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SYSTEMATICS OF STATOR OF NORTH AND CENTRAL AMERICA (COLEOPTERA: BRUCHIDAE)
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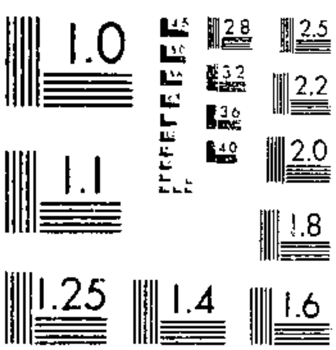

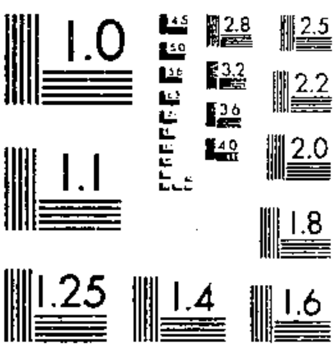

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SYSTEMATICS OF STATOR OF NORTH AND CENTRAL AMERICA (Coleoptera: Bruchidae)

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SYSTEMATICS OF STATOR OF NORTH AND CENTRAL AMERICA (Coleoptera: Bruchidae)

By CLARENCE D. JOHNSON, *associate professor, Department of Biological Sciences, Northern Arizona University,* and JOHN M. KINGSOLVER, *research entomologist, Systematic Entomology Laboratory, Northeastern Region, Agricultural Research Service*

The genus *Stator* was described by Bridwell (*1946*)[1] along with 11 other genera of Bruchidae. For these genera he listed only type-species; therefore the placement of the many described species, which were in *Bruchus,* into Bridwell's new genera has been left to subsequent workers, such as Bottimer (*1961, 1968b*), Johnson (*1963, 1968b*), and Johnson and Kingsolver (*1973*).

Johnson (*1963*) was the first to revise one of Bridwell's genera when he treated the U.S species of *Stator*. Since then Kingsolver (*1970b, 1972a, 1972b*) and Bottimer (*1973*) have described new species and transferred described species to *Stator*. In addition to taxonomic studies, information on the ecology and behavior of species of *Stator* has been published by Janzen (*1967, 1969*), Johnson (*1968a*), Bottimer (*1973*), and Center and Johnson (*1974*).

Species of *Stator* are most abundant in the New World Tropics, but the geographical range of the genus extends from the United States to Argentina. Several species are found in Hawaii and the West Indies. Until more specimens of *Stator* from South America become available, revisionary studies of those species must be delayed. *Stator* is not known outside the New World and Hawaii.

Our studies show that *Stator* has well-defined generic limits, but until other New World genera are studied, the analysis of the relationships of *Stator* to other bruchid genera must wait. We regard *Stator* as a natural group related to *Sennius* Bridwell, *Bruchidius* Schilsky, and *Acanthoscelides* Schilsky as well as most of the genera described by Bridwell (*1946*).

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[1] The year in italic after an author's name indicates the reference in Literature Cited, p. 71.

In this bulletin we describe *Stator* and its North and Central American species, compile groups of closely related species of *Stator* including the known species from other parts of the Western Hemisphere (table 4 ftnt.), compile lists of host plants from published data, and add new host data. Our classification is based on morphological and ecological data.

Genus STATOR Bridwell

Stator Bridwell, 1946: 55; Bradley, 1947: 39; Blackwelder and Blackwelder, 1948: 45; Johnson, 1963: 860; Decelle, 1966: 112; Teran, 1967: 308, 316; Johnson, 1968b: 1270; Bottimer, 1968b: 1027, 1039, 1041; Kingsolver, 1972b: 219; Johnson and Kingsolver, 1973: 1, 5.

Type-Species.—Bruchus pruininus Horn, by original designation. Small to medium bruchids in the Acanthoscelidini with the following morphological characteristics:

Head with frons carinate or with finely punctate line extending from frontoclypeal suture to vertex; antennae alike in both sexes, distal segments slightly eccentric, not serrate, usually reaching to humerus; posterior margin of eye usually protruding laterally, well separated from vertex; width of eye usually slightly wider than width of frons; distance from base of antennae to apex of labrum about one-half as long as distance from upper limits of eyes to apex of labrum.

Vestiture varying from all white hairs uniformly distributed to white, yellow, golden-brown hairs intermixed, or in distinct patterns.

Prothorax usually with complete lateral carina extending to coxal cavity, sometimes extending only 0.5-0.66 distance to coxal cavity; campanulate to subcampanulate; anterolateral margin of pronotum posterior to eye with bisetigerous tubercle; procoxae sometimes contiguous at apices, usually separated for 0.8-0.9 their length by vertical lamina of prosternum.

Elytra with lateral margins arcuate, apex gently rounded; with striae regular, not distorted laterally, well marked, without basal gibbosities, asperities, or spines; striae sometimes abbreviated at base, usually with striae 3 and 4, and 5 and 6 closer to each other at base than to adjacent striae; elytra either all black or all red, or often black marked with red vittae; scutellum short, broad, bifid apically.

Hind femur (fig. 10) broad, as wide as or slightly wider than hind coxa, with ventral face flattened, lateroventral and mesoventral margins carinate, carinae sometimes faint or spinulate; mesoventral margin of face with subapical spine, spine usually strong, acuminate; lateroventral carina either slightly sinuately emarginate apically without blunt angulation, or sinuately emarginate apically with blunt angulation; either all black, all red, or base red and apex black.

Hind tibia (fig. 10) with tibial corona, mucro usually short, usually scarcely longer than coronal denticles; from two to four longitudinal carinae, lateroventral carina often incomplete or absent; 11 of the 18 species with a fossa on dorsal surface (fig. 3), fossa weak or strong, usually filled with white setae, sometimes fossa accompanied by a dorsal carina and sulcus. First hind tarsomere with three longitudinal carinae, occasionally with only ventral carina.

Abdomen with basal sternum unmodified; pygidium evenly rounded or slightly convex, without asperities; apical margin of last sternum of male broadly emarginate to receive apex of pygidium, apical margin of last sternum of female without emargination. Male genitalia (figs. 7 and 8) with lateral lobes expanded mesally at apices; internal sac without or with one, two, or many spines and denticles.

The terminology of the parts of the male genitalia used here follows that proposed by Kingsolver (*1970a*) and Johnson and Kingsolver (*1973*). We also follow the terminology established by Johnson and Kingsolver (*1973*) to describe the hind leg.

Diagnosis. — *Stator* is distinguished from other genera in the Acanthoscelidini in various ways. It most closely resembles *Sennius* but differs in usually having a complete lateral pronotal carina, a lateral ventral carina on the hind femur, and lacking hinge sclerites in the male genitalia. In keys, *Acanthoscelides* is usually separated from *Stator* by the statement that *Acanthoscelides* has two or more spines at the apex of the hind femur, whereas *Stator* has only one. But *Acanthoscelides* has from none to four spines. The lateral pronotal carina is the best character for separating the two genera.

Stator is distinguished by its pronotal carina from the Old World genus *Bruchidius*, which also has a single femoral spine but lacks a carina.

At the subfamily level, *Stator* can be distinguished from the described genera of Bruchinae by one or a combination of the following characteristics: Possession of a smooth lateral pronotal carina, one subapical spine on mediolateral margin of hind femur, lateroventral margin of hind femur carinate and emarginate but not spined near apex, and lack of hinge sclerites in the internal sac of the male genitalia.

Specifically *Stator* is distinguished from other sympatric genera as follows: With more than one spine on the hind femur, or a spine with a serrate posterior margin - *Algarobius* Bridwell, *Althaeus* Bridwell, *Caryedes* Hummel, *Ctenocolum* Kingsolver and Whitehead, *Gibbobruchus* Pic, *Meibomeus* Bridwell, *Merobruchus* Bridwell, *Mimosestes* Bridwell, *Pectinibruchus* Kingsolver, *Penthobruchus* Kingsolver, *Pseudopachymerina* Zacher, *Pygiopachymerus* Pic, *Rhipibruchus* Bridwell, and *Stylantheus* Bridwell.

The following New World genera with a single spine or no spines on the hind femur can be distinguished from *Stator* by the following: *Dahlibruchus* Bridwell and *Cosmobruchus* Bridwell by their elongate form and lack of a lateral carina on the metatibia; *Cercidiestes* Bridwell by the presence of a denticulate lateral carina on the pronotum; *Lithraeus* Bridwell and *Bonaerius* Bridwell by the lack of lateral carinae on the metatibia; *Neltumius* Bridwell by the gibbous pronotum; *Abutiloneus* Bridwell by the lack of a subapical spine on the hind femur or this only a minute spine; and *Megacerus* Fåhraeus by the lack of a spine on the hind femur.

Callosobruchus Pic and *Bruchus* Linnaeus, which include cosmopolitan economic species with an Old World origin, differ from *Stator* in having a distinct external spine on the hind femur and by lacking the lateral pronotal carina, although most species of *Bruchus* have a distinct tooth on the lateral pronotal margin.

PHYLOGENETIC GROUPS OF STATOR

Although we have constructed a tentative classification of *Stator*, it is obvious from our studies that a much better understanding of the systematic and biological relationships within *Stator* will only come with more collections and field studies. Specimens and host plant data from the Tropics are especially desirable to supplement our hypothesis on classification.

Characters

Many structures were studied to find characters of value at the generic and species level. The generic characters and their value are discussed in the previous section. External characters of value for separating species are as follows: Color of the hind leg; length of the inner spine at the apex of the hind femur; development of a blunt angulation on the outer margin at the apex of the hind femur; number of longitudinal glabrous carinae on the hind tibia; presence or absence of a dorsal fossa, sulcus, and dorsal carina on the hind tibia; length of the mucro; number of longitudinal carinae on the first hind tarsomere; arrangement of the vestiture on the pronotum, elytra, and pygidium; color of the antennae, color of the elytra; development of a line or carina on the frons; flattened or protruding eyes; width of the frons; length of the antennae; length of the lateral carina of the prothorax; distance to which the prosternum separates the procoxae; elytral striae abbreviated or complete basally; hind coxa completely or only partially punctate. Characters of the male genitalia used were shape of the apex of the ventral valve, width of the base of the ventral valve, pattern of the armature of the internal sac, shape of the spines in the internal sac, and depth of the cleft of the lateral lobes.

Structures not previously described in the Bruchidae—the dorsal fossa, dorsal carina, and dorsal sulcus of the hind tibia—are used here for the first time to classify species of *Stator*. Twelve of the eighteen species treated have at least a faint fossa on the hind tibia. Bottimer (*1973: 550*) mentioned a "groove" on the "fore tibia" of *S. mexicanus*. It could be that a typographical error was made and that he was referring to the hind tibia. We did not find a groove on the fore tibia of this species.

Host Plants

Most of the larvae of the *Stator* species feed in seeds of the Leguminosae, and more specifically the Mimosoideae and the genus *Acacia* (table 2, appendix). *S. limbatus*, a wide-ranging species, is found most commonly in species of *Acacia* but has been reared from several other hosts in the Mimosoideae and the Caesalpinioideae. *S. pruininus* feeds in acacias but also commonly attacks *Mimosa* species, the only *Stator* species known to do so. It also feeds in seeds of other Mimosoideae and Papilionoideae. The few hosts in the Caesalpinioideae and Papilionoideae are attacked mostly by *limbatus* and *pruininus*, respectively.

The only verified reports of *Stator* species feeding in a nonlegume are *bixae* and *championi* in *Bixa* L. (Bixaceae). Specimens of *S. monachus* from Puerto Rico bear the labels "ex *Eugenia* sp. seeds." Because *Eugenia* Mich. ex Linnaeus is in the Myrtaceae, a unique host for a species of *Stator*, this record must be verified. The hosts of the remaining species treated here offer little data to use in classifying *Stator*. Because of their preference for the seeds of *Acacia* species, the appellation "acacia bruchids" is appropriate for *Stator*.

Bottimer (*1973*) reported that *S. mexicanus, subaeneus,* and *vachelliae* feed in exposed seeds of acacias after the seeds had fallen to the ground. We also found this to be true of *S. pygidialis* in seeds of *Calliandra humilis* (Schlecht.) L. Benson. We suspect that this mode of behavior is probably typical of most members of the Sordidus and Subaeneus groups.

Host Plants and Distribution

Species in *Stator* exhibit several basic host selection patterns that are probably common in the family Bruchidae. *S. limbatus* and *pruininus* have adopted a "generalist" strategy and feed in seeds of a wide variety of hosts (tables 1 and 2). Because these two species have the widest distribution of any *Stator* species, the ability to feed on a large number of hosts must be largely responsible for their wide distribution.

Other bruchids have apparently evolved a more specialized strategy and feed on few hosts. Most of them have a more restricted distribution. Species in this category, however, may have a wide distribution if their host is widespread, e.g., *S. vachelliae* in *Acacia farnesiana*. Widely distributed *Stator* species with one or few hosts are *aegrotus, beali, mexicanus, monachus, pygidialis, sordidus, subaeneus,* and *vachelliae. S. vittatithorax* may belong to this group, but our data do not indicate this at present.

Several species of *Stator* feed in seeds of hosts with a broad geographical range, but these beetles live in the seeds in a restricted part of the host's range. We interpret this as a high degree of specialization to the seeds of a host in what is probably a unique ecological situation. *S. bottimeri, championi, chihuahua,* and *generalis* exhibit this pattern.

The hosts of *S. coconino, dissimilis,* and *trisignatus* have not been identified, but their limited distribution and unique habitats suggest hosts with narrow geographical ranges.

Relationships of Groups

We place the 18 species described here into 6 groups. Since we have not yet studied all the *Stator* species, we believe that these groups will probably change. Therefore the species are arranged alphabetically rather than by groups of related species. The species placed in each group and the principal characters used to form each group and to distinguish groups from each other are listed in table 4.

Although most species of *Stator* are well defined and all fit within the limits of this genus, grouping the species within the genus is less precise. We believe, however, that the groups, as listed in table 4, accurately reflect the phylogenetic relationships between species of *Stator*. The groups are defined by combinations of several characters. Generally the numbers of the groups represent close evolutionary affinities, e.g., group 1 is most distantly related to group 6. The presence or absence of the dorsal tibial fossa, its associated dorsal carina and sulcus, and their length and placement on the tibia were the primary external characters used in reconstructing these evolutionary groups, although other characters were used. The structure of the male genitalia, especially the armature of the internal sac, also provided characters in groupings. Groups 1, 2, and 3 are probably related because all possess a rather well-defined tibial fossa, which the other groups lack. The armature of the internal sac of group 1 contains many spines, whereas most species of other groups have one or two large spines or none in the internal sac. Various intermediate species link the groups together.

(1) *Subaeneus Group.*—Members of this group are linked by the presence of golden or bronzy vestiture on their dorsal surface and armature of the internal sac of the male genitalia consisting of many large spines. Both these characters are generally consistent within species. The armature of the male genitalia is especially valuable in separating species. This group is linked to the Aegrotus group through *pruininus*.

(2) *Aegrotus Group.*—*S. pruininus* is a marginal member of this group, because of the many spines in its internal sac (fig. 54). Other members of the group have only one or two large spines in the interna. sac (fig. 7). *S. pruininus* is very similar in its external structure and color to the almost all black *monachus* and *aegrotus*.

The other species in the group are *trisignatus, vittatithorax,* and a South American species *maculatopygus* (Pic, *1930*), new combination. All have red vittae on the elytra, although *vittatithorax* sometimes has forms with all black elytra.

S. vittathorax is similar to other members of the group in its external features, but the large spine in the internal sac is very similar to that of the Sordidus group. Either convergence has occurred to produce similar spines, or the spines link this species and consequently the group to the Sordidus group.

Except for *pruininus*, the basic pattern of the male genitalia of this group is similar to that of the Limbatus group. All species of the Aegrotus group have a medial spine and most have an apical spine or apical, hemispherical, denticulate sclerite. Structure of the male genitalia and in some species similar red vittae on the elytra ally these two groups more closely than to any other groups of *Stator* considered here.

(3) *Limbatus Group.*—*S. beali* and *limbatus* resemble each other externally in the possession of red vittae on the elytra. The elytral coloration of the larger *generalis* varies from red to black. In addition to external similarities, these three species are linked together by a similar armature of the internal sac. Both *limbatus* and *generalis* have a slender spine medially and a slightly larger, serrated, usually crescentic spine apically, but in *beali* the apical spine is larger, pointed, and almost triangular. Thus in this group *beali* and *limbatus* are more similar in external features: whereas *generalis* and *limbatus* have more similar genitalia.

Both *beali* and *limbatus* are found in seeds of *Pithecellobium* species, but *limbatus* is much more often found in seeds of *Acacia* species. *S. generalis* is unique in feeding in seeds of *Enterolobium cyclocarpum.*

We consider the four other species (table 4) to be members of the Limbatus group.

The small number of spines in the internal sac of species in this group is considered a link to the Sordidus group, in which the species have a single large spine in the internal sac.

(4) *Sordidus Group.*—*S. sordidus* is very similar in its external structure and color to *chihuahua*, *coconino*, and *pygidialis*. All have only partially punctate hind coxae (fig. 5), a blunt angulation on the lateral margin at the apex of the hind femur, and generally similar vestiture; they lack a dorsal tibial fossa on the hind tibia. The basic pattern of the male genitalia is the same, with species having a single spine in the internal sac. *S. pygidialis* is separable from the other three species by differences in external color and in the male genitalia. *S. chihuahua* and *coconino* are only separable from *sordidus* by differences in the male genitalia. We consider these four species to be very closely related to each other. The hind coxa of *vachelliae* is evenly punctate over its surface, but the species is otherwise similar in external features to the other four. The spine in the internal sac is very near that of *pygidialis* and *sordidus*. We consider *vachelliae* to be a fringe member of the tightly knit Sordidus group.

(5) *Dissimilis Group.*—The only member in this group, *dissimilis*, we consider to be a marginal member of *Stator* because it

lacks a complete lateral prothoracic carina. Its hind leg, however, is similar to other species of *Stator*.

Because the male genitalia (figs. 30 and 31) are near those of *sordidus*, we consider it to be more closely related to the Sordidus group than to any previous group.

(6) ***Championi Group.***—The structurally similar *bixae* and *championi* are placed in a group by themselves because they are not closely related to any other species of *Stator*, although the hind leg is typical for *Stator*. Both species, however, lack a complete lateral prothoracic carina, indicating an affinity with *dissimilis*. The male genitalia and the aberrant nonlegume host preferences are atypical for *Stator*. *S. bixae* is known only from Brazil.

KEY TO SPECIES OF STATOR

1. Hind coxa with face entirely punctate (fig. 4) 2
   Hind coxa with lateral 0.5 and about apical 0.12 of face finely punctate, remaining medial parts smooth, without punctations (fig. 5) 17

2 (1). Elytra completely red, or black with red maculations 3
   Elytra completely black, without red maculations 8

3 (2). Lateral carina of prothorax faint, extending about 0.5 distance to coxal cavity; head, antennae, legs, and body red orange, sometimes base of hind femur and median stripe on pronotum reddish brown to brown; dorsal surface of tibia unmarked, without dorsal fossa (fig. 24); elytral vestiture as in figures 20 or 21; male genitalia as in figures 22 and 23; reared from seeds of *Bixa orellana*; Nicaragua to Brazil and Peru
   S. championi (Sharp)
   Lateral carina of prothorax strong, extending to coxal cavity; much of body and appendages black; dorsal surface of tibia usually with fossa 4

4 (3). Hind femur with inner subapical spine about 0.5 as long as width of tibial base (fig. 15); vestiture of pronotum and elytra with uniformly yellow pubescence; black maculation of lateral margin of elytron extending to sixth or fifth stria (fig. 11); prosternum separating coxae for their entire length; male genitalia as in figures 12-14; reared from seeds of *Pithecellobium flexicaule*; Texas to Veracruz and Oaxaca States, Mexico
   S. beali Johnson
   Hind femur with spine about equal to or slightly longer than width of tibial base (fig. 39); vestiture of pronotum and elytra uniformly white; black maculation of lateral margin of elytron, if present, usually extending to only seventh stria 5

5 (4). Fossa and dorsal carina on dorsal surface of hind tibia strong (fig. 71); slight sulcus between dorsal carina and dorsomesal carina 6
   Fossa, dorsal carina, and sulcus between dorsal carina and dorsomesal carina weak or absent 7

6 (5). Base of pygidium with three large patches of white hairs, one medial and two lateral (fig. 69); male genitalia as in figures 70 and 72; Panama and Colombia .... *S. trisignatus* (Sharp)

Base of pygidium without patches of hairs at base, pygidium with uniform, sparse white hairs (fig. 77); male genitalia as in figures 79 and 80; reared from seeds of *Acacia retusa*, *A. riparia*, *Leucaena* sp., and *Piptadenia flava*; State of Colima, Mexico, to Brazil .... *S. vittatithorax* (Pic) (part)

7 (5). Size large, length of pronotum-elytra 2.5-2.9 mm; base of hind femur black, about apical 0.5 red orange, varying to black with only apex red orange; elytron usually red with small black spot in center of elytron, varying to all black, intermediate form with progressively more elongate black spots; male genitalia as in figures 34 and 36; reared from seeds of *Pithecellobium cyclocarpum*; Panama .... *S. generalis*, n. sp. (part)

Size smaller, length of pronotum-elytra 1.6-2.7 mm; hind femur all black; elytron usually red orange with lateral, basal, and sutural margins black (fig. 37); elytron varying from all red orange to small basal and apical red-orange maculations on black background; male genitalia as in figures 38, 40, and 41; reared from seeds of *Acacia* spp., *Albizia* spp., *Calliandra* sp., *Cercidium* spp., *Lysiloma divaricata*, *Parkinsonia aculeata*, *Pithecellobium* spp., and *Samanea saman* (table 1); Texas to Arizona and Hawaii and south to Panama .... *S. limbatus* (Horn)

8 (2). Size small, length of pronotum-elytra 1.3-1.6 mm; lateral prothoracic carina extending about 0.66 distance to coxal cavity; subapical spine of hind femur 0.25-0.5 as long as width of tibial base; lateral and lateroventral glabrous carinae of hind tibia absent; mesal and lateral carinae of first hind tarsomere absent; male genitalia as in figures 30 and 31; near El Salto, Durango, Mexico .... *S. dissimilis*, n. sp.

Size larger, length of pronotum-elytra 1.4-3.0 mm but usually longer than 1.6 mm; lateral prothoracic carina extending to coxal cavity; subapical spine of hind femur 0.8 as long, about as long as or longer than width of tibial base; at least lateral carina of hind tibia present; mesal and lateral carinae of first hind tarsomere present 9

9 (8). Eye flattened, nearly contiguous with lateral margin of head, posterior margin expanded and merging with lateral part of vertex; male genitalia as in figures 65, 67, and 68; reared from seeds of *Acacia cornigera* and *A. farnesiana*; Texas to States of Yucatan and Chiapas, Mexico .... *S. subaeneus* (Schaeffer)

Eye not flattened, posterior margin protruding laterally and well separated from vertex 10

10 (9). Hind femur black and red orange, usually apex red orange, or femur all red orange 11

Hind femur completely black 13

11 (10). Hind femur and antennae entirely red; dorsal fossa of hind tibia well developed; male genitalia as in figures 17 and 18; reared from seeds of *Acacia farnesiana* and *A. pinetorum*; Florida to Cuba and the Bahamas .... *S. bottimeri* Kingsolver

Hind femur with some black coloration, usually at base; about apical 0.5 of antennae usually brown to black; dorsal fossa of hind tibia weak or lacking 12

12 (11). Lateral ventral carina of hind femur sinuately emarginate apically, with blunt angulation (fig. 75); male genitalia as in figures 74 and 76; reared from seeds of *Acacia farnesiana*; Texas through Mexico to Venezuela .... *S. vachelliae* Bottimer

Lateral ventral carina of hind femur sinuately emarginate apically, without blunt angulation (fig. 35); male genitalia as in figures 34 and 36; reared from seeds of *Enterolobium cyclocarpum*; Canal Zone, Panama .... *S. generalis*, n. sp. (part)

13 (10). Base of pygidium with three small, distinct, white patches of hairs (figs. 6 and 42) or if patches indistinct, then vestiture of pronotum and elytra not uniform in color 14

Base of pygidium without basal patches of hairs, pygidium covered with white hairs distributed uniformly (figs. 51 and 77) .. 15

14 (13). Pronotum and elytra covered with uniform white pubescence; hind tibia robust, with four longitudinal carinae, a dorsal carina, and sulcus; eye about twice as wide as frons; male genitalia as in figures 7-9; State of Veracruz, Mexico, to Panama and Brazil .... *S. aegrotus* (Sharp)

Pronotum and elytra covered with pubescence of intermixed colors; hind tibia not robust, with three longitudinal carinae, without dorsal carina and sulcus; eye only slightly wider than frons; male genitalia as in figures 43, 45, and 46; reared from seeds of *Acacia cornigera*; State of San Luis Potosi, Mexico, to Guatemala .... *S. mexicanus* Bottimer

15 (13). Hind femur with lateral ventral carina sinuately emarginate apically, usually with blunt angulation (fig. 81); strong dorsal fossa, dorsal carina, and dorsal sulcus; mucro at apex of hind tibia one-seventh to one-sixth as long as first tarsomere; width of eye slightly wider to two times wider than frons; male genitalia as in figures 79 and 80; reared from seeds of *Acacia retusa*, *A. riparia*, *Leucaena* sp., and *Piptadenia flava*; State of Colima, Mexico, to Venezuela and Brazil

S. vittatithorax (Pic) (part)

Lateral ventral carina of hind femur sinuately emarginate apically but without blunt angulation; without above combination of characters 16

16 (15). Prosternum separating coxae for their entire length; dorsal fossa of hind tibia deep, well defined; hind tibia usually with faint dorsal carina, usually with slight sulcus between dorsal carina and dorsomesal carina; male genitalia as in figures 48 and 50; reared from seeds of *Acacia glomerosa*, *A. riparia*, *Eugenia* (?) sp., and *Piscidia piscipula*; West Indies, Mexico, and Central America to Brazil .... *S. monachus* (Sharp)

Prosternum separating coxae for only 0.8 their length; dorsal fossa of hind tibia usually well defined; hind tibia sometimes with faint dorsal carina, sometimes with slight sulcus between dorsal carina and dorsomesal carina; male genitalia as in figures 52 and 54; reared from seeds of *Acacia* spp., *Calliandra* spp., *Chamaechrista* (?), *Coursetia glandulosa*, *Desmanthus* spp., *Glycine max*, *Indigofera anil*, *Leucaena leucocephala*, *Mimosa* spp., *Olneya tesota*, *Robinia pseudo-acacia*, and *Sesbania* spp. (table 1); California to Texas and south through Mexico and Middle America to Venezuela

S. pruininus (Horn)

17 (1). Hind femur black, except sometimes apical 0.1 red orange; elytra covered with sparse, intermixed white and brown hairs, without denser patches of hairs on elytron; elytral striae not abbreviated at base; male genitalia as in figures 56, 58, and 59; reared from seeds of *Calliandra humilis*; Arizona to Texas and south to States of Chihuahua and Durango, Mexico *S. pygidialis* (Schaeffer)

Hind femur with apical 0.2 or more red orange; elytra covered with dense, intermixed reddish-brown to brown hairs, sometimes with denser patches of white hairs; elytral striae 3-6 sometimes abbreviated at base; male genitalia as in figures 25-27, 61, and 63 18

18 (17). Male genitalia with large, curved, saddle-shaped medial spine in internal sac; without thickened folds of internal sac resembling hinge sclerites (figs. 61 and 63); reared from seeds of *Acacia wrightii*; Arizona to Texas and south through Mexico and Middle America to Colombia and Venezuela .. *S. sordidus* (Horn)

Male genitalia with many fine denticles in internal sac instead of large spine (fig. 28) or with large spine but with two large slightly bowed thickened folds of internal sac resembling hinge sclerites at apex of median lobe (fig. 26) 19

19 (18). Apex of median lobe of male genitalia with two large slightly bowed thickened folds of internal sac resembling hinge sclerites; internal sac with large medial spine (figs. 25, 26); reared from seeds of *Acacia angustissima* and *Mimosa biuncifera* *S. chihuahua*, n. sp.

Apex of median lobe of male genitalia without folds resembling hinge sclerites; internal sac with small medial spine (figs. 27, 28) .... *S. coconino*, n. sp.

DESCRIPTIONS OF SPECIES

Stator aegrotus (Sharp), new combination

(Figs. 6-10)

Bruchus aegrotus Sharp, 1885: 472 (Guatemala, Zapote); Schaeffer, 1907: 297. Type in British Museum (Natural History), London.
Acanthoscelides aegrotus: Blackwelder, 1946: 758.

Length (pronotum-elytra) 2.2-2.5 mm. Width 1.7-1.9 mm. Maximum thoracic depth 1.2-1.5 mm.

Male

Integument Color

Body black except labium, basal four and five, or sometimes all antennal segments, prothoracic legs, apices of mesofemur, mesotibia, and mesotarsus usually red orange to light brown.

Vestiture

Eye usually with medial fringe of sparse, white hairs; postocular lobe with short white hairs; usually without postocular patch of white hairs, remainder of head with sparse white hairs; pronotum, elytra, and legs with uniform, moderately dense white hairs; mesothorax, metathorax, and abdomen with moderately dense white hairs becoming denser on lateral margins; pygidium with sparse white hairs, base usually with three small white patches of hair, one medial and two lateral (fig. 6).

Structure

Head.—Short and broad, densely punctulate; frons with median glabrous carina extending from frontoclypeal suture to vertex; with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; width of eye almost two times width of frons; ocular sinus about 0.5 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments 1, 3, and 4 usually filiform, 2 moniliform, 5-10 eccentric, 11 subacute apically, 5-11 slightly broader than long; antenna reaching about 0.66 distance to humerus.

Prothorax.—Disk campanulate (fig. 6); punctate medially becoming coarser laterally; lateral prothoracic carina extending to coxal cavity; short median impressed line on median basal lobe; prosternum separating procoxae for about 0.9 their length.

Mesothorax and *Metathorax.*—Scutellum small, quadrate, with lateral posterior teeth, usually clothed with very dense recumbent white hairs; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, punctate, strial intervals punctulate finely strigulate; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae 5 and 6 abbreviated at base; humerus impunctate, usually glabrous; undersurfaces punctate; entire face of hind coxa finely shallowly foveolate; hind femur constricted basally and apically, expanded medially to slightly more than width of coxa (fig. 10); usually with scattered spinules on inner ventral longitudinal carina; femur armed with inner subapical acuminate spine about 0.8 as long as width of tibial base; lateral ventral carina sinuately emarginate apically, with blunt angulation; tibia robust, with strong ventral, lateroventral, lateral, and dorsomesal glabrous longitudinal carinae; dorsal surface of tibia somewhat roughened, with deep, well-defined fossa beginning about 0.1 from apex, fossa about 0.3 length of tibia, fossa usually filled with fine setae; strong dorsal carina, slight sulcus between dorsal carina and dorsomesal carina extending for almost entire length of tibia; tibial corona with three to four spinules, mucro 0.2-0.25 as long as first tarsomere; without sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum slightly flattened medially, about 1.5 times longer than remaining sterna, posterior margin straight; sterna 2-4 unmodified, fifth emarginate; pygidium punctate, convex in lateral view.

Genitalia.—Figures 7-9. Median lobe moderate in length; in ventral view, ventral valve slightly sinuate on lateral margins, apex acute, base about 0.5 as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of one large medial forked spine, cleft of fork almost 0.5 length of spine, hemispherical, denticulate sclerite near apex of sac, base and apex of internal sac with many densely placed denticles. Lateral lobes expanded apically, cleft to about 0.8 their length (fig. 8).

Female

Similar to male but apical margin of last visible abdominal sternum straight.

Host Plants

No host records are known for *aegrotus*. Bottimer reared this species at Barro Colorado Island, Panama, in April 1964, but the host apparently was never identified.

Distribution

Mexico: Veracruz; Guatemala, Panama, and Brazil.

Discussion

(*S. aegrotus* is in the Aegrotus species group; see also discussions of *monachus*, *pruininus*, *trisignatus*, and *vittatithorax*.) *S. aegrotus* is a robust, coarsely punctate species near *monachus*, *pruininus*, and the black forms of *vittatithorax*. Its closest relatives within the Aegrotus group are *monachus* and *trisignatus*. Characters in the key separate *aegrotus* from others in the group.

The species that we consider to be members of the Aegrotus group are *aegrotus*, *monachus*, *pruininus*, *trisignatus*, *vittati-*

thorax, and a South American species not treated here, *S. maculatopygus* (Pic). Although *maculatopygus* and *trisignatus* always have red vittae on the elytra and *vittatithorax* usually does, the latter species has all black forms also. Because the other three species in the group are almost completely black, *vittatithorax* apparently forms a color link between the species in the group.

The pattern of the armature of the internal sac of *monachus* and *aegrotus* is similar except that the medial spine of *aegrotus* is longer and is more deeply forked than in *monachus*. The most recognizable external characters used to separate them are that *aegrotus* usually has three dense white patches of hairs at the base of the pygidium, whereas *monachus* has none, and the lateral ventral carina of the metafemur of *aegrotus* has a blunt angulation apically, which *monachus* lacks.

S. pruininus is similar to the other species in the group in its external features, but its male genitalia are nearer those of the Subaenus group. We consider *pruininus* to be a marginal member of the Aegrotus group linking it to the Subaeneus group.

S. vittatithorax is also similar to the other members of this group externally, but the large median spine in the internal sac is similar to that of the Sordidus group. We believe this character of this species links the Aegrotus group to the Sordidus group.

Similar external structures and similar armature of the internal sac lead us to believe that *trisignatus* and *maculatopygus* are very closely related.

The basic pattern of the armature of the male genitalia of all members of the Aegrotus group except *pruininus* is near that of the Limbatus group. All have a medial spine and most have an apical spine or apical, hemispherical, denticulate sclerite. We believe, on the basis of the structure of the male genitalia, that the Limbatus and Aegrotus groups are more closely related to each other than they are to any of the other groups considered here.

A slightly limited distribution and the fact that few specimens of this species are found in collections indicate that *aegrotus* is probably a specialized bruchid, feeding in the seeds of a limited number of host plants.

All the specimens reared from Bottimer's Panama collections were completely black females, which were reared with specimens of *trisignatus*. We believe the black specimens to be *aegrotus* simply because they are most similar to *aegrotus*. Reared black males from this plant must be dissected to verify specific identification.

The figure of "*dufaui*" by de Luca (*1972*) is probably of *aegrotus*, because the illustration has three basal pygidial spots, features not possessed by what we interpret as *dufaui* (=*monachus*).

Stator beali Johnson

(Figs. 11-15)

Stator beali Johnson, 1963: 861 (Brownsville, Cameron County, Tex.); Bottimer, 1968b: 1027, 1039; Johnson, 1968b: 1270. Type in U.S. National Museum of Natural History, Washington, D.C. (type 67419).

Length (pronotum-elytra) 2.1-2.8 mm. Width 1.6-2.1 mm. Maximum thoracic depth 1.1-1.6 mm.

Male

In size, color, and general appearance identical to *limbatus* but with the following exceptions: Antenna all red orange to basal five segments red orange and apical six brown; elytron red orange with lateral, basal and sutural margins brownish black, lateral dark margin ending with subapical dark maculation produced medially to stria 5 or 6; hind femur black, rarely with red-orange apex; apex of hind tibia usually red orange to reddish brown, first segment of hind tarsus red orange to reddish brown. Head, pronotum, and elytra with sparse yellow pubescence; ventral surfaces with mixed yellow and white hairs. Frons with median glabrous line or carina; width of eye about 1.3 times width of frons. Prosternum separating procoxae for their entire length. Scutellum with dense white pubescence; elytral striae 3 and 4, and 5 and 6 usually abbreviated at base, intervals finely strigulate; femur armed with inner subapical acuminate spine about 0.5 times as long as width of tibial base (fig. 15); dorsal surface of tibia somewhat roughened, usually with well-defined fossa beginning about 0.1 from tibial apex, fossa about 0.33 length of tibia, fossa usually filled with fine setae; mucro about 0.2-0.25 as long as first tarsomere; without sinus at base of mucro.

Genitalia.—Figures 12-14. Median lobe moderate in length, with acuminate, lateral projections near apex; in ventral view, ventral valve broad, gently sinuate on lateral margins, apex acuminate, base about as broad as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of basal patch of fine denticles, many fine denticles lining apical 0.66 of sac, slender spine medially, and large, pointed almost triangular spine at apex. Lateral lobes expanded apically, cleft to about 0.66 their length (fig. 12).

Female

Subapical projection from lateral marginal line of elytron reaching at least to sixth stria, sometimes forming band across elytron; last visible abdominal sternum longer than preceding sternum.

Host Plants

New Records

Pithecellobium flexicaule (Bentham) Coult.: Texas. Nueces Co.: Corpus Christi, 24 March 1969 (C. Griffin). Cameron Co.: Harlingen, 9 July 1922, 12 July 1922, 22 July 1922, and 4 September 1922 (L. J. Bottimer); Brownsville, February 1923, 20 September 1947, 12 July 1960 (L. J. Bottimer); Brownsville, 8 January 1923 (L. J. Bottimer #51g4); Brownsville, 15 October 1960 (L. J. Bottimer #109e); Brownsville, 21 September 1947 (L. J. Bottimer #89j). Hidalgo Co.: Edinburg, 1, 11, 18, and 25 January 1925 (L. J. Bottimer) and 31 December 1934 (L. J. Bottimer #53m5). McAllen, July 1923 (C. M. Trotter).

Old Records

Siderocarpus (now *Pithecellobium*) *flexicaulis* (Bentham) Coult.: Johnson, 1963: 862.

Distribution

United States: Texas; Mexico: Veracruz, Oaxaca.

Discussion

(*S. beali* is in the Limbatus species group; see also discussions of *generalis* and *limbatus*.) *S. beali* is a very close relative of the widespread *limbatus* and probably is a specialized offshoot from the parent stock of the two species. *S. beali* apparently is highly specialized to feed in the seeds of *Pithecellobium flexicaule* in contrast to the generalist *limbatus* with its wide array of hosts.

Differences between *beali* and *limbatus* are given in the key and by Johnson (1963: 862).

Stator bottimeri Kingsolver

(Figs. 16-19)

Stator bottimeri Kingsolver, 1972b: 225 (Cuba: near Santiago). Type in U.S. National Museum of Natural History, Washington, D.C. (type 70396).

Length (pronotum-elytra) 2.1-2.2 mm. Width 1.5-1.7 mm. Maximum thoracic depth 1.1-1.2 mm.

Male

Integument Color

Body black with bronzy highlights; front, middle, and hind legs entirely red; antennae entirely red, seldom with darker suffusion near apex.

Vestiture

With white or gray, coppery brown, and golden setae intermixed and forming mottled pattern on elytra and pronotum, with two irregular transverse rows of white spots on elytra; mixed coppery gray beneath with lateral gray spots on abdominal terga; pygidium with mottled pattern similar to that on pronotum, and with vaguely condensed patches at anterior angles, disk with inverted, dark, U-shaped mark.

Structure

Head.—Short and broad, frons and vertex with dense, discrete, setigerous punctures; frontal carina with prominent, rounded boss between upper limits of eyes and extending as impunctate line to frontoclypeal suture, but sometimes faintly marked; with vague transverse sulcus between upper limits of eyes; posterior margin of eyes moderately protruded laterally, well separated from vertex; width of eye slightly wider than width of frons; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; segments of antennal club moderately eccentric; antenna reaching to humerus.

Prothorax.—Disk campaniform (fig. 16); lateral margins slightly arcuate in dorsal aspect; dorsal punctures disciform, individual punctures ovate to circular, discrete, setigerous; interspaces flat, impunctate; lateral prothoracic carina extending to coxal cavity; short median impressed line on median basal lobe; prosternum separating procoxae for about 0.8 their length.

Mesothorax and *Metathorax*.—Scutellum rounded, with lateral posterior teeth, densely setose; elytron about two times as long as broad; striae normal, faintly impressed longitudinally between setigerous, foveolate strial punctures; intervals densely microstrigate, setigerous; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae not abbreviated at base; mesosternum and metasternum with punctations scattered, disciform, setigerous, interspersed with punctulation; metacoxal face with densely placed punctures in irregularly reticulate pattern covering entire coxal face; hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 19); spinules sometimes present on inner, ventral longitudinal carina; femur armed with inner subapical, usually acuminate spine about as long as width of tibial base; metafemur with lateral ventral carina shallowly, sinuately emarginate subapically; hind tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina absent; dorsal surface of tibia smooth, with deep, well-defined fossa beginning about one-sixth from tibial apex, fossa about one-fourth length of tibia, fossa usually filled with fine setae; dorsal tibial carina and sulcus absent; mucro 0.2-0.25 as long as first tarsomere; without sulcus at base of mucro; first hind tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—Terminal sternum of abdomen emarginate for reception of apices of eighth sternum and pygidium.

Genitalia.—Figures 17 and 18. Median lobe moderate in length; in ventral view, ventral valve slightly sinuate on lateral margins, apex gently rounded, base about 0.5 as wide as median lobe; without hinge sclerites; armature of internal sac with 18 to 20 flat, broad spines, those near apex of sac more slender than those in middle. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 17).

Female

Similar to male but lateral patches on pygidium pure white; with dense, setigerous, disciform punctures in reticulate pattern on pygidium but not concealed by vestiture; apical margin of last visible abdominal sternum not emarginate.

Host Plants

Acacia farnesiana (L.) Willd.: Kingsolver, 1972b: 225.
A. pinetorum Hermann: Kingsolver, 1972b: 225.

Distribution

United States: Florida; Cuba and Bahamas.

Discussion

(*S. bottimeri* is in the Subaeneus species group; see also discussions of *mexicanus and subaeneus.*) Kingsolver (*1927b: 225*) compared *bottimeri* with *S. chalcodermus* Kingsolver. We compared both species under the discussion of *subaeneus.*

Stator championi (Sharp)

(Figs. 20-24)

Bruchus championi Sharp, 1885: 477 (Panama, Volcan de Chiriqui, 2,000-3,000 ft); Champion, 1923: 257. Type in British Museum (Natural History), London.
Acanthoscelides championi: Blackwelder, 1946: 759.
Stator championi: Kingsolver, 1975: 60.
Bruchus bixae, of authors.
Stator bixae, of authors.

Length (pronotum-elytra) 2.1-2.3 mm. Width 1.4-1.5 mm. Maximum thoracic depth 1.1-1.3 mm.

Male

Integument Color

Head, antennae, legs, and body red orange, eyes usually at least partially black, sometimes base of hind femur and median stripe on pronotum reddish brown to brown.

Vestiture

With white, yellow, or golden recumbent hairs as follows: Eye usually with medial fringe of sparse, white or yellowish hairs; postocular lobe with short white or yellowish hairs; usually postocular patch of dense white to yellowish hairs, remainder of head with sparse white to yellowish hairs; pronotum with broad median stripe and patches on lateral margins that appear glabrous but are covered with sparse golden or brown hairs, remainder of pronotum with dense white to golden-yellow hairs (figs. 20 and 21); elytron with dense intermixed white and golden hairs, usually humerus and lateral margin covered with sparse golden hairs giving glabrous appearance; short patches of dense white hairs on intervals between striae 2-9, about midway between base and apex; intervals between striae 4-5, sometimes 3-6 usually covered with dense hairs from base to near apex; mesothorax and metathorax with dense white hairs becoming very dense on lateral margins; abdomen with dense white hairs becoming very dense on lateral margins, fine band of golden hairs on apex of each sternum; pygidium usually with very dense band of hairs at base extending to about 0.33 from base (fig. 21), basal band forming a median and two lateral spots, sometimes spots not joined; remainder of pygidium with very sparse white or golden hairs and narrow median stripe of dense white hairs; legs covered with moderately dense white hairs.

Structure

Head.—Short and broad, densely punctulate; frons with median glabrous carina extending from frontoclypeal suture to vertex; with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; frons width about equal to width of eye; ocular sinus 0.5 or less as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments variable in shape but usually 1 and 3 filiform, 2 and 4 moniliform, 4 shorter than adjacent segments, 5-10 eccentric, 11 subacute apically, 5-11 slightly broader than long; antenna usually reaching to slightly beyond humerus.

Prothorax.—Disk subcampanulate (figs. 20 and 21); punctate medially becoming coarser laterally; faint lateral carina extending about 0.5 distance from base to coxal cavity; short median impressed line on median basal lobe; prosternum separating coxae for about 0.8 their length.

Mesothorax and *Metathorax.*—Scutellum small, quadrate, with lateral posterior teeth, clothed with very dense recumbent white hairs; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, punctate, strial intervals finely strigulate; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; humerus punctulate, usually glabrous; undersurfaces punctulate, punctures becoming more coarse laterally; entire face of hind coxa punctulate; hind femur constricted basally and apically, expanded medially to about width of coxa; without scattered spinules on inner ventral longitudinal carina; femur armed with inner subapical acuminate spine about as long as width of tibial base; lateral ventral carina slightly sinuately emarginate apically, without blunt angulation (fig. 24); tibia with ventral, lateral, and dorsomesal glabrous carinae, lateroventral carina faint but present; dorsal surface of tibia unmarked, without dorsal fossa, dorsal carina, and dorsomesal sulcus; tibial corona with about three spinules, mucro about 0.25 as long as first tarsomere; slight sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum slightly flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified, fifth emarginate; pygidium punctulate, convex in lateral view.

Genitalia.—Figures 22 and 23. Median lobe moderate in length; in ventral view, ventral valve slightly concave on lateral margins, apex gently rounded, base nearly as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of elongate mass of denticles extending from midpart of sac to apex and forked spine dorsal to mass of denticles. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 22).

Female

Similar to male but most of elytron appearing glabrous but covered with sparse golden hairs, usually dense patches of white to yellow hairs forming pattern as in figure 21; apical margin of last visible abdominal sternum straight, not emarginate.

Host Plants

New Records

Bixa orellana Linnaeus: Costa Rica. Guanacaste: Finca Taboga, 6 mi SW Cañas, August 1970 (D.H. Janzen #84).

Old Records

Bixa orellana: Bridwell, 1923b: 261; Zacher, 1952: 465, 478; Kingsolver, 1970b: 472.

Distribution

Costa Rica, Nicaragua, Panama, Brazil, Peru, Bolivia, and Venezuela.

Discussion

(*S. championi* is in the Championi species group.) *S. championi* is easily separated from other species of *Stator* because of its almost all red-orange body and the incomplete lateral carina on the prothorax. We have placed this species in the genus *Stator* because it has the typical hind leg of a *Stator* species and it has the typical ovipositional behavior of *Stator,* that of ovipositioning on exposed seeds (Bridwell, *1923b*).

S. championi is sexually dimorphic. Males tend to have uniformly dense pubescence with patches of sparse pubescence on the elytra, whereas the elytra of the females have very sparse pubescence with patches of dense white hairs forming a typical pattern (fig. 21).

S. championi has no close relatives among the species treated here but is a sister species of *S. bixae* (Drapiez) from Brazil (Drapiez, *1820, p. 120*). These two species are unique among species of *Stator* because they feed in seeds of a nonleguminous plant. Their ovipositional behavior, larval entry, and habit of continuous breeding, however, are much like those of other species of *Stator* (Bridwell, *1923b*). *S. championi* is apparently found only in Central and South America but not in Mexico. Seeds of *Bixa orellana* were collected from January 2, 1973, through February to March 10, 1973, along the tropical lowlands from 13 miles west of Manzanillo, Colima, to 8 miles south of Acaponeta, Nayarit, Mexico. Seeds and pods were collected in all stages of maturity during this period. In January most of the pods had not opened, but in February and March most of the pods had opened and the seeds were exposed. No bruchids were reared from the 24 lots of seeds collected during this period. We believe that the laboratory and field conditions under which the seeds were kept were suitable for development of the bruchids. Apparently then, *championi* does not feed in the seeds of *Bixa* in this part of Mexico.

Stator chihuahua, new species

(Figs. 25-26)

Length (pronotum-elytra) 1.6-2.2 mm. Width 1.1-1.6 mm. Maximum thoracic depth 0.9-1.3 mm.

Male

In size, color, and general external appearance identical to *sordidus* but with the following exceptions: Basal four antennal segments red orange, apical seven brown to black; hairs at apical 0.75 of pygidium sometimes sparse; coarse punctations on head.

Genitalia.—Figures 25 and 26. Median lobe moderate in length; in ventral view, ventral valve slightly concave on lateral margins, apex truncate with small medial notch, base nearly as wide as apex of median lobe, arcuate in lateral view; two large slightly bowed thickened folds of internal sac resembling hinge sclerites at apex of median lobe; armature of internal sac consisting of basal, finely denticulate structure that is contiguous with apical, bilobed, denticulate structure, large medial spine expanded at base curving to blunt apex. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 25).

Female

Identical to *sordidus*.

Host Plants

Acacia angustissima (Mill.) Kuntze: Arizona. Pima Co.: ca. 5,000 ft, Kitt Peak, 5 October 1972 (C. D. Johnson).

Mimosa biuncifera Bentham: Arizona. Cochise Co.: Cochise Stronghold, 4,900 ft, 8 September 1974 (C. D. Johnson).

Types

Holotype ♂: Arizona. Pima Co.: ca. 5000′, Kitt Peak, 5 October 1972, reared seeds No. 91-72, emerged by 16 November 1972, reared seeds of *Acacia angustissima* (C. D. Johnson). Allotype ♀: Arizona. Cochise Co.: Cochise Stronghold, 4900′, 8 September 1964, reared from seeds of *Mimosa biuncifera* (C. D. Johnson). Paratypes: Arizona. Cochise Co.: Chiricahua Mountains, 11 June 1908 (Virgil Owens) and 15 August 1959 (D. J. and J. N. Knull); Cochise Stronghold, 12 September 1964 (L. and C. W. O'Brien); Palmerlee, 9 June (H. A. Wenzel). Santa Cruz Co.: Madera Canyon, 5500′, 13-14 June 1961 (C. D. Johnson); Santa Rita Mtns., 20 June (Hubbard and Schwartz); 2 mi SE Canelo, 5200′, 10 September 1965 (L. and C. W. O'Brien). Gila Co.: Pinal Mts. (Wickham). Mexico. Chihuahua: 4300′, 21 mi S Chihuahua, 3 June 1968 (C. D. Johnson). Durango: 12 mi N Alamillo, 21 February 1953 (R. C. Bechtel and E. I. Schlinger).

Holotype, allotype, and two paratypes deposited in the U.S. National Museum of Natural History, Washington, D.C. (type 71402). Paratypes deposited in the C. D. Johnson collection and also deposited in the following collections: Arizona State University, Tempe; University of Arizona, Tucson; California Academy of Sciences, San Francisco; University of California, Berkeley; Canadian National Collection of Insects, Ottawa; and Los Angeles County Museum, Los Angeles.

Discussion

(*S. chihuahua* is in the Sordidus species group; see also discussion of *coconino, pygidialis, sordidus,* and *vachelliae.*) The only consistent differences between this species and *sordidus* and *coconino* are in the structure of the male genitalia. In addition, *chihuahua* has been collected only in southern Arizona and the States of Chihuahua and Durango, Mexico. Although *chihuahua* is apparently sympatric with *sordidus,* its distribution appears limited to north-central Mexico and southern Arizona. On the other hand, *sordidus* has a distribution from Texas, extreme southern Arizona, and northeastern and northwestern Mexico to Venezuela. *S. coconino* is limited to Arizona.

Although both reared specimens of *chihuahua* were from seeds still attached to plants, we strongly suspect that the ovipositional behavior of *chihuahua* is similar to that of *pygidialis* and *vachelliae*—it attaches its eggs to seeds on the ground.

The name "*chihuahua*" is a noun in apposition to *Stator*.

Stator coconino, new species

(Figs. 27-28)

Length (pronotum-elytra) 2.2 mm. Width 1.6 mm. Maximum thoracic depth 1.2 mm.

Male

In size, color, and general external appearance identical to *sordidus* but with the following exceptions: Basal four antennal segments red orange, remaining segments dark brown; basal 0.8 of hind femur black; without patch of dense white hairs on interval between striae 6 and 7 about midway between base and apex; hairs on apical 0.75 of pygidium sparse; antenna reaching almost to middle of elytron; disk of prothorax with coarser punctations; lateroventral carina of hind tibia absent; without sinus at base of mucro; mucro about 0.25 as long as first hind tarsomere.

Genitalia.—Figures 27 and 28. Median lobe moderate in length; in ventral view, ventral valve convex on lateral margins with broad concavity at apex, base nearly as wide as apex of median lobe, slightly arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of many fine denticles from base to bilobed apex, small medial spine expanded at base curving to blunt apex, gonopore sclerite heavily sclerotized. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 27).

Female

Similar to male but with white patch of setae at each anterolateral corner of pygidium, middle of basal margin with very sparse brown hairs; apical margin of last visible abdominal sternum straight, not emarginate.

Host Plants

Unknown.

Types

Holotype ♂: Arizona. Coconino Co.: W. Fork, Oak Creek, 8 mi N Sedona, 9 May 1972 (C. D. Johnson). Paratypes ♂ and ♀: Arizona. Cochise Co.: Palmerlee, 7 June 1907, H. A. Kaeber.

Holotype and paratypes deposited in the U.S. National Museum of Natural History, Washington, D.C. (type 71403).

Discussion

(*S. coconino* is in the Sordidus species group; see also discussions of *chihuahua, pygidialis, sordidus,* and *vachelliae.*) Although the three specimens of *coconino* differ from *sordidus* and *chihuahua* only in the structure of the male genitalia, we believe that these are sufficient for specific recognition. (See key and *sordidus* discussion.) The name "*coconino*" is a noun in apposition to *Stator.*

Stator dissimilis, new species

(Figs. 29-32)

Length (pronotum-elytra) 1.3-1.6 mm. Width 0.8-1.0 mm. Maximum thoracic depth 0.6-0.7 mm.

Male

Integument Color

Entirely black except basal two to four antennal segments and prothoracic and mesothoracic legs usually brown.

Vestiture

Eye with medial fringe of sparse white hairs; postocular lobe with short white hairs; postocular patch of dense white hairs, remainder of head with sparse white hairs; pronotum and elytra with uniform, moderately dense white hairs; mesothorax and metathorax with moderately dense white hairs becoming denser on lateral margins; abdomen with uniform, sparse white hairs becoming moderately dense on lateral margins; pygidium with uniform, moderately dense hairs, three small patches of white hairs at base, two lateral, one medial (fig. 29); leg covered with moderately dense white hairs.

Structure

Head.—Short and broad with many punctulations; frons usually with median glabrous finely punctate line extending from frontoclypeal suture to vertex; usually with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex, width about 1.5 times width of frons; ocular sinus 0.5-0.66 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments variable in shape but usually 1 and 3 filiform, 2 and 4 moniliform, 4 shorter than adjacent segments, 5-10 eccentric, 11 subacute apically, 5-11 almost as long as broad; antenna reaching to slightly beyond humerus.

Prothorax.—Disk campanulate (fig. 29); punctate medially, becoming coarser laterally; lateral carina extending about 0.66 distance to coxal cavity; short median impressed line on median basal lobe; prosternum separating coxae for about 0.8 their length.

Mesothorax and *Metathorax.*—Scutellum small, transverse with lateral posterior teeth, clothed with very dense recumbent white hairs; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, very coarsely punctate, strial intervals punctulate; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae 3 and 4 usually abbreviated at base; humerus punctulate; undersurfaces punctulate, becoming coarser laterally; all of hind coxa punctulate; hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 32); inner and outer ventral longitudinal carinae faint; femur armed with inner subapical acuminate spine 0.25-0.5 as long as width of tibial base; lateral ventral carina slightly sinuately emarginate apically, without blunt angulation (fig. 32); tibia with faint ventral and dorsomesal glabrous carinae, lateral and lateroventral carinae absent; dorsal surface of tibia unmarked, without dorsal fossa, dorsal carina, and dorsomesal sulcus; tibial corona with about four spinules, mucro one-sixth or less as long as first tarsomere, no longer than other spinules; without sinus at base of mucro; first tarsomere with faint ventral longitudinal carina, mesal and lateral carinae absent.

Abdomen.—First sternum slightly flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified, fifth emarginate; pygidium punctulate, convex in lateral view.

Genitalia.—Figures 30 and 31. Median lobe moderate in length; in ventral view, ventral valve with lateral margins straight, apex rounded to blunt point, base nearly as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of large medial spine similar to *sordidus* and *pygidialis* but about 0.5 of spine consists of two apical forks, entire sac lined with many densely placed denticles. Lateral lobes expanded apically, cleft to about 0.8 their length (fig. 30).

Female

Similar to male but first visible abdominal sternum not as long as remaining sterna; apical margin of last visible abdominal sterna straight, not emarginate.

Host Plants

Unknown.

Types

Holotype ♂, allotype ♀, and numerous paratypes: 8300 ft, 39 mi SW El Salto, Durango, Mexico, 17 August 1970 (C. D. Johnson).

Holotype, allotype, and some paratypes deposited in the U.S. National Museum of Natural History, Washington, D.C. (type 71404). Additional paratypes deposited in the Canadian National Collection of Insects, Ottawa, and in the collection of C. D. Johnson.

Discussion

(*S. dissimilis* is in the Dissimilis species group.) This minute species is a marginal member of *Stator* but has more characteristics of this genus than any other. It lacks a complete lateral pronotal carina (as does *championi*) but does have faint inner and outer glabrous longitudinal carinae on the hind femur. The male genitalia are very similar to those of *sordidus*.

It may be separated from other species of *Stator* by its small size, lack of lateral carinae on the hind tibia and first hind tarsomere, the short spine at the apex of the hind femur, its almost completely black body, and structure of the male genitalia.

Stator generalis, new species

(Figs. 33-36)

Length (pronotum-elytra) 2.5-2.9 mm. Width 1.8-2.1 mm. Maximum thoracic depth 1.3-1.8 mm.

Male

Integument Color

Head black, without red-orange postocular spot, labrum red orange to brown; usually all antennal segments red orange, sometimes six or seven segments light brown to dark brown; prothorax black; elytron usually red with small black spot in center of elytron, varying to all black, intermediate forms with progressively more elongate black spots; undersurfaces of thorax black; abdomen usually red orange but varying to black; prothoracic and mesothoracic legs red orange; base of hind femur black, about apical 0.5 red orange varying to black with only apex red orange; remainder of hind leg usually red orange but varying to all black.

Vestiture

Body with white, yellow, golden, or intermixed recumbent hairs; eye with medial fringe of sparse white hairs; postocular lobe with short white hairs; postocular patch of dense white or yellow hairs, remainder of head with sparse white or golden hairs; pronotum and elytra covered with moderately dense intermixed white and yellow, or golden hairs; mesothorax, metathorax, and abdomen with dense white hairs becoming more dense on lateral margins, hairs sometimes yellowish; pygidium with moderately dense white to yellow hairs, denser band at base forming three spots; legs covered with moderately dense white hairs.

Structure

Head.—Short and broad, coarsely punctate; frons with median glabrous finely punctate line extending from frontoclypeal suture to vertex; usually with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex, frons width slightly less than width of eye; ocular sinus 0.5-0.66 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments variable in shape but usually 1 and 3 filiform, 2 and 4 moniliform, 4 usually shorter than adjacent segments, 4 or 5-10 eccentric, 11 subacute apically, 5-11 about as long as broad; antenna usually reaching to humerus.

Prothorax.—Disk campanulate (fig. 33); punctate medially, becoming coarser laterally; lateral carina extending to coxal cavity; lateral margins of apex of pronotum strongly developed above lateral carinae to produce gibbosities at apex; short median impressed line on median basal lobe; prosternum separating coxae for about 0.8 their length.

Mesothorax and *Metathorax.*—Scutellum quadrate, with lateral posterior teeth, clothed with very dense recumbent white to yellow hairs; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, punctate, sometimes abbreviated at base; strial intervals punctulate; striae 3 and 4, and 5 and 6 usually closer to one another at base than to adjacent striae; humerus punctulate; undersurfaces punctate, becoming more coarse laterally; all of hind coxa punctulate; hind femur constricted basally and apically, expanded medially to slightly more than width of coxa (fig. 35); without scattered spinules on inner ventral longitudinal carina; femur armed with inner subapical usually acuminate sometimes blunt spine slightly longer than width of tibial base; lateral ventral carina slightly sinuately emarginate apically, without blunt angulation (fig. 35); tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina sometimes faint or incomplete; dorsal surface of tibia roughened, usually with faint fossa extending over about apical 0.33 of tibia, usually faint dorsal carina, usually with slight sulcus extending for apical 0.66 of tibia between dorsal carina and dorsomesal carina; tibial corona with about four spinules, mucro about one-sixth as long as first tarsomere; without sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum slightly flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified, fifth emarginate; pygidium punctate, convex in lateral view.

Genitalia.—Figures 34 and 36. Median lobe moderate in length, with acuminate lateral projections, in ventral view, ventral valve convex on lateral margins narrowing to sharp point at apex, base nearly as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of long strands of fine denticles lining sac from base to apex, small medial spine and slightly larger serrated crescentic spine at apex; gonopore sclerite round, well sclerotized. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 34).

Female

Similar to male but females usually of darker integumental color, apical margin of last visible abdominal sternum straight, not emarginate.

Host Plants

Enterolobium cyclocarpum (Jacq.) Griseb.: Panama Canal Zone (August Busck).

Types

Holotype ♂ and allotype ♀: Panama, Canal Zone: Pacific area, August 1965, light trap (Navy Colln.). Paratypes: From the same localities as the holotype and allotype and Panama, Canal Zone: Tabernilla, 16 June 1907 (August Busck); Ft. Kobbe, Ear Plant, 20 April 1964 (collector unknown); Boqueron Riv., *Bruchus* breeding in seeds of *Enterolobium cyclocarpum* (August Busck).

Holotype, allotype, and some paratypes deposited in the U.S. National Museum of Natural History, Washington, D.C. (type 71405). Paratypes deposited in the Canadian National Collection of Insects, Ottawa, and the C. D. Johnson collection.

Discussion

(*S. generalis* is in the Limbatus species group; see also discussions of *beali* and *limbatus*.) The elytron of *generalis* is usually red with a small black spot in the center but varies to all black. The elytra of its closest relatives, *beali* and *limbatus*, are usually red with lateral, basal, and sutural margins black, the lateral black margins usually ending with a maculation produced subapically as far as the sixth or seventh stria (figs. 11 and 37). The subapical spine of *generalis* is slightly longer than the width of the tibial base, whereas that of *limbatus* is about equal to, and that of *beali* is about 0.5 as long as, the width of the base of the hind tibia. The elytral striae of *generalis* are deeper with larger punctations and are more abbreviated at their bases than are those of *beali* and *limbatus*. *S. generalis* is usually larger than either *beali* or *limbatus*. Differences in male genitalia are discussed under *limbatus*.

S. generalis is reported to breed in the seeds of *Enterolobium cyclocarpum*, a tree that has poisonous seeds and a wide distribution in the American Tropics. The seeds of this tree have been collected from many localities in Mexico and Central America by several collectors, but no bruchids have been reared from them. Because this is the first report of a bruchid feeding in the seeds of this plant and since the seeds are only preyed on in a limited area in Panama, this host record must be verified.

Stator limbatus (Horn)

(Figs. 37-41)

Bruchus limbatus Horn, 1873: 326 (Lower California); Sharp, 1885: 454; Horn, 1894: 344; Fall, 1901: 29, 160; Schaeffer, 1907: 292, 294, 297, 303; Fall, 1910: 165; Cushman, 1911: 498, 506; Bridwell, 1920a: 406, 409; Bridwell, 1920b: 332; Bridwell, 1921a: 458; Bridwell, 1921b: 465; Bridwell, 1923b: 262; Krauss, 1944: 11. Type 8196, in Museum of Comparative Zoology, Cambridge, Mass.

B. interruptus Sharp, 1885: 470 (Mexico, Jalapa, Toxpam; Guatemala, Cerro Zunil); Schaeffer, 1907: 297. NEW SYNONYMY. Type in British Museum (Natural History), London.

Mylabris limbatus: Leng, 1920: 305; Kunhikannan, 1923: 25.

Acanthoscelides limbatus: Moreno and Bibby, 1943: 23; Blackwelder, 1946: 760; Zacher, 1952: 465, 470, 471.

A. interruptus. Blackwelder, 1946: 759.

Stator limbatus: Leech, 1954: 85; Leech, 1959: 60; Hinckley, 1960: 261; Johnson, 1963: 861; Johnson, 1968a: 267; Johnson, 1968b: 1270; Bottimer, 1968a: 284; Bottimer, 1968b: 1027, 1039; Johnson, 1969: 55; Forister and Johnson, 1970: 84; Forister and Johnson, 1971: 231; Kingsolver, 1972b: 228.

Length (pronotum-elytra) 1.6-2.7 mm. Width 1.1-2.0 mm. Maximum thoracic depth 0.9-1.5 mm.

Male

Integument Color

Head and body black with the following exceptions: Basal four to five antennal segments red orange; sometimes all segments red orange; elytron red orange, with lateral, basal, and sutural margins black, lateral black margin usually ending with maculation produced subapically as far as seventh stria; color of elytron varying from all red orange to small basal and apical red-orange maculations on black background; prothoracic and mesothoracic legs red orange, metathoracic leg usually all black, sometimes tarsus and apex of tibia red orange.

Vestiture

With recumbent white hairs as follows: Eye usually with medial fringe of sparse white hairs; postocular lobe with short white hairs; usually with postocular patch of white hairs; remainder of head with moderately dense to dense white hairs; pronotum, elytra, legs, and pygidium with uniform sparse to moderately dense white hairs; undersurfaces with moderately dense white hairs.

Structure

Head.—Short and broad, densely punctulate; frons with vague median impunctate line extending from frontoclypeal suture to vertex; with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; width of eye about 1.5 times width of frons; ocular sinus 0.5 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antenna with segment 1 cucumiform, 2-4 conical, 5 through 10 eccentric, trapezoidal, 11 elliptical, segments 5-11 forming subserrate club; antenna reaching to humerus.

Prothorax.—Broadly campaniform in dorsal aspect, apical margin evenly rounded, basal margin sinuate (fig. 37); dorsal surface evenly convex, slightly depressed on basal lobe, densely, evenly, finely punctate, setigerous punctures separated by about their own diameters, impunctate line on meson extending 0.33 length of pronotum from base toward apex; lateral prothoracic carina extending to coxal cavity; prosternum separating procoxae for about 0.9 their length.

Mesothorax and *Metathorax.*—Scutellum quadrate, with lateral posterior teeth, usually clothed with sparse white pubescence; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, punctate, strial intervals punctulate; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae 3 and 4, and 5 and 6 sometimes abbreviated at base; humerus punctulate, usually glabrous; hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 39); sometimes with spinules on inner ventral longitudinal carina; femur armed with inner subapical acuminate spine about as long as width of tibial base; lateral ventral carina slightly sinuately emarginate apically, without blunt angulation (fig. 39); hind tibia with ventral, lateral, lateroventral, and dorsomesal glabrous longitudinal carinae, lateroventral carina sometimes faint or incomplete at apex, sometimes with slight sulcus between lateroventral and ventral carinae; dorsal surface of tibia somewhat roughened, usually with well-defined fossa beginning about one-sixth from tibial apex, fossa about one-sixth length of tibia, fossa usually filled with fine setae; dorsal tibial carina and sulcus absent; tibial corona with about four spinules, mucro about one-fifth to one-sixth as long as first tarsomere; with slight sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum slightly flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified, 5 emarginate; surface of pygidium set with very shallow, lunulate, or subhexagonal depressions, each with seta on its anterior border, convex in lateral view.

Genitalia.—Figures 38, 40, and 41. Median lobe moderate in length, with acuminate, lateral projections near apex; in ventral view, ventral valve broad, gently sinuate on lateral margins, apex acuminate, base about as broad as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of basal patch of fine denticles, many fine denticles lining apical 0.66 of sac, slender spine medially and slightly larger serrated usually crescentic, sometimes only slightly curved spine near apex. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 38).

Female

Similar to male but apical margin of last visible abdominal sternum straight, last sternum as long as combined length of preceding sterna.

Host Plants

New Records

Acacia acatlensis Bentham: Mexico. Oaxaca: 9 mi SE Huajaupan de Leon, 4 July 1964 (C. D. Johnson).

A. angustissima (Mill.) Kuntze: Arizona. Pima Co.: 5000', Kitt Peak, 5 October 1972, #91-72 (C. D. Johnson); ca. 5500', Kitt Peak, 5 October 1972, #94-72 (C. D. Johnson). Mexico. Sinaloa: 4 mi S Culiacan, 26 December 1972, #185-72 (C. D. Johnson). Sonora: Benjamin Hill, 21 December 1972, #135-72 (C. D. Johnson). Sinaloa: 4 mi S Culiacan, 25 February 1973, #185-73 (C. D. Johnson).

A. baileyana F. Mueller: California. Los Angeles Co.: Tarzana, 1 June 1947 (L. J. Bottimer #87n).

A. berlandieri Bentham: Texas. Zavala Co.: 3 mi N La Pryor, 12 July 1964 (C. D. Johnson). Uvalde Co.: 11 mi N Uvalde, 13 July 1964 (C. D. Johnson). Medina Co.: 3 mi W D'Hanis, 11 July 1965 (L. and C. W. O'Brien). Mexico. Nuevo Leon: 3 mi NW Linares, 20 June 1964 (C. D. Johnson); 16 mi S Sabinas Hidalgo, 19 June 1964 (C. D. Johnson). Coahuila: 19 mi N Hermanas, 12 July

1964 (C. D. Johnson); 9 mi SE La Rosa, 11 July 1964 (C. D. Johnson).

A. coulteri Bentham: Mexico. Sonora: 8 mi E Navojoa, 24 February 1973, #179-73 (C. D. Johnson).

A. near *coulteri* Bentham: Mexico. Puebla: 4600', 5 mi SE Acatlan, 7 July 1968, #242-68 (C. D. Johnson).

A. near *glomerosa* Bentham: Mexico. Nayarit: 19 mi NW Tepic, 11 July 1968, #270-68 (C. D. Johnson).

A. greggii A. Gray: Arizona. Maricopa Co.: 9 mi S Sunflower, 11 November 1959 (C. D. Johnson); Superior, 22 November 1959 (C. D. Johnson). Yuma Co.: Martinez Lake, 24 March 1964 (S. Rosenthal). Gila Co.: Miami, 22 November 1959 (C. D. Johnson). Pima Co.: ca. 4000', mouth, Baboquivari Cyn., Baboquivari Mts., 5 October 1972, #84-72 (C. D. Johnson). California. San Bernardino Co.: Morongo, 27 December 1944 (P. H. Timberlake). Texas: Big Bend, 20 January 1931 (R. B. Lattimore). Mexico. Coahuila: Guerrero, 31 January 1925 (L. J. Bottimer).

A. millefolia Wats.: Arizona. Pima Co.: ca. 5000', Box Cyn., Santa Rita Mts., 7 October 1972, #124-72 (C. D. Johnson); western slopes of Rincon Mts., 3800', 28 April 1925 (L. J. Bottimer #53t3).

A. occidentalis Rose: Mexico. Sonora: Alamos, 14 July 1968, #331-68 (C. D. Johnson); 3 mi W San Carlos Bay, 22 December 1972, #138-72 (C. D. Johnson); 9 mi N Guaymas, 8 January 1973, #141-73 (C. D. Johnson).

A. retinodes Schlecht.: California. Los Angeles Co.: Tarzana, 1 June 1947 (L. J. Bottimer #87o).

A. retusa (Jacq.) R. A. Howard: Costa Rica: Taboga Hillside below cattle pens, 26 February 1972, 20 - XXXVIII (R. Carroll).

A. roemeriana Scheele: Texas. Brewster Co.: 51 mi S Alpine, 7 June 1972 (W. E. Clark); Bexar Co.: 30 May 1962 (L. J. Bottimer #112y); Menard, 27 June 1946 (L. J. Bottimer #86h); Junction, 17 June 1956 (L. J. Bottimer #97i).

A. tenuifolia (L.) Willd.: Costa Rica. Puntarenas Prov.: 23 mi NW Esparta, 11 March 1971 (D. H. Janzen).

A. willardiana Rose: Mexico. Sonora: 1 mi W San Carlos Bay, 12 August 1970, #67-70 (C. D. Johnson).

A. wrightii Bentham: Texas: Edinberg, 28 September 1964 (L. J. Bottimer #124g).

Calliandra sp.: Costa Rica. Comelco A, 24 March 1972, emerged 3 April 1972 (P. Opler), PAO #404.

Cercidium floridum Bentham: Arizona. Maricopa Co.: 10 mi E Mesa, 22 November 1959 (C. D. Johnson); Scottsdale, 6 December 1959 (C. D. Johnson); Ft. McDowell, 18 November 1959 (C. D.

Johnson); 8 and 10 mi S Sunflower, 11 November 1959 (C. D. Johnson); 9 mi S Sunflower, 29 November 1959 (C. D. Johnson); 5 mi W Buckeye, 12 December 1959 (C. D. Johnson); 10 mi E Mesa, 22 November 1959 (C. D. Johnson); 18 mi E Mesa, 8 November 1959 (C. D. Johnson); 12 mi NE Mesa, 3 December 1959 (C. D. Johnson); Gila Bend, 21 February 1960 (C. D. Johnson). Pinal Co.: 5 mi N Casa Grande, 21 February 1960 (C. D. Johnson). Mohave Co.: 6 mi S Yucca, 17 July 1964 (C. D. Johnson). Yuma Co.: Martinez Lake, 27 March 1967 (R. Phillips). Pinal Co.: Apache Junction, 8 November 1959 (C. D. Johnson). California. Riverside Co.: 19 mi W Blythe, 26 December 1959 (C. D. Johnson); 21 mi N Blythe, 18 December 1959 (C. D. Johnson); Indio, 11 June 1961 (C. D. Johnson). San Diego Co.: Borrego Springs, 12 June 1963 (C. D. Johnson). Imperial Co.: 1 mi W Glamis, 13 April 1965 (C. D. Johnson).

C. microphyllum (Torr.) Rose and Johnst.: Arizona. Pima Co.: ca. 3000', 23 mi SE Sells, 5 October 1972, #90-72 (C. D. Johnson). Mexico. Sonora: 9 mi S Benjamin Hill, 11 August 1970, #59-70 (C. D. Johnson).

C. praecox (Ruiz and Pav.) Harms: Mexico. Sonora: 31 mi S Navojoa, 20 August 1965 (C. D. Johnson).

Leucaena pulverulenta (Schl.) Bentham: Texas: Edinburg, 12 October 1960 (L. J. Bottimer #110g).

Lysiloma divaricata (Jacq.) MacBride: Mexico. Sinaloa: 13 mi E Navajoa, 18 August 1965 (C. D. Johnson). Oaxaca: 51 mi SE Oaxaca, 6 July 1968, #229-68 (C. D. Johnson). Jalisco: ca. 4000', 3 mi S Tecolatlan, 1 January 1973, #3-73 (C. D. Johnson). Sonora: 11 mi E Navojoa, 24 February 1973, #173-73 (C. D. Johnson).

Lysiloma sp.: Costa Rica, one-half way between Cañas and Tilaran, 4 March 1972, 20-XVII (Janzen).

Lysiloma (?): Mexico. Colima: 3 mi S Colima, 7 March 1973, #373-73 (C. D. Johnson).

Parkinsonia aculeata Linnaeus: Arizona. Pima Co.: near mouth, Baboquivari Cyn., Baboquivari Mts., 1 August 1972, #40-72 (C. D. Johnson). Texas. Uvalde Co.: Uvalde, February 1923 (L. J. Bottimer #51g6). Mexico. Sonora: Below dam, Rio Mayo, Lake Mocuzari, 25 December 1972, #156-72 (C. D. Johnson).

Pithecellobium dulce (Roxb.) Bentham: Costa Rica. Puntarenas Prov.: Boca Barranca, Puntarenas, 10 March 1971, #543 (D. H. Janzen). El Salvador. La Union: 14 mi SW La Union, 23 June 1968, #156-68 (C. D. Johnson). Mexico. Sinaloa: 1 mi S Rosario, 12 July 1968, #287-68 (C. D. Johnson).

P. pallens (Bentham) Standl.: Texas. Cameron Co.: Brownsville, January 1923 (L. J. Bottimer #51g5); Brownsville, 10 October 1960 (L. J. Bottimer #109o); Brownsville, 27 February 1963 (Lattimore and Bottimer #113K).

P. sonorae S. Wats.: Mexico. Sonora: 1 mi W San Carlos Bay, 12 August 1970, #71-70 (C. D. Johnson).

Pithecellobium sp.: El Salvador: San Andres, May 1958 (M. Salazar).

Samanea saman (Jacq.) Merrill: (Code 024) Costa Rica. Santa Rosa N.P., 10 February 1972 (R. Carroll).

Old Records

Acacia acatlensis: Johnson, 1968a: 267.

A. aculeata: Kunhikannan, 1923: 25; Zacher, 1952: 465.

A. berlandieri: Johnson, 1968a: 267.

A. confusa Merrill: Zacher, 1952: 465, 470.

A. cultriformis A. Cunn. ex G. Don: Leech, 1954: 86.

A. farnesiana (L.) Willd. (experimental): Bridwell, 1920a: 406; Zacher, 1952: 470.

A. greggii: Johnson, 1963: 861.

A. koa A. Gray: Zacher, 1952: 465, 471.

A. melanoxylon R. Br.: Leech, 1959: 60.

Albizia chinensis Merrill: Zacher, 1952: 470.

A. lebbek (L.) Bentham: Bridwell, 1920a: 406; Bridwell, 1921b: 465; Zacher, 1952: 470.

Cercidium floridum: Johnson, 1963: 861.

C. torreyanum Wats.: Kunhikannan, 1923: 25; Zacher, 1952: 465, 472.

Erythrina monosperma Gaudich.: Zacher, 1952: 465, 476.

Lysiloma divaricata: Johnson, 1968a: 267.

L. thornberi Britt. and Rose: Zacher, 1952: 470.

Pithecolobium (sic) (*Pithecellobium*) *brevifolium* Bentham: Plant Quarantine 1959: 39.

Pithecolobium (sic) (*Pithecellobium*) *dulce*: Bridwell, 1920a: 406; Zacher, 1952: 470.

Pithecollbium (sic) (*Pithecellobium*) *mexicanum* F. N. Rose: Plant Quarantine 1962: 38.

Prosopis juliflora (Swartz) DC. (experimental): Bridwell, 1920a: 406.

Samanea saman (Jacq.) Merrill: Bridwell, 1920a: 406; Bridwell, 1920b: 332.

Siderocarpus (now *Pithecellobium*) *flexicaulis* (Bentham): Bridwell, 1920a: 407; Bridwell, 1920b: 332; Cushman, 1911: 498, 506.

Distribution

United States: Arizona, California, Texas, and Hawaii; Mexico: Sonora, Baja California, Tamaulipas, Morelos, Oaxaca, Nuevo Leon, Sinaloa, Queretaro, Coahuila, Veracruz, Puebla, Nayarit, Jalisco, Colima, and Chihuahua; El Salvador; Costa Rica; and Panama. (See also Johnson, *1963*.)

Discussion

(*S. limbatus* is in the Limbatus species group; see also discussions of *beali* and *generalis*.) Means of separating *limbatus* from *beali* and *generalis* are given in the key by Johnson (*1963*), and are discussed under *generalis*.

The three species we treat in this group all have four tibial carinae, a mucro about one-sixth as long as the first tarsomere, a faint dorsal hind tibial fossa, usually three faint basal white spots on the pygidium, and a lateral ventral carina on the metafemur that is slightly sinuately emarginate apically and without a blunt angulation.

The male genitalia of the three species (figs. 41, 14, and 36) are similar in having acuminate, lateral projections near the apex of the median lobe and a similar armature of the internal sac. Both *limbatus* and *generalis* have a slender spine medially and a slightly larger, serrated, usually crescentic spine apically. This pattern is essentially the same in *beali*, but the apical spine is larger, not serrated, but is pointed and almost triangular. Although the male genitalia of *limbatus* and *generalis* are more similar, *beali* and *limbatus* are more similar in their external features.

S. limbatus appears to be the wide-ranging, generalist species in the group with a large number of host plants (table 1). *S. beali* and *generalis* are more specialized with one host each and a much more restricted distribution. Unlike some other species in this bulletin (i.e., *pygidialis*), apparently *limbatus* and *beali* cement their eggs to seeds still in pods attached to plants.

There are several other named forms that we consider to be members of the Limbatus group. *S. cearanus* (Pic) from the West Indies and Brazil and *S. bisbimaculatus* (Pic) from Uruguay and Argentina are very similar to *limbatus* (Kingsolver, *1972b*). We have examined many specimens of all three forms and can find no better characters to separate them than the spine near the apical orifice and the shape of the spiculum gastrale of the male genitalia mentioned by Kingsolver. Because *limbatus* is such a wide-ranging and variable species, it certainly seems possible that the three names may apply to one variable species with a range from California to Texas, Hawaii, the West Indies, and through Central and South America to Argentina. Much further collecting from Central and South America is needed to solve this problem.

S. rugulosus Kingsolver from Cuba is tentatively placed in the Limbatus group because of the similarity of its male genitalia to those of *limbatus*. It does not resemble other known species of *Stator* in its external structure and color, however. *S. testudinarius* (Erichson) from Peru and Ecuador is similar to *generalis* in color. The male genitalia have the same basic plan as *limbatus* but are distinct from all species in the group.

We have examined the types of *Bruchus interruptus* Sharp and *B. limbatus* Horn and conclude that both names refer to the same species.

Many of the host plants reported by Zacher (*1952*) are not documented and must be verified by further rearings.

Stator mexicanus Bottimer

(Figs. 42-46)

Stator mexicanus Bottimer, 1973: 549 (El Salto de Agua, S. L. Potosi, Mexico). Type in Canadian National Collections, Ottawa.

Length (pronotum-elytra) 1.9-2.6 mm. Width 1.6-1.9 mm. Maximum thoracic depth 1.2-1.5 mm.

Male

In size, color, and general external appearance similar to *vachelliae* but with the following exceptions:

Integument Color

Body black with an aeneus luster, middle legs bicolored, hind legs black.

Vestiture

Pubescence predominantly yellow with slight tinge of brown with ashy setae scattered to grouped into definite moderately dense spots; white pubescence evident on prothoracic disk at sides and on apical 0.5 where it forms an indefinite band of about six small dense patches; elytral pubescence yellow tinged with brown, finer than on prothorax and more evenly distributed; white pubescence unevenly scattered and spotty, occurring mostly as single setae, but with numerous small patches most of them grouped into two vague transverse bands, one before middle, 1 before apical 0.33, patches on most of even-numbered intervals; pygidial ashy pubescence fine, inconspicuous, evenly distributed, white pubescence coarser, unevenly scattered as single setae without pattern except at base where setae form small, distinct, median, triangular spot and are scattered along base to hind angles, ending in pencil of white at side of pygidium and adjacent to visible side of fifth visible sternum; pubescence beneath white, fine, not sufficiently dense to conceal surface sculpture except on outer edge of coxa and parts of metasternum; usual dense patches on sides of abdominal sterna inconspicuous.

Structure

Head.—Smooth median line on frons and sculpture about as in *vachelliae* except punctures not arranged in concentric circles about micropunctate areas; with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; eye slightly wider than width of frons; ocular sinus about 0.5 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antenna shorter, segments 1-4 slender, 5 abruptly about 0.25 wider than long, 6-10 transverse, each about 0.66 wider than long, when not expanded forming loose club, not serrate; antenna reaching to humerus.

Prothorax.—Disk campanulate (fig. 42); basal impressions less evident than in *vachelliae*; lateral prothoracic carina extending to coxal cavity; short median impressed line on median basal lobe; prosternum separating procoxae for about 0.8 their length.

Mesothorax* and *Metathorax.—Scutellum slightly broader than long; faintly bilobed apically, densely covered with ashy pubescence; elytron about two times as long as broad; sculpture similar but coarser; elytral striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae not abbreviated at base; hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 44); sometimes spinules on inner ventral longitudinal carina; femur armed with inner subapical usually acuminate, sometimes blunt spine about as long as width of tibial base; lateral ventral carina sinuately emarginate apically, with blunt angulation (fig. 44); hind tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina absent; dorsal surface of tibia smooth, with deep, well-defined fossa beginning about one-sixth from tibial apex, fossa about one-fourth length of tibia, fossa usually filled with fine setae; dorsal tibial carina and sulcus absent; mucro about 0.25 as long as first tarsomere; without sinus at base of mucro; first hind tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First visible abdominal sternum unmodified, 0.5 longer than two to five combined; five emarginate; at middle, 0.66 length of four.

Genitalia.—Figures 43, 45, and 46. Median lobe moderate in length; in ventral view, ventral valve narrow, truncate at apex, slightly convex on lateral margins, base about 0.5 as broad as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of elongate cluster of large spines, spines larger at apex of cluster, cluster occupying about apical 0.5 of internal sac. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 43).

Female

Similar to male but pygidium with small, elongate, triangular white patches of long setae at basal angles, and smaller broader triangle in middle of base; first visible abdominal sternum two-ninths longer than two to five combined, five longer than three and four combined, lacking coarser punctures of male.

Host Plants

New Records

Acacia cornigera (L.) Willd.: Guatemala. Izabal Quirigua, 20 May 1965 (D. H. Janzen). Mexico. Veracruz: Cotaxtla Exp. Sta., Cotaxtla, 31 July, 5 August, and 1 September, 1962 (D. H. Janzen); 16 mi SE Tantoyuca, 22 June 1964 (C. D. Johnson). Oaxaca: 5 mi E Temascal, 30 June 1964 (C. D. Johnson).

Old Records

Acacia cornigera: Bottimer, 1973: 551.

Distribution

Mexico: San Luis Potosi, Veracruz, Oaxaca, and Chiapas; Guatemala.

Discussion

(*S. mexicanus* is in the Subaeneus species group; see also discussions of *bottimeri* and *subaeneus*.) Bottimer (*1973*) described this species but did not compare it to other closely related species. We are placing this species in a group comprised of the closely related species *bottimeri*, *chalcodermus* Kingsolver, *mexicanus*, and *subaeneus*. See the discussion of *subaeneus* for their similarities and differences.

Stator monachus (Sharp), new combination

(Figs. 47-50)

Bruchus monachus Sharp, 1885: 471 (Guatemala, Zapote). Type in British Museum (Natural History), London.

B. seclusus Sharp, 1885: 471 (Panama, Volcan de Chiriqui 2,500-4,000 ft). NEW SYNONYMY. Type in British Museum (Natural History), London.

B. dufaui Pic, 1927: 11 (Guadeloupe). NEW SYNONYMY. Type in Museum National d'Histoire Naturelle, Paris.

Acanthoscelides monachus: Blackwelder, 1946: 760.

A. seclusus: Blackwelder, 1946: 761.

A. dufaui: Blackwelder, 1946: 759; de Luca, 1972: 103.

Stator dufaui: Kingsolver, 1972b: 220.

Length (pronotum-elytra) 1.9-3.0 mm. Width 1.4-2.0 mm. Maximum thoracic depth 1.1-1.5 mm.

Male

Integument Color

Body black except four basal antennal segments, tarsal pads, or entire tarsus reddish or reddish yellow; sometimes prothoracic and mesothoracic legs varying from black to brown to all red orange.

Vestiture

Thinly scattered gray setae; pygidium with three diffuse patches of gray setae on basal margin, sometimes pygidium with moderately dense uniform gray setae, without patches.

Structure

Head.—Ovate, vertex and frons finely, densely fossulate, thinly setose; frontal carina prominent, microgranulate; with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; eye slightly wider than width of frons; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antenna with seven distal segments forming slightly eccentric, compact club; antenna reaching to about 0.75 distance to humerus.

Prothorax.—Pronotum subhexagonal (fig. 47), lateral margins in dorsal aspect angulate anteriorly, continuous in outline with margins of elytra; dorsal punctation fine, dense, discrete, thinly setose; lateral prothoracic carina extending to coxal cavity; prosternum separating procoxae for their entire length.

Mesothorax and *Metathorax.*—Scutellum broader than long, depressed, densely setose, with lateral posterior teeth; elytra with strial rows normal, slightly impressed, with individual strial punctures discrete; intervals reticulate strigate; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae 3 and 4, and 5 and 6 sometimes abbreviated at base; mesosternum and metasternum shallowly foveolate with interspaces strigate setigerous; metacoxal face finely foveolate, foveolae discrete mesally but more densely placed and intricate laterally; hind femur constricted basally and apically, expanded medially to slightly more than width of coxa (fig. 49); sometimes with spinules on inner, ventral, longitudinal carina; femur armed with inner, subapical, usually acuminate, occasionally blunt spine about as long as width of tibial base; lateral ventral carina sinuately emarginate apically but without blunt angulation (fig. 49); tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina occasionally faint or abbreviated at apex; dorsal surface of tibia somewhat roughened, with deep, well-defined fossa beginning about one-sixth from tibial apex, fossa about one-third length of tibia, fossa usually filled with fine setae; usually faint dorsal carina, usually slight sulcus between dorsal carina and dorsomesal carina extending for two-thirds to almost entire length of tibia; tibial corona with about four spinules, mucro one-fifth to one-fourth as long as first tarsomere; without sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First visible abdominal sternum unmodified, 0.5 longer than two to five combined; five emarginate; at middle equal in length to four.

Genitalia.—Figures 48 and 50. Ventral valve of median lobe triangular; internal sac finely spiculate, with large, triangular spinelike sclerite near middle of sac, spinelike sclerite varies somewhat in basal width; hemispherical, denticulate sclerite near apex of sac; ejaculatory duct closed by circular valve flanked by thin, denticulate plates. Lateral lobes expanded apically, bowed, cleft to about 0.75 their length (fig. 48).

Host Plants

New Records

Acacia near *glomerosa* Bentham: Mexico. Nayarit: 19 mi NW Tepic, 11 July 1968 (C. D. Johnson).

Eugenia (?) sp. (Myrtaceae): Puerto Rico: Aibonito, Rivera Finca, 3 August 1923 (No. 3888).

Old Records

Acacia riparia H. B. K.: Kingsolver, 1972b: 221.

Piscidia piscipula (L.) Sarg.: Kingsolver, 1972b: 221.

Distribution

Puerto Rico, St. Vincent, St. Thomas, Tortola, Antigua, and St. Johns, Virgin Islands; Mexico: Nayarit, Veracruz; Panama: Canal Zone, Barro Colorado Island; and Brazil: Bahia.

Discussion

(*S. monachus* is in the Aegrotus species group; see also discussions of *aegrotus, pruininus, trisignatus,* and *vittatithorax*.) Kingsolver (*1972b*) compared *monachus* (as *dufaui*) with *pruininus*. Characters to separate *monachus* from other members of the Aegrotus group are given in the key and discussed under *aegrotus*.

Because *monachus* does not possess dense white patches of hairs at the base of the pygidium and the drawing published by de Luca (*1972*) as *dufaui* does, his drawing is probably of *aegrotus*.

Like most *Stator, monachus* apparently has an affinity for the seeds of *Acacia*.

We have examined the types of *Bruchus monachus, B. seclusus*, and *B. dufaui* and we conclude that all three names refer to the same species. The reported rearing from seeds of *Eugenia* (Myrtaceae) must be verified before it can be considered valid.

Stator pruininus (Horn)

(Figs. 51-54)

Bruchus pruininus Horn, 1873: 327 (Arizona); Sharp, 1885: 453, 472; Riley and Howard, 1892: 165, 166; Fall, 1901: 29, 160; Schaeffer, 1907: 292, 293, 294, 297; Fall and Cockerell, 1907: 200; Fall, 1910: 162, 164, 165, 166; Cushman, 1911: 507; Payne, 1913: 40, 41; Bridwell, 1918: 465-471; Bridwell, 1919: 18; Bridwell, 1920a: 408; Swezey, 1921: 521; Bridwell, 1923a: 79; Bridwell, 1923b: 261; Swezey, 1925: 3; Bridwell, 1938: 71. Type (lectotype 3888, designated by Bottimer, 1968a) in Museum of Comparative Zoology, Cambridge, Mass.

B. cognatus Sharp, 1885: 472 (Mexico, Saltillo in Coahuila). NEW SYNONYMY. Type in British Museum (Natural History), London.

B. piger Sharp, 1885: 473 (Mexico, Guanajuato; Nicaragua, Chinandega). NEW SYNONYMY. Type in British Museum (Natural History), London.

Mylabris pruininus: Leng, 1920: 305; Kunhikannan, 1923: 25.

Bruchidius pruininus: Herford, 1935: 15, 17.

Acanthoscelides pruininus: Blackwelder, 1946: 760.

A. cognatus: Blackwelder, 1946: 759.

A. piger: Blackwelder, 1946: 760.

Stator pruininus: Bridwell, 1946: 55; Bradley, 1947: 39; Zacher, 1952: 462-480; Hinckley, 1960: 261; Peck, 1963: 956; Johnson, 1963: 862; Johnson, 1968a: 267; Johnson, 1968b: 1270; Bottimer, 1968a: 285; Bottimer, 1968b: 1027, 1039, 1041; Bottimer, 1969: 1189, 1191; Johnson, 1969: 55; Janzen, 1969: 14, 19; Janzen, 1972: 976; Kingsolver, 1972b: 221.

Length (pronotum-elytra) 1.4-2.7 mm. Width 0.9-2.0 mm. Maximum thoracic depth 0.7-1.5 mm.

Male

Integument Color

Body black except basal two to five (sometimes all) antennal segments, prothoracic and mesothoracic legs red orange, sometimes with bases of mesothoracic tibia and femur brown to black; occasionally with appendages all black.

Vestiture

With white recumbent hairs as follows: Eye usually with medial fringe of sparse white hairs; postocular lobe with short white hairs; usually with postocular patch of white hairs; remainder of head with moderately dense to dense white hairs; pronotum, elytra, legs, and pygidium with uniform moderately dense to dense white hairs; mesothorax, metathorax, and abdomen with moderately dense to dense white hairs, usually becoming denser on lateral margins.

Structure

Head.—Short and broad, densely punctulate; frons with median glabrous carina extending from frontoclypeal suture to vertex; with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; width of eye about 0.33 wider than width of frons; ocular sinus 0.5-0.66 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments 1 and 3 usually filiform, 2 and 4 usually moniliform, 4 usually shorter than adjacent segments, 5-10 eccentric, 11 subacute apically, 5-11 slightly broader than long; antenna reaching to humerus or slightly beyond.

Prothorax.—Disk campanulate (fig. 51); punctate medially becoming coarser laterally; lateral prothoracic carina extending to coxal cavity; short median impressed line on median basal lobe; prosternum separating procoxae for about 0.8 their length.

Mesothorax and *Metathorax*.—Scutellum small, quadrate, with lateral posterior teeth, usually clothed with very dense recumbent white hairs; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, punctate, strial intervals punctulate; striae 3 and 4, and 5 and 6 usually closer to one another at base than to adjacent striae; striae sometimes abbreviated at base; humerus punctulate, usually glabrous; undersurfaces of thorax with coarse punctations; undersurfaces of abdomen punctulate; entire face of hind coxa punctate; hind femur constricted basally and apically, expanded medially to slightly more than width of coxa (fig. 53); sometimes with scattered spinules on inner ventral longitudinal carina; femur armed with inner subapical acuminate spine about as long as width of tibial base; lateral ventral carina sinuately emarginate apically, without blunt angulation (fig. 53); tibia with ventral, lateroventral, lateral, and dorsomesal glabrous longitudinal carinae; dorsal surface of tibia somewhat roughened, with usually well-defined fossa beginning about 0.2 from apex, fossa about 0.33 length of tibia, fossa usually filled with fine setae; fossa faint on smaller specimens; sometimes faint dorsal carina, sometimes slight sulcus between dorsal carina and dorsomesal carina; tibial corona with about four spinules, mucro about 0.25 as long as first tarsomere; slight sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum slightly flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified, fifth emarginate; pygidium punctate, convex in lateral view.

Genitalia.—Figures 52 and 54. Median lobe moderate in length; in ventral view, ventral valve slightly sinuate on lateral margins, apex somewhat truncated, base about as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac complex, variable, consisting of long slender sclerotized spine, crescent-shaped spine composed of many smaller spines, and 1 or 2 large spines medially, and about 8-14 smaller spines, usually arranged chainlike at apex;

apex of internal sac with many densely placed denticles; forms from Venezuela with 2 small spines at base of internal sac. Lateral lobes expanded apically, cleft to about 0.66 their length (fig. 52).

Female

Similar to male but apical margin of last visible abdominal sternum straight.

Host Plants

New Records

Acacia berlandieri Bentham: Texas. Uvalde Co.: 11 mi N Uvalde, 13 July 1964 (C. D. Johnson). Maverick Co.: 7 mi and 14 mi NE Eagle Pass, 12 July 1964 (C. D. Johnson). Zavala Co.: 3 mi N La Pryor, 12 July 1964 (C. D. Johnson).

A. californica Brandegee: Mexico. Sonora: ½ mi W San Carlos Bay, 12 August 1970, #75-70 (C. D. Johnson).

A. constricta Bentham ex Gray: Arizona. Gila Co.: Miami, 22 November 1959 (C. D. Johnson); 20 mi N Globe, 28 February 1960 (C. D. Johnson); 7 mi S Payson, 7 February 1960 (C. D. Johnson). Yuma Co.: 15 mi E Quartzite, 18 December 1959 (C. D. Johnson); 5 mi W Salome, 18 December 1959 (C. D. Johnson); 30 mi E Ehrenberg, 18 December 1959 (C. D. Johnson); 20 mi E Ehrenberg, 18 December 1959 (C. D. Johnson). Pima Co.: Tucson, 30 December 1963 (R. S. Beal); Continental, 3 September 1964 (C. D. Johnson); 16 mi W Rillito, 9 October 1971, #18-71 (C. D. Johnson); 21 mi NNE Quijotoa, 31 July 1972, #35-72 (C. D. Johnson). Cochise Co.: 6 mi NW Huachuca City, 6 October 1972, #104-72 (C. D. Johnson). Yavapai Co.: Camp Verde, 2 September 1973, #536-73, seeds on ground (C. D. Johnson); Camp Verde, 7 October 1973, #546-73, seeds on ground (C. D. Johnson).

A. delbata (sic) probably *dealbata* Link: California. Los Angeles Co.: La Cañada, 21 June 1959 (N. McFarland).

A. greggii Gray: Texas: 25 mi W Sheffield, 27 August 1924 (L. J. Bottimer #52x3).

A. rigidula Bentham: Texas: Brownsville (R. B. Lattimore); Asherton, 18 December 1924 (L. J. Bottimer #53m6); Roma, 7 May 1947 (L. J. Bottimer #88c); Laredo, 7 May 1947 (L. J. Bottimer #88e); Lake Walk, Devils River, 9 June 1948 (L. J. Bottimer #90t); Devils Lake, 3 September 1950 (L. J. Bottimer #92b). Mexico. Tamaulipas: 6.2 mi S San Fernando, 9 June 1966 (D. H. Janzen).

A. roemeriana Scheele: Texas: Menard, 27 June 1946 (L. J. Bottimer #86h).

A. schottii Torr.: Texas: Terlingua, 10 February 1926 (L. J. Bottimer #54r3).

Acacia sp.: Mexico. Tamaulipas: 5 mi NE Llera, 21 June 1964 (C. D. Johnson).

A. vernicosa Standl.: Texas: Big Bend National Park, Hot Springs, 19 June 1957 (L. J. Bottimer #100p); Big Bend National Park (Basin), 29 April 1959 (L. J. Bottimer #104x). New Mexico: Artesia, 7 August 1961 (L. J. Bottimer #112f).

A. wrightii Bentham ex Gray: Mexico. Coahuila: Guerrero, 28 November 1924 (L. J. Bottimer #53k6).

Calliandra eriophylla Bentham: Arizona. Santa Cruz Co.: 3 mi W Pena Blanca Lake, 13 June 1972, #14-72 (C. D. Johnson); Ruby, 13 June 1972, #16-72 (C. D. Johnson); ca. 4000′, 2 mi E Pena Blanca Lake, 12 June 1973, #518-73 (C. D. Johnson). Mexico: San Carlos, 22 November 1924 (L. J. Bottimer #53j4).

Calliandra sp.: Costa Rica: Sta. Rosa behind El Naranjo, 15 March 1972, 19-XXXII (Janzen).

C. tapirorum: Costa Rica: El Naranjo, 9 March 1972, 20-XXXV (Janzen).

Chamaechrista (?) Code 017: Costa Rica: Palo Verde, 9 January 1972 (R. Carroll).

Coursetia glandulosa Gray: Arizona. Pima Co.: Sabino Canyon, Santa Catalina Mts., 3000′, 2 June 1925 (L. J. Bottimer #53x1).

Desmanthus covillei (Britt. and Rose) Wiggins ex Turner: Mexico. Sonora: San Carlos Bay, 23 December 1972, #144-72 (C. D. Johnson); 8 mi E Navojoa, 24 February 1973, #175-73 (C. D. Johnson); 14 mi S Navojoa, 24 February 1973, #180-73 (C. D. Johnson).

D. leptolobus Torr. and Gray: Texas: 9 mi S Cleburne, 2 August 1959 (L. J. Bottimer #105e).

Desmanthus spp.: Texas. Val Verde Co.: 9 mi W Comstock, 17 June 1964 (C. D. Johnson); 8 mi W Comstock, 21 May 1957 (L. J. Bottimer #100k). Mexico. Sonora: Benjamin Hill, 21 December 1972, #134-72 (C. D. Johnson). Nayarit: 16 mi E San Blas, 6 January 1973, #107-73 (C. D. Johnson). Jalisco: ca. 3000′, 18 mi W Magdalena, 5 January 1973, #68-73 (C. D. Johnson); ca. 4000′, 15 mi W Magdalena, 2 March 1973, #317-73 (C. D. Johnson); ca. 4000′, 15 mi W Magdalena, 30 December 1972, #201-72 (C. D. Johnson). Sinaloa: 19 mi N Mazatlan, 7 January 1973, #124-73 (C. D. Johnson).

Mimosa biuncifera Bentham: Arizona. Maricopa Co.: Cave Creek, 27 March 1960 (C. D. Johnson). Gila Co.: Salt R. Canyon at Highway 60, 28 February 1960 (C. D. Johnson). Cochise Co.:

Cochise Stronghold, 14 October 1973 (C. D. Johnson). New Mexico: Picacho, 22 January 1926 (L. J. Bottimer #54q7). Mexico. Coahuila: 34 mi N Saltillo, 11 July 1964 (C. D. Johnson). Guanajuato: 22 mi NE Guanajuato, 7 June 1968, #63-68 (C. D. Johnson).

M. dysocarpa Bentham: Arizona. Pima Co.: ca. 5000′, Box Cyn., Santa Rita Mts., 7 October 1972, #126-72 (C. D. Johnson). Santa Cruz Co.: ca. 4600′, Ruby, 5 October 1972, #101-72 (C. D. Johnson); Pena Blanca Lake, 6 October 1972, #103-72 (C. D. Johnson).

M. grahami Gray: Arizona. Cochise Co.: Cochise Stronghold, 14 October 1973, #554-73 and #555-73 (C. D. Johnson).

M. invisa Mart.: Mexico. Nayarit: ca. 3500′, 24 mi NW Ixtlan del Rio, 5 January 1973, #84-73 (C. D. Johnson).

M. laxiflora Bentham: Mexico. Sonora: 3 mi W San Carlos Bay, 22 December 1972, #139-72 (C. D. Johnson).

M.? laxiflora: Mexico. Sonora: 13 mi E Navojoa, 25 December 1972, #167-72 (C. D. Johnson).

M. monancistra Bentham: Mexico. Aguascalientes: 14 mi S Aguascalientes, 6 June 1968 (C. D. Johnson).

M. palmeri Rose: Mexico. Sinaloa: 3 mi N Escuinapa, 10 March 1973, #486-73 (C. D. Johnson). Sonora: 14 mi W Alamos, 24 February 1973, #166-73 (C. D. Johnson); 11 mi E Navojoa, 24 February 1973, #170-73 (C. D. Johnson).

M. setigera Britt. and Rose vel sp. aff.: Mexico. Jalisco: 15 mi W Magdalena, 30 December 1972, #202-72 (C. D. Johnson). Nayarit: 16 mi E San Blas, 6 January 1973, #110-73 (C. D. Johnson). Sinaloa: 38 mi S Culiacan, 25 February 1973, #197-73 (C. D. Johnson); 38 mi S Culiacan, 11 March 1973, #500-73 (C. D. Johnson). Jalisco: ca. 4000′, 15 mi W Magdalena, 2 March 1973, #318-73 (C. D. Johnson).

M. somnians H. and B.: Mexico. Nayarit: ca. 4000′, 27 mi SE Tepic, 2 March 1973, #312-73 (C. D. Johnson).

Mimosa spp.: Mexico. Nayarit: 43 mi SW Compostela, 28 February 1973, #264-73 (C. D. Johnson); 43 mi SW Compostela, 9 March 1973. #464-73 (C. D. Johnson); Colima: 10 mi NE Armeria, 7 March 1973, #393-73 (C. D. Johnson).

Neptunia plena (L.) Benth.: Sinaloa: 2 mi N Mazatlan, 29 December 1972, #191-72 (C. D. Johnson).

Olneya tesota Gray: Arizona. Maricopa Co.: Phoenix South Mtn. Park, 25 November 1959 (C. D. Johnson); 10 mi SE Chandler, 5 December 1959 (C. D. Johnson). Pinal Co.: Sacaton (no date) (J. T. Presley). Pima Co.: S end Tucson Mts., 24-2600′, 1 August 1925 (L. J. Bottimer #54g1).

Pithecellobium pallens (Bentham) Standl.: Texas. Cameron Co.: Brownsville, 10 October 1960 (L. J. Bottimer #1090).

Robinia pseudo-acacia L.: California. Fresno Co.: Fresno, 22 August 1961 and 20 July 1962 (C. D. Johnson). San Luis Obispo Co.: Paso Robles, 18 August 1962 (C. D. Johnson).

Sesbania emerus (Aubl.) Urban: Costa Rica. Palo Verde swamp, 8 January 1972 (R. Carroll); Great Swamp, Comelco near Bagaces, Guanacaste Prov., 13 March 1971 (D. H. Janzen).

S. nr. *macrocarpa* Muhlenberg: Mexico. Jalisco: Lakeside, 3 mi W Chapala, 4 January 1973, #53-73 (C. D. Johnson). Colima: 10 mi N Colima, 6 March 1973, #363-73 (C. D. Johnson).

Sesbania sp.: Costa Rica. Comelco near Bagaces, Guanacaste, 8 March 1972 (Janzen et al.).

Old Records

Acacia berlandieri: Johnson, 1968a: 267.

A. confusa Merrill: Zacher, 1952: 462, 470.

A. constricta: Kunhikannan, 1923: 25; Zacher, 1952: 462, 470; Johnson, 1963: 862.

A. decurrens Willd.: Zacher, 1952: 462.

A. koa A. Gray: Zacher, 1952: 462, 471.

A. melanoxylon R. Br.: Kunhikannan, 1923: 25; Zacher, 1952: 462, 471.

Desmanthus sp.: Johnson, 1968a: 267.

D. virgatus (L.) Willd.: Zacher, 1952: 462, 471.

Glycine max (L.) Merrill: Zacher, 1952: 462, 476. (Needs to be confirmed.)

Indigofera anil L.: Bridwell, 1918: 468.

Leucaena leucocephala (Lam.) deWit: Bridwell, 1918: 468; Zacher, 1952: 462, 471.

Mimosa biuncifera: Johnson, 1968a: 267; Bottimer, 1969: 1191.

M. dysocarpa: Bottimer, 1969: 1191.

Olneya tesota Gray: Horn, 1873: 328; Riley and Howard, 1892: 165; Cushman, 1911: 507; Bridwell, 1918: 468; Zacher, 1952: 462, 474; Johnson, 1963: 862.

Robinia pseudo-acacia: Bridwell, 1918: 468; Kunhikannan, 1923: 25; Zacher, 1952: 462, 474; Johnson, 1963: 862.

Sesbania macrocarpa Muhlenberg: Bridwell, 1918: 469; Bridwell, 1923a: 79.

S. sesban (L.) Merrill: Zacher, 1952: 462, 474.

Experimental Rearings:

Bridwell, 1918: 469: *Glycine max, Arachis hypogaea* Linnaeus, *Prosopis juliflora* (Swartz) DC., *Cassia fistula* Linnaeus, *C. no-*

dosa Buchenau ex Roxb. Hort. Beng, *Desmodium uncinatum* DC., *Albizia saponaria* Blume, *Desmanthus virgatus, Acacia koa,* and *Caesalpinia pulcherrima* (L.) Sw.

Bridwell, 1919: 18: *Cassia siamea* Lamarck, *Samanea saman* Merrill, *Acacia decurrens*, and *Sesbania coccinea*.

Distribution

United States: Arizona, California, Texas, Hawaii, Nevada, Oregon, Utah, and New Mexico; Mexico: Tamaulipas, Sonora, Coahuila, Nuevo Leon, Durango, Puebla, Nayarit, Guanajuato, Aguascalientes, Jalisco, Sinaloa, Colima, Chihuahua, Chiapas, Mexico, and Morelos; Gulf of California: Angel de la Guardia Island, Isla Espiritu Santo, Isla Partida, San Francisco Island, and San Estaban Island; Costa Rica; El Salvador; Honduras; Nicaragua; and Venezuela. (See also Johnson, *1963*.)

Discussion

(*S. pruininus* is in the Aegrotus species group; see also discussions of *aegrotus, monachus, trisignatus,* and *vittatithorax.*) *S. pruininus* is separated from many other *Stator* species by its almost completely black color covered by coarse white pubescence, giving it a pruinose appearance. The completely black hind femur in combination with uniform white pubescence on the pygidium is diagnostic, and the male genitalia separate it from all other species of *Stator*. Other diagnostic characters are given in the key.

S. pruininus is not closely related to other species of *Stator* when all of its characters are considered. Externally it is near in structure to other members of the Aegrotus group, especially *aegrotus*, *monachus*, and black forms of *vittatithorax*. It differs from them in a variety of somewhat trivial characters, such as the size of the angulation at the outer apical margin of the hind femur and the size of the fossa on the dorsal margin of the hind tibia. It differs from the other members of the Aegrotus group in the color of the elytra.

When the male genitalia are studied, the apparent close relationships to the Aegrotus group are not evident. Most other members of this group have a single medium to large sclerite located medially in the internal sac and usually a denticulate sclerite near the apex. *S. pruininus* has a long slender spine located medially, which may be homologous to the medial sclerite of other members of the Aegrotus group. The greatest difference is that *pruininus* has about 20 additional spines medially and apically in the internal sac. This seems to link *pruininus* with the Subaeneus group, which also has many spines in the internal sac. The spines of *pruininus* are, however, usually more numerous and more sharply pointed than those of the Subaeneus group. Because of its similarity in genitalic features with the Subaeneus group, we consider *pruininus* to be a marginal member of the Aegrotus group and probably is a connecting link between the two.

Both *pruininus* and *limbatus* are very widespread species, no doubt because both are generalist species that feed on a wide variety of host plants. The variety of host plant seed size no doubt accounts for the variability in size and some structures of both species. *S. pruininus*, like *limbatus*, feeds in the seeds of acacias, but it is also common in species of *Mimosa*. Both species feed in the seeds of the Mimosoideae much more than any other subfamily of the Leguminosae. But though *limbatus* is found only occasionally in the Caesalpinioideae, *pruininus* commonly is found in that subfamily and in the genera *Coursetia, Olneya*, and *Robinia* of the Papilionoideae. We know of no other species of bruchid that feeds on such a wide variety of host species (table 2) that are placed in all three of the subfamilies of the Leguminosae. Surprisingly, to our knowledge, *pruininus* is not an economic pest.

We have examined the types of *Bruchus pruininus, B. cognatus*, and *B. piger* and have concluded that all three names refer to the same species. These synonyms probably resulted from the wide distribution of this species rather than any great differences in structure.

Many of the host plants reported by Zacher (*1952*) are not documented and must be verified by further collections and rearings.

Stator pygidialis (Schaeffer)

(Figs. 55-59)

Bruchus pygidialis Schaeffer, 1907: 297 (Huachuca Mts., Ariz.); Fall, 1910: 164, 166. Type (lectotype 42340, designated by Johnson 1968b) in U.S. National Museum of Natural History, Washington, D.C.

B. pythonicus Pic, 1913: 43.

Mylabris pygidialis: Leng, 1920: 305.

M. pythonicus: Leng, 1920: 305.

Stator pythonicus: Johnson, 1963: 864.

S. pygidialis: Bottimer, 1968b: 1027, 1039; Johnson, 1968b: 1270; Bottimer, 1973: 545.

Length (pronotum-elytra) 1.9-2.7 mm. Width 1.3-1.9 mm. Maximum thoracic depth 1.0-1.5 mm.

Male

In size and general external appearance similar to *sordidus* but with the following exceptions: Basal two to four, usually three antennal segments red orange, remaining segments black; prothoracic and mesothoracic femora usually brown to black sometimes all red orange or apical parts red orange, remainder of legs red orange; metathoracic leg usually all black, sometimes apical 0.1 of femur and remaining apical segments of leg red orange; pronotum and elytra covered with sparse, intermixed white and brown hairs; without denser patches of hairs on elytron; undersurface with dense white hairs; pattern of vestiture on pygidium similar to *sordidus* but hairs white, apical 0.75 of pygidium with sparse intermixed brown and white hairs; lateral ventral carina of hind femur with shallower emargination than *sordidus* at apex; elytral striae not abbreviated at base; without sinus at base of mucro.

Genitalia.—Figures 56, 58, and 59. Median lobe moderate in length; in ventral view, lateral margins of ventral valve slightly arcuate; ventral valve notched at apex, base nearly as wide as apex of median lobe, slightly arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of large curved massive medial spine with long curved tip and saddle shaped at its attachment to membrane of internal sac; apex of internal sac with many densely placed denticles. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 56).

Female

Similar to male but apical margin of last visible abdominal sternum straight; pygidium covered with sparse intermixed brown and white hairs, two lateral patches of very dense white hairs at base, sometimes very small median patch of white hairs at base.

Host Plants

New Records

Calliandra humilis (Schlecht.) L. Benson: Arizona. Coconino Co.: Base, south slope, Mt. Elden, Flagstaff; 12, 16, 21, 26, 28 September 1972; 2, 12 October 1972 (C. D. Johnson).

Old Records

None.

Distribution

United States: Arizona, New Mexico, and Texas; Mexico: Chihuahua and Durango.

Discussion

(*S. pygidialis* is in the Sordidus species group; see also discussions of *chihuahua, coconino, sordidus,* and *vachelliae.*) *S. pygidialis* and *sordidus* are more similar in their internal and external features than they are to any other species of *Stator. S. pygidialis* may be separated from *sordidus* and other members of the Sordidus group by characters given in the key.

The only host plant known to us for *pygidialis* is the small, low-growing *Calliandra humilis.* Fruits of this plant are rapidly and elastically dehiscent and seeds are scattered near the parent plant. Seeds with bruchid eggs attached to them were collected from the ground beneath plants of this species during September and October 1972 in Flagstaff, Ariz. Most of the eggs hatched but not all the larvae reached maturity. Fifty-three adults were reared from these seeds. Although the fruits of *C. humilis* are dehiscent and seeds normally are ejected from pods, seeds sometimes remain attached to pod valves. We have collected many of these pod valves with seeds but have yet to rear *pygidialis* from them. Because of this and other observations, we can safely assume that *pygidialis* and probably most of the Sordidus group glue their eggs to individual seeds on the ground beneath the host plant.

The specific epithet "*pythonicus*" was applied to this species by Pic (*1913*) because he considered that *Bruchus pygidialis* was a junior homonym. Subsequent authors (Leng, *1920*; Johnson, *1963*) have used *pythonicus* as the name for this species. Bottimer (*1968b*) showed that Pic's use of *pythonicus* was incorrect and that *pygidialis* was the correct name for this species.

Stator sordidus (Horn)

(Figs. 60-63)

Bruchus sordidus Horn, 1873: 319 (peninsula of Lower California); Horn, 1894: 344; Fall, 1901: 29, 160; Schaeffer, 1907: 292, 294, 298; Fall, 1910: 162-166. Type 8193 in Museum of Comparative Zoology, Cambridge, Mass.

B. semicolon Sharp, 1885: 472 (Guatemala, Capetillo); Schaeffer, 1907: 297. NEW SYNONYMY. Type in British Museum (Natural History), London.

B. usticolor Sharp, 1885: 467 (Mexico, Jalapa); Schaeffer, 1907: 294. NEW SYNONYMY. Type in British Museum (Natural History), London.

Mylabris sordidus: Leng, 1920: 305.

Acanthoscelides sordidus: Blackwelder, 1946: 761.

A. semicolon: Blackwelder, 1946: 761.

A. usticolor: Blackwelder, 1946: 761.

Stator sordidus: Johnson, 1963: 863; Johnson, 1968b: 1270; Bottimer, 1968a: 285; Bottimer, 1968b: 1027, 1039; Johnson, 1969: 55; Moldenke, 1971: 108; Bottimer, 1973: 545, 546.

S. semicolon: Bottimer, 1973: 545.
S. usticolor: Bottimer, 1973: 545.

Length (pronotum-elytra) 1.7-3.2 mm. Width 1.2-2.2 mm. Maximum thoracic depth 0.9-1.9 mm.

Male

Integument Color

Head black, without red-orange postocular spot, labrum red orange to brown; basal four or five antennal segments usually red orange, remaining segments usually brown, sometimes all segments red orange; remainder of body black except prothoracic and mesothoracic legs red orange, metathoracic leg red orange except basal 0.2-0.8 of femur black.

Vestiture

Body with white, yellow, brown, reddish-brown, or intermixed recumbent hairs; eye with medial fringe of sparse, white or yellowish hairs; postocular lobe with short, white hairs; postocular patch of dense white to reddish-brown hairs, remainder of head with sparse to moderately dense white to reddish-brown hairs; pronotum and elytra covered with dense, intermixed reddish-brown to brown, and white hairs in no apparent pattern; sometimes pronotum with broad median stripe of more sparsely distributed hairs; sometimes dense patches of white hairs at base of elytron and on interval between striae 6 and 7 about midway between base and apex; usually patch of dense white hairs at apex of prothorax beneath lateral carina; mesothorax and metathorax with dense white hairs becoming very dense on lateral margins, hairs sometimes yellowish; abdomen with dense yellowish or intermixed yellow and white hairs becoming very dense on lateral margins and apices of sterna, hairs sometimes white and uniformly dense; sometimes with dense median patch of hairs at base of first abdominal sternum; pygidium with very dense white to yellowish hairs intermixed with reddish-brown hairs; hairs at base forming more dense band of hairs extending to about 0.33 from base (fig. 60), basal band usually forming median and two lateral, distinct spots; sometimes glabrous areas between apices of spots; legs covered with moderately dense white hairs.

Structure

Head.—Short and broad, densely punctulate; frons usually with median glabrous, finely punctate line extending from frontoclypeal suture to vertex; usually with vague transverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; frons width slightly less than width of eye; ocular sinus 0.66-0.75 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments variable in shape but usually 1 and 3 filiform, 2 and 4 moniliform, 4 shorter than adjacent segments, 5-10 eccentric, 11 subacute apically, 5-11 about as long as broad; antenna usually reaching to slightly beyond humerus.

Prothorax.—Disk campanulate (fig. 60); punctate medially, becoming coarser laterally; lateral carina extending to coxal cavity; short median impressed line on median basal lobe usually obscured by pubescence; prosternum separating coxae for about 0.8 their length.

Mesothorax and *Metathorax.*—Scutellum small, quadrate, with lateral posterior teeth, clothed with very dense recumbent white hairs; elytron about twice as long as broad, dorsal surface flattened between humerus and medial margin; striae deep, coarsely punctate, strial intervals punctulate; striae 3 and 4, and 5 and 6 usually closer to one another at base than to adjacent striae; striae 3 and 4, and 5 and 6 sometimes abbreviated at base; humerus punctulate, almost obscured by pubescence; undersurfaces punctate, becoming more coarse laterally; lateral one-half and about apical one-eighth of hind coxa finely punctate, remaining medial part smooth, without punctations; hind femur constricted basally and apically, expanded medially to slightly more than width of coxa (fig. 62); sometimes with scattered spinules on inner ventral longitudinal carina; femur armed with inner subapical usually acuminate, sometimes blunt spine, about 1.3 times as long as width of tibial base; lateral ventral carina sinuately emarginate apically, with blunt angulation (fig. 62); tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina faint or absent; dorsal surface of tibia unmarked, without dorsal fossa and dorsomesal sulcus; tibial corona with about four spinules, mucro about 0.2 as long as first tarsomere; slight sinus at base of mucro; first tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum slightly flattened medially, about as long as remaining sterna, posterior margin straight; sterna 2-4 unmodified, fifth emarginate; pygidium punctate, convex in lateral view.

Genitalia.—Figures 61 and 63. Median lobe moderate in length; in ventral view, ventral valve convex on lateral margins, evenly rounded at apex, base nearly as wide as apex of median lobe, straight in lateral view, not arcuate; without hinge sclerites; armature of internal sac consisting of large, curved, saddle-shaped medial spine; apex of internal sac with many densely placed denticles and spicules. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 61).

Female

Similar to male but apical margin of last visible abdominal sternum straight; pygidium covered with sparse intermixed reddish-brown and white hairs, two lateral patches of very dense white hairs at base, sometimes very small median patch of white hairs at base; pubescence of pronotum and elytra usually less dense than that of male.

Host Plants

New Records

Acacia wrightii Bentham: Texas. Cameron Co.: Brownsville, March 1921 (J. C. Bridwell).

Old Records

None.

Distribution

United States: Arizona and Texas; Mexico: Baja California, Chiapas, Morelos, Nuevo Leon, Sinaloa, Sonora, Nayarit, Hidalgo, Oaxaca, and Jalisco; El Salvador; Venezuela; and Colombia.

Discussion

(*S. sordidus* is in the Sordidus species group; see also discussions of *chihuahua, coconino, pygidialis,* and *vachelliae.*) *S. sordidus* is one of a group of five very closely related species that have been confused for many years. This confusion has resulted in many misidentifications of specimens of bruchids thought to be *sordidus* and the publication of incorrect information. Johnson (*1963*) and Schaeffer (*1907*) treated two species under the name *sordidus*. Unfortunately Johnson published a figure of male genitalia of a species not conspecific with the type of *sordidus* as being the genitalia of *sordidus*. Bottimer (*1973*) described the new species *vachelliae* and cited Johnson's figure as depicting the genitalia of this new species. Our studies have shown Bottimer to be correct in his interpretation and that the genitalia of *sordidus* are actually most similar in their structure to those of *pygidialis*. Two of these species, *vachelliae* and *pygidialis*, may be separated from *sordidus* by using external characters, whereas *coconino* and *chihuahua* may only be separated by comparing the male genitalia.

Of the five species, only *vachelliae* has hind coxae that are entirely punctate. This character readily separates this species from the other four whose hind coxae are impunctate on the medial one-half. *S. pygidialis* is the only species among the five that has a mostly black integument and an entirely black hind femur. In the other four species at least the apex of this femur is of some lighter hue.

The only consistent differences that we have been able to find between *sordidus, coconino,* and *chihuahua* have been in the male genitalia (figs. 63, 28, and 26). The two most obvious differences between the genitalia of the three species are in the shape of the ventral valve and the structure of the armature of the internal sac.

The ventral valve of *sordidus* is convex on its lateral margins, has a slight concavity at its apex, and is not arcuate in lateral view. The ventral valve of *coconino* is similar to that of *sordidus* but has a broad concavity at its apex and is slightly arcuate in lateral view. The ventral valve of *chihuahua* is slightly concave on its lateral margins, has a truncate apex with a small medial notch, and is arcuate in lateral view. *S. chihuahua* is most easily separated from the other two species because it has two large folds in the internal sac that resemble hinge sclerites, which the others lack.

The most significant differences between the three species are in the structure of the medial spine in the internal sac. *S. sordidus* has a large curved spine with a blunt base, about 0.33 of the spine consisting of a saddle-shaped process; in lateral view with an acuminate spine projecting dorsally from the base of the process about 0.33 from the base of the spine. The spine of *chihuahua* is a simple large spine expanded at its base and curved to a blunt apex. The small spine of *coconino* is expanded at its base and is curved to a blunt apex.

Although *sordidus* is not separable from *coconino* and *chihuahua* externally, its male genitalia are most similar in structure to *pygidialis* and to a less extent to *vachelliae. S. pygidialis* differs from *sordidus* in that the ventral valve of the male genitalia has straight lateral margins and a medial notch at its apex; and it is slightly arcuate in lateral view. The large medial spine of *pygidialis* is different from that of *sordidus* in that a strongly curved *blunt* tooth projects dorsally from the base of the saddle-shaped process 0.33 from the *apex* of the large spine. The large forked medial spine of *vachelliae* is much simpler in its structure. It lacks a dorsal spine, is more flattened, and is slightly curved at its apex.

Characters that link these five species into the Sordidus group are similar external form and color of their vestiture. Of the five in the group, only *vachelliae* has entirely punctate hind coxae. The large medial, forked spine of the internal sac of *vachelliae*, however, is more similar to the medial spines of *sordidus* and *pygidialis* than it is to those of *coconino* and *chihuahua*. We consider *vachelliae*, on the basis of overall characters, to be a fringe member of the Sordidus group, and it may be nearest to an ancestral form from which the other four species evolved.

The only reliable host plant records of any extent are for *pygidialis* and *vachelliae*. These species are known to oviposit only on exposed seeds on the ground, *pygidialis* on the seeds of *Calliandra humilis* after the pods have dehisced and *vachelliae* on the seeds of *Acacia farnesiana* after the indehiscent pods have fallen to the ground and disintegrated or the seeds mechanically separated from the pods by trampling, etc. (Bottimer, *1973*). The only host records for *chihuahua* are of single specimens being reared from exposed seeds in pods of *Mimosa biuncifera* and *Acacia angustissima* still attached to the plant. Many lots of attached pods were collected from both of these species of plants out of which were reared only two specimens of *chihuahua*. This strongly suggests to us that *chihuahua* females probably oviposit normally on seeds after they have fallen to the ground but made two "mistakes" when they oviposited on seeds still attached to the plant. Collecting of seeds after they have fallen to the ground will refute or substantiate this hypothesis. The record of *sordidus* from *Acacia wrightii* must be verified.

We have examined the types of *sordidus*, *semicolon*, and *usticolor*. All three types are identical in their external features, and genitalia of the male type of *usticolor* have the same structure as the genitalia of the type of *sordidus*. Because the type of *semicolon* is a female, male genitalic structures could not be compared. The type of *semicolon* was collected in Guatemala and because the only similar specimens we have seen that far south have been *sordidus*, we believe that the names *semicolon* and *sordidus* also refer to the same species. For these reasons we have synonymized both *semicolon* and *usticolor* with their senior synonym *sordidus*.

Stator subaeneus (Schaeffer)

(Figs. 64-68)

Bruchus subaeneus Schaeffer, 1907: 298 (Texas, (Brownsville?)); Fall, 1910: 164, 166. Type 65933 in U.S. National Museum of Natural History, Washington, D.C.

Mylabris subaeneus: Leng, 1920: 305.

Stator subaeneus: Johnson, 1963: 865; Janzen, 1967: 351, 363; Johnson, 1968b: 1271; Bottimer, 1968b: 1027, 1039; Janzen, 1969: 11; Kingsolver, 1972b: 224; Bottimer, 1973: 549.

Length (pronotum-elytra) 2.4-2.8 mm. Width 1.8-2.0 mm. Maximum thoracic depth 1.4-1.6 mm.

Male

In size and general external appearance similar to *bottimeri* but with the following exceptions:

Integument Color

Head, body, hind tibia, and tarsus black; prothoracic and mesothoracic legs and antenna red orange; hind femur black.

Vestiture

Anterolateral white spots of pygidium set in diffuse, lunate band of golden setae.

Structure

Profile of body in dorsal aspect is distinctly angulate at juncture of pronotum and elytral humerus.

Head.—Frons with median glabrous carina extending from frontoclypeal suture to vertex; width of eye about equal to width of frons; eye flattened, nearly contiguous with lateral margin of head; ocular sinus about 0.5 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antenna reaching to or slightly beyond humerus.

Prothorax.—Figure 64. Lateral prothoracic carina extending to coxal cavity; prosternum separating procoxae for about 0.8 their length.

Mesothorax and ***Metathorax.***—Scutellum with lateral posterior teeth; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae 3 and 4, and 5 and 6 sometimes abbreviated at base; hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 66); sometimes with spinules on inner ventral longitudinal carina;

femur armed with inner subapical, usually acuminate, sometimes blunt spine about as long as width of tibial base; lateral ventral carina of metafemur strongly emarginate subapically; hind tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina absent; dorsal surface of tibia somewhat roughened, with deep, well-defined fossa beginning about one-sixth from tibial apex, fossa about one-fifth length of tibia, fossa usually filled with fine setae; dorsal tibial carina and sulcus absent; tibial corona with about four spinules, mucro one-fifth to one-fourth as long as first tarsomere; slight sinus at base of mucro; first tarsomere with ventral and mesal glabrous longitudinal carinae, lateral carina sometimes faint.

Abdomen.—Last abdominal sternum emarginate.

Genitalia.—Figures 65, 67, and 68. Median lobe moderate in length; in ventral view, ventral valve narrow, convex on lateral margins, base about 0.5 as broad as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of basal cluster of large, thornlike spines and apical cluster of larger, flattened spines, apex of sac lined with many fine denticles. Lateral lobes expanded apically, cleft to about 0.8 their length (fig. 65).

Female

Similar to male but basal spots of pygidium more pronounced than in male; last visible abdominal sternum as long as or longer than preceding sternum, gently rounded at apex, not emarginate.

Host Plants

New Records

Acacia cornigera (L.) Willd.: Cotaxtla Exp. Sta., Cotaxtla, Veracruz, Mexico, 7 August 1962 (D. H. Janzen).

Old Records

Acacia cornigera: Janzen, 1967: 351.
A. farnesiana (L.) Willd.: Bottimer, 1973: 549.

Distribution

United States: Texas; Mexico: Tamaulipas, San Luis Potosi, Puebla, Veracruz, Yucatan, and Chiapas.

Discussion

(*S. subaeneus* is in the Subaeneus species group; see also discussions of *bottimeri* and *mexicanus*.) We regard *subaeneus* to be a member of a group of closely related species that includes *subaeneus* and three species that were recently described, *bottimeri, mexicanus*, and the West Indian *S. chalcodermus* Kingsolver (not treated here). These species are grouped together based on similar vestiture, external structure, male genitalia, host plant preferences, and behavior.

The vestiture of *S. subaeneus* is similar to that of the other three species in that it has an all black hind femur as do *mexicanus* and *chalcodermus*, whereas the femur of *bottimeri* is entirely red, and it has a lateral ventral carina on the metafemur, which is strongly emarginate subapically like that of *mexicanus*, but which is merely sinuate in *bottimeri* and *chalcodermus*. The character that best and most easily separates *subaeneus* from the other three species is that its eye is flattened and nearly contiguous with the lateral margin of the head and the posterior margin is expanded and merges with the lateral margin of the vertex, whereas in the other species the posterior margin of the eye protrudes laterally and is well separated from the vertex.

S. mexicanus has an entirely black metafemur contrasted to *bottimeri*, which has an entirely red metafemur. The lateral ventral carina of the metafemur of *mexicanus* is strongly emarginate subapically, whereas in the other two species the carina is merely sinuate.

The external features of *bottimeri* and *chalcodermus* resemble each other very closely, but the antennae and metafemora of *bottimeri* are entirely red, whereas the metafemur of *chalcodermus* is entirely black and the antenna has some darker coloration than red.

The male genitalia are similar in general structure in all four species (i.e., many spines in the internal sac, narrow ventral valve) but are distinctly different in each species. The ventral valve of *mexicanus* is truncate at its apex, whereas in the other three species it is more or less lancet shaped. The greatest differences, however, are in the number and location of the spines in the internal sac. The spines of *chalcodermus* are most distinct (Kingsolver, *1972b*), with 10-12 flat, falcate, rather slender spines grouped in a circle near the middle of the internal sac. The spines of *subaeneus* (figs. 67 and 68) consist of a basal cluster of large spines and an apical cluster of larger spines. The spines of both *mexicanus* (figs. 45 and 46) and *bottimeri* are linearly arranged in elongate clusters, but the spines of *bottimeri* are larger and fewer than those of *mexicanus*.

Because *mexicanus*, *bottimeri*, and *subaeneus* have been reported to breed in seeds of *Acacia* species, *chalcodermus* probably has similar habits. Breeding in acacia seeds links these species together. Except for *limbatus* and *pruininus*, many of the species treated here are rare in collections. We suspect that the primary reason for this is that many species of *Stator* breed in seeds after they have fallen to the ground. This habit was reported by Bottimer (*1973*) for *subaeneus*, *mexicanus*, and *vachelliae* and is reported for *pygidialis* in this bulletin. Further investigations will probably confirm that *chalcodermus* has similar behavior.

Both *subaeneus* and *mexicanus* have been reared from seed pods collected from *Acacia cornigera* prior to falling to the ground. Oviposition on seeds while they are still on the plant is probably less common than breeding in seeds on the ground.

S. mexicanus and *subaeneus* are sympatric in much of their range in Mexico. Apparently *bottimeri* and *chalcodermus* are both allopatric from all the other species in this group, although their ranges may be found to overlap in the West Indies.

Stator trisignatus (Sharp), new combination

(Figs. 69-72)

Bruchus trisignatus Sharp, 1885: 469 (Panama, Bugaba). Type in British Museum (Natural History), London.
Acanthoscelides trisignatus: Blackwelder, 1946: 761.

Length (pronotum-elytra) 2.4-2.8 mm. Width 2.0-2.2 mm. Maximum thoracic depth 1.5-1.6 mm.

Male

Similar to *aegrotus* with the following exceptions:

Integument Color

Body black except labium, basal four to five antennal segments, prothoracic legs, usually with apices, sometimes with all of mesofemur, mesotibia, and mesotarsus red orange; elytron black with large red basal and apical spots, encompassing almost all elytron (fig. 69); spots sometimes confluent medially.

Vestiture

Base of pygidium with three larger patches of white hairs, one medial and two lateral (fig. 69).

Structure

Width of eye slightly wider to almost twice width of frons; antennae sometimes reaching almost to humerus; disk of prothorax campanulate (fig. 69); hind femur armed with inner subapical, usually acuminate, sometimes blunt spine about as long as width of tibial base; lateral ventral carina sinuately emarginate apically, with blunt angulation (fig. 71); tibia not as robust; fossa on dorsal surface of tibia sometimes one-half as long as tibia, fossa sometimes without setae; mucro one-sixth to one-fifth as long as first tarsomere; first sternum of abdomen 1.0-1.5 times as long as remaining sterna.

Genitalia.—Figures 70 and 72. Median lobe moderate in length; in ventral view, ventral valve convex on lateral margins, apex acute, base almost as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of two short chains of spinules at base, one large forked spine with broadly rounded apex, and many densely placed denticles lining internal sac, denticles forming elongate chains at apex. Lateral lobes expanded apically, cleft to about 0.66 their length (fig. 70).

Female

Similar to male but apical margin of last visible abdominal sternum straight.

Host Plants

No host records are known for *trisignatus*. Bottimer reared this species at Barro Colorado Island, Panama, in March and April 1964, but the host apparently was never identified.

Distribution

Panama and Colombia.

Discussion

(*S. trisignatus* is in the Aegrotus species group; see also discussions of *aegrotus*, *monachus*, *pruininus*, and *vittatithorax*.) *S. trisignatus* superficially resembles *vittatithorax* and *limbatus* because all three species have red vittae on the elytra. They are easily separated, however, because *trisignatus* has dense white patches at the base of the pygidium and a blunt angulation apically on the lateral ventral carina of the metafemur, both of which the other two species lack. Characters given in the key separate *trisignatus* from other species in the Aegrotus group.

The external features as well as the male genitalia link *trisignatus* closely with *monachus* and *aegrotus* to form the nucleus of the Aegrotus group. *S. trisignatus* lacks the denticulate sclerite near the apex of the internal sac found in *monachus* and *aegrotus*, but it has a large medial spine common to all three species. It is most similar to the South American species *S. maculatopygus* (Pic) in many of its features.

The armature of the internal sac of *trisignatus* is variable, but the large, forked, medial spine with a gently rounded apex (fig. 72) is a consistent feature of this species. The spine is similar to that of *maculatopygus*, but *trisignatus* has a broader spine.

The limited distribution of *trisignatus* to Panama and Colombia suggests a specialization to the seeds of its yet unknown host.

Stator vachelliae Bottimer

(Figs. 73-76)

Stator vachelliae Bottimer, 1973: 546 (Brownsville, Tex.). Type in Canadian National Collections, Ottawa.

Length (pronotum-elytra) 2.0-2.8 mm. Width 1.4-1.9 mm. Maximum thoracic depth 1.0-1.6 mm.

Male

Integument Color

Body black except four basal antennal segments, prothoracic and mesothoracic legs, and apical 0.2 of metathoracic legs red orange.

Vestiture

Pubescence of head ash colored, fine, elongate, coarser and denser on base of clypeus; pubescence of pronotum moderately fine, unevenly distributed, of varying shades of yellow with slight tinge of brown mixed with ash-colored hairs, the latter concentrated in incomplete median line and faintly so in indefinite areas at sides; elytra with pubescence similar to that of pronotum but more uniform except for feeble grouping of paler pubescence on intervals 2 and 4; occasionally pubescence of pronotum and elytra short and fine, not concealing surface sculpture; pubescence of pygidium white but with tinge of yellow with slight brownish tinge, coarser and longer than on elytra, rather sparse except at base where it is slightly coarser and condensed into ill-defined but separated areas; subtriangular spot at each side and smaller triangular median spot; pubescence beneath white, varied; pubescence of abdomen ashy, very fine, and moderately dense except for perceptibly coarser, longer setae along basal margin of sternite 1, and for dense concentrations at sides of sternites, these areas decreasing apically.

Structure

Head.—Moderately short and broad; labrum essentially impunctate, apex of clypeus densely micropunctate, basal 0.66 coarsely and densely punctate; frons with small, elongate, smooth area, surface otherwise densely and closely punctate with punctures, many coalescing, arranged in rows circling in oval pattern around glabrous area of frons, narrow, shining interspaces forming nearly complete parallel lines; with vague tranverse sulcus between upper limits of eyes; posterior margin of eye protruding laterally, well separated from vertex; width of eye slightly wider than width of frons; ocular sinus about 0.66 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments 1-4 slender, 5 abruptly larger, more or less quadrate, 6-10 transverse, outer segments two times width of 2, 11 about 0.33 longer than 10 and about 0.8 times as wide; antenna reaching to humerus or slightly beyond.

Prothorax.—Disk campanulate (fig. 73); punctations dense and distinct with some coalescing, varying in size and shape, larger ones mostly oval or elongate; interspaces forming nearly complete network of fine, smooth, shining lines, which tend to run longitudinally; lateral prothoracic carina extending to coxal cavity; short median impressed line on median basal lobe; prosternum separating procoxae for about 0.8 their length.

Mesothorax* and *Metathorax.—Scutellum slightly transverse, with lateral posterior teeth, densely covered with ashy pubescence; elytron about two times longer than broad, shallowly convex between humerus and medial margin; striae fine, punctures larger than width of striae, distinct, separated by at least their diameters, becoming smaller apically; intervals flat, densely and finely punctate, punctures tending to coalesce into shallow irregular furrows and lines across interval, sculpture near base much coarser; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; striae 3 and 5, and 5 and 6 sometimes abbreviated at base; metasternum densely punctate, with conspicuous large punctures laterally; undersurfaces of abdomen with segments 1-4 finely, densely, and shallowly punctate, 5 with larger, deeper and more crowded punctures, with some coalescing laterally; entire face of hind coxa punctate; hind femur constricted basally and apically, expanded medially to slightly less than width of coxa (fig. 75); sometimes with scattered spinules on inner ventral longitudinal carina; blunt spine on inner surface near apex slightly longer than width of tibial base; lateral ventral carina sinuately emarginate apically, with blunt angulation (fig. 75); hind tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina absent; dorsal surface of hind tibia unmarked, without dorsal fossa, dorsal carina and dorsomesal sulcus; tibial corona with about four spinules, mucro about 0.2 as long as first tarsomere; without sinus at base of mucro; first hind tarsomere with ventral, lateral, and mesal glabrous longitudinal carinae.

Abdomen.—First sternum unmodified, slightly more than 0.5 longer than 2-5 combined, 5 emarginate, 0.4 length of 4; pygidium punctate, convex in lateral view.

Genitalia.—Figures 74 and 76. Median lobe moderate in length; in ventral view, ventral valve strongly concave on lateral margins, nipple at apex slightly convex, base nearly as broad as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of large cluster of densely placed denticles at base, large forked medial spine similar in shape to that of *sordidus* and *pygidialis* but flatter and slightly curved at apex; many lines of fine denticles lining walls of apex. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 74).

Female

Similar to male but head with pubescence much finer and sparser; mentum mostly red orange rather than brown; antenna with segment 5 red orange in part, outer joints comparatively narrow but still slightly wider than long, not serrate; pubescence of prothorax much shorter and finer, not concealing surface sculpture; pubescence of elytra predominantly yellow tinged with brown but with some ashy coloration, extremely fine, short, moderately dense; very evenly distributed so as to form no patterns, surface usually appearing glabrous; occasionally pubescence of prothorax and elytra dense, concealing surface sculpture; pubescence of pygidium mainly ashy, very fine, not concealing surface sculpture, noticeably longer and coarser on apical area and at base between very dense triangular spot at each side and smaller similar spot at middle; abdominal segment 5 about 0.5 longer than 4, very broadly and evenly rounded at apex; rufous color of hind femur involves slightly more of apex than in male.

Host Plants

Acacia farnesiana (L.) Willd.: Bottimer, 1973: 547.

Distribution

United States: Texas; Mexico: Sonora, Sinaloa, Durango, Nuevo Leon, Aguascalientes, Nayarit, Jalisco, Guanajuato, Queretaro, Puebla, Veracruz, Guerrero, Oaxaca, Tabasco, Chiapas, Morelos, Baja California, and Coahuila; El Salvador; Nicaragua; and Venezuela.

Discussion

(*S. vachelliae* is in the Sordidus species group; see also discussions of *chihuahua, coconino, pygidialis,* and *sordidus.*) *S. vachelliae* is easily separated from the other four members of the Sordidus group by its entirely punctate hind coxae. In its other external structures it most closely resembles *sordidus.*

As pointed out by Bottimer (*1973*), this species oviposits on seeds after they have fallen to the ground. Its widespread distribution is no doubt due to its preference for the seeds of the widely distributed *Acacia farnesiana.*

As noted by Bottimer (*1973*) and elsewhere here, this species was confused with *sordidus* by Johnson (*1963*), who presented figures of the male genitalia of *vachelliae* as those of *sordidus.*

S. vachelliae has been recorded as the prey of a robber fly, *Efferia argyrosoma* (Hine), by F. Lavigne (in litt.).

Stator vittatithorax (Pic), new combination

(Figs. 77-81)

Bruchus vittatithorax Pic, 1930: 13; Zacher, 1952: 463, 471. Lectotype ♂ and paralectotype ♂ and ♀ here designated "Bresil, Bondar, in *Acacia* sp." Types in Museum National d'Histoire Naturelle, Paris.

Length (pronotum-elytra) 1.8-2.8 mm. Width 1.3-2.2 mm. Maximum thoracic depth 0.9-1.7 mm.

Male

Similar to *aegrotus* with the following exceptions:

Integument Color

Body black except labium, basal four to five or all antennal segments, prothoracic legs, usually apices but sometimes all of mesofemur, mesotibia, and mesotarsus red orange; elytron usually black with large red basal and apical spots (fig. 78) or spots confluent (fig. 77), red usually encompassing most of elytron; elytron varying from all black to all red, if elytron mostly black with small red spot then spot basal, near humerus; often basal spot large and apical spot small; occasionally lateral margins of pronotum with large red patches.

Vestiture

Base of pygidium without small dense white patches of hairs at base, pygidium with uniform sparse white hairs.

Structure

Eye usually slightly wider than width of frons, sometimes almost two times as wide as width of frons; antenna reaching almost to humerus; disk of prothorax campanulate (fig. 77); striae 5 and 6, and sometimes 3 and 4 abbreviated at base; hind femur armed with inner subapical, usually acuminate spine about as long as width of tibial base; lateral ventral carina sinuately emarginate apically, usually with blunt angulation (fig. 81); dorsal fossa of hind tibia 0.33-0.5 length of hind tibia; mucro one-sixth to one-seventh as long as first tarsomere, slight sinus at base of mucro; first sternum of abdomen 1.0-1.5 times as long as remaining sterna.

Genitalia.—Figures 79 and 80. Median lobe moderate in length; in ventral view, ventral valve convex on lateral margins, apex subacute, base almost as wide as apex of median lobe, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of large curved medial spine with a blunt base, about 0.4 of spine forked, in lateral view small curved tooth projecting dorsally from base of fork; many densely placed denticles lining internal sac, denticles forming elongate chains in apical 0.66 of sac; large triangular, denticulate sclerite at apex of sac. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 79).

Female

Similar to male but apical margin of last visible abdominal sternum straight.

Host Plants

New Records

Acacia retusa (Jacq.) R. A. Howard: Costa Rica. Along river inland from El Naranjo, Santa Rosa, 9 March 1972, 20 XXXII (Janzen); Taboga Hillside below cattle pens, 26 February 1972, XXXVIII (R. Carroll); hog pasture, La Pacifica, 2 March 1972, 20 XXXXVIII (Janzen); Puntarenas: 23 mi NW Esparta, #581, 11 March 1971 (D. H. Janzen).

A. riparia H. B. K. vel sp. aff.: Mexico. Colima: 13 mi W Manzanillo, 8 March 1973, #418-73 (C. D. Johnson).

Leucaena sp.: Mexico. Intercepted 13 March 1969, Washington, D.C.

Piptadenia flava (Spreng.) Benth.: Mexico. Colima: ca. 1100′, 7 mi S Colima, 7 March 1973, #380-73 (C. D. Johnson).

Old Records

None.

Distribution

Mexico: Colima and Oaxaca; Guatemala; Costa Rica; Colombia; Venezuela; and Brazil.

Discussion

(*S. vittatithorax* is in the Aegrotus species group; see also discussions of *aegrotus, monachus, pruininus,* and *trisignatus.*) *S. vittatithorax* is a species with well-defined limits. Characters for separating it from the other members of the Aegrotus group are given in the key. *S. vittatithorax* is similar to *trisignatus* and *maculatopygus* (Pic) in having red vittae on the elytra of most specimens. It differs from these and *aegrotus* by lacking three dense white hair patches at the base of the pygidium as do *pruininus* and *monachus.*

Based on general external characters, *vittatithorax* closely resembles other members of its group, but the large medial spine in the internal sac is very different from that of other members of the group. The spine is very similar to that of *pygidialis* (fig. 58), and therefore we believe that the genitalia of *vittatithorax* provide an evolutionary link between the Aegrotus and Sordidus groups.

The many host plants of *vittatithorax* probably account for its wide distribution from Colima to Brazil and its variation in color and size.

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APPENDIX

TABLE 1.—*Stator species and their host plants*

Stator *spp.*	*Host plants*
(1) *aegrotus* (Sharp), new combination	Unknown
(2) *beali* Johnson	*Pithecellobium flexicaule*
(3) *bottimeri* Kingsolver	*Acacia farnesiana*
	A. pinetorum
(4) *championi* (Sharp)	*Bixa orellana*
(5) *chihuahua*, new species	*Acacia angustissima*
	Mimosa biuncifera
(6) *coconino*, new species	Unknown
(7) *dissimilis*, new species	Unknown
(8) *generalis*, new species	*Enterolobium cyclocarpum*
(9) *limbatus* (Horn)	*Acacia acatlensis*
	A. angustissima
	A. baileyana
	A. berlandieri
	A. confusa
	A. coulteri
	A. near *coulteri*
	A. cultriformis
	A. near *glomerosa*
	A. greggii
	A. koa
	A. melanoxylon
	A. millefolia
	A. occidentalis
	A. retinodes
	A. retusa
	A. roemeriana
	A. tenuifolia
	A. willardiana
	A. wrightii
	Albizia chinensis
	A. lebbek
	Calliandra sp.
	Cercidium floridum

TABLE 1.—*Stator species and their host plants*—Con.

Stator *spp.*	*Host Plants*
	C. microphyllum
	C. praecox
	C. torreyanum
	Leucaena pulverulenta
	Lysiloma divaricata
	L. thornberi
	Parkinsonia aculeata
	Pithecellobium dulce
	P. pallens
	P. sonorae
	Samanea saman
(10) *mexicanus* Bottimer	*Acacia cornigera*
(11) *monachus* (Sharp), new combination	*Acacia* near *glomerosa*
	A. riparia
	Eugenia (?) sp. (Myrtaceae)
	Piscidia piscipula
(12) *pruininus* (Horn)	*Acacia berlandieri*
	A. californica
	A. confusa
	A. constricta
	A. dealbata
	A. decurrens
	A. greggii
	A. koa
	A. melanoxylon
	A. rigidula
	A. roemeriana
	A. schottii
	A. vernicosa
	A. wrightii
	Calliandra eriophylla
	Calliandra sp.
	C. tapirorum
	Chamaechrista (?)
	Coursetia glandulosa
	Desmanthus covillei
	D. leptolobus
	Desmanthus spp.

	D. virgatus
	Glycine max
	Indigofera anil
	Leucaena leucocephala
	Mimosa biuncifera
	M. dysocarpa
	M. nr. *dysocarpa*
	M. grahami
	M. invisa
	M. laxiflora
	M. monancistra
	M. palmeri
	M. setigera
	M. somnians
	Neptunia plena
	Olneya tesota
	Pithecellobium pallens
	Robinia pseudo-acacia
	Sesbania emerus
	S. macrocarpa
	S. sesban
	Sesbania sp.
(13) *pygidialis* (Schaeffer)	*Calliandra humilis*
(14) *sordidus* (Horn)	*Acacia wrightii*
(15) *subaeneus* (Schaeffer)	*Acacia cornigera*
	A. farnesiana
(16) *trisignatus* (Sharp), new combination	Unknown
(17) *vachelliae* Bottimer	*Acacia farnesiana*
(18) *vittatithorax* (Pic), new combination	*Acacia retusa*
	A. riparia
	Leucaena sp.
	Mimosa (?)
	Piptadenia flava

TABLE 2.—*Plants attacked by* Stator *species*

Host plants	Stator *spp.*
Nonlegumes:	
Bixa orellana (Bixaceae)	*championi*
Eugenia sp. (Myrtaceae)	*monachus*
Caesalpinioideae:	
Cercidium floridum	*limbatus*

TABLE 2.—*Plants attacked by* Stator *species*—Con.

Host plants	Stator *spp.*
C. microphyllum	*limbatus*
C. praecox	*limbatus*
C. torreyanum	*limbatus*
Chamaechrista (?)	*pruininus*
Parkinsonia aculeata	*limbatus*
Mimosoideae:	
Acacia acatlensis	*limbatus*
A. angustissima	*chihuahua*
	limbatus
A. baileyana	*limbatus*
A. berlandieri	*limbatus*
	pruininus
A. californica	*pruininus*
A. confusa	*limbatus*
	pruininus
A. constricta	*pruininus*
A. cornigera	*mexicanus*
	subaeneus
A. coulteri	*limbatus*
A. cultriformis	*limbatus*
A. dealbata	*pruininus*
A. decurrens	*pruininus*
A. farnesiana	*bottimeri*
	subaeneus
	vachelliae
A. near *glomerosa*	*limbatus*
	monachus
A. greggii	*limbatus*
	pruininus
A. koa	*limbatus*
	pruininus
A. melanoxylon	*limbatus*
	pruininus
A. millefolia	*limbatus*
A. occidentalis	*limbatus*
A. pinetorum	*bottimeri*
A. retinodes	*limbatus*
A. retusa	*limbatus*
	vittatithorax

A. rigidula	*pruininus*
A. riparia	*monachus*
	vittatithorax
A. roemeriana	*limbatus*
	pruininus
A. schottii	*pruininus*
A. tenuifolia	*limbatus*
A. vernicosa	*pruininus*
A. willardiana	*limbatus*
A. wrightii	*limbatus*
	pruininus
	sordidus
Albizia chinensis	*limbatus*
A. lebbek	*limbatus*
Calliandra eriophylla	*pruininus*
C. humilis	*pygidialis*
Calliandra spp.	*limbatus*
	pruininus
C. tapirorum	*pruininus*
Desmanthus covillei	*pruininus*
D. leptolobus	*pruininus*
Desmanthus spp.	*pruininus*
D. virgatus	*pruininus*
Enterolobium cyclocarpum	*generalis*
Leucaena leucocephala	*pruininus*
L. pulverulenta	*limbatus*
Leucaena sp.	*vittatithorax*
Lysiloma (?)	*limbatus*
Lysiloma divaricata	*limbatus*
L. thornberi	*limbatus*
Mimosa (?)	*vittatithorax*
Mimosa biuncifera	*chihuahua*
	pruininus
M. dysocarpa	*pruininus*
M. nr. *dysocarpa*	*pruininus*
M. grahami	*pruininus*
M. invisa	*pruininus*
M. laxiflora	*pruininus*
M. monancistra	*pruininus*
M. palmeri	*pruininus*
M. setigera	*pruininus*
M. somnians	*pruininus*
Neptunia plena	*pruininus*
Piptadenia flava	*vittatithorax*

TABLE 2.—*Plants attacked by* Stator *species*—Con.

Host Plants	Stator *spp.*
Pithecellobium dulce	*limbatus*
P. flexicaule (= *S. flexicaulis*)	*beali*
P. pallens	*limbatus*
	pruininus
P. sonorae	*limbatus*
Samanea saman	*limbatus*
Papilionoideae:	
Coursetia glandulosa	*pruininus*
Indigofera anil	*pruininus*
Olneya tesota	*pruininus*
Piscidia piscipula	*monachus*
Robinia pseudo-acacia	*pruininus*
Sesbania emerus	*pruininus*
S. macrocarpa	*pruininus*
S. sesban	*pruininus*

TABLE 3.—*Synonymical list of* Stator *species of North and Central America*

(1) *Stator aegrotus* (Sharp), new combination, 1885: 472 (*Bruchus*)
(2) *Stator beali* Johnson, 1963: 861
(3) *Stator bottimeri* Kingsolver, 1972b: 225
(4) *Stator championi* (Sharp), 1885: 477 (*Bruchus*)
(5) *Stator chihuahua* Johnson and Kingsolver, new species
(6) *Stator coconino* Johnson and Kingsolver, new species
(7) *Stator dissimilis* Johnson and Kingsolver, new species
(8) *Stator generalis* Johnson and Kingsolver, new species
(9) *Stator limbatus* (Horn), 1873: 326 (*Bruchus*)
Bruchus interruptus Sharp, 1885: 470. NEW SYNONYMY
(10) *Stator mexicanus* Bottimer, 1973: 549
(11) *Stator monachus* (Sharp), new combination, 1885: 471 (*Bruchus*)
Bruchus seclusus Sharp, 1885: 471. NEW SYNONYMY
Bruchus dufaui Pic, 1927: 11. NEW SYNONYMY

(12) *Stator pruininus* (Horn), 1873: 327 (*Bruchus*)
Bruchus cognatus Sharp, 1885: 472. NEW SYNONYMY
Bruchus piger Sharp, 1885: 473. NEW SYNONYMY
(13) *Stator pygidialis* (Schaeffer), 1907: 297 (*Bruchus*)
Bruchus pythonicus Pic, 1913: 43
(14) *Stator sordidus* (Horn), 1873: 319 (*Bruchus*)
Bruchus semicolon Sharp, 1885: 472. NEW SYNONYMY
Bruchus usticolor Sharp, 1885: 467. NEW SYNONYMY
(15) *Stator subaeneus* (Schaeffer), 1907: 298 (*Bruchus*)
(16) *Stator trisignatus* (Sharp), new combination, 1885: 469 (*Bruchus*)
(17) *Stator vachelliae* Bottimer, 1973: 546
(18) *Stator vittatithorax* (Pic), new combination, 1930: 13 (*Bruchus*)

TABLE 4.—*Phylogenetic groups of* Stator *species of the New World*

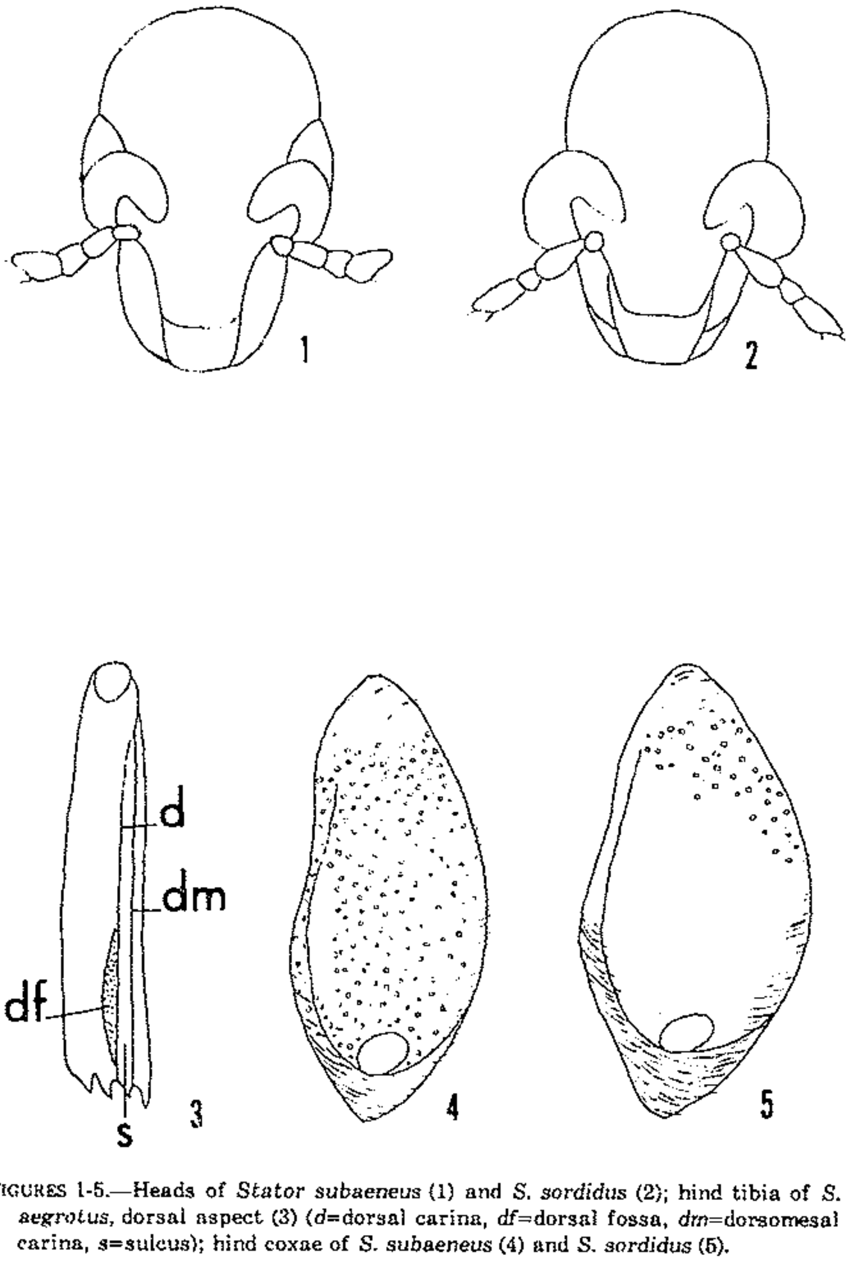
	Group characters
(1) Subaeneus group: *bottimeri* Kingsolver *chalcodermus* Kingsolver[1] *mexicanus* Bottimer *subaeneus* (Schaeffer)	(1) Golden or bronzy vestiture on dorsal surfaces. (2) Many large spines in internal sac of male genitalia. (3) Dorsal fossa on hind tibia. (4) Entire face of hind coxa punctate. (5) Complete lateral carina on prothorax.
(2) Aegrotus group: *aegrotus* (Sharp) *maculatopygus* (Pic)[1] *monachus* (Sharp) *pruininus* (Horn) *trisignatus* (Sharp) *vittatithorax* (Pic)	(1) Uniform white pubescence on dorsal surfaces. (2) Usually one or two large spines in internal sac of male genitalia. (3) Dorsal fossa on hind tibia. (4) Entire face of hind coxa punctate. (5) Complete lateral carina on prothorax.

TABLE 4.—*Phylogenetic groups of* Stator *species of the New World*—Con.

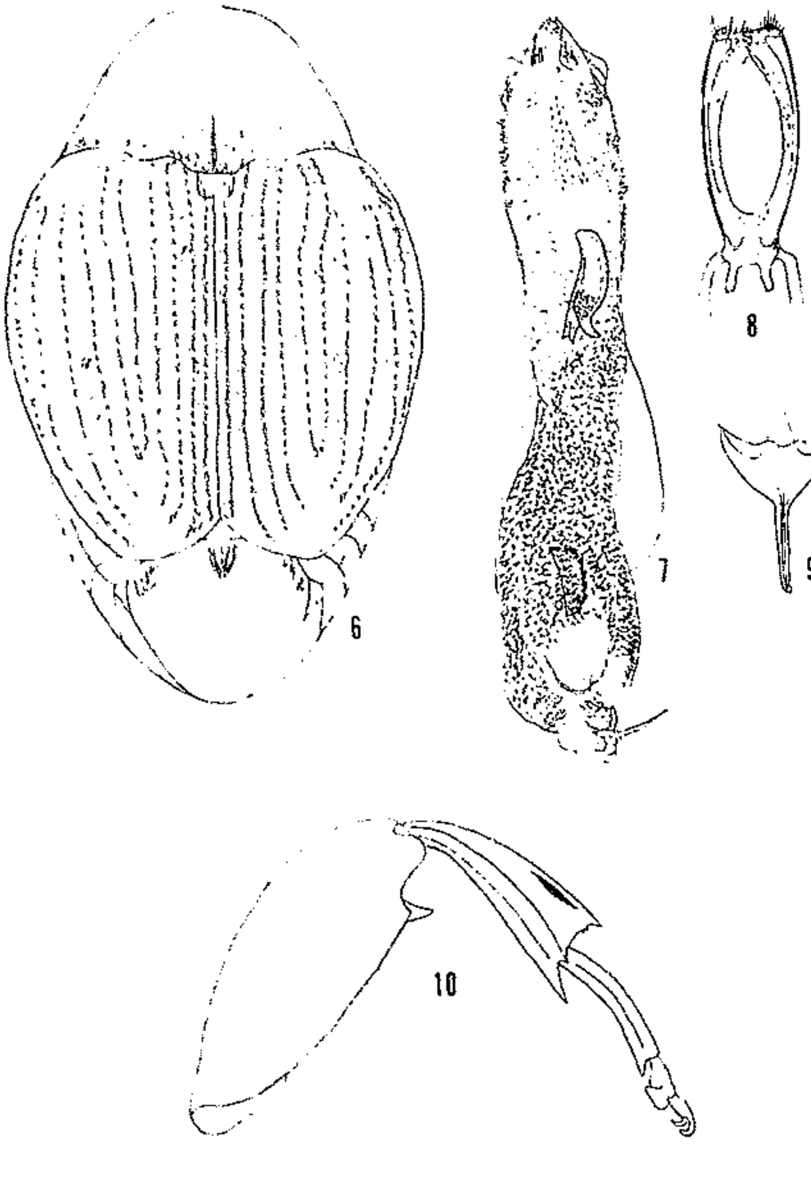
	Group Characters
(3) Limbatus group: *beali* Johnson *bisbimaculatus* (Pic)[1] *cearanus* (Pic)[1] *generalis* Johnson and Kingsolver *limbatus* (Horn) *rugulosus* Kingsolver[1] *testudinarius* (Erichson)[1]	(1) Usually uniform white or yellow vestiture on dorsal surfaces. (2) Similar pattern of armature in internal sac of male genitalia. (3) Dorsal fossa on hind tibia. (4) Entire face of hind coxa punctate. (5) Complete lateral carina on prothorax.
(4) Sordidus group: *chihuahua* Johnson and Kingsolver *coconino* Johnson and Kingsolver *pygidialis* (Schaeffer) *sordidus* (Horn) *vachelliae* Bottimer	(1) With intermixed white, yellow, brown, or reddish-brown vestiture on dorsal surfaces. (2) Usually one large spine in internal sac of male genitalia. (3) Without dorsal fossa on hind tibia. (4) Usually face of hind coxa only partially punctate. (5) Complete lateral carina on prothorax.
(5) Dissimilis group: *dissimilis* Johnson and Kingsolver	(1) Uniform white vestiture on dorsal surfaces. (2) One large spine in internal sac of male genitalia. (3) Without dorsal fossa on hind tibia. (4) Hind coxa punctulate. (5) Incomplete lateral carina on prothorax.
(6) Championi group: *bixae* (Drapiez)[1] *championi* (Sharp)	(1) Variegated white vestiture on dorsal surfaces forming distinct patterns.

(2) Elongate mass of denticles and a forked spine in internal sac of male genitalia.
(3) Without dorsal fossa on hind tibia.
(4) Hind coxa punctulate.
(5) Incomplete lateral carina on prothorax.

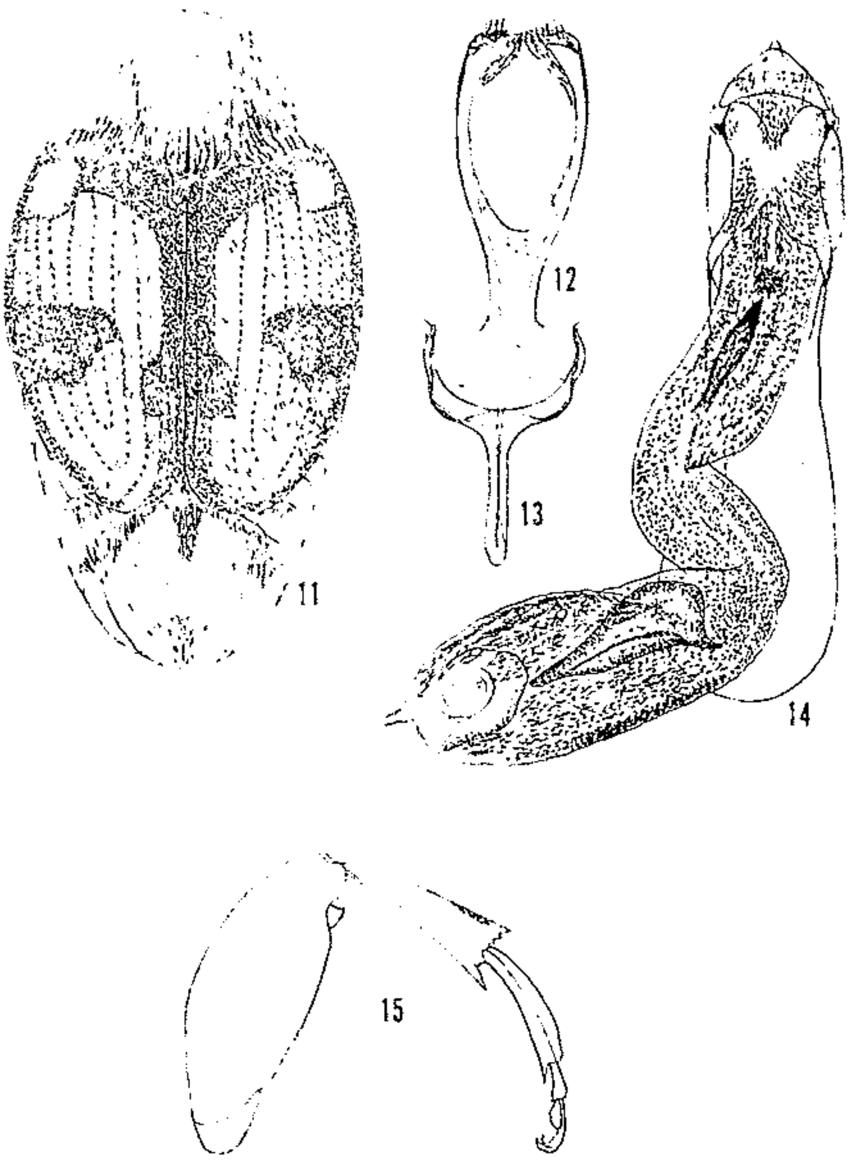
[1]Not treated here.



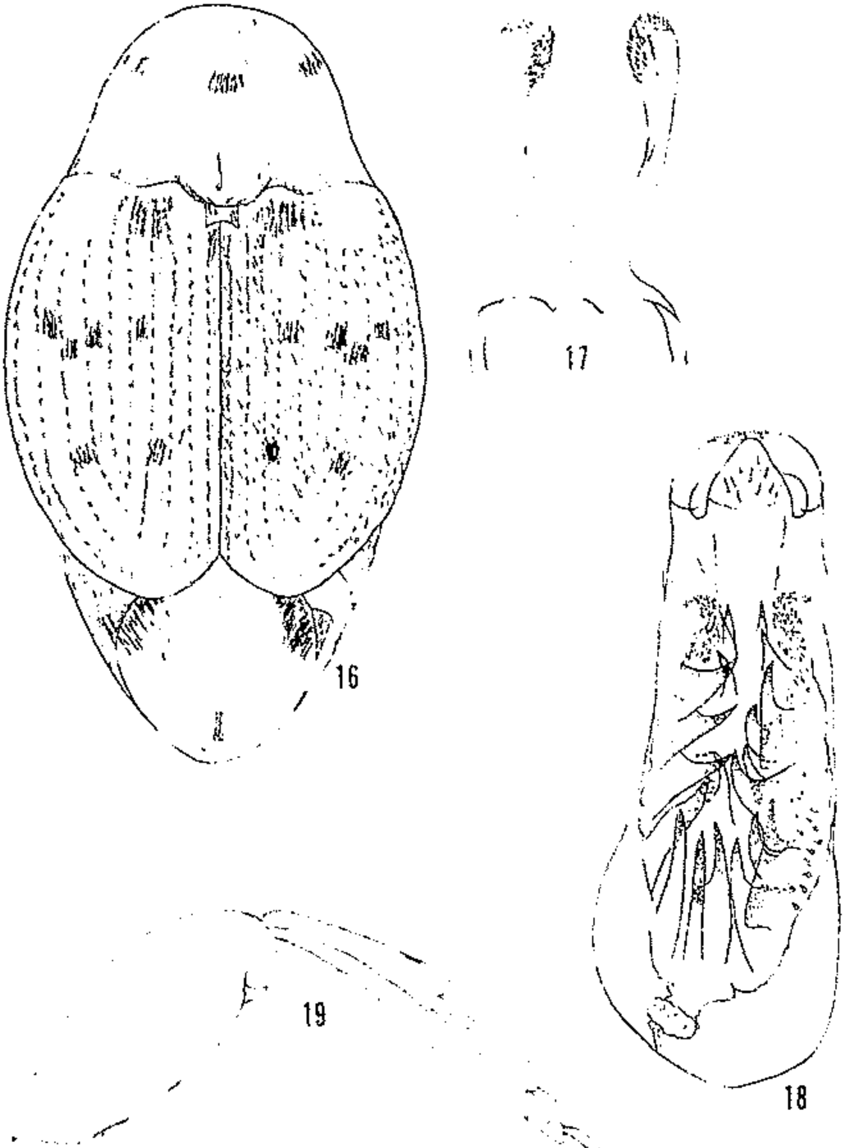
FIGURES 1-5.—Heads of *Stator subaeneus* (1) and *S. sordidus* (2); hind tibia of *S. aegrotus*, dorsal aspect (3) (*d*=dorsal carina, *df*=dorsal fossa, *dm*=dorsomesal carina, *s*=sulcus); hind coxae of *S. subaeneus* (4) and *S. sordidus* (5).



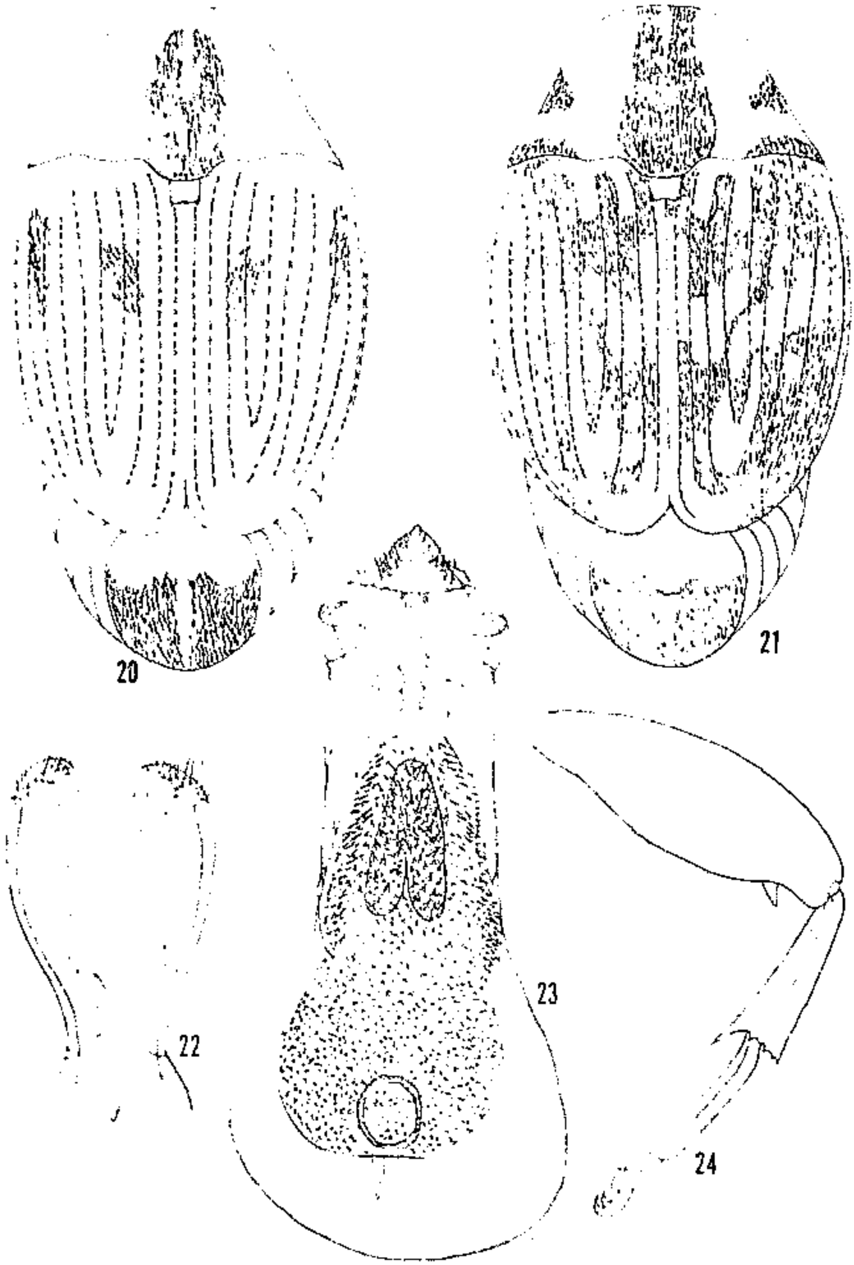
FIGURES 6-10.—*Stator aegrotus*: 6, Dorsal aspect; 7, median lobe, ventral view; 8, lateral lobes, ventral view; 9, spiculum; 10, hind leg.



FIGURES 11-15.—*Stator beali*: 11, Dorsal aspect; 12, lateral lobes, ventral view; 13, spiculum; 14, median lobe, ventral view; 15, hind leg.

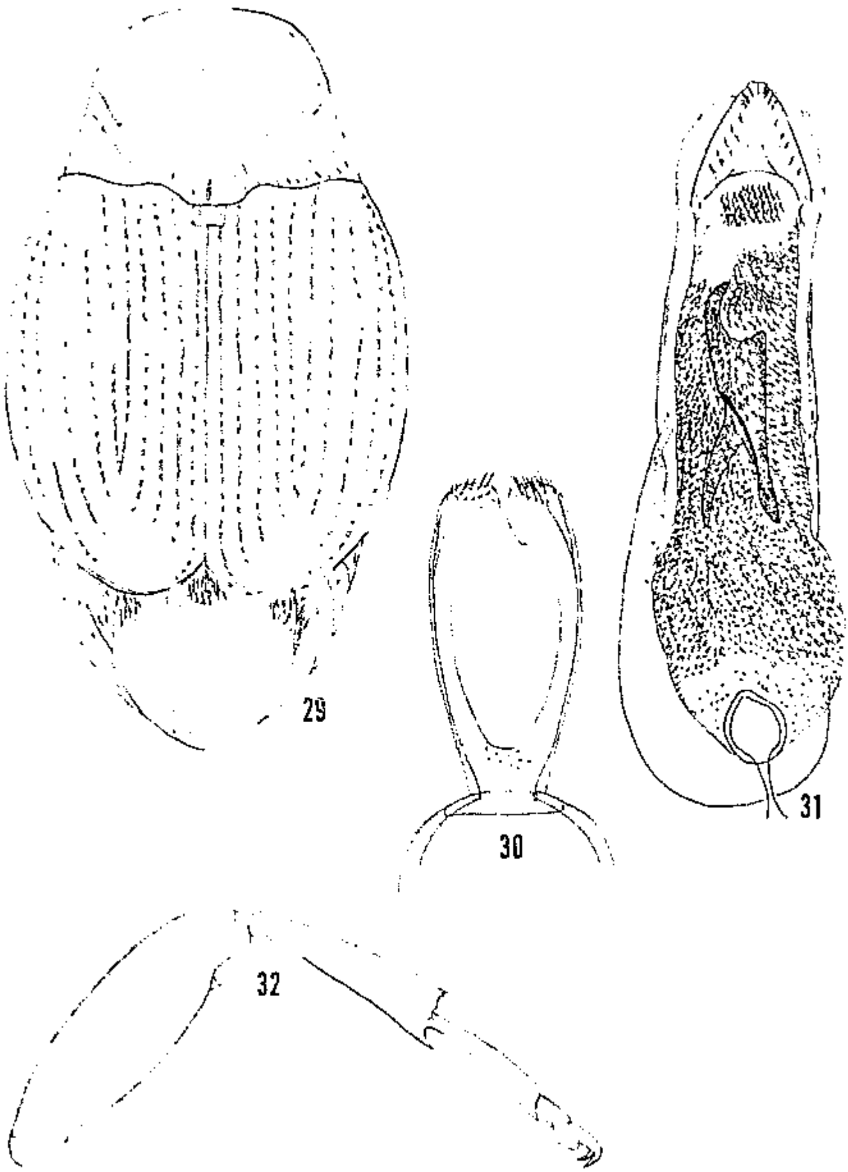


FIGURES 16-19.—*Stator bottimeri*: 16, Dorsal aspect; 17, lateral lobes, ventral view; 18, median lobe, ventral view; 19, hind leg.

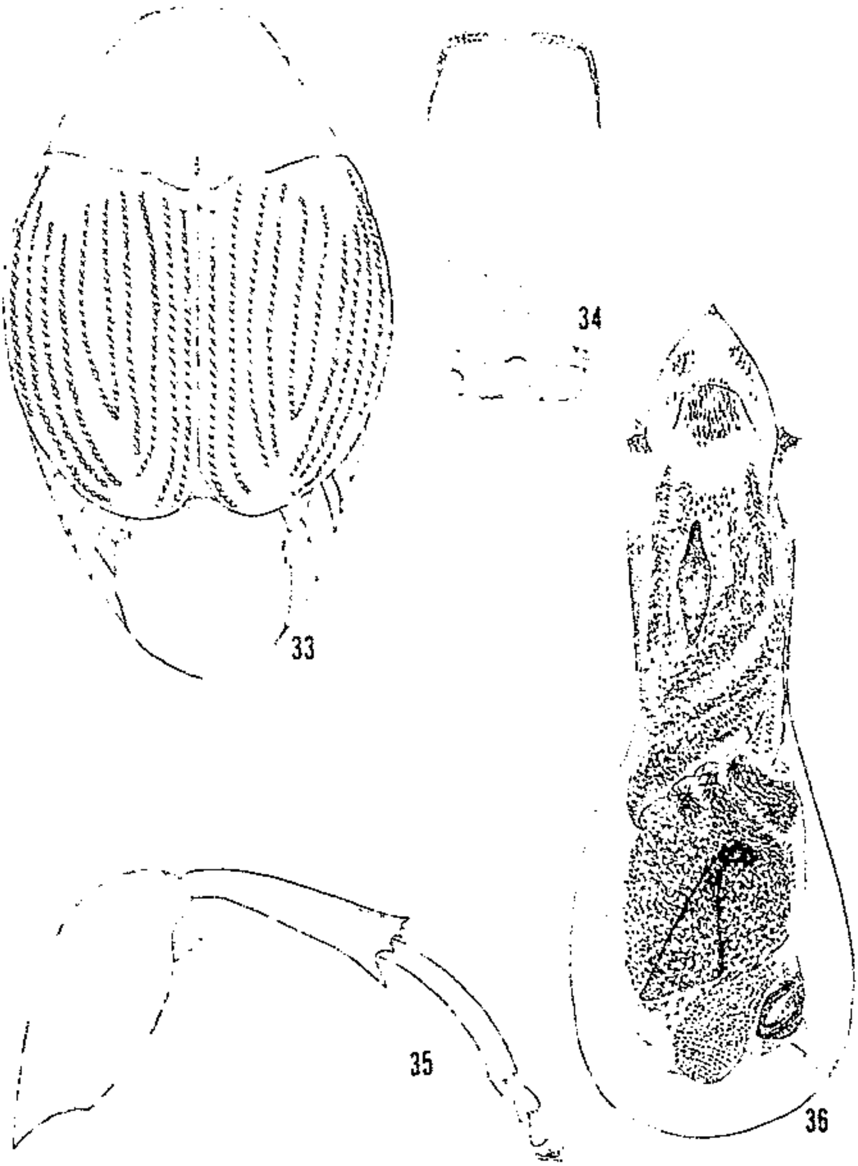


FIGURES 20-24.—*Stator championi*: 20, Dorsal aspect, ♂; 21, dorsal aspect, ♀; 22, lateral lobes, ventral view; 23, median lobe, ventral view; 24, hind leg.

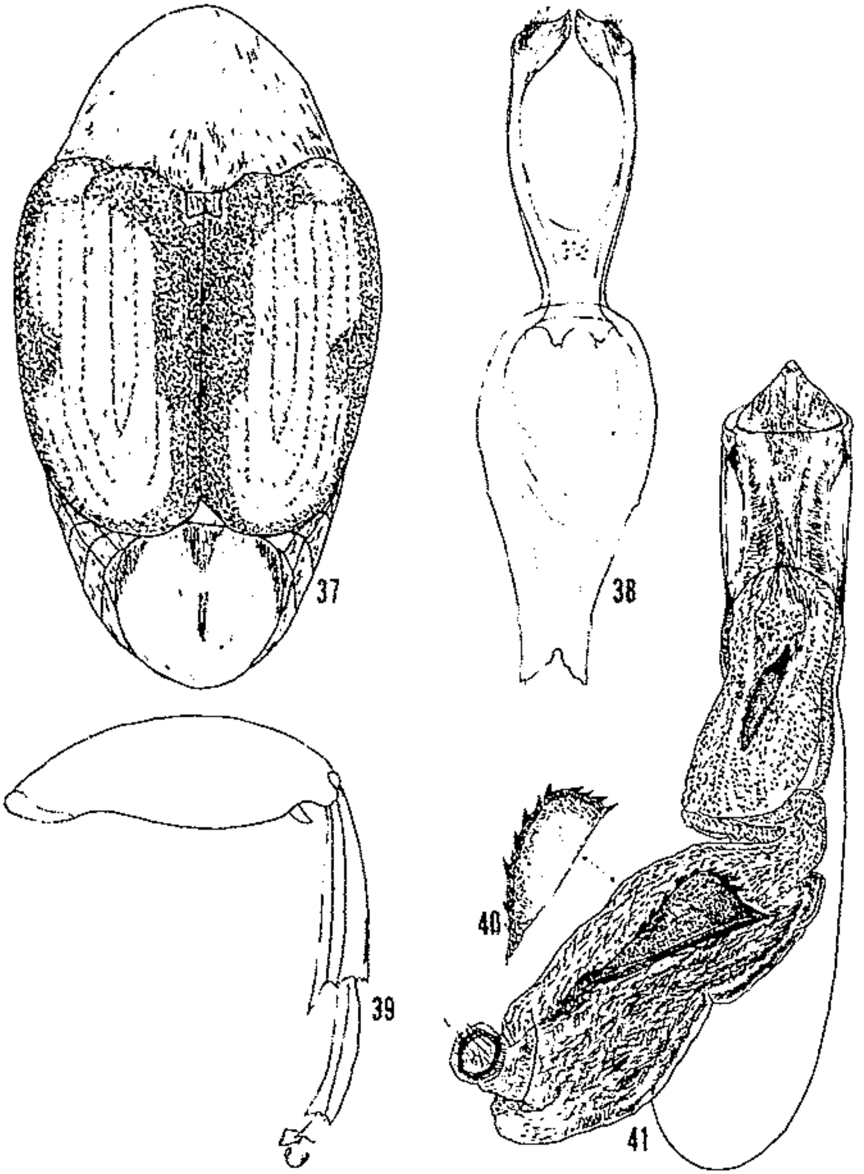
FIGURES 25-28.—*Stator chihuahua*: 25, Lateral lobes, ventral view; 26, median lobe, ventral view. *S. coconino*: 27, Lateral lobes, ventral view; 28, median lobe, ventral view.



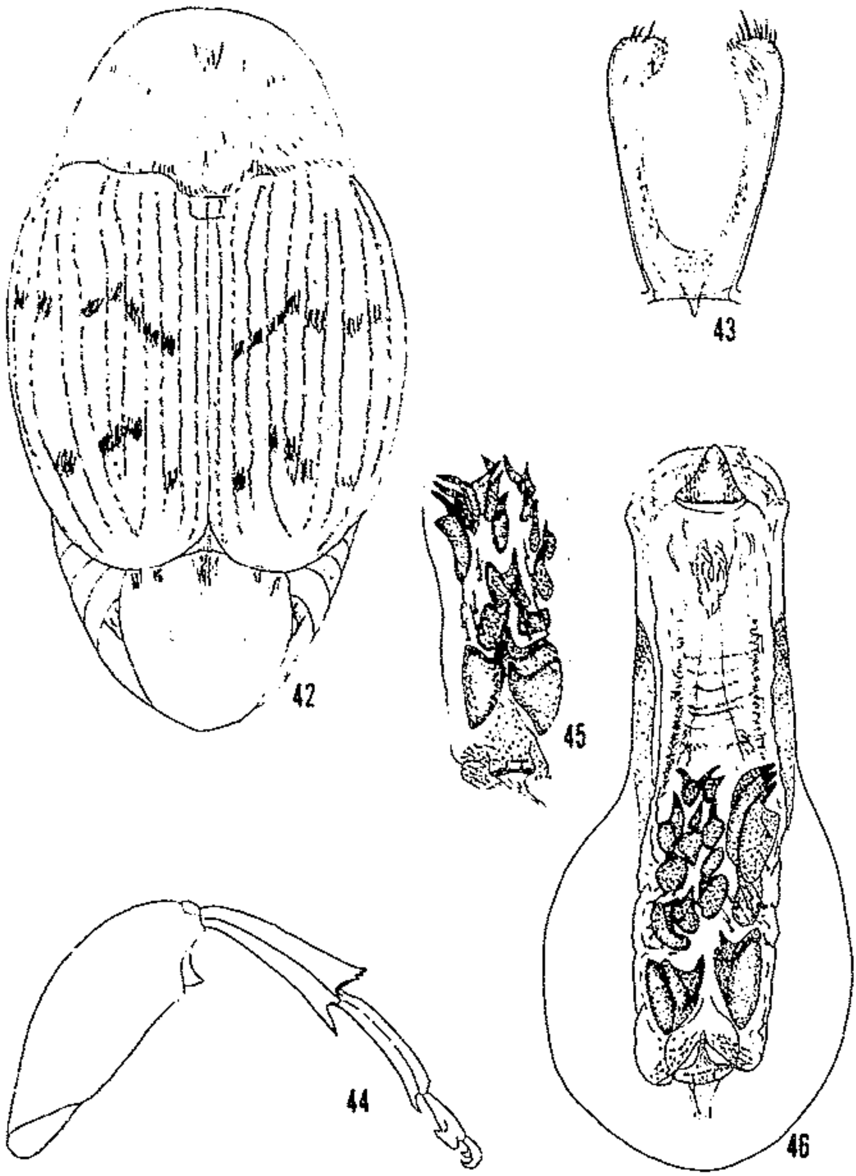
FIGURES 29-32.—*Stator dissimilis*: 29, Dorsal aspect; 30, lateral lobes, ventral view; 31, median lobe, ventral view; 32, hind leg.



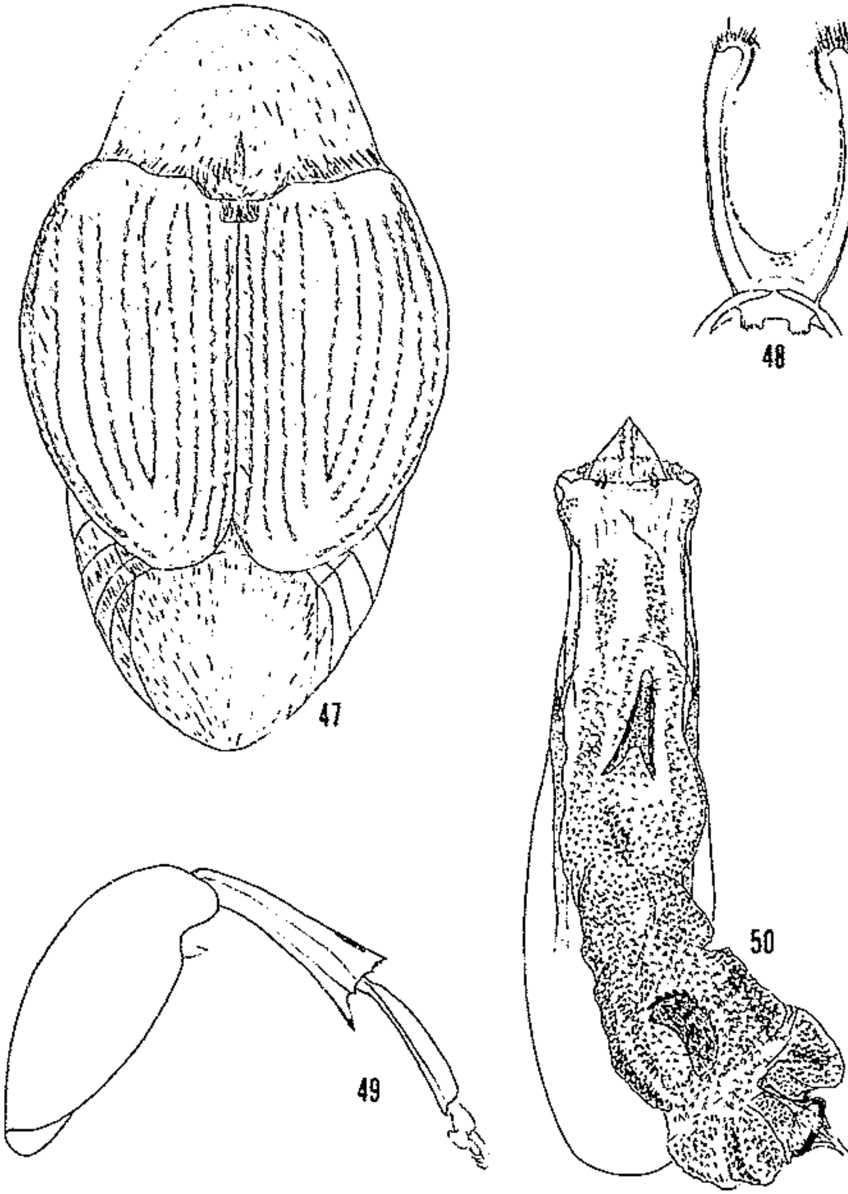
FIGURES 33-36.—*Stator generalis*: 33, Dorsal aspect; 34, lateral lobes, ventral view; 35, hind leg; 36, median lobe, ventral view.



FIGURES 37-41.—*Stator limbatus*: 37, Dorsal aspect; 38, lateral lobes, ventral view; 39, hind leg; 40, variant of spinous sclerite in internal sac; 41, median lobe, ventral view.



FIGURES 42-46.—*Stator mexicanus*: 42, Dorsal aspect; 43, lateral lobes, ventral view; 44, hind leg; 45, sclerites of internal sac, dorsal view; 46, median lobe, ventral view.



FIGURES 47-50.—*Stator monachus*: 47, Dorsal aspect; 48, lateral lobes, ventral view; 49, hind leg; 50, median lobe, ventral view.

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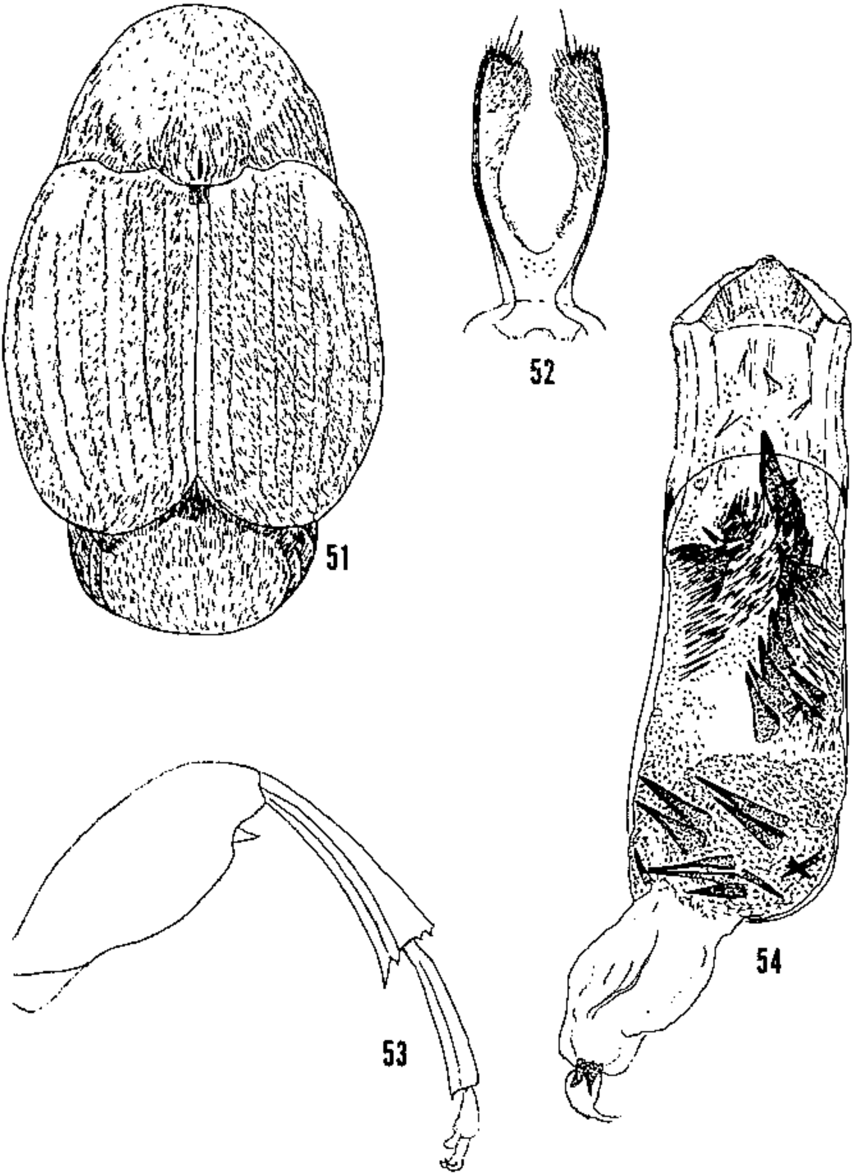
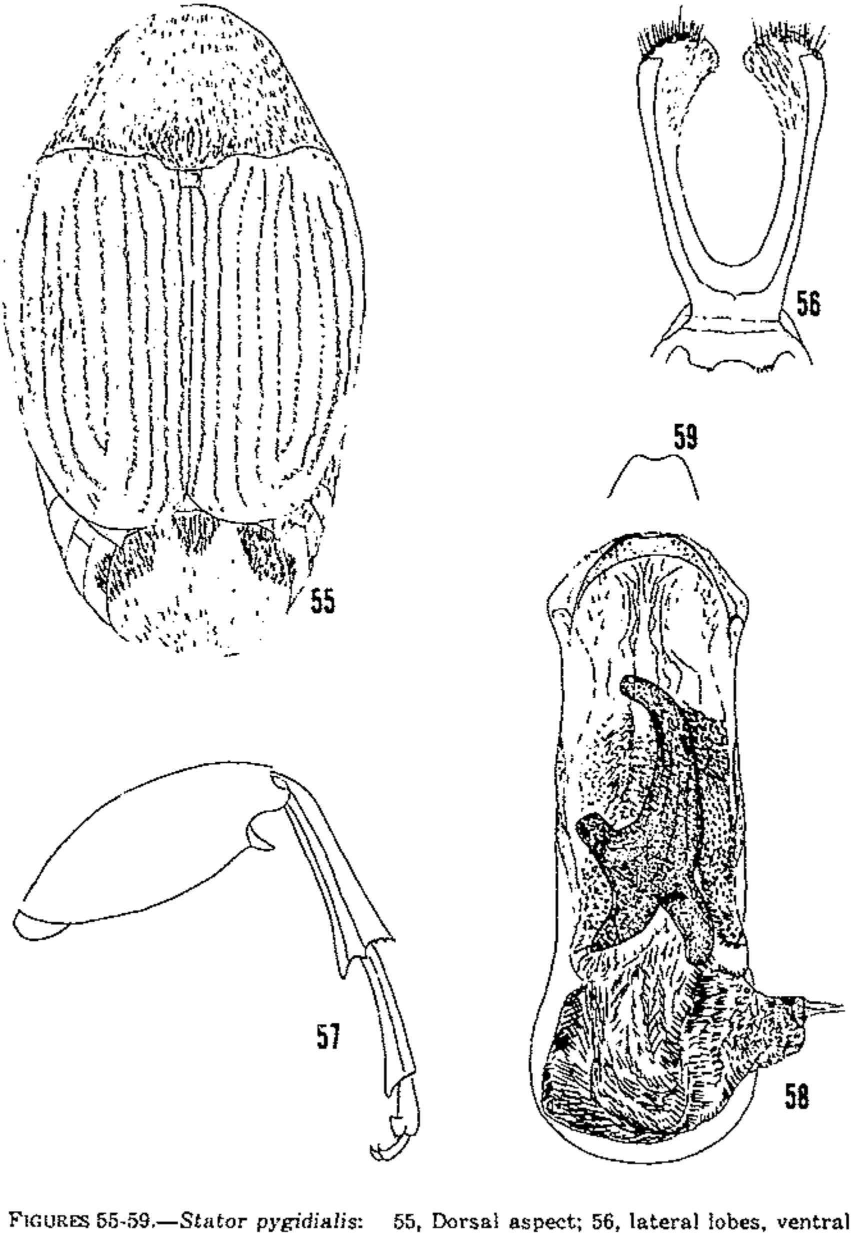
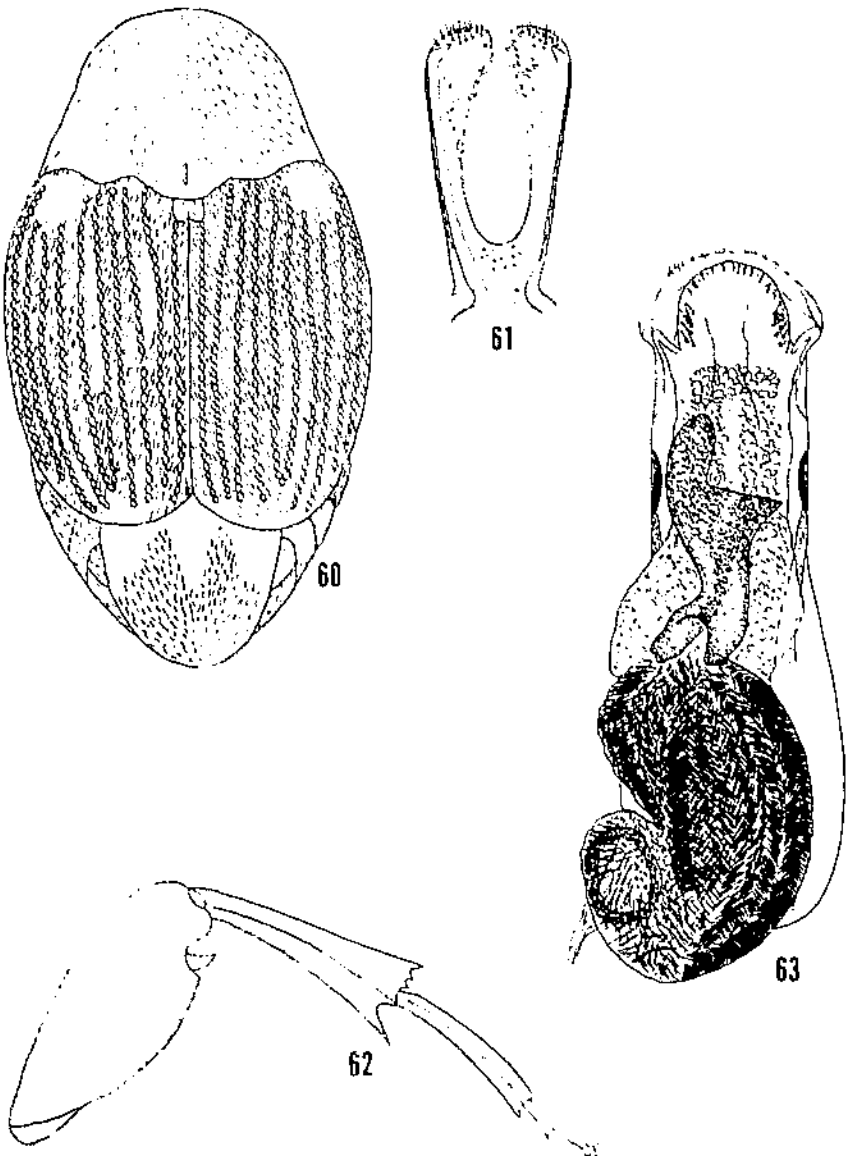


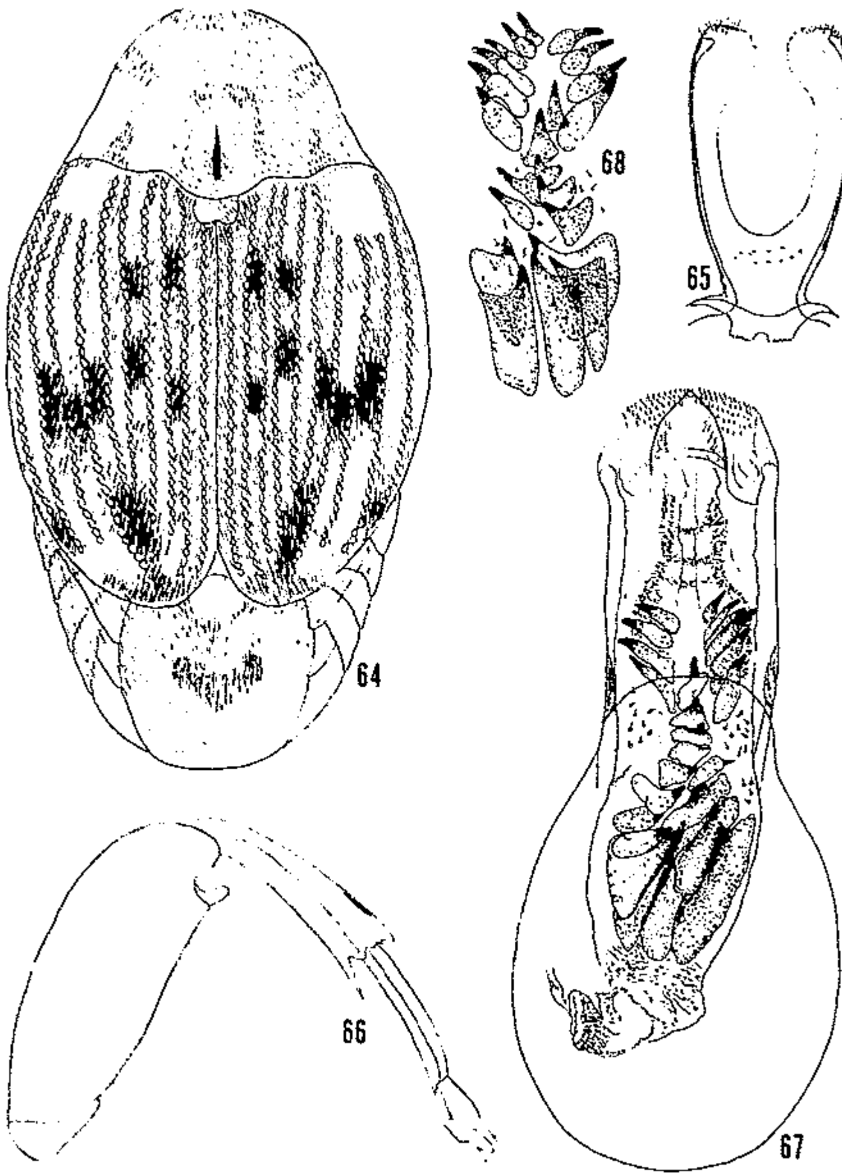
FIGURES 51-54.—*Stator pruininus*: 51, Dorsal aspect; 52, lateral lobes, ventral view; 53, hind leg; 54, median lobe, ventral view.



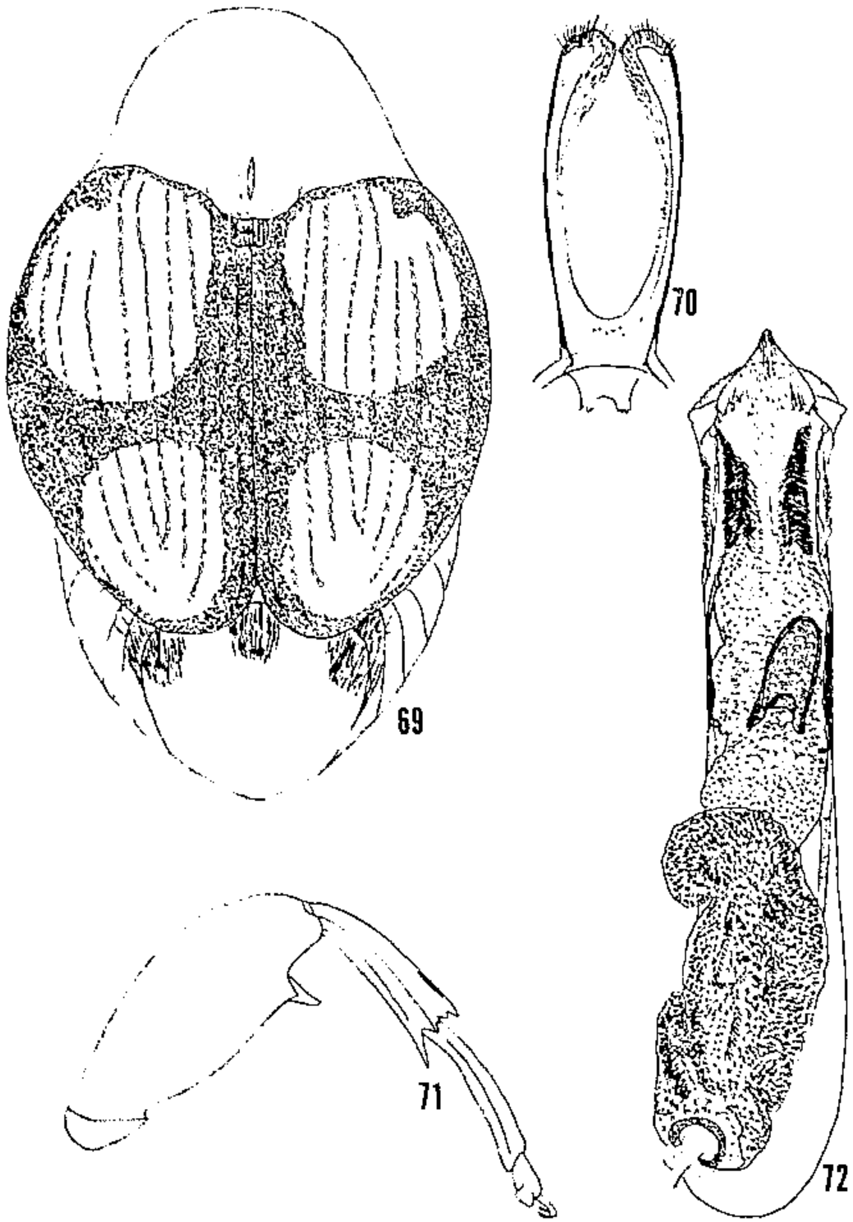
FIGURES 55-59.—*Stator pygidialis*: 55, Dorsal aspect; 56, lateral lobes, ventral view; 57, hind leg; 58, median lobe, ventral view; 59, variant of apex of ventral valve of median lobe.



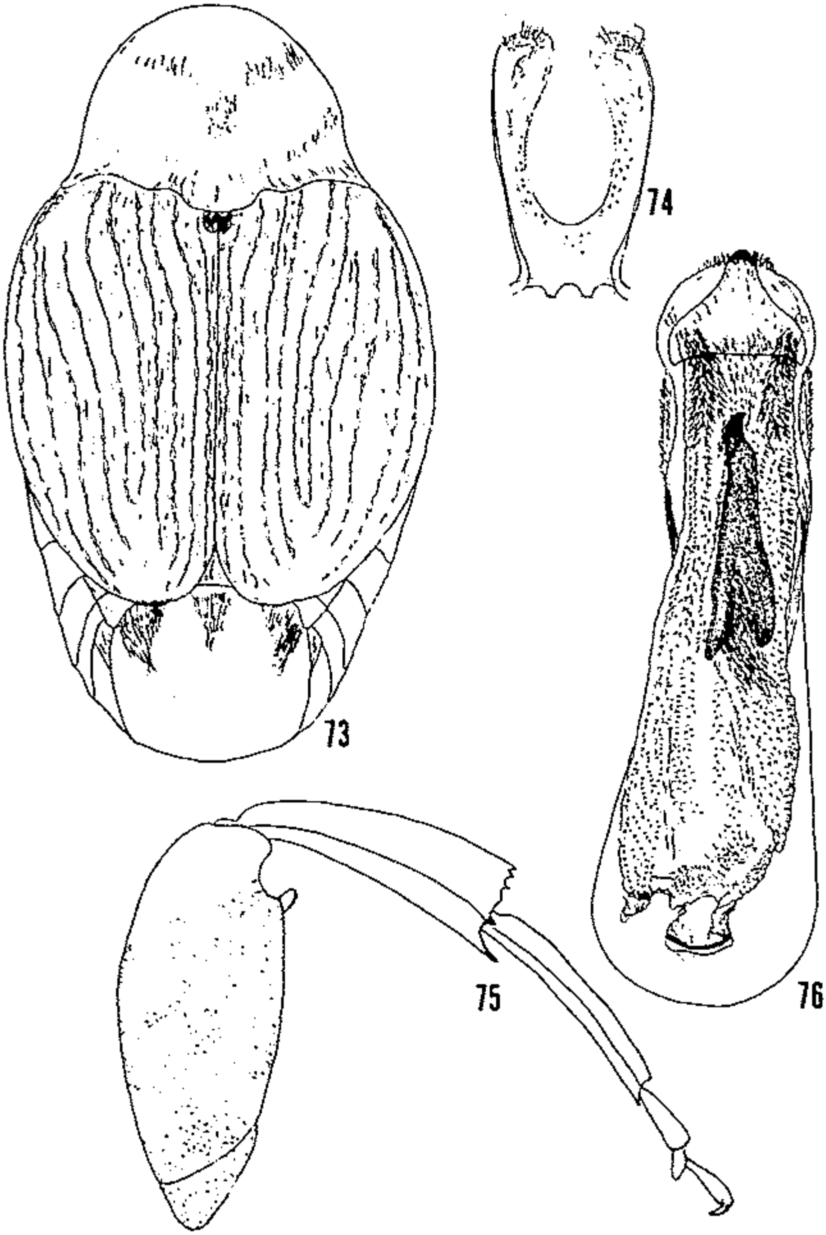
FIGURES 60-63.—*Stator sordidus*: 60, Dorsal aspect; 61, lateral lobes, ventral view; 62, hind leg; 63, median lobe, ventral view.



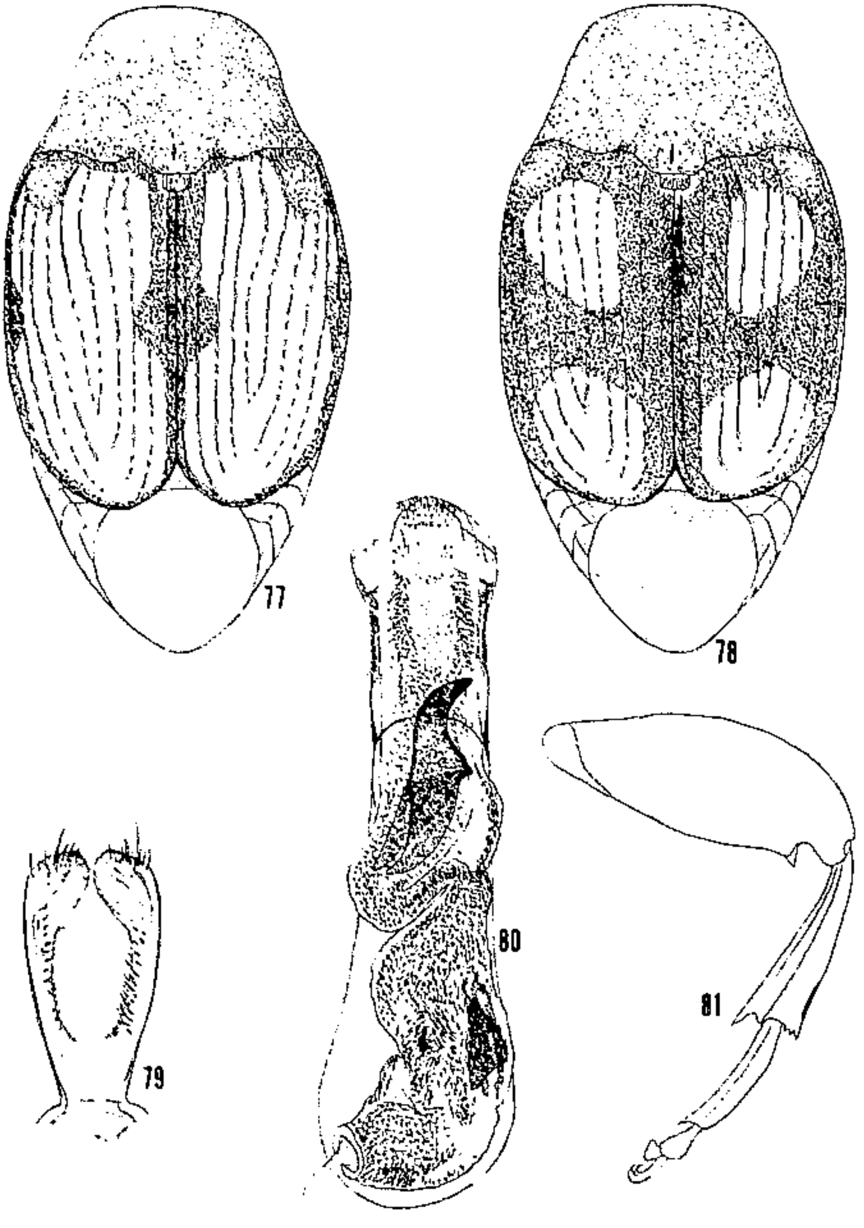
FIGURES 64-68.—*Stator subaeneus:* 64, Dorsal aspect; 65, lateral lobes, ventral view; 66, hind leg; 67, median lobe, ventral view; 68, sclerites of internal sac, dorsal view.



FIGURES 69-72.—*Stator trisignatus*: 69, Dorsal aspect; 70, lateral lobes, ventral view; 71, hind leg; 72, median lobe, ventral view.



FIGURES 73-76.—*Stator vachelliae*: 73, Dorsal aspect; 74, lateral lobes, ventral view; 75, hind leg; 76, median lobe, ventral view.



FIGURES 77-81.—*Stator vittatithorax*: 77, Dorsal aspect; 78, color pattern variant; 79, lateral lobes, ventral view; 80, median lobe, ventral view; 81, hind leg.

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