOR. (UCCC).

Discussion.—The female described here seems to agree with the male in all respects except size and sexual characters and is considered to be the same species. This female is the second specimen in the type series of *bizonata* and is not designated as allotype of *chigata* because of the possibility of it being another species. *E. chigata* is smaller and not as elongate as *bizonata.* See remarks under *bizonata.* The male genitalia are similar to those of *narinoi,* but the basal lobe of *narinoi* is nearly parallel-sided before the middle in ventral view and the apex of the sipho is broadly rounded and the ventral tooth distinct. The female fifth sternum is much more strongly produced medially in *narinoi* than in *chigata.*

Epilachna narinoi, new species

(Figs. 200, 617–619, 1456–1458; map 16)

Male.—Length 8 mm., width 7.05 mm. Form ovate, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–7 yellow, 8–11 piceous; anterolateral angle of pronotum narrowly yellow; elytron black with four yellow spots, first spot irregularly oval, near lateral margin behind callus, second spot elongate-oval near scutellum, separated from suture by one-half its width, third spot small, transversely oval, near lateral margin on apical one-half, fourth spot elongate, near suture on apical one-half (fig. 200). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron shining, finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum notched; sixth tergum broadly, weakly emarginate. Genitalia as described for *chigata* except basal lobe nearly parallel-sided medially and apex of sipho broadly rounded, ventral tooth distinct (figs. 617–619).

Female.—Similar to male except abdomen with hind margin of fifth sternum strongly produced medially; sixth sternum emarginate, lacking pigment medially, as figured for *chigata;* sixth tergum feebly emarginate medially (fig. 1456). Genitalia with 10th tergum convex, entire (fig. 1457); genital plate transverse, all angles rounded, posterior margin nearly truncate, anteromedian angle slightly produced, stylus visible only in apical view (fig. 1458).

Variation.—Length 8–9.43 mm., width 7.05–7.91 mm.

Holotype.—Male. COLOMBIA: Narino: 25 mi. SW. Mocoa, 2080 m., III–3–1955, E. I. Schlinger and E. S. Ross collectors (CAS).

Allotype.—Female. Same data as holotype (CAS).

Paratype.—Total one. Same data as holotype. (USNM).

Discussion.—Although *narinoi* has the *reichei* type of color pattern, it is very closely related to *chigata* and *monovittata.* It is possible that *narinoi* will prove to be not specifically distinct from *chigata* when more specimens are available. See discussion under *chigata.*

Epilachna pemptea, new species

(Figs. 201, 620–622; map 16)

Male.—Length 6.69 mm., width 5.88 mm. Form ovate, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, strongly rounded from humeral angle to apex. Color black; mouthparts brown to piceous; antennna with basal segment black, segments 2–6 yellow, 7–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron black with two narrow, orange bands not

TB 1493 (1975) USDA TECHNICAL BULLETINS UPDATA

A REVISION OF THE EPILACHNINE OF THE WESTERN HEMISPHERE (COLEOPTERA

GORDON, R.D. 2 OF 5

reaching suture, anterior band in front of middle, posterior band behind middle (fig. 201). Punctation on elytron dual, small punctures dense, separated by their diameter or less, large punctures separated by one to four times their diameter. Surface of elytron dull, densely, finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly convex, entire; sixth sternum notched; sixth tergum weakly emarginate. Genitalia with basal lobe longer than paramere, upper margin with basal one-fourth straight, carinate in dorsal view, abruptly curved downward to middle, lobe curved upward in apical one-half, lacking setae, apex reflexed pointed; paramere widened apically (figs. 620, 621); sipho tapered to blunt point at apex, ventral tooth distinct (fig. 622).

Female.—Not known.

Holotype.—Male. PERU: *Amazonas:* Guayabamba subt. val., 70 Km. E. of Chachapoyas, Aug.16, 1936, F. Woytkowski (USNM 71656).

Discussion.—*E. pemptea* is obviously related to *chigata,* but the male genitalia of *pemptea* with the absence of setae on the basal lobe and the carinate basal part of the lobe are distinctive. *E. pemptea* is also smaller and more rounded in form than *chigata.*

Epilachna monovittata, new species

(Figs. 202, 623–625, 1459–1463; map 16)

Male.—Length 6.38 mm., width 5.42 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron broadly explanate, rounded from humeral angle to apex. Color black; pronotum with anterior angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellowish brown, 9–11 piceous; elytron dark yellow, completely margined with black, a black median vitta extending from basal margin at callus nearly to apex, not reaching apical black margin, widened medially (fig. 202). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum faintly, broadly emarginate. Genitalia with basal lobe slender, longer than paramere, broadly and strongly curved upward apically with abrupt, upward hook at apex, a group of setae present dorsolaterally on each side at apical one-third; paramere slender, narrowed medially, apex widened (figs. 623, 624); sipho slender, pointed, orifice dorsal, subterminal (fig. 625).

Female.—Similar to male except hind margin of fifth sternum strongly produced and convex medially; sixth sternum nearly completely divided (fig. 1459); sixth tergum truncate (fig. 1460). Genitalia with 10th tergum produced medially, convex (fig. 1461); genital plate transverse, anteromedian angle pronounced, stylus visible in apical view (fig. 1462).

Variation.—Length 6.38–7.90 mm., width 5.42–6.59 mm. Yellow anterolateral angle of pronotum is nearly invisible in all specimens except holotype. Three specimens from Colombia average larger than others and have elytral punctation noticeably coarser and lateral and basal black borders wider, covering callus completely. They also have apical end of median vitta distinctly united with apical black border. Single specimen from Los Rios, Ecuador, has median vitta extremely widened medially, reaching sutural border and nearly reaching lateral border, leaving two elongate anterior spots and partially divided posterior spot. Female genital plates vary slightly between specimens from Colombia and Ecuador (figs. 1462, 1463).

Holotype.—Male. PERU: *Amazonas:* San Ildefondo Hills, 1900–4000 m asl, July 26, 1936, F. Woytkowski (USNM 71657).

Other Specimens.—Total seven. COLOMBIA: *Narino:* 10 mi. E. Pasto, 3000 m., III–1–1955, E. I. Schlinger and E. S. Ross. ECUADOR: *Chimborazo:* 30 mi. SW. of Alausi, 2500 m., II–14–55, E. I. Schlinger and E. S. Ross; Los Rios: 39 mi. E. Quevado, 2000 m., II–6–1955, E. I. Schlinger and E. S. Ross. (CAS) (USNM).

Discussion.—All specimens except the holo-

type are females and not designated as type material. No females were available from Peru and it is possible that either the Ecuador or Colombia material or both may not be the same species as the holotype. In external appearance *monovittata* resembles *vittigera* and *cushmani*, but the actual affinities appear to be with *chigata* and allies. The strongly explanate elytral margin and relatively coarse elytral punctures are of the *chigata* type as are the female genitalia. The male genitalia are of a type intermediate between *chigata* and *vittigera*. The sipho lacks the ventral tooth found in *chigata* and the basal lobe lacks the subapical swelling on the upper surface found in *vittigera*. There is probably a tendency for the median vitta on the elytron to expand medially, reaching the sutural and marginal border and leaving a color pattern of four yellow spots on each elytron. This then would be the type of pattern found in *narinoi*, and, if carried further, could become the pattern of transverse bands found in *chigata*.

Epilachna univittata Crotch

(Figs. 203, 1464–1466)

Epilachna univittata Crotch, 1874, p. 59.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Female.—Length 6 mm., width 5.39 mm. Form round, convex, widest anterior to middle of elytra, lateral margin of elytron explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; elytron yellowish orange, completely bordered with black, a median black vitta extending from base inside callus nearly to apex, lateral border slightly widened medially (fig. 203). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Abdomen with hind margin of fifth sternum weakly notched; sixth sternum convex, entire (fig. 1464); sixth tergum convex, entire. Genitalia with 10th tergum convex (fig. 1465); genital plate transversely oval, posterior margin ragged, stylus visible (fig. 1466).

Male.—Not known.

Type Locality.—Ecuador.

Type Depository.—UCCC.

Discussion.—*E. univittata* apparently belongs near *vittigera* based on the type of female genital plate. The round, convex form as well as differences in genitalia and terminal abdominal sterna distinguish *univittata* from other species in the group. The unique type bears the following labels: "Ecuad."; "TYPE univittat"; "TYPE" (blue paper).

Specimens Examined.—Total one. The type.

Epilachna cushmani, new species

(Figs. 204, 626–628, 1467–1470; map 17)

Male.—Length 6.47 mm., width 5.06 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterolateral angle of pronotum narrowly yellow; elytron yellow, completely bordered with black, lateral border widened in basal two-thirds, sutural border narrowed from base to apex, a black vitta extending from base inside callus nearly to apex (fig. 204). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Surface of elytron distinctly reticulate. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum strongly emarginate. Genitalia of the *vittigera* type; basal lobe longer than paramere, apex reflexed, pointed, in ventral view widened medially, narrowed apically and posteriorly; paramere straight, slightly widened apically (figs. 626, 627); sipho slender, apex blunt, orifice dorsal, subterminal (fig. 628).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex medially; sixth sternum truncate medially, longitudinal suture present (fig. 1467); sixth tergum feebly emarginate (fig. 1468). Genitalia with 10th tergum strongly emarginate (fig. 1469); genital plate with anteromedian

angle produced, posterior margin truncate (fig. 1470).

Variation.—Length 6.47–7.60 mm., width 5.06–6 mm.

Holotype.—PERU: *Cuzco:* Nunenmacher collection (CAS).

Allotype.—Female. No data, Korschefsky collection (USNM).

Discussion.—*E. cushmani* resembles *vittigera* in external appearance and male genitalia, but *cushmani* is larger and more elongate and has the elytron much more densely and coarsely punctured, the black vitta on the elytron wider, and the basal lobe of the genitalia widened medially. The allotype has no data, but there is little doubt that it is the same species as the holotype. The two specimens agree in all details except sexual characters. This species is named for Arthur Cushman, whose illustrations have contributed much to this publication.

Epilachna divisa (Weise)

Solanophila divisa Weise, 1899, pp. 263–264.
Epilachna divisa: Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

The type material of this species cannot be located, nor has any specimen matching the original description been observed. The following description has been modified from Weise's original description.

Length 7 mm. Form oval, strongly convex, similar to *inserta*. Antenna yellow except basal segment and club dark brownish yellow. Color black; elytron light tobacco brown, completely bordered with black, median black vitta extending from base at callus nearly to apex, sutural border wider at middle than at either end, brown areas on each side of median vitta about twice as wide as vitta. Pubescence gray, appressed on brown areas of elytron, more erect and opposing on black vitta and borders, giving appearance of light-colored longitudinal line down center.

Type Locality.—Peru: *Cuzco:* Callanga.

Type Depository.—Not known.

Discussion.—Since Weise did not give any range of size, he probably had only a single specimen when he wrote his description. Dr. Hieke informed me that there is no specimen of this species presently in the MNHUB. According to the description, *divisa* resembles *divisoides* and *cushmani* in color pattern and is placed near them in this review. In *divisa* the light-colored areas of the elytron are said to be twice as wide as the black vitta or borders and the median vitta does not reach the apex. This description does not fit either *divisoides* or *cushmani* and all three are treated here as separate species.

Epilachna vittigera Crotch

(Figs. 205–206, 629–631, 1471–1474; map 17)

Epilachna v-pallidum var. *vittigera* Crotch, 1874, p. 58.
Solanophila graphis Weise, 1906*a*, p. 228.—Mader, 1958, pp. 5–6. NEW SYNONYMY.
Epilachna crotchi Sicard, 1912*b*, p. 303.—Korschefsky, 1931, p. 61. NEW SYNONYMY.
Solanophila bisbilineata Weise, 1926, pp. 2–3. NEW SYNONYMY.
Solanophila graphis ab. *incompleta* Mader, 1958, p. 6.
Epilachna crotchi var. *pallida* Crotch (sic); Korschefsky, 1931, p. 61.
Epilachna crotchi ab. *vittigera:* Korschefsky, 1931, p. 61.
Epilachna graphis: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.
Epilachna crotchi v. *vittigera:* Blackwelder, 1945, p. 441.
Epilachna bisbilineata: Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 6.55 mm., width 5 mm. Form oval, widest anterior to middle of elytra, elytron with lateral margin rounded from humeral angle to apex. Color black; anterolateral angle of pronotum yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, completely margined with black, divided into three unequal areas by a black vitta and band, vitta extending from basal margin near callus to apical one-fifth, band obliquely transverse from sutural margin to lateral margin, both sutural and lateral margins thickened and extending inward somewhat at band (fig. 205). Punctation on elytron dual, small punctures separated by less than their diameter, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Tarsal claw lacking basal angula-

tion. Postcoxal line complete, distinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly emarginate. Genitalia with basal lobe longer than paramere, curved upward slightly before apex, upper margin descending to apex, apex pointed, abruptly turned upward, small group of setae present laterally near lower margin; paramere widened slightly at apex (figs. 629, 630); sipho short, orifice dorsal, subterminal (fig. 631).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum broadly emarginate (fig. 1471); sixth tergum faintly, broadly emarginate (fig. 1472). Genitalia with 10th tergum broadly convex (fig. 1473); genital plate transversely oval, stylus visible (fig. 1474).

Variation.—Length 5.70–7 mm., width 4.75–5.80 mm. Elytron may have single median vitta with no trace of transverse band (fig. 206), or transverse band may be as strong as vitta with all intergrades between these conditions occurring.

Type Locality.—Of *vittigera,* Peru; of *graphis,* Bolivia; Yungas de la Paz; of *bisbilineata,* Peru, Pachitea.

Type Depository.—Of *vittigera* and *crotchi,* UCCC (lectotypes here designated); of *graphis,* MNHUB; of *bisbilineata,* NREA.

Discussion.—This species resembles *E. v-pallidum v-pallidum* Blanchard and was mistaken by Crotch for that species. Sicard (*1912b*) pointed out that the specimens in the Crotch collection were not *v-pallidum,* then described them as a new species, *crotchi,* but not using the name *vittigera* which Crotch (*1874*) proposed as a variety of *v-pallidum.* Weise (*1906a*) named a species *graphis,* the female type of which has been examined and has been found to be conspecific with *vittigera.* The unique male type of *bisbilineata* was also examined and proved to be a synonym of *vittigera.* The third specimen in the series of *vittigera* in the Crotch collection bearing the following labels is here designated lectotype of *crotchi:* "v-pallidum, Bolivia D" (green paper). The first specimen in this series bearing the following label is here designated lectotype of *vittigera:* "vittigera T, Boliv. Higg." (green paper).

Specimens Examined.—Total 16. "Am. m." BOLIVIA: *Cochabamba:* Br. Ichillo R., Rain Forest, Oct. 15–16, 1966, B. and K. Burks; Yanachi, Yungas, M. Cardenas. *La Paz:* Ancapata, Sept. 1925, G. L. Harrington; Yungas de la Paz, 1000 m., H. Rolle. PERU: *Cuzco:* "Cuzco"; Machu Picchu Pueblo, 6491 ft., III–22–1947, J. C. Pallister; Pilco, I, 14–20–1953, Woytkowski. (CAS) (UCCC) (USNM) (ZSBS).

Epilachna freudei (Mader), new combination

(Figs. 207–211, 632–634, 1475–1478; map 17)

Solanophila freudei Mader, 1958, p. 5.
Solanophila freudei a. *manca* Mader, 1958, p. 5.
Solanophila irritans Mader, 1958, p. 5. NEW SYNONYMY.

Male.—Length 6 mm., width 4.95 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–12 piceous; elytron black with two large yellow spots, anterior spot triangular, near base between humeral callus and scutellum, outer side oblique from callus to near suture, inner side parallel to suture, posterior spot triangular, anterior end of spot narrow, just reaching anterior spot, outer side of posterior spot oblique from near suture to near outer margin of elytron at apical one-third, a small black spot near apex (fig. 207). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially. Genitalia with basal lobe longer than paramere, curved upward, apex with point abruptly turned upward, apex smoothly rounded in ventral view, a group of setae present medially on each side; paramere straight, slightly thickened apically (figs. 632,

633); sipho short, apex truncate, orifice dorsal, subterminal (fig. 634).

Female.—Similar to male except hind margin of sixth tergum not as deeply notched (fig. 1475); sixth sternum notched medially as in male (fig. 1476). Genitalia with 10th tergum evenly convex (fig. 1477); genital plate elongate-oval, stylus not visible (fig. 1478).

Variation.—Length 5.30–7 mm., width 4–5.42 mm. Dorsal color pattern is variable. Apical angle of elytron may be black, concealing subapical spot and posterior yellow spot becomes reduced in size (fig. 208). Anterior and posterior spots may be joined and occupy nearly all of elytron (fig. 209). In some specimens yellow spots are reduced, distinctly separated with posterior spot triangular (fig. 210). Species *irritans* Mader is form of *freudei* in which elytron has both spots very reduced in size, oval, and widely separated. Most extreme form is like *irritans*, but only a small anterior spot remains on each elytron (fig. 211).

Type Locality.—Bolivia: Yungas de Arepucho, Sihuencas, 2200–2500 m.

Type Depository.—ZSBS.

Discussion.—The types of *freudei* and *irritans* have been examined and found to be conspecific. The extreme color variations described here occur in a series collected at the same place on the same day. If single specimens of this species are collected, accurate determination could be very difficult. The male genitalia will identify *freudei* with certainty, but the female genitalia are not quite as distinctive. According to Article 45 of the International Rules, the name *manca* Mader has no standing.

Specimens Examined.—Total 139. BOLIVIA: *Cochabamba*: Locotal, 1850 m. alt., VIII–2–1951, on Composite (?), G. H. Dieke; Yungas de Arepucho, Sihuencas, 2200–2500 m. *La Paz*: Incachaca, alt. 2500 m., J. Steinbach. (CM) (FM) (USNM) (ZSBS).

Epilachna taeniola, new species

(Figs. 212–213, 635–637, 1479–1482; map 17)

Male.—Length 7.66 mm., width 6.71 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterolateral angle of pronotum narrowly yellow; elytron black with two yellow spots separated by a wide, transverse black band, anterior spot transverse, callus black, posterior spot triangular with a black projection extending from lateral border (fig. 212). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to twice their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, not extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly concave; sixth sternum notched; sixth tergum broadly, feebly emarginate. Genitalia angled downward from base, curved upward toward apex, apex reflexed, pointed, a small group of setae present near lateral margin anterior to middle; paramere slightly widened apically (figs. 635, 636); sipho long, slender, apex pointed, orifice dorsal, subterminal (fig. 637).

Female.—Similar to male except abdomen with hind margin of fifth sternum projecting slightly medially; sixth sternum notched, longitudinal suture present (fig. 1479); sixth tergum truncate (fig. 1480). Genitalia with 10th tergum entire, convex (fig. 1481); genital plate transversely oval, anterolateral angle obsolete, stylus visible (fig. 1482).

Variation.—Length 7.66–8.43 mm., width 6.71 mm. One paratype has median transverse band on elytron reduced to discal spot and lateral projection, and posterior spot lacking projection from lateral margin (fig. 213).

Holotype.—Male. COLOMBIA: Cauca Valley, Mari Lopez, Nunenmacher collection (CAS).

Allotype.—Female. COLOMBIA: *Cauca* (USNM).

Paratypes.—Total three. COLOMBIA: *Cauca:* Nunenmacher collection; Cauca; St. Antonio, 19–7–08, Nunenmacher collection. (CAS) (USNM).

Discussion.—The male genitalia are of the

vittigera type. The typical color pattern is distinctive, but genitalia must be used when the pattern is as described under Variation here.

Epilachna caucaensis (Weise)

(Figs. 638–640, 1483–1486; map 17)

Solanophila quadriplagiata ab. *caucaensis* Weise, 1926, p. 5.

Epilachna quadriplagiata ab. *caucaensis*: Korschefsky, 1931, p. 66.

Epilachna bouplandi ab. *caucaensis*: Blackwelder, 1945, p. 441.

Female.—Length 7.39 mm., width 6.21 mm. Form round, slightly elongate, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–4 yellow, 5–10 piceous; anterolateral angle of pronotum narrowly yellow; elytron yellowish orange completely bordered with black, short extension of border covering callus, obscurely defined area between callus and scutellum yellow. Punctation on elytron dual, small punctures separated by one to four times their diameter, large punctures separated by their diameter or less. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum projecting medially; sixth sternum convex, entire (fig. 1483); sixth tergum nearly truncate medially (fig. 1484). Genitalia with 10th tergum entire, convex (fig. 1485); genital plate transversely oval, stylus not visible (fig. 1486).

Male.—Similar to female except abdomen with hind margin of sixth sternum notched; sixth tergum notched. Genitalia of the *vittigera* type, basal lobe longer than paramere, apex recurved, a group of setae on upper margin before middle; paramere feebly widened near apex (figs. 638, 639); sipho long, slender, blunt, orifice dorsal, subterminal (fig. 640).

Variation.—Length 6.28–7.39 mm., width 5.40–6.31 mm. Pale-yellow spot on elytron is occasionally absent in some specimens and some individuals have obscure yellow spot on apical one-third of elytron.

Type Locality.—Colombia: Cauca.

Type Depository.—NREA (not examined).

Discussion.—This species was described as an aberration of *quadriplagiata* but is quite obviously a valid species based on form and genitalia. The strongly explanate margin of the elytron, though not as pronounced, is somewhat like that of *latimargo*. The color pattern is like that of *ignobilis*, but the pronounced projection of the black border of the elytron at the callus is apparently not shared by *ignobilis* or related species and the pale-yellow area between the scutellum and callus has been observed only in *caucaensis*. This description was taken from a specimen in the Korschefsky collection compared with the type by Korschefsky.

Specimens Examined.—Total 63. COLOMBIA: "Columb," Thieme, Korschefsky collection. *Cauca:* "Cauca"; Nunenmacher coll.; Kraatz, R. Korschefsky, cum typ. comp., Korschefsky collection. (CAS)(PM)(USNM).

Epilachna discoidea Erichson

(Figs. 214, 641–643, 1487–1490; map 17)

Epilachna discoidea Erichson, 1847, p. 183.—Mulsant, 1853, p. 165.—Crotch, 1874, p. 122.—Weise, 1895, p. 122.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 5.95 mm., width 4.95 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle yellow; mouthparts brown to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with large discal, yellowish-orange spot, posterior border of spot truncate, lateral border extending obliquely from behind humeral callus toward lateral margin of elytron at apical one-third, anterior margin with black extending narrowly along suture for short distance (fig. 214). Punctation on elytron dual, small punctures separated by less than their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum faintly emarginate medially. Genitalia of the *fenes-*

troides type; basal lobe longer than paramere, slender, curved upward at apex, apex reflexed, a group of setae present on each side anterior to middle; paramere widened apically (figs. 641, 642); sipho straight before apex, apex curved upward, orifice dorsal, subterminal (fig. 643).

Female.—Similar to male except hind margin of sixth sternum weakly emarginate (fig. 1487); sixth tergum with hind margin nearly truncate, slightly convex (fig. 1488). Genitalia with 10th tergum evenly convex (fig. 1489); genital plate transverse, posterior margin concave, stylus visible (fig. 1490).

Variation.—Length 5.95–6.95 mm., width 4.95–5.90 mm. Discal spot on elytron is slightly larger in some specimens and posterior margin of spot may be emarginate rather than truncate.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—The male and female genitalia place this species in the *vittigera* group although the dorsal color pattern is of the *bellata* or *peltata* type. The type or types were not available, but the specimens described here match Erichson's description and this was the species identified as *discoidea* by Korschefsky in his collection. The elytral color pattern and small size separate *discoidea* from related species except *honesta*. See remarks under *honesta*.

Specimens Examined.—Total 12. PERU: "Peru," coll. Staudinger, Korschefsky collection. *Cuzco*: San Miguel, 5000 ft., 1 Sept. 1911, Yale Peruv. Exp. *Junin:* Chanchamayo. *Lima:* Soukup. (PM) (USNM).

Epilachna honesta (Weise)

(Figs. 644–646, 1491–1494; map 18)

Solanophila honesta Weise, 1899, pp. 262–263.
Epilachna honesta: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Female.—Length 6.60 mm., width 5.62 mm. Description as for *discoidea* with differences as noted here. Orange discal spot on elytron larger than in *discoidea*, nearly reaching explanate part of elytron medially. Punctation on elytron dual, sparse, small punctures fine, separated by two to four times their diameter, coarse punctures much larger than small punctures, separated by one to three times their diameter. Abdomen with hind margin of fifth sternum truncate; sixth sternum emarginate (fig. 1491); sixth tergum convex, entire (fig. 1492). Genitalia with 10th tergum convex, nearly truncate medially (fig. 1493); genital plate transversely oval, stylus visible (fig. 1494).

Male.—Similar to female except abdomen with hind margin of fifth sternum notched; sixth tergum feebly, broadly emarginate. Genitalia with basal lobe longer than paramere, slender, narrowed toward apex, apex reflexed, group of setae on upper margin at middle; paramere widened at apex (figs. 644, 645); sipho straight in apical one-half, apex blunt, orifice dorsal, subterminal (fig. 646).

Variation.—Length 6.03–6.98 mm., width 5.05–5.59 mm.

Type Locality.—Peru: Callanga.

Type Depository.—USNM (lectotype here designated).

Discussion.—The single specimen in the Korschefsky collection bearing the following labels is here designated lectotype: "Callanga, Peru" (green paper); "TYPUS" (red paper); "coll. Weise"; "Solanophila honesta Ws., det. R. Korschefsky 1940." There is little doubt that this is a specimen of the original type series, and since Dr. Hieke informed me that there are no specimens of *honesta* now in the MNHUB collection, it seems appropriate to make this specimen the lectotype. The abdomen is entirely absent, but the large size (6.60 mm. long) would indicate that this is a female. Fortunately, specimens of *honesta* from the type locality were found in the Paris museum (Sicard collection), so it has been possible to describe the male and female genitalia.

Specimens Examined.—Total 21. PERU: *Cuzco*: Callanga, Staudinger. (PM) (USNM).

Epilachna ignobilis (Weise)

(Figs. 215, 647–649, 1495–1498; map 18)

Solanophila ignobilis Weise, 1902, p. 161.
Epilachna ignobilis: Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Female.—Length 6.85 mm., width 5.30 mm. Form oval, narrowed apically, widest anterior to middle of elytra, lateral margin of elytron broadly explanate. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basel segment black, segments 2–8 yellow, 9–11 piceous; elytron brownish red except basal margin near callus, broad lateral margin and short vitta on suture posterior to scutellum black, very narrow piceous line present on suture from vitta to apex (fig. 215). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by their diameter or less. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line complete, indistinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex; sixth sternum broadly, weakly emarginate (fig. 1495); sixth tergum broadly convex (fig. 1496). Genitalia with 10th tergum emarginate medially (fig. 1497); genital plate transversely triangular, lower margin ragged, angled upward to join anterior margin, stylus not visible (fig. 1498).

Male.—Similar to female except abdomen with hind margin of sixth sternum notched; sixth tergum emarginate. Genitalia with basal lobe longer than paramere, wide, abruptly narrowed before apex, group of setae present on each side anterior to middle; paramere slender, feebly widened at apex (figs. 647, 648); sipho with apex blunt, lower margin bent downward (fig. 649).

Variation.—Length 5.81–7.01 mm., width 4.60–5.53 mm.

Type Locality.—Peru: Marcapata.

Type Depository.—USNM (lectotype here designated).

Discussion.—None of Weise's type specimens other than a female in the Korschefsky collection can be located. This single female bearing the following labels is here designated lectotype: "Peru, Staud." (green paper); "TYPUS" (red paper); "'Coll. Weise." There appears to be little doubt that this specimen is from Weise's type series and was acquired by Korschefsky, probably directly from Weise. The peculiar transversely triangular genital plate is unlike anything as yet described in this group although obviously related to the transversely oval plates characteristic of other species of the *vittigera* group. There is no trace of a median black band on the elytron, resembling *discoidea* in this respect. In the Paris museum (Sicard collection) is a large series of *ignobilis* from the type locality. These specimens may well be type material, but there seems to be no way of verifying this.

Specimens Examined.—Total 16. PERU: *Cuzco*: Callanga; Marcapata, Staudinger. (PM) (USNM).

Epilachna strictanotata, new species

(Figs. 216, 650–652; map 18)

Male.—Length 7 mm., width 5.55 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron broadly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–5 yellow, 6–11 piceous; anterolateral angle of pronotum narrowly yellow; elytron black with broad, median orange spot extending to suture, anterior margin of spot angled posteriorly toward lateral margin, posterior margin of spot truncate (fig. 216). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with basal lobe longer than paramere, upper margin sinuate with a group of setae medially and anterior to middle, lower margin angled upward in apical one-fourth, apex finely recurved, pointed; paramere widened at apex (figs. 650, 651); sipho straight in apical one-half, apex abruptly thickened, blunt, orifice dorsal, subterminal (fig. 652).

Female.—Not known.

Holotype.—Male. PERU: *Junin:* Chanchamayo, Schneider (PM).

Discussion.—The male genitalia place *strictanotata* near *ignobilis*, from which species the thickened apex of the sipho and extremely finely

recurved apex of the basal lobe distinguish it. The elytral color pattern resembles that of *peltata*.

Epilachna fenestroides, new species

(Figs. 217–219, 653–655, 1499–1502; map 18)

Male.—Length 6.20 mm., width 4.90 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded, nearly straight medially. Color black; pronotum with anterolateral angle yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large yellow spots, anterior spot slightly smaller than posterior, neither spot reaching either sutural or lateral margin (fig. 217). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to two times their diameter. Surface of elytron finely reticulate. Pubescence yellow. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum faintly emarginate medially. Genitalia with basal lobe slightly longer than paramere, in lateral view dorsal surface sinuate, apex abruptly turned upward, a group of setae present medially on each side; paramere slightly widened apically (figs. 653, 654); sipho with apex blunt, slightly curved downward, orifice dorsal, subterminal (fig. 655).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum not as deeply notched (fig. 1499); sixth tergum with hind margin feebly convex (fig. 1500). Genitalia with 10th tergum truncate, angles rounded (fig. 1501); genital plate transversely oval, anterior margin truncate, stylus on posterior margin, visible only in a posterior view (fig. 1502).

Variation.—Length 5.90–7 mm., width 4.50–5.45 mm. Anterior spot is much smaller than posterior spot in many specimens and there is tendency for median vitta to form, dividing spots longitudinally (figs. 218, 219).

Holotype.—Male. PERU: *Pasco:* Oxapampa, 1800 m., I–10–1955, leaves of *Baccharis*, Weyrauch (USNM 71658).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total 42. PERU: *Pasco:* Same data as holotype; Oxapampa, 1600 m., IX–1940, Weyrauch. (USNM).

Discussion.—As usual in this group, the male genitalia are the only certain criterion for distinguishing *fenestroides*.

Epilachna nana, new species

(Figs. 220, 656–658; map 18)

Male.—Length 5.43 mm., width 4.83 mm. Form round, slightly elongate, convex, widest anterior to middle of elytra, lateral margin of elytron extremely explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–7 yellow, 8–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron black with two large, yellow spots (fig. 220). Punctation on elytron dual, deeply impressed, small punctures separated by their diameter or less, large punctures separated by less than to twice their diameter. Pubescence grayish white. Postcoxal line distinct, complete, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum emarginate medially; sixth sternum notched; sixth tergum emarginate. Genitalia with basal lobe longer than paramere, angled downward slightly in basal one-fourth, slightly curved upward to apex, apex reflexed, pointed, group of setae present medially on each side of middle; paramere slightly widened apically (figs. 656, 657); sipho slender, apex blunt, orifice dorsal, subterminal (fig. 658).

Female.—Not known.

Holotype.—Male. COLOMBIA: *Cundinamarca:* Bogota, Buq. (MNHUB).

Discussion.—*E. nana* has male genitalia of the *vittigera* type and may be distinguished from related species by the small size, round form, and extremely explanate lateral margin of the elytron. In external appearance it most nearly resembles *bonplandi*.

Epilachna bonplandi Mulsant

(Figs. 221, 659–661)

Epilachna bonplandi Mulsant, 1850, pp. 721–723.—Crotch, 1874, p. 58.—Korschefsky, 1931, p. 66 (as

a synonym of *quadriplagiata* Latreille).—Blackwelder, 1945, p. 441.

Coccinella quadriplagiata Latreille, 1809, p. 231 (not *Coccinella quadriplagiata* Swartz, 1808).—Guérin, 1844, p. 219.

Epilachna acuminata Mulsant, 1853, p. 112.

Epilachna quadriplagiata: Crotch, 1874, p. 58.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 441.

Epilachna quadriplagiata ab. *acuminata:* Korschefsky, 1931, p. 66.

Epilachna bonplandi ab. *acuminata:* Blackwelder, 1945, p. 441.

Male.—Length 6.44 mm., width 5.49 mm. Form round, slightly elongate, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts brown to black; anterolateral angle of pronotum narrowly yellow; elytron black with two large, orange spots (fig. 221). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by their diameter or less. Pubescence yellowish white. Tarsal claw lacking basal angulation. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum feebly emarginate. Genitalia of the *fenestroides* type; basal lobe slightly longer than paramere, upper margin gently curved, unmodified, group of setae present medially, apex reflexed, pointed; paramere widened apically (figs. 659, 660); sipho extremely long, 2½ times as long as phallobase, apical three-fourths straight, apex blunt, nearly truncate (fig. 661).

Female.—Not known.

Type Locality.—Peru (Dejean, Buquet, Chevrolat, Dohrn, Guerin, Melly, Reiche).

Type Depository.—DLM (lectotype here designated).

Discussion.—The name *Coccinella quadriplagiata* Latreille is preoccupied by *Coccinella* (*Cheilomenes*) *quadriplagiata* Swartz (*1808*). Mulsant (*1850*) was apparently aware of this because he renamed the species *E. bonplandi* although he did not discuss his reasons for doing so. Mulsant had material from several collections (see "type locality" here) but indicated the Dejean material as "type." This material is also the type of *quadriplagiata* Latreille and the first specimen of *bonplandi* in the Dejean collection, a male standing under the following label, is here designated lectotype of both *quadriplagiata* and *bonplandi:* "Epilachna bonplandi, quadriplagiata Latreille, in Perou, D. Bonpland." There is another specimen in the Dejean collection, a female standing beside the lectotype, which is another species. This specimen is labeled "Columbia, Lebas." The strongly explanate lateral margin of the elytron and round form of *bonplandi* distinguish it from all related species except *nana,* which is much smaller and has different male genitalia.

Specimens Examined.—Total five. "COLOMBIA." "PERU." (DLM) (PM).

Epilachna harringtoni, new species

(Figs. 222, 1503–1506; map 18)

Female.—Length 6.65 mm., width 5.05 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large orange spots, posterior spot longer than anterior spot with small, elongate-oval, black spot near apex, black band dividing two spots oblique (fig. 222). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending one-half distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum truncate with median longitudinal suture (fig. 1503); sixth tergum faintly emarginate (fig. 1504). Genitalia with 10th tergum nearly truncate (fig. 1505); genital plate transversely oval, posterior margin produced near outer angle, stylus visible (fig. 1506).

Male.—Not known.

Variation.—Length 6.30–6.65 mm., width 4.95–5.05 mm.

Holotype.—Female. BOLIVIA: *La Paz:* Mapiri, September 1925, GL Harrington (USNM 71659).

Paratype.—Total one. BOLIVIA: *La Paz:* Ancapata, 1925, GL Harrington. (USNM).

Discussion.—The color pattern of *harringtoni* is very similar to that of *bolivicola,* which is also a Bolivian species, but the female genitalia are not the same in the two species and *harringtoni* is more elongate in form whereas *bolivicola* is more rounded.

Epilachna bolivicola (Mader), new combination

(Figs. 223, 662–664, 1507–1510; map 19)

Solanophila bolivicola Mader, 1950, p. 39.

Female.—Length 5.86 mm., width 5.08 mm. Form oval, convex, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; basal segment of antenna black, segments 2–8 yellow, 9–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron with color pattern as described for *harringtoni* (fig. 223). Punctation on elytron dual, small punctures separated by their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum projecting medially; sixth sternum feebly emarginate medially (fig. 1507); sixth tergum broadly, feebly emarginate medially (fig. 1508). Genitalia with 10th tergum weakly emarginate (fig. 1509); genital plate transverse, all angles rounded, posterior margin ragged, stylus visible (fig. 1510).

Male.—Similar to female except abdomen with hind margin of sixth sternum emarginate; sixth tergum entire, convex. Genitalia with basal lobe longer than paramere, apex recurved, pointed, a group of setae present medially on each side of upper surface; paramere straight, feebly widened apically (figs. 662, 663); sipho short, apex bent downward, orifice dorsal, subterminal (fig. 664).

Type Locality.—Bolivia: Yungas de Palmar.

Type Depository.—FM (lectotype here designated).

Discussion.—*E. bolivicola* may be separated from other similarly marked species such as *harringtoni* by the broadly oval form and extremely strongly explanate lateral margin of the elytron. The male cotype bearing the following labels is here designated as lectotype: "2000 m., 15–3–49"; "Bolivia, Zischka"; "Yungas de Palmar"; "cotypus" (red paper); "bolivicola m."

Specimens Examined.—Total three. BOLIVIA: *Cochabamba:* The type series. (FM).

Epilachna korschefskyi, new species

(Figs. 224, 665–667, 1511–1514; map 19)

Male.—Length 6 mm., width 4.93 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color dark brown; pronotum with disk black, lateral and apical margins yellowish brown; legs piceous to black; elytron dark brown with two large yellow spots and a yellow vitta on lateral margin (fig. 224). Punctation on elytron dual, small punctures separated by their diameter, larger punctures separated by one to four times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum faintly, broadly emarginate. Genitalia of *fenestroides* type; basal lobe narrower than in *fenestroides,* less sinuate in lateral view (figs. 665, 666); sipho longer (fig. 667).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex medially; sixth sternum emarginate (fig. 1511); sixth tergum emarginate (fig. 1512). Genitalia with 10th tergum weakly emarginate (fig. 1513); genital plate transversely oval, posterior margin ragged, stylus visible (fig. 1514).

Holotype.—Male. ECUADOR: *Los Rios:* Balzapamba, R. Haensch S., Korschefsky collection (USNM 71660).

Allotype.—Female. ECUADOR: *Los Rios:* 31 mi. E. Quevedo, 1000 m., II–6–1955, E. I. Schlinger and E. S. Ross collectors (CAS).

Discussion.—In addition to the genitalia, the dorsal color pattern is unlike anything as yet described in the group. When more specimens become available, probably the areas described

as dark brown or piceous here will prove to be black.

Epilachna adnexa (Mader), new combination

(Figs. 225, 668–670, 1515–1518; map 19)

Solanophila adnexa Mader, 1958, p. 6.

Male.—Length 6.43 mm., width 4.81 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; anterolateral angle of pronotum narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large yellow spots separated by a narrow black band, a teardrop-shaped black mark extending posteriorly from median band onto apical one-third. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, not extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum notched; sixth tergum entire, convex. Genitalia with basal lobe longer than paramere, gently curved upward, apex with small dorsal tooth; paramere sinuate, strongly widened in apical one-half (figs. 668, 669); sipho angled downward before apex, apex thickened, orifice dorsal, subterminal (fig. 670).

Female.—Similar to male except abdomen with hind margin of fifth sternum produced medially; sixth sternum emarginate (fig. 1515); sixth tergum entire, convex (fig. 1516). Genitalia with 10th tergum convex (fig. 1517); genital plate slightly transverse, all angles rounded, stylus barely visible on apical margin (fig. 1518).

Variation.—Posterior black mark on elytron is not always connected to transverse band (fig. 225).

Type Locality.—Bolivia: Songotal, St. Rosa, 2600 m.

Type Depository.—ZSBS.

Discussion.—The presence of the teardrop-shaped black mark extending posteriorly from the median band distinguishes this species from any presently known member of the *vittigera* group. The type specimen has been examined.

Specimens Examined.—Total 10. BOLIVIA: *Cochabamba:* Songotal, St. Rosa, 2600 m., 23–8–53, leg. W. Forster. (FM) (ZSBS).

Epilachna bistriguttata Mulsant

(Figs. 226, 671–673; map 19)

Epilachna bistriguttata Mulsant, 1850, pp. 719–720.—Crotch, 1874, p. 57.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 5.48 mm., width 4.23 mm. Form oval, elongate, widest anterior to middle of elytra, lateral margin of elytron weakly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 brown; pronotum with anterolateral angle narrowly yellow; elytron with three yellow spots, anterior spot largest, inside callus, posterior two spots in transverse row on apical one-third (fig. 226). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to two times their diameter. Pubescence yellowish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum faintly emarginate. Genitalia of *fenestroides* type; upper margin of basal lobe with two setae posterior to middle; paramere strongly sinuate, slightly widened before apex, apex narrowed (figs. 671, 672); sipho as described for *conjuncta*, n. sp. (fig. 673).

Female.—Not known.

Type Locality.—"Yungas, Haut-Perou" (Paris museum) (Bolivia).

Type Depository.—PM (lectotype here designated).

Discussion.—Mulsant listed the Paris museum as being the only collection in which he had seen specimens of *bistriguttata*. A male specimen from the PM bearing the following labels is here designated lectotype: "Museum Paris, Bolivie (Yungas), D'Orbigny 1834"; "Epilachna bistriguttata Muls, auct. det." The following new species, *conjuncta*, is very close to *bistriguttata*. See remarks under *conjuncta*. If

the elytral pattern of three spots on each elytron is constant in this species, it will afford an excellent means of separation as this pattern is very uncommon in the *vittigera* group.

Specimens Examined.—Total one. The lectotype.

Epilachna conjuncta, new species

(Figs. 227–228, 674–676; map 19)

Male.—Length 5 mm., width 3.93 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle yellow; mouthparts brown to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large yellow spots, anterior spot completely divided by black vitta which extends to posterior spot and penetrates spot in apical one-third (fig. 228). Punctation on elytron dual, small punctures separated by one to two times their diameter. Surface of elytron finely reticulate. Pubescence yellow. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum faintly emarginate medially. Genitalia of *fenestroides* type; basal lobe longer than in *fenestroides*, more slender, no median group of setae present; paramere widened apically, curved downward (figs. 674, 675); sipho with apex straight (fig. 676).

Female.—Not known.

Variation.—Length 5–5.25 mm., width 3.93–4.03 mm. Paratype has two small, round yellow spots on elytron (fig. 227).

Holotype.—Male. BOLIVIA: *Cochabamba:* 2000 m. alt., San Antonio Rd., VIII–6–1951, Solanum sp., G. H. Dieke (USNM 71661).

Paratype.—Total one. Same data as holotype. (USNM).

Discussion.—The elytral color pattern of the paratype is a further reduction of the color pattern of the holotype. It is probable that the normal pattern for the species will prove to be two spots on each elytron as in *fenestroides*. The male genitalia are of the *vittigera* type and are distinctive. The size, color, and elytral punctation are very much as in *bistriguttata*, but there are differences in the male genitalia, and the elytral patterns are not the same. Possibly these two species will prove to be not specifically distinct when more specimens become available.

Epilachna bistrisignata (Mader), new combination

(Figs. 229, 1519–1522; map 19)

Solanophila bistrisignata Mader, 1950, pp. 39–40.

Female.—Length 6.59 mm., width 5.38 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron black with three yellow spots, anterior spot oval, near base between callus and scutellum, posterior spots elongate, in transverse row on apical one-third (fig. 229). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct. Abdomen with hind margin of fifth sternum projecting medially; sixth sternum truncate (fig. 1519); sixth tergum feebly, broadly emarginate (fig. 1520). Genitalia with 10th tergum broadly convex (fig. 1521); genital plate transverse, all angles rounded, posterior margin ragged (fig. 1522).

Male.—Not known.

Type Locality.—Bolivia: Yungas de Totora, Mt. Punco.

Type Depository.—FM (lectotype here designated).

Discussion.—The female cotype bearing the following labels is here designated as lectotype: "Mt. Punco, 3000 m."; "Yungas de Totora"; "Bolivia, 18–3–49." The presence of three spots on the elytron would seem to place this species near *sexmaculata* or *bistrispilota*, but it does not resemble either of these species except in color pattern. The female genitalia are of the type found in the *vittigera* group.

Specimens Examined.—Total two. BOLIVIA: *La Paz:* The type series. (FM).

Epilachna geometrica (Weise)

(Figs. 230, 677–679, 1523–1526; map 20)

Solanophila geometrica Weise, 1899, p. 264.
Epilachna geometrica: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 5 mm., width 3.77 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron feebly rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron dark yellow, completely margined with black, black median vitta extending from behind callus nearly to apex, short, black vitta present between median vitta and lateral margin posterior to middle (fig. 230). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum faintly, broadly emarginate. Genitalia slightly longer than paramere, lower margin gradually curved upward, apex abruptly turned upward, group of setae present dorsolaterally at apical one-third; paramere narrowed medially, widened apically (figs. 677, 678); sipho strongly curved, apex blunt, thickened, orifice dorsal, subterminal (fig. 679).

Female.—Similar to male except hind margin of fifth abdominal sternum produced medially, convex; sixth sternum feebly, broadly emarginate (fig. 1523); sixth tergum weakly emarginate (fig. 1524). Genitalia with 10th tergum broadly convex (fig. 1525); genital plate transversely oval, stylus visible (fig. 1526).

Variation.—Length 4.85–5.66 mm., width 3.73–4.30 mm. Short lateral vitta on elytron is only a spot on some specimens, quite elongate on others. Apical end of median vitta is often enlarged and slightly hooked outward.

Type Locality.—Peru: Callanga.

Type Depository.—No type material located.

Discussion.—None of Weise's type material of *geometrica* could be located, but there is little doubt that the specimens described here are that species. The small size, elongate form, and color pattern are quite distinctive.

Specimens Examined.—Total 50. PERU: "Peru." *Ayacucho:* Rio Pampas (Hyw. 7), III–8–51, Ross and Michelbacher. *Cuzco:* Abancay, III–6–51, Ross and Michelbacher collection; 3 mi. E. of Abancay, III–6–51, Ross and Michelbacher; 35 mi. E. of Abancay, III–5–51, Ross and Michelbacher; 35 mi. E. of Abancay, Cactus Mesquite Zone, III–5–51, Ross and Michelbacher; Cuzco, 40 mi. E., III–4–51, Ross and Michelbacher collection; Cuzco, 36 mi. S., III–4–51, Ross and Michelbacher; Machu Picchu Ruins, alt. 9500 ft., III–7–1947, J. C. Pallister; Madre de Dios; Pilco, 2800 m., I, 14–20–1953, Woytkowski. (AMNH) (CAS) (USNM).

Epilachna ostensa (Weise)

(Figs. 231, 680–682, 1527–1530; map 20)

Solanophila ostensa Weise, 1902, p. 164.
Epilachna ostensa: Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 6 mm., width 5.05 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, completely bordered with black, border widest at base, median vitta extending from basal black margin at midpoint, connected to transverse band extending from suture nearly to lateral margin, round black spot present on apical one-third (fig. 231). Punctation on elytron not dual, punctures coarse, separated by their diameter. Surface of elytron distinctly reticulate. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum weakly emarginate medially; sixth sternum notched; sixth tergum broadly emarginate. Genitalia with basal lobe longer than paramere, strongly constricted and curved downward at apical one-third, curved upward before apex, group

of setae present on posterior margin of constricted area; paramere slender, slightly curved downward, apex widened (figs. 680, 681); sipho with apex curved upward, hooklike, orifice dorsal, subterminal (fig. 682).

Female.—Similar to male except hind margin of fifth sternum faintly emarginate; sixth sternum deeply notched (fig. 1527); sixth tergum feebly broadly emarginate (fig. 1528). Genitalia with hind margin of 10th tergum strongly convex (fig. 1529); genital plate transversely oval, posteromedian angle thickened, produced, stylus visible (fig. 1530).

Variation.—Length 5.93–6.50 mm., width 4.78–5.15 mm. In some specimens transverse, black band on elytron reaches outer margin, completely dividing yellow area.

Type Locality.—Peru: Marcapata.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—The type series of nine specimens was examined and the first specimen selected as the lectotype. The male lectotype bears the following labels: "Marcapata" (green paper); "Solan-ostensa w" (white paper). Both male and female genitalia are distinctive and the elytral color pattern, although resembling that of *vittigera* and *ostensoides,* should not be confused with either of these species.

Specimens Examined.—Total 11. BOLIVIA: "Bolivia." *La Paz:* Yungas de la Paz, Heyne V. PERU: "Peru," Gehr. W. Muller, Korschefsky collection. (MNHUB) (USNM).

Epilachna ostensoides, new species

(Figs. 232–233, 683–685, 1531–1534; map 20)

Male.—Length 6.30 mm., width 4.55 mm. Form elongate, widest anterior to middle of elytra, lateral margin of elytron feebly rounded from humeral angle to apex, nearly straight medially. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black; segments 2–8 yellow, 9–11 piceous; elytron yellow, completely bordered with black, border narrowest at base, broad median vitta extending from basal margin at callus to apical one-fifth, vitta strongly narrowed, posterior to transverse band, enlarged apically, black band present extending from suture to margin, narrow near suture (fig. 233). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence yellowish white. Tarsal claw lacking basal angulation. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum emarginate medially; sixth tergum weakly, broadly emarginate. Genitalia with basal lobe longer than paramere, straight, lower margin abruptly angled upward before apex, apex curved upward and backward, strongly narrowed in ventral view; paramere broad, curved downward, apex widened (figs. 683, 684); sipho short, apex slightly curved upward, orifice dorsal, subterminal (fig. 685).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum convex, entire (fig. 1531); sixth tergum broadly convex, entire (fig. 1532). Genitalia with 10th tergum narrow, broadly convex (fig. 1533); genital plate subrectangular, with rounded angles and small posterolateral process, stylus not visible (fig. 1534).

Variation.—Length 5.58–6.80 mm., width 3.95–5.10 mm. Median vitta on elytron may be terminated at transverse band, leaving large rectangular spot alone on apical one-third (fig. 232). Transverse band may not quite reach lateral margin of elytron.

Holotype.—Male. PERU: *Ancash:* N. Cajacay, 2650 m., III–5–1956, W. Weyrauch 6564 (USNM 71662).

Allotype.—Female. PERU: *Cajamarca:* Cascas, 1200 m., II–1950, coll. Weyrauch (USNM).

Paratypes.—Total 53. ECUADOR: *Loja:* "Loja." PERU: *Ancash:* Same data as holotype. *Cajamarca:* Same data as allotype; Cascas, Cerca, Trujillo, 1200 m., Weyrauch 5379; Contumaza, 2850 m., Weyrauch. *Lambayeque:* 15 mi. E. of Olmos, 700 m., I–20–55, E. I. Schlinger and E. S. Ross; 21 mi. E. Olmos, I–18–1955, E. I. Schlinger and E. S. Ross. *Lima:* Varrugas Can., Apr. 16, CH Townsend. (AMNH) (CAS) (USNM).

Discussion.—The specimens with the incomplete median vitta on the elytron superficially

resemble *ostensa*, but the black basal margin is always wide in *ostensa*, narrow in *ostensoides*. The male and female genitalia are different in the two species.

Epilachna olmosi, new species

(Figs. 234, 686–688, 1535–1538; map 20)

Male.—Length 6.05 mm., width 4.85 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with four yellow spots, anterolateral spot elongate, extending from near base posteriorly between callus and lateral margin of elytron, anteromedian spot near scutellum obliquely oval, posterolateral spot triangular, near margin at apical one-third, posteromedian spot elongate, teardrop-shaped, near suture at apical one-third (fig. 234). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence yellow. Tarsal claw lacking basal angulation. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum with shallow notch medially; sixth tergum faintly emarginate. Genitalia with basal lobe slightly longer than paramere, apex abruptly curved upward in lateral view, in ventral view sides nearly parallel, abruptly narrowed at apical one-fourth; paramere curved, widened apically (figs. 686, 687); sipho short, robust, apex pointed, orifice dorsal, subterminal (fig. 688).

Female.—Similar to male except sixth sternum with hind margin entire (fig. 1535); sixth tergum with hind margin entire (fig. 1536). Genitalia with hind margin of 10th tergum truncate (fig. 1537); genital plate irregularly oval, stylus not visible (fig. 1538).

Variation.—Length 6.05–6.35 mm., width 4.85–5 mm.

Holotype.—Male. PERU: *Lambayeque:* 21 mi. E. Olmos, I–18–1955, E. I. Schlinger and E. S. Ross collectors (CAS).

Allotype.—Female. PERU: *Lambayeque:* 15 mi. E. of Olmos, 700 m., I–20–55, E. I. Schlinger and E. S. Ross collectors (CAS).

Discussion.—The female sixth abdominal tergum and sternum are not emarginate or notched on the hind margin and the female genital plate has no visible stylus. These characteristics along with the male genitalia and dorsal color pattern should distinguish this species. The male genitalia are very similar to those of *ostensoides*, but the female genital plates and the elytral color patterns are different.

Epilachna divisoides, new species

(Figs. 235, 689–691, 1539–1542)

Female.—Length 8.91 mm., width 6.28 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron black with two narrow, yellow vittae, outer vitta extending from behind callus nearly to suture at apex, inner vitta extending from base near scutellum parallel to suture, ending about 1.5 mm. from apex (fig. 235). Punctation on elytron not dual, dense, punctures separated by less than their diameter. Surface of elytron distinctly reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with posterior margin of fifth sternum slightly projecting medially; sixth sternum feebly, broadly emarginate, longitudinal suture present (fig. 1539); sixth tergum broadly, barely perceptibly emarginate (fig. 1540). Genitalia with 10th tergum convex, entire (fig. 1541); genital plate transverse, anteromedian angle broadly produced, stylus visible (fig. 1542).

Male.—Similar to female except abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly emarginate. Genitalia with basal lobe longer than paramere, abruptly curved upward in apical one-third to pointed apex, group of long, dense setae present dorsally and laterally at apical one-third; paramere straight before midpoint (figs. 689, 690); apical one-half of

sipho broadly curved, apex blunt, orifice dorsal, subterminal (fig. 691).

Variation.—Allotype slightly smaller than holotype with head and thorax missing.

Holotype.—Female. PERU: "Perou" (PM).

Allotype.—Male. Same data as holotype (PM).

Discussion.—The male genitalia are distinctive, but in external appearance *divisoides* is similar to *cushmani*. In *cushmani* the apex of the median black area on each elytron does not reach the suture at the apex, and the elytral punctation is distinctly dual in *cushmani* and not dual in *divisoides*.

Epilachna approximata Group

Length approximately 4.70–7 mm. Mandible and labrum not significantly different from type found in *vittigera* group. Color black, elytron with two large, yellow or orange spots occupying most of elytron (except *dubia*). Lateral margin of elytron usually rounded from humeral angle to apex, sometimes straight medially; epipleuron nearly twice as wide anterior to middle as posterior to middle. Male genitalia with basal lobe longer than paramere, lower margin angled upward near or anterior to middle, apical part slender, curved upward near apex (fig. 693); sipho short, robust, feebly curved, upper margin flattened before middle, narrowed toward apex (fig. 694). Female genital plate transversely oval, stylus not visible or visible only in apical view (fig. 1546). The distribution of the species known thus far is limited to Ecuador and Colombia.

The *approximata* group is rather homogeneous both in external appearance and in type of genitalia. *E. dubia* has the entire center of the elytron yellow, but the genitalia are typical of the group.

Key to Species of *Epilachna approximata* Group

1. Elytron yellow, bordered with black, no trace of transverse median band visible (fig. 237); Ecuador ..... *dubia* Crotch (p. 114)
   Elytron usually with two large, orange or yellow spots, transverse median band occasionally incomplete, with outer or inner parts of band incomplete; Ecuador, Colombia 2
2. Body extremely narrowed in apical one-half, apex pointed (fig. 240) ..... *aculata*, n. sp. (p. 115)
   Body oval, rounded, not extremely narrowed in apical one-half, apex blunt as in figure 236 3
3. Length less than 5.30 mm 4
   Length more than 5.70 mm 5
4. Spots on elytron yellow, strongly separated medially, length always less than 5.30 mm. (fig. 236) ..... *gnoma*, n. sp. (p. 114)
   Spots on elytron orange, usually not completely separated medially or only feebly so, length occasionally more than 5.30 mm ..... *soachae*, n. sp. (p. 115)
5. Transverse median band of elytron reduced to small lateral projection and or small sutural projection (fig. 238) 6
   Transverse median band of elytron complete, distinct 7
6. Species known only from Colombia ..... *soachae*, n. sp. (p. 115)
   Species known only from Ecuador ..... *approximata* Crotch (p. 113)
7. Male genitalia with paramere constricted medially, not curved downward at apex (fig. 696); basal lobe not sinuate before apex (fig. 695) ..... *aequatorialis*, n. sp. (p. 113)
   Male genitalia with paramere wide, curved downward at apex 8
8. Male genitalia with sipho short, stout, thickened anterior to middle (fig. 694); trabes slightly longer than basal piece (fig. 693) ..... *approximata* Crotch (p. 113)
   Male genitalia with sipho long, slender, not thickened anterior to middle (fig. 709), trabes nearly twice as long as basal piece ..... *hybridula*, n. sp. (p. 115)

Descriptions of Species in *Epilachna approximata* Group

Epilachna approximata Crotch

(Figs. 692–694, 1543–1546; map 20)

Epilachna approximata Crotch, 1874, pp. 58–59.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 6 mm., width 4.80 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large yellow spots approximately equal in size. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to two times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum shallowly notched; sixth tergum broadly weakly emarginate. Genitalia with basal lobe longer than paramere, lower part of basal lobe abruptly angled upward at apical one-third, apex turned upward, group of setae present on each side before apex; paramere broad, curved downward, apex obliquely truncate (figs. 692, 693); sipho short, robust, dorsal margin flattened before middle, dorsal and ventral margins sinuate, orifice dorsal, elongate subterminal (fig. 694).

Female.—Similar to male except abdomen with hind margin of fifth sternum slightly convex; sixth sternum truncate with a median longitudinal suture (fig. 1543); sixth tergum convex, entire (fig. 1544). Genitalia with 10th tergum convex, entire (fig. 1545); genital plate transversely oval, stylus visible (fig. 1546).

Variation.—Length 6–7 mm., width 4.80–5.30 mm. One specimen examined had black band separating spots on elytron incomplete medially.

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—This species is difficult to separate from several others except by the male genitalia. Specimens from Ecuador having this type of elytral color pattern will probably be this species. The female type specimen bears the following labels: "Ecuad."; "TYPE approximata"; "TYPE" (blue paper). Two specimens besides the type are in the series, neither of which has any data.

Specimens Examined.—Total eight. ECUADOR: "Ecuad." *Tungurahua:* Ambato, Korschefsky collection; Banos, 2200 m., 5–V–39; Runtun, XI–22–1930, Coll. F M. Brown. (UCCC) (USNM).

Epilachna aequatorialis, new species

(Figs. 695–697; map 20)

Male.—Length 5.75 mm., width 4.80 mm. Form oval, narrowed posteriorly, widest anterior to middle of elytra, lateral margin of elytron distinctly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron black with two large, yellow spots, anterior spot transversely oval, not covering callus, posterior spot somewhat triangular on posterior one-half of elytron. Punctation on elytron dual, small punctures separated by two to five times their diameter, large punctures separated by one to two times their diameter. Surface of elytron feebly reticulate, strongly shining. Pubescence grayish white. Postcoxal line complete, distinct, extending well beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum truncate medially. Genitalia of the *approximata* type; basal lobe longer than paramere, lower margin angled upward in apical one-third, apex curved upward, slightly reflexed, group of setae present laterally on upper surface before apex; paramere slightly sinuate, widened at apex (figs. 695, 696); sipho short, robust, upper margin slightly sinuate, apex curved upward, pointed, orifice dorsal (fig. 697).

Female.—Not known.

Holotype.—Male. ECUADOR: *Loja:* 10 mi. N. of Loja, 20–VI–1964, D. Q. Cavagnaro (CAS).

Discussion.—The male genitalia and dorsal color pattern are of the *approximata* type. In addition to the genitalia, the rather strongly explanate lateral margin of the elytron will help in distinguishing *aequatorialis* from other species of the *approximata* group.

Epilachna gnoma, new species

(Figs. 236, 698–700)

Male.—Length 5.28 mm., width 4.40 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large orange spots occupying most of elytron, anterior spot slightly larger (fig. 236). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum notched; sixth tergum faintly emarginate. Genitalia of the *approximata* type; phallobase short; basal lobe longer than paramere, lower part abruptly angled upward at apical one-third, apex turned upward, setae absent; paramere broad, curved downward, apex truncate (figs. 698, 699); sipho short, robust, sinuate near apex (fig. 700).

Female.—Not known.

Variation.—Length 4.73–5.28 mm., width 3.90–4.40 mm.

Holotype.—Male. No data on specimen, probably from Colombia as the specimen was with a group of specimens from Colombia in the Korschefsky collection (USNM 71663).

Paratype.—Total one. Same data as holotype.

Discussion.—*E. gnoma* is very close to *approximata*. The male genitalia of *gnoma* have the phallobase one-half as long as in *approximata*, the paramere is more strongly curved downward, and the apex is truncate with the lower angle slightly produced. In *approximata* the basal lobe has a group of setae laterally on each side before the apex; this is not so in *gnoma*. If the small size proves to be constant, it will afford an external means of separation. This group of species is predominantly Colombian and *gnoma* is probably also found in Colombia.

Epilachna dubia Crotch

(Figs. 237, 701–703, 1547–1550; map 21)

Epilachna dubia Crotch, 1874, p. 59.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 5 mm., width 4.07 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; anterolateral angle of pronotum narrowly yellow; elytron yellow, completely bordered with black, sutural border narrower than lateral border, lateral border barely covering callus (fig. 237). Punctation on elytron dual, small punctures widely scattered, large punctures separated by less than to two times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum emarginate. Genitalia similar to those of *soachae;* basal lobe longer than paramere, lower part of basal lobe angled upward in apical one-half, apex curved upward; paramere curved downward, widened toward apex, apex nearly truncate (figs. 701, 702); sipho short, robust, narrowed toward pointed apex (fig. 703).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire (fig. 1547); sixth tergum convex, entire (fig. 1548). Genitalia with 10th tergum convex, entire (fig. 1549); genital plate transversely oval, stylus visible (fig. 1550).

Variation.—Length 4.76–5.71 mm., width 3.90–4.83 mm.

Type Locality.—Ecuador.

Type Depository.—UCCC.

Discussion.—The unique type in the Crotch collection is a male labeled "TYPE," "Ecuad." The small size and dorsal color pattern will usually separate *dubia* from related species.

Specimens Examined.—Total 12. ECUADOR: "Ecuad." *Pichincha:* Quito. (PM) (UCCC) (USNM).

Epilachna soachae, new species

(Figs. 238, 239, 704–706, 1551–1554; map 21)

Male.—Length 5.70 mm., width 4.63 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly pale; mouthparts yellow to piceous; antenna with basal segment black; segments 2–8 yellow, 9–11 piceous; elytron black with two large orange spots occupying most of elytron, median black band separating spots reduced, obsolete medially (fig. 238). Punctation on elytron distinctly dual, small punctures separated by their diameter or less, large punctures separated by less than to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum notched; sixth tergum weakly, broadly emarginate. Genitalia with basal lobe longer than paramere, lower part of basal lobe angled upward in apical one-third, apex abruptly turned upward, apex truncate in ventral view, group of long setae present on each side anterior to middle; paramere strongly widened apically (figs. 704, 705); sipho short, robust, flattened dorsally in basal one-half, apex curved upward (fig. 706).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate (fig. 1551); sixth tergum convex, entire (fig. 1552). Genitalia with 10th tergum emarginate (fig. 1553); genital plate transversely oval, stylus not visible (fig. 1554).

Variation.—Length 5.05–6.11 mm., width 4.05–4.88 mm. Some specimens have transverse band on elytron completely absent or nearly so (fig. 239).

Holotype.—Male. COLOMBIA: *Cundinamarca:* Soacha, 2520 m., Aug. 15, 1939, Murillo (USNM 71664).

Allotype.—Female. COLOMBIA: *Cundinamarca:* Bogota, Coll. Janson (PM).

Paratypes.—Total 10. "N. Grenada." COLOMBIA: *Cundinamarca:* Fusagasuga; Soacha, 18–II–40, Murillo. (PM) (USNM).

Discussion.—When more specimens of this species become available, all gradations of elytral color pattern will probably occur, from those described here to a form in which the band separating the spots on the elytron is broad and complete.

Epilachna hybridula, new species

(Figs. 707–709; map 21)

Male.—Length 6.50 mm., width 5 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly pale; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large yellowish-orange spots occupying most of elytron, anterior spot slightly larger. Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum notched; sixth tergum faintly emarginate. Genitalia of *approximata* type; basal lobe and paramere nearly identical to those of *approximata* (figs. 707, 708); sipho long, slender, sinuate near apex (fig. 709).

Female.—Not known.

Variation.—Length 6.10–6.75 mm., width 4.80–5.10 mm.

Holotype.—Male. ECUADOR: *Santiago. Zamora:* Sucula, Macas, 800 m. (USNM 71665).

Paratypes.—Total two. COLOMBIA: *Cauca:* "Cauca"; Staudinger; Cauca. (USNM).

Discussion.—The basal lobe of the male genitalia is practically indistinguishable from the same structure in *approximata*, but the siphos are different. The sipho of *hybridula* is much more slender and elongate and lacks the dorsal flattened area present on the sipho of *approximata*.

Epilachna aculata, new species

(Figs. 240, 710–712, 1555–1558; map 21)

Male.—Length 6 mm., width 4.70 mm. Form oval with posterior one-half of body strongly

narrowed to point, widest anterior to middle of elytra, lateral margin of elytron rounded. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large orange spots approximately equal in size (fig. 240). Punctation on elytron dual, small punctures widely scattered, large punctures separated by less than to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending two-thirds the distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum notched medially; sixth tergum broadly, weakly emarginate. Genitalia with basal lobe longer than paramere, lower part of basal lobe abruptly angled upward at apical one-third, apex turned upward, group of setae present on each side before apex; paramere narrow, constricted medially, widened apically (figs. 710, 711); sipho short, robust, as in *approximata* but more robust and apex distinctly upturned (fig. 712).

Female.—Length 6.50 mm., width 5 mm. Similar to male except abdomen with hind margin of fifth sternum strongly triangularly projecting medially; sixth sternum strongly convex, entire (fig. 1555); sixth tergum convex, entire (fig. 1556). Genitalia with 10th tergum truncate medially, lateral angles broadly rounded (fig. 1557); genital plate transversely oval, outer margin straight, stylus visible (fig. 1558).

Variation.—Length 5.75–6.75 mm., width 4.30–5 mm.

Holotype.—Male. COLOMBIA: *Cundinamarca:* Fusagasuga, 21–IV–40, Murillo (USNM 71666).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total six. COLOMBIA: "Columb," Korschefsky collection; "Colo." *Cundinamarca:* Anolaima, 6–IV–40, Murillo; El Colegio, 4–III–40; Salto de Teauendama, alt. 2400 m., 8–III–39. Murillo. (USNM).

Discussion.—*E. aculata* is readily distinguished by the strongly narrowed posterior part of the body and by the strongly triangular hind margin of the fifth abdominal sternum in the female. The male genitalia most nearly resemble those of *angustata* Mulsant, and *aculata* appears to be intermediate between the group of species centering around *approximata* and those of the *angustata* type.

Epilachna angustata Group

Length approximately 6–8 mm. Mandible usually nearly completely concealed beneath labrum, three major teeth grouped in apical one-third, first tooth multidentate, second tooth with minor tooth on lower margin, third tooth short, acute, simple (fig. 32); labrum with apex deeply emarginate medially, appearing bilobed (fig. 18). Color black, elytron with two yellow or orange spots, anterolateral angle of pronotum yellow. Form elongate (extremely so in *angustata* and *kraatzi*), lateral margin of elytron straight or slightly rounded medially; epipleuron slightly wider anterior to middle than posterior to middle. Male genitalia long, robust, subequal in length to abdominal sterna 2–5, apex of basal lobe abruptly narrowed and bent upward (fig. 717); sipho long, apex bent downward (fig. 718). Female with sixth sternum strongly produced medially, conical (fig. 1559). Female with 10th tergum produced, truncate medially, small, sharp tubercles present (fig. 1561); genital plates fused, elongate, stylus visible in apical view (fig. 1562). Distribution of the presently known species is limited to Venezuela and Colombia.

This group is well characterized by the type of male and female genitalia. *E. paracuta* is not so elongate in form as the other species, resembling *aculata* in this respect, but the male genitalia are of the *angustata* type.

Key to Species of *Epilachna angustata* Group

1. Body oval, somewhat narrowed in posterior one-half; orange spots on elytron large, more or less oval ..... *paracuta*, n. sp. (p. 117)
   Body elongate, nearly parallel-sided, abruptly narrowed in apical one-fourth; yellow spots on elytron small, oblique (fig. 241) 2
2. Species known only from Venezuela ..... *angustata* Mulsant (p. 117)
   Species known only from Colombia ..... *kraatzi*, n. sp. (p. 118)

Descriptions of Species in *Epilachna angustata* Group

Epilachna paracuta, new species

(Figs. 713–715; map 22)

Male.—Length 6.90 mm., width 5.30 mm. Form oval, elongate, widest anterior to middle of elytra, elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly pale; mouthparts yellow to piceous; antenna with basal segment black, segments 2–5 yellow, 6–11 piceous; elytron black with color pattern as in *aculata*. Punctation on elytron not noticeably dual, punctures separated by less than their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, reaching beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum faintly, broadly emarginate medially. Genitalia with basal lobe longer than paramere, abruptly curved upward at apex; paramere very broad basally, narrowed and strongly curved upward toward apex, sinuate (figs. 713, 714); sipho robust, apex curved upward, orifice dorsal, subterminal (fig. 715).

Female.—Not known.

Variation.—Length 6.75–6.95 mm., width 4.98–5.35 mm.

Holotype.—Male. COLOMBIA: *Cundinamarca:* 2520 m., Nov. 22, 1939, Murillo (USNM 71667).

Paratypes.—Total two. Same data as holotype. (USNM).

Discussion.—The male genitalia will immediately separate *paracuta* from any known species of *Epilachna*.

Epilachna angustata Mulsant

(Figs. 716–718, 1559–1562; map 21)

Epilachna angustata Mulsant, 1850, p. 720.—Crotch, 1874, p. 58.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 6 mm., width 4.35 mm. Description as for *kraatzi* with exception of genitalia. Genitalia with basal lobe gradually curved upward nearly to apex, ventral margin abruptly vertical just before apex, apex sharply curved upward; paramere narrowed medially, apex widened (figs. 716, 717); sipho gradually curved upward in apical one-half, apex bluntly pointed, orifice dorsal, subterminal (fig. 718).

Female.—Similar to *kraatzi* with exception of small genitalic and abdominal differences. Abdomen with sixth sternum slightly more strongly convex and pointed (fig. 1559); sixth tergum more strongly convex (fig. 1560). Genitalia with 10th tergum like blunt arrowhead (fig. 1561); genital plate slightly wider, less elongate than in *kraatzi* (fig. 1562).

Variation.—Length 6–7.85 mm., width 4.35–5.48 mm. Spots on elytron may be larger than in typical specimens but rarely as large as in *kraatzi*.

Type Locality.—Colombia (Buquet, Guerin, Reiche).

Type Depository.—UCCC (lectotype here designated).

Discussion.—There are six specimens in the Crotch collection, two of which are labeled "Type angustata ex Muls" and "Type angustata, Muls. Chev." with the word "Type" crossed out in both cases. Since material from the Reiche collection was included in the type series of Mulsant, the first specimen (male) listed is here designated lectotype. The specimens in the Crotch collection are labeled as being from Venezuela, whereas Mulsant stated that his specimens of *augustata* were from Colombia. Colombia included Venezuela from 1821 to 1829, when some of the specimens available to Mulsant must have been collected; in fact Mulsant (*1850*) placed the province of

Caracas in Colombia on pages 705, 707, and 712.

Specimens Examined.—Total 32. VENEZUELA: "Venez." *Aragua:* Rancho Grande, 1100 m., 12–VII–52, F. Fernandez Y. *Merida:* "Merida"; La Mucuy, 4–IX–56, 8–IX–56, C. J. Rosales. *Tachira:* Queniguea, Zumbadot, 2350 m., 24–IX–66, C. J. Salcedo. *Trujillo:* Bocono, 25–IV–1948, Guagliami. (AMNH) (CAS) (UCCC) (USNM) (V).

Epilachna kraatzi, new species

(Figs. 241, 719–721, 1563–1566; map 22)

Male.—Length 6.34 mm., width 4.45 mm. Form elongate, widest posterior to humeral angle, elytron with lateral margin straight medially, narrowed abruptly at apical one-fourth. Color black; pronotum with anterolateral angle broadly yellow, lateral and anterior margins narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black; segments 2–8 yellow, 9–11 piceous; elytron black with two yellow spots, anterior spot curved behind callus, not touching any margin, posterior spot oblique, axis of spot from suture posteriorly toward margin (fig. 241). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum emarginate medially; sixth tergum notched. Genitalia with basal lobe nearly straight, ventral margin abruptly slanted upward before apex, apex curved upward, in ventral view gradually widened from base to apex, orifice for sipho broadly emarginate before apex; paramere narrowed before apex, apex widened (figs. 719, 720); sipho robust, nearly straight in apical two-thirds, apex bluntly pointed, orifice dorsal, subterminal (fig. 721).

Female.—Length 7 mm., width 4.95 mm. Similar to male except hind margin of fifth sternum convex; sixth sternum strongly convex, nearly pointed (fig. 1563); sixth tergum convex (fig. 1564). Genitalia with 10th tergum shaped like very blunt arrowhead (fig. 1565); genital plate diagonally oval, stylus small, inconspicuous, on middle of apical margin (fig. 1566).

Variation.—Length 6–7.33 mm., width 4.42–5.25 mm.

Holotype.—Male. COLOMBIA: *Cundinamarca:* El Colegio, 1–III–40, Murillo (USNM 71668).

Allotype.—Female. COLOMBIA: Cauca, Kraatz (USNM).

Paratypes.—Total 24. COLOMBIA: "Colombia"; "Colom."; H. Rolle; no data. *Cauca:* Same data as allotype; "Cauca"; Cauca, Korschefsky collection. *Cundinamarca:* Bogota; de Savanna a Bogota, 1877, D. O. Thiere. (CAS) (CM) (MNHUB) (USNM).

Discussion.—See remarks under *angustata*. The only apparent external difference between *kraatzi* and *angustata* is the size of the elytral spots, which are usually slightly larger in *kraatzi*.

Epilachna latimargo Group

Length approximately 5.25–7.50 mm. Mandible of two types—*walteri* and *bituberculata* possessing mandibles of *fenestrata* type and other members of group possessing mandibles of *vittigera* type. Color and form variable. Male genitalia with basal lobe longer than paramere, abruptly divided in apical one-half, basal part blunt and truncate or emarginate, apical part more slender and curved upward at apex (fig. 723); sipho slender, apex curved upward (fig. 724). Female with genital plate transversely oval or transversely rectangular (fig. 1570). Species of this group are known only from Ecuador and Colombia.

The only basic character shared by all species in this group is the type of male genitalia, and, to a lesser degree, the type of female genital plate. The wide divergence among the members in form and color pattern as well as the type of mandible suggests that this is not a homogeneous group.

Key to Species of *Epilachna latimargo* Group

1. Elytron with large, red tubercle on disk (fig. 243) ..... *bituberculata* Waterhouse (p. 119)
   Elytron without tubercle 2
2. Form broad, lateral margin of elytron strongly explanate, one-fifth width of elytron (fig. 242) ..... *latimargo* (Weise) (p. 119)
   Form not as described above 3
3. Elytron yellowish orange bordered with black, four black marks on yellow area (fig. 244) ..... *walteri* (Sicard) (p. 120)
   Elytron not as described above 4
4. Elytron black with two red spots; Ecuador ..... *jarugui*, n. sp. (p. 120)
   Elytron black with four yellow spots (fig. 245); Colombia ..... *inserta* (Weise) (p. 121)

Descriptions of Species in *Epilachna latimargo* Group

Epilachna latimargo (Weise)

(Figs. 242, 722–724, 1567–1570; map 22)

Solanophila latimargo Weise, 1926, p. 5.
Epilachna latimargo: Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 442.

Female.—Length 7.43 mm., width 6.86 mm. Form broadly oval, slightly elongate, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, explanate part one-fourth width of elytron, lateral margin rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; pronotum with anterolateral angle narrowly, obscurely pale; elytron yellow, completely bordered with black, black extending inward to cover callus, short, posteromedian black band extending from lateral margin beyond middle of elytron, black sutural margin slightly widened on disk (fig. 242). Punctation on elytron not dual, punctures separated by one to two times their diameter. Pubescence grayish white. Epipleuron descending externally. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly concave; sixth sternum entire, truncate medially (fig. 1567); sixth tergum broadly convex (fig. 1568). Genitalia with 10th tergum emarginate medially (fig. 1569); genital plate transversely oval, all angles rounded, posterior margin ragged, stylus visible (fig. 1570).

Male.—Similar to female except abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum truncate. Genitalia with basal lobe short, wide, lower one-half truncate at apex, upper one-half curved upward to blunt apex; paramere widened apically; trabes shorter than basal piece (figs. 722, 723); sipho with apex curved upward, orifice dorsal, subterminal (fig. 724).

Type Locality.—Colombia: Cauca.

Type Depository.—NREA (lectotype here designated).

Discussion.—The extremely broadly explanate lateral margin of the elytron and elytral color pattern distinguish *latimargo*. The first specimen in the type series, a female bearing the following labels, is here designated as lectotype: "Cauca, Colombia"; "latimargo"; "TYPUS" (red paper); "237,70" (pink paper); "Riksmuseum, Stockholm" (green paper). One additional specimen is in the type series, a male bearing the same data as the lectotype.

Specimens Examined.—Total two. The type series

Epilachna bituberculata Waterhouse

(Figs. 243, 725–727, 1571–1574; map 22)

Epilachna bituberculata Waterhouse, 1879, p. 429.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 442.
Epilachna pustulifera Gorham, 1897, p. 237.—Weise, 1904*b*, p. 364.

Male.—Length 7.13 mm., width 6.46 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron strongly explanate medially, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–5 brown, 6–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron black with elongate, red spot on disk, blood-red, rounded tubercle on disk (fig. 243).

Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending just to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe subequal in length to paramere, lower one-half bluntly rounded at apex, upper one-half curved upward to pointed apex; trabes slightly longer than basal piece; paramere curved downward, widened apically (figs. 725, 726); sipho with apex curved upward, orifice dorsal, subterminal (fig. 727).

Female.—Similar to male except hind margin of fifth sternum truncate; sixth sternum narrow, convex, entire (fig. 1571); sixth tergum convex, entire (fig. 1572). Genitalia with 10th tergum convex, entire (fig. 1573); genital plate transverse, nearly rectangular, stylus visible (fig. 1574).

Type Locality.—Colombia: Medellin.

Type Depository.—BMNH.

Discussion.—The presence of the tubercle on the elytron distinguishes this species from any presently known species of *Epilachna*. The genitalia place it near *latimargo* and *walteri* in spite of a superficial resemblance to *tumida*.

A specimen labeled *pustulifera* in the BMNH bearing the following labels is here designated as lectotype of *pustulifera:* "Medellin"; "George Lewis coll., B. M. 1926-369."

Specimens Examined.—Total three. COLOMBIA: *Antioquia:* Types as listed here; Medellin, Gerard. (BMNH) (MNHUB).

Epilachna walteri (Sicard)

(Figs 244, 728–730, 1575–1578; map 22)

Solanophila walteri Sicard, 1912*a*, p. 507.

Epilachna walteri: Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 6.75 mm., width 6.05 mm. Form oval, widest anterior to middle of elytra, elytron with lateral margin rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow; 9–11 piceous; elytron yellowish orange with narrow sutural line, explanate outer margin, base, callus and three spots black, anterior spot on disk touching suture, median spot touching lateral margin, posterior spot on apical one-third, transversely oval (fig. 244). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum notched; sixth tergum truncate. Genitalia with basal lobe longer than paramere, lower margin truncate in apical one-fourth, apex abruptly curved upward, in ventral view orifice for sipho gradually widened from base to apical one-fourth; paramere slightly narrowed apically (figs. 728, 729); sipho curved from base nearly to apex, apex pointed, curved upward, orifice dorsal, subterminal (fig. 730).

Female.—Similar to male except hind margin of fifth sternum feebly notched; sixth sternum convex with longitudinal suture (fig. 1575); sixth tergum broadly convex (fig. 1576). Genitalia with 10th tergum convex (fig. 1577); genital plate suboval, transverse, stylus visible (fig. 1578).

Variation.—Length 6.75–8 mm., width 6.05–6.50 mm. Elytral spots may or may not coalesce. Anterior and median spots may be joined to form irregular transverse band not extending to suture or be completely separated. Posterior spot may be widened into irregular band from margin to suture.

Type Locality.—Colombia.

Type Depository.—PM.

Discussion.—The elytral color pattern is unusual for species in this section of the genus and will distinguish *walteri* from other species of Colombian *Epilachna*.

Specimens Examined.—Total eight. COLOMBIA: *Caldera:* Salento, July 14, 1939, 1895 m., Murillo. *Cauca:* "Cauca." (CAS) (USNM).

Epilachna jarugui, new species

(Figs. 731–733)

Male.—Length 6.90 mm., width 6.06 mm.

Form broadly oval, convex, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; epipleuron with inner two-thirds dark reddish brown; pronotum with anterolateral angle reddish yellow; elytron black with two large red spots, anterior spot transversely oval, occupying most of elytron anterior to middle, posterior spot irregularly round, occupying most of apical one-half. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron feebly reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending one-half distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum weakly emarginate. Genitalia extremely small in comparison to size of body; basal lobe equal in length to paramere, divided apically, upper branch angled upward, curved at apex, lower branch bluntly pointed; paramere curved downward; trabes longer than paramere (figs. 731, 732); sipho slender, apex slightly curved upward, orifice dorsal, subterminal (fig. 733).

Female.—Not known.

Holotype.—Male. ECUADOR: Jarugui, Staudinger and Bang-Haas dedit, Korschefsky collection (USNM 71669).

Discussion.—The male genitalia are of the *latimargo* type although much reduced in overall size and not as extremely modified. Externally *jarugui* is very difficult to separate from *satipensis* or *woytkowskii* except by the form. *E. jarugui* is much broader across the humeral angle and more strongly tapered posteriorly than the other two species. The type locality cannot be found.

Epilachna inserta (Weise)

(Figs. 245, 734–736, 1579–1582; map 23)

Solanophila inserta Weise, 1899, p. 263.
Epilachna inserta: Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Male.—Length 5.90 mm., width 4.60 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; anterolateral angle of pronotum narrowly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–12 piceous; elytron with four pale yellow, irregularly arranged spots, anterolateral spot largest, near suture posterior to callus, anteromedian spot round, nearly reaching base and scutellum, posterolateral spot oval, occupying most of apical one-third, posteromedian spot near suture at apical one-third (fig. 245). Punctation on elytron not noticeably dual, punctures coarse, separated by less than their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth abdominal sternum faintly emarginate; sixth sternum notched medially; sixth tergum faintly emarginate medially. Genitalia with basal lobe equal in length to paramere, in lateral view ventral margin straight, lower one-half truncate at apical one-fourth, upper one-half curving upward to point, in ventral view sides nearly parallel, abruptly narrowed at apical one-fourth, apex truncate; paramere curved, apex widened (figs. 734, 735); sipho short, apex curved upward to point, orifice dorsal, subterminal (fig. 736).

Female.—Similar to male except sixth abdominal sternum with hind margin entire (fig. 1579); sixth tergum with hind margin entire (fig. 1580). Genitalia with 10th tergum convex, faintly emarginate medially (fig. 1581); genital plate subrectangular, anteromedian angle rounded, posterolateral angle acute, stylus not visible (fig. 1582).

Variation.—Length 5.32–7 mm., width 4.48–5.50 mm. Elytral spots vary slightly in size and shape but remain constant in number and position.

Type Locality.—Colombia.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—The type series is composed of six specimens, the first of which bears a green label, "Columb, Heyne," and a white label,

"Solanophila inserta Ws." This specimen is here designated as lectotype. The irregular arrangement of spots on the elytron and overall shape distinguish *inserta*.

Specimens Examined.—Total 27. COLOMBIA: *Caldas:* Manizales. *Valle del Cauca:* Cali, VI–30–1938; Cali, 13–V–40; Cali, 1938, F. W. Furry; Mares above Cali, 2088 m., 5–III–42, Chapin; S. Antonio; St. Antonio, 16–7–08. (CAS) (USNM).

Epilachna satipensis Group

Length approximately 6.25–9 mm. Mandible of *vittigera* type, usually nearly completely concealed beneath labrum. Color black, elytron black with either two large orange spots or discal area entirely orange; anterolateral angle of pronotum yellow. Lateral margin of elytron rounded from humeral angle to apex; epipleuron slightly wider anterior to middle of elytron than posterior to middle. Male genitalia with basal lobe longer than paramere, strongly divided anterior to middle, lower part robust, blunt, forming tube for sipho, upper part slender, curved upward at apex (fig. 738). Female genital plate transverse, somewhat oval, stylus visible (fig. 1586). Two species of group occur in Peru, one in Ecuador.

The color, form, and genitalia are all the same type, and the group is highly distinctive within the genus.

Key to Species of *Epilachna satipensis* Group

1. Species known only from Ecuador ..... *furcata*, n. sp. (p. 123)
   Species known only from Peru 2
2. Elytron with two orange spots widely separated by transverse median band (fig. 246) ..... *satipensis*, n. sp. (p. 122)
   Elytron with two orange spots incompletely separated or narrowly so (fig. 247) . . *woytkowskii*, n. sp. (p. 123)

Descriptions of Species in *Epilachna satipensis* Group

Epilachna satipensis, new species

(Figs. 246, 737–739, 1583–1586; map 23)

Male.—Length 7 mm., width 5.83 mm. Description as for *woytkowskii* except color and genitalia. Elytron black with two orange spots widely separated, anterior spot larger than posterior (fig. 246). Genitalia generally as described for *woytkowskii*; upper branch of basal lobe lacking teeth on ventral margin near base; basal piece short, broad; paramere only slightly narrowed before apex (figs. 737, 738); sipho with apex curved upward, orifice dorsal, subterminal (fig. 739).

Female.—Length 7.80 mm., width 6.73 mm. Similar to male except hind margin of fifth sternum deeply, narrowly notched; sixth sternum convex, entire (fig. 1583); sixth tergum convex, faintly emarginate medially (fig. 1584). Genitalia with 10th tergum truncate, projecting slightly (fig. 1585); genital plate with all angles rounded, stylus visible (fig. 1586).

Variation.—Length 7–7.80 mm., width 5.83–6.73 mm. One paratype has posterior spot on elytron reduced, nearly absent.

Holotype.—Male. PERU: *Junin:* Satipo, VIII–1944, Paprzycki (USNM 71670).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total six. PERU: *Cuzco:* Quiroz, Woytkowski; Quiroz, Rio Paucartambo. *Huanuco:* Monson Valley, Tingo Maria, XI–10–1954, F. I. Schlinger and E. S. Ross. *Junin:* Same data as holotype except year 1943. (CAS) (USNM).

Discussion.—*E. woytkowskii* and *satipensis* resemble each other closely, but *woytkowskii* has the phallobase more slender, longer, and the basal piece is more elongate than *satipensis*. In *satipensis* the small teeth on the lower margin of the upper branch of the basal lobe are lacking. Both these species and *furcata* are clearly distinguished from other species of *Epilachna* by the type of male genitalia and

the fact that the fifth abdominal sternum of the female is deeply notched on the hind margin and the male fifth sternum is only feebly emarginate. In this respect it is approached by the females of *quirozensis*. The male genitalia represent the extreme development of the general type found in *approximata* and present in some form in nearly all the species of the *approximata* and related groups.

Epilachna woytkowskii, new species

(Figs. 247, 740–742, 1587–1590; map 23)

Male.—Length 7.30 mm., width 6.10 mm. Form oval, strongly convex, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum with anterolateral angle yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron with two orange spots occupying most of surface, spots narrowly joined near suture where median black band disappears (fig. 247). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Surface of elytron reticulate, reticulation visible only under high magnification. Pubescence grayish white. Postcoxal line complete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate; sixth sternum deeply notched medially; sixth tergum broadly, weakly emarginate. Genitalia with basal lobe branched, siphonal orifice between branches, lower branch with ventral margin straight, upper branch angled upward, apex abruptly curved upward, blunt teeth on lower margin near base; basal piece elongate; paramere long, narrowed before apex, apex strongly widened (figs. 740, 741); sipho slender, straight before apex, apex curved upward, orifice dorsal, subterminal (fig. 742).

Female.—Similar to male except hind margin of fifth sternum deeply, narrowly notched; sixth sternum convex, entire (fig. 1587); sixth tergum convex, faintly emarginate (fig. 1588). Genitalia with 10th tergum truncate, projecting (fig. 1589); genital plate with all angles rounded, stylus present (fig. 1590).

Variation.—Length 6.35–8.78 mm., width 4.99–7.47 mm. Dorsal color pattern quite uniform except five paratypes from Rio Santiago have elytral spots completely separated by median black band.

Holotype.—Male. PERU: *Cuzco:* Callanga, II, 10–III, 17, 1953, 1300 m., Woytkowski (USNM 71671).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total 18. BOLIVIA: *La Paz:* Yungas de La Paz. PERU: "Peru." "Peru," Gehr. W. Muller, Vermacht. 1909; 1 specimen, no data. *Amazonas:* Rio Santiago, XI–11–24, XI–21–28, H. Bassler. *Cuzco:* Same data as holotype. (AMNH) (CAS) (MNHUB) (USNM).

Discussion.—See remarks under *satipensis*.

Epilachna furcata, new species

(Figs. 248, 743–745; map 23)

Male.—Length 7.81 mm., width 6.87 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; inner one-half of epipleuron dark reddish brown; anterolateral angle of pronotum narrowly yellow; elytron red, completely bordered with black, black border covering callus at base, abruptly widened medially on lateral margin, widened at apex (fig. 248). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by two to three times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, not extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum notched; sixth sternum deeply notched; sixth tergum emarginate. Genitalia of the *woytkowskii* type; basal lobe longer than paramere, divided medially, lower part short, blunt, forming open tube for sipho, upper part slender, apex curved upward to sharp point; paramere widened at apex (figs. 743, 744); sipho long, slender, apex curved upward, rounded, orifice dorsal, subterminal (fig. 745).

Female.— Not known.

Holotype.—Male. ECUADOR: *Los Rios:* Balzapamba (PM).

Discussion.—The male genitalia of *furcata* are close to those of *satipensis* and *woytkowskii*, but the basal lobe is wider and the entire phallobase is more robust in *furcata* than in the other two species. This is the only species of this group thus far known from Ecuador.

Epilachna quirozensis Group

Length approximately 7–8 mm. Mandible of *vittigera* type but extending slightly farther beyond labrum. Color black, elytron variable, anterolateral angle of pronotum narrowly yellow. Lateral margin of elytron rounded from humeral angle to apex; epipleuron less than twice as wide in basal one-half as posterior to middle. Male genitalia with basal lobe longer than paramere, lower margin abruptly narrowed at or anterior to middle, slender before apex, curved upward at apex (fig. 747); sipho robust, narrowed to pointed apex (fig. 748). Female genital plate oval, somewhat transverse, stylus visible (fig. 1594). The distribution of species is apparently limited to Peru and Ecuador.

E. peltata is not a typical member of the *quirozensis* group but is placed here because of the similar female genitalia and because the male genitalia are perhaps closer to the *quirozensis* type than any other presently known.

Key to Species of *Epilachna quirozensis* Group

1. Elytron with two red or orange spots (fig. 249) ..... *quirozensis*, n. sp. (p. 124)
   Elytron with single, median, yellow to red spot 2
2. Elytron orange or yellow, completely bordered with black 3
   Elytron with orange spot extending to suture (fig. 252) ..... *peltata* Erichson (p. 126)
3. Length 7.63 mm. or more; form strongly narrowed in apical one-half (fig. 251) *buckleyi* Crotch (p. 125)
   Length about 7 mm.; form not strongly narrowed in apical one-half (fig. 250) ..... *latreillei*, n. sp. (p. 125)

Descriptions of Species in *Epilachna quirozensis* Group

Epilachna quirozensis, new species

(Figs. 249, 746–748, 1591–1594; map 23)

Male.—Length 6.49 mm., width 5.28 mm. Form oval, widest anterior to middle of elytra, elytron with lateral margin rounded from humeral angle to apex. Color black; pronotum with anterolateral angle broadly yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large orange spots, anterior spot slightly smaller than posterior (fig. 249). Punctation on elytron indistinct, dual, small punctures separated by one to two times their diameter. Surface of elytron finely, indistinctly reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum emarginate; sixth sternum notched; sixth tergum weakly, broadly emarginate. Genitalia with basal lobe longer than paramere, lower margin obliquely truncate medially, apex abruptly curved upward; trabes longer than phallobase; paramere widened apically (figs. 746, 747); sipho with apex pointed, bent downward, orifice dorsal, subterminal (fig. 748).

Female.—Length 7.65 mm., width 6.25 mm. Similar to male except hind margin of fifth sternum deeply notched; sixth sternum convex (fig. 1591); sixth tergum broadly convex (fig. 1592). Genitalia with 10th tergum convex (fig. 1593); genital plate with all angles broadly rounded, stylus visible (fig. 1594).

Variation.—Length 6–8 mm., width 4.83–6.40 mm. Spots on elytron may be larger than described here. Occasional specimen has spots joined medially near suture. Black band separating spots is nearly completely absent.

Holotype.—Male. PERU: *Cuzco:* Quiroz, Rio Paucartambo (USNM 71672).

Allotype.—Female. PERU: *Junin:* Chanchamayo, La Merced, Carl O. Schunke (USNM).

Paratypes.—Total 46. PERU: Same data as holotype; same data as allotype. *Cuzco:* Callanga, II 1–III–17, 1953; Quiroz, Woytkowski. *Huanuco:* F. Sinchono, alt. 1200 m., VIII–31–1947, Schunke; F. Sinchono, VIII–25–47, Schunke; ex coll. F. Knab, 1917. *Junin:* Chanchamayo; Chanchamayo, Korschefsky collection; Chanchamayo, IV–5–49, J. M. Schunke; Chanchamayo, IV–26–48, J. M. Schunke; Chanchamayo, X–14–1961, alt. 1200 m., J. Schunke; La Merced, Chanchamayo; Rio Oxabamba, La Merced, Chanchamayo; Rio Toro, La Merced, Chanchamayo. *Pasco:* Oxapampa, Korschefsky collection. *San Martin:* Boqueron Abas, IV–7–1962, alt. 500 m., J. Schunke. (CAS) (MNHUB) (USNM) (ZSBS).

Discussion.—This species is very similar in external appearance to *satipensis* but may be separated by the indistinct elytral punctation as well as the male and female genitalia.

Epilachna latreillei, new species

(Figs. 250, 749–751; map 23)

Male.—Length 7 mm., width 5.72 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterolateral angle of pronotum narrowly yellow; elytron black with elongate, oval orange spot on disk, lateral black border widened medially, extending onto discal spot (fig. 250). Punctation on elytron dual, small punctures separated by one to two times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with lower margin of basal lobe suddenly narrowed medially, apex curved upward to point, setae present dorsolaterally before apex; paramere widened apically (figs. 749, 750); sipho straight before apex, apex pointed, orifice dorsal, subterminal (fig. 751).

Female.—Not known.

Holotype.—Male. ECUADOR: *Napo Pastaza:* Puyo Oriente, XII–5–38, coll. F. M. Brown (AMNH).

Discussion.—The elytral color pattern is much like that of *buckleyi* and the male genitalia are closest to those of *quirozensis.*

Epilachna buckleyi Crotch

(Figs. 251, 752–754; 1595–1598)

Epilachna buckleyi Crotch, 1874, p. 57.—Korschefsky, 1931, p. 57.—Blackwelder, 1945, p. 440.

Male.—Length 7.63 mm., width 6.39 mm. Form cordate, tapered to blunt point posteriorly, widest posterior to humeral angle, lateral margin of elytron strongly, broadly explanate, curved from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterolateral angle of pronotum yellow; elytron black with large elongate, yellow discal spot, lateral margin of spot emarginate with black (fig. 251). Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by less than to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum notched. Genitalia with basal lobe sinuate on upper and lower margins, in ventral view wide medially, narrowed to rounded apex, group of setae present on each side of upper surface before apex; paramere widened apically (figs. 752, 753); sipho robust, apex truncate in dorsal view, acute in lateral view, orifice dorsal, well back from apex (fig. 754).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly produced, a small, distinct notch present medially; sixth sternum extremely convex, almost triangular, median suture present (fig. 1595); sixth tergum feebly emarginate (fig. 1596). Genitalia with 10th tergum

feebly emarginate (fig. 1597); genital plate with posterior margin truncate, all angles rounded except posterolateral angle produced, stylus visible (fig. 1598).

Variation.—Length 7.63–8.33 mm., width 6.39–6.59 mm.

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The type series is composed of the female type and four other specimens, the fourth of which is described here as *amplipunctata*, n. sp. Two of the three have no data, the other one is labeled "Ecuador." The extremely triangular form is like that of *holmgreni*, and the form, explanate elytron, and dorsal color pattern make *buckleyi* an easily recognizable species.

Specimens Examined.—Total three. The type series.

Epilachna peltata Erichson

(Figs. 252, 755–757, 1599–1602; map 24)

Epilachna peltata Erichson, 1847, p. 183.—Mulsant, 1853, p. 165.—Crotch, 1874, p. 54.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 7.68 mm., width 6.58 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; pronotum with anterolateral angle narrowly yellow; elytron with large orange spot on disk, in conjunction with spot on other elytron forming heart-shaped spot (fig. 252). Punctation on elytron barely perceptibly dual, small punctures separated by one to two times their diameter, large punctures separated by less than to twice their diameter. Surface of elytron finely reticulate, shining. Pubescence grayish white. Postcoxal line complete, distinct, extending four-fifths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate medially; sixth sternum notched; sixth tergum weakly emarginate. Genitalia with basal lobe slightly longer than paramere, angled downward in basal four-fifths, curved upward before apex, apex pointed, upper margin sinuate with clump of setae anterior to middle; paramere slender, slightly widened apically; trabes short, less than twice length of basal piece (figs. 755, 756); sipho slender, gradually curved upward before apex, apex bluntly rounded, orifice dorsal, subterminal (fig. 757).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly produced? (specimen with fifth sternum damaged); sixth sternum strongly produced, nearly truncate medially, median area lacking pigmentation (fig. 1599); sixth tergum convex, entire (fig. 1600). Genitalia with 10th tergum convex, nearly truncate medially (fig. 1601); genital plate transverse, posterior margin truncate, anterior margin strongly, broadly produced, stylus visible (fig. 1602).

Variation.—Length 7.86–8.80 mm., width 6.58–7.10 mm. Elytral spot in female examined has anterior and posterior margins nearly straight, appearing round rather than heart shaped.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—This is a highly distinctive species superficially resembling *sellata* and *Dira nucula* (Weise) in color pattern. The combination of size, round or heart-shaped elytral spot, and strongly explanate lateral margin of the elytron as well as the distinctive male genitalia characterize *peltata*. The type or types of *peltata* were not available, but the species described here matches Erichson's description exactly and it is the only species of *Epilachna* from Peru thus far examined that is even close. *E. peltata* does not fit well into the *quirozensis* group but seems to be more closely allied to that group than any other.

Specimens Examined.—Total three. BOLIVIA: *La Paz:* Yungas de La Paz. PERU: *Junin:* Chanchamayo, XII–4–1968, J. Schunke. *Pasco:* Oxapampa, Korschefsky collection. (HH) (PM) (USNM).

Epilachna azurea Group

Length approximately 7.75–11 mm. Mandible of *flavofasciata* type. Color black, elytron bluish black except *bisbivittata* and some examples of *pretiosa*. Lateral margin of elytron pinched or straight medially; epipleuron twice as wide anterior to middle as posterior to middle. Male genitalia short, wide, extremely robust; basal lobe longer than paramere, thick at base, lower margin angled upward to pointed apex in apical one-half, in ventral view apex deeply emarginate (fig. 758); sipho abruptly bent at basal one-third, laterally compressed, apex blunt (fig. 760). Female genital plate short, narrowed posteriorly, stylus visible (fig. 1605). The distribution is the Andean chain from Colombia to Bolivia.

The unusual type of male genitalia is possessed by all members of this group and sets it apart from all other groups of *Epilachna*. The group may be more closely related to *flavofasciata* than would seem to be indicated by the male genitalia. The type of mandible, form, and basic color pattern are much like those of the *flavofasciata* type.

Key to Species of *Epilachna azurea* Group

1. Elytron with two yellow spots on dark background, occasionally with posterior spot divided 2
   Elytron not as described above 5
2. Species known only from Colombia ..... *azurea* (LaPorte) (p. 127)
   Species not known from Colombia 3
3. Species known only from Ecuador ..... *languida* (Weise) (p. 129)
   Species not known from Ecuador 4
4. Species known only from Peru ..... *lepida* Erichson (p. 128)
   Species known only from Bolivia ..... *pretiosa* (Mader), n. comb. (p. 130)
5. Elytron with median area orange with two yellow spots (fig. 258) ..... *pretiosa* (Mader), n. comb. (p. 130)
   Elytron not as described above 6
6. Elytron yellow with two black vittae (fig. 259) ..... *bisbivittata*, n. sp. (p. 130)
   Elytron black with large, irregular yellow area along lateral margin (fig. 255) ..... *confixa*, n. sp. (p. 129)

Descriptions of Species in *Epilachna azurea* Group

Epilachna azurea (LaPorte)

(Figs. 253, 758–760, 1603–1605; map 24)

Coccinella azurea LaPorte, 1840, p. 524.

Epilachna azurea: Korschefsky, 1931, p. 62 (as a synonym of *humeralis* Latreille).—Blackwelder, 1945, p. 441 (as a synonym of *flavofasciata* LaPorte).

Solanophila gemina Weise, 1899, p. 259. NEW SYNONYMY.

Epilachna gemina: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 442.

Male.—Length 9.30 mm., width 7.50 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron slightly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with two large yellow spots, anterior spot directly behind callus, round, posterior spot on apical one-third near lateral margin, round (fig. 253). Punctation on elytron not dual, fine, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly emarginate medially; sixth tergum emarginate. Genitalia with phallobase short, robust, heavily pigmented, basal lobe broad, lower margin extending obliquely up and outward to apex, in ventral view apex broadly, arcuately emarginate, lateral angle truncate, sides nearly parallel; trabes short, equal in length to paramere; paramere broad, gradually widened toward apex, upper margin nearly straight (figs. 758, 759); sipho short, very robust, bent through about

135° near base, apex bent upward slightly, orifice dorsal, subterminal (fig. 760).

Female.—Similar to male except sixth abdominal sternum broadly, feebly emarginate, longitudinal suture present (fig. 1603); sixth tergum emarginate medially. Genitalia with hind margin of 10th tergum truncate medially (fig. 1604); genital plate triangular, inner margin convex near base, anterior and lateral angles nearly straight, stylus visible (fig. 1605).

Variation.—Length 8.25–11 mm., width 6.65–9 mm. Bluish tinge of elytron may appear greenish on some specimens, and size of yellow spots is somewhat variable.

Type Locality.—Of *azurea*, Colombia; of *gemina*, Colombia.

Type Depository.—Of *azurea*, not known; of *gemina*, MNHUB, (lectotype here designated.)

Discussion.—The large yellow spots on the elytron and the genitalia of both sexes distinguish *azurea* from *lepida*, *languida*, and *pretiosa*, all of which have the same general type of male and female genitalia. *E. bisbivittata* also has this type of genitalia, but the elytral color pattern is quite different. The color pattern of *azurea* and related species is nearly identical to that of some species of the *flavofasciata* group, but the genitalia are very different. Mulsant (*1850*), Crotch (*1874*), and Weise (*1899*) all were apparently unaware of LaPorte's description of *azurea* in 1840. Mulsant and Crotch made no mention of *azurea* and Weise described it as new, giving it the name *gemina*. Examination of the type series of *gemina* shows it to be a synonym of *azurea*. The 13th specimen in the series of *gemina*, a female, is here designated as the lectotype of *gemina*. The lectotype bears the following label: "Columb, Thieme" (green paper). Type material of *azurea* could not be located, but there is little doubt as to the identity of the species.

Specimens Examined.—Total 52. COLOMBIA: "Columb."; "Colombie"; "Colombia"; Columb., Kraatz; Colombia, Felipe Ovalle, Q. *Cauca:* "Cauca"; Cauca, W. Horn; Cauca, Kraatz; Cauca, Felipe Ovall, Q.; "Columbien," (Hac. Pehlke), E. Pehlke S.; *Cundinamarca:* Anolaima, 6–IV–40, Murillo; Bogota; Soacha, Nov. 22, 1931, Murillo; Santa Fe de Bogota. (AMNH) (CAS) (CM) (USNM) (ZSBS).

Epilachna lepida Erichson

(Figs. 254, 761–763, 1606–1608; map 24)

Epilachna lepida Erichson, 1847, p. 184.—Mulsant, 1853, p. 166.—Crotch, 1874, p. 54.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Solanophila lepida: Weise, 1899, p. 259.

Solanophila lepida var. *mendosa* Weise, 1899, p. 259.

Epilachna lepida var. *mendosa:* Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Epilachna imperfecta Crotch, 1874, p. 56.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441. NEW SYNONYMY.

Male.—Length 8.05 mm., width 6.75 mm. Description nearly as for *azurea;* differences discussed below. Elytron with dark violet or brassy luster, spots pale yellow (fig. 254). Punctation on elytron dual, coarse punctures distinct. Genitalia similar to those of *azurea* except basal lobe with apical emargination narrower, triangular, lateral angle wider than in *azurea;* paramere much more strongly sinuate on upper and lower margin and apex more strongly widened (figs. 761, 762); sipho with base narrower and apex more elongate than in *azurea* (fig. 763).

Female.—Similar to male except for sexual characters. Sixth abdominal sternum and tergum nearly as in *azurea* (figs. 1606, 1607). Genitalia with 10th tergum faintly emarginate medially; genital plate same general shape as in *azurea,* but posterior margin truncate, two-thirds as long as anterior margin (fig. 1608).

Variation.—Length 7.78–10.63 mm., width 6.33–8.70 mm. Anterior spot on elytron is more elongate in some specimens. Variety *mendosa* has posterior spot divided into halves and faint trace of yellow present near lateral margin next to anterior spot.

Type Locality.—Of *lepida*, Peru; of *mendosa*, Chanchamayo, Peru; of *imperfecta*, Peru.

Type Depository.—Of *lepida*, MNHUB (not available); of *mendosa*, MNHUB; of *imperfecta*, UCCC.

Discussion.—The genitalic and external differences described here should serve to separate *azurea* and *lepida*. If the two species should prove to be conspecific with availability of

large series, *azurea* would have priority. No specimens of *lepida* have been observed except from Peru, and *azurea* is apparently restricted to Colombia. The unique type of *mendosa* was examined and proved to be a female with genitalia identical to those of *lepida*. The following labels are on the type of *mendosa:* "Chanchamayo" (green paper); "var. mendosa." The male type of *imperfecta* Crotch has been examined and found to be conspecific with *lepida*. The color pattern of *imperfecta* is the same as that of *mendosa*. The unique type bears the following labels: "TYPE" (blue paper); "bis 3-guttat., Peru R." (green paper); "TYPE, imperfecta."

Specimens Examined.—Total 44. PERU: *Cuzco:* Machu Picchu Ruins, alt. 9500 ft., March 4, 1947, J. C. Pallister; Quiroz, Woytkowski. *Junin:* Chanchamayo, X–30–1961, alt. 1200 m., J. Schunke; Chanchamayo, 2–I–52; Chanchamayo, VIII–7–48, J. M. Schunke; Valle Chanchamayo, 1600 m., 1–2–1939, Weyrauch. (CAS) (MNHUB) (UCCC) (USNM) (ZSBS).

Epilachna confixa, new species

(Figs. 255, 764–766; map 24)

Male.—Length 8.58 mm., width 6.61 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–5 yellow, 9–11 piceous; elytron black with large, irregular yellow area along lateral margin, yellow area narrowed medially (fig. 255). Punctation on elytron barely perceptibly dual, small punctures separated by one to two times their diameter. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly, strongly emarginate. Genitalia of the *lepida* type; basal lobe extremely wide in ventral view, apical emargination deep, arcuate, lateral apical angle pointed (figs. 764, 765); sipho robust, laterally flattened (fig. 766).

Female.—Not known.

Holotype.—Male. PERU: *San Martin:* Rio Mixiollo, Huallaga, 1900, Baer (PM).

Paratype.—Total one. Same data as holotype. (PM).

Discussion.—The elytral color pattern of *confixa* is apparently derived from the pattern of *lepida*. The two spots on each elytron are joined in *confixa*. The basal lobe of the male genitalia in *confixa* is nearly one-fourth again as wide as the same structure in *lepida*, and the apical emargination is broader and deeeper in *confixa*.

Epilachna languida (Weise)

(Figs. 256, 767–769; map 24)

Solanophila languida Weise, 1899, p. 263.
Epilachna languida: Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Male.—Length 9 mm., width 6.98 mm. Form cordate, widest just posterior to humeral angle, elytron slightly pinched. Color black; mouthparts yellow to piceous; antenna with first segment and club piceous, other segments yellow; elytron bluish black, two yellow spots present, anterior spot 0.95 mm. in diameter, posterior to and slightly nearer suture than humeral callus, posterior spot 1.05 mm. in diameter, 2.75 mm. anterior to apical angle of elytron, nearer margin than suture (fig. 256). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by two to four times their diameter. Pubescence grayish white. Postcoxal line complete, extending past middle of first abdominal sternum. Abdomen with fifth sternum faintly emarginate medially, sixth sternum emarginate, sixth tergum with posterior margin notched. Genitalia of *azurea* type; basal lobe broad, apex flattened, sides nearly parallel; paramere shorter than basal lobe, sinuate on outer margin (figs. 767, 768); sipho short, stout, orifice dorsal, subterminal (fig. 769).

Female.—Not known.

Type Locality.—Ecuador.

Type Depository.—MNHUB.

Discussion.—*E. languida* is another member of the *azurea* group. In addition to differences in the male genitalia, *languida* apparently may be separated from the other members of the group except *lepida* by the presence of a distinctly dual system of punctures on the elytron. Most of the other species have small

punctures with perhaps an occasional large puncture present. The yellow spots on the elytron are small as in *pretiosa*, but no reticulation is on the elytron as in *pretiosa*. The genitalia drawings and habitus view were taken from the unique type specimen.

Specimens Examined.—Total two. The unique type from the MNHUB and one male from Peru, Huanuco, identified by Weise (NREA).

Epilachna pretiosa (Mader), new combination

(Figs. 257–258, 770–771; map 24)

Solanophila pretiosa Mader, 1958, pp. 3–4.

Male.—Length 8.68 mm., width 6.85 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron barely perceptibly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black, two small, yellow spots present, anterior spot directly behind callus, slightly elongate, posterior spot on apical one-third near lateral margin, round (fig. 257). Punctation on elytron not dual, fine, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct, reaching beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly emarginate medially; sixth tergum feebly emarginate. Genitalia of *azurea* type; basal lobe in ventral view widened medially, slightly narrowed at apex, lateral angle blunt; paramere with upper margin slightly sinuate (fig. 770); sipho nearly as in *azurea* (fig. 771).

Female.—Length 9.66 mm., width 7.50 mm. Similar to male except hind margin of sixth abdominal sternum feebly, broadly emarginate, longitudinal suture present; sixth tergum broadly emarginate medially. Genitalia with 10th tergum feebly convex, lateral angle abrupt; genital plate with posterolateral angle pale, produced, stylus visible.

Variation.—Bluish tinge of elytra may become greenish or violet. Elytron may have disk and posterior one-half reddish brown (fig. 258). Two specimens examined had distinctly dual punctation on elytron.

Type Locality.—Bolivia: Yungas de Palmar, 1250 m.

Type Depository.—ZSBS.

Discussion.—The description of the male here was taken from a specimen with no trace of the reddish-brown discal area on the elytron that is possessed by both type specimens. This specimen is tentatively considered to be conspecific with the type of *pretiosa*, a female. It is possible, of course, that these are two distinct species, but males with the coloration of typical *pretiosa* are needed to determine this. *E. pretiosa* resembles *languida* most closely, but the male genitalia are different. The holotype from Munich and the paratype from the Frey museum are both females.

Specimens Examined.—Total six. BOLIVIA: *Cochabamba:* Locotal, 1850 m. alt., VIII–2–1951, on vegetation, G. H. Dieke. *Santa Cruz:* Oct. 1954, G. Pinckert; Yungas de Palmar, 1250 m., 16–10–53, W. Forster. (FM) (USNM) (ZSBS).

Epilachna bisbivittata, new species

(Figs. 259, 772–774, 1609–1612)

Male.—Length 8.58 mm., width 6.78 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron perceptibly pinched medially. Color black; mouthparts brown to piceous; antenna with basal segment black; segments 2–5 brown, 6–11 piceous; elytron yellow with all margins and two vittae bluish black, outer vitta complete from callus to apex, inner vitta reaching from basal black margin slightly more than one-half the distance to apex (fig. 259). Punctation on elytron not dual, fine, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly emarginate; sixth tergum feebly emarginate. Genitalia of *azurea* type; basal lobe with sides parallel in ventral view, narrowed slightly before apex, apical emargination narrow, rounded; paramere with upper and lower margins sinuate (figs. 772, 773); sipho with base slender, apex more elongate than in *azurea* (fig. 774).

Female.—Similar to male except for sexual differences. Hind margin of sixth sternum and sixth tergum nearly as in *azurea* (figs. 1609, 1610). Genitalia with 10th tergum nearly truncate (fig. 1611); genital plate with posteromedian angle rounded, posterolateral angle acute, stylus visible (fig. 1612).

Variation.—Length 8.58–10 mm., width 6.78–8.05 mm.

Holotype.—Male. PERU: Vic. Sani Beni, 840 m. a. s. l., IV–13–1935, F. Woytkowski (KSU).

Allotype.—Female. Same data as holotype except date VI–2–1935 (UK).

Discussion.—The male and female genitalia place *bisbivittata* in the *azurea* group, but the vittate elytron immediately distinguishes *bisbivittata*. The type locality, Sani Beni, cannot be found.

Epilachna holmgreni Group

This group is composed of a single species, *E. holmgreni* (Weise). The large size, strongly narrowed form, and distinctive female genital plate with the triangular apex (fig. 1616) combine to prevent *holmgreni* from being placed in any existing group of species. The mandible was not examined. Known only from Bolivia.

Description of Species in *Epilachna holmgreni* Group

Epilachna holmgreni (Weise)

(Figs. 260, 1613–1616; map 24)

Solanophila holmgreni Weise, 1926, p. 2.
Epilachna holmgreni: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Female.—Length 9.83 mm., width 7.66 mm. Form cordate, gibbous, widest near humeral angle, strongly narrowed posteriorly, lateral margin of elytron strongly explanate, straight medially, tapering to blunt point at apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; pronotum with anterolateral angle narrowly, obscurely reddish piceous; elytron black with two yellow spots at middle, outer spot narrow, elongate, inner spot with outer margin straight, inner margin rounded, not touching suture (fig. 260). Punctation on elytron not noticeably dual, punctures separated by one to two times their diameter. Surface of elytron reticulate. Pubescence short, grayish white. Epipleuron broadly descending externally. Postcoxal line complete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum strongly projecting, triangular; sixth sternum strongly convex, feebly emarginate medially, longitudinal suture present (fig. 1613); sixth tergum truncate (fig. 1614). Genitalia with 10th tergum truncate, weakly emarginate medially (fig. 1615); genital plate with apex triangular, outer margin straight, inner margin and posterior margin ragged, stylus visible (fig. 1616).

Male.—Not known.

Type Locality.—Bolivia: Pelechuco (N. Holmgren).

Type Depository.—NREA (lectotype here designated).

Discussion.—The form and elytral color pattern of *holmgreni* are highly distinctive and are unique in the genus. The first specimen in the type series bearing the following labels is here designated as lectotype: "Pelechuco, Boliv."; "N. Holmgren"; "holmgreni" (handwritten, purple ink); "TYPUS" (red paper); "232, 70" (pink paper); "Riksmuseum, Stockholm" (green paper). The only other specimen in the type series, also a female, bears the label "N. Holmgren," but the locality is illegible.

Specimens Examined.—Total two. The type series.

Epilachna amplipunctata Group

E. amplipunctata is another species that is apparently not close to any existing group of species. The coarse, irregular patch of punctures on each elytron and the slightly rounded female genital plate with no visible stylus and ragged posteromedian angle (fig. 1620) set *amplipunctata* apart. When males become known, they may prove to have genitalia similar to those of *rittigera*. Known only from "New Grenada," probably Colombia.

Description of Species in *Epilachna amplipunctata* Group

***Epilachna amplipunctata*, new species**

(Figs. 261, 1617–1620)

Female.—Length 7.63 mm., width 6.51 mm. Form oval, elongate, widest anterior to middle of elytra, lateral margin of elytron broadly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black; segments 2–8 yellow, 9–11 piceous; elytron yellow with broad lateral margin, narrow basal margin and short vitta extending from base along suture to basal one-fourth black, projection of basal black border covering callus, uneven, broad, brownish-yellow vitta on middle of elytron extending from near callus nearly to apex (fig. 261). Elytron nearly impunctate except on median vitta where extremely large punctures are confluent or separated by one to two times their diameter, each large puncture with smaller punctures at bottom, few small punctures present along lateral margin. Pubescence grayish white. Postcoxal line complete, distinct, not reaching middle of first abdominal sternum. Abdomen with hind margin of fifth sternum triangularly projecting medially; sixth sternum emarginate, with longitudinal suture (fig. 1617); sixth tergum feebly emarginate (fig. 1618). Genitalia with 10th tergum emarginate, narrow (fig. 1619); genital plate widened toward base, posterolateral angle ragged, stylus visible (fig. 1620).

Holotype.—Female. "N. Grenada" (UCCC).

Discussion.—The specimen described here is the fifth and last specimen in the series of *buckleyi* in the Crotch collection. The median, coarsely punctured vitta on the elytron is unlike that of any presently known species of *Epilachna*. The female genitalia place *amplipunctata* in the group of species related to *fenestrata*, but the exact placement is not known.

Epilachna borealis Group

Length approximately 6.75–11 mm. Mandible large, usually protruding well beyond labrum, three major teeth grouped in apical one-half, first tooth bifid, lower part much longer than upper, ventral margin serrated with minor teeth, second and third teeth each with several minor teeth, inner margin of mandible below third tooth serrate with minor teeth (fig. 22). Color basically yellow with elytron and sometimes pronotum with black spots (except *kraussi*). Lateral margin of elytron rounded from humeral angle to apex; epipleuron widest at middle, slightly wider anterior to middle than posterior to middle (fig. 59). Male genitalia with basal lobe longer than paramere, abruptly, strongly bent upward before apex (fig. 777); sipho S-shaped, apex blunt with ventral tooth, orifice with large, setigerous, membranous area visible (fig. 778). Female genital plate slightly elongate, stylus visible (fig. 1624). Members of this group are found from New York across the eastern and southern United States to Arizona, south to Bolivia, northern Argentina, and southern Brazil.

The *borealis* group is the most widely distributed group of *Epilachna* and; in spite of this, one of the most homogeneous. Some of the species are apparently much more tolerant of extremes of cold, heat, and aridity than is usual for members of the genus.

Key to Species of *Epilachna borealis* Group

1. Elytron reddish brown, completely immaculate ..... *pocohantae*, n. sp. (p. 141)
   Elytron pale with dark markings or entirely black except pale lateral and or basal borders 2
2. Elytron entirely black with pale lateral and basal borders (fig. 276); see variations of *tredecimnotata* ..... *kraussi*, n. sp. (p. 142)
   Elytron not as described above 3
3. Elytron with two transverse rows of connected dark spots and triangular apical spot (fig. 274) ..... *discincta* Weise (p. 140)
   Elytron not as described above 4
4. Elytron with eight dark spots on pale background (fig. 277) ..... *paenulata* (Germar) (p. 143)
   Elytron with less than eight spots or not as described above 5
5. Elytron with seven dark, elongate spots (fig. 275); sipho of male genitalia slender, strongly curved (fig. 789) ..... *boraustralis*, n. sp. (p. 141)
   Elytron with spots round; sipho of male genitalia short, stout, not strongly curved as in figure 780 .. 6
6. Elytron nearly always with seven dark spots, discal spot reaching sutural margin (fig. 262); eastern United States to central Texas ..... *borealis* (F.) (p. 133)
   Elytron with spot pattern extremely variable, when pattern as in *borealis* discal spot is separated from suture (fig. 263); southwest Texas to Arizona, south to Colombia .. *tredecimnotata* (Latreille) (p. 135)

Descriptions of Species in *Epilachna borealis* Group

Epilachna borealis (Fabricius)

(Figs. 262, 775–778, 1621–1624; map 25)

Coccinella borealis Fabricius, 1775, p. 82.
Coccinella punctatissima Weber, 1801, p. 48.
Epilachna borealis: Hope, 1840, p. 157.—Mulsant, 1850, p. 826 (in part).—Crotch, 1874, p. 64.—Weise, 1898*a*, p. 98.—Casey, 1899, p. 103.—Korschefsky, 1931, pp. 55–57.
Epilachna borealis ab. *punctatissima:* Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Male.—Length 8 mm., width 6.83 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from base to apex. Color yellow; pronotum with four black spots, two spots on midline, basal spot touching base, apical spot touching apical margin, small spot present on each side medially, not touching lateral margin, metasternum mostly piceous to black, abdominal sterna 1–4 with brown area laterally on each side of middle; elytron with seven black spots arranged 3, 3, 1, inner spot of first and second touching suture forming single round spot in conjunction with spot on opposite elytron; scutellum black (fig. 262). Punctation on elytron not dual, punctures separated by less than their diameter. Pubescence yellowish white, dark on elytral spots. Postcoxal line incomplete, distinct, reaching two-thirds distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate medially; sixth sternum broadly notched medially; sixth tergum weakly emarginate medially. Genitalia with basal lobe longer than paramere, basal part straight, slightly compressed medially, apex sharply curved upward, apex pointed; paramere slender, apex not widened (figs. 775, 776); sipho robust, short, curved downward well before apex, curved outward and slightly upward just before apex, apex blunt, compressed laterally, with small ventral tooth, ventral surface of sipho immediately before apex broadly carinate medially, unmodified, oval in outline, apex not slender, produced (figs. 777, 778).

Female.—Similar to male except hind margin of fifth sternum convex medially; sixth sternum broadly, feebly emarginate with longitudinal suture (fig. 1621); sixth tergum broadly convex, faintly emarginate (fig. 1622). Genitalia with 10th tergum feebly emarginate, triangular median area lacking pigmentation (fig. 1623); genital plate with all angles rounded, median edge emarginate, stylus visible (fig. 1624).

Variation.—Length 7.35–9.80 mm., width 5.50–7.63 mm. Size of spots on pronotum is subject to much variation, ranging from very large, median two spots connected to spots completely absent on occasional specimen. Elytral spots are remarkably constant but may vary slightly in size.

Type Locality.—North America, probably Jamaica, Long Island, N.Y. (H. S. Barber, personal communication).

Type Depository.—Kiel (fide Zimsen).

Discussion.—Several forms related to *borealis* have been described and treated in literature and catalogs (Korschefsky *1931*, Blackwelder *1945*) as varieties or aberrations of *borealis*. Examination of male genitalia has revealed more than one species, causing a complete rearrangement of the current classification. *E. borealis* is determined to be a species apparently limited to the United States; the westernmost records observed are from Victoria, New Braunfels, and Comal County, Tex. The male genitalia are substantially different from those of the very similar appearing *tredecimnotata* (*immaculicollis* Chevrolat), which has been observed from southern Arizona and southwestern Texas to Colombia, South America. It is possible that the distribution of the two species does not overlap at any point. The only certain way to distinguish *borealis* from *tredecimnotata* is to examine the apex of the sipho, which is simple in *borealis* and ventrally widened and laterally pinched in *tredecimnotata*. In addition, the discal black spots on each elytron are always confluent in *borealis*, rarely so in *tredecimnotata*. Fabricius's type material came from Drury and, according to H. S. Barber (personal communication), Drury's specimens are supposed to have come from Jamaica, Long Island, which would then be the type locality. In any event there is little doubt that *borealis* is indeed the common North American species long associated with that name. See remarks under *tredecimnotata*.

E. borealis is apparently native to the eastern and southern United States, unlike the only other species of *Epilachna* in this area, the introduced *E. varivestis*. *E. varivestis* is similar in appearance to *borealis*, but *borealis* has large black spots and the median discal spot reaches the suture. *E. varivestis* has small black spots and the median discal spot does not reach the suture. *E. borealis* feeds on cucurbits and *varivestis* on beans.

Specimens Examined.—Total 714. "Amer.," Sept. UNITED STATES: *Alabama:* Birmingham, J. E. Graf. *Arkansas:* South West, Chas. Palm. *District of Columbia:* D.C., VI–21–23; D.C., R. W. Van Horn; D.C., Aug., C. V. Riley; Benning, 26 Aug. 03, pupa 28 Aug., Iss. 6 Sept., ambrosis, E. S. G. Titus; Benning, pupa 28 Aug., Iss. 12 Sept., muskmelon, pupa 2 Sept., Iss. 13 Sept., muskmelon, E. S. Titus; Benning, 26 Aug. 03, pupa 3 Spt., Iss. 12 Spt., beans, E. S. G. Titus; Brookland, squash, Sept. 14–17, J. B. Parker; Little Falls, Aug. 22, 1915, W. L. McAtee; Tacoma Park, 8–8–21, Ewing; Wash., VII–19–07, I–V–18, VII–09–1918, L. L. B.; Washington, 25–6, 6–6, 19–10, 19–10, III, Hubbard and Schwarz; Washington, 16–10, 27–X–06, W. L. McAtee; Washington, VII–07, VIII–6–07, Wm. Palmer; Washington, Rock Creek, July 23, 1899, Nov. 26, 1905, 8 Jul. '07, C. E. Burden. *Florida:* Tallahassee, March 5, 1919, 9–3, Hubbard and Schwarz. *Georgia:* "Georgia"; Thomasville, July 22–26, 16. *Illinois:* Lache, VI–12–1956, P. J. Spangler. *Indiana:* "Indiana." *Kansas:* Douglas Co., 900 ft., 1910; Lawrence, 8–21–1925, W. Benedict; Lyon Co., June 5, 1923, W. J. Brown; Manhattan, E. G. Kelly. *Louisiana:* Cloutierville, IV–26–48, A. H. Rosenfeld; Mound, collected on squash, June 22, 1915, T. H. Jones; New Orleans, I–20–44, E. S. Ross; Olivier, E. S. G. Titus. *Maryland:* Beltsville, XI–1, H. F. Wickham; Beltsville, on squash, July 8, 1950, D. J. Caffrey; Cabin John Bridge, 14 July 99, 26 Aug. 04, F. D. Couden; Cabin John Bridge, 11–VII–06, F. Knab; Cabin John Bridge, 22–8–09, Fred K. Knab; Chesapeak Beach, 7–11–16, C. F. Van Horn; College Park, 6–1–11, A. B. Duckett; College Park, collected on squash, 1917–8–25, K. W. Babcock; Forest Glen, clover, VIII–28–13, O. Heidemann; Glen Echo, 4–X–20, Bridwell; Glen Echo, summer 1922, J. C. Bridwell; Glen Echo, cantaloup, Aug. 97, F. C. Pratt; Gt. Falls, VI–22–1912; Hyattsville, 23–IX–17, E. V. Hall; Marshall Hall, 4–VII–06, F. Knab; Odenton, June 11, 1922, W. L. McAtee; Plummers Id., VI–29–13; Plummers Id., 28–5–02, H. S. Barber; Plummers Id., Sept. 15–07, F. Knab; Plummers Id., June, A. K. Fisher; Plummers Id., Oct. 23–20, E. A. Schwarz; Plummers Id., 12–12–20, R. C. Shannon; near Plummers Id., VII–21–17, Geo. M. Greene; Preston, Jun. 92; Riverdale, June '20, D. H. Blake; Tacoma Park, on squash, 8–8–21, Ewing.

Massachusetts: Cotuit, 21–VIII–1899; Harwichport, VI–27–1933, L. Lacey; Marion, 9–5, F. C. Bowditch; Woods Hole, IX–5–18–1916. *Mississippi:* Natchez, on *Polygonum* sp., V–25–09, E. S. Tucker; Pachuta; Vicksburgh, 26–11–94, H. Soltau. *Missouri:* East Prairie, VI–3–1956, P. J. Spangler; Sikeston, 7–18–56, D. W. Stout. *New Jersey:* Atco, Kaeber; Chester, VI–19, E. L. Dickerson; Clementon, V–6–06, Geo. M. Greene; Cumbrld Co., VIII, E. L. Dickerson; Fort Lee; Fort Lee Dist.; Glassboro, 1–1–05, Geo. M. Greene; Highland, H. Soltau; Middlsx Co., 7–16, Millville, 3–3–1923, F. M. Schott; N. Brnswck, IX–12; Ocean City, VII–3–1932, R. C. Casselberry; Palisades; Riverton, IX–23, R. J. and M. B. Sim; Riverton, IV–17–98, Geo. M. Greene; Riverton, VII–12–1912, T. H. Frison. *New York:* "N.Y.," J. B. Smith; vicinity of N.Y., Chas. Palm; Brooklyn, VII–5–1906; East Hampton, 7–20–01; Orient, 12–VII–1908, J. L. Zabriskie; Long Island, 7–20–4, June 15–80; Cld. Spg. Harbor, L.I., July 23, 1900, Aug. 4, 1900; Coldspring Harb., L.I., 30–VII–22, H. M. Parshley; Huntington, L.I., Bridwell; Quioque, L.I., 1–IX–1906, J. L. Zabriskie; Yaphank, L.I., IX–2–1916. *North Carolina:* "N.C."; Ashville, VI–22–13, W. M. Mann; Hot Spgs.; Valley of Black Mts., July 7, 1906, W. Beutenmuller. *Ohio:* Marietta, 10–11, Hubbard and Schwarz; Portsmouth, X–20–49, P. J. Spangler. *Pennsylvania:* "Penn"; Allhegeny; Essington, IV–27, Kaeber; Frankford, V–30, A. Schmidt; Jeannette, VIII–6, H. G. Klages; Lawndale, II–17–01, Geo. M. Greene; Phila., VI–26–04, 9–19–35, Geo. M. Greene; Roxborough, VII–10–15, F. Haimbach; Upper Darby, Del. Co., 5–6–16, Kaeber; Wyoming, X–17–04, Geo. M. Greene. *Rhode Island:* Hopkinsville, Sept. 14, 1947, F. H. Pough; Rock Island, Aug. 28, 1891. *South Carolina:* Batesburg, in corn fld., 3–16–12, E. A. McGregor; Beaufort; Charleston, on chayote, Aug. 30–25, J. P. Rogers; McChellanville, Aug. 4, 1945, P. Vaurie; Swansea, Aug. 6, 1911, Aug. 7, 1911, Fred K. Knab. *Tennessee:* Elmwood, J. Corse. *Texas:* Columbus, Comal Co., 27–8; Lee Co., Fedor; New Braunfels, VI–7–02, H. Mittendorf; New Braunfels, VI–7–42, E. S. Ross; Victoria, IV–21–0, Hunter; Victoria, 2–01, E. A. Schwarz; Victoria, XII–20, J. C. Bridwell; Victoria, VII–22–07, J. D. Mitchell; Victoria Co., on cornus, 4–13–11, J. D. Mitchell; Victoria, on leaves of mustang grape, Apr. 18–17, T. E. Snyder; Victoria, under bark, I–22–10, 11–24, J. D. Mitchell; Victoria, under willow bark, XII–31–08, J D. Mitchell. *Virginia:* Alex., VI–19–1913; Arlington, 4–2–00, 0–1–1921, 0–31–22; Barcroft, V–20, Geo. M. Greene; Bluement, July 04, F. C. Pratt; Charles City, collected on walnut, Sept. 26, 1910; Charlttsville, F. W. Poos; East End, July 24–03; Fairfax Co., VI–25–1910; Dead Run, Fairfax Co., IV–7–19, W. S. Fisher; Falls Church, Aug. 22; Falls Church, IV–14–17, V–20–17, IX–3–17, IX–7–17, IX–20–17, Geo. M. Greene; Fauq. Co., Belvoir, VI–5–1940, Dieke; Gt. Falls, VI–27–1911; Loudoun Co., F. C. Pratt; Nelson Co., July 12, 1910, W. Robinson; Norfolk, 1926, F. W. Poos; Paris, G. Y. Valient; Pennington Gap, Hubbard and Schwarz; Syria, 9–9–36, D. T. Wlke.; Vienna, VI–17–11, C. W. Hooker; West Point, 10 July, W. L. Wheeler. (AMNH) (CM) (UK) (USNM) (ZSBS).

Epilachna tredecimnotata (Latreille)

(Figs. 263–273, 778*a*, 779–780; map 26)

Coccinella tredecimnotata Latreille, 1833, p. 67.

Epilachna borealis ab. *13-notata:* Mulsant, 1850, p. 827.

Epilachna borealis ab. *tredecimnotata:* Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Coccinella immaculicollis Chevrolat, 1834, p. 70.

Epilachna borealis ab. *immaculicollis:* Mulsant, 1850, p. 827.—Crotch, 1874, p. 64.—Gorham, 1898, p. 242.—Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Epilachna particollis Mulsant, 1850, p. 810.—Crotch, 1874, p. 63 (as a synonym of *aequinoctialis* (sic) Mulsant).

Epilachna aequinoxialis Mulsant, 1850, p. 824.—Crotch, 1874, p. 63, *aequinoctialis* (sic).

Epilachna borealis ab. *indiga* Mulsant, 1850, p. 828.—Korschefsky, 1931, p. 56.

Epilachna indiscreta Mulsant, 1850, p. 235.—Crotch, 1874, p. 63 (as a synonym of *aequinoctialis* (sic) Mulsant).

Epilachna simillima Crotch, 1874, p. 63.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442. NEW SYNONYMY.

Epilachna picescens Gorham, 1897, p. 238.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442. NEW SYNONYMY.

Epilachna borealis ab. *particollis:* Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Epilachna borealis ab. *aequinoxialis:* Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Epilachna borealis ab. *indiscreta:* Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Male.—Length 7.90 mm., width 6.50 mm. Description as for *borealis* with differences in color pattern and male genitalia noted here. Elytron with black spots smaller than in *borealis,* slightly elongate, median row of spots with tendency to coalesce, sutural spot distinctly separated from suture (fig. 263). Genitalia with basal lobe not as slender and more strongly curved upward apically than in *borealis* (fig. 778); sipho with upper margin constricted at apical one-eighth, ventral surface immediately before apex sharply carinate, strongly compressed laterally, apex slender, elongate, produced, with small ventral tooth, orifice dorsal, subterminal, with setigerous membrane (figs. 779, 780).

Female.—Similar to male, abdomen and genitalia as described for *borealis.*

Variation.—Length 6.75–10.10 mm., width 5.10–8.05 mm. Pronotal and elytral color patterns vary a great deal and several names have been proposed for these color forms. *E. particollis* Mulsant: Pronotum as in *borealis* with median spots united, elytron black with red basal spot reaching from scutellum to callus; type locality, Mexico (fig. 264). *E. aequinoxialis:* Mulsant's description makes little difference between color pattern of typical *borealis* and *aequinoxialis* except uniting of median band of spots on elytron; type locality, Buenos Aires (fig. 265). *E. indiga* Mulsant: Red above and below; elytron with black band formed by confluence of basal row of spots, middle row of spots completely absent, subapical spot small (fig. 266). Apical spot may be completely absent; type locality, Mexico. *E. indiscreta:* Color pattern as in *particollis* with addition of oval pale area near lateral margin of elytron behind callus; type locality, Colombia. *E. immaculicollis* (Chevrolat): Pronotum with spots completely lacking; elytron with pattern as in *borealis,* spots reduced; type locality, Mexico, Vera Cruz, Tuxpan Alvarudo (fig. 267). *E. simillima* Crotch: Very similar to *aequinoxialis* Mulsant; type locality, Bogota, Colombia. In addition to the forms that have been given names, nearly any possible variation of the elytral pattern may be observed in a large enough sample (figs. 268–273).

Type Locality.—"America equinox."

Type Depository.—Of *tredecimnotata,* DLM (lectotype here designated); of *immaculicollis, particollis, indiga, indiscreta,* and *simillima,* UCCC; of *aequinoxialis,* not known; of *picescens,* BMNH (lectotype here designated).

Discussion.—The type specimen is very probably from Colombia and matches some Colombian specimens in the USNM collection exactly. The single female specimen standing before the following label in the Dejean collection is here designated lectotype: "Epilachna borealis var. 13-notata Latreille, b. in Amer. aequi, D. Bonpland." Specimens of *tredecimnotata* from Arizona and Mexico vary only slightly in color pattern, usually possessing the *immaculicollis* type of pattern. From Guatemala south into Colombia the extreme color variation described here occurs. Little or no geographic pattern can be seen as specimens from both Guatemala and Colombia have been observed that run the complete gamut from the *immaculicollis* pattern to the *indiscreta* pattern. The male and female exhibit no differences among any of the described forms listed here and these are considered to be simply synonyms of *tredecimnotata.* Crotch believed *simillima* to be close to *varivestis,* but the genitalia are those of *tredecimnotata.* A female syntype of *picescens* Gorham bearing the following labels has been examined and found to be synonymous with *tredecimnotata* and is here designated lectotype: "Syntype"; Bugaba, Panama, Champion"; B.C.A., Col., VII., Epilachna picescens Gorh."

Specimens Examined.—Total 1,515. BRITISH HONDURAS: *Cayo:* El Cayo, Mar. 15, 1922, H. F. Loomis. *Corozal:* Rio Hondo, Blancaneau. COLOMBIA: "Columbia"; Colom; Casey bequest, 1925; Columb., Moritz; Colombia, H. Rolle. *Antioquia:* Picacho, X–1942, F. Gallego; S. Jeronimo, Jun. 143, May 1945, Gallego; V. Medellin, Sep. 1945, Gallego. *Bolivar:* Cartagena, Boca Grande, 21–XII–64, P. R. Craig; Monteria, 1941, Gallego; Monteria, Oct. 1942, Gallego. *Boyaca:* Arcabuco, 2200–3000 m., III–28–48, L. Richter. *Caldas:* Caucatal. *Cauca:* "Cauca," F. Gallego; Pto. Araujo, Aug. 1945, F. Gallego; Villa Elvira. *Choco:* Itsmina, altitude 65 mi., 21–VIII–40, Murillo. *Cundinamarca:* Bogota; Fusagasuga, Pasca,

1900–1940 ft., 8–VIII–1958, L. Richter; Fusagasuga, San Miguel, 1950 m., 1947, I–12–1947, L. Richter. *Magdalena:* Aracataca, Darlington; Minca, June; Rio Frio, Darlington; S. Nevada (S. Marta), Jul. 1942, Gallego; San Diego, 100 ft.; Sevilla, Darlington; Sevilla, Jul. 1942, Gallego; Venecia, Jul. 1943, Gallego. *Meta:* Villavicencio, 1938, F. W. Furry; 3 mi. W. Villavicencio, 920 m., III–11–1955, E. I. Schlinger and E. S. Ross. *Santander:* Rio Opon, 20–XII–1947 to 7–I–1948, L. Richter. *Valle del Cauca:* Cali; Candelaria, alt. 1020 m., 17–V–1939, Murillo; Palmira, Nov.–42, B. Losada. COSTA RICA: "Costa Rica"; Costa Rica, Biolley; Costa Rica, 30–XII–23, F. Nevermann. *Alajuela:* San Carlos, Schild-Burgdorf. *Cartago:* Turrialba; Turrialba, A '46, R. Perez. *Guanacaste:* X–34, F. Nevermann; Los Canas. Pac. slope, alt. 50 ft., Jun 11 '23, A. Smith. *Heredia:* San Pedro de Montes de Oca, 30–VIII–1932, 15–IX–1932; San Pedro de Montes de Oca., on chayote, VI–28–32, C. H. Ballou; San Pedro de Montes de Oca., on caiba, 8–30–32, C. H. Ballou. *Limon:* Las Mercedes, May 10, 1922, Nevermann; Guapiles, Sta. Clara, 250–300 m., V–34, F. Nevermann. *Puntarenas:* Los Loras near Puntarenas, Sept. 8–05, Fred K. Knab. *San Jose:* San Jose, May 1930; San Jose, 1160 m., M. Valerio; San Jose, 1000–1200 m., 25–VIII–28, F. Nevermann; Coronado, 1400–1500 m., 15–I–29, F. Nevermann; del Cabo.; Palmar, Aug. 11, 1950, R. G. Oakley; Piedras Negros; Piedr. Negros, Schild and Burgdorf. CUBA: "Cuba"; Cuba, Mull. *Las Villas:* Buenos Aires, Trinidad Mts., VI–39, Parsons; Buenos Aires, Trinidad Mts., elevation 2350–2800 ft., May 4, 1932, S. C. Bruner and A. Otero; Buenos Aires, Trinidad Mts., 2500–3500 ft., May 8–14, 1936, Darlington; Soledad, 16–6, J. G. Myers; Soledad, Cienfuegos, June 1929, Darlington; San Blas, Sta. Clara, Sept. 12, 1932, B. B. Leavitt; Sta. Clara, 1922; Trinidad Mts., Santa Clara, Aug. 28, 1930, Richard Dow. EL SALVADOR: El Salvador, Martinez Cuestas, Ahurachapan, VIII–18–1960. *San Salvador:* S. Salvador, 14–8, Fred K. Knab; San Salvador, X–2, K. A. Salman; San Salvador, VI–15–25, K. A. Salman; San Salvador, 24–26 May 1958, O. L. Cartwright; San Salvador, Aug. 7, '58, J. R. Munguia; San Salvador, IX–19–1960; Santa Tecla, June 6, '58, L. J. Bottimer; Santa Tecla, 11–15 June 1958, O. L. Cartwright. *Santa Anna:* Santa Anna, X–1959, N. L. H. Krauss. *Sonsonate:* Izalco, 21–8, Fred K. Knab. *Usulutan:* Usulutan, VII–28–1963, D. Q. Cavagnaro and M. E. Irwin. GUATEMALA: "Guatemala"; Guatemala, F. C. Bowditch. *Alta Verapaz:* Tamahu, 3500 ft., VII–11–1947; Tamahu, 3500 ft., VII–11–1947, C. and P. Vaurie. *Baja Verapaz:* "Pancina," Champion; Rabinal, 3000 ft., VIII–1–1947, VIII–2–1947, C. and P. Vaurie; S. Geronimo, Champion; San Geronimo, Champion. *Chiquimula:* Chizuimula, 1000 ft., VII–22–1947, VII–23–1947, C. and P. Vaurie. *El Quiche:* Cunen, 6000 ft., Aug. 11, 1947, C. and P. Vaurie; Nebaj, 6000 ft., VIII–8–47, VIII–9–47, C. and P. Vaurie; Sacapulas, 4500 ft., VIII–12–1947, C. and P. Vaurie. *Guatemala:* Guatemala City, 7–11–1923, 7–23–1923, E. G. Smith; Nueva Concepcion, 50 ft., VIII–17–63, D. Q. Cavagnaro and M. E. Irwin. *Huehuetenango:* Huehuetenango, VII–28–1959, P. and C. Vaurie. *Jutiapa:* Guazacapan, 11–VIII–52, R. H. Painter. *Quezaltenango:* Cerro Qunil, 4–5000 ft., Champion. *Retalhuleu:* Retalhuleu, V–16–15, E. J. Hambleton; S. Sebastian, '25, L. Thiel. *Sacatepequez:* Acatenango, July 1948, H. T. Dalmat; Antiqua, 5–14–23, E. G. Smyth; Antiqua, IX–1959, N. L. H. Krauss; Capetillo, G. C. Champion. *San Marcas:* La Conquista. *Suchetepequez:* Finca El Cipres, 3000 ft., May 1926, June 1926, J. R. Slevin; Finca Moca, 11 June 1967, Flint and Ortiz. HONDURAS: *Atlantida:* La Ceiba, 29–6–20, F. J. Dyer; Lancetilla, I–4–28, P. C. Standley. *Cortes:* San Pedro Sula. *Francisco Morazan:* Tegucigalpa, June 16–18, X–6–18, F. J. Dyer. *Olancho:* Olanchito, Y., June 16, 1960, J. L. Nichel. MEXICO: "Mex."; "Mexico"; Mexico, Deppe; Mexico, Flohr; Mexico, R. F. Pearsall; Tlaqueplaque, IX–1965, N. L. H. Krauss. *Baja California:* Lower Cal., Sierra Laguna, VIII–15–1919, J. R. Slevin. *Chiapas:* "Chiapas"; Chiapas, XI; El Rincon, Rt. 17, V–13–14, 1969, H. F. Howden; Honduras, A. Duges; El Ocotal, VIII–3–52, E. E. Gilbert and C. D. MacNeil; Pacific Slope, Cordilleras 800–1000 m., '19, L. Hotzen; 17 mi. S. E. Teopisca, Rt. 24, VI–3–4–, 1969, H. Howden; 15 mi. S. La Trinitaria, VII–27–54; Tuxtla, Gutierrez, VII-

11–52, E. E. Gilbert and C. D. MacNeil. *Chihuahua:* Cocomorachio, Aug. 20, 1950, Ray F. Smith; 2 mi. W. Matachic, 6400 ft., VII–7–47, Cazier; Matachic, VII–7–47, Michener; Matachic, VII–7–47, Schramel; 6 mi. N. E. Meoqui, Sept. 2, 1950, Ray F. Smith; Saucillo, Sept. 9, 1950, Ray F. Smith. *Colima:* Colima, IX–1965, N. L. H. Krauss; 2 mi. S. El Colima, 150 ft., Nov. 23, 1950, Ray F. Smith; 4 mi. S. W. Colima, Nov. 24, 1950, Ray F. Smith; 7 mi. W. Colima, Aug. 2, 1956, W. J. Gertsch; Armeria, VII–21–53, C. and P. Vaurie; Armeria, Aug. 1, 1954, M. Cazier, W. Gertsch, Bradts; Queseria, XI–25–50, Fay Smith; Rio Naranjo, VII–16–1953, C. and P. Vaurie; Tecolopa, July 31, 1954, M. Cazier, W. Gertsch, Bradts; 4 mi. N. Tecoman, Nov. 23, 1950, Ray F. Smith; 10 mi. S. Tonila, VII–17–53, C. and P. Vaurie; Valle Verdi, July 31, 1954, M. Cazier, W. Gertsch, Bradts; Vulcano, L. Contradt; Vulkan Colima, 1918, Joh. Lave. *Durango:* Nombre de Dios, Sept. 19, 1950, Ray F. Smith. *Guerrero:* Guerrero, R. Muller; Taxco, VII–1959, N. L. H. Krauss. *Hidalgo:* Progreso Valle, July 27, 1963, Alfred B. Lau. *Jalisco:* 8 mi. W. Cihuatlan, 100 ft., X–23–1940, Oct. 23, 1950, XI–23–50, Ray F. Smith; Cocula, Nov. 23, W. M. Mann; 3 mi. E. Jaluco, XI–22–50, Ray F. Smith; Guadalajara, Crawford; Guadalajara, H. Rolle, Berlin S. W. 11; Guadalajara, 6–26–1903, J. F. McClendon; Sebastian Sierra Madero Mts., 1800 m., I–11–1927; Tuxpan, 9–6–03, J. F. McClendon; Tuxpan, 9–6–1902, J. F. McClendon. *Mexico:* Jalapa, Hoege; Jalapa, W. Schaus; Tejupilco, Temascaltepec, VII–1932, H. Hinton. *Michoacan:* El Sabino, Uruap., 7–25–36, H. D. Thomas; N. Morelia, 6500 ft., on squash, VIII–27–1955, G. H. Dieke; Oropeo, VIII–1945, W. F. Forhag; San Jose Parva, VI–1965, N. N. L. H. Krauss; 2 mi. E. S. Jose Parva, 5500 ft., wild cucurbit, VIII–27–1955, G. H. Dieke; 6 mi. N. Tumbiscatio, 3100 ft, Dec. 1, 1950, Ray F. Smith; 7 mi. S. Tumbiscatio, Dec. 1, 1950, Ray F. Smith. *Morelos:* Morelos, 12–15–1961, D. R. Whitehead; Cuernavaca, June; Cuernavaca, June, A. Fenyes; Cuernavaca, VIII–25–44, VIII–30–44, N. L. H. Krauss; Cuernavaca, VIII–1955, N. L. H. Krauss; Cuernavaca, VI–1959, N. L. H. Krauss; Cuernavaca, VIII–1959, N. L. H. Krauss; 8 mi. South Cuernavaca, Aug. 22, 1958, H. Howden; Pte, de Ixtle, Wickham; Pte. de Ixtle, 8–18–30, B. J. Landis; Tepaltzingo, Silty stream bank, 24–VI–63, D. R. Whitehead; 6.7 mi. S. Yautepec, 29 July 1963, Naumann and Willis. *Nayarit:* 2 mi. S. Compostela, Nov. 8, 1950, Ray F. Smith; 6 mi. S. Compostela, Oct. 5, 1950, Ray F. Smith; vic. Compostela, VII–10–35, VIII–20–33; vic. Compostela, III–20–1933, VII–10–1933, VII–17–1933, VIII–20–1933, VIII–1934, VIII–27–1936, 42–V–15; Jalisco, Aug. 23, 1954, Jose Keef; Jalisco, Sept. 1954, Sharon Keef; Navarrete, VII–28–53, C. and P. Vaurie; San Blas, Aug. 7, 1964, J. F. Mc Alpine; Tepic, Nov. 23, W. M. Mann. *Nuevo Leon:* Monterrey, 6–XII–1955, W. K. Clore. *Oaxaca:* Almolayas, Fred K. Knab; Juguila Mixes, 4700 ft., VII–1968, W. S. Miller; Oaxaca, VII–8–52, E. E. Gilbert and C. D. MacNeil; Oaxaca, 17–22–1968, VIII–17–1968, G. Pollard; Oax. Valle National, VII–10–30–1965, Alfred B. Lau; Tuxtepec, VI–1934, J. Oamelo. *Puebla:* Puebla, May 28, May 29, 1932, E. G. Smyth; Atencingo, June 2, 1922, E. G. Smyth. *San Blas:* Mandingo R. Gulf of San Blas, May 29, 1929, Pinchot Exp. *San Luis Potosi:* El Salto Falls, 15 June 1956, Naumann and Willis; Huichihuayan, (8 mi. N.), VI–20–41, H. S. Dybas; Valles, VII–1959, L. R. Steude; Xilitla, 1450 ft., VII–23–54; Xilitla, 5 mi. E., 1600 ft., 23–VII–1954, J. G. Chillcott. *Sinaloa:* 8 mi. W. El Palmito, VII–24–64, VII–29–64, H. F. Howden; Los Mochis, VIII–9–1922, C. T. Dodds; Mazatlan, VII–31–1959, R. Schammel; 3 kil. E. Mazatlan, Aug. 15, 1954, R. E. Ryckman, C. P. Christianson and D. Spencer; 40 mi. N. Mazatlan, July 22, 1954, M. Cazier, W. Gertsch and Bradts; Rosario, Oct. 2, 1950, Ray F. Smith; Venadillo, Sept. 26, 1950, Ray F. Smith; 6 mi. E. Villa Union, VII–23–1954, M. Cazier, W. Gertsch and Bradts; 27 mi. E. Villa Union, VII–7–64, H. F. Howden. *Sonora:* Agua Prieta, 8–22–26, W. W. Jones; 18 mi. E. El Puerto, VIII–7–60. *Tamaulipas:* 8 mi. N. W. of Gamez Farios, June 1964, J. Reddell; Tampico, Locke; Tampico, 16–12, E. A, Schwarz. *Vera Cruz:* Vera Cruz, Casey Bequest, 1925; Vera Cruz, Dec. 15–07, Fred K. Knab; Cordoba, A. Fenyes; Cordoba, 12–6, 13–6, Fred K. Knab; Cordoba, V–11–1946, V–14–1946, V–15–1946,

V–16–1946, May 15, 1946, J. and D. Pallister; Cordoba, July 5, 1963, A. B. Lau; Cordoba, VIII–4–65, A. B. Lau; Jalapa, Hoege; Jalapa, W. Schaus; Jicaltepec, 3–4–96; Jalapa, VI–1, Smith; Jalapa, Aug. 1947, H. Wegener; Mojarras, VI–12–47, C. and P. Vaurie; Orizaba, June; Orizaba, Blatchley; Orizaba, June, A. Fenyes; Orizaba, Jan. 9–16, 92, H. Osborn; Presidio, July 30, 1963, Alfred B. Lau; Presidio, X–1–63, A. B. Lau; Presidio, XI–1–1963, A. B. Lau; Puente Nacional, VIII–17–1960, H. Howden; Saltillo, E. Palmer; San Carlos Plantation Minatitlan, VI–2–05, Cassius Smith; San Miguel, nr. Cordoba, Goodnights; Sn. Rafael, Jicaltepec, 6–22–96; San Rafael, Jicaltepec, June, Townsend; Sn. Rafael, Jicaltepec, Mch. 2, '96, F. C. Bowditch. *Yucatan:* Chichen Itza, IX–12–1964, J. C. and D. Pallister; Yucatan Colonia, VIII–16–1964, J. C. and D. Pallister. NICARAGUA: *Chinandega:* Consiquina, slope. *Chontales:* Nicaragua, Janson; Nicaragua, T-Belt. *Managua:* Nicaragua, B. A. Rene; Nicaragua, VIII–7–'44, E. J. Hambleton. PANAMA: "Pan." *Chiriqui:* V. de Chiriqui, 25–4000 ft., Champion. *Canal Zone:* C. Z., G. Ireneo; C. Z., A. H. Jennings; C. Z., Feb. 10, 1939, C. H. Richardson; Ancon, 9–XII–12, S. T. Darling; Ancon, VIII–37, Lucile Cook; Barro Colorado, March 22, 1933, F. H. Schwarz; Barro Colorado, 9–II–1936, Dec. 3, 1930, F. E. Lutz; Barro, Colo. Isld., XI–24–1928, I–3–1929, C. H. Curran; Barro Colorado Is., IV–V–1939, J. Zetek; Barro Colo. Is., Sept.—Oct. '39, 8–'39, Mar.—Apr. '49, J. Zetek; Bohio, August Busck; Bohio, Feb. 7–11, E. A. Schwarz; Cabima, May 19–11, August Busck; Ciricito, 7–9–51, 7–27–31, 8–29–31, 8–28–31, 9–23–31, 10–11–31, 11–7–31; Corozal, 1–19–1929, C. H. Curran; Corozal, from chayote, VI–12–'30, J. Zetek; Ft. Clayton, V–44, K. E. Frick; Ft. Davis, 5–VII–1927, N. Banks; Frijoles, Nov. 8–15–1923; Frijoles, March 27, 1911, E. A. Schwarz; Gamboa, 1924, N. Banks; Gatun, 15–5–11, A. H. Jennings; Limon Chagres River Plantation, on chayote and guiana bean, July 14, 1918, H. F. Dietz; Paraiso, I–17–11, August Busck; Paraiso, Jan. 23–11, Jan. 26–11, Feb. 10–11, May 4–11, E. A. Schwarz; Pedro Miguel, VIII–10–23, R. C. Shannon; Plantation "Borracho," swept from grass under papaya trees, July 10, '18, H. F. Dietz and Zetek; Summit, IX–1946, N. L. H. Krauss; Taboga I., A. H. Jennings; Taboga I., Jun. 10–11, Jun. 14–11, August Busck; Taboga Is., Sept. 21, 22, 1918, H. F. Dietz; X X Plantation, 2–4–30. UNITED STATES: *Arizona:* Ariz. Destroying cucurbitaceous plants, Wyatt W. Jones; Douglas, W. W. Jones; Douglas, VIII–1–23, 9–20–24, J. R. Douglas; Douglas, on native ground vine, 20–IX–22; Douglas, on watermelon, Sept. 1924, J. R. Douglas; Nogales, Sept. 12, 1957, G. R. Dunn; Nogales, 7–IX–59, M. Noon; Patagonia, 7–36, E. S. Ross; Portal, VIII–10–1944, W. W. Jones; Thatcher, 8–21–12, A. W. Merrill. *Texas:* Davis Mts., VI–VII–1928, O. C. Poling; Davis Mts., VI–26–42, Van Dyke; Fort Davis, Davis Co., VII–3–1963, J. G. and B. L. Rozen; 16 mi. S. Marathon, Brewster Co., July 17, 1950, Ray F. Smith. VENEZUELA: Venez., Casey bequest, 1925; *Amazonas:* Pro. Ayacucho, T. F., 10–15–VIII–55; Samariapo, June 12, 1950, J. Maldonado Caprilles; *Anzoategui:* Rio Neveri, Pekin Abajo, 100 m., 10° 11′ N., 64° 30′ 0., 16–VIII–1966, L. J. Joly T. *Aragua:* Colonia Tovar, 2000 m., 25–XII–54, P. Ferjeves; Maracay, P. Vogl; Maracay, III–5–1959, A. M. Nadler; Maracay, Boca del Rio, 450 m., 8–IX–45, F. Fernandez Y.; Costa Limon, 29–VII–1957, 22–II–1968, L. Rodriguez. V. and C. Andara; Laguna Valencia, C. T. Boca de Rio, 22–X–1947, F. Fernandez Y. *Barinas:* Suripa, 14–III–54, W. Syumolfowsky. *Carabobo:* Altamira, 1200 m., 5–III–1968, J. & B. Bechyne. *Cojedes:* El Baul, 11–V–1967; La Sierra Cojede, 1100 m., VIII–7–46, Villegas and Ginas. *Distrito Federale:* Caracas, 1921, A. J. C. Rojas; El Valle, 10–11–X–1950, C. J. Rosales; Hacienda El Limon La Conchita, 850 m., 10° 28′ N., 67° 16′ 0. *Guarico:* Central Tacarigua, 18–V–1962; Central Tacarigua, II–VIII–61, M. Gelbez; Hato, Las Lajas, 15–VIII–1964, A. Dascoli; Yuma, 31–8–1967, J. and B. Bechyne. *Merida:* "Merida"; Carr-Panamericana—El Vigia, Coloncito, km. 60, 6–I–55, C. J. Rosales; El Vigia, 24–IX–1951; La Victoria, 13–VIII–1964, C. J. Rosales, E. Osuna, and M. Gelbez. *Miranda:* Los Chorros, E. Miranda, 25–I–1950, E. Nanyama and F. Fernandes F. *Monagas:* Caripito, 50 m., 19–9–1965; Jusepin, 8–X–1965, F. Fernandez Y. and C. J. Rosales; Jusepin, 6–VIII–1966, F. Fernandez

Y. and C. J. Rosales. *Sucre:* Cumanacoa, G. Netting. *Zulia:* Cajmera Perija, 12–4–1960; Cajmera, Jerija, 11–IV–60; Kasmera, Perija, 12–IV–63, P. J. Solinas; Kasmera Rio Yasa, Sierra de Perija, 21–IX–1961, F. Fernandes and C. J. Rosales; La Kasmera, Sierra Perija, 15–XII–62, A, T. Perez. (AMNH) (CAS) (CM) (CNC) (HH) (MCZ) (MNHUB) (UK) (USNM) (V) (ZSBS).

Epilachna discincta Weise

(Figs. 274, 781–783, 1625–1626; map 27)

Epilachna discincta Weise, 1890, p. 21.
Epilachna borealis ab. *discincta:* Gorham, 1898, p. 241.—Korschefsky, 1931, p. 56.—Blackwelder, 1945, p. 441.

Male.—Length 7.80 mm., width 6.47 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color yellowish red; pronotum with median area piceous from base to apex; elytron yellowish red with anterior and median rows of spots coalescent, appearing as uneven, transverse bands, large, dark spot on apical one-third (fig. 274). Punctation on elytron not dual, punctures separated by their diameter or less. Pubescence yellowish white, dark brown on dark areas. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate medially. Genitalia of *borealis* type; basal lobe feebly constricted at middle, thickened in apical one-half (figs. 781, 782); sipho long, slender, apical part recurved (fig. 783).

Female.—Similar to male, abdomen and genitalia nearly as described for *borealis;* sixth sternum notched (fig. 1625). Genitalia with genital plate emarginate on inner margin (fig. 1626).

Variation.—Length 7–8.80 mm., width 5.60–7.66 mm. Median dark area of pronotum disappears completely in some specimens. Transverse rows of spots on elytron may be less completely coalesced giving margin of transverse bands a very uneven appearance.

Type Locality.—Honduras: Sao Pedro.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—This species has been placed as an aberration or variety of *borealis* by most authors, but examination of the male genitalia indicates a valid species. The external appearance is quite distinctive and it should only be confused with an occasional specimen of *tredecimnotata* having coalescent elytral spots. Male genitalia must be examined in such cases. The type series of eight specimens was examined and the only specimen bearing the following label is here designated as lectotype: "Honduras."

Specimens Examined.—Total 116. BRITISH HONDURAS: "Br. Hondurus." *Belize:* Belize, Peck. *Cayo:* El Cayo, 1959, N. H. L. Krauss. *Toledo:* Toledo, 8–1–5–'06, Peck; Punta Gorda, Sep. 10–20–06, Peck; Punta Gorda, VI–1935, J. J. White. GUATEMALA: "Guatemala"; Guat., VII–IX–37, R. Meiggs. *Alta Verapaz:* Chacoj, Champion; Panzos, Champion; Panzos, Korschefsky collection; San Juan, Champion; Teleman, Champion; Trece Aguas, cacao, 13–4, 2–4, 4–4, Barber and Schwarz. *El Progreso:* El Rancho. HONDURAS: La Lima, Sept. 7, 1967. *Atlantida:* La Ceiba, XII–19–16, IV–3–17, F. J. Dyer; Tela, W. M. Mann; Tela, V–22, Dakota Farm, T. H. Hubbell. *Francisco Morazan:* Tegucigalpa, IV–30–17, IV–1–17, IV–5–17, F. J. Dyer. MEXICO: "Mex." "Mexico." *Chiapas:* Pichucalco, V–15–1959; Simojovel, 15–XII–1932, C. C. Plummer. *Tabasco:* Teapa, Feb., H. H. S. Hoge; Teapa, March, H. H. S. Hoge; Teapa, VI–29–1964, J. C. and D. Pallister. *Vera Cruz:* Vera Cruz, 6–5–40; Jesus Carranza, June 1944, M. Guerra; Lake Catemaco, VIII–8–16–1960, H. F. Howden; Lake Catemaco, V–1–3–1969, D. E. Bright; Lake Catemaco, IV–30–1969, V–1–2–1969, Bright and Campbell; Comospan Falls, 14–VII–63, Ackerman and Whitehead; Cordoba, Dr. A. Fenyes; Cordoba, 15–6, May 11, 08, F. Knab; Cordoba, VIII–13–1964, Paul J. Spangler; Coyame, Lake Catemaco, 1–15–VII–63, D. R. Whitehead; Fortin de las Flores, 26–30–VI–63, D. R. Whitehead; Orizales, 1–10–IV; St. Lucrecia, F. Knab; Tuxpango, Dobzhansky. (AMNH) (CAS) (CM) (CNC) (MCZ) (MNHUB) (USNM) (ZSBS).

Epilachna pocohantae, new species

(Figs. 784–786; map 27)

Male.—Length 7.88 mm., width 6.40 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color brownish red; epipleuron, mouthparts, antenna, and legs yellowish brown; elytron brownish red with no markings. Punctation on elytron not dual, punctures separated by their diameter or less. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum weakly, broadly emarginate. Genitalia as described for *discincta* except basal lobe not thickened before apex, upper and lower margins parallel (figs. 784, 785); sipho with curve before apex slightly less abrupt than in *discinta* (fig. 786).

Female.—Similar to male, abdomen and genitalia as described for *borealis*.

Variation.—Length 7–9.95 mm., width 5.80–8.66 mm.

Holotype.—Male. COSTA RICA: *Cartago:* Turrialba, 2–VIII–46, R. Perez A., Interam. Inst. Agri. Sciences 70 (USNM 71673).

Allotype.—Female. COSTA RICA: *Cartago:* Turrialba, 19 June 1951. O. L. Cartwright (USNM).

Paratypes.—Total 61. On bananas from Central America., P. Howard. S. Cruz., 9–VIII–53, Porrillo, Salazar. COSTA RICA: *Alajuela:* San Carlos, Schild and Burdgorf. *Cartago:* Same data as holotype; same data as allotype; Costa Rica, 3–III–28, 1–VII–33, F. Nevermann, an Gebusch; Turrialba, Schild and Burgdorf; Turrialba, 19–XI–1953. *Limon:* Batan. 16 June 1951, O. L. Cartwright; Estrella 15–IV–1960, J. Saenz L.; Philadelphia, Banana R., F. Knab; Port Limon, 30–9–05, F. Knab. GUATEMALA: "Guatemala." *Escuintla:* San Jose, May '43, D. G. Hall; San Jose, 6–8, F. Knab. *Santa Rosa:* Guazacapan, 11–VIII–52, R. H. Painter. *Suchitepequez:* Finca El Cipres, 3000 ft., June 1926, J. R. Slevin; Rio Bravo, 500 ft., VI–28–47, C. and P. Vaurie; Tiquisate, 200 ft., VI–27–1947, C. and P. Vaurie; Variedades, 500 ft., VII–3–47, VIII–27–47, VII–17–59, C. and P. Vaurie. EL SALVADOR: *San Salvador:* San Salvador, Aug. 7, '58, J. R. Munguia. *Sonate:* Izalco, 21–8, F. Knab. MEXICO: On bananas, 2–1–29, Rail. *Nayarit:* 14 mi. E. San Blas, Oct. 8, 1950, Ray F. Smith; 3 mi. N. W. Las Varas, Nov. 11, 1950, Ray F. Smith; 4 mi. S. Las Varas, XI–9–1950, Ray F. Smith; Ruiz, Jan. 7, 1930, Stromberg; Santiago, Esq., Feb. 1923, W. M. Mann. 24 mi. S. E. Tepic, VIII–16–60, D. C. Rentz; Tuxpan, 11–29–21, A. W. Morrill. PANAMA: *Bocas del Toro:* Bocas del Toro, July 1, 1908, W. Robinson. (AMNH) (CAS) (USNM).

Discussion.—This species is the only known member of the *borealis* group completely devoid of elytral maculation. The male genitalia are close to those of *discincta*, but since no intergrades have been observed, they are here considered to be two distinct species.

Epilachna boraustralis, new species

(Figs. 275, 787–789; map 28)

Male.—Length 7.05 mm., width 5.87 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color brownish red; mouthparts, antenna, propleuron, epipleuron, and legs yellowish brown; elytron brownish red with seven black spots arranged as in *borealis* (fig. 275); pronotum with four black spots as in *borealis*. Punctation on elytron not dual, punctures separated by their diameter or less. Surface of elytron finely alutaceous and reticulate. Pubescence grayish white, not dark on elytral spots. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum broadly, weakly emarginate. Genitalia with basal lobe as described for *discinta* (figs. 787, 788); sipho slender with curve before apex pronounced, orifice dorsal, subterminal, nearly round and not elongate as in *discinta* (fig. 789).

Female.—Similar to male, abdomen and genitalia as described for *borealis*.

Variation.—Length 6.90–9.30 mm., width 5.50–7.29 mm. In some specimens median pronotal spots are fused; also tendency for elytral spots to coalesce in a few individuals.

Holotype.—Male. ECUADOR: *Los Rios:* Pichilingue, 40 m., II–2–55, E. I. Schlinger and E. S. Ross collectors (CAS).

Allotype.—Female. ECUADOR: *Pichincha:* 1 mi. W. Santo Domingo de los Colorados, II–23–55, E. I. Schlinger and E. S. Ross collectors (CAS).

Paratypes.—Total 19. ECUADOR: Same data as holotype; same data as allotype, ex. Ecuador, quarantine; ex. Ecuador, New Orleans. CHILE: ex. Chile, quarantine. (CAS) (USNM).

Other Specimens Examined.—Total eight. COLOMBIA: *Antioquia:* Pto. Berrio, VIII–12–38, Henry S. Dybas. *Cauca:* Pto. Araujo, Aug. 1945, F. Gallego; Magdalena Sevilla, 23–IX–35. ECUADOR: *Chimborazo:* Bucay, Dr. Ohaus. *Loja:* "Loja." *Los Rios:* Pichilingue, 40 m., II–2–55, E. I. Schlinger and E. S. Ross; Quevedo; Quevedo, Har. Ana Maria. VENEZUELA: *Aragua:* Paraiso, V–22, coll. by L. R. Reynolds. *Distrito Federale:* Caracas Valley, V–6–22, L. R. Reynolds. *Mirando:* El Valle, VI–22, coll. by L. R. Reynolds; Santa Lucia, V–14–22, L. R. Reynolds. (BMNH) (CAS) (MNHUB) (USNM).

Discussion.—This species superficially resembles *paenulata* both in external appearance and in the shape of the sipho of the male genitalia. The elongate elytral spots are much as in the form of *tredecimnotata,* called *simillima* by Crotch, but the sipho is slender and strongly curved, unlike the stout, short sipho found in *tredecimnotata.* In some ways *borealis* could be considered to be an intermediate species between *paenulata* and *tredecimnotata.*

Epilachna kraussi, new species

(Figs. 276, 790–792, 1627–1630; map 28)

Male.—Length 9.45 mm., width 7.90 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron broadly explanate in basal one-half, rounded from humeral angle to apex. Color brownish yellow; pronotum with two lateral spots and one median black spot, median spot extending from base to apex; metasternum and median area of abdominal sterna piceous; elytron black with margins pale, basal margin narrowly reddish brown, broadly reflexed lateral margin and apical margin yellow (fig. 276). Punctation on elytron not dual, punctures separated by their diameter or less. Surface of elytron finely alutaceous. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, triangularly notched; sixth tergum broadly, weakly emarginate. Genitalia of the *borealis* type with basal lobe angled downward past midpoint, then broadly curved upward to apex (figs. 790, 791); sipho with orifice dorsal, well back of apex (fig. 792).

Female.—Similar to male except pronotum with only trace of median basal spot; basal pale margin of elytron broadened from callus to suture. Hind margin of fifth abdominal sternum convex medially; sixth sternum with hind margin feebly emarginate (fig. 1627); sixth tergum nearly truncate (fig. 1628). Genitalia with 10th tergum truncate, broad median area lacking pigmentation (fig. 1629); genital plate with anterior angles rounded, posterolateral angle abrupt, median margin notched (fig. 1630).

Variation.—Length 9.45–11 mm., width 7.90–8.90 mm.

Holotype.—Male. PANAMA: *Cocle:* El Valle, XI–1946, N. H. L. Krauss (USNM 71674).

Allotype.—Female. Same data as holotype (USNM).

Other Specimens.—COLOMBIA: *Boyaca:* Carare, 5–VII–'39, L. Richter, Murillo. *Meta:* Rio Guayuriba, Dec. 1946, L. Richter coll. (AMNH) (USNM).

Discussion.—*E. kraussi* is a member of the *borealis* group and has the same basic type of genitalia. The following characters appear to be diagnostic: Broadly explanate margin of elytron, black elytron completely bordered with yellow; genitalia with basal lobe long, angled downward to midpoint, sipho with orifice well back from apex; female with sixth tergum truncate, genital plate with inner margin distinctly notched. The two specimens from Colombia may not belong to the species described here although they agree in nearly all respects.

Epilachna paenulata (Germar)

(Figs. 277–278, 793–795, 1631–1634; map 28)

Coccinella paenulata Germar, 1824, p. 618.
Epilachna paenulata: Mulsant, 1850, p. 823.—Crotch, 1874, p. 63.—Weise, 1895, p. 123.—Weise, 1910, p. 56 (*Solanophila*).—Korschefsky, 1931, p. 64.—Hayward, 1942, p. 15.—Bosq, 1943, p. 20.—Blackwelder, 1945, p. 442.
Solanophila paenulata var. *ustulata* Weise, 1898*c*, p. 236.
Epilachna paenulata var. *ustulata:* Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 7.50 mm., width 5.72 mm. Form elongate, oval, widest anterior to middle of elytron, lateral margin of elytron feebly explanate, gradually rounded from humeral angle to apex. Color black; pronotum with lateral margin an anterior angle broadly yellow; propleuron and epipleuron yellow; mouthparts piceous to yellow; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow with eight black spots, first three elongate in transverse row near base, inner spot touching suture, spots 4–6 less elongate, in transverse row at middle of elytron, spot 7 large, transverse, on apical one-third, spot 8 small, in apical angle (fig. 277). Punctation on elytron dual, small punctures separated by their diameter. Large punctures separated by one to four times their diameter. Surface of elytron distinctly reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum faintly emarginate. Genitalia with basal lobe of *borealis* type; long, slender, apex curved upward (figs. 793, 794); sipho with double curve, apex not hooked ventrally, orifice terminal (fig. 795).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum weakly emarginate (fig. 1631); sixth tergum feebly emarginate (fig. 1632). Genitalia with 10th tergum entire (fig. 1633); genital plate with all angles rounded, gradually narrowed from apex to base (fig. 1634).

Variation.—Length 6.75–8.78 mm., width 5.45–6.85 mm. Pronotum may have entire apical margin yellow, completely immaculate, or have central dark spot and lateral spot on each side connected along base. First row of three spots on elytron may be black with all other spots reddish brown, contrasting but little with the background (var. *ustulata*) (fig. 278).

Type Locality.—Argentina: Buenos Aires.

Type Depository.—Not known.

Discussion.—This is a common South American species and there is no doubt that this is indeed Germar's species although no type material has been seen. The eight elytral spots distinguish *paenulata* from other South American *Epilachna*. Hayward (*1942*) and Bosq (*1943*) record *paenulata* as feeding primarily on cucurbits. This is one of the few Neotropical *Epilachna* species recorded as being of some economic importance.

Specimens Examined.—Total 604. ARGENTINA: "Argentina"; "Argentinien"; Argentina, Packard. *Buenos Aires:* "Buenos Aires"; Buen. Aires, Beschke; Buenos Aires, J. Bosco; Buenos Aires, Dr. P. Frank, Korschefsky collection; Buenos Aires, Jan. 25; Buenos Aires, Jan. 22, G. L. Harrington; Buenos Aires, Sept. 4, 1922, D. S. Bullock; Buenos Aires, December 1925, G. L. Harrington; Isla Martin Garcia, 20–IV–37, M. Viana; Veronica, 21–II–44, J. M. Borg. *Cajamarca:* Andalgala, 1–45, Deguerre; El Alto, I–1951, L. J. Arganaras. *Cordoba:* "Cordoba", Cordoba, Capital, 13–IV–1955, A. Giorgetta; Cap. del Mon., VII–1957, A. Lutschel; Capilla d. Monte; Cordoba City, IV–15–1945; 5 mi. N. of Dean Funes, II–8–51, Ross and Michelbacher; Huerta Grande, 15–XI–1952, 25–II–10–III, 1953, 1–I–1955, 20–30–XI–1957, H. Foerster. *Entre Rios:* Concordia, K. J. Hayward. *Formosa:* Formosa, XI–1952, Daguene. *Jujuy:* El Quemado, III–V–'26, May '26, G. L. Harrington; Leon de Jujuy, under bark of Eucalyptus, V–7–27, V–10–27, M. Kisliuk; Talilequa, 13–II–1950, Monros and Willink. *La Rioja:* Velazco, La Esperanza, I–1944, F. Monros. *Mendoza:* Mendoza, 2–II–02, Jensen-Haarup. *Misiones:* Eldorado, IX–27–1964, A. Kovacs. *Presidente Peron:* Boas, Zelaya, VII–1958, Deguerre. *Salta:* General Ballivian, 1927–28, 1931, G. L. Harrington; Macueta, X–XI–33, W. C. Harrington; Metan, P. Dor., 50 km. S. Oran, 4–V–64, C. E. and E. S. Ross; Tablillas, XII–32–IX–33, W. C. Harrington; Tablillas, XII–

33–1, 1934, G. L. Harrington, *San Juan:* San Lucia, feeding on squash, III–1–27, M. Kisliuk. *Santiago del Estero:* Rio Santiago. *Tucuman:* Tucuman, A. H. Rosenfeld; Tucuman, II–23–1917, E. W. Rust; Tucuman, 10–II–25, G. F. Moznette; Tucuman, I–30–1929, XII–2–1929, II–14–1930, H. A. Jaynes; Tucuman, on squash, XI–15–1928, H. A. Jaynes; Quebrada, de los Sosa, 800 m., 30–IV–64, C. E. & E. S. Ross; Taji viejo, 10–I–1947, A. Brizuela. BOLIVIA: "Bolivia"; "Bolivier," Ehrhorn; Yhancaroinza Chuquia, April 1924, G. Harrington. *Chiquisaca:* Camatindi, 3–20–'22, 3–23–'22, Harrington; Tiguipa, Apr. 1922, Harrington. *Cochabamba:* Cochabamba, 1943, M. Cardenes; Cochabamba, alt. 2570 m., Hermono Julio; Cochabamba, on squash, 25–XII–1951, J. A. Munro; Mendoza. *La Paz:* Coroico, Staudinger, Korschefsky collection; Yungas de La Pas; Yungas de La Paz, 1000 m., H. Bolle, Casey bequest 1925; Yungas de La Paz, 1000 m., H. Rolle, Berlin, S. W. 11. *Santa Cruz:* Santa Cruz, 29–1–1956, G. Pinckert; Boyuibe, 1949, J. Daguerre; Charaqua, Jun. 22, Harrington. BRAZIL: "Brasl"; "Brasilien." *Mato Grosso:* Chapada, Apr.; Corumba, Apr. *Minas Gerais:* B. Horizonte, Oscar Monte. *Parana:* "Parana." *Rio Grande do Sul:* "Rio Grande do Sul"; Rio Grande do Sul, Staudinger, Korschefsky collection; Rio Grande do Sul, X–4–33, XI–1–33; Santa Cruz. *Santa Catarina:* Cauna, XII–1945; Cauna, III–1945, XII–1945, XII–1948, A. Maller; Lanca, Oct. 1944, A. Maller; Lanca, XII–1944, A. Maller; Mapa, March 1942, A. Maller; Rio Negrinde, XI–1925, A. Maller, Korschefsky collection; Rio Vermelho, XII–1945, A. Maller; Nova Teutonia, lat. 27–11 S, lon. 52–53 W., X–5–1948, X–7–1948, X–12–1948, X–14–1948, IX–20–1948, IX–24–1948, F. Plauman. *Sao Paulo:* S. Paulo, Camargo; S. Catarina, Camargo. COLOMBIA: Colombia, Korschefsky collection. ECUADOR: *Guayas:* Guayaquil, F. W. Goding. *Los Rios:* 31 mi. E. Quevedo, 1000 m., 11–6–1955, E. I. Schlinger and E. S. Ross. PARAGUAY: Paraguay, X–949, H. Forster. *Presidente Hayes:* Asuncion, Dec. PERU: *Ayacucho:* Huanta, 6–II–1954; nr. Huanta, 2100 m., II–47, W. Weyrauch; Huanta, on squash, III–8–51, Ross, Michelbacher and Schlinger; Huanta, Buenos Aires, III–8–51, Ross and Michelbacher; Rio Pampas (Hwy. 7), III–8–51, Ross and Michelbacher. *Cuzco:* Calca, nr. Cuzco, Jan. 18, 1923, D. S. Bullock. URUGUAY: *Canelones:* Montevideo, VII–'60; nr. Montevideo, I–25–39, P. A. Berry; Montevideo, to Salta, Mar. 6–14–'04, H. L. Parker. (AMNH) (CAS) (CM) (IML) (MCZ) (MNHUB) (USNM) (V) (ZSBS).

Epilachna cordula Group

E. cordula is the only member of this group. The mandible is of the *borealis* type. The large size, form, and color pattern combined with the simple male genitalia with almost straight basal lobe (fig. 797), long, slender sipho (fig. 798), and short, almost round female genital plate (fig. 1638) set *cordula* apart from any other *Epilachna* group. It is known only from Colombia.

In external appearance *cordula* would appear to belong to the *axillaris* group, whereas the male genitalia are similar to those of the *deuterea* group. The female genital plate bears a slight resemblance to that of the *azurea* type.

Description of Species in *Epilachna cordula* Group

Epilachna cordula (Weise)

(Figs. 279, 796–798, 1635–1638; map 29)

Solanophila cordula Weise, 1898c, p. 235.
Epilachna pictipennis ab. *cordula:* Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 8.75 mm., width 7.47 mm. Form broadly oval, widest at middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color piceous to black; pronotum with lateral margin broadly piceous, anterolateral angle paler; epipleuron with inner three-fourths yellow; elytron yellow with basal one-third and lateral margin black, three

black spots present, one joined to lateral margin at midpoint, second spot joined to suture at midpoint forming with its counterpart on other elytron a heart-shaped spot, third spot free on apical one-third (fig. 279). Punctation on elytron not dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth tergum faintly, broadly emarginate. Genitalia with basal lobe slender, lower margin angled upward in apical one-third to blunt apex; paramere slightly curved downward (figs. 796, 797); sipho long, slender, apex slightly thickened, orifice dorsal, subterminal (fig. 798).

Female.—Similar to male except hind margin of sixth sternum weakly emarginate (fig. 1635); sixth tergum feebly emarginate (fig. 1636). Genitalia with 10th tergum lacking pigment medially (fig. 1637); genital plate nearly round, posterolateral angle slightly produced, stylus visible (fig. 1638).

Variation.—Length 8.75–9 mm., width 7.47–7.55 mm. Lateral, median spot and free apical spot on elytron are broadly united in one specimen observed.

Type Locality.—Colombia.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—This species resembles those centering around *pictipennis* and *cinctipennis* in elytral color pattern. Korschefsky (*1931*) placed *cordula* as an aberration of *pictipennis*. The male and female genitalia are not of the *pictipennis* type and the position of *cordula* within the genus is uncertain. Two specimens are in the type series. The first specimen, a female bearing the following labels, is designated as lectotype: "Columb Thieme" (green paper); "Epilachna cordula w." The second specimen is a male with the same data as the lectotype.

Specimens Examined.—Total four. COLOMBIA: Type series. *Cauca:* Cauca, K. E. Frick; Rio Cauca, Korschefsky collection. (CAS)(USNM).

Epilachna axillaris Group

Length approximately 9.50–13.50 mm. Mandible of *borealis* type. Color variable. Lateral margin of elytron usually rounded from humeral angle to apex; epipleuron of the *borealis* type. Male genitalia with basal lobe longer than paramere, strongly curved upward before apex (fig. 800); sipho robust, S-shaped, apex blunt, lacking ventral tooth, orifice with large, setigerous membrane visible (fig. 801). Female genital plate slightly elongate, stylus visible (fig. 1642). Known from Venezuela, Colombia, and Ecuador.

This group is obviously related to the *borealis* group, but the extremely large size of most of the species and the lack of a ventral tooth at the apex of the sipho distinguish the *axillaris* group. *E. praecipua* resembles somewhat the *mutabilis* group and may perhaps be considered an intermediate species between the two groups.

Key to Species of *Epilachna axillaris* Group

1. Elytron yellow, bordered with black, two black vittae present (fig. 292) . . . *nigrovittata* Crotch (p. 151)
   Elytron not as described above 2
2. Elytron bluish black with four elongate, yellow spots (fig. 291) . . . . . *praecipua*, n. sp. (p. 151)
   Elytron not as described above 3
3. Elytron black with transverse orange band anterior to middle (fig. 290) . . . *madida* Mulsant (p. 150)
   Elytron not as described above 4
4. Surface of elytron dull, densely microreticulate, bluish black with three transverse orange bands (fig. 285), or with median area orange with median bluish-black spot (fig. 286) . . . . . *fryii* Crotch (p. 149)
   Surface of elytron shining, not microreticulate, color pattern not as described above 5

5. Elytron orange, bordered with black, an oblique, transverse, median band and elongate projection across callus present (fig. 280) ..... *axillaris* Mulsant (p. 146)
   Elytron not as described above 6
6. Elytron orange, bordered with black, an elongate, black projection across callus present (fig. 281), or elongate projection continued to apical one-third, widest at apex (fig. 282) ... *stolata* Mulsant (p. 147)
   Elytron not as described above 7
7. Elytron yellow, triangular median spot, triangular anteromedian spot, elongate sutural spot from base nearly to middle, sutural spot on apical one-third and narrow lateral border black (fig. 283) ..... *radiata* (Guérin) (p. 147
   Elytron not as described above 8
8. Elytron yellow, large median spot, irregular sutural spot behind scutellum black, black lateral border with large projection over callus, small median projection and apical one-fifth black (fig. 284) ..... *pictipennis* Crotch (p. 148)
   Elytron not as described above 9
9. Elytron black with elongate yellow spot between callus and scutellum, transverse yellow band anterior to middle and obliquely transverse, yellow band on apical one-third (fig. 287) *cinctipennis* Crotch (p. 149)
   Elytron yellow or orange with narrow, black lateral and basal border, with transverse, anterior, and median black bands and incomplete posterior band (fig. 289), or with only anterior and median bands present ..... *madida* Mulsant (p. 150)

Descriptions of Species in *Epilachna axillaris* Group

Epilachna axillaris Mulsant

(Figs. 280, 799–801, 1639–1642; map 29)

Epilachna axillaris Mulsant, 1850, p. 55.—Crotch, 1874, p. 60.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Female.—Length 11.50 mm., width 9.60 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron distinctly explanate, rounded from humeral angle to apex. Color as described for *stolata* except for broad, black, oblique band extending from suture to lateral margin at about middle of elytron (fig. 280). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line nearly complete, distinct. Abdomen with hind margin of fifth sternum convex; sixth sternum weakly emarginate (fig. 1639); sixth tergum weakly emarginate (fig. 1640). Genitalia with 10th tergum broadly convex, lacking pigmentation medially (fig. 1641); genital plate with inner margin arcuate, outer margin sinuate, posterolateral angle not produced (fig. 1642).

Male.—Similar to female except abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum weakly notched. Genitalia as described for *stolata* except basal lobe more constricted in basal one-half in ventral view (figs. 799, 800); sipho with lower margin at apex abrupt, not rounded (fig. 801).

Type Locality.—Colombia (Perroud collect.) (probably Venezuela).

Type Depository.—Not known.

Discussion.—*E. axillaris* resembles *stolata*, but the difference in genitalia would seem to distinguish them. Superficially they are easily separated by the transverse band on the elytron of *axillaris*. Although no type material has been found, there is little doubt that this is the species Mulsant described as *axillaris*. The type was stated to be from Colombia, but the locality was almost certainly present-day Venezuela.

Specimens Examined.—Total 58. One, no data. VENEZUELA: "Colombia"; "Chevr."; "Chevr., D. E. Nadar"; "Venezuela"; coll. C. Felsche, Geschenk, 1907, Korschefsky collection; "Columbia." *Aragua:* Rancho Grande, 1–X–50, J. R. Labrador; Rancho Grande, 1–XI–50, 25–8–50, F. Fernandez Yepez; Rancho Grande, 13–V–51, 18–V–52, 18–VI–52, F. Fernandez Y.; Rancho Grande, 21–V–53, J. Gonzales; Rancho Grande, 25–V–53, C. R. Rosales; Rancho Grande, 27–VI–65, 26–VI–66, F. Romero; Rancho Grande, 1100 m., 5–X–48, F. Fernandez Y.; Rancho Grande nr. Maracay, 16–III–1946, 17–IV–1948; Rancho Grande nr. Maracay, V–13–1948, III–23– 1948; Maracay, 450 m., 4–V–51, P. Paredes. *Distrito Federale:* Barbula, 1460 m., 12–2–1964, Joly;

Caracas; n. Caracas; Caracas Valley, V–6–22, L. R. Reynolds; Rio Limon, Colonia Tovar, 9–V–59. (AMNH) (CAS) (UCCC) (USNM) (V) (ZSBS).

Epilachna stolata Mulsant

(Figs. 281–282, 802–804, 1643–1646; map 29)

Epilachna stolata Mulsant, 1850, p. 704.—Crotch, 1874, p. 59.
Epilachna scapularis Mulsant, 1850, p. 705.—Crotch, 1874, p. 59.
Epilachna scapularis ab. *stolata*: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Female.—Length 11 mm., width 8.90 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron distinctly explanate, rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; epipleuron with inner two-thirds yellow; mouthparts yellow to piceous; antenna with basal segment black; segments 2–8 yellow, 9–11 piceous; elytron brownish red, all margins black, black sutural margin narrow behind middle, widened toward apex, lateral black margin broad, wider than explanate part of elytron, short black vitta present extending from base across callus nearly to middle of elytron (fig. 281). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum weakly emarginate (fig. 1643); sixth tergum feebly emarginate (fig. 1644). Genitalia with 10th tergum truncate, lacking pigmentation medially (fig. 1645); genital plate with inner margin straight, outer margin feebly sinuate, posterolateral angle slightly produced (fig. 1646).

Male.—Similar to female except abdomen with hind margin truncate; sixth sternum notched; sixth tergum weakly emarginate. Genitalia with basal lobe slender, angled downward to middle, arcuately upward to apex; paramere sinuate, widened at apex (figs. 802, 803); sipho laterally flattened before apex, broadly notched on ventral margin before apex, orifice dorsal, subterminal (fig. 804).

Variation.—Length 9.60–11 mm., width 7.51–8.90 mm. Short black vitta on elytron may extend from base across callus to apical one-third of elytron gradually widened from base to apex, apex obliquely truncate (*scapularis*) (fig. 282).

Type Locality.—Of *stolata*, Colony Tavar (Salle); of *scapularis*, Caracas (Salle).

Type Depository.—Of *stolata*, UCCC; of *scapularis*, not known.

Discussion.—*E. stolata* has been treated as an aberration of *scapularis* by Korschefsky (*1931*) and Blackwelder (*1945*), but *stolata* has page priority. No males with the *stolata* type of color pattern have been examined, but the female genitalia are nearly identical with those of *scapularis*, and *scapularis* is treated here as simply a synonym of *stolata*. This species is closely related to *axillaris*, but it is slightly smaller on the average and the small genitalic differences appear to be consistent. The specimen labeled "Type" in the Crotch collection has the contents of the abdomen eaten away by dermestids and the other four specimens in the series are females. The type locality, Colony Tavar, is in present-day Venezuela. The type locality of *scapularis*, "environs of Caracas," is of course also in Venezuela. The specimen in the UCCC is labeled simply "Muls. Chev."

Specimens Examined.—Total eight. VENEZUELA: "Chevr."; "Chevr.," D. E. Nador; "Venezuela," coll. C. Felsche, Geschenk, 1907, Korschefsky collection. *Distrito Federale:* Caracas, Caracas Valley, V–6–22, L. R. Reynolds. (UCCC) (USNM).

Epilachna radiata (Guerin)

(Figs. 283, 1647–1650; map 29)

Coccinella (*Epilachna*) *radiata* Guérin, 1844, p. 318.
Epilachna radiata: Mulsant, 1850, p. 701.—Crotch, 1874, p. 60.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Female.—Length 11.10 mm., width 9 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron distinctly explanate, rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; epipleuron with inner two-thirds yellow; mouthparts yellow to piceous; antenna with basal segment black, seg-

ments 2–8 yellow, 9–11 piceous; elytron yellow with lateral margin and four spots black, spot 1 triangular, extending obliquely posterior to callus, spot 2 long, narrow, touching suture from base nearly to midpoint, spot 3 triangular, posterior to middle of elytron, spot 4 narrow, along suture in apical one-third, extending to lateral black margin (fig. 283). Punctation on elytron not dual, punctures separated by their diameter or less. Surface of elytron finely reticulate, alutaceous. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum faintly emarginate with longitudinal suture (fig. 1647); sixth tergum very faintly emarginate (fig. 1648). Genitalia with 10th tergum truncate (fig. 1649); genital plate with inner margin arcuate, outer margin sinuate, posterolateral angle produced, stylus near anterolateral angle (fig. 1650).

Male.—Not known.

Variation.—Length 9.50–11.15 mm., width 7.30–9.10 mm. Two narrow sutural spots may be narrowly connected along suture leaving elytron completely bordered with black except for basal margin.

Type Locality.—Colombia.

Type Depository.—UCCC.

Discussion.—All the specimens observed of this species have been females. The distinctive elytral color pattern and female genitalia make *radiata* an easily recognized species. The type specimen is a female in the Crotch collection labeled "Type radiata, col. Guerin."

Specimens Examined.—Total nine. Two, no data. COLOMBIA: "Colombia"; "Nova Grenada"; no data, "radiata Muls. Chev."; no data, ex. coll. F. Knab, 1917; Bogota, coll. Kirsch, Korschefsky collection; "Columb," Ost Cordill., Nov. 1910, 1500 m., Korschefsky collection. (CM) (UCCC) (USNM).

Epilachna pictipennis Crotch

(Figs. 284, 805–806, 1651–1654; map 29)

Epilachna pictipennis Crotch, 1874, p. 60.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 9.60 mm., width 7.95 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron distinctly explanate, rounded from humeral angle to apex. Color black; pronotum with anterolateral angle narrowly yellow; epipleuron with inner three-fourths yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellowish orange with lateral margin and four spots black, spot 1 joined to base and suture forming with its counterpart an inverted heart shape, spot 2 joined to base and lateral margin, elongate, covering callus, spot 3 on disk near suture but not touching suture, spot 4 in apical angle joined to suture and margin, black border of lateral margin abruptly widened adjacent to spot 3 (fig. 284). Punctation on elytron not dual, coarse, punctures separated by less than their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly, deeply emarginate. Genitalia with basal lobe angled downward for basal two-thirds, constricted medially, thickened and curved upward before apex, setae present on dorsal surface in basal one-third; paramere curved outward, widened before apex (fig. 805); sipho with double curve, constricted before apex, apex with small notch on ventral surface, orifice dorsal, terminal (fig. 806).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum weakly emarginate (fig. 1651); sixth tergum faintly emarginate (fig. 1652). Genitalia with 10th tergum broadly, feebly convex, pigment lacking in median area (fig. 1653); genital plate with inner margin nearly straight, outer margin sinuate, posterolateral angle slightly produced (fig. 1654).

Variation.—Length 9–9.60 mm., width 7.55–7.95 mm.

Type Locality.—New Grenada (Deyr.) (Colombia).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The material in the Crotch collection consists of the type (male) and four other specimens. This species is recognized by

the distinctive elytral color pattern as well as the male genitalia. The only species likely to be confused with it is *cordula*. See remarks under *cordula*.

Specimens Examined.—Total nine. COLOMBIA: Type series alt. d. L. Cruces, 2200 m. *Cauca:* "Cauca"; Cauca, Korschefsky collection. (CAS) (USNM).

Epilachna fryii Crotch

(Figs. 285–286, 807–808, 1655–1658; map 29)

Epilachna fryii Crotch, 1874, p. 61.—Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 10.43 mm., width 7.95 mm. Form oval, elongate, widest anterior to middle of elytra, lateral margin feebly rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron bluish black with three transverse, orange bands not touching sutural or lateral margin, anterior band behind callus nearly reaching scutellum, median band at center of elytron, posterior band on apical one-fourth (fig. 285). Punctation on elytron extremely fine, visible only under high magnification, not dual, punctures separated by their diameter or less. Surface of elytron dull, densely microreticulate. Pubescence grayish white. Postcoxal line complete, indistinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum weakly notched. Genitalia with basal lobe longer than paramere, nearly straight, abruptly curved upward at apex; paramere slender, not widened apically (fig. 807); sipho slender, with double curve, apex blunt, orifice dorsal, subterminal, with setigerous membrane (fig. 808).

Female.—Similar to male except abdomen with hind margin of fifth sternum feebly projecting medially; sixth sternum weakly notched, longitudinal suture present (fig. 1655); sixth tergum emarginate (fig. 1656). Genitalia with 10th tergum emarginate, median area lacking pigment (fig. 1657); genital plate narrowed toward base, all angles rounded, stylus visible (fig. 1658).

Variation.—Length 10.43–13.50 mm., width 7.95–9.05 mm. A member of type series has entire area between median and posterior bands on elytron orange with elongate, bluish-black spot on middle (fig. 286).

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The large size, elytron with punctures nearly invisible, and elytral color pattern distinguish *fryii*. The type in the Crotch collection is a female bearing the following labels: "Ecuad."; "TYPE fryii"; "TYPE" (blue paper).

Specimens Examined.—Total seven. ECUADOR: "Ecuad."; no data. *Santiago Zamora:* Macas, Korschefsky collection. (CAS) (UCCC) (USNM) (ZSBS).

Epilachna cinctipennis Crotch

(Figs. 287, 809–811, 1659–1662; map 30)

Epilachna cinctipennis Crotch, 1874, p. 60.—Korschefsky, 1931, p. 57.—Blackwelder, 1945, p. 441.

Male.—Length 10.80 mm., width 8 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron broadly explanate, rounded from humeral angle to apex. Color black; narrow anterolateral angle of pronotum and inner two-thirds of epipleuron yellow; mouthparts yellow to piceous; antenna with segments 1–8 yellow, 9–11 piceous; elytron black with three yellow areas, first area an elongate spot near base inside callus, second area a transverse band extending from suture nearly to lateral margin medially, third area an oblique band on apical one-third not reaching suture or margin (fig. 287). Punctation on elytron not dual, punctures separated by less than their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly, feebly emarginate. Genitalia with basal lobe angled downward to middle apical one-half broadly, strongly curved upward; paramere sinuate (figs. 809, 810); sipho short with double curve, apex widened, broadly notched ventrally, orifice dorsal, subterminal (fig. 811).

Female.—Similar to male except hind mar-

gin of fifth sternum convex; sixth sternum weakly emarginate (fig. 1659); sixth tergum entire, broadly convex (fig. 1660). Genitalia with 10th tergum weakly emarginate, lacking pigmentation medially (fig. 1661); genital plate with inner margin slightly curved, outer margin feebly sinuate, posterolateral angle slightly produced (fig. 1662).

Variation.—Length 10.50–12.10 mm., width 7.80–9.75 mm. Transverse and oblique bands on elytron are wider in some specimens than others, but pattern is constant in all specimens examined.

Type Locality.—Venezuela.

Type Depository.—UCCC (lectotype here designated).

Discussion.—This is another of the large species related to *stolata* and *radiata*. As in most members of the group, *cinctipennis* apparently may be recognized by the elytral color pattern, as well as genitalia.

Specimens Examined.—Total 25. VENEZUELA: *Merida:* "Merida"; Merida, W. Robinson; Carbonera, 22–11–1964, J. and B. Bechyna. (AMNH) (CAS) (UCCC) (USNM) (V) (ZSBS).

Epilachna madida Mulsant

(Figs. 288–290, 812–814, 1663–1666; map 30)

Epilachna madida Mulsant, 1850, p. 710.—Crotch, 1874, p. 61.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Epilachna nigrofasciata Mulsant, 1853, p. 105.—Crotch, 1874, p. 61 (as a synonym of *madida*).—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Female.—Length 11.10 mm., width 9.05 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; epipleuron with inner two-thirds yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron red with lateral margin, two transverse bands and apical spot black, first band extending from humeral angle irregularly to suture, narrow medially and extending to base along suture, second band extending from lateral margin to suture behind middle of elytron, bands narrowly connected along suture, apical spot free on apical two-thirds of elytron (fig. 288). Punctation on elytron not dual, fine, dense, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum emarginate medially with longitudinal suture (fig. 1663); sixth tergum feebly emarginate (fig. 1664). Genitalia with 10th tergum truncate, lacking pigmentation medially (fig. 1665); genital plate with inner margin notched, lateral margin sinuate, posterior margin rounded (fig. 1666).

Male.—Similar to female except hind margin of sixth abdominal sternum notched; sixth tergum emarginate. Genitalia of *stolata* type; basal lobe abruptly bent upward before apex; paramere narrowed toward apex (figs. 812, 813); sipho with double curve, orifice dorsal, subterminal (fig. 814).

Variation.—Length 9.50–12.10 mm., width 7.68–9.51 mm. Elytral color pattern in *madida* is highly variable. Pattern ranges from a form with single anterior red band on a black background on each elytron (fig. 290) to form in which elytron is yellowish orange with margin and two transverse bands black (fig. 289). Nearly all degrees of variation have been observed between these two extremes.

Type Locality.—Of *madida*, Colombia (Salle); of *nigrofasciata*, Colombia (Perroud).

Type Depository.—Not known.

Discussion.—In spite of the degree of variability in dorsal color pattern, most specimens of *madida* may be distinguished by color alone. The male genitalia are also distinctive.

Specimens Examined.—Total 63. VENEZUELA: "Columbien." *Aragua:* Guacatal, 10° 27 N., 67° 19 0., L. J. Joly T1; Guacatal, 1500 m., 10° 27 N., 67° 160., A. J. Perez and G. York; Las Trincheras, VI–21–22, L. R. Reynolds; Rancho Grande, 28–VIII–67. A. Andata; Rancho Grande, 27–XI–48, 7–V–54, 24–V–55, 5–VI–58, F. Fernandez Y.; Rancho Grande, 1100 m., 29–VII–49; F. Fernandez Y. and P. Fenjves; Rancho Grande, 4–III–68, M. Gellez and L. Roonguez V.; Rancho Grande, 14–VIII–49, 6–II–54, Fred Kern; Rancho Grande, 12–II–1951, 11–V–52, 9–VI–53, 19–X–

53, J. Roguena; Rancho Grande, 1600 m., 4–VIII–52, J. Roguena; Rancho Grande, 6–10–48, 21–IX–55, 24–X–64, 13–II–1965, VI–19–65, 11–IV–66, 21–V–66, F. Romero, Rancho Grande, 20–VI–52, F. Rondon; Rancho Grande, 25–V–50, 9–X–50, 15–XII–50, 1–X–50, 3–V–51, Luis A. Sales; Rancho Grande, 18–VI–52, 31–VII–52, 3–V–51, Luis A. Sales, Rancho Grande, 1100 m., Nov. 27, '67, G. I. Stage; Rancho Grande nr. Maracay, VI–30–1948, VI–29–1948, VII–17–1948, VI–9–1948. (AMNH) (USNM) (V) (ZSBS).

Epilachna praecipua, new species

(Figs. 291, 815–816; map 30)

Male.—Length 9.87 mm., width 7.33 mm. Form elongate, oval, widest at middle of elytra. Lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with segments 1–8 yellow, 8–11 piceous; triangular area on frons and broad anterolateral angle of pronotum yellow; propleuron and basal one-fourth of epipleuron yellow; anterior trochanter and femora entirely yellow, middle trochanter and basal one-half of middle femora yellow, posterior trochanter and basal one-fourth of posterior femora yellow; elytron bluish black with four elongate yellow spots, first spot between callus and lateral margin, second spot between callus and scutellum, third spot on apical one-third near lateral margin, fourth spot posterior to middle near suture (fig. 291). Punctation on elytron dual, small punctures separated by their diameter or less. Surface of elytron strongly reticulate. Pubescence grayish white. Postcoxal line incomplete, indistinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum strongly notched; sixth tergum feebly, broadly emarginate. Genitalia with basal lobe longer than paramere, angled downward from base to middle, strongly, abruptly bent upward from middle to apex, apex pointed; paramere slender, slightly sinuate, not widened apically (fig. 815); sipho robust with double curve, apex blunt, orifice dorsal, elongate, with setigerous membrane visible (fig. 816).

Female.—Not known.

Holotype.—Male. Ecuador: *Santiago Zamora:* Macas, Nunenmacher collection (CAS).

Discussion.—This is a large, distinctively marked species, not closely resembling any other species of *Epilachna*. The elytral color pattern and bicolored legs distinguish it from other members of the group.

Epilachna nigrovittata Crotch

(Figs. 292, 817–819; map 30)

Epilachna nigrovittata Crotch, 1874, p. 60.—Weise, 1898*b*, p. 235.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 8.50 mm., width 7.10 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron feebly curved from humeral angle to apex. Color black; anterolateral angle of pronotum and epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, bordered with black, two broad black vittae present, outer vitta extending from base at callus parallel to lateral margin and ending at suture, inner vitta parallel to suture, not touching base and ending at apical one-third (fig. 292). Punctation on elytron not dual, fine, punctures separated by their diameter or less. Surface of elytron distinctly reticulate. Pubescence yellowish brown. Tarsal claw lacking basal angulation. Postcoxal line distinct, incomplete, extending two-thirds distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched medially; sixth tergum broadly emarginate medially. Genitalia with basal lobe longer than paramere, angled downward toward middle, apical one-half strongly, abruptly bent upward to point; paramere widened and curved upward apically (figs. 817, 818); sipho strongly double curved, apex thickened, lower margin angulate, orifice dorsal, subterminal (fig. 819).

Female.—Not known.

Type Locality.—Ecuador (Buckley).

Type Depository.—UCCC.

Discussion.—In spite of an external resemblance to *propinqua* and *basalis*, the male genitalia indicate a close relationship to

members of the *axillaris* group. The unique type, a male, bears the following labels: "Type nigrovittata"; "Ecuad."; "TYPE" (blue paper).

Specimens Examined.—Total three. ECUADOR: "Ecuad." *Tunguraha:* Ambato, Equateur, ex. coll. Lethierry, Korschefsky collection. (UCCC) (USNM).

Epilachna mutabilis Group

Length approximately 6.65–12.25 mm. Mandible of *borealis* type. Color variable. Lateral margin of elytron usually rounded from humeral angle to apex; epipleuron slightly wider anterior to middle than *borealis* type. Male genitalia with basal lobe longer than paramere, thickened, and abruptly bent upward before apex (fig. 820); sipho S-shaped, apex blunt, orifice without setigerous membrane (fig. 821). Female genital plate elongate, stylus visible (fig. 1670). Known from Ecuador, Peru, and Bolivia with one species found only in coastal Brazil.

This group is very much like the *axillaris* group, but the sipho of the male genitalia lacks the setigerous membrane found in members of the *axillaris* group.

Key to Species of *Epilachna mutabilis* Group

1. Elytron yellowish brown to dark brown (fig. 297), often with black lateral and basal border (fig. 296); punctation of elytron not dual ..... *pastica* (Weise) (p. 154)
   Elytron not as described above, punctation usually dual 2
2. Elytron black with yellow lateral border (fig. 298) ..... *pseudostriata*, n. sp. (p. 155)
   Elytron not as described above 3
3. Elytron vittate 4
   Elytron not vittate 5
4. Lateral margin of elytron black (fig. 299) ..... *propinqua* (Weise) (p. 155)
   Lateral margin of elytron yellow or orange (fig. 300) ..... *callangae*, n. name (p. 156)
5. Elytron with black scutellar spot, completely bordered with yellow, disk brownish yellow (fig. 301), or brown with pale spot behind middle (fig. 302), or entirely black (fig. 303) *clandestina* Mulsant (p. 157)
   Elytron not as described above 6
6. Male genitalia with apex of sipho abruptly bent upward in apical one-fifth, nearly vertical (fig. 823); known only from Peru (Huanuco: Pachitea) ..... *pachiteensis* (Weise) (p. 153)
   Male genitalia with apex of sipho gently curved upward, not vertical in apical one-fifth (fig. 821); known from Ecuador and Peru (Junin: Chanchamayo) ..... *mutabilis* Crotch (p. 152)

Descriptions of Species in *Epilachna mutabilis* Group

Epilachna mutabilis Crotch

(Figs. 293–294, 820–821, 1667–1670; map 30)

Epilachna mutabilis Crotch, 1874, pp. 60–61.—Kirsch, 1883, p. 213.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 9.33 mm., width 7 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron feebly rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterolateral angle of pronotum broadly brownish yellow; anterior angle of propleuron and inner one-half of epipleuron brownish piceous to yellow; elytron black with three brownish-yellow spots, anterolateral spot long, narrow, parallel to lateral margin outside callus, anteromedian spot elongate, extending from near base nearly to middle, posterior spot occupying most of posterior one-half, nearly divided by extension of lateral black border (fig. 293). Punctation on elytron indistinctly dual, small punctures not much smaller than large punctures, separated by their diameter or less, large punctures separated by less than to three times their diameter. Surface of elytron feebly shining, finely reticulate. Pubescence grayish white. Postcoxal line incomplete, indistinct,

extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, lower margin "pinched" in basal one-third, apex abruptly curved upward, bluntly pointed; paramere widened at apex (fig. 820); sipho with double curve, gently curved upward to apex in apical one-third, orifice terminal (fig. 821).

Female.—Similar to male except abdomen with hind margin of sixth sternum notched, longitudinal suture present (fig. 1667); sixth tergum barely perceptibly emarginate (fig. 1668). Genitalia with 10th tergum convex, lacking pigment medially (fig. 1669); genital plate narrowed toward base, inner margin emarginate medially, basal margin notched, anterior angles rounded, stylus visible (fig. 1670).

Variation.—Length 9.33–11.81 mm., width 7–9.05 mm. Anterolateral angle of pronotum is broadly, brightly yellow in specimens from Chanchamayo. Elytral color pattern varies from that described here to one in which anterolateral spot is narrowly continuous with posterior spot and black extension very nearly touches suture on posterior one-fifth (fig. 294); these are specimens from Chanchamayo, which also have elytral surface strongly shining, feebly reticulate.

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The specimens from Chanchamayo are not quite like the specimens from Ecuador as indicated under Variation. The geographic separation is great and possibly these specimens represent yet another species. The male genitalia are nearly identical in specimens from Ecuador and Chanchamayo and because of this and the basically similar color pattern, the specimens from Chanchamayo are here considered to be *mutabilis*. The elytral color pattern should distinguish *mutabilis* from related species except *pachiteensis*. See remarks under *pachiteensis*. *E. mutabilis* is represented by 12 specimens in the Crotch collection, one of which is *pastica* Weise; the 12th specimen (the type) bears only a "TYPE" label with no locality data.

Specimens Examined.—Total 14. ECUADOR: "Equateur," Korschefsky collection. *Napo Pastaza:* Sara-yacu, R. Haensch S., Korschefsky collection. *Tungurahua:* Ambato. PERU: *Junin:* Chanchamayo, XI–13 1961, J. Schunke; Utcuyacu, Tarma, 1600–3000 m., Mar. 16, 1948, F. Woytkowski. (AMNH) (PM) (USNM).

Epilachna pachiteensis (Weise)

(Figs. 295, 822–823, 1671–1674; map 30)

Solanophila pachiteensis Weise, 1926, p. 3.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 11.76 mm., width 9 mm. Description as for *mutabilis* except differences as noted here. Pronotum with anterolateral angle broadly yellow. Elytron with four yellow spots, anterolateral spot narrow, extending from base anterior to callus along lateral margin to apical one-third, anteromedian spot elongate, oval, extending from base between scutellum and callus to middle, third spot behind middle near suture, fourth spot small, triangular, in apical angle (fig. 295). Genitalia with basal lobe much longer than paramere, widened in apical one-half, broadly, strongly curved upward to bluntly pointed apex, lower margin lacking "pinched" area; paramere nearly straight, feebly widened at apex (fig. 822); sipho with double curve, straight and nearly paralled-sided in median one-third, apical one-third strongly curved, U-shaped, orifice terminal, slightly ventral (fig. 823).

Female.—Similar to male except abdomen with hind margin of sixth sternum broadly notched, longitudinal suture present (fig. 1671); sixth tergum barely perceptibly emarginate (fig. 1672). Genitalia with 10th tergum convex, feebly emarginate, lacking pigment medially (fig. 1673); genital plate narrowed posteriorly, inner margin emarginate medially, posterior margin notched, stylus visible (fig. 1674).

Variation.—Length 11.76–12.10 mm., width 9–10.10 mm. Color pattern varies from that described here to pattern illustrated for typical *mutabilis*.

Type Locality.—Peru: Pachitea.

Type Depository.—NREA.

Discussion.—The females of *pachiteensis* are nearly impossible to distinguish from females of *mutabilis*, but the male genitalia, especially the sipho, are quite different in the two species. The type of *pachiteensis* is a unique female in the Stockholm collection bearing the following labels: "Pachitea, Peru"; "pachiteensis, ws."; "TYPUS" (red paper); "240, 70" (pink paper); "Riksmuseum, Stockholm" (green paper). This type specimen is not distinguishable from *mutabilis*, but in the Korschefsky collection is a male from *pachitea* which is described here. This specimen might have been part of the original material seen by Weise although it is not possible to say for sure. In view of the locality and obviously similar appearance, the male from *pachitea* is here considered to be *pachiteensis* and as such, specifically distinct from *mutabilis*.

Specimens Examined.—Total three. PERU: *Huanuco:* Pachitea; Pachitea, Korschefsky collection. (NREA) (PM) (USNM).

Epilachna pastica (Weise)

(Figs. 296–297, 824–826, 1675–1678; map 31)

Solanophila pastica Weise, 1902, pp. 165–166.
Epilachna pastica: Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.
Solanophila gibbula Weise, 1902, p. 166. NEW SYNONYMY.
Epilachna gibbula: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 10.30 mm., width 8.45 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; broad anterolateral angle of pronotum, most of propleuron and inner two-thirds of epipleuron yellow; mouthparts yellow to piceous; basal segment of antenna black, segments 2–8 yellow, 9–11 piceous; elytron reddish brown bordered with black, lateral black margin occupying one-third of elytron, basal black margin broad, extending well past scutellum, sutural margin narrow (fig. 296). Punctation on elytron not noticeably dual, fine, dense, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum weakly emarginate. Genitalia with basal lobe suddenly thickened before apex, abruptly bent upward to apex; paramere short, not widened at apex (figs. 824, 825); sipho abruptly bent upward toward apex, orifice dorsal, subterminal (fig. 826).

Female.—Similar to male except hind margin of fifth sternum convex; sixth sternum emarginate (fig. 1675); sixth tergum entire, broadly convex (fig. 1676). Genitalia with 10th tergum convex (fig. 1677); genital plate with inner margin notched, outer margin sinuate, posterior margin rounded, posterolateral angle slightly produced (fig. 1678).

Variation.—Length 9.75–11.80 mm., width 7.66–9 mm. Lateral pronotal spot may occupy apical one-third of lateral margin or extend to basal margin. Elytron may have lateral black border confined to explanate margin and basal black border entirely absent (*gibbula*) (fig. 297).

Type Locality.—Of *pastica*, Peru; of *gibbula*, Bolivia: San Antonio, Chaco (Staudinger).

Type Depository.—Of *pastica*, not known; of *gibbula*, Korschefsky collection, USNM (lectotype here designated).

Discussion.—None of Weise's type material of *pastica* could be located in the MNHUB, but his description leaves little doubt as to what species he had. A single female from Weise's type series of *gibbula* is preserved in the Korschefsky collection. No other specimens have been located. The female specimen in the Korschefsky collection (USNM) bearing the following labels is here designated as the lectotype: "Bolivia, Staudinger" (green paper); "coll. Weise"; "Typus" (red paper). Several specimens from the Weise collection are in the Korschefsky collection and this specimen is here accepted as being one of the original type series. A better choice for the lectotype would be one of the series labeled "San Antonio, Chaco" if such a specimen exists. *E. gibbula* differs from *pastica* only in the elytral color pattern as described here.

Specimens Examined.—Total 42. BOLIVIA: *Cochabamba:* San Antonio; San Antonio Rd., VIII–4–1951, G. H. Dieke. *La Paz:* Chuani, V–19–25, G. L. Harrington; Incachaca, alt. 2500 m., March 1921, J. Steinbach; Yungas de La Paz; Yungas de La Paz, Heyne V.; Yungas de La Paz, 1000 m., H. Rolle. PERU: *Cuzco*: Callanga; Callanga, II, 10–III, 17, 1953, Woytkowski; Quincemil, April 15, 1947, elev. 2400 ft., J. C. Pallister. (AMNH) (CAS) (CM) (MCZ) (MNHUB) (USNM).

Epilachna pseudostriata, new species

(Figs. 298, 827–829, 1679–1682; map 31)

Male.—Length 9.75 mm., width 7.60 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; broad anterolateral angle of pronotum, most of propleuron and entire epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron with lateral margin yellow (fig. 298). Punctation on elytron dual, indistinct, fine punctures separated by less than their diameter, large punctures separated by one to three times their diameter. Surface of elytron strongly alutaceous, rugose. Pubescence dense, grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum weakly emarginate. Genitalia of the *pastica* type; basal lobe not as abruptly bent upward as in *pastica*; paramere sinuate (figs. 827, 828); sipho as in *pastica* but more robust (fig. 829).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex; sixth sternum broadly, weakly emarginate (fig. 1679); sixth tergum entire, broadly convex with longitudinal suture (fig. 1680). Genitalia with 10th tergum weakly emarginate, lacking pigmentation medially (fig. 1681); genital plate notched on inner margin, outer margin sinuate, posterolateral angle slightly produced (fig. 1682).

Variation.—Length 9.75–13.10 mm., width 7.60–9.90 mm. Lateral margin of elytron ranges from pale yellow to reddish yellow.

Holotype.—Male. PERU: *Cuzco:* Pampaconas R., Aug., 1911, Yale Peruv. Exp. (USNM 71675).

Allotype.—Female. PERU: *Cuzco:* Callanga, 1300 m., II,10–III,17,1953, Woytkowski (USNM).

Paratypes.—Total six. PERU: Same data as holotype; same data as allotype. (USNM).

Discussion.—The combination of large size, black elytron with yellow lateral border, and rugose sculpture on the elytron make this an easily recognizable species. The genitalia indicate a close relationship to *pastica* although they appear quite different externally.

Epilachna propinqua (Weise)

(Figs. 299, 830–832, 1683–1686; map 31)

Solanophila propinqua Weise, 1899, p. 266.
Epilachna propinqua: Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 9.68 mm., width 7.75 mm. Form elongate, oval, widest anterior to middle of elytron, lateral margin of elytron rounded from humeral angle to apex. Color black; V-shaped area on frons, lateral margin and narrow anterior margin of pronotum, entire propleuron, inner two-thirds of epipleuron, and anterolateral angle of first sternum yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron reddish brown completely bordered with black and with three black vittae, first vitta beginning at scutellum extending to apical one-third parallel to suture, second vitta beginning at inner margin of callus extending slightly obliquely inward to apical one-third, nearly touching first vitta, third vitta extending from base, across callus parallel to lateral margin, ending just before touching suture at apex (fig. 299). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron strongly alutaceous. Pubescence grayish white. Postcoxal line incomplete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum weakly emarginate. Genitalia with basal lobe as described for *pastica*, apical one-third not

as abruptly bent upward; paramere strongly sinuate, widened apically (figs. 830, 831); sipho long, slender with double curve, orifice terminal (fig. 832).

Female.—Similar to male except hind margin of sixth sternum broadly notched, with longitudinal suture (fig. 1683); sixth tergum entire, broadly convex (fig. 1684). Genitalia with 10th tergum convex, pigmentation nearly complete (fig. 1685); genital plate slightly notched on inner margin, outer margin strongly sinuate, posterolateral angle slightly produced (fig. 1686).

Variation.—Length 9.50–11.10 mm., width 7.10–9 mm. First vitta on elytron may be entirely free, basal end not touching scutellum, second vitta may also be free, basal end not reaching callus, and all vittae are subject to some variation in width.

Type Locality.—Peru: Callanga.

Type Depository.—Not known.

Discussion.—None of Weise's type material could be located, but there is little doubt that the species described here is *propinqua*. A specimen in the Korschefsky collection bears the label "R. Korschefsky cum type comp."

Specimens Examined.—Total 17. PERU: *Junin:* Chanchamayo, La Merced, Carl O. Schunke; Chanchamayo, IX–30–1961, X–11–1961, alt. 1200 m., XI–20–1961, J. Schunke; Quiroz, coll. by Woytkowski; Chanchamayo, Staudinger and Bang-Hass dedit, Korschefsky collection; Chanchamayo, B. Schwarser, R. Korschefsky cum type. comp., Korschefsky collection; Valle Chanchamayo, 800 m., IV–1941, 1–II–1953, leg. Weyrauch. (USNM).

Epilachna callangae, new name

(Figs. 300, 833–835, 1687–1690; map 31)

Solanophila vittigera Weise, 1899, pp. 264–265; (not *vittigera* Crotch, 1874).

Epilachna vittigera: Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 9.70 mm., width 7.65 mm. Form elongate, widest at middle of elytra, lateral margin of elytron straight medially, rounded at humeral and apical angles. Color black; anterolateral angle of pronotum, propleuron except narrow lateral margin, and base of anterior trochanter yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellowish orange with narrow basal and sutural margins and four vittae black, lateral margin pale yellow, sutural vitta short, not touching base and extending slightly beyond middle, second vitta extending from inner margin of callus to apical one-eighth where it joins third vitta, third vitta extending from near base across callus to apical one-eighth, fourth vitta close to explanate margin, extending from midpoint posteriorly to suture, touching margin of elytron near suture (fig. 300). Punctation on elytron not dual, punctures fine, separated by one to two times their diameter. Surface of elytron strongly alutaceous, alutaceous sculpture obscuring punctures. Pubescence yellowish white. Postcoxal line indistinct, incomplete, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly emarginate. Genitalia of the *nigrovittata* type, apical part of basal lobe not as strongly bent upward; paramere more slender, elongate (figs. 833, 834); sipho as in *nigrovittata* except apex not angulate, orifice terminal (fig. 835).

Female.—Similar to male except abdomen with hind margin of sixth sternum emarginate, longitudinal suture present (fig. 1687); sixth tergum feebly emarginate (fig. 1688). Genitalia with 10th tergum nearly truncate medially, median area lacking pigmentation (fig. 1689); genital plate with inner margin notched, lateral margin sinuate, stylus visible (fig. 1690).

Type Locality.—Peru: Callanga.

Type Depository.—Not known.

Discussion.—This species resembles *nigrovittata*, but the four vittae and yellow lateral margin on each elytron are characteristic of *callangae* as is the overall shape and strongly alutaceous sculpture. Weise's type material could not be located, but the specimens described here are from Peru and agree exactly with his description of *vittigera*. The name *vittigera* is preoccupied by *vittigera* Crotch, 1874, and the name *callangae* is here proposed for this species.

Specimens Examined.—Total four. PERU: *Cuzco:* Machu Picchu Pueblo, 6491 ft., March

20, 1947, III–21, 1947, J. C. Pallister. (AMNH) (USNM).

Epilachna clandestina Mulsant

(Figs. 301–303, 836–838, 1691–1693; map 31)

Epilachna clandestina Mulsant, 1850, p. 848.—Mulsant, 1853, p. 126.—Crotch, 1874, p. 65.—Korschefsky, 1931, p. 57.—Blackwelder, 1945, p. 441.
Solanophila clandestina: Weise, 1910, p. 56.

Male.—Length 8.50 mm., width 6.80 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color piceous to yellowish brown; pronotum yellow with four piceous spots, lateral spot oblique near base, small oval spot near base anterior to scutellum, transverse spot just anterior to middle; head black with clypeal area yellow; propleuron and epipleuron entirely yellow; mouthparts yellow to piceous; antenna with segments 1–8 yellow, 9–11 piceous; elytron completely bordered with yellow, inside yellow border is piceous, disk of elytron brownish yellow, scutellum and short scutellar vitta on each elytron black, apex of elytron with small piceous spot surrounded by yellow outer border (fig. 301). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to two times their diameter. Surface of elytron reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum weakly emarginate. Genitalia with basal lobe slender, lower margin abruptly narrowed at basal one-third; paramere strongly sinuate, widened toward apex (figs. 836, 837); siphe with double curve, orifice terminal (fig. 838).

Female.—Similar to male except abdomen with hind margin of fifth sternum more shallowly notched (fig. 1691); sixth tergum emarginate (fig. 1692). Genitalia with 10th tergum convex, pigmentation lacking medially; genital plate with inner margin feebly notched, outer margin sinuate, posterior margin truncate, stylus visible (fig. 1693).

Variation.—Length 6.68–9 mm., width 5.78–7.30 mm. Pronotal maculation ranges from seven separate spots through four spots as described here to form in which entire pronotum is black except for yellow lateral and anterior margins. Color pattern of elytron ranges from that described here to completely black except for yellow border (figs. 302, 303). Teneral specimens may have elytron entirely yellow except for black scutellar vitta and apical spot.

Type Locality.—Brazil.

Type Depository.—DLM (lectotype here designated).

Discussion.—This species has the male genitalia of the type possessed by *propinqua* and related species, but the dorsal color pattern is like that of the *cacica* group. The dark apical spot and short scutellar vitta separate *clandestina* from members of the *cacica* group. *E. circumcincta* of the *staudingeri* group also has this type of color pattern but does not have the apical spot or scutellar vitta. The first specimen standing under the name *clandestina* in the Dejean collection, with the following data, is here designated lectotype: "Brasilia, Latreille."

Specimens Examined.—Total 189. "S. AMERICA." BRAZIL: "Bras."; "Brasil"; "Brasilia"; "Brasilien"; Brazil, Munroe; Brasil, V. Olf. *Espirito Santo:* Espir. Santo, Staudinger, Korschefsky collection; Espirito Santo, Casey bequest; Espirito Santo, H. Rolle; Jabaquara, XII–1932, J. Halik. *Goias:* Goiatuba, J. Guevin. *Minas Gerais:* Chapada; Chapada, Oct.; Lambari, 22–IX–1963, J. Halik; V. Monte Verde, 11–III–1963, 17–IX–1962, 7–IX–1963, 27–II–1964, J. Halik; Vila Monte Verde, 6–XII–1964, J. Halik; Vicosa, 2–IX–'33, E. J. Hambleton. *Parana:* Parana, 1912, Korschefsky collection; Caviuna, Dec. 1946, XII–1945, A. Maller; Curitiba, 14–IV–64, C. E. and E. S. Ross; Rolandia, May 1948, A. Maller. *Pernambuco:* Bonito, col. on cotton, 17–I–83, A. Koebele. *Rio de Janeiro:* "Janeiro"; "Rio de Janeiro"; Theresopolis, Korschefsky collection. *Rio Grande do Sul:* Rio Grande do Sul, 1917, K. Knab. *Santa Catarina:* Boiteuxburgo, 800 m., 1930, Korschefsky collection; N. Teutonia, Korschefsky collection; Rio Natal, II–1945, A. Maller; Rio Vermelho, I–1945, X–1945, II–1945, A. Maller. *Sao Paulo:* "Sao Paulo"; Sao Paulo,

capital; S. Paulo, Camargo; Sao Paulo, V–54, N. L. H. Krauss; Campinas, A. Braatz V.; Campinas, F. C. Camargo; Campinas, F. C. Camargo, Korschefsky collection; Cantareira, 2–1, 1962, 14–IX–1957, 24–1–1963, 25–IX–1962, 28–I–1964, 29–III–1965, J. Halik; Compos Jordao, 11, III, 1963, J. Halik; Cruz Alto, F. Martin; Jarinu, V. Autuori; Santana, I–1958, 14–XI–1957, J. Halik; Sitio Banaval Guarulhos, 6–II–1944, J. Halik. (AMNH) (CAS) (CM) (DLM) (MCZ) (MNHUB) (USNM) (ZSBS).

Epilachna basalis Group

Length approximately 7.50–8.50 mm. Mandible extending slightly beyond labrum, short, thick, robust, three major teeth in apical one-half, first tooth bifid, upper tooth narrow, short, lower tooth very broad, longer than lower tooth, second tooth truncate, third tooth blunt, bifid at apex (except *mandibularis*) (figs. 26, 26*a*). Color usually black with elytron nearly solid black or yellow or brown with three vittae and narrow lateral border black. Lateral margin of elytron rounded from humeral angle to apex; epipleuron slightly wider anterior to middle than posterior to middle. Male genitalia basically similar to those of members of *mutabilis* group, but basal lobe angled downward in basal one-third, abruptly angled upward in apical one-half (fig. 842); sipho S-shaped, apex blunt (fig. 843). Female with genital plate nearly round, slightly narrowed posteriorly, stylus visible (fig. 1701). Known from southern Peru and northern Bolivia.

This is a compact group of species easily separated from allied groups by the short, thick mandible.

Key to Species of *Epilachna basalis* Group

1. Elytron not vittate ..... *parastriata*, n. sp. (p. 158)
   Elytron vittate 2
2. Elytron with short vitta nearest suture not reaching base of elytron (fig. 305); species known only from Peru 3
   Elytron with short vitta nearest suture reaching base of elytron (fig. 306); Bolivia ..... *sexlineata* (Weise) (p. 159)
3. Mandible with two blunt apical teeth, often appearing as single truncate tooth ..... *basalis* (Weise) (p. 159)
   Mandible with three sharp apical teeth ..... *mandibularis*, n. sp. (p. 160)

Descriptions of Species in *Epilachna basalis* Group

Epilachna parastriata, new species

(Figs. 304, 839–841, 1694–1697; map 32)

Male.—Length 8.25 mm., width 6.77 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color black; broad anterolateral angle of pronotum, most of propleuron and inner three-fourths of epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron black with broad yellow vitta laterally inside explanate margin in apical three-fourths, occupying entire margin in basal one-fourth, lateral margin with explanate part black in apical three-fourths (fig. 304). Punctation on elytron not noticeably dual, dense, indistinct, punctures separated by their diameter or less. Surface of elytron densely alutaceous, rugose. Pubescence dense, grayish white. Postcoxal line incomplete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum deeply notched; sixth tergum broadly emarginate. Genitalia with basal lobe strongly bent downward in basal two-thirds, angled upward in apical one-third; paramere sinuate, widened apically (figs. 839, 840); sipho as in *pseudostriata*, apex slightly widened (fig. 841).

Female.—Similar to male except abdomen with hind margin of sixth sternum notched, with longitudinal suture (fig. 1694); sixth tergum emarginate medially, sinuate laterally (fig. 1695). Genitalia with 10th tergum truncate, pigmentation nearly complete medially (fig. 1696); genital plate irregularly round, inner margin strongly sinuate, posteromedian angle sharply produced (fig. 1697).

Variation.—Length 8.25–8.75 mm., width 6.77–7.78 mm. Some specimens in type series have small reddish-yellow spot at base of elytron between scutellum and callus and one paratype has trace of narrow, reddish-yellow vitta near and parallel to suture.

Holotype.—Male. PERU: *Cuzco:* Callanga, 1300 m., II, 10–III, 17, 1953, Woytkowski (USNM 71676).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total three. Same data as holotype. (USNM).

Discussion.—Superficially this species resembles *pseudostriata*, but the small size, black, explanate margin of elytron, and both male and female genitalia separate the two species.

Epilachna basalis (Weise)

(Figs. 305, 842–843, 1698–1701; map 32)

Solanophila basalis Weise, 1899, p. 266.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 7.63 mm., width 5.90 mm. Form oval, elongate, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Mandible robust, apex with two short, blunt teeth, lower tooth longer than upper tooth, broad, flattened tooth inside outer two teeth. Color black; lateral margin of pronotum broadly yellow; entire propleuron and epipleuron except narrow, black, outer border yellow; clypeus yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellowish brown, sutural margin with black border narrowed from base to apex, inner vitta extending from near base to just beyond middle, median vitta extending from inner margin of callus to apical one-fifth, outer vitta nearly touching base of elytron, extending to apical one-seventh, apex curved inward, nearly reaching outer vitta, humeral angle yellow, lateral margin with black border beginning at basal one-sixth extending to suture at apex (fig. 305). Punctation on elytron not noticeably dual, punctures fine, dense, separated by less than their diameter. Surface of elytron finely, densely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly, weakly emarginate. Genitalia with basal lobe longer than paramere, angled downward, then abruptly curved upward to point in apical one-third; paramere sinuate, feebly widened apically (fig. 842); sipho S-shaped, orifice terminal (fig. 843).

Female.—Similar to male except abdomen with hind margin of fifth sternum slightly produced medially; sixth sternum notched with longitudinal suture present (fig. 1698); sixth tergum emarginate (fig. 1699). Genitalia with 10th tergum convex, entire, lacking pigmentation medially (fig. 1700); genital plate rounded, posterolateral angle sharply produced, posterior margin feebly emarginate, stylus visible (fig. 1701).

Variation.—Length 7.63–8.44 mm., width 5.90–6 mm.

Type Locality.—Peru: Callanga.

Type Depository.—Not known.

Discussion.—Weise's type material of *basalis* has not been located, but a series of specimens from Cuzco matches the description exactly and is almost certainly this species. The robust, bidentate mandible with large flattened inner tooth and the pale humeral angle with no black border distinguish *basalis* from the related *sexlineata* and *mandibularis*.

Specimens Examined.—Total seven. PERU: "Peru." *Cuzco:* Callanga; Machu Picchu, 29–I–1952, 2000 m., F. Monros. (IML) (PM) (USNM) (ZSBS).

Epilachna sexlineata (Weise)

(Figs. 306, 844–846, 1702–1705; map 32)

Solanophila sexlineata Weise, 1898*c*, pp. 235–236.
Epilachna sexlineata: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 7.50 mm., width 6 mm. Form

ovate, widest anterior to middle of elytra, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Mandible robust, apex with three blunt, strong teeth, lower teeth more than twice as long as upper tooth. Color black; anterolateral angle of pronotum, propleuron, and epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellowish orange, completely margined with black, three longitudinal vittae present, outer vitta extending from base at callus to apical one-fifth, median vitta extending from base inside callus and joining outer vitta at apex, inner vitta extending from base to just past middle of elytron (fig. 306). Punctation on elytron not dual, punctures dense, separated by less than their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate; sixth tergum faintly, broadly emarginate. Genitalia with basal lobe longer than paramere, abruptly bent downward medially and abruptly upward toward apex; paramere sinuate, apex widened (figs. 844, 845); sipho strongly curved downward, then outward and upward to apex, orifice dorsal, terminal (fig. 846).

Female.—Similar to male except hind margin of sixth abdominal sternum emarginate, with longitudinal suture (fig. 1702); sixth tergum feebly emarginate (fig. 1703). Genitalia with 10th tergum feebly emarginate, lacking pigmentation medially (fig. 1704); genital plate with all angles rounded, inner margin weakly notched, narrowed in basal one-half (fig. 1705).

Type Locality.—Bolivia: Chaco.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—The type series is composed of two specimens, the first of which, a female bearing the following labels, is here designated as lectotype: "Chaco, Staud'g" (green paper); "6-lineata." The second specimen is also a female from Mapin, Bolivia. *E. sexlineata* may be separated from all other vittate species of *Epilachna* except *basalis* and *mandibularis* by the dorsal color pattern. See remarks under *basalis*.

Specimens Examined.—Total seven. BOLIVIA: *Cochabamba:* Type series; Chaco; San Antonio. *La Paz:* Coroico. (MNHUB) (PM) (USNM).

Epilachna mandibularis, new species

(Figs. 307, 1706; map 32)

Female.—Length 8 mm., width 5.97 mm. Description as for *basalis* except for differences discussed here. Mandible robust with three strong, bluntly pointed, apical teeth. Pronotum with anterolateral angle yellow, yellow extending one-half distance to hind angle. Elytron with lateral and basal margins narrowly bordered with black, including humeral angle (fig. 307). Genitalia with genital plate rounded, lateral margin broadly produced medially, posterolateral angle with feebly pointed angulation (fig. 1706).

Male.—Not known.

Holotype.—Female. PERU: *Junin:* Valle Chanchamayo, 1600 m., 1–4–1939, leg. Weyrauch (USNM 71677).

Paratype.—Total one. PERU: *Loreto:* Ucalayi, 1916, Coll. E. Ross, Berlin N. 113, Korschefsky collection. (USNM).

Discussion.—This species is similar to *basalis*, but the tridentate mandible and the feebly angulate posterolateral angle of the female genital plate of *mandibularis* as well as the color differences would seem to indicate that they are not conspecific.

Epilachna varivestis Group

Length approximately 6.40–8.20 mm. Mandible visible beyond labrum, three major teeth in apical one-half, first tooth bifid, apices of both parts bluntly rounded, second tooth bluntly rounded with several minor teeth on lower margin, third tooth sharper than others, minor tooth forming serrate inner margin of mandible between second and third tooth and

below third tooth (fig. 23). Color variable. Lateral margin of elytron rounded from humeral angle to apex; epipleuron slightly wider anterior to middle than posterior to middle. Male genitalia with basal lobe longer than paramere, abruptly bent upward before apex (fig. 848); sipho S-shaped, apex bluntly rounded (fig. 849). Female genital plate with anterior angles rounded, upper surface with integument folded, stylus visible (fig. 1709). Known from northwestern United States to Mississippi River and from Idaho and South Dakota to southern Mexico.

E. varivestis has been widely distributed because of its habit of feeding on cultivated beans. The two species in this group are closely allied and have distinctive male genitalia.

Key to Species of *Epilachna varivestis* Group

Elytron black with seven orange spots (fig. 313); ventral surface entirely black except legs; length 6.50 mm ..... *varipes* Mulsant (p. 165)

Elytron usually pale with dark spots (fig. 308); ventral surface usually yellow or brown; length 6.48–8.10 mm ..... *varivestis* Mulsant (p. 161)

Descriptions of Species in *Epilachna varivestis* Group

Epilachna varivestis Mulsant

(Figs. 308–312, 847–849, 1707–1709; map 33)

Epilachna varivestis Mulsant, 1850, pp. 815–816.—Crotch, 1874, p. 62.—Gorham, 1898, p. 242.—Korschefsky, 1931, p. 58 (as an aberration of *corrupta* Mulsant).—Blackwelder, 1945, p. 442.

Epilachna corrupta Mulsant, 1850, p. 815.—Casey, 1899, p. 103.—Korschefsky, 1931, p. 58.

Epilachna varivestis var. *cervina* Mulsant, 1850, p. 817.

Epilachna varivestis var. *genuina* Mulsant, 1850, p. 817.

Epilachna corrupta ab. *cervina:* Korschefsky, 1931, p. 58.

Epilachna corrupta ab. *genuina:* Korschefsky, 1931, p. 58.

Epilachna cervina: Blackwelder, 1945, p. 442.

Epilachna maculiventris Bland, 1864, p. 256.—Crotch, 1874, p. 64 (as a synonym of *borealis* F.).—Korschefsky, 1931, p. 38 (as a synonym of *corrupta* Mulsant).—Blackwelder, 1945, p. 442.

Epilachna cuprea Cockerell, 1918, p. 153.—Blackwelder, 1945, p. 442.

Epilachna juncta Johnson, 1910, p. 79.—Blackwelder, 1945, p. 442.

Epilachna corrupta ab. *cuprea:* Korschefsky, 1931, p. 58.

Epilachna corrupta ab. *juncta:* Korschefsky, 1931, p. 58.

Male.—Length 6.75 mm., width 5 mm. Form elongate-oval, widest anterior to middle of elytra, lateral margin of elytron nearly straight medially. Color brownish yellow; metasternum and median area of abdominal sterna slightly darker; elytron brownish yellow with eight dark-brown spots arranged in transverse rows 3, 3, 2, none of spots touching suture or margin, first three spots in row from callus to suture, middle spot posterior to others, second row of three spots at middle of elytron, posterior two spots on apical one-third (fig. 308). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron alutaceous. Pubescence grayish white, dark brown on spots on elytron. Postcoxal line nearly complete, distinct, extending three-fourths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly emarginate; sixth tergum weakly emarginate. Genitalia with basal lobe angled downward near base, narrowed and curved upward before apex, apex abruptly bent upward, in dorsal view an oval, transparent area present on apical one-third; paramere curved upward, sides parallel; trabes short, as long as basal piece, apex spatulate, narrowed toward base (figs. 847, 848); sipho with double curve, apex slightly thickened, orifice dorsal, subterminal (fig. 849).

Female.—Similar to male except abdomen with hind margin of sixth sternum entire, convex (fig. 1707); sixth tergum convex, entire (fig. 1708). Genitalia with 10th tergum con-

vex; genital plate with anterior angles rounded, inner margin curved, outer margin strongly sinuate, upper surface with integument folded, appearing as sharp, curved line from base at posterolateral angle to near apex posterior to stylus (fig. 1709).

Variation.—Length 6.43–8.10 mm., width 4.85–6.38 mm. In light form described here some of spots on elytron may be missing. Underside is dark in many individuals, first metasternum and middle of abdomen become darkened then nearly entire ventral surface including legs is dark brown or black. Dorsal surface may vary from dark with light rings around black spots to mostly dark brown with ocellate spots. Finally entire body is dark brown to black with pubescence remaining whitish gray except on elytral spots where it is brown. This is form described as *corrupta*. Posterior two spots on elytron are often fused (figs. 309–312).

Type Locality.—Of *varivestis*, *corrupta*, *cerrina*, and *genuina*, Mexico; of *maculiventris*, Rocky Mountains, Colorado territory; of *cuprea*, Boulder, Colo.; of *juncta*, not stated.

Type Depository.—Of *varivestis* and *corrupta*, UCCC (lectotypes here designated); of *cerrina*, not known; of *genuina*, DLM (lectotype here designated); of *maculiventris*, PAS; of *cuprea* and *juncta*, types not selected by authors.

Discussion.—As pointed out by Chapin (*1936*), the name *varivestis* Mulsant was selected for this species by the first reviser, Crotch (*1874*), and must be maintained according to Article 28 of the International Code even though *corrupta* Mulsant has page priority. *E. varivestis* is a widely distributed variable species, forms of which have been named by several authors. The male and female genitalia are both very distinctive within the genus, and if used, no confusion with any other species is possible. The genitalia remain constant in all color forms and it is not possible to retain any of the proposed names either as valid species or subspecies. A good deal of work on the biology of *varivestis* has been done in the United States by many workers because of its economic importance. As far as is known, *varivestis* attacks only beans. This beetle has been observed feeding on various forms of the kidney bean (*Phaseolus vulgaris*), including string, pale, navy, and Mexican, on the lima bean (*P. lunatus*), and on the soybean. The distribution of *varivestis* in the United States, as shown in map 33, has been taken from the records of Plant Protection and Quarantine Programs (USDA). Many of the specimens on which the distribution is based have not actually been examined for this publication.

The first specimen under the name *varivestis* in the Crotch collection bearing the label "Type, varivestis, Muls., Chev." is here designated lectotype of *varivestis*. The last specimen under the name *varivestis* in the Crotch collection bearing the label "Type, corrupta, Mex." is here designated lectotype of *corrupta*. The single specimen of *genuina* in the Dejean collection under the label "Mexico, Orizaba" is here designated lectotype of *genuina*.

E. varivestis is native to southern and central Mexico and has migrated north probably a result of Indians' cultivating beans of the *Phaseolus* type. Chittenden and Marsh (*1920*) stated that injury caused by *varivestis* was first observed in New Mexico about 1850. The beetle was introduced into the Eastern United States (Birmingham, Ala.) in 1918, probably on shipments of alfalfa hay from the West. After 1918 the beetles spread very rapidly, mostly in a northeasterly direction. As may be seen on map 33, there is a gap between the eastern and western populations of *varivestis* corresponding to the Central Plains States. Climatic conditions in this area are apparently too severe to permit the beetle to reproduce and multiply successfully.

Specimens Examined.—Total 1,494. Central America, Kraatz, Korschefsky collection; Nord America, E. A. Bottcher, Korschefsky collection. COSTA RICA: Costa Rica, P. Biolley, Korschefsky collection. *Cartago:* Cartago, on soybeams, IX–27–43, Knight; Irazu, Schildt, and Burgdorf. *San Jose:* "San Jose"; San Jose, Schildt and Burgdorf; San Jose, 1000–1200 m., 17–V–'34, 15–VIII–31, F. Nevermann; San Pedro de Montes Oca, on soybeams, V–20–1933, V–16–1933, C. H. Ballou. EL SALVADOR: San Andres, 7–25–44, E. J. Hambleton. GUATEMALA: "Guatemala"; Panzos,

Staudinger and Bang-Haas dedit. *Antigua:* Antigua, VI–18–1931, D. M. Bates; Antigua, on citrus, V–25–45, E. J. Hambleton; Antigua, on beans, 19–VIII–52, 20–VIII–52, R. H. Painter. *Baja Verapaz:* San Jeronimo, 3000 ft., VII–27–1947, VII–26–1947, VII–25–1947, C. and P. Vaurie. *Chimaltenango:* Finca Alameda, beans, VII–VIII–'37, J. R. Johnson. *El Quiche:* Sacapulas, 4500 ft., VIII–12–1947, C. and P. Vaurie. *Iza Bal:* Cayuga, II–'15, Wm. Schaus. *Sacatepequez:* Capetillo, 5000 ft., VIII–21–1947, C. and P. Vaurie. HONDURAS: *Francisco Morazan:* Esc. Agr. Pan., Zamorano, 2600 ft. (hortaliza), July 20, 1948, T. H. Hubbell. MEXICO: Mexico, Flohr; Mexico, Koppe; Mex., Casey bequest 1925; Mex., VI–1945, N. L. H. Krauss; Mex., 8–24–29, B. J. Landis; Mex., VII–'53, J. Mann; Mex., on black bean, Aug. 26, 1921, H. F. Wickham; Mex. on wild legume, Aug. 1921, H. F. Wickham; Mex., on foliage *Eupatorium adenophorum*, N. L. H. Krauss; Mex., from larva on foliage *Eupatorium adenophorum*, N. L. H. Krauss; Mex., from pupa on leaf of *Eupatorium adenophorum*, X–1944, N. L. H. Krauss. *Chiapas:* Jct. Hwys. 190–195, VI–6–1969, H. F. Howden. *Chihuahua:* Arroyo Catarinas 15 mi. S. Matamoros, Sept. 14, 1950, Ray F. Smith; Basuchil, VIII–18–50, Ray Smith; Catarinas, 5800 ft., VII–25–47, Cazier; Madera, 7200 ft., VII–6–47, Cazier; Madera, 7200 ft., VII–6, Gertsch; Mesa del Huracan 108° 15′ 30° 4′, 7400 ft., 21–25–VII–1964, J. E. H. Martin; Mesa de Huracan, 7400 ft., 21–25–VII–1964, J. E. H. Martin; Santa Barbara Sta. Barbara Dist., 7500 ft., July 18, 1947, Michener; Santa Barbara Sta. Barbara Dist., 6300 ft., July 17, 1947, Spieth; Tacuba, on bean, A.–1921, A.–30–1921, H. F. Wickham; Tepehuanes, Wickham. *Colima:* 10 mi. W. Colima, Aug. 1, 1954, M. Cazier, W. Gertsch, and Bradts; Vulcano, L. Conrad; Vulkan Colima, 1918, Joh. Lave. *Distrito Federale:* Dist. Fedl., 7–18–10, J. R. Inda; Coapa, on bean, June 12, June 20, June 26, 1922, E. G. Smith; San Jacinto, 8–1923, E. G. Smyth; San Jeronimo, VI–21–1946, VII–1–1946, J. and D. Pallister. *Durango:* "Durango"; Durango City, H. Heyne; Durango City, Staudinger, Korschefsky collection; 5 mi. W. Durango, VI–24–1964, H. F. Howden; 5 mi. W. Durango, 6500 ft., July 29, 1964, J. F. McAlpine; 25 mi. W. Durango, VI–29–1964, VI–23–1964, H. F. Howden; 10 mi. W. El Salto, 9000 ft., 26–VI–1964, J. E. H. Martin; Palos Colorados, 8000 ft., Aug. 5, 1947, Michener. *Guanajuato:* Gonzales Jct.; Gonzales Jct., Wickham; Leon, VIII–16–53, C. and P. Vaurie. *Jalisco:* Tequila, VII–18–53, C. and P. Vaurie; 4 mi. W. Mazamitla, 6800 ft., Oct. 16, 1950, Ray F. Smith; Tuxpan, 9–16–1903, J. F. McClendon. *Mexico:* Amecameca, VI–8–1897; El Oro City, Summer 1924; Huipulco, on bean, Aug. 29, 1922; Ixtapan de la Sal, VIII–9–1964; Ixtapan, Sal., 5500 ft., 9–VIII–1954, J. G. Chilcott; Mixcoac, on black bean, Aug. 19, 1921, H. W. Wickham; Teotihuacan, on vegetation, IX–12–1952, G. H. Dieke; Toluca, Wickham; Tultenango, 13–VII, R. H. Hay. *Michoacan:* N. Morelia, sweeping, IX–5–1952, G. H. Dieke; Patzcuaro, VII–7–1964, Paul J. Spangler; San Jose Parva, VI–1965, N. L. H. Krauss. *Morelos:* Morelos, Koebele; Morelos, VII–25–29–1944, N. L. H. Krauss; Cuernavaca, Wickham; Cuernavaca, Oct. 21, 22, 23 1922, 9–1923, E. G. Smith; South of Cuernavaca, IX–1935, Dobzhansky; 16 mi. South, Cuernavaca, Aug. 22, 1958, H. Howden; Cuernavaca, 34 mi. S., 2600 ft., 4–VIII–1954, J. G. Chilcott; Cuernavaca, 34 mi. S., 5500 ft., 9–VIII–1954, J. G. Chilcott; Cuernavaca, 34 mi. S., 7500 ft., 9–VIII–1954, J. G. Chilcott; Pte. de Ixtla, Wickham. *Oaxaca:* Oaxaca, 9–1928, E. G. Smith; Oaxaca, VI–15–1968, G. Pollard; Oaxaca, VII–8–52, E. E. Gilbert and C. D. MacNeil; Cerro San Jose, IX–8–1935, Th. Dobzhansky; Juguila Mixes, 4700 ft., VII–1968, VI–1968, V–1968, W. S. Miller; Monte Alban, 6391 ft., June 30, 1955, P. and C. Vaurie; Tlacolula, 9–1923, E. G. Smyth. *Puebla:* Puebla, Koeble; Atencingo, June 1, 1922, E. G. Smith; 2 mi. S. of Cholula, July 1956. *San Luis Potosi:* San Luis Potosi, 3700 ft., 23 July 1962; bet. Barbarita and Aquazarca, 3600 ft., 6–18–49, G. M. Bradt. *Sinaloa:* Copala, VII–26–1959, R. Schrammel; Villa Union; 5 mi. E. Villa Union, VII–29–1959, R. Schrammel. *Vera Cruz:* Vera Cruz, Korschefsky collection; El Fortin, 3000 ft., VII–12–41, H. S. Dybas; Jalapa, Hoege; Jalapa, W. Schaus; Nogales, 16–6–05, Fred K. Knab; Orizaba, on bean, 9–1921, H. F. Wickham; Orizaba, 9–23, 9–27–23, E. G. Smith; Saltillo, E. Palmer.

UNITED STATES: *Alabama:* Birmingham, July 28, 1920, F. L. Thomas; Birmingham, X–1922, 4–20–21, N. F. Howard; Birmingham, IX–13–21, H. L. Weatherby; Birmingham, on bean, May 1921, Oct. 1922, N. F. Howard; Birmingham, feeding on beans, July 17, 1921, N. F. Howard. *Arizona:* Ariz., C. V. Riley; Clifton, E. G. Holt; Cochise Co., Palmerlee, VI–23; Douglas, Aug., F. H. Snow; Douglas, 9–20–24, J. R. Douglas; Garden Canon, Huachuca Mts., W. M. Mann; Globe, Duncan; Oak Creek, July 1904, Smyth; Oak Creek Canyon, 6000 ft., Aug., F. H. Snow; San Franciso R., 13 mi. above; Santa Rita Mts., 5 to 8000 ft., June, F. H. Snow; Thatcher, 8–21–'12, A. W. Morrill; Whiteriver, Aug. 3, 1911. *Colorado:* "Colorado"; Colo., 5–1–73, C. V. Riley; Colorado, on bean, July 86, Aug. 3–82, Oct. 1–89; Boulder, E. C. Jackson; Boulder, 5500 alt., VI–30–1922; Colo. Springs, Hubbard and Schwarz; Colo. Springs, 6000–7000 ft., June 15–30, '96, H. F. Wickham; Denver, Moore; Denver, June 1897, Wickham; Denver, Aug. 24, 1914, E. C. Jackson; Durango, VII–29, E. J. Oslor; Fort Collins, 9–6–'98, 8–10–01, Dyar and Caudell; Fort Collins, on bean, IX–6–08; Grand Jct., 6–14–27, J. M. Aldrich; Greeley; Greeley, VII–30–19, Jy 14, June '19, July 21, '19, A. E. Mallory; Greeley, beans, Aug. 4 1930; Pueblo; Rocky Ford; Rocky Ford feeding on beans, 7 Oct. 09, 6 Sep. 09, H. O. Marsh; Rocky Ford, under weeds, 19 Mar. 10, H. O. Marsh; Trinidad, 9–12–98, VI–25, Wickham. *Connecticut:* New Canaan, VIII–18–1950, VIII–21–1950, VI–22–1950, VII–2–1950, VII–4–1950, VI–16 1950, M. Statham; Meriden, July 30, 1952, S. Parfin; S. Norwalk, Sept. 5, 1944, A. Gray; Stamford, Oct. 2, 1935, S. W. Bromley. *Delaware:* Rehoboth, in beach wash up, VI–8–1943, Dieke. *Georgia:* Athens, Apr. 7, 1928, A. G. R., Jr.; Thomasville, July 7, 1921. *Idaho:* Jerome, ex beans, VII–25–1960, K. E. Evans and K. E. Gilson. *Indiana:* Lafayette, IX–20–31, H. R. Painter; Lafayette, soybean leaf, IX–13–33, H. R. Painter. *Kentucky:* Rockholds, Aug. 1923. *Maryland:* Baltimore, 1929; Ba. Co., Hotcholiff, on beans, X–11–1939; Bladensburg, V–13–34; Calvert Bch. June 15, 1946, D. Gedder and S. Parfin; Mayo Bch., Aug. 27, 1944, E. A. Chapin; Pr. Fredrick, Dieke; Takoma Pk., VI–1934. *Massachusetts:* Harwich Port, VIII–24–1933, L. Lacey; Northboro, X–11–31, C. A. Frost. *Michigan:* Kalamazoo Co., 7–17–35. *Missouri:* St. Louis, USDA traps, June 24, 1936. *New Hampshire:* E. Westmoreland, VI–22–32, E. W. Strong. *New Jersey:* Brigantine, 5–IX–1930; Englewood, VIII–10–47; Monmouth Junct., X–13–1941; Ramsey, July 1929, Schott; Summit, Oct. 22, 1944. *New Mexico:* "New Mexico"; New Mexico, F. H. Snow; Albuq., Hubbard and Schwarz; Albuquerque, August, 1894, Snow; Bernardo, Aug. 8; Bernardo, on beans, 26 Aug. 04; Bernardo, on beans, 20 Aug. '04, 25 Aug. '04, O. Leffreing; Dona Ana Co., 9–18–36; Espanola, July 28, 1909, V. C. Stevenson; Estancia, 1925, J. R. Douglas; James Mts., VII–4–1911; James Mts., VII–12, Jao. Woodgate; Las Vegas, beans, 8–3–13, V. L. Wildermuth; Maxwell, VIII–21–16, D. J. Caffrey; Mesilla Park, S.–22–19; Mountainair, 0–4–1922, C. H. Popence; Santa Fe, 6–5, H. S. Barber; Santa Fe, VII–2–18, R. Hopping; Shiprock, 8–12–33, Ball; Silver City, on bean, Oct. 99, Metcalf; State College, IX, Merrill; Tajique, 7–20–30, J. G. Shaw; Torrance Co., July 1925, C. H. Martin; Tularosa, feeding on bean, Aug. 21, 1909, Bishop. *New York:* Allegany St. Pk., 8–4–36, 8–10–38; Gerrittson Beach, Brooklyn, Sept. 6, 1944, J. C. Pallister; Huguenot, Aug. 1, 1941, T. C. Wilfred; Ithaca, Oct. 8, 1947; N.Y. City, X–17–1928, X–12–1932; Wayne Co., X–9–1948, IX–17–48, IX–14–1948, IX–29 48, IX–17–49, IX–19–1949; Yonkers, July 11, 1929, A. Hartzell. *North Carolina:* Hickory, 8–1925. *Ohio:* Athens, O. U. Airport, IX–30–49, P. J. Spangler; Wheelersburg, Scioto Co., 5–13–50, P. J. Spangler. *Pennsylvania:* 5 mi. W. Davidsburg, VI–17–1953, P. J. Spangler; Delaware Co., VI–6–1941, R. C. Casselberry; Lebanon Co., 6–28–46, P. J. Spangler; Pittsburgh, VII–30–27; York, 7–31–42, P. J. Spangler. *South Carolina:* Florence, woods trash, II–8, II–13, 11–17; John's Id., July 28, 1944; McClellanville, July 26, 1945, P. Vaurie. *Tennessee:* Mem., 5–27–49. *Texas:* "Tex."; Alpine, VIII–27; El Paso, VIII–9–'05; El Paso, on muskmelon, 23–8–43. *Utah:* Ogden, H. Saltan. *Virginia:* Arlington, 25 May 48, Rozman; Arlington, Aug. '32, F. W. Poos; Barcroft, 7–22–28, 6–14–28, J. C. Bridwell;

Eastville, III–30–1940, Dieke; Fauq. Co., Belvoir, VI–2–1940, Dieke; Nelson Co., June 19, 1927, W. Robinson; Norfolk, Ocean View, Sep. 23, 28, E. A. Chapin; Norfolk Co., 5–11–28; Norton, Nov. 1923; Warrenton, 6–5–28, L. C. Woodruff. (AMNH) (CAS) (CM) (CNC) (HH) (MCZ) (MNHUB) (UK) (USNM) (ZSBS).

Epilachna varipes Mulsant

(Figs. 313, 850–852)

Epilachna varipes Mulsant, 1850, p. 812.—Crotch, 1874, p. 62.—Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 442.

Male.—Length 6.50 mm., width 5.10 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts and antenna yellow; legs with apical one-fifth of femur, basal and apical one-fourth of tibia, and entire tarsus yellow; elytron black with seven orange spots, first three spots in transverse row from callus to scutellum, second three spots in transverse row at middle of elytron, seventh spot large, on apical one-third (fig. 313). Punctation on elytron dense, small punctures separated by less than their diameter, large punctures separated by less than to three times their diameter, often contiguous; narrow, feebly raised costa behind callus not as densely punctured. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate; sixth tergum weakly emarginate. Genitalia with basal lobe longer than paramere, upper margin sinuate, abruptly bent upward to sharp apex in apical one-fourth; paramere feebly widened apically; trabes short, equal in length to basal piece (figs. 850, 851); sipho S-shaped, apex bluntly rounded, orifice dorsal, subterminal, small area posterior to orifice with many fine spinules present (fig. 852).

Female.—Not known.

Type Locality.—Mexico (Dupont).

Type Depository.—PM (lectotype here designated).

Discussion.—Crotch (*1874*) first placed *varipes* as a synonym of *varivestis* and was followed in this by all subsequent authors. A male specimen in the Paris museum (Sicard collection) bearing the following labels is considered to be type material and is here designated lectotype: "Mexique (coll. Mniszech)"; "TYPE." The male genitalia of *varipes*, especially the S-shaped sipho with spinules posterior to the orifice, are somewhat like those of *varivestis* but highly distinctive. In addition to the genitalia, the elytral color pattern and dense punctation will separate *varipes* from other Mexican *Epilachna*.

Specimens Examined.—Total one. MEXICO: The lectotype.

Epilachna mexicana Group

Length 7.70–10.58 mm. Mandible of *borealis* type. *E. mexicana* is the only species in this group and is not strikingly different from members of *borealis* or *varivestis* group. However, male genitalia with broadly, strongly curved basal lobe (fig. 854) and female genital plate fused to ninth tergum (fig. 1712) do not allow *mexicana* to be placed in any presently defined group. The distribution is central and southern Mexico with populations (probably introduced) in Colombia and Venezuela.

Description of Species in *Epilachna mexicana* Group

Epilachna mexicana (Guérin)

(Figs. 314–319, 853–855, 1710–1712; map 34)

Coccinella (*Epilachna*) *mexicana* Guérin, 1842, p. 319.
Epilachna mexicana: Mulsant, 1850, pp. 731–733.—Crotch, 1874, p. 61.—Henshaw, 1885, p. 48.—Gorham, 1897, p. 240.—Casey, 1899, p. 103.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 442.
Epilachna defecta Mulsant, 1850, pp. 733–735.—Crotch, 1874, pp. 61–62.—Gorham, 1897, p. 241.—Casey, 1899, p. 103.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441. NEW SYNONYMY.

Epilachna fuscipes Mulsant, 1850, p. 735.—Crotch, 1874, p. 61.—Gorham, 1898, p. 241.
Epilachna defecta ab. *fuscipes:* Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.
Epilachna mexicana var. *dealbata* Weise, 1895, p. 124.
Epilachna mexicana var. *fulvitarsis* Weise, 1895, p. 124.
Epilachna defecta var. *apicalis* Weise, 1895, p. 124.
Epilachna defecta var. *defectrix* Weise, 1895, p. 124.
Epilachna defecta var. *defectissima* Weise, 1895, p. 124.
Epilachna mexicana ab. *dealbata:* Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 442.
Epilachna defecta ab. *apicalis:* Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.
Epilachna defecta ab. *defectrix:* Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.
Epilachna defecta ab. *defectissima:* Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 9 mm., width 7.25 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron nearly straight medially. Color black; mouthparts yellow to dark brown; antenna with basal segment brown, segments 2–5 yellow, 6–11 dark brown; elytron piceous with six large, yellow spots arranged 1, 2, 2, 1, none of spots touching margin of elytron (fig. 314). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron alutaceous. Pubescence grayish white except on piceous area of elytron where it is dark brown. Postcoxal line complete, distinct, extending three-fourths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum weakly emarginate. Genitalia with basal lobe slender, narrowed from base to middle, curving upward and thickened before bluntly rounded apex; paramere angled upward in apical one-third, not widened at apex; trabes spatulate, narrowed near base (figs. 853, 854); sipho slender, with double curve, orifice dorsal, subterminal (fig. 855).

Female.—Similar to male except abdomen with hind margin of sixth sternum deeply emarginate (fig. 1710); sixth tergum entire, broadly convex (fig. 1711). Genitalia with 10th tergum broadly convex; genital plate with anterolateral angle rounded, strongly produced, inner margin straight, posterolateral angle rounded, obsolete, posteromedian angle produced, fused to ninth tergum, stylus visible (fig. 1712).

Variation.—Length 7.70–10.58 mm., width 6–8.90 mm. Pronotum varies from completely black to reddish brown with anteromedian black spot to entirely reddish brown. Elytral maculation varies a great deal and several varieties have been described. In *E. mexicana* var. *dealbata* (var. C of Mulsant), three posterior spots are united so that posterior one-half of elytron is almost completely yellow (fig. 315). Varieties A and B of Mulsant are transitions from typical form to *dealbata*. In *E. mexicana* var. *fulvitarsis*, tarsi are light brownish yellow, tibiae reddish piceous, and tips of femora and tibia paler. In *E. defecta*, basal spot is absent and tips of femora and base of tibiae are reddish (figs. 316, 317). In *E. defecta* var. *apicalis*, three apical spots are united so as to form one large apical spot with marginal part of separation between spots 4 and 6 usually present; legs with basal two-thirds of femora black. In *E. defecta* var. *defectrix*, posterior three spots are lacking, leaving elytron black except for three anterior yellow spots; legs as in *apicalis*. In *E. defecta* var. *defectissima*, elytron is completely black; legs as in *apicalis*. In *E. fuscipes*, maculation of elytron as in *defecta* but background color is light reddish brown and ventral surface including legs is yellowish brown. In addition to variations described under these names other variations occur. Maculation on elytron may be reduced to two spots anterior to middle (fig. 318) or entire apical three-fourths of elytron may be yellow except for small dark spot near middle (fig. 319).

Type Locality.—Of *mexicana, dealbata, fulvitarsis, defecta,* Mexico; of *apicalis* and *defectrix,* not known; of *defectissima,* Guatemala; of *fuscipes,* Colombia.

Type Depository.—Of *mexicana* and *fuscipes,* UCCC; of *dealbata,* MNHUB (lectotype here designated); of *fulvitarsis,* MNHUB; of *defecta,* DLM; of *apicalis, defectrix,* and *defectissima,* not known.

Discussion.—Mulsant (*1850*) described *defecta* and *fuscipes* as valid species distinct from *mexicana* Guérin (*1844*). Crotch (*1874*) united *fuscipes* with *defecta,* and all authors since have maintained *defecta* and *mexicana* as separate species and named varieties of both. There are no structural differences to

separate the two species; the only differences are in variation of the spot pattern. *E. mexicana* is therefore treated here as a variable species extending from Mexico through Central America to Colombia. From the material examined, no subspecies can be defined as the various types of color pattern may occur throughout the range. The pattern of typical *mexicana* is predominant in northern Mexico and that of *fuscipes* is most often found in specimens from Colombia. Leng (*1920*) listed *mexicana* from the United States near the border of Mexico, but no U.S. specimens have been seen in this study. The type series of *dealbata* composed of four specimens has been examined and the specimen bearing the following label is here designated as lectotype: "Mexico, Reitter." The other three specimens had no labels. The single specimen of *fulvitarsis* in the MNHUB collection was also examined. This specimen bears the labels "Mexico, Kolbe"; "mexico. var. fulvitarsis."

Specimens Examined.—Total 1,328. COLOMBIA: *Antioquia:* La Estrella, Sept. 1943, Gallego; Medellin, on corn, Oct. 1965, R. Velez A.; San Jeronimo, VI–1943, Gallego. *Caldas:* "Caldas"; Quinchia, X–1942, F. Gallego. *Cundinamarca:* El Colegio, 6 June 1946. *Narino:* "La Esperanza" (Imues), 17–III–1959, B. Yanguatin, Manzano. *Valle del Cauca:* Andalucia, alt. 1080 m., 26–V–39, Murillo; Buga, Sept. 1943, IX–1943, Gallego; Buga, alt. 1010 m., 4–11–41, Murillo; Cali, 4–27–39, B. Losada S.; Hormiguero, Cauca Valley, alt. 3260 ft., I–25–1935, Severo Quiatero; Palmira, May 1946, V–1946, Gallego; Palmira, 1085 m., 18–V–1939, Murillo; Val. Palmira, I–1944, VIII–1942, May 44, B. Losada S.; Rio Jamundí, 10 mí. S. Cali, 3000 ft., II–25–1970, H. F. Howden; Tulua, 5–II–41, Murillo. COSTA RICA: "Costa Rica"; Costa Rica, 1160 m., P. Biolley; Costa Rica, Underwood; Costa Rica, V. Patten. *Alajuela:* El Cacao, 5–VIII–1931, C. H. Ballou; E Cacao, VIII–5–31, Phoebe Tonduzü and C. H Ballou. *Cartago:* Guayabillos, SW—Abhang, Irazu, 2200 m., F. Nevermann; Irazu, H. Rolle; Irazu, Schild and Burgdorf; Pacayas, C. Werckele; Turrialba, Heyne, 900 m.; Turrialba, Schild and Burgdorf. *Heredia:* 10 mi. N. of Vara Blanca, 16 June 1967, Flint and Ortiz. *Limon:* Hamburg Farm. *San Jose:* "San Jose"; San Jose, H. Rolle; San Jose, Schild and Burgdorf; San Jose, 10–15–VIII–37; San Jose, 21–8–05, Fred K. Knab; San Jose, Sept. 27, 1921, Nevermann; San Jose, V–28, M. Valerio; San Jose, 9–X–1932, C. H. Ballou; San Jose, XI–1959, N. L. H. Krauss; San Jose, 1000–1200 m., 21–S.–05, F. Nevermann and Fred K. Knoke; San Pedro de Montes de Oca, 19–I–1933, C. H. Ballou; San Pedro de Montes de Oca, on *Celtum lanatum*, I–19–33, C. H. Ballou, EL SALVADOR: Chauchapa, VI–28–1963, D. Q. Cavagnaro and M. E. Irwin, *San Salvador:* Quezaltepeque, VII–15–1963, D. Q. Cavagnaro and M. E. Irwin; Quezaltepeque, 500 m., VII–5–63, VI–19–63, D. Q. Cavagnaro and M. E. Irwin; Mt. San Salvador, 400–6400 ft., VII–8–1963, D. Q. Cavagnaro and M. E. Irwin; San Salvador, IX–1960; San Salvador, VI–26–25, K. A. Salman; San Salvador, 7–25–44, E. J. Hambleton; San Salvador, July 3, July 8, 1957, Moratoy J. San Salvador, June 25, '58, L. J. Bottimer; San Salvador, 24–26 May 1958, VI–7–58, O. L. Cartwright. *Usulutan:* E. slope Cerro Verde, 3800 ft., VII–5–1963, D. Q. Cavagnaro and M. E. Irwin. GUATEMALA: "Guatemala"; Guate., Casey bequest. *Alto Verapaz:* Trece Aguas, Cacao, 6–4, Schwarz and Barber. *Baja Verapaz:* Rabinal, 3000 ft., VIII–2–1947, C. and P. Vaurie; Salama, 3000 ft., VII–29–1947, C. and P. Vaurie; San Jeronimo, 3000 ft., VII–26–1947, C. and P. Vaurie. *Chimaltenango:* Chichavac, 8600 elev., August, 1926, J. R. Slevin; Yepocapa, III–VI–45, H. Elishewitz; Yepocapa, April 1948, May 1948, June 1948, July 1948, 1948, July 1949, June 1950, H. T. Dalmot. *El Quiche:* Chichicastenango, 6000 ft., VIII–7–1947, C. and P. Vaurie; Chichicastenango, VIII–59, N. L. H. Krauss; Cunen, 6000 ft., Aug. 11, 1947, C. and P. Vaurie; Nebaj, 6000 ft., VIII–9–47, C. and P. Vaurie. *Escuintla:* Finca Los Cerritos, VII–5–44, E. J. Hambleton. *Guatemala:* Barcena, 11–VIII–52; Guat. City, 5000 ft., Mch. 2, 1932, C. Nainslie; Nueva Concepcion 50 ft., VIII–17–63, D. Q. Cavagnaro and M. E. Irwin; San Jose de Pinula, V–24, W. M. Mann; 5 mi. S. E. Villa Conales, on decaying banana plant, F. A. Ruhoff. *Sacatepequez:* Acatenango, July 1948, H. T. Dalmot; Capetillo, G. C. Champion; Duenas, 4500 ft., VIII–18–1947, C. and P. Vaurie; Sta. Maria,

VI, W. Schauss. *San Marcos:* N. W. Guate., IV–1952, Dr. H. Taarbor; La Conquista. *Solola:* Panjachel, VIII–19–63, D. Q. Cavagnaro and M. E. Irwin; Santa Clara, elev. 5500 ft., VIII–10–48, R. D. Mitchell. *Suchatepequez:* Finca El Cipres, 3000 ft., May 1926, J. R. Slevin; Moca, 3000 ft., VI–25–47, C. and P. Vaurie. *Zacapa:* Santa Clara in interior Valley of Sierre de los Minas (N. of Cabovas). HONDURAS: Honduras, Casey bequest 1925. *Atlantida:* San Juan, Parm. Es Parta, banana, IX–22–59?, J. L. Nickel; Tela, W. M. Mann. *Cortes:* S. Pedro Sula. *El Paraiso:* Danli, 4–IX–1958, Barnegas. *Francisco Morazan:* El Loarque, VII–30–1968, B. K. Dozier; Tegucigalpa, X–25–15, X–6–18, X–22–18, VII–22–18, VII–10–18, F. J. Dyer; near Tegucigalpa, May 26, 1918, F. J. Dyer; Zambrano, Oct. 2, 1946, Williams. *Olancho:* Ceiba, banana, 12–IV–1926. MEXICO: "Mexico"; Mex., Barrett; Mexico, Flohr; Mexico, Deppe; Mexico, W. Horn; Mex., July, Barrett; El Pueblito, Aug. 9, 1954, R. Ryckman, C. Christianson and R. Lee; Presidio, July 7, 1963, A. B. Lau; Pte de Ixtla, Wickham, Casey bequest 1925; Tres Marias, Oct. 24, 1922, E. G. Smyth; Vulcan, Santa Maria, 24–6–82, Korschefsky collection. *Chiapas:* 5 mi. N. Bochil, III–16–53, R. C. Bechtel and E. I. Schlinger; Pacific slope Cordilleras, 800–1000 m., '19, L. Hotzen; San Antonio; San Cristobal de las Casus, 11,000 ft., 8–VIII–62, H. E. Milliron. *Colima:* Colima Vulcano, L. Conrad; Vulkan Colima, 1918, Joh. Lave. *Distrito Federale:* Distrito Federale, 11 July 04; Distrito Federale, J. R. Inda; Distrito Federale, R. F. Pearsall; Mexico City, J. Mohns; Tlalpam, IX–3–03; Tulyehualco, 6–1923, 8–1923, E. G. Smyth. *Durango:* Nombre de Dios, 5900 ft., Aug. 13, 1947, Cazier; Nombre de Dios, 5900 ft., Aug. 13, 1947, Gertsch; Nombre de Dios, 5900 ft., Aug. 13, 1947, Schramel; Nombre de Dios, 5900 ft., Aug. 13, 1947, Spieth. *Guanajuato:* Guanajuato, 5–6–VIII–'49, L. J. Bottimer. *Guerrero:* Guerrero, Casey bequest 1925; Hidalgo, W. M. Mann; Amula, 6000 ft., Aug., H. H. Smith. *Hidalgo:* Chapulhuacan, V–20–1952, M. Cazier, W. Gertsch, and R. Schrammel; Jacala, VIII–20–1960, H. Howden; Jacala, July 2–3, 1965, Flint and Ortiz. *Jalisco:* Guadalajara, McConnell. *Mexico:* Tlalpam, Pedregal, 4 Oct. 1942, W. F. Foshag; Tultenango, 13–VII, R. H. Hay; Teotihuacan, July 1, 1965, O. S. Flint. *Michoacan:* 4 mi. E. Angahuan, 7800 ft., Nov. 29, 1950, Ray F. Smith; Morelia, Dr. M. M. Salozano; Patzcuaro, VII–7–1964, Paul J. Spangler; L. Patzcuaro, on cucurbit and solanum, IX–4–1952, G. H. Dieke; Tacambaro, Hoge; Urupan, el. 5000 ft., 7–12–00, O. C. Dean. *Morelos:* 6 kil. N. Alpuyeca Rte. 95, 3400 ft., August 10, 1962, George E. Ball; Cuautla, Aug. 17, 1903, July–Aug. 1903; Cuautla, VIII–7–44, N. L. H. Krauss; Cuautla, VII–13–1946, J. and D. Pallister; Cuernavaca, June–July, Wm. Schaus; Cuernavaca, VIII–1–03, VII–21–03, VII–30–03; Cuernavaca, el. 5000 ft., 7–7–00, C. C. Dean; Cuernavaca, Aug. 25, 28, 1921, H. F. Wickham; Cuernavaca, '23, E. G. Smith; Cuernavaca, VIII–27–28, Wickham; Cuernavaca, 6–2–30, B. J. Landis; Cuernavaca, VI–7–1946, J. and D. Pallister; Cuernavaca, VIII–15, 21–1944, VI–1945, VI–1959, VIII–1955, N. L. H. Krauss; Joyutla, Aug. 6, 1903; Matamoros, Aug. 9, 1903; Tepoztlan, V–4–1945, N. L. H. Krauss. *Nayarit:* Vic. Compostela, 15–VI–1934. *Oaxaca:* Juzula Mixes, 4000 ft., W. S. Miller; Juzuila Mixes, 4700 ft., VI–1968, VII–1968, V–1968, W. S. Miller; Oaxaca, Aug. 17, 1903; Oaxaca, May 27, 1900, 9–18, L. O. Howard; Oaxaca, 9–1923, E. G. Smith; Oaxaca, VII–20–37, Mead; Oaxaca, May 15, 1938, R. Greenfield, 3 mi. E. S. E. Oaxaca, VII–19–53, A. A. Alcorn; Oaxaca, 5034 ft., July 1, 1955, P. and C. Vaurie; Oaxaca, 9–IX–1956, Lattimore; Oaxaca, VIII–1959, N. Krauss; Oaxaca, VIII–1–1968, VII–31–1968, G. Pollard; 4.3 mi. W. Tamazulapan Rte. 190, 5800 ft., VIII–11–65, George E. Ball and D. R. Whitehead. *Puebla:* Puebla, May 27, 1902, E. G. Smyth; Atencingo, June 1–2, 1922, E. G. Smyth; Necara, G. Deine; nr. Puebla (Lago Valsequillo), 24–VI–63, D. R. Whitehead. *San Luis Potosi:* Bet. Barbarita and Agua Zarca, 3600 ft., 6–18–49, G. M. Bradt. *Sinaloa:* 8 mi. W. E. Palmito, VII–19–64, VII–25–64, H. F. Howden; 50 mi. E. Mazatlan, July 26, 1959, R. Schrammel. *Tamaulipas:* 8 mi. N. W. of Gomez Farias, June 1964, J. Reddell; Tampico, Locke. *Vera Cruz:* Vera Cruz, Casey bequest 1925; Vera Cruz, Koebele; Banderilla, May 1947, H. M. Wegner; Catemaco, V–28–1964, VI–19–1964, J. C. and

D. Pallister; S. E. Citlaltepetl Fortin, el. 2000 ft., VII–22–64, L. W. Swan; Citlaltepetl, el. 3000 ft., VII–3–64, 1 July 64, Swan; Citlaltepetl, 31. 3000 ft., 4 Jul. 65, L. W. Swan; S. E. Citlaltepetl Fortin, el. 3000 ft., VII–4–64, VII–3–64, L. W. Swan; Coatepec, IX–15–49, Hendrichs; Coatepec, 4019 ft., July 28, 1955, P. and C. Vaurie; Coatepec, nr. Jalapa, Conradt; Cordoba, Dr. A. Fenyes; Cordoba, Apr. 1 '08, Apr. 7/17–08, 10–6, 15–6, Fred Kn. Knab; Cordoba, May 10, 1946, May 12, 1946, V–17–1946, May 15, 1946, V–14–1946, V–15–1946, J. and D. Pallister; Cordoba, V–1955, VII–1959, N. L. H. Krauss; Cordoba, 15–VIII–62, H. E. Milliron; Cordoba, July 13, 1963, VIII–4–65, 11–2–1965, VII–28–1964, VII–15–1964, VII–25–1964, VII–27–1964, A. B. Lau; Cuitlahuac, July 24–27, 1965, Flint and Ortiz; Fortin, 3000 ft., July 22, 1955, P. and C. Vaurie; Fortin, V–1963, M. W. McFadden; Fortin de los Flores, 26–30–VI–63, D. R. Whitehead; Huatusca, VII–25–1964, A. B. Lau; Jalapa, Hoege; Jalapa, W. Schaus; Jalapa, Smith; Jalapa, May; Jalapa, V–28–47; Jalapa, 6–1, Champion; Jalapa, VI–1, Smith; Jalapa, 6–70–30, B. J. Landis; Jalapa, May 19, 1946, V–14–1946, J. and D. Pallister; Jalapa, VI–1955, N. L. H. Krauss; Nacimiento de Rio Atojal, VII–13–65, A. B. Lau; Nogales, 16–6–05, Fred Kn. Knab; Nogales, IX–1955, N. L. H. Krauss; Orizaba, June; Orizales, on Solonum, 6–5–21, H. F. Wickham; St. Lucrecia, Fred K. Knab; Dm. 100, Rd. to Taxco, Aug. 10, 1946, Goodnight and Binco Bellini; Vega del Sal., VII–27–1964, A. B. Lau. NICARAGUA: *Esteli:* Ducuali, 13 June 1967, Flint and Ortiz. *Managua:* Managua, B. A. Rene; Managua, A. D. Harvey. PANAMA: Panama, VI–14–45, E. J. Hambleton. *Chiriqui:* Chiriqui, H. Rolle, Berlin, S.W. 11; Chiriqui, Casey bequest 1925. VENEZUELA: *Lara:* Cubiro, 1500–1700 m., 29–VIII–68, J. R. Requena, R. Cassres, and J. B. Teran. *Tachira:* Jalapa, IX–22–1961, Jorge Navarro T. Trujillo; Bocono, 25–IV–1948, P. Guagliumi; Duri, 22–IX–54, F. Fernandes Y. and C. J. Rosales; La Puerta, 17–V–1949, F. Fernandes Y.; Cr. La Puerta, 1700 m., 21–IX–54, C. J. Rosales. (AMNH) (CAS) (CM) (CNC) (HH) (MCZ) (MNHUB) (USNM) (V) (ZSBS).

Epilachna plagiata Group

Length approximately 8.65–11.30 mm. Mandible of *borealis* type except that second major tooth is apparently bifid apically and has many minor teeth on lower margin (fig. 36). Color black, usually with one red spot on each elytron, occasionally two spots present. Lateral margin of elytron rounded from humeral angle to apex; epipleuron slightly wider anterior to middle than posterior to middle. Male genitalia long; basal lobe strongly curved upward before apex (fig. 857); sipho extremely long, apex bluntly rounded, somewhat S-shaped (fig. 858). Female genital plate slightly elongate, stylus visible (fig. 1715). Distribution limited to Costa Rica and Panama.

The species in the *plagiata* group are large, robust beetles with essentially the same type of color pattern and male genitalia. They resemble the South American species of *Epilachna* (*axillaris* group) more closely than most of the Central America species of *Epilachna*.

Key to Species of *Epilachna plagiata* Group

1. Form extremely convex, gibbous ..... *tumida* Gorham (p. 171)
   Form evenly convex, not gibbous 2
2. Apex of basal lobe of male genitalia notched (fig. 861); female genital plate not notched on inner margin (fig. 1719) ..... *erichsoni* Crotch (p. 170)
   Apex of basal lobe of male genitalia not notched (fig. 856); female genital plate notched near base (fig. 1715) ..... *plagiata* Gorham (p. 170)

Descriptions of Species in *Epilachna plagiata* Group

Epilachna plagiata Gorham

(Figs. 320–323, 323*a*, 856–858, 1713–1715; map 35)

Epilachna plagiata Gorham, 1897, p. 238.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 9.40 mm., width 8.25 mm. Form broad, oval, widest anterior to middle of elytra, lateral margin of elytron broadly explanate, strongly rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with two large dark-red spots, anterior spot smaller, just anterior to middle, posterior spot large, occupying most of apical one-half (fig. 320). Punctation on elytron not dual, fine, punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum broadly notched; sixth tergum feebly emarginate. Genitalia with basal lobe long, slender, narrowed toward apical one-fifth, apical one-fifth curved upward to point; paramere slender, widened at apex, shorter than basal lobe (figs. 856, 857); sipho slender, orifice dorsal, subterminal (fig. 858).

Female.—Similar to male except abdomen with hind margin of sixth sternum truncate medially (fig. 1713); sixth tergum entire, broadly convex. Genitalia with 10th tergum marginate, lacking pigmentation medially (fig. 1714); genital plate with inner margin notched near base, anterior angles rounded, inner margin strongly rounded anterior to notch, stylus visible (fig. 1715).

Variation.—Length 8.65–11.10 mm., width 7.40–9.60 mm. Elytral color pattern is variable, ranging from specimens in which spots on elytron are strongly reduced, close together at middle, to specimens in which entire elytron is dark red except for broad, black margin (figs. 321–323). Metasternum and lateral and apical abdominal areas are often piceous to reddish piceous. A series of five specimens from Turrialba, Costa Rica, are apparently not fully mature and have head and pronotum yellowish red, elytron yellowish brown bordered with brownish piceous, and sutural border less than one-half as wide as lateral border (fig. 323*a*).

Type Locality.—Panama: Volcan de Chiriqui, 4,000–6,000 feet.

Type Depository.—BMNH (lectotype here designated).

Discussion.—A female syntype of *plagiata* in the BMNH bearing the following labels is here designated lectotype: "Syntype"; "V. de Chiriqui, 4000–6000 ft., Champion"; "plagiata Gorh."; "B.C.A., Col., VII. Epilachna plagiata Gorh." *E. plagiata* can usually be separated from other Central American species of *Epilachna* on size and elytral color pattern. The series of pale specimens from Turrialba described under Variation here have a different appearance and it is necessary here to use the male genitalia. *E. plagiata* was thought to be simply a synonym of *erichsoni* Crotch, but the male and female genitalia are obviously different although they are not separable externally. See discussion under *erichsoni*.

Specimens Examined.—Total 57. COSTA RICA: "Costa Rica." *Cartago:* Turrialba, Heyne, Korschefsky collection; Turrialba, Schild and Burgdorf; Turrialba, 20 May 1951, 21 May 1951, 26 May 1951, 31 May 1951, 2 June 1951, 4 June 1951, 5 June 1951, 20 June 1951, 25 June 1951, O. L. Cartwright; Turrialba, 9–16–57, P. A. Berry; Turrialba, July 5, 1964, L. J. Bottimer; Turrialba, VII–15–65, P. J. Spangler. *San Jose:* Carrillo; Carrillo, Schild and Burgdorf; San Mateo, Biolley. PANAMA: *Chiriqui:* Volcan Chiriqui, 6000 ft., VI–39, J. R. Slevin. (CAS) (CM) (CNC) (USNM).

Epilachna erichsoni Crotch

(Figs. 859–861, 1716–1719; map 35)

Epilachna erichsoni Crotch, 1874, p. 58.—Gorham, 1897, p. 238.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 9 mm., width 7.73 mm. Description as for *plagiata* except differences as noted here. Male genitalia with apex gently

curved upward, apex in ventral view emarginate medially; paramere feebly sinuate, widened toward apex (figs. 859, 860); sipho curved upward in apical one-fourth, orifice dorsal, subterminal (fig. 861).

Female.—Similar to male except abdomen with hind margin of sixth sternum broadly truncate medially (fig. 1716); sixth tergum feebly emarginate (fig. 1717). Genitalia with 10th tergum emarginate, lacking pigment medially (fig. 1718); genital plate with inner margin straight medially, posterior margin notched, posterolateral angle slightly produced, stylus visible (fig. 1719).

Variation.—Length 8.10–10.61 mm., width 6.71–8.52 mm.

Type Locality.—Panama: Veragua.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—In external appearance *erichsoni* cannot be separated from *plagiata*, but the male genitalia with the emarginate apex of the basal lobe, the relatively short, overall length, and the female genital plate completely lacking a notch on the inner margin distinguish *erichsoni*. The only specimens examined were members of the type series, and more specimens are needed from other localities to establish the exact relationship between *plagiata* and *erichsoni*. The type series in the MNHUB consists of two males and one female; the males lack data and the female bearing the following labels is here designated lectotype: "Veragua (an illegible name)," "4542," "erichsoni Crotch."

Specimens Examined.—Total three. The type series.

Epilachna tumida Gorham

(Figs. 324, 862–863, 1720–1723; map 35)

Epilachna tumida Gorham, 1897, p. 237.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 10 mm., width 8.25 mm. Form broad, oval, widest anterior to middle of elytra, elytra strongly gibbous in lateral view, lateral margin of elytron strongly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellowish brown, 7–11 piceous; elytron black with red discal spot, spot widened anteriorly, angled outward toward lateral margin, posterior one-half of spot with sides parallel and parallel to suture (fig. 324). Punctation on elytron not dual, punctures separated by one to two times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line nearly complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly emarginate; sixth tergum broadly, feebly emarginate. Genitalia of the type described for *plagiata:* Basal lobe long, constricted near middle, apex curved upward to blunt point; paramere shorter than basal lobe, widened at apex (fig. 862); sipho slightly curved upward before apex, orifice dorsal, subterminal (fig. 863).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex medially; sixth sternum nearly truncate (fig. 1720); sixth tergum entire, broadly convex (fig. 1721). Genitalia with 10th tergum emarginate, lacking pigmentation medially (fig. 1722); genital plate with inner margin curved, posteromedian angle obsolete, anterior and outer margins strongly curved, stylus visible (fig. 1723).

Variation.—Length 10–11.30 mm., width 8.25–8.30 mm. Size of spot on elytron varies slightly, but retains L-shape described here in all specimens examined.

Type Locality.—Costa Rica.

Type Depository.—BMNH (lectotype here designated).

Discussion.—A male specimen in the BMNH bearing the following labels is here designated as lectotype: "Syntype" (blue and white disk); "Costa Rica, Van Patten"; "E. tumida Gorham, Type"; "B.C.A., Col. VII. Epilachna tumida Gorh." *E. tumida* is another distinctive Central American species rendered easily recognizable by the elytral color pattern and the extremely gibbous form.

Specimens Examined.—Total 18. COSTA RICA: "Costa Rica"; Costa Rica, Underwood. *Cartago:* Navarro, May '37; Pacayas, C. Werckele; R. Sucio, H. Rogers; Turrialba. *San Jose:* San Jose, V–2–25, M. Valerio. PAN-

AMA: *Chiriqui:* Barriles, I–31–31, M. E. McLellan; Volcan Chiriqui, 6000 ft., VI–39, J. R. Slevin. (AMNH) (BMNH) (CAS) (CM) (USNM).

Epilachna abrupta Group

E. abrupta, the only species in this group, is unusual in several respects. The antenna has segments 4–8 short, compact, and at least as wide as long (fig. 12). The mandible is of the *borealis* type, but the second and third teeth are simple, long, and slender and are located in the apical one-third (fig. 35). The male genitalia are similar to those of the *deuterea* group, the basal lobe is simple, slightly curved upward toward the apex (fig. 865), and the sipho is short, straight in the apical one-half, with apex blunt (fig. 866). The distribution is apparently limited to Costa Rica and the eastern edge of Panama.

E. abrupta is apparently another of the Central American species that has diverged from the typical South American type. This type of antenna with the short, wide segments is apparently unique, at least in the Western Hemisphere *Epilachna.*

Description of Species in *Epilachna abrupta* Group

Epilachna abrupta Gorham

(Figs. 325–326, 864–866, 1724–1727; map 36)

Epilachna abrupta Gorham, 1897, p. 236.—Korschefsky, 1931, p. 54.—Blackwelder, 1945, p. 440.

Male.—Length 10.10 mm., width 8.10 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron broadly explanate, straight medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–6 yellow, 7–11 piceous; elytron light yellow, completely bordered with black, lateral black border abruptly widened at middle (fig. 325). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence fine, nearly absent, grayish white. Postcoxal line with basal one-half obsolete, outer one-half incomplete, not distinct, directed toward basal margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly projecting medially; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with basal lobe longer than paramere, slender, gradually curved upward to blunt apex; paramere straight; trabes short, slightly longer than basal piece (figs. 864, 865); sipho short, orifice dorsal, subterminal (fig. 866).

Female.—Similar to male except abdomen with hind margin of fifth sternum more strongly projecting medially; sixth sternum broadly, shallowly notched (fig. 1724); sixth tergum entire, convex (fig. 1725). Genitalia with 10th tergum narrow, convex (fig. 1726); genital plate with inner margin straight, ragged, posteromedian angle obsolete, ragged, posterolateral angle abrupt, fused to ninth tergum, stylus visible (fig. 1727).

Variation.—Length 9.42–12.05 mm., width 7.50–10 mm. A large series of specimens from San Isidro, Costa Rica, has yellow area on elytron completely divided by median, transverse, black band extending from enlarged part of lateral border to suture (fig. 326).

Type Locality.—Costa Rica, Volcan de Chiriqui, 4,000–6,000 feet.

Type Depository.—BMNH (lectotype here designated).

Discussion.—A male specimen in the BMNH collection bearing the following labels has been selected as lectotype: "Syntype" (blue and white disk); "V. de Chiriqui," "4000–6000 ft. Champion"; "E. abrupta Gorham, Type"; "B.C.A., Col., VII. Epilachna abrupta Gorh." *E. abrupta* is an easily recognized Central American species because of its large size, striking yellow and black pattern, and shortened antenna.

Specimens Examined.—Total 90. COSTA RICA: Costa Rica, Underwood; C. Rica, 1905–100, Fry. *Cartago:* La Chonta, 9 June 1951,

O. L. Cartwright; Pacayas, C. Werckele; San Isidro, 9 June 1951, O. L. Cartwright; Vulkan Irazu, 2200 m., 1–XI–1938. *San Jose:* Coronado, 1400–1500 m., E. Assman; Guayabillas, Aug., 1932, Ballou (on Solanum Torum); Poas, Wm. Schaus; Rancho Redondo, 1200 m., Biolley; San Jose, Nevermann; Santa Maria de Dota, 1500 m., XII–'25, P. C. Standley; Tablazo, April 1905. PANAMA: *Chiriqui:* Chiriqui, XII–10–37, C. W. Funaro; Bariles, I–30–1931; Cerro Punta, 5200 ft., I–6–1961, C. E. Yunker; El Volcan Chiriqui, III–V–38, E. White; V. de Chiriqui, 4000–6000 ft., Champion; V. de Chiriqui, 4000–8000 ft., Champion. (AMNH) (CAS) (CM) (CNC) (MCZ) (MNHUB) (USNM).

Epilachna nigrocincta Group

Length approximately 5.70–8.75 mm. Mandible visible well beyond labrum, three major teeth grouped in apical one-third, first tooth trifid with minor tooth on lower margin of median branch, lower margin of second and third teeth with minor teeth present (fig. 44). Labrum short, truncate; maxilla with lacinia reduced to short projection, both galea and lacinia sparsely pubescent (fig. 52). Labium with median projection narrowed toward apex, palpus with ultimate segment distinctly shorter than penultimate (fig. 56). Color variable. Lateral margin of elytron rounded from humeral angle to apex. Tarsal claw with lower tooth rising at base (fig. 82). Postcoxal line on first abdominal sternum short, strongly incomplete. Male genitalia simple, basal lobe longer than paramere, apex pointed, bent downward; trabes longer than phallobase (fig. 868); sipho feebly curved anterior to base, apex blunt (fig. 869). Female genital plate fused to ninth tergum, anteromedian angle slightly produced, stylus visible or not (fig. 1730). Known from Mexico, Guatemala, and Panama.

The two species comprising the *nigrocincta* group are similar to each other in all respects except form and color pattern. The peculiar maxilla with the reduced lacinia and the elongate, narrow, median projection of the labrum set this group apart from other groups of *Epilachna*.

Key to Species of *Epilachna nigrocincta* Group

Elytron yellow, bordered with black (fig. 327), a fine pattern of black lines sometimes present (fig. 328) . . . . . *nigrocincta* Mulsant (p. 173)

Elytron yellow with small black spots (fig. 329), or entirely brown to piceous . . . . . *vincta* Crotch (p. 174)

Descriptions of Species in *Epilachna nigrocincta* Group

Epilachna nigrocincta Mulsant

(Figs. 327–328, 867–869, 1728–1730; map 35)

Epilachna nigrocincta Mulsant, 1850, p. 716.—Crotch, 1874, p. 62.—Gorham, 1897, p. 239.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 64.

Solanophila nigrocincta var. *scripta* Weise, 1898c, p. 236.—Weise, 1904b, p. 364.

Male.—Length 7 mm., width 5.53 mm. Form elongate-oval, widest anterior to middle of elytra, lateral margin of elytron straight medially, narrowed toward apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron yellow, completely bordered with black, basal border wide, covering callus, short projection extending posteriorly from middle (fig. 327). Punctation on elytron not dual, fine, dense, punctures separated by their diameter or less. Pubescence grayish white. Tarsal claw lacking basal angulation, lower tooth arising at base. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate medially; sixth tergum convex. Genitalia with basal lobe slender, pointed, lower margin curved upward before apex;

paramere with margins parallel, not widened toward apex, trabes longer than phallobase (figs. 867, 868); sipho slightly curved, orifice dorsal, subterminal (fig. 869).

Female.—Similar to male except abdomen with hind margin of sixth sternum broadly, feebly emarginate (fig. 1728); sixth tergum entire, truncate medially (fig. 1729). Genitalia with 10th tergum convex (fig. 1730); genital plate with anterior angles obsolete, outer margin projecting medially, posterolateral angle fused to ninth tergum, stylus visible (fig. 1730).

Variation.—Length 6–8.75 mm., width 4.60–6.80 mm. Color pattern on elytron varies from that described here to form in which black basal projection extends posteriorly beyond middle and curves inward to join suture. In addition, occasional specimen has narrow lateral vitta on apical one-half terminating at short, broad band near apex beginning at lateral margin but not reaching suture (fig. 328).

Type Locality.—Mexico (Chevrolat, Dejean).

Type Depository.—DLM (lectotype here designated).

Discussion.—The elytral color pattern easily separates *nigrocincta* from any other Mexican or Central American species; the specimens in which the discal and lateral lines are present are especially striking. The first specimen in a series of three standing under the label "Mexico" in the Dejean collection is here designated lectotype.

Specimens Examined.—Total 156. GUATEMALA: *Chimaltenango:* Santa Itena, 9800 ft., July 31, 1926, J. R. Slevin. *El Quiche:* Chicastengo, VIII–59, N. L. H. Krauss; Cunen, 6000 ft., Aug. 11, 1947, C. and P. Vaurie; Tetonicopan, May 16, 1906, O. F. Cook. MEXICO: Mexico, Flohr; Mexico, Koebele; Mexico, Kraatz; Boba del Monte, Hoege; ded. 30–VI–1897, R. Korschefsky, cum. typ. comp., C. Hoge, Korschefsky collection. *Colima:* Colima, Conradt; Vulcano Colima, L. Conrad; Vulkan Colima, 1918, Joh. Lave. *Guerrero:* Guerrero, Casey bequest 1925; Chilpancingo, 4600 ft., July, H. H. Smith; Omilteme, 8000 ft., July, H. H. Smith. *Morelos:* South of Cuernavaca, IX–1935, Dobzhansky. *Oaxaca;* Oaxaca, VII–31–1968, G. Pollard; Cerro San Jose, IX–8–1935, Dobzhansky; Esperanza; Esperanza, Hoege; Juchatengo, in bromeliads, 7100 ft., III–23–1966, George E. Ball and D. R. Whitehead; Km. 180–212, Puerto Escondido, Hwy., Sept. 6–9, 1968, A. and H. Howden; Tejocates, Rt. 190, km. 491, Aug. 4, 1965, Flint and Ortiz; Tejocates, Rt. 190, km. 491, 8 June 1967, O. S. Flint, Jr. *Puebla:* Puebla, Casey bequest 1925. *Sinaloa:* 4.5 mi. W. El Palmito, 6300 ft., July 20, 1964, J. F. McAlpine. *Vera Cruz:* E. Citlaltepetl, 7000 ft., VII–21–64, L. W. Swan. (AMNH) (CAS) (CNC) (HH) (MNHUB) (USNM) (ZSBS).

Epilachna vincta Crotch

(Figs. 329–330, 870–872, 1731–1734; map 37)

Epilachna vincta Crotch, 1874, p. 63.—Gorham, 1897, p. 240.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 6 mm., width 4.90 mm. Form oval, convex, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color yellowish brown; head black except V-shaped frontal area yellow; pronotum with transverse, median black spot; elytron yellow with six black spots and curved, elongate black mark, mark extending from callus along base to scutellum and posteriorly along suture for one-third of its length, not touching suture, widened toward apex, one elongate spot near and parallel to apex of basal mark, second spot transverse, outside and slightly posterior to first spot, third spot round, outside second spot, round spot near suture at apical two-thirds, two small spots close together and parallel to lateral margin on apical one-third (fig. 329). Punctation on elytron dual, small punctures separated by their diameter or slightly more, large punctures separated by one to two times their diameter. Surface of elytron reticulate. Pubescence grayish white except black on elytral spots. Postcoxal line incomplete, distinct, outer end directed toward lateral margin of first abdominal sternum, extending beyond middle of sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate; sixth tergum entire, convex. Genitalia with phallobase short; basal lobe nearly straight, longer than paramere, lower margin angled upward before apex; trabes

longer than phallobase; paramere broad, oval, lower margin constricted near base (figs. 870, 871); sipho slightly curved, orifice dorsal, subterminal (fig. 872).

Female.—Similar to male except abdomen with hind margin of sixth sternum just perceptibly emarginate (fig. 1731); sixth tergum convex, entire (fig. 1732). Genitalia with 10th tergum convex (fig. 1733); genital plate with anteromedian angle acute, inner margin rounded, apical margin straight, angled posteriorly, posterolateral angle fused to ninth tergum, stylus not visible (fig. 1734).

Variation.—Length 5.70–7.68 mm., width 4.72–6.10 mm. Pronotum varies from having narrow, uneven, transverse spot on disk to completely black with narrow, piceous anterior and lateral margins. Ground color of elytron ranges from pale yellow with maculation as described here to form in which elytron is completely bordered with black (fig. 330) and underside is black and finally to form in which entire elytron is piceous, causing dorsal surface to appear completely black. Dark color phase has elytral maculation still discernible with adequate light and magnification. Underside is entirely black in dark phase.

Type Locality.—Guatemala.

Type Depository.—UCCC (lectotype here designated).

Discussion.—The dark color phase may be confused with dark specimens of *Mada polluta*, but *polluta* does not have the maculation still visible as does *vincta*. The male genitalia, claw, labrum, and maxilla indicate a close relationship to *nigrocincta* as discussed under the group heading.

Specimens Examined.—Total 147. BRITISH HONDURAS: "Br. Honduras." COSTA RICA: "Costa Rica"; Costa Rica, leaves of *Vaca blanca*. *Cartago:* San Isidro de Coronada, leaves of *Vaca blanca*, II–29–33, C. H. Ballou; Tucuriqne, Schild and Burgdorf; Turrialba, Schild and Burgdorf; Turrialba, Heyne, Korschefsky collection; Turrialba, 5 June 1951, O. L. Cartwright. *Limon:* La Gloria, alt. 900 m., VI–31, M. Valerio. GUATEMALA: "Guatemala"; El Naranjo, on cinchona, VII–12–44, E. J. Hambleton. *Chimaltenango:* Acatenango, May 1948, H. T. Dalmot; Yepocapa, May 1948, June 1948, H. T. Dalmot. *Escuintla:* Escuintla, VI–13–45, E. J. Hambleton. *El Quiche:* Cunen, 6000 ft., Aug. 11, 1947, E. and P. Vaurie. *San Marcos:* La Conquista; La Conquista, Nevermann; La Conquista, Korschefsky collection. *Santa Rosa:* Barberena R., Korschefsky cum type comp., Korschefsky collection. *Suchitepequez:* Chicacao, VII–13–44, E. J. Hambleton; Fca. Moca, 12 June 1966, Flint and Ortiz. MEXICO: *Chiapas:* El Rincon, Rt. 17, V–13–14, 1969, H. F. Howden. PANAMA: Finca Pan., VI–14–45, E. J. Hambleton. (AMNH) (CAS) (HH) (MCZ) (USNM).

Epilachna calligrapta Group

Length approximately 7.30–8.50 mm. Mandible not examined, visible beyond labrum. Color variable. Lateral margin of elytron rounded from humeral angle to apex. Male genitalia with basal lobe longer than paramere, upper margin sinuate, abruptly angled upward before apex (fig. 876); sipho variable. Female genitalia known only for *pseudograpta*. The distribution is apparently limited to eastern Panama and Costa Rica.

Key to Species of *Epilachna calligrapta* Group

Lateral border of elytron yellow, color pattern composed of black spots on yellow background (fig. 332) ..... *calligrapta* Gorham (p. 176)

Lateral border of elytron black, color pattern basically orange with large, irregular black areas (fig. 331) ..... *pseudograpta*, n. sp. (p. 176)

Descriptions of Species in *Epilachna calligrapta* Group

Epilachna pseudograpta, new species

(Figs. 331, 873–874, 1735–1738; map 37)

Male.—Length 7.35 mm., width 6.10 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron reddish brown completely bordered with black, lateral border very wide, sutural border wide in basal one-third, narrow from basal one-third to apical one-third, projection from lateral border extending inward at midpoint, two small reddish-brown spots present near lateral margin posterior to callus, apical angle with small reddish-brown spot (fig. 331). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Pubescence yellowish white. Postcoxal line complete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, evenly concave; sixth sternum weakly emarginate; sixth tergum deeply notched. Genitalia of *calligrapta* type; basal lobe longer than paramere, lower margin abruptly angled upward in apical one-fourth, upper margin sinuate, slightly thickened medially; paramere slightly widened apically; trabes short, slightly longer than basal piece (figs. 873, 874); sipho lost.

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate, longitudinal suture present (fig. 1735); sixth tergum deeply notched (fig. 1736). Genitalia with 10th tergum convex, entire (fig. 1737); genital plate elongate, narrowed posteriorly, all angles rounded, stylus visible (fig. 1738).

Variation.—Length 7.35–8.41 mm., width 6.10–6.62 mm. Allotype has lateral black border broader than holotype, occupying about one-half of elytron, no lateral or apical spots visible.

Holotype.—Male. COSTA RICA: *Cartago:* Pacayas, C. Werkele (AMNH).

Allotype.—Female. COSTA RICA: *Cartago:* Pacayas, C. Werkele (CAS).

Discussion.—*E. pseudograpta* is close to *calligrapta*, but the elytral color patterns are different, although basically similar. *E. pseudograpta* has the sixth tergum deeply notched, whereas it is entire and convex in *calligrapta*. The basal lobe of the male genitalia is longer and more slender in *pseudograpta*.

Epilachna calligrapta Gorham

(Figs. 332, 875–877; map 37)

Epilachna calligrapta Gorham, 1897, p. 240.
Epilachna vincta ab. *calligrapta:* Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 7.31 mm., width 5.36 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron distinctly explanate, rounded from humeral angle to apex. Color black; pronotum with anterolateral angle obscurely piceous; epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment piceous; segments 2–8 yellow, 9–11 brown; elytron yellow with suture narrowly piceous and lateral margin paler yellow, seven piceous spots present, first spot elongate, extending from base across callus, ending at basal one-fifth, second spot small, round, between apical end of first spot and suture, third spot elongate on suture extending from base to apical one-fifth, widened at apex, spots 4–6 in oblique, transverse row at middle of elytron, lateral spot large, elongate, seventh spot small, round, on middle of apical one-third (fig. 332). Punctation on elytron not dual, punctures large, separated by one to two times their diameter. Surface of elytron smooth, shining. Pubescence grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly concave; sixth sternum weakly notched; sixth tergum entire, convex. Genitalia with lower margin of basal lobe straight, angled upward before apex, upper margin curved downward before apex, angled upward toward apex, apex broken, missing; paramere long, slender, not widened apically; trabes short, equal in length to basal piece (figs. 875, 876); sipho stout, abruptly curved near base,

apex blunt, orifice dorsal, subterminal (fig. 877).

Female.—Not known.

Type Locality.—Panama: *Chiriqui:* Volcan de Chiriqui, 4,000–6,000 feet.

Type Depository.—BMNH.

Discussion.—*E. calligrapta* was placed as an aberration of *vincta* by Korschefsky (*1931*) and has been maintained in that status by subsequent authors. Examination of the type of *calligrapta* has shown it to be different from *vincta* except in elytral color pattern. In addition to the different male genitalia, the combination of completely dark pronotum and pale lateral margin of the elytron has not been observed in any specimen of *vincta*. The form of *calligrapta* is elongate with the lateral margin of the elytron distinctly explanate; in *vincta* the form is more rounded, more strongly convex, and the lateral margin of the elytron is feebly explanate. The male type bearing the following labels was examined: "Type" (white disk with orange margin); "V. de Chiriqui, 4000–6000 ft., Champion"; "E. calligrapta Gorham"; "B.C.A., Col., VII. Epilachna calligrapta Gorh."

Specimens Examined.—Total 12. The type; V. de Chiriqui, Champion. (BMNH) (PM).

Epilachna olivacea Group

Length approximately 6–9.50 mm. Mandible visible beyond labrum, three major teeth in apical one-half, first tooth trifid, minor teeth present on lower margin of median branch, third tooth short, minor teeth present on lower margin and on inner margin of mandible below third tooth (fig. 25). Antenna with club segments distinctly larger than preceding segments (fig. 13). Color variable. Lateral margin of elytron rounded from humeral angle to apex. Male genitalia with basal lobe longer than paramere, curved downward nearly to apex, curved upward before apex (fig. 878); sipho long, slender (fig. 879). Female genital plate with lateral margin sinuate, posterolateral angle produced, stylus visible (fig. 1742). Known from Mexico and Central America north of Panama.

E. vulnerata is not a typical member of this group as the male genitalia are quite different, but it is placed here because of the similarity of the female genitalia and the body form to those of the *olivacea* group.

Key to Species of *Epilachna olivacea* Group

1. Elytron entirely black or piceous 2
   Elytron not entirely black or piceous 3
2. Elytron with pubescence grayish yellow except spots formed by brownish piceous pubescence (fig. 333) . . . . . *obscurella* Mulsant (p. 178)
   Elytron with uniform greenish-gray pubescence . . . . . *olivacea* Mulsant (p. 177)
3. Elytron dark red except narrow lateral and basal border black (fig. 334) . . . . . *aubei* Mulsant (p. 179)
   Elytron dark red, bordered with black, with two transverse, irregular black bands (fig. 335) . . . . . *vulnerata* Gorham (p. 180)

Descriptions of Species in *Epilachna olivacea* Group

Epilachna olivacea Mulsant

(Figs. 878–879, 1739–1742; map 37)

Epilachna olivacea Mulsant, 1850, pp. 808-809.—Crotch, 1874, p. 62.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 7.47 mm., width 5.60 mm. Form elongate-oval, widest anterior to middle of elytra, lateral margin of elytron feebly rounded from humeral angle to apex, nearly straight at midpoint. Color black; mouthparts yellow to piceous; antenna with segments 1–9 yellow, 10–11 brown; legs with trochanter piceous, basal two-thirds of femur black, rest of leg yellow. Punctation on elytron extremely fine, dense, punctures separated by less than

their diameter. Surface of elytron alutaceous. Pubescence dense, greenish gray, giving dorsal surface an olive-colored appearance. Postcoxal line incomplete, distinct, extending to middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, weakly notched; sixth tergum feebly emarginate. Genitalia with basal lobe curved downward before apex, apex bent upward; paramere long, slender, not widened apically; trabes short, spatulate, broad (fig. 878); sipho curved nearly to apex, orifice dorsal, subterminal (fig. 879).

Female.—Similar to male except abdomen with hind margin of sixth sternum entire, convex (fig. 1739); sixth tergum feebly emarginate (fig. 1740). Genitalia with 10th tergum truncate, lateral angle rounded (fig. 1741); genital plate with anterior margin truncate, stylus visible on anteromedian angle (fig. 1742).

Variation.—Length 7.33–9.45 mm., width 5.49–7.75 mm.

Type Locality.—Mexico (Perroud).

Type Depository.—Not known.

Discussion.—Although no type material has been found, there is little doubt that this is Mulsant's *olivacea*. The species is very distinctive and should not be confused with any presently known species of *Epilachna*. The dense greenish-gray pubescence is a character shared by *obscurella*, but *olivacea* lacks the spots of dark pubescence and *obscurella* has the legs entirely dark.

Specimens Examined.—Total 15. COSTA RICA: "Costa Rica." GUATEMALA: *Quezaltenango:* Ostuncalco, Champion; Ostuncalco, 7500 ft., Champion. MEXICO: *Chiapas:* Sn. Cristobal, 19–VII–69, L. A. Kelton; 3 mi. N.W. San Cristobal, V–29–1969, H. F. Howden; nr. Tinijapa, 8 mi. N.E. San Cristobal, V–18–1969, J. M. Campbell. (AMNH) (CAS) (CM) (CNC) (HH) (MCZ) (USNM).

Epilachna obscurella Mulsant

(Figs. 333, 880–881, 1743–1746; map 37)

Epilachna obscurella Mulsant, 1850, p. 809.—Crotch, 1874, p. 62 (as a synonym of *E. olivacea*).—Gorham, 1898, p. 243.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Epilachna murina Mulsant, 1850, p. 814.—Crotch, 1874, p. 62 (as a synonym of *E. varivestis*).—Blackwelder, 1945, p. 442. NEW SYNONYMY.

Epilachna corrupta ab. *murina:* Korschefsky, 1931, p. 58.

Male.—Length 6.43 mm., width 4.60 mm. Form elongate-oval, widest anterior to middle of elytra, lateral margin of elytron feebly rounded from humeral angle to apex, nearly straight at midpoint. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with seven piceous spots, first three spots in uneven row, first spot on callus, inner spot close to suture, middle spot slightly posterior to other two, second row with three spots in straight line at middle from near lateral margin to near suture, seventh spot on center of apical one-fourth (fig. 333). Punctation on elytron fine, dense, not dual, punctures separated by less than their diameter. Surface of elytron smooth, shining. Pubescence dense, grayish yellow, giving dorsal surface olive-green appearance, spots on elytron caused by areas of brownish piceous pubescence. Postcoxal line complete, distinct, extending two-thirds distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum broadly emarginate. Genitalia of *olivacea* type; phallobase more slender, not as abruptly curved medially; paramere straighter; trabes not as broadly spatulate (fig. 880); sipho as described for *olivacea* (fig. 881).

Female.—Similar to male except abdomen with hind margin of sixth sternum feebly emarginate, nearly truncate (fig. 1743); sixth tergum feebly emarginate (fig. 1744). Genitalia with 10th tergum emarginate, lacking pigmentation medially (fig. 1745); genital plate with inner margin rounded toward base, posteromedian angle obsolete, posterolateral angle abrupt, not fused to ninth sternum (fig. 1746).

Variation.—Length 6–7.22 mm., width 4.75–5.75 mm. Spots on elytron are sometimes not apparent except apical spot, which seems to be always there. Since spots are caused solely by pubescence in mature individuals, individual that has been rubbed will have spots

removed. Teneral specimens have elytron dark brown to piceous with black spots where dark pubescence occurs. These teneral specimens also have underside dark brown.

Type Locality.—Of *obscurella*, Mexico (Chevrolat); of *murina*, Mexico (Chevrolat, Dejean, Germar, and Schaum).

Type Depository.—Of *obscurella*, not known; of *murina*, UCCC (lectotype here designated).

Discussion.—Crotch (*1874*) treated *murina* as a synonym of *varivestis* in which he has been followed by all subsequent authors. Examination of genitalia has shown *murina* to be quite different from *varivestis* and to be conspecific with *obscurella*, which has page priority. Mulsant described *obscurella* from a single incomplete specimen in poor condition, but the size and presence of a brown subapical spot leave little doubt that he was referring to the same species described here. *E. obscurella* resembles the dark forms of *varivestis* from which it may be separated by the smaller size, presence of elytral spots formed by the pubescence, and the completely dark legs. See remarks under *olivacea*. The next to last specimen under the name *varivestis* in the Crotch collection bears the label "TYPE murina, Mexico," and is here designated lectotype of *murina*.

Specimens Examined.—Total 44. MEXICO: "Mex."; Mexico, Deppe; Mexico, Korschefsky collection; Mexico, Koeble. *Distrito Federale:* Distrito Federale, L. Conradt; Distrito Federale, J. R. Inda; Distrito Federale, VIII–1931, IX, X, 1930, C. C. Plummer; El Guarda, potato, elev. 9800 ft., VIII–10–45, J. G. Shaw. *Durango:* El Salto, VII–5–64, H. F. Howden; 3 mi. E. El Salto, VII–5–64, H. F. Howden. *Mexico:* Chapingo, alfalfa, 4–VIII–53, J. A. Sifuentes. *Puebla:* Puebla, Casey bequest 1925. *Vera Cruz:* Orizales, 9–27–23, E. G. Smyth. (CNC) (MCZ) (MNHUB) (USNM).

Epilachna aubei Mulsant

(Figs. 334, 882–884, 1747–1749; map 37)

Epilachna aubei Mulsant, *1850*, p. 810.—Crotch, *1874*, p. 62.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 6.61 mm., width 5.41 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with segments 1–8 yellow, 9–11 piceous; legs with anterior one-fifth of femora, tibiae, and tarsi yellow; elytron dark red except narrow lateral and basal border black (fig. 334). Punctation on elytron not dual, fine, punctures separated by their diameter or less. Surface of elytron reticulate, feebly shining. Pubescence grayish white except on median area of elytron where it is reddish brown. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with basal lobe longer than paramere, strongly curved in basal seven-eighths, curved upward to blunt point in apical one-eighth, paramere slender, curved, not widened apically; trabes short, slightly longer than basal piece (figs. 882, 883); sipho curved throughout, curved upward at apex, orifice dorsal, subterminal (fig. 884).

Female.—Similar to male except abdomen with hind margin of sixth sternum shallowly emarginate (fig. 1747). Genitalia with 10th tergum broadly convex (fig. 1748); genital plate narrowed to blunt point posteriorly, stylus visible (fig. 1749).

Variation.—Length 6.58–7.26 mm., width 5.35–5.71 mm.

Type Locality.—Mexico (PM).

Type Depository.—PM (lectotype here designated).

Discussion.—The dorsal color pattern, partially yellow legs, and male genitalia characterize *aubei* very well. The single female specimen of *aubei* found in the Paris museum bearing the following labels is here designated lectotype: "Museum Paris, Mexique, Giesbrecht 1842"; "Epilachna aubei Muls., auct. det."

Specimens Examined.—Total 18. MEXICO: "Mexico," Korschefsky collection; "Mex."; "Mexique". *Guerrero:* Omilteme, Guerrero, 8000 ft., Aug., July, H. H. Smith; Omilteme, H. H. Smith. *Jalisco:* Jalisco, Schneider. *Oaxaca:* Juquila, Salle; Yolotepec, Flohr; Yolotepec, Salle. (BMNH) (CAS) (MCZ) (MNHUB) (USNM).

Epilachna vulnerata Gorham

(Figs. 335, 885–887, 1750–1753; map 35)

Epilachna vulnerata Gorham, 1898, p. 243.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Female.—Length 7.78 mm., width 6.58 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron definitely explanate, rounded from humeral angle to apex. Color black; apical one-third of femur, entire tibia and tarsus reddish brown; mouthparts reddish brown to piceous; antenna with segments 1–8 yellow, 9–11 piceous; elytron dark red bordered with black, two irregular, transverse black bands present, anterior band posterior to callus, posterior band at apical one-third (fig. 335). Punctation on elytron not dual, punctures separated by their diameter or less. Surface of elytron distinctly reticulate. Pubescence short, grayish white. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex medially; sixth sternum entire, hind margin truncate medially (fig. 1750); sixth tergum feebly emarginate medially (fig. 1751). Genitalia with 10th tergum convex, narrowly pigmented (fig. 1752); genital plate with inner margin rounded, posteromedian angle obsolete, posterolateral angle produced, stylus visible (fig. 1753).

Male.—Similar to female except genitalia with basal lobe slightly longer than paramere, upper margin sinuate, smaller medially, apex gently curved upward, bluntly rounded; paramere slightly widened apically (figs. 885, 886); sipho robust, apex bluntly rounded, orifice dorsal, subterminal (fig. 887).

Variation.—Length 7.48–7.78 mm., width 6.36–6.58 mm. Male specimen is not as strongly marked on elytron as female lectotype.

Type Locality.—Mexico.

Type Depository.—BMNH (lectotype here designated).

Discussion.—The female in the BMNH collection figured by Gorham (*1897*) and bearing the following labels is here designated lectotype: "Syntype"; "2307" (green paper); "Mexico, Salle coll."; "E. vulnerata Gorham, Type"; "B.C.A., Col., VII., Epilachna vulnerata Gorh." It is not absolutely certain that the male described here is the same species as the lectotype of *vulnerata*, but the color pattern and form are essentially the same and these specimens are treated here as being the same species.

Specimens Examined.—Total two. MEXICO: The lectotype. *Guatemala:* Duenas, G. C. Champion. (BMNH) (MNHUB).

Epilachna patula Group

Length approximately 5–7.10 mm. Mandible visible beyond labrum, three major teeth in apical one-half, first tooth trifid, minor teeth present on upper margin of dorsal branch and on lower margin of median branch, appearing serrate, second and third teeth with minor teeth on both margins, appearing serrate, many small, pointed teeth on lower surface of second and third teeth (fig. 46). Color variable. Lateral margin of elytron rounded, feebly explanate. Male genitalia with basal lobe longer than paramere, simple, curved upward before apex (fig. 889); sipho broadly curved, apex blunt, orifice with setigerous membrane visible (fig. 890). Female genital plate somewhat square or rectangular, posteromedian angle usually notched (fig. 1757). Distribution is throughout Central America and southern Mexico.

Key to Species of *Epilachna patula* Group

1. Elytron entirely black, three spots present, formed by dark pubescence (fig. 339), or black without spots ..... *tenebricosa* Mulsant (p. 183)
   Elytron not entirely black 2
2. Pronotum entirely black except narrow lateral margin occasionally yellow 3
   Pronotum entirely light colored or with black spots, or median area black 4

3. Mexico; elytron black with three transverse rows of piceous spots on orange background (fig. 337) .... *modesta* Mulsant (p. 182)
   Costa Rica; elytron reddish brown with five black spots and transverse, black band (fig. 341) .... *gorhami*, n. sp. (p. 184)
4. Elytron yellow with nine piceous spots in three transverse rows, irregular piceous band between each row (fig. 338) .... *difficilis* Mulsant (p. 182)
   Elytron not as described above 5
5. Elytron with four black spots and irregular, transverse, median band (fig. 336) .... *patula* Mulsant (p. 181)
   Elytron not as described above 6
6. Elytron with 10 black spots and irregular, transverse band, lateral border paler than background color (fig. 340) .... *vanpatteni* Gorham (p. 184)
   Elytron not as described above 7
7. Length 6.47 mm. or more; broad black border just inside lateral margin of elytron (fig. 342) .... *championi*, n. sp. (p. 185)
   Length 6.40 mm. or less; no lateral black border on elytron (fig. 344) .... *godmani*, n. sp. (p. 186)

Descriptions of Species in *Epilachna patula* Group

Epilachna patula Mulsant

(Figs. 336, 888–890, 1754–1757; map 38)

Epilachna patula Mulsant, 1850, p. 65.—Crotch, 1874, p. 62.—Weise, 1895, p. 124.—Gorham, 1898, p. 245.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 6.25 mm., width 5.28 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color yellow; pronotum with lateral black spot on each side and median black spot extending from base to apex; metasternum and median area of abdominal sterna black; elytron reddish yellow with four black spots and transverse, irregular median band, anterior spot near base inside callus, band nearly touching suture, extending to explanate part of elytron, anterior and posterior margin very irregular, spots 2 and 3 at apical one-third, outer spot near lateral margin, inner spot close to suture, spot 4 transverse, near apex (fig. 336). Punctation on elytron not noticeably dual, punctures separated by their diameter or less. Surface of elytron very finely reticulate. Pubescence yellowish white. Tarsal claw with feeble basal angulation. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum faintly emarginate. Genitalia with basal lobe similar to that described for *borealis;* dorsal carina present on apical one-third; paramere with upper and lower margins appearing parallel in lateral view (figs. 888, 889); sipho with a single curve, apex bluntly rounded, orifice dorsal, subterminal, exposed setigerous membrane present (fig. 890).

Female.—Similar to male except hind margin of fifth sternum slightly convex; sixth sternum convex with faint emargination (fig. 1754); sixth tergum entire, convex (fig. 1755). Genitalia with 10th tergum convex, entirely pigmented (fig. 1756); genital plate rectangular, posteromedian angle emarginate, stylus visible (fig. 1757).

Variation.—Length 6.10–7.10 mm., width 5–6.05 mm. Median pronotal spot quite often does not extend to apical margin. Spots 4 and 5 on elytron are sometimes narrowly connected.

Type Locality.—Mexico (Chevrolat).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The small size and elytral pattern should distinguish this species. The sipho of the male genitalia has the setigerous membrane characteristic of the *borealis* group but is not doubly curved. The single specimen under the name *patula* in the Crotch collection bearing the label "TYPE patula," is here designated lectotype.

Specimens Examined.—Total 13. MEXICO: *Vera Cruz*: Jalapa, W. Schaus; Las Vigas; Las Vigas, Hoege; Sn. Rafael, Jicaltepec. (AMNH) (CAS) (MCZ) (USNM).

Epilachna modesta Mulsant

(Figs. 337, 891–893; map 38)

Epilachna modesta Mulsant, 1850, pp. 817–818.—Crotch, 1874, p. 63.—Gorham, 1898, p. 245.
Epilachna corrupta ab. *modesta:* Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 442.

Male.—Length 5.47 mm., width 4.40 mm. Form oval, rounded, convex, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color black; narrow anterior and lateral pronotal margins, basal two-thirds of head, leg except basal two-thirds of femur, apical and lateral margins of last two abdominal sterna yellow; mouthparts and antenna yellow; elytron black with eight piceous spots in transverse rows of 3, 3, and 2 on background of irregular transverse bands of orange, apical angle orange, narrowly connected to posterior transverse band along suture (fig. 337). Punctation on elytron dual, small punctures fine, dense, separated by less than their diameter, large punctures separated by two to four times their diameter. Pubescence grayish white except on piceous spots on elytron where it is dark brown. Tarsal claw with feeble basal angulation. Postcoxal line incomplete, distinct, extending three-fourths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with basal lobe slender, gradually narrowed from base to apex, apex abruptly curved upward, pointed; paramere angled upward, widened at apex; trabes shorter than phallobase (figs. 891, 892); sipho short, robust, broadly, strongly curved, orifice dorsal, subterminal with setigerous membrane (fig. 893).

Female.—Not known.

Type Locality.—Mexico (Dejean, Reiche).

Type Depository.—DLM (lectotype here designated).

Discussion.—*E. modesta* is a member of a group of small species including *patula, vanpatteni, gorhami,* and *difficilis,* and it has previously been considered to be close to or a form of *varivestis.* The male genitalia separate *modesta* from the other species in this group. In addition, the legs of *modesta* have the femur black in the basal two-thirds, whereas all other members of the group have the legs entirely yellow. See remarks under *difficilis.* The single specimen of *modesta* in the Dejean collection, standing under the label "Mexico, Hopfner," is here designated lectotype.

Specimens Examined.—Total 18. MEXICO: "Mexico." *Guerrero:* 5 mi. N. Chilpancingo, Aug. 25–VIII–1958, H. F. Howden. *Morelos:* Cuernavaca; Cuernavaca, 6 mi. N., 7500 ft., 15–VIII–1954, J. G. Chillcott. *Oaxaca:* Oaxaca, Deppe; Oaxaca, Hoege; Oaxaca, VII–20–37, Mead. *Vera Cruz:* Cordoba, Dr. A. Fenyes; Citlaltepetl, 2800 ft., 23 Jun. '64, L. W. Swan; n. Orizaba, IX–5–1955, G. H. Dieke. (CAS) (CNC) (MCZ) (MNHUB) (USNM) (ZSBS).

Epilachna difficilis Mulsant

(Figs. 338, 894–896, 1758–1761; map 38)

Epilachna difficilis Mulsant, 1850, pp. 818–819.—Crotch, 1874, p. 63 (as a synonym of *modesta* Mulsant).—Blackwelder, 1945, p. 442 (as a synonym of *varivestis* Mulsant).
Epilachna corrupta ab. *difficilis:* Korschefsky, 1931, p. 58.

Male.—Length 5.66 mm., width 4.35 mm. Form oval, round, convex, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color yellow; longitudinal median area of pronotum, prosternum, mesosternum, and median area of abdominal sterna black; elytron yellow with nine piceous spots arranged in three transverse rows of 4, 3, 2, between each row of spots is irregular, transverse, piceous band extending from suture to lateral margin, anterior row of spots uneven, outer spot on callus, median two spots between callus and scutellum in row (fig. 338). Punctation on elytron dual, small punctures fine, dense, separated by less than their diameter, large punctures separated by two to four times their diameter. Pubescence grayish white except on piceous spots and transverse piceous bands of elytron where it is dark brown. Postcoxal line incomplete, distinct, extending three-fourths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum broadly, weakly emarginate; sixth ter-

gum emarginate. Genitalia with phallobase short, robust; basal lobe broad, gradually curved upward to point; paramere angled upward, widened toward apex; trabes short, spatulate (figs. 894, 895); sipho short, robust, strongly curved, apex with ventral hook, orifice dorsal, subterminal, with setigerous membrane (fig. 896).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum entire, convex (fig. 1758); sixth tergum entire, convex (fig. 1759). Genitalia with 10th tergum convex, lacking pigmentation medially (fig. 1760); genital plate elongate, anterior angles rounded, posterior angles abrupt, posterior margin truncate, stylus visible (fig. 1761).

Variation.—Length 5–6.15 mm., width 3.90–4.98 mm. Pronotal color pattern varies from that described here to form having small black spot on each side of middle to having entire pronotum black except for narrow anterior and lateral margins. Color pattern of elytron may have one or both irregular transverse bands absent except for dark spot on lateral margin. Median anterior spot of first row may be obscure and difficult to see.

Type Locality.—Mexico (Dupont).

Type Depository.—Not known.

Discussion.—*E. difficilis* has been placed as a synonym, aberration, or variation of *modesta* or *varivestis* by all authors subsequent to Mulsant. Dissection of the male genitalia has shown *difficilis* to be a valid species. The species most likely to be confused with *difficilis* is *modesta*, but the presence of dark pubescence on the transverse bands of the elytron as well as the entirely yellow legs should distinguish *difficilis*. The type of *difficilis* listed by Mulsant (*1850*) as being from Dupont may perhaps be in the Paris museum, but it could not be located on a visit to that institution.

Specimens Examined.—Total 22. GUATEMALA: "Guatemala." *Chimaltenango:* Yeocapa, May 1948, Aug. 1949, May 1950, Dalmat. *Sacapetequez:* Capetillo, G. C. Champion. MEXICO: *Chiapas:* Chiapas, Van Patten. *Durango:* 24 mi. W. La Ciudad, VI–20–64, H. F. Howden. *Jalisco:* Guadalajara, McConnell. *Sinaloa:* 8 mi. W. El Palmito, VIII–7–64, H. F. Howden; 15 mi. W. El Palmito, VII–11–64, H. F. Howden. (AMNH) (CAS) (CM) (CNC) (MCZ) (USNM).

Epilachna tenebricosa Mulsant

(Figs. 339, 897–899, 1762–1765)

Epilachna tenebricosa Mulsant, 1850, pp. 809–810.—Crotch, 1874, p. 62 (as a synonym of *olivacea* Mulsant).—Korschefsky, 1931, p. 64 (as a synonym of *obscurella*).—Blackwelder, 1945, p. 442.

Male.—Length 5.51 mm., width 4.36 mm. Form elongate, oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts and antenna entirely yellow; posterior one-third of head, narrow lateral and anterior angles of pronotum and apical one-fourth of femur, entire tibia and tarsus yellow. Punctation on elytron barely perceptibly dual, small punctures usually contiguous in irregular, transverse rows, larger punctures sparsely, irregularly scattered. Pubescence dense, greenish white. Tarsal claw lacking basal angulation. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum entire. Genitalia of *modesta* type; basal lobe slightly longer than paramere, curved upward toward apex; paramere not widened apically (figs. 897, 898); sipho strongly, broadly curved, apex slender, blunt, orifice dorsal, subterminal (fig. 899).

Female.—Similar to male except elytron with three round, dark spots caused by areas of dark, reddish-brown pubescence, first spot small, on center of elytron, second spot three times as large as first, at middle of elytron near suture, third spot small, near suture at apical one-fourth (fig. 339). Abdomen with hind margin of sixth sternum convex, entire (fig. 1762); sixth tergum convex, entire (fig. 1763). Genitalia with 10th tergum convex, weakly pigmented medially (fig. 1764); genital plate somewhat rectangular, posteromedian angle notched, inner margin straight, stylus visible (fig. 1765).

Variation.—Length 5.51–6 mm., width 4.36–4.90 mm. See discussion under female.

Type Locality.—Mexico (Dupont).

Type Depository.—PM (lectotype here designated).

Discussion.—*E. tenebricosa* was first placed in synonymy by Crotch (*1874*) under *olivacea*, then Korschefsky (*1931*) and Blackwelder (*1945*) synonymized it with *obscurella*. The male and female genitalia are of the *modesta* type, not like *olivacea* or *obscurella* at all, and *tenebricosa* is here considered to be a valid species. Possibly the female described here is not the same species as the male, but they agree in all respects except the presence of the dark elytral spots. The female bears the same data as the male. Because of the elytral spots, *tenebricosa* may be confused with *obscurella*, but *obscurella* never has the anterior and lateral angles of the pronotum yellow. The first specimen in the Sicard collection (Paris museum) under the name *tenebricosa*, a male bearing the following labels, is here designated lectotype: "Mexique (coll. Mniszech)"; "TYPE."

Specimens Examined.—Total two. MEXICO: The lectotype male and female described here. (PM).

Epilachna vanpatteni Gorham

(Figs. 340, 900–902, 1766–1769; map 38)

Epilachna vanpatteni Gorham, 1898, p. 244.—Korschefsky, 1931, p. 66.—Blackwelder, 1943, p. 442.

Male.—Length 6.30 mm., width 5.25 mm. Form oval, round, convex, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color yellow, median basal spot and two small lateral spots on pronotum, prosternum, mesosternum, metasternum, legs, and abdomen except narrow lateral and apical margins black; elytron yellow with lateral margin pale yellow, 10 black spots and irregular transverse band present, three spots in row from callus to scutellum, transverse band at midpoint, not touching suture or lateral margin, three spots in transverse row posterior to middle, two spots in transverse row on apical one-third, one spot in center of elytron posterior to two spots, one spot near apical angle (fig. 340). Punctation on elytron dual, small punctures dense, separated by less than their diameter, large punctures separated by one to three times their diameter. Tarsal claw with feeble basal angulation. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, feebly emarginate; sixth tergum entire, convex. Genitalia with basal lobe slightly sinuate, curving upward to bluntly pointed apex, lateral margin narrowed to carina before apex; paramere constricted before base, widened toward apex; trabes broad, flat, slightly narrowed toward base (figs. 900, 901); sipho slender, broadly curved, orifice dorsal, subterminal, with setigerous membrane (fig. 902).

Female.—Similar to male except abdomen with hind margin of sixth sternum truncate medially (fig. 1766); sixth tergum entire, convex (fig. 1767). Genitalia with 10th tergum convex, pigmentation faint medially (fig. 1768); genital plate rectangular, anterolateral angle rounded, posteromedian angle notched, stylus visible (fig. 1769).

Variation.—Length 6.10–7 mm., width 5.15–5.90 mm. Pronotum may have entire discal area black, anterior margin of black spot irregular.

Type Locality.—Costa Rica.

Type Depository.—BMNH.

Discussion.—The combination of the black ventral surface and completely black legs will separate *vanpatteni* from other members of this group. The male genitalia are quite distinctive in having the lateral margin of the basal lobe narrowed to a carina before the apex. The unique type bearing the following labels has been examined: "Costa Rica, Van Patten"; "E. vanpatteni Gorham, Type"; "B.C.A., Col., VII, Epilachna Gorh."

Specimens Examined.—Total 12. COSTA RICA: "Costa Rica." *Cartago*: Turrialba, Heyne, Berlin-Wilm., Korschefsky collection; type specimen. GUATEMALA: *Quezaltenango:* Cerro Zunil, 4000 ft., Champion. (BMNH) (CAS) (USNM).

Epilachna gorhami, new species

(Figs. 341, 903–905, 1770–1773; map 38)

Male.—Length 5.68 mm., width 4.85 mm. Form oval, rounded, widest anterior to middle

of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; head reddish brown; pronotum black with narrow anterolateral angle obscurely piceous; epipleuron yellow; propleuron, prosternum, median area of mesosternum, and abdomen reddish brown; mouthparts and antenna yellow to brown; elytron reddish brown with five black spots and short, transverse black band, first three spots in row from callus to scutellum, median spot small, fourth spot near lateral margin at midpoint, external to band, fifth spot near apical angle (fig. 341). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by two or four times their diameter. Pubescence grayish white. Tarsal claw with feeble basal angulation. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum truncate medially; sixth tergum feebly emarginate. Genitalia with basal lobe slender, gradually curved upward to sharp point; paramere narrowed apically; trabes spatulate, gradually narrowed toward base (figs. 903, 904); sipho robust, strongly curved, slightly recurved near apex, orifice dorsal, subterminal, with setigerous membrane (fig. 905).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire (fig. 1770); sixth tergum broadly convex, entire (fig. 1771). Genitalia with 10th tergum truncate medially (fig. 1772); genital plate rectangular, anterior angles rounded, inner margin with strong longitudinal notch at basal one-third, stylus visible (fig. 1773).

Holotype.—Male. COSTA RICA: *Cartago:* Turrialba, Heyne, Berlin-Wilm., 900 m., VI, Korschefsky collection (USNM 71678).

Allotype.—Female. COSTA RICA: *Cartago:* Turrialba, Heyne, Berlin-Wilm., Korschefsky collection (USNM).

Paratype.—Total one. GUATEMALA: *El Quiche:* Nebaj, 6000 ft., VIII–9–47, C. and P. Vaurie. (AMNH).

Discussion.—Both male and female genitalia are distinctive in this species. The male genitalia are closest to the *borealis* type of any member of the *patula* group, and the female genitalia most nearly resemble those of *vanpatteni.* The reduced elytral maculation and the almost completely black pronotum should distinguish *gorhami.*

Epilachna championi, new species

(Figs. 342–343, 906–908; map 38)

Male.—Length 6.47 mm., width 5.79 mm. Form oval, widest anterior to middle of elytra; lateral margin of elytron rounded from humeral angle to apex. Color brownish piceous; head reddish brown; mouthparts yellow; prosternum, mesosternum, and metasternum black; legs yellow except femur reddish brown in basal one-half; lateral margins of abdominal sterna reddish brown; pronotum with narrow reddish-brown margin and four reddish-brown spots, three of spots in row along base, fourth spot in center of disk; elytron reddish brown with broad, black border laterally and seven black spots, three spots in transverse row from callus to scutellum, three spots narrowly fused in transverse row at midpoint, one large round spot on apical one-third, irregularly triangular piceous area between rows of transverse spots extending inward from lateral border one-half distance to suture, lateral margin outside black border narrowly reddish brown (fig. 342). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to six times their diameter. Surface of elytron finely reticulate. Pubescence grayish white except on seven elytral spots where it is brown. Tarsal claw with feeble basal angulation. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate; sixth tergum feebly, broadly emarginate. Genitalia with basal lobe longer than paramere, angled downward near base, gradually curved upward to pointed apex; paramere slightly widened apically; trabes as long as paramere (figs. 906, 907); sipho with single curve, apex blunt, orifice dorsal, subterminal with setigerous membrane visible (fig. 908).

Female.—Not known.

Variation.—Length 6.47–6.74 mm., width 5.79–6.05 mm. Black spots in mediar row on

elytron are not fused on paratype (fig. 343).

Holotype.—Male. GUATEMALA: *San Marcos:* N.W. Guatemala, IV–1952 (CAS).

Paratypes.—Total two. Same data as holotype. *Sacatepequez:* Capetillo, G. C. Champion. (CAS) (MCZ).

Discussion.—The male genitalia are distinctive but close to those of *vanpatteni* and *gorhami*. *E. championi* may be distinguished externally by the presence of the black border on the elytron, the arrangement of elytral spots, and by the presence of dark-brown pubescence on the elytral spots.

Epilachna godmani, new species

(Figs. 344, 909–911, 1774–1777; map 38)

Male.—Length 6.35 mm., width 5.10 mm. Form oval, convex, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color reddish brown; mouthparts, epipleuron, and legs yellow; elytron brown with seven piceous spots, three spots in transverse row from callus to scutellum, three spots in transverse row medially, one spot on apical one-third (fig. 344). Punctation on elytron barely perceptibly dual, small punctures separated by their diameter or less, larger punctures separated by one to three times their diameter. Pubescence grayish white except on piceous spots where it is dark brown. Tarsal claw with feeble basal angulation. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, upper margin widened at base, apex curved upward, pointed; paramere straight, feebly widened apically (figs. 909, 910); sipho robust, broadly curved, lower margin emarginate before apex, apex blunt, orifice dorsal, subterminal, with setigerous membrane (fig. 911).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire (fig. 1774); sixth tergum barely perceptibly emarginate (fig. 1775). Genitalia with 10th tergum convex, entire, lacking pigment medially (fig. 1776); genital plate rectangular with small notch at posteromedian angle, stylus visible (fig. 1777).

Variation.—Length 6–6.81 mm., width 4.78–5.43 mm.

Holotype.—Male. GUATEMALA: *San Marcos:* La Conquista, Korschefsky collection (USNM 71679).

Allotype.—Female. GUATEMALA: *Baja Verapaz*: Sabo, Champion (PM).

Paratypes.—Total two. Same data as allotype. (PM) (USNM).

Discussion.—*E. godmani* resembles *gorhami* most closely, especially in male and female genitalia, but *godmani* is larger, has a reddish-brown pronotum, and the lateral margin of the elytron is much less strongly explanate than in *gorhami*. The apex of the male sipho and the depth of the notch on the female genital plate are quite different in the two species.

Epilachna staudingeri Group

Length approximately 7–9.50 mm. Mandible visible beyond labrum, three major teeth in apical one-half, first tooth strongly, deeply bifid, dorsal branch with apex rounded, minor teeth on upper margin, ventral branch blunt, minor teeth on lower margin, second and third teeth long, bluntly pointed (fig. 42). Antenna with club segments not as noticeably produced on lower margin as is typical for genus (fig. 11). Lateral margin of elytron usually rounded from humeral angle to apex. Metasternum of male with strong conical or hornlike protuberance on each side of middle. Male genitalia with basal lobe longer than paramere widened gradually from base nearly to apex, apex extremely blunt, in ventral view apex emarginate; trabes short, usually not longer than basal piece (figs. 915, 916); sipho short, robust, apex blunt, bent downward (fig. 917). Female genital plate irregularly oval, widest posterior to middle,

stylus visible (fig. 1788). The distribution of species is along the Andean chain from Ecuador to Argentina with a single species occurring only in coastal Brazil.

The male genitalia and the presence of the protuberances on each side of the male metasternum separate this group immediately. The mandible is also of a unique type.

Key to Species of *Epilachna staudingeri* Group

1. Elytron black with two yellow spots 2
   Elytron not as described above 3
2. Elytron with yellow spots round (fig. 347); Peru, Bolivia . . . *staudingeri* (Weise) (p. 188)
   Elytron with yellow spots transverse (fig. 349); Ecuador . . . *coniventris*, n. sp. (p. 190)
3. Elytron completely black, sometimes with obscure piceous vitta . . . *mammifera*, n. sp. (p. 189)
   Elytron not completely black 4
4. Elytron with yellow border, piceous border inside yellow border, disk brownish yellow (fig. 345) . . . *circumcincta* Mulsant (p. 187)
   Elytron not as described above 5
5. Elytron black with two yellow vittae feebly connected at apex (fig. 346) . . . *furtiva*, n. sp. (p. 188)
   Elytron brownish yellow with piceous border (fig. 348) . . . *conifera*, n. sp. (p. 189)

Descriptions of Species in *Epilachna staudingeri* Group

Epilachna circumcincta Mulsant

(Figs. 345, 912–914, 1778–1780; map 39)

Epilachna circumcincta Mulsant, 1850, p. 847.—Crotch, 1874, p. 65.—Korschefsky, 1931, p. 57.—Blackwelder, 1954, p. 441.

Male.—Length 8.10 mm., width 6.80 mm. Form oval, broad, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; broad lateral margin of pronotum, entire propleuron and epipleuron pale yellow; mouthparts yellow to piceous; antenna with basal segment piceous, segments 2–8 yellow, 9–11 piceous; elytron bordered with yellow, inside yellow border is piceous border, disk of elytron brownish yellow (fig. 345). Punctation on elytron dual, small punctures very fine, separated by their diameter or less, large punctures separated by one to two times their diameter. Pubescence grayish white. Metasternum with large, bluntly pointed projection laterally. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex; sixth sternum feebly emarginate; sixth tergum feebly emarginate. Genitalia of *staudingeri* type; basal lobe constricted before apex and apex broadly emarginate in ventral view (figs. 912, 913); sipho slightly thickened in apical one-half (fig. 914).

Female.—Similar to male except abdomen with hind margin of sixth sternum nearly truncate (fig. 1778); sixth tergum convex, entire. Genitalia with 10th tergum narrow, strongly convex (fig. 1779); genital plate narrowed basally, inner and outer margins nearly straight (fig. 1780).

Variation.—Length 7.10–8.80 mm., width 6–7.50 mm. Piceous border on elytron may be broken at humeral callus or between callus and scutellum. It is much broader, occupying more of discal area on some specimens than on others. Discal area will vary from pale yellow to reddish yellow or reddish brown.

Type Locality.—Brazil.

Type Depository.—Dejean collection.

Discussion.—This species resembles *conifera* of the *staudingeri* group most closely, but *conifera* has the lateral margin of the elytron black. See remarks under *clandestina*. The first specimen standing under the name *circumcincta* in the Dejean collection, bearing the following label, is here designated lectotype: "Brasilia."

Specimens Examined.—Total 30. BRAZIL: *Minas Gerais:* Vicosa, Parker; Vicosa, I–14–30, 1931, Mrs. Y. Mexia. *Rio Grande do Sul:* "Rio Grande do Sul." *Sao Paulo*: Sao Paulo, Camargo; Sao Paulo, F. C. Camargo; Campinas, F. C. Camargo; Campos do Jordao; Santos, J. Metz. (CAS) (MCZ) (USNM).

Epilachna furtiva, new species

(Figs. 346, 1781–1784; map 39)

Female.—Length 8.43 mm., width 6.55 mm. Form elongate, oval, widest posterior to humeral angle, lateral margin of elytron feebly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 brown; pronotum with broad, yellow lateral margin; propleuron entirely yellow; elytron yellow, completely bordered with black, broad black vitta occupying most of discal area (fig. 346). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to two times their diameter. Pubescence white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum strongly convex medially; sixth sternum with small, median notch, longitudinal suture present (fig. 1781); sixth tergum entire, convex (fig. 1782). Genitalia with 10th tergum strongly convex (fig. 1783); genital plate with all angles rounded, narrowed toward apex, stylus visible (fig. 1784).

Male.—Not known.

Holotype.—Female. PERU: *Cuzco:* Machu Picchu Pueblo, March 22, 1947, alt. 6491 ft., J. C. Pallister coll. (AMNH).

Discussion.—Although no males have been seen, this species appears to belong in the *staudingeri* group. The dorsal color pattern is highly distinctive and not approached by any described species of *Epilachna*.

Epilachna staudingeri (Weise)

(Figs. 347, 915–917, 1785–1788; map 39)

Solanophila staudingeri Weise, 1902, pp. 162–163.
Epilachna staudingeri: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 8.62 mm., width 6.92 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron straight medially. Color black; broad lateral margin of pronotum and entire propleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron black with illusive bluish tinge, two yellow spots present, anterior spot behind callus, elongate-oval, posterior spot on apical one-third, round (fig. 347). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to five times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Metasternum with strongly produced, bluntly pointed protuberance on each side of middle. Postcoxal line complete, distinct, extending two-thirds distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, weakly emarginate; sixth tergum weakly emarginate. Genitalia with basal lobe longer than paramere, bluntly rounded at apex, in ventral view gradually thickened toward apex, suddenly narrowed before apex, a group of setae present on upper surface medially; trabes very short, shorter than basal piece; paramere straight, angled upward, dorsoventrally flattened (figs. 915, 916); sipho short, abruptly bent near base, apex thickened, curved downward, orifice dorsal, subterminal (fig. 917).

Female.—Similar to male except hind margin of sixth sternum feebly emarginate (fig. 1785); sixth tergum broadly convex (fig. 1786). Genitalia with hind margin of 10th tergum broadly convex, slightly produced medially (fig. 1787); genital plate with posterior margin truncate, angles rounded, stylus visible (fig. 1788).

Variation.—Length 8–9.41 mm., width 6.75–7.60 mm. One specimen observed had yellow pronotal margin extending only one-half distance from anterior to posterior angle. Anterior yellow spot on elytron may be more strongly elongate in some specimens.

Type Locality.—Peru: Marcapata.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—*E. staudingeri* is a distinctive species. The elytral color pattern is of a type possessed by many unrelated species of *Epilachna*, but the presence of the broad, yellow pronotal margin and yellow propleuron immediately separate *staudingeri*. The single female specimen from the MNHUB collection

bearing the following labels is here designated as lectotype: "Marcapata, Peru, Staud." (green paper); "Staudingeri ws." Although Weise saw more than one specimen when he described *staudingeri*, the lectotype is the only specimen remaining in the MNHUB collection.

Specimens Examined.—Total seven. Amazon River, Fuchs. BOLIVIA: *La Paz:* Coroico. PERU: *Cuzco:* Marcapata, Staud. *Huanuco:* Monson Valley, Tingo Maria, X–10–1954, E. I. Schlinger and E. S. Ross; F. Sinchono, alt. 1300 m., VIII–30–1947, Schunke. *Junin:* Chanchamayo, La Merced, Carl O. Schunke. *Pasco:* Oxapampa. (AMNH) (CAS) (USNM).

Epilachna mammifera, new species

(Figs. 918–920, 1789–1792; map 39)

Male.—Length 7.25 mm., width 6.50 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; broad lateral margin of pronotum, entire propleuron and inner one-third of epipleuron in basal one-half yellow; mouthparts yellow to piceous; elytron completely black. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Surface of elytron reticulate. Pubescence grayish white. Metasternum with blunt, conical projection on each side of middle. Abdomen with hind margin of fifth sternum truncate; sixth sternum convex; sixth tergum broadly convex. Genitalia of *staudingeri* type; basal lobe abruptly narrowed before apex, apex with lateral angle rounded, emarginate medially; setae present on upper surface medially; paramere narrowed from base to apex, straight, angled upward; trabes shorter than basal piece (figs. 918, 919); sipho short, abruptly bent near base, thickened ventrally at middle, apex bent downward, orifice dorsal, subterminal (fig. 920).

Female.—Similar to male except elytron with obscure, piceous vitta extending from inner margin of callus nearly to apex. Abdomen with hind margin of sixth sternum truncate medially, with longitudinal suture (fig. 1789); sixth tergum very feebly emarginate medially (fig. 1790). Genitalia with 10th tergum convex, produced medially (fig. 1791); genital plate narrowed posteriorly, all angles rounded, stylus visible (fig. 1792).

Variation.—Length 7.25–8.65 mm., width 6.50–7.68 mm. Three paratypes have obscure piceous vitta on elytron as described under female.

Holotype.—Male. BOLIVIA: *La Paz:* Calisaya, Rio Boopi, coll. G. L. Harrington (USNM 71680).

Allotype.—Female. BOLIVIA: *La Paz:* Encuentro Dep., May 1925, G. L. Harrington (USNM).

Paratypes.—Total six. BOLIVIA: Same data as holotype; same data as allotype. *La Paz:* Tocoroni, Encuentro, V–25, G. L. Harrington. (CAS) (USNM).

Discussion.—All presently known species in the *staudingeri* group may apparently be separated by dorsal color pattern alone. *E. mammifera* is the only member of the group with solid black or almost solid black elytra.

Epilachna conifera, new species

(Figs. 348, 921–923, 1793–1796; map 39)

Male.—Length 7.65 mm., width 6.80 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; wide lateral margin of pronotum, entire propleuron and inner one-half of epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment piceous, segments 2–8 yellow, 9–11 piceous; elytron with brownish-yellow median area bordered with piceous brown, lateral border wide, extending over callus, narrowed toward apex, sutural border narrow (fig. 348). Punctation on elytron dual, small punctures separated by less than their diameter, large punctures separated by one to two times their diameter. Surface of elytron smooth. Pubescence grayish white. Metasternum with large blunt protuberance on each side of middle. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum convex; sixth tergum broadly convex. Genitalia of the *staudingeri* type; basal lobe constricted before apex, lateral angle acute, setae present on dorsal surface

medially (figs. 921, 922); sipho nearly as described for *mammifera* (fig. 923).

Female.—Similar to male except for narrow, elongate, brownish-yellow spot near margin posterior to callus. Abdomen with hind margin of sixth sternum truncate medially (fig. 1793); sixth tergum broadly convex (fig. 1794). Genitalia with 10th tergum strongly convex, narrow (fig. 1795); genital plate with inner margin nearly straight, outer margin angled obliquely in apical one-half, stylus visible (fig. 1796).

Variation.—Length 7–8.10 mm., width 6–6.80 mm. Pale posthumeral spot was present on all specimens observed except on holotype.

Holotype.—Male. ARGENTINA: *Salta:* General Ballivian, 1931, Coll. G. L. Harrington (USNM 71681).

Allotype.—Female. ARGENTINA: *Jujuy.* El Quemada, Apr. '26, coll. G. L. Harrington (USNM).

Paratypes.—Total three. ARGENTINA: Same data as holotype; same data as allotype. BOLIVIA: *La Paz:* Tocorani, Chulumani, V–25, G. L. Harrington. (CAS) (USNM).

Discussion.—This is the species of the *staudingeri* group occurring farthest south in the Andes and completes the pattern of distribution along the Andean chain.

Epilachna corniventris, new species

(Figs. 349, 924–926; map 39)

Male.—Length 8.21 mm., width 6.88 mm. Form cordate, widest posterior to humeral angle, lateral margin of elytron feebly pinched medially. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; propleuron and broad anterolateral angle of pronotum yellow, small, round, yellow spot near posterolateral angle of pronotum; elytron black with two transverse yellow spots, first spot anterior to middle and second spot posterior to middle of elytron, first spot with very small spot externally (fig. 349). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to three times their diameter. Pubescence grayish white. Metasternum with large, hornlike protuberance on each side of middle, apex of protuberance curved laterally and posteriorly, blunt. Postcoxal line complete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly convex, entire; sixth sternum convex, entire; sixth tergum emarginate. Genitalia of *staudingeri* type; basal lobe longer than paramere, widened toward apex, lower margin curved upward to bluntly rounded apex, group of setae on upper margin before apex; paramere angled upward, narrowed toward apex; trabes shorter than basal piece (figs. 924, 925); sipho short, robust, apex thickened, blunt, bent downward, orifice dorsal, subterminal (fig. 926).

Female.—Not known.

Holotype.—Male. ECUADOR: *Santiago Zamora:* Mera (PM).

Discussion.—This species is separated from other members of the *staudingeri* group by the large, posterolaterally directed metasternal protuberances and the distinctive color pattern, which resembles that of *staudingeri* to a certain extent.

Epilachna cacica Group

Length usually more than 8 mm. Mandible of *borealis* type. Dorsal color pattern usually some sort of zonate or ringed pattern. Lateral margin of elytron rounded from humeral angle to apex, very feebly explanate, form nearly round, convex, humeral callus reduced. Postcoxal line incomplete, extending about two-thirds distance to hind margin of first abdominal sternum, outer end directed toward lateral margin of elytron (fig. 95). Male genitalia with basal lobe straight or wedge-shaped; paramere curved downward, nearly always longer than basal lobe (fig. 931). Female genital plate somewhat rectangular, stylus visible, posterolateral angle fused to ninth tergum (fig. 1803).

Key to Species of *Epilachna cacica* Group

1. Species with elytron uniformly light reddish brown or yellowish brown, lateral margin yellow (suture narrowly yellow in *marginella*), no dark margin or border present ... 2
   Species with elytron usually dark brown to black, black border or margin often present either on or near suture or lateral margin or both (teneral specimens may have elytron light brown or yellow but dark border is nearly always visible) ... 4
2. Lateral and sutural margins of elytron yellow (fig. 354) ... *marginella* (F.) (p. 194)
   Lateral margin yellow, suture same color as disk ... 3
3. Length less than 8 mm.; Brazil ... *concolor* Mulsant (p. 195)
   Length more than 8 mm.; Colombia ... *darlingtoni*, n. sp. (p. 196)
4. Lateral margin of elytron always yellow ... 5
   Lateral margin of elytron brown or black, never yellow (elytron may be entirely dark brown or black) (figs. 357, 358) ... *velata* Erichson (p. 197)
5. Elytron solidly brown to black with yellow lateral margin ... 6
   Elytron with dark-brown or black border inside lateral yellow margin, suture either yellow with inside black border or simply black ... 8
6. Elytron black with yellow lateral margin, legs yellow; Colombia, Panama (fig. 356) ... *pseudorealis*, n. sp. (p. 196)
   Elytron dark reddish brown to piceous with lateral margin yellow; legs reddish brown ... 7
7. Species known only from Ecuador ... *nigripes* Weise (p. 199)
   Species known only from Surinam, French Guiana ... *velutina* (Olivier) (p. 195)
8. Species with sutural margin of elytron yellow ... 9
   Species with sutural margin of elytron black ... 10
9. Elytron with black border inside yellow sutural and lateral margins (fig. 350) ... *spreta* Mulsant (p. 191)
   Elytron with no black border, elytron brown or yellowish brown inside yellow sutural and lateral margins (fig. 354) ... *marginella* (F.) (p. 194)
10. Elytron with yellow lateral margin narrower than black border, small reddish-brown spot on disk ... 11
    Elytron with yellow lateral margin wider than black border, disk with large yellowish-brown area (fig. 360) ... *merae*, n. sp. (p. 198)
11. Elytron with central brown area reduced in size, often smaller in area than black border (fig. 359) ... *extrema* Crotch (p. 198)
    Elytron with central brown area usually larger in area than black border (figs. 351, 352) ... *cacica* (Guérin) (p. 192)

Descriptions of Species in *Epilachna cacica* Group

Epilachna spreta Mulsant

(Figs. 350, 927–929, 1797–1799; map 40)

Epilachna spreta Mulsant, 1850, pp. 845–846.—Crotch, 1874, p. 65.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.
Solanophila spreta: Weise, 1910, p. 56.
Epilachna spreta ab. *illusa* Mulsant, 1850, p. 846.—Korschefsky, 1931, p. 66.

Male.—Length 9 mm., width 7.68 mm. Form broadly oval, widest anterior to middle of elytron, lateral margin of elytron rounded from humeral angle to apex. Color black; pronotum yellow with seven black spots, lateral two spots confluent, median three spots confluent; entire propleuron and outer one-half of epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; scutellum black; elytron completely bordered with pale yellow, inside yellow border is black border complete except for narrow break on basal margin, disk of elytron brownish yellow (fig. 350). Punctation on elytron dual, small punctures separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal line complete, distinct, ending at basal margin of first abdominal sternum, extending more than one-half distance to hind margin of sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum broadly notched; sixth tergum broadly, feebly emarginate. Genitalia with basal lobe longer than paramere, lower margin curved upward to blunt point, upper margin nearly straight; paramere straight, slightly widened

toward apex (figs. 927, 928); sipho short, straight in apical two-thirds, apex feebly curved upward, orifice dorsal, subterminal (fig. 929).

Female.—Similar to male except abdomen with hind margin of fifth sternum feebly convex; sixth sternum feebly emarginate (fig. 1797); sixth tergum entire, convex. Genitalia with 10th tergum convex (fig. 1798); genital plate with posteromedian angle rounded, posterolateral angle produced, fused to ninth sternum, stylus visible (fig. 1799).

Variation.—Length 8.30–11.50 mm., width 6.70–10 mm. Black spots on pronotum range from seven separate spots on occasional specimen to fused condition described here to form in which all spots are solidly fused, leaving only anterior and lateral margins yellow. Disk of elytron ranges from pale yellow to chestnut brown and black border tends to widen on darker specimens. In teneral forms underside, especially abdominal sterna, is brownish yellow to piceous.

Type Locality.—Brazil (Buquet, Chevrolat, Dohrn, Guérin).

Type Depository.—?UCCC (lectotype here designated).

Discussion.—*E. spreta* is not a typical member of the *cacica* group in spite of a close resemblance in color pattern. The postcoxal line is complete, the male genitalia have the basal lobe longer than the paramere, and the paramere is not curved. On the other hand, the female genital plate is fused to the ninth sternum and the lateral margin of the elytron is barely explanate as in the *cacica* group. *E. spreta* most nearly resembles *cacica* in color pattern but may be separated by the yellow sutural margin. The first specimen in the series of *spreta* in the Crotch collection bearing the following labels is here designated lectotype: "TYPE, spreta ex Mulsant."

Specimens Examined.—Total 65. America meridionale. BRAZIL: "Bras."; "Brasilia"; "Brasilien"; Brasil, V. Olf; Brazil, Mrs. Monroe; Brasilien, Kraatz. Espirito Santo, Espirito Santo, Fruhstorfer. *Minas Gerais:* Muri, 2-III-1952, W. Wittmer. *Rio de Janeiro:* "Ric de Janeiro"; Rio de Janeiro, D. Bourget; Rio de Jan., Nov. *Rio Grande do Sul:* Entre Rios, Sept. *Santa Catarina:* Colonia, Hansa, H. Rolle, Berlin, S.W. 11; Corupa, (Hansa Humbolt), Oct. 1944; Corupa (Hansa Humbolt), IX-1945, Oct. 1944, Nov. 1948, A. Maller; Rio Natal, III-1945, XII-1945, A. Maller; Rio Vermelho, II-1945, XII-1945, A. Maller. *Sao Paulo:* "Sao Paulo"; Sao Paulo, Hammer; Santos, J. Metz. (AMNH) (CAS) (CM) (MCZ) (MNHUB) (UCCC) (ZSBS).

Epilachna cacica (Guérin)

(Figs. 351–353, 930–932, 1800–1803; map 40)

Coccinella (*Epilachna*) *cacica* Guérin, 1844, p. 319.
Epilachna cacica: Mulsant, 1850, p. 842.—Crotch, 1874, p. 64.—Korschefsky, 1931, p. 57.—Blackwelder, 1945, p. 441.
Epilachna praecincta Erichson, 1847, p. 183.—Crotch, 1874, p. 64 (as a synonym of *cacica*).
Epilachna cacica ab. *praecincta:* Korschefsky, 1931, p. 57.—Blackwelder, 1945, p. 441.
Epilachna serva Mulsant, 1853, p. 151.—Crotch, 1874, p. 64.—Korschefsky, 1931, p. 57.—Blackwelder, 1945, p. 441.

Male.—Length 8.50 mm., width 7.75 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color yellowish brown; anterolateral angle of pronotum, entire, propleuron and outer one-third of epipleuron yellow; inner two-thirds of epipleuron brown; disk of pronotum reddish brown; elytron with narrow lateral margin yellow, bordered on inside by broad black vitta extending from base across callus to suture at apex, median area chestnut brown, narrow, black, sutural vitta extending from scutellum to apex (fig. 351). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, extending to within two-thirds distance to hind margin of first abdominal sternum, outer end directed toward lateral margin of sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum emarginate medially; sixth tergum truncate medially. Genitalia with paramere longer than basal lobe, basal lobe straight, upper and lower margins tapering to a blunt point, in ventral view narrowed before apex, apex blunt; paramere curved downward, setae on inner

margin extending nearly to base (figs. 930, 931); sipho slender, straight in apical two-thirds, orifice dorsal, subterminal (fig. 932).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum emarginate (fig. 1800); sixth tergum entire, broadly convex (fig. 1801). Genitalia with 10th tergum convex (fig. 1802); genital plate angular, inner margin curved toward base, posterolateral angle abrupt (fig. 1803).

Variation.—Length 7–10.90 mm., width 6–9.80 mm. Typical form described here is predominant in Bolivia, Paraguay, and Brazil, disk of pronotum is darker in some specimens from southern Brazil. A few specimens from Argentina had disk of elytron as pale as lateral margin. Specimens from Peru tend to be darker and more heavily marked than typical form. *E. praecincta* is simply the dark form from Peru, which has underside black or dark brown, head with transverse black mark, disk of pronotum piceous to black. Some extreme examples from Peru have been observed that have head black, pronotum black except for anterolateral angle, elytron completely ringed with black, brown discal area reduced to elongate spot much as in *extrema* (figs. 352, 353). In same series (Tingo Maria) that these extreme specimens occur are examples marked as in typical *cacica*.

Type Locality.—Of *cacica*, Bolivia; of *praecincta*, Peru; of *serva*, not known.

Type Depository.—Of *cacica*, UCCC (lectotype here designated); of *praecincta*, MNHUB; of *serva*, not known.

Discussion.—The wide range of variability discussed here is to be expected in a species as widely distributed in South America as is *cacica*. No subspecific breakdown of the species could be detected although the dark forms seemed to be limited to Peru. The first specimen in the series of *cacica* in the Crotch collection bearing the following label is here designated lectotype: "TYPE, cacica Guerin."

Specimens Examined.—Total 806. ARGENTINA: *Jujuy:* Calilequa, 13–II–1950, Monros and Willink; El Quemado, III–1926, Apr. '26, May '26, Apr. '28, May '28, G. L. Harrington. *Misiones:* Eldorado, II–42, J. M. Borg. *Salta:* Salta, C. Bruch; Salta, II–9–58, C. Olleros; Betonia de Salta, sweep. weeds in orchard, V–13–17; Metan, III–9–57; 50 km. S. Oran., 4–V–64, C. E. and E. S. Ross; Tablillas, XII–33–1–1934, G. L. Harrington; Tablillas, IX–3–II–34, W. C. Harrington. *Tucuman:* Tucuman, 10–II–25, G. F. Moznette; Tucuman, on corn, XI–20–1928, H. A. Jaynes. BOLIVIA: "Bolivia." *Beni:* Calvinas, Rio Beni, Feb. 1922, Mulford, Bio. Expl. 1921–22, Wm. M. Mann; Rurrenabaque, Rio Beni, Oct., Mulford, Bio. Expl. 1921–22, Wm. M. Mann. *Chuquisaca:* Machareti, W. C. Harrington. *La Paz:* Calisaya, Rio Boopi, G. L. Harrington; Coroico; Yungas de Paz; Yungas de La Paz, 1000 ft., H. Rolle; Yungas de La Paz, 1000 m., H. Rolle, Berlin, S.W. 11; Yungas de Paz, 1000 m., Casey bequest 1925. *Santa Cruz:* Santa Cruz, Feb. 1956, G. Pinckert; Charaqua, Jun. 22, Harrington; Palometas, 10 Mar. 1956, G. Pinckert; Sara, 500 m., 1–VI–1904, J. Steinbach. BRAZIL: "Brasilia"; Brazil, IX–10–19; Brazil, Fruhstorfer; Brasilen, Kraatz; Porto Velho, de S. Antonio, M. Bolton; Santa Cruz. *Amapa:* Serra do Navio, 25–V–1964, 26–V–1964, C. E. and E. S. Ross. *Amazonas:* Barba, III–1943, II–1943, Halik; Manaus, Miss H. Merrill; Manaus, X–1945, W. Praetorius; Puraquequara, Oct. 4, 1945, W. Praetorius; Teffe, IV–1932, Werner Hopp. *Espirito Santo:* "Espirito Santo"; Espirito Santo, Fruhstorfer. *Para:* Para, Casey bequest 1925; Para, Korschefsky collection; Itaituba, J. Guerin; Santarem; Santarem, June 1919, S. M. Klages. *Parana:* Caviuna, Nov. 1946, Dec. 1946, XII–1946, A. Maller. *Pernambuco:* Recife Inst. Agronomia, I–30–1959, A. M. Nadler. *Mato Grosso:* Chapada, Jan., March, Apr., Sept., Oct., Nov., Dec.; Corumba; Corumba, highland, March 15–16. *Minas Gerais:* B. Horizonte, Oscar Monte; Lavras, 1938, Malveira; Vicosa, 8–IV–33, Sept. 20–Oct. 10, 1929, E. J. Hambleton. *Rio de Janeiro:* "Rio de Jan." *Rio Grande do Sul:* Rio Gr. do Sul, H. Rolle; Rio Grande do Sul, Korschefsky collection, Staudinger; Rio Grde. do Sul, XII–1964, K. E. Hudepohl. *Santa Catarina:* Colonia Hansa. *Sao Paulo:* "Sao Paulo"; Sao Paulo, IV–1903; Sao Paulo, Korschefsky collection, Staudinger; Campinas, F. C. Camargo; Sao Paulo, II–1944, V. Autueri; Sao Paulo, 1–XI–1957, J. Halik. COLOMBIA: *Amazonas:* Leticia, 21 June 1965, 19 June

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A REVISION OF THE EPILACHNINE OF THE WESTERN HEMISPHERE (COLEOPTERA 5 OF 5

GORDON, R.D.

1965, P. R. Craig and J. Robb. *Meta:* 3 mi. W. Villavicencio, III–11–1955, E. I. Schlinger and E. S. Ross. ECUADOR: "Ecuador"; Ecuador, Baron. *Napo Pastaza:* 2–8 mi. N. of Puyo, 953 m., II–9–1955, E. I. Schlinger and E. S. Ross. *Santiago Zamora:* Macas, E. A. Bottcher. PARAGUAY: "Para."; Paraguay, H. Rolle; Paraguay, 188__, Dr. Drake. *Alto Parana:* Puerto Bertoni, Kraatz. *Itapua:* Sa. Trinidad, 1913, X–1914, I–1914. *Paraguari:* Paraguari, 1917, F. Knab; Sapucay, Feb., Mar., W. T. Foster. *San Pedro:* Buena Vista, Feb. 9, Donald Wees; Caromse, Golbach. PERU: "Peru"; Peru, Kraatz. *Amazonas:* Rio Santiago, X–29–24, X–20–30, XI–21–24, VII–11–30, XII–2–24, XI–18–24, IX–3–24; Rio Santiago, F 6170, VIII–13–30, H. Bassler; Rio Santiago, F 6198, X–20–24, XI–11–24, H. Bassler. *Cuzco:* Cuzco, 26–I–1958; Callanga; Quiroz, Woytkowski: Vilcanota; Vilcanota, Staudinger. *Huanuco:* 5 mi. S. W. Las Palmos, 1000 m., X–16–1954, E. I. Schlinger and E. S. Ross; Tingo Maria, 1948; Tingo Maria, Sept. 13–17, 1956, C. Gregoire; Tingo Maria, on cucurbita, 670 m., Nov. 1946, W. Weyrauch; Tingo Maria, on squash, Dec.–Feb. 1949–1950, 15–I–49, H. A. Allard; Tingo Maria, on vegetation, VIII–16–25, G. H. Dieke; Tingo Maria, 670 m., Nov. 1946, W. Weyrauch; Tingo Maria, 670 m., Weyrauch; Tingo Maria, flying 670 m., VIII–26–1951, G. H. Dieke; Tingo Maria, 2200 ft., Oct. 20, 1946, May 22, 1947, X–28–1946, J. C. Pallister; Tingo Maria, 2200 ft., lower merzon, May 15, 1947, J. C. Pallister; Tingo Maria, Monson Valley, XI–10–1954, X–12–1954, X–21–1954; Tingo Maria (Rio Huallaga) 700 m., III–1947, Weyrauch; 43 mi. E. Tingo Maria, 1200 m., XI–18–54, E. I. Schlinger and E. S. Ross; Monson Valley, Tingo Maria, XII–9–1954, X–26–1954, X–12–1954, XI–21–1954, XII–2–1954, XII–11–1954, XI–29–1954, IX–23–1954, X–10–1954, E. I. Schlinger and E. S. Ross. *Junin:* Chanchamayo, XI–4–1961, J. Schunke; Chanchamayo, VIII–8–48, IV–24–48, J. M. Schunke; Chanchamayo, La Merced, Carl O. Schunke; Chanchamayo, 1200 m., X–30–1961, XI–20–1961, J. Schunke; Chanchamayo, 1000 m., A. Heyne; Valle, Chanchamayo, 800 m., I–30–1953, 1–I–47, 1800, I–1953, Weyrauch; Colonia Perene, Rio Perene, 18 mi. N. E. La Merced, I–3–55, E. I. Schlinger and E. S. Ross; Satipo, Nov. 1945, A. Maller; Satipo, X–1944, XII–1944, XII–1945, P. Paprzycki; Satipo, VIII–1944, 1943, VII–1944, IX–1944, III–1945, Paprzycki. *Loreto:* Iquitos, 1917, F. Knab; Middle Rio Maranon, IX–14–29, II–2–29; Rio Tapiche, XII–17–23, Yurac, VI–47, Weyrauch. *Puno:* "Pund." *San Martin:* Achinamiza, I–10–26, III–30–25, IX–20–27, X–8–27, XI–25–27; Boqueron Abad., III–19–1962, III–21–1962, III–25–1962, III–29–1962, III–31–1962, J. Schunke. VENEZUELA: *Portuguesa:* Anzoategui—El Tigre, 800 m., 29–XI–64, C. J. Rosales. (AMNH) (CAS) (CM) (IML) (MCZ) (MNHUB) (USNM) (V) (ZSBS).

Epilachna marginella (Fabricius)

(Figs. 354, 933–935, 1804–1807; map 40)

Coccinella marginella Fabricius, 1787, p. 53.
Coccinella palliata Fabricius, 1803, p. 293.—Schönherr, 1808, p. 151.
Coccinella albicincta Germar, 1824, p. 619.
Epilachna marginella: Crotch, 1874, p. 64.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 63.
Epilachna palliata: Mulsant, 1850, pp. 843–844.
Epilachna albicincta: Korschefsky, 1931, p. 63.

Male.—Length 8.46 mm., width 7 mm. Form round, slightly elongate, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color reddish brown; mouthparts yellow to brown; lateral margin of pronotum broadly yellow and lateral margin of epipleuron narrowly yellow; elytron light reddish brown with suture and lateral margin bordered with yellow (fig. 354). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to three times their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum convex, entire. Genitalia of *cacica* type; basal lobe shorter than paramere, tapered from base to blunt point, in ventral view gradually narrowed before apex, apex rounded; paramere not widened apically (figs. 933, 934); sipho straight before apex, apex slightly curved upward, orifice dorsal, subterminal (fig. 935).

Female.—Similar to male except abdomen

with hind margin of sixth sternum emarginate (fig. 1804); sixth tergum feebly emarginate (fig. 1805). Genitalia with 10th tergum convex, entire (fig. 1806); genital plate with posteromedian angle rounded, nearly obsolete, posterolateral angle fused to ninth sternum, stylus visible (fig. 1807).

Variation.—Length 8.46–10.15 mm., width 7–8.51 mm. Dorsal color ranges from pale yellowish brown to reddish brown. Pale specimens appear to be teneral.

Type Locality.—Of *marginella* and *palliata* F., not known; of *albicincta*, not known.

Type Depository.—Of *marginella*, not known; of *palliata* F., not known; of *albicincta*, not known.

Discussion.—The color pattern of pale-yellow sutural and lateral elytral margins has been distinctive in all specimens examined. An occasional specimen of *cacica* will lack a dark sutural margin, but the margin is never paler than the rest of the elytron.

Specimens Examined.—Total 21. BRAZIL: "Brazil"; Rio de Jan.; Cantagallo. (PM) (UCCC) (USNM) (ZSBS).

Epilachna velutina (Olivier)

(Figs. 355, 936–938, 1808–1811; map 40)

Coccinella velutina Olivier, 1808, p. 1039.
Epilachna velutina: Mulsant, 1850, p. 845.—Crotch, 1874, p. 66.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 8.04 mm., width 7 mm. Form nearly round, slightly elongate, convex, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color dark reddish brown; mouthparts and antenna yellow; propleuron entirely yellow and epipleuron with base and outer margin yellow; elytron dark chestnut brown, lateral margin narrowly bordered with yellow (fig. 355). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter, large punctures with fine punctures at bottom. Pubescence grayish white. Postcoxal line incomplete, distinct, extending slightly beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum notched; sixth tergum convex, entire. Genitalia as described for *marginella* except basal lobe with apex more rounded and with upper margin slightly curved downward in lateral view (figs. 936–938).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate (fig. 1808); sixth tergum convex, entire (fig. 1809). Genitalia with 10th tergum convex, entire (fig. 1810); genital plate with posteromedian angle rounded, posterolateral angle fused to ninth tergum, stylus visible (fig. 1811).

Variation.—Length 7.83–9.51 mm., width 6.66–8.40 mm. Elytron and median area of pronotum vary from reddish or chestnut brown to piceous and suture may have very narrow, obscurely paler, reddish border.

Type Locality.—French Guiana.

Type Depository.—UCCC (lectotype here designated).

Discussion.—This species is separable from *marginella* only by the dorsal color pattern. The male genitalia of the two species are very similar and when the biologies are worked out, the species may prove to be conspecific. The second specimen under the name *velutina* in the Crotch collection bearing only the label "TYPE" is here selected as lectotype.

Specimens Examined.—Total 18. FRENCH GUIANA: *Guyane:* Cora; Cayenne. SURINAM: *Surinam:* Paramaribo, coll. Korschefsky. Sint Barbara. (CAS) (MNHUB) (UCCC) (USNM).

Epilachna concolor Mulsant

(Figs. 939–941, 1812–1815; map 40)

Epilachna concolor Mulsant, 1850, p. 849.—Crotch, 1874, p. 58.—Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 7.58 mm., width 6.74 mm. Form nearly round, convex, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color light reddish brown; mouthparts, propleuron, and epipleuron paler brownish yellow. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Postcoxal

line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum convex, entire. Genitalia similar to those of *marginella* but with lower margin of basal lobe distinctly angled upward in apical one-half in lateral view (figs. 939–941).

Female.—Similar to male except abdomen with hind margin of sixth sternum truncate medially (fig. 1812); sixth tergum weakly emarginate (fig. 1813). Genitalia with 10th tergum convex, entire (fig. 1814); genital plate with inner margin nearly straight, posteromedian angle rounded, posterolateral angle fused to ninth tergum, stylus visible (fig. 1815).

Variation.—Length 7.58–8 mm., width 6.74–6.78 mm.

Type Locality.—Brazil (Reiche, Paris museum).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The male genitalia, female genital plate, and sixth sternum are unlike those of any presently known member of the *cacica* group. The unicolorous upper surface is also unique in the group. The single male under the name *concolor* in the Crotch collection is here designated lectotype; this specimen bears only the label "TYPE." Mulsant (*1850*) listed specimens from Reiche and the Paris museum.

Specimens Examined.—Total three. BRAZIL: "Braz: 1," V. Olf; Nord de la Capit. de St. Paul. (MNHUB) (PM) (UCCC).

Epilachna darlingtoni, new species

(Figs. 942–944, 1816–1819; map 40)

Male.—Length 8.75 mm., width 7.80 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color light yellowish brown; lateral margin of pronotum and elytron yellow. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, directed toward basal margin of first abdominal sternum, extending beyond middle of sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum broadly feebly emarginate. Genitalia with basal lobe much shorter than paramere, in ventral view abruptly narrowed before apex, apex with bluntly rounded median projection; paramere curved downward toward apex, inner margin with row of setae nearly to base (figs. 942, 943); sipho nearly straight in apical two-thirds, orifice dorsal, subterminal (fig. 944).

Female.—Similar to male except abdomen with hind margin of sixth sternum feebly emarginate (fig. 1816); sixth tergum broadly, feebly emarginate (fig. 1817). Genitalia with 10th tergum strongly convex (fig. 1818); genital plate with inner margin curved, posteromedian angle obsolete, posterolateral angle abrupt, fused to ninth tergum, stylus visible (fig. 1819).

Variation.—Length 8.10–10.50 mm., width 7.65–9.30 mm.

Holotype.—COLOMBIA: *Magdalena:* Aracataca, V–13–28, Darlington (MCZ).

Allotype.—Female. COLOMBIA: *Magdalena:* Rio Frio, Mgd., Darlington (MCZ).

Paratypes.—Total 17. COLOMBIA: Same data as holotype; same data as allotype; same data as holotype except date, V–13–28. (MCZ) (USNM).

Discussion.—The pale color and male genitalia distinguish *darlingtoni* from other members of the *cacica* group. The species is probably limited to northwestern Colombia.

Epilachna pseudorealis, new species

(Figs. 356, 945–947, 1820–1821; map 41)

Female.—Length 9.30 mm., width 8.42 mm. Form broadly oval, widest anterior to middle of elytra, callus nearly obsolete, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color brownish yellow; pronotum yellow laterally, median two-thirds irregularly piceous; metasternum and median area of abdominal sterna piceous; elytron piceous with all margins except basal margin pale, sutural margin narrowly reddish brown, lateral margin broadly yellow (fig. 356). Punctation on elytron dual, small punctures sepa-

rated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, extending slightly more than two-thirds distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum faintly emarginate medially; sixth sternum faintly emarginate; sixth tergum entire, convex (fig. 1820). Genitalia with 10th tergum strongly convex, entirely pigmented (fig. 1821); genital plate with anterior margin obliquely slanted posteriorly, posterolateral angle acute, basal margin with small notch near posterolateral angle, stylus visible (fig. 1821).

Male.—Similar to female except genitalia with basal lobe shorter than paramere, in ventral view abruptly narrowed before apex, apex bluntly rounded; paramere curved (figs. 945, 946); sipho long, slender, apex slightly curved upward, orifice dorsal, subterminal (fig. 947).

Variation.—Length 9.30–10.05 mm., width 8.42–8.76 mm. Elytron is black rather than piceous in one specimen of type series.

Holotype.—Female. PANAMA: *Canal Zone:* Ciricito, 8/28/31 (USNM 71682).

Allotype.—Male. COLOMBIA: *Meta:* Rio Guayuriba, Dec. 1946, L. Richter (AMNH).

Paratypes.—Total two. COLOMBIA: *Boyaca:* Carare, 5–VII–'39, L. Richter. PANAMA: Same data as holotype except date 3–16–30. (USNM).

Discussion.—The dorsal color pattern easily separates *pseudorealis* from other members of the *cacica* group. In this respect *pseudorealis* closely resembles *kraussi* of the *borealis* group, which is known from the same localities.

Epilachna velata Erichson

(Figs. 357–358, 948–949, 1822–1824; map 41)

Epilachna velata Erichson, 1847, p. 183.—Mulsant, 1853, p. 164.—Kirsch, 1876, p. 125.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Female.—Length 11.30 mm., width 9.39 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron barely perceptibly explanate, rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; vertex of head with triangular, reddish-brown spot; pronotum with anterolateral angle broadly yellow, propleuron nearly completely yellow; elytron dark brown with barely perceptible, broad, black, lateral border (fig. 357). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to three times their diameter. Surface of elytron shining, finely reticulate. Pubescence grayish white. Postcoxal line incomplete, distinct, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, broadly rounded; sixth sternum weakly emarginate (fig. 1822); sixth tergum broadly, feebly emarginate. Genitalia with 10th tergum strongly convex (fig. 1823); genital plate with inner margin rounded, posterolateral angle fused to ninth tergum, stylus visible (fig. 1824).

Male.—Similar to female except abdomen with hind margin of sixth sternum notched; sixth tergum feebly emarginate. Genitalia with basal lobe slightly longer than paramere, tapered to bluntly pointed apex; paramere curved, not widened apically (fig. 948); sipho long, slender, orifice dorsal, subterminal (fig. 949).

Variation.—Length 7.95–11.41 mm., width 6.91–9.63 mm. Color pattern varies from that described here to form in which elytron is completely bordered with black, sutural border narrower than lateral border with clear reddish-brown disk (fig. 358). Some specimens have narrow reddish-brown margin outside black border and pronotum varies from black to piceous.

Type Locality.—Peru.

Type Depository.—MNHUB.

Discussion.—The type or types were not available for study, but the female description here was taken from a specimen compared with the type by Korschefsky. This is apparently a variable species as far as color pattern is concerned, but the presence of the pale, triangular spot on the vertex, dual punctation on the elytron, and black elytral margin distinguish it from other Peruvian and Bolivian species of the *cacica* group. *E. velata* most closely resembles *extrema* from Ecuador, but the male genitalia are not the same.

Specimens Examined.—Total 32. BOLIVIA: *La Paz:* Asunta, May 1925, G. L. Harrington. Yungas de La Paz, 1000 m., Korschefsky collection; Yungas de La Paz, 1000 m., H. Rolle; Yungas de La Paz, 1000 m., H. Rolle, Berlin, S. W. 11; PERU: *Ayacucho:* Quiroz, Woytkowski. *Cuzco:* Quincemil, 2400 ft., April 13, 1947; Quincemil, 2400 ft., April 13, 1947, J. C. Pallister. *Huanuco:* F. Sinchono, 1300 m., VIII–25–1947, Schunke; 43 mi. E. of Tingo Maria, X–5–1954, E. I. Schlinger and E. S. Ross. *Junin:* Chanchamayo; Chanchamayo, Korschefsky Collection; Chanchamayo, III–25–1968, J. Schunke; Chanchamayo, 1300 m.. X–14–1961, J. Schunke; Chanchamayo, La Merced, Carl O. Schunke; Estancia Naranjal San Ramon, 1000 m., VII–20–27–1965, P. and B. Wygodzinsky; Rio Oxabamba, La Merced, Chanchamayo; Valle Chanchamayo, 800 m., 1953, Weyrauch. *Loreto:* Rio Abujao, F 6009, II–29; Rio Tapiche, XII–25–23; Upper Rio Maranon, IX–30–23. (AMNH) (CAS) (HH) (USNM) (ZSBS).

Epilachna extrema Crotch

(Figs. 359, 950–952, 1825–1828; map 41)

Epilachna extrema Crotch, 1874, p. 64.—Korschefsky, 1931, p. 61.—Blackwelder, 1945, p. 441.

Male.—Length 9 mm., width 8 mm. Form broadly oval, widest anterior to middle of elytra, lateral margin of elytron broadly explanate. Color black; broad anterolateral angle and lateral margin of pronotum, propleuron and outer one-half of epipleuron yellow; elytron black with pale-yellow lateral margin and elongate, red, discal spot (fig. 359). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to two times their diameter. Pubescence grayish white. Postcoxal line incomplete, outer end directed toward lateral margin of first abdominal sternum, extending beyond middle of sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate; sixth sternum broadly notched; sixth tergum truncate medially. Genitalia with basal lobe shorter than paramere, upper margin compressed laterally to form ridge, lower margin gradually curved upward to blunt apex; paramere curved downward apically, inner margin with row of setae nearly to base (figs. 950, 951); sipho gradually curved throughout, apex thickened, orifice dorsal, subterminal (fig. 952).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate (fig. 1825); sixth tergum broadly, feebly emarginate (fig. 1826). Genitalia with 10th tergum convex (fig. 1827); genital plate with inner margin curved, posteromedian angle obsolete, posterolateral angle abrupt, fused to ninth sternum, stylus visible (fig. 1828).

Variation.—Length 8.85–11 mm., width 7.80–9.50 mm. Two specimens observed from Colombia had red spot on elytron much more elongate than others.

Type Locality.—Ecuador.

Type Depository.—UCCC (lectotype here designated).

Discussion.—There are eight specimens under this name in the Crotch collection, all except the type without locality or other labels. Seven of these satisfy the description given here. The eighth specimen is smaller and different from the others in dorsal color pattern and is obviously the specimen to which Crotch (*1874*) referred as affording a lead in the direction of *marginella*. *E. extrema* is likely to be confused only with *merae*, n. sp. The discal red spot on the elytron is smaller in *extrema* than in *merae* and the marginal yellow area is twice as wide in *merae*. The first specimen in the Crotch collection labeled "TYPE, cacica Guerin" is here designated lectotype.

Specimens Examined.—Total 20. COLOMBIA: Umbria Guines Fluss, Korschefsky collection. ECUADOR: "Ecuador." *Napo Pastaza:* Abitagua, 1200 m., June – '37, E. Brundage. *Pichincha:* Santa Inez, R. Haensch S., Korschefsky collection. *Santiago Zamora:* Mera, Staudinger and Bang-Haas dedit; Mera, Korschefsky. (CAS) (MNHUB) (UCCC) (USNM).

Epilachna merae, new species

(Figs. 360, 953–955; map 41)

Male.—Length 9.35 mm., width 7.95 mm. Form broadly oval, tapering toward apex, widest anterior to middle of elytra, lateral

margin of elytron feebly explanate, rounded from humeral angle to apex. Color black; broad anterolateral angle and lateral margin of pronotum, entire propleuron, and epipleuron yellow; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; elytron with broad, lateral margin yellow, piceous border inside yellow margin, disk of elytron reddish brown (fig. 360). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Postcoxal line incomplete, distinct, outer end directed toward lateral margin of first abdominal sternum, extending beyond middle of sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly notched; sixth tergum broadly, feebly emarginate. Genitalia with basal lobe equal in length to paramere, slender, lower margin angled upward gradually to blunt point; paramere nearly as described for *cacica* (figs. 953, 954); sipho slender, apex bent downward slightly, orifice dorsal, subterminal (fig. 955).

Female.—Not known.

Holotype.—Male. ECUADOR: *Santiago Zamora:* Mera, Korschefsky collection, Staudinger and Bang-Haas dedit (USNM 71683).

Paratype.—Total one. ECUADOR: *Santiago Zamora:* Mera, Korschefsky collection. (USNM).

Discussion.—*E. merae* resembles *extrema*, especially in color pattern. See remarks under *extrema*.

Epilachna nigripes Weise

Epilachna nigripes Weise, 1895, pp. 124–125.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

The type material of *nigripes* cannot be located and no specimens have been examined that exactly match Weise's description. The description here has been modified from the original.

Length 8–10 mm. Description as for *velutina* from which it is separated by black legs and sharply delineated, yellow lateral border. Yellow border begins on pronotum at inner margin of eye, extending to posterior angle of pronotum, narrowed posteriorly. Yellow border on elytron extends from humeral angle in equal width to shortly before apex where it is suddenly narrowed but is always wider than reflexed margin. Elytron is covered with large, flat punctures, surface between large punctures somewhat wrinkled and densely, finely punctured.

Type Locality.—Ecuador (E. Deville).

Type Depository.—Not known.

Discussion.—Weise stated that the type specimens were from the "Museum Bruxelles," but inquiries directed there and to the MNHUB revealed tht the types are not at either place. Since Weise gave a range of size, it may be assumed that he had more than one specimen. From the description, *nigripes* would seem to resemble *merae* or *pseudorealis* most closely. *E. merae* is found in Ecuador, but the elytral color pattern is quite different from that described for *nigripes*. *E. pseudorealis* has the correct dorsal color pattern, but the legs are yellow and it presumably does not occur in Ecuador.

Genus DIRA Mulsant, new status

Epilachna (*Dira*) Mulsant, 1850, p. 849.—Crotch, 1874, p. 65.—Korschefsky, 1931, p. 18.—Blackwelder, 1945, p. 440. Type-species: *Coccinella obscurocincta* Klug, by present designation.

Length 4.50–6.25 mm. Labrum short, wide; labium with palpus inserted medially, segments short, robust (fig. 57). Epipleuron nearly flat, depressions for apices of middle and hind femora not present. Anterior tibia slender, feebly grooved for reception of tarsus (fig. 73); tarsal claw with small but distinct basal angulation (fig. 83). Middle and hind tibiae lacking grooves, small, oval, flattened area present at apex (fig. 75). First abdominal sternum with postcoxal line incomplete, evenly rounded, not reaching hind margin of sternum. Male genitalia with basal lobe simple, longer than paramere, curved upward at apex (fig. 958); sipho short, robust, basal one-third not enlarged, apex emarginate in dorsal view (fig.

959). Female genital plate lacking visible stylus (fig. 1832).

Mulsant (*1850*) included several species in *Dira* that are not included here. The male and female genitalia are the best criteria for determining whether or not a specimen is a member of this genus. In external appearance *Dira* resembles the *cacica* group of *Epilachna* and could be confused with it quite easily except for the presence of the basal angulation on the claw. *D. clarkii* has the genitalia of the genus *Dira* but is more like *Epilachna* in form. It could perhaps be considered an intermediate species between the two genera. *Dira* has characteristics of both the Epilachnini and Madaini. See comments under Epilachnini. Six previously described and three new species are placed here in *Dira*, totaling nine species.

Key to Species of *Dira*

1. Elytron completely bordered with yellow and with black or piceous border inside yellow border, median area of elytron brownish yellow (fig. 361) ..... *clarkii* (Crotch), n. comb. (p. 200)
   Elytron not agreeing with above statements 2
2. Elytron with lateral border narrowly yellow, broad black border inside yellow border extending across base of elytron nearly to suture (fig. 362) ..... *obscurocincta* (Klug), n. comb. (p. 201)
   Species not agreeing with above statements 3
3. Elytron immaculate, sometimes with paler yellow lateral border particularly noticeable at humeral angle 4
   Elytron always with some form of dark marking 6
4. Species from Colombia or Venezuela ..... *subcincta* (Mulsant), n. comb. (p. 202)
   Species not from Colombia or Venezuela 5
5. Male genitalia with sipho nearly straight in apical one-third (fig. 959), paramere wider than basal lobe at apical one-fourth; female genital plate slightly wider than long, anteromedian angle rounded (fig. 1836) ..... *obscurocincta* (Klug), n. comb. (p. 201)
   Male genitalia with sipho curved upward in apical one-third (fig. 965), paramere slender, not as wide as basal lobe at any point (fig. 964); female genital plate much wider than long, anteromedian angle abrupt (fig. 1840) ..... *tomentosa* (Mulsant), n. comb. (p. 203)
6. Elytron completely black with yellow or reddish-yellow lateral border (fig. 363) 7
   Elytron not completely black 8
7. Species from Colombia ..... *richteri*, n. sp. (p. 202)
   Species from Panama ..... *gossypioides*, n. sp. (p. 204)
8. Elytron reddish brown with narrow, yellow lateral border and narrow piceous border definite at callus, becoming obscure toward apex; pronotum reddish brown medially ..... *gossypiata* (Mulsant), n. comb. (p. 204)
   Elytron brownish red with narrow, black lateral border; pronotum black medially 9
9. Elytron with lateral black border covering callus; lateral margin of pronotum narrowly yellow ..... *nucula* (Weise), n. comb. (p. 205)
   Elytron with lateral black border not reaching callus; lateral margin of pronotum broadly yellow ..... *inexculta*, n. sp. (p. 205)

Descriptions of *Dira* Species

Dira clarkii (Crotch), new combination

(Figs. 361, 956–958, 1829–1832; map 42)

Epilachna (*Dira*), *clarkii* Crotch, 1874, p. 65.
Epilachna clarki: Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 6.36 mm., width 5.40 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–8 yellow, 9–11 piceous; anterior and lateral margins of pronotum, propleuron, and outer two-thirds of epipleuron yellow; elytron with complete yellow border, narrow, complete piceous to black border inside yellow border, median area of elytron brownish yellow (fig. 361). Punctation on elytron dual, small punctures indistinct, separated by one to two times their diameter, large punctures coarse, dense, separated by less than to two times their diameter. Pubescence grayish white. Tarsal claw with feeble angulation at base. Postcoxal line incomplete, distinct, not extending to hind margin of first abdominal sternum. Abdomen

with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, slender, curved upward apically, few setae present on each side of dorsal surface; paramere widened apically (figs. 956, 957); sipho short, stout, orifice dorsal, subterminal (fig. 958).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly protruding medially; sixth sternum feebly emarginate medially, longitudindal suture present (fig. 1829); sixth tergum broadly convex (fig. 1830). Genitalia with 10th tergum feebly convex, lacking pigmentation medially (fig. 1831); genital plate with anterior margin nearly truncate, anterolateral angle broadly rounded, produced, stylus not visible (fig. 1832).

Variation.—Length 5.61 mm., width 4.74–5.33 mm. Occasional specimen has disk of elytron dark reddish brown. Black ring around elytron may be incomplete at base.

Type Locality.—Brazil: Constancia.

Type Depository.—UCCC.

Discussion.—The dorsal color pattern is almost exactly like that of *E. clandestina,* but *clarkii* has the pronotum nearly all black and is much smaller. The genitalia of both the male and female and the postcoxal line are of the type found in the genus *Dira.* The form, lack of depressions in the epipleuron, and horizontal epipleuron are of the *Epilachna* type. Two specimens, a male and female, are in the type series. The first specimen, a male from *Constancia,* bears Crotch's "type" label; the second specimen is a female labeled "Minas."

Specimens Examined.—Total 26. BRAZIL: *Bahia:* "Bahia." *Minas Gerais:* Vicosa, 1930, E. J. Hambleton; Vicosa, 1–14–30, Mrs. Y. Mexia. *Rio de Janeiro:* "Rio de Jan." *Sao Paulo:* "Sao Paulo"; Est. S. Paulo, 15–II–1919, Saude; Constancia; Silio Bananal, Guarulhos, 27–X–1957, Halik; Horto Florestal, 24–III–1964; Cantareira, 6–I–1962, 13–11–1962, 15–III–1960, 24–I–1963, 25–XI–1962, Halik collection. (CAS) (CM) (MCZ) (MNHUB) (UCCC) (USNM).

***Dira obscurocincta* (Klug), new combination**

(Figs. 362, 957*a*, 958*a*, 959, 1833–1836; map 42)

Coccinella obscurocincta Klug, 1829, p. 10.
Epilachna (Dira) obscurocincta: Mulsant, 1850, pp. 849–850.—Crotch, 1874, p. 66.
Epilachna obscurocincta: Brèthes, 1925, p. 6.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.
Epilachna (Dira) placida Mulsant, 1850, pp. 850–851.—Crotch, 1874, p. 65.
Epilachna placida: Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 6 mm., width 5.15 mm. Form round, convex, widest at middle of elytra. Color yellow; head black; pronotum black except narrow anterior and lateral margins yellow; mesosternum, metasternum, and legs black; elytron with narrow basal and lateral margins yellow, broad black ring inside yellow margin extending from near scutellum to callus, posteriorly to suture at apex, disk of elytron reddish brown, slightly paler along suture (fig. 362). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Epipleuron feebly descending externally. Tarsal claw with small basal angulation. Postcoxal line incomplete, distinct, rounded, not reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum weakly emarginate; sixth sternum deeply notched; sixth tergum broadly convex, entire. Genitalia with basal lobe slightly longer than paramere, narrowed from base to apex, apex curved upward, row of setae present on each side on dorsal surface; paramere not widened apically (figs. 957*a*, 958*a*); sipho with basal one-third straight, apical two-thirds abruptly bent, apex in dorsal view emarginate medially, orifice dorsal, subterminal (fig. 959).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly produced medially; sixth sternum narrow, faintly emarginate medially, longitudinal suture present (fig. 1833); sixth tergum broadly convex, faintly emarginate medially (fig. 1834). Genitalia with 10th tergum convex, entire (fig. 1835); genital plate with posterior margin truncate, anterolateral angle

broadly rounded, produced, no stylus visible (fig. 1836).

Variation.—Length 4.60–6.18 mm., width 3.91–5.20 mm. Most of the specimens examined varied from the typical *obscurocincta* as described here in having the head, entire pronotum, mesosternum, metasternum, and legs brownish yellow. This is the form described by Mulsant as *placida*.

Type Locality.—Of *obscurocincta*, Brazil; of *placida*, Bolivia.

Type Depository.—Of *obscurocincta*, MNHUB (lectotype here designated); of *placida*, UCCC (lectotype here designated).

Discussion.—*D. obscurocincta* is apparently a fairly common species in southern Brazil and Bolivia. The large size and black elytral ring extending across the base of each elytron but not reaching the suture should distinguish this species. The first specimen in the type series of *obscurocincta*, a female bearing the following labels, is here designated as lectotype: "Cassapava, Sellow" (green paper); "4551"; "obscurocincta, Dej" (green paper). The specimen under the name *obscurocincta* in the Crotch collection, a male bearing the following labels, is here designated as the lectotype of *placida:* "TYPE, placida ex Muls." Crotch first placed *placida* as a synonym of *obscurocincta* and this placement appears to be correct in spite of the color differences. The male and female genitalia of the two forms are identical.

Specimens Examined.—Total 263. ARGENTINA: *Jujuy:* Talilequa, 13–II–1950, Monros and Willink. *Misiones:* Eldorado, VI–20–1963, A. Kovacs. *Salta:* "Salta." *Tucuman:* Arroyo Misto, I–30–65, F. G. Werner; Los Puestos, 1961, Golbach; Tucuman, II–15–1918. BOLIVIA: "Bolivia." *Beni:* Rurrenabaque, Rio Beni, Oct., Wm. Mann. *La Paz:* Huachi, Rio Beni, G. L. Harrington. *Santa Cruz:* Santa Cruz, Korschefsky collection; Santa Cruz, Feb. 1956, G. Pinckert; Sara; del Sara, Steinbach; del Sara, 450 m., J. Steinbach. BRAZIL: "Brasil"; Brasil, V. Olf. *Goias:* Vianopolis, R. Spitz. *Mato Grosso:* Chapada; Chapada, Nov.; Corumba. *Para:* Para, Sieber; Taperina. *Parana:* Ponta Grossa; Rio Negro. *Santa Catarina:* "Santa Catarina"; S. Cath., XII–1945, A. M. Maller. *Sao Paulo:* "Sao Paulo"; Campinas, F. Plaumann; Nova Teutonia, lat. 22–11 S., lon. 52–23 W., IX–29–1948. PARAGUAY: Paraguay, C. Fiebrig S. V. *Itapua:* Sa. Trinidad, IX–1913, Korschefsky collection. URUGUAY: *Canelones:* Montevideo. (AMNH) (CAS) (CM) (IML) (MCZ) (MNHUB) (UCCC) (USNM).

Dira subcinta (Mulsant), new combination

Epilachna (*Dira*) *subcincta* Mulsant, 1850, pp. 857–858.—Crotch, 1874, p. 66.

Epilachna subcincta: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

The only specimen of this species available for study was the single specimen described here. Since the abdomen is missing on this specimen, the sex is not known. The species is placed in *Dira* as it resembles the pale form of *obscurocincta* very closely.

Length 5.47 mm., width 5.31 mm. Form round, convex, widest at middle of elytra. Color yellow; head, pronotum, metasternum, and legs pale reddish brown; elytron reddish brown with lateral margin slightly paler. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Epipleuron feebly descending externally. Tarsal claw with small basal tooth.

Type Locality.—New Granada (Reiche).

Type Depository.—UCCC.

Discussion.—The single specimen under the name *subcincta* in the Crotch collection is here accepted as the type, as Mulsant (*1850*) stated that his material was from the Reiche collection and the Reiche collection was acquired by Crotch. Unfortunately the abdomen of this specimen is missing and there are no locality data. The type specimen bears the following labels: "A"; "TYPE" (white paper); "TYPE" (blue paper). *D. subcincta* appears quite close to *obscurocincta*, but *obscurocincta* is not known to occur in Colombia. No specimens have been observed from Colombia that come close to matching the type of *subcincta*.

Dira richteri, new species

(Figs. 363, 960–962; map 42)

Male.—Length 6.71 mm., width 6 mm. Form

round, convex, widest at middle of elytra. Color yellow; mesosternum, metasternum, and legs reddish brown; pronotum with large black area medially; elytron black with reddish-yellow lateral border (fig. 363). Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by one to five times their diameter. Pubescence grayish white. Tarsal claw with feeble basal angulation. Postcoxal line rounded, nearly reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum feebly emarginate. Genitalia with phallobase long, slender; basal lobe longer than paramere, simple, curved apically, row of setae present on each side on upper surface; paramere not widened apically (figs. 960, 961); sipho short, robust, apex in dorsal view deeply emarginate (fig. 962).

Female.—Not known.

Holotype.—Male. COLOMBIA: *Amazonas:* Rio Tacana, 8–XL–1946, L. Richter coll. (AMNH).

Discussion.—*D. richteri* has the dorsal color pattern of *Malata burgdorfi* and *Mada rabauti* but belongs in the genus *Dira*.

***Dira tomentosa* (Mulsant), new combination**

(Figs. 963–965, 1837–1840)

Epilachna (*Dira*) *tomentosa* Mulsant, 1850, p. 858.—Crotch, 1874, p. 66.

Epilachna tomentosa: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Epilachna (*Mada*) *sororia* Mulsant, 1850, p. 859.

Mada ab. *sororia:* Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 422.

Rodolia pubivestis, Mulsant, 1853, p. 132.

Epilachna (*Dira*) *pubivestis:* Crotch, 1874, p. 66.—Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 5 mm., width 4.47 mm. Form round, convex, widest anterior to middle of elytra. Color yellowish brown; pronotum except narrow anterolateral angle brownish red; elytron except narrow lateral margin brownish red. Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with very feeble basal projection. Postcoxal line incomplete, distinct, rounded, not reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, curved upward strongly before apex; paramere slender, angled upward, feebly widened apically (figs. 963, 964); sipho short, robust, pointed apically, in dorsal view apex emarginate, orifice dorsal, subterminal (fig. 965).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire (fig. 1837); sixth tergum broadly convex, entire (fig. 1838). Genitalia with 10th tergum entire, hind margin nearly truncate (fig. 1839); genital plate with base truncate, anterolateral angle broadly rounded, produced, stylus not visible (fig. 1840).

Type Locality.—Brazil (Dejean, Reiche).

Type Depository.—UCCC (lectotype here designated).

Discussion.—Mulsant (*1850*) described *tomentosa* from specimens in the collections of Dejean and Reiche, indicating the type as being in the Dejean collection and from Brazil. In 1853 Mulsant described *Rodolia pubivestis* from Cayenne, using specimens from Deyrolle. Crotch (*1874*) recognized *pubivestis* as belonging to *Epilachna* and placed it as a synonym of *tomentosa*. There are now two specimens under the name *tomentosa* in the Crotch collection, apparently identical in all respects, from which specimens this description has been drawn. The first specimen, a female, bears the following labels: "pubivestis T Cay" (green paper); "TYPE"; "TYPE" (blue paper); "A." The second specimen, a male, bears the following labels: "tomentosa Braz Reiche" (green paper); "A"; "tomentosa Reiche." This specimen is apparently the one from the Reiche collection mentioned by Mulsant under his description of *tomentosa*. The type is supposed to be in the Dejean collection, but no specimens are presently under the name *tomentosa*. The second specimen in the Crotch collection is here designated lectotype of *tomentosa* and the first specimen discussed here is designated lectotype of *pubivestis*. The second specimen under the label *fraterna* in

the Dejean collection discussed under *fraterna* is here designated lectotype of *sororia*.

Specimens Examined.—Total three. See previous discussion.

Dira gossypioides, new species

(Figs. 966–968, 1841–1844; map 42)

Male.—Length 5.63 mm., width 5.29 mm. Form round, convex, widest at middle of elytra. Color yellow; pronotum yellow with median area at base brownish black; metasternum and legs brownish yellow; elytron brownish black with broad, yellow lateral border. Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by less than to twice their diameter. Pubescence grayish white. Tarsal claw with feeble basal angulation. Postcoxal line incomplete, distinct, extending nearly to hind margin of first abdominal sternum, median part flattened, parallel to hind margin of sternum. Abdomen with hind margin of fifth sternum weakly emarginate; sixth sternum notched; sixth tergum weakly emarginate. Genitalia of *gossypiata* type; basal lobe longer than paramere, abruptly curved upward before apex, group of setae present dorsolaterally before apex, in ventral view slightly widened medially; paramere straight, not widened apically (figs. 966, 967); sipho short, robust, orifice dorsal, terminal, in dorsal view sides parallel, apex emarginate (fig. 968).

Female.—Similar to male except abdomen with hind margin of fifth sternum strongly, triangularly projecting medially; sixth sternum weakly emarginate (fig. 1841); sixth tergum broadly convex, entire (fig. 1842). Genitalia with 10th tergum convex, entire (fig. 1843); genital plate with anteromedian angle rounded, broadly projecting, basal margin truncate, stylus not visible (fig. 1844).

Variation.—Length 5.63–5.71 mm., width 4.97–5.29 mm.

Holotype.—Male. PANAMA: Barro Colorado, Canal Zone, May 13, 1929, Darlington (MCZ).

Allotype.—Female. Same data as holotype (MCZ).

Other Specimens.—Total two. COLOMBIA: *Magdalena:* Rio Frio, Darlington. (MCZ).

Discussion.—The male genitalia are more robust than in *gossypiata*, the basal lobe is wider, and the apex of the sipho is not narrowed as in *gossypiata*. The sipho is of the *obscurocincta* type. The elytron is nearly black except the yellow lateral border.

Dira gossypiata (Mulsant), new combination

(Figs. 969–971, 1845–1848; map 43)

Epilachna (*Dira*) *gossypiata* Mulsant, 1850, p. 857.—Crotch, 1874, p. 66.

Epilachna gossypiata: Korschefsky, 1931, p. 62.—Blackwelder, 1945, p. 441.

Male.—Length 6.25 mm., width 5.74 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; median area of pronotum and metasternum reddish brown; elytron reddish brown with narrow, yellow lateral margin and narrow piceous ring inside yellow margin extending from base across callus to suture at apex. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Epipleuron feebly descending externally. Tarsal claw with small basal angulation. Postcoxal line incomplete, distinct, rounded, not extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly, feebly emarginate medially; sixth sternum deeply notched; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, slender, strongly curved upward apically, row of setae present on each side of middle on upper surface; paramere straight, angled upward, not widened apically (figs. 969, 970); sipho short, stout, feebly curved, apex in dorsal view tapered to blunt point, emarginate medially, orifice dorsal, subterminal (fig. 971).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly produced medially; sixth sternum entire, nearly truncate medially, longitudinal suture present (fig. 1845); sixth tergum broadly convex (fig. 1846). Genitalia with 10th tergum convex, entire (fig. 1847); genital plate with posteromedian angle strongly notched, all

other angles rounded, stylus not visible (fig. 1848).

Variation.—Length 5.63–6.77 mm., width 4.79–5.81 mm. Some specimens observed had piceous ring on elytron paler, only slightly darker than discal color.

Type Locality.—Bolivia (Guerin, Reiche).

Type Depository.—UCCC (lectotype here designated).

Discussion.—This species resembles other members of the genus externally, but the feebly curved male sipho and the strongly notched female genital plate distinguish *gossypiata*. The single male specimen in the Crotch collection bearing the following labels is here designated as lectotype: "TYPE, gossypiata, Bol, Guer"; "TYPE" (blue paper). This is apparently the Guérin specimen listed by Mulsant (*1850*) as "type."

Specimens Examined.—Total five. BOLIVIA: Type specimen. *Santa Cruz:* Feb. 1956, G. Pinckert; del Sara, Steinbach Coll. (UCCC) (USNM).

Dira nucula (Weise), new combination

(Figs. 364, 972–974, 1849–1852; map 43)

Solanophila nucula Weise, 1902, p. 161.
Epilachna nucula: Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Female.—Length 6.75 mm., width 5.51 mm. Form oval, widest anterior to middle of elytra, lateral margin of elytron feebly explanate, rounded from humeral angle to apex. Color black; broad anterolateral angle of pronotum and entire propleuron yellow; mouthparts yellow to piceous; antenna with basal segment brownish yellow, segments 2–8 yellow, 9–11 dark brown; elytron brownish red with black lateral border extending from base inside callus, across callus, parallel to margin, and joining suture at apex (fig. 364). Punctation on elytron indistinct, dual, small punctures separated by one to three times their diameter, large punctures separated by one to three times their diameter. Surface of elytron very finely reticulate. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line nearly complete, distinct, extending almost to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum produced medially, with longitudinal suture (fig. 1849); sixth tergum feebly convex (fig. 1850). Genitalia with 10th tergum convex, narrowly pigmented (fig. 1851); genital plate triangular, narrowed posteriorly, posteromedian angle notched, posterior margin truncate (fig. 1852).

Male.—Similar to female except abdomen with hind margin of sixth sternum emarginate; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, slender, strongly curved upward in apical one-third, setae present on upper margin from base nearly to apex, in ventral view lateral margin strongly sinuate, apex truncate; paramere straight, angled upward (figs. 972, 973); sipho short, robust, feebly curved near base, apex blunt (fig. 974).

Variation.—Length 6.28–6.78 mm., width 5.19–5.80 mm.

Type Locality.—Peru: Marcapata.

Type Depository.—Not known.

Discussion.—*D. nucula* resembles *inexculta* a great deal in external appearance, and these two species are distinct from the other members of *Dira* in this respect. No type material can be located, but Weise's description is clear and two females are in the Korschefsky collection labeled "nucula." In addition, since several specimens are in the Paris museum (Sicard collection) from the type locality, there is little doubt as to the identity of this species.

Specimens Examined.—Total 25. PERU: "Peru," Korschefsky collection. *Cuzco:* Callanga, Staudinger; Marcapata, Staudinger. (PM) (USNM).

Dira inexculta, new species

(Figs. 365, 975–977; map 43)

Male.—Length 6.97 mm., width 6.10 mm. Form round, slightly elongate, widest anterior to middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color black; head with clypeus and antennal insertion yellow; mouthparts yellow to piceous; antenna with basal segment brown, segments 2–8 yellow, 9–11 piceous; propleuron entirely yellow; pronotum with lateral margin broadly

yellow; elytron brownish red with narrow, black, lateral border not reaching callus (fig. 365). Punctation on elytron dual, small punctures very fine, separated by one to two times their diameter, large punctures separated by less than to three times their diameter. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, distinct, extending nearly to hind margin of elytron. Abdomen with hind margin of fifth sternum emarginate; sixth sternum notched; sixth tergum broadly convex, entire. Genitalia with basal lobe slender, longer than paramere, strongly curved upward before apex, row of setae present on upper margin; paramere slender, feebly widened apically (figs. 975, 976); sipho short, robust, weakly curved, apex pointed, orifice dorsal, subterminal (fig. 977).

Female.—Not known.

Holotype.—BOLIVIA: *Beni:* Tumapaca, IX–1925, W. C. Harrington collector (CAS).

Discussion.—*D. inexculta* resembles *nucula* in form and color pattern, but in *nucula* the lateral black border on the elytron is broader, covering the callus, and the pronotum has only the anterolateral angle yellow. In overall size *inexculta* is larger than *nucula*.

Tribe MADAINI, new tribe [4]

Average length under 6 mm. Form nearly round, convex, widest at middle of elytra, lateral margin of elytron not or barely perceptibly explanate. Epipleuron descending externally, often strongly so, nearly always with depressions present to receive apices of middle and hind femora. Anterior leg with tibia short, wide, not reaching trochanter in repose, tarsus received in shallow tibial groove. Middle and hind legs with tibia slender, not reaching trochanter in repose, tibia without grooves for reception of tarsus, with small, oval, flattened areas at apex on inner margin. Postcoxal line incomplete, nearly always extending well beyond middle of first abdominal sternum, usually angulate.

The tribe Madaini is composed of small, round species that are rather uniform in appearance except for *Mada lineatopunctata* and *M. polluta*. *M. lineatopunctata* in particular is unusual in lacking any trace of the depressions in the epipleuron.

[4] *Subcoccinella vigintiquatuorpunctata* (L.) is a European species that has become established in New Jersey, Pennsylvania, Maryland, and Ohio and was discovered in 1972. It is about 4.20 mm. long, round, and yellowish red, with a varying number of black spots on each elytron. *Epilachna varivestis*, *E. borealis*, and *S. vigintiquatuorpunctata* are the only species of Epilachninae occurring north of Arizona, and both *varivestis* and *borealis* belong to the tribe Epilachnini, whereas *vigintiquatuorpunctata* is a member of the Madaini. *S. vigintiquatuorpunctata* has thus far been recorded as feeding only on *Saponaria officinalis* L. in North America, but it is an alfalfa (*Medicago sativa* L.) pest in Europe. This species was discovered in North America too late to be included formally in this bulletin.

Key to Genera of Madaini [5]

1. Clypeus narrow, produced, lateral angle distinct, acute, anterior margin deeply, almost triangularly emarginate (fig. 8) ..... *Pseudodira*, n. genus (p. 207)
   Clypeus not as described above, anterior margin shallowly, evenly emarginate 2
2. Tarsal claw without basal angulation or with angulation barely perceptible 3
   Tarsal claw with strong basal angulation, usually appearing trifid (fig. 85) 4
3. Tarsal claw with inner tooth broad, curved inward, touching tooth on opposite claw (fig. 86) ..... *Malata*, n. genus (p. 213)
   Tarsal claw with inner tooth slender, not approaching inner tooth on opposite claw (fig. 84) ..... *Lorma*, n. genus (p. 207)
4. Labrum usually long, narrow; male genitalia with basal lobe not divided, or if divided, then lower part longer than upper part ..... *Mada* Mulsant, n. status (p. 217)
   Labrum short, wide (fig. 9); male genitalia with basal lobe divided, lower part much shorter than upper part, paramere large with long, dense setae (fig. 1117) ..... *Damatula*, n. genus (p. 236)

[5] *Subcoccinella vigintiquatuorpunctata* (L.) goes to couplet 3 because the claws are simple although not identical to those of *Lorma* and *Malata* type. *S. vigintiquatuorpunctata* is known from Europe and the Eastern United States. Members of *Lorma* and *Malata* do not occur north of Mexico. (See footnote 4.)

Genus PSEUDODIRA, new genus

Form round, convex, lateral margin of elytron very feebly explanate, size range of only known species 5.65–6.25 mm. in length. Clypeus narrow, produced, lateral angle distinct, obtusely rounded, anterior margin deeply, almost triangularly emarginate (fig. 8). Antenna with basal segment slightly enlarged, not produced externally. Tibiae with apical spurs. Tarsal claw with no trace of basal angulation. First abdominal sternum with postcoxal line incomplete, distinct, V-shaped, not reaching hind margin of sternum (fig. 99). Female genital plate lacking visible stylus (fig. 1856).

Type-species: *Pseudodira clypealis*, n. sp., gender is feminine.

Pseudodira resembles *Dira* in the form of the tarsal claw and in the genital plate lacking a visible stylus. The produced, strongly emarginate clypeus and V-shaped postcoxal line distinguish *Pseudodira*.

Description of *Pseudodira* Species

***Pseudodira clypealis*, new species**

(Figs. 1853–1856; map 42)

Female.—Length 6.23 mm., width 5.38 mm. Form round, convex, widest at middle of elytra. Color black; mouthparts yellow to piceous; antenna with basal segment black, segments 2–11 yellow; abdomen brownish red; elytron entirely greenish black. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter, very fine punctures present at bottom of large punctures. Pubescence yellowish white. Postcoxal line V-shaped, incomplete, not extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum narrow, convex, entire (fig. 1853); sixth tergum broadly convex, entire (fig. 1854). Genitalia with 10th tergum convex, entire (fig. 1855); genital plate with inner margin broadly deeply emarginate, no visible stylus (fig. 1856).

Male.—Not known.

Holotype.—Female. BRAZIL: *Guanabara:* Rio de Janeiro, XI–1963, M. Alvarenga coll. (USNM 71684).

Paratypes.—Total three. BRAZIL: *Guanabara:* Same data as holotype; Rio de Jan. (CM) (USNM).

Genus LORMA, new genus

Length 3.50–5.40 mm. Labium with palpus inserted apically, segments slender, much longer than wide. Epipleuron descending externally, depressions for apices of middle and hind femora distinct. Tarsal claw with basal angulation feeble or entirely lacking (fig. 84). First abdominal sternum with postcoxal line incomplete, rounded, outer part sometimes sinuate (fig. 102). Male genitalia with basal lobe and paramere simple (fig. 994); sipho long, slender, base enlarged (fig. 995). Female genital plate where known with stylus visible (fig. 1860).

Type-species: *Lorma haliki*, n. sp., generic name created arbitrarily, gender is feminine.

The lack of females for so many of the species in this genus makes speculation on the type of female genital plate difficult. The simple claw is unusual in this tribe and characterizes *Lorma* immediately. Three previously described and eight new species are placed here in *Lorma*, totaling 11 species.

Key to Species of *Lorma*

1. Elytron light brownish red with obscurely paler lateral and sutural margins; Costa Rica ..... *nevermanni*, n. sp. (p. 208)

Elytron dark brown to black or with distinct dark color pattern 2

2. Elytron with five yellow spots on dark background (fig. 366) ..... *specca*, n. sp. (p. 208)
   Elytron not as described above 3
3. Elytron bluish black with apical one-seventh yellow; pronotum usually entirely reddish brown (fig. 367) ..... *apicalis*, n. sp. (p. 209)
   Elytron entirely dark colored or with narrowly pale lateral border 4
4. Dorsal surface entirely black except narrow anterolateral angle of pronotum; head black except clypeus yellow ..... *rufoventris* (Mulsant), n. comb. (p. 209)
   Dorsal surface usually not entirely black, if so, then at least anterior two-thirds of head yellow 5
5. Elytron entirely piceous or bluish black 8
   Elytron with distinct dark pattern on paler background or with yellow or red lateral border (figs. 369, 370) 6
6. Length 6.50 mm. or more ..... *batesi* (Crotch), n. comb. (p. 213)
   Length 5.50 mm. or less 7
7. Lateral border of elytron black, sutural border black, widened on disk; Brazil ..... *haliki*, n. sp. (p. 210)
   Lateral border of elytron yellow, sutural border obscurely darker than median area; Peru ..... *paprzyckii*, n. sp. (p. 212)
8. Head with at least posterior one-third black 9
   Head usually entirely yellow, occasionally with faint brown spot immediately anterior to pronotum 10
9. Length about 4.60 mm.; Brazil ..... *glaucina* (Mulsant), n. comb. (p. 210)
   Length about 4.11 mm.; Bolivia ..... *sicardi*, n. sp. (p. 211)
10. Postcoxal line rounded; male genitalia with basal lobe slender in lateral view, narrowed from base to apex (fig. 997); Colombia ..... *imitator*, n. sp. (p. 211)
    Postcoxal line feebly angulate; male genitalia with basal lobe wide in lateral view, upper margin arcuate before base, sinuate (fig. 1003); Panama ..... *sopita*, n. sp. (p. 212)

Descriptions of *Lorma* Species

Lorma nevermanni, new species

(Figs. 978–980; map 44)

Male.—Length 4.55 mm., width 4.38 mm. Form round, convex, widest at middle of elytra. Color brownish red; anterolateral angle of pronotum, head and mouthparts, propleuron, epipleuron, and legs yellow; elytron brownish red with broad lateral and narrow sutural margin yellow. Punctation on elytron dual, small punctures indistinct, separated by two to three times their diameter, large punctures separated by one to six times their diameter. Pubescence grayish white. Tarsal claw barely perceptibly angulate at base. Postcoxal line incomplete, distinct, rounded, extending three-fourths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched medially; sixth tergum broadly convex, entire. Genitalia with basal lobe slender, slightly longer than paramere, apex pointed, in ventral view spatulate, lateral margin arcuately rounded, apex projecting; paramere strongly widened apically (figs. 978, 979); sipho slender, apex curved upward, orifice dorsal, subterminal (fig. 980).

Female.—Not known.

Holotype.—Male. COSTA RICA: *Limon:* Hamburg Farm, Reventazon, Ebene Limon, 5–X–28, F. Nevermann (USNM 71685).

Discussion.—This is the only presently known species of *Lorma* from Central America with the dorsal surface completely immaculate.

Lorma specca, new species

(Figs. 366, 981–983, 1857–1860; map 44)

Male.—Length 3.47 mm., width 2.89 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; median area of pronotum dark reddish brown; elytron with five yellow spots on dark ground color, triangular spot between callus and humeral angle, round spot posterior to and inside of callus, round spot posterior to middle of elytron near suture, small, elongate spot at lateral margin in apical one-half, round spot on apical one-half near suture, ground color dark reddish brown except becoming nearly black posterior to callus and behind two apical spots (fig. 366). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to six times their diameter.

Pubescence grayish white. Tarsal claw barely perceptibly angulate at base. Postcoxal line incomplete, distinct, feebly angulate, not reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth abdominal sternum truncate; sixth sternum notched; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, lower margin angled upward to pointed apex, in ventral view abruptly narrowed at apical one-third, sides parallel to bluntly pointed apex; paramere broad, margins sinuate, narrowed at apex (figs. 981, 982); sipho slender, apex bluntly pointed, orifice dorsal, subterminal (fig. 983).

Female.—Similar to male except abdomen with hind margin of sixth sternum emarginate (fig. 1857); sixth tergum feebly emarginate (fig. 1858). Genitalia with 10th tergum broadly convex (fig. 1859); genital plate rounded, with posteromedian angle produced, acute, stylus visible (fig. 1860).

Variation.—Length 3.47–3.89 mm., width 2.89–3.10 mm.

Holotype.—Male. PANAMA: *Chiriqui:* Bugaba, Champion (PM).

Allotype.—Female. Same data as holotype (PM).

Paratypes.—Total two. Same data as holotype. (PM) (USNM).

Discussion.—*L. specca* is one of the most easily recognized members of the genus *Lorma* or any of the genera of small, round, epilachnines. The elytral color pattern and male genitalia are very unusual and not to be confused with those of any presently known species.

Lorma apicalis, new species

(Figs. 367, 984–986; map 44)

Male.—Length 3.81 mm., width 3.34 mm. Form round, convex, widest at middle of elytra. Color reddish yellow; head, pronotum, and metasternum reddish brown; elytron bluish black with narrow lateral and sutural margins piceous, apical one-seventh yellow (fig. 367). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with basal angulation feeble, nearly absent. Postcoxal line incomplete, distinct, angulate, extending beyond middle of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate. Genitalia with basal lobe longer than paramere, apex curved upward, pointed, group of setae on dorsal surface anterior to middle; paramere slender, not widened apically (figs. 984, 985); sipho narrowed before apex, apex pointed, orifice dorsal, subterminal. (fig. 986).

Female.—Similar to male except abdomen with sixth tergum convex, entire. Genitalia with 10th tergum convex, entire; genital plate oval, all angles rounded, stylus visible.

Variation.—Length 3.35–4.38 mm., width 2.90–3.91 mm. Pronotum varies from entirely reddish brown to nearly completely black.

Holotype.—Male. COLOMBIA: *Magdalena:* Rio Frio, Darlington (MCZ).

Allotype.—Female. Same data as holotype. (MCZ).

Paratypes.—Total six. Same data as holotype. (MCZ) (USNM).

Discussion.—The bluish-black elytra with yellow apex and reddish-yellow pronotum distinguish *apicalis* from any known species of *Lorma.*

Lorma rufoventris (Mulsant), new combination

(Figs. 987–989, 1861–1864; map 45)

Epilachna (Mada) rufoventris Mulsant, 1850, p. 859.—Crotch, 1874, p. 67.

Mada rufoventris: Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.

Male.—Length 4 mm., width 3.49 mm. Form round, slightly elongate, widest at middle of elytra. Color black; narrow anterolateral angle of pronotum, clypeus, mouthparts and antenna, propleuron, and legs yellow. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence dense, grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, distinct, angulate, nearly touching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex, entire; sixth sternum weakly notched medially; sixth

tergum broadly convex, entire. Genitalia with basal lobe straight, slender, longer than paramere, slightly curved upward at apex, row of setae present on upper surface; paramere angled upward slightly, widened at apex (figs. 987, 988); sipho slender, apex thickened, abruptly curved upward, orifice dorsal, subterminal (fig. 989).

Female.—Similar to male except hind margin of sixth abdominal sternum weakly emarginate (fig. 1861); sixth tergum broadly convex, entire (fig. 1862). Genitalia with 10th tergum convex (fig. 1863); genital plate with all angles rounded, lateral margin projecting medially (fig. 1864).

Variation.—Length 4–5.34 mm., width 3.49–4.41 mm.

Type Locality.—Brazil (Dejean).

Type Depository.—DLM (lectotype here designated).

Discussion.—The single female specimen of *rufoventris* in the Dejean collection labeled "Brasilia" is here designated lectotype. Another female specimen in the Paris museum labeled "Museum Paris, Cap de Rio Grande entre les missions et Rio Pardo"; "Epilachna rufoventris Muls., auct. det." is also this species although apparently not type material. *L. rufoventris* superficially appears very much like the members of the genus *Damatula*, but the genitalia and labrum are not the *Damatula* type.

Specimens Examined.—Total 12. BRAZIL: "Brasilia"; Cap de Rio Grande entre les missions et Rio Pardo. *Para:* Santarem; E. A. di Para, Santarem; Taperina. *Santa Catarina:* Nova Teutonia, lat. 27–11S, lon. 52–53W, X–18–1948. F. Plaumann. (CAS) (CM) (DLM) (PM) (USNM).

Lorma glaucina (Mulsant), new combination

(Figs. 990–992)

Epilachna (Mada) glaucina Mulsant, 1850, p. 860.—Crotch, 1874, p. 67.

Mada glaucina: Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.

Male.—Length 4.60 mm., width 4.08 mm. Form round, convex, widest at middle of elytra. Color piceous; anterior two-thirds of head, legs, and narrow anterolateral angle of pronotum brownish yellow; elytron bluish black. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by less than to four times their diameter. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, distinct, not reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, slender, straight, upper margin slightly sinuate with group of setae anterior to middle, apex slightly curved upward to point; paramere slender, not widened apically (figs. 990, 991); sipho slender, apex thickened, blunt, orifice dorsal, subterminal (fig. 992).

Female.—Not known.

Type Locality.—Brazil (Germar and Schaum; Paris museum).

Type Depository.—PM (lectotype here designated).

Discussion.—The male genitalia of *glaucina* and *haliki* are rather similar, although the sipho of *glaucina* is not nearly as strongly curved near the base, but the dorsal color patterns are entirely different and the postcoxal line is weakly but distinctly angulate in *haliki* and evenly rounded in *glaucina*. *L. glaucina* also is larger than most specimens of *haliki*. The single male specimen in the Paris museum bearing the following labels is here designated lectotype: "232"; "Epilachna glaucina Muls., auct. det."

Specimens Examined.—Total one. The lectotype.

Lorma haliki, new species

(Figs. 368, 993–995, 1865–1868; map 45)

Male.—Length 4 mm., width 3.49 mm. Form round, convex, widest at middle of elytra. Color yellowish brown; median one-third of pronotum, entire epipleuron, mesosternum, metasternum, and median area of first abdominal sternum black; elytron reddish brown with black border completely surrounding elytron, border widened to cover callus at humeral angle, widened slightly on disk (fig. 368). Punctation on elytron dual, small punctures separated by their diameter or less, large punc-

tures separated by one to three times their diameter. Pubescence dense, grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, distinct, angulate, extending four-fifths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex, entire; sixth sternum feebly emarginate; sixth tergum convex, entire. Genitalia with basal lobe straight, narrowed before apex, row of setae present on upper surface; paramere slender, straight, not widened apically (figs. 993, 994); sipho bent downward before apex, apex thickened, curved upward, orifice dorsal, subterminal (fig. 995).

Female.—Similar to male except abdomen with hind margin of sixth sternum distinctly emarginate (fig. 1865); sixth tergum broadly convex, entire (fig. 1866). Genitalia with 10th tergum strongly convex medially (fig. 1867); genital plate egg-shaped, inner margin more strongly arcuate than outer margin, stylus visible (fig. 1868).

Variation.—Length 4–5.23 mm., width 3.68–4.20 mm.

Holotype.—Male. BRAZIL: *Sao Paulo:* Cantareira, 24–I–1963, Halik (USNM 71686).

Allotype.—Female. Same data as holotype (USNM).

Paratypes.—Total 13. Same data as holotype except additional dates as follows: 12–XII–1963, 17–II–1960, 21–IV–1959, 29–III–1965. (USNM).

Discussion.—The elytral color pattern with the black border abruptly widened to cover the callus distinguishes this species. The male genitalia are very similar to those of *rufoventris*, but the apex of the sipho is not so abruptly curved upward and the basal lobe is not quite so straight on the upper margin. The paramere is more slender, not at all widened apically.

Lorma imitator, new species

(Figs. 996–998; map 44)

Male.—Length 3.89 mm., width 3.50 mm. Form round, convex, widest at middle of elytra. Color yellow; base of head narrowly black; pronotum black with broad lateral border yellow; mesosternum, metasternum, epipleuron, and abdominal sterna light brown; elytron dark brown with narrow lateral border slightly paler. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by three to six times their diameter. Pubescence grayish white. Tarsal claw of *haliki* type, basal angulation lacking. Postcoxal line distinct, incomplete, rounded, extending nearly to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum broadly convex, entire. Genitalia simple, basal lobe subequal in length to paramere, upper margin straight, lower margin angled slightly upward before apex, paramere feebly widened apically (figs. 996, 997); sipho long, slender, thickened, and slightly bent downward at apex, orifice dorsal, subterminal (fig. 998).

Female.—Not known.

Holotype.—Male. COLOMBIA: *Magdalena:* Rio Frio, Darlington (MCZ).

Discussion.—The male genitalia are simple and of the general type found in *rufoventris* and *haliki*.

Lorma sicardi, new species

(Figs. 999–1001; map 45)

Male.—Length 4.11 mm., width 3.71 mm. Form round, convex, widest at middle of elytra. Color pale reddish brown; posterior one-third of head, broad median area of pronotum, and entire elytron black; epipleuron piceous. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to five times their diameter. Pubescence grayish white. Tarsal claw with barely perceptible basal angulation. Postcoxal line incomplete, distinct, slightly angulate, not reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly emarginate; sixth tergum broadly convex, entire. Genitalia simple; basal lobe longer than paramere, slightly constricted in basal one-fourth, apex feebly curved upward to point, group of setae on upper margin medially; paramere narrowed at apex (figs. 999, 1000); sipho slender, continually curved from basal one-fifth to apex, apex slightly curved upward to point, orifice dorsal, subterminal (fig. 1001).

Female.—Not known.

Holotype.—Male. BOLIVIA: *Cochabamba:* Chaco (PM).

Discussion.—The male genitalia of *sicardi* are simple as is typical of members of this genus, and not strikingly different from those of *haliki*. *L. sicardi* is the only species of *Lorma* as yet known from Bolivia. The holotype was found in the Sicard collection (Paris museum) as part of the unidentified material.

Lorma sopita, new species

(Figs. 1002–1004, 1869–1872; map 44)

Male.—Length 4.10 mm., width 3.76 mm. Form round, convex, widest at middle of elytra. Color yellow; median one-third of pronotum black; metasternum and median area of abdominal sterna reddish brown; elytron black with narrow lateral border dark brown, scutellum reddish brown. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by three to six times their diameter. Pubescence grayish white. Tarsal claw of *haliki* type. Postcoxal line weakly angulate, nearly reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum entire, convex. Genitalia with basal lobe slightly shorter than paramere, upper margin sinuate, upper surface with sharp, median carina, lower margin straight nearly to apex, apex bluntly pointed; paramere widened apically (figs. 1002, 1003); sipho long, slender, apex blunt, slightly angled downward, orifice dorsal, subterminal (fig. 1004).

Female.—Similar to male except hind margin of sixth sternum feebly emarginate (fig. 1869); sixth tergum broadly convex, entire (fig. 1870). Genitalia with 10th tergum transverse, nearly truncate (fig. 1871); genital plate oval with all angles rounded, inner margin emarginate medially, strongly sclerotized area extending inward from emargination (fig. 1872).

Variation.—Length 4.10–4.50 mm., width 3.76–4 mm. Some specimens have been examined that have elytron red with black area reduced to broad, complete lateral border and narrow sutural border ending just posterior to middle of elytron.

Holotype.—Male. PANAMA: *Canal Zone:* Barro Colorado, May 1929, Darlington (MCZ).

Allotype.—Female. PANAMA: *Canal Zone:* Barro Colorado Is., 10–17.V.64, W. D. and S. S. Duckworth (USNM).

Paratypes.—Total seven. Same data as allotype. (USNM).

Discussion.—Both the male and female genitalia of *sopita* are quite distinctive and will separate *sopita* from any presently known species of *Lorma*.

Lorma paprzyckii, new species

(Figs. 1005–1007, 1873–1876; map 45)

Male.—Length 3.81 mm., width 3.46 mm. Form round, convex, widest at middle of elytra. Color yellow; median one-third of pronotum, mesosternum, metasternum, and median area of first three abdominal sterna reddish brown; elytron light reddish brown with broad, yellow lateral margin, dark-brown vitta inside yellow margin, and small circular area on disk obscurely dark reddish brown. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by two to four times their diameter. Pubescence dense, grayish white. Tarsal claw barely perceptibly angulate at base. Postcoxal line incomplete, feebly angulate, distinct, nearly touching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate medially; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe slightly longer than paramere, curved downward and then upward, in ventral view narrowed before apex, apex pointed; paramere strongly widened apically (figs. 1005, 1006); sipho extremely slender, narrowed from middle to apex (fig. 1007).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex; sixth sternum feebly emarginate with longitudinal suture (fig. 1873); sixth tergum convex, entire (fig. 1874). Genitalia with 10th tergum rectangular, nearly truncate (fig. 1875); genital plate with inner margin notched near base,

all angles rounded, stylus visible (fig. 1876).

Variation.—Length 3.81–4.65 mm., width 3.46–4.05 mm.

Holotype.—Male. PERU: *Junin:* Satipo, VII–1944, Paprzycki (USNM 71687).

Allotype.—Female. Same data as holotype. (USNM).

Paratype.—Total one. Same data as holotype. (USNM).

Discussion.—In addition to the male and female genitalia, the emarginate fifth sternum of the male and the color pattern will help to distinguish this species.

Lorma batesi (Crotch), new combination

(Figs. 369–370, 1008–1010, 1877–1879; map 45)

Epilachna batesi Crotch, 1874, p. 68.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Epilachna batesi ab. *rufovittata* Crotch, 1874, p. 68.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Male.—Length 6.60 mm., width 6.47 mm. Form round, convex, widest at middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color reddish yellow; pronotum with broad median area red; abdomen dark brown; elytron dark brown with reddish tint, lateral margin with broad, reddish yellow border (fig. 369). Punctation on elytron dual, small punctures fine, separated by two to three times their diameter, large punctures separated by less than to four times their diameter. Surface of elytron strongly shining, faintly reticulate. Pubescence grayish white, long, erect on elytron. Tarsal claw with very feeble basal angulation. Postcoxal line distinct, incomplete, nearly reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum convex, entire. Genitalia with basal lobe shorter than paramere, upper margin sinuate, lower margin curved upward before apex to bluntly pointed apex; paramere angled upward, widened at apex, lower surface of paramere at apex and sipho bearing tiny, scattered tubercles (figs. 1008, 1009); sipho slender, gradually curved upward in apical one-third, orifice dorsal, subterminal (fig. 1010).

Female.—Similar to male except abdomen with hind margin of sixth sternum emarginate (fig. 1877); sixth tergum broadly, feebly emarginate medially (fig. 1878). Genitalia with 10th tergum entire, broadly convex; genital plate with posterolateral angle produced, stylus not visible (fig. 1879).

Variation.—Length 6.58–7.74 mm., width 6.39–6.89 mm. Female in type series has discal area of elytron red, joining lateral red border near apex of elytron (fig. 370).

Type Locality.—Brazil: Ega.

Type Depository.—UCCC (lectotype here designated).

Discussion.—This species does not fit well into any of the genera defined here and is tentatively placed in *Lorma* to which it seems to be most closely allied. The large size and postcoxal line are not of the *Lorma* type. The appearance is that of a member of the genus *Dira,* but the male genitalia are entirely different from those of the *Dira* species. The size and dorsal color pattern make *batesi* easily recognizable, resembling *D. richteri* most closely in these respects. The female type in the Crotch collection is lacking an abdomen and bears the following labels: "Ega"; "TYPE" (blue paper). The other three specimens in the type series are also from Brazil, labeled "Ega" and "Para."

Specimens Examined.—Total four. BRAZIL: The type series. Amazonas. (PM) (UCCC).

Genus MALATA, new genus

Length 3.50–5 mm. Labium with palpus inserted apically, segments slender, much longer than wide. Epipleuron descending externally, depressions for apices of middle and hind femora distinct. Tarsal claw with basal projection nearly obsolete, inner claw broad, curved inward, usually touching inner tooth on opposite claw (fig. 86). First abdominal sternum with postcoxal line incomplete, evenly rounded, not reaching hind margin of sternum (fig. 103). Male genitalia with basal lobe bent downward at apex or often with dorsal tooth before apex

and apex slightly curved upward (figs. 1012, 1015). Female genital plate where known with visible stylus (fig. 1883).

Type-species: *Epilachna* (*Dira*) *mitis* Mulsant, generic name created arbitrarily, gender is feminine.

The tarsal claw is quite distinctive in this genus. All species thus far known with this type of claw are from Mexico or Central America. Two previously described and four new species are included here in *Malata*, totaling six species.

Key to Species of *Malata*

1. Elytron light brown or yellow with brown to black markings 2
   Elytron entirely piceous or black, usually with narrow, yellow lateral border 4
2. Abdomen with median area of at least first sternum black or piceous 3
   Abdomen entirely yellow or reddish yellow ..... *diekei*, n. sp. (p. 216)
3. Abdomen with median area of first sternum black; length about 3.61 mm ..... *pseudomitis*, n. sp. (p. 216)
   Abdomen with median area of at least first two sterna black; length 4.40 mm. or more ..... *mitis* (Mulsant), n. comb. (p. 214)
4. Epipleuron yellow; mesosternum, metasternum, and median area of first four abdominal sterna black; Costa Rica ..... *burgdorfi*, n. sp. (p. 215)
   Epipleuron piceous; ventral surface not as stated above 5
5. Length about 4.41 mm.; punctures on abdominal sterna coarse, rarely separated by more than diameter of puncture, abdomen entirely yellow; Guatemala ..... *apatela*, n. sp. (p. 215)
   Length about 3.85 mm.; punctures on abdominal sterna fine, separated by two to four times diameter of puncture, abdomen reddish brown with intercoxal protuberance dark brown; Mexico ..... *delphinae* (Gorham), n. comb. (p. 215)

Descriptions of *Malata* Species

Malata mitis (Mulsant), new combination

(Figs. 371, 1011–1013, 1880–1883; map 46)

Epilachna (*Dira*) *mitis* Mulsant, 1850, pp. 853–854.—Crotch, 1874, p. 66.

Epilachna mitis: Gorham, 1898, p. 245.—Korschefsky, 1931, p. 64.—Blackwelder, 1945, p. 442.

Male.—Length 4.48 mm., width 4.03 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; irregular, narrow median area of pronotum, metasternum, and median area of first four abdominal sterna black; elytron with broad lateral border yellow, broad black border inside yellow border, basal and sutural margins bordered with black, sutural border slightly widened on disk (fig. 371). Punctation on elytron dual, small punctures separated by their diameter, large punctures separated by two to four times their diameter. Pubescence grayish white. Tarsal claw barely perceptibly angulate at base. Postcoxal line incomplete, distinct, rounded, extending four-fifths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum notched; sixth tergum broadly convex, entire. Genitalia with basal lobe curved downward then upward apically, in ventral view widened before apex, apex bluntly pointed; paramere wider than basal lobe, not wider apically (figs. 1011, 1012); sipho long, apex bent slightly upward, orifice dorsal, subterminal (fig. 1013).

Female.—Similar to male except hind margin of sixth sternum feebly emarginate (fig. 1880); sixth tergum convex, entire (fig. 1881). Genitalia with 10th tergum feebly convex, nearly truncate (fig. 1882); genital plate transversely rectangular, stylus present (fig. 1883).

Variation.—Length 4.48–4.75 mm., width 4.03–4.26 mm. Median black area of pronotum may be complete or broken medially. Widening of sutural black border is more evident on some specimens than on others.

Type Locality.—Mexico (Chevrolat).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The first specimen under the name *mitis* in the Crotch collection, a female bearing the following labels, is here designated lectotype: "TYPE, mitis, Mexico." Five specimens are under the name. In spite of the fact

that the type is from Mexico, most of the other specimens seen were from Costa Rica and Guatemala. The dorsal color pattern is much like that of *diekei*, but *mitis* is larger and the male genitalia of the two species are completely different.

Specimens Examined.—Total 33. COSTA RICA: Costa Rica, Biolley. *Cartago:* Turrialba, Schild and Burgdorf; Turrialba, Heyne, Korschefsky collection. *San Jose:* San Jose, M. Valerio; San Jose, 1000–2000 m., F. Nevermann. EL SALVADOR: *San Vicente:* S. Vicente, IX–27–196 ., N. Virkki. GUATEMALA: *Baja Verapaz:* San Jeronimo, Champion; San Jeronimo, 3000 ft., VII–26–47, C. and P. Vaurie. MEXICO: *Oaxaca:* Oaxaca, Hoege. *Vera Cruz:* Lake Catemaco, V–1–2, 1969, Bright and Campbell; Tuxpan, Salle. (CAS) (CM) (CNC) (UCCC) (USNM).

Malata burgdorfi, new species

(Figs. 1014–1016; map 46)

Male.—Length 4.69 mm., width 4 mm. Form round, convex, widest at middle of elytra. Color yellowish brown; median one-third of pronotum, intercoxal process of prosternum, mesosternum, metasternum, and median area of abdominal sterna 1–4 black; elytron black with lateral margin reddish brown. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to five times their diameter. Surface of elytron strongly reticulate. Pubescence dense, grayish white. Tarsal claw barely perceptibly angulate basally. Postcoxal line incomplete, distinct, rounded, extending four-fifths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum strongly convex, entire; sixth sternum feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe curved downward nearly to apex, apex slightly curved upward, small, blunt, median tooth on upper surface before apex, in ventral view apex bluntly pointed; paramere curved downward, slightly widened apically (figs. 1014, 1015); sipho slender, strongly curved, apex slightly curved upward, sharp, orifice dorsal, subterminal (fig. 1016).

Female.—Not known.

Holotype.—Male. COSTA RICA: *San Jose:* Piedr. Negras, Coll. Schild and Burgdorf (USNM 71688).

Malata apatela, new species

(Figs. 1017–1018; map 46)

Male.—Length 4.41 mm., width 4.05 mm. Form round, convex, widest at middle of elytra. Color yellow; median one-half of pronotum, epipleuron, and median area of metasternum black; elytron black with narrow lateral margin reddish brown. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by two to four times their diameter. Surface of elytron strongly reticulate. Pubescence dense, grayish white. Tarsal claw barely perceptibly angulate basally. Postcoxal line incomplete, distinct, rounded, nearly touching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum notched medially; sixth tergum truncate medially. Genitalia with basal lobe curved downward nearly to apex, apex bent upward, strong median tooth on upper surface before apex, in ventral view apex rounded; paramere wider than basal lobe; trabes spatulate in ventral view (figs. 1017, 1018); sipho not known.

Female.—Not known.

Holotype.—Male. GUATEMALA: *Izaba:* Livingston, 7–5, Barber and Schwarz coll. (USNM 71689).

Discussion.—This species is close to *burgdorfi;* both species have the same general type of male genitalia. In addition to the differences in genitalia, *apatela* has the pale lateral margin of the elytron about one-half as wide as in *burgdorfi.*

Malata delphinae (Gorham), new combination

(Figs. 1019–1021; map 46)

Ladoria delphinae Gorham, 1895, p. 213.—Korschefsky, 1931, p. 231.—Blackwelder, 1945, p. 451.

Male.—Length 3.85 mm., width 3.58 mm. Form round, convex, widest at middle of elytra. Color reddish brown; median one-third of pronotum, mesosternum, metasternum, and intercoxal protuberance black; elytron bluish black with narrow lateral margin reddish

brown. Punctation on elytron dual, small punctures separated by their diameter, large punctures separated by two to six times their diameter. Surface of elytron finely reticulate. Pubescence grayish white. Tarsal claw barely perceptibly angulate at base. Postcoxal line incomplete, distinct, angulate, nearly touching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum weakly notched; sixth tergum broadly convex, entire. Genitalia with basal lobe slender, upper margin straight nearly to apex, lower margin narrowed before apex, apical one-fifth bent downward; paramere wider than basal lobe (figs. 1019, 1020); sipho slender, apex slightly curved upward, pointed, orifice dorsal, subterminal (fig. 1021).

Female.—Not known.

Type Locality.—Mexico; Oaxaca.

Type Depository.—BMNH (lectotype here designated).

Discussion.—A male syntype of *delphinae* bearing the following labels is here designated as lectotype: "Syntype"; "Oaxaca, Mexico, Hoege"; "B.C.A., Col., VII, L. delphinae Gorh." The dorsal color pattern is like that of *apatela* and *burgdorfi*, and *delphinae* and *apatela* are apparently not separable with certainty on external characters. The male genitalia of *delphinae* are of the *mitis* type, quite different from those of *apatela*.

Specimens Examined.—Total two. MEXICO: Oaxaca, lectotype. *Tamaulipas:* Tampico, 14–12, E. A. Schwarz.

Malata diekei, new species

(Figs. 1022–1024; map 46)

Male.—Length 4 mm., width 3.48 mm. Form round, convex, widest at middle of elytra. Color reddish yellow; metasternum slightly darker reddish yellow; elytron with broad lateral border yellow, piceous border inside yellow border, sutural margin narrowly bordered with piceous, slightly wider on disk. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw barely perceptibly angulate at base. Postcoxal line incomplete, distinct, rounded, extending four-fifths distance to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum notched; sixth tergum broadly convex, entire. Genitalia with upper margin of basal lobe straight nearly to apex, lower margin narrowed nearly to apex, apical one-fifth bent downward, in ventral view narrowed from base to blunt apex; paramere curved downward, widened anterior to middle (figs. 1022, 1023); sipho strongly curved, apex sharp, slightly curved upward (fig. 1024).

Female.—Not known.

Variation.—Length 3.81–4.43 mm., width 3.72–3.81 mm. Postcoxal line is feebly angulate in some specimens and discal area of pronotum is often darker reddish yellow than lateral margin.

Holotype.—Male. MEXICO: *Tamaulipas:* Tampico, 14–12, E. A. Schwarz collector (USNM 71690).

Paratypes.—Total eight. MEXICO. "Mex." *Tamaulipas:* Tampico, 7–12, 16–13, 15–12, E. A. Schwarz collector. (MCZ) (USNM).

Discussion.—The color pattern is much like that of *mitis*, but *diekei* has no black on the pronotum or abdomen. The genitalia are similar to those of *apatela*.

Malata pseudomitis, new species

(Figs. 1025–1027; map 46)

Male.—Length 3.61 mm., width 3.36 mm. Form round, convex, widest at middle of elytra. Color yellow; mesosternum, metasternum, and median area of first abdominal sternum black; pronotum with median one-third black; elytron with lateral margin broadly yellow, piceous, curved vitta extending from base inside callus nearly to apex, disk brownish yellow, suture narrowly bordered with piceous, sutural border widest medially. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw lacking basal angulation. Postcoxal line incomplete, rounded, not reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth ster-

num triangularly projecting; sixth sternum emarginate; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, sinuate near apex, pointed, in ventral view basal lobe tapered from base to blunt apex; paramere wide; trabes short, wide (figs. 1025, 1026); sipho short, stout, orifice dorsal, subterminal (fig. 1027).

Female.—Not known.

Holotype.—Male. GUATEMALA: *Alta Verapaz:* Chiacaman, Champion, Nunenmacher collection (CAS).

Discussion.—*D. pseudomitis* has the same type of color pattern as *mitis* and *diekei*, but the combination of small size and black area on the pronotum should separate *pseudomitis*. The male genitalia of each of the three species are highly distinctive.

Genus MADA Mulsant, new status

Epilachna (Mada) Mulsant, 1850, p. 858.—Crotch, 1874, p. 66. Type-species: *Epilachna (Mada) fraterna* Mulsant, by subsequent designation of Korschefsky, 1931.

Mada:Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.

Ladoria Mulsant, 1850, p. 928.—Crotch, 1874, p. 280.—Chapuis, 1876, p. 221.—Gorham, 1895, p. 213.—Korschefsky, 1931, p. 231.—Blackwelder, 1945, p. 442. Type-species: *Ladoria desarmata* Mulsant, by subsequent designation of Korschefsky, 1931. NEW SYNONYMY.

Length 3.25–5.75 mm. Labrum usually long, narrow; labium with palpus inserted apically, segments slender, much longer than wide (fig. 58). Epipleuron descending externally, usually strongly so, depression for apices of middle and hind femora distinct (except in *lineatopunctata*). Tarsal claw with strong basal angulation, usually appearing trifid (fig. 85). First abdominal sternum with postcoxal line incomplete, usually angulate and reaching hind margin of sternum (except *amydra, concentrica, lineatopunctata,* and *polluta*).

This genus is not nearly so homogeneous as the other genera of the Madaini, and probably *Mada* will be broken down into several genera when more information and specimens become available. Based primarily on male genitalia, members of the genus may be grouped as follows: Species with male genitalia simple, basal lobe essentially straight, unmodified, as in *amydra* and *amazona;* species with basal lobe curved upward at apex, a dorsal emargination before apex, sipho long, as in *contempta* and *zonula;* species with basal lobe spatulate in ventral view, paramere strongly widened at apex, curved downward, apex of sipho in dorsal view trifid, as in *adusta;* species with male genitalia resembling those of the *contempta* group but with lateral margin of elytron nearly straight medially and the postcoxal line rounded, as in *polluta* (fig. 104); species with form elongate, narrowed apically, dorsal color pattern vittate, no apparent depressions on epipleuron, as in *lineatopunctata;* species with tarsal claw less strongly angulate than other members of the genus, as in *rabauti;* species with basal lobe of male genitalia with lower one-fourth or one-half abruptly narrowed before apex, upper part slender, curved upward, as in *dissita* and *elegans;* species with the basal lobe divided, lower part large, robust, forming a tube for the sipho, upper part small, slender, as in *circumducta* and *pseudodamata;* and species with genitalia of the type found in the genus *Azya*, basal lobe very short, paramere strongly widened, as in *azyoides*.

The genus *Ladoria* has been placed near *Azya* and *Exoplectra* in previous classifications, but examination of the type species in the Crotch collection has shown it to belong to the Epilachninae and to be synonymous with *Mada*. The types of *Ladoria rudepunctata* Crotch and *Ladoria discomaculata* Crotch in the Crotch collection have been examined and both species belong to other genera. *L. rudepunctata* is a synonym of *Zenoria revestita* Mulsant (Gordon, *1971*) and *L. discomaculata* is here transferred to the genus *Chnoodes*. Thirteen previously described and 18 new species are included here in *Mada*, totaling 31 species.

Key to Species of *Mada*

1. Species with elytron dark brown to reddish or yellowish brown, no dark markings of any kind present, sometimes with lateral border paler than rest of elytron 2
   Species not agreeing with above statements 12
2. Species with lateral border of elytron distinctly paler than rest of elytron 3
   Species with elytron unicolorous 8
3. Species known only from Panama 4
   Species known only from South America 5
4. Postcoxal line rounded; length about 4.08 mm ..... *amydra*, n. sp. (p. 221)
   Postcoxal line angulate; length about 3.61 mm ..... *flavomarginata*, n. sp. (p. 226)
5. Species known only from French Guiana ..... *apada*, n. sp. (p. 225)
   Species not known from French Guiana 6
6. Median area of pronotum darker in color than elytron; mesosternum and metasternum brownish piceous ..... *deyrollei*, n. sp. (p. 222)
   Median area of pronotum no darker in color than elytron; mesosternum and metasternum yellowish brown 7
7. Postcoxal line abruptly, sharply angulate ..... *amazona* (Weise), n. comb. (p. 223)
   Postcoxal line feebly angulate ..... *synemia*, n. sp. (p. 223)
8. Species known only from Panama ..... *amydra*, n. sp. (p. 221)
   Species known only from South America 9
9. Species known only from French Guiana 10
   Species known only from Brazil (Santarem) ..... *santaremae*, n. sp. (p. 224)
10. Postcoxal line rounded, not reaching hind margin of first abdominal sternum *pseudofraterna*, n. sp. (p. 220)
    Postcoxal line angulate, extending to hind margin of first abdominal sternum 11
11. Discal area of elytron lacking coarse punctures; male genitalia with sipho slender, simple (fig. 1039); basal lobe abruptly narrowed medially on ventral margin (fig. 1038) *cayennensis*, n. sp. (p. 221)
    Discal area of elytron with coarse punctures; male genitalia with sipho long, slender, curved (fig. 1030), basal lobe with apex trilobed and densely setigerous in ventral view (fig. 1028) ..... *fraterna* (Mulsant), n. comb. (p. 219)
12. Elytron entirely black or bluish black (sometimes piceous), usually with narrow, pale lateral border 13
    Species not agreeing with above statements 20
13. Elytron entirely black or piceous, lateral border not paler 14
    Elytron with lateral border paler than rest of elytron 16
14. Species known only from South America ..... *adusta*, n. sp. (p. 230)
    Species known only from Central America or Mexico 15
15. Length more than 4.25 mm.; Mexico ..... *polluta* (Mulsant), n. comb. (p. 230)
    Length less than 3.50 mm.; Panama ..... *azyoides*, n. sp. (p. 235)
16. Postcoxal line with outer part less than one-half width of first abdominal sternum ..... *desarmata* (Mulsant), n. comb. (p. 222)
    Postcoxal line with outer part more than one-half width of first abdominal sternum 17
17. Species known only from Bolivia; length about 3.34 mm ..... *dissita*, n. sp. (p. 232)
    Species not known from Bolivia; length 3.65 mm. or more 18
18. Lateral border of elytron pale yellow, wide, reaching lower margin of callus ..... *rabauti*, n. sp. (p. 232)
    Lateral border of elytron reddish yellow to piceous, narrow, not approaching callus 19
19. Male genitalia with apex of basal lobe abruptly bent upward (fig. 1053), sipho with small spinules before apex (fig. 1054) ..... *spinula*, n. sp. (p. 224)
    Male genitalia not agreeing with above statements 20
20. Elytron with four or five rings of contrasting color 21
    Elytron with one to three rings of color or color pattern of entirely different type 22
21. Elytron with five rings of color (fig. 374) ..... *gounellei*, n. sp. (p. 225)
    Elytron with four rings of color (fig. 372) ..... *concentrica* (Weise), n. comb. (p. 221)
22. Elytron reddish brown to yellow, completely bordered with black as in figure 373 23
    Elytron not as stated above 26
23. Legs bicolored; Mexico ..... *amplexata* (Mulsant), n. comb. (p. 231)
    Legs unicolorous; South America 24
24. Postcoxal line rounded, not reaching hind margin of first abdominal sternum ..... *synemia*, n. sp. (p. 223)
    Postcoxal line abruptly angulate, extending to hind margin of first abdominal sternum 25
25. Epipleuron entirely black or piceous; length less than 4.70 mm ..... *amazona* (Weise), n. comb. (p. 223)
    Epipleuron black except inner one-half of apical one-third; length 4.70 mm. or more ..... *insolitaphallus*, n. sp. (p. 234)

26. Elytron red or brownish red with black border extending from suture to apex on basal and lateral margins 27
Elytron not as stated above 28
27. Ventral surface except epipleuron brownish yellow ..... *nexophallus*, n. sp. (p. 234)
Ventral surface except abdomen entirely black ..... *pseudodamata*, n. sp. (p. 235)
28. Elytron with disk immaculate, lateral border yellow, black or piceous border present inside yellow border, suture bordered with black or not 29
Elytron not as stated above 33
29. Sutural margin of elytron without black border 30
Sutural margin of elytron with black border 31
30. Black border of elytron extending from apex to callus; pronotum usually with two or three piceous spots ..... *circumflua* (Mulsant), n. comb. (p. 226)
Black border of elytron extending from apex to callus and across basal margin to scutellum; median area of pronotum solidly black or piceous ..... *contempta* (Mulsant), n. comb. (p. 227)
31. Black sutural border of elytron strongly widened medially (fig. 377); pronotum with median black area extending nearly to apex ..... *zonula* (Mulsant), n. comb. (p. 228)
Black sutural border of elytron not widened medially (fig. 382); pronotum with median black area confined to basal one-fourth 32
32. Abdomen yellow with median area of first abdominal sternum black; Peru ..... *elegans*, n. sp. (p. 233)
Abdomen brownish yellow, no black area present; Brazil ..... *circumducta* (Mulsant), n. comb. (p. 233)
33. Elytron with median area yellowish or brownish marked with longitudinal vittae 34
Elytron with median area yellowish or brownish marked with irregular dark spots 36
34. Epipleuron without depressions for apices of middle and hind femora; form elongate; length more than 5 mm.; vittae on elytron black (fig. 381) ..... *lineatopunctata* (Germar), n. comb. (p. 231)
Epipleuron with depressions; form round; length usually less than 5 mm.; vittae on elytron brown or piceous 35
35. Elytron with three vittae, outer vitta extending from callus to apex (fig. 378) ..... *virgata* (Mulsant), n. comb. (p. 228)
Elytron with two vittae, outer vitta never reaching apex, usually extending to middle of elytron (fig. 379) ..... *inepta* (Gorham), n. comb. (p. 229)
36. Elytron with three small, brown spots in irregular row anterior to middle and irregular V-shaped mark on posterior one-half (fig. 380); Mexico ..... *polluta* (Mulsant), n. comb. (p. 230)
Elytron with two dark marks, short outer vitta and elongate spot near center of elytron; Central America ..... *inepta* (Gorham), n. comb. (p. 229)

Descriptions of *Mada* Species

Mada fraterna (Mulsant), new combination

(Figs. 1028–1030, 1884–1887; map 47)

Epilachna (Mada) fraterna Mulsant, 1850, pp. 858–859.—Crotch, 1874, p. 67.
Rodolia carmelitana Mulsant, 1853, p. 130.
Rodolia guinoni Mulsant, 1853, p. 132.
Epilachna (Mada) carmelitana: Crotch, 1874, p. 67.
Epilachna (Mada) guinoni: Crotch, 1874, p. 67.
Mada fraterna: Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.
Mada carmelitana: Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.
Mada guinoni: Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.

Female.—Length 4.40 mm., width 3.95 mm. Form round, convex, widest at middle of elytra. Color pale yellowish brown; pronotum dark reddish brown with anterolateral angle slightly paler. Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw strongly angulate at base, appearing trifid. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of sixth sternum entire (fig. 1884); sixth tergum broadly convex (fig. 1885). Genitalia with 10th tergum strongly convex (fig. 1886); genital plate nearly square, inner margin emarginate, basal margin truncate, posterolateral angle produced, fused to ninth tergum (fig. 1887).

Male.—Similar to female except abdomen with hind margin of fifth sternum truncate medially; sixth sternum feebly convex, entire; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, in lat-

eral view narrowed toward apex, apex turned upward, pointed, in ventral view basal lobe slender medially, apex abruptly widened, trilobed, lateral angle broadly rounded with long setae along outer margin, median projection short, bluntly rounded; paramere strongly widened apically (figs. 1028, 1029); sipho long, slender, apex curved upward, pointed, orifice dorsal, subterminal (fig. 1030).

Variation.—Length 4–4.40 mm., width 3.56–3.95 mm.

Type Locality.—Cayenne (Dejean).

Type Depository.—DLM (lectotype here designated).

Discussion.—The female description here is taken from the first of two specimens labeled *fraterna* in the Dejean collection. This specimen with the following data is here designated lectotype: "Cayenne, Lacordaire." The second specimen in the Dejean collection under the name *fraterna* is a male given the name *E. sororia* by Mulsant (*1850*). This specimen is conspecific with *Dira tomentosa,* which has page priority. The first specimen in the Crotch collection under the name *fraterna* is not *fraterna* but appears to be *pseudofraterna.* The second specimen in the Crotch collection is a badly damaged female and it is uncertain what species it may be. Several species of *Mada* are from French Guiana having the appearance of *fraterna* and they are very difficult to distinguish from each other except by using the genitalia. Crotch (*1874*) placed *Rodolia carmelitana* and *R. guinoni* Mulsant (*1853*) as synonyms of *fraterna.* It now appears that one or both of these species may have been valid, but the types cannot now be located and so they must remain in synonymy. The nearly square genital plate and distinctive male genitalia of *fraterna* are unlike those of any of the species with similar external appearance described here.

Specimens Examined.—Total five. FRENCH GUIANA: *Guyane:* Cayenne; "Cuyane Francaise," Dr. Bongrand, 1913; Fourdonville, Decembre. (DLM) (PM).

Mada pseudofraterna, new species

(Figs. 1031–1033, 1888–1891; map 47)

Male.—Length 3.78 mm., width 3.48 mm. Form round, convex, widest at middle of elytra. Color reddish brown; epipleuron, mouthparts, and broad lateral margin of pronotum yellowish brown. Punctation on elytron dual, small punctures fine, separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, rounded, not quite reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum weakly notched; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, lower margin abruptly angled upward to bluntly rounded apex in apical one-half; paramere feebly widened apically (figs. 1031, 1032); sipho slender, strongly curved, apex slightly thickened, orifice dorsal, subterminal (fig. 1033).

Female.—Similar to male except abdomen with hind margin of fifth sternum strongly convex; sixth sternum weakly notched (fig. 1888); sixth tergum feebly emarginate (fig. 1889). Genitalia with 10th tergum strongly convex (fig. 1890); genital plate slightly elongate, inner margin curved, apical angles rounded, stylus visible (fig. 1891).

Variation.—Length 3.78–4.81 mm., width 3.48–4.45 mm.

Holotype.—Male. FRENCH GUIANA: *Guyane:* Saint-Jean du Maroni, Janvier (PM).

Allotype.—Female. FRENCH GUIANA: *Guyane:* Nouveau Chantier Bas-Maroni, Juillet (PM).

Paratypes.—Total three. FRENCH GUIANA: *Guyane:* Nouveau Chantier Bas Maroni; St. Jean du Maroni; Guyane: St.-Jean du Maroni, collection Le Moult. (PM) (USNM).

Discussion.—This is one of several species resembling *fraterna* in external appearance. *M. pseudofraterna* may be separated from the others externally by the rounded postcoxal lines that do not extend to the hind margin of the first abdominal sternum. The genitalia are closest to those of *M. amydra* from Panama. Associating males with females in this group of species is difficult. Large series of specimens have not been available, and only in the case of

pseudofraterna and *fraterna* has it been possible to definitely associate the two sexes.

Mada amydra, new species

(Figs. 1031–1036; map 47)

Male.—Length 4.08 mm., width 3.47 mm. Form round, convex, widest at middle of elytra. Color yellow; median area of pronotum, mesosternum, metasternum, and legs reddish brown; elytron with broad lateral border yellow, broad piceous border inside yellow border, disk reddish brown. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by two to four times their diameter. Pubescence grayish white. Tarsal claw strongly angulate at base, appearing trifid. Postcoxal line incomplete, distinct, rounded, nearly touching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum feebly emarginate, sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, angled downward, lower margin bent upward to blunt point in apical one-third, small group of setae present dorsolaterally before middle; paramere slightly widened apically (figs. 1034, 1035); sipho slender, strongly curved, apex thickened, bent upward, orifice dorsal, subterminal (fig. 1036).

Female.—Not known.

Variation.—Paratype is not as mature as holotype and is paler.

Holotype.—Male. PANAMA: *Colon:* Porto Bello, 20–2–11, E. A. Schwarz collector (USNM 71691).

Paratype.—Total one. PANAMA: *Canal Zone:* Summit, July–1953, Krauss. (USNM).

Mada cayennensis, new species

(Figs. 1037–1039; map 47)

Male.—Length 4.52 mm., width 4 mm. Form round, convex, widest at middle of elytra. Color reddish brown; epipleuron, mouthparts, and broad anterolateral angle of pronotum yellowish brown. Punctation on elytron not dual except near lateral margin, punctures fine, separated by their diameter or less. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, feebly angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly, broadly emarginate; sixth sternum weakly notched; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, lower margin narrowed medially, apex blunt, group of setae on upper surface medially; paramere widened at apex (figs. 1037, 1038); sipho slender, apex not thickened, orifice dorsal, subterminal (fig. 1039).

Female.—Not known.

Holotype.—Male. "Cayenne" (PM).

Paratypes.—Total six. BRAZIL: *Para:* Benevides, Gounelle. (PM).

Discussion.—The lack of coarse punctures on the elytral disk is unusual in the genus, and if constant, will help to distinguish *cayennensis*. The type was labeled "*Mada fraterna*" by someone and closely resembles that species in external appearance.

Mada concentrica (Weise), new combination

(Figs. 372, 1040–1042, 1892–1895; map 47)

Epilachna concentrica Weise, 1926, p. 8.—Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 3.77 mm., width 3.34 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; pronotum obscurely brown medially, metasternum brown; elytron with four rings of color, outer ring yellow, second ring broad, dark-brown third ring narrow, yellow, fourth ring reddish brown (fig. 372). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, rounded, extending to hind margin of first abdominal sternum, outer end slightly curved forward. Abdomen with hind margin of fifth sternum emarginate medially; sixth sternum feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe slender, shorter than paramere, upper margin narrowed before apex, curved upward, group of setae present dorsolaterally, lower margin straight, gradually curved upward in apical one-fourth to pointed apex; paramere angled

upward, widened at apex (figs. 1040, 1041); sipho with base slender, apex slightly bent upward, orifice dorsal, subterminal (fig. 1042).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex, entire; sixth sternum convex, entire (fig. 1892); sixth tergum broadly convex, entire (fig. 1893). Genitalia with 10th tergum strongly convex (fig. 1894); genital plate ovate, all angles rounded, outer margin angled inward posteriorly, stylus visible (fig. 1895).

Type Locality.—Brazil: Amazon superior.

Type Depository.—NREA.

Discussion.—The four rings of color on the elytra should enable this species to be easily recognized. The unique male type bears the following labels: "concentrica" (handwritten, purple ink); "Amazon superior"; "TYPUS" (red paper); 238, 68 (pink paper); "Riksmuseum, Stockholm" (green paper).

Specimens Examined.—Total two. BRAZIL: The type specimen. *Para:* Itaituba, Korschefsky collection. (NREA) (USNM).

Mada desarmata (Mulsant), new combination

(Figs. 1896–1898)

Ladoria desarmata Mulsant, 1850, p. 928.—Crotch, 1874, p. 280.—Korschefsky, 1931, p. 231.—Blackwelder, 1945, p. 451.

Female.—Length 4.10 mm., width 3.81 mm. Form round, convex, widest at middle of elytra. Color yellowish brown; posterior one-half of head black; pronotum black with anterolateral angle and narrow lateral margin brown; prosternum, mesosternum, metasternum, epipleuron, and median area of abdomen reddish piceous; elytron black with narrow lateral border reddish piceous. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by two to six times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, extending to hind margin of first abdominal sternum, angulate, outer part less than one-half width of sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum narrow, convex, entire (fig. 1896); sixth tergum convex, entire (fig. 1897). Genitalia with 10th tergum narrow, strongly convex, entire; genital plate with all angles rounded, anteromedian angle slightly produced, stylus visible (fig. 1898).

Male.—Not known.

Type Locality.—Brazil.

Type Depository.—UCCC (lectotype here designated).

Discussion.—Nine specimens are listed after the name *desarmata* in the Crotch collection, all of which, except the first specimen, belong to species other than *desarmata*. The first specimen bearing the following labels is here designated as lectotype: "TYPE" (blue label); "TYPE, desarmata Chev." Gorham (*1897*) recorded *desarmata* from Mexico, but the specimens Gorham had were not *desarmata* and it is unlikely that *desarmata* occurs anywhere other than in southern Brazil.

Specimens Examined.—Total one. The lectotype.

Mada deyrollei, new species

(Figs. 1043–1045)

Male.—Length 3.48 mm., width 3.35 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; head with posterior one-half brownish piceous; pronotum brownish piceous with anterolateral angle broadly brownish yellow; prosternum, mesosternum, metasternum, epipleuron, and median area of first abdominal sternum brownish piceous; elytron brownish piceous with faint bluish tinge, lateral margin obscurely paler. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, extending to hind margin of first abdominal sternum, angulate, outer part one-half width of sternum. Abdomen with hind margin of fifth sternum convex, entire; sixth sternum emarginate medially; sixth tergum broadly convex, entire. Genitalia with phallobase short; basal lobe shorter than paramere, nearly straight, pointed, in ventral view slightly widened toward apex, apex pointed; paramere nearly straight (figs. 1043, 1044); sipho slender, apex slightly thickened, orifice dorsal, subterminal (fig. 1045).

Female.—Not known.

Holotype.—Brazil?, Deyr. (UCCC).

Discussion.—The holotype bears no locality label, but Crotch (*1874*) listed the specimens from Deyrolle as being from Brazil. This is the second specimen under the name *desarmata* in the Crotch collection.

Mada synemia, new species

(Figs. 373, 1046–1048, 1899–1902; map 47)

Female.—Length 5.83 mm., width 5.05 mm. Form round, convex, widest at middle of elytra. Color black; anterolateral angle of pronotum narrowly yellow; epipleuron and legs piceous; elytron orange, completely bordered with black, lateral border completely covering callus (fig. 373). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, rounded, not extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum convex; sixth sternum convex, entire (fig. 1899); sixth tergum broadly convex (fig. 1900). Genitalia with hind margin of 10th tergum nearly truncate (fig. 1901); genital plate short, posterolateral angle produced, stylus visible (fig. 1902).

Male.—Similar to female except abdomen with hind margin of fifth sternum entire, feebly convex; sixth sternum notched medially; sixth tergum broadly, feebly emarginate. Genitalia with basal lobe slightly shorter than paramere, lower margin curved upward apically to bluntly pointed apex, group of setae present on upper surface medially; paramere angled upward, widened apically (figs. 1046, 1047); sipho with apex bent upward, rounded, orifice dorsal, subterminal (fig. 1048).

Variation.—Length 3.99–5.83 mm., width 3.60–5.05 mm. Elytral color pattern varies from typical described here to specimens that are entirely reddish brown.

Holotype.—Female. ECUADOR: *Santiago Zamora:* Mera, Staudinger and Bang-Haas edit, Korschefsky collection (USNM 71692).

Allotype.—Male. ECUADOR: *Santiago Zamora:* Mera (PM).

Paratypes.—Total seven. ECUADOR: "Ecuador," E. DeVille. *Santiago Zamora:* Macas; Mera, same data as allotype; same data as holotype. (MNHUB) (PM) (USNM).

Discussion.—This species is variable in color pattern, but the typical form bears a strong resemblance to *insolitaphallus*. The rounded postcoxal line is somewhat like that found in species of *Dira*.

Mada amazona (Weise), new combination

(Figs. 1049–1051, 1903–1906; map 48)

Epilachna amazona Weise, 1926, p. 7.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Solanophila sanguinea Brethes, 1925, p. 6. NEW SYNONYMY.

Epilachna sanguinea: Korschefsky, 1931, p. 66.—Blackwelder, 1945, p. 442.

Male.—Length 3.69 mm., width 3.50 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; pronotum black with anterolateral angle and lateral margin yellow; mesosternum and metasternum brown; epipleuron piceous except depressions for legs yellow; elytron bluish black with lateral margin obscurely piceous. Punctation on elytron not dual, punctures fine, separated by one to three times their diameter. Pubescence grayish white. Tarsal claw strongly angulate at base. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex; sixth sternum emarginate; sixth tergum convex, entire. Genitalia with basal lobe shorter than paramere, simple, lower margin curved upward near apex, apex bluntly pointed, row of setae present dorsolaterally and group of setae present ventrolaterally before apex; paramere feebly widened at apex (figs. 1049, 1050); sipho slender, apex bluntly rounded, orifice dorsal, subterminal (fig. 1051).

Female.—Similar to male except pronotum with anterolateral angle narrowly yellow, epipleuron entirely piceous. Abdomen with hind margin of fifth sternum convex; sixth sternum convex, entire (fig. 1903); sixth tergum broadly convex, entire (fig. 1904). Genitalia with 10th tergum strongly convex (fig. 1905); genital plate with posterior lateral angle produced, stylus visible (fig. 1906).

Variation.—Length 3.65–4.61 mm., width 3.10–4.08 mm. Specimen from Peru has elytron yellowish brown completely bordered with black and pronotum yellow with narrow median area black. Another specimen from Peru is yellow with elytron yellowish red and lateral margin slightly paler, pronotum yellowish red except yellow anterolateral angle.

Type Locality.—Brazil: Amazonas, Itaituba.

Type Depository.—NREA (lectotype here designated).

Discussion.—The specimens discussed under Variation here are placed here as this species because the male genitalia are apparently identical to those of the lectotype. The male genitalia with the ventrolateral tuft of setae are quite distinctive. The male specimen in the type series bearing the following labels is here designated lectotype: "Itaituba"; "amazona Ws"; "TYPUS" (red paper); "221,70" (pink paper); "Riksmuseum, Stockholm" (green paper). The unique male type of *sanguinea* in the BMNH has been examined and bears the following labels: "TYPE" (red and white disk); "Type"; "Amazons. 70–8"; "Solanophila sanguinea Brethes." *M. sanguinea* has male genitalia identical to those of *amazona* and is here considered to be synonymous with *amazona.*

Specimens Examined.—Total 16. BRAZIL: *Mato Grosso:* Chapada. *Para:* Santarem; Santarem, July 1919, S. M. Klages; Taperina; Itaituba; "Amazons." PERU: *Amazonas:* Rio Santiago, F 6140, XII–15–28. *Junin:* Satipo, XI–1941, Paprzycki. (AMNH) (BMNH) (CM) (NREA) (USNM).

Mada spinula, new species

(Figs. 1052–1054; map 48)

Male.—Length 3.33 mm., width 3 mm. Description as for *deyrollei* with differences as described here. Head entirely brownish yellow; pronotum black with anterior margin piceous, lateral margin broadly brownish yellow; elytron bluish black with narrow reddish-piceous lateral margin. Genitalia with basal lobe shorter than paramere, angled downward in basal one-half, angled slightly upward in apical one-half, apex pointed, abruptly bent upward, in ventral view feebly widened from base to apical one-fourth, narrowed to apex; paramere curved downward, feebly widened at apex (figs. 1052, 1053); sipho short, stout, band of short spines on lateral and ventral margins before apex, in dorsal view apex hastate, orifice dorsal, subterminal (fig. 1054).

Female.—Not known.

Holotype.—COLOMBIA: *Cundinamarca:* Bogota (UCCC).

Discussion.—The sipho with sharp spines is unlike any as yet described in the subfamily. The basal lobe of the male genitalia is also characteristic for this species. The holotype of *spinula* is the fourth specimen under the name *desarmata* in the Crotch collection.

Mada santaremae, new species

(Figs. 1055–1057; map 48)

Male.—Length 3.78 mm., width 3.39 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; median area of pronotum, mesosternum, and metasternum reddish brown; elytron entirely pale red. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum emarginate medially; sixth sternum weakly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, broad, apex curved upward to sharp point, in ventral view anterolateral angle bluntly rounded; paramere widened before apex (figs. 1055, 1056); sipho strongly curved near base, bent downward before apex, thickened and angled upward again immediately before apex, row of short, blunt setae present on each side of ventral margin in anterior one-fifth, orifice lateral, subterminal (fig. 1057).

Female.—Not known.

Holotype.—Male. BRAZIL: *Para.* Santarem (CM).

Paratypes.—Total four. BRAZIL: "Bresil." Amazon, Para, Amazonas, Staudinger. (PM) (USNM).

Discussion.—The male genitalia of *santare-*

mae are highly distinctive. The overall shape of the sipho is much like the sipho of *circumflua*, but the presence of short stout setae on the sipho has been observed only on the sipho of *spinula*.

Mada apada, new species

(Figs. 1058–1060, 1907–1910; map 48)

Male.—Length 4 mm., width 3.61 mm. Form round, convex, widest at middle of elytra. Color light reddish brown, median area of pronotum, mesosternum, metasternum, and median area of first abdominal sternum dark reddish brown. Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, sharply angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex; sixth sternum feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe subequal in length to paramere, wide, lower margin curved upward strongly before apex, upper margin strongly descending anterior to middle, apical one-sixth strongly curved upward to pointed apex, group of setae present on upper surface medially; paramere slender, widened apically (figs. 1058, 1059); sipho short, robust, strongly curved anterior to base, dorsal surface with two large teeth at apical one-fourth, margin of teeth serrate, group of small, sharp teeth on each side before apex, apex curved upward, bluntly pointed, narrow transverse area below dorsal teeth lightly sclerotized, orifice dorsal, posterior to dorsal teeth (fig. 1060).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly projecting medially; sixth sternum convex, entire (fig. 1907); sixth tergum weakly, broadly emarginate (fig. 1908). Genitalia with 10th tergum convex, nearly truncate medially (fig. 1909); genital plate elongate, anterolateral angle produced, anterior margin emarginate, stylus visible, extremely large, extending beyond anterolateral angle (fig. 1910).

Holotype.—Male. FRENCH GUIANA: *Guyane:* Nouveau Chantier Bas-Maroni, Juin (PM).

Other Specimens.—Total two. FRENCH GUIANA: *Guyane:* Le Hattes, Aout; St. Jean du Maroni. (PM).

Discussion.—The highly modified sipho of the male is unlike anything as yet described in *Mada* although generally similar to that of *circumflua*. The female described here may not be the same species as the male, but probably it is, as the elytral punctation, size, and color are the same in both sexes. It would seem reasonable to suppose that when the male has such a unique sipho, the female might also have a highly distinctive genital plate.

Mada gounellei, new species

(Figs. 374, 1061–1063, 1911–1914; map 48)

Male.—Length 3.72 mm., width 3.33 mm. Form round, convex, widest at middle of elytra. Color yellow; pronotum with median area piceous; elytron with five rings of color, lateral ring wide, yellow, second ring wide, piceous, extending from base across callus nearly to suture at apex, third ring reddish yellow, extending from base to suture, fourth ring on disk, not touching suture at either end, fifth ring an elongate, reddish-yellow area parallel to suture on disk (fig. 374). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum emarginate; sixth tergum convex, entire. Genitalia with basal lobe longer than paramere, gradually narrowed and feebly curved upward to pointed apex, group of setae on upper margin medially; paramere widened apically (figs. 1061, 1062); sipho robust, strongly curved, apex curved upward, orifice dorsal, subterminal (fig. 1063).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex, entire; sixth sternum convex, entire (fig. 1911); sixth tergum convex, entire (fig. 1912). Genitalia with 10th tergum nearly truncate me-

dially (fig. 1913); genital plate elongate, with posterolateral angle acute, produced, posteromedian angle rounded, nearly obsolete, stylus visible (fig. 1914).

Variation.—Length 3.72–4.31 mm., width 3.33–3.89 mm.

Holotype.—Male. BRAZIL: *Pernambuco:* Pery-Pery, Gounelle (PM).

Allotype.—Female. Same data as holotype (PM).

Paratypes.—Total three. Same data as holotype. (PM) (USNM).

Discussion.—The five rings of color on the elytra of *gounellei* are highly distinctive, resembling only *concentrica*, which has entirely different genitalia. The genitalia of *gounellei* are of the *circumflua* type. The type material of *gounellei* was found in the Sicard collection (Paris museum) under the manuscript name *gounellei.*

Mada circumflua (Mulsant), new combination

(Figs. 375, 1064–1066, 1915–1917; map 48)

Epilachna (Dira) circumflua Mulsant, 1850, p. 852.
Epilachna (Mada) circumflua: Crotch, 1874, p. 66.
Solanophila circumflua: Weise, 1904*a*, p. 194.
Epilachna circumflua: Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 4.39 mm., width 3.97 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; disk of pronotum reddish yellow; elytron with broad, yellow lateral margin, narrow black ring extending from base across callus to suture at apex, area between black ring and suture reddish brown (fig. 375). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence dense, grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, indistinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum broadly notched medially; sixth tergum broadly convex, entire. Genitalia with basal lobe much longer than paramere, broadly curved upward to sharp apex; group of setae present dorsolaterally at middle; paramere widened apically (figs. 1064, 1065); sipho short, robust, strongly curved, apex blunt, bent upward, orifice dorsal subterminal (fig. 1066).

Female.—Similar to male except abdomen with hind margin of fifth sternum triangularly projecting medially; sixth sternum convex, entire (fig. 1915); sixth tergum broadly convex, entire (fig. 1916). Genitalia with 10th tergum feebly emarginate medially; genital plate elongate, narrowed basally, inner margin curved, notched, anterolateral angle bluntly protruding, stylus visible (fig. 1917).

Variation.—Length 4.28–5.38 mm., width 3.91–4.27 mm. Pronotum may have black spot on each side near base and on some specimens two spots are narrowly joined, which, in conjunction with black ring on elytron, gives specimen a completely ringed appearance.

Type Locality.—Brazil (many collections).

Type Depository.—UCCC (lectotype here designated).

Discussion.—This is apparently a fairly common species in southern Brazil. *M. circumducta* superficially resembles *circumflua*, but *circumflua* never has the base of the elytron and suture black and the genitalia of both sexes are completely different. The sipho of *circumflua* is of the *Dira* type but much more strongly curved. The female specimen in the Crotch collection bearing the following label is here designated lectotype: "TYPE, circumflua, ex. Muls."

Specimens Examined.—Total 75. BRAZIL: "Brazil"; Brasil, V. Olf; "Braz." *Guanabara:* Rio de Jan. *Mato Grosso:* Chapada. *Parana:* Caviuna, X–1945, VIII–1946, Nov. 1946, Feb. 1947, A. Maller Coll.; Rolandia, XI–1947, Sept. 1948, April 1949, A. Maller Coll. *Santa Catarina:* Brasilia, Korschefsky collection. *Sao Paulo:* Campinas, F. C. C.; Capital, Korschefsky collection; Cantareira, 4–XII–1958, 17–III–1959, 15–XI–1959, 23–XI–1959, 17–XII–1959, 24–XII–1961, 2–I–1962, 4–I–1962, 4–XI–1962, 12–XI–1963, 25–XI–1963, 12–XII–1963, 28–I–1964, 24–III–1964, Halik collection. (AMNH) (CM) (MNHUB) (UCCC) (USNM).

Mada flavomarginata, new species

(Figs. 1067–1069; map 50)

Male.—Length 3.61 mm., width 3.39 mm.

Form round, convex, widest at middle of elytra. Color brownish yellow; metasternum and abdomen reddish brown; median area of pronotum and entire elytron except broad lateral border reddish brown, lateral border yellow, widest at callus and narrowed gradually toward apex. Punctation on elytron dual, small punctures extremely fine, separated by one to two times their diameter; large punctures separated by less than to to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate medially; sixth sternum notched; broadly convex, entire. Genitalia of *circumflua* type; basal lobe longer than paramere, angled downward basally, slender and gradually curved upward to pointed apex in apical one-half, group of setae on upper margin medially; paramere straight, widened at apex (figs. 1067, 1068); sipho robust, strongly curved, apex blunt, slightly curved upward, orifice dorsal, subterminal (fig. 1069).

Female.—Not known.

Holotype.—Male. PANAMA: *Chiriqui:* Bugaba, 800–1,500 ft., Champion (PM).

Paratype.—Total one. PANAMA: *Chiriqui:* Bugaba, Champion. (PM).

Discussion.—This is a rather undistinguished species, especially externally, having male genitalia much like those of the Brazilian *circumflua* and apparently with no close Central American allies. The pale lateral border on the elytron is apparent and will help to distinguish *flavomarginata*, but the male genitalia must be examined for certain identification.

Mada contempta (Mulsant), new combination

(Figs. 376, 1070–1072, 1918–1921; map 49)

Epilachna (*Dira*) *contempta* Mulsant, 1850, p. 851.
Epilachna (*Mada*) *contempta:* Crotch, 1874, p. 66.
Epilachna contempta: Korschefsky, 1931, p. 58.—Blackwelder, 1945, p. 441.

Male.—Length 5.18 mm., width 4.69 mm. Form round, slightly elongate, convex, widest at middle of elytra. Color yellow; irregular median area of pronotum, vertex of head, prosternum, mesosternum, metasternum, and legs black; abdomen piceous; elytron with lateral yellow ring, narrow, median black ring, area between black ring and suture reddish brown (fig. 376). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to three times their diameter. Pubescence short, dense, yellowish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate; sixth tergum broadly convex. Genitalia with basal lobe shorter than paramere, as described for *virgata* except apical emargination broader, deeper; paramere widened apically (figs. 1070, 1071); sipho as described for *virgata* (fig. 1072).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire, longitudinal suture present (fig. 1918); sixth tergum broadly convex, entire (fig. 1919). Genitalia with 10th tergum strongly convex (fig. 1920); genital plate with all angles rounded, small pointed projection at posterolateral angle, stylus visible (fig. 1921).

Variation.—Length 5.18–6 mm., width 4.69–5.15 mm. Ventral surface may be brownish red rather than black.

Type Locality.—Brazil (Reiche).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The dorsal color pattern is most like that of *circumflua*, but the pronotum of *contempta* is solidly black medially. Crotch (*1874*) synonymized *contempta* under *circumflua* and the series of *circumflua* in his collection reflects this. The male lectotype of *contempta* here designated is one of the specimens in the series of *circumflua* and bears the following labels: "Rio"; "TYPE" (blue paper).

Specimens Examined.—Total 22. BRAZIL: The type; Brasil, V. Olf. *Goiaz:* Vianopolis, R. Spitz. *Mato Grosso:* Chapada, Nov., Apr. *Santa Catarina:* Corupa, (Hansa Humbolt), Mar. 1949, A. Maller Coll. (AMNH) (CM) (MNHUB) (UCCC) (USNM).

Mada zonula (Mulsant), new combination

(Figs. 377, 1073–1075, 1922–1923; map 49)

Epilachna (*Dira*) *zonula* Mulsant, 1850, p. 854.
Epilachna (*Mada*) *zonula:* Crotch, 1874, p. 67.
Epilachna zonula: Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.

Male.—Length 4.38 mm., width 3.88 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; head posterior to antenna black; mesosternum and metasternum reddish brown; pronotum yellow with black basal area; elytron with lateral margin broadly yellow, broad black border inside yellow margin extending from base across callus to suture at apex, narrow, sinuate brownish-yellow vitta extending from near scutellum to black border at apex, sutural margin chestnut brown, widened on disk (fig. 377). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, angulate, reaching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate; sixth sternum feebly emarginate; sixth tergum deeply notched. Genitalia with basal lobe longer than paramere, robust, upper margin abruptly descending before apex, apex strongly curved upward, group of setae present dorsolaterally; paramere nearly straight, slightly widened apically (figs. 1073, 1074); sipho with apex forked, orifice dorsal, subterminal (fig. 1075).

Female.—Similar to male except hind margin of fifth sternum strongly, triangularly projecting; sixth sternum convex, entire (fig. 1922). Genitalia with genital plate rounded, posterolateral angle produced, acute, fused to ninth sternum, stylus not visible (fig. 1923).

Variation.—Length 4.38–4.66 mm., width 3.88–4.05 mm.

Type Locality.—Brazil.

Type Depository.—PM (lectotype here designated).

Discussion.—This beautifully marked species should not be confused with any known species of *Mada*. In addition to the dorsal color pattern, the deeply notched sixth tergum of the male and the strongly triangular sixth sternum of the female are known only in this species. The forked sipho of the male genitalia is also unique in the genus. The male specimen in the Paris museum bearing the following labels is here designated lectotype: *Bresil* (coll. Mniszech)"; "TYPE."

Specimens Examined.—Total three. BRAZIL: *Espirito Santo:* Jabaquara, "Bresil," coll. Mniszech. (PM) (USNM).

Mada virgata (Mulsant), new combination

(Figs. 378, 1076–1078, 1924–1927; map 50)

Epilachna (*Dira*) *virgata* Mulsant, 1850, p. 855.—Gorham, 1898, p. 246.—Korschefsky, 1931, p. 67.—Blackwelder, 1945, p. 442.
Epilachna (*Mada*) *virgata:* Crotch, 1874, p. 67.

Male.—Length 4.35 mm., width 3.72 mm. Form round, convex, widest at middle of elytra. Color yellow; mesosternum, metasternum, and legs reddish brown; pronotum with longitudinal median area brown; elytron reddish brown with lateral margin yellow, piceous ring extending from base across callus to suture at apex, two piceous vittae inside ring extending from base to middle of elytron, outer vitta beginning at callus, inner vitta beginning at base between callus and scutellum (fig. 378). Punctation on elytron dual, small punctures separated by less than to two times their diameter, large punctures separated by one to four times their diameter. Pubescence yellowish white. Postcoxal line incomplete, distinct, angulate, extending nearly to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum truncate; sixth tergum feebly emarginate medially. Genitalia with basal lobe shorter than paramere, lower margin narrowed before middle, upper margin straight nearly to apex, abruptly curved downward then upward to bluntly pointed apex, group of setae present dorsolaterally before apex; paramere slightly curved downward, not widened at apex (figs. 1076, 1077); sipho robust, apex slightly curved upward, orifice dorsal, subterminal (fig. 1078).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire, with longitudinal suture present (fig.

1924); sixth tergum broadly convex, entire (fig. 1925). Genitalia with 10th tergum truncate (fig. 1926); genital plate with stylus visible, posterolateral angle bluntly produced, (fig. 1927).

Variation.—Length 4–5.26 mm., width 3.67–4.81 mm. Ground color of elytron may vary from dark reddish brown to pale yellow depending on maturity of specimen.

Type Locality.—Colombia (Dejean, Dupont).

Type Depository.—DLM (lectotype here designated).

Discussion.—The striped appearance of the elytron is quite distinctive as are the male and female genitalia. The male genitalia resemble those of *contempta*. The single specimen of *virgata* in the Dejean collection with the data "Colombia, Valencia, Klug" is here designated lectotype.

Specimens Examined.—Total 59. COLOMBIA: Columb., Moritz. *Antioquia:* V. Medellin, June 1942, Gallego. COSTA RICA: "Costa Rica"; Costa Rica, Biolley. *San Jose:* Orocuaja, Rio Jesus Maria, F. Nevermann, 6–IX–26, Korschefsky collection; Piedr. Negras, Schild and Burgdorf. PANAMA: *Canal Zone:* Ancon, 6–VIII–1924, N. Banks; Ft. Clayton, V–44, K. E. Frick; Summit, VI–1953, Krauss. *Cocle:* Aguadulce, IX–1946, N. L. H. Krauss. *Panama:* El Cermeno, IV–V–39, J. Zetek. VENEZUELA: *Aragua:* Rancho Grande, nr. Maracay. *Bolivar:* Ciudad Bolivar, X–30–98, VII–3–98, Apr. 25–V–98, X–12–98, E. A. Klages; Suapure, Caura River, Jan. 6–17–1899, E. A. Klages. *Cojedes:* La Yagua, 11–V–1967, J. and B. Bechyne. *Guarico:* Roblecito, 28–X–50, J. R. Reguena. (AMNH) (CAS) (CM) (MCZ) (MNHUB) (USNM) (V).

Mada inepta (Gorham), new combination

(Figs. 379, 1079–1081, 1928–1931; map 50)

Epilachna inepta Gorham, 1898, p. 245.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 441.

Male.—Length 3.79 mm., width 3.47 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; head with vertex black; pronotum with piceous spot at base on each side of middle; elytron brownish yellow with piceous ring extending from base across callus nearly to suture apically and irregular, elongate piceous spot on disk (fig. 379). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw strongly angulate at base, appearing trifid. Postcoxal line incomplete, distinct, not reaching hind margin of first abdominal sternum, lower part flattened, parallel to hind margin of sternum. Abdomen with hind margin of fifth sternum feebly emarginate medially; sixth sternum feebly emarginate; sixth tergum broadly convex. Genitalia with basal lobe longer than paramere, narrowed from base to apex, apex abruptly bent upward, blunt; paramere slender, widened apically (figs. 1079, 1080); sipho stout, bent downward before apex, apex curved upward, pointed, orifice dorsal, subterminal (fig. 1081).

Female.—Similar to male except hind margin of fifth sternum truncate; sixth sternum convex, entire, longitudinal suture present (fig. 1928); sixth tergum broadly convex, entire (fig. 1929). Genitalia with 10th tergum feebly emarginate (fig. 1930); genital plate with no visible stylus, inner margin angled outward posteriorly, posteromedian angle abrupt, posterolateral angle fused to ninth sternum, posterior margin truncate (fig. 1931).

Variation.—Length 3.78–5.10 mm., width 3.37–4.15 mm. In some specimens piceous ring on elytron reaches only to midpoint of elytron. Piceous ring may be divided posteriorly, median area becoming yellow. Ground color of elytron varies from pale yellow to dark brown.

Type Locality.—Mexico: Presidio.

Type Depository.—BMNH (lectotype here designated).

Discussion.—The dorsal color pattern is distinctive for this species. The only species with which it might be confused is *virgata*, but the black vertex of the head and the two basal spots on the pronotum distinguish *inepta*. A female specimen bearing the following labels is here designated lectotype: "Syntype"; "Presidio, Mexico, Forrer"; "E. inepta Gorham"; "B.C.A., Col., VII., Epilachna inepta Gorh."

Specimens Examined.—Total three. COSTA RICA: Pacayas, C. Werckele. *Cartago:* Turrialba, Heyne, Korschefsky collection. *San Jose:* San Jose, July 1, 1957, E. Morales M.;

Paso Ancho de San Sebastian, C. H. Ballou. MEXICO: "Mex." *Chiapas:* Simojovel, 20–XII–1932, C. C. Plummer. *Colima:* Colima, IX–1965, N. H. L. Krauss. *Nayarit:* Tepic, Nov. 1925, Roxana S. Ferris. *Vera Cruz:* St. Lucrecia, Fredk. Knab. (AMNH) (CAS) (USNM) (ZSBS).

Mada adusta, new species

(Figs. 1082–1085; map 49)

Male.—Length 4 mm., width 3.52 mm. Form convex, oval, widest at middle of elytra. Color yellow; median one-half of pronotum, mesosternum, metasternum, and epipleuron piceous; elytron black with elongate reddish-piceous median area. Punctation dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Tarsal claw strongly angulate basally, appearing trifid. Postcoxal line incomplete, distinct, angulate, nearly touching hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, abruptly bent upward apically, apex sharp, in ventral view strongly widened before apex; paramere strongly widened apically, subapical row of setigerous punctures present (figs. 1082, 1083); sipho with apex sharp, in dorsal view trifid, orifice dorsal, subterminal (figs. 1084, 1085).

Female.—Not known.

Holotype.—Male. PARAGUAY: *Cordillera:* S. Bernardino, K. Fiebrig collector (USNM 71693).

Paratype.—Total one. BRAZIL: *Para:* Santarem. (UCCC).

Discussion.—The only outstanding characters distinguishing this species are the male genitalia. The paratype is the sixth specimen under the name *desarmata* in the Crotch collection.

Mada polluta (Mulsant), new combination

(Figs. 380, 1086–1088, 1932–1935; map 50)

Epilachna (*Cleta*) *polluta* Mulsant, 1850, pp. 870–871.

Epilachna polluta: Crotch, 1874, p. 63.—Gorham, 1898, p. 245.—Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Epilachna patula var. *nigripennis* Weise, 1895, p. 124. NEW SYNONYMY.

Epilachna patula ab. *nigripennis:* Korschefsky, 1931, p. 65.—Blackwelder, 1945, p. 442.

Male.—Length 5 mm., width 4.34 mm. Form slightly elongate, convex, widest posterior to middle of elytra, lateral margin of elytron nearly straight medially. Color yellow; pronotum with piceous spot near base on each side of middle obscurely connected along base; elytron yellow with three piceous spots and obscure, brownish-yellow, irregularly transverse spot behind middle, first spot posterior to and outside of callus, second spot nearly parallel to and inside of callus, third spot near suture anterior to middle (fig. 380). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, slightly angulate, not extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate medially; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, lower margin angled upward slightly before middle, apex curved upward, short carina on each side of middle of dorsal surface before apex; paramere slightly widened apically (figs. 1086, 1087); sipho with lower margin sinuate before apex, apex curved upward, orifice dorsal, subterminal (fig. 1088).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire, longitudinal suture present (fig. 1932); sixth tergum broadly convex, entire (fig. 1933). Genitalia with 10th tergum convex (fig. 1934); genital plate with inner margin broadly emarginate in basal one-half, stylus not visible (fig. 1935).

Variation.—Length 4.48–5.88 mm., width 3.58–4.83 mm. Dorsal color pattern varies from typical form described here to form with dorsal surface entirely blackish piceous except for

reddish-yellow anterior and lateral pronotal margins (*nigripennis* Weise).

Type Locality.—Mexico (Reiche).

Type Depository.—UCCC (lectotype here designated).

Discussion.—The typical form is easily recognized by the dorsal color pattern but the dark form is not particularly distinctive except for the male and female genitalia. A female type specimen of *E. patula* var. *nigripennis* from the MNHUB proved to be the dark form of *polluta*.

Specimens Examined.—Total 57. MEXICO: "Mex.," F. C. Bowditch. *Guerrero:* Chilpancingo, 4000 ft., 19–VII–1962, H. E. Milliron. *Michoacan:* 2 mi. E. S. Jose Purua, VIII–27–1955, G. H. Dieke; Tacambaro, Hoge. *Morelos:* 11.5 mi. W. Cuautla, Rte. 115D, 4500', VII–9–65, George E. Ball and D. R. Whitehead; Cuernavaca; Cuernavaca, 4 Dec. 1931, 8–X–1933, 29–XI–1931, C. C. Plummer; Cuernavaca, VIII–3–44, VI–1959, N. H. L. Krauss. *San Luis Potosi:* Tamazunchale, May 4, 1953. *Vera Cruz:* "Vera Cruz"; 4 mi. S. W. Cd. Mendoza, 3–4000', 16–VIII–62, H. E. Milliron. (CAS) (CNC) (MCZ) (USNM).

Two specimens of *polluta* are in the Crotch collection, the first of which, bearing only the label "TYPE," is here selected as lectotype.

Mada amplexata (Mulsant), new combination

(Figs. 1936–1939)

Epilachna (Dira) amplexata Mulsant, 1850, p. 856.
Epilachna amplexata: Crotch, 1874, p. 62.—Korschefsky, 1931, p. 55.—Blackwelder, 1945, p. 440.

Female.—Length 5.75 mm., width 4.81 mm. Form round, slightly elongate, not strongly convex. Color black; mouthparts yellow to piceous; antenna, broad lateral margin of pronotum, tibiae, apical one-fifth of all femora, and last three abdominal sterna yellow; elytron dark red with broad lateral and narrow sutural borders black, lateral margin extremely narrowly red. Punctation on elytron dual, small punctures fine, separated by their diameter or less, large punctures separated by less than to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, feebly angulate. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate (fig. 1936); sixth tergum broadly convex, entire (fig. 1937). Genitalia with 10th tergum convex, entire (fig. 1938); genital plate with posteromedian angle broadly emarginate, all angles rounded, stylus not visible (fig. 1939).

Male.—Not known.

Type Locality.—Mexico (Dupont).

Type Depository.—PM (lectotype here designated).

Discussion.—The only specimen available of this species was a female, here designated lectotype, bearing the following labels: "Mexique (coll. Mniszech)"; "TYPE." The genital plates resemble those of *polluta*. *M. amplexata* is not a typical member of the genus *Mada* in that the form is somewhat elongate and there are apparently no depressions in the epipleuron for the femoral apices. The trifid tarsal claws and typical postcoxal line are of the *Mada* type.

Specimens Examined.—Total one. MEXICO: The lectotype.

Mada lineatopunctata (Germar), new combination

(Figs. 381, 1089–1091, 1940–1943; map 49)

Coccinella lineatopunctata Germar, 1824, p. 618.
Epilachna lineatopunctata: Mulsant, 1850, pp. 831–832.—Korschefsky, 1931, p. 63.—Blackwelder, 1945, p. 442.
Epilachna (Dira) lineatopunctata: Crotch, 1874, p. 66.

Male.—Length 5.53 mm., width 4.56 mm. Form oval, elytra narrowed in apical one-third, widest anterior to middle of elytra. Color pale yellow; mesosternum, metasternum, and median area of abdomen dark brown; elytron pale yellow with suture narrowly piceous and six piceous markings present, small round spot on callus, narrow, elongate spot on base between scutellum and callus, three short vittae medially, outer two vittae fused, small, transverse spot on apical one-third (fig. 381). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than to two times their diameter. Surface of elytron retic-

ulate. Pubescence very short, nearly invisible, yellowish white. Epipleuron quite strongly descending externally. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, slightly angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly emarginate medially, sixth sternum notched; sixth tergum feebly emarginate. Genitalia with phallobase extremely long, slender; basal lobe longer than paramere, lower margin abruptly angled upward at apical three-fourths, apex curved upward; paramere long, slender, constricted before apex (figs. 1089, 1090); sipho with apex curved upward, orifice dorsal, subterminal (fig. 1091).

Female.—Similar to male except abdomen with hind margin of fifth sternum truncate; sixth sternum convex, entire (fig. 1940); sixth tergum convex, entire (fig. 1941). Genitalia with 10th tergum strongly convex (fig. 1942); genital plate transverse, posterolateral angle produced, fused to ninth sternum, stylus not visible (fig. 1943).

Variation.—Length 5.10–5.99 mm., width 4.05–5.09 mm. Two outer vittae on elytron may be completely separated or connected by narrow brown area. Pronotum is often darker yellow than elytron and mesosternum and anterior one-half of metasternum may be yellow.

Type Locality.—"America meridional" (Brazil).

Type Depository.—Not known.

Discussion.—This is an easily recognized species on the basis of dorsal color pattern as well as male and female genitalia. This is not a typical member of the genus *Mada* but is placed here because of the basal angulation of the tarsal claw and the descending epipleuron. The shape is elongate rather than round and no depressions are on the epipleuron to receive the legs. The female genital plate does not resemble that of any presently known species of *Mada*. *M. lineatopunctata* is an isolated species with apparently no close relative.

Specimens Examined.—Total 18. BRAZIL: *Bahia:* 1936, Dr. G. Bondar, Korschefsky collection; Agua Preta, Bondar, Korschefsky collection; Casadinha, Nov. 2, 1945, P. Silva; Catule, 11/2/45, Pedrito Silva. (USNM).

Mada rabauti, new species

(Figs. 1092–1094; map 49)

Male.—Length 5.35 mm., width 4.90 mm. Color yellow; mesosternum and metasternum piceous; pronotum with median two-thirds black; elytron black except scutellum and broad lateral border yellow. Punctation on elytron dual, small punctures separated by one to two times their diameter. Pubescence grayish white. Tarsal claw with basal angulation. Postcoxal line angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly emarginate; sixth sternum weakly notched; sixth tergum feebly emarginate. Genitalia with basal lobe shorter than paramere, lower margin abruptly angled upward in apical one-fourth, apex curved upward, pointed, in ventral view apex triangular, bluntly pointed, siphonal orifice with slender projection extending posteriorly from apical margin, group of setae present dorsolaterally before apex; paramere widened at apex (figs. 1092, 1093); sipho slender, apex bent upward, in dorsal view apex flattened, triangular, orifice dorsal, subterminal (fig. 1094).

Female.—Not known.

Holotype.—Male. BRAZIL: *Amazonas:* Benjamin Constant, Rio Javary, Feb. 15–Mar. 15, 1942, August Rabaut (AMNH).

Discussion.—*Mada rabauti* most nearly resembles *Dira burgdorfi* in external appearance, but the lateral yellow border is much more pronounced in *rabauti* and the male genitalia are not at all alike.

Mada dissita, new species

(Figs. 1095–1097; map 49)

Male.—Length 3.48 mm., width 3.37 mm. Form round, convex, widest at middle of elytra. Color yellow; median area of pronotum piceous; mesosternum, metasternum, epipleuron, and median area of first abdominal sternum reddish brown; elytron brownish piceous with narrow lateral margin obscurely reddish brown. Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Elytron

descending externally. Tarsal claw strongly angulate basally. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate medially; sixth tergum feebly emarginate. Genitalia with basal lobe shorter than paramere, lower one-half truncate before apex, upper one-half curved upward to apex; paramere with sides parallel, not widened apically; trabes spatulate, equal in length to basal piece (figs. 1095, 1096); sipho broadly curved upward before apex, in dorsal view apex cordate, orifice dorsal, subterminal (fig. 1097).

Female.—Not known.

Holotype.—Male. BOLIVIA: *Beni:* Rosario, Lake Rogagua, Wm. Mann, Oct. 28-Nov.9, 1921, Mulford Bio. Expl. 1921–22 (USNM 71694).

Discussion.—Externally there is little to distinguish *dissita* from several other species of *Mada*, but the male genitalia are quite distinctive.

Mada elegans, new species

(Figs. 382, 1098–1100; map 51)

Male.—Length 4 mm., width 3.72 mm. Form round, convex, widest at middle of elytra. Color yellow; narrow, median basal area of pronotum, vertex of head, mesosternum, metasternum, and median area of first abdominal sternum black; elytron yellow with black ring extending from scutellum along base to callus, then posteriorly to suture at apex, suture narrowly bordered with black (fig. 382). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum feebly convex medially; sixth sternum feebly emarginate medially; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, lower margin abruptly narrowed medially, apex bent upward to blunt point; paramere slender, curved slightly downward (figs. 1098, 1099); sipho robust, apex bent upward, orifice dorsal, subterminal (fig. 1100).

Female.—Not known.

Holotype.—Male. PERU: *Junin:* Satipo, V–VI–1942, Paprzycki (USNM 71695).

Discussion.—The dorsal color pattern is nearly identical to that of *circumducta*, but this species does not have the mesosternum and metasternum black. The male genitalia of the two species are distinctive.

Mada circumducta (Mulsant), new combination

(Figs. 383, 1101–1103, 1944–1947; map 51)

Epilachna (*Dira*) *circumducta* Mulsant, 1850, pp. 854–855.—Mulsant, 1853, p. 126.—Korschefsky, 1931, p. 57.— Blackwelder, 1945, p. 441.

Epilachna (*Mada*) *circumducta:* Crotch, 1874, p. 67.

Male.—Length 3 mm., width 3.41 mm. Form round, convex, widest at middle of elytra. Color reddish yellow; pronotum with narrow, median black band at base; elytron with broad, yellow lateral margin, narrow black ring extending from scutellum along base to callus, then posteriorly to suture at apex, sutural margin narrowly piceous, area between black ring and sutural margin reddish brown (fig. 383). Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence dense, grayish white. Tarsal claw strongly angulate at base, appearing trifid. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, feebly emarginate; sixth tergum broadly convex. Genitalia with basal lobe shorter than paramere, divided near base, lower part forming tube for sipho, apex blunt, upper part one-half as long as lower part, deeply emarginate apically in ventral view; paramere slightly curved downward, widened apically (figs. 1101, 1102); sipho with apex bent upward, orifice dorsal, subterminal (fig. 1103).

Female.—Similar to male except abdomen with hind margin of sixth sternum convex, entire (fig. 1944); sixth tergum convex, entire (fig. 1945). Genitalia with 10th tergum convex, entire (fig. 1946); genital plate with pos-

terolateral angle extremely produced, fused to ninth sternum, all other angles rounded, stylus not visible (fig. 1947).

Type Locality.—Brazil (Germar and Schaum: Paris museum).

Type Depository.—PM (lectotype here designated).

Discussion.—The male and female genitalia are highly distinctive in this species. The small size and dorsal color pattern should also distinguish it from any presently known species of *Mada* from Brazil. The specimen of *circumducta* in the Paris museum bearing the following labels is here selected as lectotype: "Museum Paris, Bresil, Minas-Geraes a Goyaz, de Castelnau 19–47"; "Epilachna circumducta Muls., auct. det."

Specimens Examined.—Total eight. BRAZIL: "Braz." "Brazil," V. Olf. *Parana*: Ponta Grossa, 27–IV–1963, Halik collection. *S. Paulo*: Est. S. Paulo, 3–6–20, Saude, Korschefsky collection; Bara, Korschefsky collection. (MNHUB) (UCCC) (USNM).

Mada insolitaphallus, new species

(Figs. 384, 1104–1106, 1948–1951; map 51)

Male.—4.73 mm., width 4.41 mm. Form round, convex, widest slightly anterior to middle of elytra. Color yellow; pronotum with median two-thirds black; mesosternum, metasternum, and abdomen brownish yellow; epipleuron black with inner one-half yellow from base to slightly beyond median point; elytron orange, completely bordered with black, lateral border not completely covering callus (fig. 384). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, indistinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum broadly, feebly emarginate; sixth tergum feebly emarginate. Genitalia with basal lobe shorter than paramere, divided at base, lower part robust, wide, forming tube for sipho, upper part slender, curved, apex slightly curved upward; paramere slender, widened apically (figs. 1104, 1105); sipho bent upward at apex, orifice dorsal, subterminal (fig. 1106).

Female.—Similar to male except abdomen with hind margin of fifth sternum deeply notched; sixth sternum feebly emarginate medially (fig. 1948); sixth tergum broadly convex (fig. 1949). Genitalia with 10th tergum strongly convex (fig. 1950); genital plate with posterolateral angle produced, all other angles rounded, stylus visible (fig. 1951).

Variation.—Length 4.73–5.45 mm., width 4.41–4.71 mm.

Holotype.—Male. PERU: *Junin:* Satipo, XI–1942, Papyrzycki (USNM 71696).

Allotype.—Female. Same data as holotype (USNM).

Discussion.—*M. insolitaphallus* is easily distinguished by color, male genitalia, and the deeply notched fifth sternum of the female. In color it most closely resembles *synemia*, n. sp., but in *insolitaphallus*, the black border of the elytron does not cover the callus and the ventral surface is not black.

Mada nexophallus, new species

(Figs. 385, 1107–1109, 1952–1955)

Male.—Length 5 mm., width 4.41 mm. Form round, convex, widest at middle of elytra, lateral margin of elytron rounded from humeral angle to apex. Color brownish yellow; outer margin of epipleuron black; head except narrow black band on vertex and broad lateral margin of pronotum yellow; elytron red with bluish-black border broad on lateral margin, covering callus, narrow along base; scutellum black (fig. 385). Punctation on elytron dual, small punctures separated by one to two times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly emarginate; sixth sternum emarginate; sixth tergum feebly emarginate. Genitalia of *insolitaphallus* type; basal lobe shorter than paramere, divided at base, lower part short, robust, forming open tube for sipho, upper part slender, curved,

apex reflexed, blunt; paramere widened at apex (figs. 1107, 1108); sipho long, slender, feebly curved at base, apex curved upward, blunt, orifice dorsal, subterminal (fig. 1109).

Female.—Similar to male except abdomen with hind margin of fifth sternum narrowly deeply notched; sixth sternum wide, broadly convex (fig. 1952); sixth tergum entire, broadly convex (fig. 1953). Genitalia with 10th tergum entire, convex (fig. 1954); genital plate transverse, all angles except posterolateral rounded, posterolateral angle produced, fused to ninth tergum, stylus not visible (fig. 1955).

Variation.—Length 5–5.48 mm., width 4.41–4.58 mm.

Holotype.—Male. PERU: "Perou" (PM).

Allotype.—Female. Same data as holotype (PM).

Discussion.—The male genitalia of *nexophallus* resemble those of *insolitaphallus* closely. The sipho is different in curvature in the two species and the apex of the upper part of the median lobe is bulbous in dorsal view in *nexophallus* and slender in *insolitaphallus*. As is often the case with old specimens, the collection data are far from satisfactory.

Mada pseudodamata, new species

(Figs. 1110–1112; map 51)

Male.—Length 6.18 mm., width 5.47 mm. Form round, convex, widest at middle of elytra. Color black; head with anterior margin of clypeus, mouthparts, and antenna yellow; pronotum with anterolateral angle yellow; elytron red with broad, black, lateral border extending from base near scutellum to suture at apex, covering callus and narrowed slightly posteriorly. Punctation on elytron barely perceptibly dual, small punctures separated by one to four times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation, appearing trifid. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum convex, entire; sixth tergum broadly convex, entire. Genitalia with basal lobe longer than paramere, divided anterior to middle, lower part robust, blunt, forming open tube for sipho, upper part slender, apex curved upward; paramere angled upward, apex widened (figs. 1110, 1111); sipho robust, long, apex abruptly bent upward, pointed, orifice dorsal, subterminal (fig. 1112).

Female.—Not known.

Holotype.—Male. BOLIVIA: *La Paz:* "Ocobamba," Garlepp (PM).

Discussion.—This is another species with male genitalia of the *nexophallus* type. *M. pseudodamata* is the largest known species in the group and is apparently from Bolivia, whereas the other species are from Peru. The locality "Ocobamba" could not be located in Bolivia and may perhaps be in Peru. There is, however, a Bolivian locality "Ocobayba" in the Department of LaPaz and this is here assumed to be the type locality.

Mada azyoides, new species

(Figs. 1113–1115; map 51)

Male.—Length 3.34 mm., width 3 mm. Form round, convex, widest at middle of elytra. Color yellow; head with posterior two-thirds black; pronotum bluish black with narrow lateral margin and anterolateral angle obscurely reddish brown; prosternum, mesosternum, metasternum, propleuron, and epipleuron dark reddish brown; elytron entirely bluish black. Punctation on elytron not dual, fine, separated by their diameter or less. Surface of elytron finely reticulate. Pubescence grayish white. Epipleuron strongly descending externally, deeply notched for apices of middle and hind femora. Tarsal claw of *pseudodamata* type, strongly angulate basally. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum broadly convex, sixth sternum weakly notched; sixth tergum feebly emarginate. Genitalia with basal lobe extremely short, less than one-half as long as paramere, apex round in ventral view; paramere strongly widened medially, slightly narrowed at apex; trabes longer than phallobase (figs. 1113, 1114); sipho robust, evenly

curved, apex pointed, orifice dorsal, subterminal (fig. 1115).

Female.—Not known.

Holotype.—Male. PANAMA: *Canal Zone:* Barro, Colorado, 23–VII–1924, N. Banks (MCZ).

Discussion.—This species resembles members of the genus *Azya* in many respects and perhaps will be placed in a new genus when more specimens and information on biology become available. In the following characteristics *azyoides* resembles *Azya* perhaps more than *Mada*: The male genitalia are of the *Azya* type and do not resemble those of any *Mada* species thus far described; the elytral punctation is not dual as it is in all known species of *Mada*; the anterior tibia is strongly widened (although not nearly as much so as in *Azya*); and the epipleuron is strongly notched for the middle and hind legs (although not nearly as strongly as in *Azya*). In all other respects *azyoides* is a typical member of *Mada*.

Genus DAMATULA, new genus

Length 3.70–5.25 mm. Labrum short, wide (fig. 9); labium with palpus inserted subapically, segments slender, much longer than wide. Epipleuron descending externally, strongly so, depressions for apices of middle and hind femora distinct. Tarsal claw with strong basal angulation (fig. 88). First abdominal sternum with postcoxal line incomplete, extending to hind margin of sternum, strongly angulate (fig. 100). Male genitalia with phallobase long, slender; basal lobe divided, lower part short, forming tube for sipho, upper part long, usually about twice as long as lower part; paramere strongly widened apically, setae long, dense (figs. 1119, 1120); sipho long robust, apex curved upward, pointed (fig. 1121).

Type-species: *Epilachna* (*Mada*) *fairmairei* Mulsant, generic name arbitrarily formed, gender is feminine.

This genus is characterized by the male genitalia and, to a less degree, the extremely short, wide labrum. The female genitalia are not very well known because of the lack of associated females for so many of the species. Two previously described and seven new species are included here in *Damatula*, totaling nine species.

Key to Species of *Damatula*

1. Species known only from Central America ..... *schwarzi*, n. sp. (p. 240)
   Species known only from South America 2
2. Species known only from Colombia; male genitalia with basal lobe wide, upper margin sinuate in lateral view (fig. 1141) ..... *colombiana*, n. sp. (p. 240)
   Species not known from Colombia or with basal lobe of male genitalia not as described above 3
3. Dorsal surface distinctly greenish black ..... *carina*, n. sp. (p. 238)
   Dorsal surface black or bluish to purplish black 4
4. Male genitalia with apex of basal lobe bluntly rounded, not curved upward (fig. 1117) ..... *carnegiana*, n. sp. (p. 237)
   Male genitalia with apex of basal lobe curved upward, usually somewhat pointed 5
5. Male genitalia with basal lobe wide medially in lateral view, upper margin strongly curved downward anterior to middle as in figure 1129 6
   Male genitalia not agreeing with above statements 8
6. Apex of basal lobe simple, not reflexed or widened (fig. 1129) ..... *porioides* (Weise), n. comb. (p. 239)
   Apex of basal lobe reflexed 7
7. Apex of basal lobe not widened, narrowly reflexed (fig. 1132) ..... *smarti*, n. sp. (p. 239)
   Apex of basal lobe widened, blunt, broadly reflexed (fig. 1126) ..... *yurimagi*, n. sp. (p. 238)
8. Male genitalia with lower part of basal lobe much less than one-half length of upper part 9
   Male genitalia with lower part of basal lobe one-half length of upper part (fig. 1135) ..... *disjuncta*, n. sp. (p. 239)

9. Male genitalia with paramere strongly narrowed toward apex in lateral view, apex of basal lobe recurved, pointed (fig. 1120) ..... *fairmairei* (Mulsant), n. comb. (p. 237)
Male genitalia with paramere not widened toward apex, apex of basal lobe slightly reflexed, bluntly rounded (fig. 1123) ..... *carina*, n. sp. (p. 238)

Descriptions of *Damatula* Species

Damatula carnegiana, new species

(Figs. 1116–1118, 1956–1959; map 52)

Male.—Length 4.71 mm., width 4.53 mm. Form round, convex, widest at middle of elytra. Color yellowish brown; pronotum except broad anterolateral angle, head posterior to eye and outer one-half of epipleuron bluish black; elytron entirely purplish black. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to three times their diameter. Pubescence grayish white. Epipleuron strongly descending externally. Tarsal claw with basal angulation strong, appearing trifid. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum weakly notched; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, divided in basal one-half, lower part a short tube for sipho, upper part long, slender in ventral view, laterally compressed, upper margin curved, apex blunt; paramere curved, narrowed at apex (figs. 1116, 1117); sipho long, apex curved upward, orifice dorsal, subterminal (fig. 1118).

Female.—Similar to male except head and epipleuron entirely bluish black. Abdomen with hind margin of sixth sternum entire, convex, with longitudinal suture (fig. 1956); sixth tergum nearly truncate, feebly emarginate medially (fig. 1957). Genitalia with 10th tergum feebly convex, entire (fig. 1958). Genital plate with posterolateral angle produced, fused to ninth sternum, stylus not visible (fig. 1959).

Variation.—Length 4.71–5.10 mm., width 4.53–4.76 mm.

Holotype.—Male. BRAZIL: *Para:* Santarem (CM).

Allotype.—Female. Same data as holotype (CM).

Paratypes.—Total eight. BRAZIL: *Para:* Same data as holotype; Taperina. (CM) (USNM).

Discussion.—As usual in this genus, the male genitalia of *carnegiana* are distinctive. The combination of purplish black elytra and yellow anterolateral angle of the pronotum also helps to distinguish *carnegiana*.

Damatula fairmairei (Mulsant), new combination

(Figs. 1119–1121; map 52)

Epilachna (*Mada*) *fairmairei* Mulsant, 1850, p. 859.—Crotch, 1874, p. 67 (as a synonym of *rufoventris* Mulsant).

Mada fairmairei: Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442 (as a synonym of *rufoventris* Mulsant).

Male.—Length 5.10 mm., width 4.69 mm. Description as for *carnegiana* except genitalia. Genitalia with basal lobe shorter than paramere, divided at basal one-third, lower part a short tube for sipho, apex blunt, upper part long, slender, laterally compressed, upper and lower margins nearly straight, apex broadly, strongly recurved; paramere slender and narrowed toward apex in lateral view, broad, spatulate toward apex in ventral view (figs. 1119, 1120); sipho long, robust, apex curved upward, pointed, orifice dorsal, subterminal (fig. 1121).

Female.—Not known.

Variation.—Length 5.10–5.34 mm., width 4.69–5 mm.

Type Locality.—Not stated.

Type Depository.—PM (lectotype here designated).

Discussion.—Externally this species appears to be identical to *Lorma rufoventris*, but they are not at all alike except in superficial appearance. *D. fairmairei* has been con-

sidered a synonym of *L. rufoventris* by all authors since Mulsant (*1850*). A specimen has been located in the Paris museum, a male bearing the following labels, which is here considered to be type material and is here designated lectotype: "Museum Paris, Minas Geraes, Serra D'Estrella, De Castelnau 1857"; "Epilachna rufoventris Muls. var. fairmairei Muls., auct. det." The pronotum of the lectotype is entirely black, whereas in the specimen from Chapada it is broadly yellow, but the genitalia of the two specimens are identical.

Specimens Examined.—Total two. BRAZIL: The lectotype. *Mato Grosso:* Chapada. (PM) (USNM).

Damatula carina, new species

(Figs. 386, 1122–1124, 1960–1963; map 52)

Male.—Length 5.40 mm., width 4.98 mm. Form round, convex, widest at middle of elytra. Color yellowish brown; mesosternum, metasternum, middle and hind leg, and epipleuron piceous; head greenish black from antenna to posterior margin; pronotum greenish black except anterolateral angle narrowly pale; elytron entirely greenish black (fig. 386). Punctation on elytron dual, small punctures dense, separated by less than their diameter, large punctures separated by one to two times their diameter. Pubescence grayish white. Epipleuron strongly descending externally. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe shorter than paramere, divided at basal one-third, lower part a short, stout tube for sipho, upper part long, slender, curved upward at apex, in ventral view apex bluntly rounded; paramere with elongate, depressed area before apex (figs. 1122, 1123); sipho with apex curved upward, orifice dorsal, subterminal (fig. 1124).

Female.—Similar to male except abdomen with hind margin of fifth sternum convex; sixth sternum convex, entire, with faint longitudinal suture (fig. 1960); sixth tergum feebly emarginate medially (fig. 1961). Genitalia with 10th tergum transverse, hind margin nearly truncate (fig. 1962); genital plate with posterolateral angle produced, fused to ninth sternum, posterior margin uneven, stylus visible (fig. 1963).

Holotype.—Male. BRAZIL: Minas (UCCC).

Allotype.—Female. BRAZIL: Bahia (UCCC).

Paratype.—Total one. BRAZIL: "Brazilien," Sao Paulo, Korschefsky collection. (USNM).

Discussion.—Two of the known specimens of *carina* are in the series labeled *rufoventris* in the Crotch collection. Seven specimens are in the series, two of which are *carina*, two are *yurimagi*, two belong to another genus, and one is a female specimen of *Damatula*. In addition to the genitalia, the greenish luster of the dorsal surface should distinguish *carina*. The genitalia are closest to those of *fairmairei*.

Damatula yurimagi, new species

(Figs. 1125–1127)

Male.—Length 5 mm., width 4.80 mm. Description as for *Lorma rufoventris* except differences described here. Color bluish black; scutellum, anterolateral angle of pronotum, head, and ventral surface except abdomen reddish brown; abdomen piceous. Pubescence yellowish white. Genitalia with basal lobe shorter than paramere, divided at midpoint, lower part short, blunt, forming tube for sipho, upper part long, upper margin arcuate, apex recurved, apex bluntly pointed; paramere widened apically (figs. 1125, 1126); sipho long, robust apex curved upward, pointed, orifice dorsal, subterminal (fig. 1127).

Female.—Not known.

Holotype.—Male. BRAZIL: Yurimag, Barag. (UCCC).

Paratype.—Total one. BRAZIL: Ega. (UCCC).

Discussion.—The male genitalia resemble those of *smarti*, but the apex of the basal lobe is much more strongly recurved in *yurimagi* and the parameres show subtle differences.

The type locality "Yurimag. Barag." cannot be found.

Damatula porioides (Weise), new combination

(Figs. 387, 1128–1130)

Mada porioides Weise, 1899, pp. 266–268.—Korschefsky, 1931, p. 68.—Blackwelder, 1945, p. 442.

Male.—Length 5.27 mm., width 4.79 mm. Form round, convex, widest slightly posterior to middle of elytra. Color yellowish brown; median area of pronotum and base of head posterior to eye bluish black; elytron bluish black (fig. 387). Punctation on elytron dual, small punctures separated by their diameter or less, large punctures separated by one to three times their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched medially; sixth tergum convex, entire. Genitalia with basal lobe slightly shorter than paramere, divided at middle, lower part a short, stout tube for sipho, upper part with upper margin strongly curved, apex curved upward, pointed; paramere curved slightly downward, widened at apex (figs. 1128, 1129); sipho long, slender, apex curved upward, pointed, orifice dorsal, subterminal (fig. 1130).

Female.—Not known.

Variation.—Length 5.20–5.39 mm., width 4.75–4.82 mm.

Type Locality.—Colombia.

Type Depository.—MNHUB (lectotype here designated).

Discussion.—The only specimens examined of this species were the five specimens in the type series. All these bear a yellow label "Columb Staud." The first specimen in the series described here is here designated as lectotype. As is usual in this group the male genitalia are the only reliable characters for recognizing species. *D. smarti* has genitalia similar to those of *porioides*, but the basal lobe is recurved in *smarti* and simple in *porioides*.

Specimens Examined.—Total five. The type series.

Damatula smarti, new species

(Figs. 1131–1133)

Male.—Length 4.75 mm., width 4.08 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; posterior one-half of head black; median two-thirds of pronotum black; mesosternum, metasternum, and median area of first abdominal sternum dark brown; epipleuron piceous; elytron bluish black. Punctation on elytron dual, small punctures separated by one to three times their diameter, large punctures separated by one to four times their diameter. Pubescence grayish white. Epipleuron strongly descending externally. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum deeply emarginate medially; sixth tergum feebly emarginate. Genitalia with basal lobe equal in length to paramere, upper margin arcuate, abruptly descending before apex, lower margin with tube for sipho ending anterior to middle, apex curved upward with sharp, dorsal, apical tooth; paramere slightly curved, angled upward, not widened apically (figs. 1131, 1132); sipho robust, bent near base, apex slightly bent upward, sharp, orifice dorsal, subterminal (fig. 1133).

Female.—Not known.

Holotype.—BRAZIL: Amaz., Bates (UCCC).

Discussion.—In addition to the genitalia, the deeply emarginate fifth sternum will help to separate this species from the other species of *Damatula*. The holotype is the ninth specimen under the name *Mada desarmata* in the Crotch collection.

Damatula disjuncta, new species

(Figs. 1134–1136; map 52)

Male.—Length 3.95 mm., width 3.61 mm. Description as for *Mada deyrollei* with differences as described here. Pronotum black with anterior margin piceous, lateral margin broadly brownish yellow; mesosternum, metasternum, epipleuron, and median area of first abdominal sternum brownish piceous; elytron completely bluish black. Postcoxal line with

outer part extending beyond middle of first abdominal sternum. Genitalia with basal lobe shorter than paramere, basal one-half wide, apical one-half slender, apex abruptly bent upward, in ventral view orifice for sipho at apex of wide basal part; paramere curved downward, strongly widened at apex (figs. 1134, 1135); sipho with apex pointed, curved upward, orifice dorsal, subterminal (fig. 1136).

Female.—Not known.

Holotype.—BRAZIL: S. Paulo (UCCC).

Discussion.—As in most members of this genus, the male genitalia are highly distinctive. This is the third specimen under the name *Mada desarmata* in the Crotch collection.

Damatula schwarzi, new species

(Figs. 1137–1139, 1964–1967; map 52)

Male.—Length 3.79 mm., width 3.60 mm. Form round, convex, widest at middle of elytra. Color yellowish brown; head reddish brown; pronotum piceous with lateral margin broadly yellowish brown; elytron brownish piceous with obscure, irregular, reddish-brown spot on disk. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by one to four times their diameter. Pubescence dense, grayish white. Tarsal claw strongly angulate at base. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum feebly emarginate; sixth tergum broadly convex, entire. Genitalia with basal lobe equal in length to paramere, divided at base, lower part short, forming tube for sipho, upper part long, slender, curved slightly downward toward apex, gently curved upward immediately before apex, apex bluntly rounded; paramere slender, widened apically (figs. 1137, 1138); sipho long, robust, strongly curved upward at apex, orifice dorsal, subterminal (fig. 1139).

Female.—Similar to male except abdomen with hind margin of sixth sternum emarginate (fig. 1964); sixth tergum broadly convex (fig. 1965). Genitalia with 10th tergum feebly convex (fig. 1966); genital plate with stylus visible, inner margin angled outward, joining outer margin at posterolateral angle, posterolateral angle fused to ninth sternum (fig. 1967).

Variation.—Length 3.79–4.55 mm., width 3.60–4.15 mm. Piceous area on the pronotum may be obscurely divided medially by narrow reddish-brown spot. Lateral margin of elytron may be narrowly, obscurely reddish brown.

Holotype.—Male. PANAMA: *Colon:* Porto Bello, Feb. 21–11, E. A. Schwarz, collector (USNM 71697).

Allotype.—Female. PANAMA: *Colon:* Porto Bello, Mar. 13–11, August Busck (USNM).

Paratypes.—Total 11. PANAMA: *Canal Zone:* Plantation, Feb. 4, 1930, 2–9–30, Blackwelder collection. *Colon:* Same data as holotype; Porto Bello, 28–II–11, 20–2–11, E. A. Schwarz, collector; Port Bello, Feb. 27, A. Busck Coll. (USNM).

Discussion.—This species is not a typical member of the genus *Damatula*. The narrow clypeus, male genitalia with the divided basal lobe, and the form of the tarsal claw place it in *Damatula*, but the dorsal color pattern is not a solid bluish black and the stylus is visible on the female genital plate. This is the only Central American representative of this genus known.

Damatula colombiana, new species

(Figs. 1140–1141, 1141*a*)

Male.—Length 4.27 mm., width 3.87 mm. Form round, convex, widest at middle of elytra. Color brownish yellow; head yellow with posterior one-half black; pronotum black with lateral margin and anterior angle broadly yellow; mesosternum, metasternum, and abdomen piceous; elytron purplish black. Punctation on elytron dual, small punctures separated by one to two times their diameter, large punctures separated by less than twice their diameter. Pubescence grayish white. Tarsal claw with strong basal angulation. Postcoxal line incomplete, distinct, angulate, extending to hind margin of first abdominal sternum. Abdomen with hind margin of fifth sternum truncate; sixth sternum notched; sixth tergum broadly convex, entire. Genitalia with basal

lobe slightly longer than paramere, divided near base, lower part short, robust, forming tube for sipho, upper part long, slender, feebly curved upward to bluntly rounded apex; paramere slender, feebly constricted medially (figs. 1140, 1141); sipho long, robust, apex curved upward, orifice dorsal, subterminal (fig. 1141*a*).

Female.—Not known.

Holotype.—Male. COLOMBIA: "Colombie," R. Dagua, Rodenber, ex. coll. Tring (PM).

Discussion.—The male genitalia of *colombiana* with the slender, bluntly rounded basal lobe are different from those of any presently known species of *Damatula* except *schwarzi*. *D. colombiana* is considerably smaller than *porioides*, the only species of *Damatula* thus far recorded from Colombia. In addition to having genitalia similar to *schwarzi*, both *schwarzi* and *colombiana* have the labrum longer and not as wide as is typical of members of *Damatula*.

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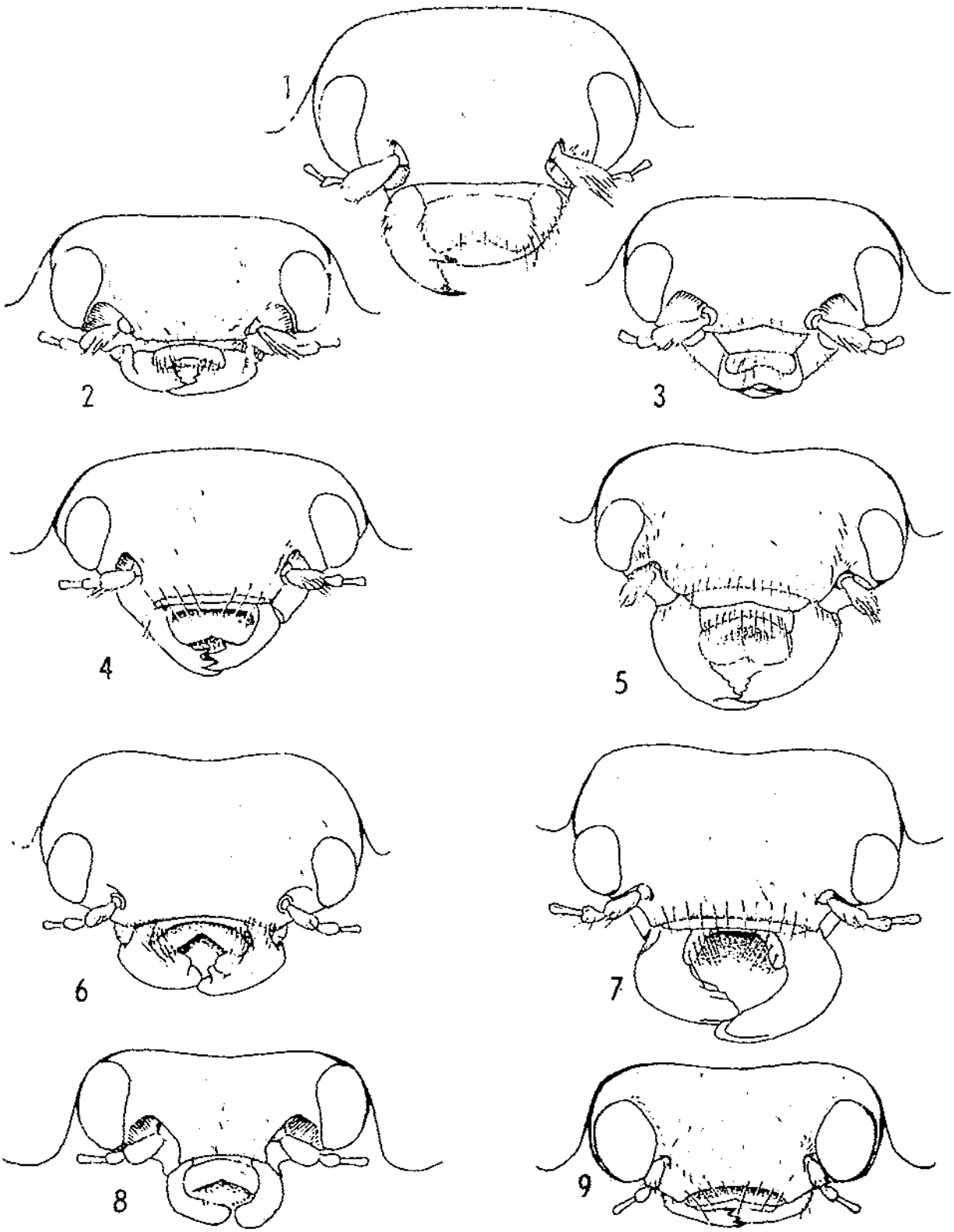
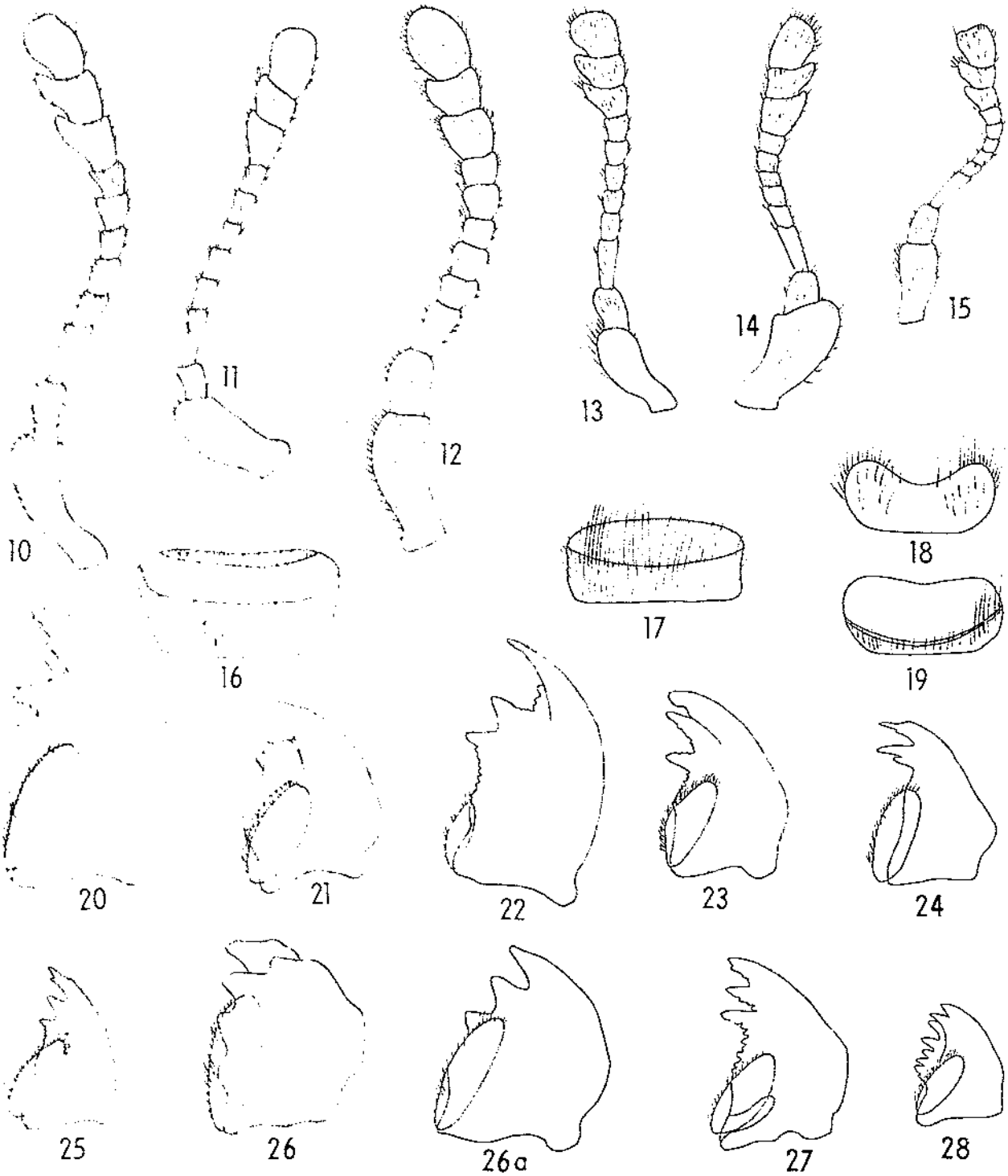
INDEX OF NAMES

	Page
abrupta	172
abrupta group	172
aculata	115
adnexa	107
adusta	230
aequatorialis	113
albovittata	70
albovittata group	69
amazona	223
ambigua	83
amplexata	231
amplipunctata	132
amplipunctata group	132
amydra	221
andicola	28
angustata	117
angustata group	116
apada	225
apatela	215
apicalis	209
approximata	113
approximata group	112
aubei	179
aureola	70
aureopilosa	90
austrina	54
axillaris	146
axillaris group	145
azurea	127
azurea group	127
azyoides	235
banosi	24
basalis	159
basalis group	158
batesi	213
bisbivittata	130
bistriguttata	107
bistrisignata	108
bistrispilota	73
bituberculata	119
bizonata	84
bolivicola	106
bonplandi	104
boraustralis	141
borealis	133
borealis group	132
bourcieri	88
buckleyi	125
burgdorfi	215
cacica	192
cacica group	190
callangae	156
calligrapta	176
calligrapta group	175
carnegiana	237
caucaensis	101
cayennensis	221
chacoi	32
championi	185
chapini	31
chigata	94
cinctipennis	149
circumcincta	187
circumducta	233
circumflua	226
clandestina	157
clarkii	200
clypealis	207
colombiana	240
concentrica	221
concolor	195
confixa	129
conifera	189
conjuncta	108
consimilis	81
consularis	72
contempta	227
convergens	81
cordula	144
cordula group	144
corniventris	190
cruciata	77
cruciata group	77
cuscoi	58
cushmani	97
cuzcoensis	26
Damatula	236
darlingtoni	196
delphinae	215
desarmata	222
deuterea	60
deuterea group	59
deyrollei	222
diekei	216
difficilis	182
Dira	199
discincta	140
discoidea	101
discolor	76
discolor group	76
disjuncta	239
disparans	36
dissita	232
dives	52
divisa	98
divisoides	111
dorsigera	57
dorsigera group	56
dubia	114
earina	238
ecuadorica	55
elegans	233
emerita	72
Epilachna	37
Epilachninae	16
Epilachnini	17
erichsoni	170
eusema	55
eximia	92
extrema	198
fairmairei	237
fausta	53
fenestrata	89
fenestrata group	85
fenestroides	104
flavofasciata	48
flavofasciata group	48
flavomarginata	226
forsteri (Epilachna)	68
forsteri (Toxotoma)	29
fraterna	219
freudei	99
fryii	149
furcata	128
furtiva	188
fuscopilosa	84
gentilis	33
geometrica	109
glaucina	210
gnoma	114
godmani	186
gorhami	184
gossypiata	204
gossypioides	204
gounellei	225
guerini	36
haliki	210
harringtoni	105
haywardi	30
hektea	64
hiekei	36
holmgreni	131

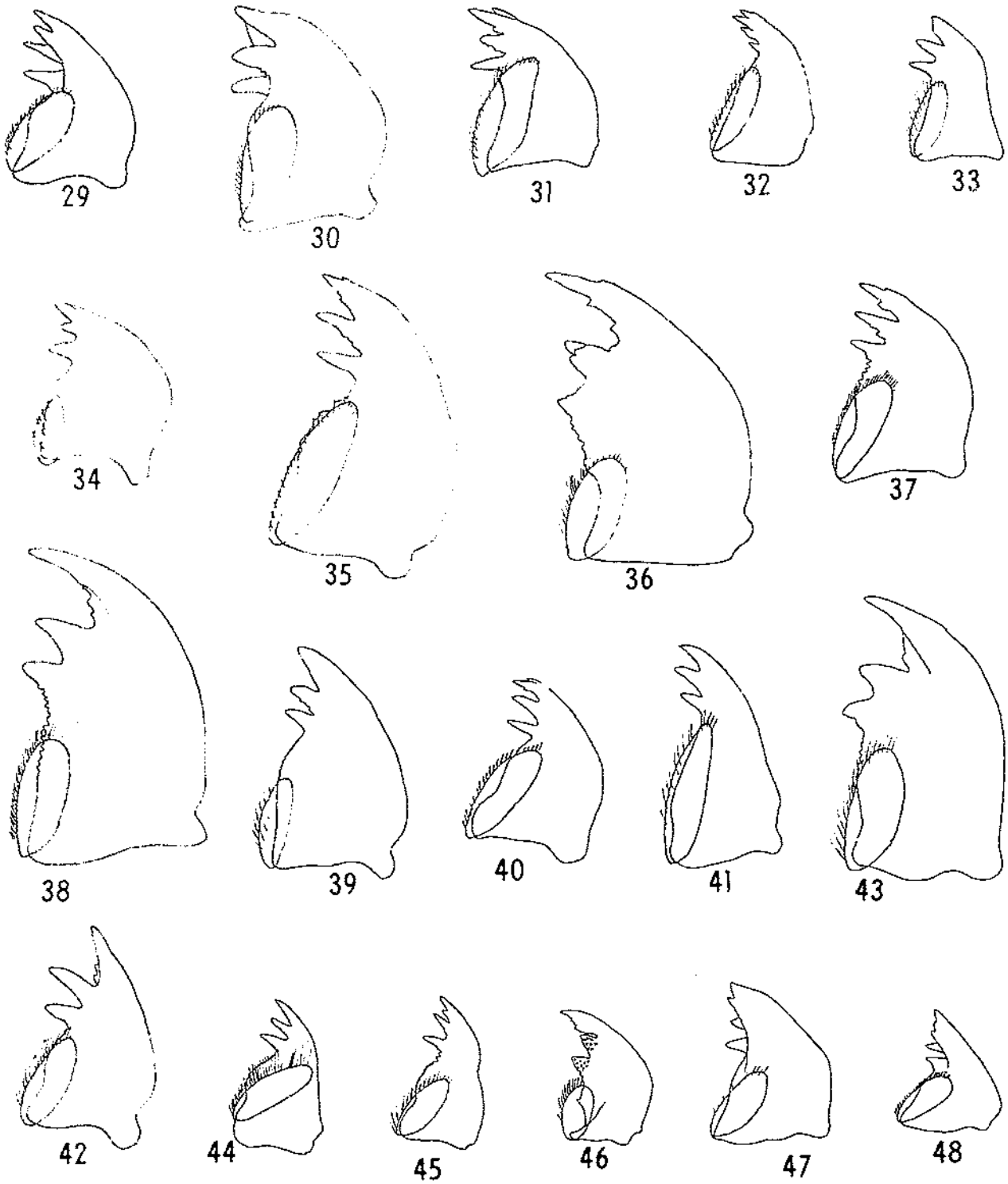
	Page
holmgreni group	131
honesta	102
huanucoi	24
humboldti	33
hybridula	115
ignobilis	102
imitator (Lorma)	211
imitator (Toxotoma)	29
incaorum	86
inepta	229
inexculta	205
inserta	121
insolitaphallus	234
jarugui	120
jujuyi	35
korschefskyi	106
kraatzi	118
kraussi	142
languida	129
latimargo	119
latimargo group	118
latreillei	125
leechi	27
lepida	128
lineatopunctata	231
locotalis	23
longicrura	32
lorata	71
Lorma	207
Mada	217
Madaini	206
madida	150
Malata	213
mammifera	189
mandibularis	160
manni	87
marginella	194
merae	198
mexicana	165
mexicana group	165
mimetica	31
mitis	214
modesta	182
monovittata	96
murilloi	30
mutabilis	152
mutabilis group	152
nana	104
narinoi	95
nevermanni	208
nexophallus	234
nigripes	199
nigrocincta	173
nigrocincta group	173
nigrovittata	151
nucula	205
nunenmacheri	22
obliqua	75
obliqua group	75
obscurella	178
obscurocincta	201
obtusiforma	65
octoverrucata	56
olivacea	177
olivacea group	177
olmosi	111
opacula	22
opulenta	33
orbicula	29
orthostriata	67
ostensa	109
ostensoides	110
ovaloides	61
oviforma	91
pachiteensis	153
paenulata	143
papyrzyckii	212
paracuta	117
parastriata	158
parvicollis	62
pastica	154
patricia	79
patricia group	78
patula	181
patula group	180
peltata	126
pemptea	95
persimilis	74
peruviana	68
pictipennis	148
pilifera	35
plagiata	170
plagiata group	169
pocohantae	141
polluta	230
porioides	239
praecipua	151
pretiosa	130
propinqua	155
pseudodamata	235
Pseudodira	207
pseudofraterna	220
pseudograpta	176
pseudomitis	216
pseudorealis	196
pseudospilota	73
pseudostriata	156
pulchra	34
punctatissima	91
quirozensis	124
quirozensis group	124
rabauti	232
radiata	147
reichei	83
richteri	202
riveti	53
rosae	25
rufoventris	209
rugulosa	26
santaremae	224
satipensis	122
satipensis group	122
schunkei	90
schwarzi	240
sellata	58
sexlineata	159
sexmaculata	64
sicardi	211
simplex	81
simulans	88
smarti	239
soachae	115
sopita	212
soukupi	25
specca	208
spinula	224
spreta	191
staudingeri	188
staudingeri group	186
stolata	147
strictanotata	103
striola	74
subcincta	202
synemia	223
taeniola	100
tenebricosa	183
tetartea	67
tomentosa	203
townsendi	23
Toxotoma	18
transverselineata	59
tredecimnotata	135
tridentata	28
tritea	61
tumida	171
univittata	97
vanpatteni	184
varipes	165
varivestis	161
varivestis group	160
velata	197
velutina	195
venusta	21
vincta	174
virgata	228
viridilineata rossi	63
viridilineata viridilineata	63
viridinitens	82
vittigera	98
vittigera group	92
v-pallidum angulata	67
v-pallidum group	65
v-pallidum v-pallidum	66
vulnerata	180
walteri	120
weisei	80
weyrauchi	24
woytkowskii	123
yurimagi	238
zischkai	87
zonula	228



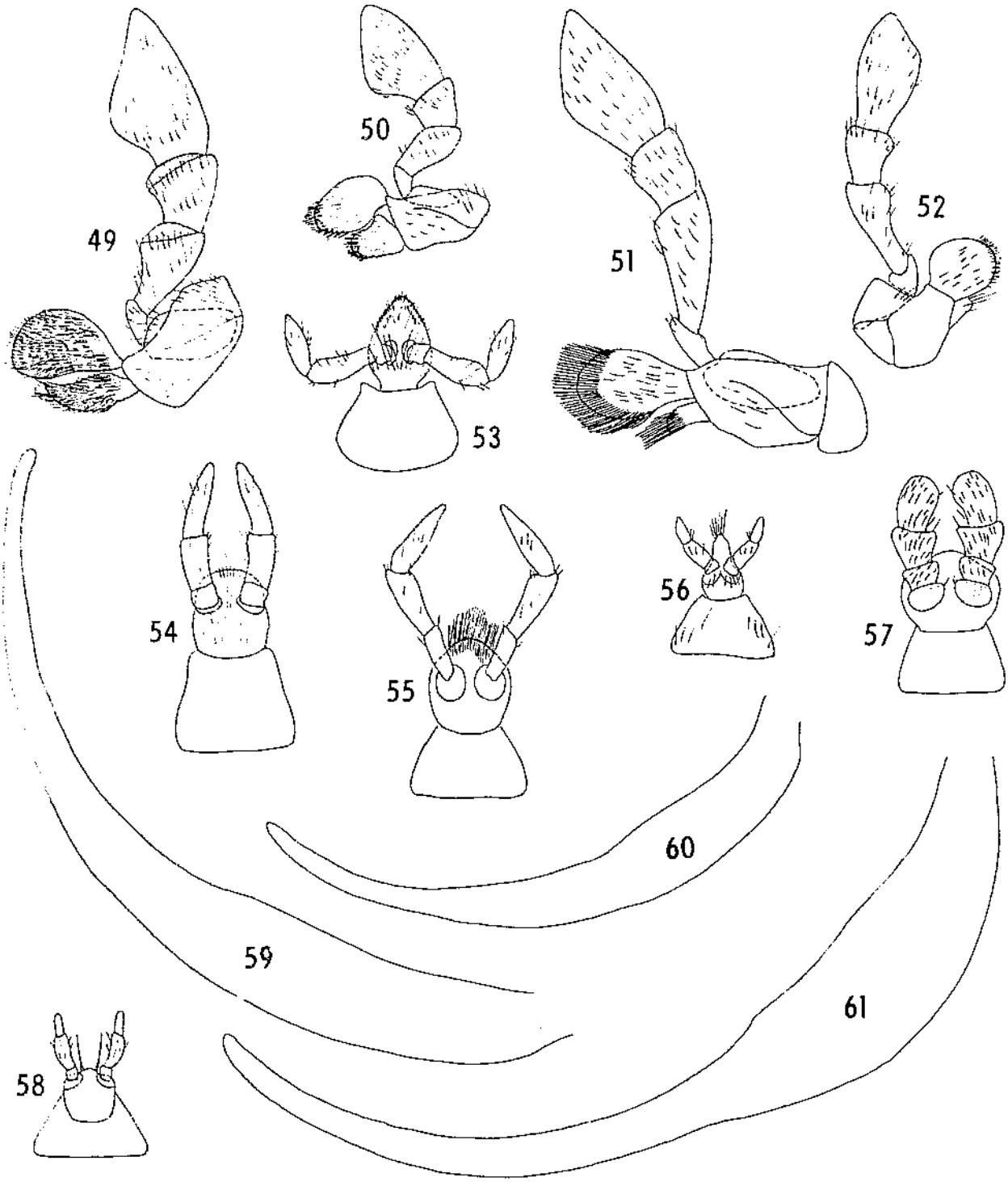
FIGURES 1–9.—Mouthparts and heads: *Epilachna borealis* (1), *E. aureola* (2), *E. woytkowskii* (3), *E. patricia* (4), *Toxotoma venusta* (5), *T. rosae* (6), *T. rugulosa* (7), *Pseudodira clypealis* (8), *Damatula carina* (9).



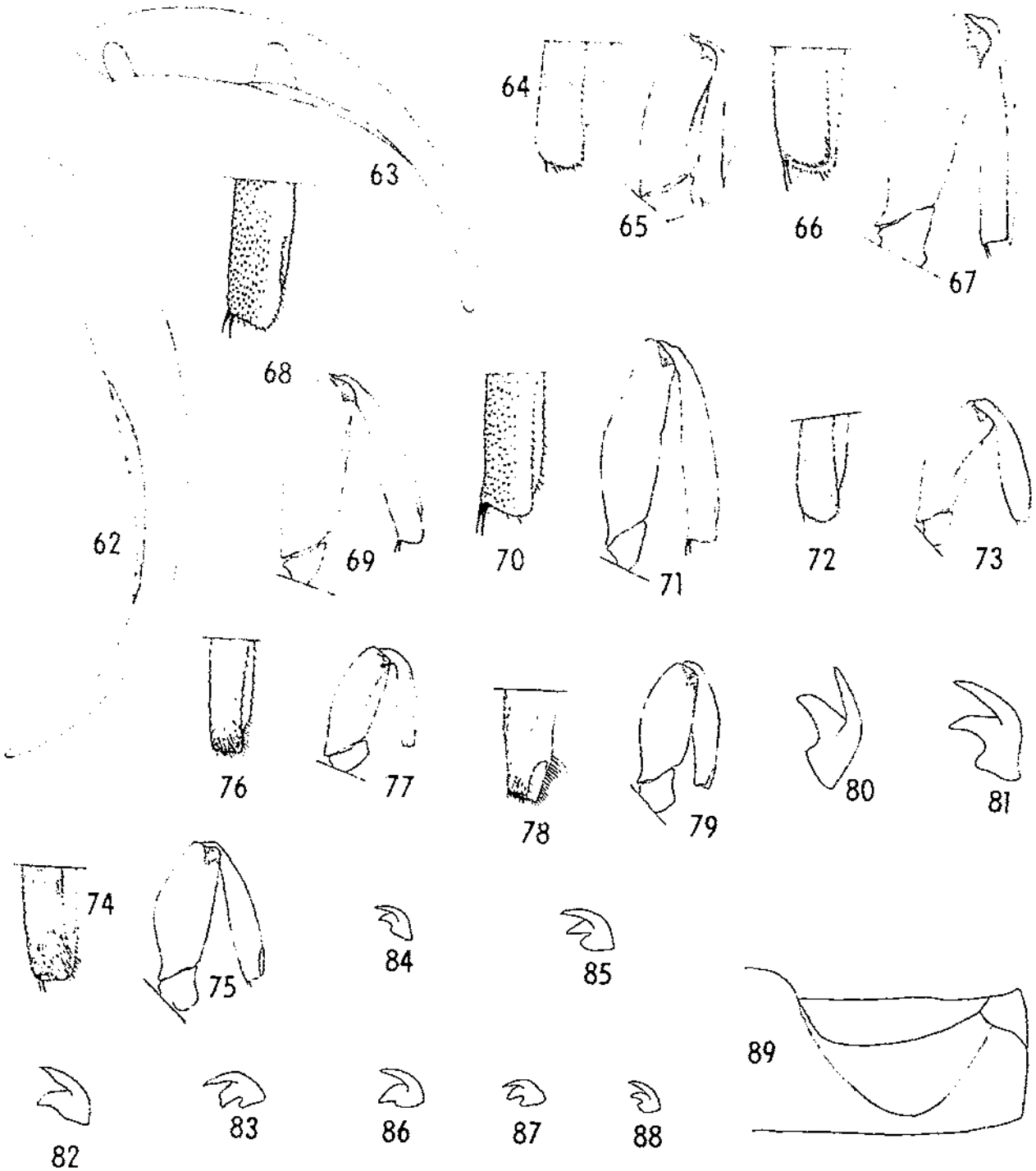
FIGURES 10–28.—Antennae: *Epilachna borealis* (10), *E. staudingeri* (11), *E. abrupta* (12), *E. obscurella* (13), *Dira obscurocincta* (14), *Damatula carnegiana* (15). Labra: *Epilachna borealis* (16), *E. flavofasciata* (17), *E. angustata* (18), *E. patricia* (19). Mandibles: *Terotoma cuzcoensis* (20), *T. jujuyi* (21), *Epilachna borealis* (22), *E. varirestis* (23), *E. patricia* (24), *E. obscurella* (25), *E. basalis* (26, dorsal; 26a, ventral), *E. placida* (27), *Larma haliki* (28).



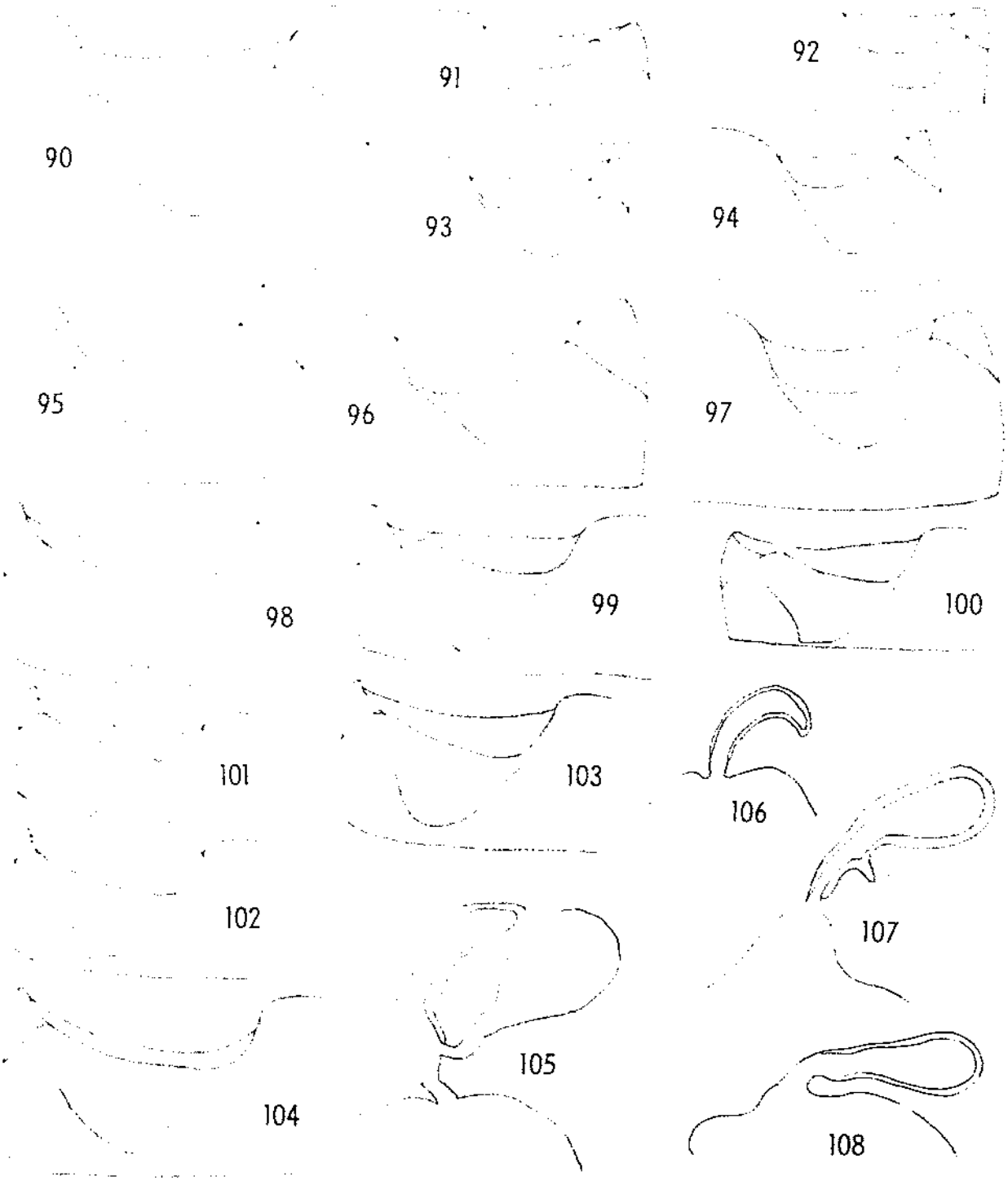
FIGURES 29–48.—Mandibles: *Mada polluta* (29), *Toxotoma murilloi* (30), *Epilachna lorata* (31), *E. angustata* (32), *E. vittigera* (33), *E. orthostriata* (34), *E. abrupta* (35), *E. tumida* (36), *E. mexicana* (37), *E. pastica* (38), *E. flavofasciata* (39), *E. cruciata* (40), *E. fenestrata* (41), *E. staudingeri* (42), *E. cacica* (43), *E. nigrocincta* (44), *E. vineta* (45), *E. difficilis* (46), *Malata mitis* (47), *Damatula carnegiana* (48).



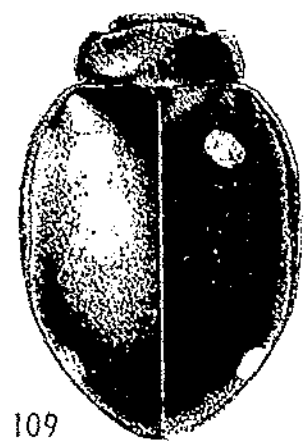
FIGURES 49–61.—Maxillae: *Epilachna borealis* (49), *E. difficilis* (50), *Toxotoma cuzcoensis* (51), *E. nigrocincta* (52). Labia: *Epilachna borealis* (53), *E. flavofasciata* (54), *Toxotoma cuzcoensis* (55), *E. nigrocincta* (56), *Dira obscurocincta* (57), *Malata mitis* (58). Epipleura: *Epilachna borealis* (59), *E. fenestrata* (60), *E. flavofasciata* (61).

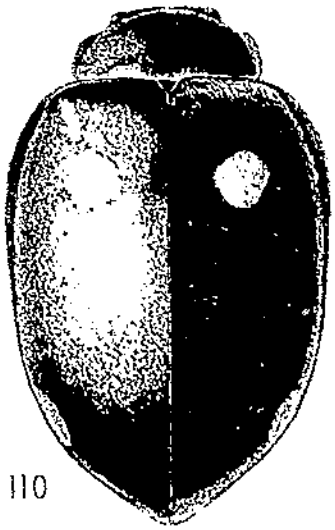


FIGURES 62–89.—Epipleura: *Dira obscurocincta* (62), *Lorma haliki* (63). Legs: *Epilachna borealis* (64–67), *Toxotoma cuzcoensis* (68–71), *Dira obscurocincta* (72–75), *Mada polluta* (76–79). Claws: *Epilachna borealis* (80), *E. abrupta* (81), *E. nigrocincta* (82), *Dira obscurocincta* (83), *Lorma haliki* (84), *Mada polluta* (85), *Malata mitis* (86), *Damatula schwarzi* (87), *D. carnegiana* (88). Postcoxal line: *Epilachna borealis* (89).



FIGURES 90–108.—Postcoxal lines: *Epilachna pastica* (90), *E. vittigera* (91), *E. fenestrata* (92), *E. difficilis* (93), *E. vincta* (94), *E. cacica* (95), *Toxotoma murilloi* (96), *T. cuzcoensis* (97), *Dira obscurocincta* (98), *Pseudodira clypealis* (99), *Damatula carnegiana* (100), *D. schwarzi* (101), *Lorma haliki* (102), *Malata mitis* (103), *Mada polluta* (104). Spermathecae: *Epilachna sexmaculata* (105), *E. quirozensis* (106), *E. cacica* (107), *Toxotoma cuzcoensis* (108).


109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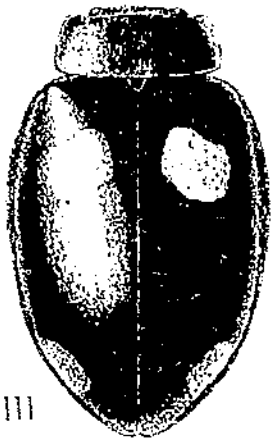
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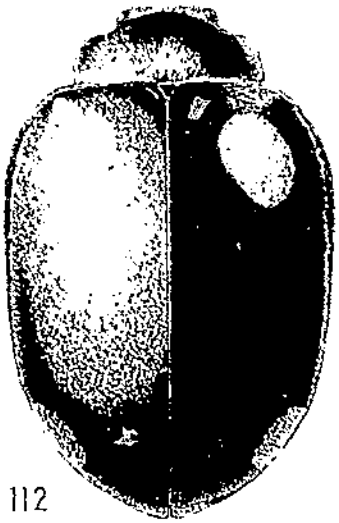
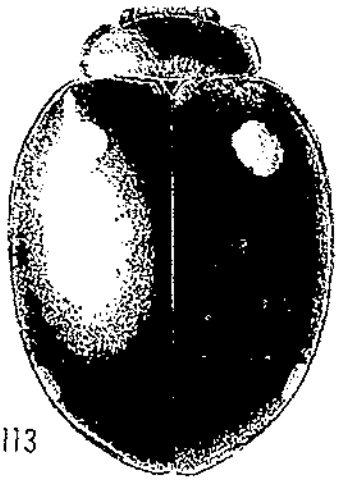
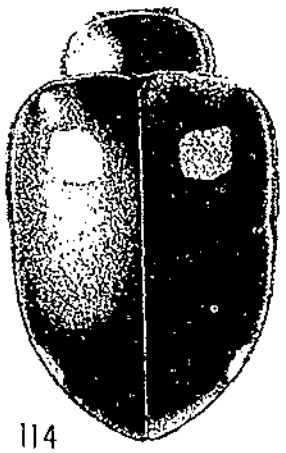
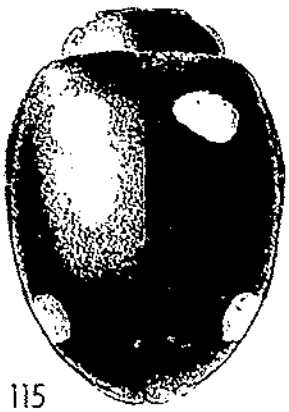

112


113


114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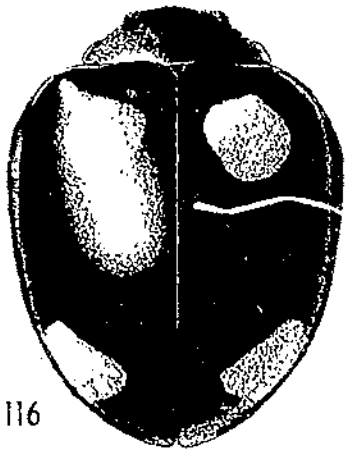
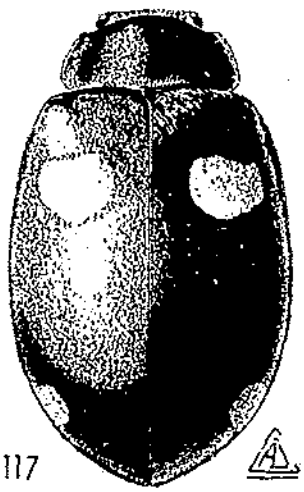
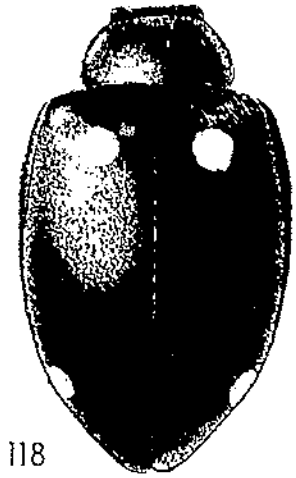
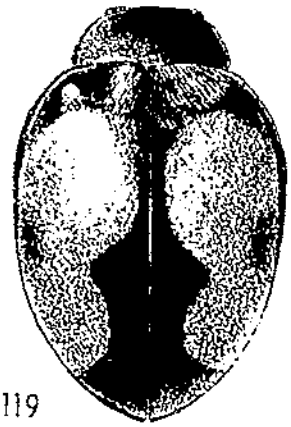

116

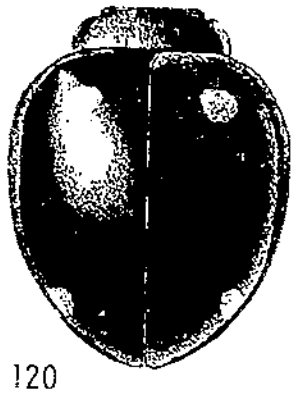

117

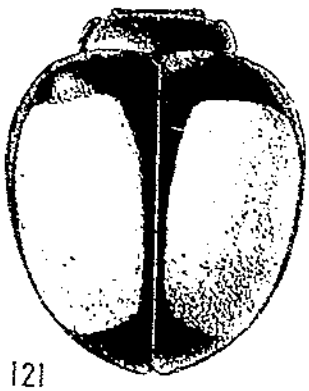
PN-3251

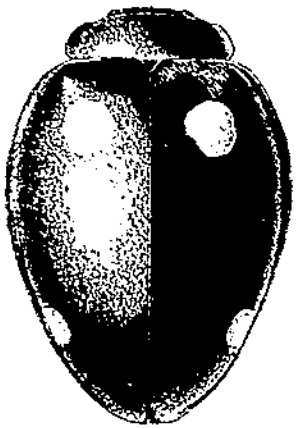
FIGURES 109–117.—Habitus views: *Toxotoma venusta* (109), *T. opacula* (110), *T. townsendi* (111), *T. weyrauchi* (112), *T. huanucoi* (113), *T. soukupi* (114), *T. rosae* (115), *T. rugulosa* (116), *T. cuzcoensis* (117).

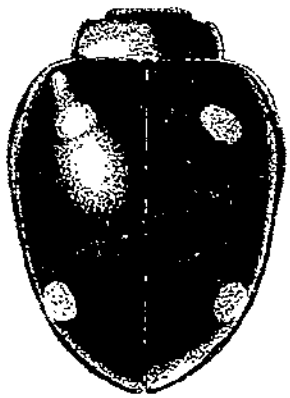


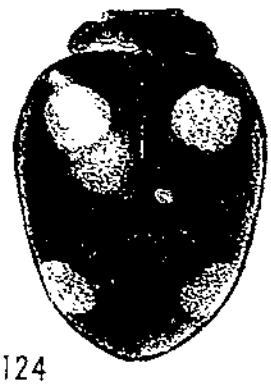


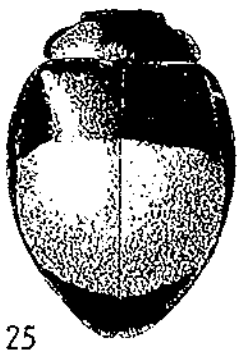


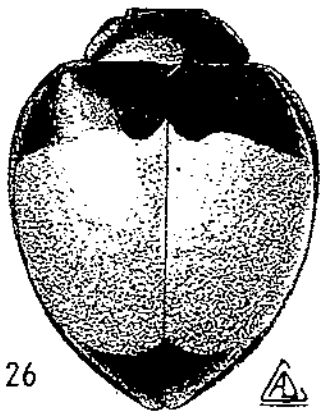






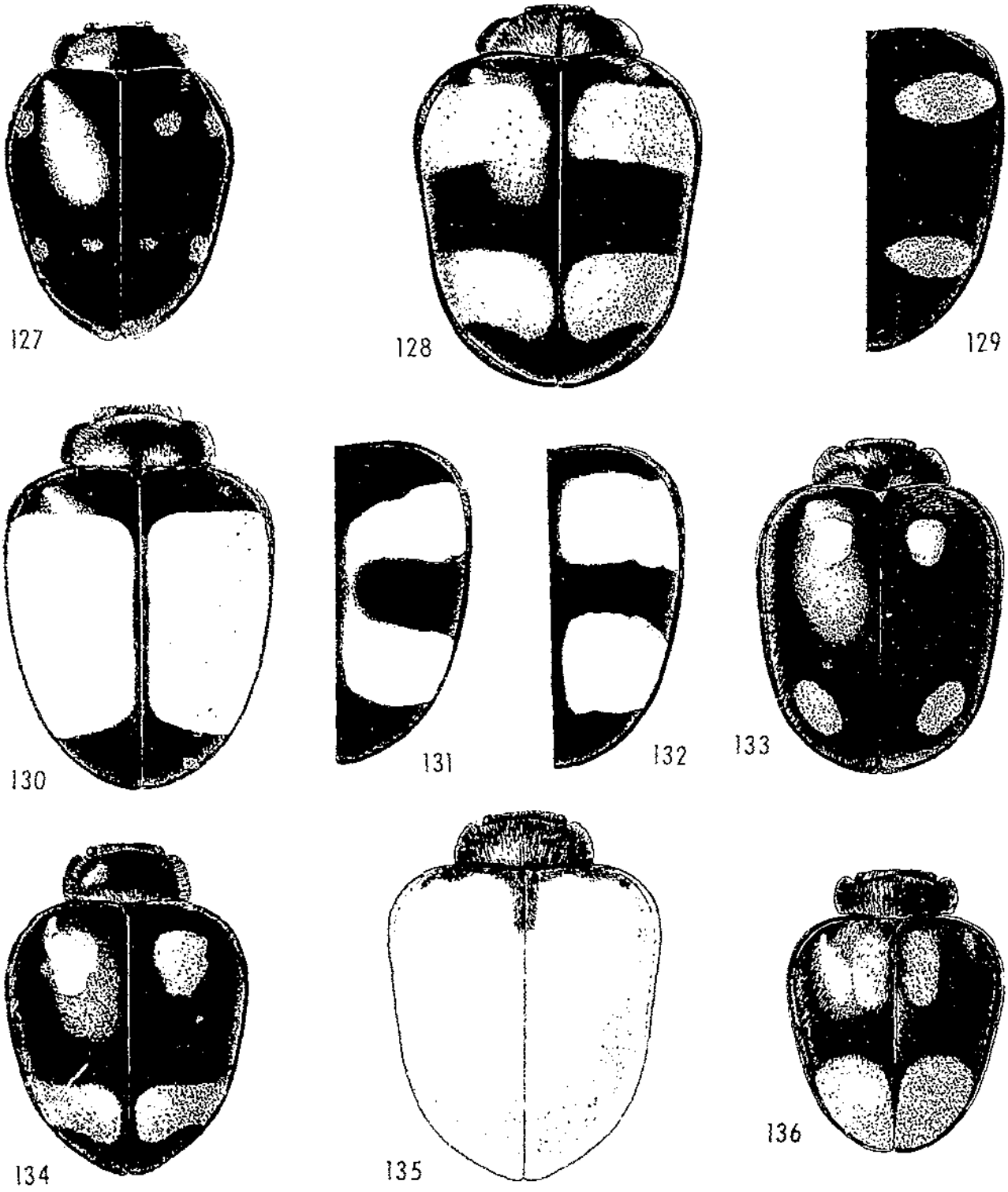






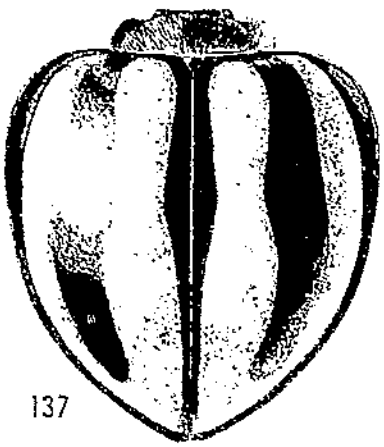
FN-3252

FIGURES 118–126.—Habitus views: *Toxotoma leechi* (118), *T. forsteri* (119), *T. orbicula* (120), *T. murilloi* (121), *T. haywardi* (122), *T. mimetica* (123), *T. pulchra* (124), *T. pilifera* (125), *T. jujuyi* (126).



PN-3263

FIGURES 127–136.—Habitus views: *Toxotoma disparans* (127), *Epilachna flavofasciata* (128–132), *E. dives* (133), *E. fausta* (134), *E. austrina* (135), *E. eusema* (136).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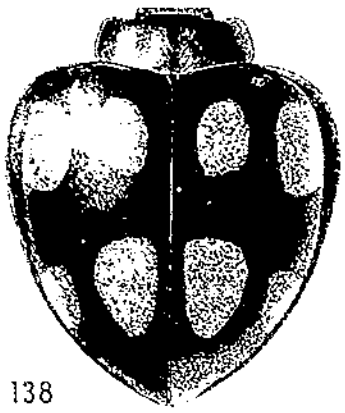
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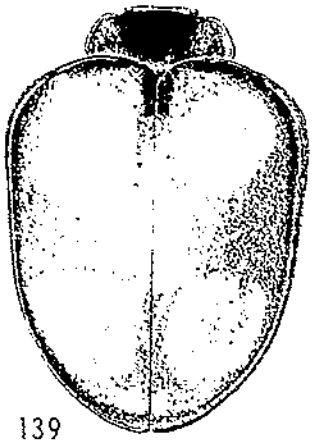
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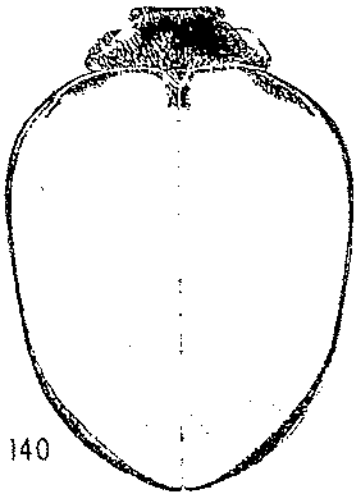
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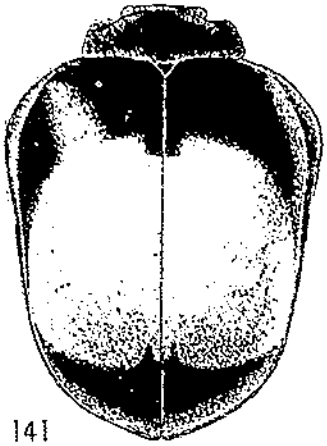
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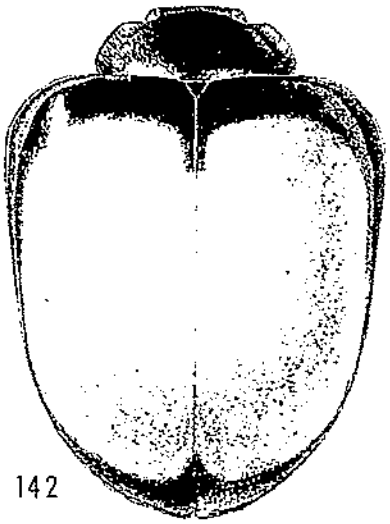
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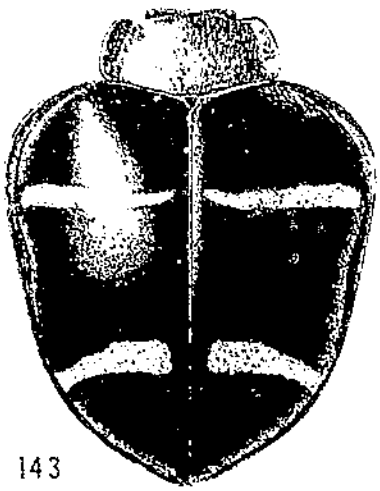
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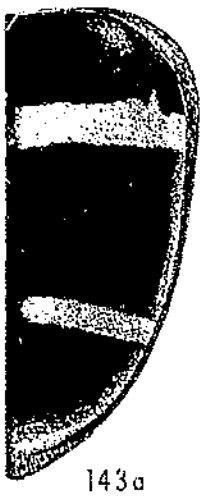
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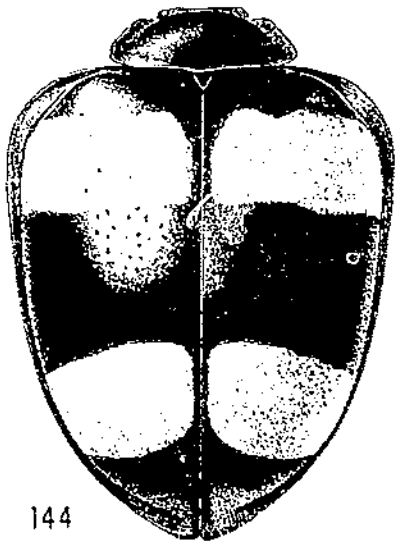
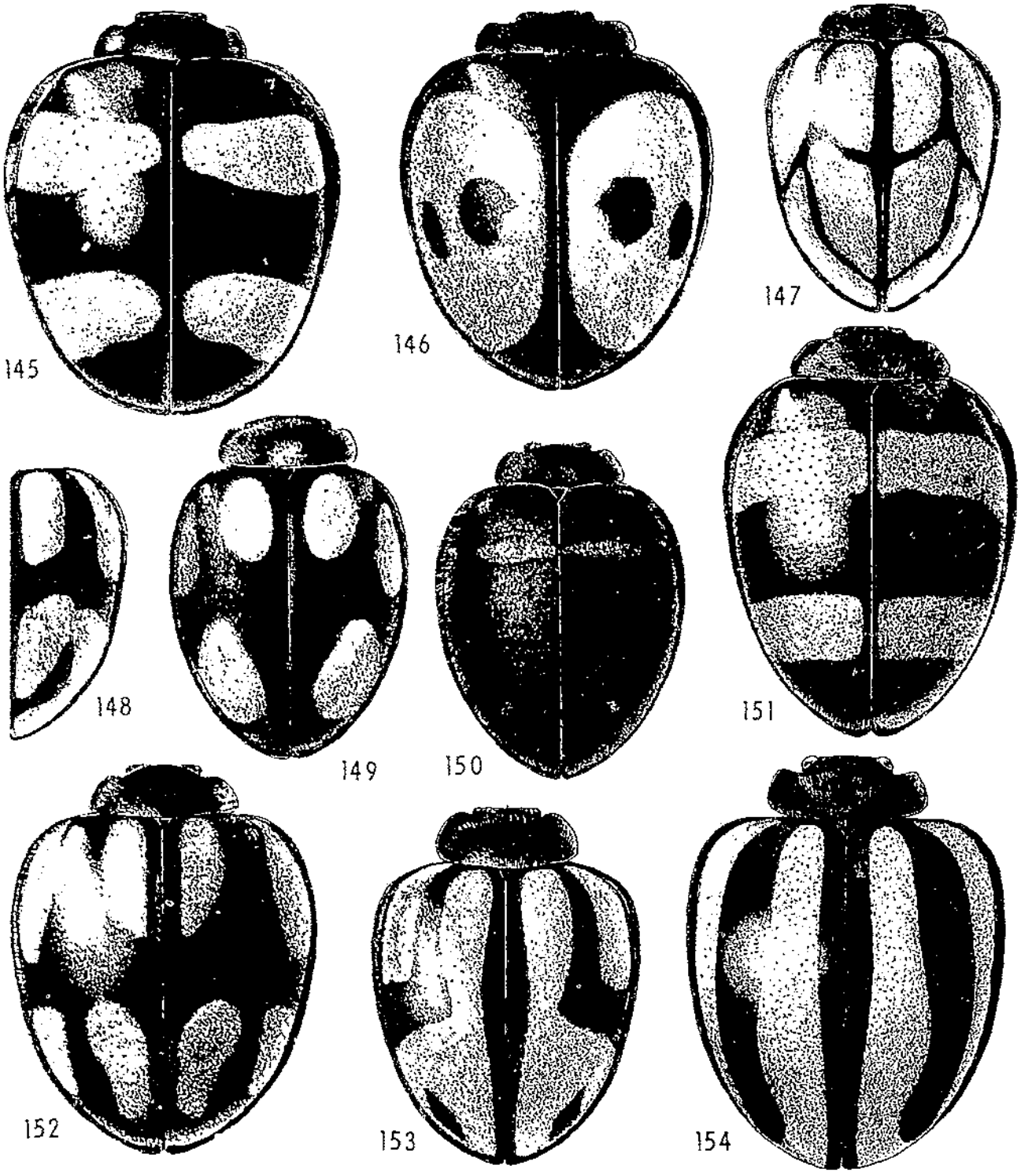

144

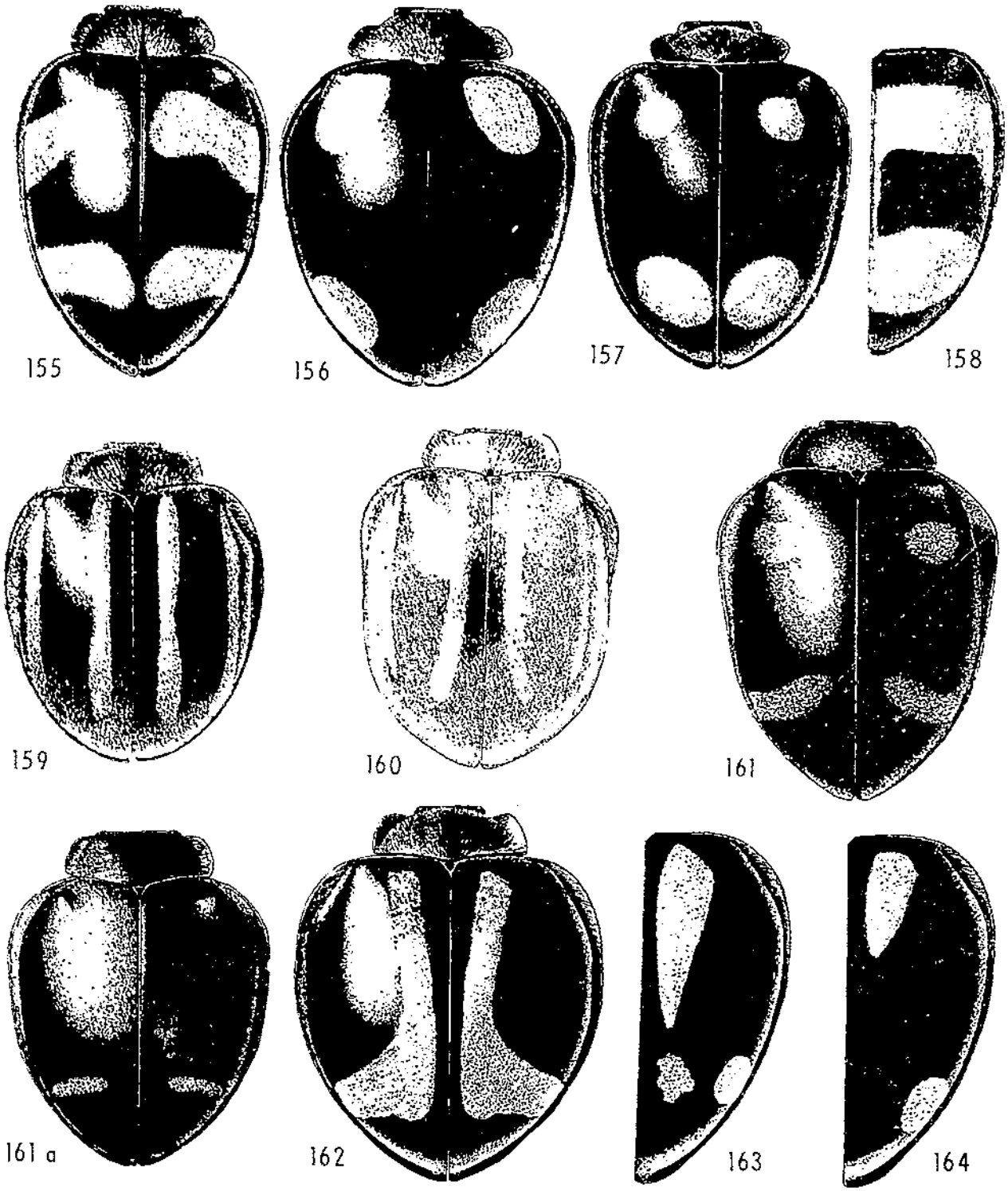
PN-3254

FIGURES 137–144. Habitus views: *Epilachna ecuadorica* (137), *E. octoverrucata* (138), *E. dorsigera* (139–140), *E. sellata* (141), *E. cuscoi* (142), *E. transverselineata* (143, 143a), *E. deuterea* (144).



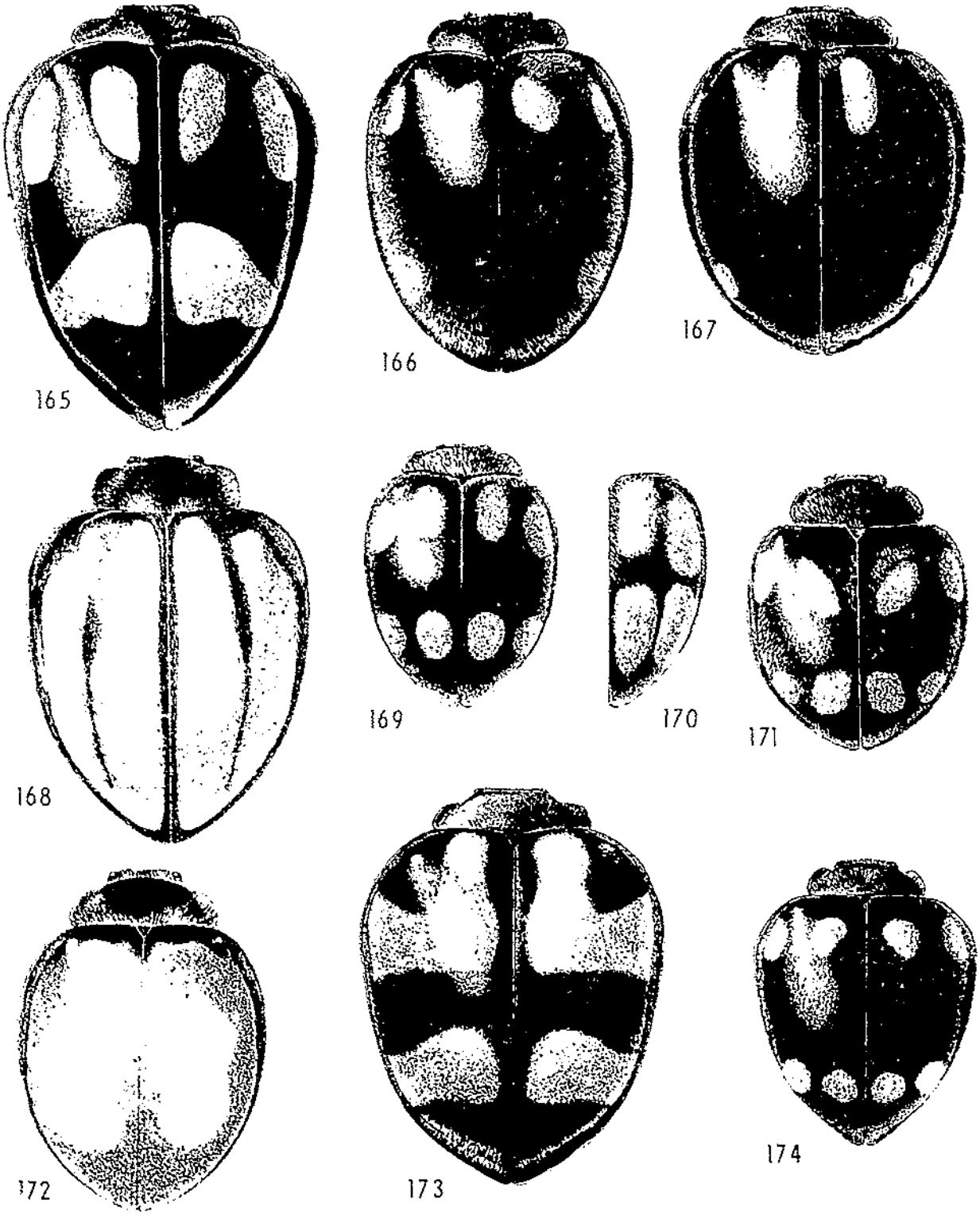
FN-3265

FIGURES 145–154. Habitus views: *Epilachna tritea* (145), *E. ovaloides* (146), *E. viridineata viridilineata* (147), *E. viridilineata rossi* (148), *E. sexmaculata* (149), *E. hektea* (150), *E. obtusiforma* (151), *E. v-pallidum v-pallidum* (152), *E. v-pallidum angulata* (153), *E. orthostriata* (154).



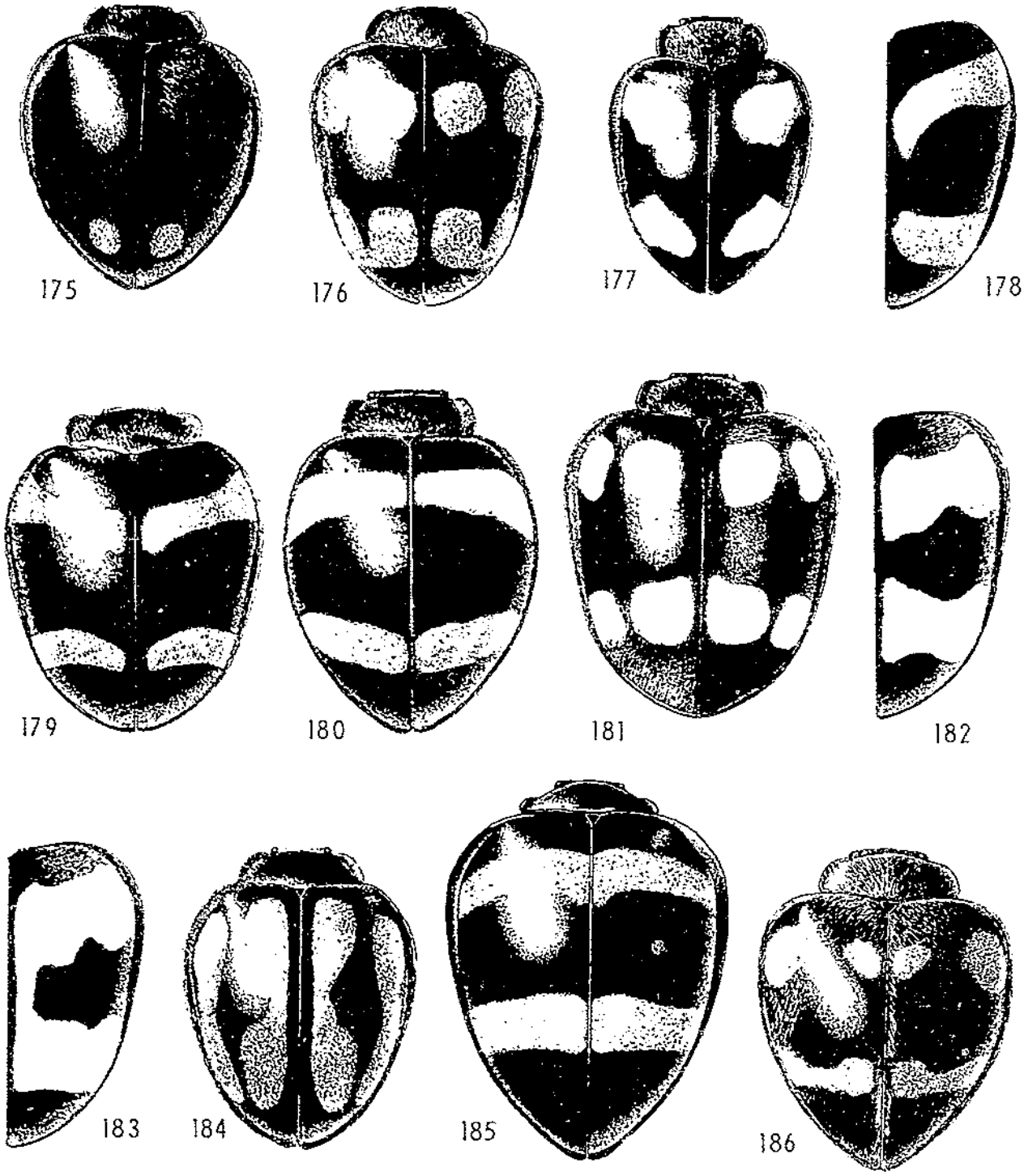
PN-3256

FIGURES 155-164.—Habitus views: *Epilachna tetartea* (155), *E. forsteri* (156), *E. peruviana* (157–158), *E. albovittata* (159), *E. aureola* (160), *E. lorata* (161, 161a), *E. emerita* (162–164).



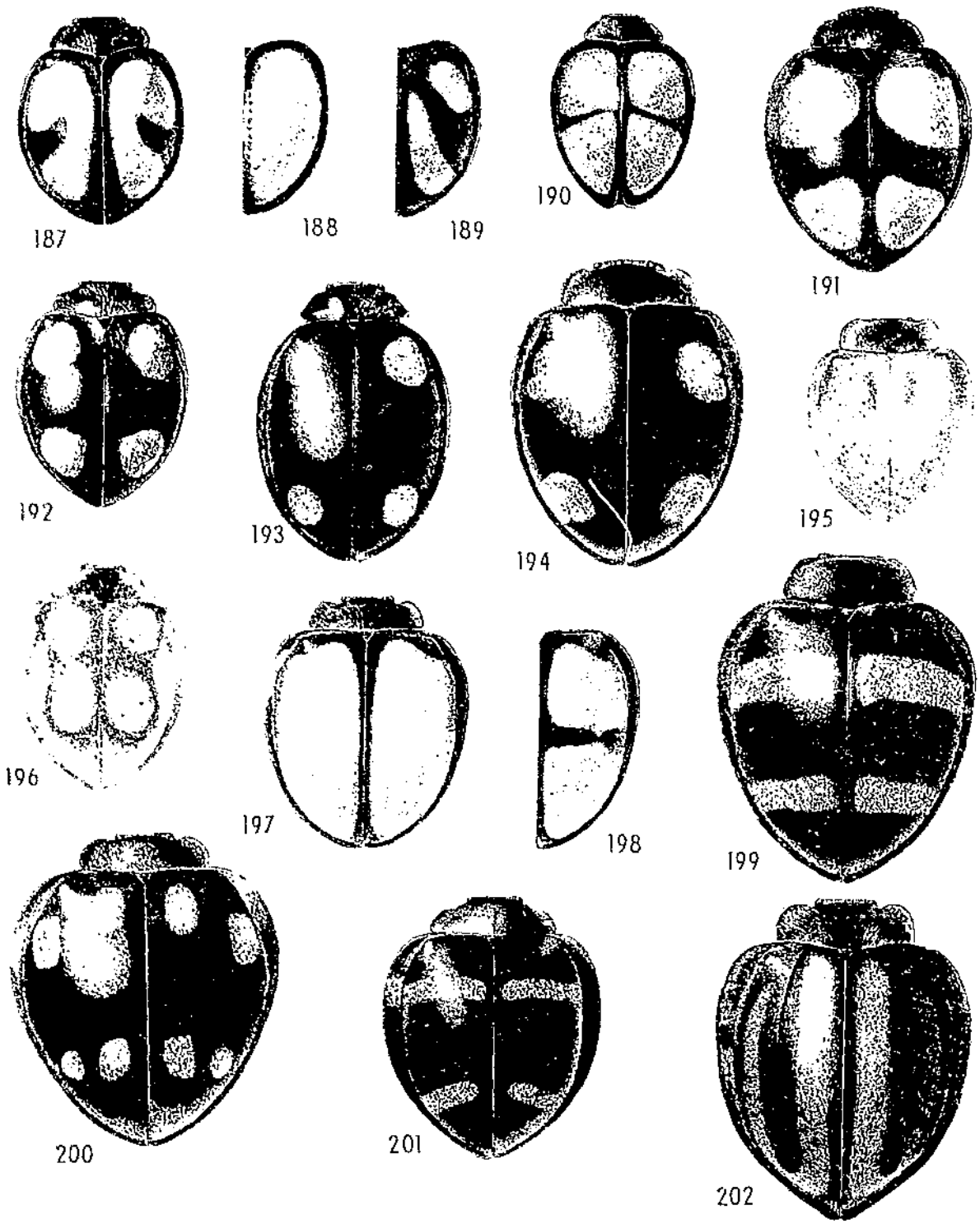
PN-3257

FIGURES 165–174.—Habitus views: *Epilachna consularis* (165), *E. bistrispilota* (166), *E. pseudospilota* (167), *E. striola* (168), *E. persimilis* (169–170), *E. obliqua* (171), *E. discolor* (172), *E. cruciata* (173), *E. patricia* (174).



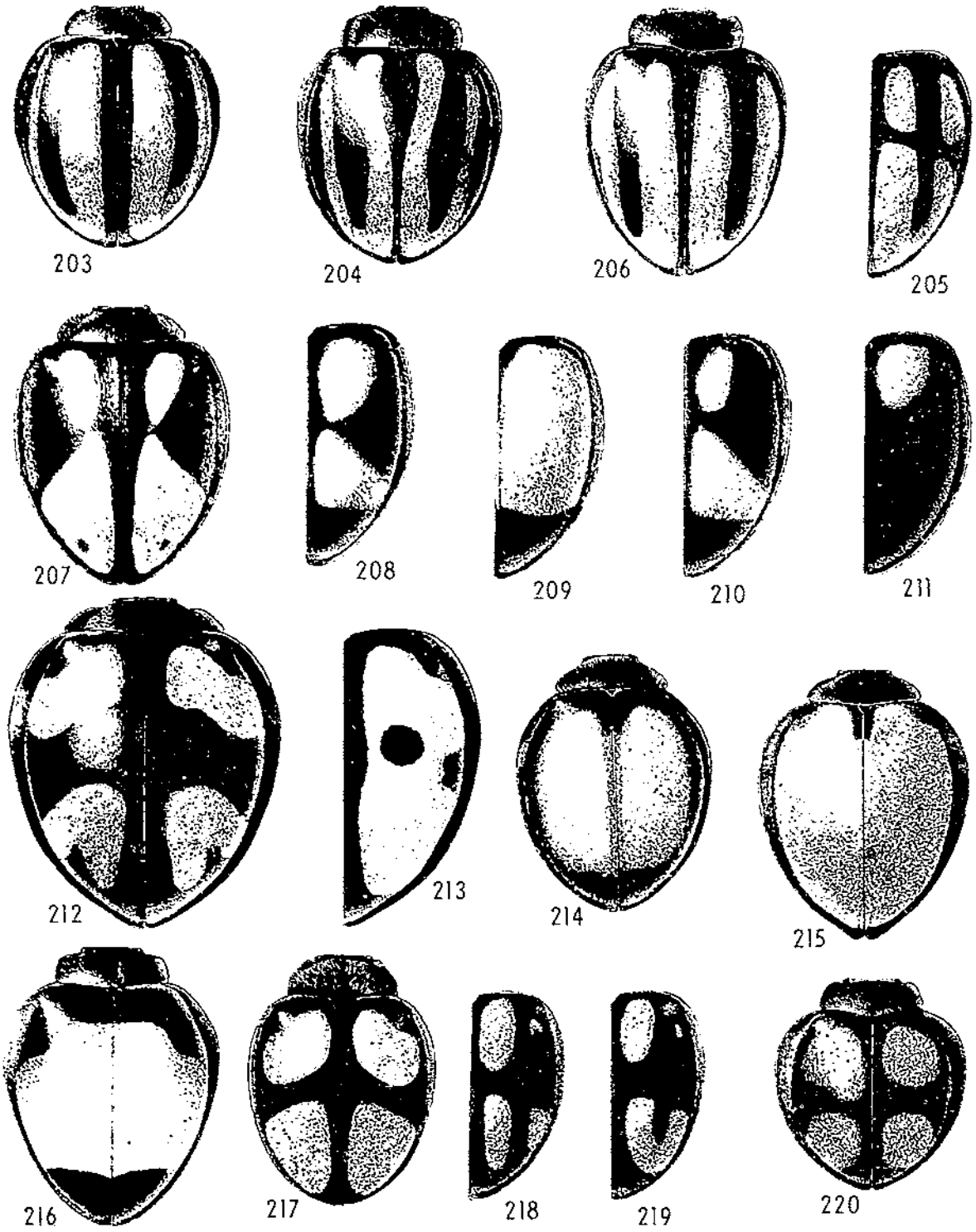
PN-3258

FIGURES 175–186. Habitus views: *Epilachna weisei* (175), *E. consimilis* (176), *E. simplex* (177), *E. convergens* (178–179), *E. viridinitens* (180), *E. reichei* (181–183), *E. ambigua* (184), *E. bizonata* (185), *E. fuscopilosa* (186).



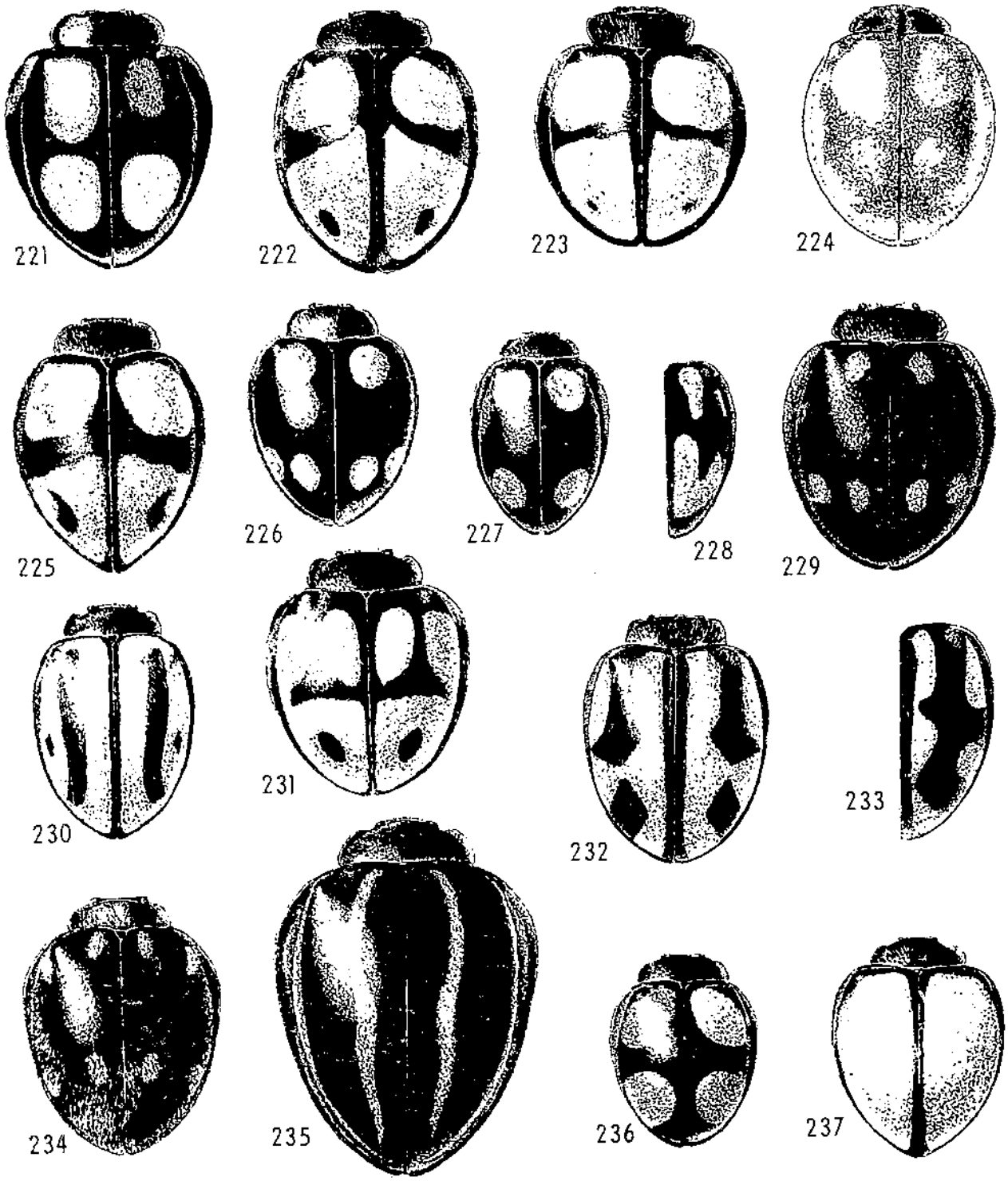
PN-3259

FIGURES 187-202. Habitus views: *Epilachna incaorum* (187–189), *E. zischkai* (190), *E. manni* (191), *E. fenestrata* (192), *E. schunkei* (193), *E. oriformis* (194), *E. punctatissima* (195–196), *E. eximia* (197–198), *E. chigata* (199), *E. narium* (200), *E. pemptea* (201), *E. monovittata* (202).



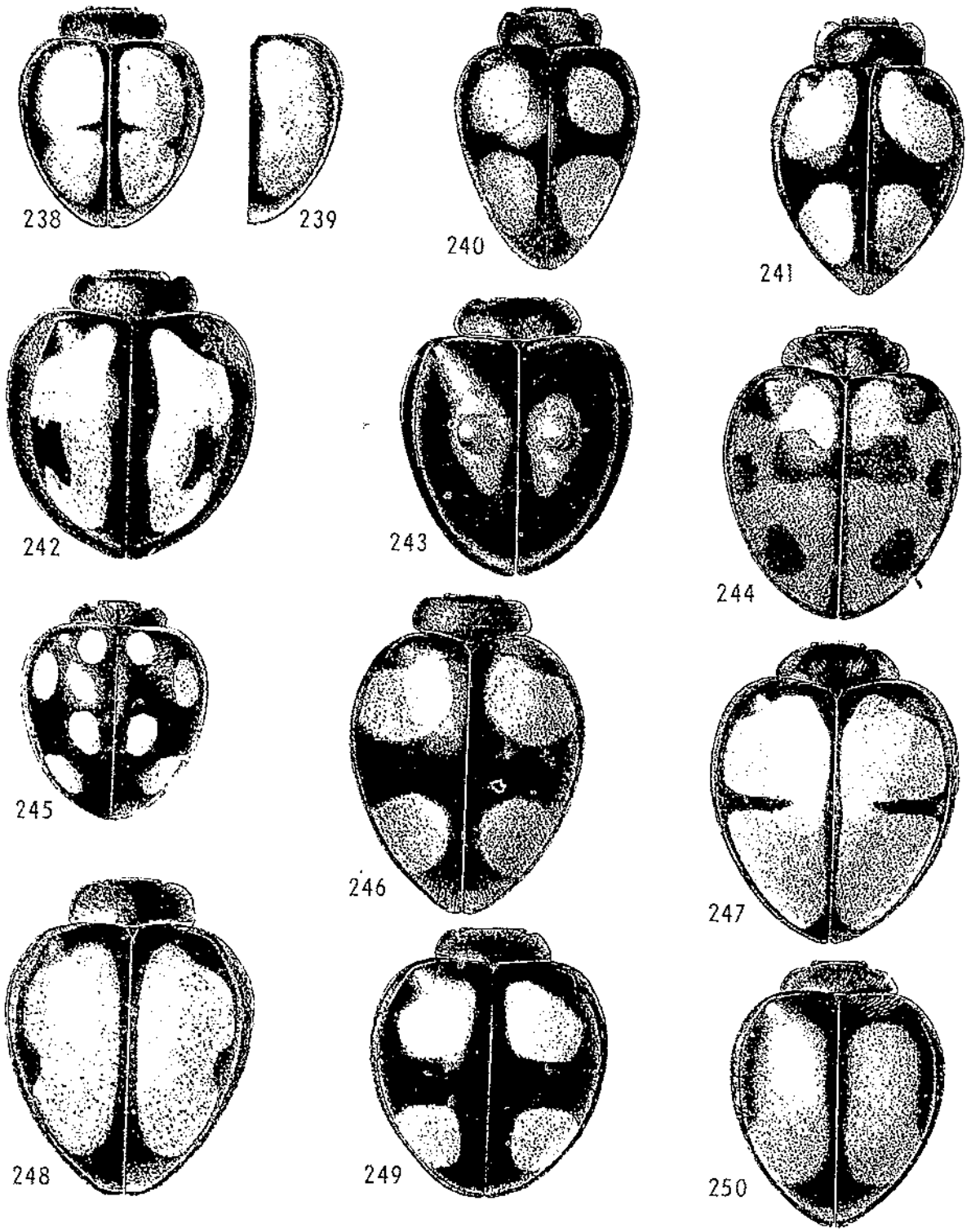
PN-3260

FIGURES 203-220.—Habitus views: *Epilachna univittata* (203), *E. cushmani* (204), *E. vittigera* (205-206), *E. frondea* (207-211), *E. laeuola* (212-213), *E. discoidea* (214), *E. ignobilis* (215), *E. strictanotata* (216), *E. fenestroides* (217-219), *E. nana* (220).



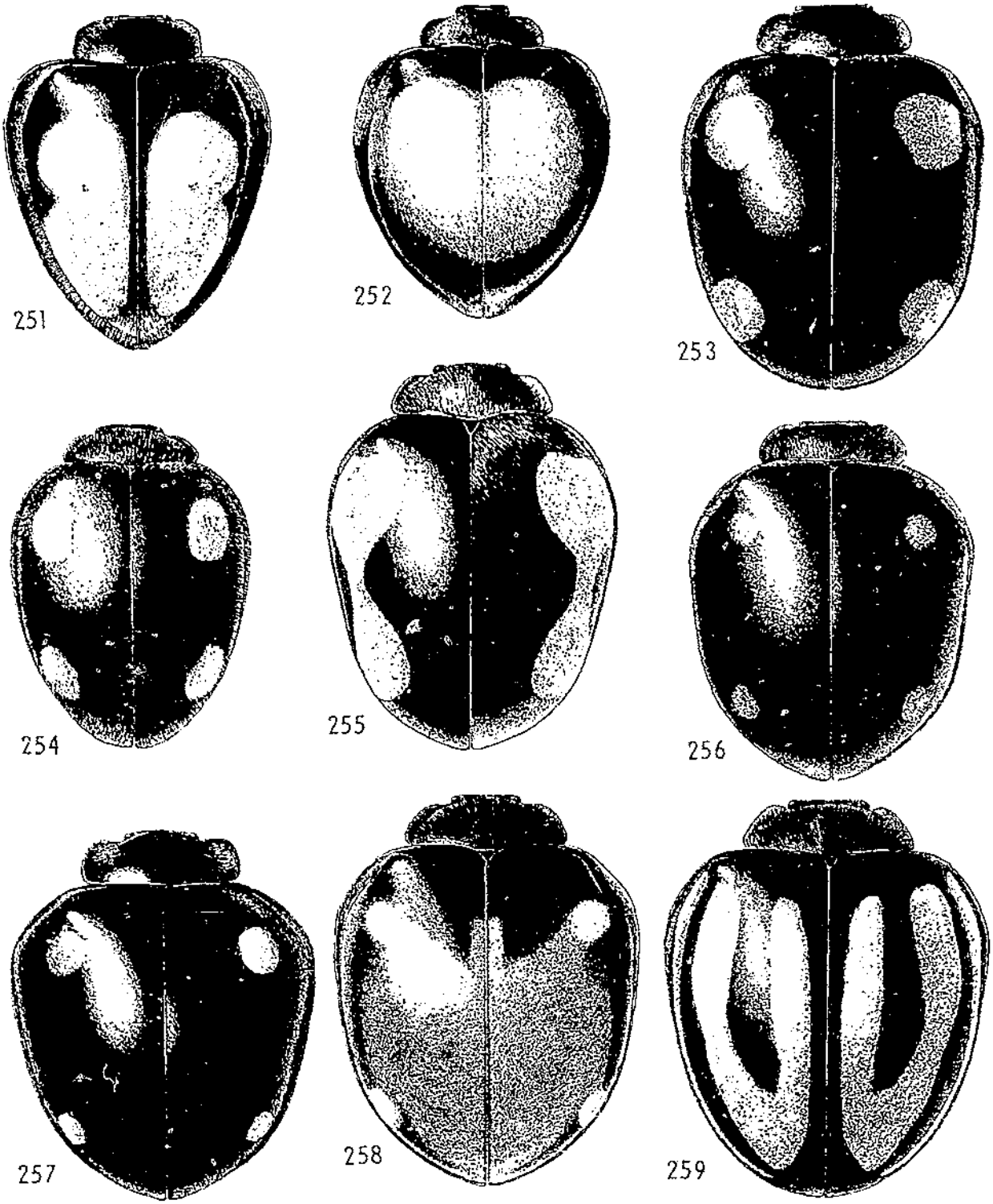
PN–3261

FIGURES 221–237.—Habitus views: *Epilachna bouplandi* (221), *E. harringtoni* (222), *E. bolivicola* (223), *E. korschefskyi* (224), *E. adnexa* (225), *E. bistriguttata* (226), *E. conjuncta* (227–228), *E. bistrisignata* (229), *E. geometrica* (230), *E. ostensa* (231), *E. ostensoides* (232–233), *E. olmosi* (234), *E. divisoides* (235), *E. gnoma* (236), *E. dubia* (237).



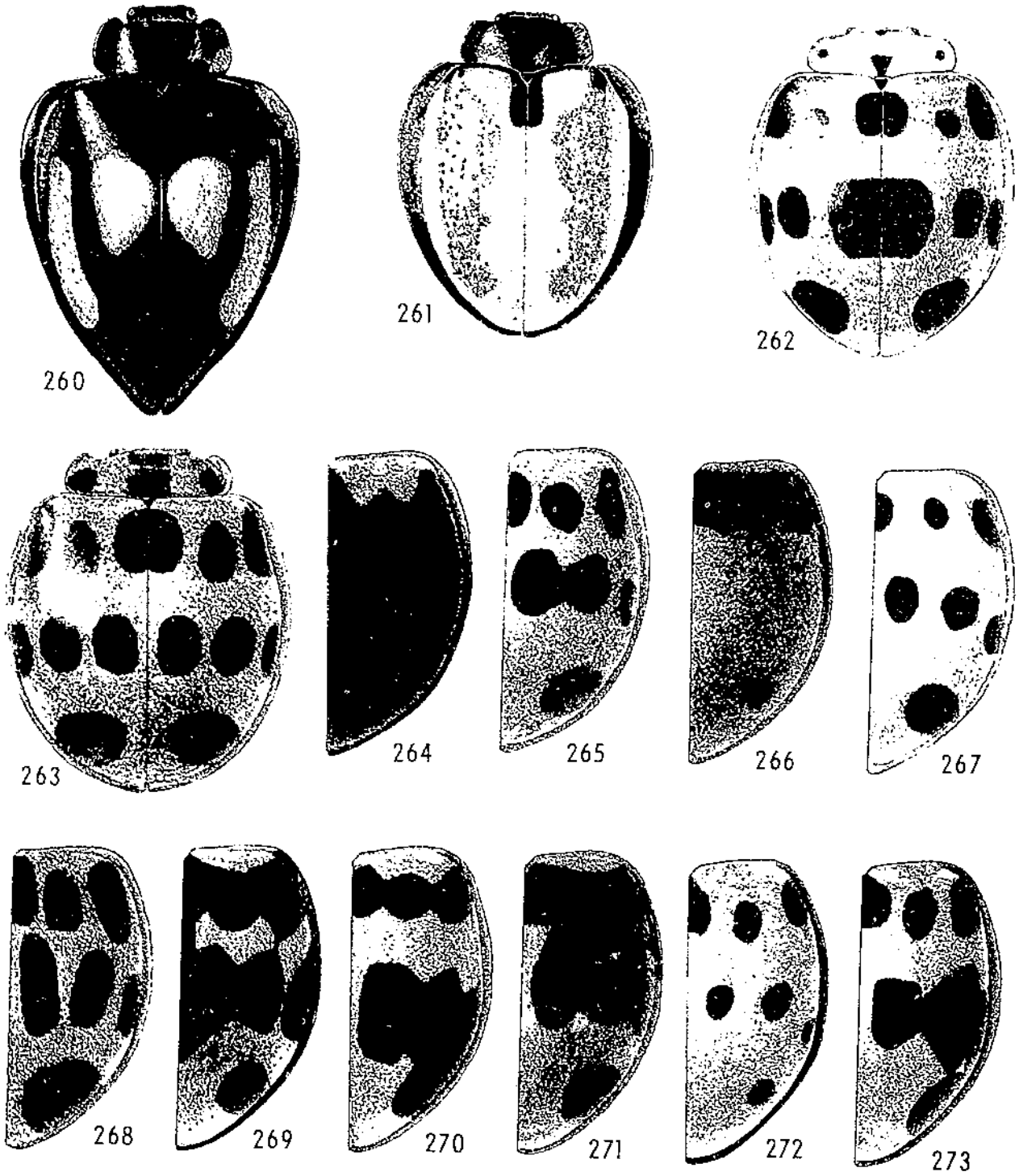
PN-3262

FIGURES 238–250.—Habitus views: *Epilachna soachae* (238–239), *E. aculata* (240), *E. kraatzi* (241), *E. latimargo* (242), *E. bituberculata* (243), *E. walteri* (244), *E. inserta* (245), *E. satipensis* (246), *E. woytkowskii* (247), *E. furcata* (248), *E. quirozensis* (249), *E. latreillei* (250).

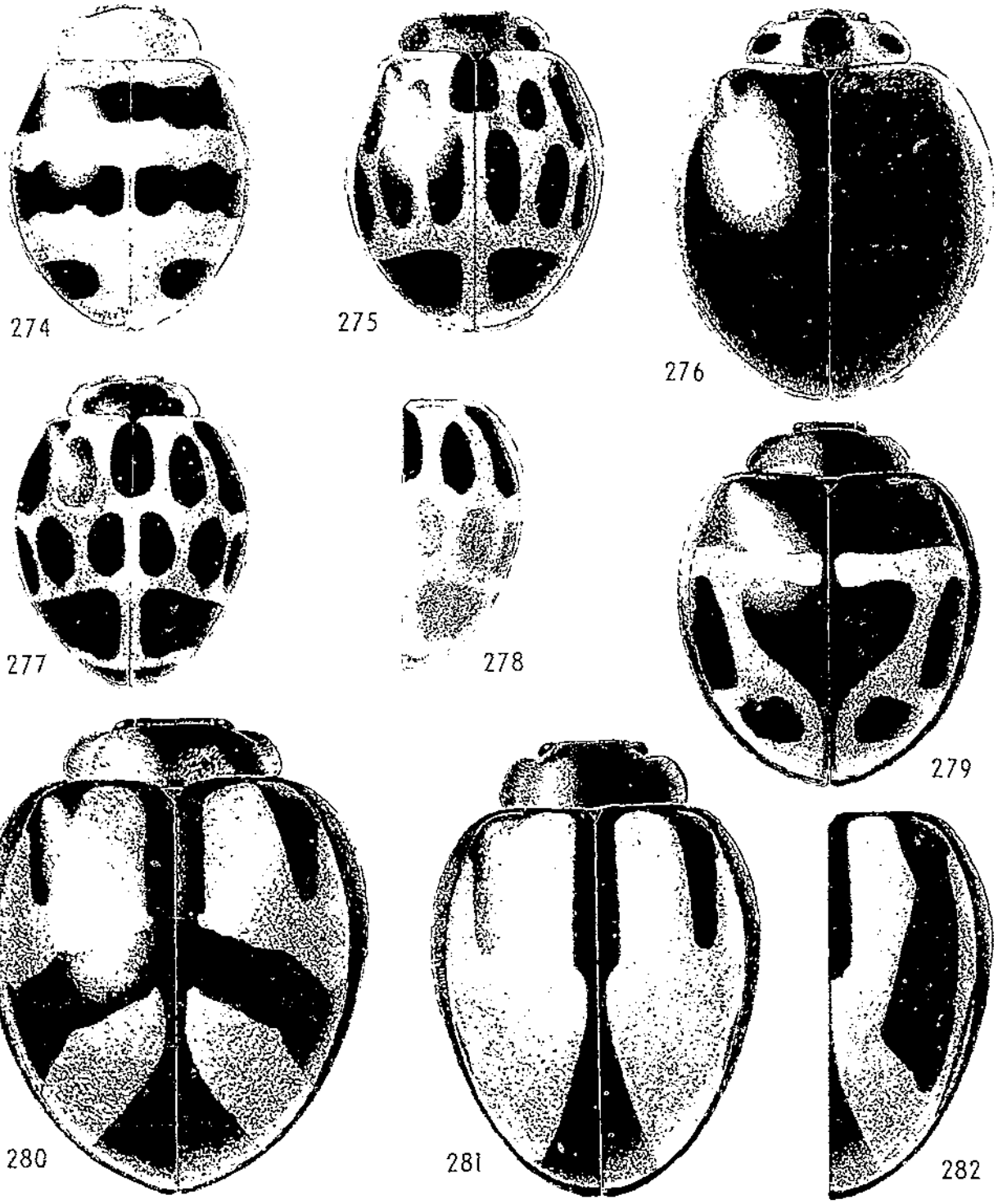


PN-3263

FIGURES 251–259.—Habitus views: *Epilachna buckleyi* (251), *E. peltata* (252), *E. azurea* (253), *E. lepida* (254), *E. confixa* (255), *E. languida* (256), *E. pretiosa* (257–258), *E. bisbivittata* (259).

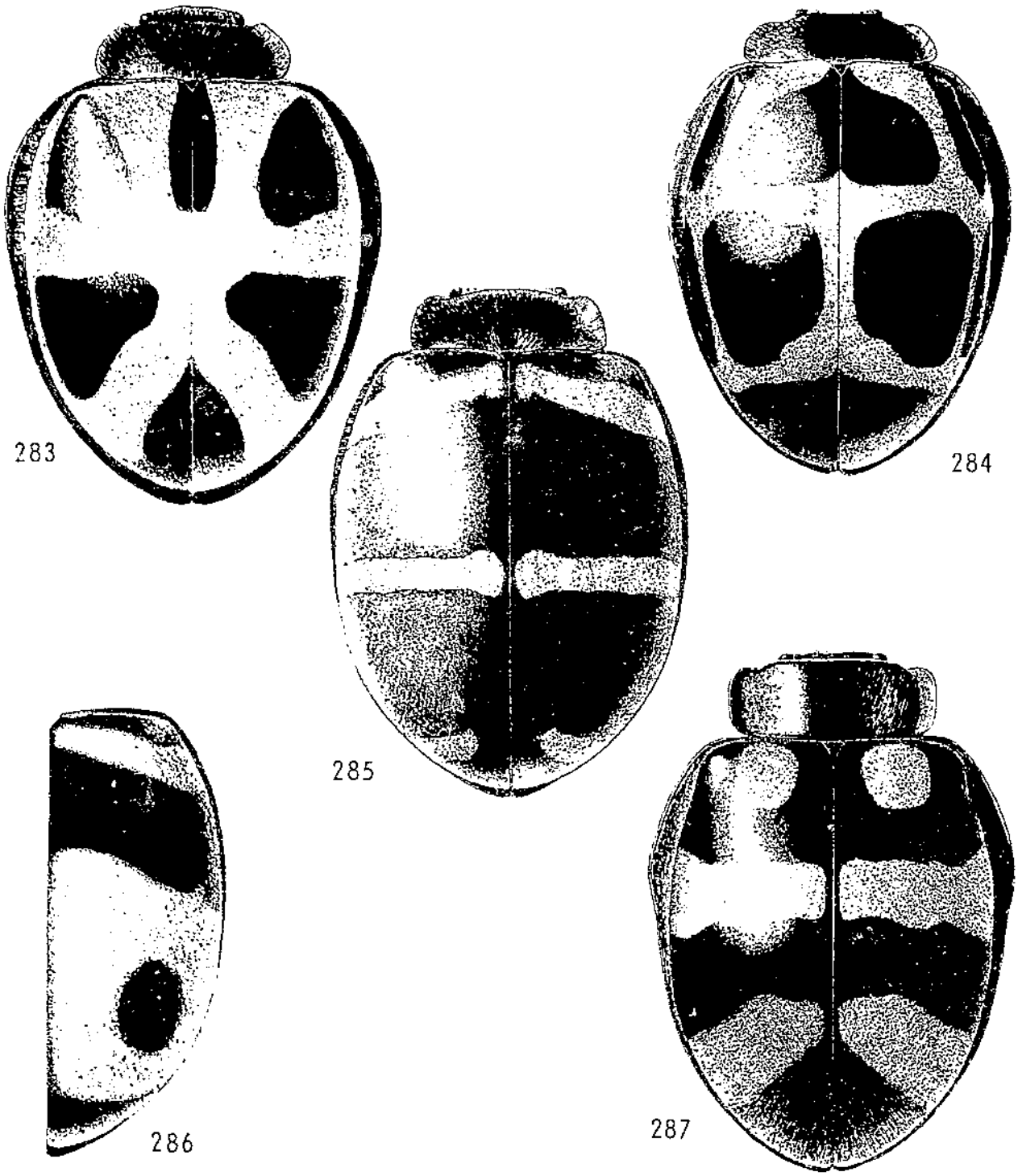


FIGURES 260-273.—Habitus views: *Epilachna holmgreni* (260), *E. amplipunctata* (261), *E. borealis* (262), *E. tredecimnotata* (263–273). PN-3264



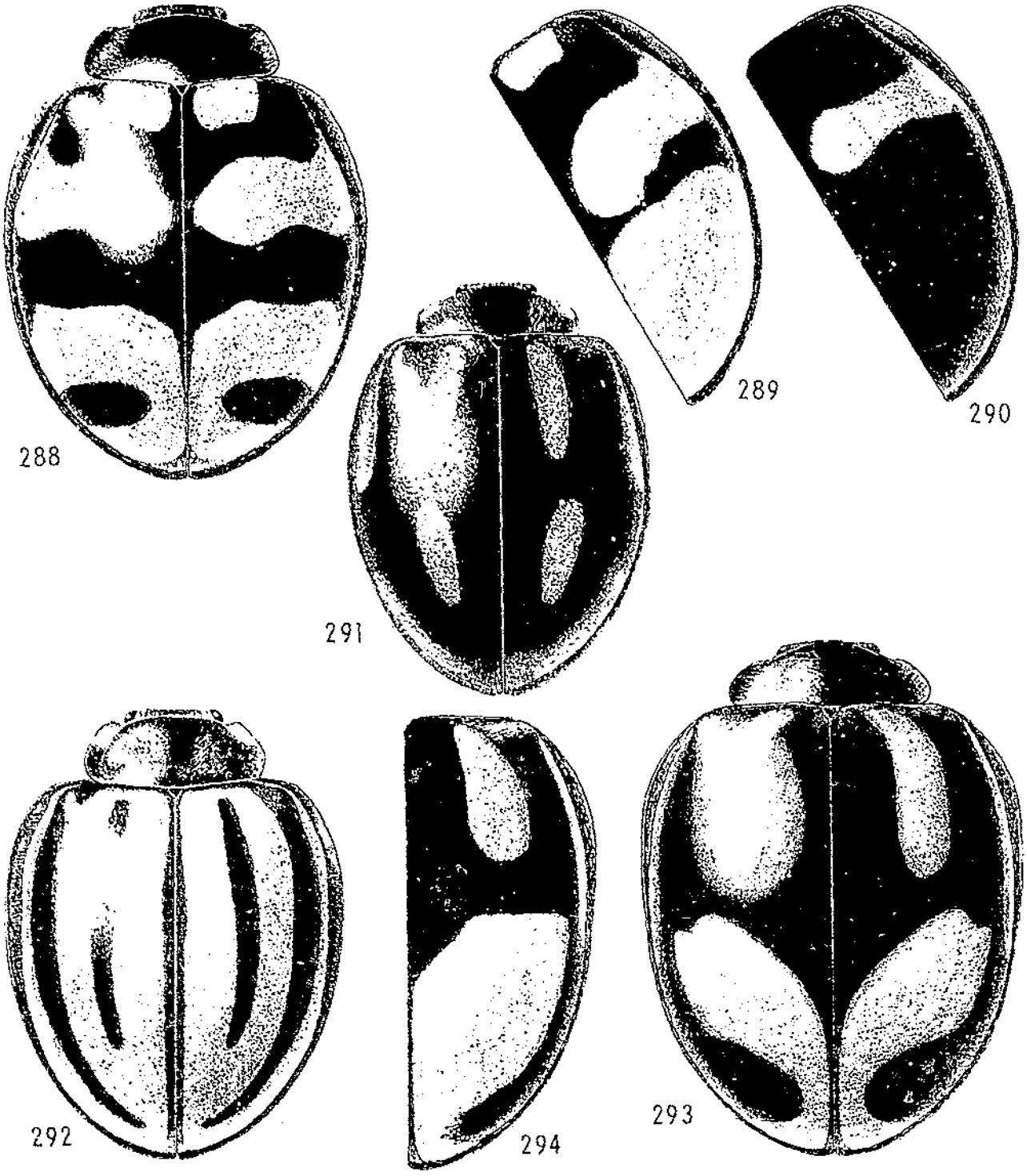
PN-3265

FIGURES 274–282.—Habitus views: *Epilachna discincta* (274), *E. boraustralis* (275), *E. kraussi* (276), *E. paenulata* (277–278), *E. cordula* (279), *E. axillaris* (280), *E. stolata* (281–282).



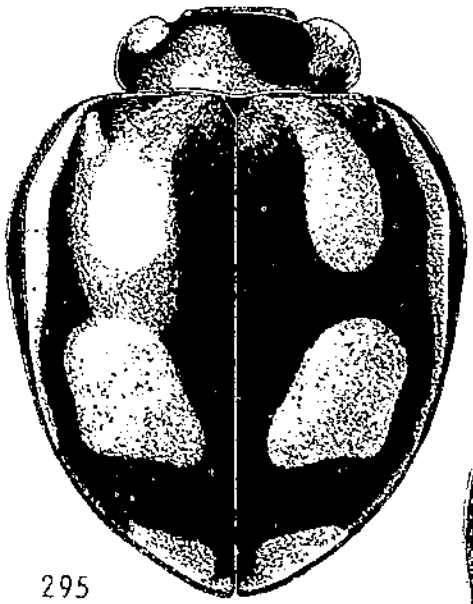
PN-3266

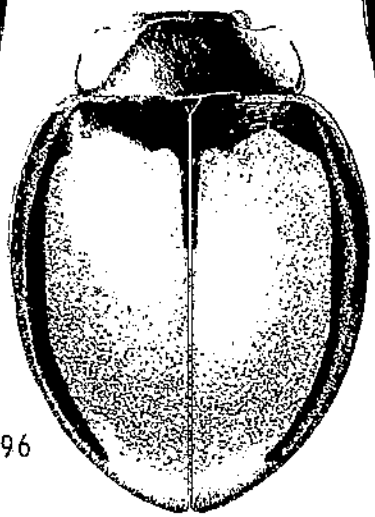
FIGURES 283–287.—Habitus views: *Epilachna radiata* (283), *E. pictipennis* (284), *E. fryii* (285–286), *E. cinctipennis* (287).

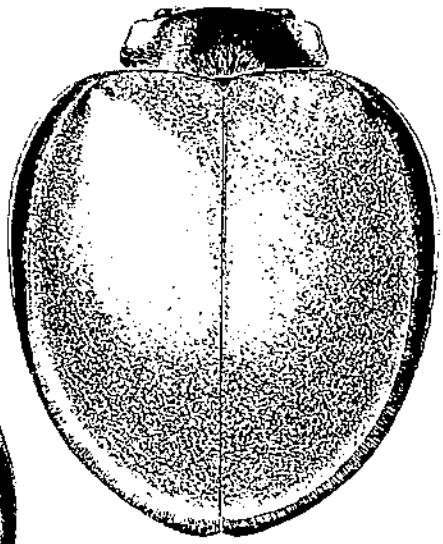


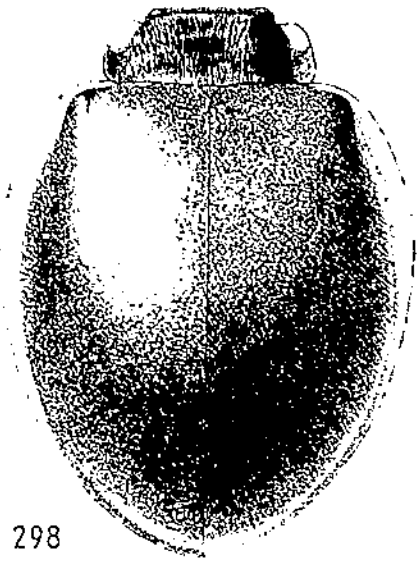
PN-3267

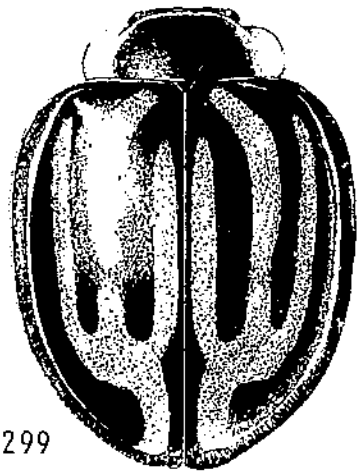
FIGURES 288-294.—Habitus views: *Epilachna madida* (288–290), *E. praecipua* (291), *E. nigrovittata* (292), *E. mutabilis* (293–294).

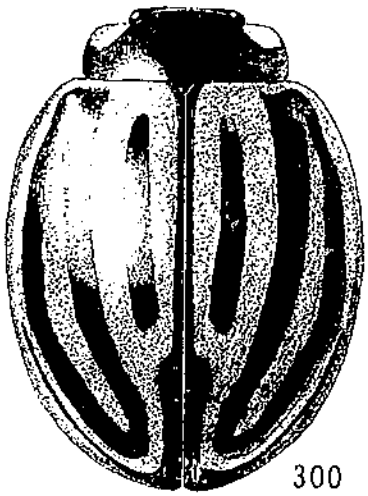






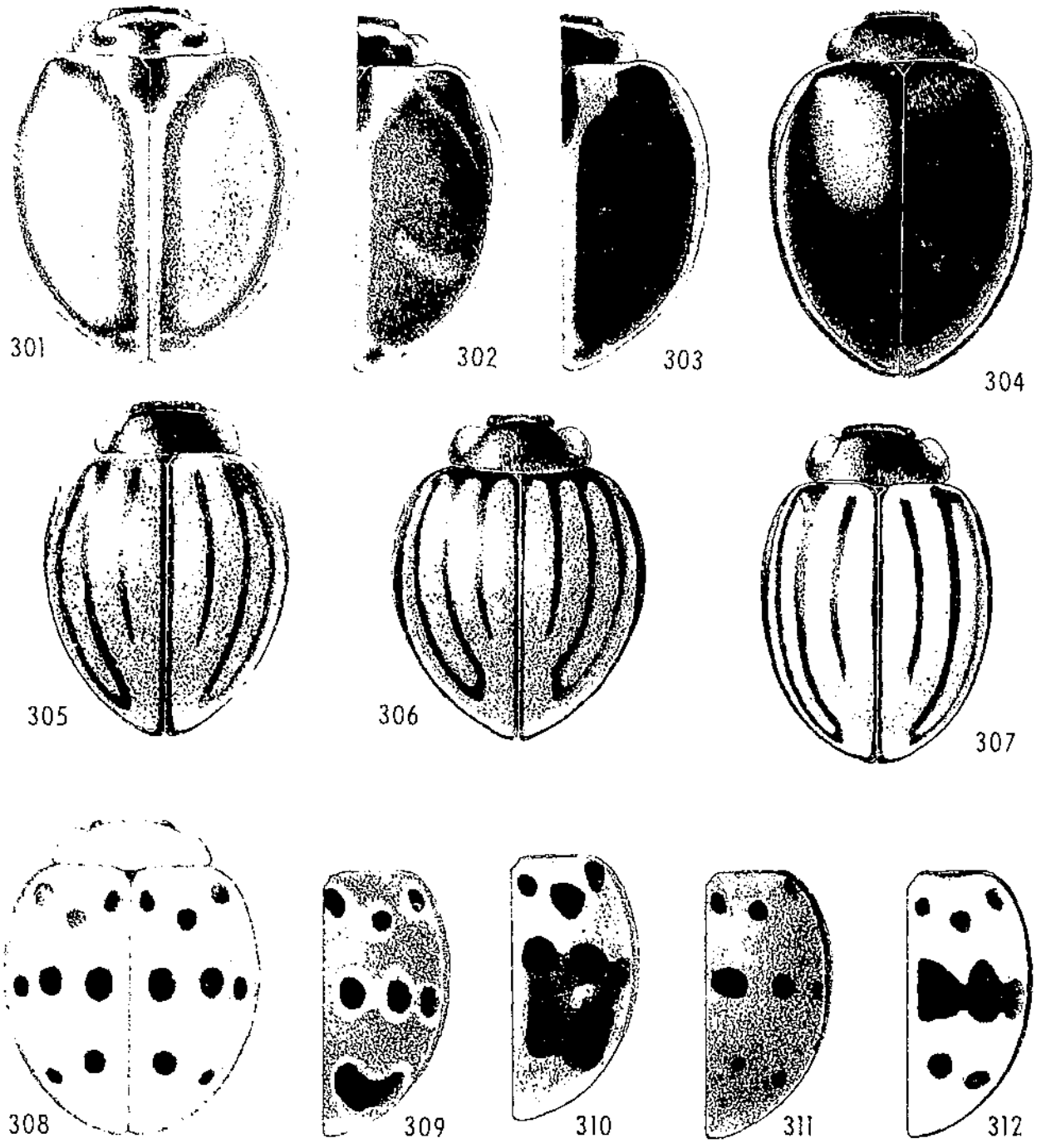






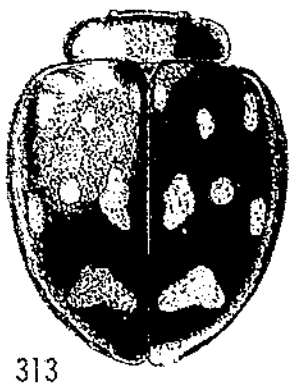
PN-3268

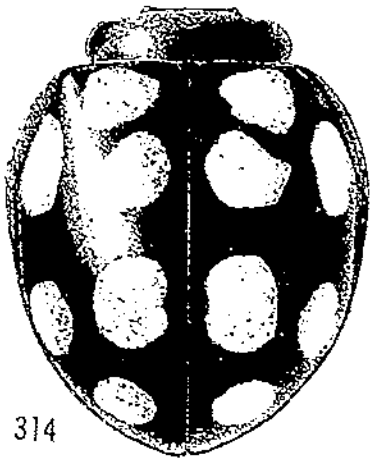
FIGURES 295–300.—Habitus views: *Epilachna pachiteensis* (295), *E. pastica* (296–297), *E. pseudostriata* (298), *E. propinqua* (299), *E. callangae* (300).

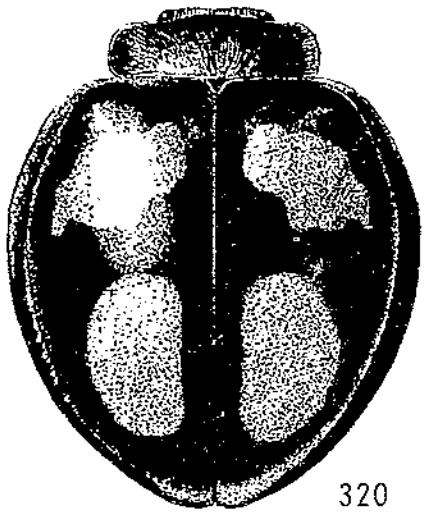


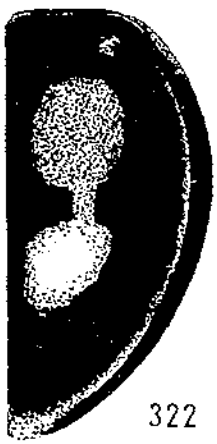
PN-3269

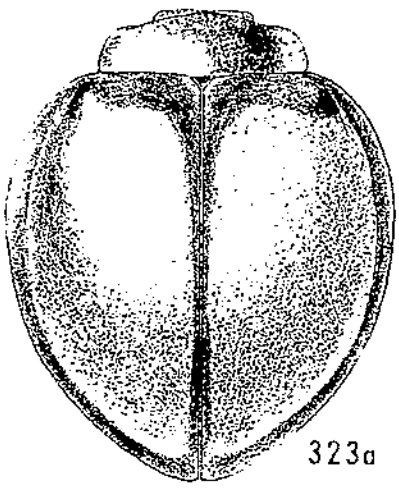
FIGURES 301–312.—Habitus views: *Epilachna clandestina* (301–303), *E. parastriata* (304), *E. basalis* (305), *E. sexlineata* (306), *E. mandibularis* (307), *E. varivestis* (308–312).





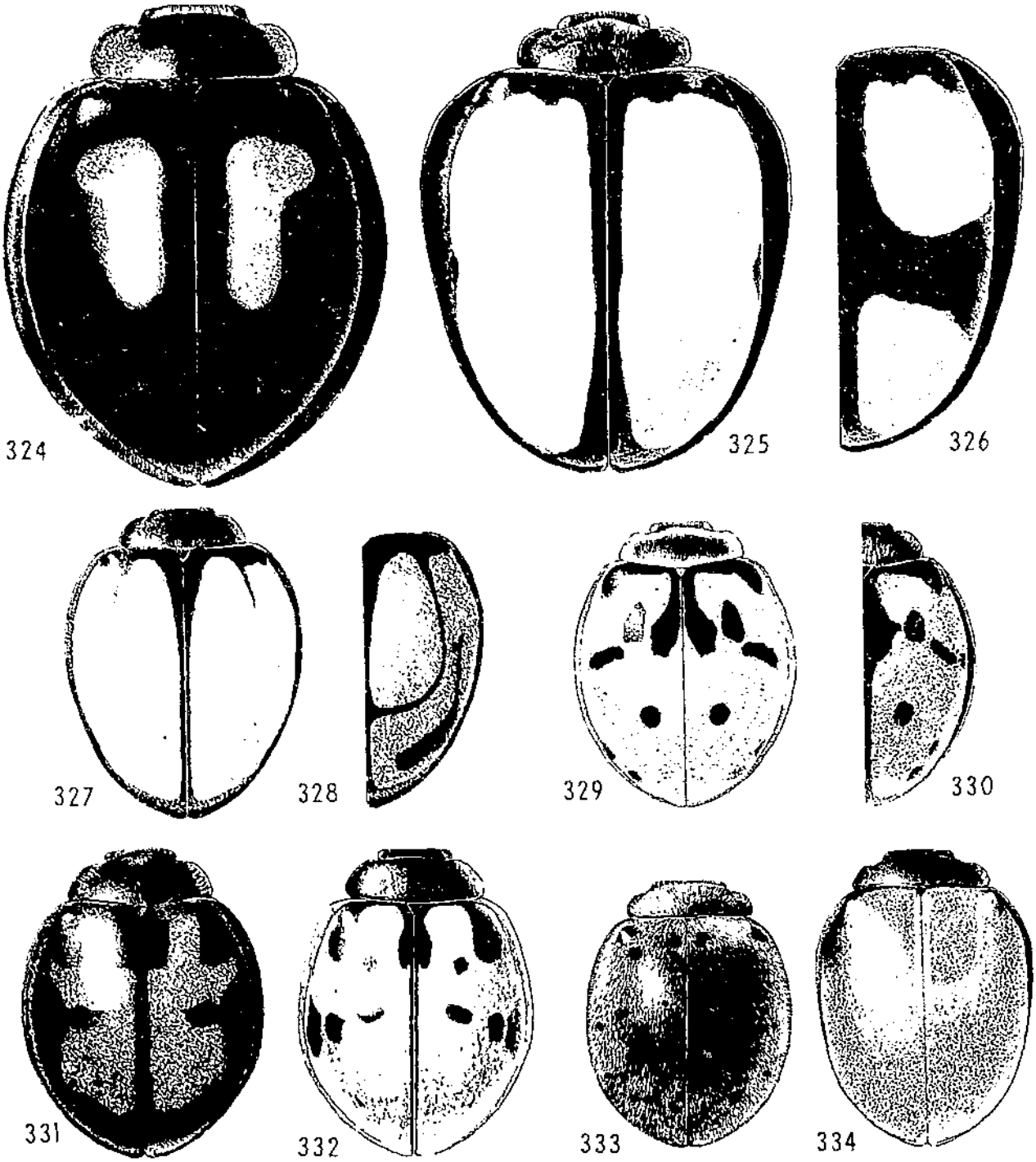






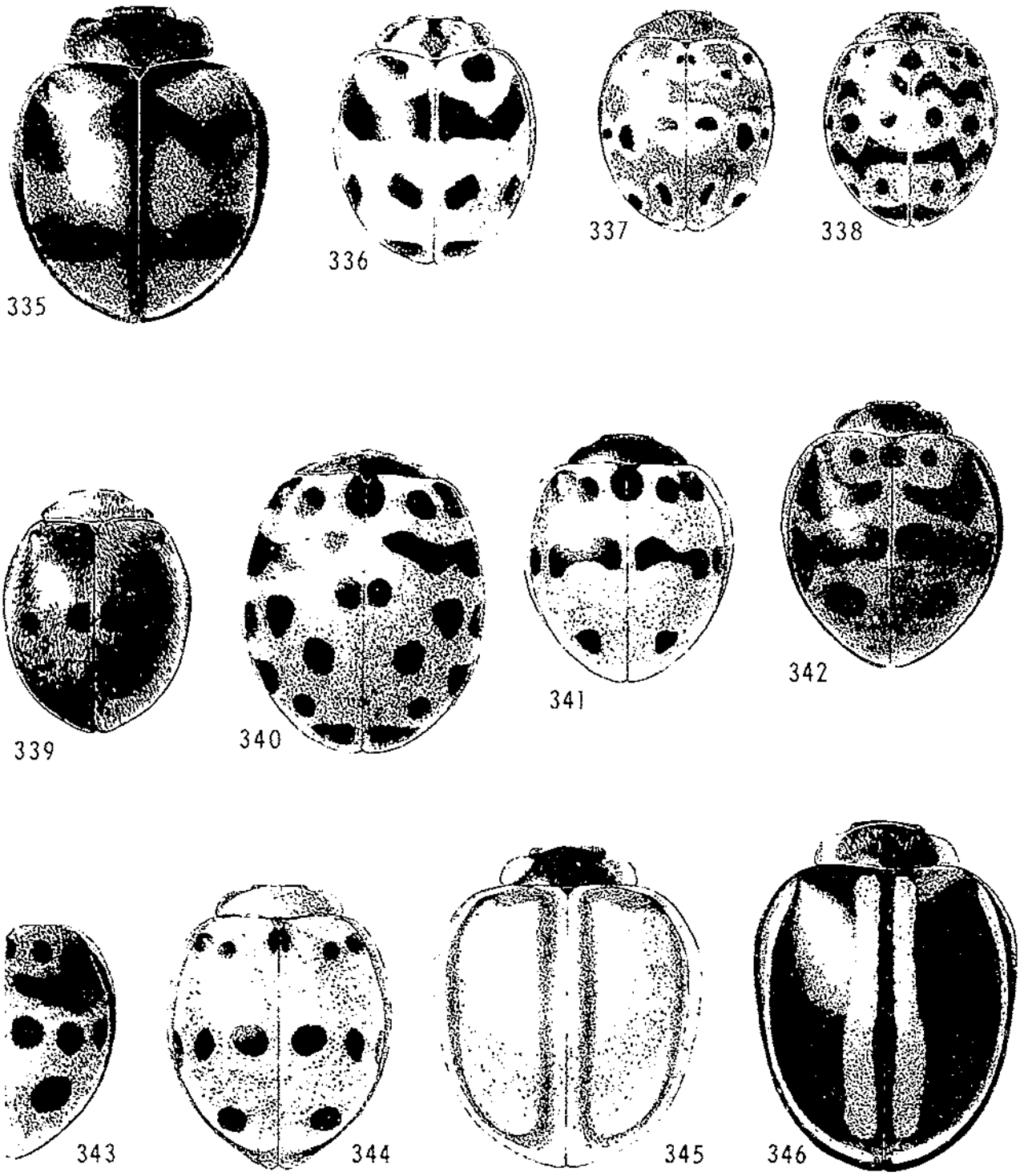
PN-3270

FIGURES 313–323, 323a.—Habitus views: *Epilachna varipes* (313), *E. mexicana* (314–319), *E. plagiata* (320–323, 323a).



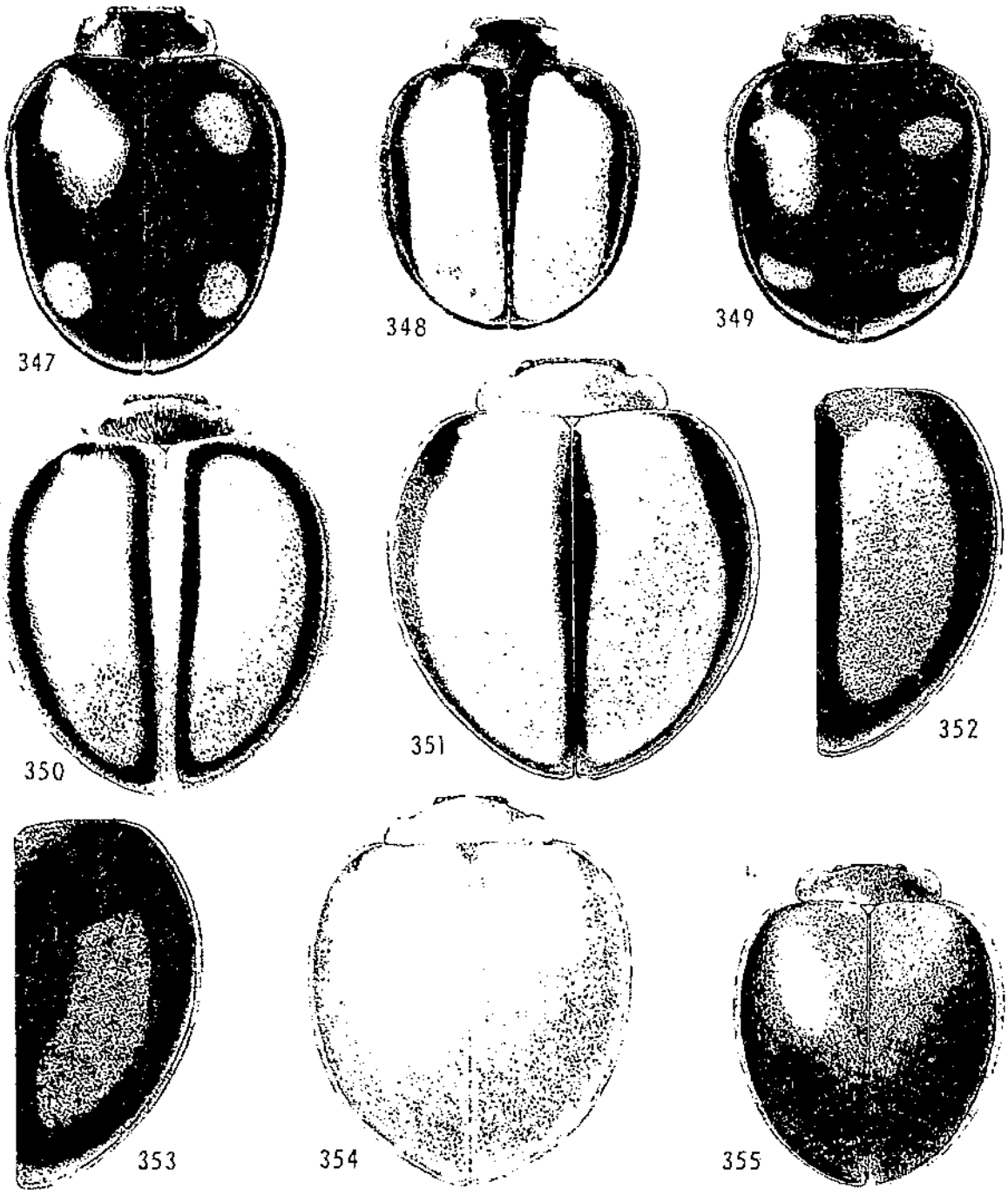
PN-3271

FIGURES 324–334.—Habitus views: *Epilachna tumida* (324), *E. abrupta* (325–326), *E. nigrocincta* (327–328), *E. vincta* (329–330), *E. pseudographa* (331), *E. calligrapta* (332), *E. obscurella* (333), *E. nubci* (334).



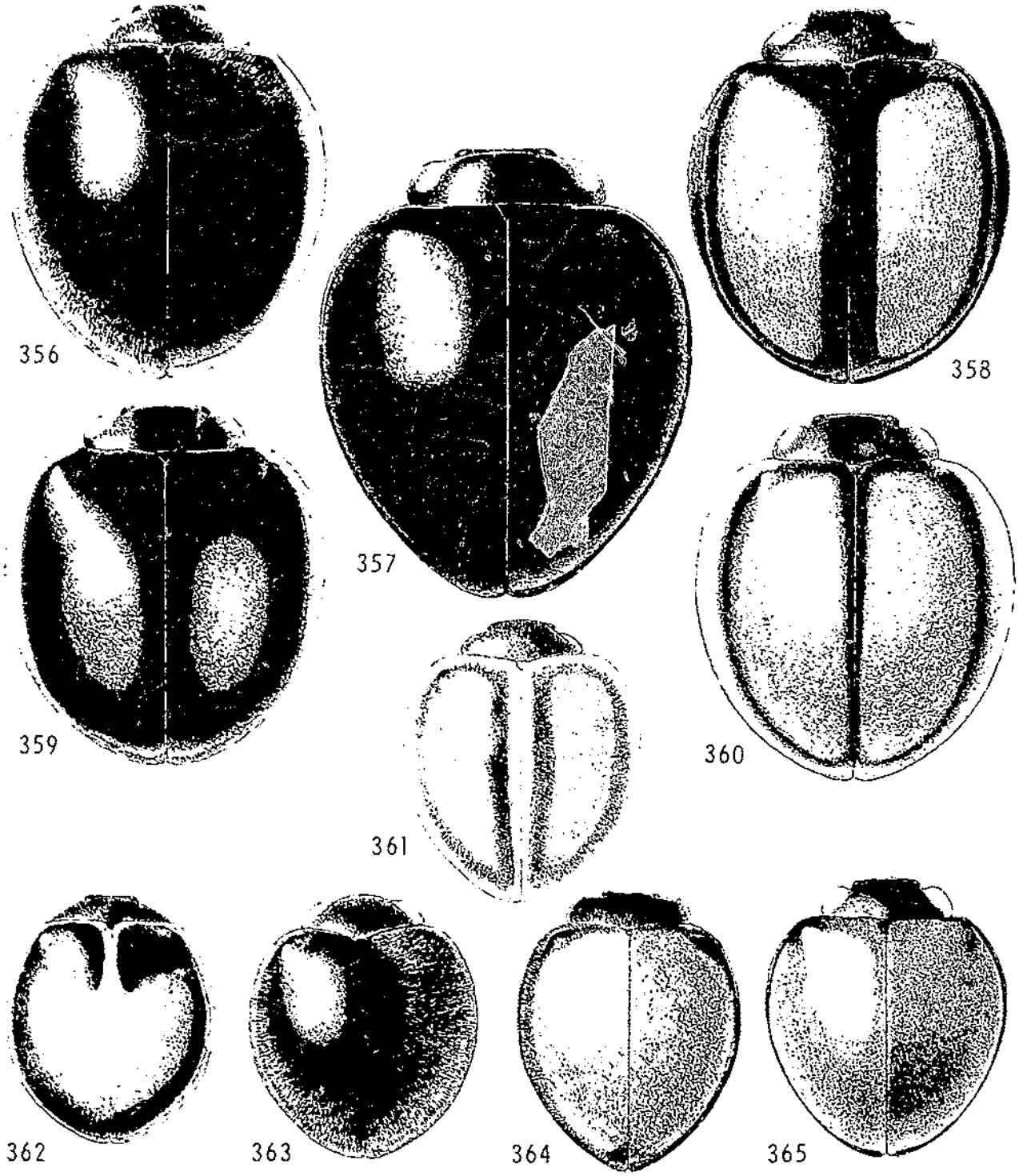
PN-3272

FIGURES 335–346.—Habitus views: *Epilachna vulnerata* (335), *E. patula* (336), *E. modesta* (337), *E. difficilis* (338), *E. tenebricosa* (339), *E. vanpatteni* (340), *E. gorhami* (341), *E. championi* (342–343), *E. godmani* (344), *E. circumcincta* (345), *E. furtiva* (346).



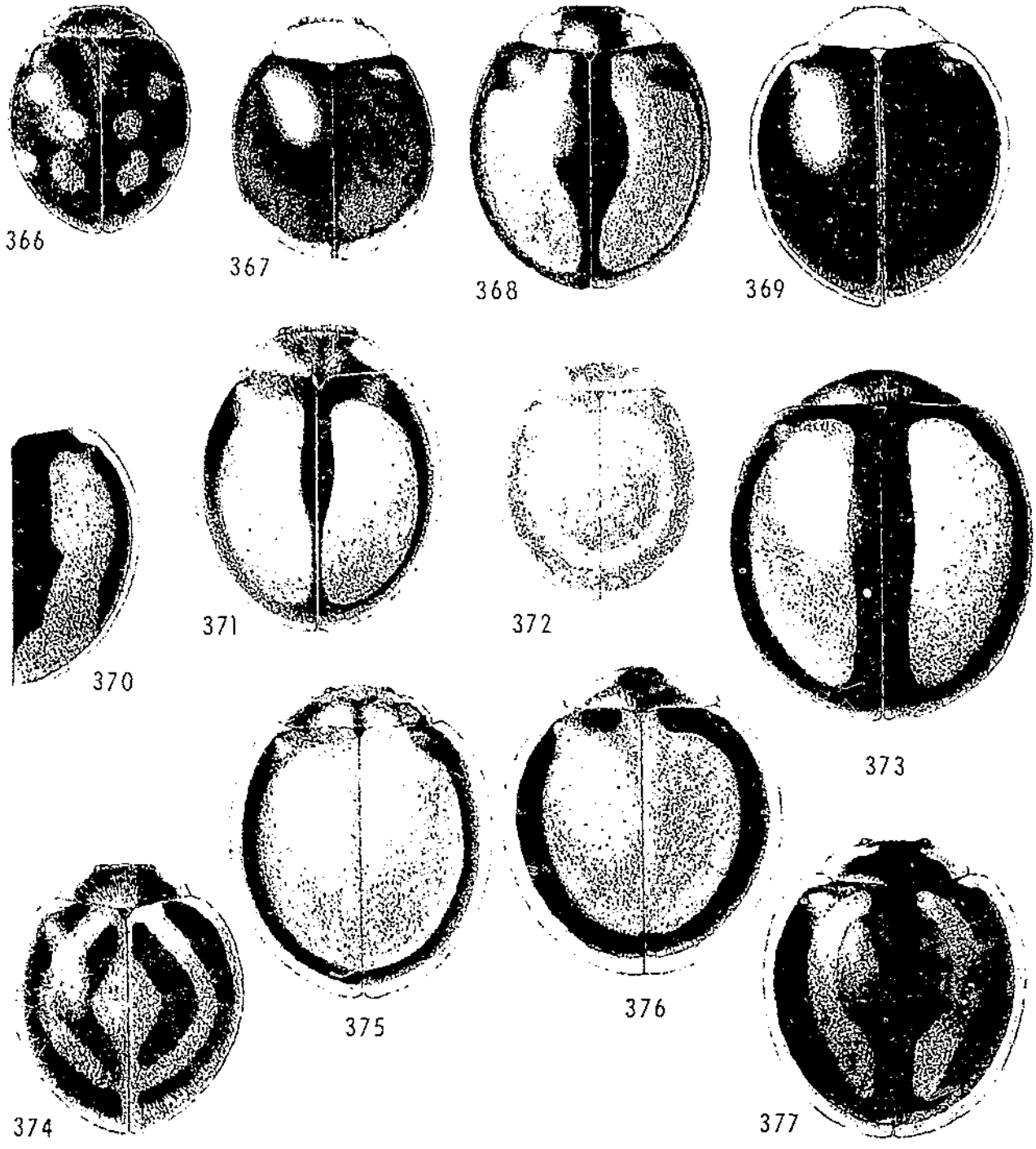
PN-3273

FIGURES 347–355.—Habitus views: *Epilachna standingeri* (347), *E. conifera* (348), *E. corniventris* (349), *E. spreta* (350), *E. cacica* (351–353), *E. marginella* (354), *E. velutina* (355).



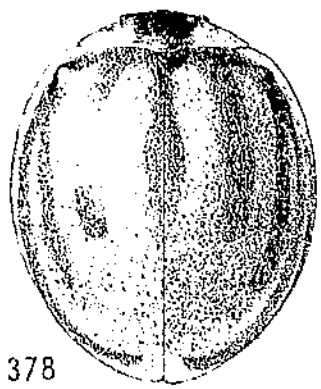
PN-3274

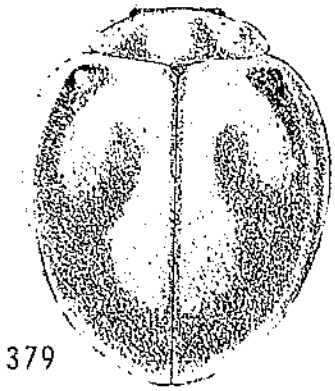
FIGURES 356–365.—Habitus views: *Epilachna pseudorealis* (356), *E. velata* (357–358), *E. extrema* (359), *E. merae* (360), *Dira clarkii* (361), *D. obscurocincta* (362), *D. richteri* (363), *D. nucula* (364), *D. inexculta* (365).

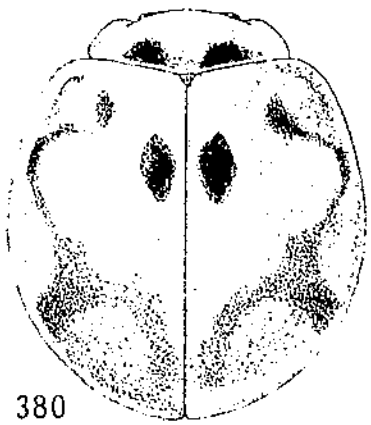


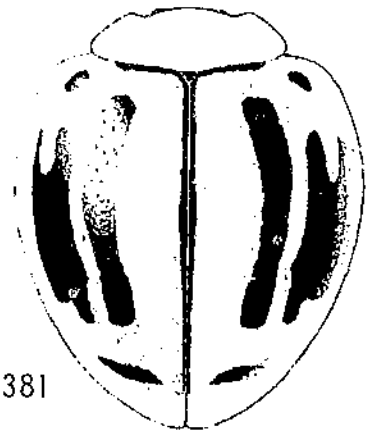
PN-3275

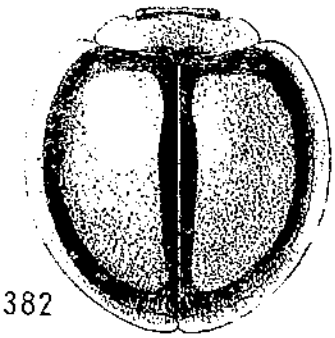
FIGURES 366–377. Habitus views: *Lorma specca* (366), *L. apicalis* (367), *L. haliki* (368), *L. batesi* (369–370), *Malata mitis* (371), *Mada concentrica* (372), *M. synemia* (373), *M. gounelleі* (374), *M. circumflua* (375), *M. contempta* (376), *M. zonula* (377).

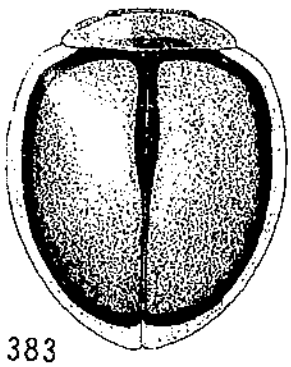


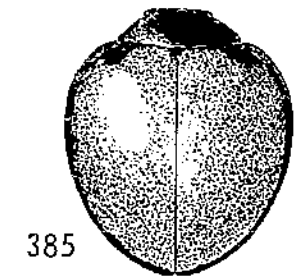


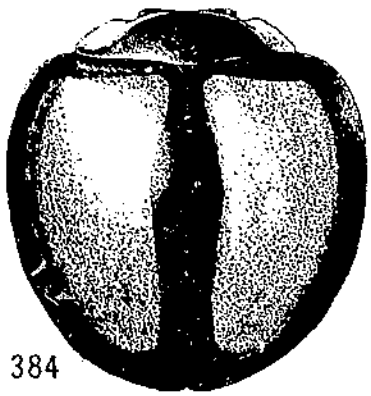


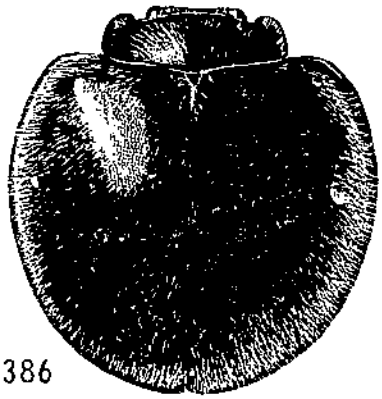


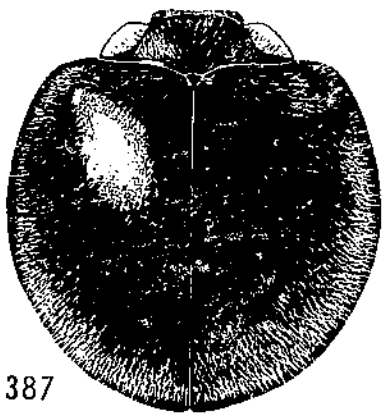






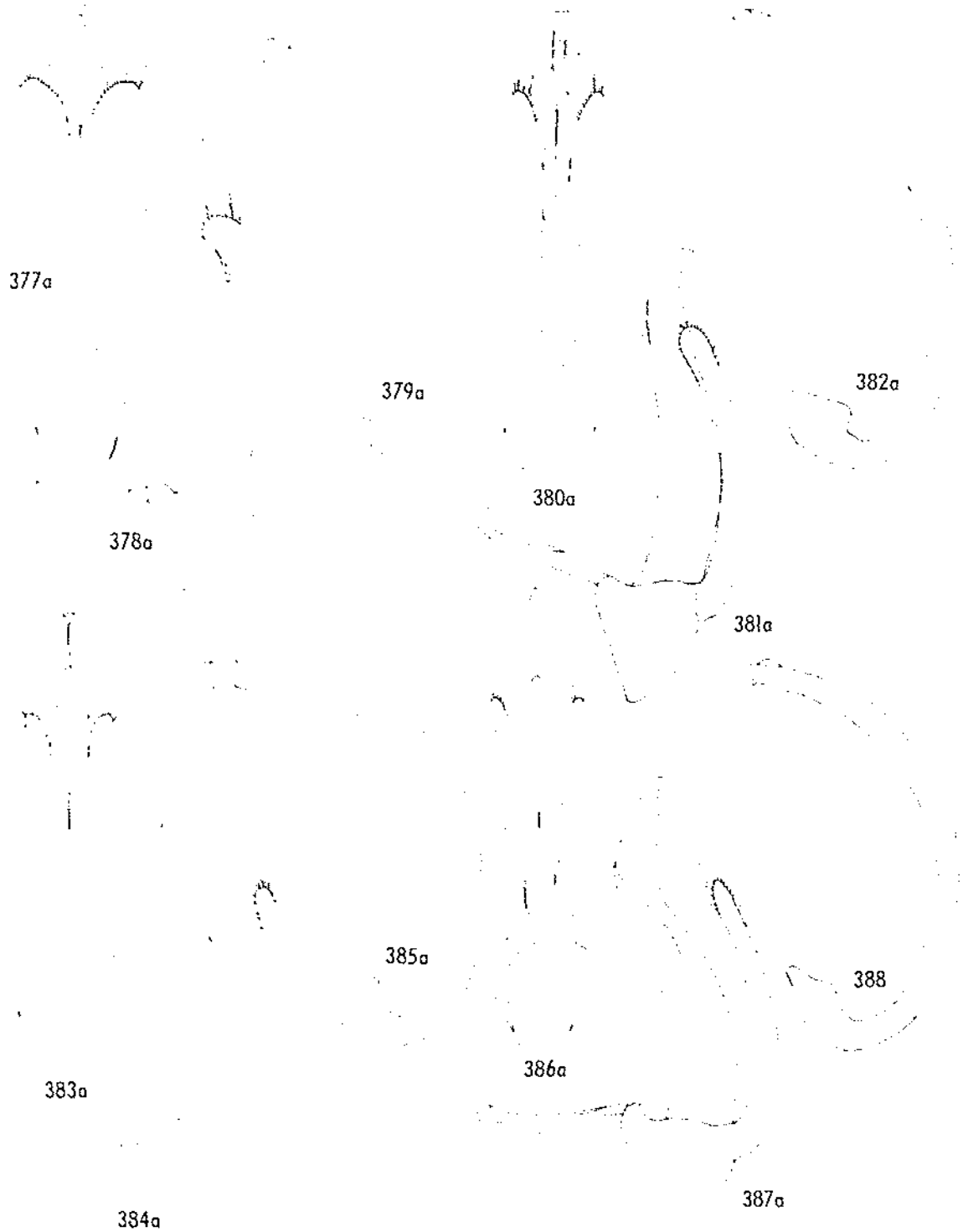






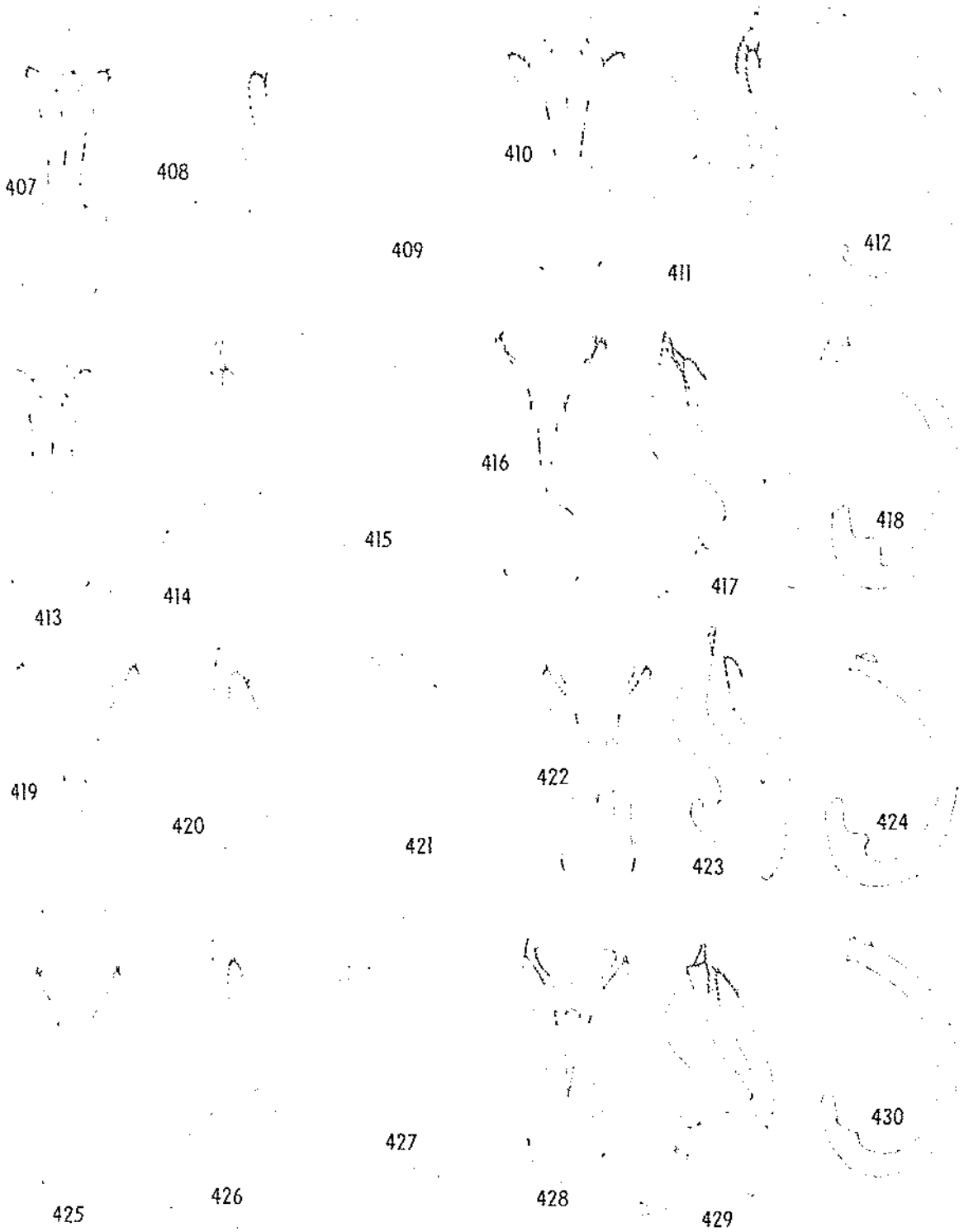
PN-3276

FIGURES 378–387.—Habitus views: *Mada virgata* (378), *M. inepta* (379), *M. polluta* (380), *M. lineatopunctata* (381), *M. elegans* (382), *M. circumducta* (383), *M. insolitaphallus* (384), *M. nexophallus* (385), *Damatula carina* (386), *D. perioides* (387).

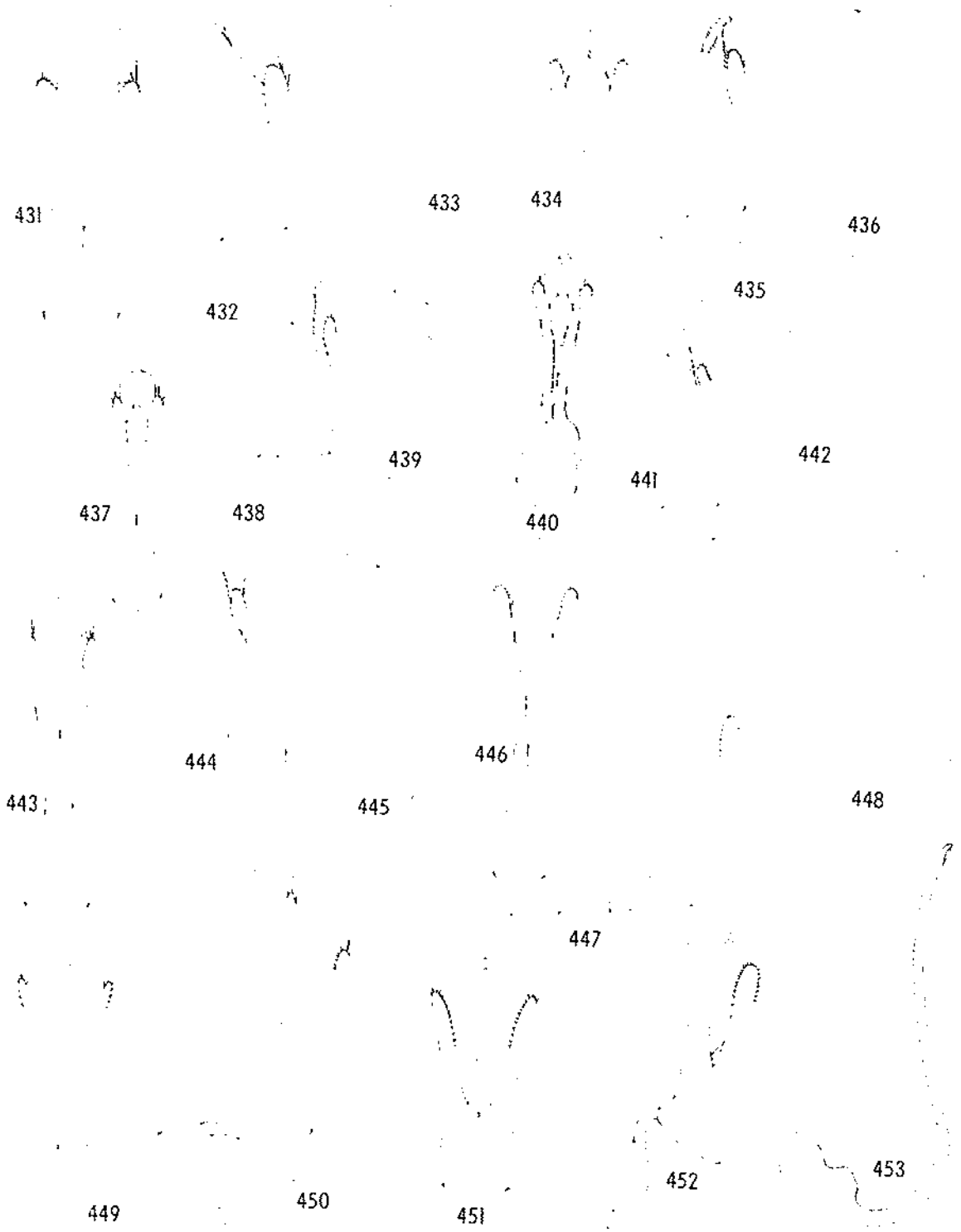


FIGURES 377a-387a, 388.—Male genitalia: *Toxoloma venula* (377a–379a), *T. nunenmacheri* (380a–382a), *T. opaculu* (383a–385a), *T. townsendi* (386a–387a, 388).

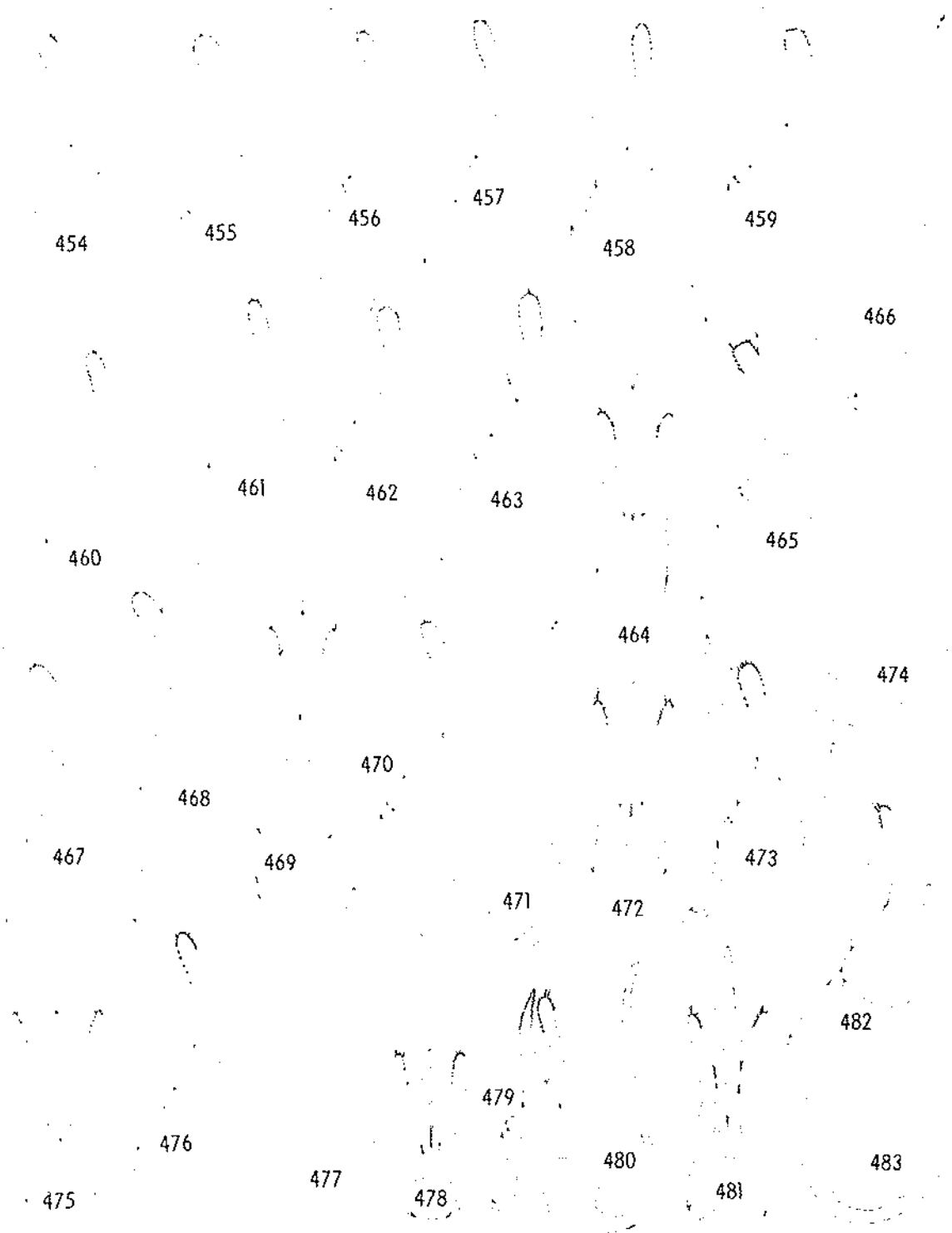
FIGURES 389–406.—Male genitalia: *Toxotoma huanucoi* (389–391), *T. banosi* (392–394), *T. rosae* (395–397), *T. rugulosa* (398–400), *T. cuzcoensis* (401–403), *T. imitator* (404–406).



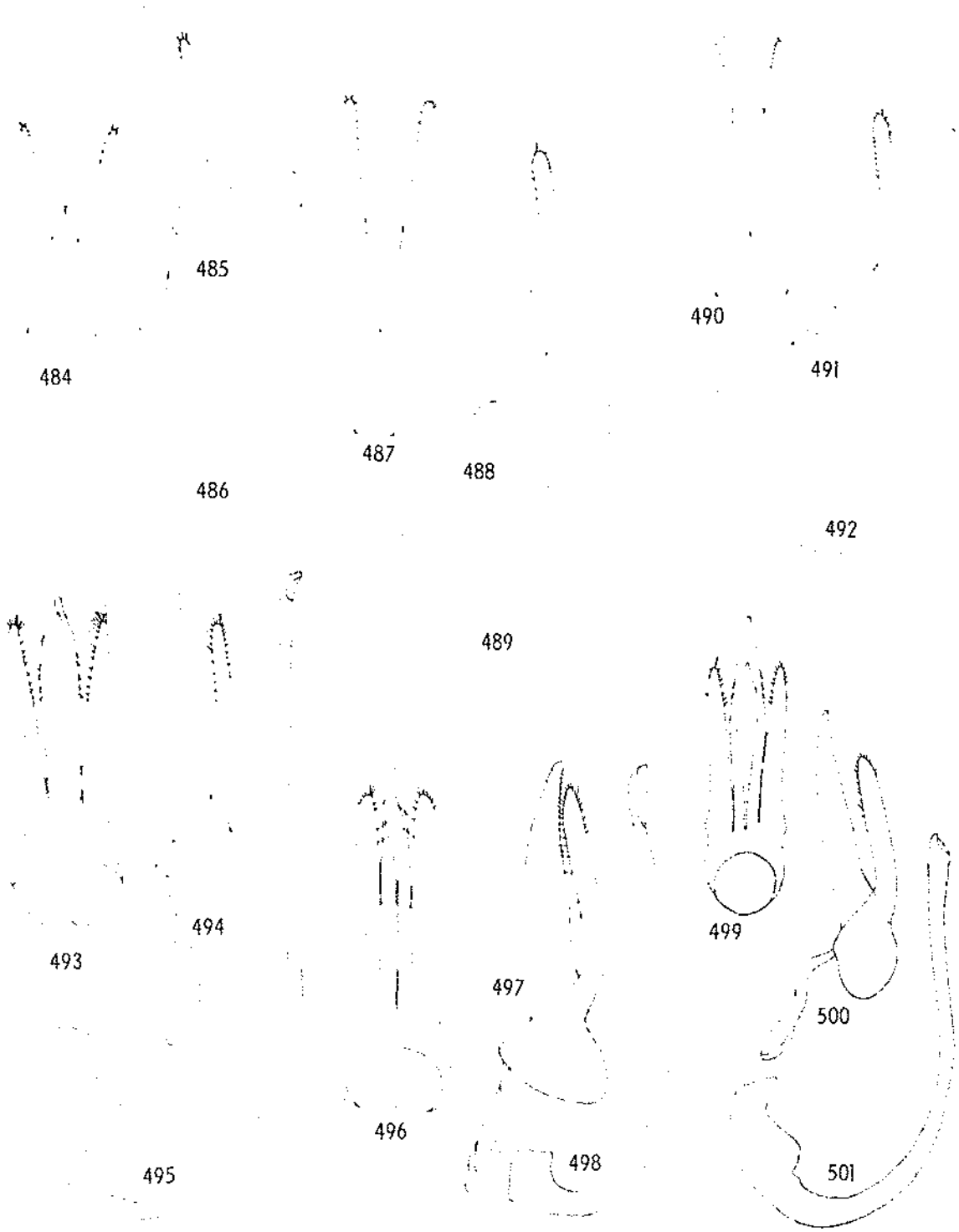
FIGURES 407–430.—Male genitalia: *Toxotoma lecchi* (407–409), *T. tridentata* (410–412), *T. forsteri* (413–415), *T. orbicula* (416–418), *T. murilloi* (419–421), *T. chapini* (422–424), *T. longicrura* (425–427), *T. chacoi* (428–430).



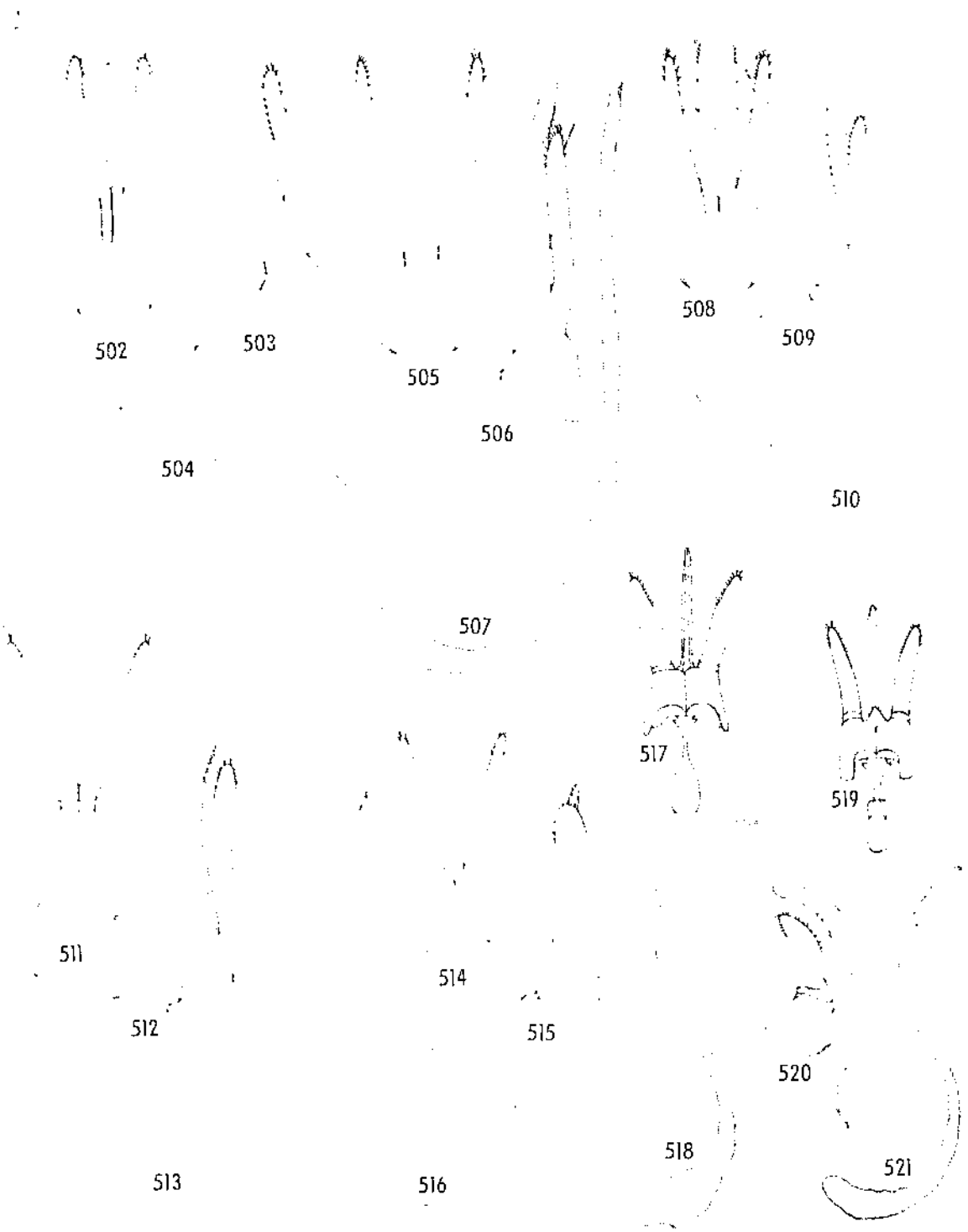
FIGURES 431–453.—Male genitalia: *Toxotoma gentilis* (431–433), *T. humboldti* (434–436), *T. opulenta* (437–439), *T. pulchra* (440–442), *T. pilifera* (443–445), *T. jujuyi* (446–448), *T. guerini* (449–450), *Epilachna flavofasciata* (451–453).



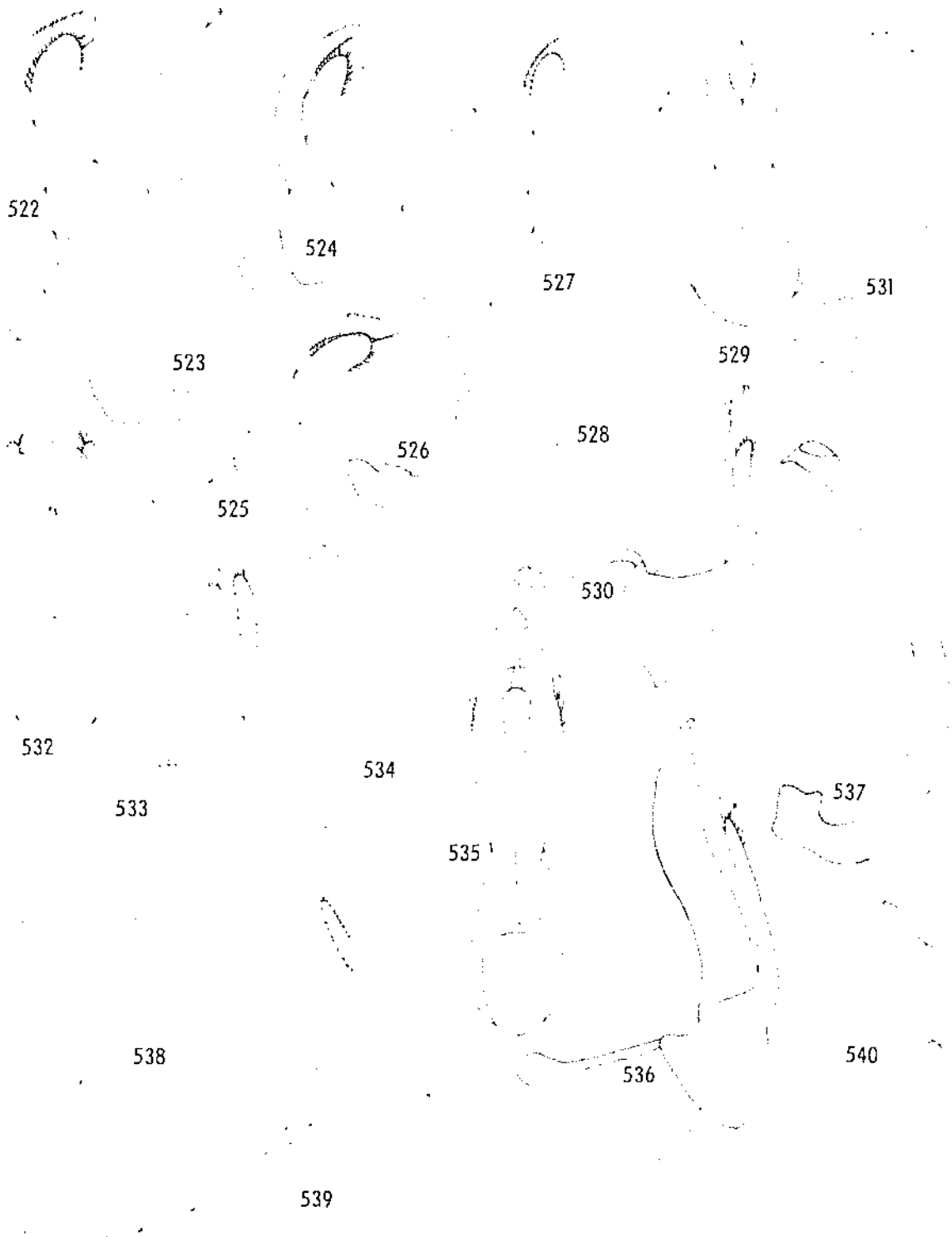
FIGURES 454–483.—Male genitalia: *Epilachna flavofasciata* (454–463), *E. dives* (464–468), *E. fausta* (469–471), *E. riveti* (472–474), *E. austrina* (475–477), *E. cuscma* (478–480), *E. ecuadorica* (481–483).



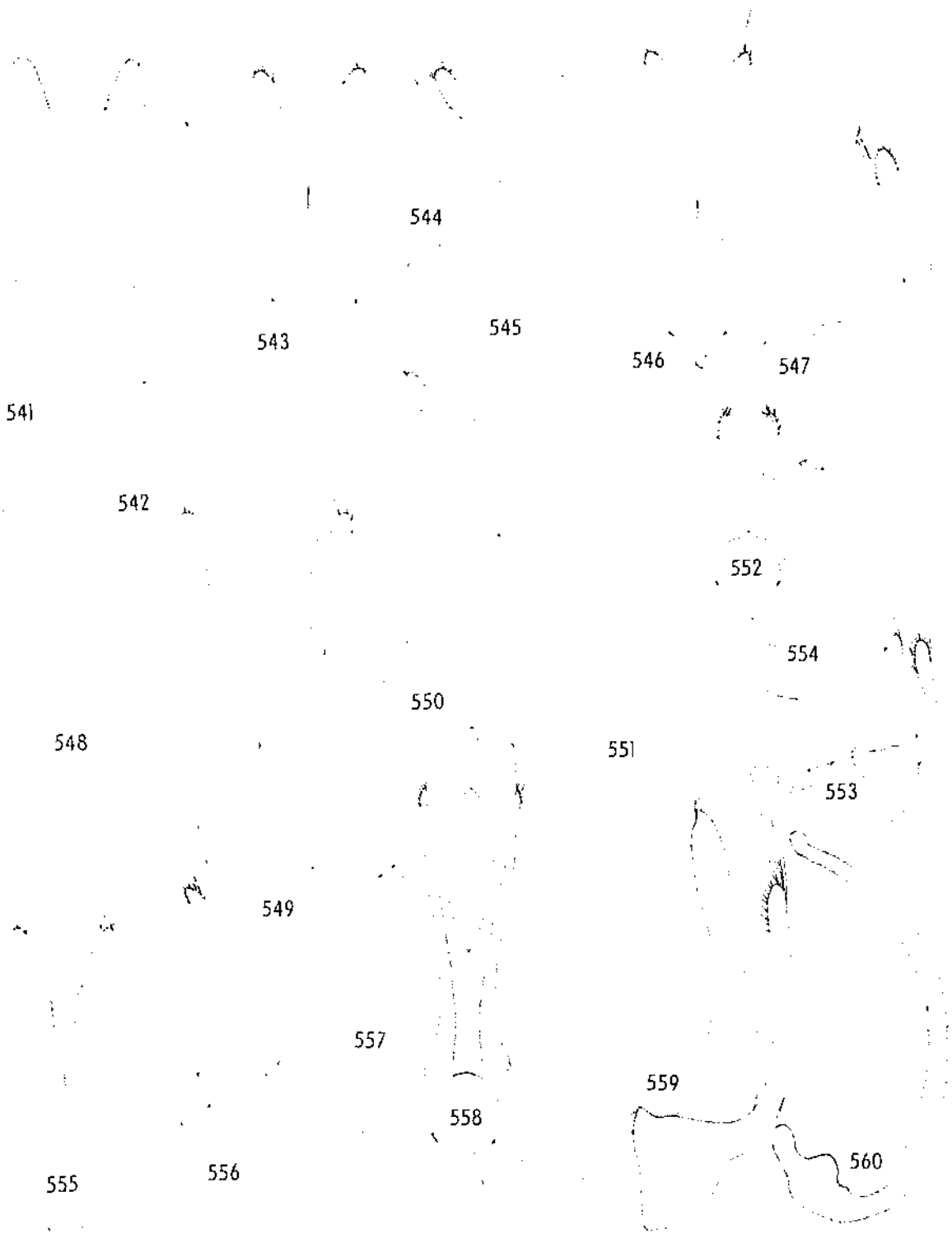
FIGURES 484–501).—Male genitalia: *Epilachna octoverrucata* (484–486), *E. dorsigera* (487–489), *E. sellata* (490–492), *E. cuscoi* (493–495), *E. transverselineata* (496–498), *E. deutera* (499–501).



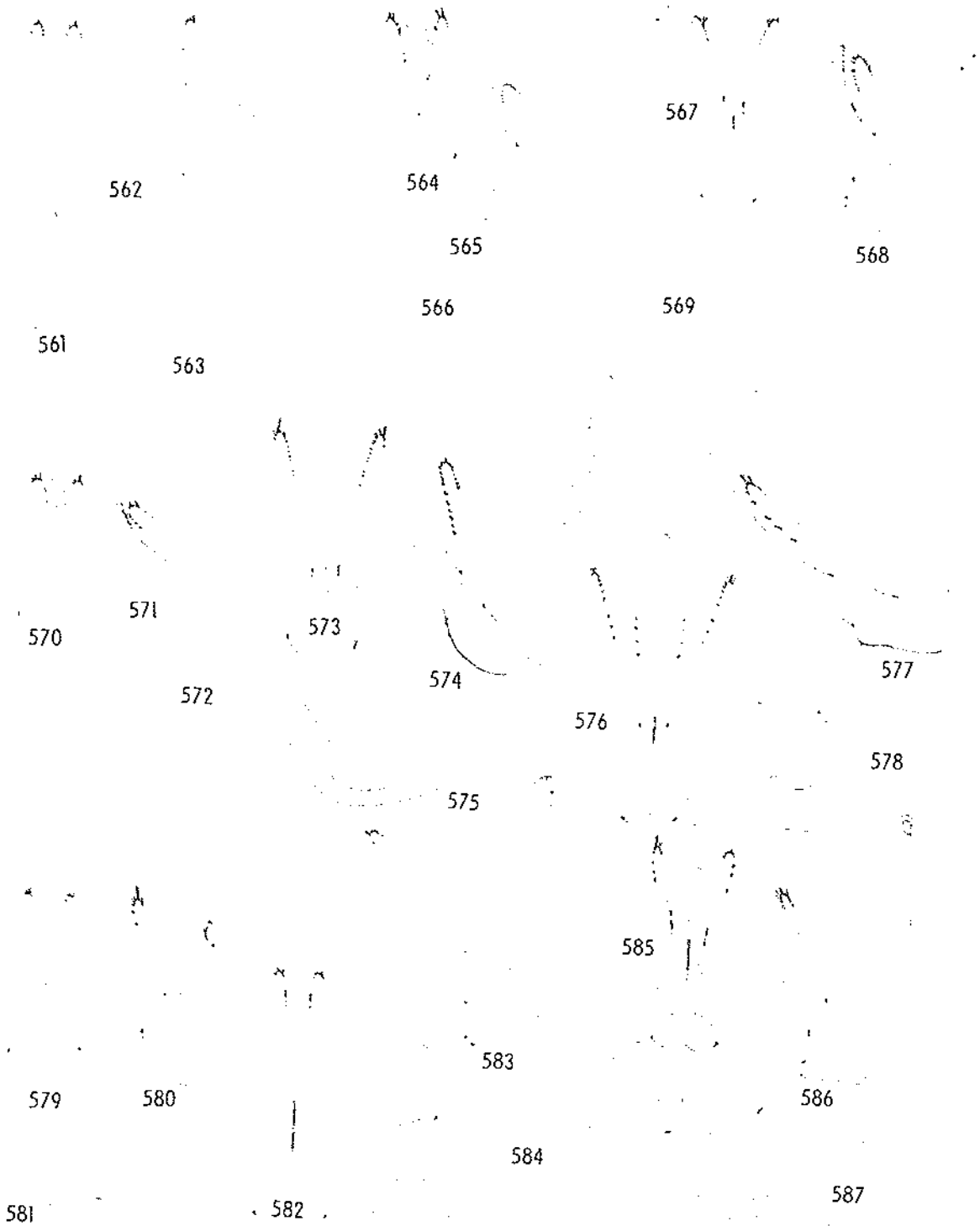
FIGURES 502–521. Male genitalia: *Epilachna tritea* (502–504), *E. ovaloides* (505–507), *E. viridilineata viridilineata* (508–510), *E. sexmaculata* (511–513), *E. hektea* (514–516), *E. v-pallidum v-pallidum* (517–518), *E. v-pallidum angulata* (519–521).



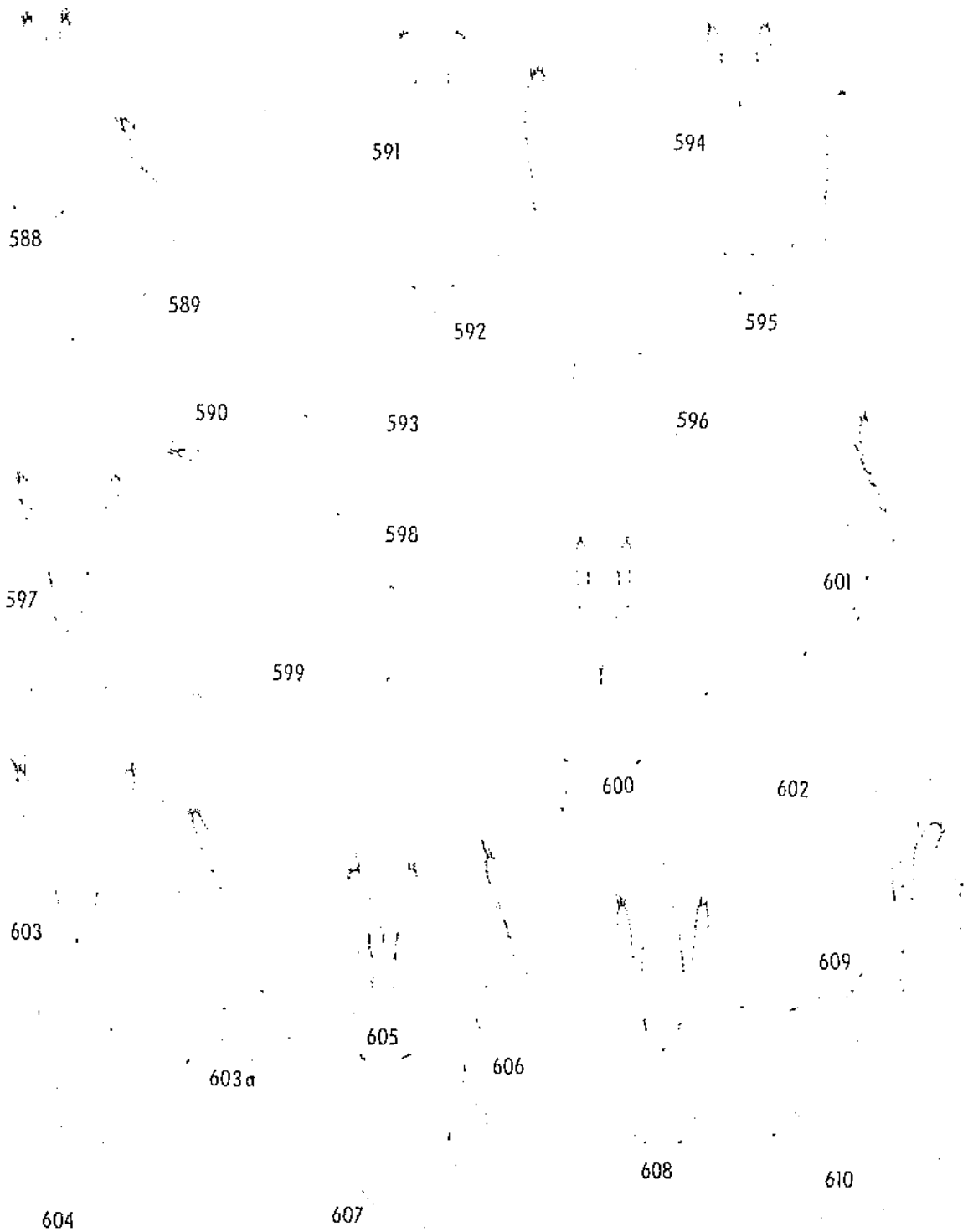
FIGURES 522–540.—Male genitalia: *Epilachna orthostriata* (522–523), *E. tetartea* (524), *E. forsteri* (525–526), *E. peruviana* (527–528), *E. albovittata* (529–531), *E. aureola* (532–534), *E. lorata* (535–537), *E. emerita* (538–540).



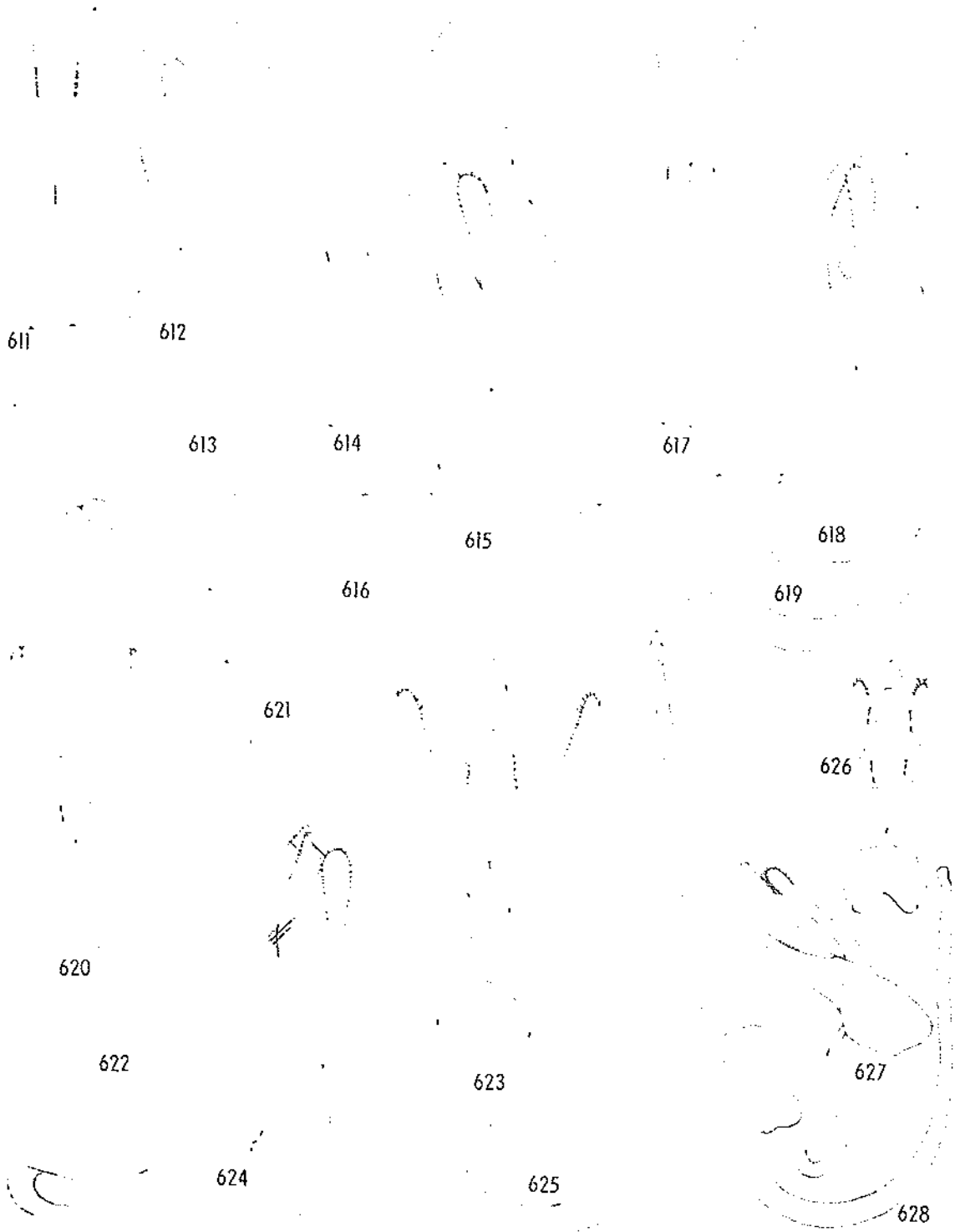
FIGURES 541–560.—Male genitalia: *Epilachna consularis* (541–542), *E. bistrispilota* (543–545), *E. pseudospilota* (546–548), *E. striola* (549–551), *E. persimilis* (552–554), *E. obliqua* (555–557), *E. discolor* (558–560).



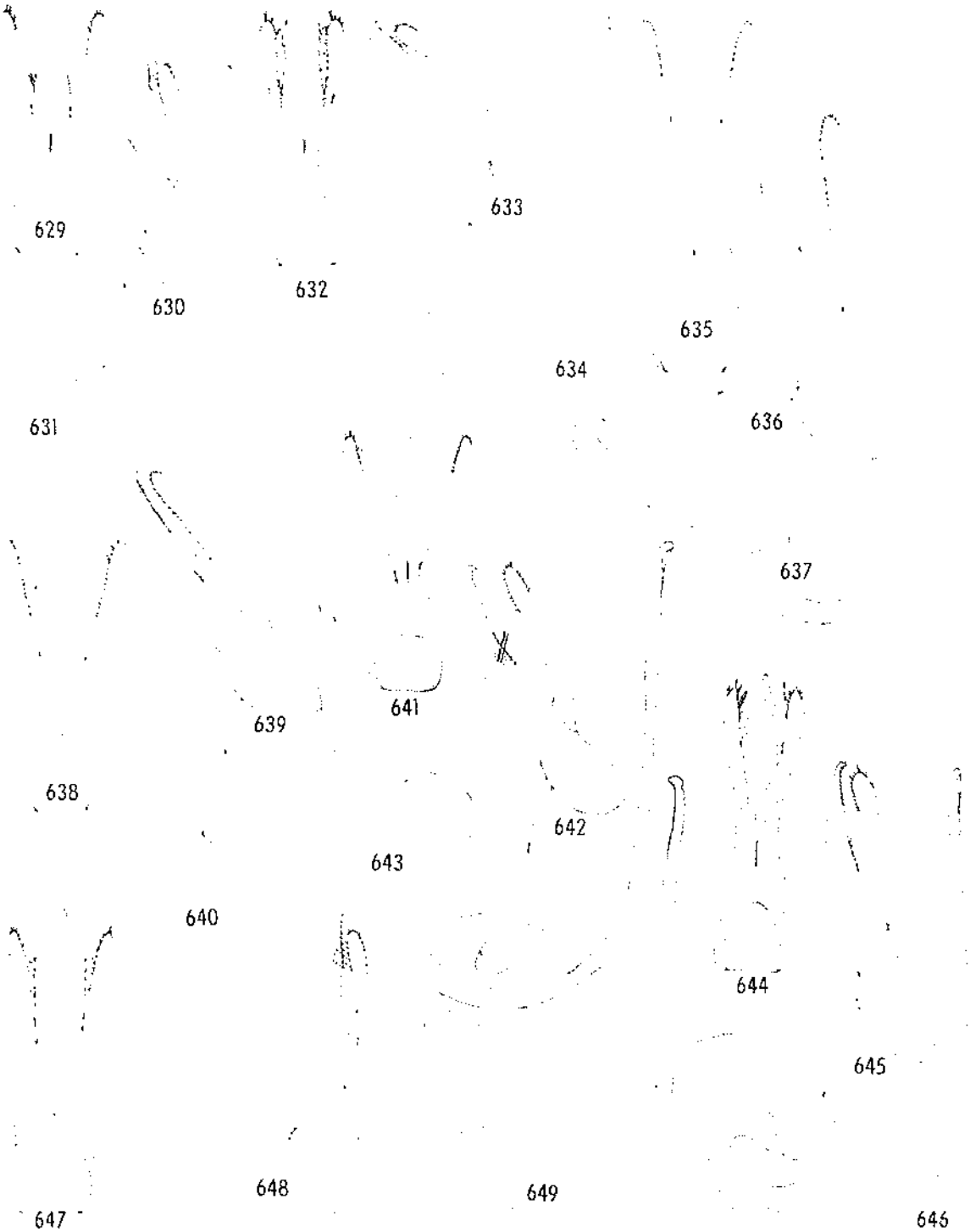
FIGURES 561–587.—Male genitalia: *Epilachna cruciata* (561–563), *E. patricia* (564–566), *E. weisei* (567–569), *E. simplex* (570–572), *E. convergens* (573–575), *E. reichei* (576–578), *E. ambigua* (579–581), *E. fuscopilosa* (582–584), *E. incaorum* (585–587).



FIGURES 588–610.—Male genitalia: *Epilachna zischkai* (588–590), *E. manni* (591–593), *E. bourcieri* (594–596), *E. simulans* (597–599), *E. fenestrata* (600–602), *E. schunkei* (603–604, 603a), *E. aureopilosa* (605–607), *E. punctatissima* (608–610).

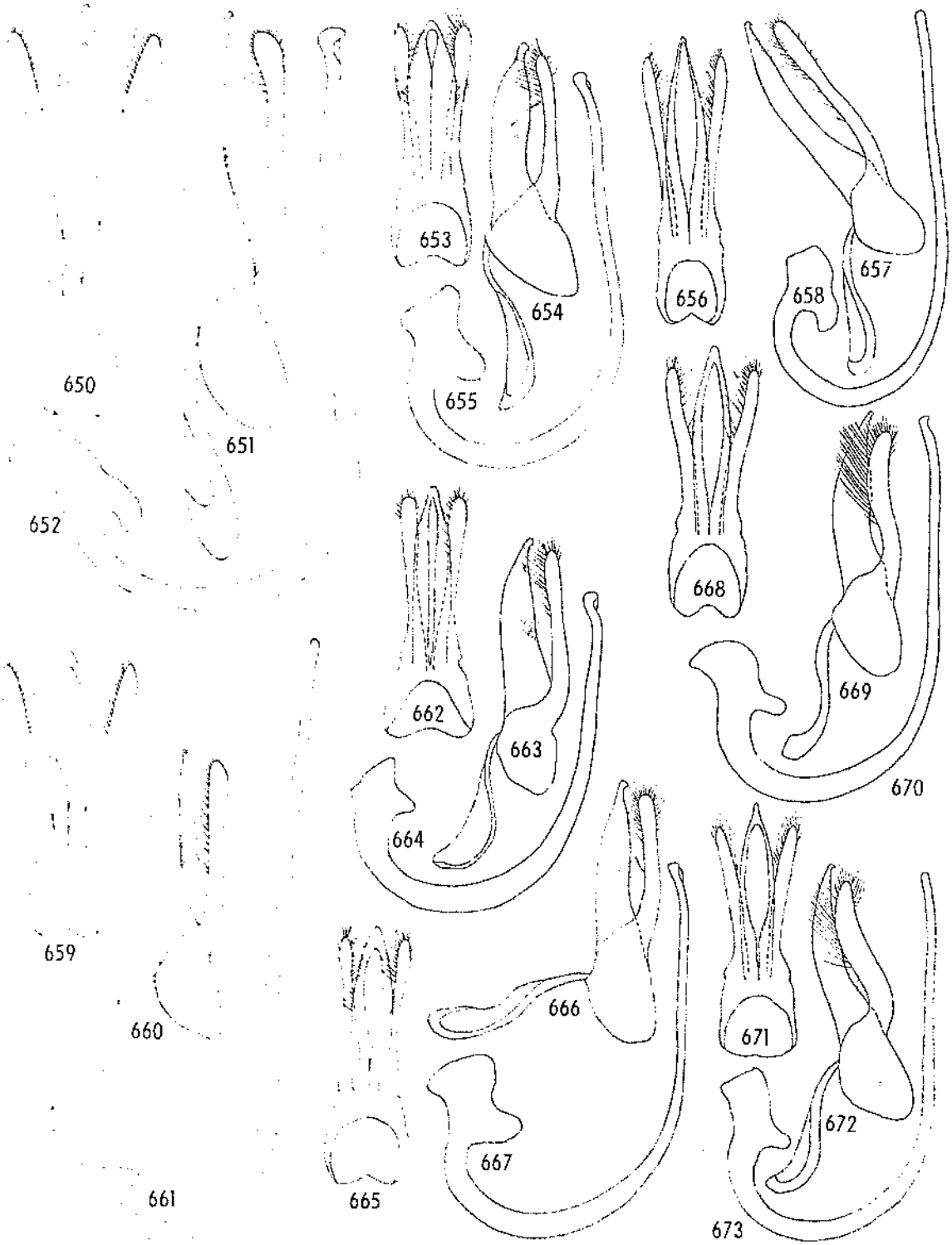


FIGURES 611–628.—Male genitalia: *Epilachna eximia* (611–613), *E. chiyata* (614–616), *E. narimoi* (617–619), *E. pemptea* (620–622), *E. monovittata* (623–625), *E. cushmani* (626–628).

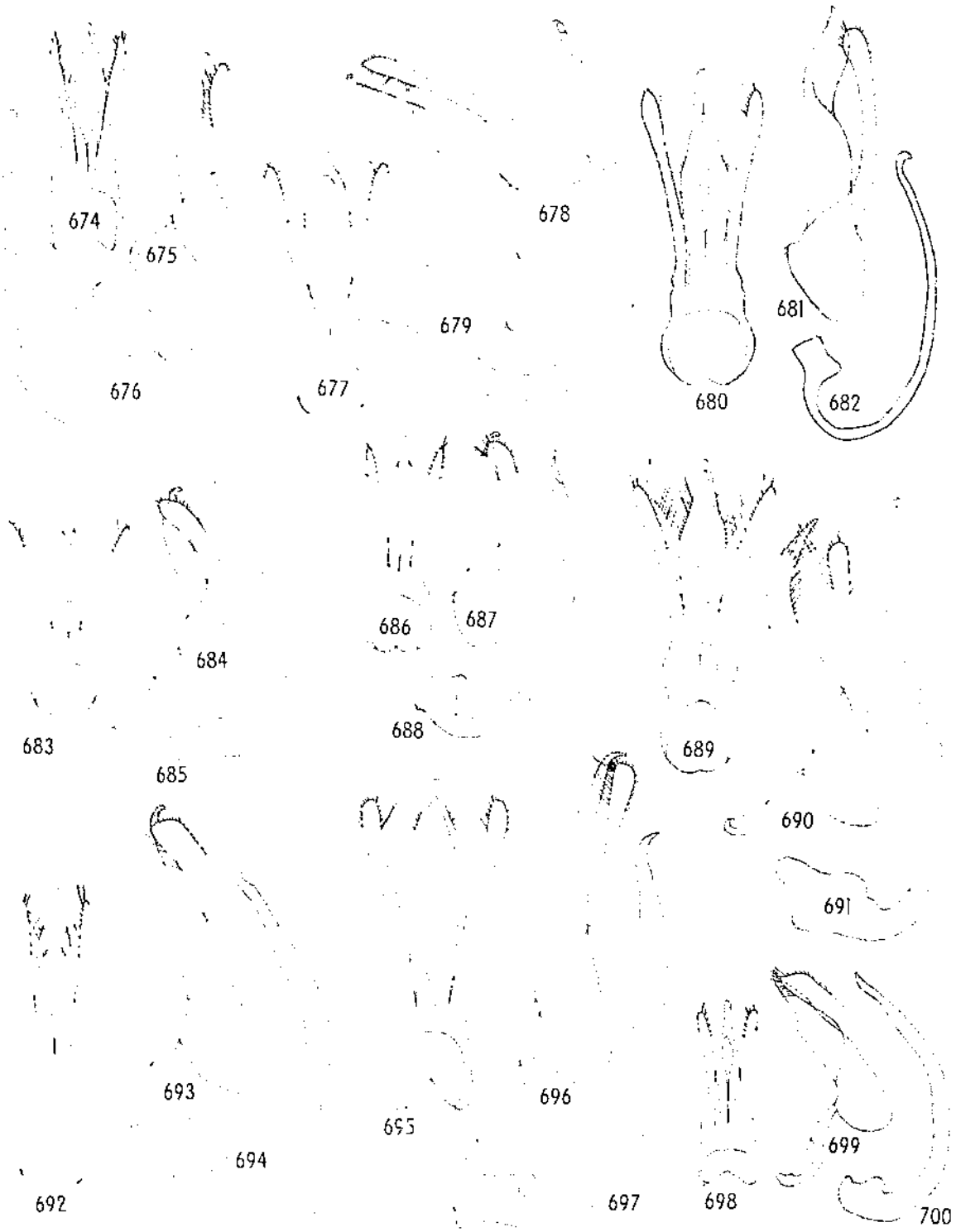


FIGURES 629–649.—Male genitalia: *Epilachna vittigera* (629–631), *E. freudei* (632–634), *E. taeniola* (635–637). *E. caucaensis* (638–640), *E. discoidea* (641–643), *E. honesta* (644–646), *E. ignobilis* (647–649).

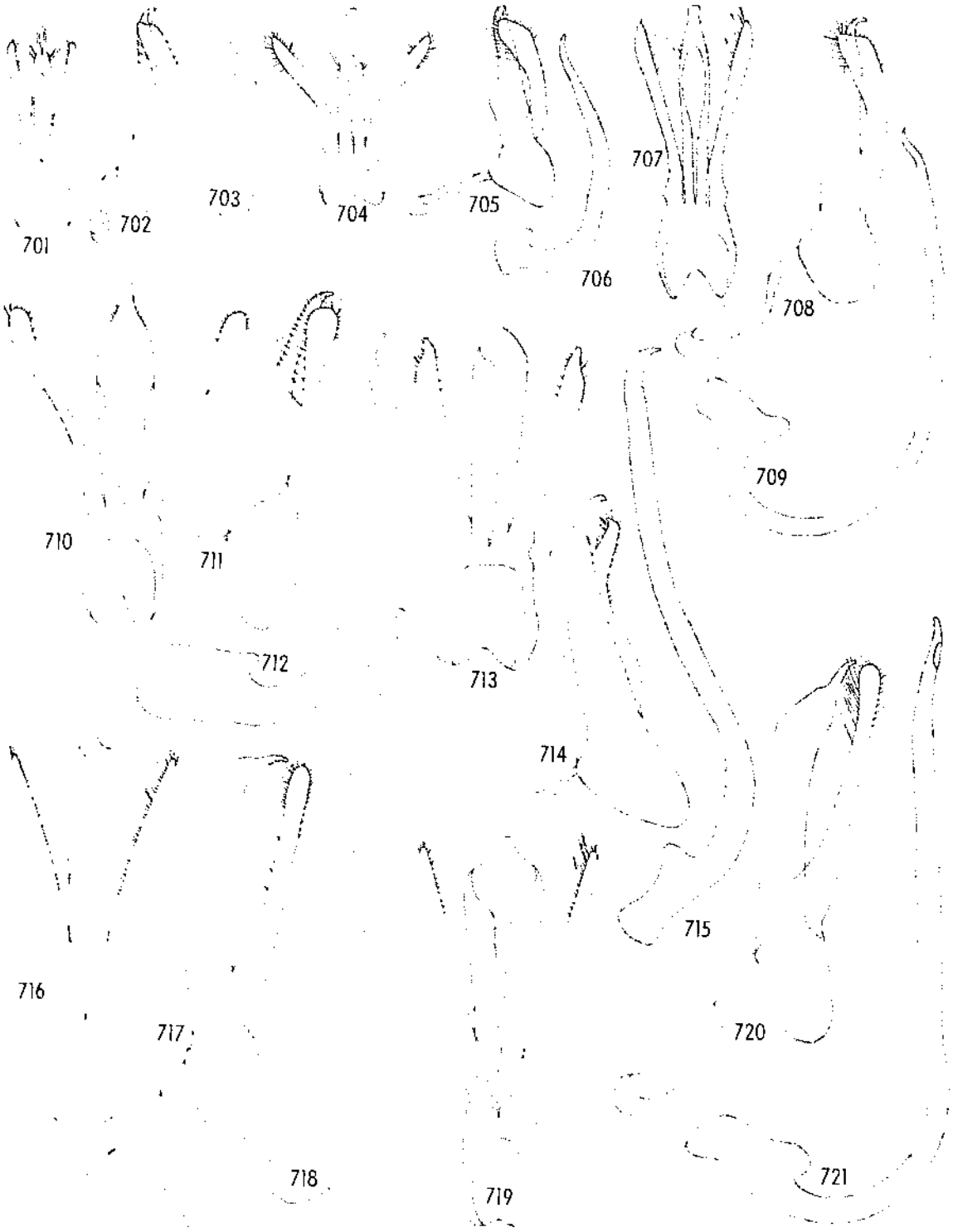
TB-1492 (1975) 7 USDA TECHNICAL BULLETINS UPDATA
A REVISION OF THE EPILACHNINE OF THE WESTERN HEMISPHERE (COLEOPTERA
GORDON, R.D. 4 OF 5



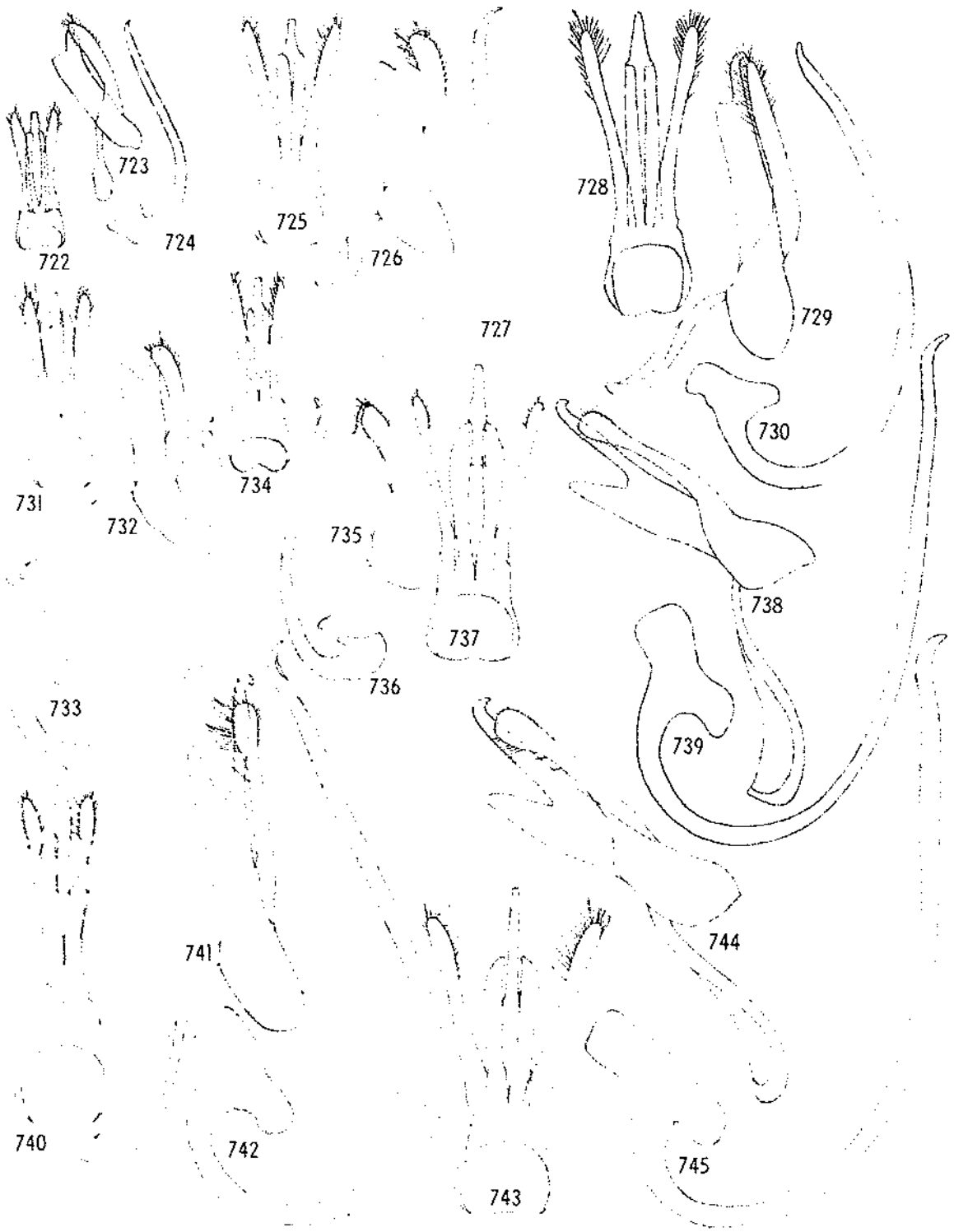
FIGURES 650–673.—Male genitalia: *Epilachna strictanotata* (650–652), *E. fenestroides* (653–655), *E. nana* (656–658), *E. quadriplagiata* (659–661), *E. bolivicola* (662–664), *E. korschefskyi* (665–667), *E. adnexa* (668–670), *E. bistriguttata* (671–673).



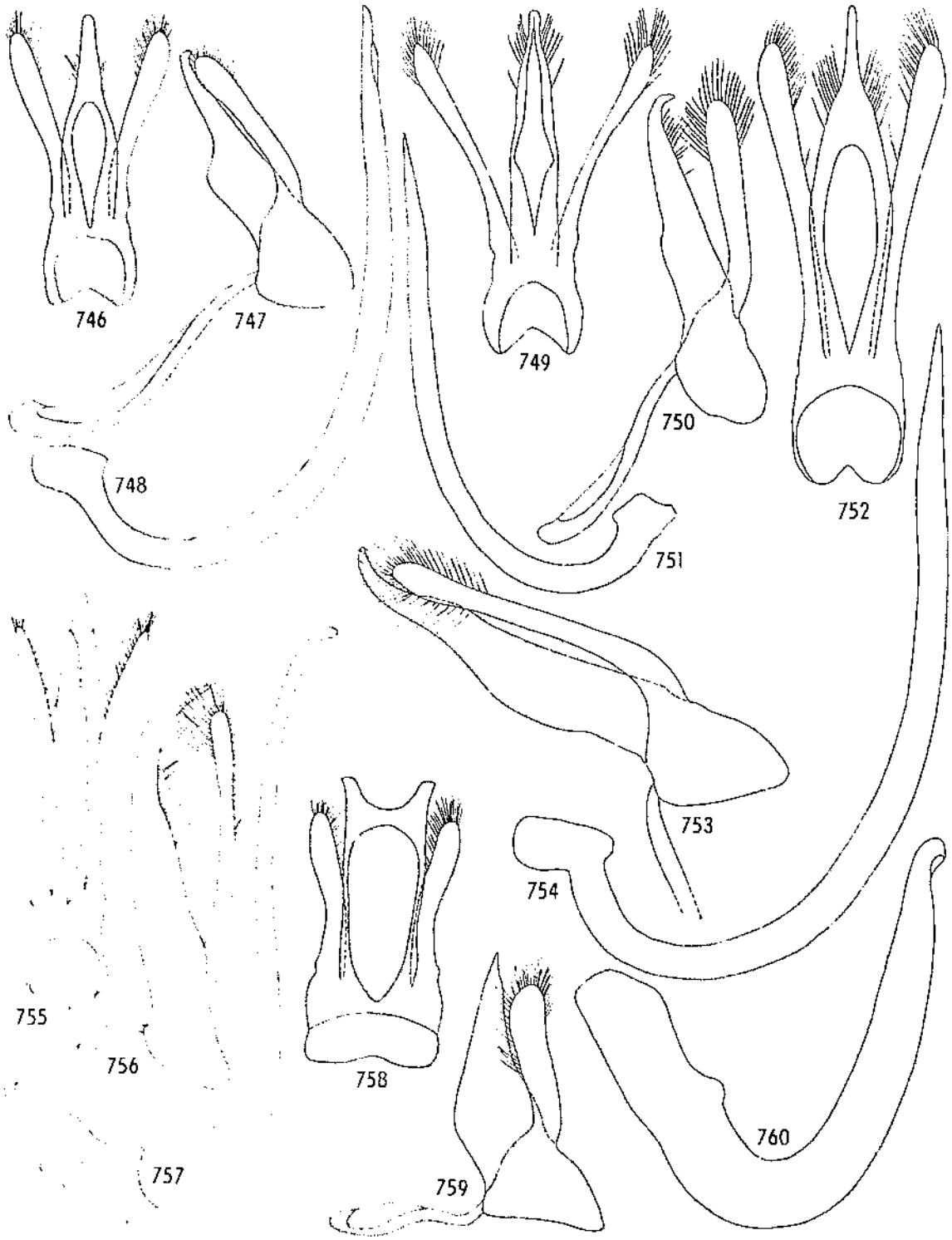
FIGURES 674–700.—Male genitalia: *Epilachna conjuncta* (674–676), *E. geometrica* (677–679), *E. ostensa* (680–682), *E. ostensoides* (683–685), *E. olmosi* (686–688), *E. divisoides* (689–691), *E. approximata* (692–694), *E. aequatorialis* (695–697), *E. gnoma* (698–700).



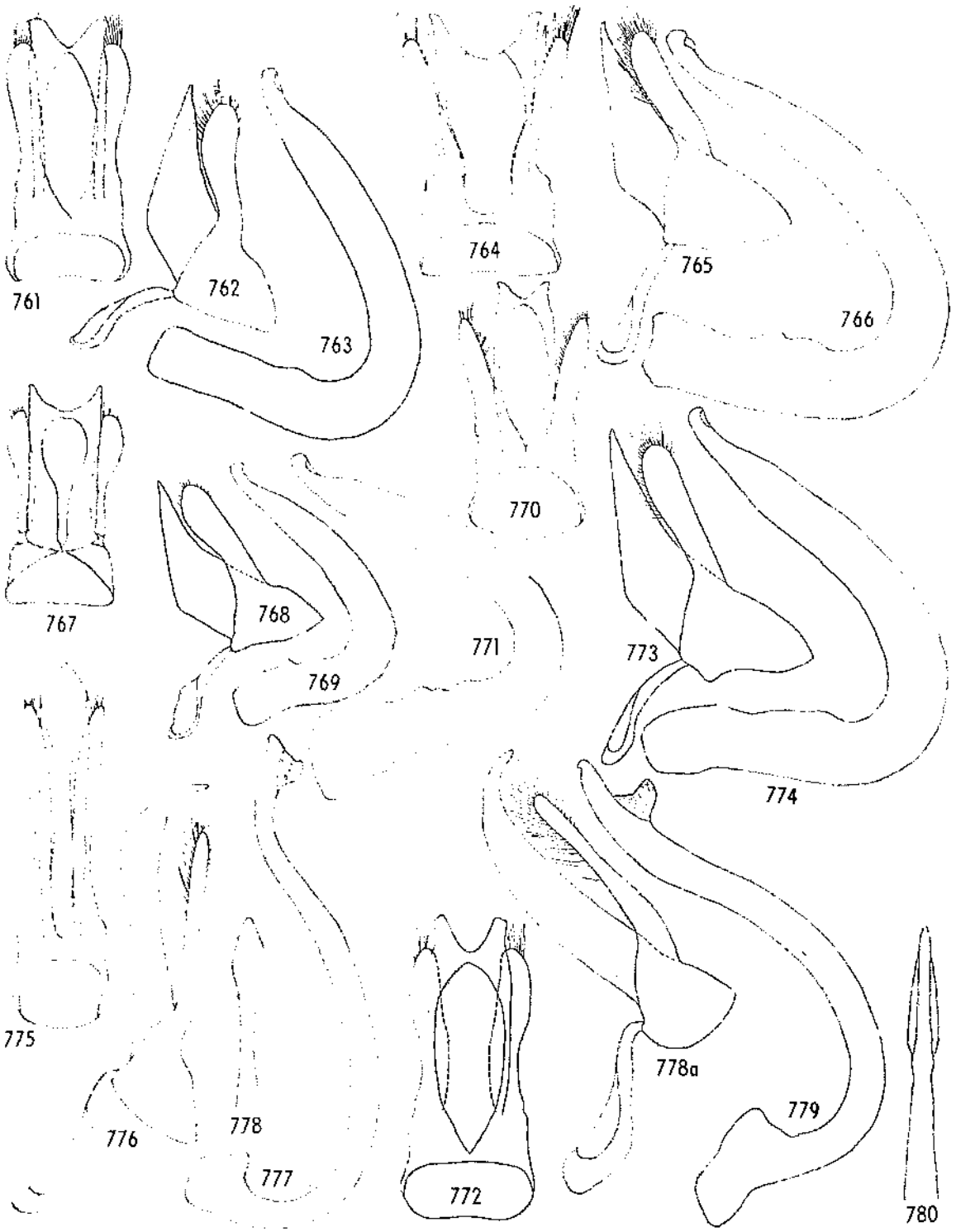
FIGURES 701–721.—Male genitalia: *Epilachna dubia* (701–703), *E. soachae* (704–706), *E. hybridula* (707–709), *E. aculata* (710–712), *E. paracuta* (713–715), *E. angustata* (716–718), *E. kraatzi* (719–721).



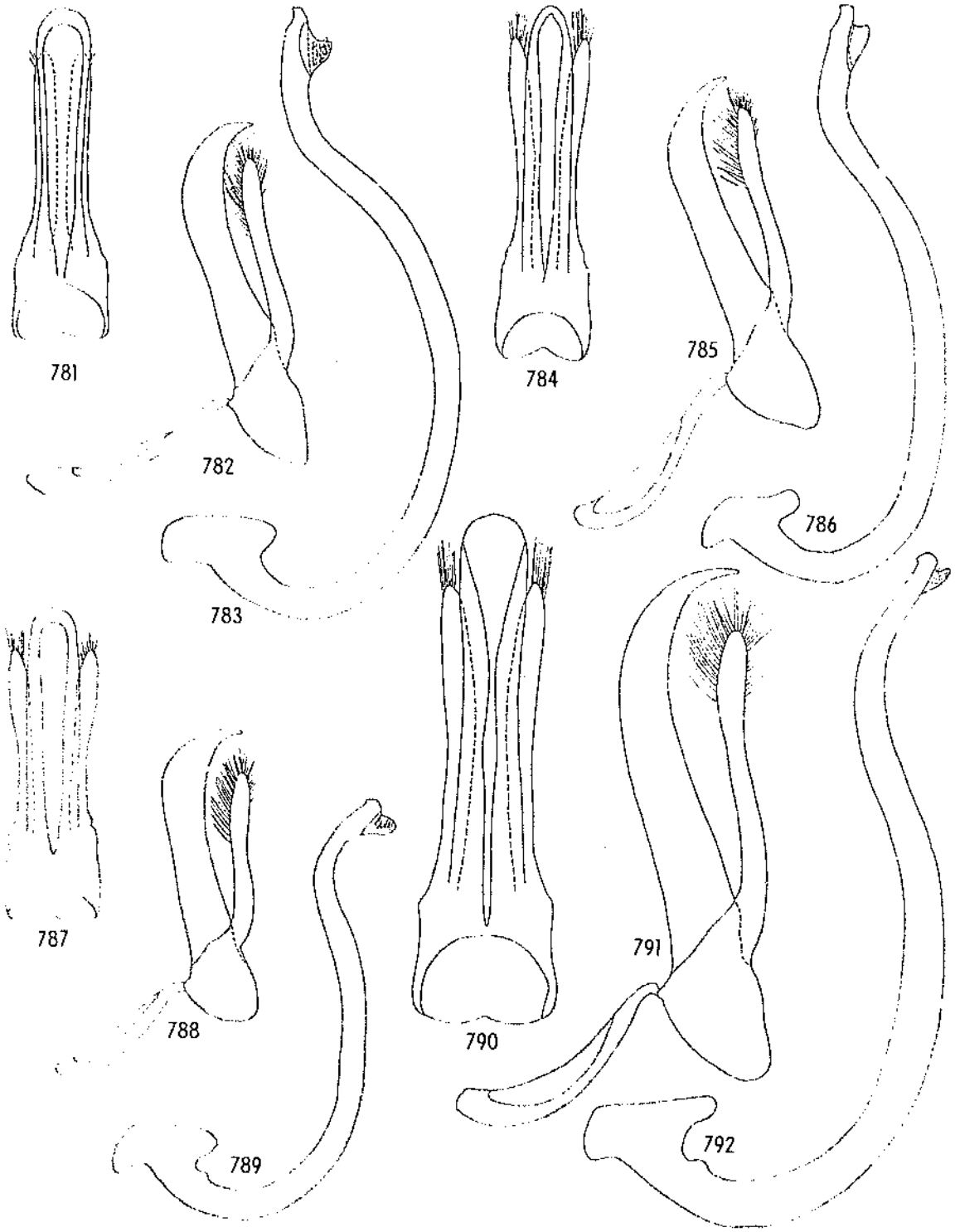
FIGURES 722–745.—Male genitalia: *Epilachna latimargo* (722–724), *E. bituberculata* (725–727), *E. walteri* (728–730), *E. jarugui* (731–733), *E. inserta* (734–736), *E. satipensis* (737–739), *E. woytkowskii* (740–742), *E. furcata* (743–745).



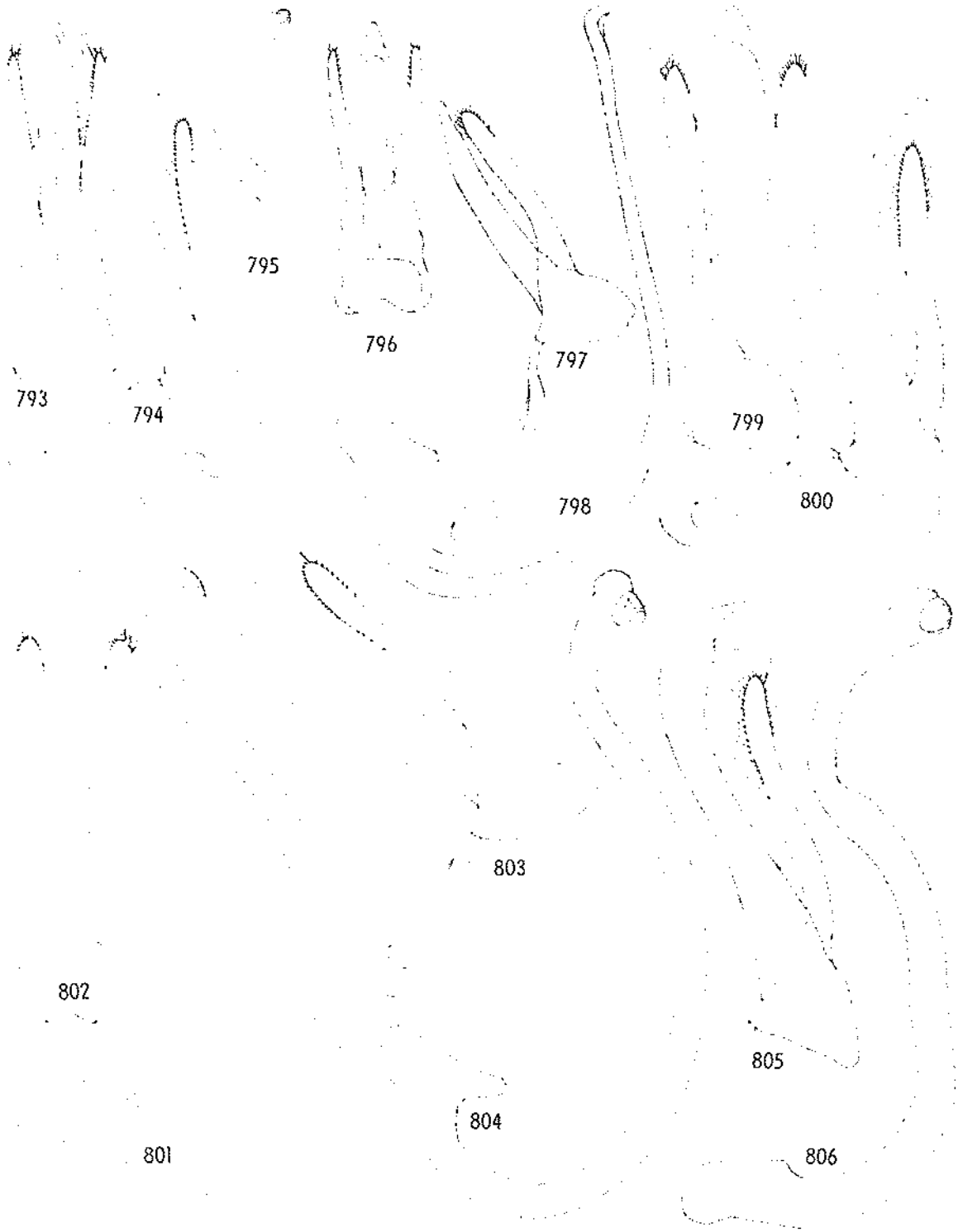
FIGURES 746–760.—Male genitalia: *Epilachna quirozensis* (746–748), *E. latreillei* (749–751), *E. buckleyi* (752–754), *E. peltata* (755–757), *E. azurea* (758–760).



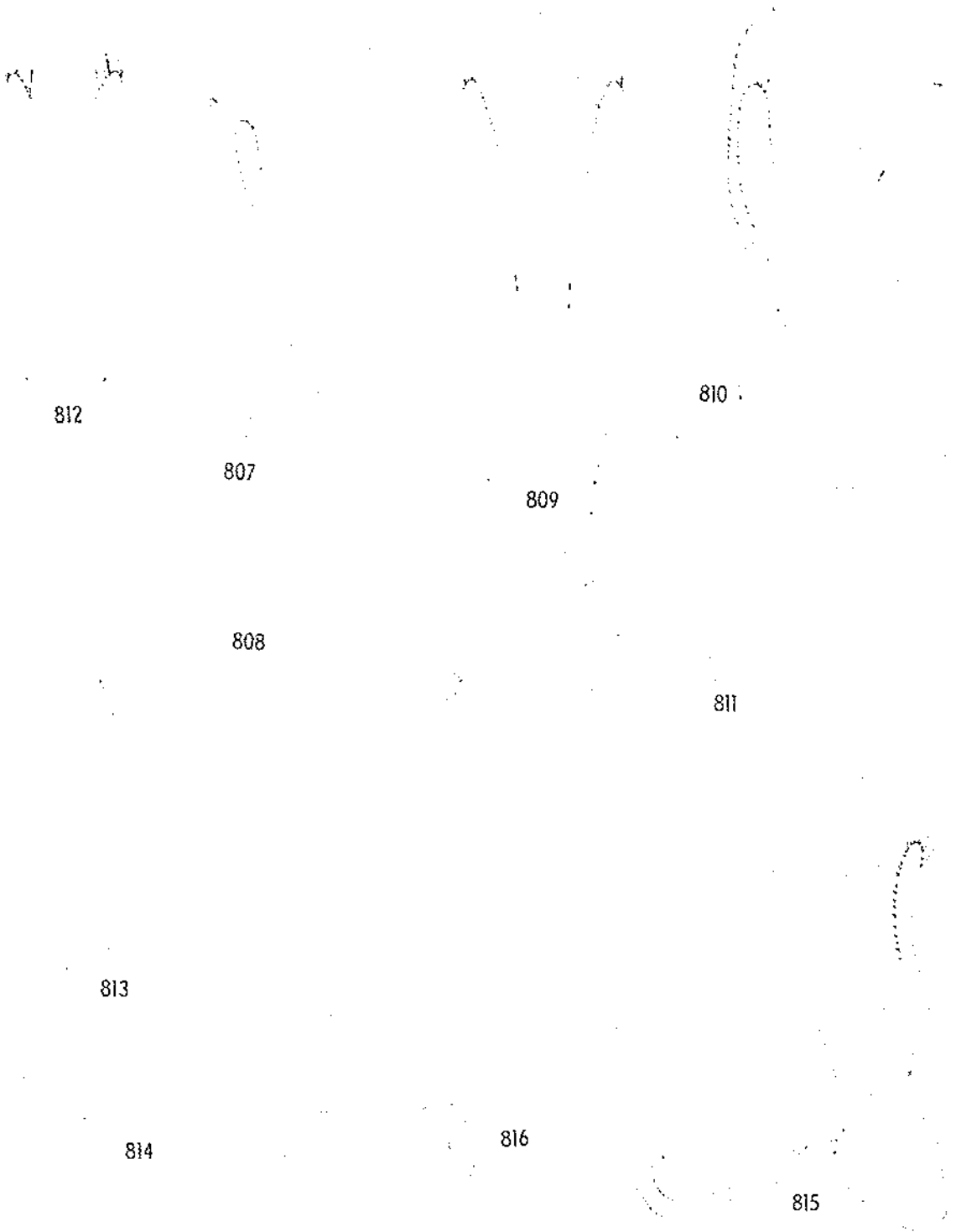
FIGURES 761–780, 778a.—Male genitalia: *Epilachna lepida* (761–763), *E. confixa* (764–766), *E. languida* (767–769), *E. pretiosa* (770–771), *E. bisbivittata* (772–774), *E. borealis* (775–778), *E. tredecimnotata* (778a, 779–780).



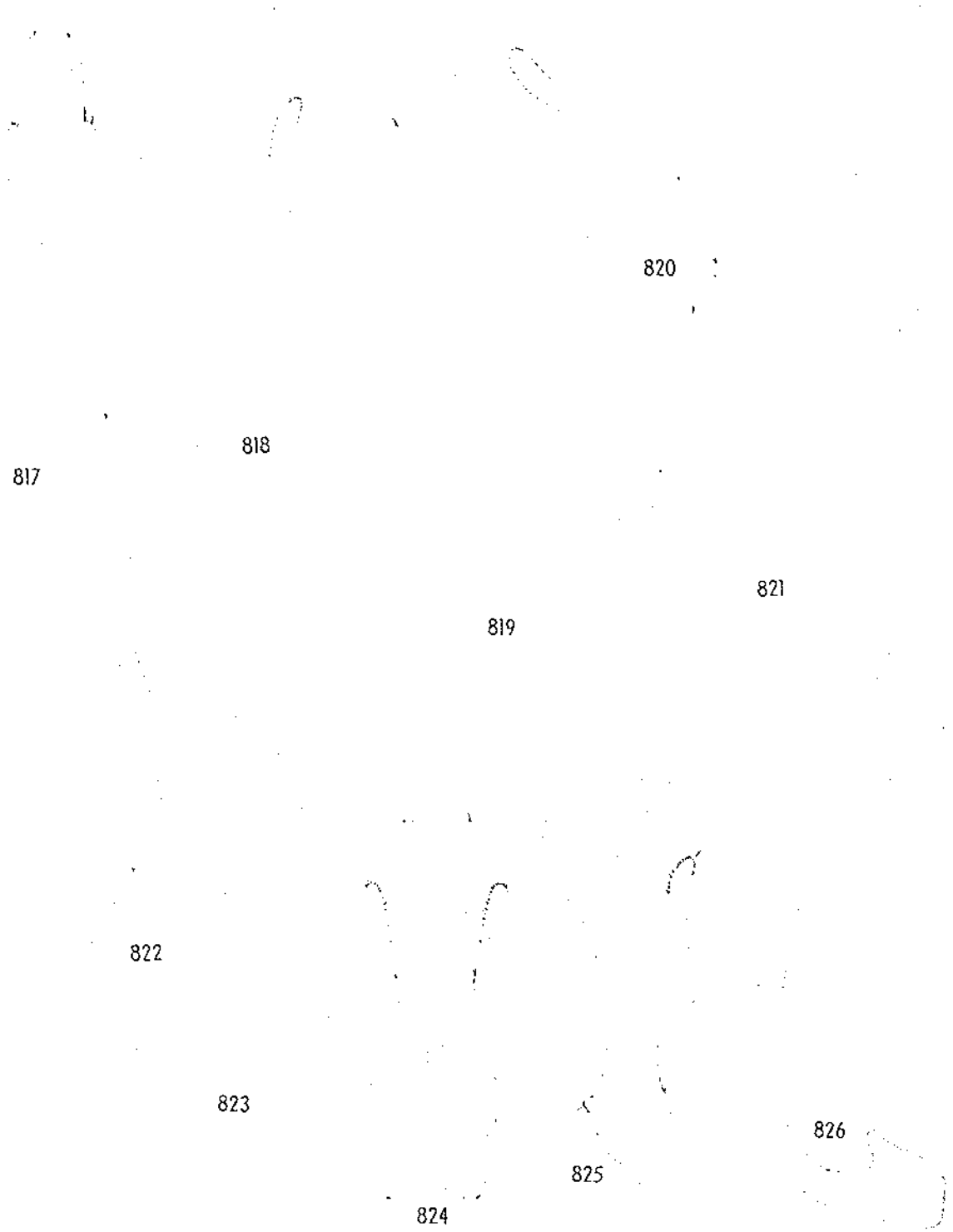
FIGURES 781–792.—Male genitalia: *Epilachna discincta* (781–783), *E. pocohantae* (784–786), *E. boraustralis* (787–789), *E. kraussi* (790–792).



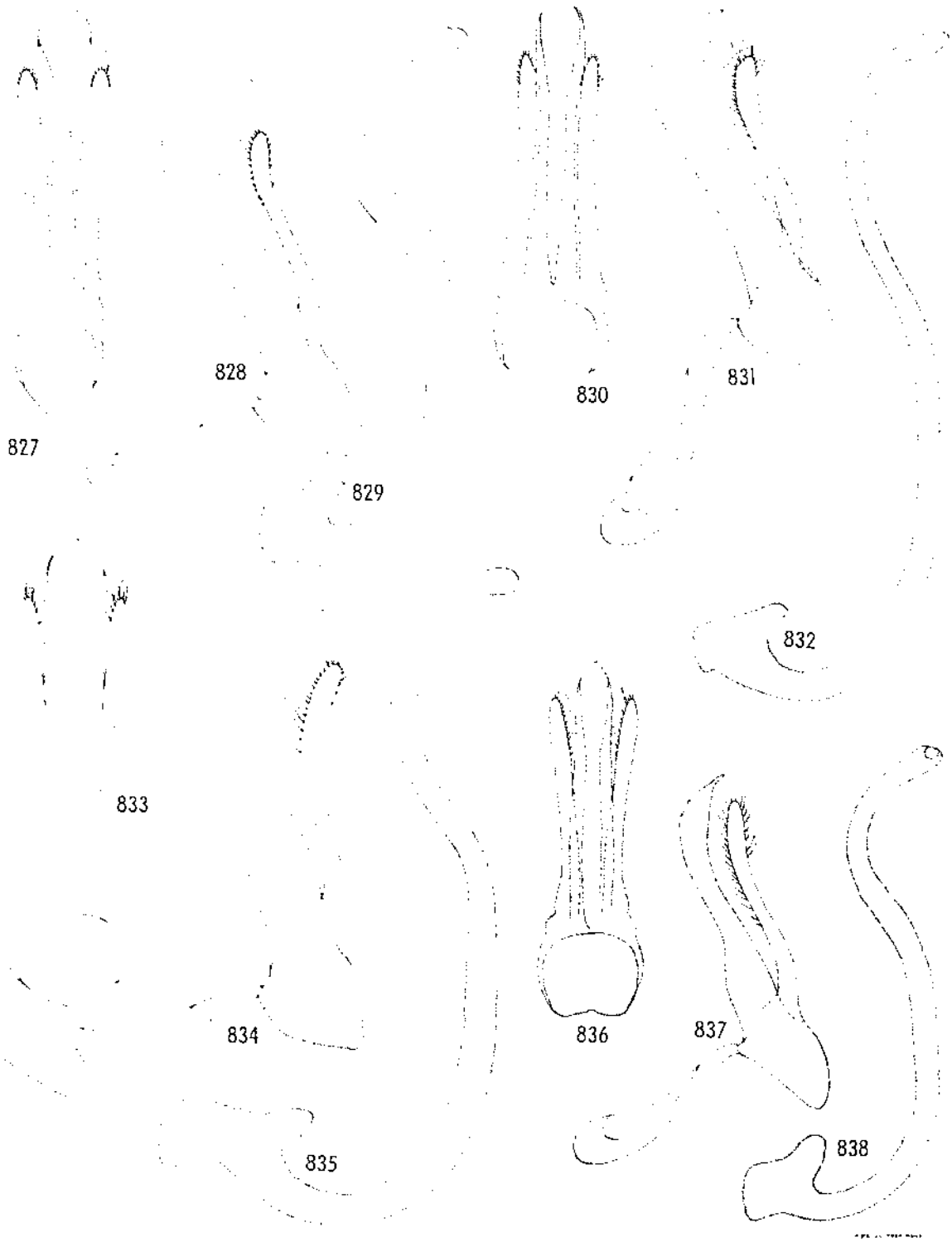
FIGURES 793–806.—Male genitalia: *Epilachna paenulata* (793–795), *E. cordula* (796–798), *E. axillaris* (799–801), *E. stolata* (802–804), *E. pictipennis* (805–806).



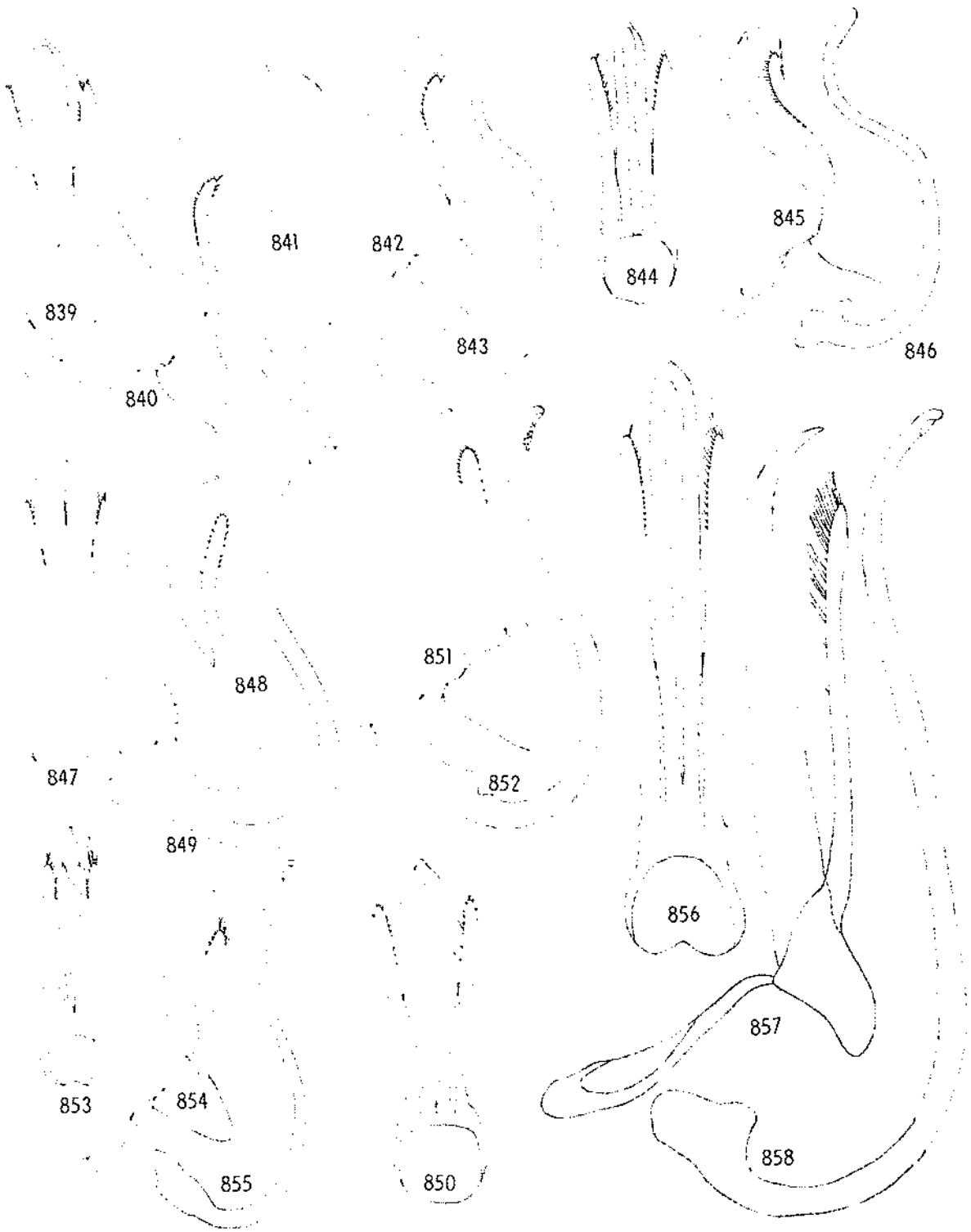
FIGURES 807–816.—Male genitalia: *Epilachna fryii* (807–808), *E. cinctipennis* (809–811), *E. madida* (812–814), *E. praecipua* (815–816).



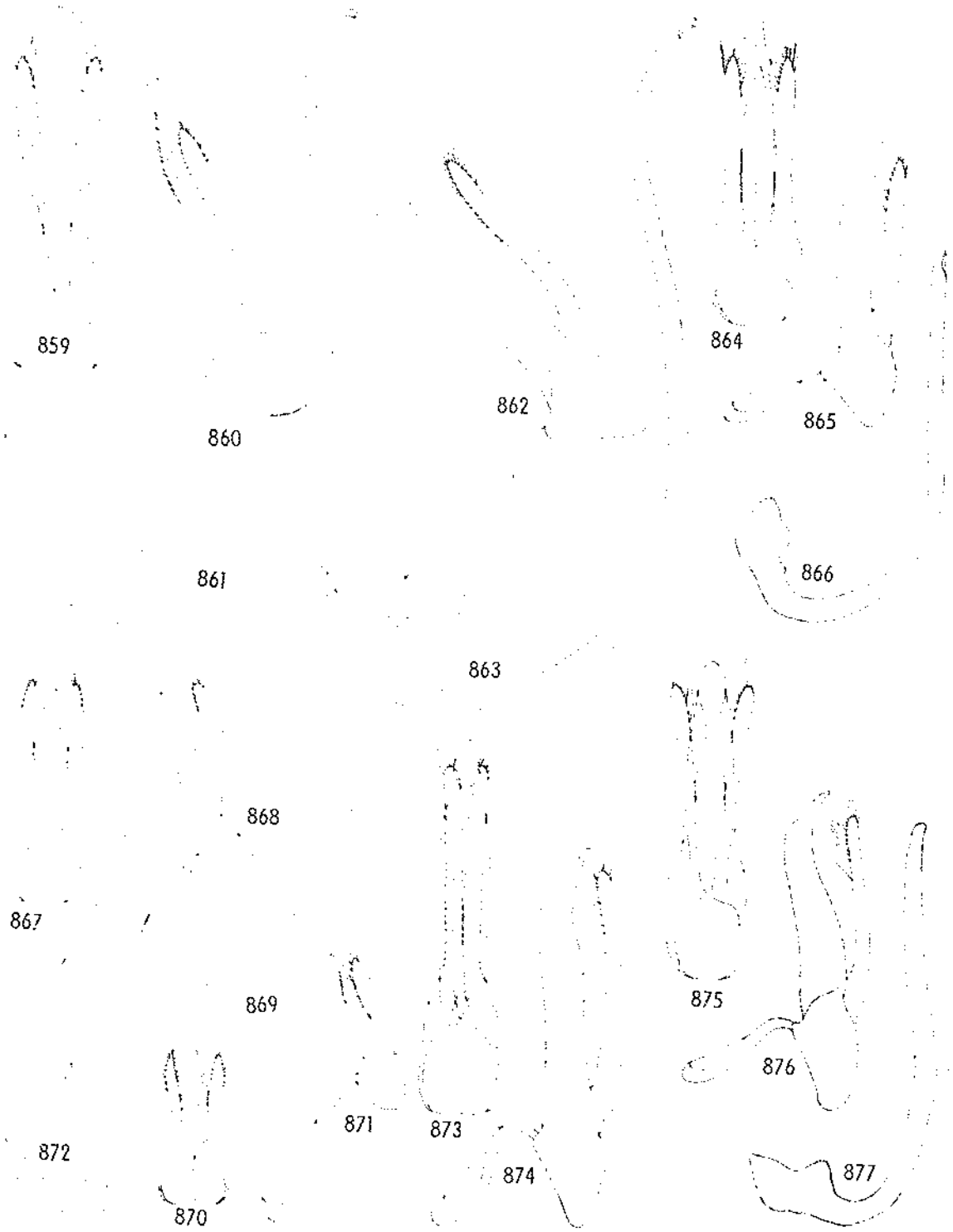
FIGURES 817–826.—Male genitalia: *Epilachna nigrovittata* (817–819), *E. mutabilis* (820–821), *E. pachiteensis* (822–823), *E. pastica* (824–826).



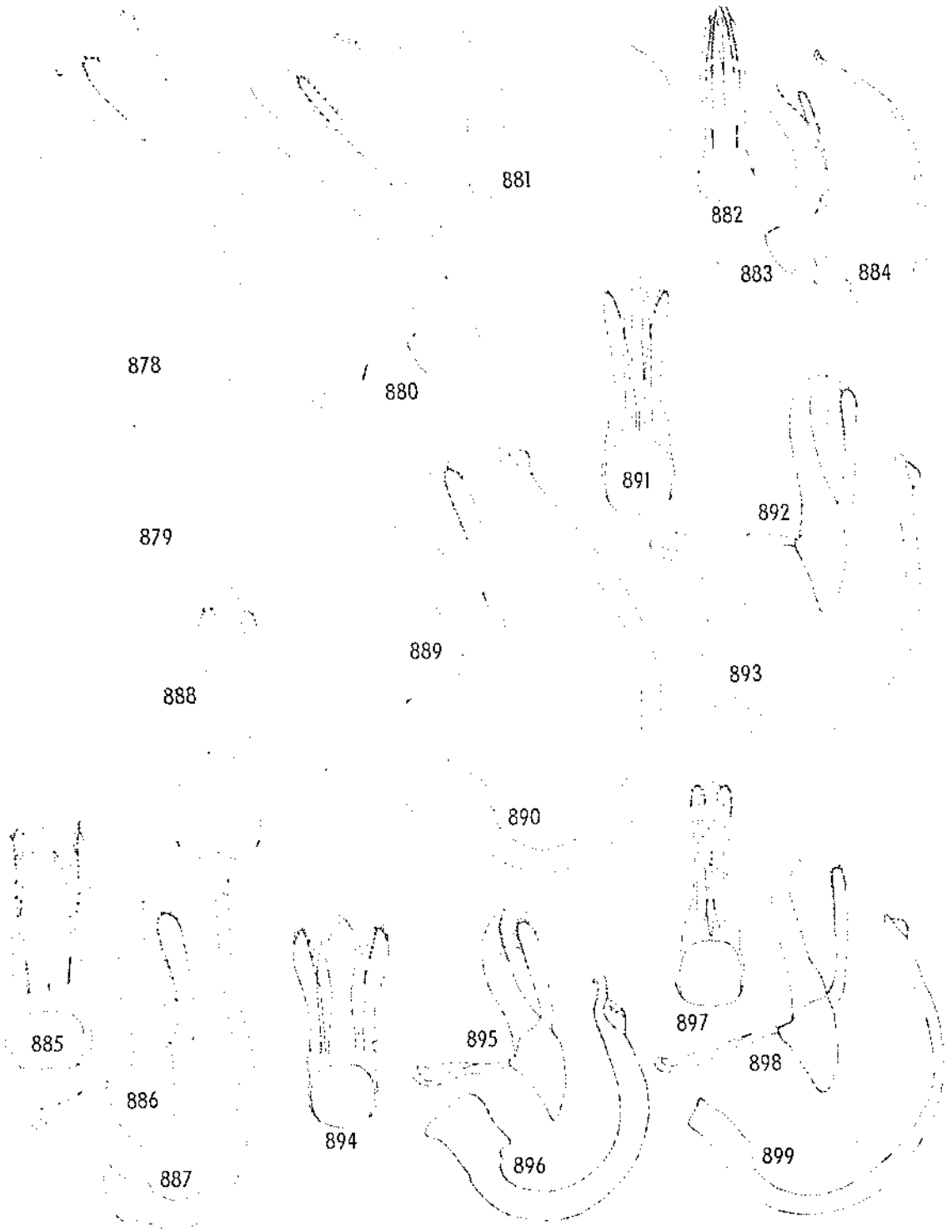
FIGURES 827–838.—Male genitalia: *Epilachna pseudostriata* (827–829), *E. propinqua* (830–832), *E. callangae* (833–835), *E. clandestina* (836–838).



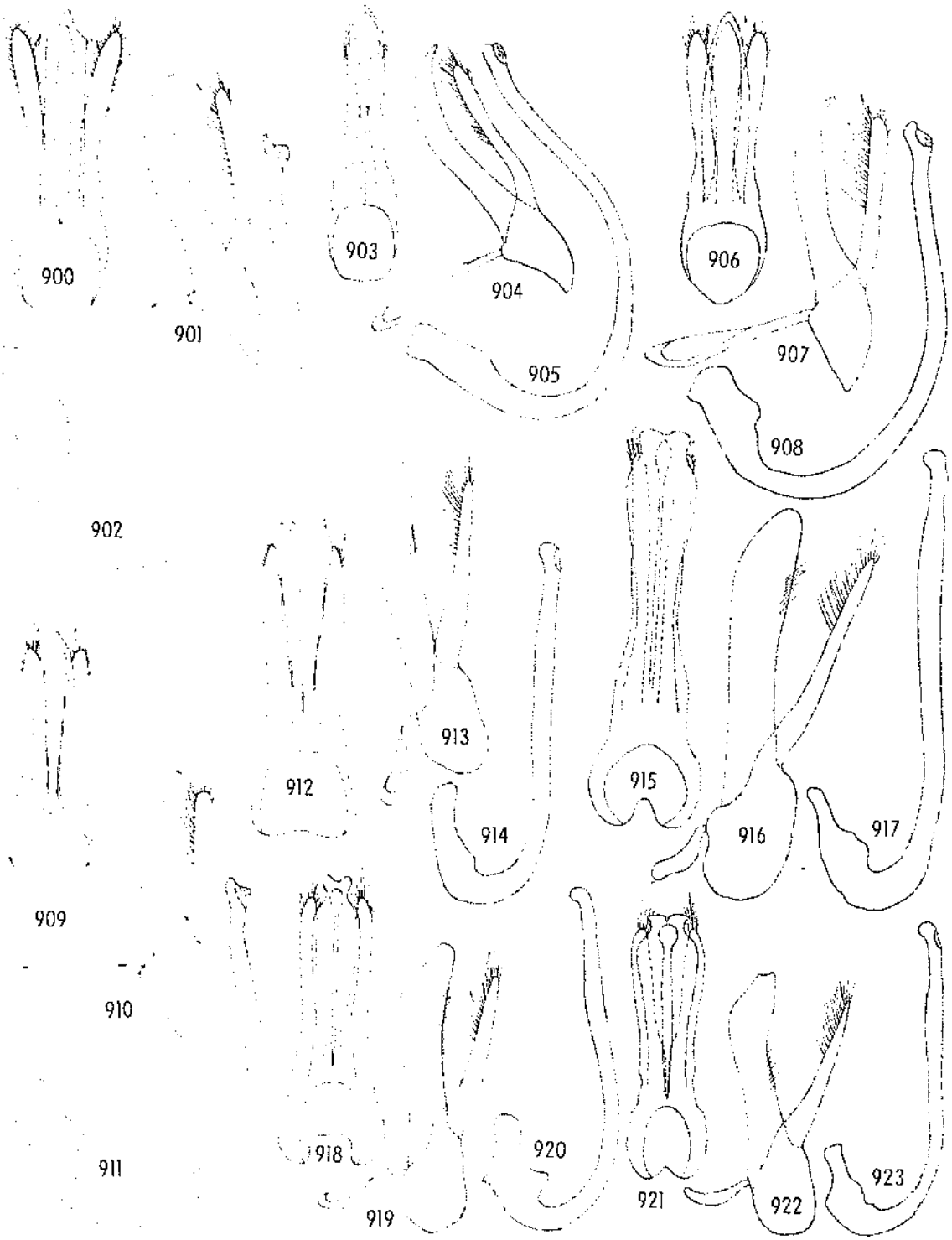
FIGURES 839–858.—Male genitalia: *Epilachna parastriata* (839–841), *E. basalis* (842–843), *E. sexlineata* (844–846), *E. varivestis* (847–849), *E. varipes* (850–852), *E. mexicana* (853–855), *E. plagiata* (856–858).



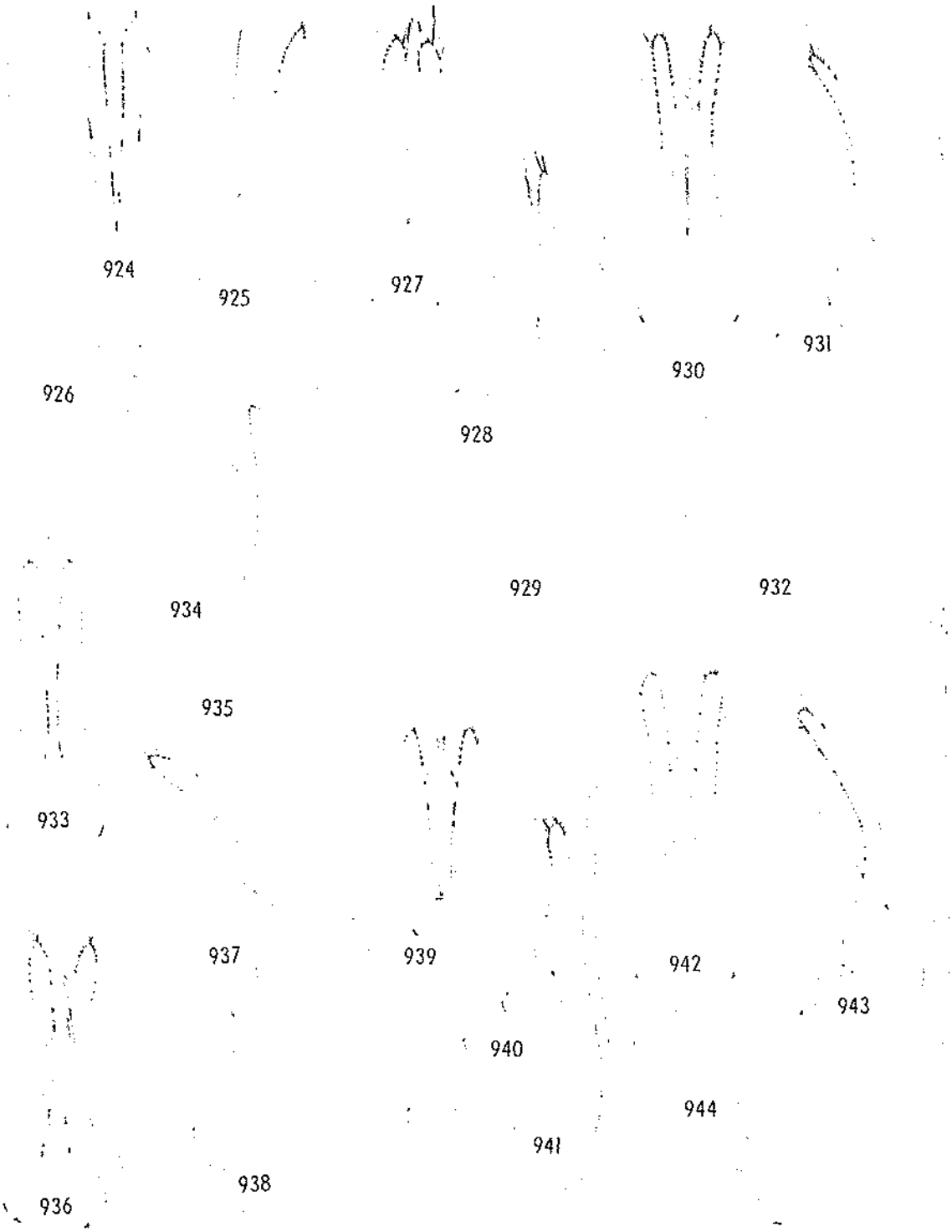
FIGURES 859–877.—Male genitalia: *Epilachna erichsoni* (859–861), *E. tumida* (862–863), *E. abrupta* (864–866), *E. nigrocincta* (867–869), *E. vincta* (870–872), *E. pseudographa* (873–874), *E. calligrapta* (875–877).



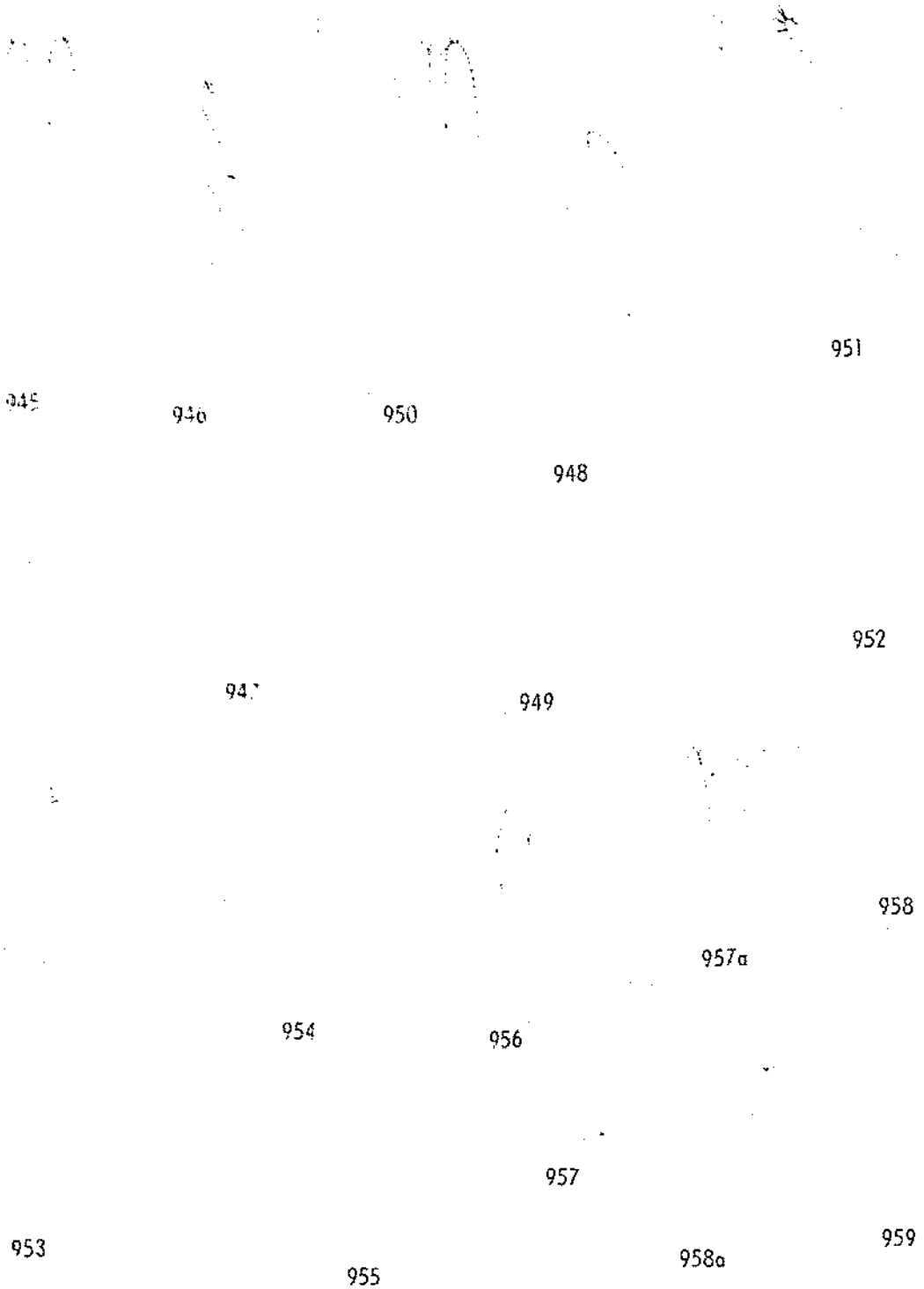
FIGURES 878–899.—Male genitalia: *Epilachna olivacea* (878–879), *E. obscurella* (880–881), *E. aubei* (882–884), *E. vulnerata* (885–887), *E. patula* (888–890), *E. modesta* (891–893), *E. difficilis* (894–896), *E. tenebricosa* (897–899).



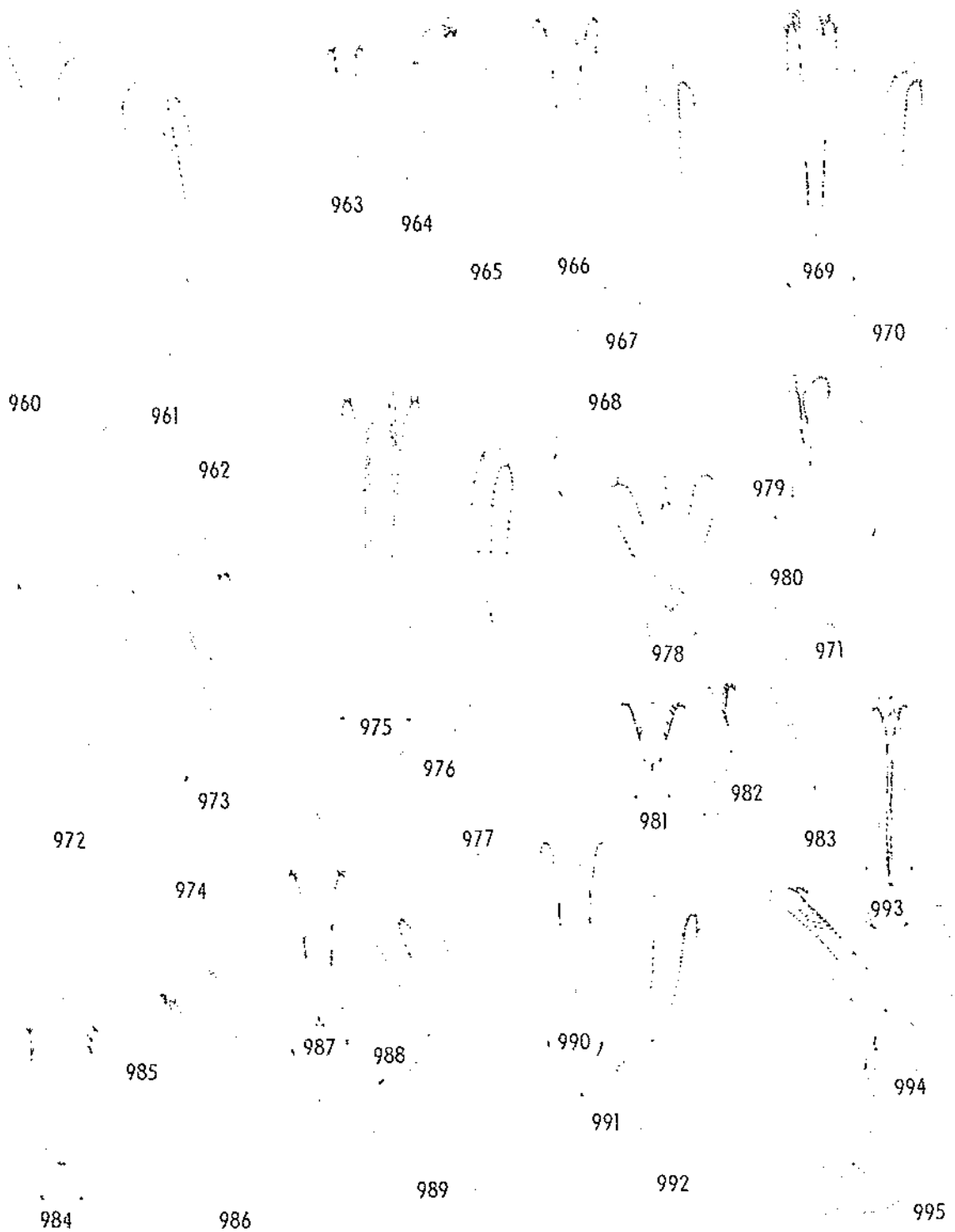
FIGURES 900–923.—Male genitalia: *Epilachna vanpatteni* (900–902), *E. gorhami* (903–905), *E. championi* (906–908), *E. godmani* (909–911), *E. circumcincta* (912–914), *E. staudingeri* (915–917), *E. mammifera* (918–920), *E. conifera* (921–923).



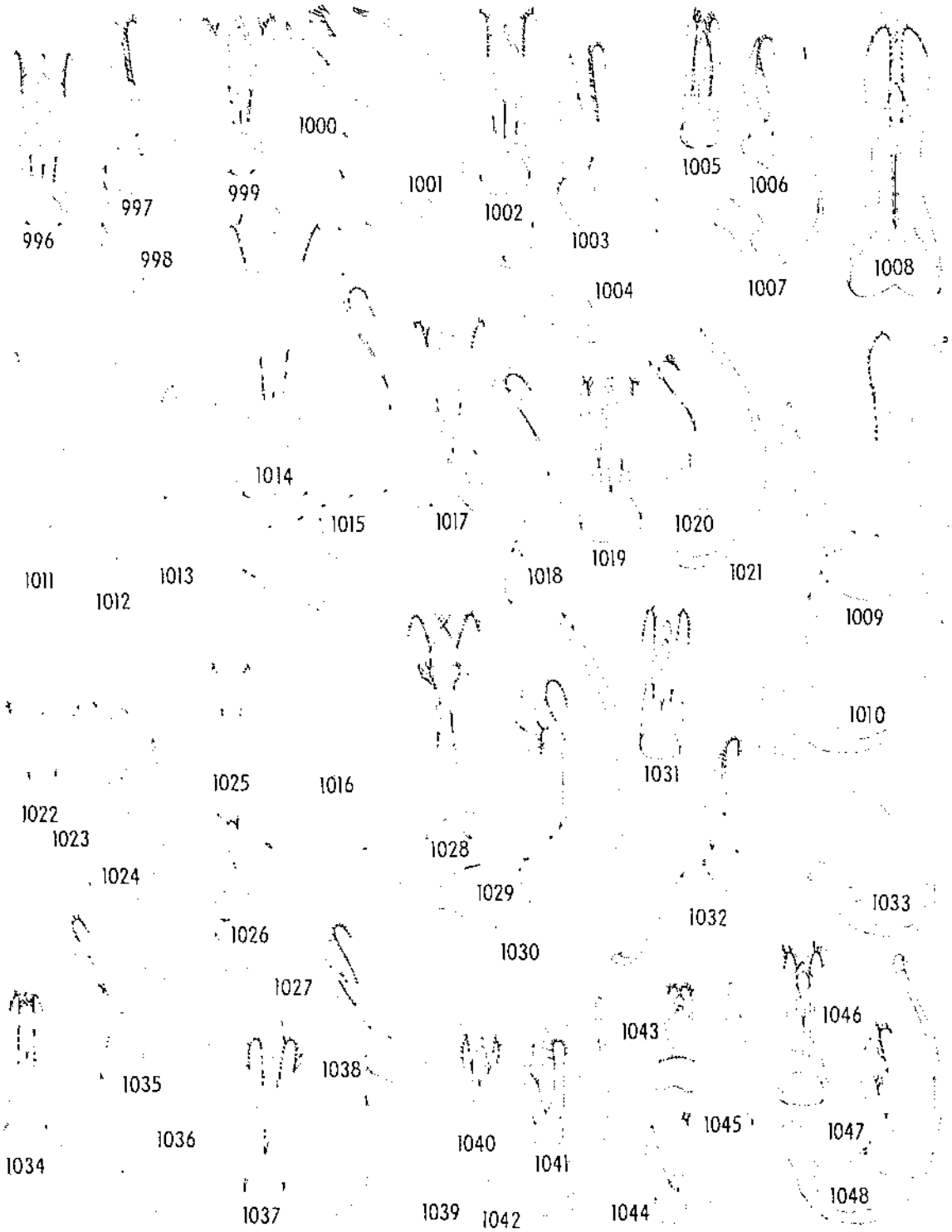
FIGURES 924–944.—Male genitalia: *Epilachna corniventris* (924–926), *E. spreta* (927–929), *E. cacica* (930–932), *E. marginella* (933–935), *E. velutina* (936–938), *E. concolor* (939–941), *E. darlingtoni* (942–944).



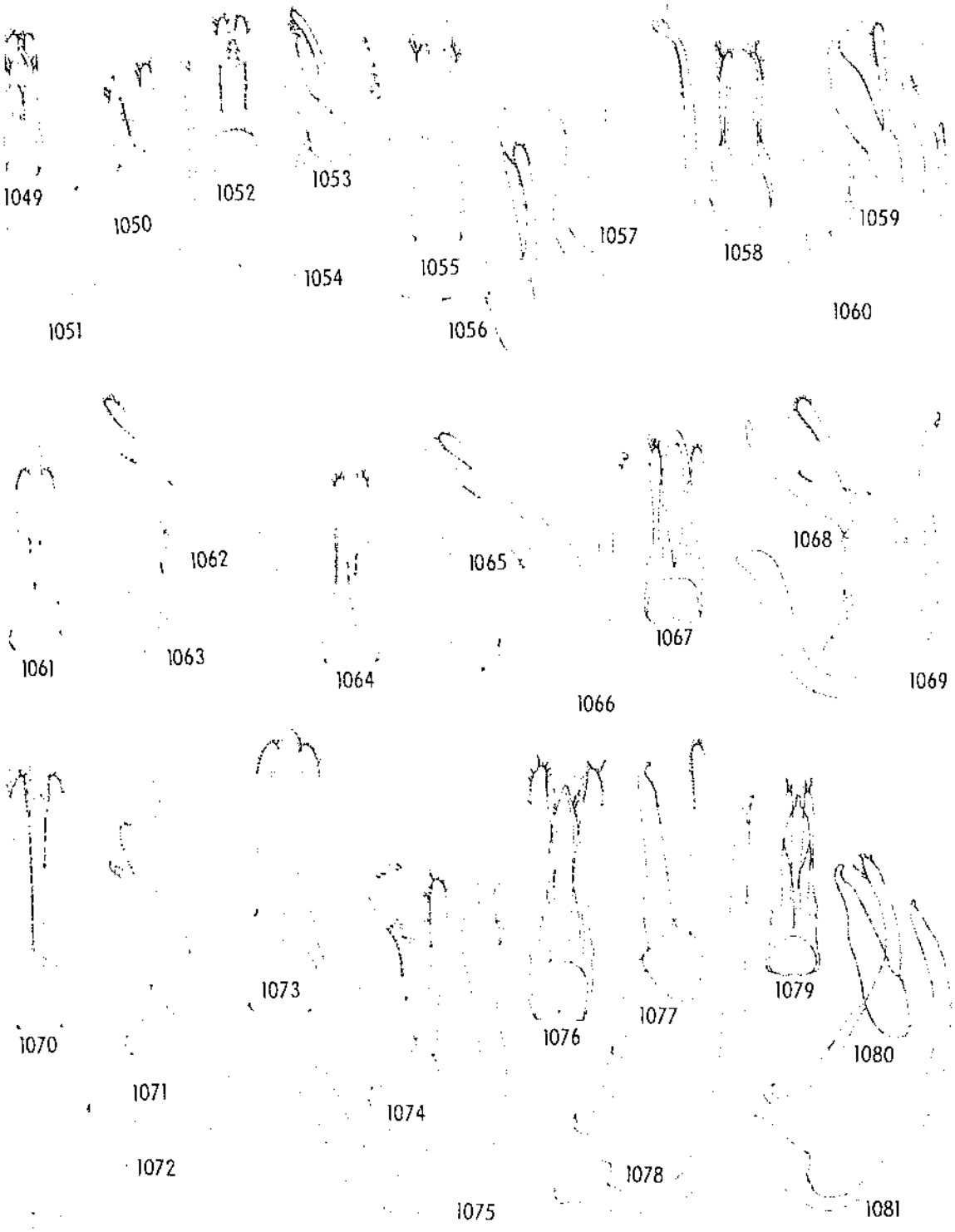
FIGURES 945–959.—Male genitalia: *Epilachna pseudorealis* (945–947), *E. velata* (948–949), *E. extrema* (950–952), *E. merae* (953–955), *Dira clarkii* (956–958), *D. obscurocincta* (957a–958a, 959).



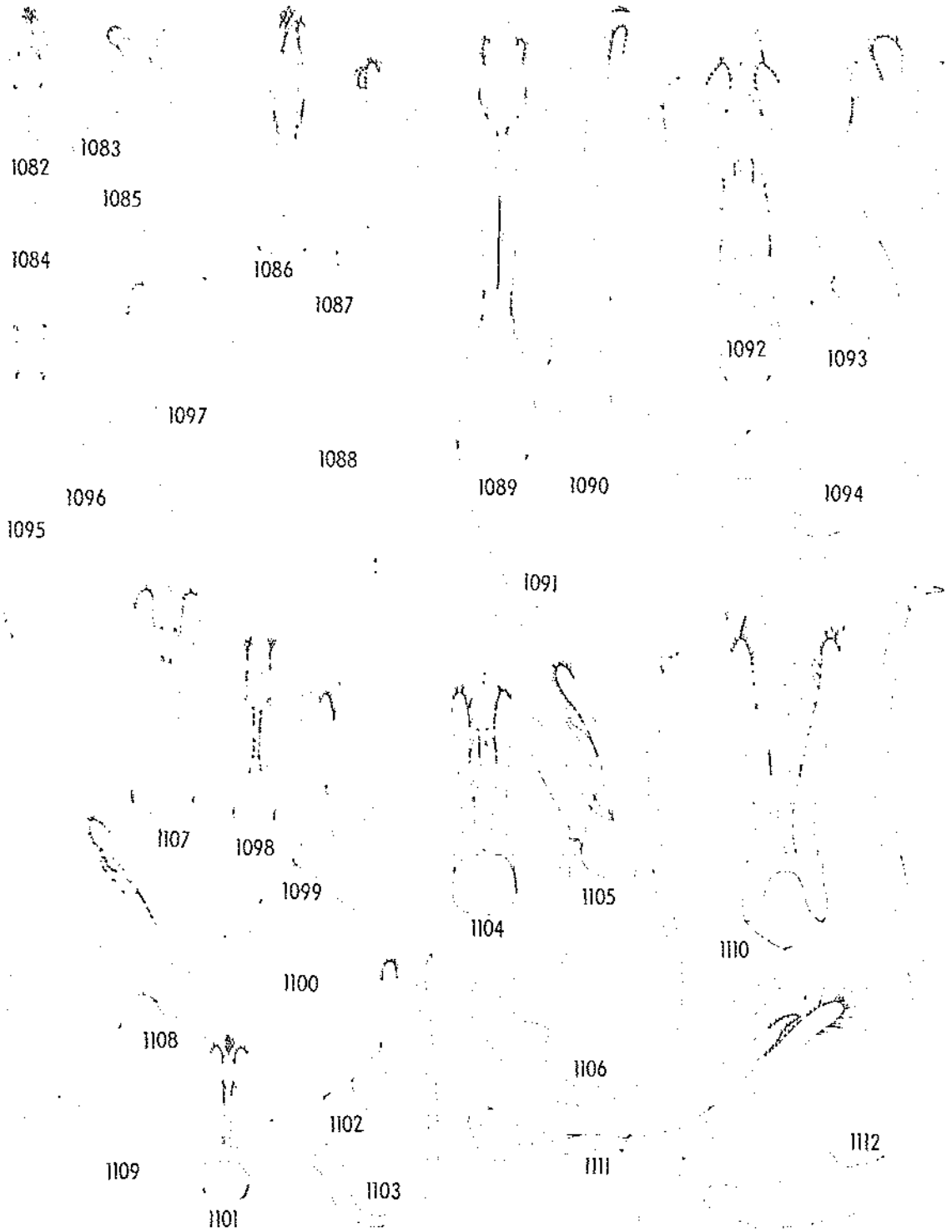
FIGURES 960–995.—Male genitalia: *Dira richteri* (960–962), *D. tomentosa* (963–965), *D. gossypioides* (966–968), *D. gossypiata* (969–971), *D. nucula* (972–974), *D. inexculta* (975–977), *Lorma nevermanni* (978–980), *L. specca* (981–983), *L. apicalis* (984–986), *L. ruficentris* (987–989), *L. glaucina* (990–992), *L. haliki* (993–995).



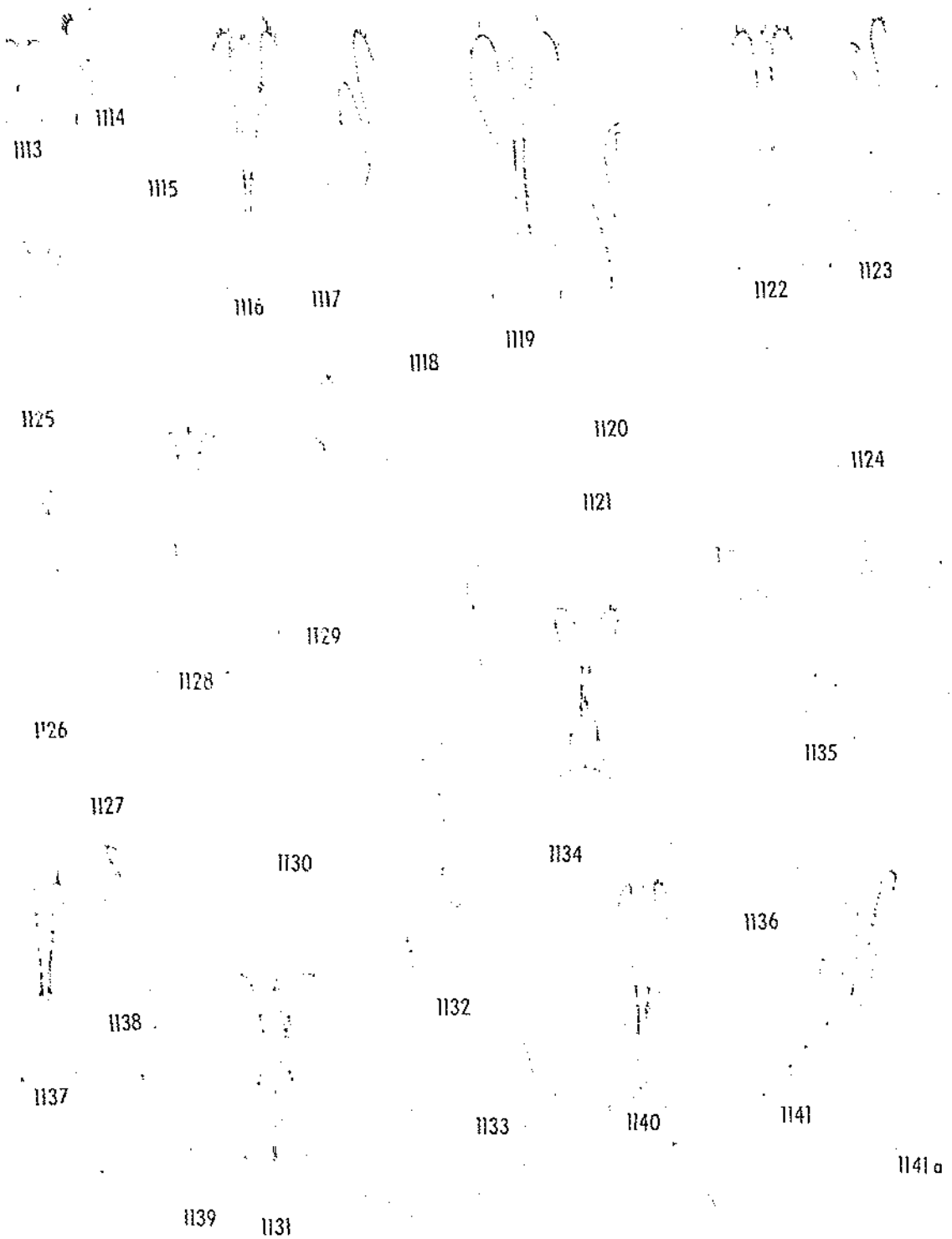
FIGURES 996–1048.—Male genitalia: *Lorma imitator* (996–998), *L. sicardi* (999–1001), *L. sopita* (1002–1004), *L. paprzyckii* (1005–1007), *L. batesi* (1008–1010), *Malata mitis* (1011–1013), *M. burgdorfi* (1014–1016), *M. apatela* (1017–1018), *M. delphinae* (1019–1021), *M. dickei* (1022–1024), *M. pseudomitis* (1025–1027), *Mada fraterna* (1028–1030), *M. pseudofraterna* (1031–1033), *M. amydra* (1034–1036), *M. cayennensis* (1037–1039), *M. concentrica* (1040–1042), *M. deyrollei* (1043–1045), *M. synemia* (1046–1048).



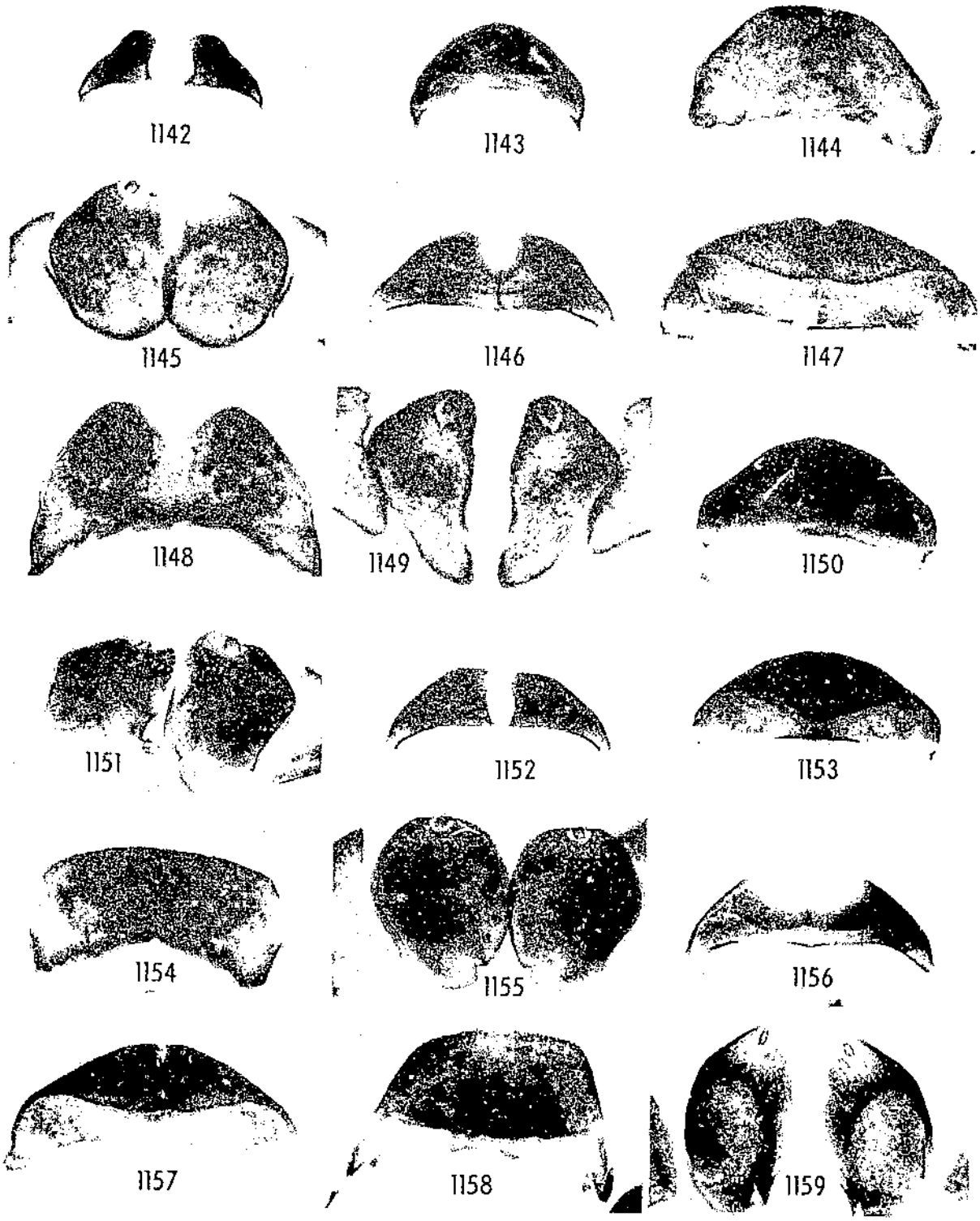
FIGURES 1049–1081.—Male genitalia: *Mada amazona* (1049–1051), *M. spinula* (1052–1054), *M. santaremae* (1055–1057), *M. apada* (1058–1060), *M. gounellei* (1061–1063), *M. circumflua* (1064–1066), *M. flavomarginata* (1067–1069), *M. contempta* (1070–1072), *M. zonula* 1073–1075), *M. virgata* (1076–1078), *M. inepta* (1079–1081).



FIGURES 1082–1112.—Male genitalia: *Mada adusta* (1082–1085), *M. polluta* (1086–1088), *M. lineatopunctata* (1089–1091), *M. rabauti* (1092–1094), *M. dissita* (1095–1097), *M. elegans* (1098–1100), *M. circumducta* (1101–1103), *M. insolitaphallus* (1104–1106), *M. nexophallus* (1107–1109), *M. pseudodamata* (1110–1112).

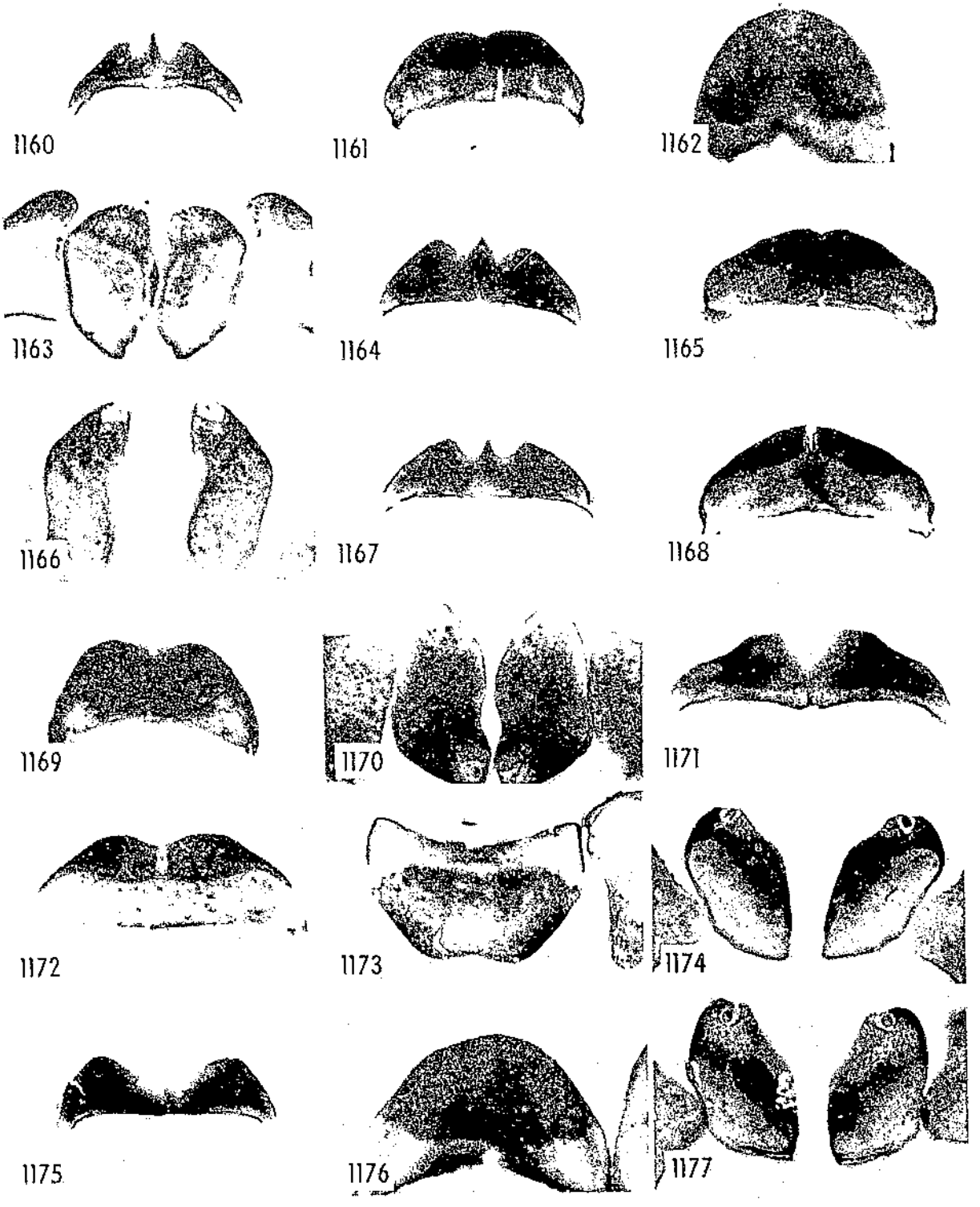


FIGURES 1113–1141, 1141a.—Male genitalia: *Mada azyoides* (1113–1115), *Damalula carnegiana* (1116–1118), *D. fairmairei* (1119–1121), *D. carina* (1122–1124), *D. gurimagi* (1125–1127), *D. porioides* (1128–1130), *D. smarti* (1131–1133), *D. disjuncta* (1134–1136), *D. schwarzi* (1137–1139), *D. colombiana* (1140–1141, 1141a).



FN-3277

FIGURES 1142–1159.—Female genitalia: *Toxotoma venusta* (1142–1145), *T. opacula* (1146–1149), *T. locotalis* (1150–1151), *T. weyrauchi* (1152–1155), *T. huancoi* (1156–1159).



PN-3278

FIGURES 1160–1177.—Female genitalia: *Toxotoma sonkupi* (1160–1163), *T. rosae* (1164–1166), *T. rugulosa* (1167–1170), *T. cuzcoensis* (1171–1174), *T. leechi* (1175–1177).

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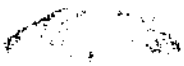

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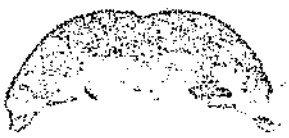

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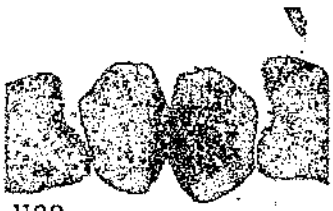

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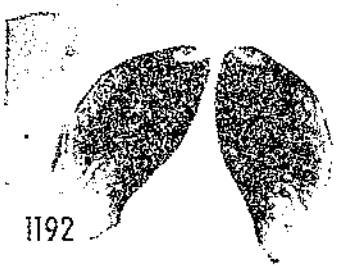

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FIGURES 1178–1195.—Female genitalia: *Toxotoma andicola* (1178–1181), *T. tridentata* (1182–1184), *T. forsteri* (1185–1188), *T. murilloi* (1189–1192), *T. haywardi* (1193–1195).

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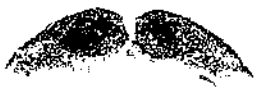
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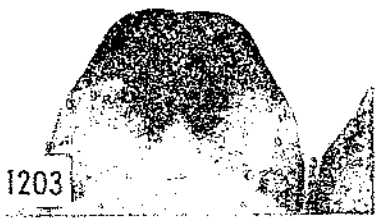
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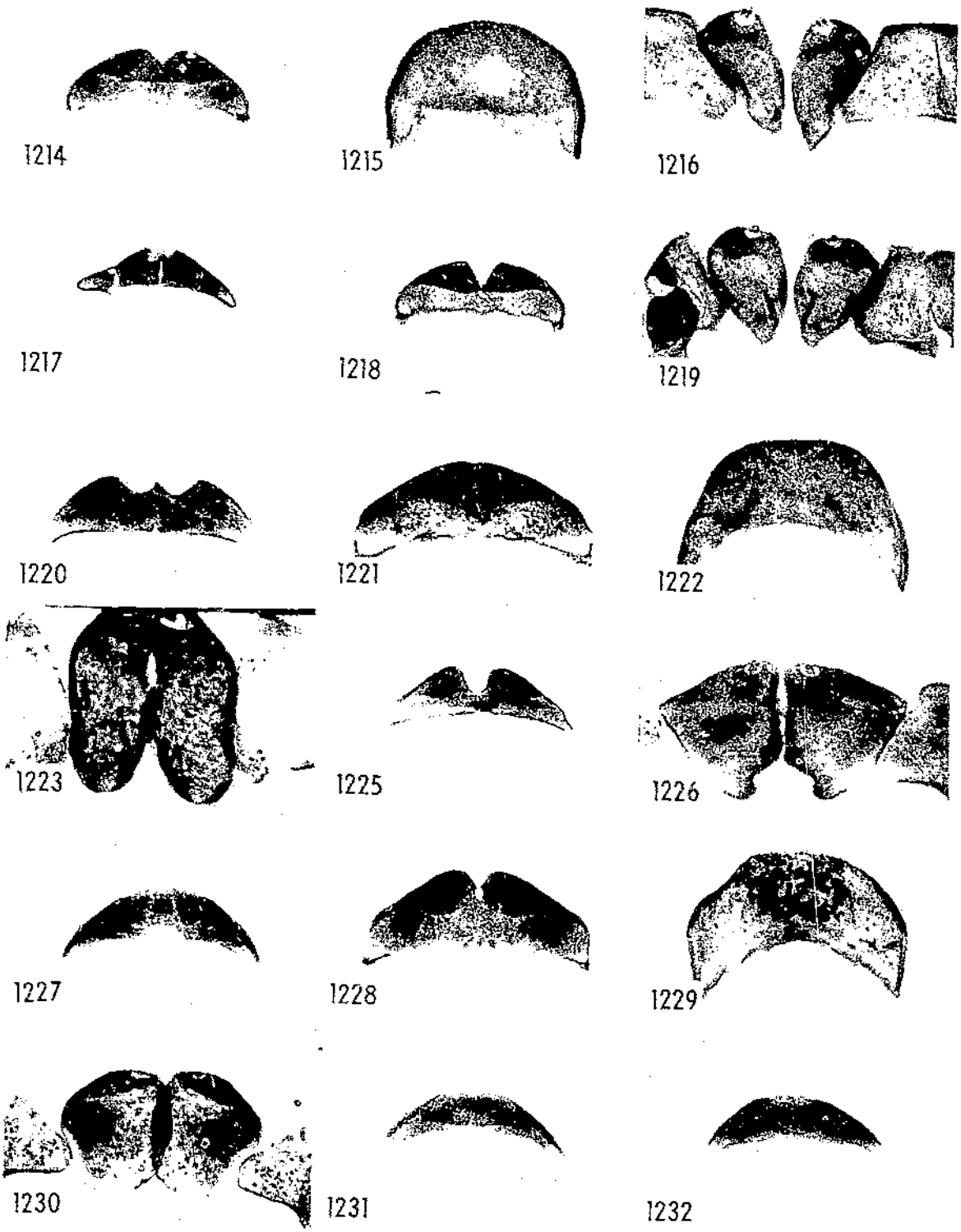
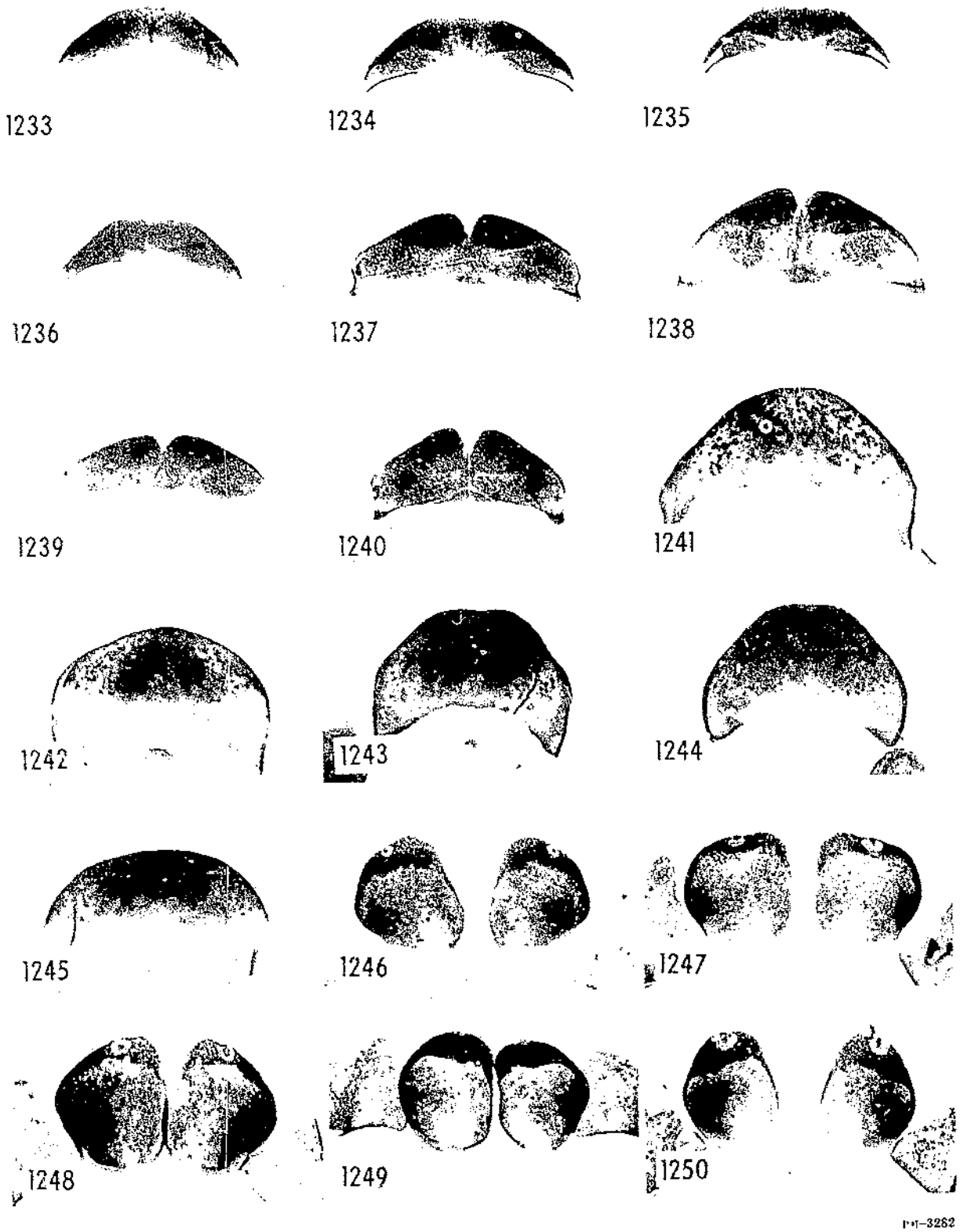
FIGURES 1196–1213.—Female genitalia: *Toxotoma haywardi* (1196), *T. mimetica* (1197–1200), *T. chapini* (1201–1204), *T. opulenta* (1205–1208), *T. pulchra* (1209–1212), *T. pilifera* (1213).



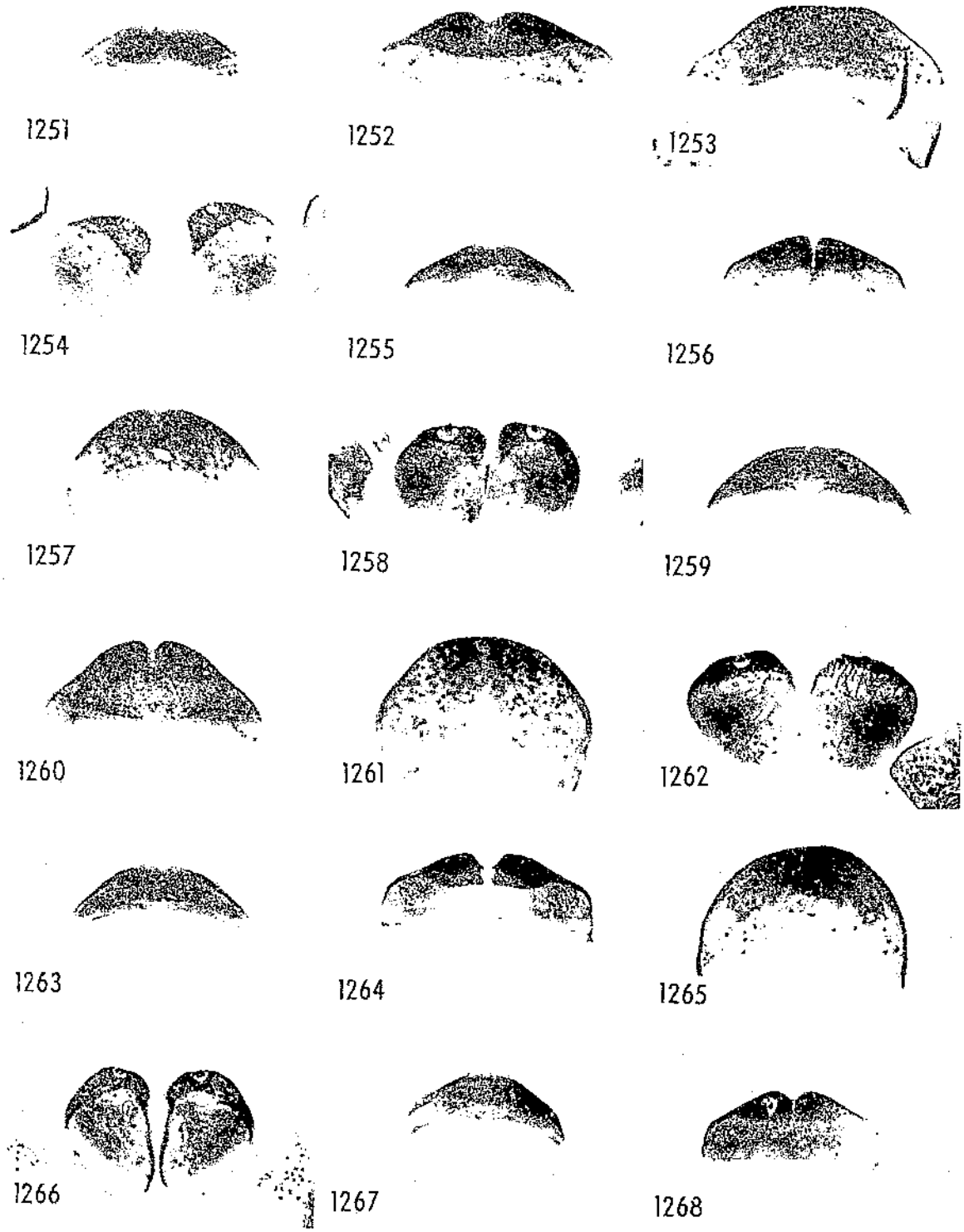
PN-3281

FIGURES 1214–1232.—Female genitalia: *Toxotoma pilifera* (1214–1216), *T. jujuyi* (1217–1219), *T. hiekei* (1220–1223), *T. disparans* (1225–1226), *Epilachna flavofasciata* (1227–1232).



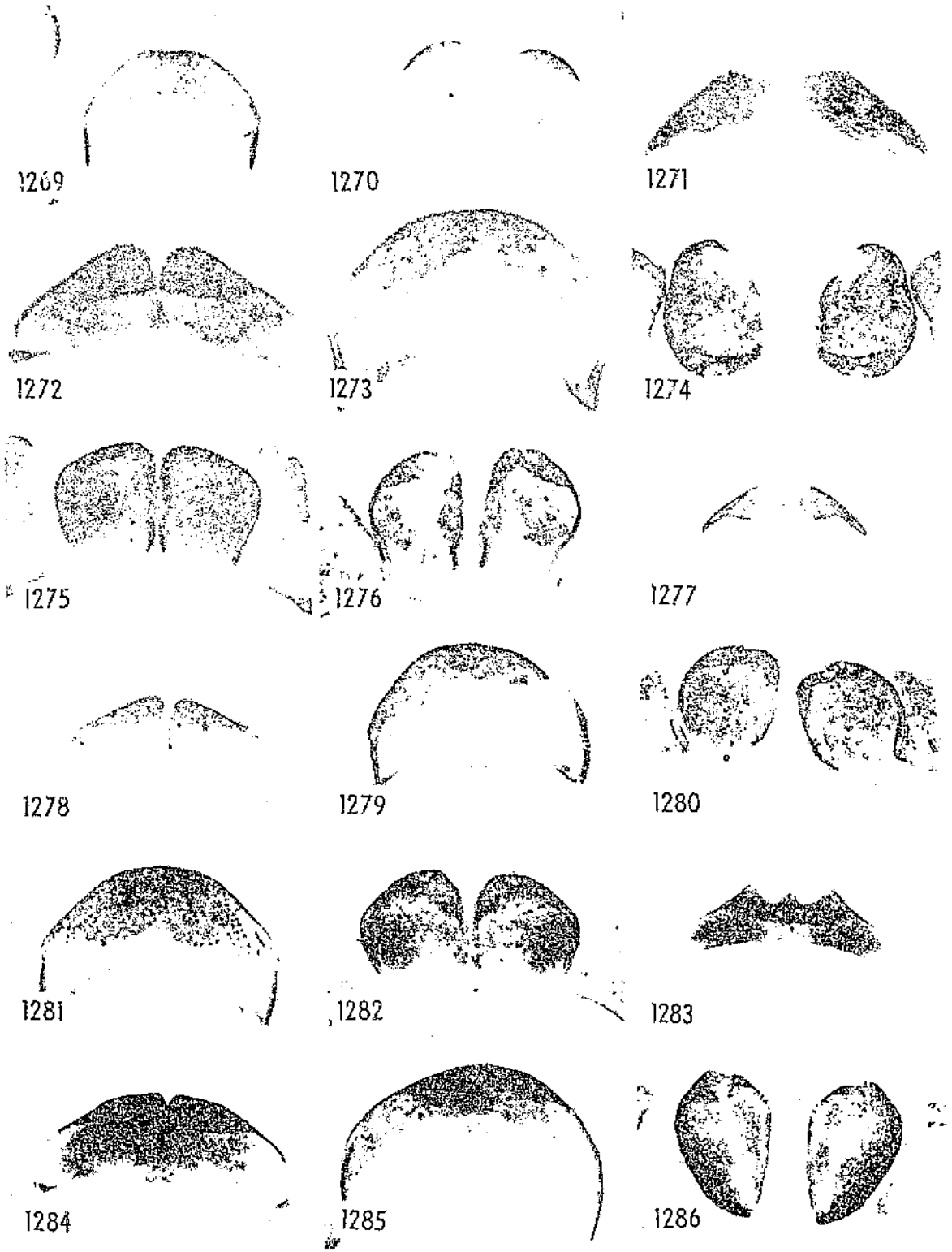
PH-3262

FIGURES 1233–1250.—Female genitalia: *Epilachna flavofasciata* (1233–1250).



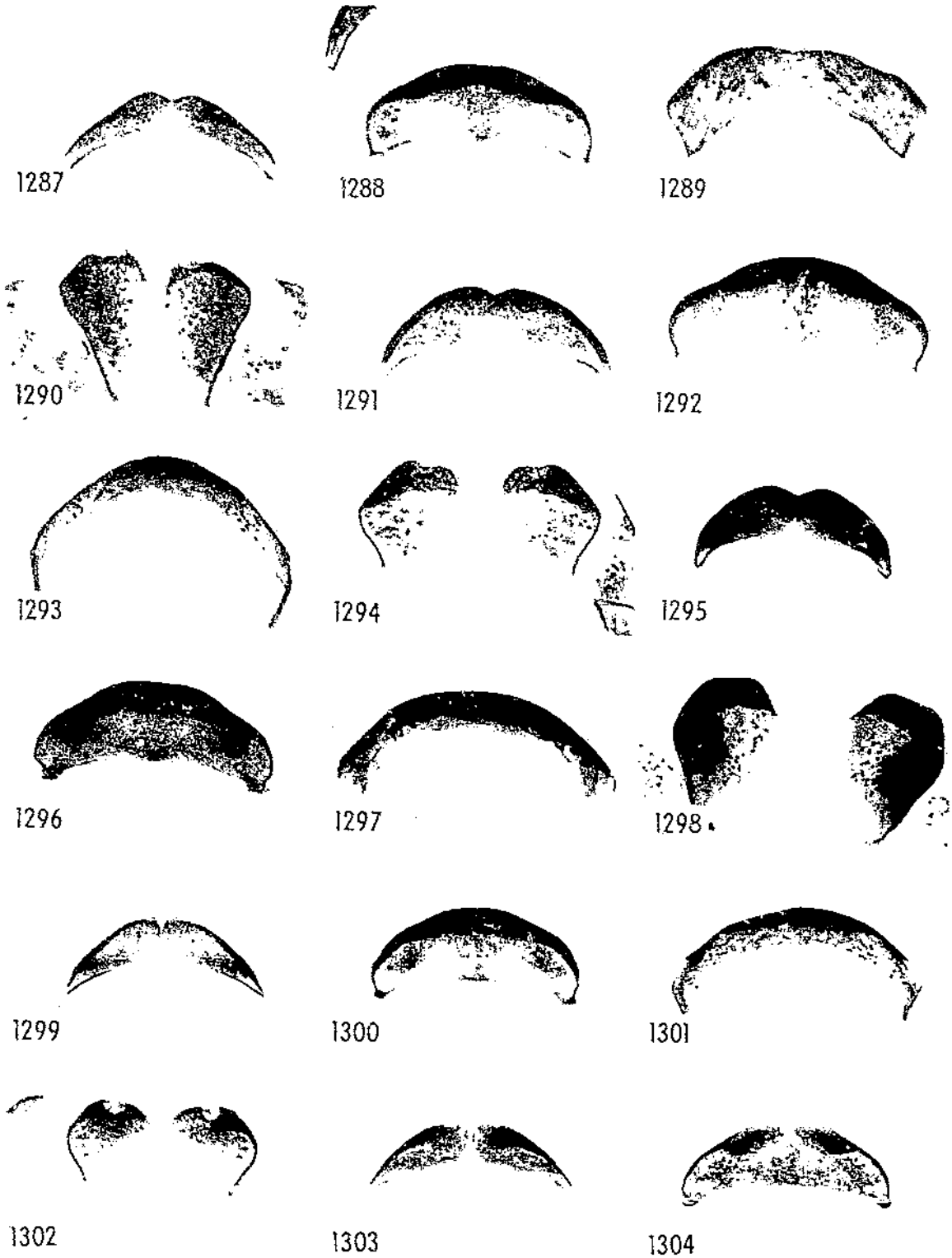
FN-3283

FIGURES 1251–1268.—Female genitalia: *Epilachna dives* (1251–1254), *E. fausta* (1255–1258), *E. riveti* (1259–1262), *E. austrina* (1263–1266), *E. cusema* (1267–1268).



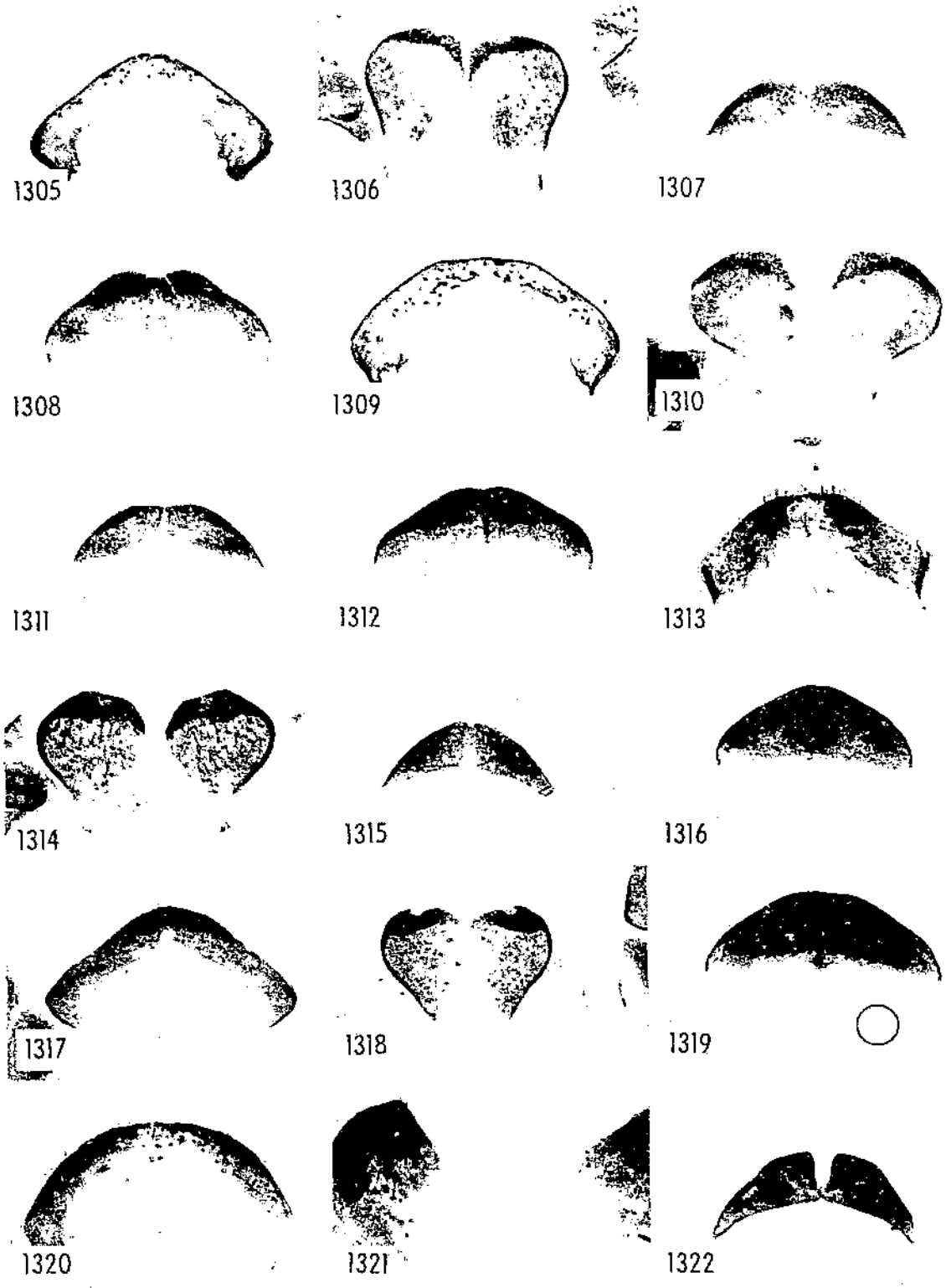
PN-3284

FIGURES 1269–1286.—Female genitalia: *Epilachna cusema* (1269–1270), *E. dorsigera* (1271–1276), *E. sellata* (1277–1280), *E. cuscoi* (1281–1282), *E. transverselineata* (1283–1286).



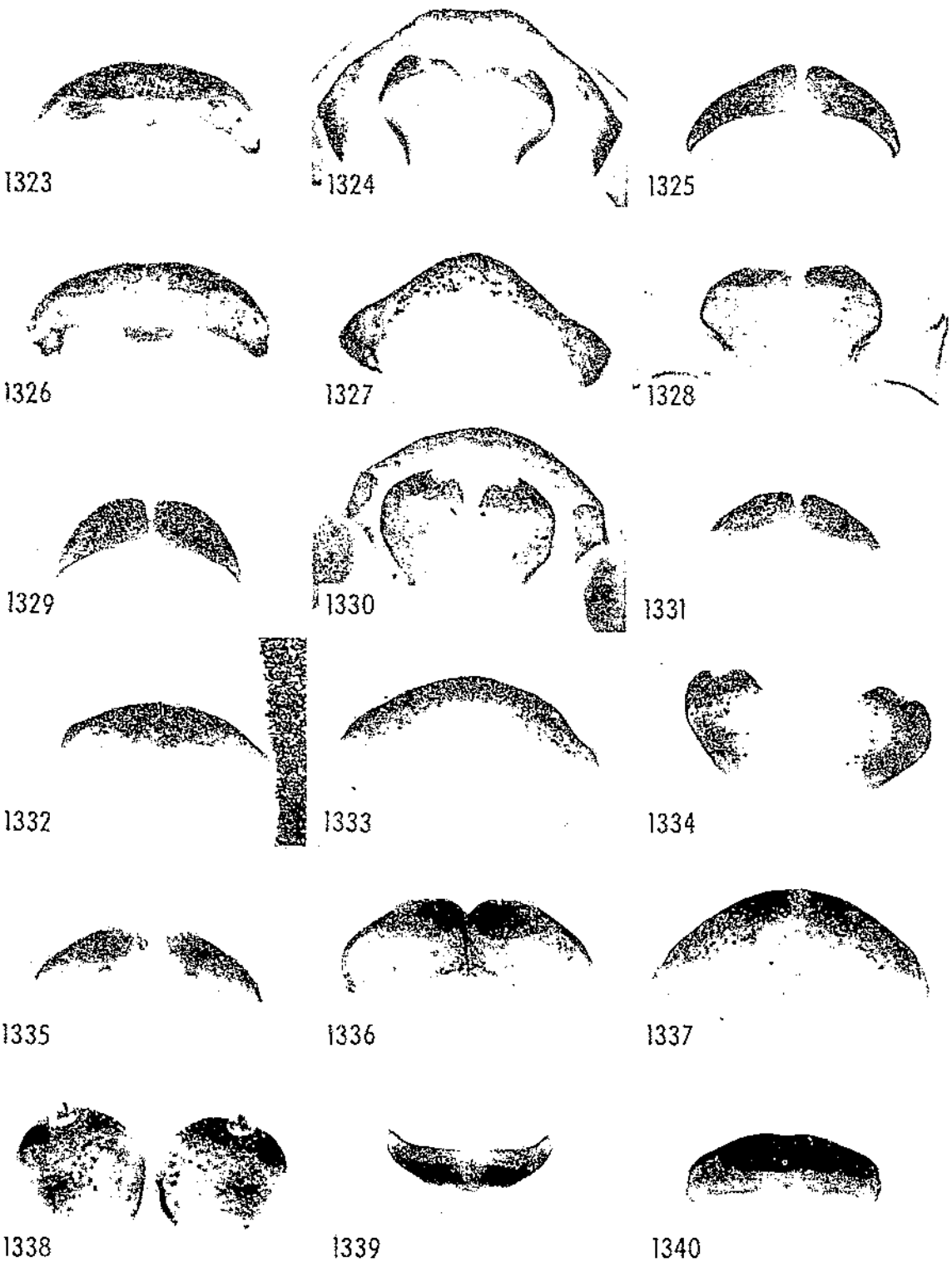
PN-3285

FIGURES 1287–1304.—Female genitalia: *Epilachna deuterea* (1287–1290), *E. tritea* (1291–1294), *E. ovaloides* (1295–1298), *E. parvicollis* (1299–1302), *E. viridilineata viridilineata* (1303–1304).



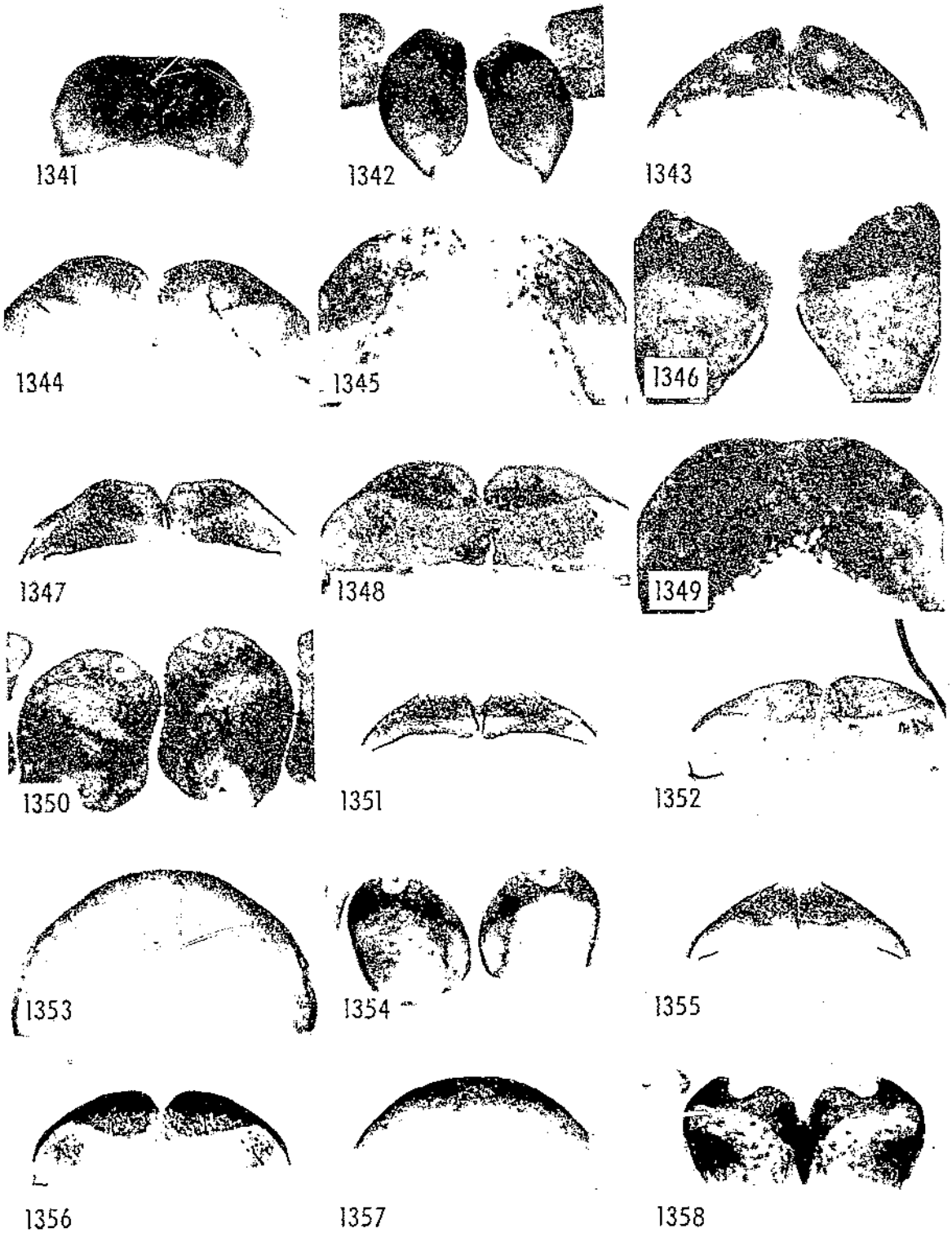
PN-3286

FIGURES 1305–1322.—Female genitalia: *Epilachna viridilineata viridilineata* (1305–1306), *E. viridilineata rossi* (1307–1310), *E. sexmaculata* (1311–1314), *E. hektea* (1315–1318), *E. obtusiforma* (1319–1321), *E. v-pallidum v-pallidum* (1522).



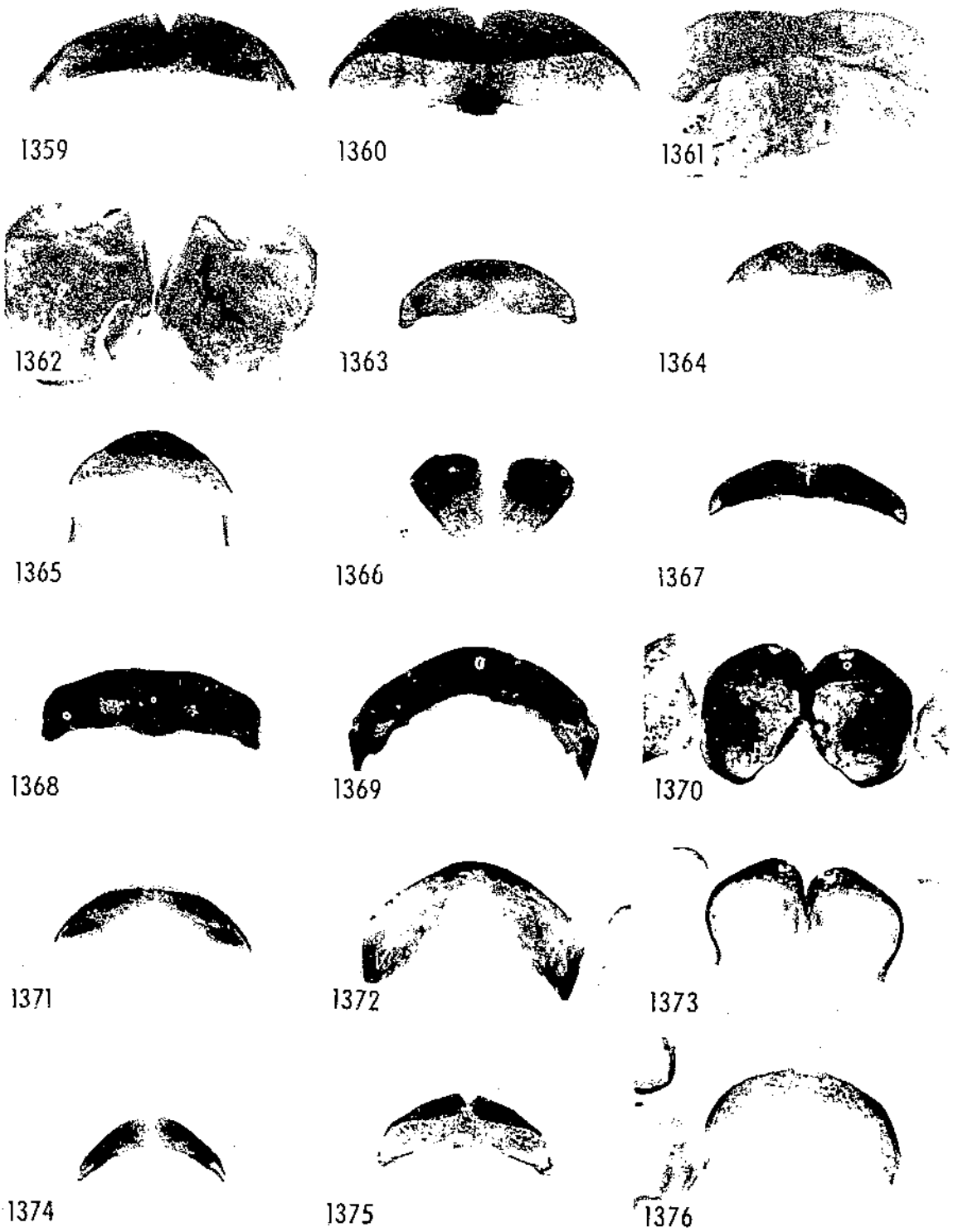
PN-3287

FIGURES 1323–1340.—Female genitalia: *Epilachna v-pallidum v-pallidum* (1323–1324), *E. orthostriata* (1325–1328), *E. tetartea* (1329–1330), *E. peruviana* (1331–1334), *E. albovittata* (1335–1338), *E. lorata* (1339–1340).



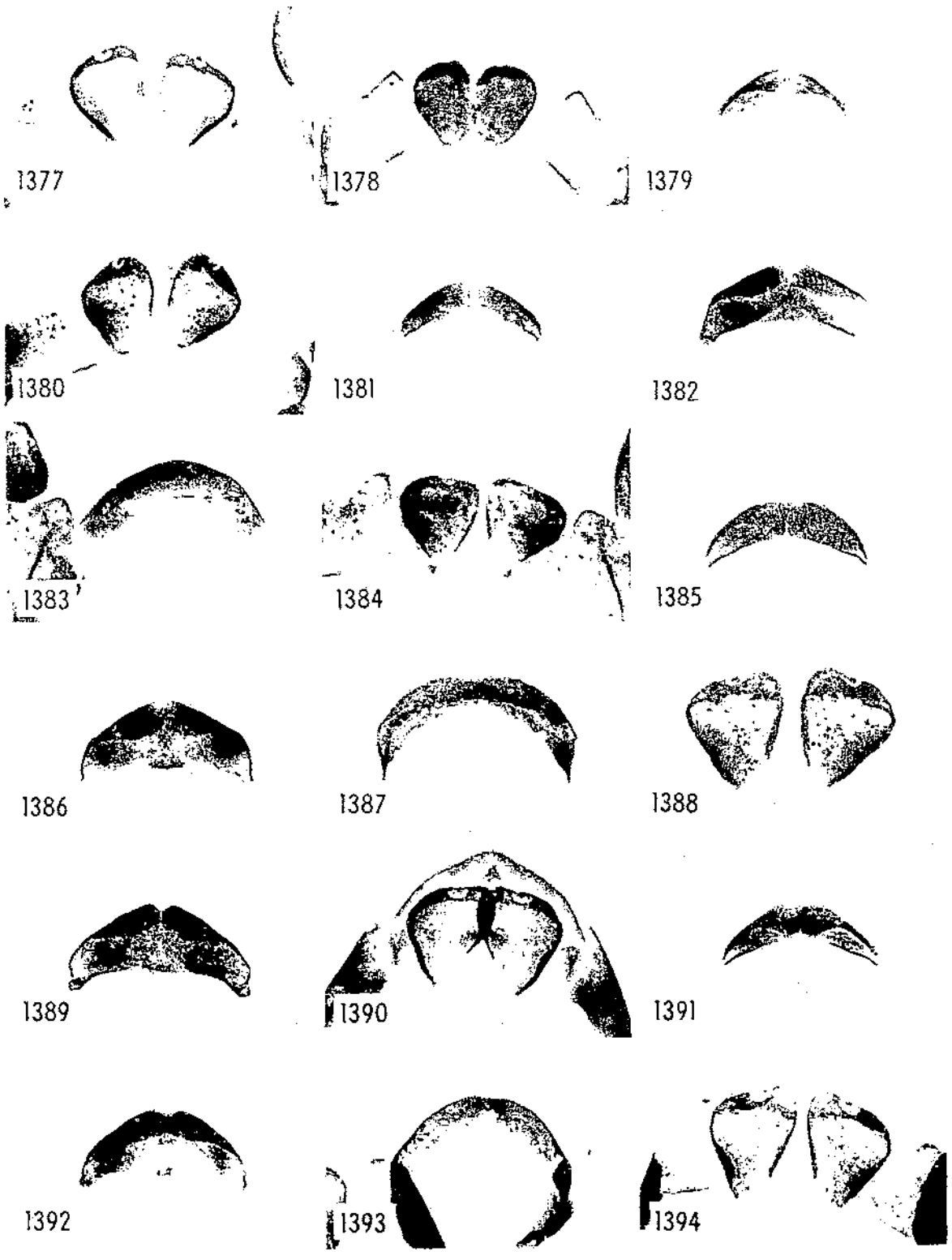
PN-3288

FIGURES 1341–1358.—Female genitalia: *Epilachna lorata* (1341–1342), *E. emerita* (1343–1346), *E. consularis* (1347–1350), *E. bistrispilota* (1351–1354), *E. pseudospilota* (1355–1358).



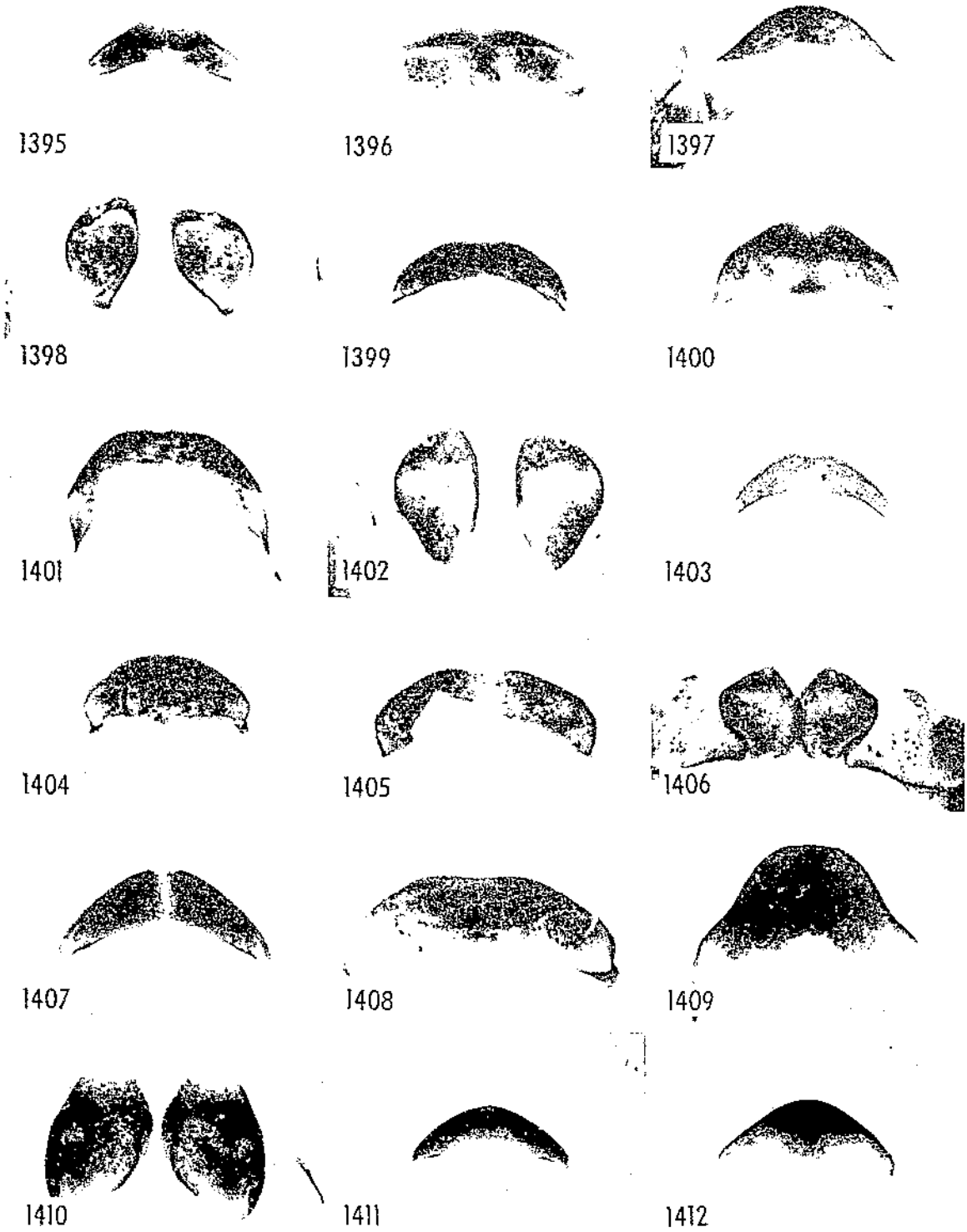
FN-3289

FIGURES 1359–1376.—Female genitalia: *Epilachna striola* (1359–1362), *E. persimilis* (1363–1366), *E. discolor* (1367–1370), *E. cruciata* (1371–1373), *E. patricia* (1374–1376).



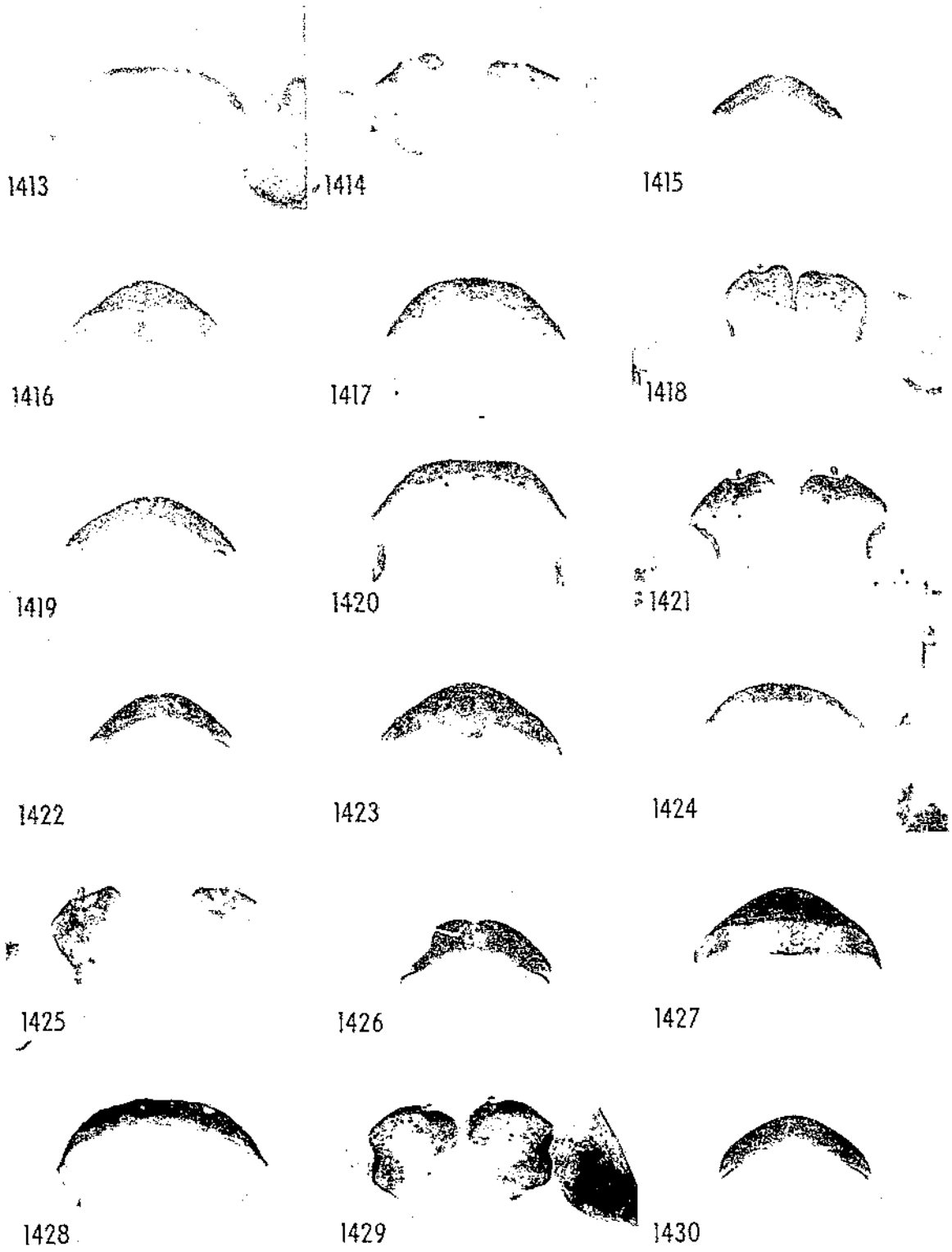
PN-3290

FIGURES 1377–1394.—Female genitalia: *Epilachna patricia* (1377–1380), *E. weisei* (1381–1384), *E. consimilis* (1385–1388), *E. simplex* (1389–1390), *E. convergens* (1391–1394).



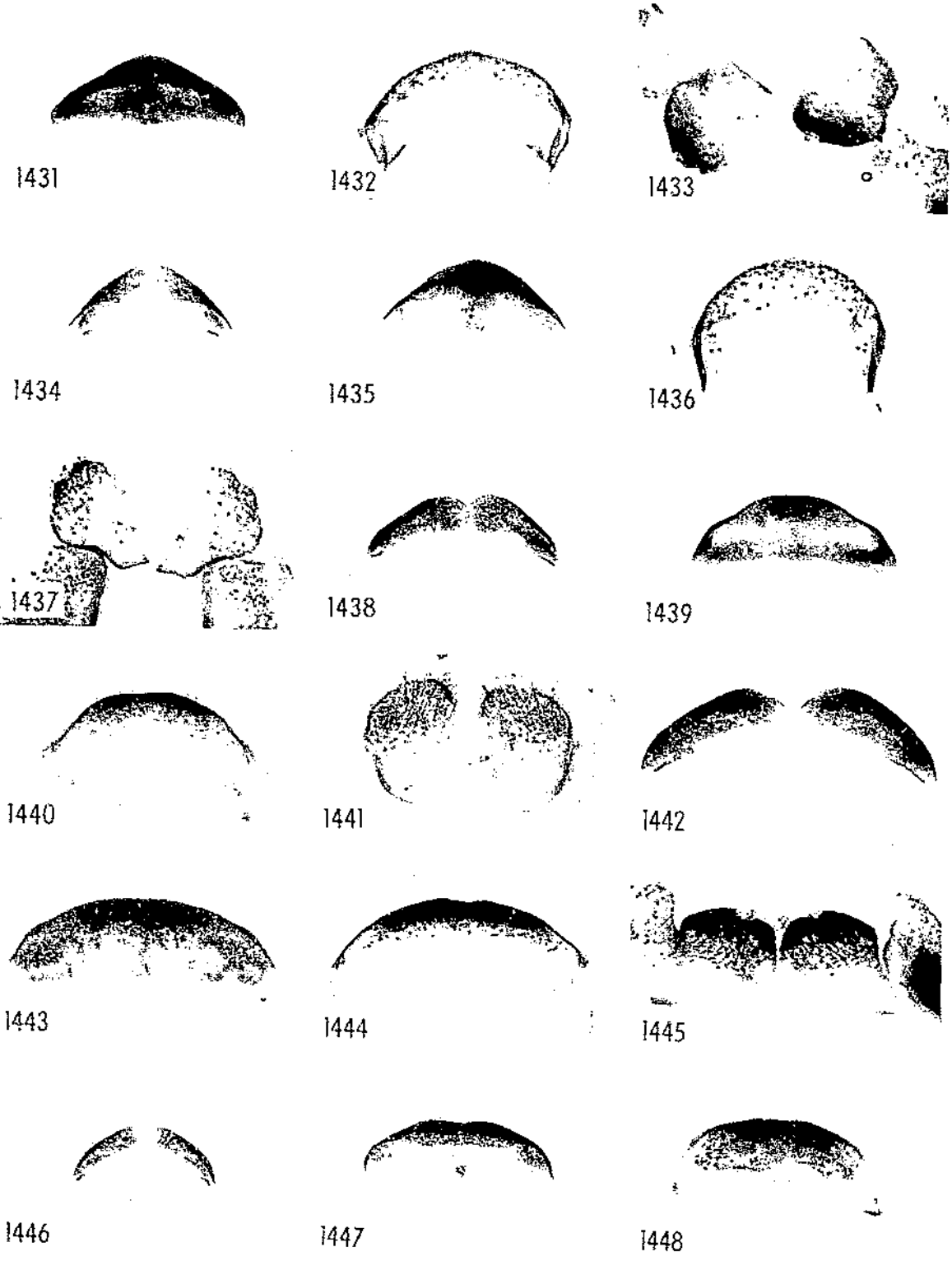
FX-3291

FIGURES 1395–1412.—Female genitalia: *Epilachna viridinitens* (1395–1398), *E. reichei* (1399–1402), *E. ambigua* (1403–1406), *E. bizonata* (1407–1410), *E. incaorum* (1411–1412).



PN-3292

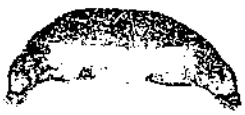
FIGURES 1413–1430.—Female genitalia: *Epilachna incaorum* (1413–1414), *E. zischkai* (1415–1418), *E. manni* (1419–1421), *E. bourcieri* (1422–1425), *E. simulans* (1426–1429), *E. fenestrata* (1430).



FIGURES 1431–1448.—Female genitalia: *Epilachna fenestrata* (1431–1433), *E. schunkei* (1434–1437), *E. aureopilosa* (1438–1441), *E. oviforma* (1442–1445), *E. punctatissima* (1446–1448).

PN-3293

1449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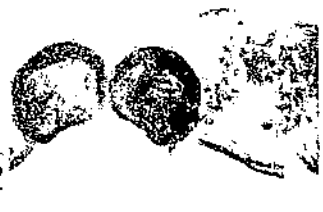
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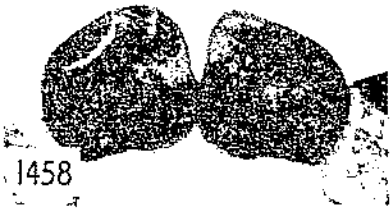
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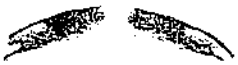
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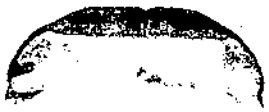
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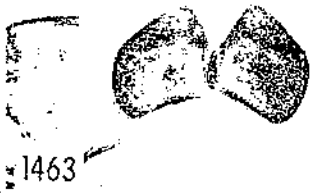
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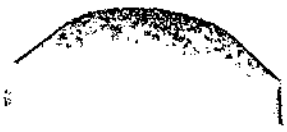
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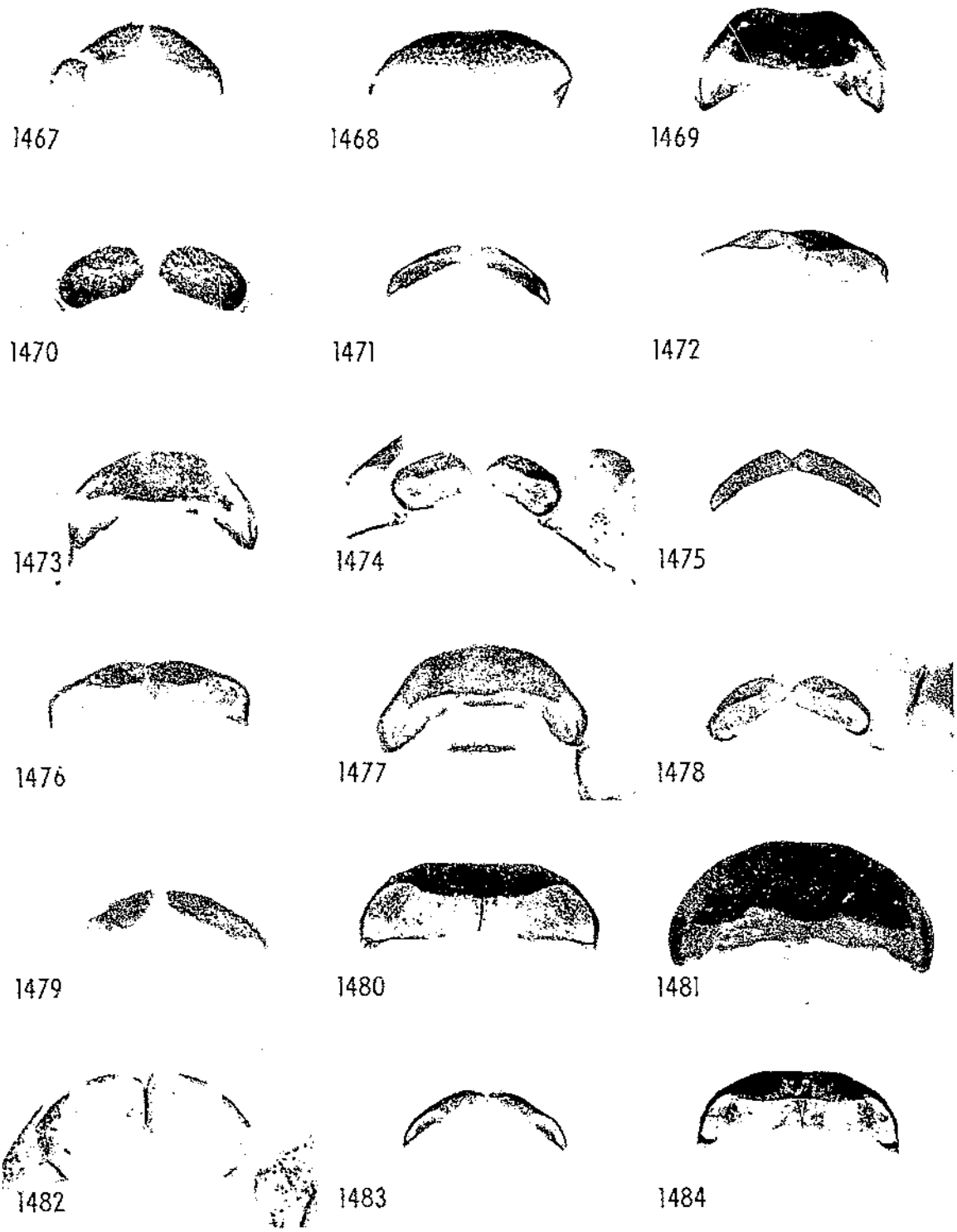
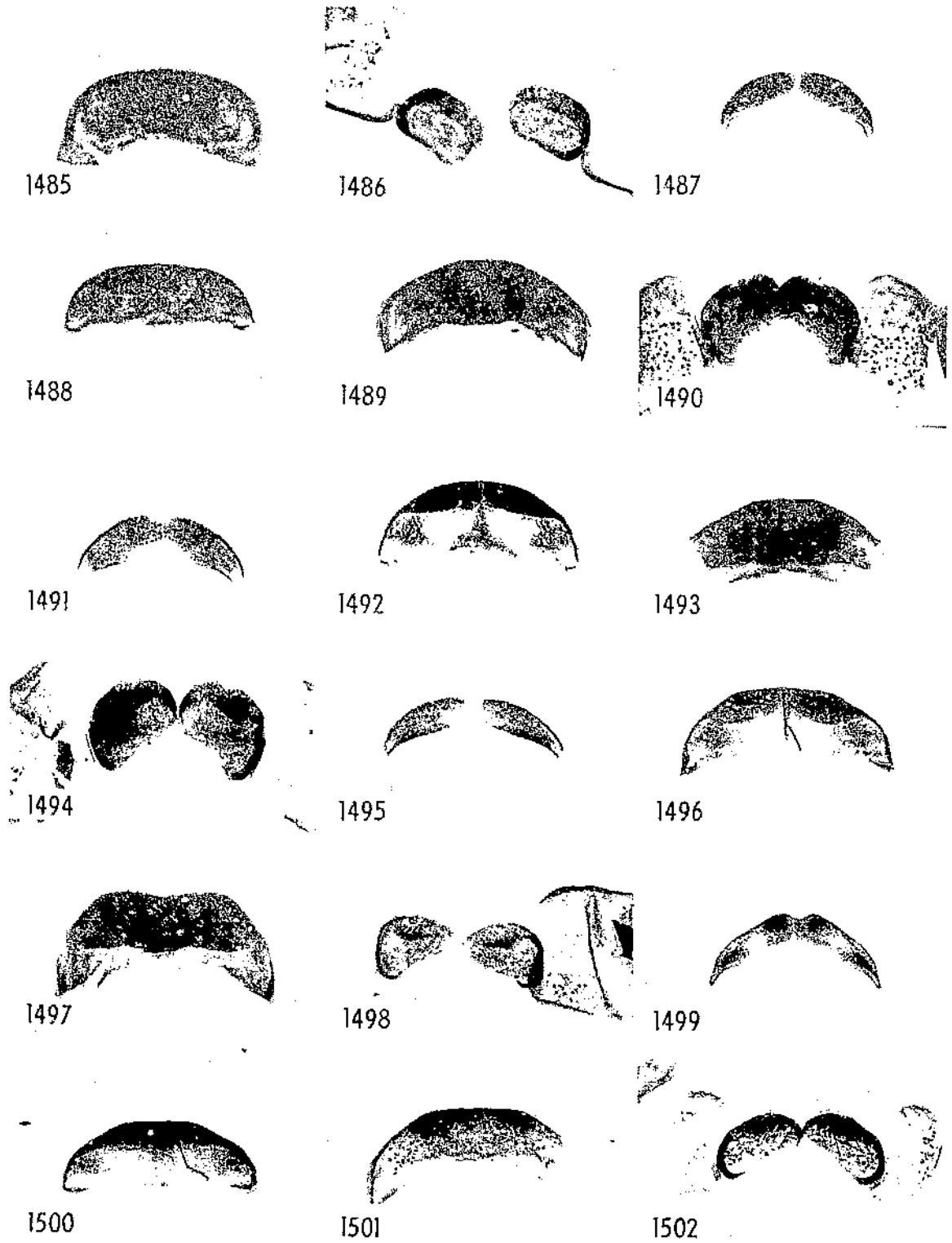
PN-3294

FIGURES 1449–1466.—Female genitalia: *Epilachna punctatissima* (1449), *E. eximia* (1450–1452), *E. chigata* (1453–1455), *E. norinoi* (1456–1458), *E. monovittata* (1459–1463), *E. univittata* (1464–1466).



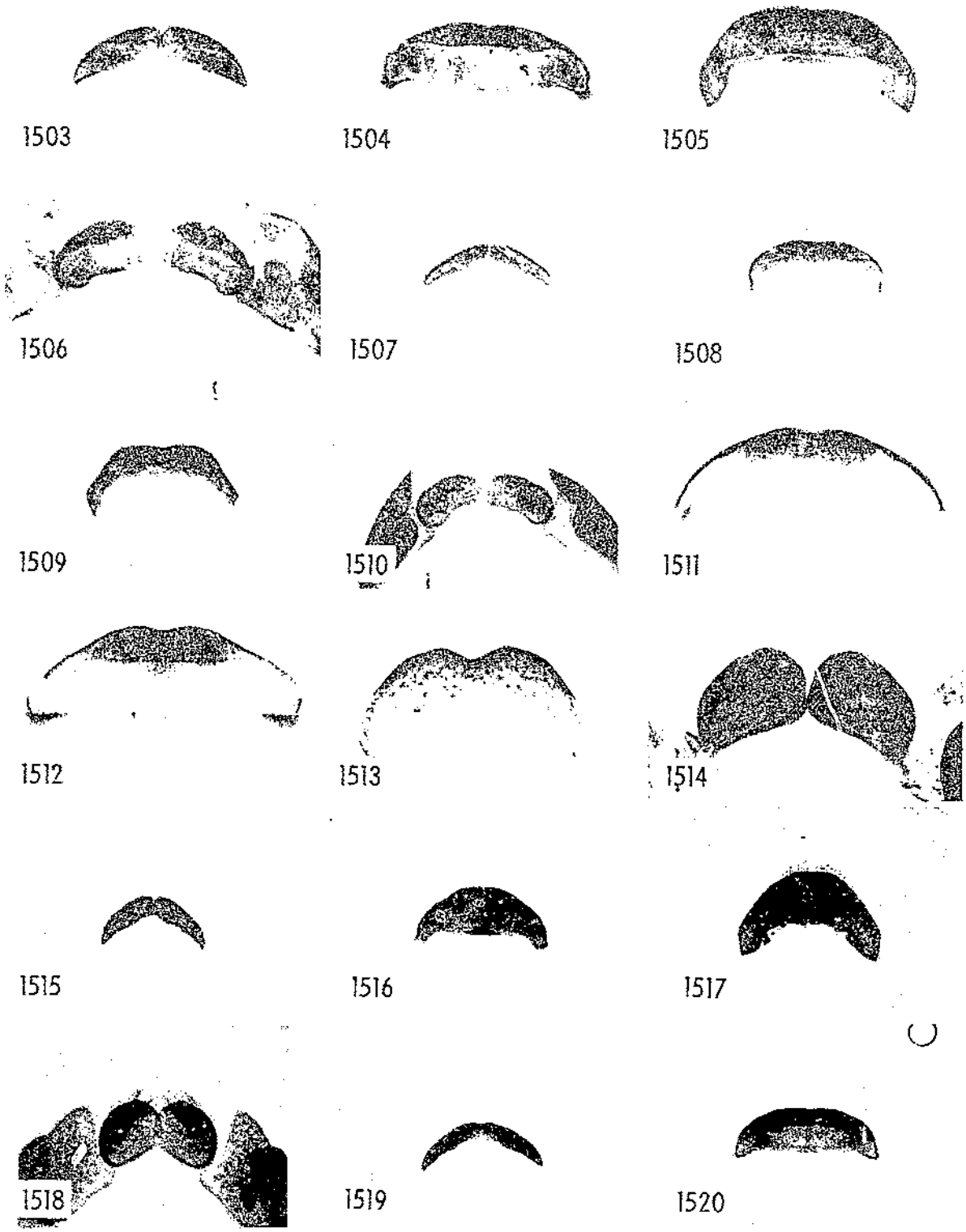
PN-3295

FIGURES 1467–1484.—Female genitalia: *Epilachna cushmani* (1467–1470), *E. vittigera* (1471–1474), *E. freudei* (1475–1478), *E. taeniola* (1479–1482), *E. caucaensis* (1483–1484).



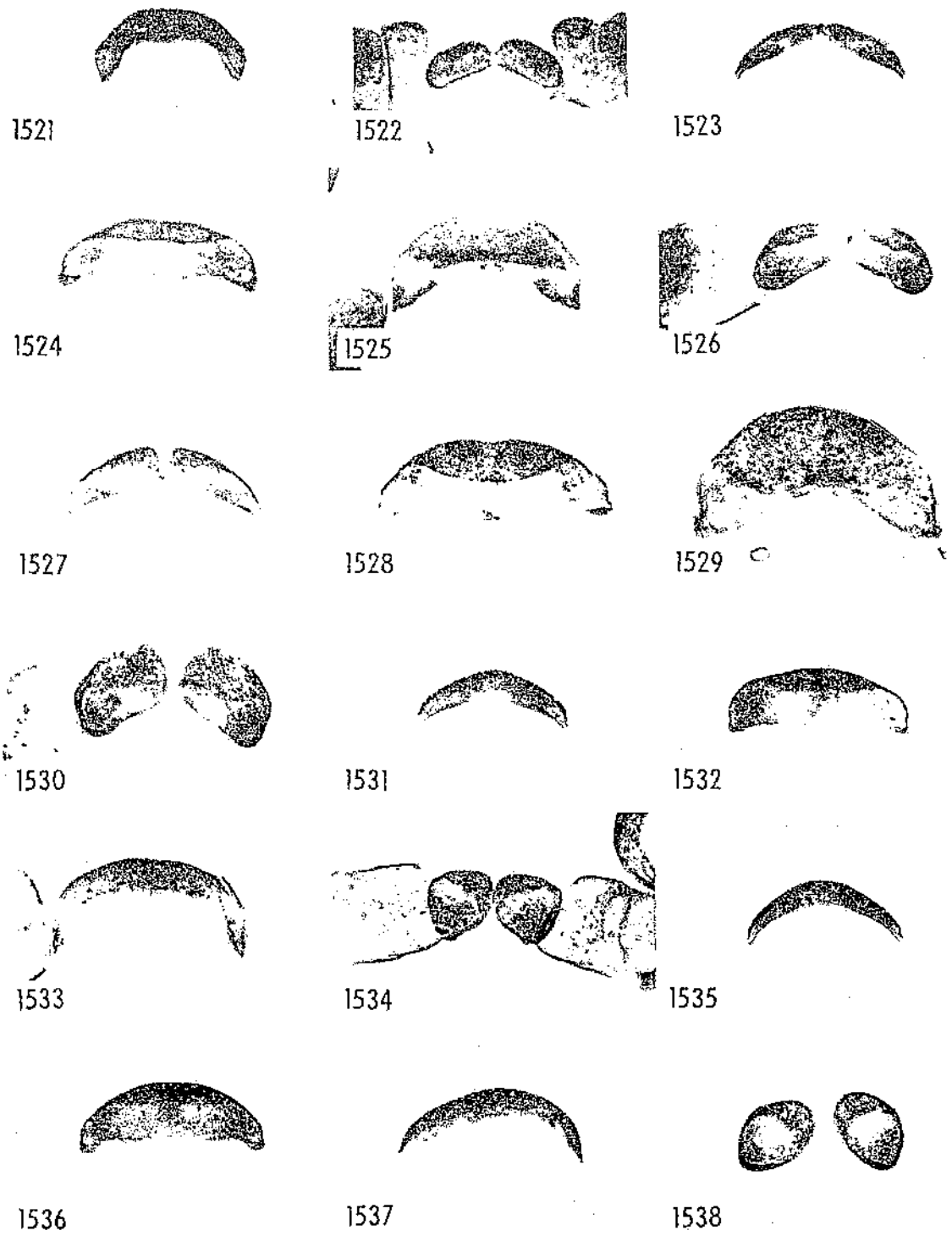
PN-3296

FIGURES 1485–1502.—Female genitalia: *Epilachna caucaensis* (1485–1486), *E. discoidea* (1487–1490), *E. honesta* (1491–1494), *E. ignobilis* (1495–1498), *E. fenestroides* (1499–1502).



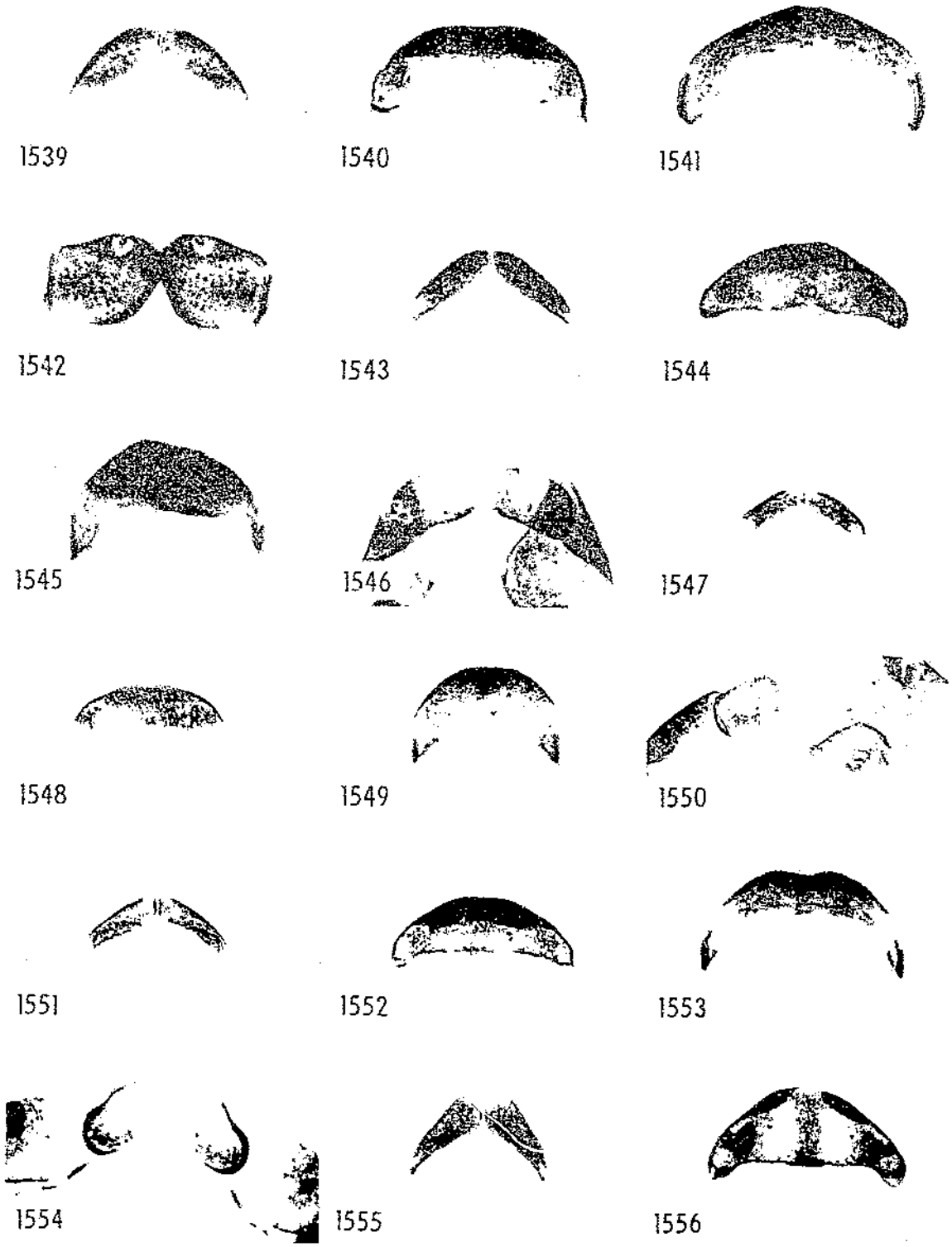
PN-3297

FIGURES 1503–1520.—Female genitalia: *Epilachna harringtoni* (1503–1506), *E. bolivicola* (1507–1510), *E. korschefskyi* (1511–1514), *E. adnexa* (1515–1518), *E. bistrisignata* (1519–1520).



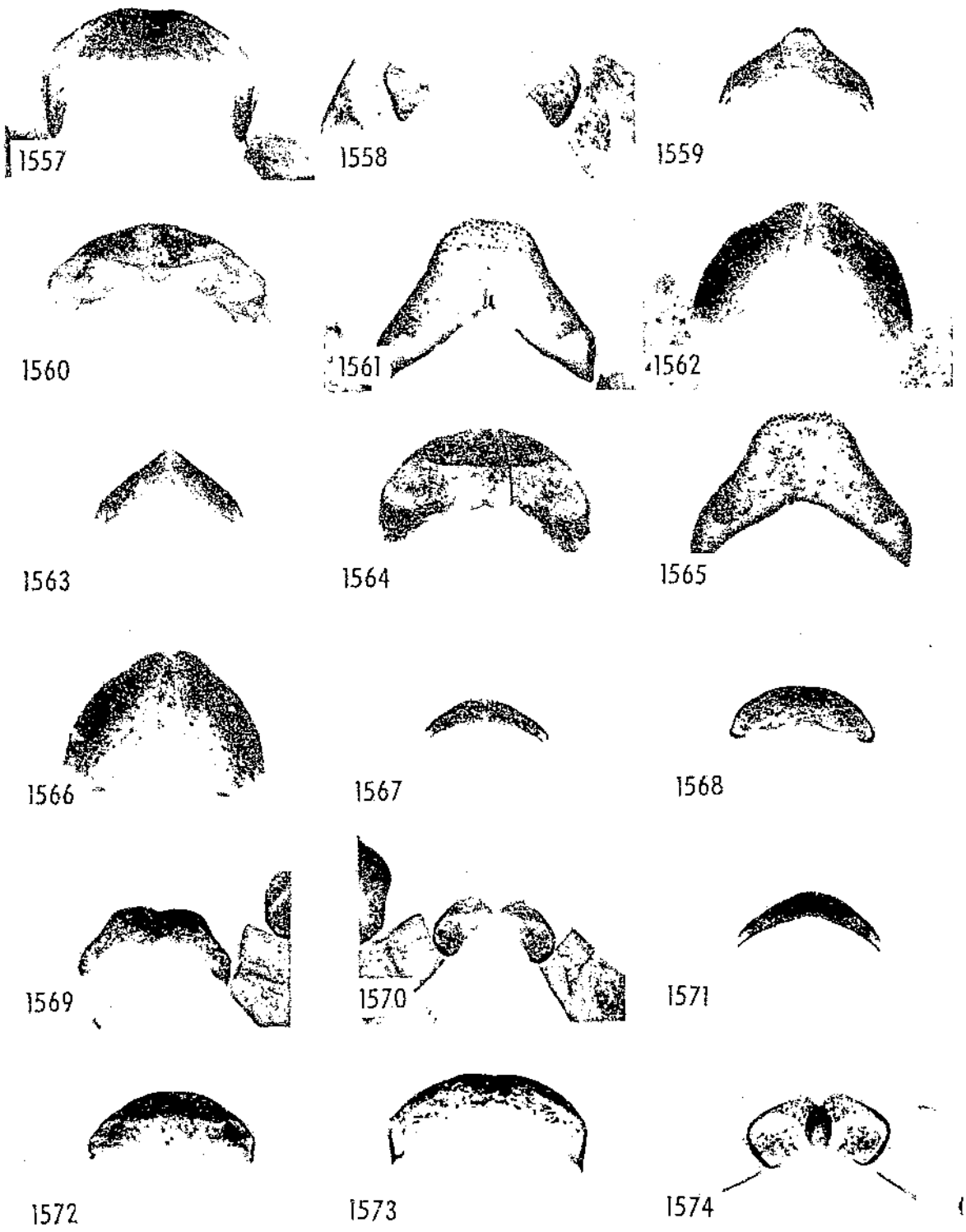
PN-3298

FIGURES 1521–1538.—Female genitalia: *Epilachna bistrisignata* (1521–1522), *E. geometrica* (1523–1526), *E. ostensa* (1527–1530), *E. ostensoides* (1531–1534), *E. olmosi* (1535–1538).



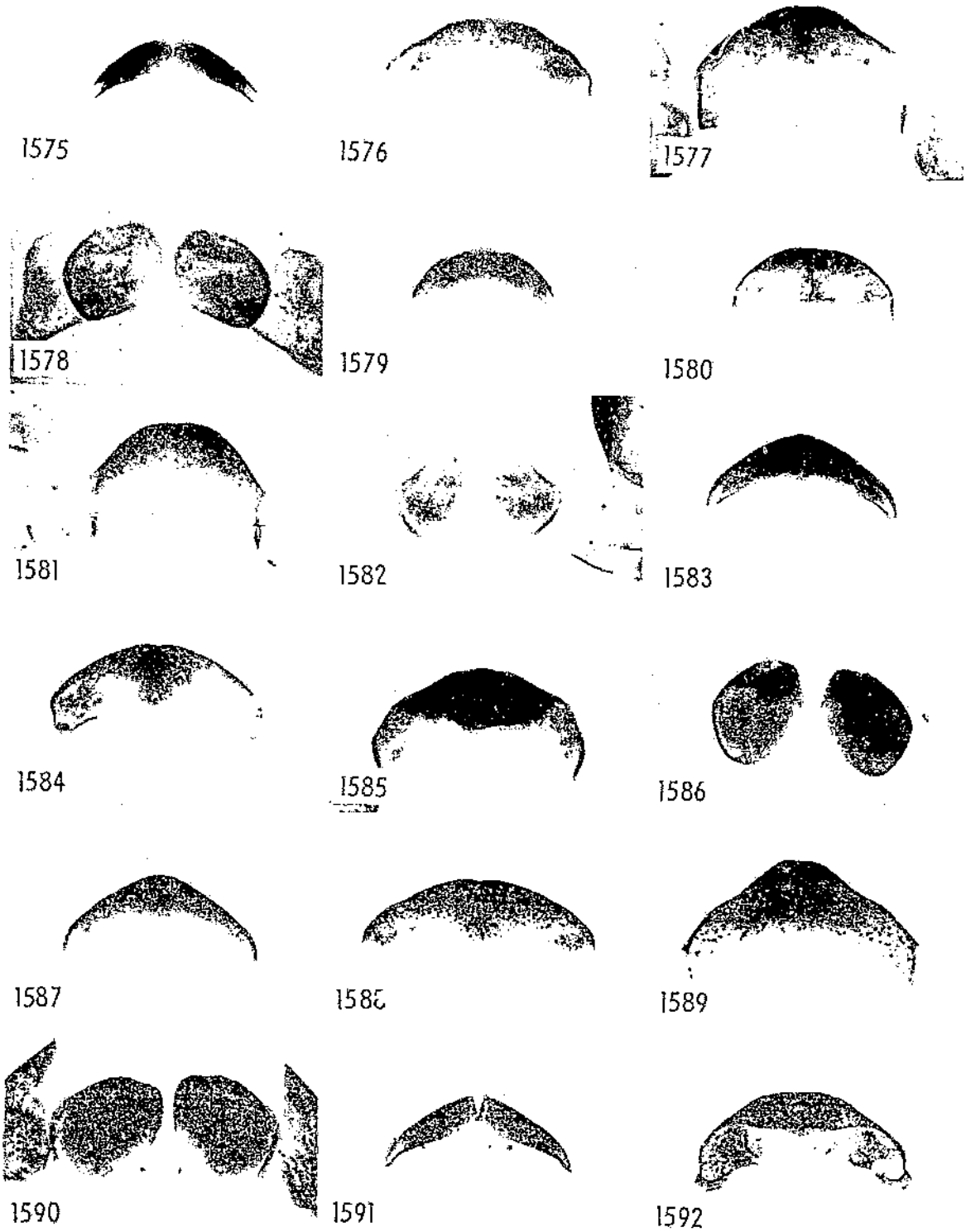
PN-3299

FIGURES 1539–1556.—Female genitalia: *Epilachna divisoides* (1539–1542), *E. approximata* (1543–1546), *E. dubia* (1547–1550), *E. sonchae* (1551–1554), *E. aculata* (1555–1556).



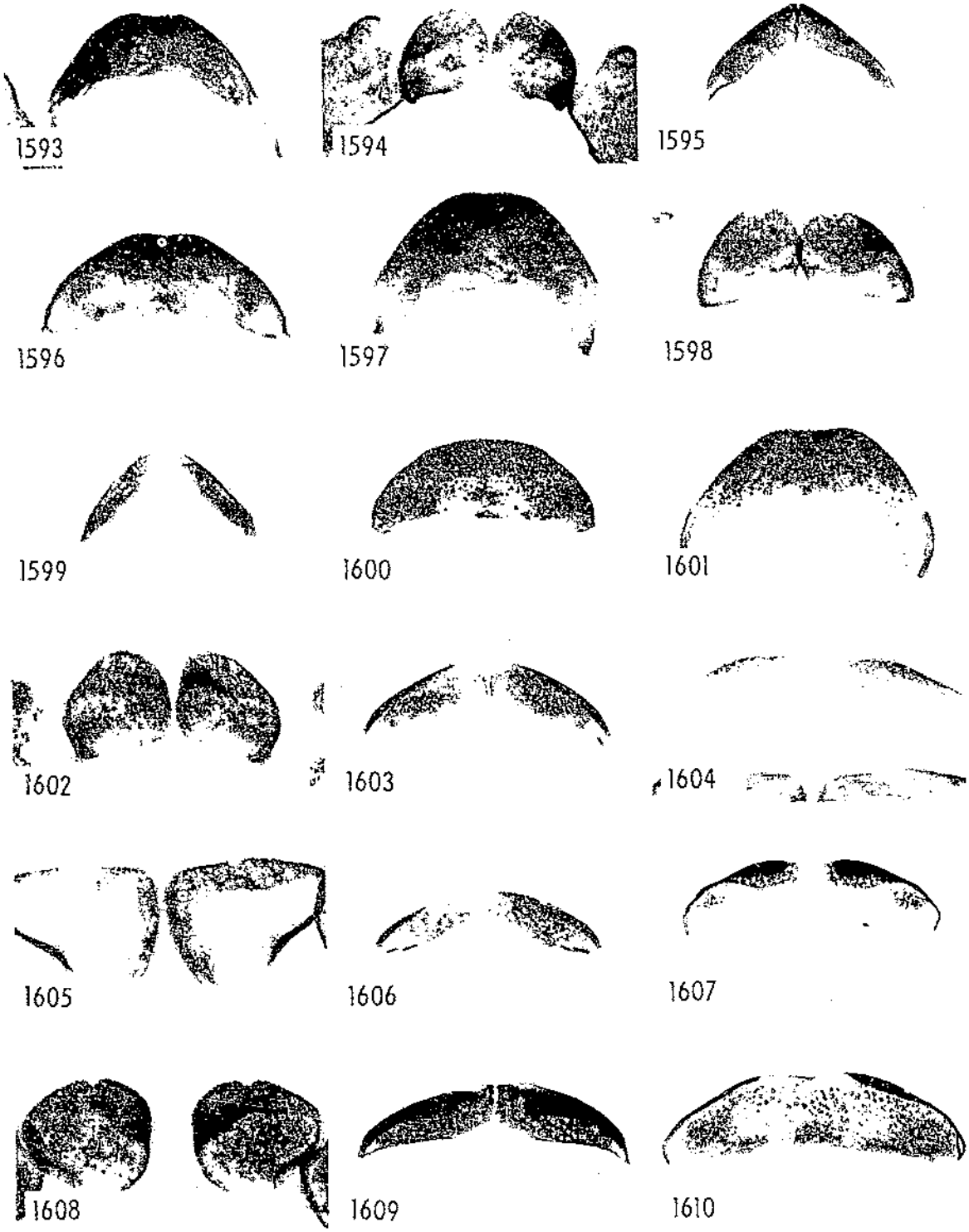
PN-3300

FIGURES 1557–1574.--Female genitalia: *Epilachna aculata* (1557–1558), *E. angustata* (1559–1562), *E. kraatzi* (1563–1566), *E. latimargo* (1567–1570), *E. bituberculata* (1571–1574).



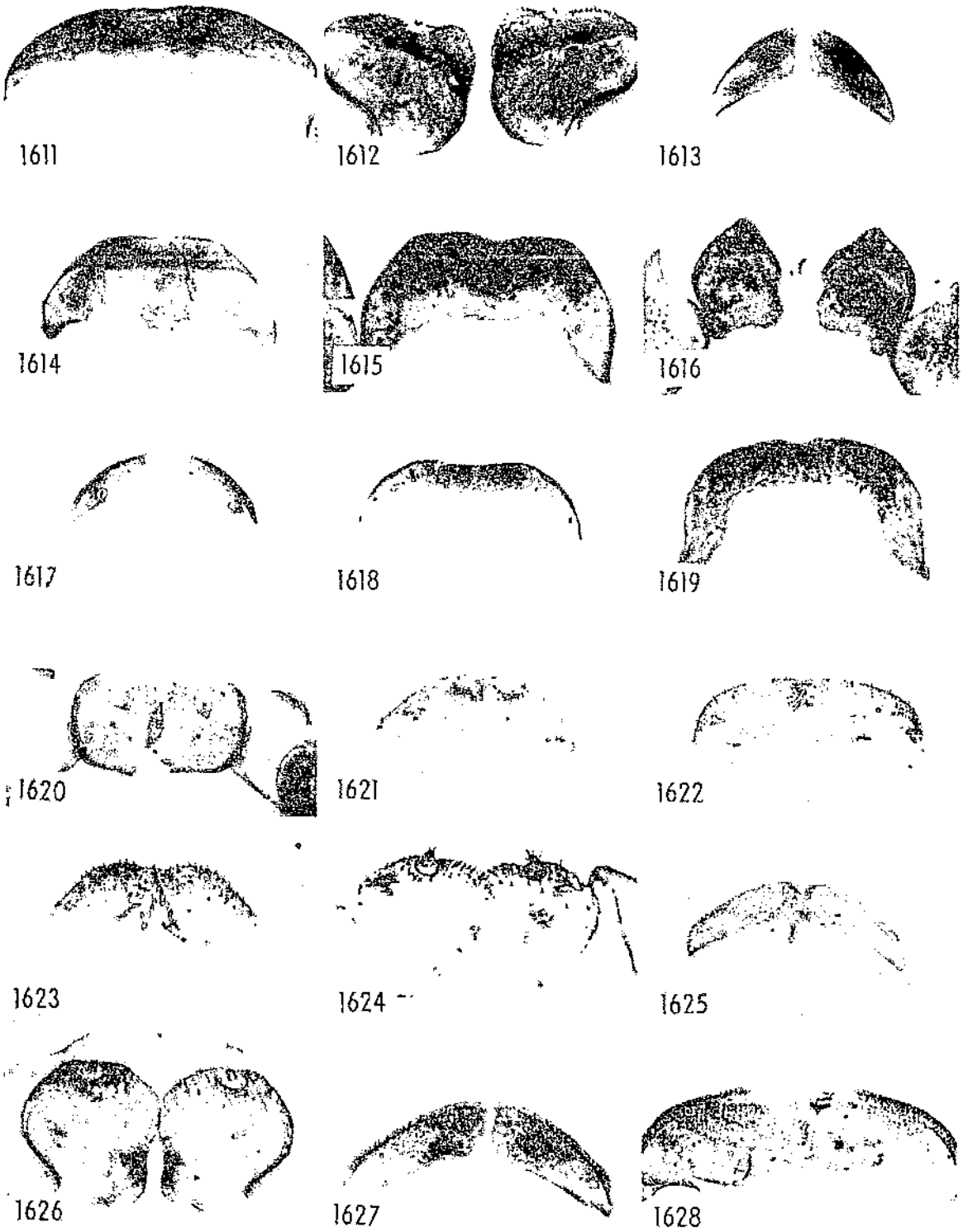
FIGURES 1575–1592.—Female genitalia: *Epilachna walleri* (1575–1578), *E. inserta* (1579–1582), *E. satipensis* (1583–1586), *E. wagtkowski* (1587–1590), *E. quirozensis* (1591–1592).

PN-3801



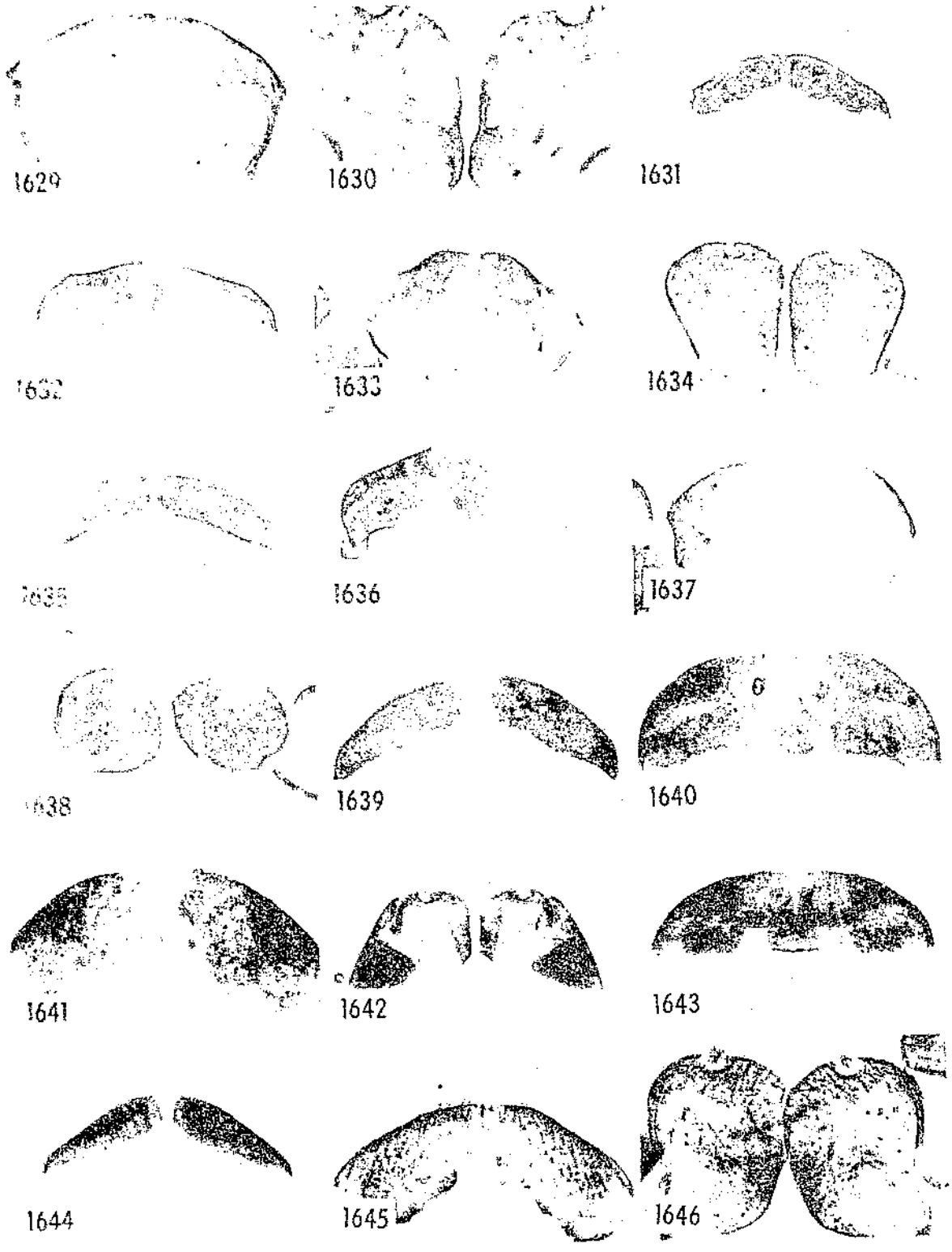
PN-3302

FIGURES 1593–1610. Female genitalia: *Epilachna quirozensis* (1593–1594), *E. buckleyi* (1595–1598), *E. pallata* (1599–1602), *E. azurea* (1603–1605), *E. lepida* (1606–1608), *E. bisbivittata* (1609–1610).



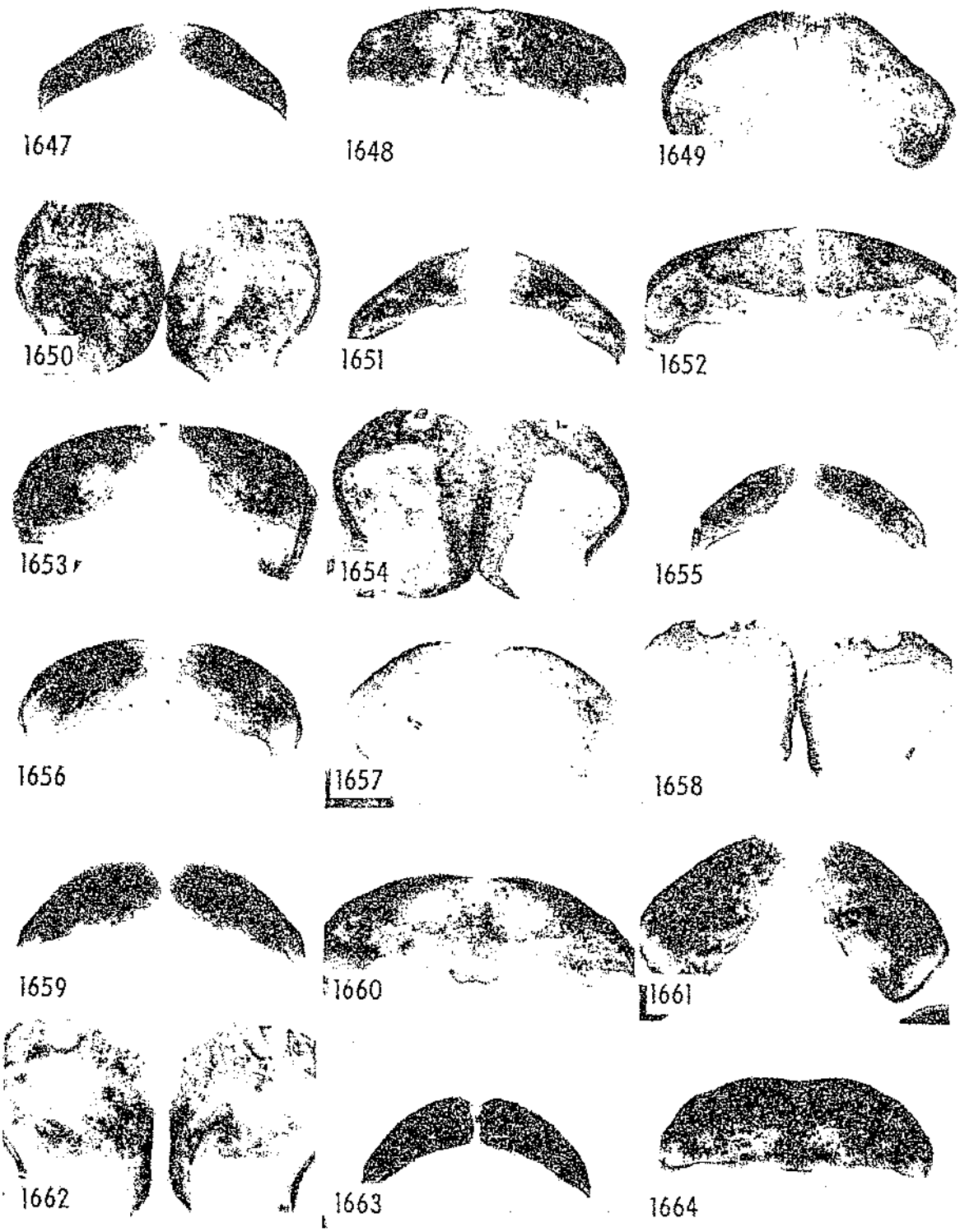
PN-3303

FIGURES 1611–1628.—Female genitalia: *Epilachna bisbiritiata* (1611–1612), *E. holmgreni* (1613–1616), *E. amplipunctata* (1617–1620), *E. borealis* (1621–1624), *E. discincta* (1625–1626), *E. kraussi* (1627–1628).



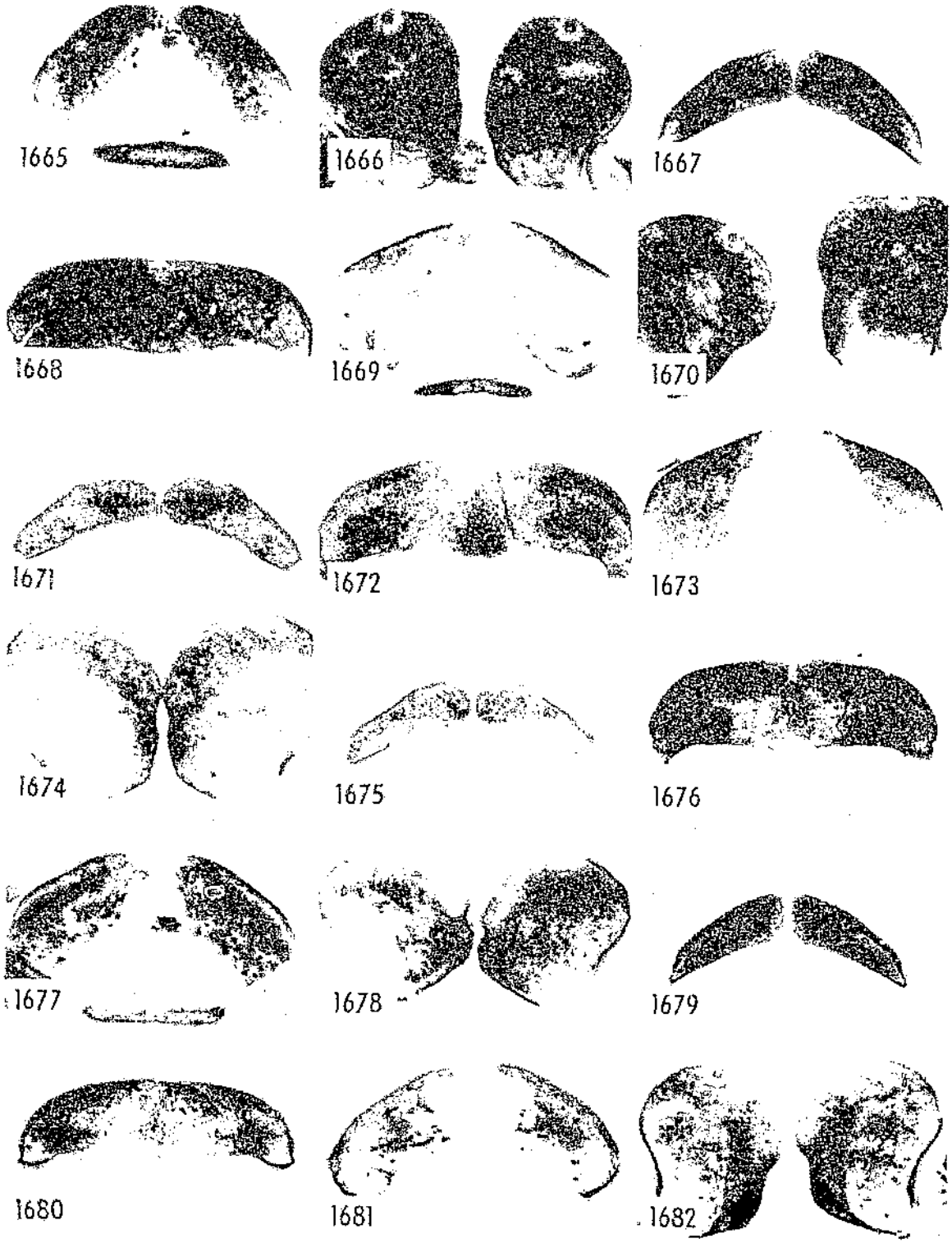
FN-3304

FIGURES 1629-1646. Female genitalia: *Epilachna kraussi* (1629–1630), *E. paenulata* (1631–1634), *E. cordula* (1635–1638), *E. axillaris* (1639–1642), *E. stalata* (1643–1646).



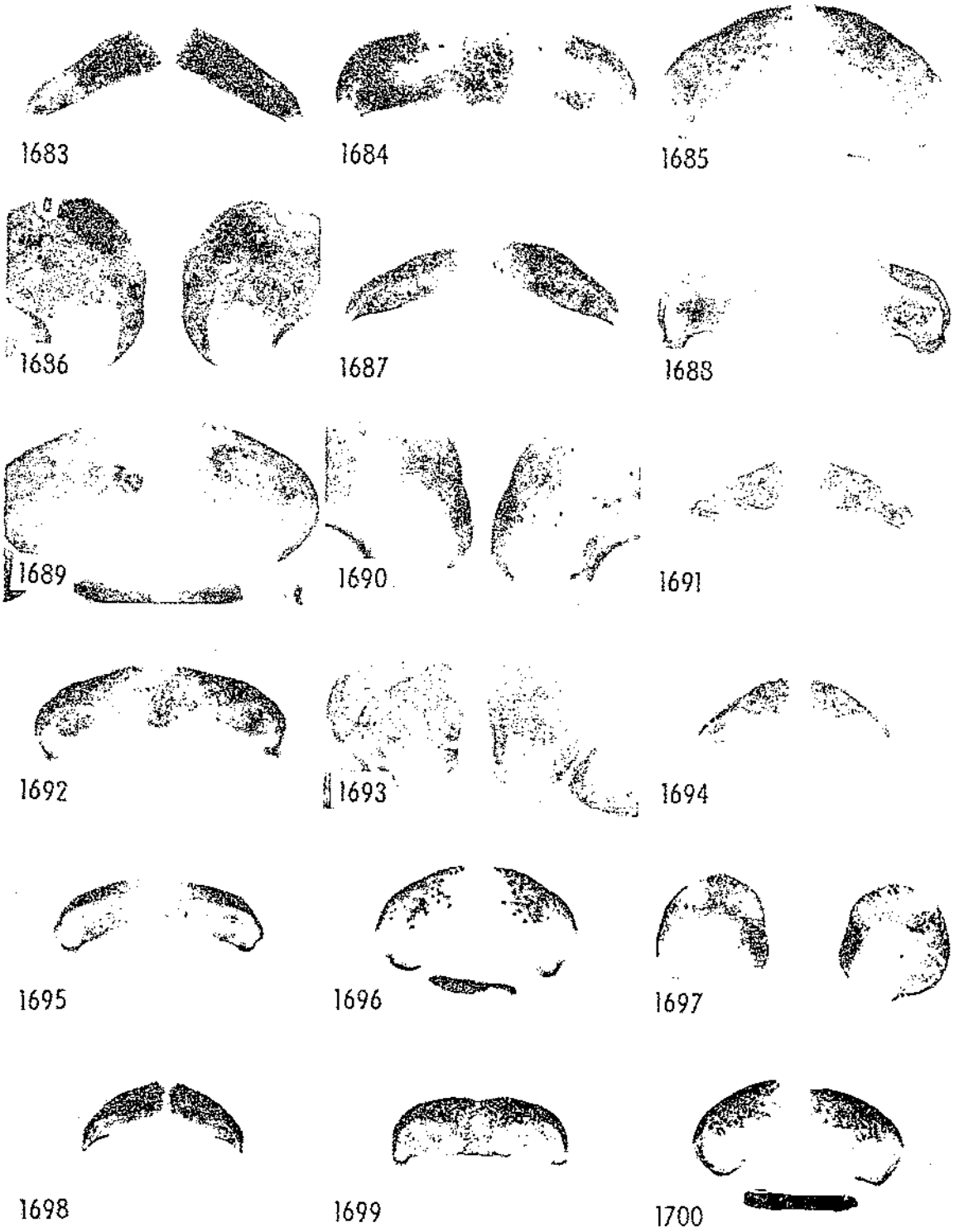
FN-3305

FIGURES 1647–1664.—Female genitalia: *Epilachna radiata* (1647–1650), *E. pictipennis* (1651–1654), *E. fryii* (1655–1658), *E. cinctipennis* (1659–1662), *E. madida* (1663–1664).



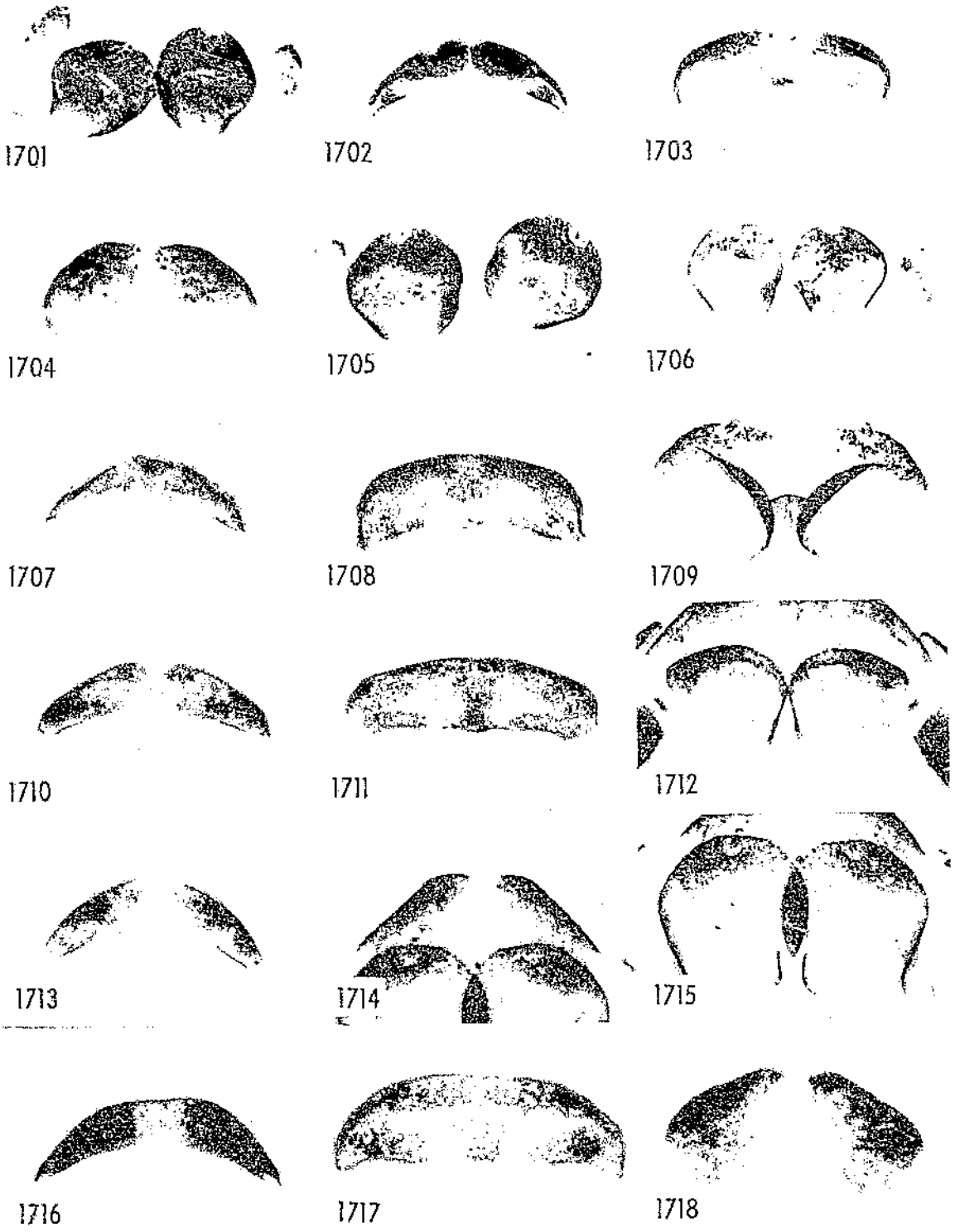
FN-3306

FIGURES 1665–1682.—Female genitalia: *Epilachna madida* (1665–1666), *E. mutabilis* (1667–1670), *E. pachiteensis* (1671–1674), *E. pastica* (1675–1678), *E. pseudostriata* (1679–1682).



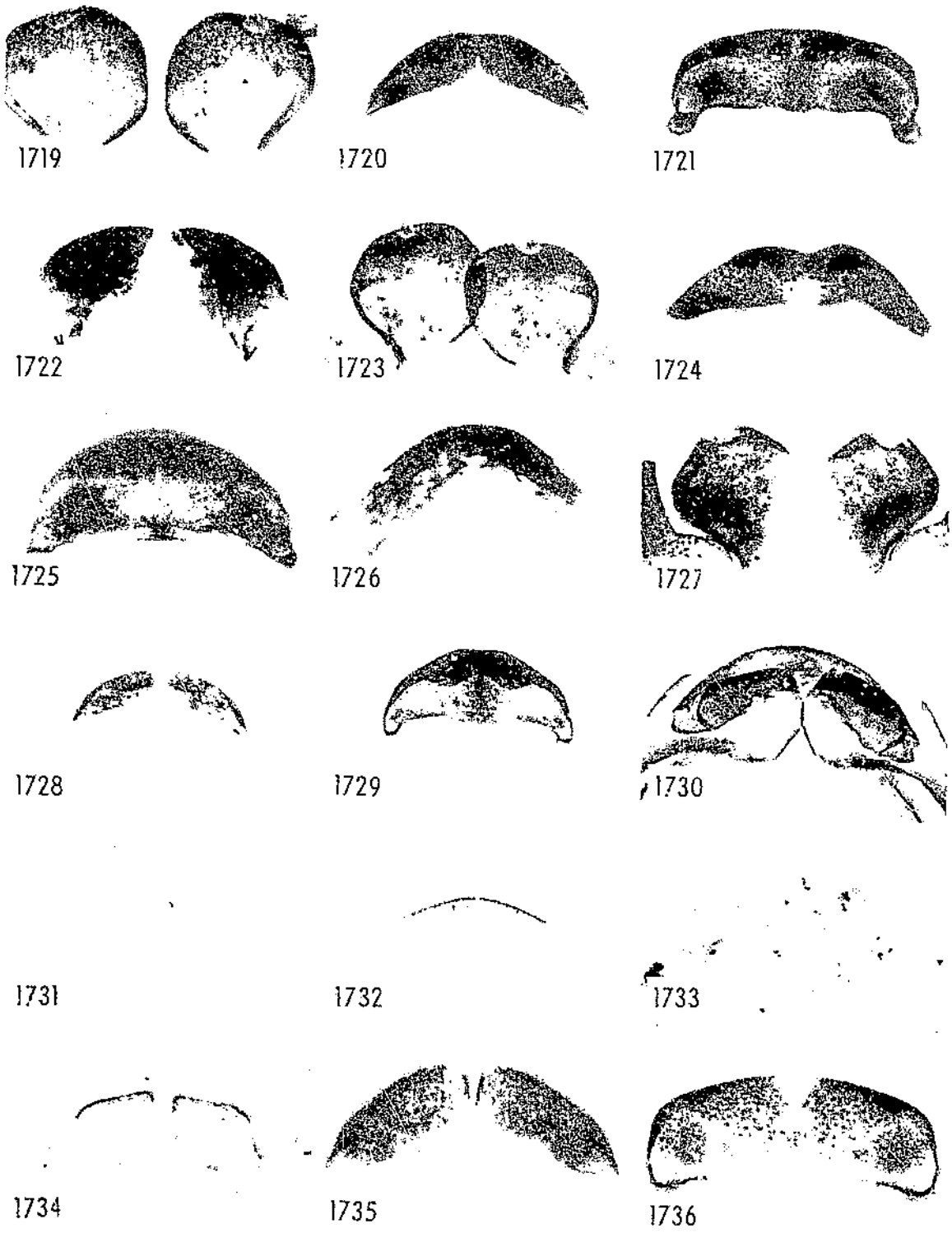
PN-3307

FIGURES 1683–1700.—Female genitalia: *Epilachna propinqua* (1683–1686), *E. callangae* (1687–1690), *E. clandestina* (1691–1693), *E. parastriata* (1694–1697), *E. basalis* (1698–1700).



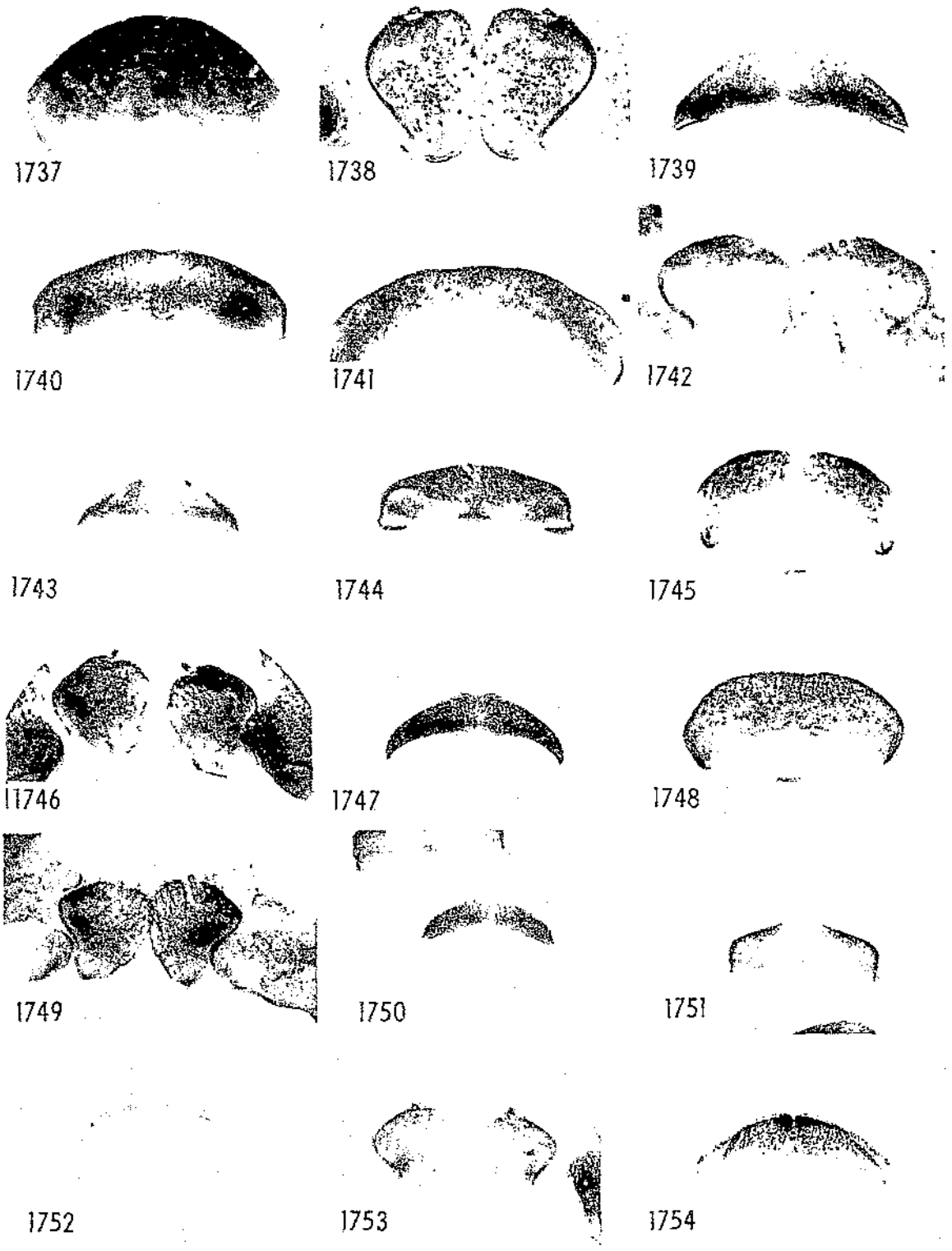
PN-3308

FIGURES 1701–1718.—Female genitalia: *Epilachna basalis* (1701), *E. sexlineata* (1702–1705), *E. mandibularis* (1706), *E. varivestis* (1707–1709), *E. mexicana* (1710–1712), *E. plagiata* (1713–1715), *E. erichsoni* (1716–1718).



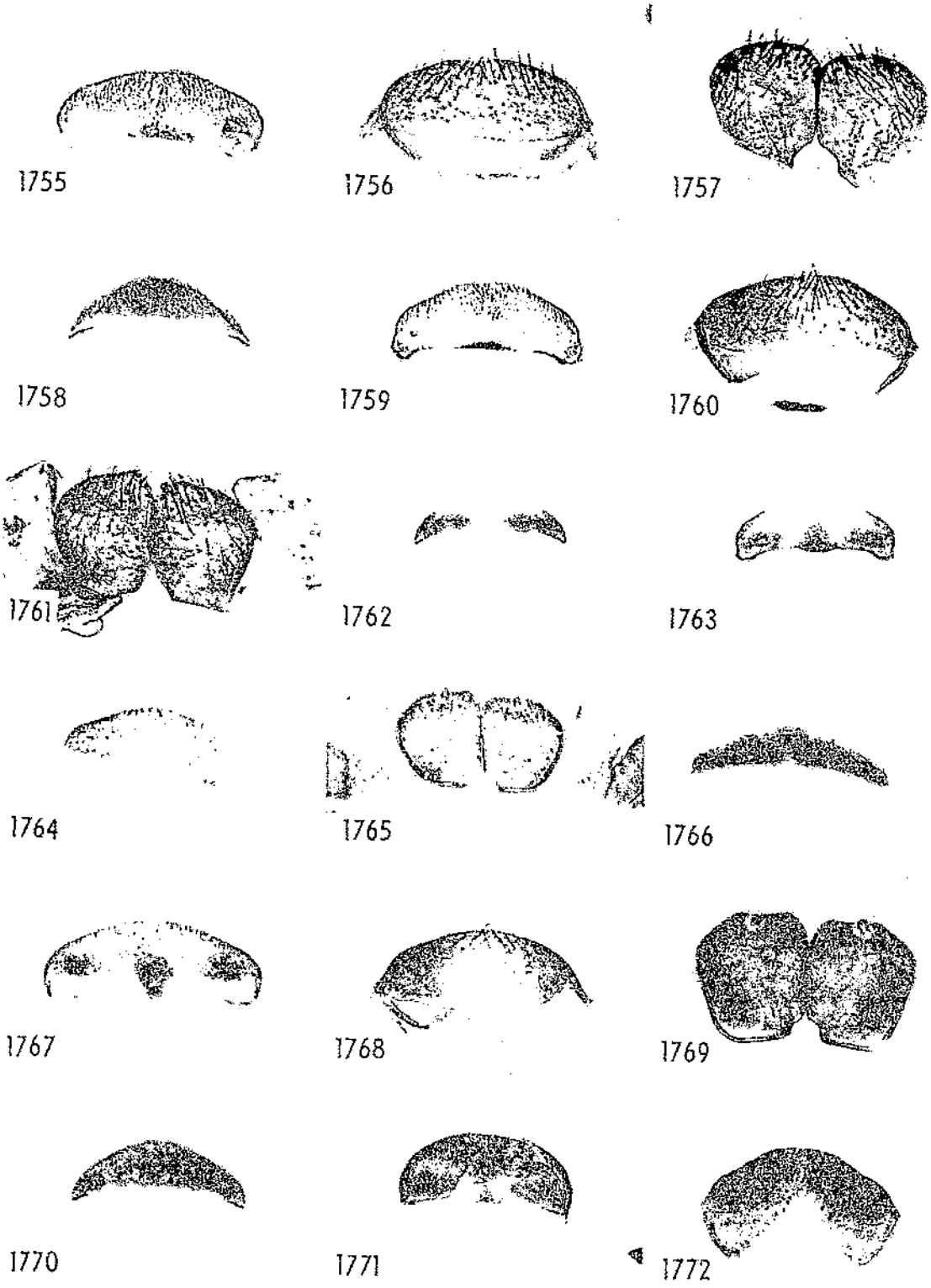
PN-3309

FIGURES 1719–1736.—Female genitalia: *Epilachna erichsoni* (1719), *E. tumida* (1720–1723), *E. abrupta* (1724–1727), *E. nigrocincta* (1728–1730), *E. vincta* (1731–1734), *E. pseudographa* (1735–1736).



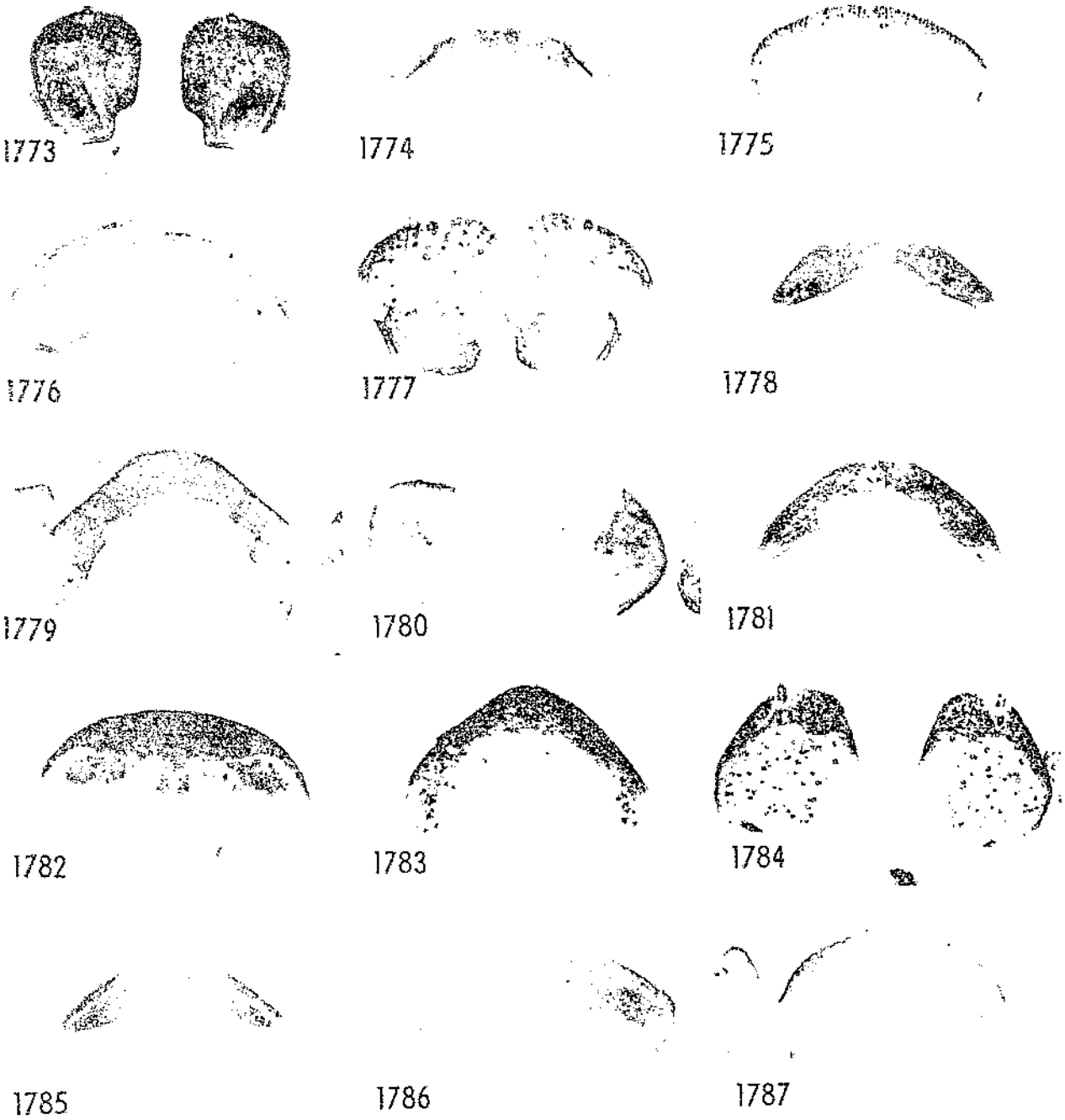
PN-3310

FIGURES 1737–1754.—Female genitalia: *Epilachna pseudograpta* (1737–1738), *E. olivacea* (1739–1742), *E. obscurella* (1743–1746), *E. aubei* (1747–1749), *E. vulnerata* (1750–1753), *E. patula* (1754).



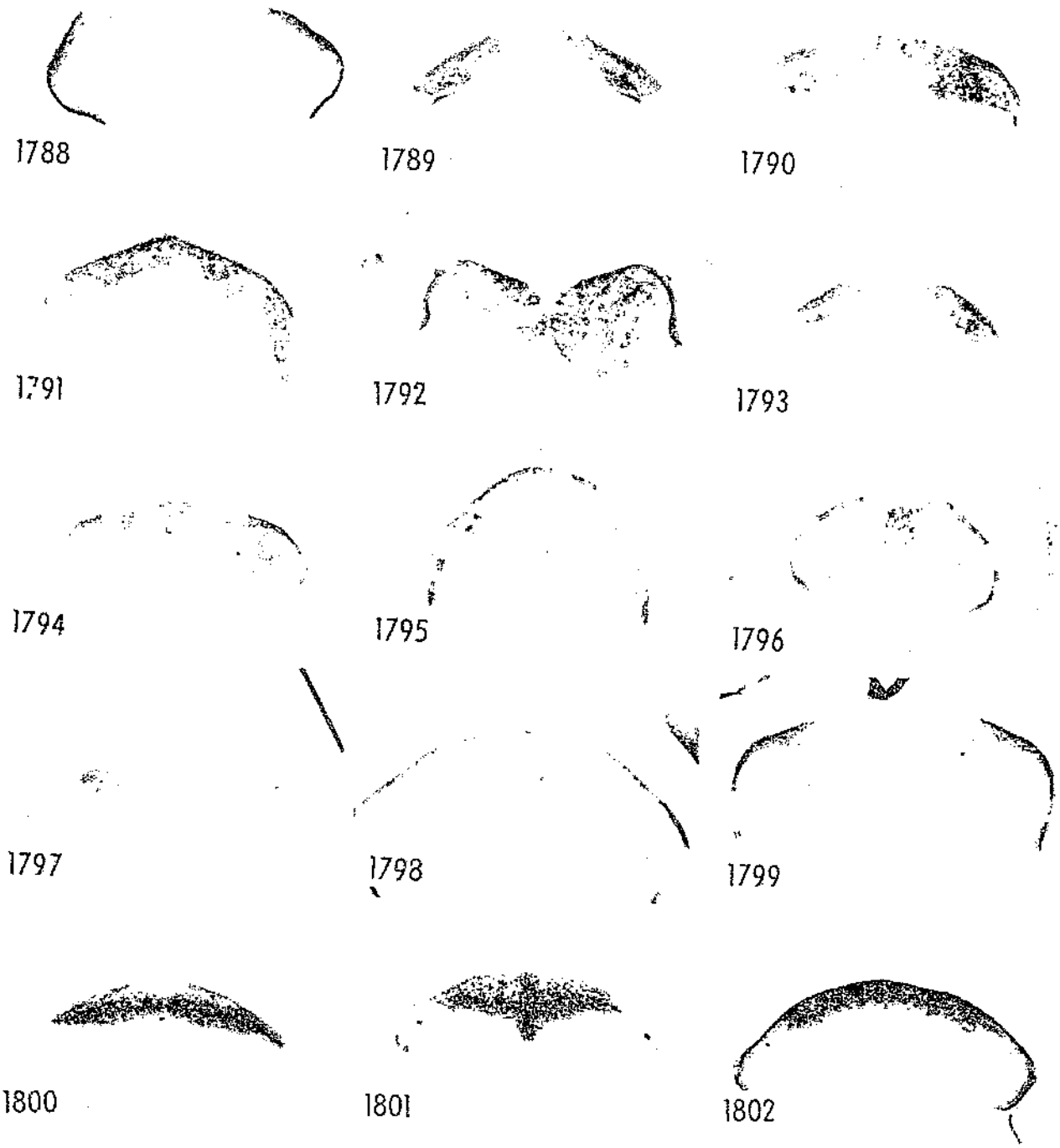
PN-3311

FIGURES 1755–1772.—Female genitalia: *Epilachna patula* (1755–1757), *E. difficilis* (1758–1761), *E. tenebricosa* (1762–1765), *E. vanpatteni* (1766–1769), *E. gorhami* (1770–1772).



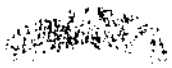
PN-3312

FIGURES 1773–1787.—Female genitalia: *Epilachna garhami* (1773), *E. godmani* (1774–1777), *E. circumcincta* (1778–1780), *E. furtiva* (1781–1784), *E. staudingeri* (1785–1787).



FIGURES 1788-1802.—Female genitalia: *Epilachna staudingeri* (1788), *E. mammifera* (1789–1792), *E. conifera* (1793–1796), *E. spreta* (1797–1799), *E. cacica* (1800–1802). PN-3313

1803



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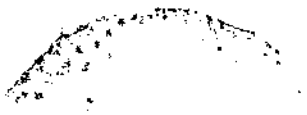

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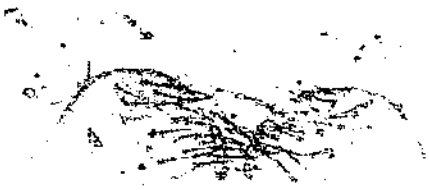

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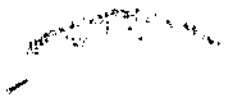

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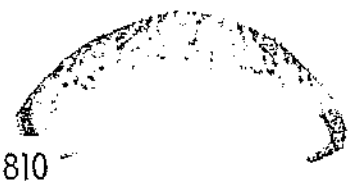

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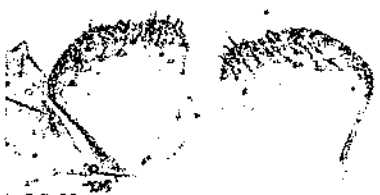

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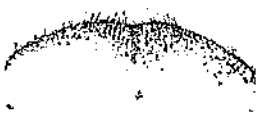

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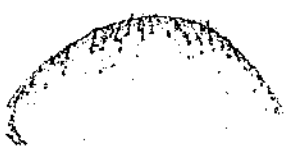

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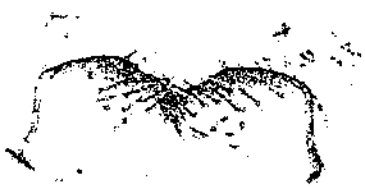

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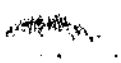
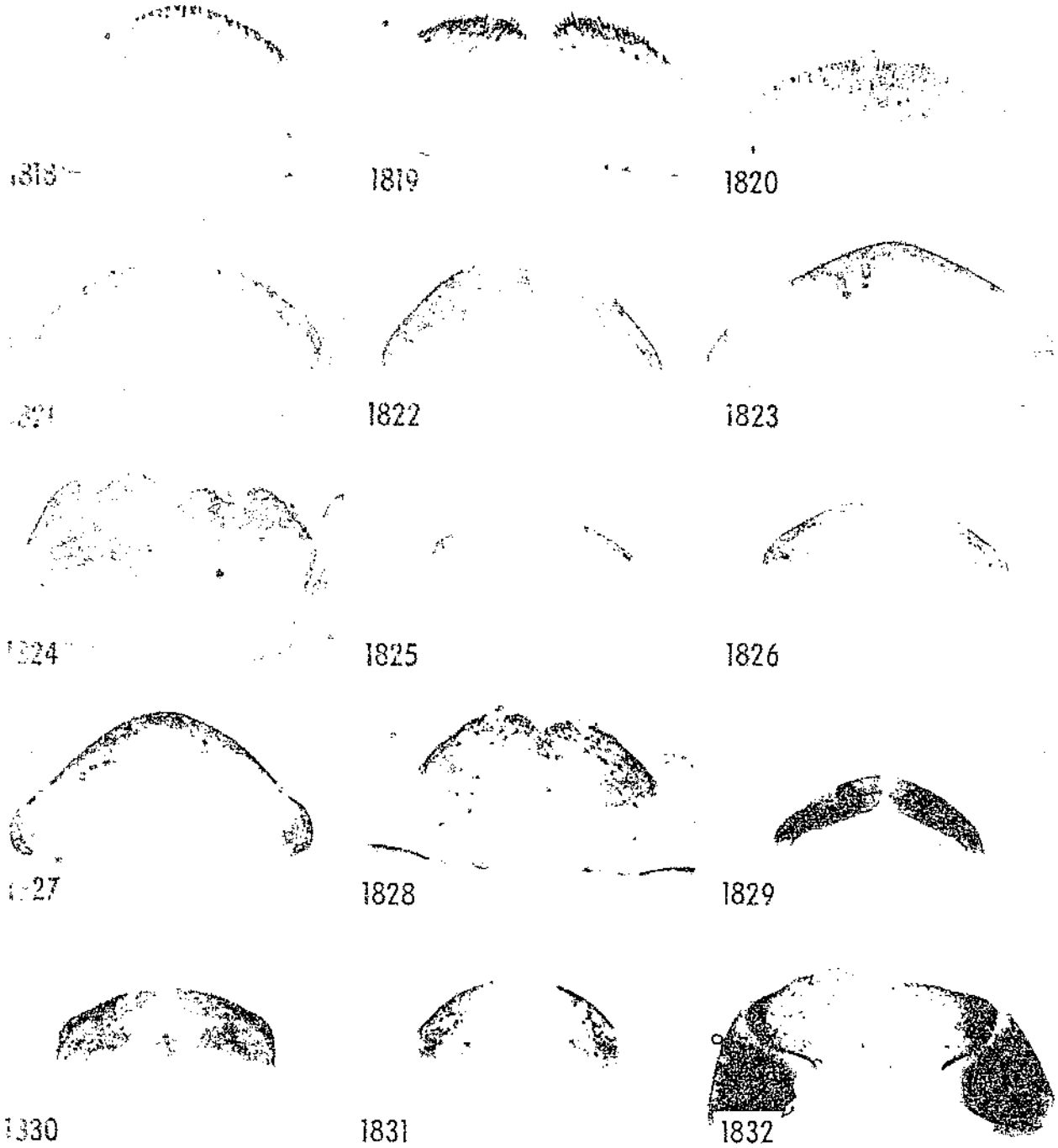


1816

1817

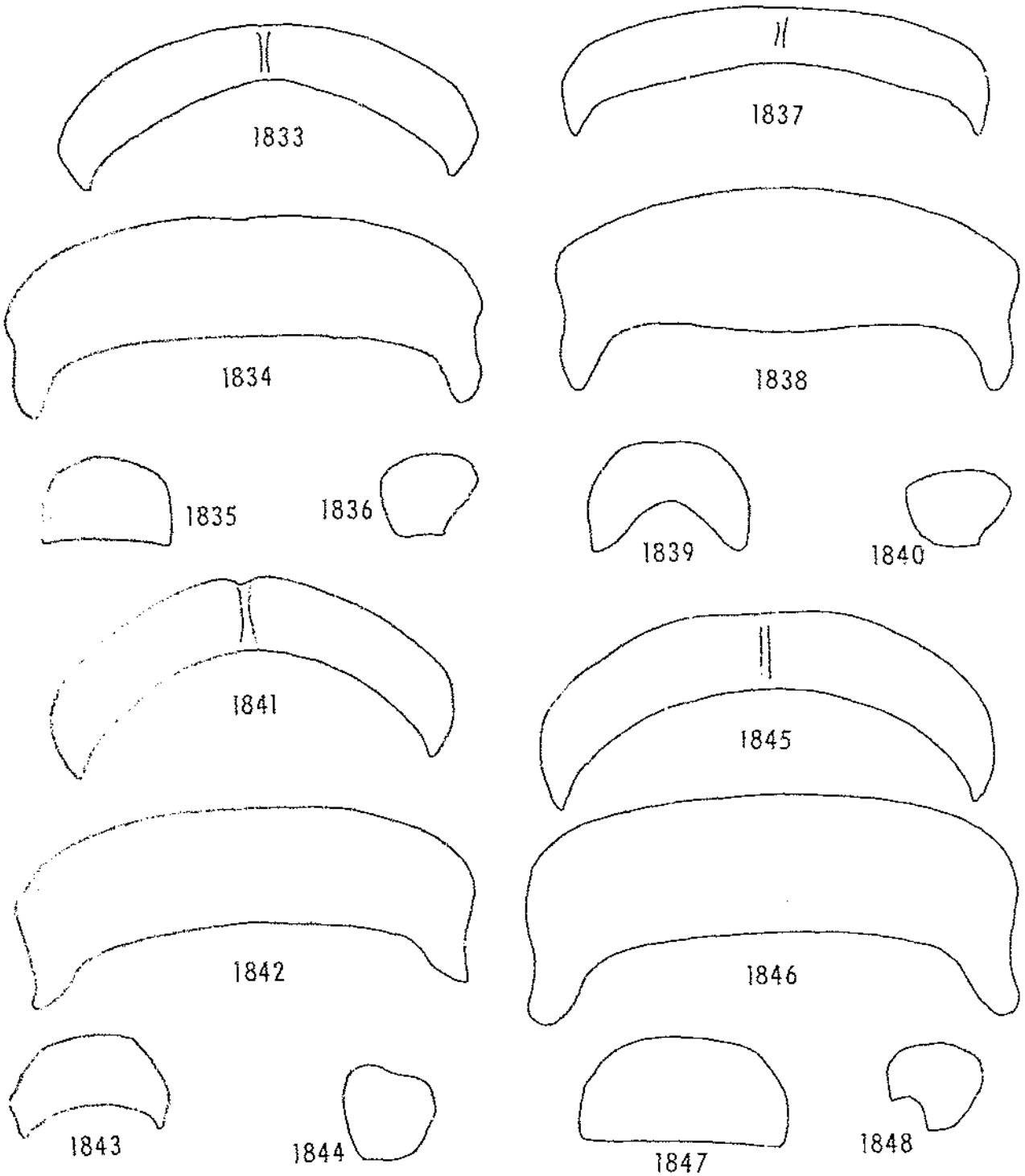
PN-3314

FIGURES 1803-1817.—Female genitalia: *Epilachna cacica* (1803), *E. marginella* (1804–1807), *E. velutina* (1808–1811), *E. concolor* (1812–1815), *E. darlingtoni* (1816–1817).

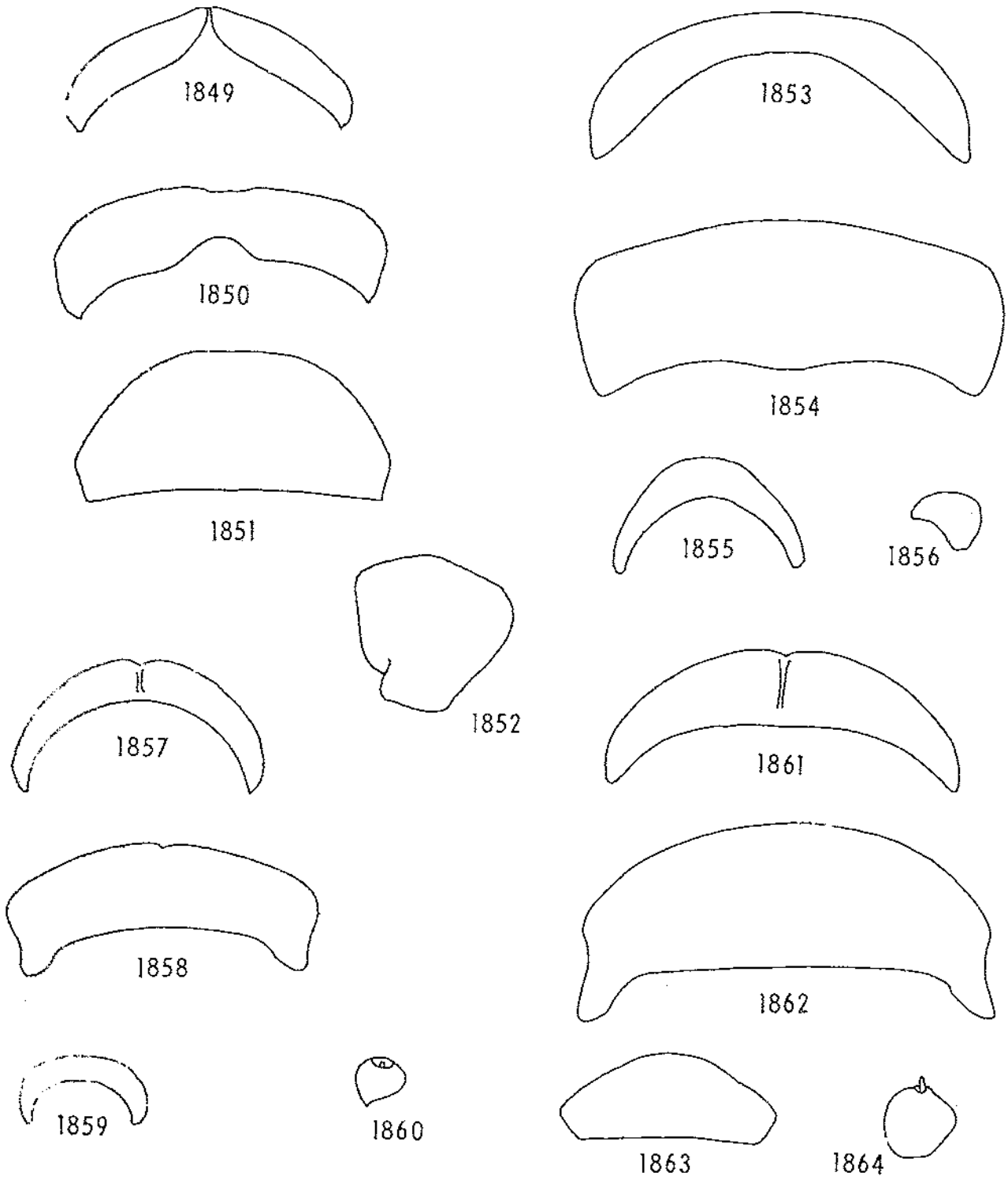


PN-3315

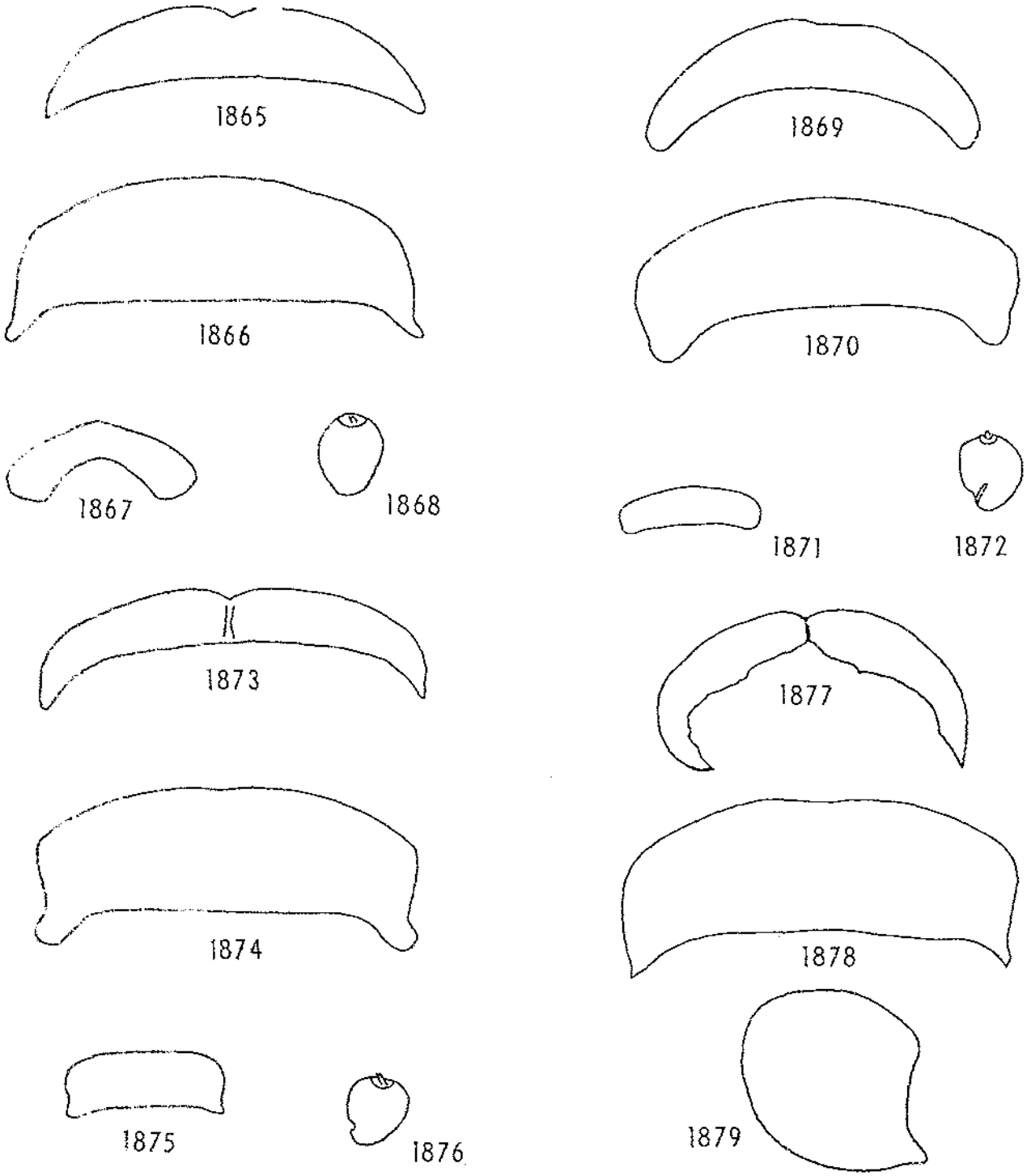
FIGURES 1818–1832.—Female genitalia: *Epilachna darlingtoni* (1818–1819), *E. pseudorealis* (1820–1821), *E. relata* (1822–1824), *E. extrema* (1825–1828), *Dira clarkii* (1829–1832).



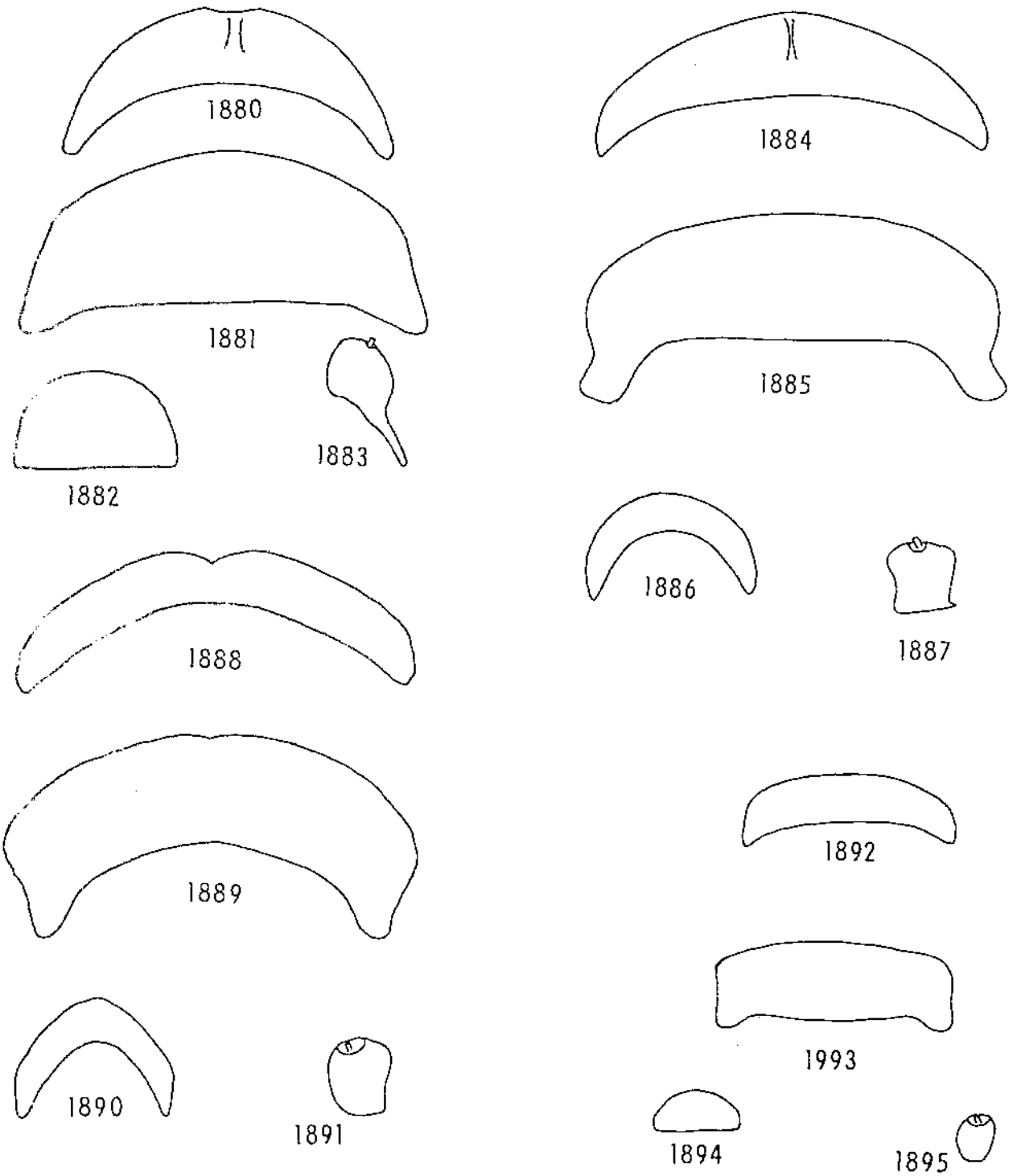
FIGURES 1833–1848.—Female genitalia: *Dira obscurocincta* (1833–1836), *D. tomentosa* (1837–1840), *D. gossypinoides* (1841–1844), *D. gossypiata* (1845–1848).



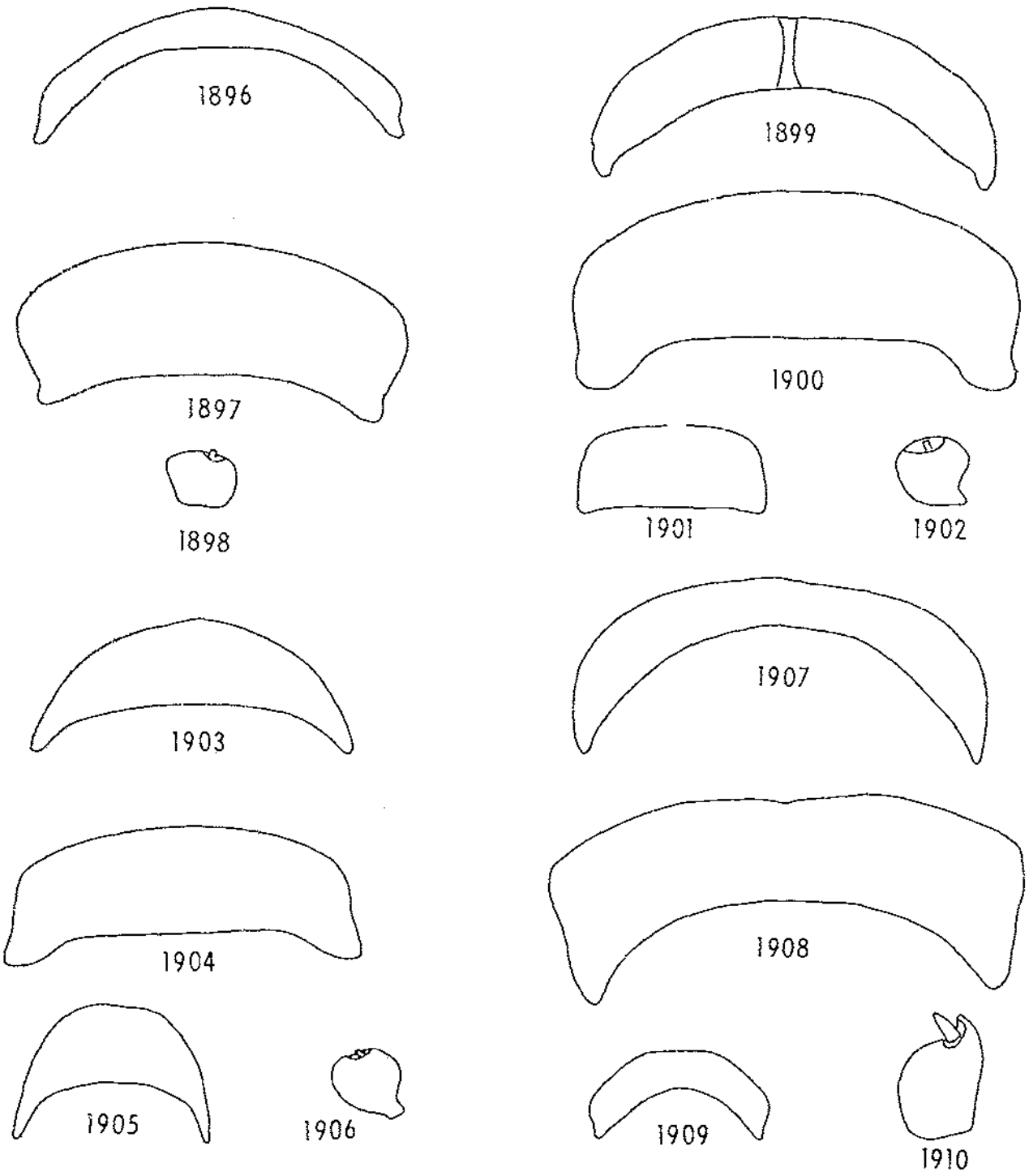
FIGURES 1849–1864.—Female genitalia: *Dira nucula* (1849–1852), *Pseudodira clypealis* (1853–1856), *Lorma specca* (1857–1860), *L. rufoventris* (1861–1864).



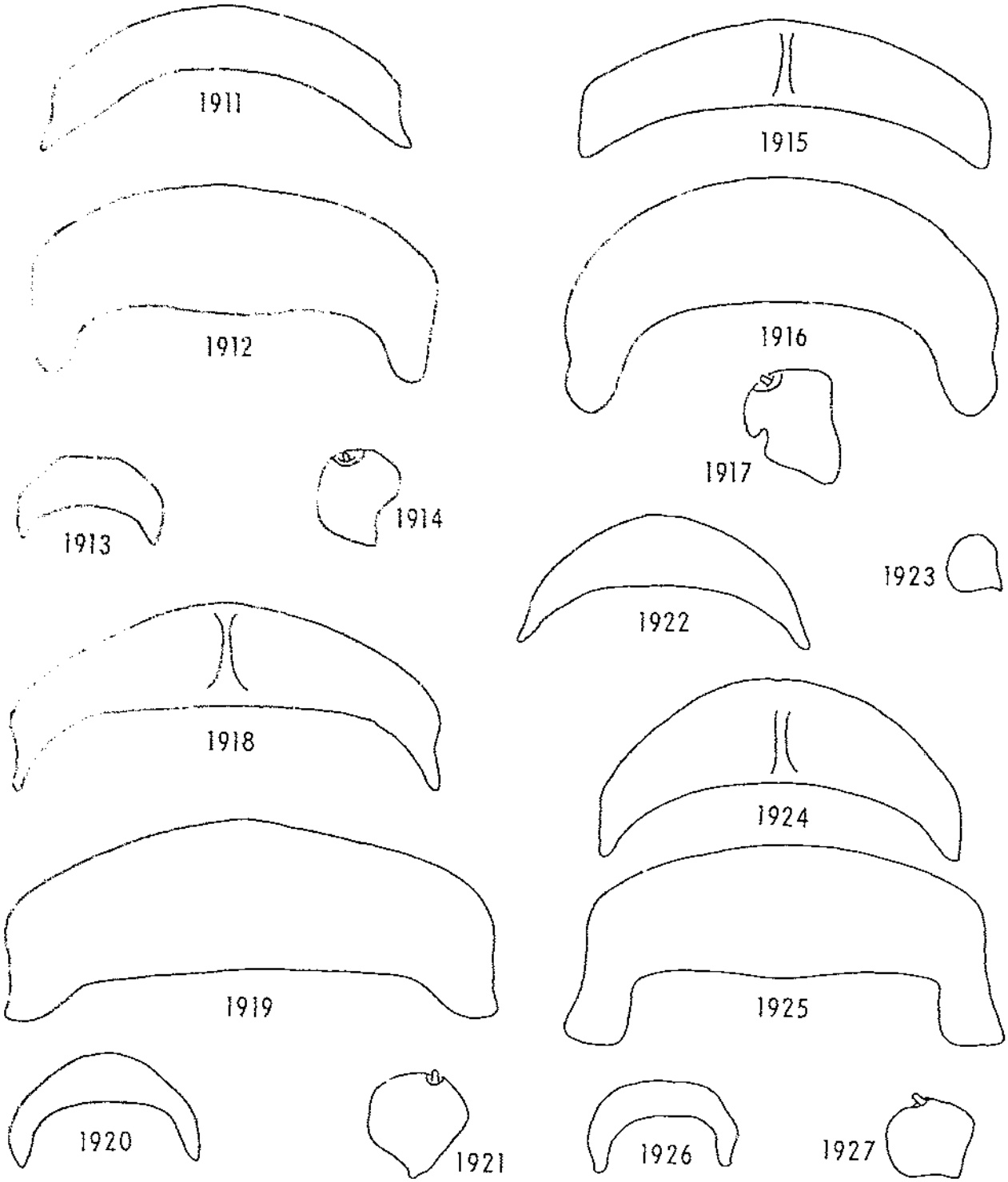
FIGURES 1865–1879. Female genitalia: *Lorma halfki* (1865–1868), *L. sopita* (1869–1872), *L. paprzyckii* (1873–1876), *L. batesi* (1877–1879).



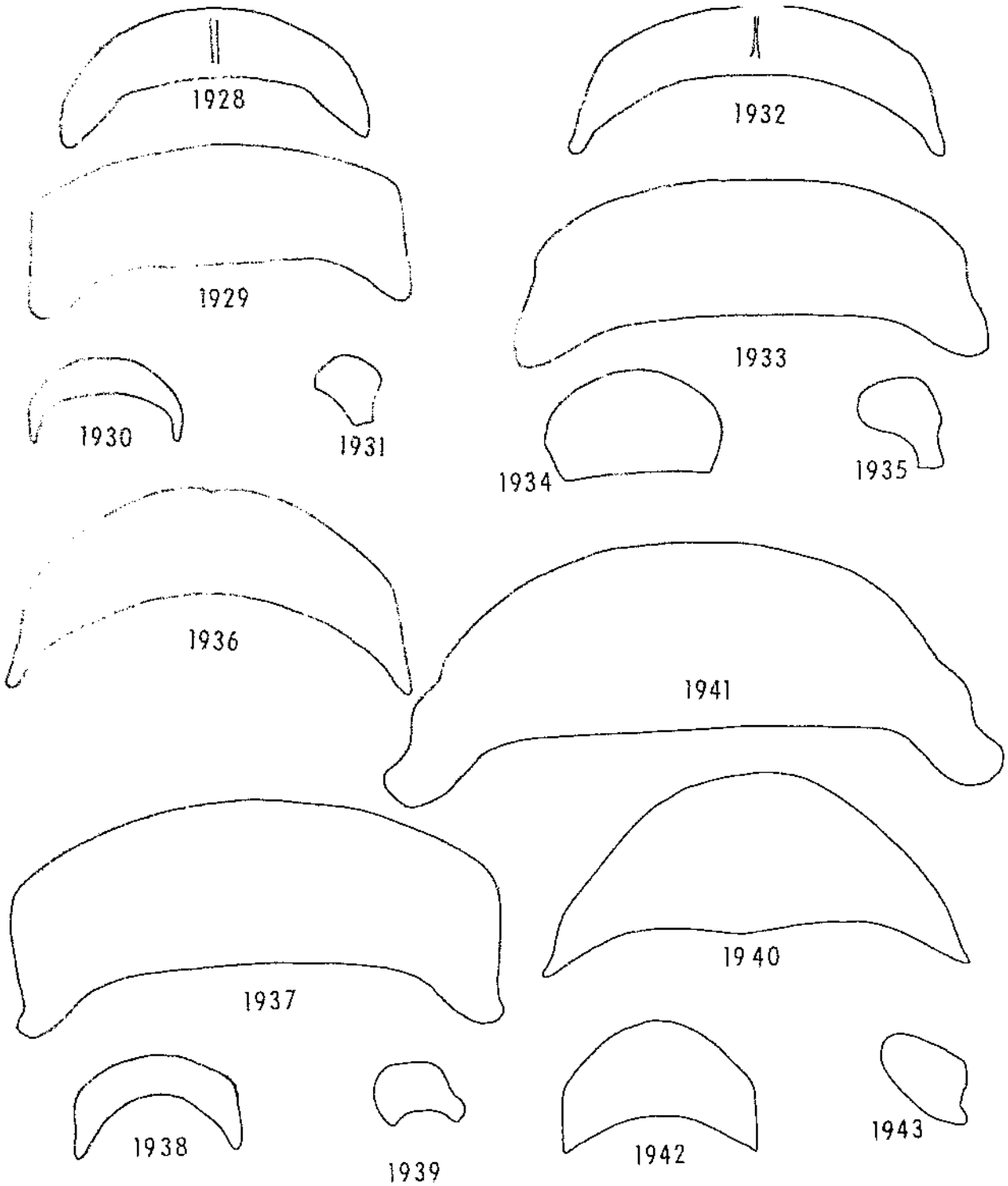
FIGURES 1880–1895.—Female genitalia: *Malata mitis* (1880–1883), *Mada fraterna* (1884–1887), *M. pseudofraterna* (1888–1891), *M. concentrica* (1892–1895).



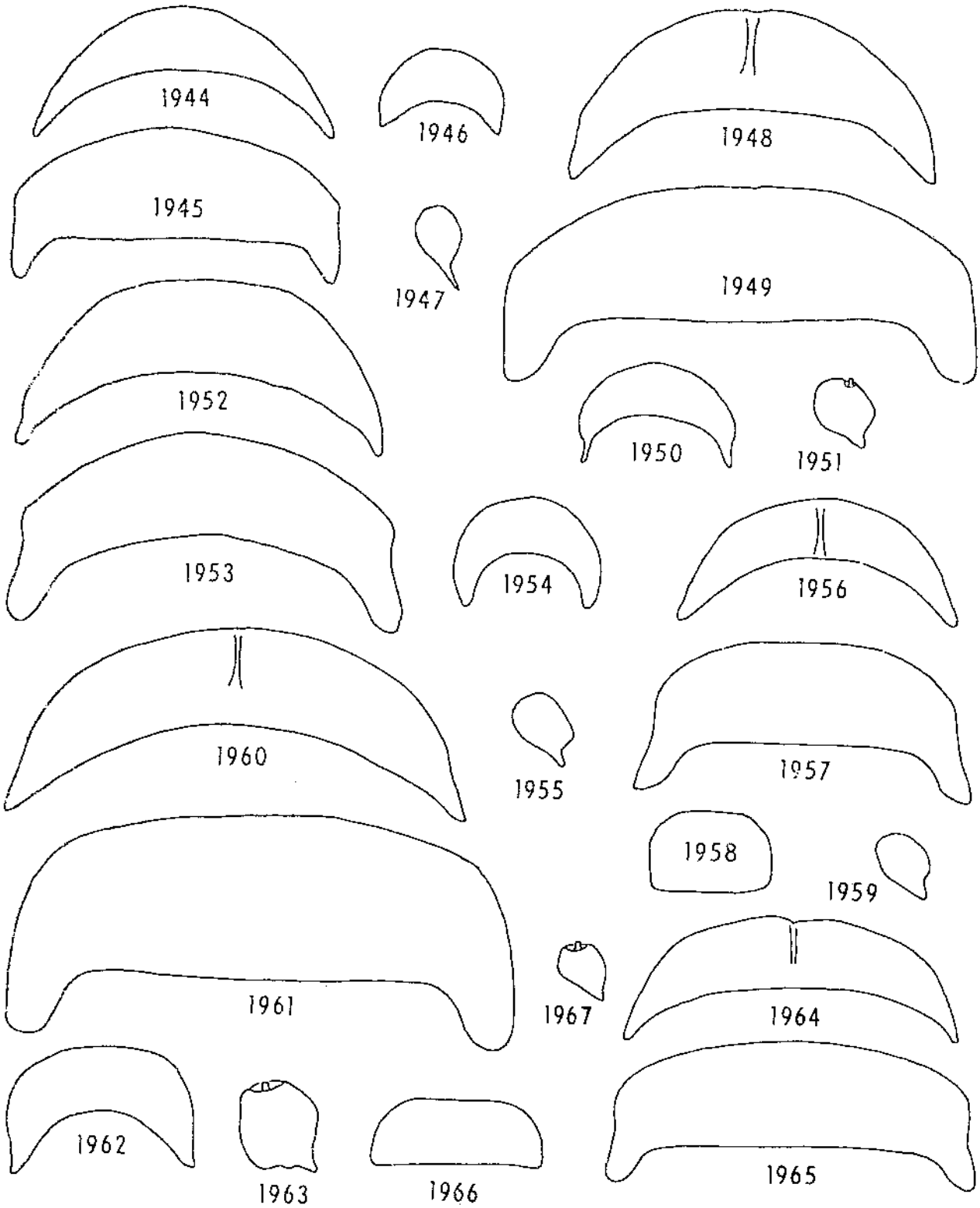
FIGURES 1896–1910. Female genitalia: *Mada desarmata* (1896–1898), *M. syncmia* (1899–1902), *M. amazona* (1903–1906), *M. apada* (1907–1910).



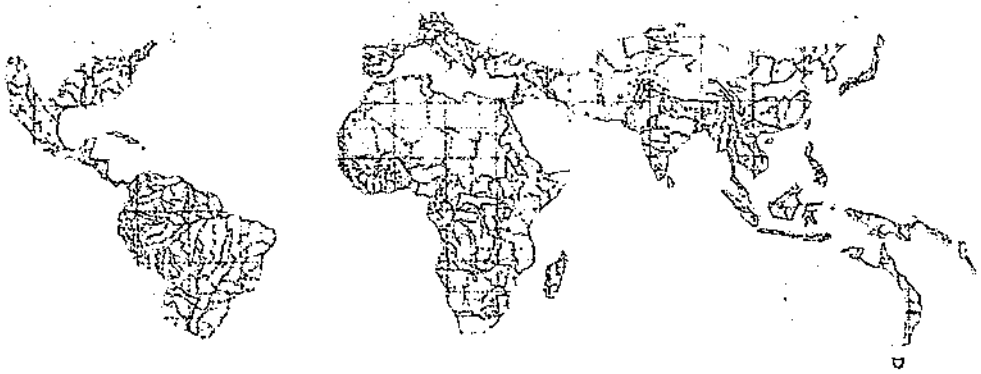
FIGURES 1911-1927.--Female genitalia: *Mada gounellei* (1911–1914), *M. circumflua* (1915–1917), *M. contempta* (1918–1921), *M. zonula* (1922–1923), *M. virgata* (1924–1927).



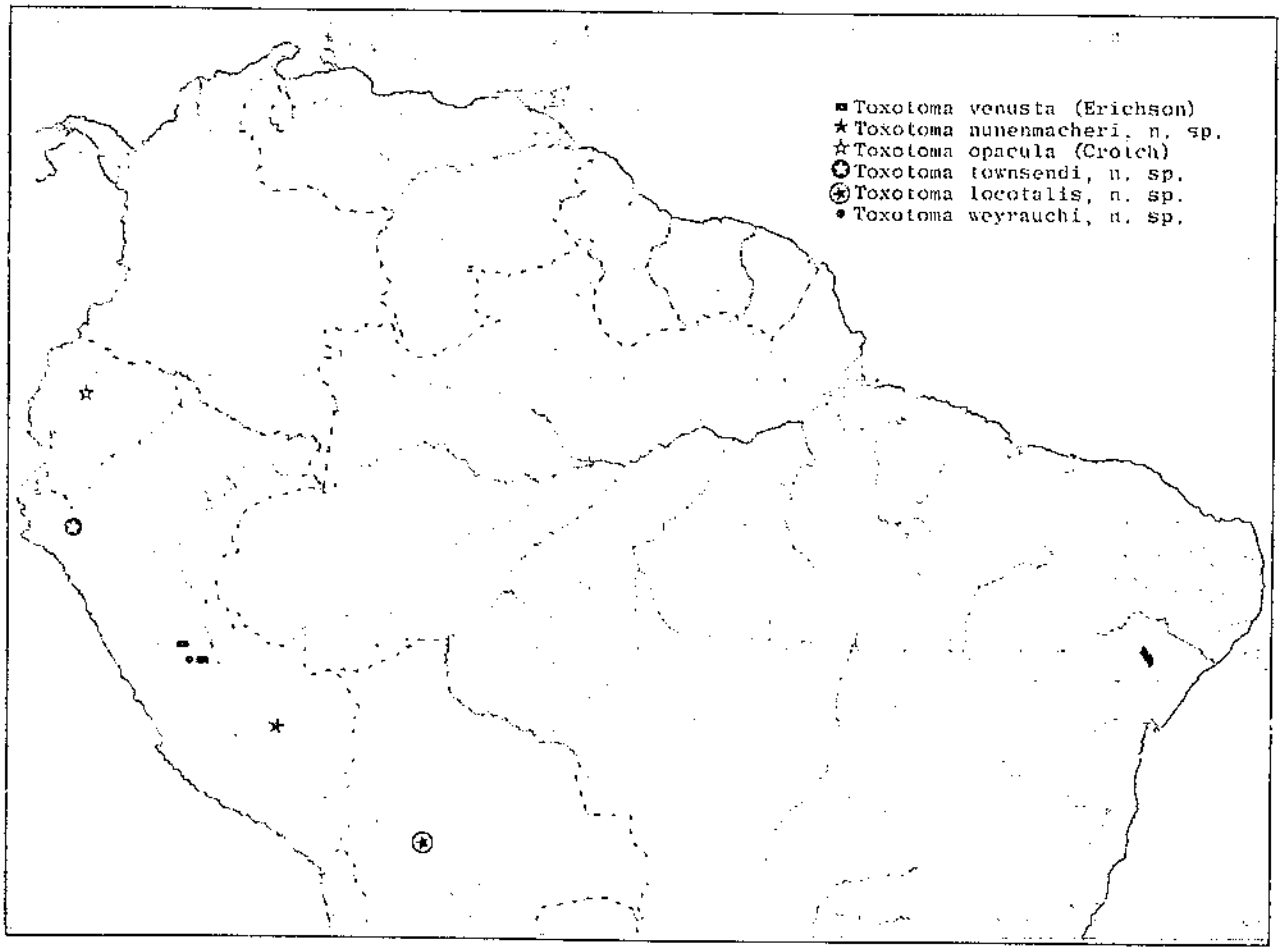
FIGURES 1928–1943.—Female genitalia: *Mada inepta* (1928–1931), *M. polluta* (1932–1935), *M. amplexata* (1936–1939), *M. lineatopunctata* (1940–1943).



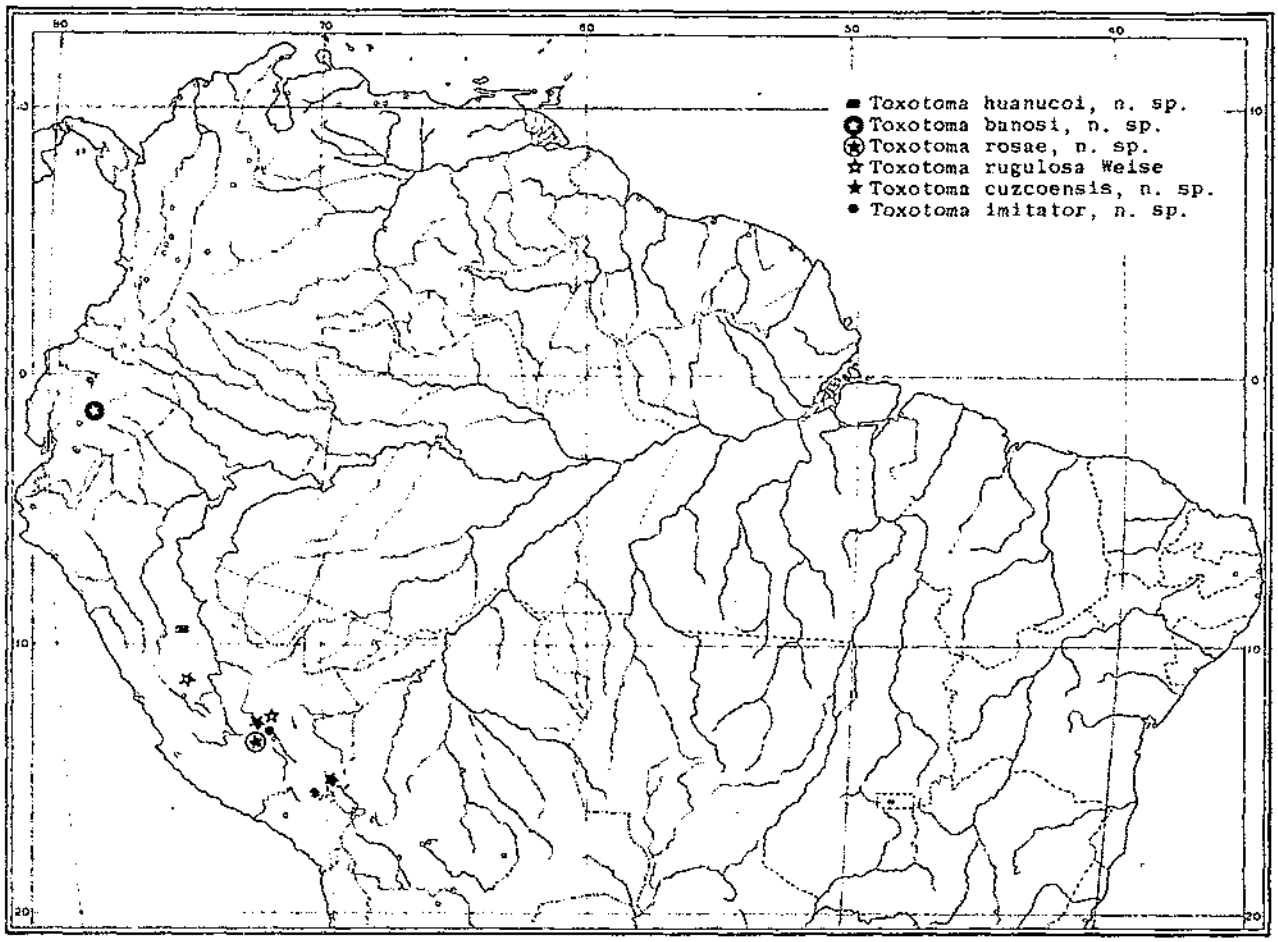
FIGURES 1944-1967.- Female genitalia: *Madu circumducta* (1944–1947), *M. insolitaphallus* (1948–1951), *M. vexophallus* (1952-1955), *M. rutoreceptis* (1956–1959), *Damalula carina* (1960-1963), *D. schwarzi* (1964–1967).



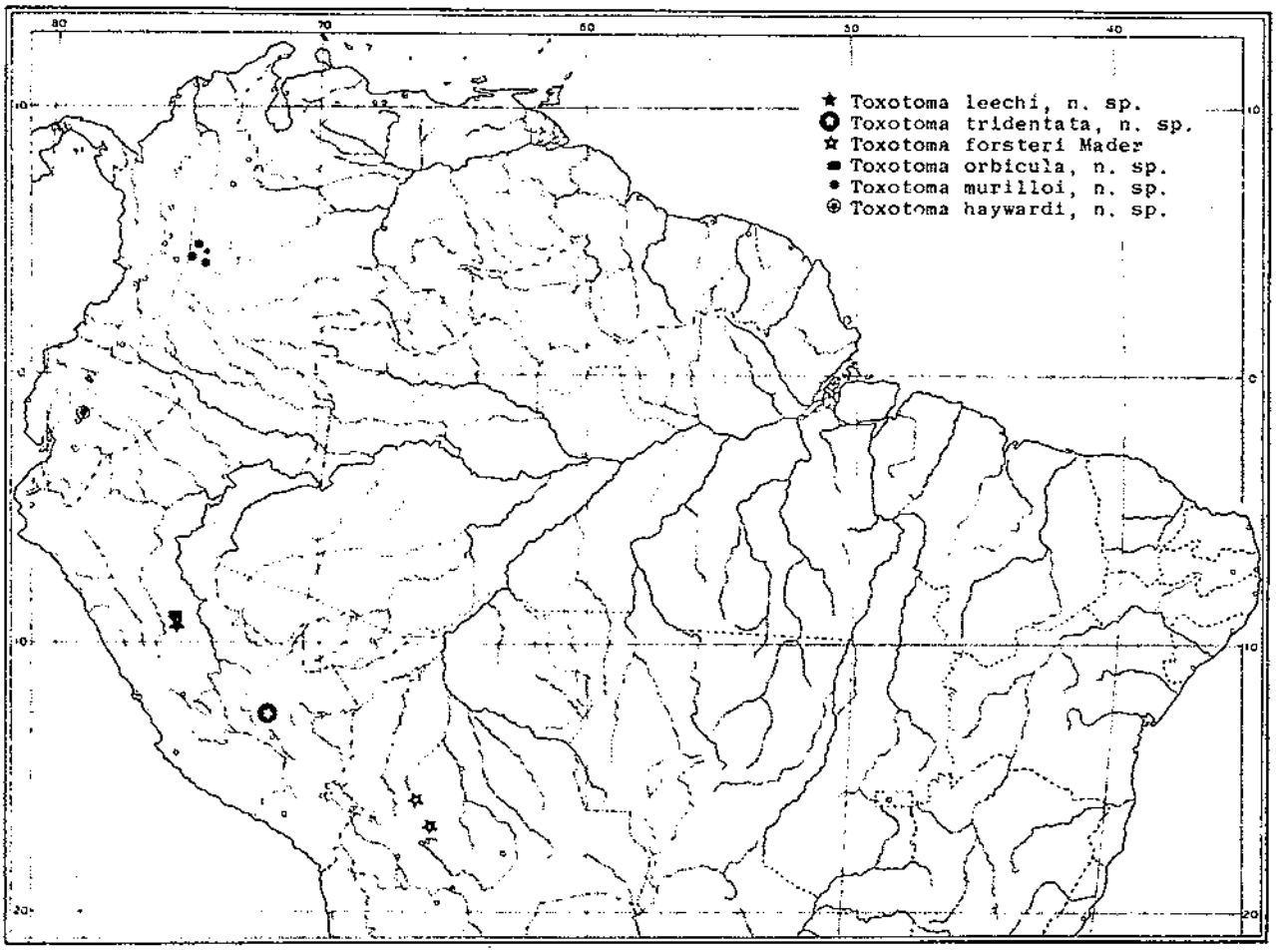
MAP 1


Toxotoma venusta (Erichson)
Toxotoma nunenmacheri, n. sp.
Toxotoma opacula (Croich)
Toxotoma townsendi, n. sp.
Toxotoma locotalis, n. sp.
Toxotoma weyrauchi, n. sp.

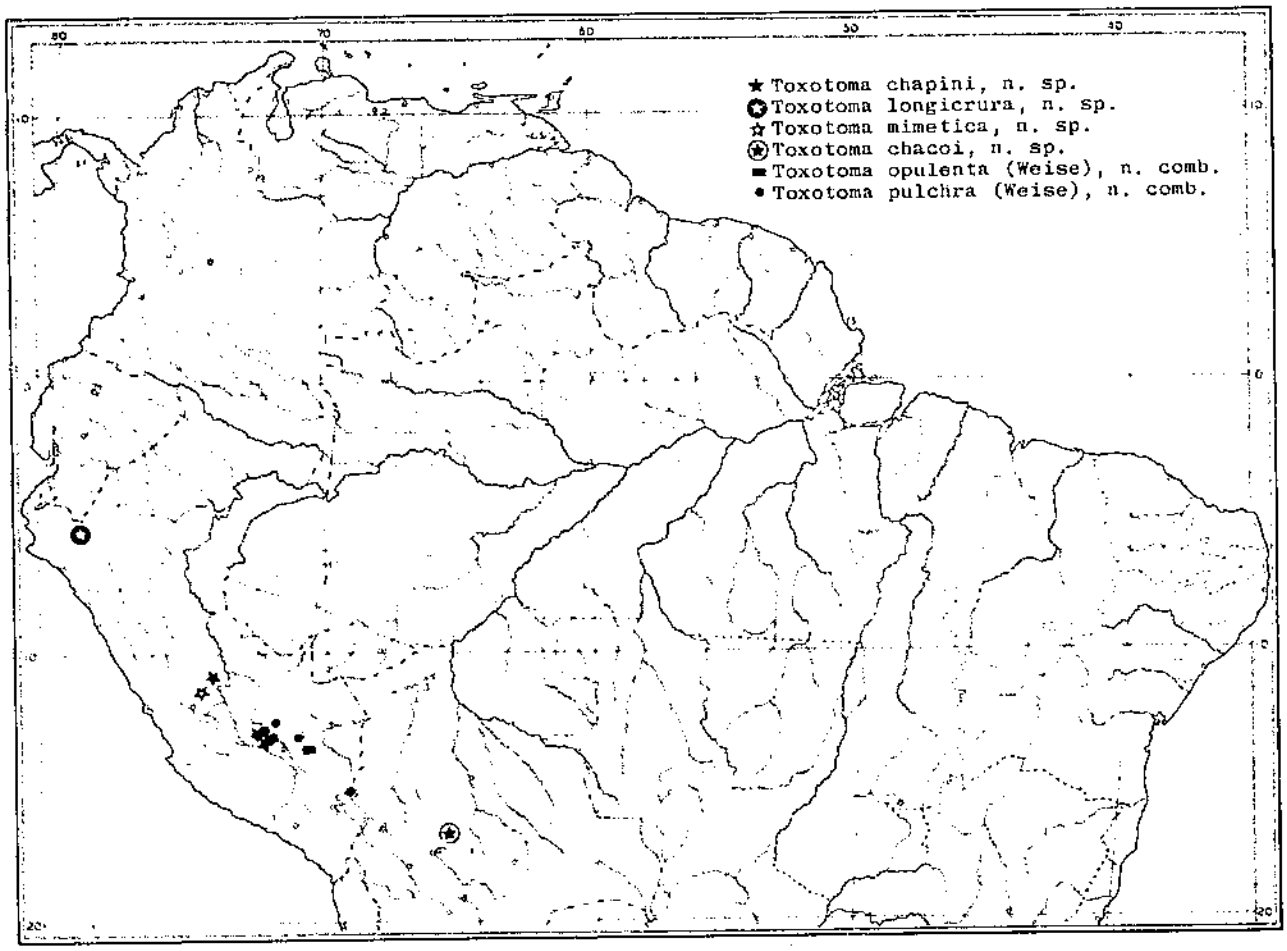
MAP 2


Toxotoma huanucoi, n. sp.
Toxotoma banosi, n. sp.
Toxotoma rosae, n. sp.
Toxotoma rugulosa Weise
Toxotoma cuzcoensis, n. sp.
Toxotoma imitator, n. sp.

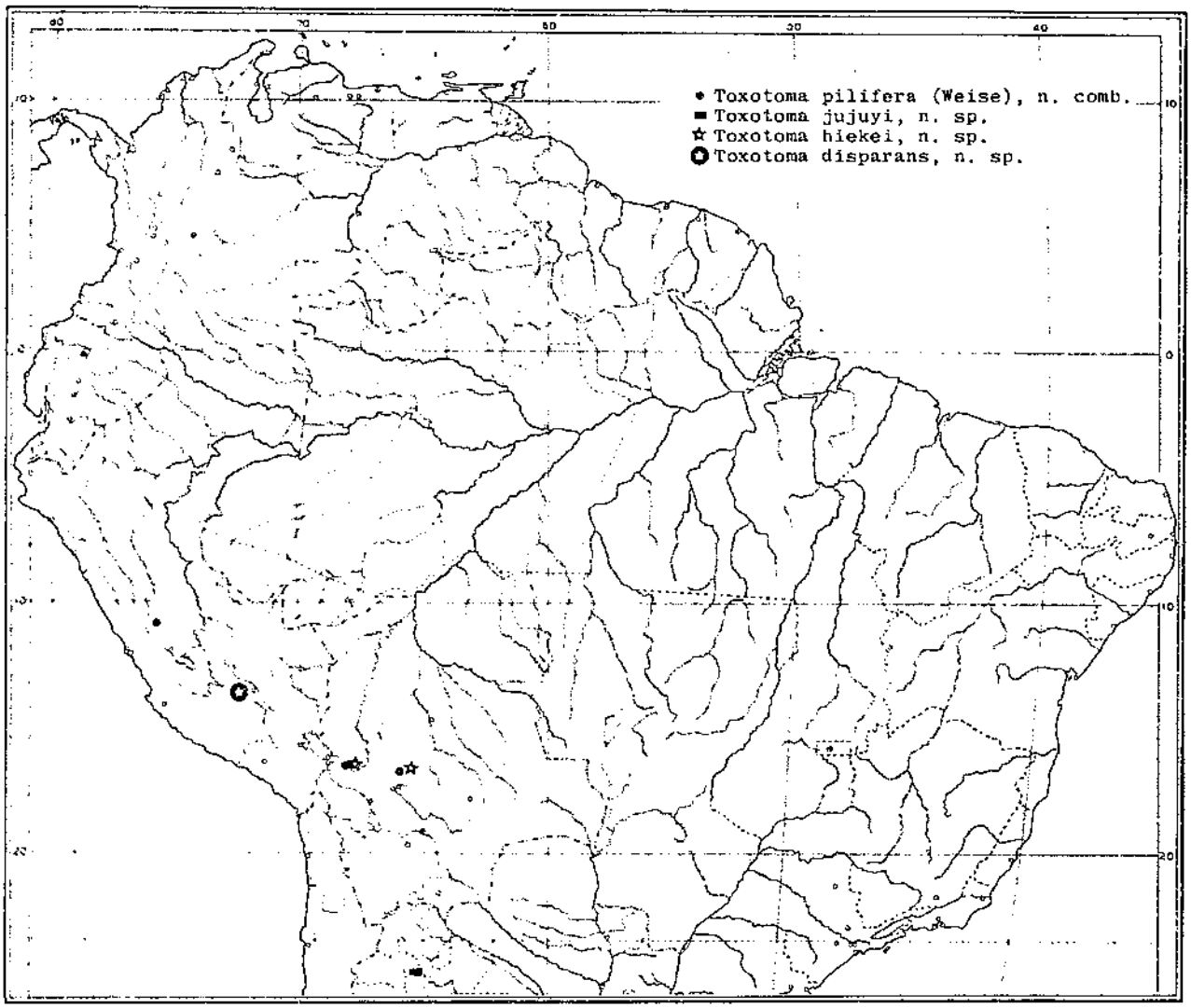
MAP 3


Toxotoma leechi, n. sp.
Toxotoma tridentata, n. sp.
Toxotoma forsteri Mader
Toxotoma orbicula, n. sp.
Toxotoma murilloi, n. sp.
Toxotoma haywardi, n. sp.

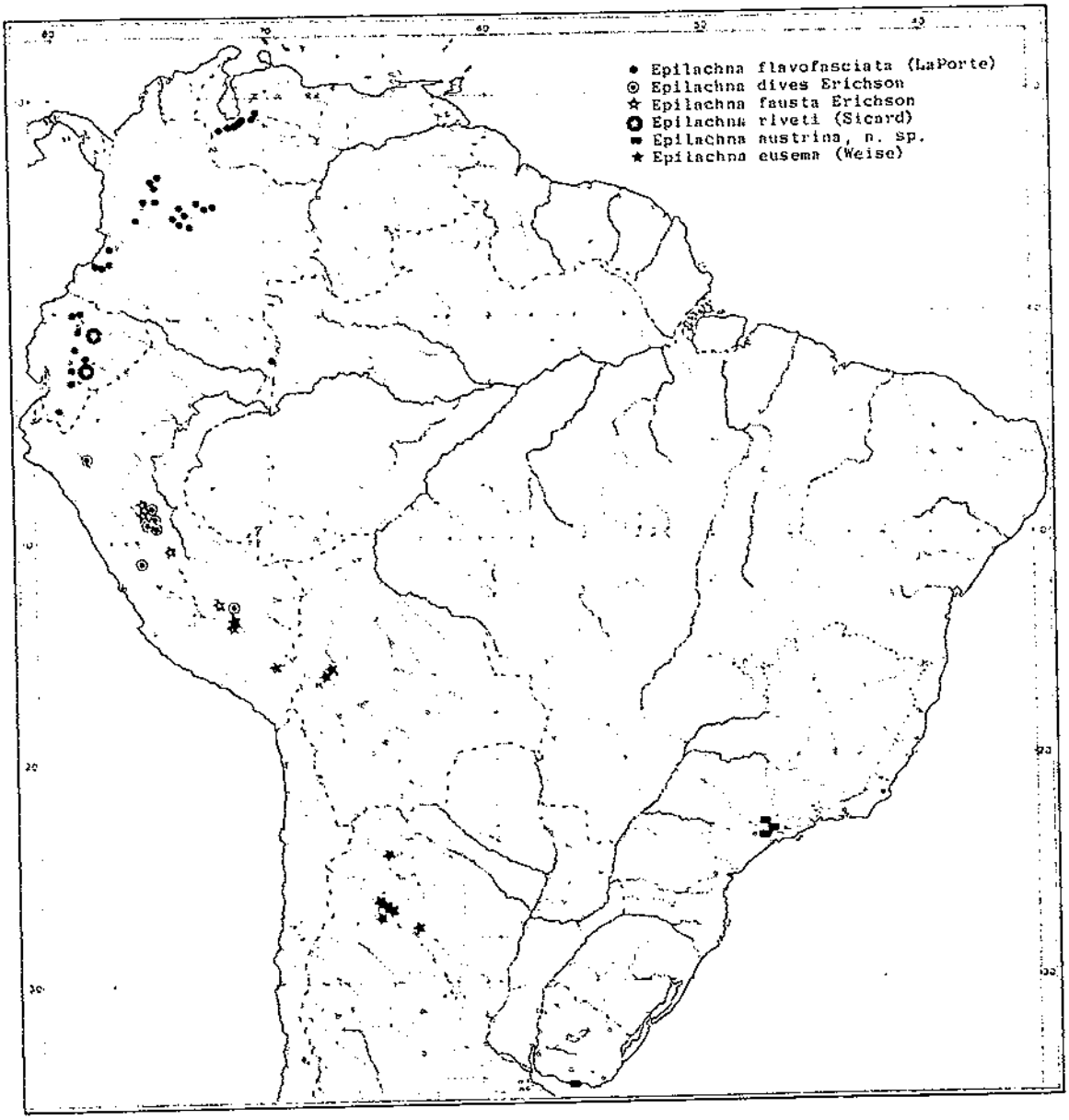
MAP 4


★ Toxotoma chapini, n. sp.
Toxotoma longicrura, n. sp.
☆ Toxotoma mimetica, n. sp.
Toxotoma chacoi, n. sp.
▬ Toxotoma opulenta (Weise), n. comb.
• Toxotoma pulchra (Weise), n. comb.

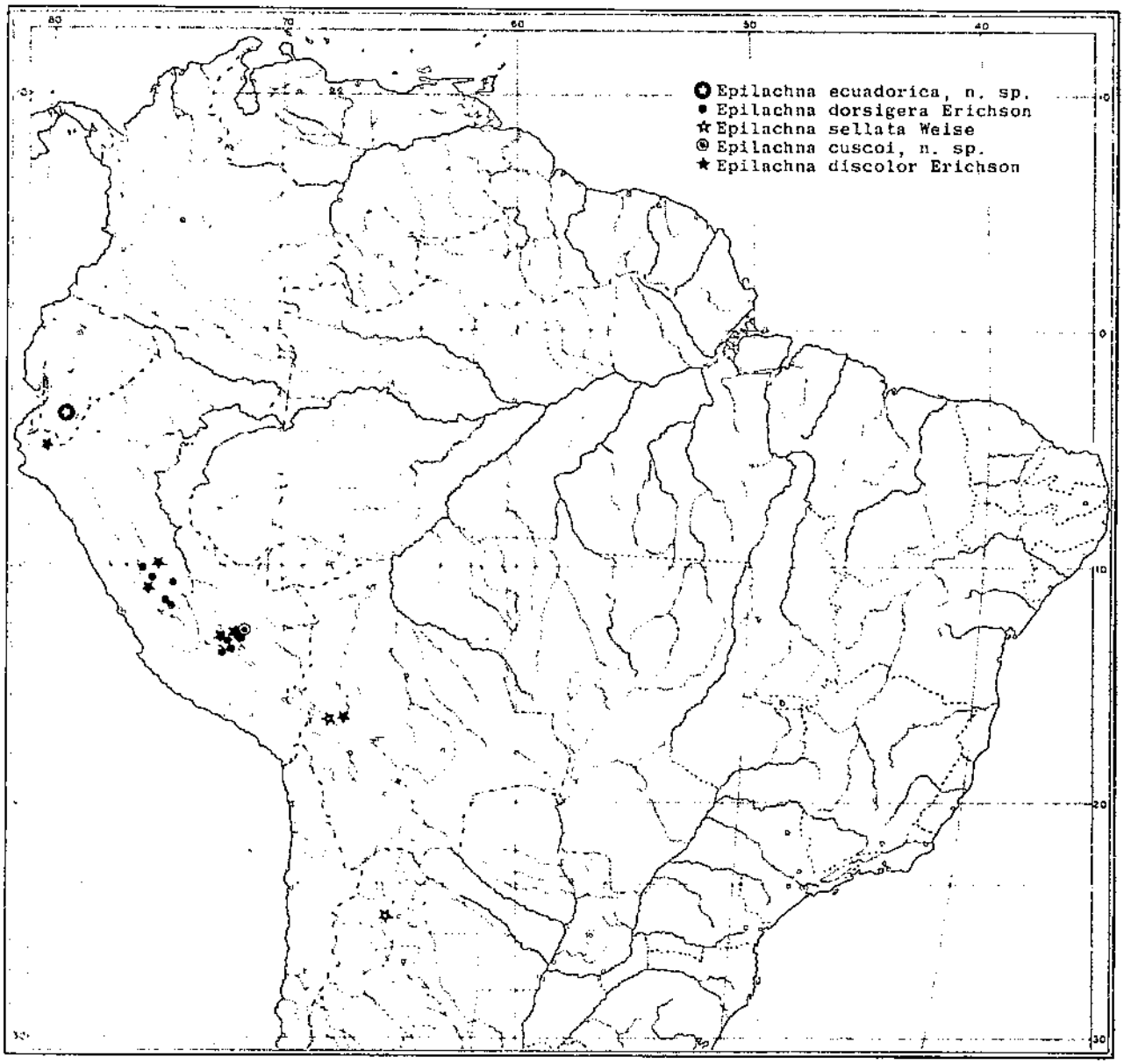
MAP 5


• Toxotoma pilifera (Weise), n. comb.
■ Toxotoma jujuyi, n. sp.
☆ Toxotoma hiekei, n. sp.
Toxotoma disparans, n. sp.

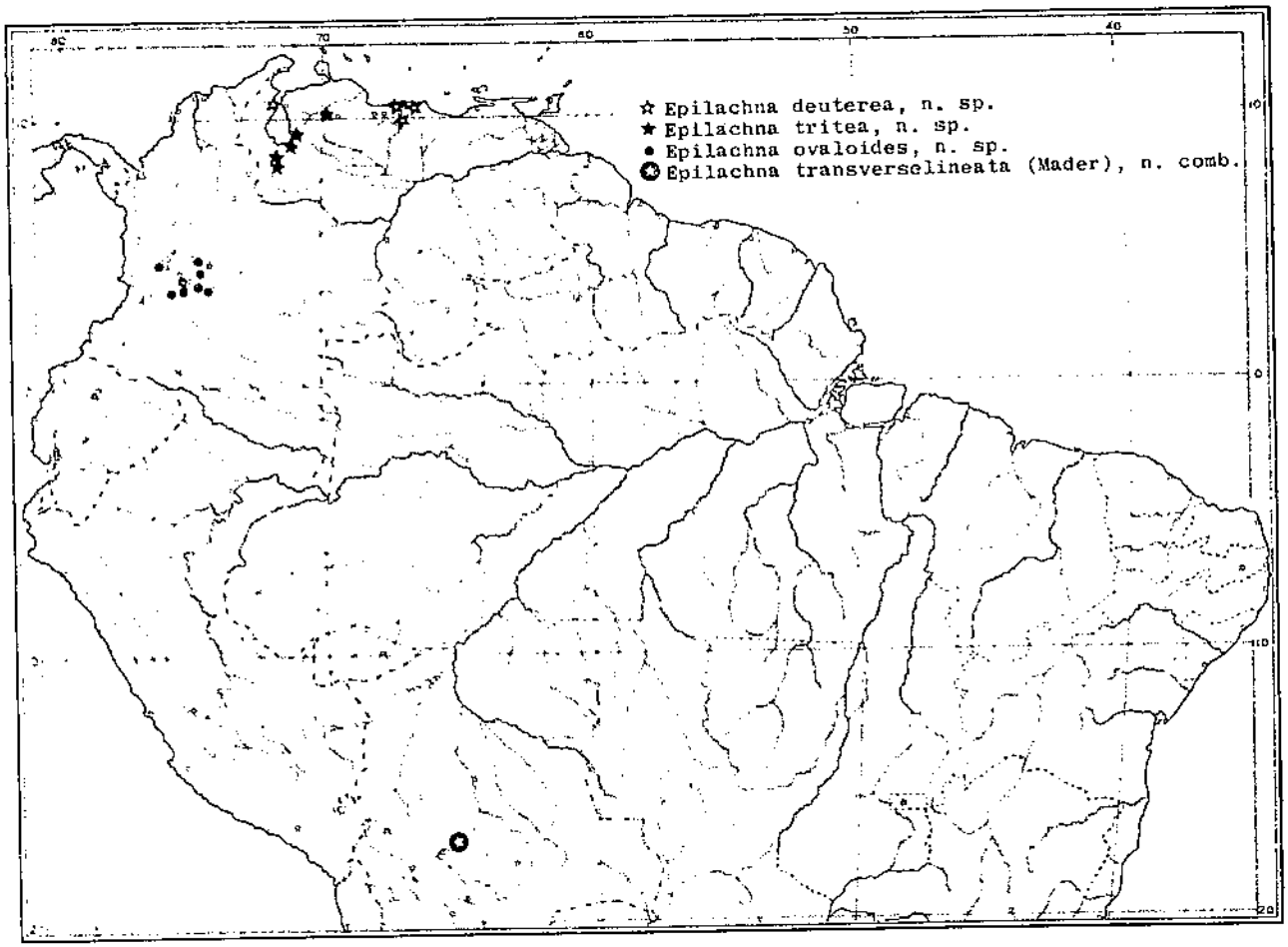
MAP 6


Epilachna flavofasciata (LaPorte)
Epilachna dives Erichson
Epilachna fausta Erichson
Epilachna riveti (Sicard)
Epilachna austrina, n. sp.
Epilachna eusema (Weise)

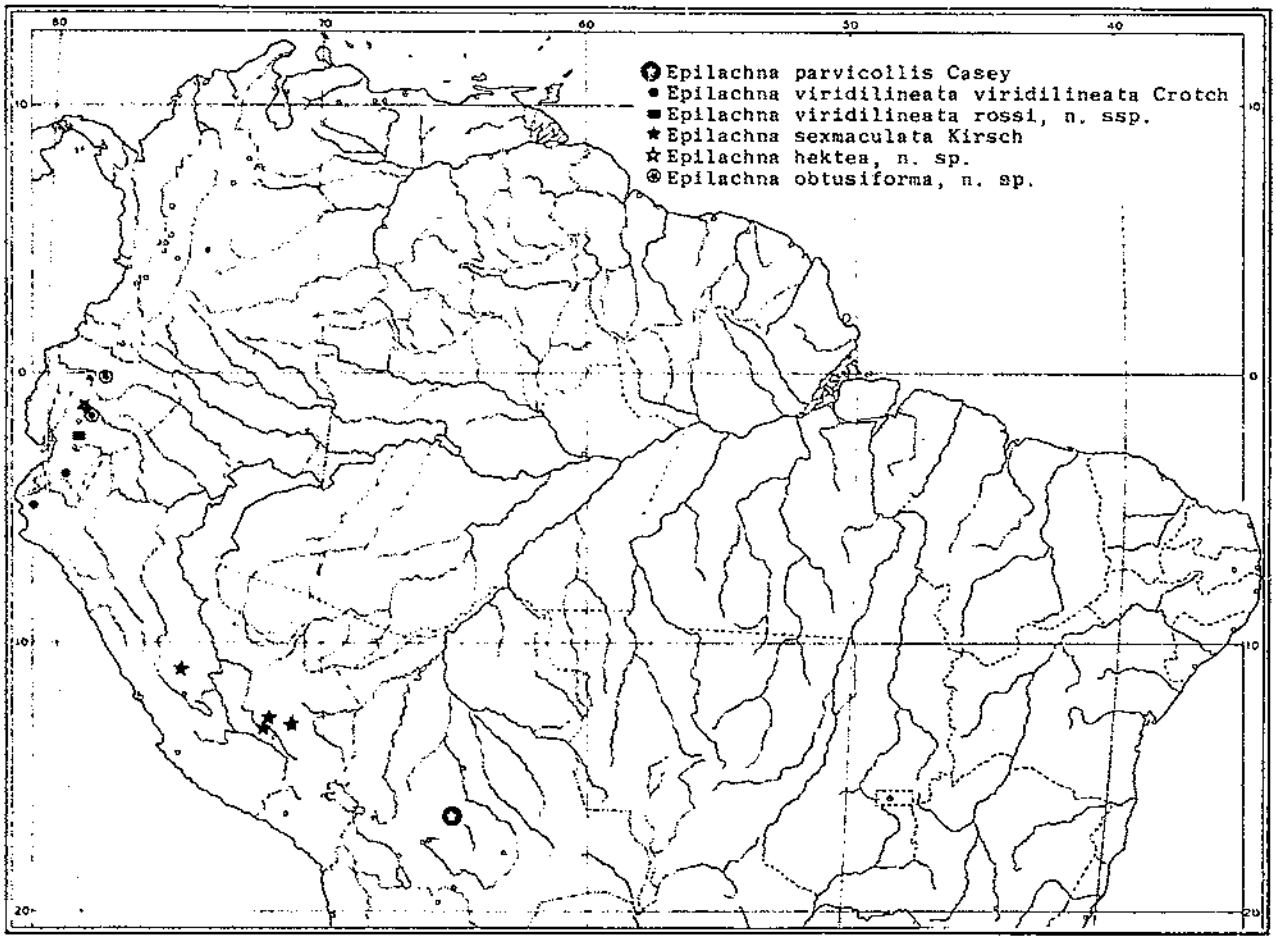
MAP 7


Epilachna ecuadorica, n. sp.
Epilachna dorsigera Erichson
Epilachna sellata Weise
Epilachna cuscoi, n. sp.
Epilachna discolor Erichson

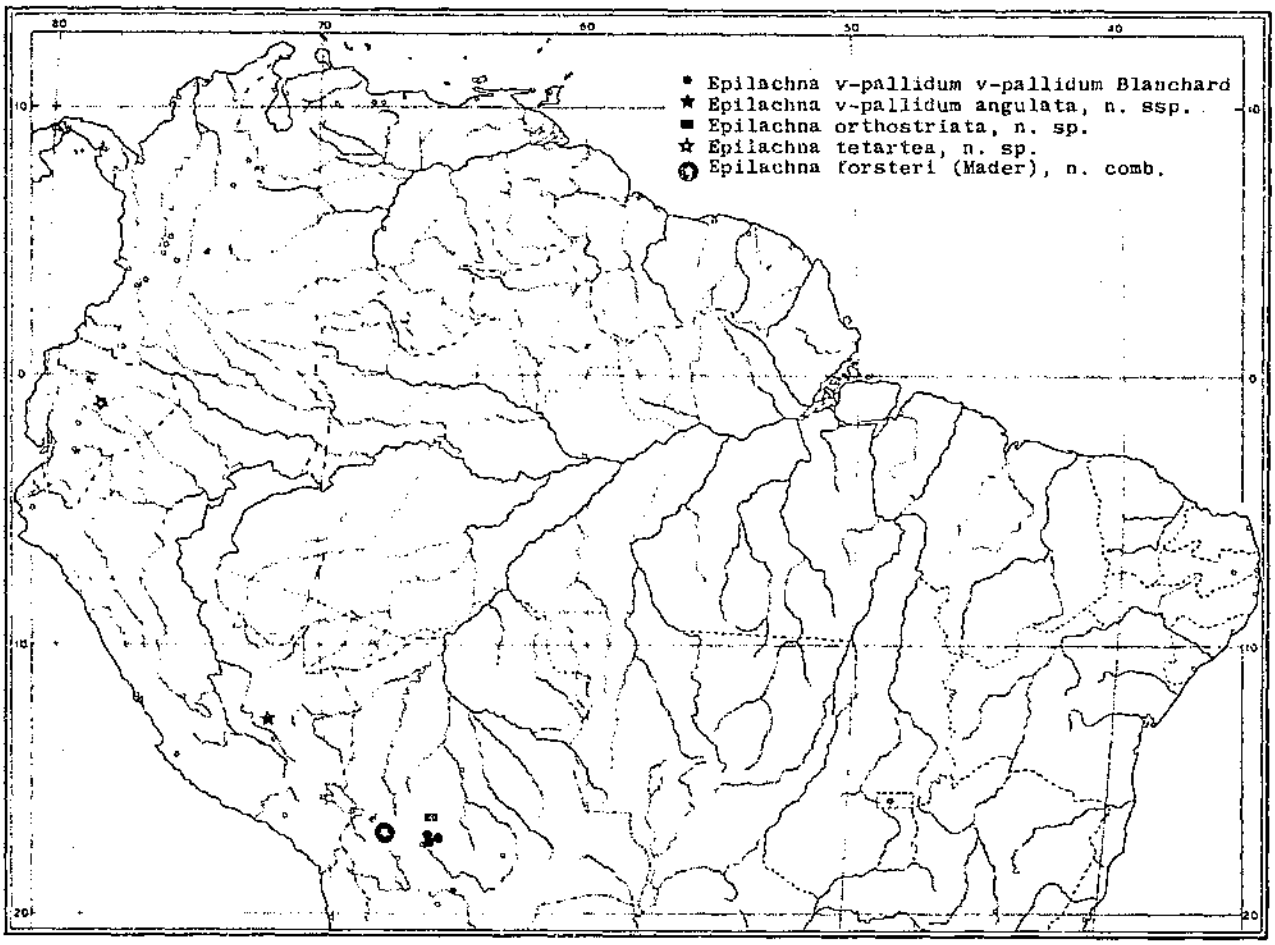
MAP 8


☆ Epilachna deuterea, n. sp.
★ Epilachna tritea, n. sp.
● Epilachna ovaloides, n. sp.
✪ Epilachna transverselineata (Mader), n. comb.

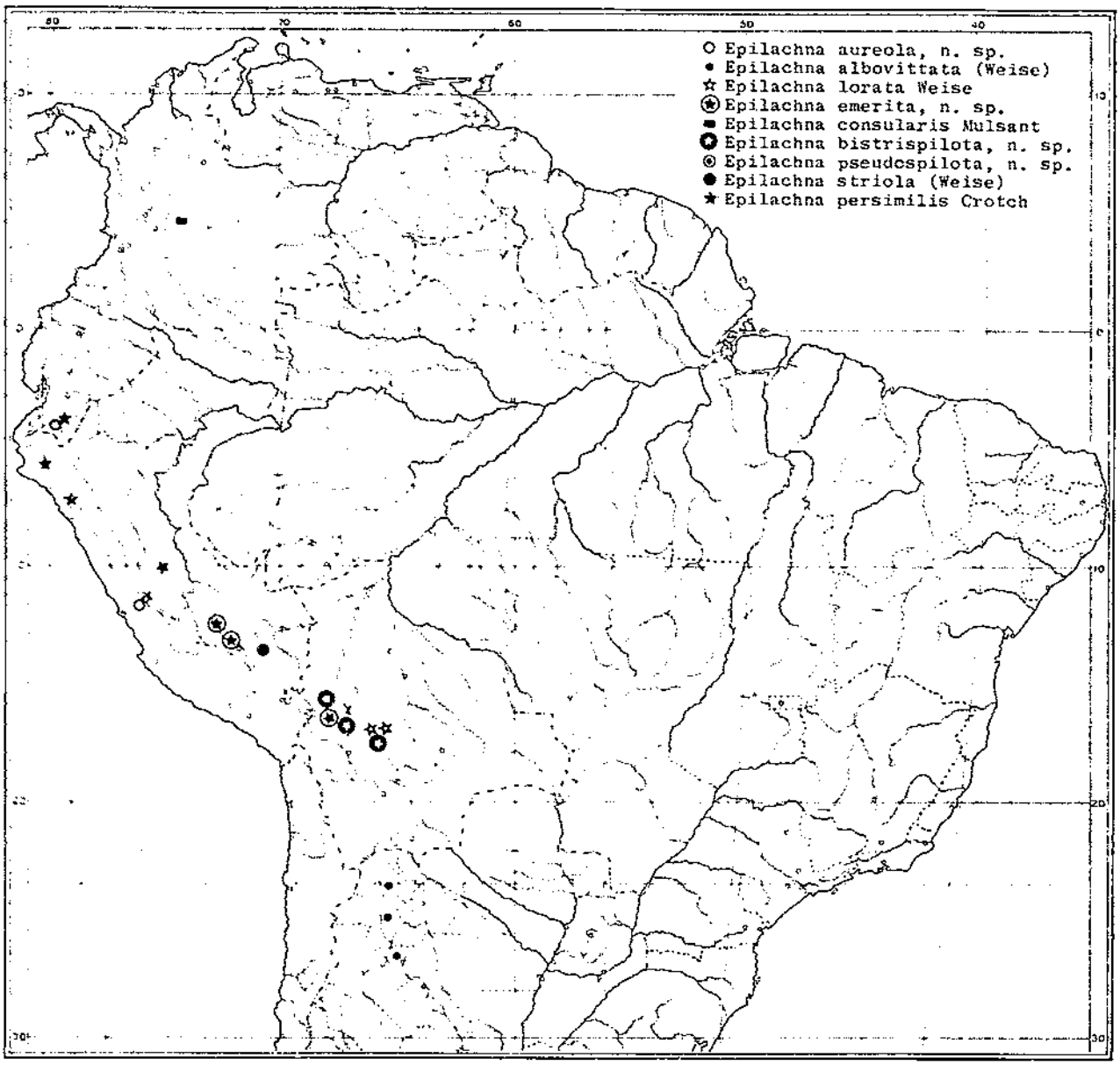
MAP 9


Epilachna parvicollis Casey
Epilachna viridilineata viridilineata Crotch
Epilachna viridilineata rossi, n. ssp.
Epilachna sexmaculata Kirsch
Epilachna hektea, n. sp.
Epilachna obtusiforma, n. sp.

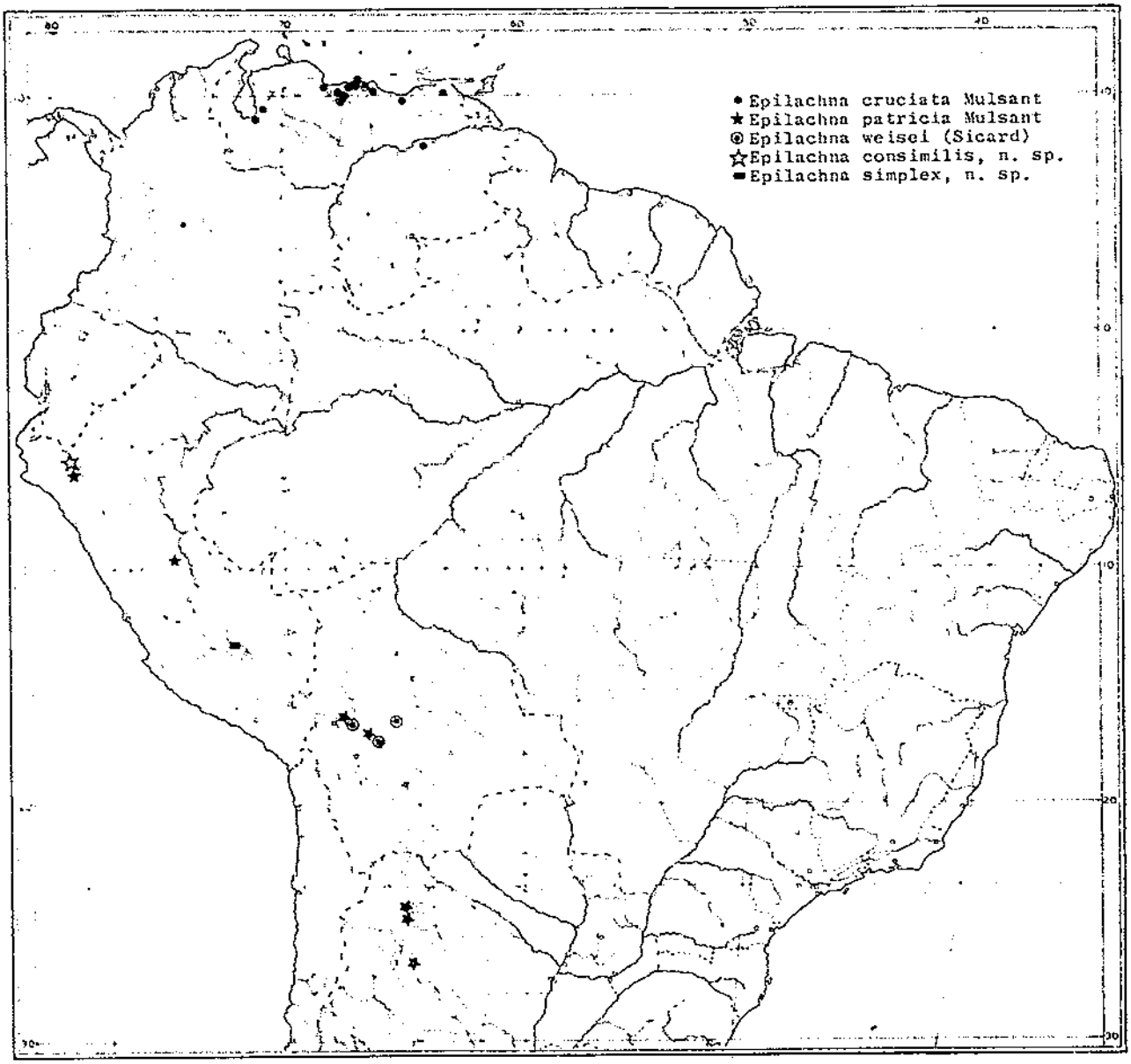
MAP 10


Epilachna v-pallidum v-pallidum Blanchard
Epilachna v-pallidum angulata, n. ssp.
Epilachna orthostriata, n. sp.
Epilachna tetartea, n. sp.
Epilachna forsteri (Mader), n. comb.

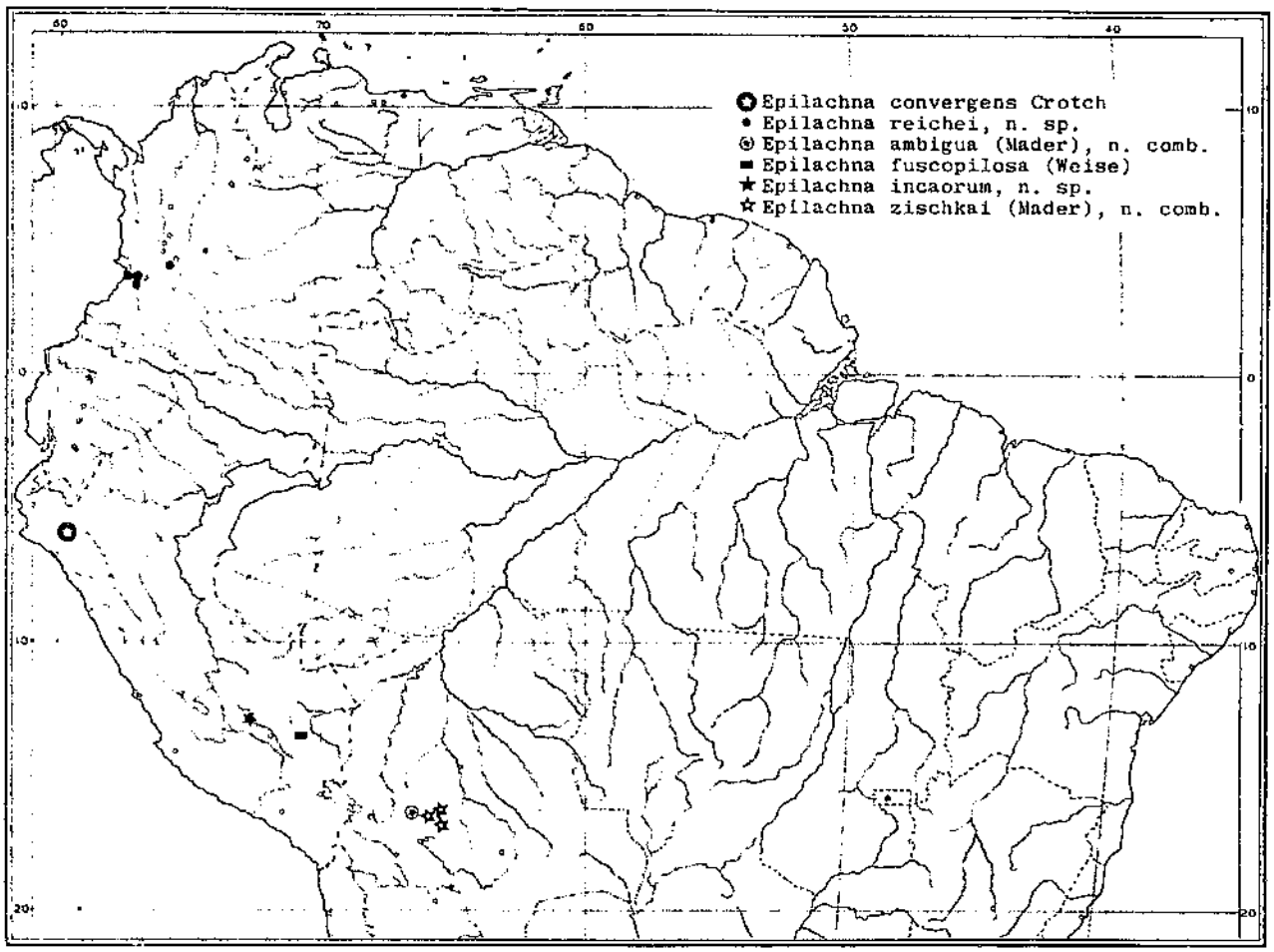
MAP 11


Epilachna aureola, n. sp.
Epilachna albovittata (Weise)
Epilachna lorata Weise
Epilachna emerita, n. sp.
Epilachna consularis Mulsant
Epilachna bistrispilota, n. sp.
Epilachna pseudospilota, n. sp.
Epilachna striola (Weise)
Epilachna persimilis Crotch

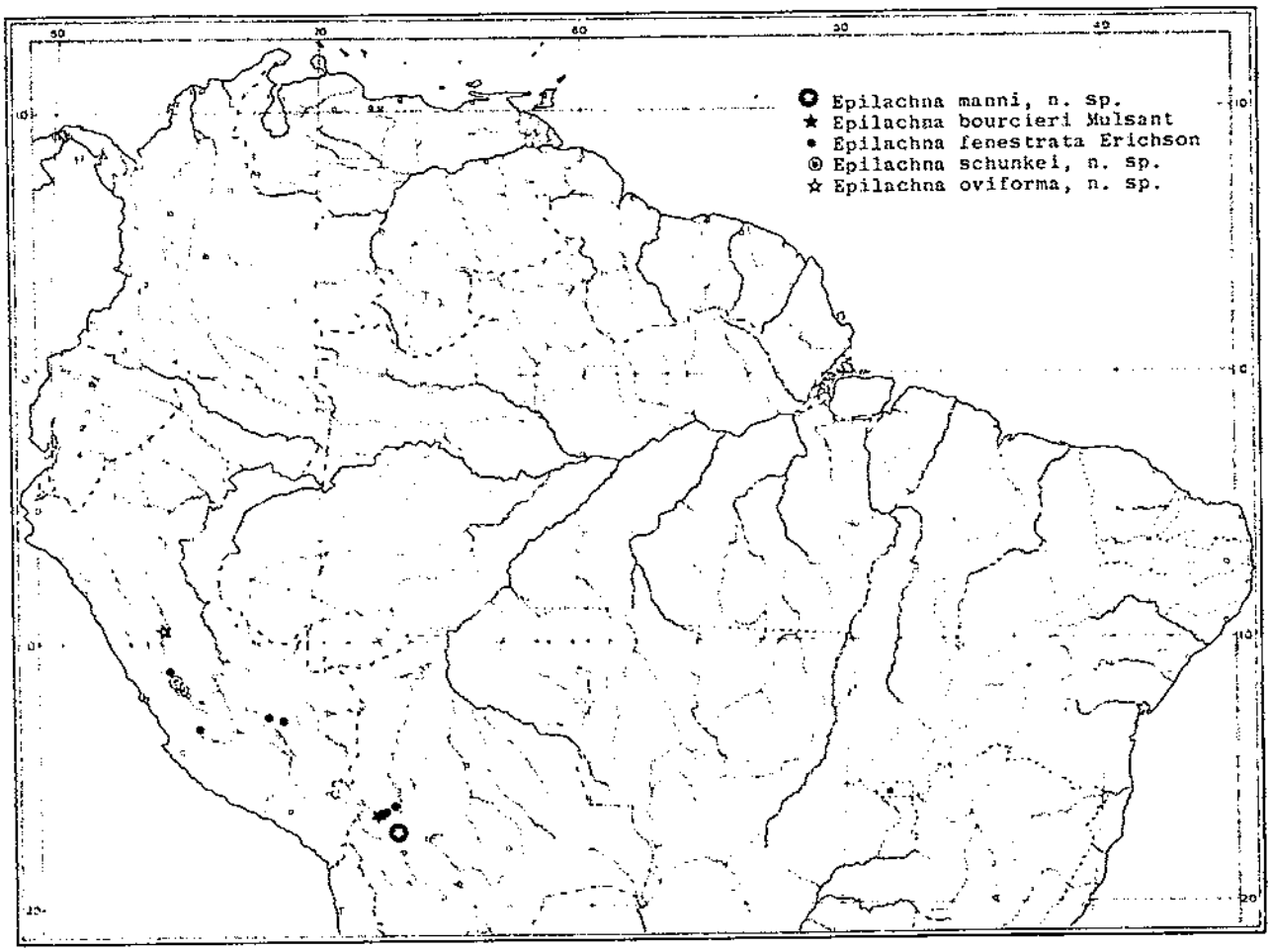
MAP 12


Epilachna cruciata Mulsant
Epilachna patricia Mulsant
Epilachna weisei (Sicard)
Epilachna consimilis, n. sp.
Epilachna simplex, n. sp.

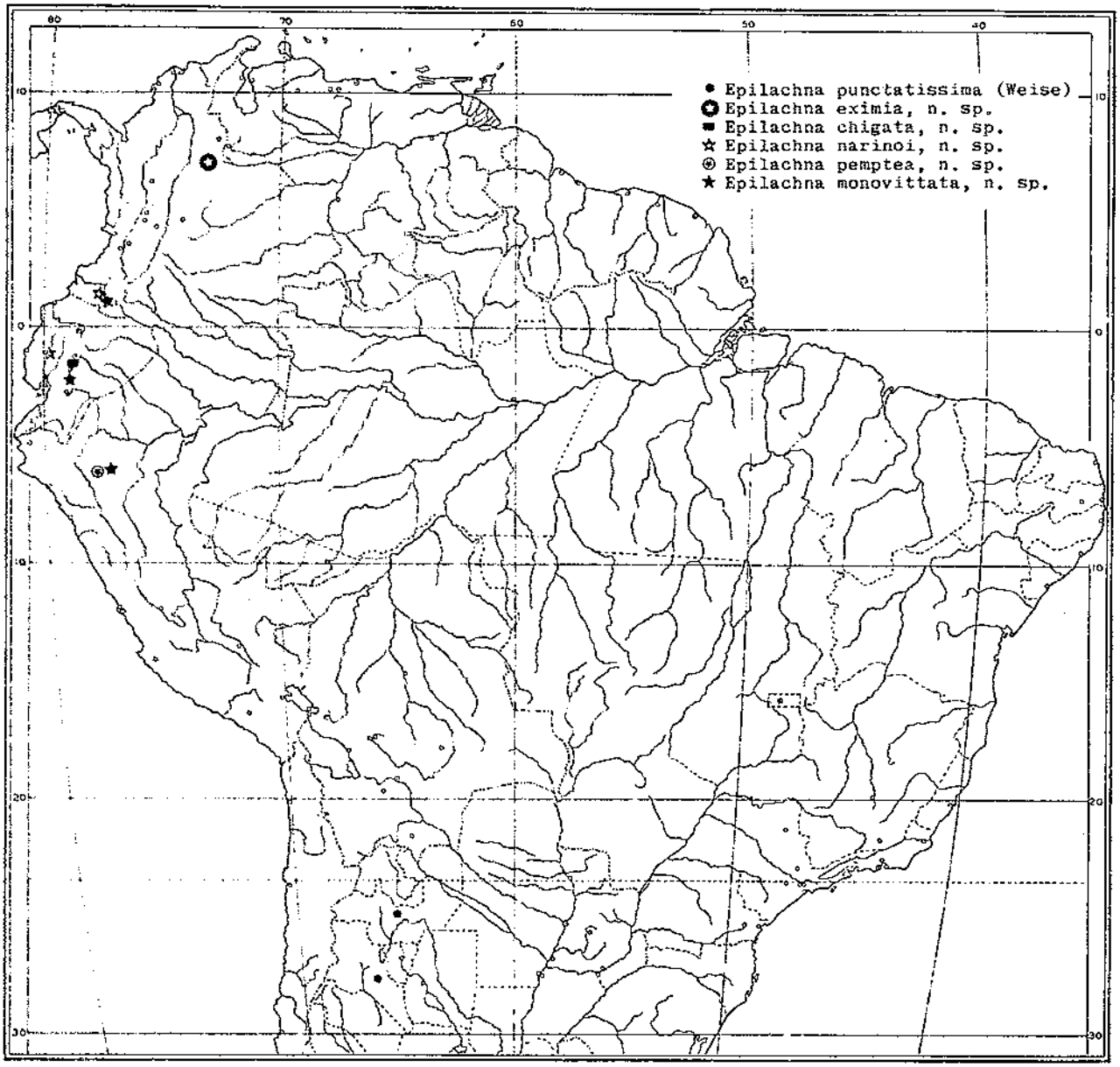
MAP 13


Epilachna convergens Crotch
Epilachna reichei, n. sp.
Epilachna ambigua (Mader), n. comb.
Epilachna fuscopilosa (Weise)
Epilachna incaorum, n. sp.
Epilachna zischkai (Mader), n. comb.

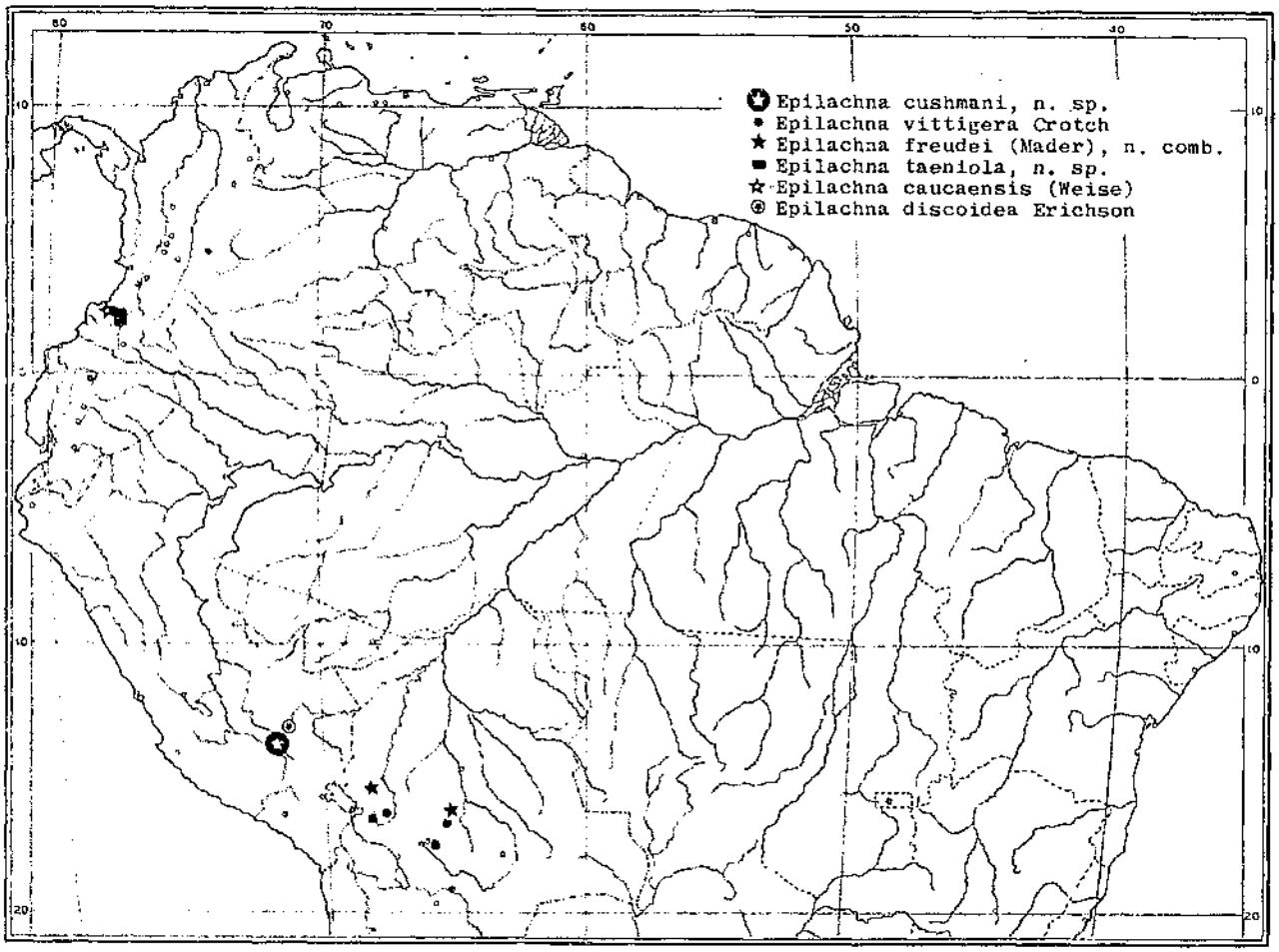
MAP 14


Epilachna manni, n. sp.
Epilachna bourcieri Mulsant
Epilachna fenestrata Erichson
Epilachna schunkei, n. sp.
Epilachna oviforma, n. sp.

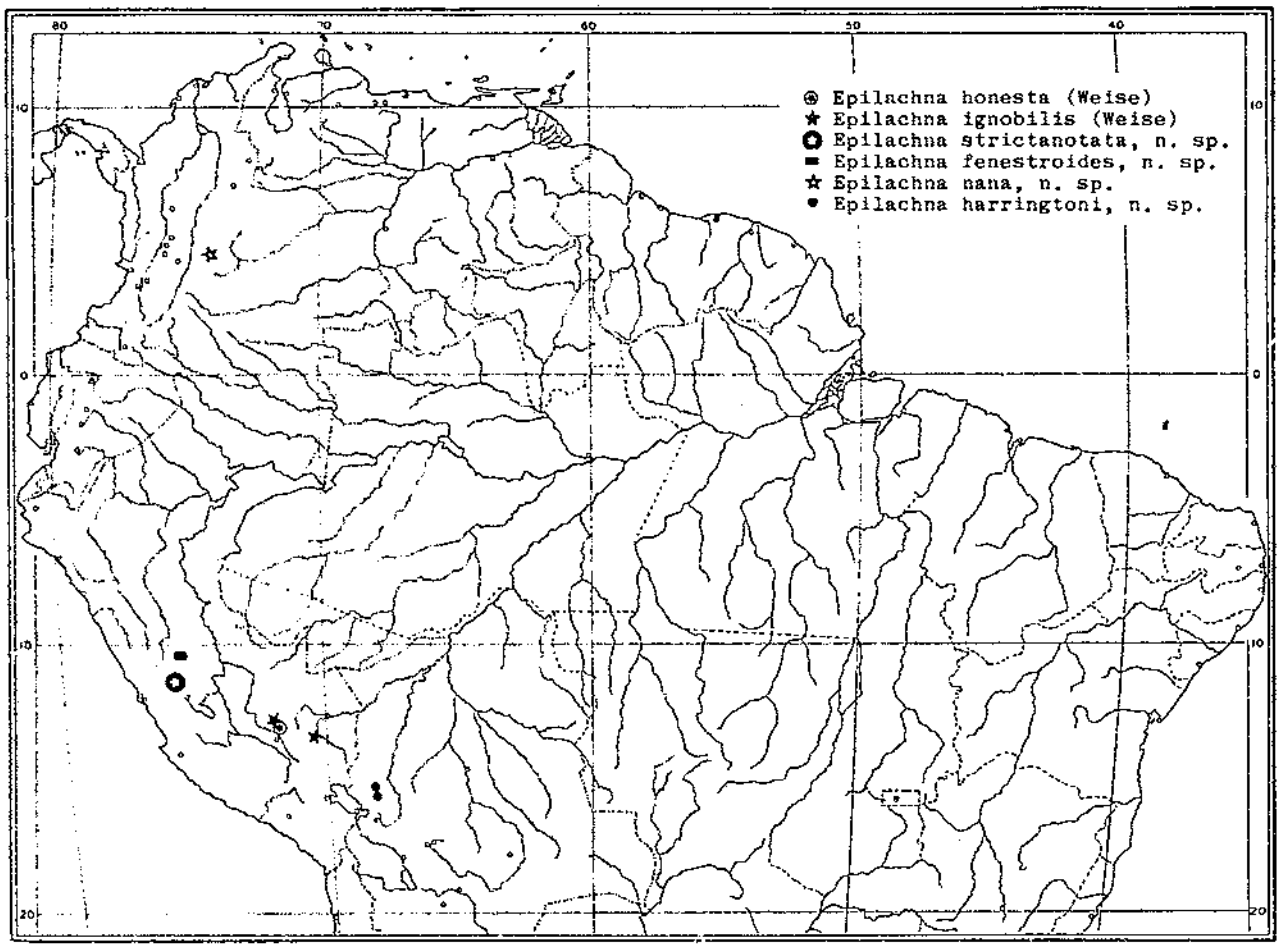
MAP 15


Epilachna punctatissima (Weise)
Epilachna eximia, n. sp.
Epilachna chigata, n. sp.
Epilachna narinoi, n. sp.
Epilachna pemptea, n. sp.
Epilachna monovittata, n. sp.

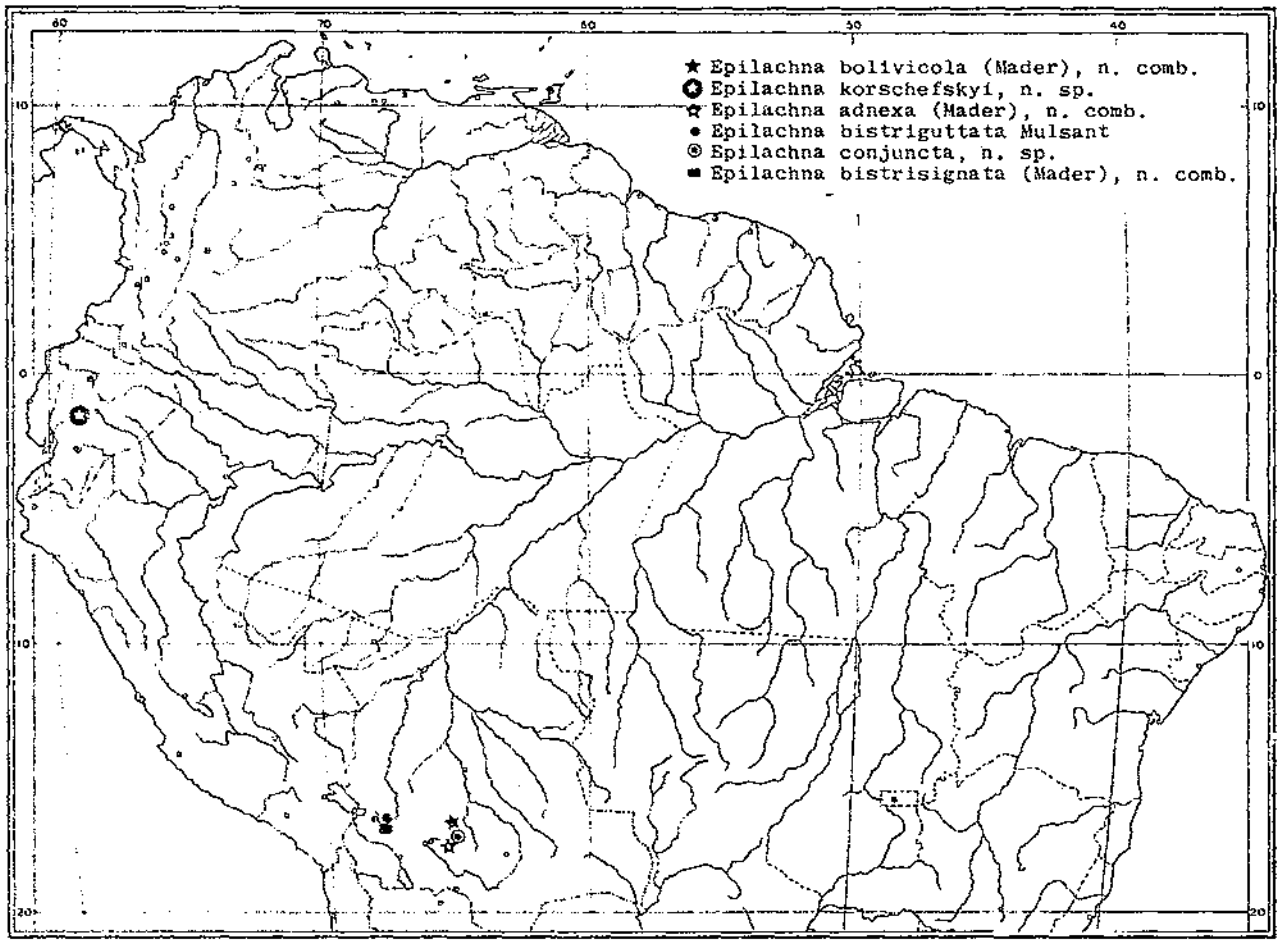
MAP 16


Epilachna cushmani, n. sp.
Epilachna vittigera Crotch
Epilachna freudei (Mader), n. comb.
Epilachna taeniola, n. sp.
Epilachna caucaensis (Weise)
Epilachna discoidea Erichson

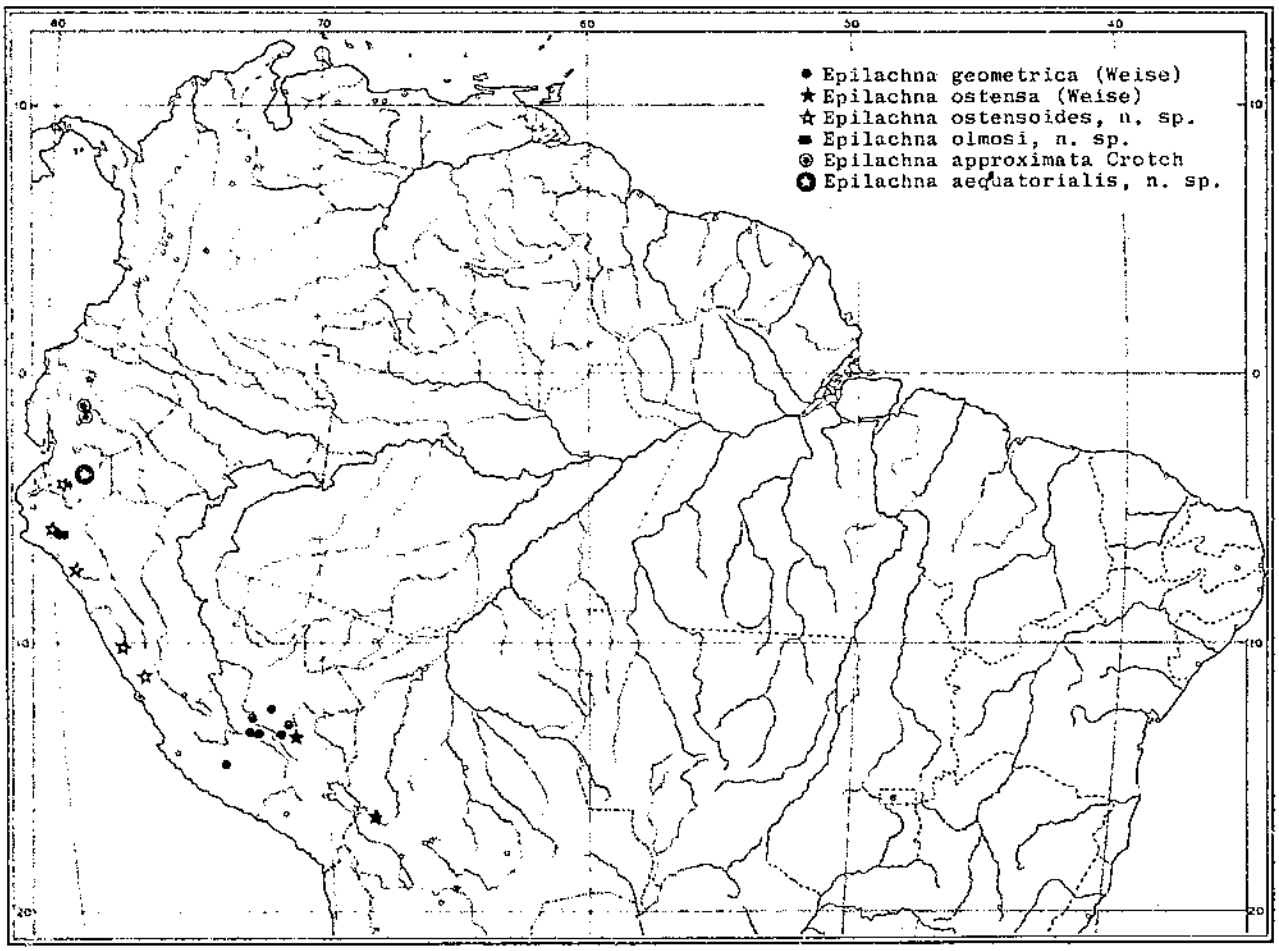
MAP 17


Epilachna honesta (Weise)
Epilachna ignobilis (Weise)
Epilachna strictanotata, n. sp.
Epilachna fenestroides, n. sp.
Epilachna nana, n. sp.
Epilachna harringtoni, n. sp.
80
70
60
50
40
10
0
10
20

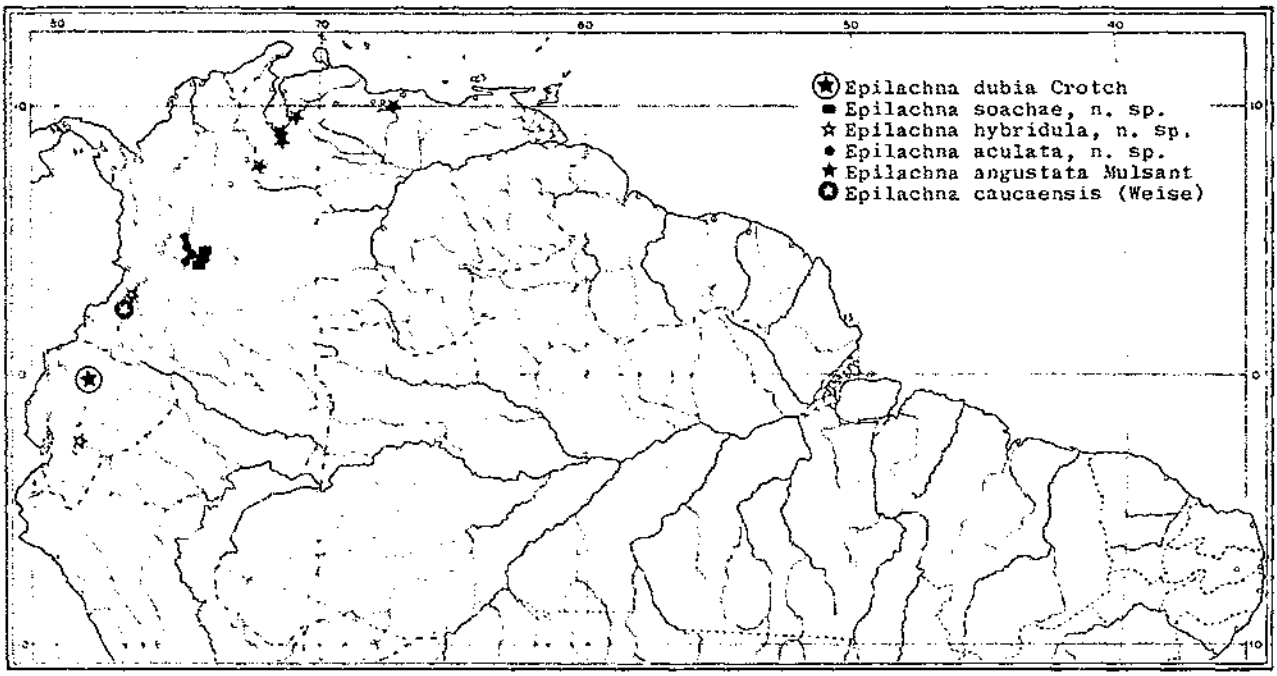
MAP 18


★ Epilachna bolivicola (Mader), n. comb.
Epilachna korschefskyi, n. sp.
Epilachna adnexa (Mader), n. comb.
• Epilachna bistriguttata Mulsant
Epilachna conjuncta, n. sp.
■ Epilachna bistrisignata (Mader), n. comb.

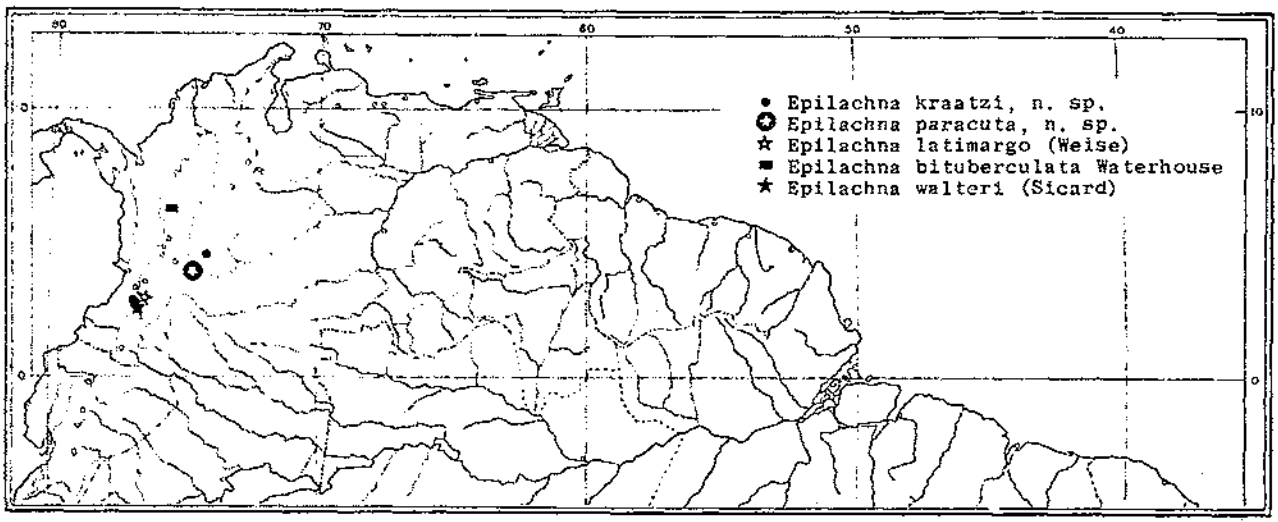
MAP 19


Epilachna geometrica (Weise)
Epilachna ostensa (Weise)
Epilachna ostensoides, n. sp.
Epilachna olmosi, n. sp.
Epilachna approximata Crotch
Epilachna aequatorialis, n. sp.

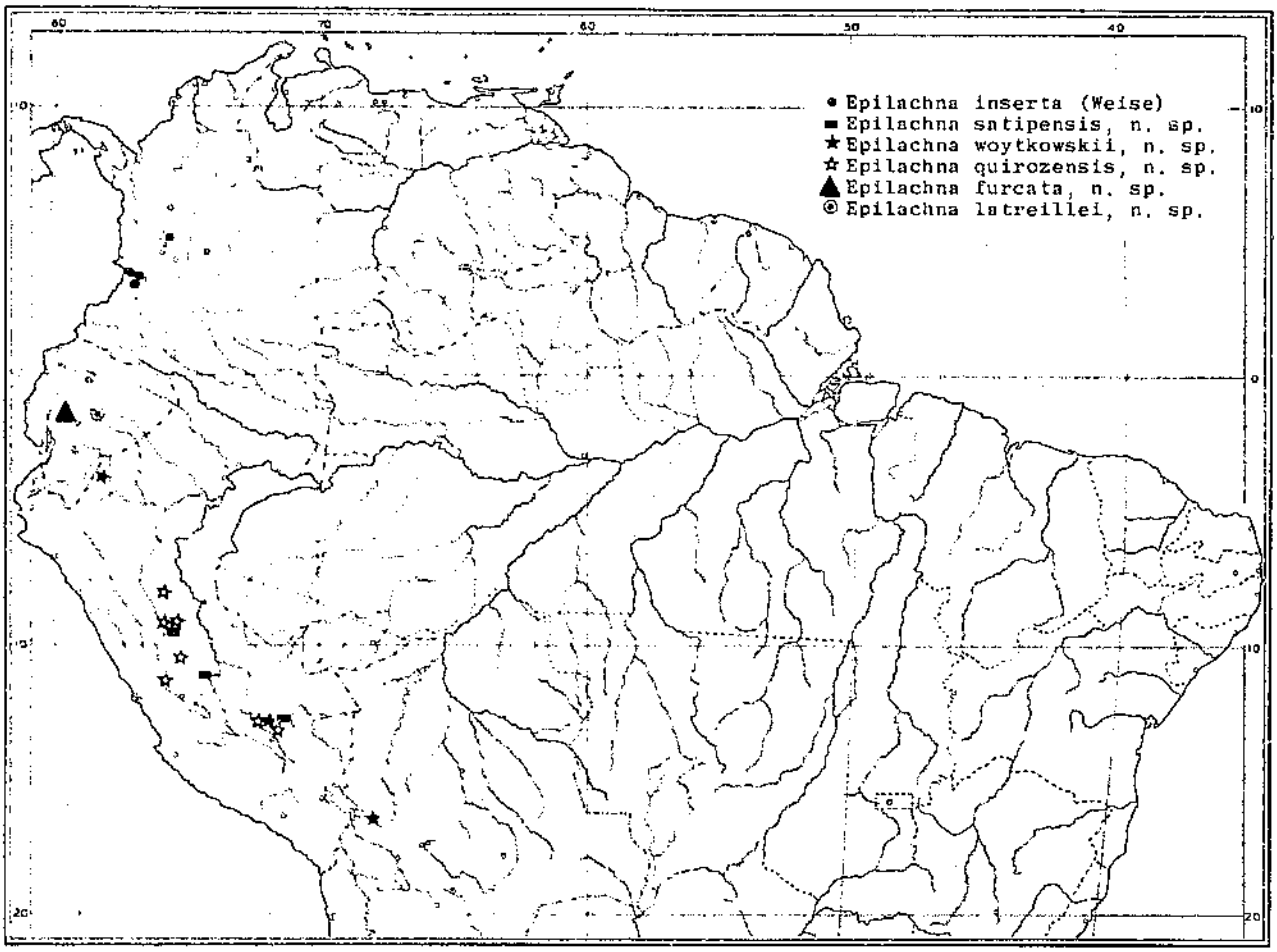
MAP 20


Epilachna dubia Crotch
Epilachna soachae, n. sp.
Epilachna hybridula, n. sp.
Epilachna aculata, n. sp.
Epilachna angustata Mulsant
Epilachna caucaensis (Weise)

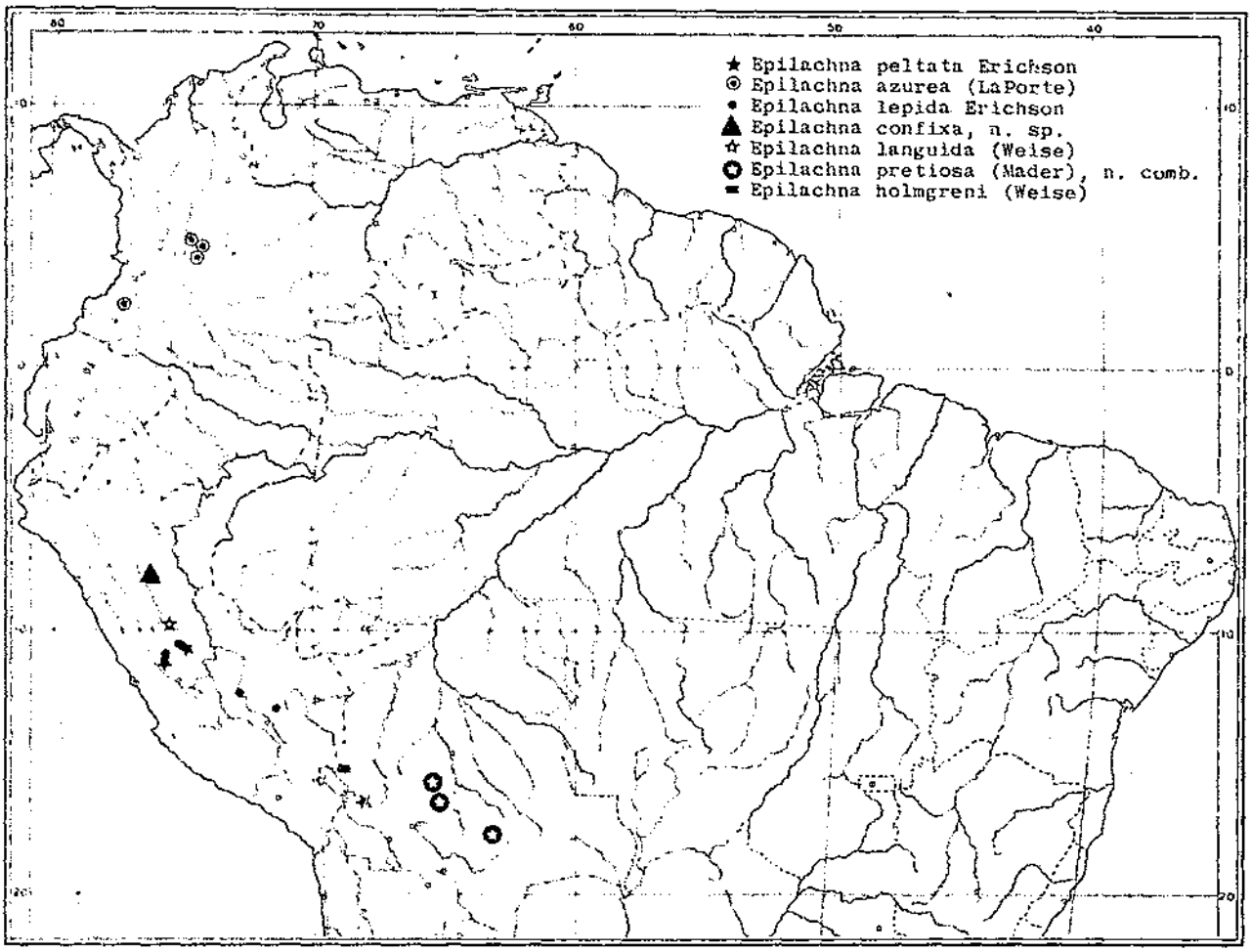
MAP 21


Epilachna kraatzi, n. sp.
Epilachna paracuta, n. sp.
Epilachna latimargo (Weise)
Epilachna bituberculata Waterhouse
Epilachna walteri (Sicard)

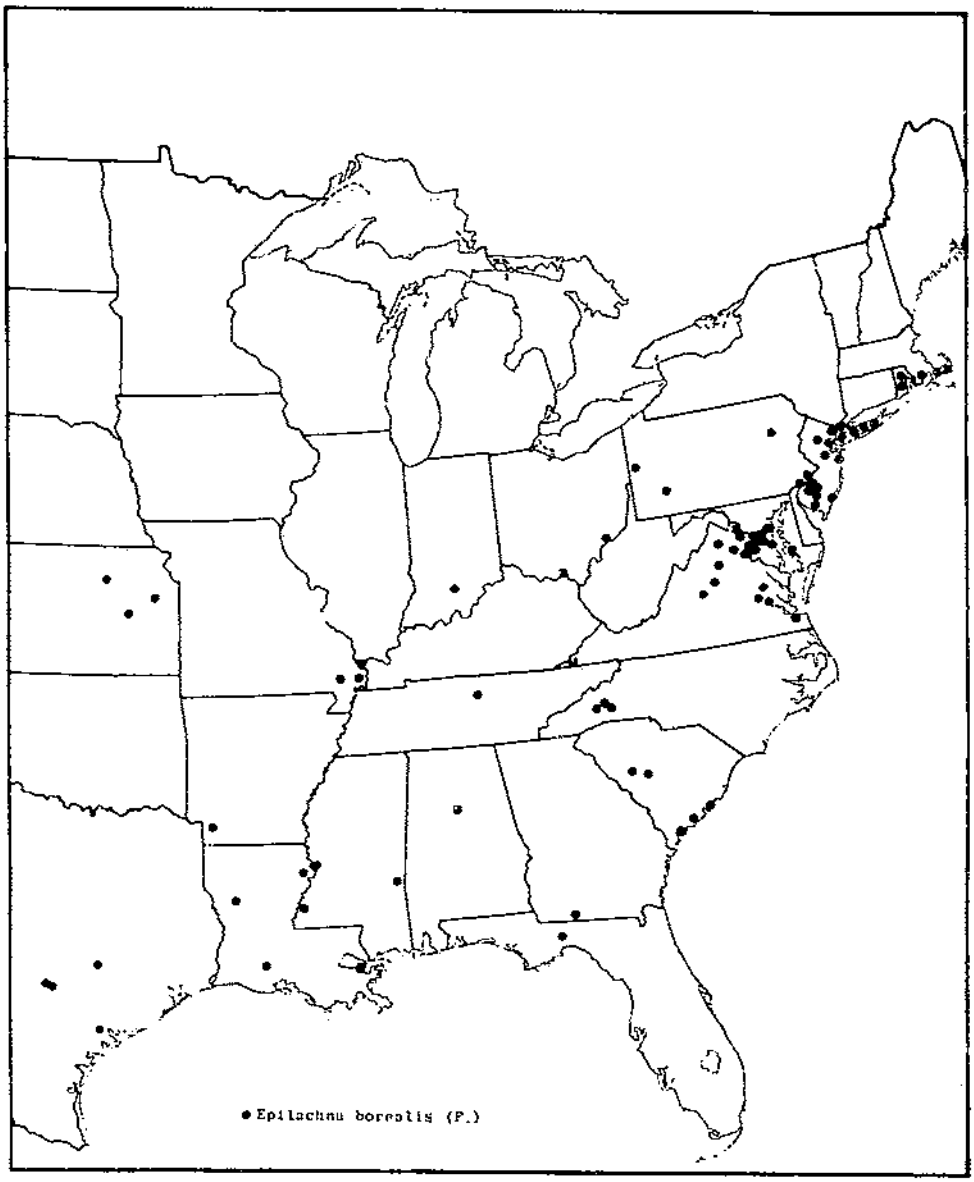
MAP 22


Epilachna inserta (Weise)
Epilachna santipensis, n. sp.
Epilachna woytkowskii, n. sp.
Epilachna quirozensis, n. sp.
Epilachna furcata, n. sp.
Epilachna latreillei, n. sp.

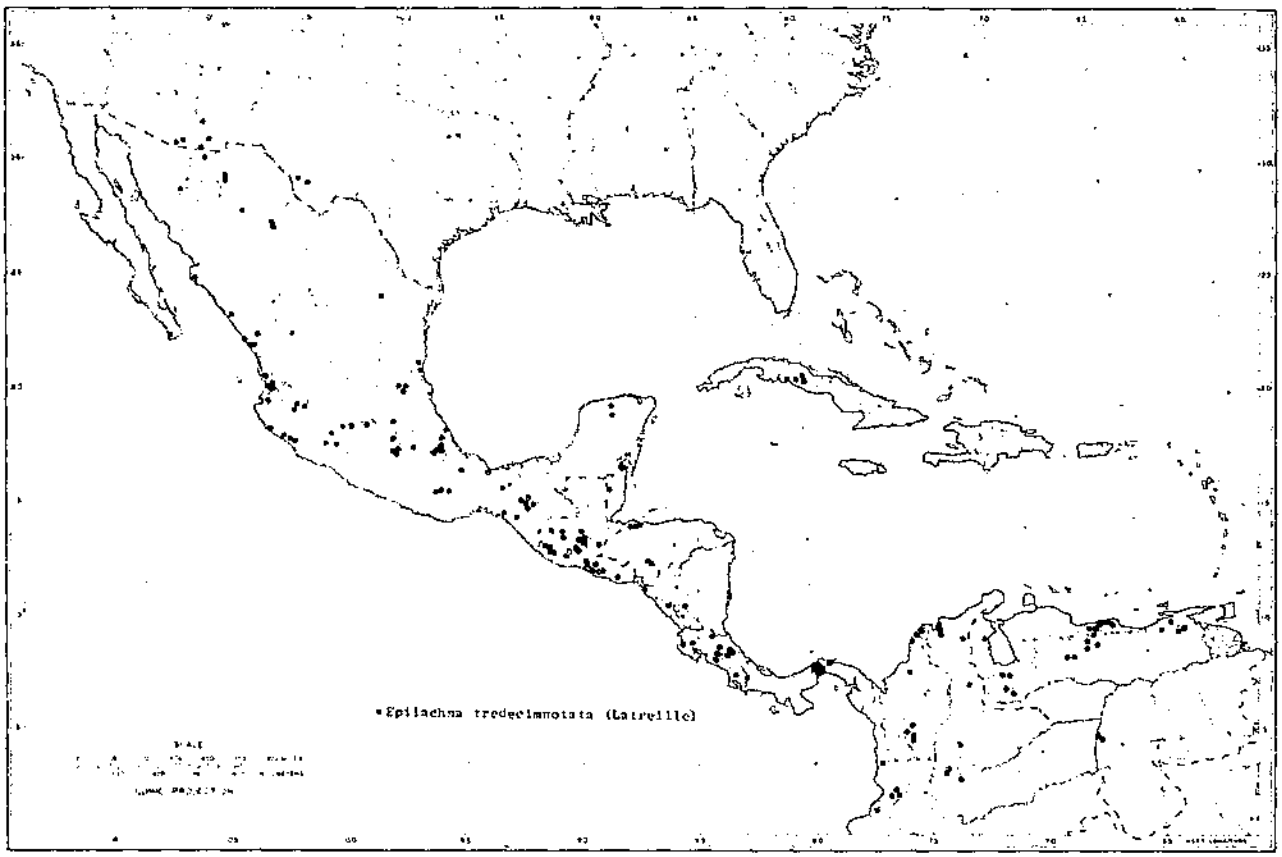
MAP 23


★ Epilachna peltata Erichson
◉ Epilachna azurea (LaPorte)
• Epilachna lepida Erichson
▲ Epilachna confixa, n. sp.
☆ Epilachna languida (Weise)
⭘ Epilachna pretiosa (Mader), n. comb.
▬ Epilachna holmgreni (Weise)

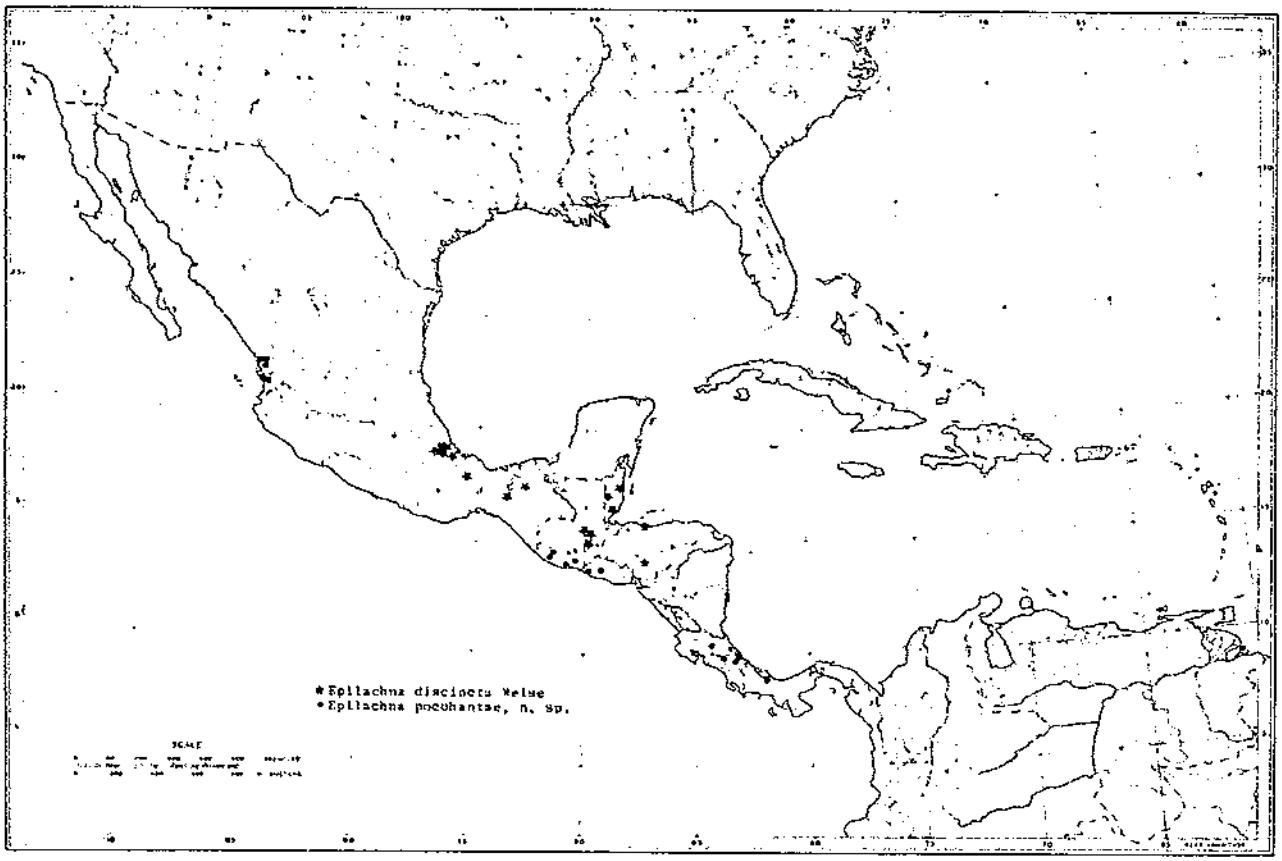
MAP 24



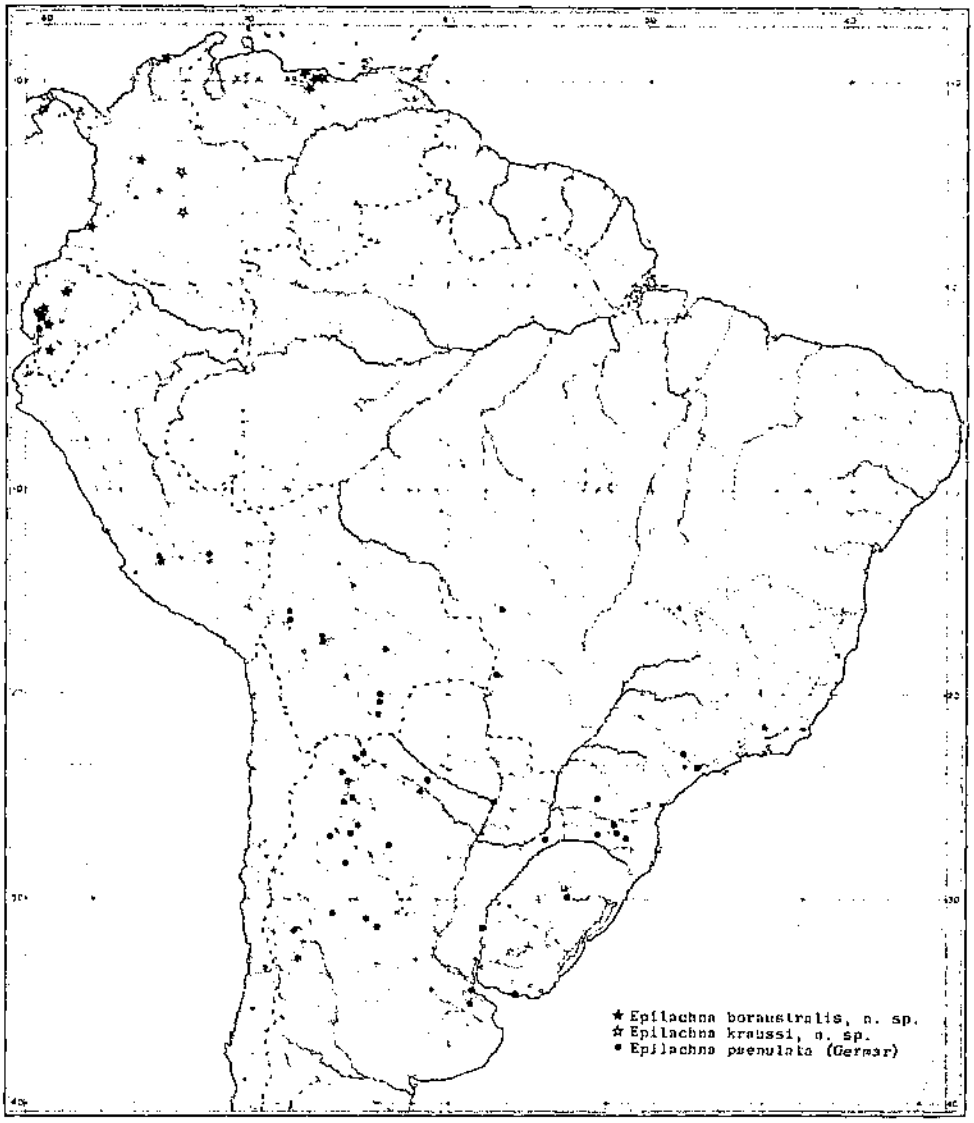
MAP 25



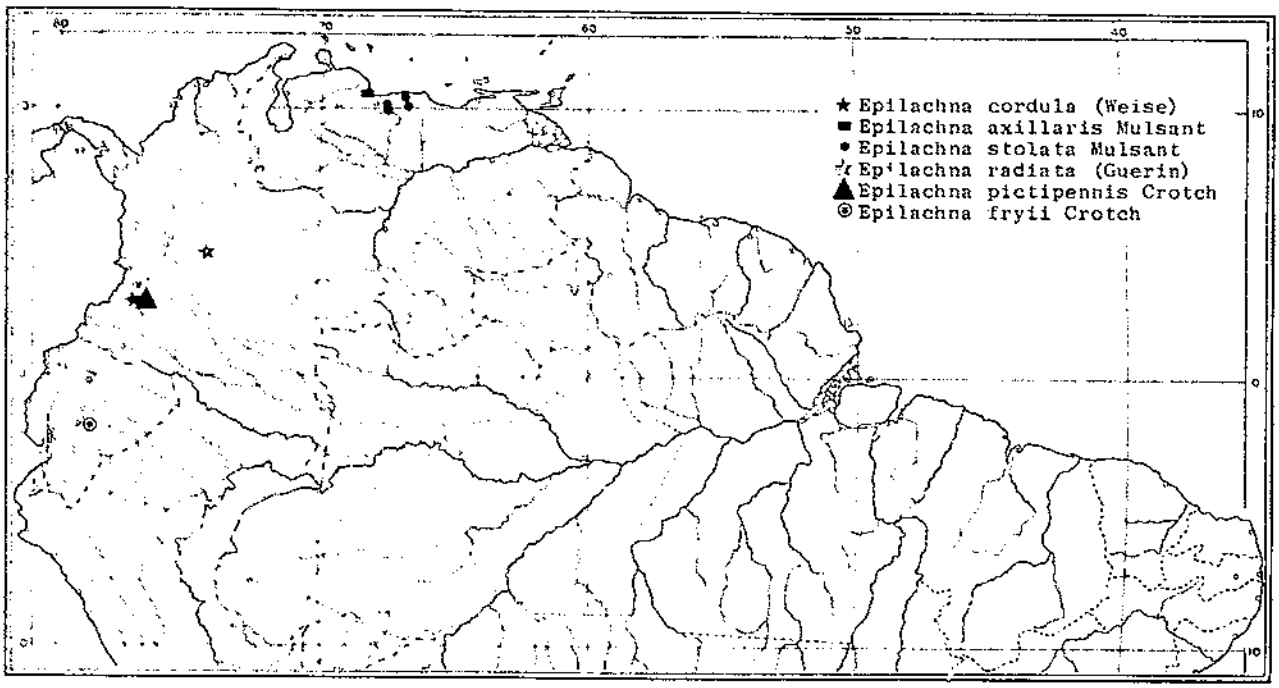
MAP 26


*Epilachna discincta Weise
•Epilachna pocahontae, n. sp.
SCALE

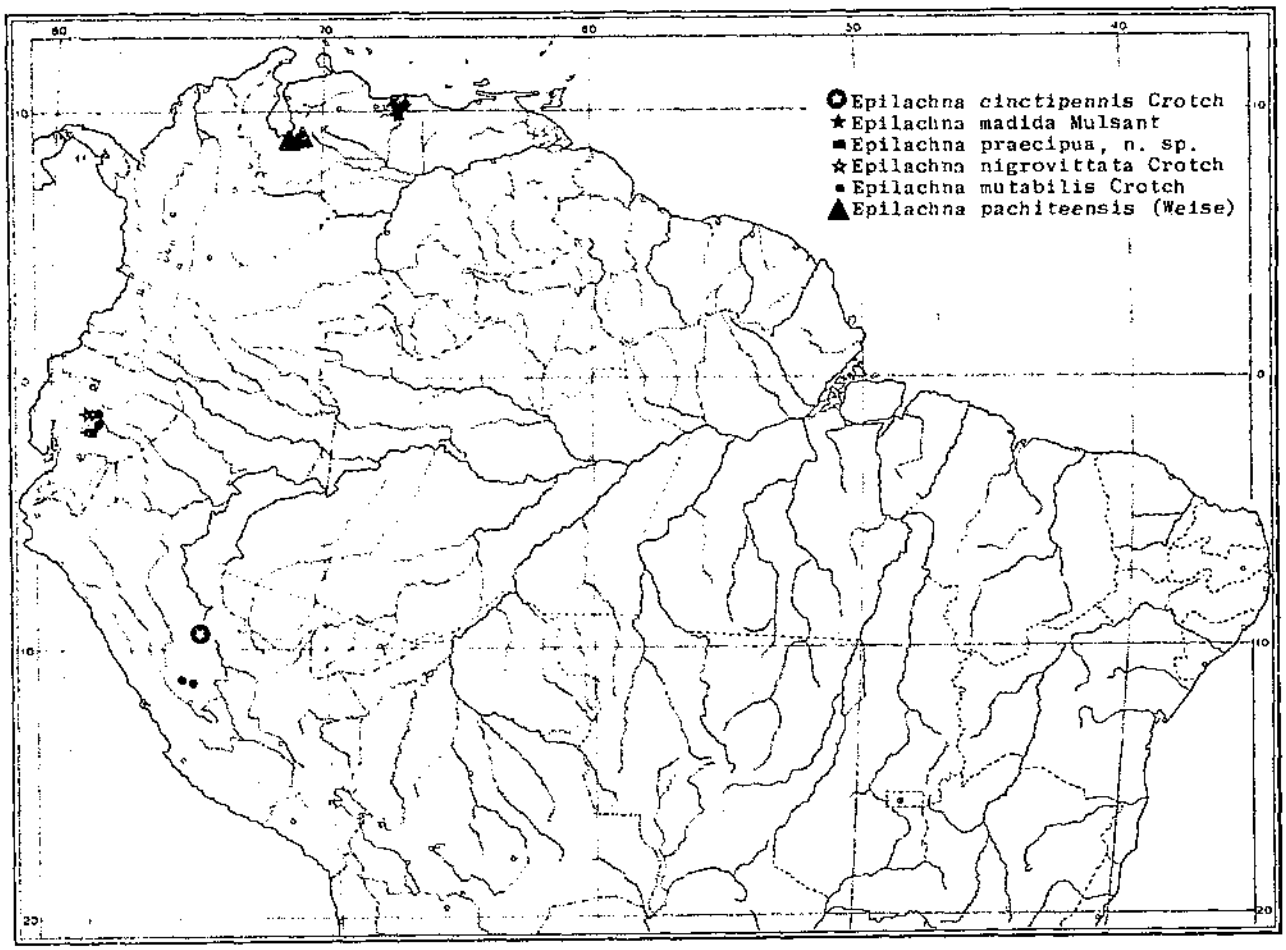
MAP 27


★ Epilachna boraustralis, n. sp.
☆ Epilachna kraussi, n. sp.
• Epilachna paenulata (Germar)

MAP 28

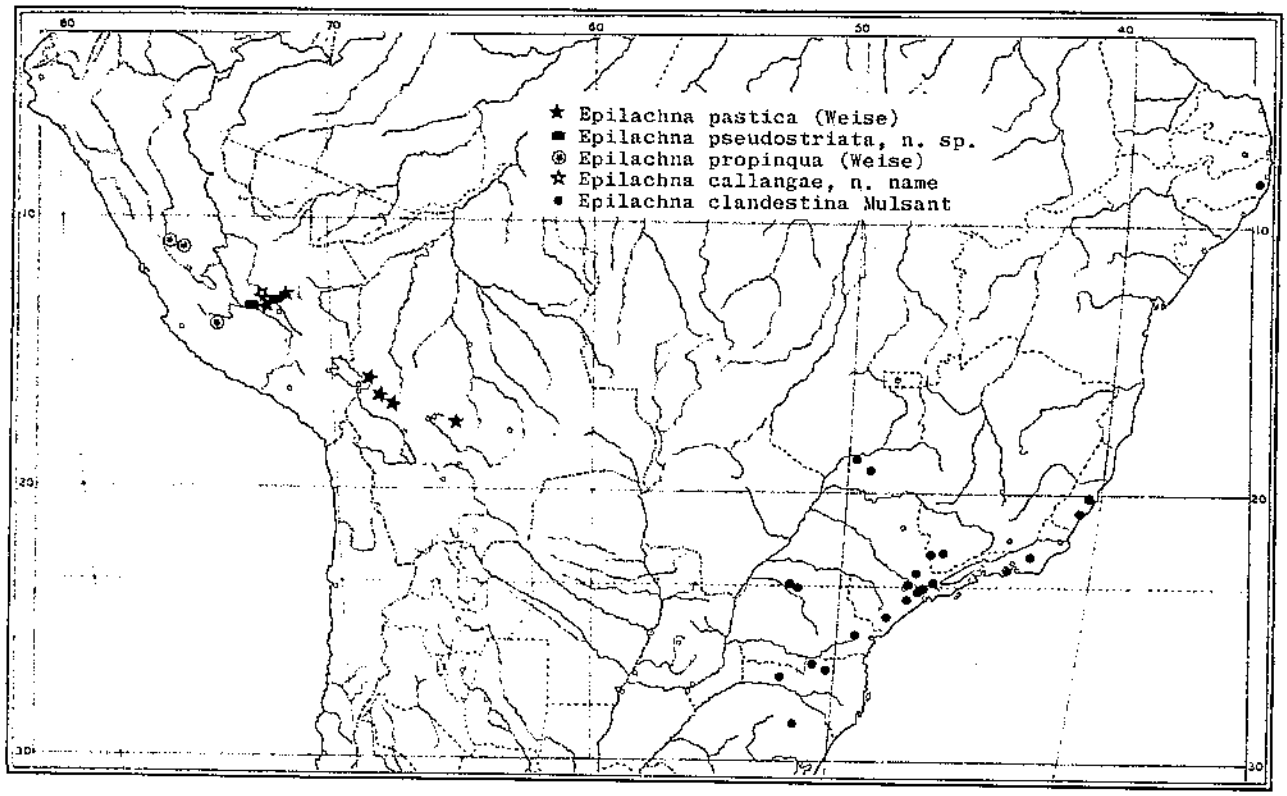

★ Epilachna cordula (Weise)
■ Epilachna axillaris Mulsant
● Epilachna stolata Mulsant
Epilachna radiata (Guerin)
▲ Epilachna pictipennis Crotch
◉ Epilachna fryii Crotch

MAP 29

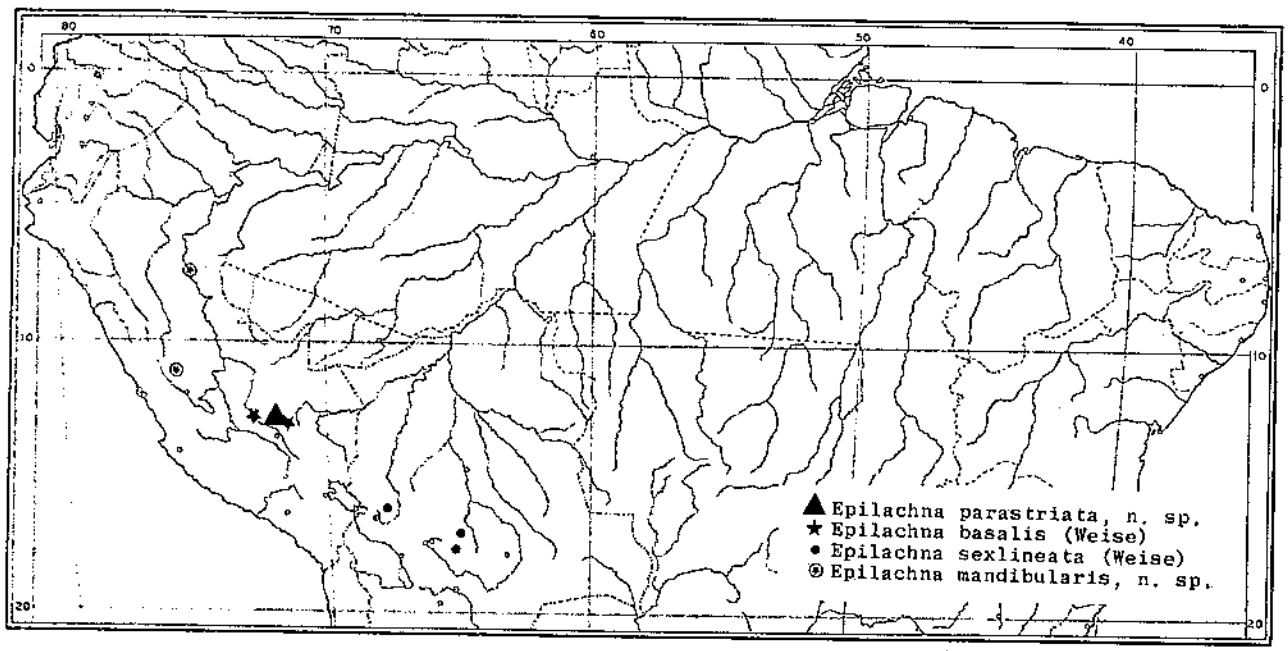

Epilachna cinctipennis Crotch
Epilachna madida Mulsant
Epilachna praecipua, n. sp.
Epilachna nigrovittata Crotch
Epilachna mutabilis Crotch
Epilachna pachiteensis (Weise)

MAP 30

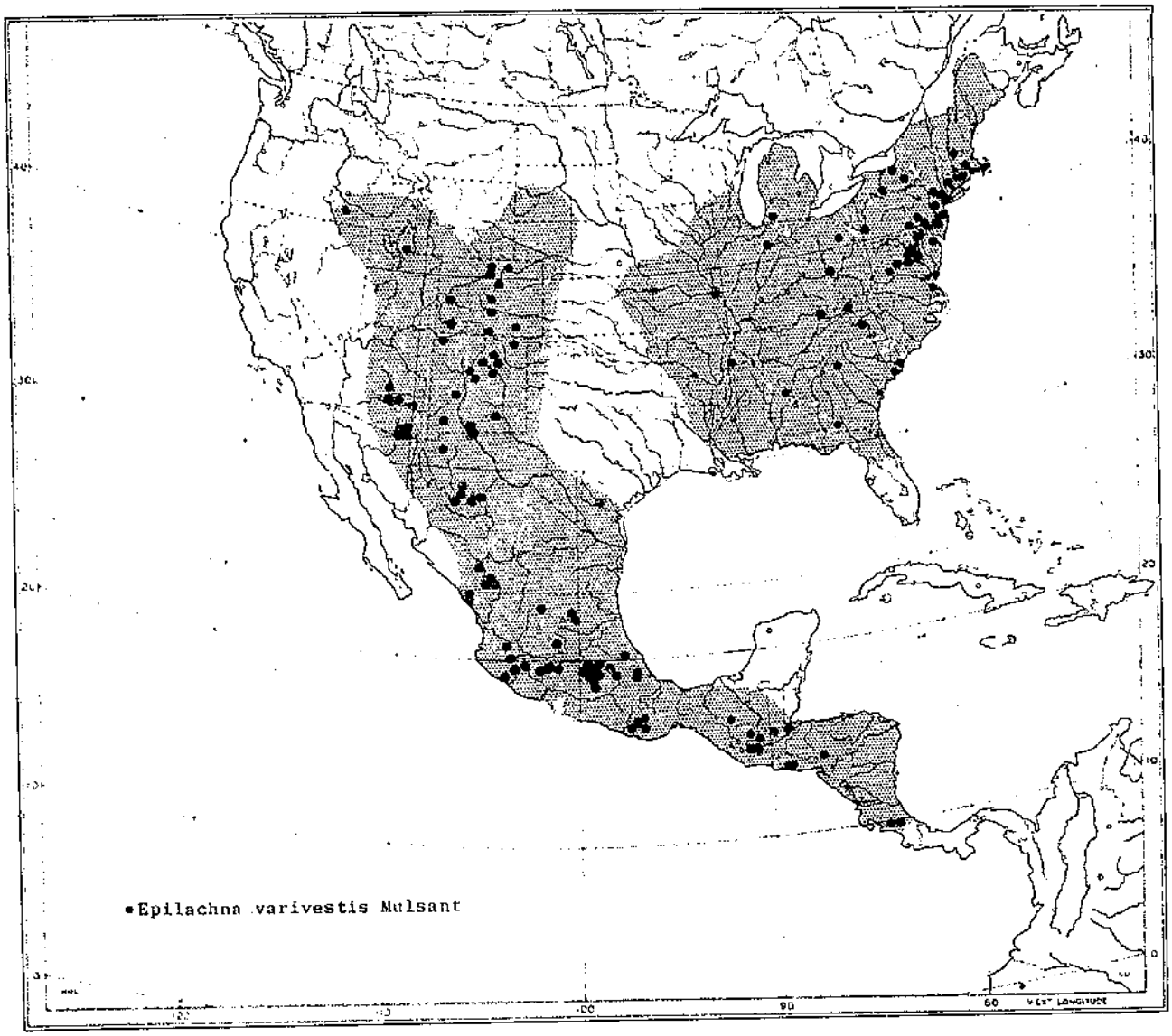
LB 1149 (1975) USDA TECHNICAL BULLETINS UPRATH
A REVISION OF THE ERIACHNINE OF THE WESTERN HEMISPHERE (COLEOPTERA
GORDON, R.D. 5 OF 5


★ Epilachna pastica (Weise)
■ Epilachna pseudostriata, n. sp.
⊛ Epilachna propinqua (Weise)
☆ Epilachna callangae, n. name
• Epilachna clandestina Mulsant

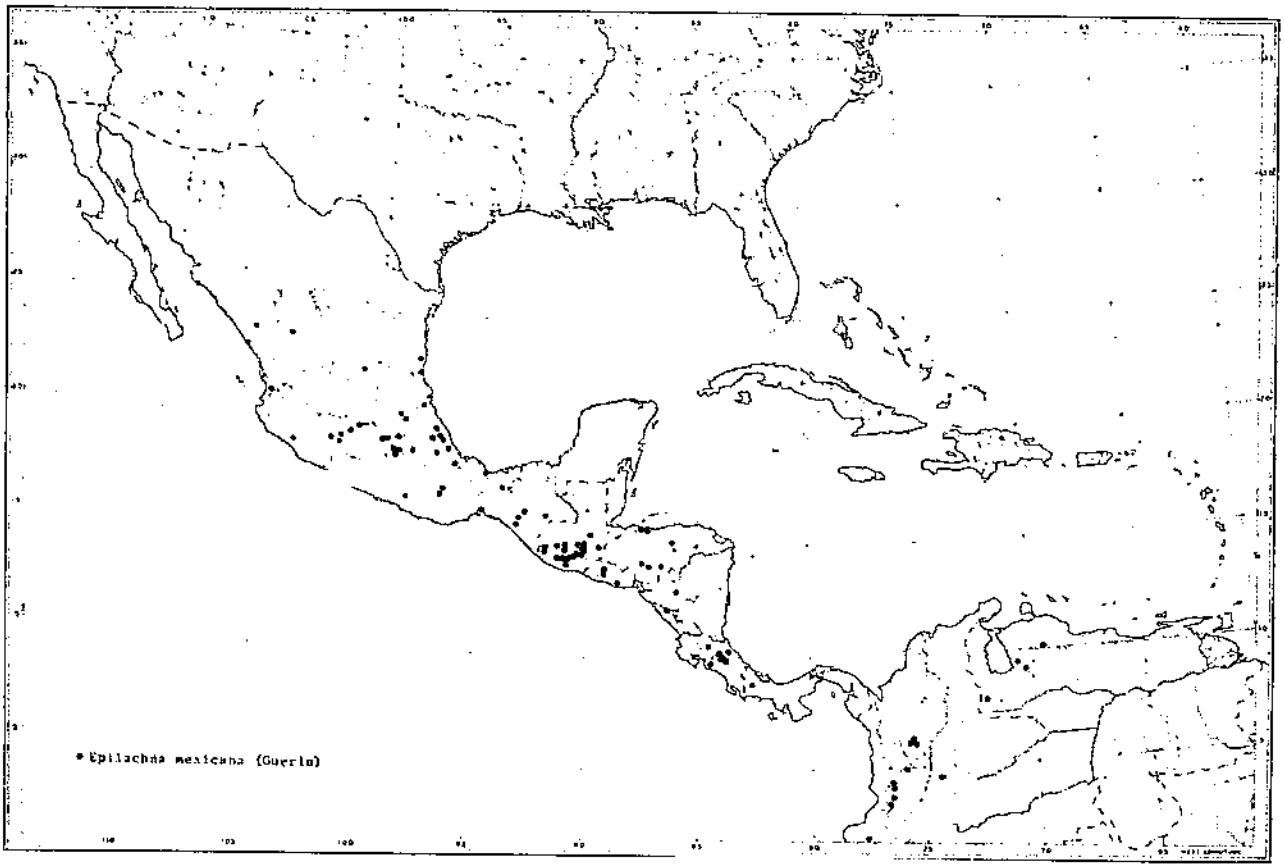
MAP 31


▲ Epilachna parastriata, n. sp.
★ Epilachna basalis (Weise)
• Epilachna sexlineata (Weise)
⊛ Epilachna mandibularis, n. sp.

MAP 32



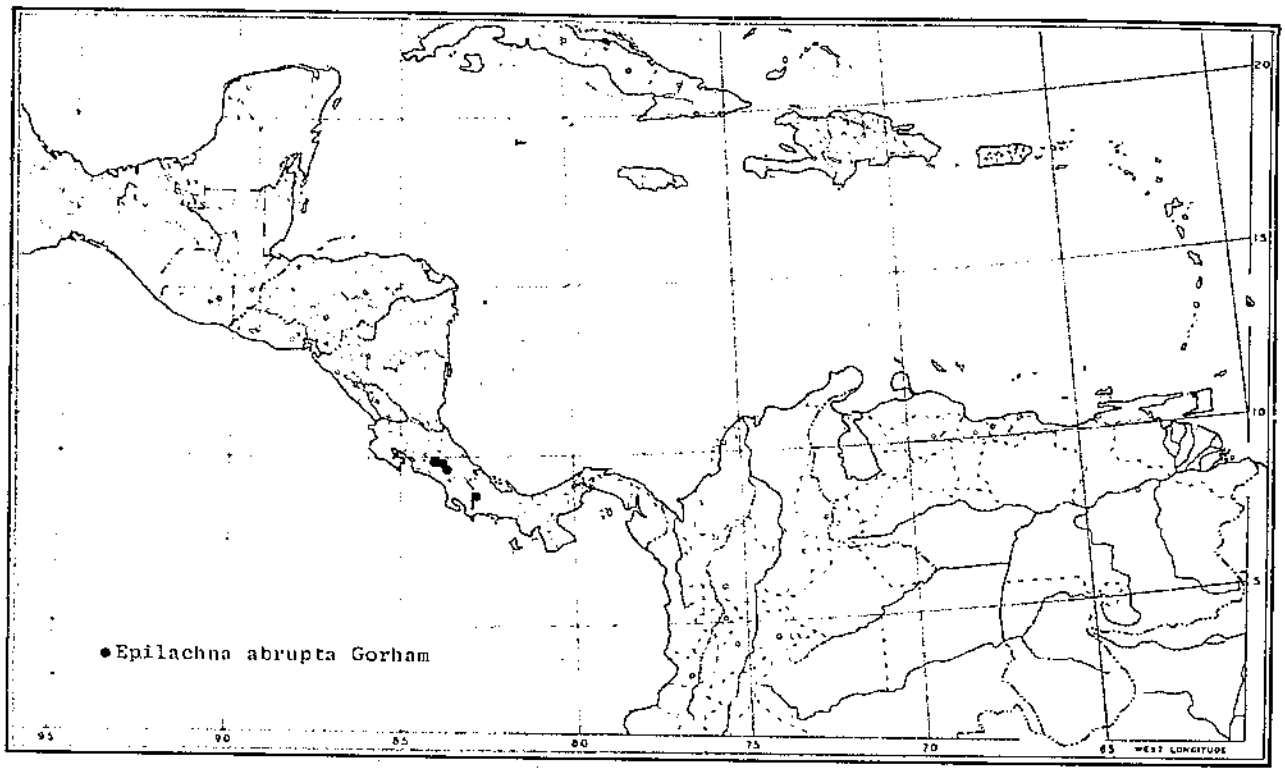
MAP 33



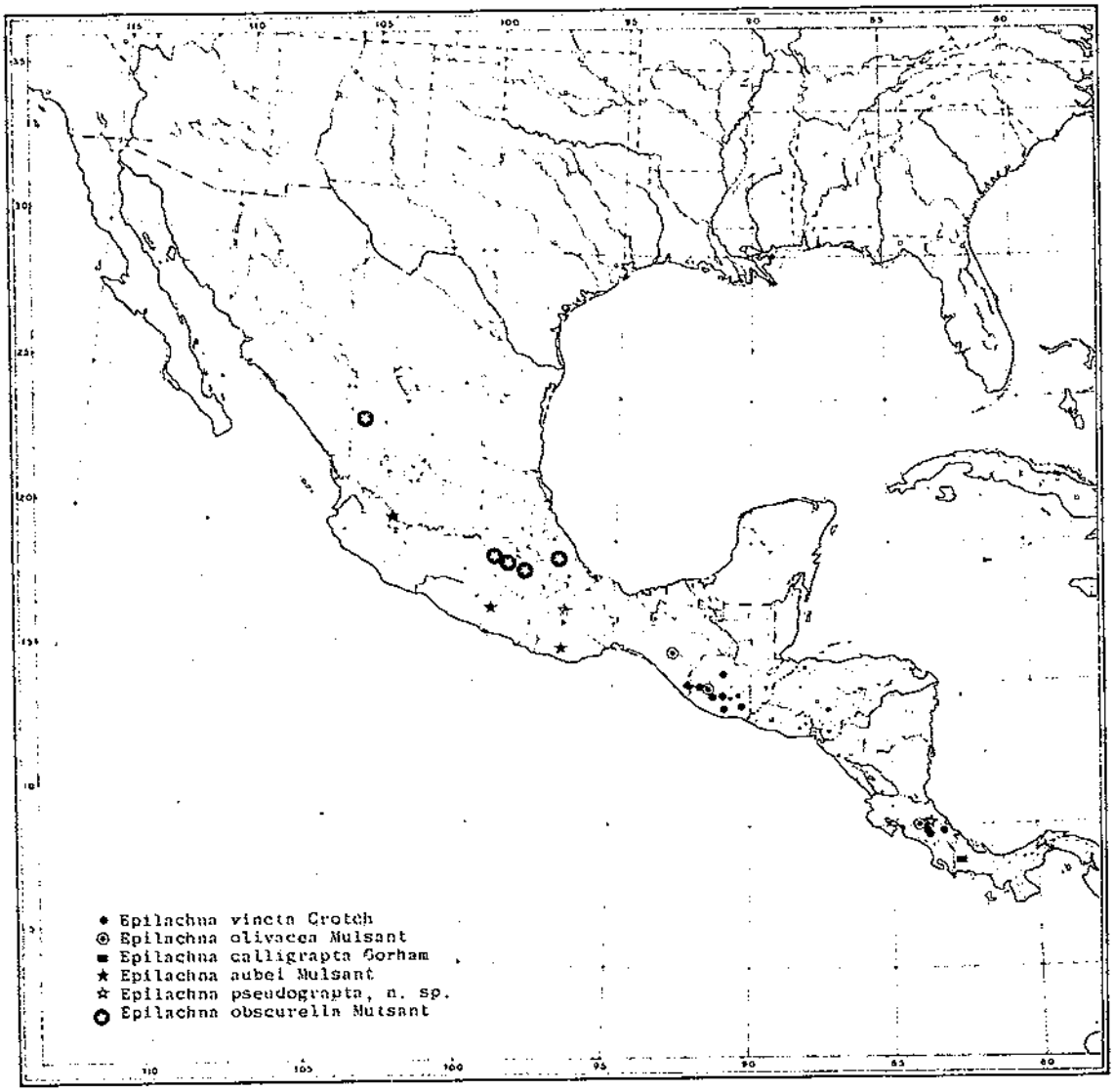
MAP 34

★ Epilachna plagiata Gorham
Epilachna erichsoni Crotch
Epilachna tumida Gorham
☆ Epilachna vulnerata Gorham
• Epilachna nigrocincta Mulsant

MAP 35


Epilachna abrupta Gorham
95
90
85
80
75
70
65
WEST LONGITUDE
20
15
10
5

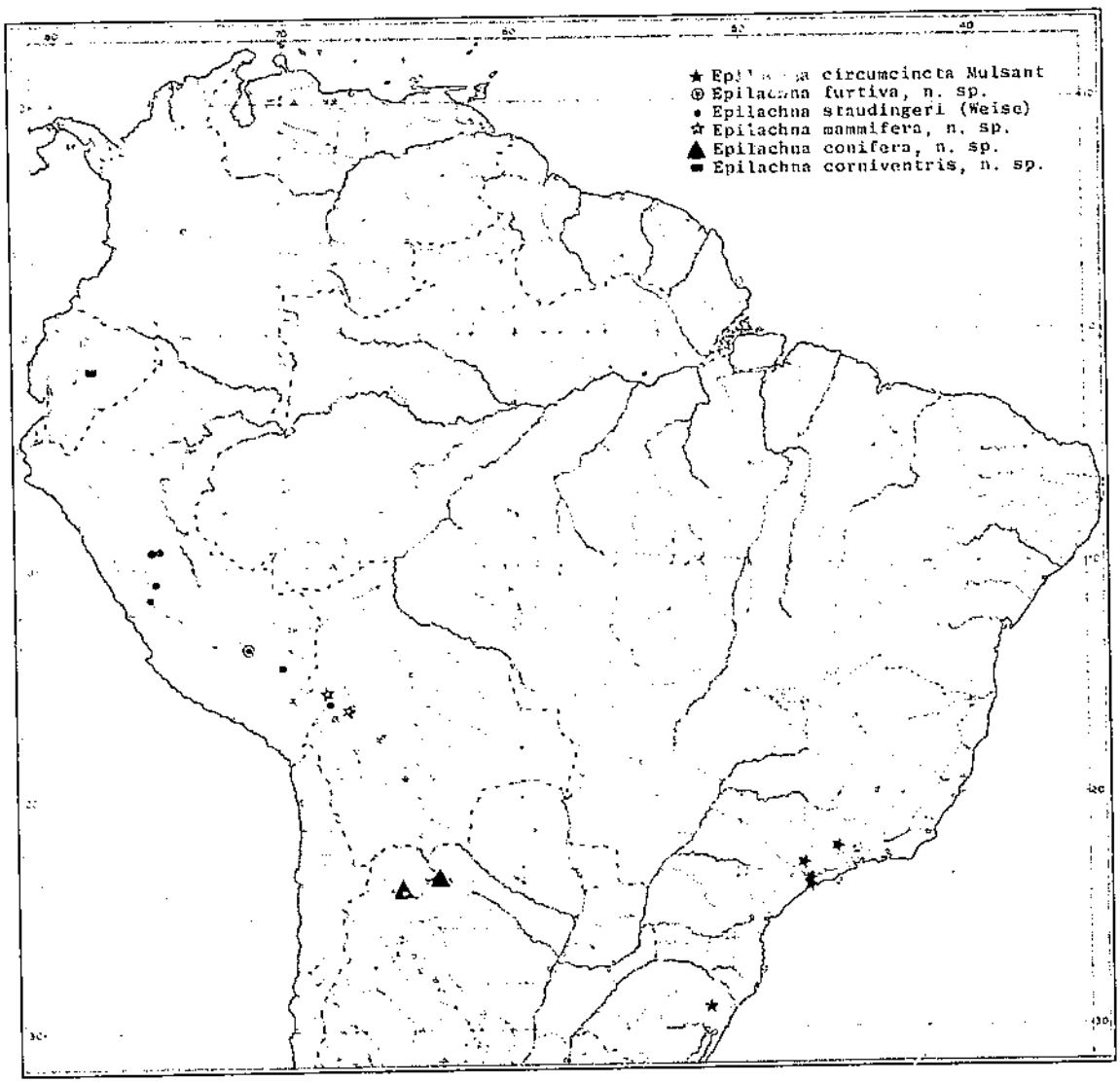
MAP 36


Epilachna vincta Crotch
Epilachna olivacea Mulsant
Epilachna calligrapta Gorham
Epilachna aubei Mulsant
Epilachna pseudograpta, n. sp.
Epilachna obscurella Mulsant

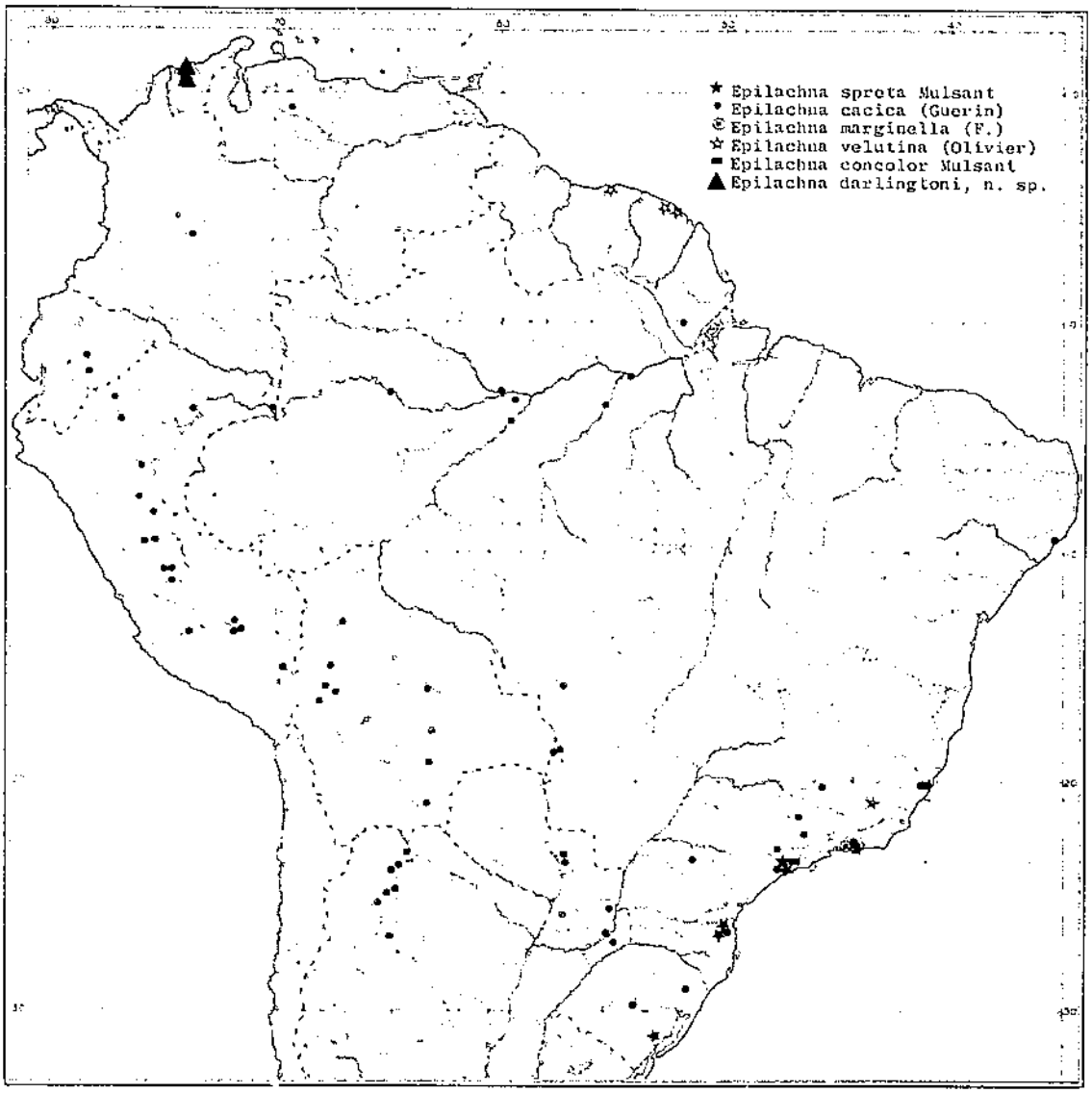
MAP 37

Epilachna patula Mulsant
Epilachna modesta Mulsant
Epilachna difficilis Mulsant
Epilachna vanpatteni Gorham
Epilachna gorhami, n. sp.
Epilachna godmani, n. sp.
Epilachna championi, n. sp.

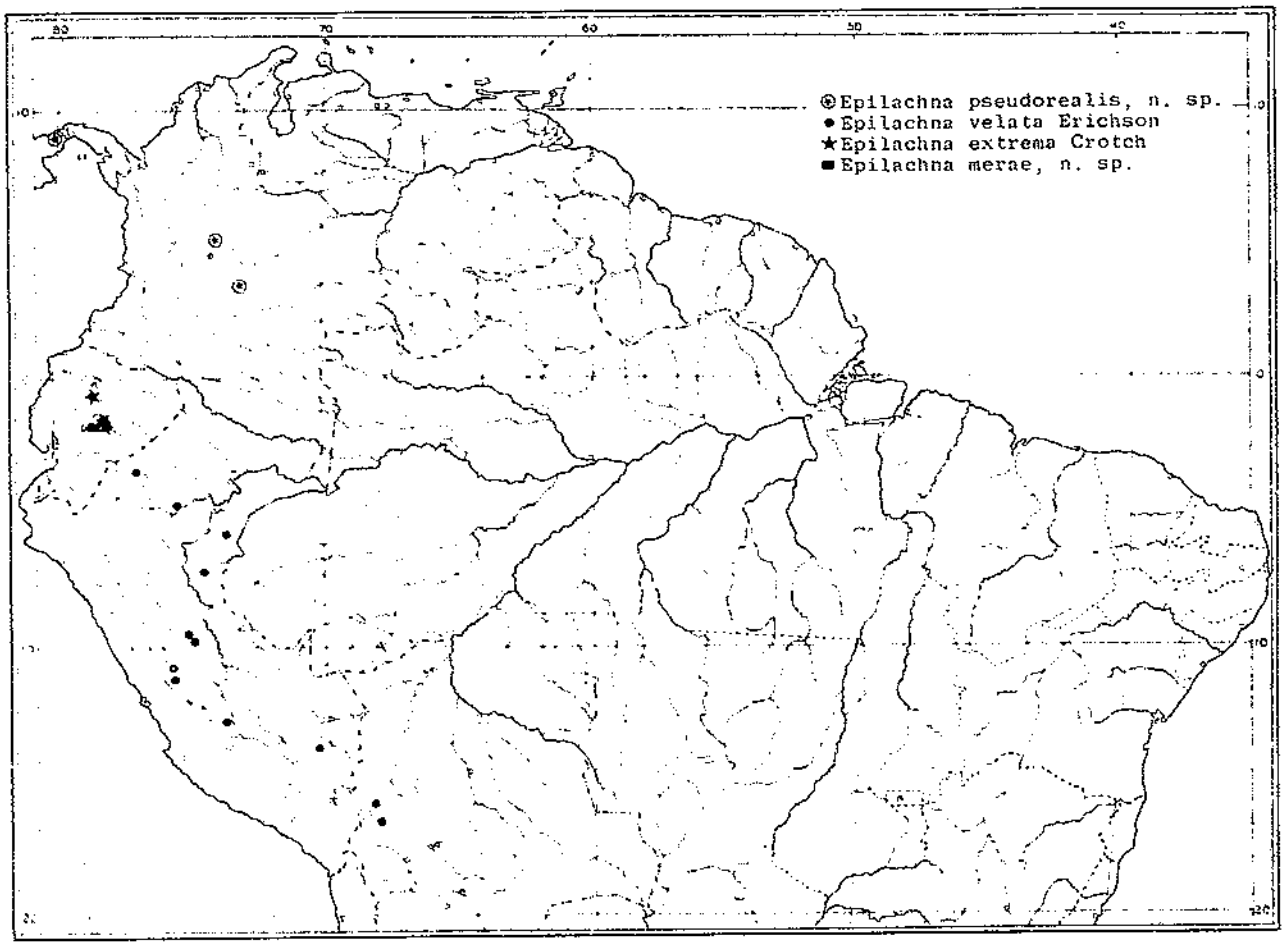
MAP 38


★ Epilachna circumcincta Mulsant
⊛ Epilachna furtiva, n. sp.
• Epilachna staudingeri (Weise)
☆ Epilachna mammifera, n. sp.
▲ Epilachna conifera, n. sp.
▬ Epilachna corniventris, n. sp.

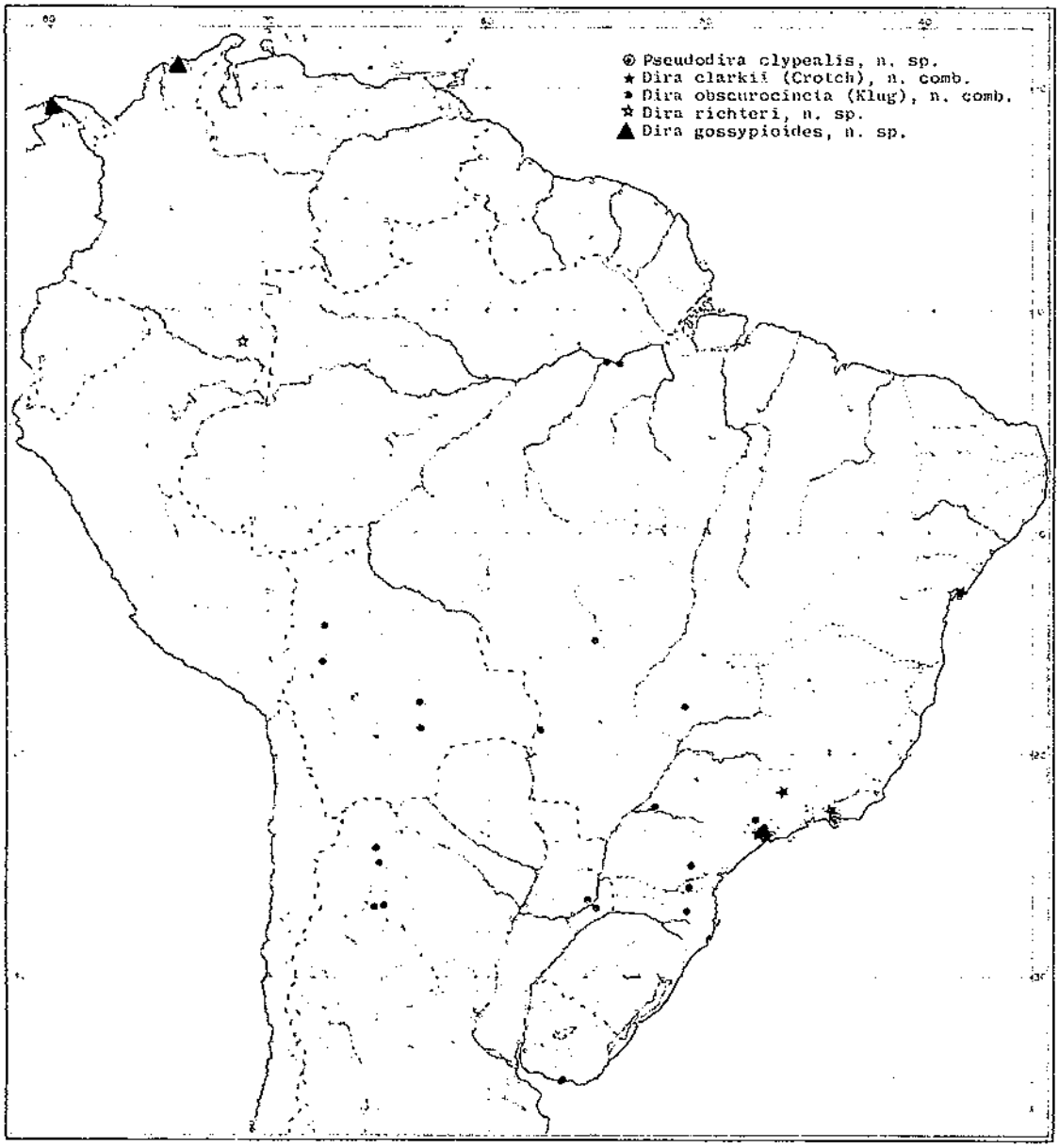
MAP 39


Epilachna spreta Mulsant
Epilachna cacica (Guerin)
Epilachna marginella (F.)
Epilachna velutina (Olivier)
Epilachna concolor Mulsant
Epilachna darlingtoni, n. sp.

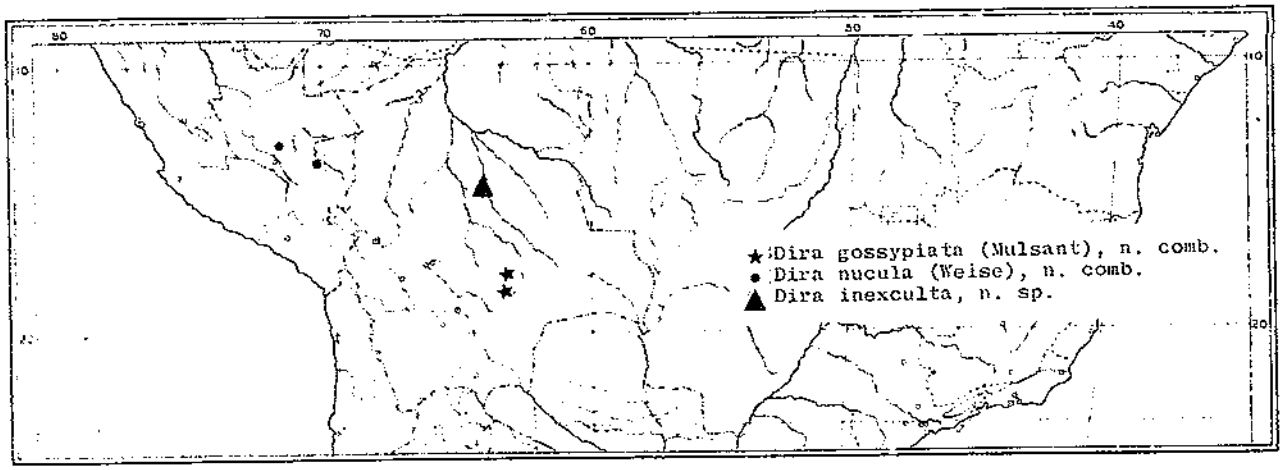
MAP 40


Epilachna pseudorealis, n. sp.
Epilachna velata Erichson
Epilachna extrema Crotch
Epilachna merae, n. sp.

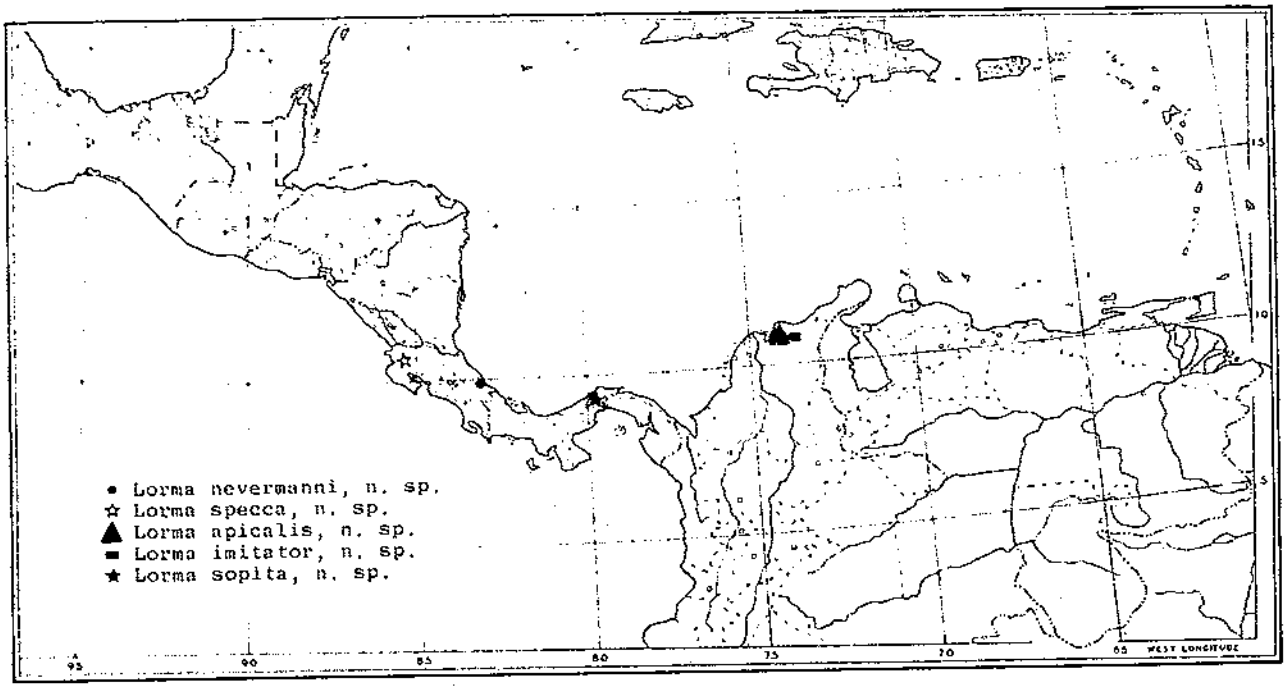
MAP 41


Pseudodira clypealis, n. sp.
Dira clarkii (Crotch), n. comb.
Dira obscurocincta (Klug), n. comb.
Dira richteri, n. sp.
Dira gossypioides, n. sp.

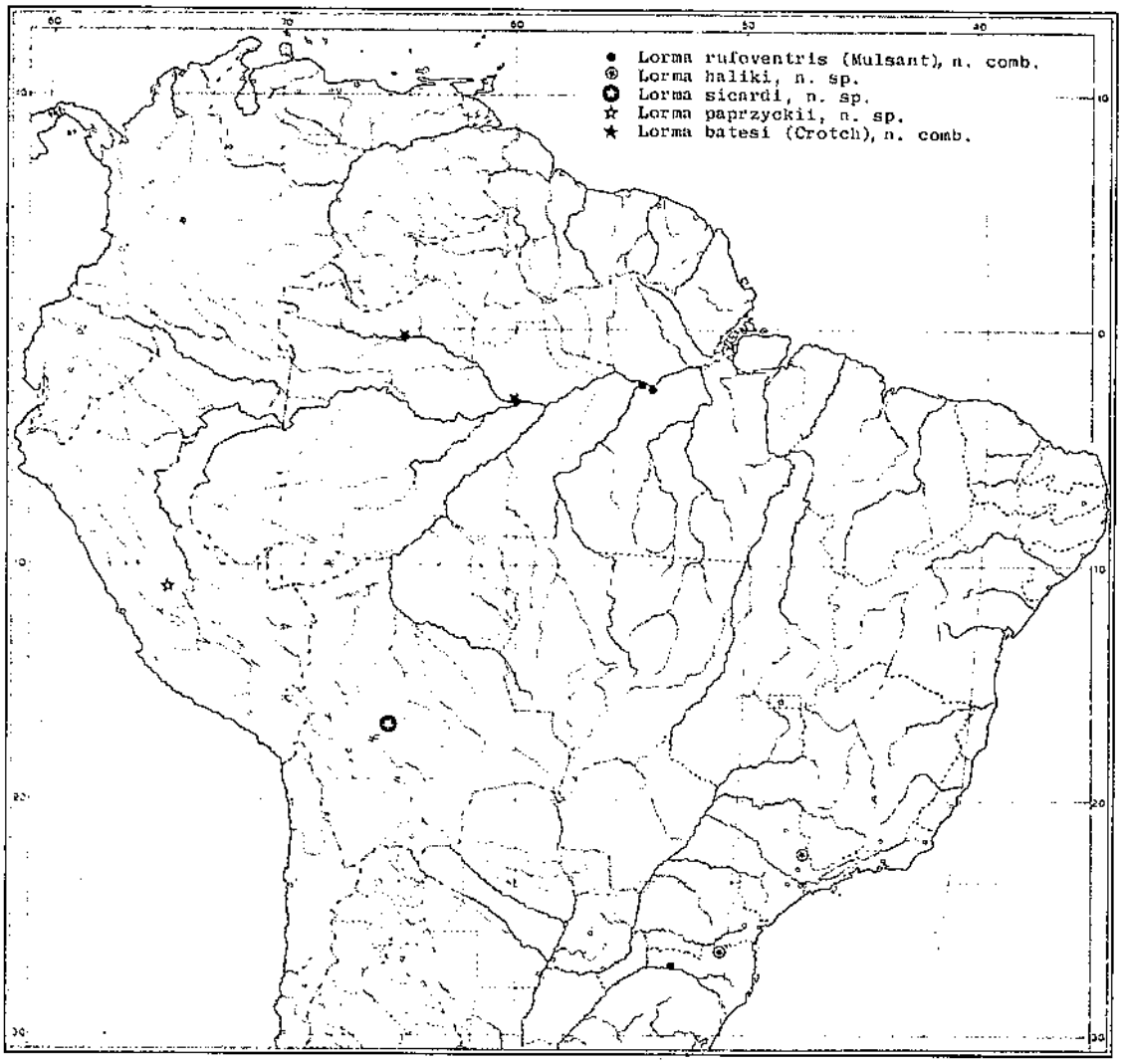
MAP 42


★ Dira gossypiata (Mulsant), n. comb.
● Dira nucula (Weise), n. comb.
▲ Dira inexculta, n. sp.

MAP 43


• Lorma nevermanni, n. sp.
☆ Lorma specca, n. sp.
▲ Lorma apicalis, n. sp.
▬ Lorma imitator, n. sp.
★ Lorma sopita, n. sp.
WEST LONGITUDE

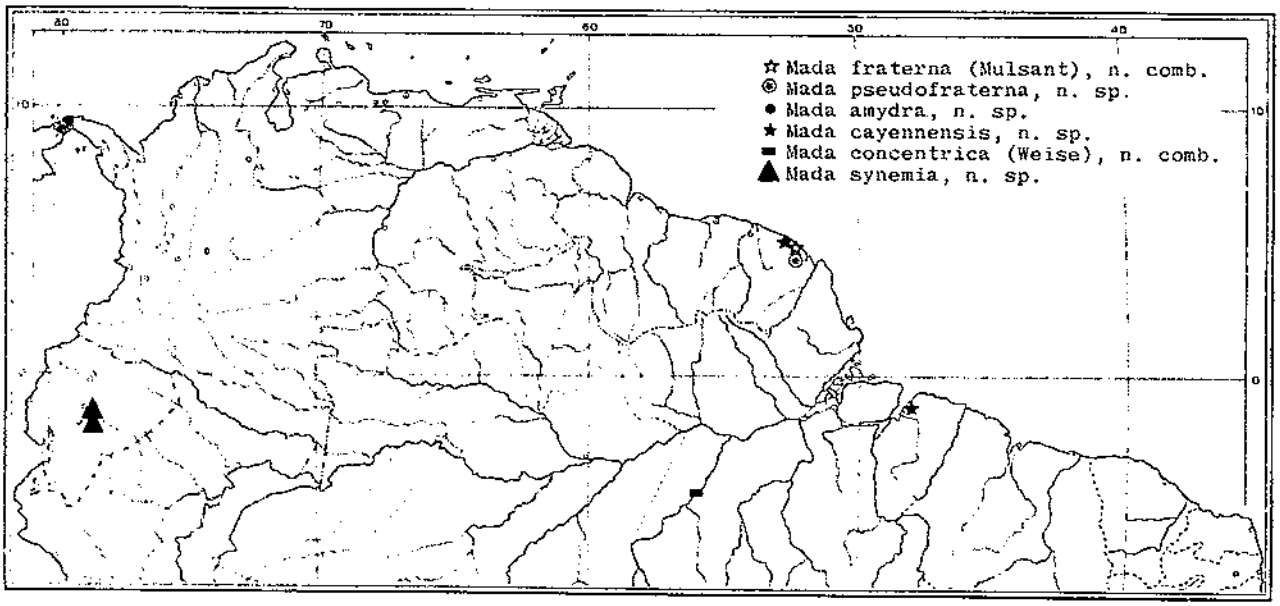
MAP 44


Lorma rufoventris (Mulsant), n. comb.
Lorma haliki, n. sp.
Lorma sicardi, n. sp.
Lorma paprzyckii, n. sp.
Lorma batesi (Crotch), n. comb.

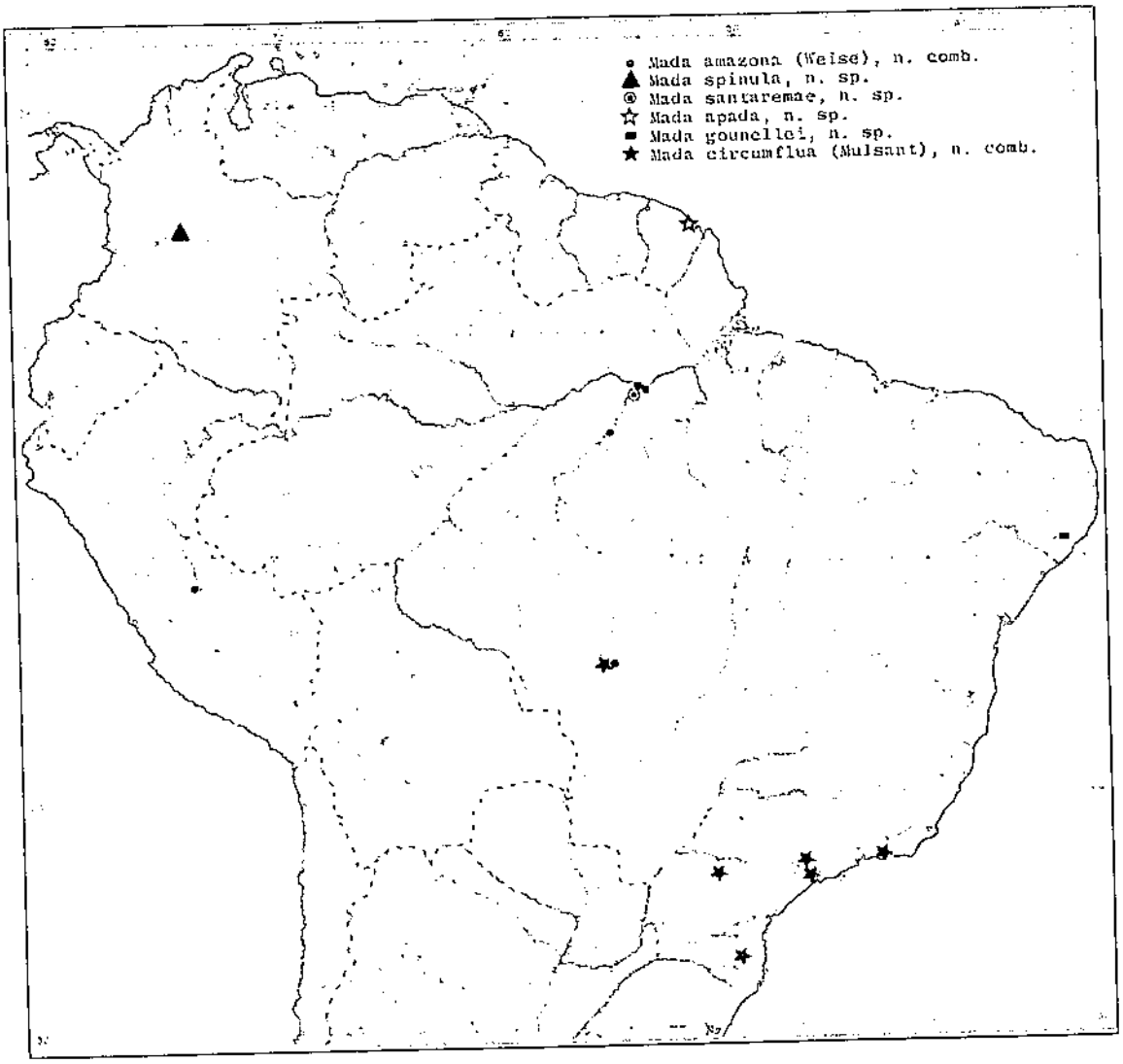
MAP 45

• Malata mitis (Mulsant), n. comb.
▬ Malata burgdorfi, n. sp.
◎ Malata apatela, n. sp.
☆ Malata delphinae (Gorham), n. comb.
✪ Malata diekei, n. sp.
★ Malata pseudomitis, n. sp.

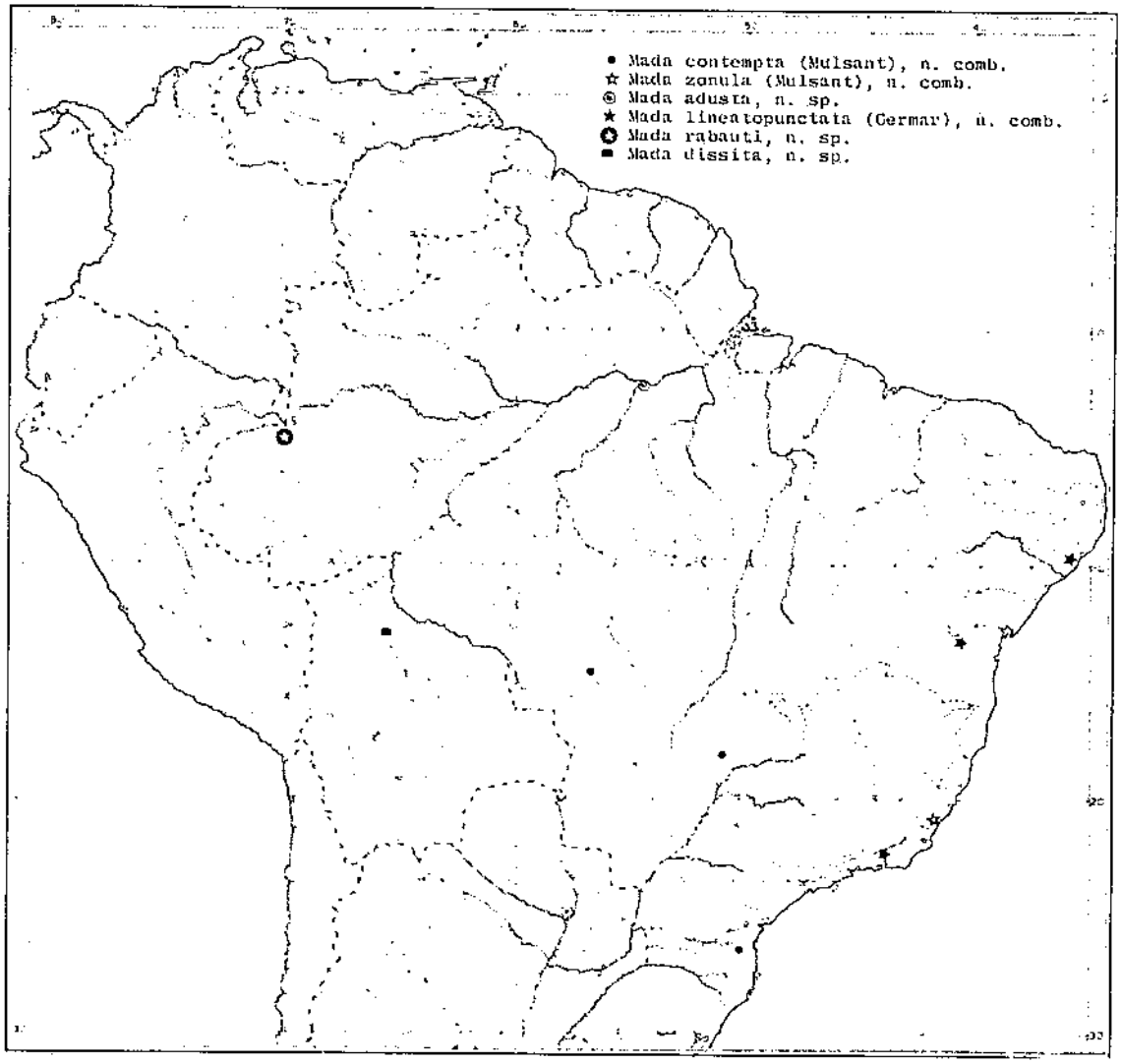
MAP 46


☆ Mada fraterna (Mulsant), n. comb.
◉ Mada pseudofraterna, n. sp.
● Mada amydra, n. sp.
★ Mada cayennensis, n. sp.
▬ Mada concentrica (Weise), n. comb.
▲ Mada synemia, n. sp.

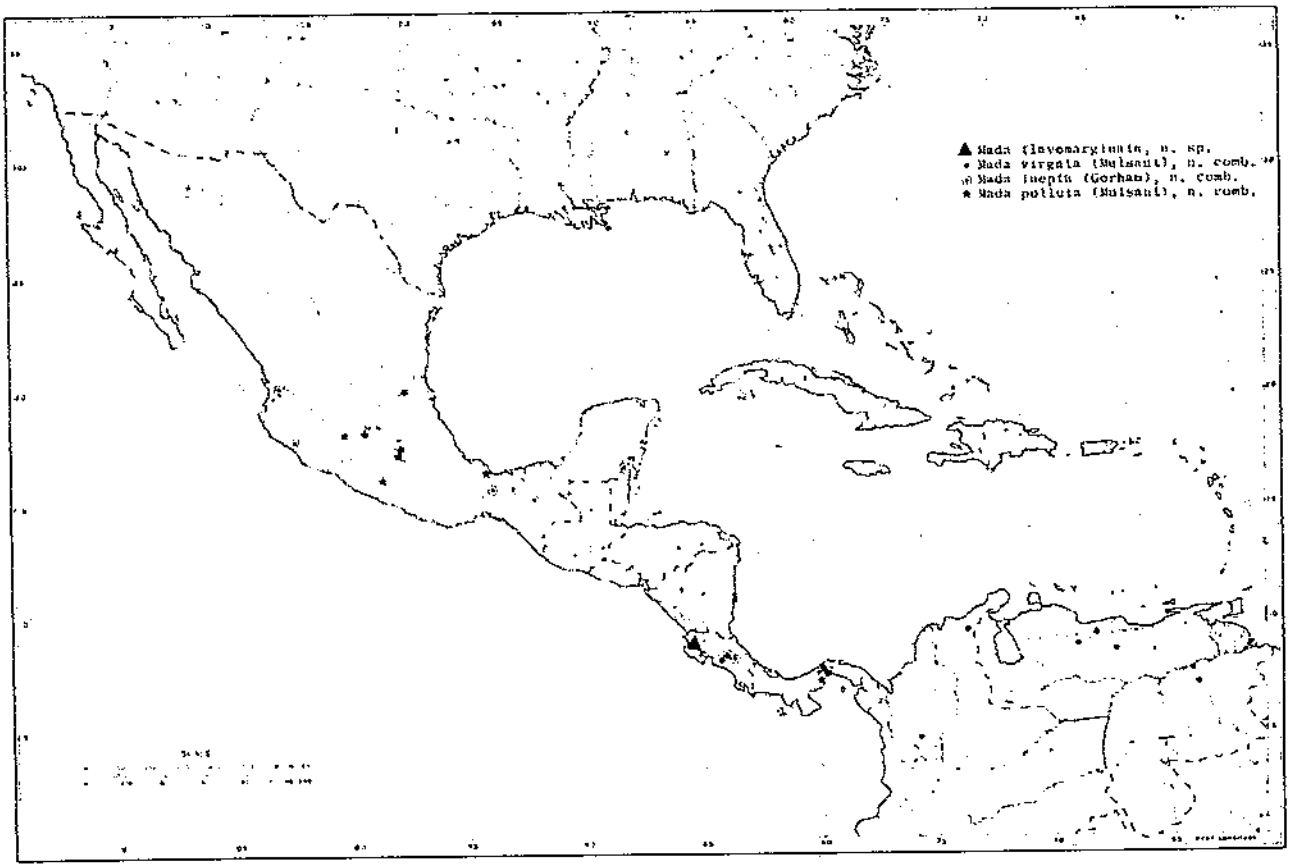
MAP 47


Mada amazona (Weise), n. comb.
Mada spinula, n. sp.
Mada santaremae, n. sp.
Mada apada, n. sp.
Mada gounellei, n. sp.
Mada circumflua (Mulsant), n. comb.

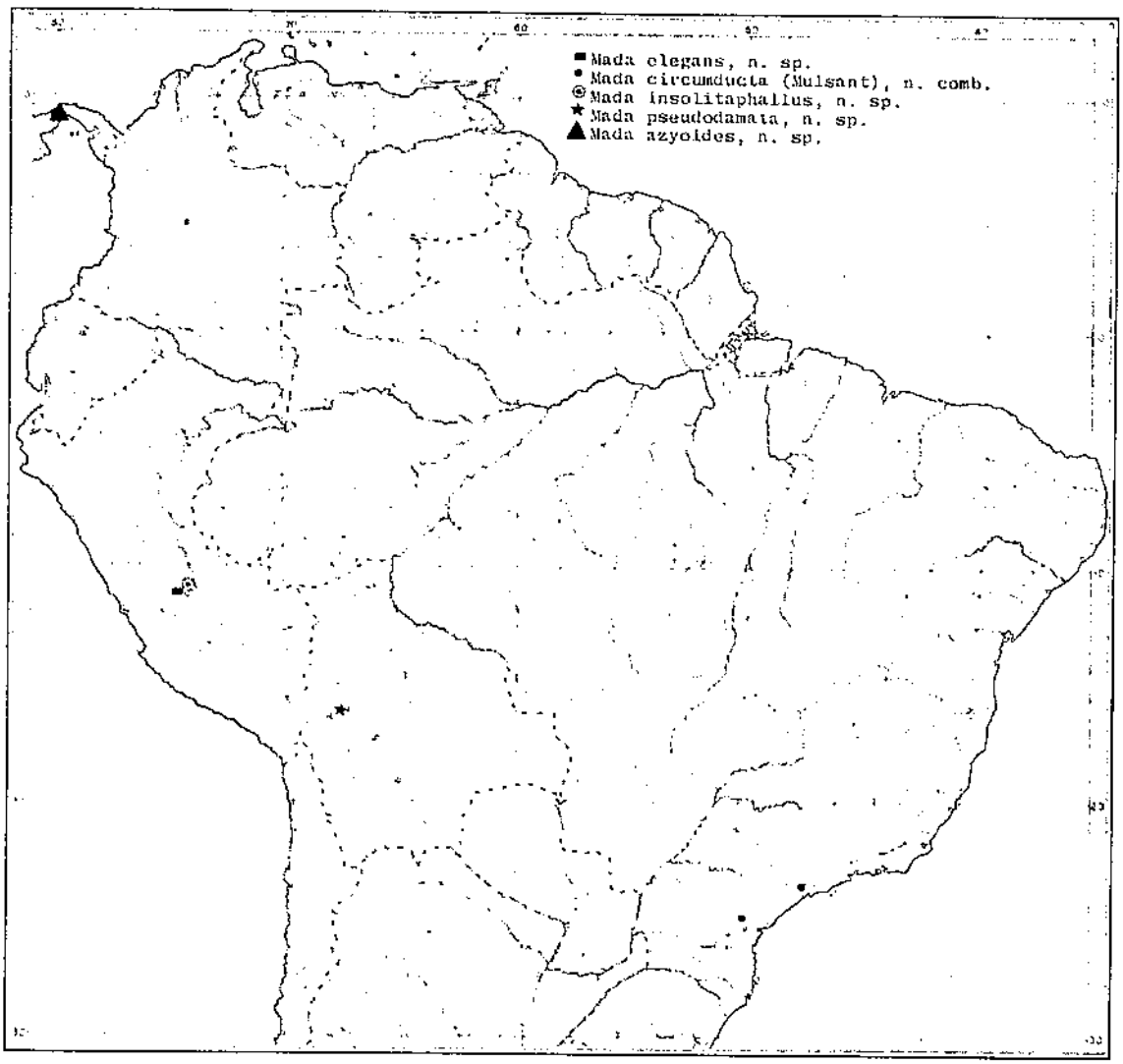
MAP 48


• Mada contempta (Mulsant), n. comb.
☆ Mada zonula (Mulsant), n. comb.
◎ Mada adusta, n. sp.
★ Mada lineatopunctata (Germar), n. comb.
◘ Mada rabauti, n. sp.
▬ Mada dissita, n. sp.

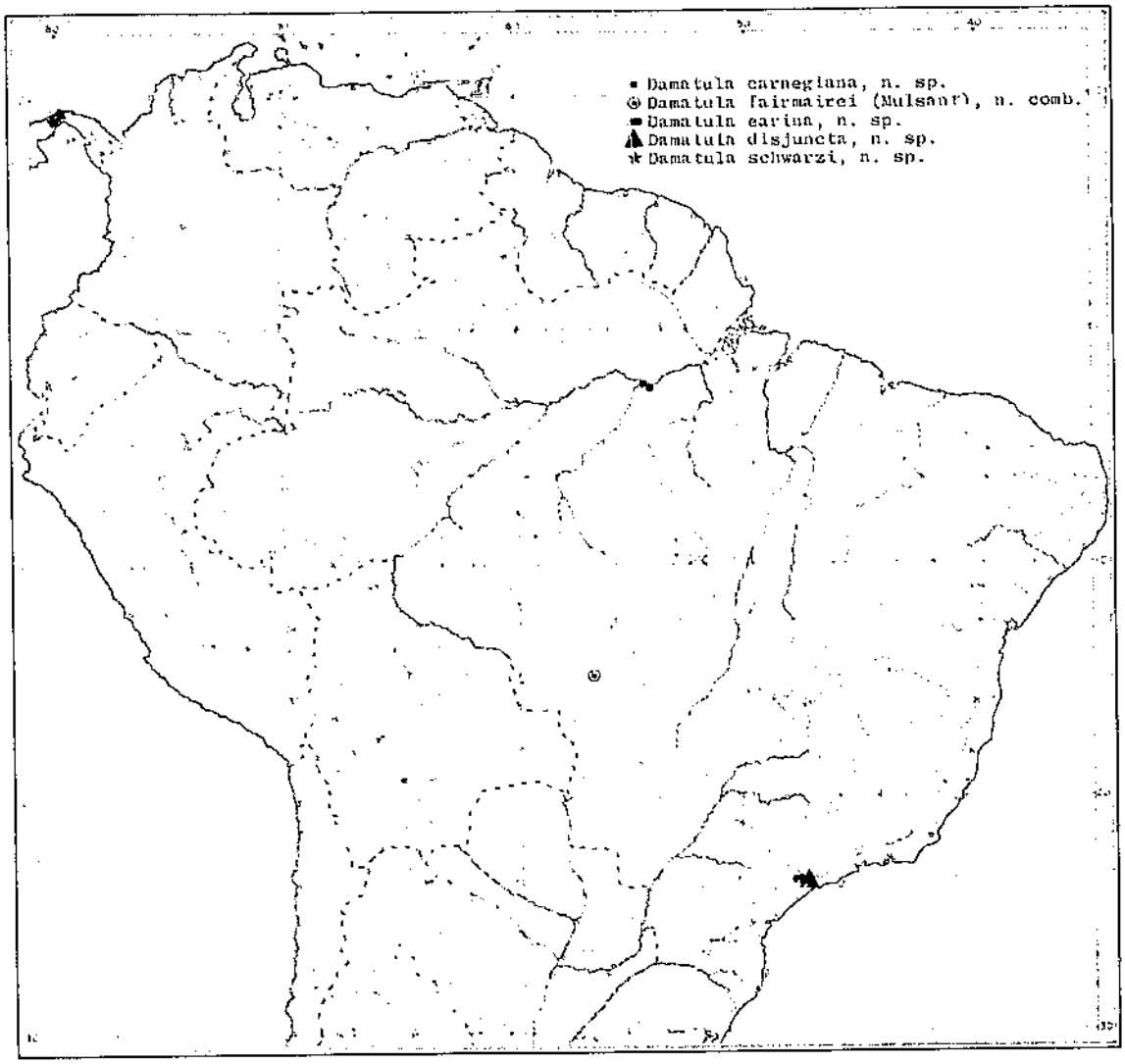
MAP 49


▲ Nada (Levomaryinata, n. sp.
• Nada virgata (Mulsant), n. comb.
Nada inepta (Gorham), n. comb.
★ Nada potluta (Mulsant), n. comb.

MAP 50


Mada elegans, n. sp.
Mada circumducta (Mulsant), n. comb.
Mada insolitaphallus, n. sp.
Mada pseudodamata, n. sp.
Mada azyoides, n. sp.

MAP 51



MAP 52

☆ U. S. GOVERNMENT PRINTING OFFICE : 1976 O - 538-159

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