



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

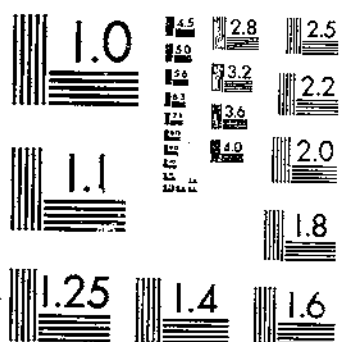
Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

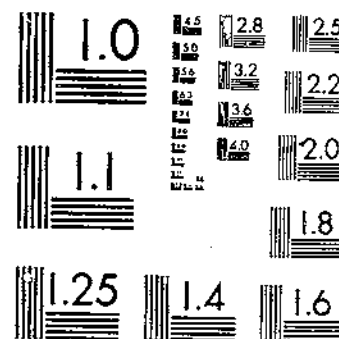
*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

TB 1617 (1980) USDA TECHNICAL BULLETIN UPDATA
THE NEARCTIC PARASITIC WASPS OF THE GENERA PSILUS PANZER AND COPTERA
HUESEBECK, F. W. 1 OF 1

START



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SEP 10 1980

THE NEARCTIC PARASITIC
WASPS OF THE GENERA
PSILUS PANZER AND
COPTERA SAY
(HYMENOPTERA,
PROCTOTRUPOIDEA,
DIAPRIIDAE)



UNITED STATES
DEPARTMENT OF
AGRICULTURE

TECHNICAL
BULLETIN
NUMBER 1617

PREPARED BY
SCIENCE AND
EDUCATION
ADMINISTRATION

ABSTRACT

Muesebeck, Carl F. W. 1980. The Nearctic Parasitic Wasps of the Genera Psilus Panzer and Coptera Say (Hymenoptera, Proctotrupoidea, Diapriidae). U.S. Department of Agriculture, Technical Bulletin No. 1617, 71 pp.

The diapriid genera Psilus Panzer and Coptera Say have generally been treated as a single genus, but they are well distinguished by significant differences in structure. The species of Psilus appear to be essentially northern in distribution and are largely restricted to higher latitudes or altitudes, whereas those of Coptera occur everywhere. As is true for almost all Diapriidae, the hosts are undoubtedly all Diptera. There appear to be no published host association records for any species of Psilus, but an unnamed European species of the genus has been reared from a species of Anthomyiidae. Various species of Coptera are known parasites of species belonging to a number of families of Diptera, including fruit flies (Tephritidae) of economic importance. Several species of Coptera described in this bulletin are parasites of various pest fruit flies of the genus Rhagoletis. Seventeen species of Psilus, 13 of them new, and 29 species of Coptera, of which 25 are new, are treated in this publication.

KEYWORDS: Coptera, Diapriidae, Hymenoptera, Nearctic parasitic wasps, Psilus.

THE NEARCTIC PARASITIC
WASPS OF THE GENERA
PSILUS PANZER AND
COPTERA SAY
(HYMENOPTERA,
PROCTOTRUPOIDEA,
DIAPRIIDAE)

by

CARL F. W. MUESEBECK



UNITED STATES
DEPARTMENT OF
AGRICULTURE

TECHNICAL
BULLETIN
NUMBER 1617

PREPARED BY
SCIENCE AND
EDUCATION
ADMINISTRATION

ACKNOWLEDGMENTS

Various institutions and individuals have supplied specimens for this study. I am grateful to all of them. Type-specimens were included in material received from J. M. Perron, Laval University, Quebec; Jane A. Schafrik, Cornell University; Allen Young, Milwaukee Public Museum; and Paul H. Arnaud, California Academy of Sciences. Considerable additional material, nearly all unnamed, was received from Lubomir Masner, Canadian National Collection; Henry Townes, Ann Arbor, Mich.; R. L. Fischer, Michigan State University; S. I. Frommer, University of California, Riverside; K. S. Hagen, University of California, Division of Biological Control, Albany; M. S. Wasbauer, California Division of Plant Industry, Sacramento; Floyd G. Werner, University of Arizona; Donald W. Webb, Illinois State Natural History Survey; H. E. Evans, Colorado State University; George Wallace, Carnegie Museum of Natural History; and Marilyn Pearce, Museum of Comparative Zoology, Harvard University. These loans have been extremely helpful.

In addition, I am particularly indebted to Elaine R. Hodges, an artist on the staff of the U.S. National Museum of Natural History, who prepared all the illustrations.

CONTENTS

	Page
Genus <u>Psilus</u> Panzer.....	2
Key to females of Nearctic species of <u>Psilus</u> Panzer.....	3
Key to males of Nearctic species of <u>Psilus</u> Panzer.....	4
Descriptions of <u>Psilus</u> species.....	6
Genus <u>Coptera</u> Say.....	21
Key to females of Nearctic species of <u>Coptera</u> Say.....	22
Key to males of Nearctic species of <u>Coptera</u> Say.....	24
Descriptions of <u>Coptera</u> species.....	26
Literature cited.....	52
Index to species and genera.....	54

Issued July 1980

THE NEARCTIC PARASITIC WASPS OF THE GENERA PSILUS PANZER AND COPTERA SAY

(HYMENOPTERA, PROCTOTRUPOIDEA, DIAPRIIDAE)

By Carl F. W. Muesebeck^{1/}

The genus Psilus Panzer, 1801, has been widely misunderstood and species of various unrelated genera have been referred to it. In his review of the North American Proctotrupoidea, Ashmead (1893: 420)^{2/} treated Psilus Panzer as a synonym of Diapria Latreille, 1796, and he (pp. 408-409) used Galesus Curtis for the complex considered in this bulletin. He cited only six North American species in the genus and one of them (floridanus Ashmead) is a species of Trichopria (Muesebeck and Walkley, 1951: 678). Brues (1906: 150-151) published a key to 10 North American species, including the 6 listed by Ashmead, and also used the generic name Galesus Curtis. In his revision of the world Diapriidae, Kieffer (1916: 200-235) continued the use of Galesus for the group but gave Haliday, 1831, as the author. Although he correctly interpreted Psilus Panzer, he treated it as a synonym of the more recent Galesus Haliday, together with Coptera Say, 1836, Anisoptera Herrich-Schaeffer, 1840, and the subgenus Schizogalesus Kieffer, 1911; the North American species he included were those that had been listed by Brues.

More recently Muesebeck and Walkley (1956: 354, 394), Hellen (1963: 31), and Masner (1965: 35) placed Galesus Haliday, 1829, as a synonym of Psilus Panzer, 1801, since the two are isogenotypic and Psilus is the older name. However, this is not a homogeneous group but comprises two well-distinguished segregates that merit independent generic status. Tomsik (1946), with sound arguments, elevated Schizogalesus Kieffer (here treated as a synonym of Coptera Say) to full generic rank; and although Jansson (1955) later expressed the opinion that it should not even be considered as a subgenus but rather as a straight synonym of Galesus Haliday, there should be no question concerning its generic distinctness.

True Psilus species seem to be largely confined to higher latitudes and altitudes, whereas those of the other genus, for which the name Coptera Say is available, appear to be more numerous and to occur everywhere. The two genera may be readily distinguished by the following characterizations:

^{1/} Cooperating scientist, Systematic Entomology Laboratory, Science and Education Administration, c/o U.S. National Museum, Washington, D.C. 20560.

^{2/} The underlined year in parentheses refers to Literature Cited, p. 52.

Forewing with complete subcosta (figs. 1, 1, a), although apical part of vein is frequently hyaline; occipital carina wanting; forewing of female entire, with no suggestion of an apical incision; antennae of male with very short first flagellar segment, which is always much shorter than second.....Psilus Panzer

Forewing with subcosta incomplete (figs. 2, 2, a); occipital carina present though sometimes poorly developed; forewing of female (rarely that of male) always deeply and sharply incised at apex (fig. 2, a); first segment of antennal flagellum of male never shorter than secondCoptera Say

There are authentic host records for various species of Coptera, but I know only a single unpublished host record for a species of Psilus.

Identification of species of both genera is often difficult because of marked intraspecific variation in many structural features, as well as in the color of the antennae and legs (head, thorax, and abdomen are always black). Among the more helpful characters are details of the antennae, and in Psilus the nature of the prominently elevated anterior rim of the antennal sockets. In both genera there are reliable specific differences in the development of the longitudinal sulci of the large abdominal tergite, in the relative length of the malar space, the relative size of the eyes and width of the temples, as well as the head shape in general. Certain species of Coptera are distinguishable by unusual development of the notaulices and the character of the foveae and punctures of the scutellum.

Because of sexual dimorphism and because some of the species treated here are presently known only in one sex, it has been necessary to construct separate male and female keys for both genera. These are not infallible owing to the variation in most characters mentioned here, but I believe they will enable correct identification.

Genus PSILUS Panzer

Psilus Panzer, 1801, Heft 83, No. 11. (Type-species: Psilus cornutus Panzer. By monotypy.)

Galesus Haliday, 1829, Column 108. (Type-species: Psilus cornutus Panzer. By monotypy.)

Anisoptera Herrich-Schaeffer, 1840: 57, 69. (Type-species: Anisoptera egregia Herrich-Schaeffer. By monotypy.)

Laches Gistel, 1848: viii. (Type-species: Anisoptera egregia Herrich-Schaeffer. By substitution of Laches for Anisoptera Herrich-Schaeffer, preoccupied by Anisoptera Berthold, 1827.)

Length approximately 2.5-6 mm. Head ranging from longer than broad to broader than long; occiput virtually horizontal, very briefly declivous posteriorly and not carinately margined above the declivity; eyes with only a few scattered long hairs; face ventral, horizontal; anterior rim of antennal sockets strongly elevated and usually more or less notched or emarginate medially; antennae of female 12-segmented, flagellum gradually clavate; those

of male 14-segmented and more or less filiform, first flagellar segment always much shorter than second; notaulices strongly impressed with two large basal foveae and usually with a row of minute punctures or foveolae across apex, never with a pair of large punctures at apex as usually in Coptera; propodeum usually with two prominent carinae arising at basal middle and diverging posteriorly, the large median area impressed, occasionally propodeum strongly rugulose and diverging carinae not apparent; forewing entire with no indication of an apical incision or emargination, and with a complete, though apically usually hyaline, subcosta well removed from anterior margin of wing (figs. 1, 1, a); all femora shortly pedunculate, somewhat broadened on apical two-thirds; abdomen petiolate, petiole with a lateral carina along each side and three dorsal longitudinal carinae which are usually but not always well developed, the median one often incomplete; second tergite strongly convex, smooth, and polished, extending almost to apex of abdomen, always with a median sulcus on approximately basal third and sometimes with a pair of shorter basal lateral sulci although these are most frequently represented by small, poorly defined impressions or foveae; following tergites greatly reduced and inconspicuous. All species are black, with wings usually somewhat infuscated and legs and antennae ranging from completely yellow to completely black.

Hosts are presumably Diptera, but I am aware of only a single unpublished record of host association for a species of Psilus. This pertains to the rearing of an unidentified European species of Psilus from pupae of a species of Scatophaga (family Anthomyiidae).

KEY TO FEMALES OF NEARCTIC SPECIES OF PSILUS PANZER

1. Elevated rim of antennal sockets subtruncate or broadly rounded, without median notch or with very weak one (figs. 4, 11, 15)..... 2
Elevated rim of antennal sockets with sharp median notch and descending strongly each side of this (figs. 8, 10, 18, 20)..... 6
2. Vertex, especially ocellar area, finely rugose, granulose, or shagreened (fig. 47).....dissidens, new species
Vertex smooth..... 3
3. Malar space as long as eye; distance from lateral ocelli to posterior margin of head nearly three times maximum eye diameter; length about 2.5 mm.....pusillus, new species
Malar space and distance from lateral ocelli to posterior margin of head not so long; length at least 3 mm..... 4
4. Petiole of abdomen with all three dorsal carinae well developed and complete, interspaces largely smooth; neck of prothorax usually strongly rugose..... 5
Petiole of abdomen with dorsal carinae, especially lateral pair, weak, irregular, or incomplete, surface more or less rugulose or shagreened; neck of prothorax largely smooth and shiny.....
.....masoni, new species

5. Legs brownish yellow except coxae, which are black; basal segments of antennal flagellum yellowish or brown, first segment usually twice as long as broad at apex; metapleuron closely, evenly rugose.....aquilonius, new species
 Legs piceous; antennae black; first segment of antennal flagellum not twice as long as broad; metapleuron with a few prominent irregular rugae enclosing cells that are smooth or very weakly sculptured.....microtomus (Kieffer)
6. Malar space not or barely half as long as eye..... 7
 Malar space much more than half as long as eye..... 10
7. Basal lateral longitudinal sulci of large abdominal tergite well developed, half as long as median sulcus; temples in lateral view less than twice as broad as eyes; length more than 3 mm..... 8
 Basal lateral sulci of large abdominal tergite not developed, at most represented by short, shallow, poorly defined impressions; temples in lateral view twice as broad as eyes; length less than 3 mm..... 9
8. All coxae and femora black; antennae entirely black.....
singularis, new species
 Coxae more or less darkened but remainder of legs brownish yellow; antennae, including scapes, largely reddish yellow.....viereckii (Brues)
9. Legs black.....abruptus, new species
 Legs yellowish except for coxae which may be more or less darkenedautumnalis (Brues)
10. Elevated rim of antennal sockets deeply notched at middle (figs. 8, 10); prothoracic neck somewhat rugulose; legs beyond coxae entirely honey yellow..... 11
 Elevated rim of antennal sockets with sharp but shallow median notch (fig. 11); prothoracic neck smooth; coxae black, femora somewhat darkened.....masneri, new species
11. Malar space nearly as long as eye; antennal scapes black.....
eximius, new species
 Malar space about 0.6 as long as eye; antennal scapes normally redfortis, new species

KEY TO MALES OF NEARCTIC SPECIES OF PSILUS PANZER

1. First segment of antennal flagellum slender, more than half as long as second segment (fig. 30)..... 2
 First segment of antennal flagellum short, usually thickened, not more than half as long as second segment (figs. 23, 31)..... 4
2. Vertex in part finely rugulose, granulose, or shagreened; petiole of abdomen finely rugulose.....dissidens, new species
 Vertex smooth; petiole of abdomen, except for longitudinal carinae, largely smooth and shiny..... 3

3. Elevated rim of antennal sockets with sharp median notch and sloping away rather strongly on each side of notch (fig. 6); basal lateral sulci of large tergite represented by short foveaeautumnalis (Brues)
Elevated rim of antennal sockets subtruncate and without median notch or with a very faint one (fig. 14); basal lateral longitudinal sulci of large tergite well developed.....nidicola, new species
4. Malar space much more than half as long as eye; rim of antennal sockets subtruncate or broadly rounded, never deeply notched..... 5
Malar space at most barely half as long as eye, rarely slightly more but then rim of antennal sockets deeply notched medially.... 7
5. Head in dorsal view not longer than broad and not narrowing behind eyes; legs beyond coxae yellow.....shannoni, new species
Head in dorsal view longer than wide and narrowing behind eyes; legs darker..... 6
6. Raised rim of antennal sockets horizontal and sharply notched medially (fig. 3); antennae, tegulae, and legs black or blackish....
.....angusticeps, new species
Raised rim of antennal sockets broadly and gently rounded and faintly notched medially (fig. 16); legs not so completely darkened; tegulae pale.....quebecensis (Provancher)
7. Basal lateral longitudinal sulci of large abdominal tergite well developed, half as long as median sulcus; elevated rim of antennal sockets sharply incised medially (figs. 9, 21)..... 8
Basal lateral longitudinal sulci of large abdominal tergite not developed, represented by short, shallow, poorly defined impressions; elevated rim of antennal sockets subtruncate or broadly rounded and with only a weak median notch or emargination (figs. 13, 19)..... 10
8. Malar space slightly more than half as long as eye; distance from lateral ocelli to posterior margin of head very nearly twice eye height; antennal scapes black; all coxae completely black.....
.....eximius, new species
Malar space considerably less than half as long as eye; distance from lateral ocelli to posterior margin of head not nearly twice eye height; scapes of antennae usually reddish; coxae usually reddish piceous..... 9
9. Head in dorsal view narrowing behind eyes; temples in lateral view only slightly wider than eyes; distance from lateral ocelli to posterior margin of head only a little longer than eye height; most flagellar segments of antennae twice as long as broad.....
.....viereckii (Brues)
Head in dorsal view usually not narrowing behind eyes; temples in lateral view about 1.5 times as wide as eyes; distance from lateral ocelli to posterior margin of head 1.5 times eye height; most of antennal flagellar segments 3-11 less than twice as long as broad.....fortis, new species

10. Antennae very long, flagellar segments 2-11 usually 2.5-3 times as long as broad, apical segment 4-6 times as long as broad at base; venter of abdomen with very narrow median hairless strip bordered by dense strips of long hairs, and large tergite with abundant long hair apically and along sides; length about 4 mm...
aquilonius, new species
 Antennae not unusually long; abdomen not so hairy; length about 3 mm..... 11
11. Petiole of abdomen usually somewhat bowed outward and broadest at middle, its surface usually finely rugulose and dorsal carinae, especially lateral pair, weak, irregular, or incomplete; propodeum rugulose without distinct diverging keels setting off large triangular median area; neck of prothorax largely smooth and shiny.....masoni, new species
 Petiole of abdomen usually approximately parallel-sided, its surface smooth with all three dorsal longitudinal carinae well developed and complete; propodeum with well-developed diverging keels setting off large triangular median area and smooth basal lateral areas; neck of prothorax finely rugulose..... 12
12. Malar space about half as long as eye; legs, including tibiae and tarsi, blackish; antennae black.....microtomus (Kieffer)
 Malar space about 0.35 as long as eye; legs largely yellowish, with coxae black and femora sometimes more or less darkened.....
vicinus, new species

DESCRIPTIONS OF PSILUS SPECIES

Psilus abruptus, new species

This is most similar to P. autumnalis (Brues), from which it may be immediately distinguished, however, by its dark legs.

Female.---Length 2.8 mm. In dorsal view head longer than wide, parallel-sided, and practically as wide as thorax; distance from lateral ocelli to posterior margin of head about twice maximum eye diameter; in lateral view temples twice as broad as eyes; malar space hardly half as long as eye; elevated rim of antennal sockets sharply notched at middle and descending steeply each side of notch; antennae very short; first flagellar segment a little longer than wide, second as broad as long, segments 3-9 broader than long, successively more strongly transverse, 8 twice as broad as long.

Notaulices fine, not strongly convergent; scutellum convex, its apex with transverse line of small, contiguous punctures; propodeum with small median triangular area and large basal lateral areas smooth and shiny; mesopleuron not impressed; metapleuron weakly rugose, with few weak raised lines, very shiny.

Petiole of abdomen somewhat less than twice as long as broad, parallel-sided, very smooth and shiny between dorsal longitudinal carinae, all of which are complete, median carina at least as strong as others; median sulcus of large tergite extending about to end of basal third of segment, basal lateral sulci not developed.

Black; antennae entirely black; legs with coxae and femora black, trochanters, tibiae, and tarsi largely piceous, hindtibiae basally and hindtarsi except apical segment brownish.

Male.--Unknown.

Holotype female.--In collection of University of California, Riverside.

Distribution.--Known only from the holotype, which is labeled "Cal., Riverside Co., Menifee Vly (hills on west end) 33° 39' N. 117° 13' W., 1800' el. iii-16-1978, John D. Pinto."

Psilus angusticeps, new species

(Figs. 3, 22)

This is most similar to P. quebecensis (Provancher), from which it differs in color, in its longer malar space, and in having the elevated rim of antennal sockets sharply notched medially.

Male.--Length about 4 mm. Head in dorsal view decidedly longer than wide and narrowing gradually behind eyes; distance from lateral ocelli to posterior margin of head twice maximum eye diameter; temples in lateral view about twice as wide as eyes; eyes shorter than antennal scapes; malar space about three-fourths as long as eye; elevated rim of antennal sockets horizontal but with sharp though small median notch (fig. 3); first segment of antennal flagellum longer than wide but barely half as long as second, segments 2-11 twice as long as broad, apical segment barely longer than second but three times as long as broad at base.

Thorax about as deep as wide; neck of prothorax finely longitudinally rugulose; polished disk of scutellum wider than long, basal foveae of scutellum large and virtually confluent; apical margin of scutellum with tight row of minute longitudinal foveolae; propodeum rugose; mesopleuron very weakly dished medially; metapleuron closely rugose and densely hairy.

Petiole of abdomen with all three dorsal longitudinal carinae strong and complete; median sulcus of large tergite extending barely to end of basal third of segment, basal lateral sulci well defined and more than half as long as median sulcus.

Black; antennae entirely black; all coxae and femora black or blackish, trochanters, tibiae, and sometimes tarsi piceous; tegulae black; wings infumated.

Female.--Unknown.

Holotype male.--In collection of University of California, Riverside.

Distribution.--Known only from the holotype and one male paratype, both labeled "New Mex., Sandoval Co., West Fork Jemez Riv., Las Conchas Campground, viii.14.1972, 8300 ft. R. E. Orth," and one male from "Forester's Ranch, Colo.," collected by C. F. Baker 3 August 1896.

Psilus aquilonius, new species

(Figs. 1, 1, a, 4, 23, 34, 43, 44, 61)

This is extremely similar to specimens (all males) from Austria identified by Priesner as P. rufitarsis (Kieffer) and it may prove to be the same. However, there are some differences that appear significant. The European specimens consistently have the legs and antennae more intensely darkened than the darkest North American specimens I have seen; also, in the Austrian specimens the head is relatively a little broader and does not narrow so distinctly behind the eyes as in males of aquilonius, and the eyes are relatively somewhat larger and the malar space is shorter.

Female.--Length about 3.8 mm. Head in dorsal view slightly longer than broad, sides parallel or gently rounded; distance from lateral ocelli to posterior margin of head about twice maximum eye diameter; temples in lateral view nearly twice as wide as eyes; malar space nearly three-fourths as long as eye; elevated rim of antennal sockets truncate or subtruncate and without median notch or with very faint one (fig. 4); first segment of antennal flagellum normally fully twice as long as broad at apex, second very slightly longer than broad, and segments 3-9 usually as broad as long or slightly broader than long.

Thorax somewhat depressed; neck of prothorax strongly rugose; scutellum nearly flat, basal foveae oblique and often confluent or weakly separated; apical margin of scutellum with row of closely placed and minute foveolae or punctures, sometimes poorly apparent; propodeum usually irregularly rugose with diverging carinae poorly developed or irregular; metapleuron closely rugose and densely covered with subappressed hair.

Petiole with all three dorsal carinae prominent and complete (fig. 61); median sulcus of large tergite deep and broad and extending well beyond basal third of segment, basal lateral sulci represented by deep, elongate foveae.

Black; antennal flagellum usually brownish basally; legs usually brownish yellow except all coxae, which are black; wings somewhat infumated.

Male.--Usually somewhat larger than female (length around 4.5 mm). Head in dorsal view fully as long as broad; distance from lateral ocelli to posterior margin of head about 1.5 times eye height; temples gradually receding behind eyes, in lateral view a little wider than eyes; malar space slightly less than half as long as eye; first segment of antennal flagellum less than half as long as second, segments 2-11 usually more than twice as long as broad, in some specimens nearly three times, apical segment four to six times as long as broad at base; venter of abdomen with narrow hairless strip bordered each side by broad, conspicuous, very densely hairy strip; antennal flagellum varying in color from almost entirely yellowish to blackish.

Holotype female.--In Canadian National Collection.

Distribution.--The holotype is from Constance Bay, Ontario, collected 21-28 September 1973 by L. Masner; 6 female and 42 male paratypes are from the same locality, all taken by L. Masner in August and September 1973. In

addition to the type-series, I have seen numerous specimens (mostly males) from localities in New Brunswick, Quebec, Ontario, Manitoba, Alberta, and British Columbia in Canada and in the United States from localities in Maine, New Hampshire, Vermont, Massachusetts, New York, Pennsylvania, Maryland, Virginia, North Carolina, Michigan, Illinois, Wisconsin, Minnesota, Colorado, Wyoming, Utah, Arizona, and California. In occasional male specimens, especially from western localities at relatively high elevations, the legs and antennae are strongly darkened.

One male specimen, from Hull, Quebec, is conspicuously larger (5.5 mm) than all other specimens of aguilonius I have seen, but otherwise it agrees so well with that species that I have placed it here tentatively.

Psilus autumnalis (Brues)

(Figs. 5, 6, 24, 35, 45)

Galesus autumnalis Brues, 1906: 151. Female.

Psilus autumnalis (Brues), Muesebeck and Walkley, 1951: 675.

This is most like P. viereckii (Brues), but it is easily distinguished from that species. It is smaller and the large abdominal tergite lacks well-defined basal lateral sulci as found in viereckii. Moreover, the female head is much longer and in the male the first segment of the antennal flagellum is more slender and relatively longer than in that species.

Female.--Length around 2.8 mm. Head relatively very large, in dorsal view noticeably longer than wide, as wide as thorax and nearly as long; distance from lateral ocelli to posterior margin of head twice maximum eye diameter; temples in lateral view twice as wide as eyes; malar space about half as long as eye; antennae short, pedicel longer than first flagellar segment, second segment almost spherical, following segments all broader than long except apical segment, which is stout and twice as long as penultimate segment.

Thorax only slightly wider than deep but hardly as deep as head; mesoscutum and scutellum flat; basal foveae of scutellum strongly oblique, apical margin truncate, and with tight transverse row of minute punctures; propodeum largely rugulose; metapleuron closely, finely rugulose.

Petiole of abdomen with all three carinae present, but they are usually rather weak and irregular; median sulcus of large tergite hardly reaching end of basal third of segment, basal lateral sulci not developed, represented only by short, weak foveae.

Black; antennae, including scapes, brownish yellow but with apical segments somewhat darkened; legs yellow except coxae, which are normally more or less darkened.

Male.--Head in dorsal view barely longer than wide and rather roundly parallel-sided; temples in lateral view at least a little broader than eyes; malar space about one-third as long as eye; first segment of antennal flagellum slender, nearly as long as pedicel, and more than half as long as

second, most of remaining segments usually less than twice as long as broad, apical segment longer than rest.

Holotype female.--In Milwaukee Public Museum.

Distribution.--In addition to the holotype, which is labeled "Milwaukee Co., Wis. x.27.06," I have seen specimens, most of them males, from Quebec, Ontario, New York, Maryland, and North Carolina.

Psilus dissidens, new species

(Figs. 7, 25, 36, 47, 48, 62)

This is strikingly similar to the European P. subapterus (Thomson), which it closely resembles in body form, in the finely rugulose vertex (an unusual condition in this genus), in the strongly posteriorly convergent notaulices, in the finely rugulose petiole of the abdomen, and in the structure of the antennae in both sexes. It differs particularly in the female being fully winged (in subapterus the wings of the female are greatly reduced, extending barely to the end of the abdominal petiole), in the somewhat less elongate head of the female, and in the much paler legs and antennae in both sexes.

Female.--Length about 2.7 mm. Head in dorsal view noticeably longer than wide with subparallel sides; distance from lateral ocelli to posterior margin of head more than twice maximum eye diameter; vertex finely rugulose or shagreened (fig. 47); temples in lateral view twice as wide as eyes; malar space about half as long as eye; elevated rim of antennal sockets subtruncate, without median notch or with very weak one (fig. 7); antennae as in figure 36.

Thorax depressed but only slightly wider than deep and barely wider than head; neck of prothorax finely and irregularly transversely striate anteriorly and finely rugulose or granulose posteriorly; mesoscutum and scutellum flat; notaulices strongly convergent and median lobe of mesoscutum consequently very narrow at apex; basal foveae of scutellum strongly oblique; apical margin of scutellum with row of minute, closely placed punctures; propodeum with large median triangular area weakly roughened and large basal lateral areas largely smooth; metapleuron closely, finely rugulose.

Petiole with dorsal carinae usually complete though often weak, interspaces, as well as sides of petiole, finely rugulose or granulose; median sulcus of large tergite extending beyond basal third of segment, basal lateral sulci not developed.

Black; antennae, including scapes, brownish yellow or brown; legs light brown to brownish yellow with coxae usually piceous; wings subhyaline.

Male.--Head relatively shorter and broader than in female and vertex usually much more weakly sculptured; temples in lateral view much wider than eyes; malar space about one-third as long as eye; distance from lateral ocelli to posterior margin of head about 1.7 times eye height; first segment of antennal flagellum noticeably more than half as long as second, most of segments 2-11 about twice as long as wide, apical segment longer (fig. 25).

Holotype female.--In Museum of Comparative Zoology, Harvard University.

Distribution.--The holotype, five female paratypes, and one male paratype are from Holliston, Mass., collected by Nathan Banks. Twenty-two additional paratypes (males and females) are from localities in Ontario, Maine, New Hampshire, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, North Carolina, and Iowa.

Psilus eximius, new species

(Figs. 8, 9, 26, 49, 50, 63)

In the deeply notched elevated rim of antennal sockets this most nearly resembles P. singularis, new species, but it differs conspicuously from that species in its relatively much longer malar space, broader temples, and paler legs.

Female.--Length 4 mm. Head in dorsal view somewhat longer than broad, gently rounded behind eyes, and widest near middle; distance from lateral ocelli to posterior margin of head more than twice eye height; temples in lateral view more than twice as wide as eyes; malar space nearly as long as eye; strongly elevated rim of antennal sockets deeply cleft and descending sharply each side of cleft (fig. 8); first segment of antennal flagellum twice as long as broad at apex, segments 4-9 broader than long, apical segment more than twice as long as penultimate segment.

Neck of prothorax smooth anteriorly, rugulose posteriorly; basal foveae of scutellum contiguous, separated only by low median ridge; apex of scutellum with transverse row of minute punctures; propodeum with large basal lateral areas and triangular median area largely smooth; metapleuron coarsely rugose.

Petiole of abdomen with all three dorsal carinae prominent and complete, interspaces smooth; median sulcus of large tergite broad and short, hardly extending to end of basal third of segment, basal lateral sulci well defined and more than half as long as median sulcus.

Black; pedicel and base of antennal flagellum dark brown; legs brownish yellow except all coxae, which are black; wings weakly infuscated.

Male.--Essentially as in female; antennae as in figure 26, somewhat paler than those of female; malar space shorter than in female but still slightly more than half as long as eye.

Holotype female.--In Canadian National Collection.

Distribution.--Known only from the holotype, which is from Oxford Mills, Ontario, collected by C. Gibson 12-28 September 1973, and a male paratype from Stittsville, Ontario, taken by W. R. M. Mason 2 October 1963.

Psilus fortis, new species

(Figs. 10, 27, 37, 51)

This is very similar to P. viereckii (Brues), but the head is relatively larger, with broader and not receding temples, and the malar space in both

sexes is relatively longer; in addition, the male antennal flagellum is usually somewhat stouter, with the segments relatively shorter.

Female.--Length about 3.5 mm. In dorsal view head longer than wide and broadly rounded behind eyes, usually broadest behind middle; distance from lateral ocelli to posterior margin of head at least twice eye height; temples in lateral view fully twice as broad as eyes; malar space normally about 0.6 as long as eye; antennae as in figure 37; rim of antennal sockets sharply notched in middle and strongly though roundly descending each side of notch (fig. 10).

Thorax usually not or barely wider than head; neck of prothorax very finely transversely aciculate anteriorly, faintly rugulose posteriorly; basal foveae of scutellum confluent but usually with weak, dividing, median, longitudinal keel; apex of scutellum with row of minute, contiguous punctures or foveolae; mesopleuron not noticeably impressed; metapleuron strongly rugulose.

Petiole of abdomen less than twice as long as broad, all three dorsal carinae prominent and complete; median sulcus of large tergite extending beyond basal third of segment, basal lateral sulci well defined and usually more than half as long as median sulcus.

Black; antennae, including scapes, largely reddish; legs brownish yellow, coxae more or less darkened; wings somewhat infumated.

Male.--Head shape similar to that of female but eyes larger; distance from lateral ocelli to posterior margin of head much longer than eye height (usually in ratio of approximately 75:45); temples narrower than in female but still much broader than eyes; malar space usually about 0.4 as long as eye; rim of antennal sockets not so deeply notched as in female; second segment of antennal flagellum twice as long as first and a little longer than segments 3-11, most of which are less than twice as long as broad; mesopleuron weakly but distinctly obliquely dished medially.

Holotype female.--In Canadian National Collection.

Distribution.--The holotype was taken at Burnstown, Ontario, 27 August 1969 by J. Robillard; 15 paratypes are from Ontario, Massachusetts, New York, North Carolina, and Michigan. Also apparently belonging to this species, although not included in the type-series, are eight male specimens from New Mexico, Idaho, California, Yukon, and Alaska; in these the antennal scape is usually darker than in eastern specimens.

Psilus masneri, new species

(Figs. 11, 38, 52)

At least in the female (the male is unknown) this is very similar to P. aquilonius, new species. It differs especially in its smaller eyes and correspondingly broader temples, in its smooth prothoracic neck, and in the form of the elevated rim of the antennal sockets.

Female.--Length about 3.5 mm. Head in dorsal view somewhat longer than wide, sides gently rounded behind eyes; distance from lateral ocelli to posterior margin of head more than twice maximum eye diameter; temples in lateral view fully twice as broad as eyes; malar space about 0.75 as long as eye; elevated rim of antennal sockets shallowly but sharply notched at middle and descending rather strongly each side of notch (fig. 11); first segment of antennal flagellum not quite twice as long as wide, segments 4-9 transverse.

Neck of prothorax largely smooth and shiny; scutellum very weakly convex, apex with transverse row of minute, irregular punctures; propodeum rugulose, diverging carinae irregular but apparent; mesopleuron not impressed; metapleuron coarsely rugose and densely hairy.

Petiole of abdomen about 1.5 times as long as broad, all three dorsal longitudinal carinae well developed and complete; median sulcus of large tergite extending to end of basal third of segment, basal lateral sulci present though weak.

Black; antennal pedicel and basal flagellar segments usually brownish; coxae black, remainder of legs brownish to blackish.

Male.--Unknown.

Holotype female.--In Canadian National Collection.

Distribution.--Known only from three females taken at Constance Bay, Ontario, by L. Masner, the holotype 12-19 October 1973 and the two paratypes 28 September-12 October 1973.

Psilus masoni, new species

(Figs. 12, 28, 39, 53, 54)

This is very similar to P. microtornus (Kieffer), from which it may be distinguished as explained in the description of that species.

Female.--Length about 3 mm. Head in dorsal view appreciably longer than wide, sides parallel or weakly rounded; distance from lateral ocelli to posterior margin of head usually more than twice eye height; temples in lateral view usually twice as wide as eyes; malar space about two-thirds as long as eye; elevated rim of antennal sockets broadly rounded and with very weak but usually apparent median notch (fig. 12); antennae as in figure 39.

Thorax rather strongly depressed; neck of prothorax largely smooth, notaulices sharp and fine; apical margin of scutellum with row of minute, irregular, more or less confused foveolae; propodeum rugulose, usually without diverging keels setting off large median triangular area; mesopleuron shallowly obliquely dished medially; metapleuron densely rugulose.

Petiole of abdomen usually about 1.5 times as long as wide and bulging at middle, more or less finely granulose or weakly rugulose, especially posteriorly, and dorsal carinae, especially lateral pair, normally weak and incomplete; median sulcus of large tergite not or barely reaching end of basal third of segment, basal lateral sulci present but very short.

Black; antennae usually entirely black; legs blackish, trochanters usually as dark as femora.

Male.--Head relatively shorter and broader than in female; eyes larger and temples correspondingly narrower although still clearly wider than eyes; malar space about half as long as eye; antennae as in figure 28; antennal flagellum and legs beyond coxae sometimes yellowish; otherwise essentially as in female.

Holotype female.--In Canadian National Collection.

Distribution.--The holotype, five female paratypes, and seven male paratypes were taken at Chimo, Quebec, 17-18 August 1959 by W. R. M. Mason. In addition to the type-series, I have seen specimens from localities in New Brunswick, Quebec, Ontario, Manitoba, Alberta, British Columbia, and Yukon Territory in Canada and in the United States from New Hampshire, North Carolina, Colorado, and Alaska.

Psilus microtomus (Kieffer)

(Figs. 13, 29, 40, 55, 64)

Galesus microtomus Kieffer, 1906: 285. Male.

Psilus microtomus (Kieffer), Muesebeck and Walkley, 1951: 675.

This is most similar to P. masoni, new species. It differs especially in the structure of the propodeum and the abdominal petiole; the propodeum has very prominent diverging carinae delimiting a large median triangular area and two large basal lateral areas, all of them smooth and shiny, and the abdominal petiole is relatively slender with nearly parallel sides and with all three dorsal carinae strong and complete; the neck of the prothorax is largely finely sculptured (smooth in masoni).

Male.--Length about 3 mm. Head in dorsal view about as wide as long, narrowing only faintly behind eyes; distance from lateral ocelli to posterior margin of head about 1.5 times eye height; temples in lateral view clearly wider than eyes; malar space just about half as long as eye; elevated rim of antennal sockets broadly rounded and with weak median notch (fig. 13); antennae of type broken, 12 segments remaining (fig. 29).

Neck of prothorax weakly transversely striate anteriorly, finely rugulose posteriorly; apical margin of slightly convex scutellum with row of minute, contiguous punctures; propodeum as indicated previously; mesopleuron shallowly but distinctly obliquely dished medially; metapleuron with few prominent irregular rugae, areas enclosed by them very weakly sculptured.

Petiole of abdomen twice as long as wide, practically parallel-sided, all three dorsal carinae prominent and complete, interspaces smooth and shiny; median sulcus of large tergite not or hardly reaching end of basal third of segment, basal lateral sulci represented by short, shallow, poorly defined impressions.

Black; antennae completely black; coxae black, otherwise legs more or less piceous.

Female.--Head in dorsal view a little longer than wide, parallel-sided; distance from lateral ocelli to posterior margin of head twice eye height; temples in lateral view twice as wide as eyes; malar space about 0.6 as long as eye; antennae as in figure 40; antennal flagellum piceous; otherwise as in male.

Holotype male.--In California Academy of Sciences.

Distribution.--The holotype is from San Mateo County, Calif., collected by C. F. Baker; the collection of the University of California at Riverside has a female specimen, collected near Hayward, Calif., 28 February 1937, which I am convinced is this species.

Psilus nidicola, new species

(Figs. 14, 30)

In the subtruncate and weakly notched rim of antennal sockets and in the relatively long first antennal flagellar segment, this resembles P. dissidens, new species. It is readily distinguished from that species, however, by its smooth vertex, relatively shorter malar space, different abdominal petiole, and presence of well-developed basal lateral sulci on the large abdominal tergite; it is also noticeably larger.

Male.--Length about 3.5 mm. Head in dorsal view slightly longer than wide, rounding off very gently behind eyes; distance from lateral ocelli to posterior margin of head nearly 1.5 times eye height; temples in lateral view much wider than eyes; malar space about 0.4 as long as eye; elevated rim of antennal sockets subtruncate and without median notch or with very faint one (fig. 14); first segment of antennal flagellum slender and more than half as long as second, which is constricted at base and somewhat broadened near middle and nearly as long as apical segment, segments 3-11 about twice as long as broad, and all segments very weakly sculptured and very shiny.

Prothoracic neck strongly longitudinally rugulose; notaulices fine, sharp; scutellum weakly convex, basal foveae large and contiguous; propodeum with narrow triangular median area and large lateral areas all more or less rugulose; mesopleuron very weakly obliquely impressed medially; metapleuron finely rugulose.

Petiole of abdomen with all three dorsal longitudinal carinae well developed and complete; median sulcus of large tergite extending to about end of basal third of segment, basal lateral sulci well developed, half as long as median sulcus.

Black; pedicel and flagellum of antennae uniformly light brown; legs yellowish except coxae, which are black.

Female.--Unknown.

Holotype male.--In collection of Illinois Natural History Survey.

Distribution.--Known only from three male specimens (one the holotype) obtained from the nest of a woodchuck at Louisiana, Mo., 1 October 1942 by Robert Traub.

Psilus pusillus, new species

(Figs. 15, 41, 56)

This is a very small, slender species that is superficially rather similar to P. dissidens, new species, but it lacks the fine sculpture of the vertex, which is characteristic of dissidens, the eyes are even smaller than in that species, and the malar space is relatively much longer.

Female.--Length about 2.5 mm. Head in dorsal view strongly elongate, considerably longer than broad and parallel-sided (fig. 56); distance from lateral ocelli to posterior margin of head nearly three times maximum eye diameter; temples in lateral view more than twice as wide as eyes; malar space about as long as eye; elevated rim of antennal sockets smoothly and broadly rounded with only very weak median notch (fig. 15); antennae gradually clavate, pedicel much longer than first flagellar segment, apical segment very large, more than twice as long as penultimate segment (fig. 41).

Thorax barely wider than head and noticeably depressed; notaulices very fine; basal foveae of scutellum small and strongly oblique, apical margin with row of minute punctures; propodeum smooth and shiny in basal lateral areas, otherwise finely rugulose, median triangular area poorly delimited; metapleuron finely rugulose punctate.

Petiole of abdomen with dorsal carinae only faintly indicated; median sulcus of large tergite extending a little beyond basal third of segment, basal lateral sulci not developed.

Black; antennal flagellum largely brown, scape blackish; legs brown with coxae black and femora noticeably darkened.

Male.--Unknown.

Holotype female.--USNM 76418.

Distribution.--Known only from two female specimens, one the holotype, collected at Slave Lake, Alberta, in 1924 by Owen Bryant, the holotype 15 August, the paratype 17 August.

Psilus quebecensis (Provancher)

(Fig. 16)

Galesus Quebecensis Provancher, 1881: 260. Male.

Galesus Quebecensis Provancher, 1883: 559 (again described as new).

Galesus quebecensis Provancher, Gahan and Rohwer, 1917: 427 (lectotype designated).

Psilus quebecensis (Provancher), Muesebeck and Walkley, 1951: 675.

Psilus quebecensis (Provancher), Masner, 1969: 779.

Through the kindness of J. M. Perron, Laval University, Quebec, I have had the privilege of studying the lectotype of this species. The following description is based on that specimen. P. quebecensis is rather similar to P. angusticeps, new species, but it may be distinguished as pointed out in the description of that species.

Male.--Length about 3.8 mm. In dorsal view head slightly longer than wide and narrowing very gradually behind eyes; distance from lateral ocelli to posterior margin of head much greater than maximum diameter of eyes (in ratio of 70:50); in lateral view temples about 1.5 times as wide as eyes; malar space about three-fifths as long as eye; clypeus strongly convex, a pronounced impression at its base; labrum largely rugulose striate; elevated rim of antennal sockets broadly and very gently rounded and with faint notch medially (fig. 16); first segment of antennal flagellum slightly longer than wide, not quite half as long as second, segments 3-11 subequal and about twice as long as wide, second and apical segments a little longer.

Mesoscutum destroyed by pin. Disk of scutellum rather flat, slightly broader than long, and with row of small punctures across apex; propodeum with diverging carinae well developed, largely rugulose in large lateral areas and strongly transversely rugose in median triangular area; mesopleuron shallowly but distinctly obliquely dished from lower anterior corner to upper posterior corner; metapleuron closely rugose but densely covered with pale hair.

Petiole of abdomen less than twice as long as broad, broadest at middle, sides rounded, all three dorsal carinae well developed and complete, median one at least as strong as others; median sulcus of large tergite not extending beyond basal third of segment, basal lateral sulci present and about half as long as median sulcus.

Black; scape of antenna dark brown, flagellum light brown except first segment, which, together with pedicel, is slightly darker; wings hyaline (possibly faded); tegulae brownish yellow; coxae blackish, remainder of legs (hindlegs missing beyond coxae) brown, femora and trochanters a little darker, tibiae and tarsi lighter.

Female.--Unknown.

Lectotype male.--In Laval University, Quebec.

Distribution.--Known only from the lectotype (other specimens treated as this species by Provancher are not the same), which is from Quebec.

Psilus shannoni, new species

(Figs. 17, 31, 57)

This is very similar to P. fortis, new species, but it is distinguished by its much longer malar space and by the different form of the elevated rim of antennal sockets.

Male.--Length about 4 mm. In dorsal view head just about as wide as long and not narrowing behind eyes; distance from lateral ocelli to posterior

margin of head much greater than maximum eye diameter (in ratio of 90:50); in lateral view temples fully 1.5 times as wide as eyes; malar space considerably more than half as long as eye (in ratio of 35:45); elevated rim of antennal sockets sharply though not deeply notched medially and sloping very gently from notch (fig. 17); second segment of antennal flagellum fully twice as long as first and clearly longer than segments 3-11 (fig. 31), which are not quite twice as long as broad.

Notaulices sharply impressed, not strongly convergent; basal foveae of scutellum unusually large and separated only by a low median carina; apex of scutellum with transverse row of punctures; diverging keels of propodeum well developed, median triangular area and basal lateral areas largely smooth; mesopleuron very weakly obliquely dished medially; metapleuron coarsely rugose reticulate.

Petiole of abdomen twice as long as broad, all three dorsal carinae strong and complete; median sulcus of large tergite not quite reaching end of basal third of segment, basal lateral sulci well defined and about half as long as median sulcus.

Black; antennae entirely black; legs uniformly brownish yellow except all coxae, which are completely black; wings a little infumated.

Female.--Unknown.

Holotype male.--USNM 76417.

Distribution.--Known only from the holotype, which was collected in Virginia near Plummers Island, Md., 22 February 1915 by R. C. Shannon.

Psilus singularis, new species

(Fig. 18)

As indicated in the description of P. eximius, new species, singularis has a similar unusually deeply cleft rim of the antennal sockets, but it differs in its much darker legs, much shorter malar space, and narrower temples.

Female.--Length about 3.3 mm. In dorsal view head a little longer than broad and parallel-sided; distance from lateral ocelli to posterior margin of head twice maximum eye diameter; in lateral view temples less than twice as broad as eyes; malar space barely half as long as eye; antennae stout, first flagellar segment about 1.5 times as long as broad at apex, second about as broad as long, segments 3-9 transverse, apical segment fully twice as long as penultimate segment; elevated rim of antennal sockets deeply cleft and descending sharply from each side of incision (fig. 18).

Notaulices not strongly convergent; disk of scutellum gently convex, broader than long, basal foveae oval and oblique, apical margin with row of small, contiguous foveolae; metapleuron very densely covered with appressed hair, which conceals sculpture.

All three dorsal carinae of abdominal petiole strong and complete; median sulcus of large tergite extending well beyond basal third of segment, basal lateral sulci sharply defined and unusually long, fully two-thirds as long as median sulcus.

Black; antennae entirely black; all coxae and femora completely black, tibiae also largely darkened; wings weakly discolored.

Male.--Unknown.

Holotype female.--In collection of Henry Townes.

Distribution.--Known only from the holotype, which is labeled "Portal, Ariz. ix.7.1974. H. & M. Townes."

Psilus vicinus, new species

(Figs. 19, 32, 58)

This is very similar to P. microtomus (Kieffer), from which it appears to differ significantly only in its relatively shorter malar space and usually paler legs. It is an eastern species, whereas microtomus is known only from California.

Male.--Length about 2.8 mm. In dorsal view head hardly as wide as long, narrowing roundly, and very slightly behind eyes; distance from lateral ocelli to posterior margin of head much greater than length of eyes (in ratio of 70:40); in lateral view temples clearly wider than eyes; malar space about 0.35 as long as eye; elevated rim of antennal sockets subtruncate, with very small median notch (fig. 19); first segment of antennal flagellum hardly half as long as second, which is a little longer than segments 3-11, all of the latter about twice as long as broad (fig. 32).

Neck of prothorax finely rugulose; basal foveae of scutellum very large and weakly separated; disk of scutellum convex, its apex with transverse row of small punctures, which are in part confluent; propodeum with prominent, strongly divergent carinae setting off large basal areas and large triangular median area, all of which are largely smooth and shining; mesopleuron medially shallowly obliquely dished.

Petiole of abdomen virtually parallel-sided, about twice as long as broad, all three dorsal carinae well developed and complete, interspaces smooth; median sulcus of large tergite not extending beyond basal third of segment, basal lateral sulci represented by short, shallow, very poorly defined impressions.

Black; antennae with scape black, pedicel and flagellum usually dark brown; legs of holotype brownish yellow, with all coxae black, but sometimes femora are more or less darkened; wings subhyaline.

Female.--Unknown.

Holotype male.--In Canadian National Collection.

Distribution.--The holotype and one paratype are labeled "Constance Bay, Ont. 28.ix-12. 1973, L. Masner;" two paratypes are from Quebec, one is from New York and one from Michigan.

Psilus viereckii (Brues)

(Figs. 20, 21, 33, 42, 59, 60)

Galesus viereckii Brues, 1905: 187. Male.

Psilus viereckii (Brues), Muesebeck and Walkley, 1951: 675.

This most closely resembles P. fortis, new species, from which it appears to differ particularly as explained in the description of that species.

Male.--The following description is based largely on the holotype. Length about 3.5 mm. In dorsal view head about as broad as long, narrowing behind eyes; distance from lateral ocelli to posterior margin of head only a little greater than maximum diameter of eyes; in lateral view temples not or only slightly wider than eyes; malar space usually about one-third as long as eye; second segment of antennal flagellum twice as long as first, most of segments 3-11 twice as long as broad, apical segment narrowly conical and somewhat longer than rest; elevated rim of antennal sockets sharply though shallowly notched medially (fig. 21).

Neck of prothorax finely transversely striate anteriorly, weakly rugulose posteriorly; disk of scutellum very weakly convex, its apical margin with even row of contiguous minute punctures or foveolae; propodeum with large triangular median area and large basal lateral areas largely smooth and shining; mesopleuron weakly obliquely dished medially; metapleuron closely rugose.

Petiole of abdomen usually more than twice as long as broad, all three dorsal carinae developed and complete although median carina is often very weak; median sulcus of large tergite extending beyond basal third of segment, basal lateral sulci shallow and broad but distinct and half as long as median sulcus.

Black; antennae nearly always with scape brownish yellow; flagellum sometimes largely yellowish but more often brown; tegulae usually brownish yellow; legs brownish yellow to yellow but coxae nearly always darkened, sometimes black.

Female.--In dorsal view head a little longer than wide, sides subparallel or receding a little (fig. 59); distance from lateral ocelli to posterior margin of head about 1.5 times maximum eye diameter; in lateral view temples less than twice as broad as eyes; malar space about half as long as eye; antennae rather strongly clavate and largely brownish yellow, including scape, but apical segments usually darkened.

Holotype male.--USNM 66274.

Distribution.--The holotype was collected at Colebrook, Conn., 21 July 1905 by H. L. Viereck. I have identified as this species numerous specimens

(both sexes) from localities in New Brunswick, Quebec, Ontario, Manitoba, and British Columbia in Canada and in the United States from Maine, New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, North Carolina, Georgia, Ohio, Michigan, Minnesota, and Washington.

Genus COPTERA Say

Coptera Say, 1836: 281. (Type-species: Coptera polita Say. By monotypy.)
Schizogalesus Kieffer, 1911: 832, 833. (Type-species: Galesus (Schizogalesus)
punctatus Kieffer. By designation of Muesebeck and Walkley, 1951: 675.)
New synonymy.

Length approximately 2-5 mm. In dorsal view head ranging from clearly longer than broad and parallel-sided to broader than long and narrowing strongly behind; occiput horizontal, convex, usually weakly, irregularly carinately margined posteriorly; eyes with a few scattered long hairs; anterior rim of antennal sockets usually not prominently elevated as in Psilus; antennae of female 12-segmented and more or less clavate, those of male 14-segmented and filiform or moniliform, first flagellar segment of male antennae never shorter than second; notaulices sharply impressed, sometimes greatly broadened, especially posteriorly; scutellum with two large basal foveae and also an elongate-oval fovea at each side of disk, apex of scutellum nearly always with a pair of punctures that may be large and contiguous or relatively small and well separated; propodeum normally with two prominent carinae that arise at basal middle and diverge strongly caudad but sometimes not distinct and then surface strongly rugose; mesopleuron sometimes flat but often more or less distinctly, shallowly dished medially; forewing of female always, that of male very rarely, with a narrow but deep apical incision, and subcosta always incomplete (figs. 2, 2, a); femora pedunculate, broadened on apical two-thirds; petiole of abdomen usually with three dorsal longitudinal carinae medially; second tergite extending nearly to apex of abdomen, and with a median longitudinal sulcus extending from base usually to near middle of segment or a little beyond and becoming a delicate groove posteriorly, sometimes also with two basal lateral sulci that are short and weakly defined and often represented by short shallow impressions or by foveae; remaining tergites almost completely retracted under second. Species black, with wings usually more or less clouded and legs and antennae ranging from yellow to black.

According to presently available information, species of Tephritidae are the most common hosts of species of Coptera, but members of other dipterous families are also authentically recorded as hosts, including Psilidae, Muscidae, Milichiidae, Otitidae, Drosophilidae, and Lonchaeidae. An African species, Coptera silvestrii (Kieffer), is a parasite of the Mediterranean fruit fly (Ceratitidis capitata (Wiedemann)) and other species of Ceratitidis. In 1913 an attempt was made to introduce it into Hawaii, but establishment was apparently unsuccessful. Several of the species described as new here are parasites of pest species of Rhagoletis.

KEY TO FEMALES OF NEARCTIC SPECIES OF COPTERA SAY

1. Malar space at least half as long as maximum eye diameter..... 2
Malar space clearly less than half as long as maximum eye diameter. 16
2. Notaulices greatly broadened so that middle lobe of mesoscutum at apex is not or barely half as wide as lateral lobes (figs. 128, 129)..... 3
Notaulices not so greatly broadened..... 4
3. All coxae black; mesopleuron flat; body length about 2.5 mm.....
.....pacifica, new species
Coxae yellowish brown, hindcoxae sometimes darkened; mesopleuron obliquely dished medially; body length 3-3.3 mm.....
.....occidentalis, new species
4. All coxae black or piceous..... 5
Coxae yellow, rarely hindcoxae darkened basally..... 11
5. Head in dorsal view clearly longer than wide..... 6
Head in dorsal view not longer than wide..... 9
6. Pedicel and basal segments of antennal flagellum yellowish brown; femora yellow.....sulcata, new species
Antennae completely black or flagellum black basally and brown apically; femora usually piceous to black..... 7
7. Large abdominal tergite with well-defined basal lateral longitudinal sulci..... 8
Large abdominal tergite without basal lateral sulci, with only small, shallow; poorly defined basal lateral impressions.....
.....montana, new species
8. Thorax strongly compressed dorsoventrally; median sulcus of large tergite extending to beyond middle of segment; paired punctures at apex of scutellum small and widely separated.....atricornis (Ashmead)
Thorax not especially compressed dorsoventrally; median sulcus of large tergite not reaching middle of segment; paired punctures at apex of scutellum large and close together.....
.....dissimilis, new species (in part)
9. Antennae short, first segment of flagellum not twice as long as broad at apex, segments 5-9 much broader than long; length about 3 mm.....evansi, new species
Antennae more elongate, first segment of flagellum twice as long as broad at apex, preapical segments not or barely broader than long; length about 4 mm..... 10
10. All femora black; antennae completely black.....aequalis, new species
Legs beyond coxae yellowish brown; pedicel and basal segments of antennal flagellum brownish.....strauziae, new species
11. Occipital margin, on each side of head, produced into minute toothlike projection (fig. 109); median carina of abdominal petiole wanting or greatly reduced.....denticulata, new species
Occipital margin with no indication of such toothlike projections; median carina of abdominal petiole well developed, at least to beyond middle..... 12

12. A tiny species, barely 2 mm long; distance from lateral ocelli to posterior margin of occiput twice maximum eye diameter; pronotum without usual row of punctures bordering posterior margin.....
.....pholeomyiae, new species
Larger; distance from lateral ocelli to posterior margin of occiput not nearly twice maximum eye diameter; pronotum with distinct row of punctures bordering posterior margin..... 13
13. Head in dorsal view wider than long and narrowing behind eyes..... 14
Head in dorsal view at least as long as wide and parallel-sided behind eyes..... 15
14. Dorsum of head weakly but noticeably raised keellike down middle; occipital carina strong and angulate at middle where keellike line meets it.....sublata, new species
Dorsum of head evenly convex; occipital carina weak or indistinct and not angulate at middle.....mellipes, new species
15. Antennae thickening very gradually to apices, none of flagellar segments broader than long (fig. 99); paired punctures at apex of scutellum usually very small and separated by more than diameter of one of them.....polita Say
Antennae more strongly clavate, preapical segments clearly wider than long (fig. 100); paired punctures at apex of scutellum rather large and more narrowly separated.....pomonellae, new species
16. Anterior rim of antennal sockets strongly raised and with deep median cleft (fig. 66).....divisa, new species
Anterior rim of antennal sockets not prominently raised and with only very shallow median notch..... 17
17. Head in dorsal view narrowing behind eyes; eyes in lateral view wider than temples.....distans, new species
Head in dorsal view parallel-sided, or nearly so, behind eyes; eyes in lateral view not wider than temples..... 18
18. Legs, including all coxae, yellow..... 19
Coxae darkened..... 22
19. Notaulices strongly broadened posteriorly so that middle lobe of mesoscutum is greatly narrowed at apex.....chylizae, new species
Notaulices normal..... 20
20. Eyes unusually short and broad, subcircular (fig. 125); all three dorsal carinae of abdominal petiole strong and complete; wings somewhat infumated.....townesi, new species
Eyes more elongate; median carina of abdominal petiole incomplete; wings virtually hyaline..... 21
21. Large abdominal tergite with well-developed basal lateral longitudinal sulci; mesopleuron obliquely dished medially.....
.....pilosa (Ashmead) (in part)
Large abdominal tergite without distinct basal lateral sulci; mesopleuron not dished medially.....cingulatae, new species
22. Median carina of abdominal petiole strong and complete..... 23
Median carina of abdominal petiole incomplete..... 24
23. Legs, except coxae, yellowish brown; in dorsal view head not or barely longer than broad; mesopleuron weakly obliquely dished medially; length about 3.5 mm.....tersa, new species
Legs black; in dorsal view head considerably longer than broad; mesopleuron not impressed medially; length about 2.8 mm.....
.....dissimilis, new species (in part)

24. Mesopleuron obliquely dished medially; median sulcus of large abdominal tergite not reaching middle of segment..... 25
 Mesopleuron flat; median sulcus of large abdominal tergite extending to middle of segment.....punctiger (Fouts)
 25. Large abdominal tergite without basal lateral sulci; notaulices noticeably broadened at posterior ends.....wasbaueri, new species
 Large abdominal tergite with basal lateral sulci; notaulices not broadened at posterior ends.....pilosa (Ashmead) (in part)

KEY TO MALES OF NEARCTIC SPECIES OF COPTERA SAY

1. Forewing with narrow but deep incision at apex; head in dorsal view longer than broad..... 2
 Forewing at most with very shallow notch or weak emargination at apex; head in dorsal view not longer than broad..... 3
 2. All coxae black; length about 3 mm.....aliena, new species
 All coxae yellow; length about 2 mm.....pholeomyiae, new species
 3. Second segment of antennal flagellum strongly constricted toward base, somewhat broadened and more or less angulate on lower side above constriction (figs. 74, 76)..... 4
 Second segment of antennal flagellum not angulate, more or less cylindrical..... 9
 4. Notaulices abnormally widened, especially toward posterior ends (fig. 128) so that middle lobe of mesoscutum at apex is no wider than apical width of notaulices..... 5
 Notaulices normal..... 6
 5. Basal lateral sulci of large abdominal tergite well developed (eastern species).....chylizae, new species
 Basal lateral sulci of large abdominal tergite not developed (Pacific coast species).....occidentalis, new species
 6. Apical segment of antennal flagellum decidedly longer than first; three or four preapical segments three times as long as broad; all femora yellow.....angulata, new species
 Apical segment of antennal flagellum about as long as first; three or four preapical segments not or barely twice as long as broad; all femora more or less darkened..... 7
 7. Large abdominal tergite with well-developed basal lateral sulci....
tersa, new species
 Large abdominal tergite without distinct basal lateral sulci..... 8
 8. Malar space fully half as long as eye; abdominal petiole 2.5 times as long as wide; propodeum rugose reticulate without diverging carinae defining large median triangular area....huachuca, new species
 Malar space not half as long as eye; abdominal petiole less than twice as long as wide; propodeum with well-developed diverging carinae setting off large median triangular area....montana, new species
 9. Antennae short, at least segments in apical third of flagellum not or barely longer than broad (figs. 75, 78, 81)..... 10
 Antennae not as above; flagellar segments more elongate..... 13
 10. Legs, including all coxae, honey yellow.....mellipes, new species
 Coxae darkened and often femora piceous to black..... 11

11. Anterior rim of antennal sockets strongly elevated and deeply cleft medially (fig. 66).....divisa, new species
Anterior rim of antennal sockets not prominent and with only very shallow median emargination..... 12
12. Large abdominal tergite with well-developed basal lateral sulci; most flagellar segments of antennae not longer than broad (fig. 78); mesopleuron shallowly but distinctly obliquely dished medially.....pilosa (Ashmead)
Large abdominal tergite with weak, very short, and indistinctly defined basal lateral sulci; most flagellar segments longer than broad (fig. 81); mesopleuron not dished medially.....punctiger (Fouts)
13. All coxae black or piceous, or at least noticeably darker than remaining parts of legs..... 14
Coxae yellow or reddish yellow, rarely hindcoxae darkened basally.. 19
14. Large abdominal tergite with well-defined basal lateral sulci..... 15
Large abdominal tergite without developed basal lateral sulci, at most with shallow, poorly defined impressions near basal lateral angles..... 16
15. Forewing with small but distinct, sharp notch at apex; flagellar segments of antennae not so elongate.....atricornis (Ashmead)
Forewing without apical notch; most flagellar segments of antennae more than twice, apical segment about four times, as long as broadsulcata, new species
16. Mesopleuron clearly obliquely dished from lower anterior angle to upper posterior angle; eyes in lateral view wider than temples; length about 2 mm.....wasbaueri, new species
Mesopleuron not noticeably dished; eyes in lateral view not wider than temples; length 3-4 mm..... 17
17. Legs, except for darkened coxae, brownish yellow..... 18
Legs much darker; all femora completely black.....aequalis, new species
18. Length about 3 mm; median carina of abdominal petiole incomplete; temples barely as wide as eyes; antennae rather loosely hairy....
.....evansi, new species
Length about 4 mm; median carina of abdominal petiole usually complete; temples broader than eyes; antennal flagellum densely covered with short, subappressed hairs..strauziae, new species (in part)
19. Notaulices incomplete, not attaining posterior margin of mesoscutum (fig. 126).....abbreviata, new species
Notaulices complete..... 20
20. Posterior margin of head, each side, with minute toothlike projection in occipital carina (fig. 109); median carina of abdominal petiole absent or very short (fig. 131).....denticulata, new species
Posterior margin of head without such formations; median carina of abdominal petiole well developed at least to beyond middle..... 21
21. Dorsum of head weakly but noticeably elevated keellike down middle; occipital carina angulate at middle; all flagellar segments of antennae at least three times as long as broad (fig. 83).....
.....sublata, new species
Dorsum of head evenly convex; occipital carina usually weak and never angulate at middle; flagellar segments of antennae usually not so greatly lengthened..... 22

22. Temples in lateral view at least as broad as eyes (fig. 123).....
strauziae, new species (in part) 23
 Temples in lateral view not as broad as eyes.....
23. Eyes relatively very large, in lateral view twice as wide as temples; paired punctures at apex of scutellum usually small and well separated; notaulices usually somewhat broadened at posterior ends so that middle lobe of mesoscutum is narrowed at apex; length about 2.5 mm.....polita Say
 Eyes not twice as wide as temples; paired punctures at apex of scutellum larger and close together; notaulices normal; length 3-4 mm..... 24
24. Eyes unusually short and broad, subcircular; malar space very short, less than one-fourth as long as eye.....townesi, new species
 Eyes normal; malar space not so short..... 25
25. Antennae evenly slender, all segments of flagellum more than twice as long as broad, apical segment at least three times as long as broad; wings hyaline or very nearly so..... 26
 Antennae not especially slender, flagellum usually thinning a little from base to apex and usually some flagellar segments less than twice as long as broad, apical segment usually about as long as first and not three times as long as broad; wings somewhat infumated..... 27
26. Hindcoxae darkened basally; antennae and labrum black or blackish; polished disk of scutellum very small, not nearly twice as wide as unusually large lateral foveae.....tenuicornis, new species
 All coxae completely yellow; antennae usually largely yellow or yellowish brown, never entirely black; labrum brownish yellow; polished disk of scutellum at least twice as broad as lateral foveae.....cingulatae, new species
27. Antennal flagellum strongly rugulose and densely covered with short subappressed hair; median carina of abdominal petiole nearly always complete; paired punctures at apex of scutellum large, usually contiguous; distance from lateral ocelli to posterior margin of occiput shorter than eye height; malar space less than 0.3 as long as eye.....distans, new species
 Antennal flagellum more loosely hairy; median carina of abdominal petiole usually incomplete; paired punctures at apex of scutellum moderate, not contiguous; distance from lateral ocelli to posterior margin of occiput equal to eye height; malar space usually about 0.4 as long as eye.....pomonellae, new species

DESCRIPTIONS OF COPTERA SPECIES

Coptera abbreviata, new species

(Figs. 68, 126)

This seems to be most similar to C. pomonellae, new species, but it may be immediately distinguished by its shortened notaulices, which do not reach the posterior margin of the mesoscutum, and by the strongly obliquely dished mesopleuron.

Male.--Length 3.2 mm. Head in dorsal view about as long as wide, without punctures above and not strongly declivous behind as in pomonellae; distance from lateral ocelli to posterior margin of occiput longer than eyes; posterior margin of occiput weakly indicated; temples practically parallel-sided, in lateral view narrower than eyes; malar space one-third as long as eye; flagellar segments rather thick and except for first and last segments not twice as long as broad (fig. 68).

Neck of prothorax rugulose; notaulices very fine and not reaching posterior margin of mesoscutum (fig. 126); disk of scutellum rather large, convex, its apex with pair of very small, weak, well-separated punctures; diverging carinae of propodeum well developed, triangular area between them largely smooth; mesopleuron conspicuously obliquely dished medially from lower anterior corner to upper posterior corner; metapleuron weakly hairy, the coarse rugose sculpture not obscured; anterior wings weakly, broadly notched at apices.

Petiole of abdomen less than twice as long as broad, all three dorsal carinae developed and complete though rather weak; median sulcus of large tergite extending to beyond middle of segment, basal lateral sulci represented by short, very weak, and shallow basal impressions.

Black; pedicel and flagellum of antennae light brown; legs, including all coxae, brownish yellow; wings somewhat infumated.

Female.--Unknown.

Holotype male.--In collection of University of California, Riverside.

Distribution.--Known only from the holotype, which was collected in the San Bernardino Mts. of California by P. H. Timberlake 4 July 1935.

Coptera aequalis, new species.

Structurally this is so similar to C. strauziae, new species, that I suspect it may prove to be only a color variant of that form, but it seems advisable to name it since intermediates have not been seen.

Female.--Length 4 mm. In dorsal view head as long as wide; distance from lateral ocelli to very weakly carinate occipital margin much longer than eyes (in ratio of 70:45); temples gently rounded, not receding, in lateral view much broader than eyes; malar space about 0.7 as long as eye; antennae stout, first flagellar segment about twice as long as broad at apex, segments 5-9 a little broader than long, apical segment hardly twice as long as penultimate segment.

Neck of prothorax smooth; notaulices strong but not broadened at apices; paired punctures at apex of scutellum very large, contiguous; diverging carinae of propodeum prominent; mesopleuron only very faintly obliquely dished medially; metapleuron densely hairy.

Petiole of abdomen about 1.5 times as long as broad, all three dorsal

carinae strong, median one not quite complete, fading at apex; median sulcus of large tergite extending to middle of segment, basal lateral sulci represented by short, broad, and poorly defined impressions.

Black; antennae completely black; all coxae and femora completely black, trochanters, tibiae, and tarsi brownish piceous; wings somewhat infumated.

Male.--In dorsal view head a little wider than long and narrowing roundly behind eyes; distance from lateral ocelli to posterior margin of occiput barely longer than eyes; malar space not quite half as long as eye; in lateral view temples about as wide as eyes; flagellar segments 1-11 of antennae subequal in length, about twice as long as broad, apical segment a little longer than others.

Holotype female and paratype male.--In collection of H. E. Evans.

Distribution.--Known only from those two specimens, which were collected by H. E. Evans 23-31 August 1974 at Fort Collins, Colo.

Coptera aliena, new species

This is distinct from all other Nearctic species in which the male is known in combining a very slender form, long head with small eyes, wide temples and long malar space, absence of paired punctures at apex of scutellum, smooth abdominal petiole, and sharply incised apices of anterior wings of the male.

Male.--Length 3 mm or slightly more. In dorsal view head longer than wide, surface smooth without punctures; distance from lateral ocelli to posterior margin of occiput much greater than eye length (in ratio of 55:35); temples virtually parallel, in lateral view much wider than eyes; malar space half as long as eye; basal segment of antennal flagellum about twice as long as wide and apical segment more than twice, remaining segments subequal, less than twice as long as wide.

Notaulices fine, strongly convergent, so that median lobe of mesoscutum is hardly half as wide at apex as lateral lobes; scutellum without the usual paired punctures at apex, sometimes with incomplete transverse row of faint, minute, irregular foveae just before apex; metapleuron feebly sculptured, in part virtually smooth; anterior wings sharply and deeply incised at apex.

Petiole of abdomen slender, smooth and polished, all three dorsal longitudinal carinae largely erased and represented only by short and weak basal stubs; median sulcus of large tergite fine and extending to a little beyond middle of segment, basal lateral sulci not developed.

Black; antennae black; all coxae black, otherwise legs brown with femora and sometimes apices of hindtibiae darker than remaining parts.

Female.--Unknown.

Holotype male.--In the collection of Henry Townes.

Distribution.--Known only from the type-series, which consists of six males (one, the holotype) collected in May 1975 (holotype on 10 May) at Cumberland, Ontario, by L. Ling; and one male without antennae (in the collection of Illinois State Natural History Survey), which was taken at Elgin, Ill., 25 April 1941 by H. H. Ross and B. D. Burks.

Coptera angulata, new species

Known only in the male sex and very similar to C. polita Say, this species may be distinguished from polita by the form of the second segment of the antennal flagellum, which is strongly constricted at the base and conspicuously angled above the constriction. In addition, the paired punctures at the apex of the scutellum are very large and close together, whereas they are usually small and well separated in polita, and the temples are relatively broader.

Male.--Length about 3 mm. Head in dorsal view slightly broader than long; distance from lateral ocelli to posterior margin of occiput just about as long as eyes; temples receding directly from eyes, in lateral view about as wide as eyes; malar space usually about one-third as long as eye; antennae slender, flagellar segments 3-11 cylindrical and usually more than twice as long as broad, apical segment usually about four times as long as broad, second segment shorter than first and noticeably angled above basal constriction.

Neck of prothorax weakly rugulose; notaulices not broadened posteriorly; scutellum very weakly convex, paired punctures at apex large and close together; mesopleuron not noticeably dished medially; metapleuron densely hairy.

Petiole of abdomen with all three dorsal carinae strong and complete; median sulcus of large tergite not reaching middle of segment and basal lateral sulci represented only by very short, shallow, smooth, poorly defined impressions.

Black; pedicel of antennae light brown, flagellum brown to piceous; legs brownish yellow, coxae brownish to piceous, posterior pair darkest; wings subhyaline.

Female.--Unknown.

Holotype male.--USNM 76419.

Distribution.--The holotype and one paratype are from Plummers Island, Md., the holotype collected 26 October 1963 by K. V. Krombein, the paratype 29 August 1971 by K. V. Krombein and P. D. Hurd; three additional paratypes are from Marmora, Ontario, and one is from Babylon, Long Island, N.Y.

Coptera atricornis (Ashmead), new combination

(Figs. 69, 88, 105, 106, 107, 108, 127, 130)

Galesus atricornis Ashmead, 1893: 408, 409. Female.

Galesus texanus Ashmead, 1893: 409, 411. Male. New synonymy.

Psilus atricornis (Ashmead), Muesebeck and Walkley, 1951: 675.

Psilus texanus (Ashmead), Muesebeck and Walkley, 1951: 675.

This seems to be most similar to C. montana, new species, but it may be readily distinguished by the differences mentioned in the description of that form.

Female.--Length about 3 mm. In dorsal view head longer than wide; distance from lateral ocelli to posterior margin of occiput much longer than eyes (in ratio of 55:35); temples parallel and in lateral view considerably wider than eyes; malar space more than half as long as eye; antennal flagellum thickening gradually to apex, not strongly clavate, basal four segments longer than broad (fig. 88).

Thorax markedly compressed dorsoventrally, almost twice as wide as deep; notaulices narrow; scutellum flat or weakly convex, paired punctures at apex of scutellum normally very small and widely separated; strongly diverging carinae of propodeum prominent, triangular area between them largely smooth; mesopleuron shallowly but distinctly obliquely dished medially; metapleuron coarsely rugose reticulate, closely hairy.

Petiole of abdomen about 1.5 times as long as wide, all three dorsal carinae well developed and complete (fig. 130); median sulcus of large tergite extending to a little beyond middle of segment, basal lateral longitudinal sulci well defined.

Black; antennae normally entirely black or blackish; legs usually dark brown with coxae and sometimes femora darker; wings weakly discolored.

Male.--In dorsal view head a little wider than long; distance from lateral ocelli to posterior margin of occiput about equal to length of eyes; temples receding slightly, in lateral view a little narrower than eyes; malar space about one-fourth as long as eye; first and last segments of antennal flagellum twice as long as broad, those between a little shorter.

Holotype female.--USNM 11793 (atricornis). Male.--USNM 11795 (texanus).

Distribution.--In addition to the two holotypes (that of atricornis from Ottawa, Canada, and that of texanus from Texas), I have seen many specimens of both sexes from localities in Quebec, Ontario, Manitoba, and British Columbia in Canada and in the United States from Maine, New York, Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Michigan, Illinois, Missouri, Arkansas, Arizona, Idaho, and Washington. Hosts recorded for some specimens in the collection of the U.S. National Museum of Natural History are Pseudoteaphritis corticalis (Loew) and Lonchaea corticis Taylor.

Coptera chylizae, new species

(Fig. 89)

This is most similar to C. occidentalis, new species, from which it may be distinguished as explained in the description of that species.

Female.--Length about 3.5 mm. In dorsal view head about as broad as long, abruptly declivous behind; distance from lateral ocelli to posterior margin of occiput slightly longer than eye height; temples weakly rounded, in lateral view barely as wide as eyes; malar space about 0.4 as long as eye; antennae rather large, first segment of flagellum twice as long as broad at apex, segments 5-11 broader than long.

Neck of prothorax strongly longitudinally rugulose; notaulices broad and noticeably broadened at posterior ends so that median lobe of mesoscutum is greatly narrowed at apex; disk of scutellum flat, apical paired punctures rather large, separated by less than their diameter, sometimes almost contiguous; propodeum rugose; mesopleuron weakly dished medially; metapleuron rather thickly hairy but sculpture not obscured.

Petiole of abdomen more than 1.5 times as long as broad, all three dorsal carinae strong and complete; median sulcus of large tergite extending to middle of segment or to slightly beyond middle, basal lateral longitudinal sulci well defined.

Black; antennal flagellum piceous; legs, including all coxae, honey yellow; wings somewhat smoky.

Male.--Head in dorsal view noticeably wider than long; distance from lateral ocelli to posterior margin of occiput shorter than eyes; temples receding rather strongly and in side view a little narrower than eyes; malar space about one-third as long as eye; first segment of antennal flagellum a little longer than second and about as long as apical segment, remaining flagellar segments subequal and usually less than twice as long as broad, second segment angulate above basal constriction; flagellum varying in color from testaceous to brown; mesopleuron more strongly dished medially than in female.

Holotype female.--USNM 76420.

Distribution.--The holotype was reared from Chyliza notata Loew at Washington, D.C., in 1912; the only female paratype is from Urbana, Ill., collected by H. H. Ross 18 July 1943. There are 14 male paratypes: 3 from Cleveland, S.C., 2 from Moorestown, N.J., and 1 each from Greenville, S.C., High Point State Park, N.J., Skyline Drive, Va., "Pink Beds," N.C., Holliston, Mass., New Bedford, Mass., Lynbrook, N.Y., and Stittsville and Cumberland, Ontario.

Coptera cingulatae, new species

(Figs. 70, 90)

This is very similar to C. polita Say, and it is sometimes not easily distinguished. However, normally the female may be recognized by its much stouter antennae, relatively shorter malar space, and much larger paired punctures at the apex of the scutellum, whereas in both sexes the notaulices do not widen noticeably at the posterior ends and the middle lobe of the mesoscutum does not narrow so greatly there as it normally does in polita.

Female.--Length about 3 mm. In dorsal view head about as long as wide, dorsal surface of head with several large punctures; distance from lateral ocelli to posterior margin of occiput longer than eyes (in ratio of 50:40); temples parallel, in lateral view fully as wide as eyes; malar space a little less than half as long as eye; antennae rather thick, first flagellar segment about twice as long as broad at apex, segments 5-9 wider than long.

Notaulices not widened at posterior ends and median lobe of mesoscutum therefore not strongly narrowed at apex, where it is a little wider than basal foveae of scutellum; paired punctures at apex of scutellum large and contiguous or nearly contiguous; mesopleuron flat; metapleuron thickly hairy, the coarsely rugose-reticulate surface being partially obscured.

Petiole of abdomen about 1.5 times as long as wide, all three dorsal carinae prominent but middle one fading apically; median sulcus of large tergite not quite reaching middle of segment, basal lateral longitudinal sulci not defined.

Black; antennal flagellum usually light brown or yellowish, scape sometimes dark but often as pale as flagellum; legs, including all coxae, yellow; wings hyaline or only faintly discolored.

Male.--In dorsal view head a little broader than long; distance from lateral ocelli to posterior margin of occiput shorter than eyes (in ratio of 40:50); temples gradually receding, in lateral view much narrower than the relatively large eyes; malar space about one-fourth as long as eye; antennae slender, flagellum of uniform thickness throughout, all segments more than twice as long as wide, and apical segment more than three times as long as wide.

Holotype female.--USNM 76421.

Distribution.--The type-series comprises 11 females (1 the holotype) and 7 males reared at Geneva, N.Y., 23 June 1927 from Rhagoletis cingulata (Loew) by Hugh Glasgow; 1 female and 2 males reared at Geneva, N.Y., 29 June 1927 from R. fausta (Osten Sacken); 1 male reared at Manhattan, Kans., 8 January 1931 from R. suavis (Loew); and 1 male reared at New Haven, Conn., 12 March 1969 from R. pomonella (Walsh). Field-collected specimens, not included in the type-series, are from Ontario, Maryland, West Virginia, South Carolina, Georgia, Florida, and Missouri.

Coptera denticulata, new species

(Figs. 65, 71, 91, 109, 131)

This differs from all related species by having a minute but apparent toothlike projection on each side of the back of the head in the occipital carina and by the greatly reduced median carina on the abdominal petiole.

Female.--Length about 2.5 mm. Head globose, in dorsal view not longer than wide, widest at middle of eyes; distance from lateral ocelli to posterior margin of occiput about equal to eye height; temples receding and in lateral view slightly wider than eyes; malar space about half as long as eye; very

small and sometimes not easily seen toothlike projection in occipital carina on each side of back of head (fig. 109); antennae as in figure 91.

Thorax only slightly depressed; notaulices not broadened at posterior ends; basal foveae of scutellum small and well separated, paired punctures at apex moderately large, narrowly separated; posterior lateral angles of propodeum projecting backward fingerlike; mesopleuron not impressed; metapleuron very coarsely rugose.

Petiole of abdomen fully twice as long as broad, of the dorsal carinae submedian pair well developed but median one wanting or only indicated at base; median sulcus of large tergite not quite reaching middle of segment, no indication of basal lateral sulci or impressions.

Black; antennae, including scapes, brownish yellow, apical segments darkened; legs, including all coxae, honey yellow.

Male.--Head in dorsal view wider than long; distance between lateral ocelli and posterior margin of occiput a little shorter than eyes; temples strongly receding and in lateral view considerably narrower than eyes; malar space about one-fourth as long as eye; all flagellar segments of antennae cylindrical, subequal, and about twice as long as broad.

Holotype female.--USNM 76422.

Distribution.--The holotype is labeled "Coleta, Ala. H. H. Smith Coll." A paratype female is from South Carolina and the four paratype males are from localities in Florida, Missouri, and Texas.

Coptera dissimilis, new species

(Figs. 93, 110)

This is superficially very similar to C. montana, new species, but it may be readily distinguished by the presence of well-defined basal lateral sulci on the large tergite and by its shorter malar space.

Female.--Length about 2.8 mm. In dorsal view head clearly longer than broad, dorsal surface with several large punctures; distance from lateral ocelli to posterior margin of occiput about 1.5 times maximum eye diameter; temples not receding, in lateral view noticeably wider than eyes; malar space not quite half as long as eye; antennal flagellum thickening only slightly and very gradually to apex, flagellar segments 6-9 globular (fig. 93); anterior rim of antennal sockets not prominent, very weakly notched medially.

Neck of prothorax smooth and shiny; notaulices fine, not broadening posteriorly; paired punctures at apex of scutellum very large and close together; diverging keels of propodeum very prominent, defined areas smooth; mesopleuron not impressed medially; metapleuron with only a few very large, poorly delimited cells.

Petiole of abdomen about 1.5 times as long as broad, all three dorsal carinae prominent and complete; median sulcus of large tergite not reaching

middle of segment, basal lateral sulci well defined and nearly half as long as median sulcus.

Black; antennae completely black; all coxae and femora black, trochanters and tibiae brownish piceous, tarsi brown; wings hyaline.

Male.--Unknown.

Holotype female.--USNM 76541.

Distribution.--Known only from the holotype, which is labeled "Ariz., Pima Co., Santa Rita Mts., 5200', 7.8.1975, McCleary Canyon, C. Olson."

Coptera distans, new species

This closely resembles C. pomonellae, new species, but it is a little larger, and in the female the head is relatively shorter, with narrower and somewhat receding temples and with a relatively shorter malar space; in the male the head is also relatively broader and shorter, with the temples narrower and usually strongly receding. In addition, the median carina of the abdominal petiole is nearly always complete in distans, whereas it is usually erased apically in pomonellae. From C. mellipes, new species, which distans also resembles, it may be distinguished as pointed out in the description of that species.

Female.--Length 3-3.5 mm. Head in dorsal view slightly broader than long, abruptly declivous behind; temples receding slightly and in lateral view usually narrower than eyes; distance from lateral ocelli to posterior margin of occiput slightly longer than maximum diameter of eyes; malar space usually about 0.4 as long as eye; antennal flagellum weakly clavate, first segment about twice as long as broad at apex, segments 2-4 decreasing in length but all longer than broad, and most of segments 5-9 not or barely broader than long.

Notaulices not broadened posteriorly; paired punctures at apex of scutellum large and usually contiguous; mesopleuron not dished medially; metapleuron hairy but coarse reticulate sculpture not obscured.

Petiole of abdomen usually about twice as long as broad, all three dorsal carinae very prominent and complete, interspaces smooth; median sulcus of large tergite extending to middle of segment, basal lateral sulci not developed.

Black; antennae usually entirely black but sometimes two or three basal segments of flagellum brownish; legs, usually including all coxae, brownish yellow, but occasionally coxae, especially posterior pair, more or less darkened; wings rather strongly infumated.

Male.--Normally a little larger than female; head relatively broader and temples more strongly receding; distance from lateral ocelli to posterior margin of occiput a little shorter than eye height; malar space about one-fourth as long as eye; antennae rather thick, flagellar segments closely rugose and densely covered with subappressed hair, usually most of them not twice as long as broad, first and last a little longer than others, subequal.

Holotype female.--In Canadian National Collection.

Distribution.--The type-series consists of 4 females and 26 males from Forsyth, Ga., the holotype taken 14-22 May 1971 by F. T. Naumann, the paratypes on various dates in 1970 and 1971 by F. T. Naumann and G. Heinrich. I have also seen many specimens, mostly males, not included in the type-series, from localities in Ontario, Massachusetts, New Jersey, Maryland, North Carolina, South Carolina, Georgia, Alabama, Michigan, Illinois, Arkansas, Missouri, Texas, Arizona, and California.

Coptera divisa, new species

(Figs. 66, 72, 92)

From all related species this differs noticeably in having the anterior rim of the of antennal sockets, especially in the female, prominently raised and divided by a deep cleft (fig. 66).

Female.--Length about 2.6 mm. In dorsal view head just about as long as wide and narrowing roundly behind eyes; distance from lateral ocelli to posterior margin of occiput a little longer than eyes (in ratio of 55:45); in lateral view temples not or barely wider than eyes; malar space less than half as long as eye; antennal flagellum thickening gradually toward apex, first segment more than twice as long as broad, and none of remaining segments broader than long (fig. 92).

Notaulices deep but not broadened at posterior ends; basal foveae of scutellum very large, paired punctures at apex of scutellum large, narrowly separated; mesopleuron not noticeably obliquely dished medially; metapleuron very coarsely, irregularly reticulate.

Dorsal carinae of abdominal petiole prominent but median one erased on apical third of petiole; median sulcus of large tergite extending hardly to middle of segment, basal lateral longitudinal sulci not defined.

Black; antennae entirely black; coxae black, femora piceous, otherwise legs brownish; wings lightly infuscated.

Male.--In dorsal view head clearly wider than long; distance from lateral ocelli to posterior margin of occiput shorter than eyes; temples receding, in lateral view much narrower than eyes; rim of antennal sockets not quite so prominent as in female but with a pronounced median cleft; malar space less than one-third as long as eye; most flagellar segments of antennae clearly less than twice as long as broad (fig. 92).

Holotype female.--USNM 76540.

Distribution.--The holotype is from Patagonia, Ariz., collected 27 June 1962 by P. H. Johnson; a female paratype is from the Catalina Mts., 4,400', and a male paratype is from Pima County, Ariz.; also included in the type-series are a female and a male from Uvalde County, Tex.

Coptera evansi, new species

(Figs. 73, 94, 111, 112, 113, 114, 132)

Although this is very closely related to C. pomonellae, new species, it may be distinguished by its completely black antennae and darker coxae and by the relatively slightly wider temples in both sexes.

Female.—Length about 3 mm. In dorsal view head not or barely longer than wide; distance between lateral ocelli and posterior margin of occiput clearly greater than eye length (in ratio of 55:40); temples parallel, and in lateral view decidedly wider than eyes; dorsum of head usually with several large widely separated punctures (fig. 111); malar space about half as long as eye; antennae short, first flagellar segment not twice as long as wide, and segments 5-9 wider than long.

Thorax only a little wider than deep; neck of prothorax smooth and shiny; notaulices rather broad; paired punctures at apex of scutellum large and close together; mesopleuron without distinct oblique median impression; metapleuron rather thinly hairy, very coarse reticulate sculpture not obscured.

Petiole of abdomen less than twice as long as broad, all three dorsal longitudinal carinae well developed but median one usually erased apically; median sulcus of large tergite barely reaching middle of segment and basal lateral sulci not defined.

Black; antennae entirely black; legs brown, coxae piceous to black; wings weakly discolored.

Male.—In dorsal view head a little wider than long; distance from lateral ocelli to posterior margin of occiput barely longer than eyes; temples weakly receding, in lateral view about as wide as eyes; malar space about 0.4 as long as eye; first segment of antennal flagellum twice as long as wide and usually about as long as apical segment, remainder usually less than twice as long as wide.

Holotype female.—In collection of Cornell University.

Distribution.—The type-series comprises five females (one the holotype) and seven males taken by H. E. Evans or H. E. and M. A. Evans in August 1959 at "S.W. Res Sta., 5 mi. W. Portal, Ariz." (holotype collected by H. E. and M. A. Evans 10 August 1969). I have seen many additional specimens of this species, including several reared from Epochra canadensis (Loew) in California and from Rhagoletis fausta (Osten Sacken) at Cashmere, Wash., and several series from Pinery Canyon, Ariz., some field collected, others reared from Rhagoletis puparia; also a series bred in the laboratory from R. completa Cresson and R. juglandis Cresson, the parents being from Rio Penasco County, N. Mex. These series from Arizona and New Mexico were provided by K. A. Hagen, University of California at Albany. I have also seen a number of field-collected specimens from Colorado, Texas, and Arizona.

Coptera huachucana, new species

(Figs. 67, 74)

Although most similar to C. montana, new species, which is from the same locality, this form, known only from a single male, differs noticeably: Larger, with stouter antennae, longer malar space, receding temples, more convergent notaulices, and conspicuously impressed mesopleuron.

Male.--Length about 3.8 mm. Head in dorsal view wider than long (in ratio of 100:80), smooth, without punctures on disk, rounded off behind, occiput lacking distinctly carinate posterior margin; distance from lateral ocelli to posterior margin of occiput a little longer than eyes; temples receding gradually from eyes, in lateral view a little wider than eyes; malar space half as long as eye; first segment of antennal flagellum twice as long as broad and about as long as apical segment, segments 2-11 shorter, second constricted at base and angulate above constriction (fig. 74).

Notaulices sharp, not broadening posteriorly but converging strongly so that median lobe of mesoscutum is greatly narrowed at apex; paired punctures at apex of scutellum very large, transversely oval, and narrowly separated; propodeum coarsely rugose reticulate, without the usual pair of diverging carinae; mesopleuron with broad, soft, oblique impression from lower anterior corner to upper posterior corner; metapleuron very coarsely and irregularly reticulate.

Petiole of abdomen fully 2.5 times as long as broad, all three dorsal longitudinal carinae well developed and complete; median sulcus of large tergite extending to middle of segment, basal lateral sulci not defined.

Black; antennae completely black; all coxae black, trochanters brown, femora blackish, narrowly brown basally and apically, tibiae and tarsi brown, hindtibiae somewhat darkened apically; wings infumated.

Female.--Unknown.

Holotype male.--In Canadian National Collection.

Distribution.--Known only from the holotype, which is labeled "Ramsey Cyn. 6000', 15 mi. S. Sierra Vista, Huachuca Mts., Ariz. Sternitzky 10.xii.67."

Coptera mellipes, new species

(Figs. 75, 95)

Although most similar to C. distans, new species, this form is readily distinguished. In the female the malar space is relatively longer and the eyes are smaller; in the male the antennae are much shorter, with some of the flagellar segments barely longer than broad.

Female.--Length about 4 mm. Head in dorsal view wider than long (in ratio of 5:5), abruptly declivous behind, its dorsal surface with two pairs of

widely separated punctures; distance from lateral ocelli to posterior margin of occiput much longer than eye height (in ratio of 65:50); temples gradually receding behind eyes, in lateral view about as wide as eyes; malar space half as long as eye; antennal flagellum stout, first segment less than twice as long as broad, second and third segments barely longer than broad, segments 4-9 a little broader than long, apical segment not quite twice as long as penultimate segment (fig. 95).

Notaulices deep and broad but not broadening posteriorly; paired punctures at apex of scutellum usually not large and not contiguous; mesopleuron not impressed medially; metapleuron densely hairy.

Petiole of abdomen stout, less than 1.5 times as long as broad, all three dorsal carinae strong and complete; median sulcus of large tergite extending nearly to middle of segment, basal lateral sulci not defined.

Black; antennae black except pedicel and basal flagellar segments, which are brown; legs, including all coxae, honey yellow; wings rather strongly infumated.

Male.--Head in dorsal view considerably wider than long; distance from lateral ocelli to posterior margin of occiput shorter than eyes (in ratio of 45:55); temples much narrower than eyes; malar space about one-third as long as eye; none of flagellar segments of antennae twice as long as broad and some in apical half barely longer than broad (fig. 75).

Holotype female.--USNM 76423.

Distribution.--The holotype and one male paratype were collected by K. V. Krombein on Plummers Island, Md., the former 9 July 1960, the latter 6 July 1963; a second male paratype was collected at Cleveland, S.C., 10 July 1961 by G. F. Townes, and a female paratype was taken at McClellanville, S.C., 17 May 1944 by H. K. Townes.

Coptera montana, new species

Superficially this is rather similar to C. atricornis (Ashmead), but it differs significantly in its less depressed thorax, in the absence of basal lateral sulci on the large abdominal tergite, and in the larger, more closely placed paired punctures at the apex of the scutellum. From C. dissimilis, new species, which it also resembles, it differs as explained in the description of that species.

Female.--Length about 2.8 mm. Head in dorsal view longer than wide and parallel-sided, without discal punctures; distance from lateral ocelli to posterior margin of occiput much longer than eyes (in ratio of 50:30); temples in lateral view clearly wider than eyes; malar space more than half as long as eye; antennal flagellum slender basally, strongly clavate apically, flagellar segments 6-9 broader than long.

Neck of prothorax smooth; notaulices very fine; paired punctures at apex of scutellum moderately large, narrowly separated; diverging carinae of propodeum well developed, large triangular area between them smooth;

mesopleuron not impressed medially; metapleuron coarsely, irregularly reticulate.

All three dorsal carinae of abdominal petiole well developed and complete; median sulcus of large tergite extending to middle of segment, basal lateral sulci represented by short and broad, very shallow, poorly delimited impressions.

Black; antennal flagellum blackish basally, brown apically; all coxae black, femora brownish piceous, remainder of legs light brown; wings weakly discolored.

Male.--Head in dorsal view wider than long; distance from lateral ocelli to posterior margin of occiput longer than eye height; temples roundly receding, in lateral view about as wide as eyes; malar space about 0.4 as long as eye; antennae slender, first flagellar segment much longer than second and as long as apical segment, second constricted at base and angled above constriction, segments 2-11 subequal and about twice as long as broad.

Holotype female.--In Canadian National Collection.

Distribution.--Known only from the holotype and two male paratypes labeled "Ramsey Cyn. 6000', 15 mi. Sierra Vista, Huachuca Mts. Ariz. Sternitzky." The holotype and one paratype were taken 25.vi.1967, the other paratype 30.v.1967.

Coptera occidentalis, new species

(Figs. 76, 96, 128)

This is most similar to C. chylizae, new species, from which it differs most significantly in its longer malar space and broader temples and in lacking well-defined basal lateral grooves on the large abdominal tergite. It appears to be essentially a west coast species, whereas chylizae is known only in the East.

Female.--Length normally 3-3.3 mm. In dorsal view head slightly wider than long, abruptly declivous behind; temples virtually parallel, in lateral view a little wider than eyes; distance from lateral ocelli to posterior margin of occiput 1.5 times eye length; malar space at least half as long as eye; antennae not strongly clavate but thickening gradually toward apices, first flagellar segment twice as long as broad and segments 5-9 about as long as broad (fig. 96).

Neck of prothorax largely smooth; notaulices conspicuously broadened (fig. 128), especially posteriorly, with result that median lobe of mesoscutum at apex is not half as wide as lateral lobes; scutellum convex, paired punctures at apex moderately large but usually separated by nearly their diameter; mesopleuron shallowly obliquely dished medially; metapleuron coarsely rugose reticulate, sparsely hairy.

Petiole of abdomen usually a little longer than wide, all three dorsal longitudinal carinae prominent and complete; median sulcus of large tergite

hardly reaching middle of segment, basal lateral longitudinal sulci not defined.

Black; antennae usually black but sometimes basal flagellar segments dark brown; legs yellowish brown, sometimes including all coxae but hindcoxae often blackish and rarely all coxae darkened.

Male.--In dorsal view head a little wider than long; distance from lateral ocelli to posterior margin of occiput about as long as eyes; malar space about 0.4 as long as eye; temples roundly receding and in lateral view about as wide as eyes; first segment of antennal flagellum more than twice as long as broad, much longer than second, and about as long as apical segment, most of remaining segments less than twice as long as broad, second somewhat constricted at base and weakly angulate above constriction (fig. 76); in color antennal flagellum varies from largely brownish yellow to black, which is also true of the coxae; wings slightly darker than in the female.

Holotype female.--In University of California, Berkeley.

Distribution.--The holotype, together with 11 paratype females and 14 paratype males, from Fairfield, Solano County, Calif., were reared in 1977 from Rhagoletis completa Cresson. Additional paratypes consist of four females and four males reared 4 November 1971 from R. completa puparia taken at Rockville, Solano Co., Calif., and two females and five males reared 5 October 1968 from R. completa puparia obtained at Napa, Calif. In addition, two male paratypes are recorded as having been reared from R. cingulata (Loew) in Benton County, Oreg.

Coptera pacifica, new species

(Fig. 129)

In its broad notaulices this species resembles C. occidentalis, new species, but it is smaller, all coxae are completely black, the mesopleuron lacks an oblique impression (present in occidentalis), the paired punctures at the apex of the scutellum are larger and closer together, and the female antennae are a little stouter.

Female.--Length about 2.5 mm. Head in dorsal view just about as long as broad, dorsal surface with several large punctures; distance from lateral ocelli to occipital margin slightly longer than eye height; temples not receding and in lateral view fully as broad as eyes, sometimes broader; malar space just about half as long as eye; first segment of antennal flagellum elongate, following segments gradually shorter, some of them a little broader than long.

Notaulices very broad, especially posteriorly (fig. 129); basal foveae of scutellum very large, paired punctures at apex of scutellum also large and only narrowly separated; diverging keels of propodeum very prominent; mesopleuron flat; metapleuron coarsely rugose reticulate.

Dorsal carinae of abdominal petiole prominent but median one usually erased apically; median sulcus of large tergite extending about to middle of

segment, basal lateral sulci not defined and represented by very small depressions each side at extreme base of segment.

Black; antennae black; all coxae entirely black, remainder of legs yellowish brown; wings hyaline.

Male.--Unknown.

Holotype female.--In California Academy of Sciences.

Distribution.--Southern California. The holotype was collected at El Toro, Orange County, 8 January 1965; three paratypes are labeled as having been taken in orange trees in Orange County and two were collected indoors at Riverside.

Coptera pholeomyiae, new species

(Figs. 77, 97, 115, 116, 117)

This tiny species resembles C. pilosa (Ashmead) in the unusually short male antennae, but the eyes in both sexes are much smaller, with correspondingly wider temples, the coxae are paler, and the anterior wings of the male are sharply incised at the apices, which is not true for pilosa.

Female.--Length about 2 mm. Head in dorsal view longer than wide, about as wide as thorax, and nearly parallel-sided but rounded off smoothly behind, middle of dorsal surface with several large, shallow punctures; distance from lateral ocelli to posterior margin of occiput twice maximum eye diameter; eyes very small; temples in lateral view considerably wider than eyes; malar space more than half as long as eye; antennae short, first segment of flagellum nearly twice as long as wide, second very slightly longer than wide, and segments 5-9 much wider than long (fig. 97).

Thorax hardly wider than head; notaulices fine; pronotum without the usual row of large punctures along its posterior margin; disk of scutellum flat, paired punctures at apex of scutellum large, usually contiguous; mesopleuron flat; metapleuron finely rugulose.

Petiole of abdomen only a little longer than wide, all three dorsal longitudinal carinae well developed and complete; median sulcus of large tergite short, not nearly attaining middle of segment, basal lateral sulci wanting.

Black; antennal flagellum piceous; legs, including all coxae, yellow; wings weakly discolored.

Male.--Head in dorsal view a little longer than broad and narrowing gradually behind; distance from lateral ocelli to posterior margin of occiput longer than eye height (in ratio of 40:30); temples in lateral view considerably wider than eyes; malar space about half as long as eye; most segments of antennal flagellum very short (fig. 77); anterior wings sharply and rather deeply incised at apices.

Holotype female.--USNM 76424.

Distribution.--Known only from the type-series, which consists of two females (one the holotype) and one male reared from Pholeomyia comans Sabrosky (fam. Milichiidae) in a nest of Atta texana (Buckley) at S. Flatwoods, La., 30 December 1958 by John S. Moser, and a single female taken from an ant nest at San Antonio, Tex., 16 January 1935 by E. V. Walter.

Coptera pilosa (Ashmead), new combination

(Figs. 78, 98)

Galesus pilosus Ashmead, 1893: 409, 411. Male.

Psilus pilosus (Ashmead), Muesebeck and Walkley, 1951: 675.

This is most similar to C. pholeomyiae, new species, and C. punctiger (Fouts) but may be distinguished as explained in the descriptions of those species.

Female.--Length about 2.5 mm. In dorsal view head wider than long (in ratio of 8:7), usually two or more widely separated large punctures on dorsal surface; distance from lateral ocelli to posterior margin of occiput not longer than eyes; temples nearly parallel, rounding off behind, in lateral view about as wide as eyes; malar space about one-third as long as eye; antennae short, first flagellar segment not twice as long as broad, second and third segments slightly longer than wide, fourth about as wide as long, segments 5-9 wider than long (fig. 78).

Notaulices usually slightly widened at posterior ends; paired punctures at apex of scutellum moderately large and narrowly separated; mesopleuron with distinct though shallow and poorly delimited oblique impression from lower anterior corner to upper posterior corner; metapleuron coarsely reticulate.

Petiole of abdomen less than 1.5 times as long as broad, all three dorsal carinae well developed but median one erased posteriorly; median sulcus of large tergite not reaching middle of segment, short basal lateral longitudinal sulci present.

Black; antennae black except usually pedicel and basal flagellar segments dark brown; legs, including coxae, brownish yellow, occasionally more or less darkened; wings hyaline.

Male.--In dorsal view head much wider than long; distance from lateral ocelli to posterior margin of occiput shorter than eyes; temples in lateral view much narrower than eyes; malar space about one-fourth as long as eye; most flagellar segments of antennae very short (fig. 78); antennae varying in color from brown to black, usually coxae, and rarely femora, more or less darkened.

Holotype male.--USNM 11796.

Distribution.--The holotype is from Texas; other specimens I have seen are

from localities in Ontario, North Carolina, Georgia, Florida, Michigan, Illinois, Missouri, and Texas.

Coptera polita Say

(Figs. 79, 99, 118)

Coptera polita Say, 1836: 282. "Male" = female.

Entomacis politus (Say), Provancher, 1888: 404.

Galesus politus (Say), Ashmead, 1893: 410.

Galesus clarimontis Kieffer, 1906: 285. Male. New synonymy.

Galesus politus (Say), Kieffer, 1916: 228.

Psilus politus (Say), Muesebeck and Walkley, 1951: 675.

This is very similar to C. cingulatae, new species, from which it may be distinguished, however, as pointed out in the description of that species.

Female.--Length normally about 2.5 mm. In dorsal view head as long as wide, sometimes a little longer than wide; distance from lateral ocelli to posterior margin of occiput much longer than eyes (in ratio of 50:35); temples parallel, in lateral view wider than eyes; malar space a little more than half as long as eye; antennae relatively long and weakly clavate, thickening very gradually to apices; first flagellar segment about twice as long as broad and all of the following at least as long as broad (fig. 99).

Thorax somewhat depressed, about 0.7 as deep as broad; notaulices rather broad and usually a little broadened at posterior ends; paired punctures at apex of scutellum usually small and well separated; mesopleuron flat.

Petiole of abdomen less than twice as long as broad, all three dorsal carinae well developed but median one usually incomplete; median sulcus of large tergite not nearly reaching middle of segment, basal lateral sulci not developed.

Black; pedicel and basal segments of antennal flagellum brownish; legs brownish yellow, coxae, especially posterior pair, often somewhat darkened; wings subhyaline.

Male.--In dorsal view head clearly wider than long and temples noticeably receding; distance from lateral ocelli to posterior margin of occiput conspicuously shorter than eyes; in lateral view temples usually only half as wide as eyes, which are very large; usually all segments of antennal flagellum about twice as long as broad, first and last segments slightly longer than remainder, basal flagellar segments thinly hairy, shiny, and very weakly sculptured; malar space hardly one-fourth as long as eye; pedicel and more or less of flagellum brownish yellow to brown.

Holotype female of polita - apparently lost; holotype male of clarimontis in California Academy of Sciences. I believe I have correctly identified both sexes of polita, and if so, clarimontis must be suppressed as a synonym. I have studied Kieffer's type of clarimontis and have been unable to distinguish it from what I consider to be polita.

Distribution.--The type-locality of polita is Indiana, that of clari-

montis is in the neighborhood of Claremont, Calif. Specimens that I have identified as this species are from Massachusetts, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Illinois, Missouri, Kansas, Arizona, and California.

Coptera pomonellae, new species

(Figs. 80, 100, 119)

This is most like C. evansi, new species, from which it is distinguishable as explained in the description of that species.

Female.--Length about 3.2 mm. In dorsal view head slightly longer than broad and parallel-sided, dorsum of head normally with two or more widely separated large punctures; distance from lateral ocelli to posterior margin of occiput nearly 1.5 times as long as eyes; temples in lateral view about as wide as eyes; malar space normally a little more than half as long as eye; antennae rather stout, first flagellar segment less than twice as long as broad, second and third segments a little longer than wide, fourth not longer than wide, and segments 5-9 broader than long.

Thorax only slightly wider than deep; notaulices rather broad and deep but not widened at posterior ends; paired punctures at apex of scutellum moderately large but usually not contiguous; mesopleuron weakly obliquely dished; metapleuron rather thinly hairy, the coarse reticulate sculpture not obscured.

Petiole of abdomen with all three dorsal carinae strong but median one nearly always erased on apical fourth of petiole; median sulcus of large tergite not extending to middle of segment, basal lateral sulci not developed, being represented by short, poorly defined, and shallow subtriangular foveae.

Black; antennae largely black but pedicel and basal flagellar segments, sometimes also scape, reddish; legs, including all coxae, orange; wings a little discolored.

Male.--In dorsal view head slightly wider than long; distance from lateral ocelli to posterior margin of occiput not or barely longer than eyes; temples usually very weakly receding, and in lateral view usually a little narrower than eyes; malar space 0.35-0.4 as long as eye; antennal flagellum closely rugulose, usually becoming gradually thinner toward apex, usually most flagellar segments not or barely twice as long as broad.

Holotype female.--USNM 76425.

Distribution.--The type-series consists of 9 females (1 the holotype) and 21 males reared from Rhagoletis pomonella (Walsh) at Orono, Maine, by C. O. Dirks. Additional specimens, from the same host, are from Connecticut, New York, and Minnesota. I have also seen a single female specimen that was reared from R. suavis (Loew) at Manhattan, Kans., in 1931 and several field-collected males from New York and South Carolina.

Coptera punctiger (Fouts), new combination

(Fig. 81)

Galesus punctiger Fouts, 1926: 170. Female; male.

Psilus punctiger (Fouts), Muesebeck and Walkley, 1951: 675.

This is most similar to C. pilosa (Ashmead). In the female it differs especially in its relatively longer head and longer malar space, and in the male in its relatively longer abdominal petiole and longer segments of the antennal flagellum; furthermore, both sexes differ in the absence of an oblique impression on the mesopleuron and the relatively longer median sulcus of the large abdominal tergite.

Female.--Length 2.5 mm. In dorsal view head just longer than broad, parallel-sided behind eyes, and rounding off behind; middle of occiput with two pairs of widely separated large punctures; distance from lateral ocelli to posterior margin of occiput somewhat longer than eyes; in lateral view temples about as wide as eyes; malar space a little less than half as long as eye; antennae short, first flagellar segment not nearly twice as long as broad, second and third segments not or barely longer than wide, segments 4-9 wider than long.

Thorax depressed, much broader than deep; notaulices not broadening posteriorly; paired punctures at apex of scutellum large, narrowly separated; mesopleuron not noticeably impressed medially; metapleuron very coarsely reticulate, with only a few large cells, not very hairy.

Petiole of abdomen hardly 1.5 times as long as wide, dorsal carinae prominent but median one incomplete; median sulcus of large tergite extending to middle of segment, basal lateral sulci weakly indicated.

Black; antennal flagellum brownish piceous; legs yellowish brown, coxae slightly darker.

Male.--In dorsal view head considerably wider than long; distance from lateral ocelli to posterior margin of occiput shorter than eyes; temples gradually receding, in lateral view much narrower than eyes, which are large and longer than antennal scapes; malar space about one-fourth as long as eye; antennae rather short, only first and last flagellar segments nearly twice as long as broad (fig. 81); petiole of abdomen about twice as long as broad; legs usually somewhat darker than in female; in one male coxae are black and remainder of legs piceous.

Holotype female.--USNM 18775.

Distribution.--The holotype and three male paratypes are recorded as doubtfully reared from Drosophila sp. by A. P. Dodd at Uvalde, Tex., in August 1925. I have also identified as punctiger single male specimens from South Carolina, Michigan, and Texas.

Coptera strauziae, new species

(Figs. 82, 101, 120, 121, 122, 123, 133)

Structurally this is virtually identical with C. aequalis, new species, differing noticeably only in the color of the legs.

Female.--Length about 4 mm. In dorsal view head parallel-sided, about as wide as long; distance from lateral ocelli to posterior margin of occiput about 1.5 times maximum diameter of eyes; in lateral view temples conspicuously broader than eyes; malar space at least 0.6 as long as eye; antennae relatively large, first flagellar segment twice as long as broad at apex, segments 5-9 usually broader than long.

Thorax only a little wider than deep; neck of prothorax usually smooth dorsally; notaulices rather broad but not noticeably broadened at posterior ends; scutellum weakly convex, paired punctures at apex of scutellum very large and contiguous or nearly; mesopleuron not conspicuously impressed medially.

Petiole of abdomen about 1.5 times as long as broad, all three dorsal carinae strong but median one sometimes fading apically; median sulcus of large tergite extending to middle of segment or a little beyond middle, basal lateral sulci represented by short, weak, shallow impressions.

Black; pedicel and basal flagellar segments of antennae usually brownish; legs yellowish brown, coxae usually darker; wings rather strongly infumated.

Male.--In dorsal view head barely wider than long, narrowing roundly behind; distance between lateral ocelli and posterior margin of occiput usually a little longer than eyes; in lateral view temples normally a little broader than eyes; malar space a little less than half as long as eye; antennal flagellum finely rugulose, segments 1-11 about twice as long as broad, pedicel and often basal part of flagellum brown.

Holotype female.--In Canadian National Collection.

Distribution.--The type-series consists of the following: Five females (one, the holotype) and eight males reared from puparia of Strauzia longipennis (Wiedemann) at Altona, Manitoba, 20 August 1953 by P. H. Westdal and E. F. Barrett; one male reared 20 August 1953 from a puparium collected at Barnsley, Manitoba, and four females and one male reared from S. longipennis in Helianthus tuberosus at Ottawa, Ontario, in the fall of 1972 by W. Haliburton; also 2 males with similar data except 15 March 1973 and 5 May 1973. I have also identified as this species a field-collected male from Cleveland, S.C.

Coptera sublata, new species

(Fig. 83)

This may be readily distinguished from all related Nearctic species by the presence of a keellike elevation along the middle of the occiput. In addition, the antennae of both sexes are unusually lengthened.

Male.--Length about 4 mm. In dorsal view head noticeably wider than long, narrowing markedly behind; occiput without punctures and weakly but distinctly elevated keellike on median longitudinal line; occipital carina well developed and angulate at middle; temples strongly receding and in lateral view much narrower than eyes; distance from lateral ocelli to occipital margin much shorter than eyes; malar space less than one-fourth as long as eye; antennae long and very slender (fig. 83), flagellar segments 1-11 three times as long as wide and rather coarsely roughened, apical segment about four times as long as wide.

Notaulices deep and broad but not broadened at posterior ends; lateral lobes of mesoscutum slightly dished; paired punctures at apex of scutellum large and narrowly separated; mesopleuron not impressed.

Petiole of abdomen about three times as long as wide, all three dorsal carinae prominent but middle one erased on apical fourth; median sulcus of large tergite not reaching middle of segment, no trace of basal lateral sulci.

Black; pedicel of antennae light brown, flagellum brownish piceous; legs, including coxae, reddish yellow; wings a little smoky.

Female.--In dorsal view head slightly wider than long; like male with low but distinct keellike elevation down middle of occiput and sharp occipital margin, which is angulate at middle; distance from lateral ocelli to occipital margin a little longer than eyes; temples receding and about as wide as eyes; malar space about 0.75 as long as eye; first segment of antennal flagellum 2.5 times as long as wide and more than half as long as scape, second twice as long as wide, and third to sixth segments all longer than wide (remainder of antennae missing); antennae, including scapes, and legs, including all coxae, honey yellow.

Holotype male.--In the Canadian National Collection.

Distribution.--The holotype is labeled "Bayou Chicot, Evangeline Co., Louisiana, 6-14.vii.1971. D. Shanek." The only other known specimen is a female paratype from Washington, D.C., which is in the U.S. National Museum of Natural History.

Coptera sulcata, new species

(Figs. 84, 102)

Although this rather closely resembles C. polita Say, it may be distinguished by the presence of distinct though short basal lateral sulci on the large abdominal tergite and a longer median sulcus. In general, the notaulices are narrower at the posterior ends and the coxae are darker; also, the female antennae are more strongly clavate and the male antennae are more slender and more elongate; in addition, the dorsum of the head lacks large punctures such as are normally present in polita.

Female.--Length about 2.7 mm. Head in dorsal view longer than wide (approximately in ratio of 80:65) and parallel-sided; distance from lateral ocelli to posterior margin of occiput twice eye height; temples in lateral

view wider than eyes; malar space a little more than half as long as eye; antennae rather strongly clavate, first flagellar segment not twice as long as broad, segments 5-9 wider than long.

Thorax somewhat depressed, noticeably wider than deep; notaulices fine, not broadened at posterior ends; scutellum flat, paired punctures at its apex rather large and narrowly separated; mesopleuron very weakly impressed medially; metapleuron densely covered with appressed hair.

Petiole of abdomen less than twice as long as broad, all three dorsal longitudinal carinae well developed and complete; median sulcus of large tergite extending to beyond middle of segment, basal lateral sulci short and shallow but distinctly defined.

Black; pedicel and basal flagellar segments of antennae brown or yellowish brown; legs largely yellowish, coxae more or less piceous; wings somewhat infumated.

Male.--Length usually about 3 mm. Head in dorsal view just wider than long but strongly narrowing behind eyes; distance from lateral ocelli to posterior margin of occiput slightly longer than eyes; temples receding sharply and in lateral view somewhat narrower than eyes; malar space about one-third as long as eye; antennal flagellum very slender (fig. 102), all segments more than twice as long as broad, first usually three times and last usually four times as long as broad; mesopleuron weakly dishd medially; antennal flagellum usually yellowish brown or brown; coxae piceous to black.

Holotype female.--USNM 76426.

Distribution.--The holotype was taken by C. F. Baker 30 August 1891 at East Lansing, Mich. Twenty-nine paratypes, males and females, are from localities in Ontario, Massachusetts, New York, New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Michigan, Illinois, Minnesota, Missouri, and Texas.

Coptera tenuicornis, new species

(Fig. 85)

This is very similar to C. polita Say, but the antennae are more slender and elongate, the eyes are relatively somewhat smaller, and the malar space longer.

Male.--Length about 3 mm. In dorsal view head wider than long and narrowing rather strongly behind eyes; distance from lateral ocelli to posterior margin of occiput slightly less than maximum eye diameter; in lateral view temples decidedly narrower than eyes; malar space one-third as long as eye; antennae about as long as body, flagellar segments 1-11 subequal and about three times as long as wide, apical segment four times as long as broad at base (fig. 85).

Notaulices broad and median lobe of mesoscutum at apex narrower than one of the large basal foveae of scutellum; lateral foveae of scutellum very

large, polished disk between them not nearly twice as broad as one of them; paired punctures at apex of scutellum large but separated by a space equal to diameter of a puncture; diverging keels of propodeum very prominent; mesopleuron weakly obliquely dished medially; metapleuron coarsely rugose reticulate.

Petiole of abdomen twice as long as broad, all three dorsal carinae well developed, median one as strong as others and complete; median sulcus of large tergite extending to middle of segment, basal lateral sulci represented by very short and weak impressions.

Black; antennae entirely black; legs brownish yellow, posterior coxae blackish above and at base below.

Female.--Unknown.

Holotype male.--In Canadian National Collection.

Distribution.--Known only from the holotype, which is labeled "Arizona, Ramsey Canyon, Sternitzky." A male specimen from "S. Catalina Mts." in the collection of the University of Arizona is extremely similar and may be this species, but because the antennae are incomplete and the abdomen is missing, definite identification is impossible.

Coptera tersa, new species

(Figs. 86, 103, 124)

This is rather similar to C. distans, new species, but it may be readily distinguished by its darker legs, by the presence of well-defined basal lateral sulci on the large abdominal tergite, and by the sharply receding temples of the male.

Female.--Length about 3.5 mm. In dorsal view head just about as long as wide and virtually parallel-sided, dorsum of head without large punctures; distance from lateral ocelli to posterior margin of occiput longer than eyes (in ratio of 60:45); in lateral view temples a little wider than eyes; malar space less than half as long as eye (in ratio of 20:45); antennae somewhat less thickened than in distans.

Prothoracic neck narrowly smooth anteriorly, finely rugulose posteriorly; notaulices not broadening at posterior ends; basal foveae of scutellum large and separated by a narrow ridge; paired punctures at apex of scutellum large, nearly contiguous; mesopleuron not noticeably dished medially; metapleuron coarsely rugose reticulate, with only a few large cells outlined by prominent ridges.

Petiole of abdomen twice as long as broad, dorsal carinae very prominent, all three complete, interspaces smooth; median sulcus of large tergite reaching middle of segment and basal lateral sulci well developed.

Black; antennae entirely black; all coxae black, otherwise legs brown but femora sometimes darker than remaining parts.

Male.--In dorsal view head barely wider than long (fig. 124); distance from lateral ocelli to posterior margin of occiput slightly longer than eyes; temples receding sharply and in lateral view about as wide as eyes; malar space about 0.4 as long as eye; all flagellar segments of antennae at least twice as long as broad, first segment conspicuously longer than any of the remainder except last and fully as long as that, second segment constricted at base and angulate above constriction; legs somewhat darker than in female.

Holotype female.--USNM 76427.

Distribution.--The holotype was collected by H. S. Barber at Las Vegas, N. Mex., on 15 August; single female paratypes are from Columbia, Mo., Lawrence, Kans., and Bisbee, Ariz.; two male paratypes are from Portal, Ariz., and one is from Chiricahua Mts., Ariz.

Coptera townesi, new species

(Figs. 104, 125)

This species appears to be most similar to C. cingulatae, new species, but it may be readily distinguished by its larger head, almost circular eyes, broader temples, relatively shorter malar space, and complete median carina on the abdominal petiole.

Female.--Length about 3.2 mm. Head in dorsal view a little longer than wide and nearly as broad as thorax, dorsal surface with several large punctures; temples parallel for a distance behind eyes and then rounded off, in lateral view barely wider than eyes, which are unusually short and broad (fig. 125); head abruptly declivous behind; distance from lateral ocelli to posterior margin of occiput considerably longer than maximum eye diameter; malar space less than 0.4 as long as eye; antennae rather short and stout (fig. 104).

Thorax only slightly wider than deep; notaulices not broadening at posterior ends; paired punctures at apex of scutellum moderately large and narrowly separated; mesopleuron not impressed.

Petiole of abdomen nearly twice as long as broad, all three dorsal carinae well developed and complete; median sulcus of large tergite extending very nearly to middle of segment, basal lateral sulci not developed.

Black; antennae black except for pedicel and basal segments of flagellum, which are brown; legs, including all coxae, entirely yellow; wings somewhat infumated.

Male.--Like female distinguished especially by its short and broad eyes and very short malar space, which is less than one-fourth as long as eye; head in dorsal view decidedly broader than long, narrowing roundly behind eyes, its dorsal surface with several large punctures; distance from lateral ocelli to posterior margin of occiput shorter than maximum diameter of eyes; temples in lateral view narrower than eyes; antennal flagellum rather loosely hairy and becoming a little thinner apically, closely rugose, segments 1-11 twice as long as broad, apical segment three times, antennal scapes not longer than eyes.

Holotype female.--In collection of Henry Townes.

Distribution.--The holotype and two female paratypes were collected at Cleveland, S.C., by G. F. Townes, the holotype and one of the paratypes 13 October 1975, the other, 6 October 1975; four male paratypes were taken at the same locality in September and October 1975. Also included in the type-series are single female paratypes from Greenville and Wattacoo, S.C., Plummers Island, Md., Gainesville, Fla., Starkville, Miss., and Williamsville, Mo.

Coptera wasbaueri, new species

(Fig. 87)

This closely resembles C. punctiger (Fouts) and C. pacifica, new species. From the former it differs in its smaller size, wider notaulices, shorter malar space of the female, and more slender preapical antennal segments of the male; and from the latter in the noticeably shorter female antennae; in addition, it differs from both in its somewhat smaller size and in the presence of a shallow but distinct oblique impression in the middle of the mesopleuron.

Female.--Length about 2 mm. In dorsal view head as wide as long and parallel-sided, nearly as wide as thorax, dorsum of head with two pairs of conspicuous punctures, anterior pair very large; distance from lateral ocelli to posterior margin of occiput clearly greater than maximum eye diameter; malar space a little less than half as long as eye; in lateral view temples usually as wide as eyes; antennae very short, first flagellar segment only a little longer than broad and segments 2-9 broader than long, apical segment thick and about 1.5 times as long as broad at base.

Notaulices widened at posterior ends; paired punctures at apex of scutellum large and narrowly separated; mesopleuron broadly and very shallowly impressed from lower anterior corner to upper posterior corner; metapleuron coarsely rugose reticulate.

Dorsal carinae of abdominal petiole rather well developed but median one short, usually extending only to middle of petiole; median sulcus of large tergite not reaching middle of segment and basal lateral sulci not developed.

Black; antennae entirely black; all coxae black, remainder of legs brownish yellow; wings hyaline.

Male.--In dorsal view head broader than long; distance from lateral ocelli to posterior margin of occiput less than maximum eye diameter; eyes clearly broader than temples; malar space about one-third as long as eye; flagellar segments 3-11 of antennae subequal, not twice as long as broad, all segments with abundant subappressed hair that more or less conceals surface.

Holotype female.--In California Academy of Sciences.

Distribution.--Known only from a single female (holotype) and three male paratypes, all collected by M. S. Wasbauer in "Imperial Co., Calif., Chocolate Mts., Ogilby Rd., 3 mi. S. Jct. Highway 78" in September 1977, and two female paratypes from Patagonia, Ariz., collected by P. H. Johnson 27 January 1961.

LITERATURE CITED

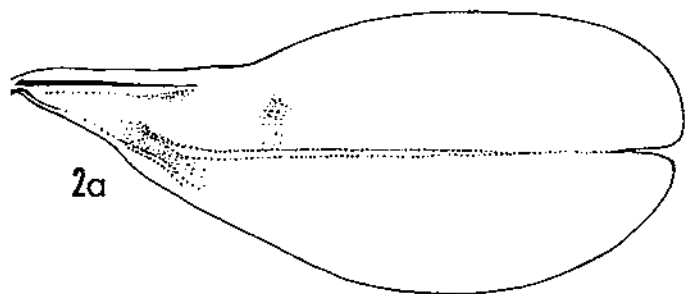
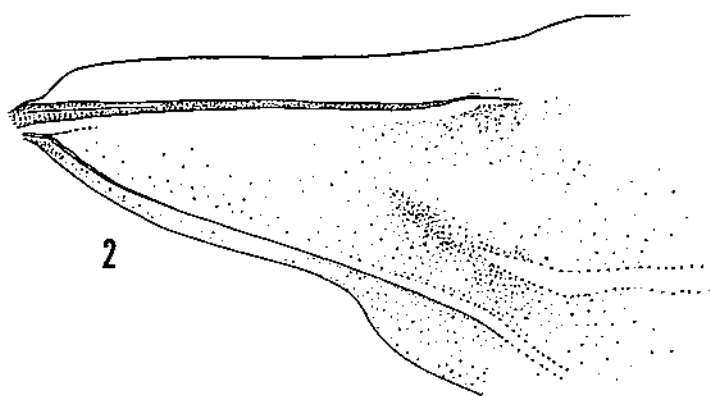
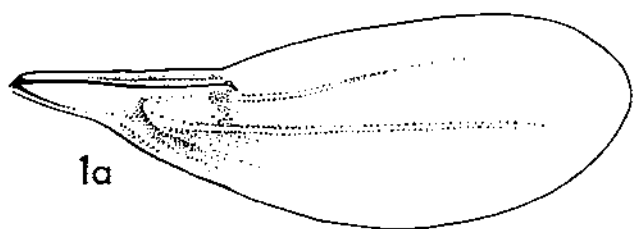
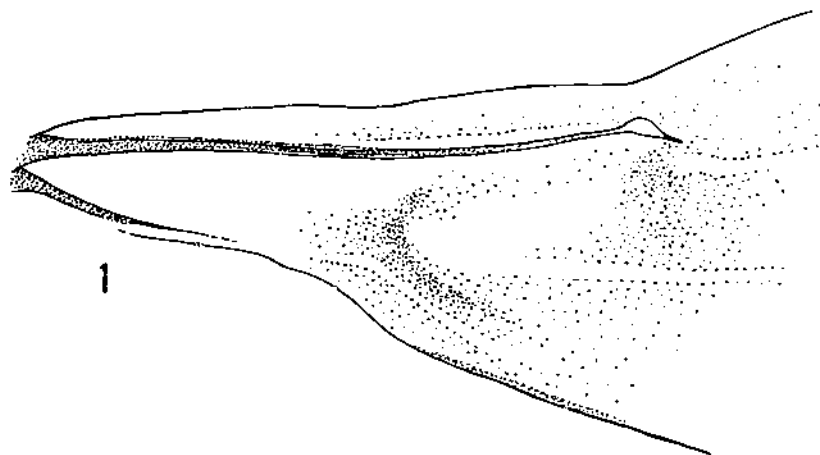
- Ashmead, W. H.
 1893. A monograph of the North American Proctotrypidae. U.S. Natl. Mus. Bul. 45: 1-472, illus.
- Brues, C. T.
 1905. Notes and descriptions of North American parasitic Hymenoptera. Wis. Nat. Hist. Soc. Bul. 3: 183-188.
 1906. Notes and descriptions of North American parasitic Hymenoptera. II. Wis. Nat. Hist. Soc. Bul. 4: 143-152.
- Fouts, R. M.
 1926. Notes on Serphoidea with descriptions of new species. Wash. Ent. Soc. Proc. 28: 167-179.
- Gahan, A. B., and Rohwer, S. A.
 - 1917-18. Lectotypes of the species of Hymenoptera (except Apoidea) described by Abbe Provancher. Canad. Ent. 49: 298-308, 331-336, 391-400, 427-433; 50: 28-33, 101, 106, 133-137, 166-171, 196-201.
- Gistel, J.
 1848. Naturgeschichte des Tierreichs für höhere Schulen. i-xvi + 216 pp., illus.
- Haliday, A. H.
 1829. In Curtis, J., A guide to an arrangement of British insects, 6 pp., 248 columns. London.
- Hellen, Wolter.
 1963. Die Diapriinen Finnlands (Hymenoptera. Proctotrupoidea). Fauna Fenn. 14: 1-34.
- Herrich-Schaeffer, G. A. W.
 1840. Nomenclator Entomologicus. Heft 2, Hymenoptera, pp. 31-240, illus. Regensburg, Germany.
- Jansson, A.
 1955. Studier över Svenska Proctotrupider. 6-9. Ent. Tidskr. 76: 4-10.
- Kieffer, J. J.
 1906. Beschreibung neuer Proctotrupiden aus Nord- und Zentralamerika. Berlin. Ent. Ztschr. 50: 237-290.
 1911. Proctotrypidae. In Andre, E., Species des Hymenopteres Europae-Algerie, v. 10, pp. 753-1015, illus. Paris.
 1916. Diapriidae. Das Tierreich 44, pp. vi-xxx, 1-627, illus. Berlin.
- Masner, L.
 1965. The types of Proctotrupoidea (Hymenoptera) in the British Museum (Natural History) and in the Hope Department of Entomology, Oxford. Brit. Mus. (Nat. Hist.) Bul. Ent., Sup. 1, pp. 1-154.
 1969. The Provancher species of Proctotrupoidea (Hymenoptera). Nat. Canad. 96: 775-784.
- Muesebeck, C. F. W., and Walkley, L. M.
 1951. Superfamily Proctotrupoidea. In Muesebeck et al., Hymenoptera of America North of Mexico - Synoptic Catalog. U.S. Dept. Agr. Agr. Monog. 2: 655-718.

- Muesebeck, C. F. W., and Walkley, L. M.
1956. Type species of the genera and subgenera of parasitic wasps comprising the superfamily Proctotrupoidea (order Hymenoptera). U.S. Natl. Mus. Proc. 105: 319-419.
- Panzer, G. W. F.
1801. Faunae insectorum germaniae initia..., Heft 83, No. 11 (n.p.). Nürnberg, Germany.
- Provancher, L.
1881. Faune Canadienne, les insectes - Hymenopteres. Nat. Canad. 12: 257-269.
- 1883. Petite faune entomologique du Canada. V. II, pp. 153-830, illus. Quebec.
- 1888. Additions et corrections au volume II de la faune entomologique du Canada, Hymenopteres supplement, pp. 346-448. Quebec.
- Say, T.
1836. Descriptions of new North American Hymenoptera, and observations on some already described. Boston Jour. Nat. Hist. 1: 210-305.
- Tomsik, B.
1946. Rody Galesus Hal., a Schizogalesus gen. n. Ent. Listy Brno 9: 119-132.

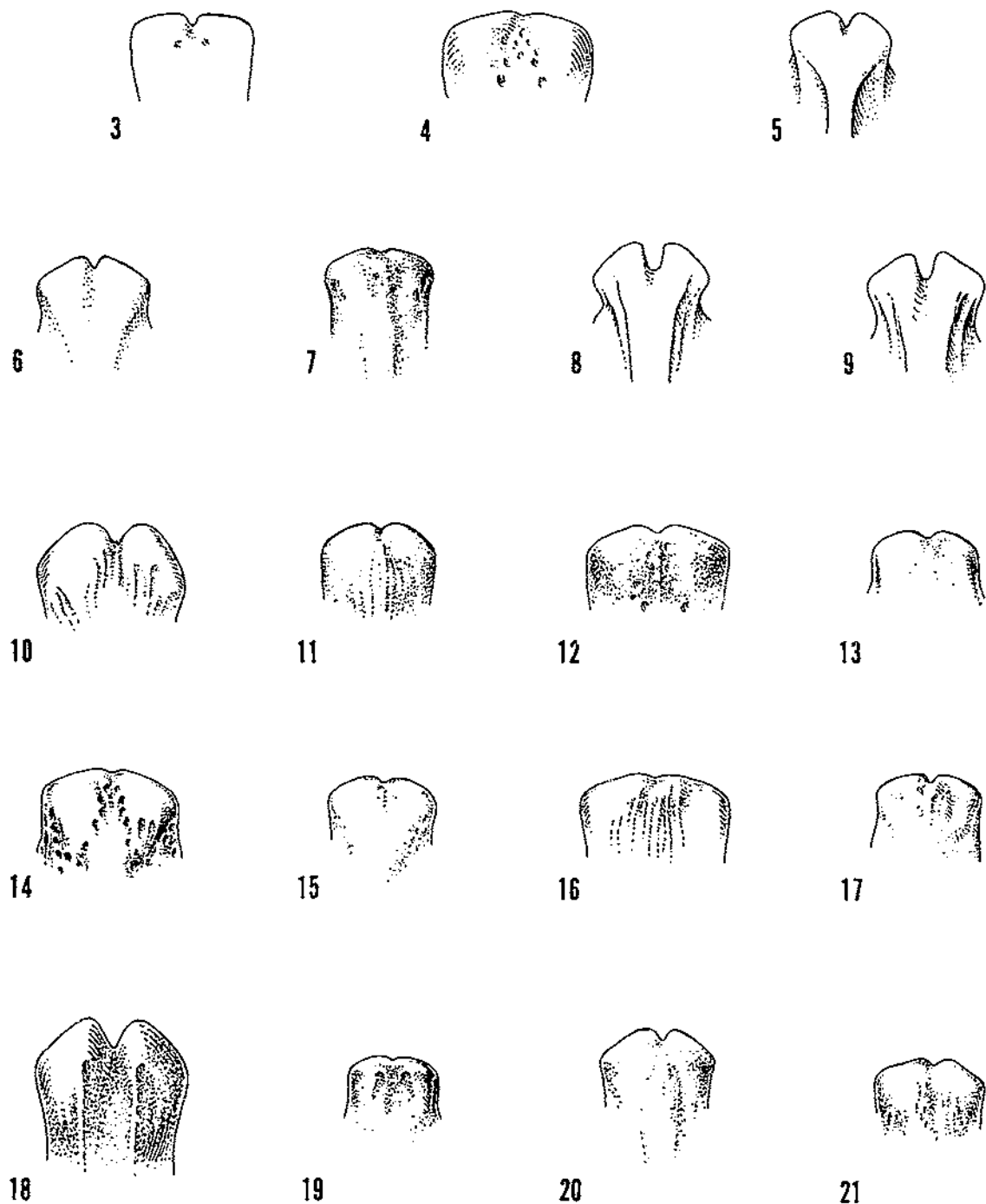
INDEX TO SPECIES AND GENERA

(Underlined numbers refer to principal treatment)

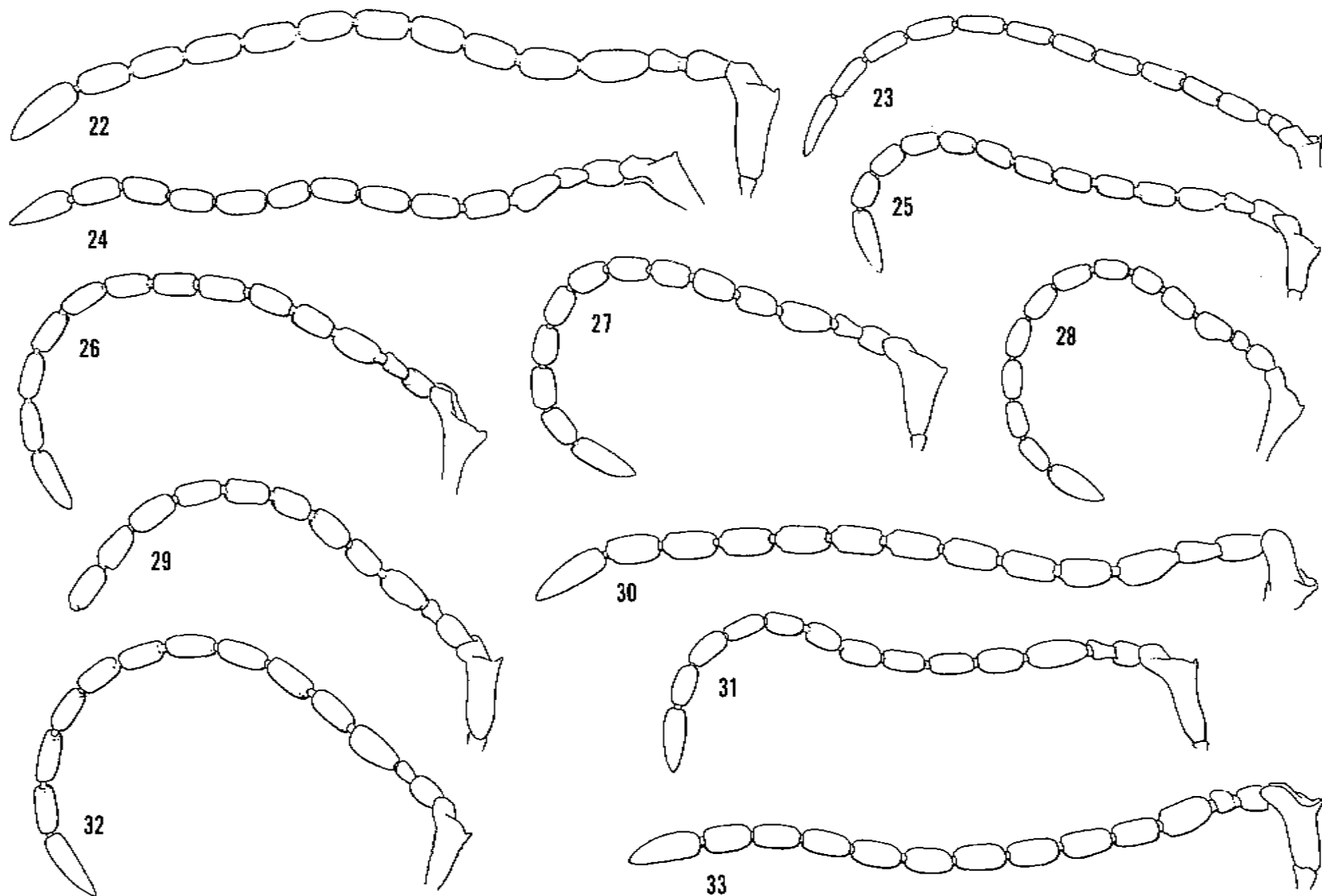
- abbreviata, new species, Coptera, 25, 26
 abruptus, new species, Psilus, 4, 6
 aequalis, new species, Coptera, 22, 25, 27, 46
 aliena, new species, Coptera, 24, 28
 angulata, new species, Coptera, 24, 29
 angusticeps, new species, Psilus, 5, 7, 17
Anisoptera Herrich-Schaeffer, 1, 2
 aqilonius, new species, Psilus, 4, 6, 8, 12
 atricornis (Ashmead), Coptera, 22, 25, 29, 30, 38
 autumnalis (Brues), Psilus, 4, 5, 6, 9
 chylizae, new species, Coptera, 23, 24, 30, 39
 cingulatae, new species, Coptera, 23, 26, 31, 43, 50
clarimontis Kieffer, Galesus, 43
 Coptera Say, 1, 2, 21
 cornutus Panzer, Psilus, 2
 denticulata, new species, Coptera, 22, 25, 32
 Diapria Latreille, 1
 dissidens, new species, Psilus, 3, 4, 10, 15, 16
 dissimilis, new species, Coptera, 22, 23, 33, 38
 distans, new species, Coptera, 23, 26, 34, 37, 49
 divisa, new species, Coptera, 23, 25, 35
 egregia Herrich-Schaeffer, Anisoptera, 2
 evansi, new species, Coptera, 22, 25, 36, 44
 eximius, new species, Psilus, 4, 5, 11, 18
 fortis, new species, Psilus, 4, 5, 11, 17, 20
Galesus Curtis, 1
Galesus Haliday, 1, 2
 huachuana, new species, Coptera, 24, 37
Laches Gistel, 2
 masneri, new species, Psilus, 4, 12
 masoni, new species, Psilus, 3, 6, 13, 14
 mellipes, new species, Coptera, 23, 24, 34, 37
 microtomus (Kieffer), Psilus, 4, 6, 13, 14, 19
 montana, new species, Coptera, 22, 24, 33, 37, 38
 nidicola, new species, Psilus, 5, 15
 occidentalis, new species, Coptera, 22, 24, 30, 39, 40
 pacifica, new species, Coptera, 22, 40, 51
 pholeomyiae, new species, Coptera, 23, 24, 41, 42
 pilosa (Ashmead), Coptera, 23, 24, 25, 41, 42, 45
 polita Say, Coptera, 21, 23, 26, 29, 31, 43, 47, 48
 pomonellae, new species, Coptera, 23, 26, 34, 36, 44
 Psilus Panzer, 1, 2
 punctatus Kieffer, Schizogalesus, 21
 punctiger (Fouts), Coptera, 24, 25, 42, 45, 51
 pusillus, new species, Psilus, 3, 16
 quebecensis (Provancher), Psilus, 5, 7, 16
 rufitarsis (Kieffer), Psilus, 8
Schizogalesus Kieffer, 1, 21
 shannoni, new species, Psilus, 5, 17
 singularis, new species, Psilus, 4, 11, 18
 strauziae, new species, Coptera, 22, 25, 26, 27, 46
 subapterus (Thomson), Psilus, 10
 sublata, new species, Coptera, 23, 25, 46
 sulcata, new species, Coptera, 22, 25, 47
 tenuicornis, new species, Coptera, 26, 48
 tersa, new species, Coptera, 23, 24, 49
 texanus Ashmead, Galesus, 29, 30
 townesi, new species, Coptera, 23, 26, 50
 vicinus, new species, Psilus, 6, 19
 viereckii (Brues), Psilus, 4, 5, 9, 11, 20
 washbaueri, new species, Coptera, 24, 25, 51



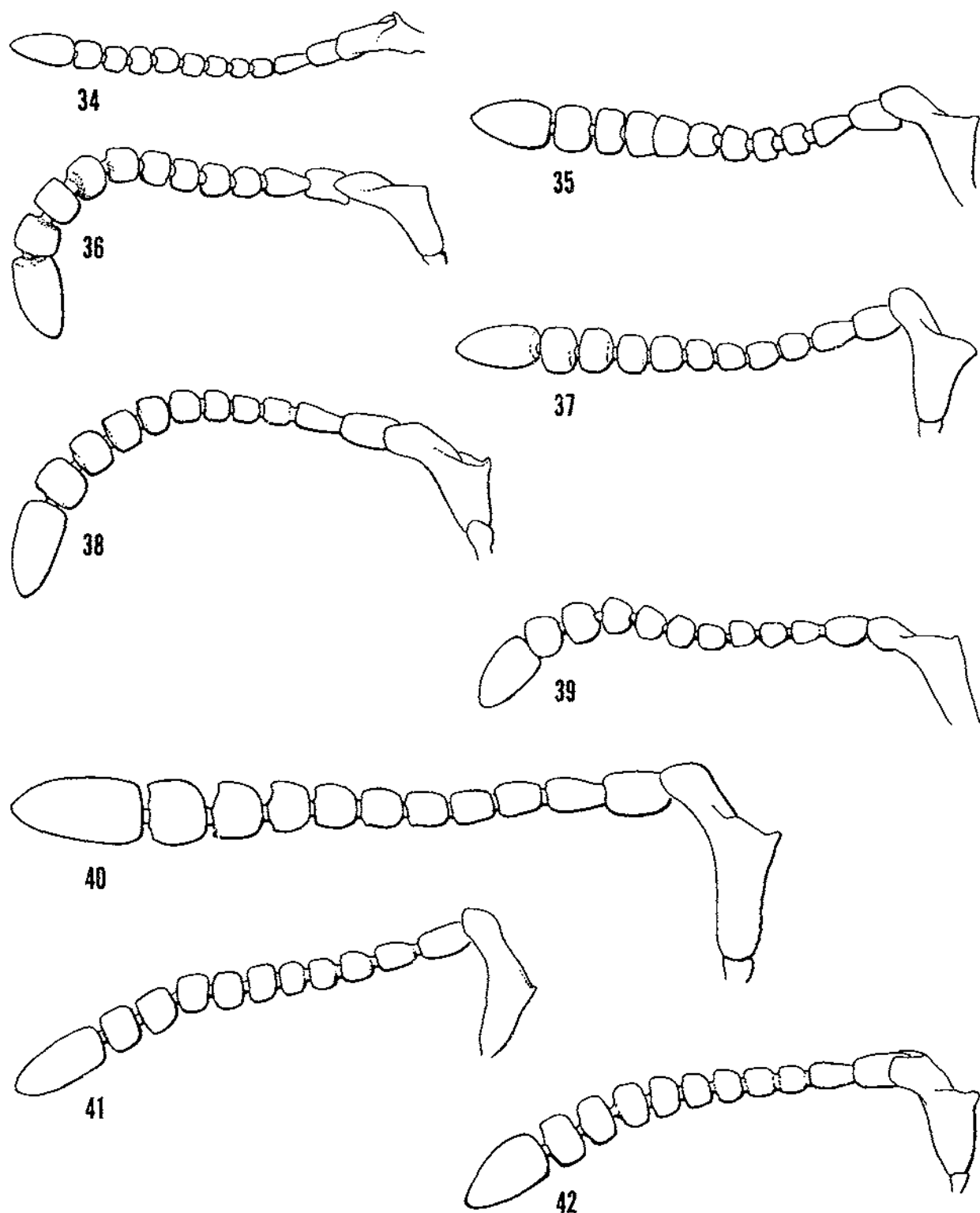
Figures 1 and 1, a.--Psilus aquilonius, n. sp.: 1, Basal part of forewing; 1, a, outline of entire wing. Figures 2 and 2, a.--Coptera strauziae, n. sp.: 2, Basal part of forewing; 2, a, outline of entire wing.



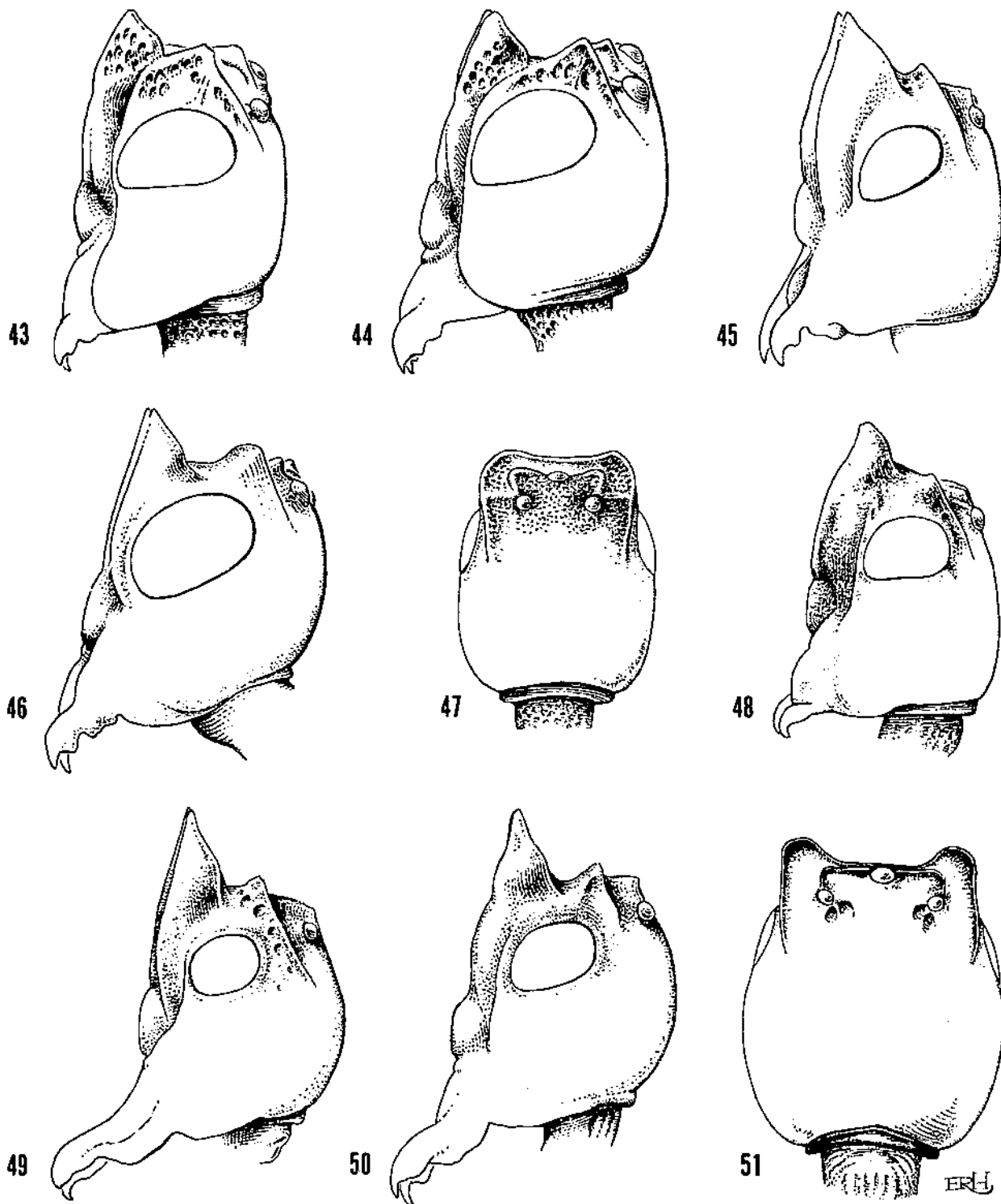
Figures 3-21.--Elevated rims of antennal sockets of *Psilus* species: 3, *angusticeps*, n. sp., male; 4, *aquilonius*, n. sp., female; 5, *autumnalis* (Brues), female; 6, same, male; 7, *dissidens*, n. sp., female; 8, *eximius*, n. sp., female; 9, same, male; 10, *fortis*, n. sp., female; 11, *masneri*, n. sp., female; 12, *masoni*, n. sp., female; 13, *microtomus* (Kieffer), male; 14, *nidicola*, n. sp., male; 15, *pusillus*, n. sp., female; 16, *quebecensis* (Provancher), male; 17, *shannoni*, n. sp., male; 18, *singularis*, n. sp., female; 19, *vicinus*, n. sp., male; 20, *viereckii* (Brues), female; 21, same, male.



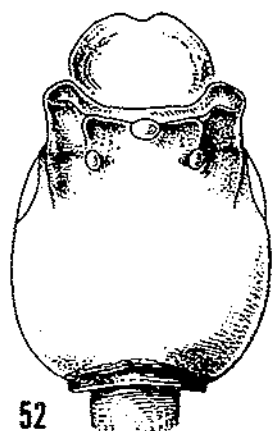
Figures 22-33.--Male antennae of Psilus species: 22, angusticeps, n. sp.; 23, aquilonius, n. sp.; 24, autumnalis (Brues); 25, dissidens, n. sp.; 26, eximius, n. sp.; 27, fortis, n. sp.; 28, masoni, n. sp.; 29, microtomus (Kieffer); 30, nidicola, n. sp.; 31, shannoni, n. sp.; 32, vicinus, n. sp.; 33, viereckii (Brues).



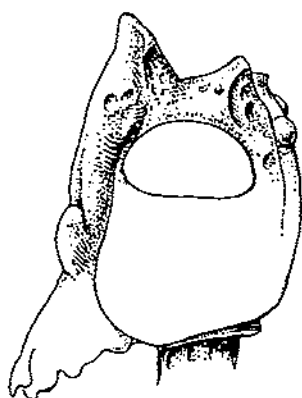
Figures 34-42.--Female antennae of Psilus species: 34, aquilonius, n. sp.; 35, autumnalis (Brues); 36, dissidens, n. sp.; 37, fortis, n. sp.; 38, masneri, n. sp.; 39, masoni, n. sp.; 40, microtomus (Kieffer); 41, pusillus, n. sp.; 42, viereckii (Brues).



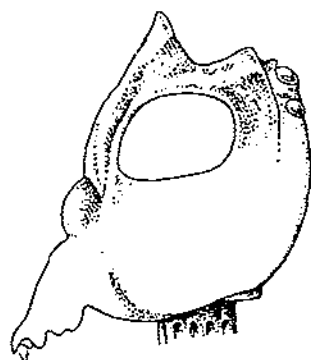
Figures 43-51.--Heads of *Psilus* species: 43, *aquilonius*, n. sp., female, lateral view; 44, same, male; 45, *autumnalis* (Brues), female, lateral view; 46, same, male; 47, *dissidens*, n. sp., female, dorsal view; 48, same, lateral view; 49, *eximius*, n. sp., female, lateral view; 50, same, male; 51, *fortis*, n. sp., female, dorsal view.



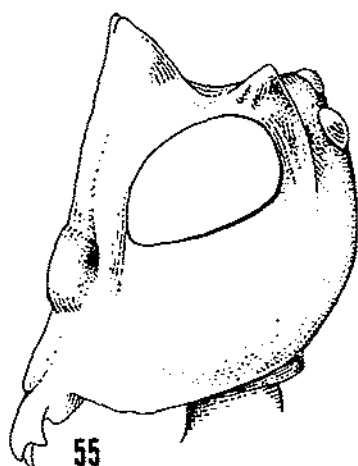
52



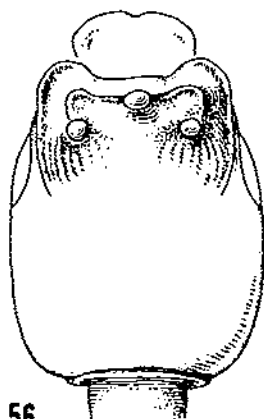
53



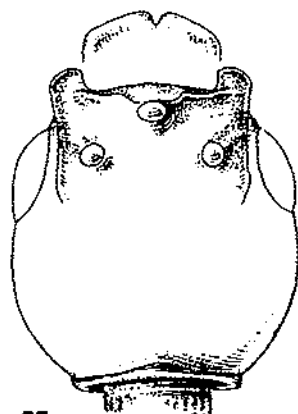
54



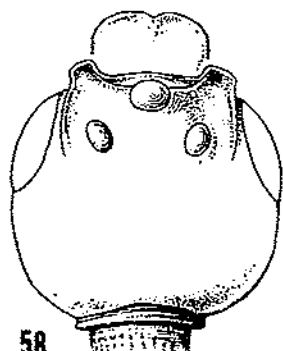
55



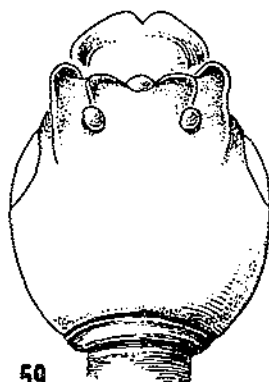
56



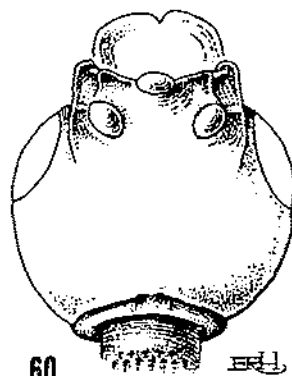
57



58

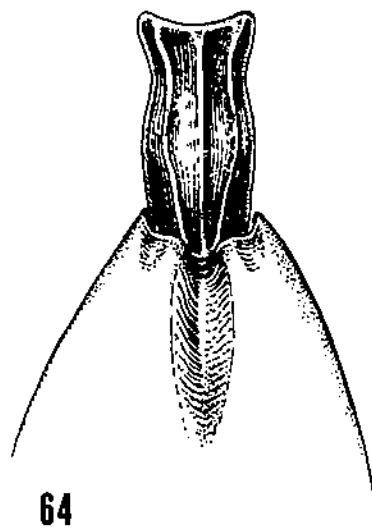
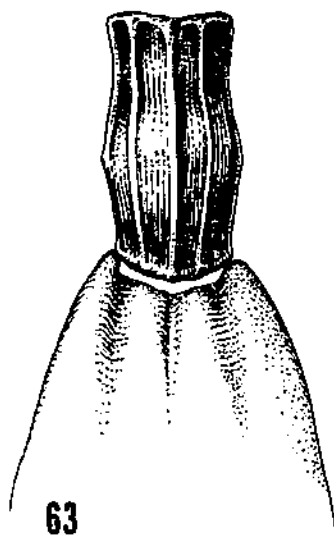
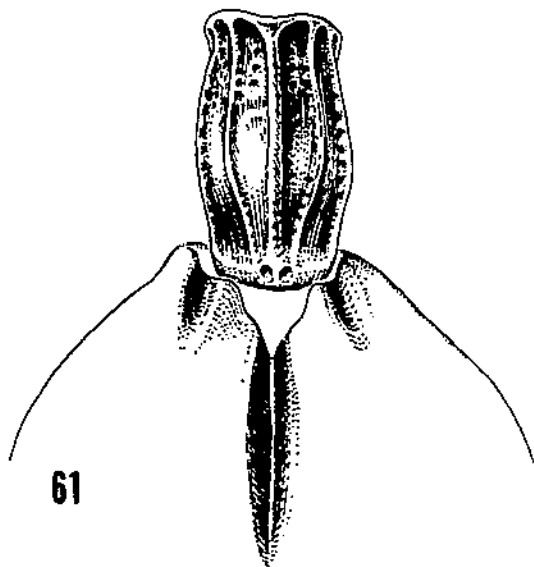


59

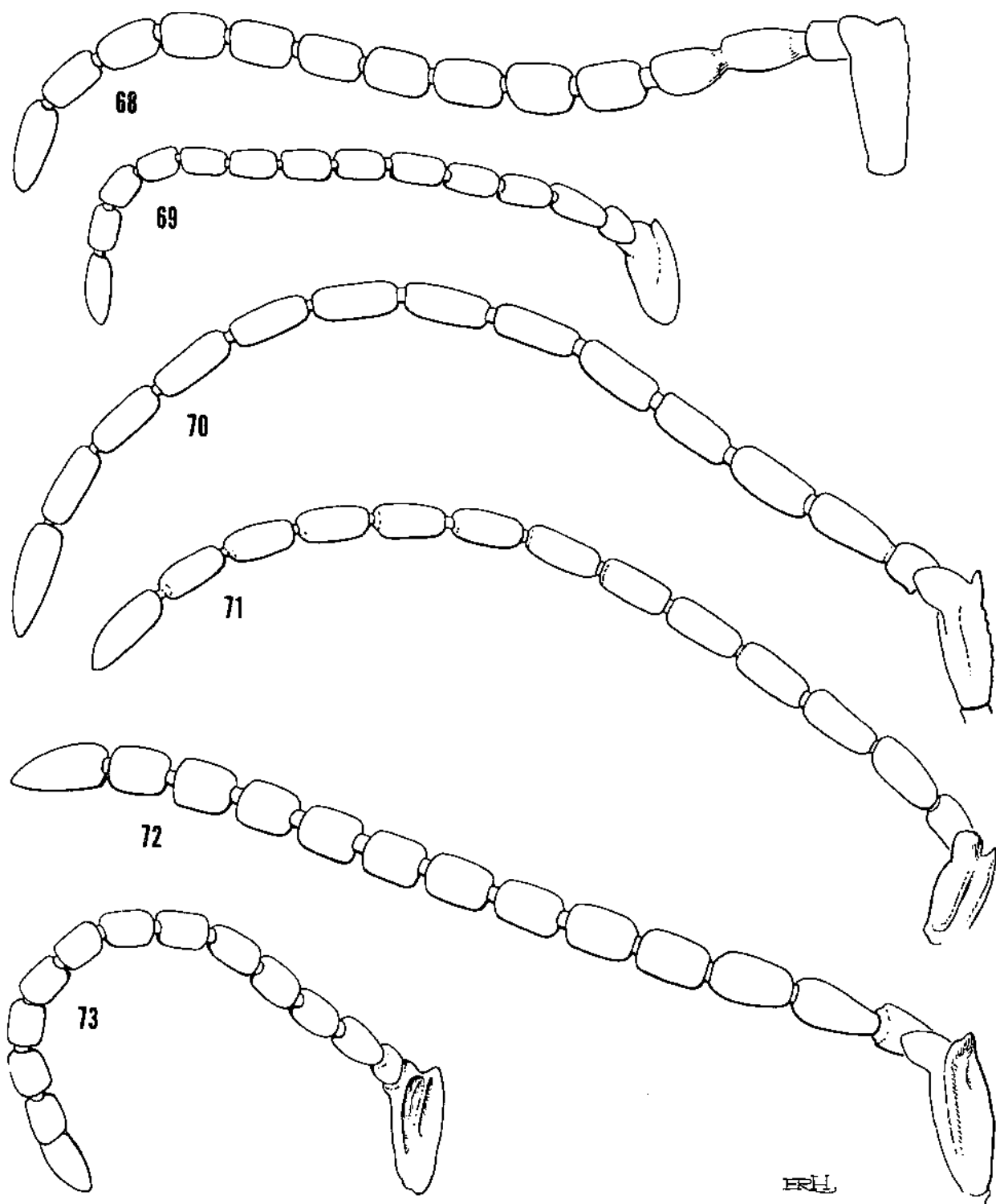


60

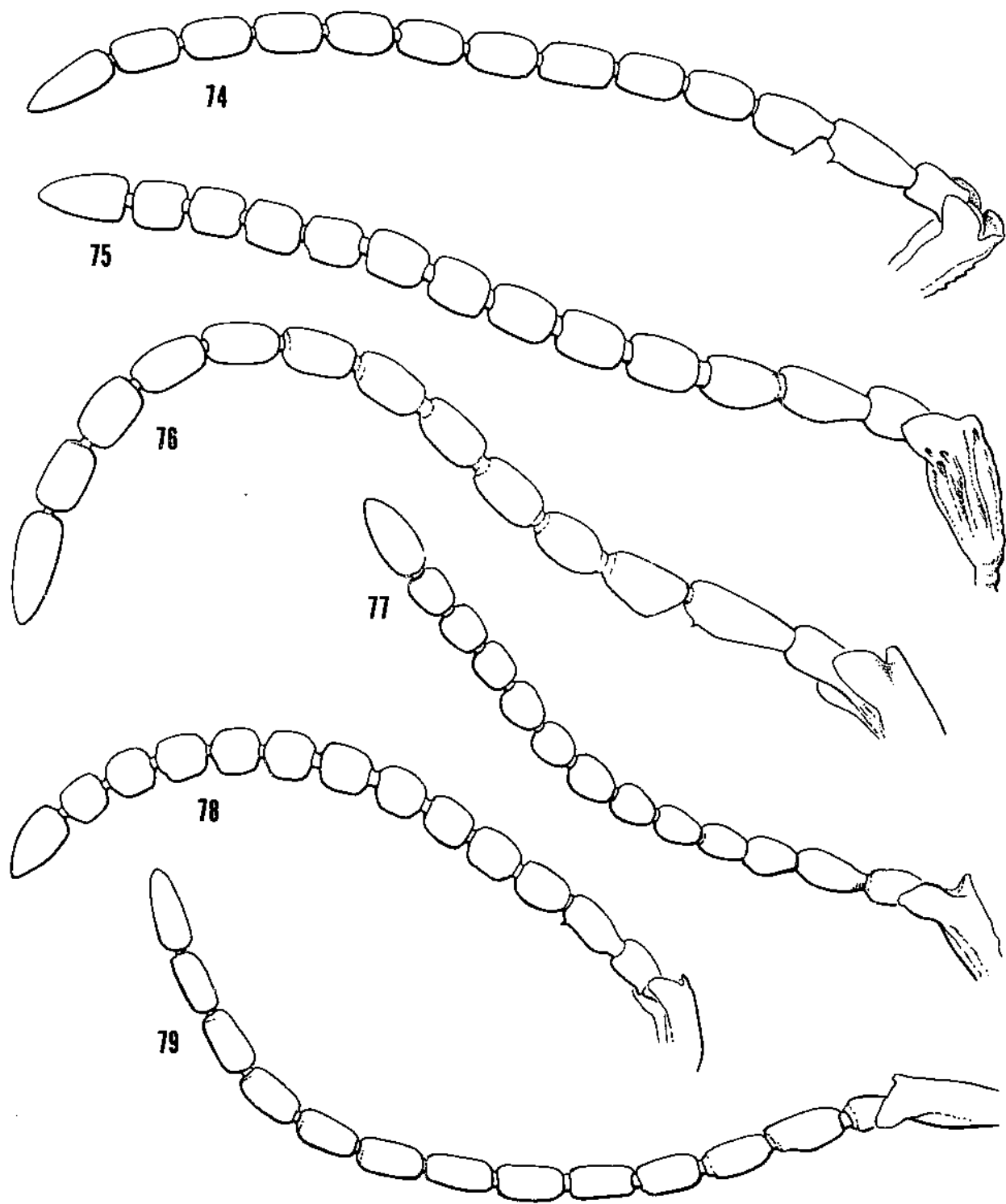
Figures 52-60.--Heads of *Psilus* species: 52, *masneri*, n. sp., female, dorsal view; 53, *masoni*, n. sp., female, lateral view; 54, same, male; 55, *microtomus* (Kieffer), male, lateral view; 56, *pusillus*, n. sp., female, dorsal view; 57, *shannoni*, n. sp., male, dorsal view; 58, *vicinus*, n. sp., male, dorsal view; 59, *viereckii* (Brues), female, dorsal view; 60, same, male.



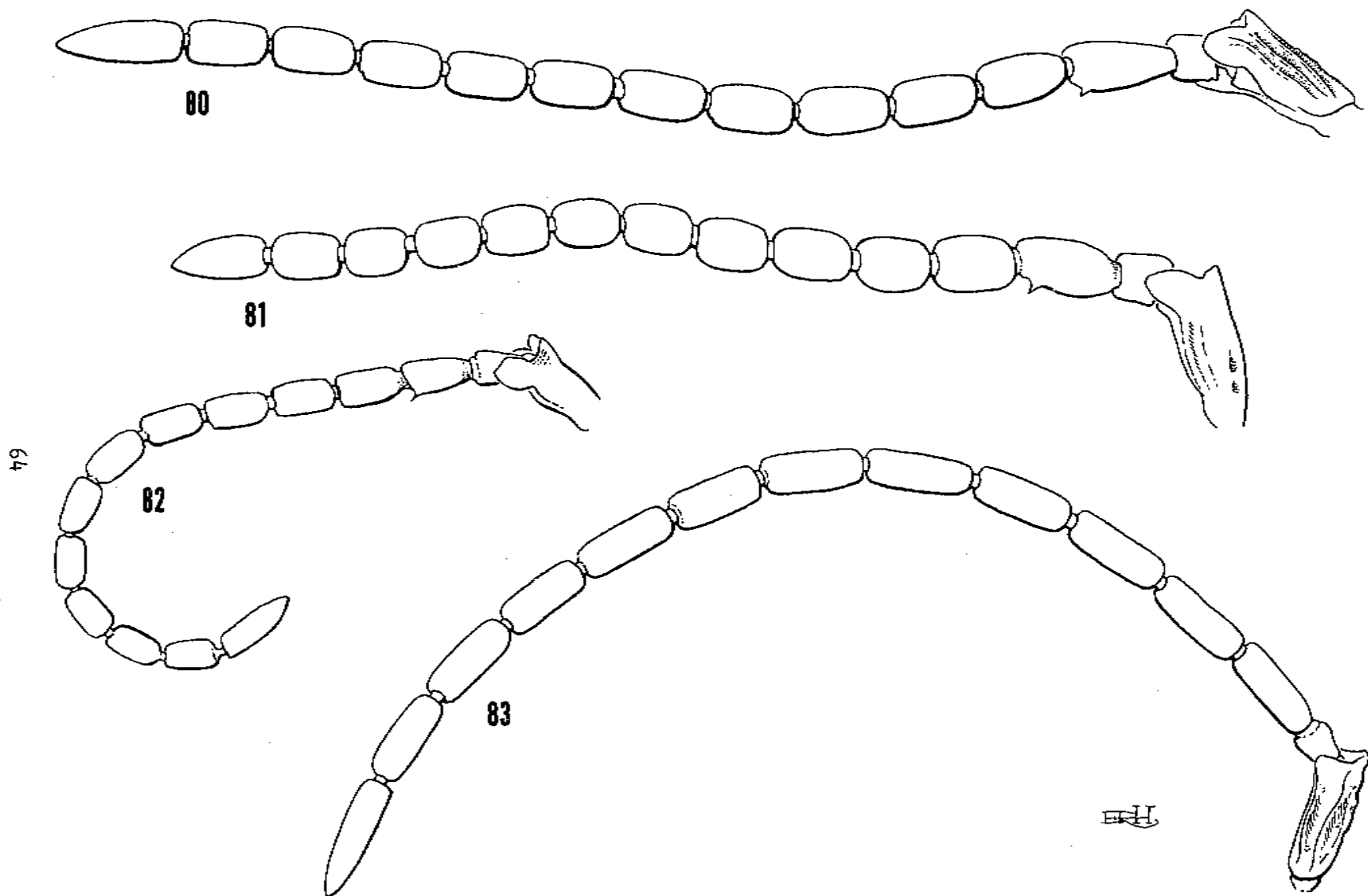
Figures 61-64.--Abdominal petioles of Psilus species: 61, aquilonius, n. sp.; 62, dissidens, n. sp.; 63, eximius, n. sp.; 64, microtomus (Kieffer). Figures 65-67.--Elevated rims of antennal sockets of Coptera species: 65, denticulata, n. sp.; 66, divisa, n. sp.; 67, huachucana, n. sp.



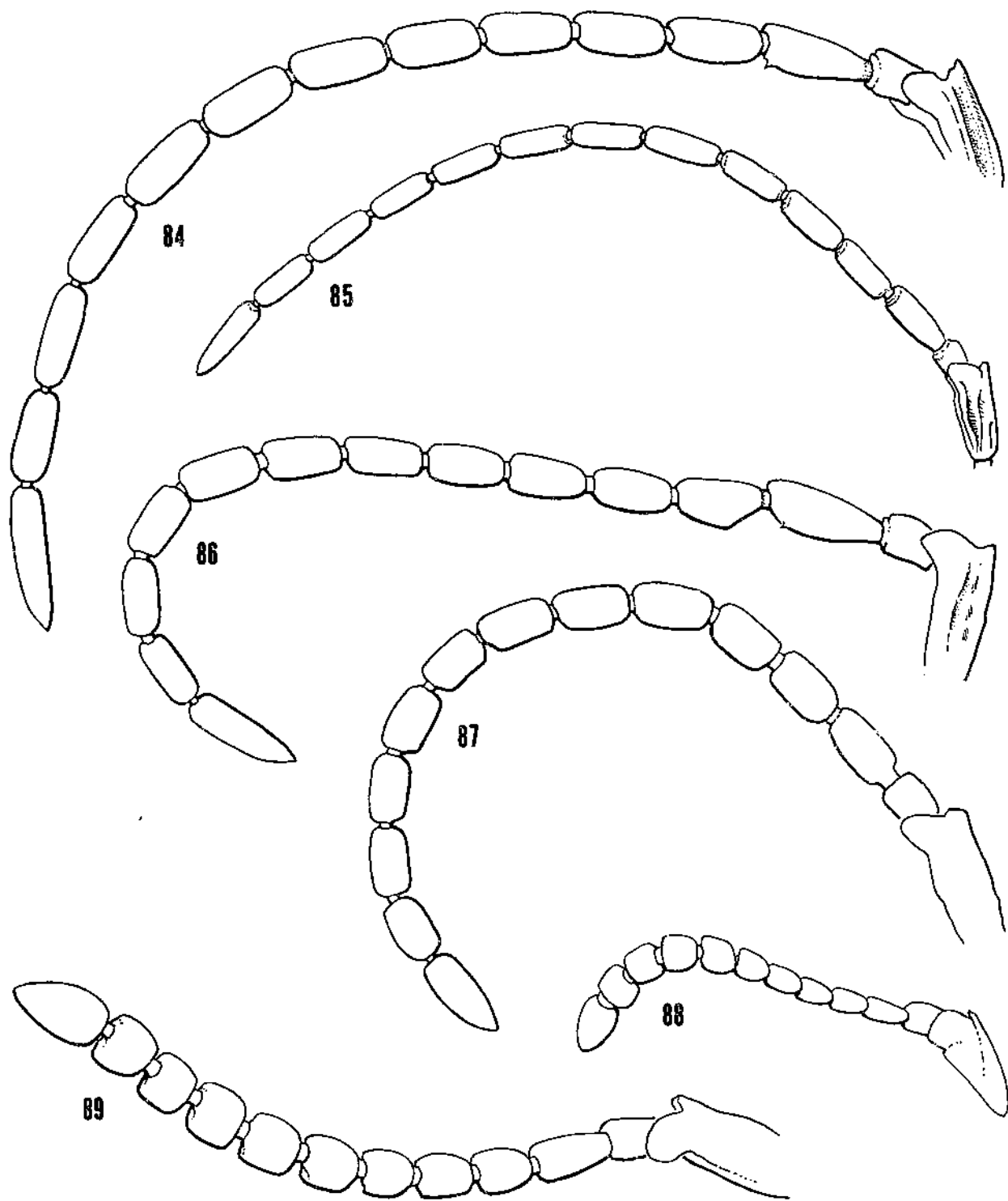
Figures 68-73.--Male antennae of Coptera species: 68, abbreviata, n. sp.; 69, atricornis (Ashmead); 70, cingulatae, n. sp.; 71, denticulata, n. sp.; 72, divisa, n. sp.; 73, evansi, n. sp.



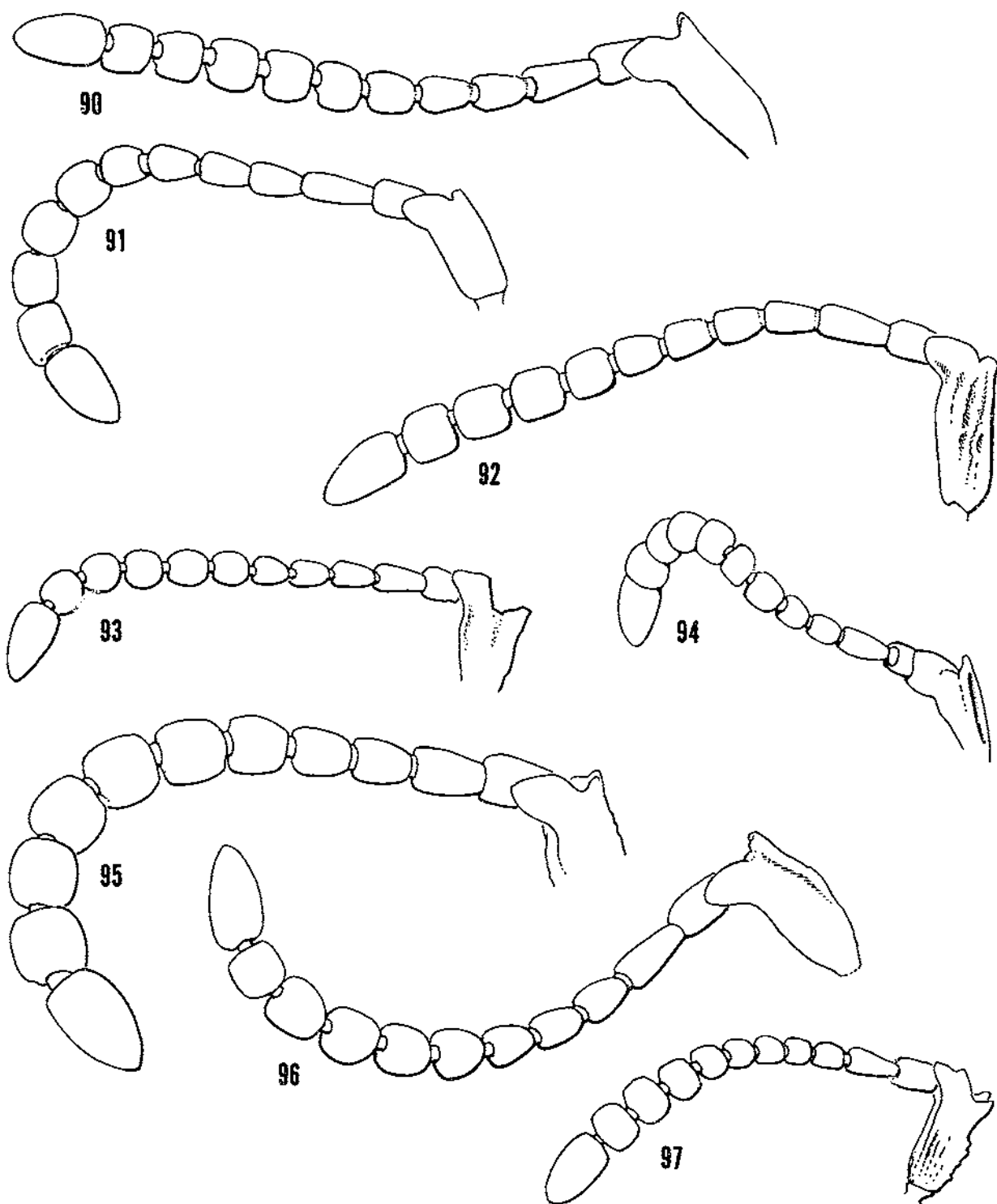
Figures 74-79.--Male antennae of *Coptera* species: 74, *huachucana*, n. sp.; 75, *mellipes*, n. sp.; 76, *occidentalis*, n. sp.; 77, *pholeomyiae*, n. sp.; 78, *pilosa* (Ashmead); 79, *polita* Say.



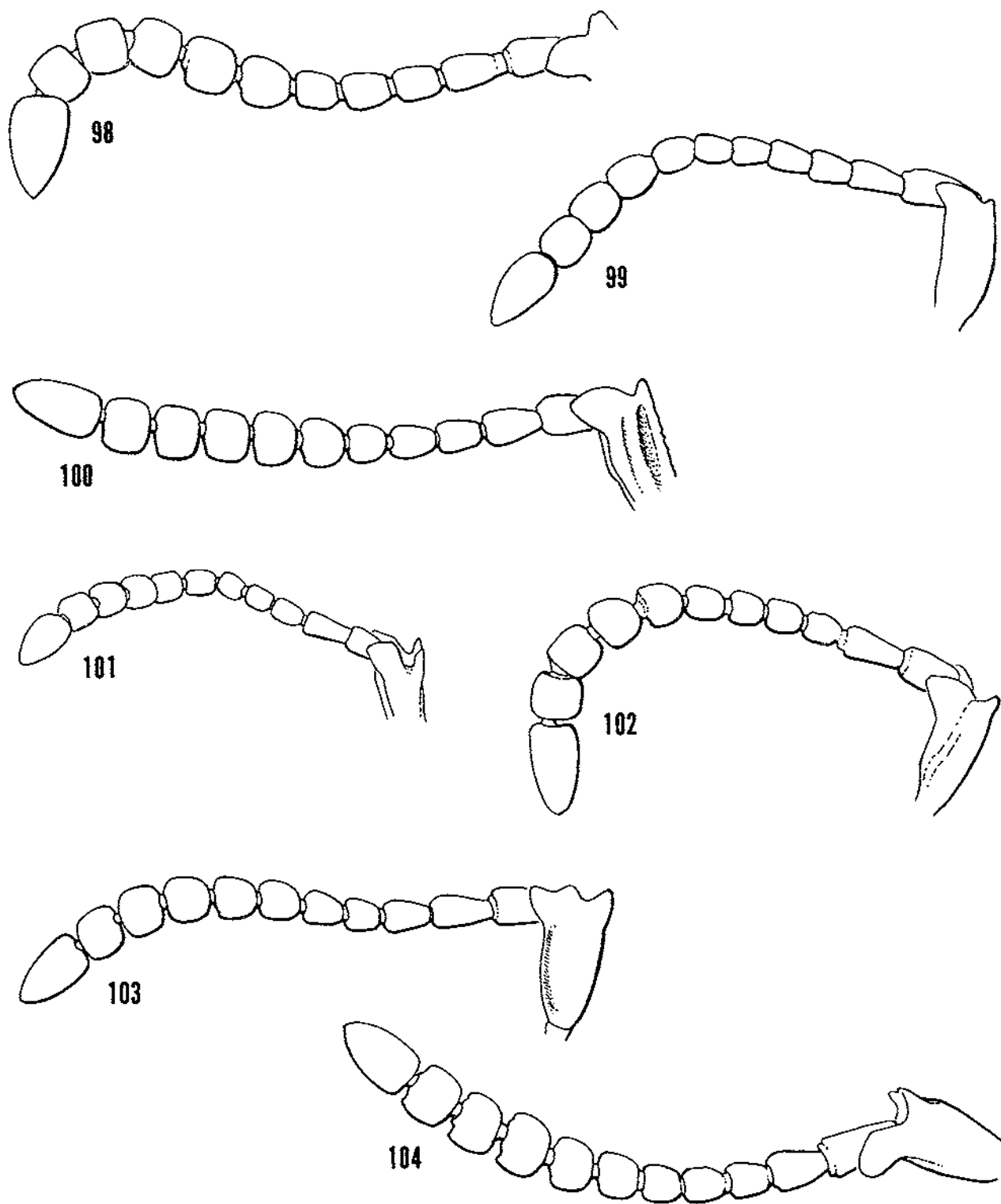
Figures 80-83.--Male antennae of *Coptera* species: 80, *pomonellae*, n. sp.; 81, *punctiger* (Fouts); 82, *strauziae*, n. sp.; 83, *sublata*, n. sp.



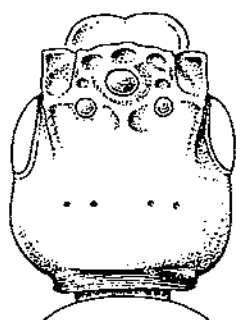
Figures 84-87.--Male antennae of Coptera species: 84, sulcata, n. sp.; 85, tenuicornis, n. sp.; 86, tersa, n. sp.; 87, wasbaueri, n. sp. Figures 88-89.--Female antennae of Coptera species: 88, atricornis (Ashmead); 89, chylizae, n. sp.



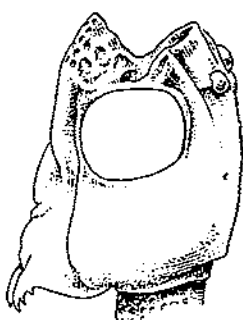
Figures 90-97.--Female antennae of Coptera species: 90, cingulatae, n. sp.; 91, denticulata, n. sp.; 92, divisa, n. sp.; 93, dissimilis, n. sp.; 94, evansi, n. sp.; 95, mellipes, n. sp.; 96, occidentalis, n. sp.; 97, pholeomyiae, n. sp.



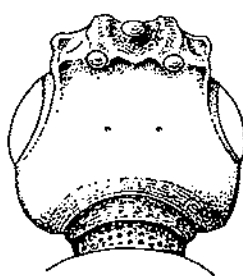
Figures 98-104.--Female antennae of Coptera species: 98, pilosa (Ashmead); 99, polita Say; 100, pomonellae, n. sp.; 101, strauziae, n. sp.; 102, sulcata, n. sp.; 103, tersa, n. sp.; 104, townesi, n. sp.



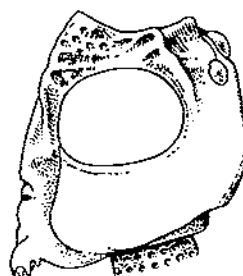
105



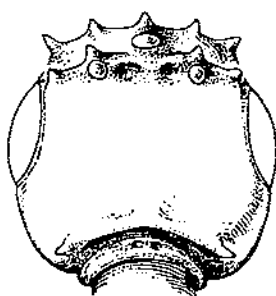
106



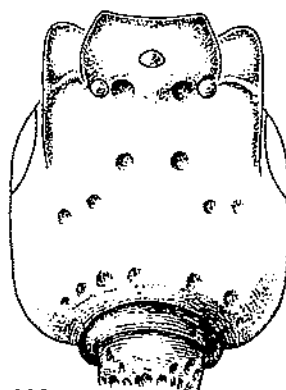
107



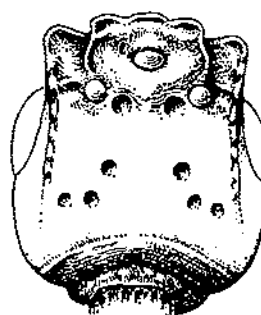
108



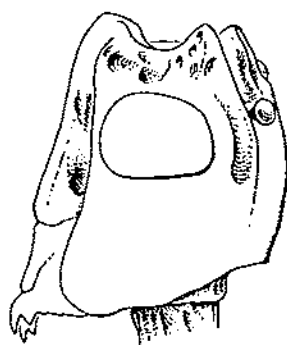
109



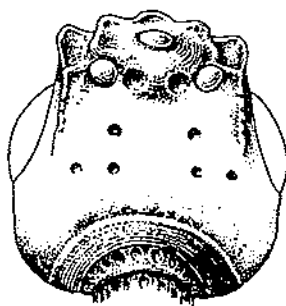
110



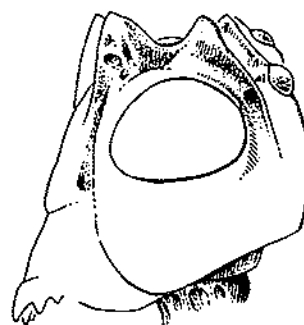
111



112

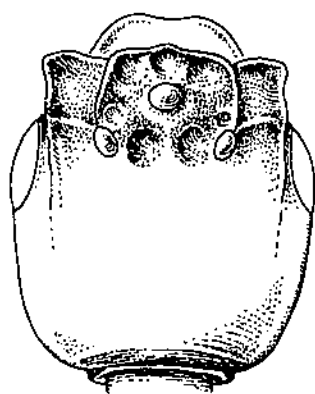


113

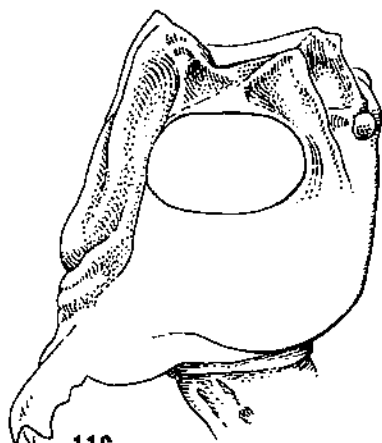


114

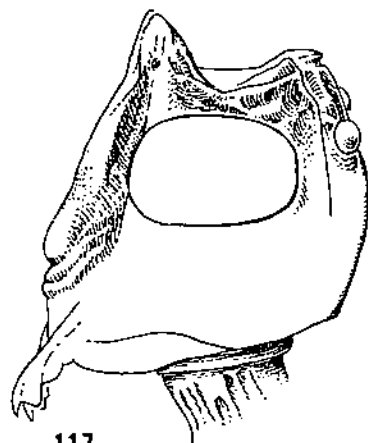
Figures 105-114.--Heads of *Coptera* species: 105, *atricornis* (Ashmead), female, dorsal view; 106, same, lateral view; 107, same, male, dorsal view; 108, same, lateral view; 109, *denticulata*, n. sp., female, dorsal view; 110, *dissimilis*, n. sp., female, dorsal view; 111, *evansi*, n. sp., female, dorsal view; 112, same, lateral view; 113, same, male dorsal view; 114, same, lateral view.



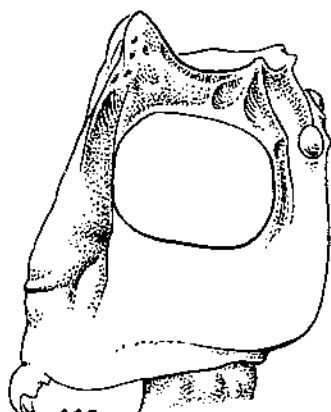
115



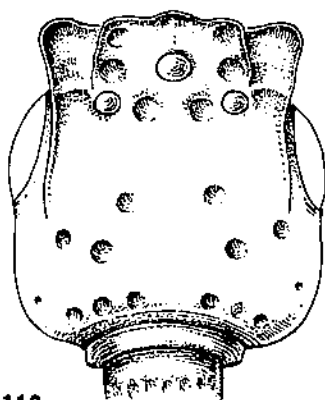
116



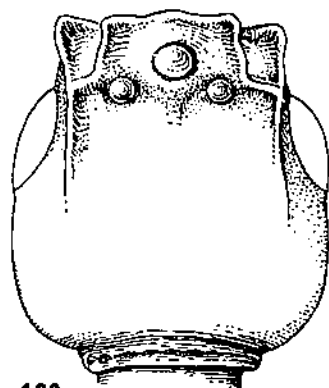
117



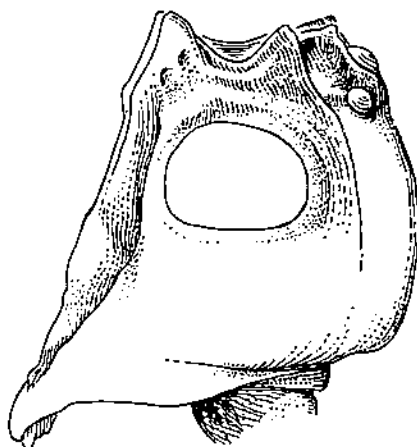
118



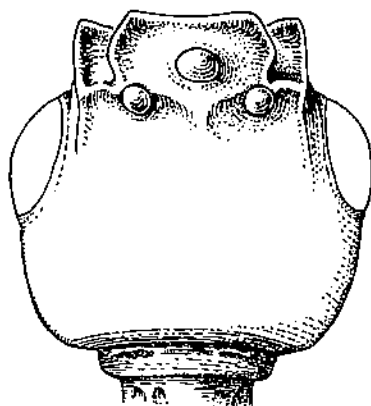
119



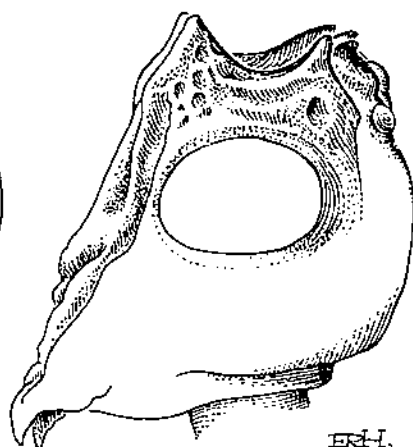
120



121

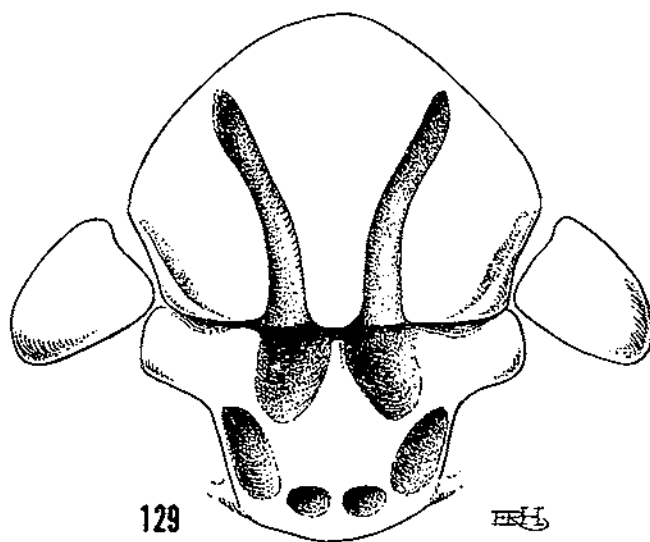
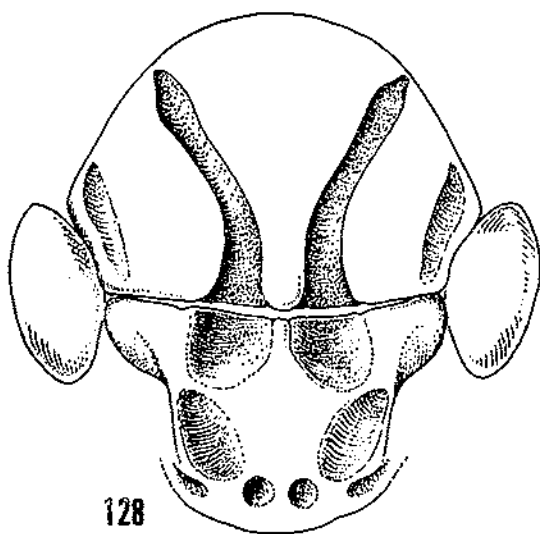
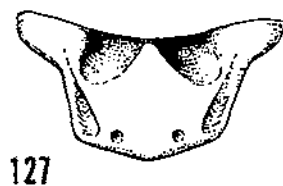
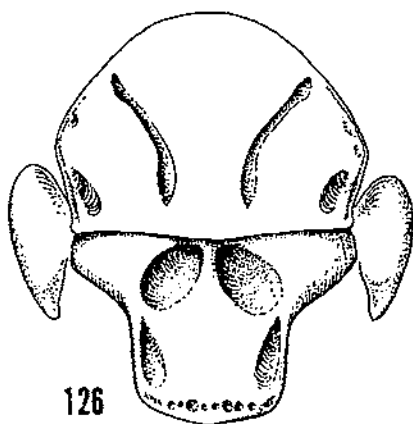
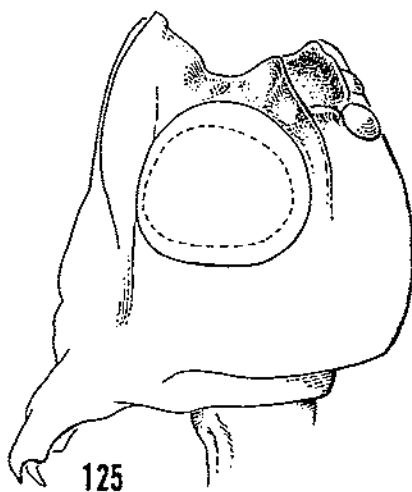
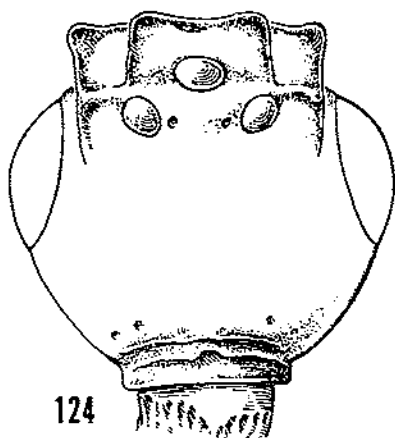


122

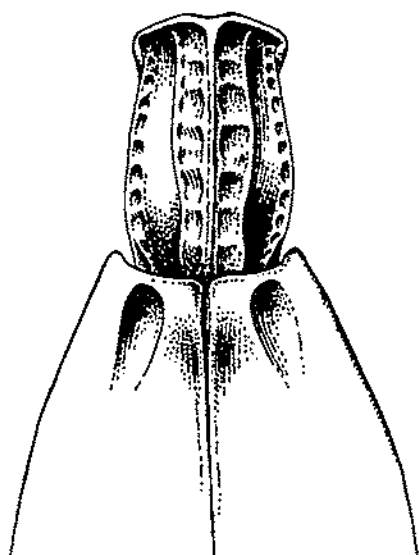


123

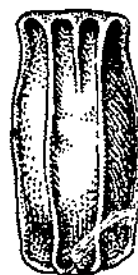
Figures 115-123.--Heads of Coptera species: 115, pholeomyiae, n. sp., female, dorsal view; 116, same, lateral view; 117, same, male, lateral view; 118, polita Say, female, lateral view; 119, pomonellae, n. sp., female, dorsal view; 120, strauziae, n. sp., female, dorsal view; 121, same, lateral view; 122, same, male, dorsal view; 123, same, lateral view.



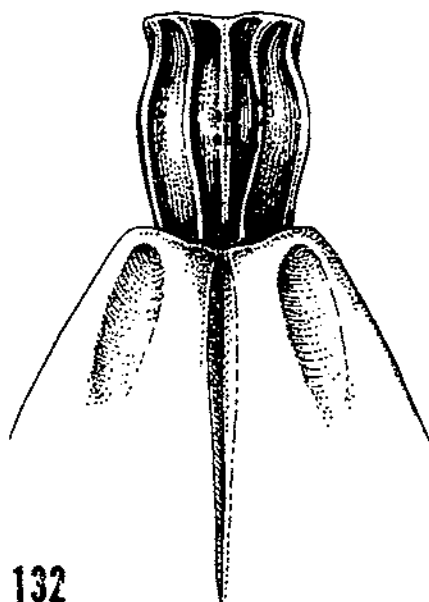
Figures 124-129.--*Coptera* species: 124, *tersa*, n. sp., male, dorsal view of head; 125, *townesi*, n. sp., female, lateral view of head; 126, *abbreviata*, n. sp., mesoscutum and scutellum; 127, *atricornis* (Ashmead), scutellum; 128, *occidentalis*, n. sp., mesoscutum and scutellum; 129, *pacifica*, n. sp., mesoscutum and scutellum.



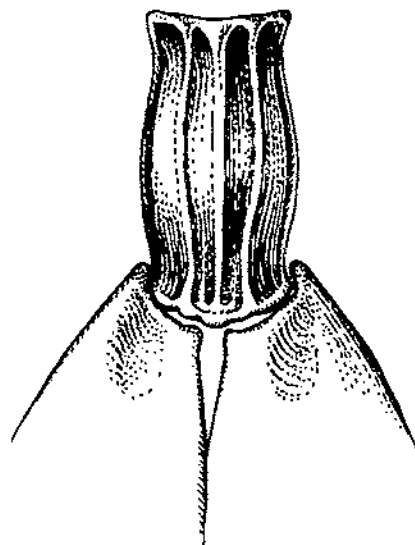
130



131



132



133

Figures 130-133.--Abdominal petioles of Coptera species: 130, atricornis (Ashmead), male; 131, denticulata, n. sp., male; 132, evansi, n. sp., male; 133, strauziae, n. sp., male.

U.S. DEPARTMENT OF AGRICULTURE
SCIENCE AND EDUCATION ADMINISTRATION
WASHINGTON, D.C. 20250

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF
AGRICULTURE
AGR 101



END