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ABSTRACT

In a revision of the subtribe Dolicaonina of the Paederinae, descriptions, illustrations, and a key are presented for the three genera and 78 species in the New World. *Acaratopus* is described as a new genus with one new species, *edenus*, from Mexico. *Stenopholea* is redescribed and nine new species are described; they are *bifurca, hadra, luma, sarma, thyma,* and *trunca* from Brazil, *papola* from Ecuador, and *aega* and *libra* from Mexico. *Gnathymenus* is redescribed and 51 new species are added; they are *flatrus, hyllus, kapetus, pipus, stubbus, twapicus, twelfus,* and *volcanus* from Chile, *avisoideus, brerus, cleofanus, divisus, garus, limus, mergus, prolixus, siagonus* and *speccus* from Colombia, *bobelus, gomphus, plancus, radulus, scoliodontus, setosus, umbus* and *zarzus* from Brazil, *angulus, geocus, kestrus, nacodus, spereus* and *tungus* from Ecuador, *fiscus* and *simatus* from Venezuela, *ascus, catillus, clinus, culebrus, falcatus, pandus, raius, ramosus, sifrus* and *spirus* from Panama, and *buganus, hamulus, lirellus, nutatus, patulus, somphus,* and *virgosus* from Mexico. *Lithocaon* Sharp, *Litozoon* Bierig, *Xanthornobium* Scheerpeltz, and *Macrognathymenus* Coiffait and Saiz are new junior synonyms of *Gnathymenus*. *Gnathymenus macropterus* (Bierig) is a new junior synonym of *Gnathymenus intermedius* (Bierig). *Xanthornobium vogelsangi* Scheerpeltz, *Dolicaon klimai* Bernhauer, *Litozoon maritimus* Bierig, *Litozoon intermedius* Bierig, *Litozoon macropterus* Bierig, *Litozoon nevermanni* Bierig, *Litozoon progenitor* Bierig, *Lithocaon fenyesi* Bernhauer, and *Lithocaon sparsus* Sharp are transferred to *Gnathymenus* and *Dolicaon distans* Sharp is transferred to *Lobrathium*. The 14 Old World genera are briefly discussed.

Cladograms are presented for three subtribes of the Paederinae, the 17 genera of the Dolicaonina, and all of the species of Dolicaonina for the New World. The presence of protibial combs is used to help define the Paederinae and to suggest relationship of the Paederinae to the Xantholinini of the Staphylininae. The Dolicaonina and Paederina are sister taxa and together form the sister group of the Cryptobiina. The Dolicaonina are defined by the compressed, pubescent, apically truncate fourth segment of the maxillary palpus, the enlarged, medially fused mesothoracic peritremes, and the medially fused genital sclerites of the female. The cladograms for the species and genera are largely unresolved.

The three New World genera are defined by characters of the aedeagus. To avoid a polyphyletic classification, three genera are recognized since each is related to a different Old World genus.

The New World species are found from northern Mexico to southern Chile where most have been collected from ground litter and debris at elevations up to 11,600 ft. (3536 m.). More than 60 percent of the species are flightless and have reduced eyes. This study of 78 species is based on 885 specimens from 87 localities.

INTRODUCTION

Within weeks of publishing a description of *Stenopholea* and declaring it the first record of the subtribe Dolicaonina in the New World (Herman, 1969), I received for identification specimens of two new species of the subtribe collected above 10,000 ft. near Bogota, Colombia. These species led me to discover that I had overlooked four South American species that had previously been included in the subtribe. Later, I read two articles describing or redescribing genera that should have been included in the Dolicaonina (Scheerpeltz, 1967; Coiffait and Saiz, 1968) but were not, and studied two previously described genera and several undescribed species that belong in the subtribe. Suddenly the purported representation of the Dolicaonina in the New World had risen from one to 25 species in seven genera.

Of immediate interest for the present work were the changes required in the classification of the Paederinae and the phylogenetic relationships of the New and Old World genera. In the following pages I discuss the phylogeny and classification of the subtribe Dolicaonina and provide descriptions, illustrations, and a key to the New World taxa.

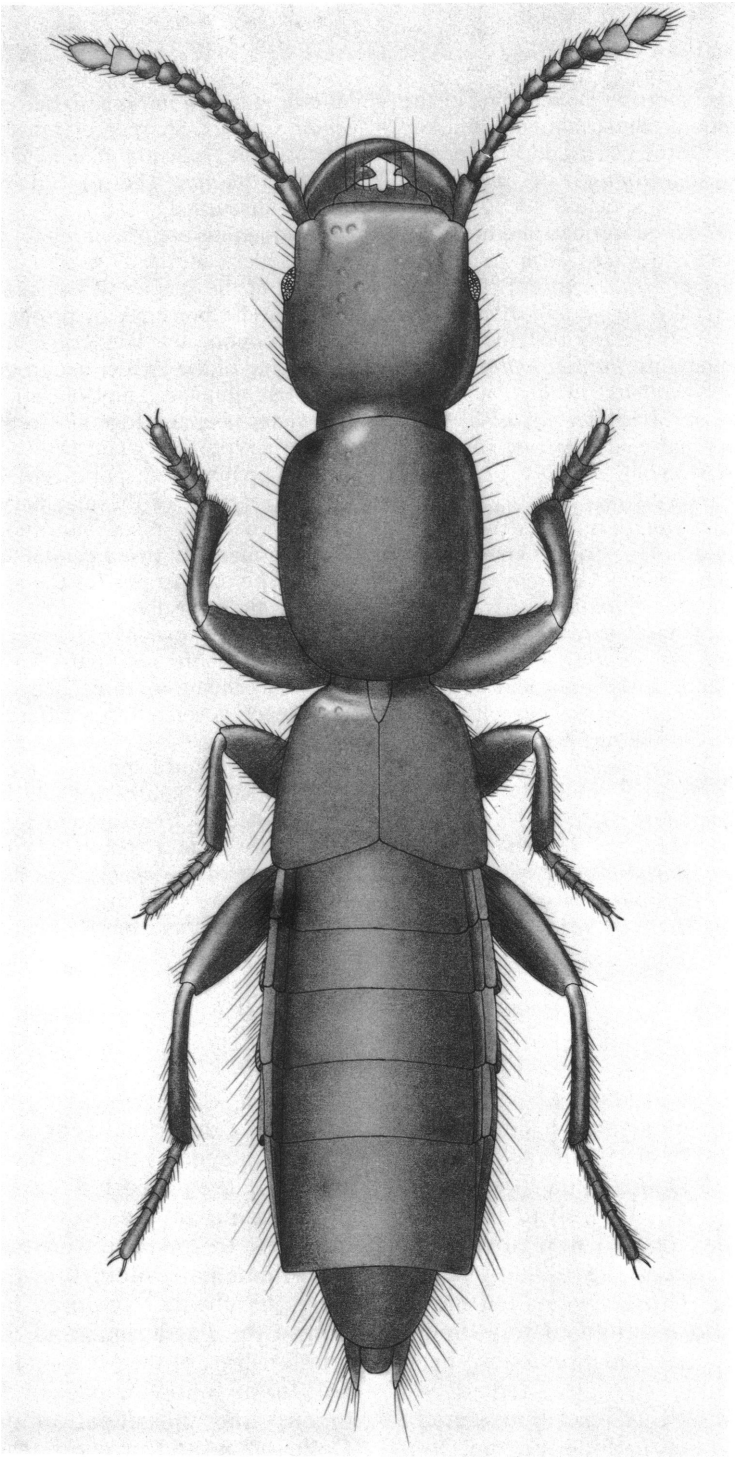

FIG. 1. *Gnathymenus avisoideus*.

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AMNH, American Museum of Natural History
BM, British Museum (Natural History), London, England; Mr. Peter Hammond
CNC, Canadian National Collection, Ottawa, Canada; Dr. Milton Campbell
FMNH, Field Museum of Natural History, Chicago; Dr. Rupert Wenzel and Mr. Henry Dybas
FS, Francisco Saiz, Valparaiso, Chile; private collection
IRSN, Institut Royal des Sciences Naturelles, Brussels, Belgium; Dr. Léon Baert
MCZ, Museum of Comparative Zoology, Cambridge, Massachusetts; Dr. Alfred Newton
MHMV, Naturhistorisches Museum Wien, Vienna, Austria; Dr. Heinrich Schönmann
MNC, Museo Nacional de Historia Natural, Santiago, Chile
MNHN, Muséum National d'Histoire Naturelle, Paris, France; Dr. Nicole Berti
USNM, National Museum of Natural History, Washington, D.C.; Dr. Terry Erwin

TAXONOMIC HISTORY

Casey (1905, pp. 20, 56–58) first segregated the subtribe Dolicaonina (as Dolicaones) and included in it *Dolicaon, Scotonomus,* and a new genus, *Leptobium*. Of the 32 species included in the three genera of the Dolicaonina by 1905, only one was listed in the New World.

Details of the tortuous taxonomic history of the Old World species and genera of the Dolicaonina are beyond the scope of the present paper. Immediately prior to Fagel's (1958) work on the Dolicaonina only two genera were recognized in the Old World, *Dolicaon* and *Scotonomus*. In three papers, Fagel (1958, 1959, 1965) described, restricted, or elevated 12 dolicaonine genera; six of them were monotypic, and 10 were restricted to Africa. At present, 158 species in 14 genera are included in the Old World Dolicaonina. Descriptions and illustrations of the genitalia of the males for most species have been published for *Dolicaon, Afracus, Afroscotonomus, Jarrigeus, Liparopus, Pinobius* (African species only), *Plathypodema, Scotticus, Laavsnartius,* and *Serrolabis* (Fagel, 1958, 1959, 1961a, 1961b, 1961c, 1962, 1965, 1973), *Sudanus* (Scheerpeltz, 1962), *Scotonomus* (Binaghi, 1970; Coiffait, 1970; Zanetti, 1977), and *Leptobium* (Fagel, 1958; Coiffait, 1969, 1972).

Casey, alluding to the only New World dolicaonine species, the Brazilian *Dolicaon distans* Sharp (1876), thought it was incorrectly assigned even though Sharp did not mention the characters needed for this decision. Casey overlooked the South American genus *Stereocephalus,* which was regarded by Lynch (1884, p. 233) as being near *Dolicaon*. Bernhauer (1927) added a second Brazilian species to *Dolicaon* (*D. klimai*).

When Blackwelder (1944, p. 126) published his checklist only four species (in *Dolicaon* and *Stereocephalus*) were included in the Dolicaonina; of these, with publication of the present paper, only Bernhauer's species (*klimai*) will remain. *Stereocephalus* was revised and transferred to the *Lathrobiina* (Herman, 1979) and *Dolicaon distans* is herein transferred to *Lobrathium*. Three other genera, *Gnathymenus, Lithocaon,* and *Litozoon* that were already described by 1944 and that should have been listed in the

Dolicaonina were included in other subtribes.

Gnathymenus, with one species from Chile, was originally described in the Oxytelinae (Solier, 1849), but later was moved to the Paederinae and considered to be related to *Paederus* (Kraatz, 1857, 1859; Fairmaire and Germain, 1861). This relationship to *Paederus* was followed by all subsequent authors who made explicit reference to the taxonomic position of *Gnathymenus* (Fauvel, 1868, 1891; Lynch, 1884; Blackwelder, 1944; Coiffait and Saiz, 1968) except Fagel (1958) who thought that *Gnathymenus* should be placed at the extreme end of the Paederini (p. 9, translated). However, reference to the extreme end is not clear and he offered no further speculation as to the position of *Gnathymenus*. Jarrige (1952, p. 118) was the first to place *Gnathymenus* in a group with *Paederus*, *Dolicaon*, and *Scotonomus*, although it had been compared to *Scotonomus* by Fauvel as early as 1873.

After *Gnathymenus apterus* was described from Chile (Solier, 1849), *G. quadripartitus* Fairmaire and Germain (1861) and *G. obesus* Fauvel (1868) from Chile, *G. rufoniger* Fauvel (1891) from Venezuela, and *G. bicolor* Bernhauer (1921) from Bolivia were added. Then, in an important study of the Chilean fauna, Coiffait and Saiz (1968) redescribed *apterus*, synonymized *quadripartitus* with it, placed *obesus* in a separate subgenus, *Macrognathymenus*, and described four more species from Chile. Most importantly, they provided the first illustrations of the aedeagus for species of *Gnathymenus*.

Sharp (1886) described *Lithocaon*, included one Panamanian species, and placed it near *Lithocharis*. A second species from Mexico was added (Bernhauer, 1910). Bierig (1933) was the first to point out that *Lithocaon* should be near *Dolicaon*, although this statement was overlooked or disregarded by Blackwelder (1944) who left it in the Lathrobiina.

Litozoon was described and placed in the subtribe Lathrobiina (cited as Lathrobia) by Bierig (1938) who made his comparisons with *Scotonomus*. Bierig (1938) originally included only one Costa Rican species, but later (1943) added four more from Costa Rica. Blackwelder (1944) followed Bierig and included the genus in Lathrobiina (cited as Lathrobii).

Scheerpeltz (1967) described the Venezuelan *Xanthornobium* with one species. Although he did not discuss relationships to other genera, the illustrations and description of the maxillary palpus and mandibles indicate inclusion in the Dolicaonina.

Finally, *Stenopholea* was described for a species from a cave in northern Mexico (Herman, 1969). This genus was compared with the Old World members of the Dolicaonina and was placed in a phyletic line with *Scotonomus*. Since I was unaware that other New World genera should be in the Dolicaonina, comparisons with appropriate New World genera were not made.

DISTRIBUTION AND HABITAT

The 158 Old World species of the Dolicaonina (fig. 2) are found in central and southern Europe, into the Caucasus Mountains, around the Mediterranean Sea, across north Africa, and south to southern Africa. Species are known from scattered localities in southern Asia, Indonesia, the Philippines, New Guinea, and Australia. Most species are from Europe, north Africa, and central Africa; however, there are probably many more to be discovered, especially in the Asian and Indo-Australian regions.

Species of the New World (fig. 2) are known from northern Mexico (Tamaulipas) south through northwestern South America and central and eastern Brazil to southern Chile (Magallanes). Since 78 species are known from only 87 localities and since about 60 percent of the species are flightless, the group is apparently susceptible to local

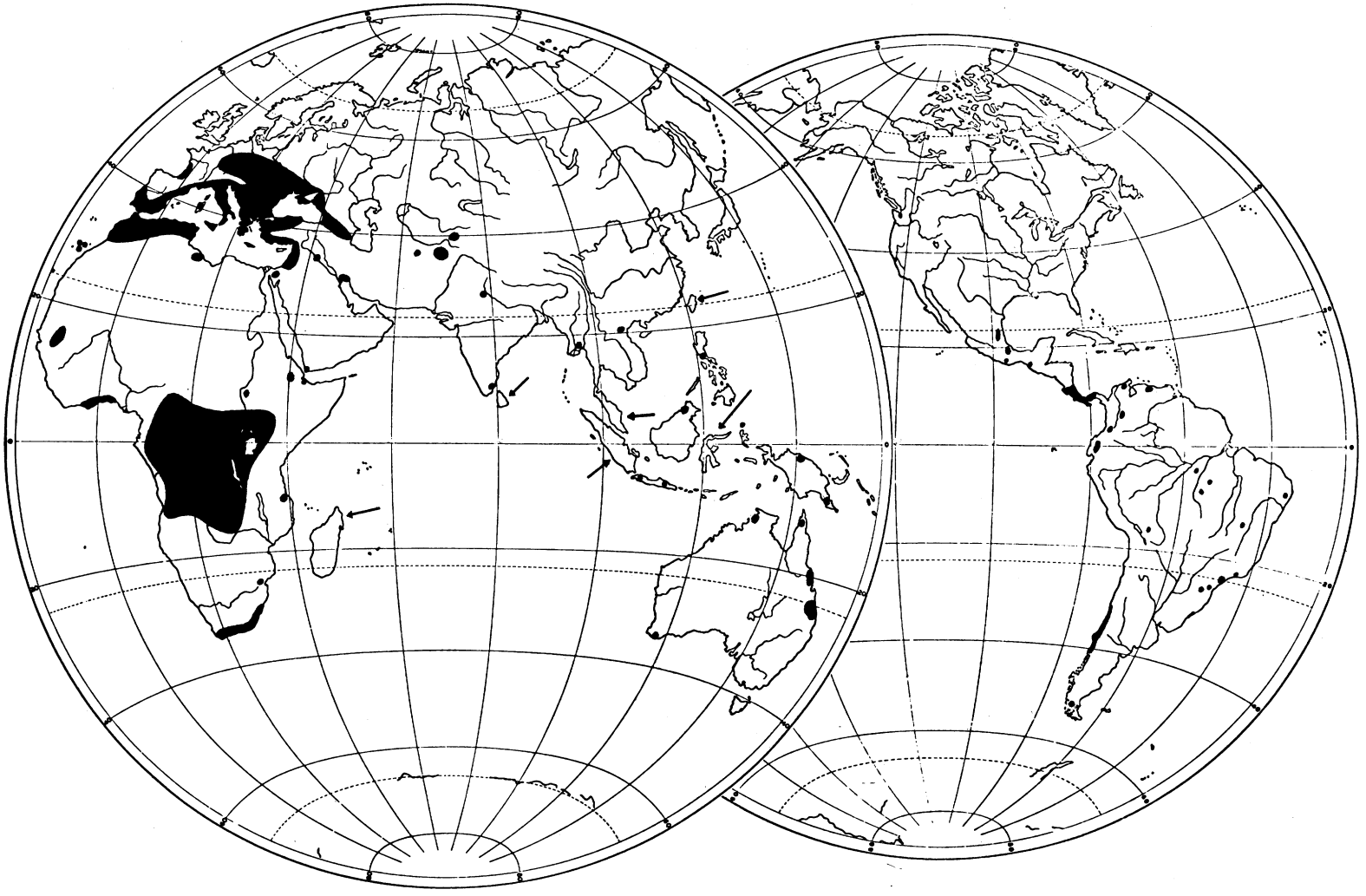


FIG. 2. Map of world showing general distribution of the Dolicaonina. Arrows indicate localities that were published in the literature but were not found or were only specified as general area.

differentiation and there may be hundreds of species yet to be found in the New World.

Species of the subtribe are generally ground-dwelling animals that are found in leaf litter and decaying debris. However, species have been taken from roots of grass tufts and ferns (*Scotticus abyssinicus*), in the rotten trunk of *Ficus* (*Jarrigeus minutus*), in decomposing wood (*Serrolabis saegeri*), in mixed soil and sawdust from the base of a dead tree (*Serrolabis saegeri*), from debris in a tree hole (*Serrolabis saegeri*), under large stones deep in the soil (*Scotonomus* spp.), from a cave (*Stenopholea reddelli*), a fungus-encrusted stump (*Gnathymenus patulus*), the nest of a bird (*Gnathymenus maritimus, G. vogelsangi*), the leaves of a bromeliad (*Gnathymenus nevermanni*), and the forest canopy (*Gnathymenus spirus*). Five species of *Gnathymenus* were collected from fungi. These include *Gnathymenus clinus* (from *Trametes scabrosa*), *G. ramosus* (from *Polyporus licnoides* and *Ganoderma* spp.), and *G. sifrus* (from *Favolus* sp., *Trametes scabrosa, Polyporus licnoides, Fomes sclerodermeus, Auricularia mesenterica, Ganoderma* sp., and *Phellinus* sp.). The other two, *G. kapetus* and *G. twelfus*, were reported from ground mushrooms. Species have been recorded at elevations as high as 11,000 ft. (3353 m.) (*Gnathymenus geocus, Scotticus abyssinicus*) and 11,600 ft. (3536 m.) (*Gnathymenus brerus*).

GENERIC CLASSIFICATION

The subtribe Dolicaonina is moderately large with 158 species in the Old World and, as reported in this paper, 78 species in the New World. The range of external variation among the species is modest. Size is the most remarkable; species range from 2 mm. (*Gnathymenus sifrus*) to nearly 25 mm. long (*Platydolicaon arachnites*). Seven species of *Gnathymenus* have a cylindrical abdomen in which the laterotergites are absent. *Jarrigeus* has a serrate mesosternal carina. Some genera and New World species exhibit variation in the form and number of the mandibular and labral denticles or lobes. Eye sizes vary, a few species lack eyes, and many exhibit hindwing brachyptery or absence of the flying wings, which is coincident with reduction of the length of the elytra, and metathorax, and loss of the dermal fringe of tergite VII. Reduction of the eyes and flying apparatus is correlated. A profemoral or metasternal process may be present, the protarsomeres expanded, the mentum carinate, and the integument sculptured; the shape of the pronotum is variable. The abdominal sternites of males may be modified, often strikingly so, particularly among the New World taxa.

In contrast to the paucity of external variation, the range of genitalic variation, particularly in the male, is staggering. Even the females exhibit impressive variation of the genital segment. Some genitalic variation is useful for recognition of groups of species; much is not. In the remainder of this section I discuss the present classification of the Old World genera and propose a new classification for the New World species, which is distributed into three genera.

In the Old World some external characters have been declared useful for recognition of 14 genera. Seven of these are monotypic, one has two species, one has four, and the other five genera contain the remaining 145 species. Each of the Old World genera will be discussed briefly in the following paragraphs.

Dolicaon Laporte (1835) has 10 species from South Africa. One other species, *D. winkleri* Koch, is still listed in *Dolicaon*, but, based on its presence in Turkey, probably belongs in *Leptobium*, which is the only genus in the subtribe known from Turkey. All the other species formerly included in *Dolicaon* have been transferred to *Pinobius, Leptobium, Jarrigeus, Liparopus, Gnathymenus*, or *Lobrathium*. The species range in size from 9.1 to 22.6 mm., but most

are more than 15 mm. long. The aedeagus (fig. 28) has long, slender parameres and a complete but lightly sclerotized basal piece; the ventroapical portion of the median lobe is inflated. Tergum IX of the male is divided midlongitudinally (as in fig. 32) and sternum IX is nearly symmetrical. The female has a midlongitudinally divided tergum IX, one genital sclerite, and the spermatheca is sclerotized. A key to nine of the species is provided by Fagel (1959), who used size and the presence of four dentiform labral lobes to separate the genus from others (Fagel, 1958). I studied the males of two species and females of one.

Scotonomus Fauvel (1873) was revised by Binaghi (1970) and other species were added by Coiffait (1970) and Zanetti (1977). These authors illustrated the aedeagus of all the known males. The 15 species are all from west central Italy and Sardinia. They are 3.5 to 5.1 mm. long, have reduced flying wings and eyes composed of only a few facets. The parameres are long and slender. The basal piece (fig. 19) is absent, the articulated sclerite is present, and the ostium is not covered by an operculum. Tergum IX of the male is almost completely divided by an elongate tergum X and sternum IX is slightly asymmetrical. Tergum IX (fig. 31) of the female is also nearly divided by tergum X, two genital sclerites (fig. 34) are present, and the spermatheca is sclerotized (fig. 36). Fagel's (1958) attempt to differentiate *Scotonomus* and *Leptobium* by the shape of the pronotum will not work for all species but the difference in size of the eye will. I examined a male and female of *Scotonomus*.

Pinobius Macleay (1873) has 23 species from Senegal, Ghana, Gabon, Angola, Zimbabwe, Zaire, Rwanda, Ethiopia, Djibouti, Madagascar, Yemen, India, Sri Lanka, Burma, Vietnam, Taiwan, Malaya, Philippine Islands, Brunei, Sumatra, Java, Sulawesi, Kei Island, New Guinea, and Australia. This group is comprised of the species left over after the other Old World species of the subtribe have been removed. They range in length from 5.8 to 12.5 mm. All but one of the African species were described by Fagel (1958, 1959, 1961a, 1962). He provides illustrations of the aedeagus of all the known males from Africa and a key to some of the species. I have illustrated the aedeagus of two species from New Guinea (figs. 14, 16) and have dissected three others from New Guinea, Philippine Islands, and Australia. All the species have long, slender parameres. The Indoaustralian species all have a complete basal piece (figs. 14, 16), and the basal foramen is surrounded by a sclerotized collar that is compressed at the juncture between the collar and median lobe. The apical portion of the median lobe has one or more variously modified hooks and processes. Tergum IX of these males is fused medially (in one species it is feebly divided) and sternum IX is slightly asymmetrical. The ninth tergum of the two Indoaustralian species I examined is medially divided and the spermatheca is not sclerotized. The female of one species has one genital sclerite, another has two. According to Fagel (1958, p. 40), *Pinobius* is defined by [unspecified] similarity of the aedeagus but there are no external characters to justify the genus.

Leptobium Casey (1905) with 81 species is the largest genus of the subtribe. It has a circum-Mediterranean distribution, and also occurs in central Europe, western France, through the Caucasus Mountains to the Caspian Sea, and in south central Asia, the northwestern edge of the Persian Gulf, and Ethiopia. Based on dissection of the males of seven European, African, and Asian species, the aedeagus (fig. 18) has long slender parameres, a medially divided basal piece and an articulated sclerite, the ventrobasal part of which is modified into an operculum covering the ostium (fig. 23). Tergum IX of the male is medially fused and sternum IX is slightly asymmetrical. The female has the ninth tergum medially divided (fig. 32), one genital sclerite (fig. 29), and a sclerotized spermatheca (fig. 35). The size of the species ranges from 4.5 to 10.0 mm. Coiffait (1969), in a revision that included a key, illustrations of the aedeagus, and descriptions for most of the species, stated that most of the species have reduced flying wings. Fagel (1958) uses the four labral lobes, and subrectangular pronotal shape to distinguish the genus.

Serrolabis Fagel (1958) has four species, three from Zaire and one from Senegal, that range from 3.6 to 4.2 mm. long. I have seen two specimens from Sudan. Fagel (1958) differentiates the genus from others by the six labral denticles. The aedeagus, which has been illustrated for each species by Fagel (1958, 1959, 1961c), has long slender parameres, a short to long flagellum that (at least in one species) is enveloped by a membranous covering (fig. 12). The basal piece is complete and the collar surrounding the basal foramen is compressed at its juncture with the median lobe. Tergum IX of the male is fused medially and sternum IX is symmetrical.

Jarrigeus Fagel (1958) has 16 species from Ethiopia, Zaire, Rhodesia, Angola, Gabon, Chad, Benin, Ghana, Ivory Coast, and Senegal. The species range from 3.6 to 7.6 mm. The aedeagus (fig. 13) has long, slender parameres, a long flagellum, and an undivided basal piece. Tergum IX of the male is fused midlongitudinally and sternum IX is nearly symmetrical in the one species I studied. The female of this species has two genital sclerites (fig. 30) and a sclerotized spermatheca (fig. 33); tergum IX is weakly divided midlongitudinally. Fagel (1958) gave a key to about half of the species but in six papers (1958, 1959, 1961a, 1962, 1965, 1973) he illustrated the aedeagus of all the known males. The genus is characterized by the serrate mesosternal carina.

Afroscotonomus Fagel (1958) is a monotypic genus from Zaire and Ethiopia. The aedeagus has large, asymmetrical parameres (Fagel, 1961a, figs. 1 and 2) and the species ranges from 4.4 to 4.6 mm. long. I have studied no specimens of the genus. External characters that purportedly differentiate *Afroscotonomus* from other genera are given by Fagel (1958, pp. 11, 12, 30).

Liparopus Fagel (1958) has one South African species. The species is 15 mm. long and the aedeagus, as illustrated by Fagel (1959, figs. 12–14), is similar to that of *Dolicaon*. I have examined no specimens of this genus. Fagel (1958) differentiates *Liparopus* from other genera by size and the presence of two labral denticles.

Plathypodema Fagel (1958) has two South African species that range in size from 13.2 to 16.4 mm. I have not examined specimens of either species but Fagel (1959, figs. 9–11) illustrates the aedeagus which is similar to that of species of *Dolicaon*. Fagel (1958) separates *Plathypodema* from other Dolicaonina by size and the presence of four labral denticles and long, erect, black setae. He also mentions that the ventral surface of the basal protarsomeres are expanded.

Platydolicaon Fagel (1958) is a monotypic genus from South Africa. The species, at 23.7 to 24.8 mm., is the largest of the subtribe. The male is unknown and I have examined no specimens of the genus. According to Fagel (1958), it can be differentiated from other genera by size and by the basal mandibular denticle. The underside of the basal protarsomeres is expanded.

Scotticus Fagel (1958), a monotypic genus from Ethiopia, varies from 4.9 to 5.2 mm. long and is differentiated from other genera by subtle characters given in a key by Fagel (1958). I have examined no specimens of *Scotticus* but Fagel (1958) illustrates the aedeagus, which has long, slender parameres.

Afracus Fagel (1959) has one species from Tanzania that is 4.6 mm. long. The aedeagus (fig. 26) has long, slender parameres, and a medially divided basal piece. The median lobe has two subapical openings. A long, slender, flattened sclerite emerges from the larger opening on the right side of the median lobe, the second opening is on the middle of the left side of the long, slender median process. It is unclear which of these openings is the ostium. There seem to be no external characters that will differentiate this genus from others. Fagel (1959, p. 20, fig. 18) shows a median labral denticle but the holotype of *Afracus laevicollis* has two denticles on each side of an edentate median emargination.

Laavsnartius Fagel (1965) is a monotypic genus from Transvaal, South Africa. The species is 4.6 to 4.9 mm. long. I have not examined a specimen but the aedeagal illustration (Fagel, 1965, fig. 2) is similar to those of species of *Leptobium*.

Sudanus Scheerpeltz (1962) has one species from Sudan that is 3.5 mm. long. The aedeagus, illustrated by Scheerpeltz, is sim-

ilar to that of *Serrolabis*. Although I have seen no specimens, I suspect that *Sudanus* will be shown to be a junior synonym of *Serrolabis*.

Among the New World Dolicaonina, recognition of genera is considerably more complicated than in the Old World. In the Old World, with the exception of seven monotypic genera and *Pinobius*, all the species apparently can be sorted into groups based on external features. I can neither confirm nor dispute these Old World genera, since I have examined only 17 species in seven genera, but the New World species cannot be classified into groups using only external characters.

Until the present work, five genera, *Litozoon*, *Lithocaon*, *Stenopholea*, *Xanthornobium*, and *Gnathymenus*, with one subgenus *Macrognathymenus*, have been listed as occurring in the New World. Two more species were included in *Dolicaon*. Of these genera only the monotypic *Macrognathymenus*, with a cylindrical abdomen, and the monotypic *Stenopholea*, with a profemoral and a metasternal process, are easily separated from the other nominal genera. None of the New World genera was ever compared to one another. Considering the immense range of genitalic variation of the New World species, the external variation is impressively slight.

The 78 New World species can be arranged in one to 31 genera. The most reasonable number seems to be either three or 31 but there are practical or theoretical problems regardless of how many genera are recognized in the New World. In the following paragraphs I discuss each of the groups and the problems, strengths, and consequences of several of the possible generic classifications. The following 31 groups of species can be recognized by using as many external characters as possible supported by genitalic characters, or in lieu of external characters, genitalic characters only. The females of only 12 groups can be sorted to species group by using external characters; all the others must be placed by association with males, even if there are group specific genital characters of the females (table 1).

The aedeagus of 11 species has long, slender parameres that are separated for most of their length from the median lobe, a medially divided basal piece, and a sclerite anterior to the basal foramen (figs. 40, 595, 619). In the remaining 67 species, the aedeagus has short, broad parameres that are appressed to the base of the median lobe, a collar surrounding the basal foramen, a small ostium, and lacks a basal piece (figs. 57, 58, 95, 96, 464, 465).

The 11 species with long, slender parameres and a divided basal piece can be divided into six groups.

The *thyma* group has a broad labral lobe (fig. 655), ground sculpturing on the head and pronotum that looks like fingerprints (figs. 642, 643), and a rodlike articulated sclerite on the aedeagus (figs. 644, 657). This group includes *thyma*, *sarma*, and *bifurca*. The females can be assigned to the group by using the integumental sculpturing. Characters of the male genitalia support this group. In one species, *sarma*, the articulated sclerite is lightly sclerotized and flattened (fig. 667).

The *trunca* group has a long bladelike articulated sclerite (figs. 619, 630) and includes *trunca* and *luma*. The labrum has a broad, truncate lobe on the anterior margin (figs. 623, 639).

The *reddelli* group, with three species, has a blunt, metasternal process (fig. 588), a profemoral process (figs. 593, 605, 616), and lacks eyes (fig. 581). It includes *reddelli*, *aega*, and *libra*. They all have the mesospiracular peritreme fused to the prohypomeron and profurcasternum (fig. 584). The labrum has a truncate lobe in *aega* (fig. 600), but is denticulate in the other two species (figs. 594, 611). One species, *reddelli*, has pebbled integumental sculpturing and angulate pronotal anterior angles (fig. 587); the other two do not. The male of *reddelli* is unknown and the species was originally segregated as the monotypic genus *Stenopholea*.

The *papola* group, with one species, *papola*, has a rodlike ostial articulating sclerite (fig. 676), and strongly pebbled ground sculpturing. It is segregated because its relationships are unclear.

The *hadra* group, with one species, *hadra*, has a broad, truncate labral lobe (fig. 687) and the articulated ostial sclerite is repre-

sented by a small sclerotized lobe on the edge of the ostium (fig. 684). On the basis of the labral lobe *hadra* might be included with the *thyma* or *trunca* groups. It is separated because its relationships are unclear.

The *edenus* group. Based on the aedeagus, which has a long, slender flagellum (figs. 40, 42, 43), *edenus* forms a separate group. The female is the only one known to have the ventral edges of tergum IX fused together medially (fig. 50). The only other species of the Dolicaonina with a long flagellum are in the Old World genera, *Sudanus, Jarrigeus* (fig. 13), and *Serrolabis* (fig. 12). However, in contrast to these three African genera, *edenus* has no notable external features that are not also found in other species. The species is eyeless (fig. 46) and has a large profemoral process (fig. 45), but so do *aega, libra,* and *reddelli.*

Among the species with short, compressed parameres appressed to the median lobe there is a multiplicity of species groups and species with uncertain relationships. By far the most easily recognizable of these are the *obesus* and *umbus* groups, both of which have a cylindrical abdomen.

The *obesus* group. In the *obesus* group, along with the modified abdomen, the aedeagus has the same general form and a rounded midapical process (figs. 194, 199, 203, 226, 234), and segment IX of the female is medially fused at the base of the ventral surface (fig. 225). One of the species, *obesus,* was separated from *Gnathymenus* as a subgenus, *Macrognathymenus.* Since then four other species, *pipus, twapicus, hyllus,* and *flatrus,* have been found.

The *umbus* group includes *umbus* and *setosus.* These species have a cylindrical abdomen in which the paratergites are feebly separated. The aedeagus has a row of setae on each side of the ventral midline (figs. 153, 161). The females have a median emargination of tergum VIII (figs. 155, 158), and the spermatheca has a duct leading to an opening to the outside on the apical genital appendage of segment IX (figs. 149, 164). This peculiar spermathecal character is also found in the *apterus* group.

The *apterus* group is equivalent to *Gnathymenus* in the narrowest sense. It includes males with one or two patches of micropores on sternite VII (figs. 62, 81, 112, 117) and females with an opening on the apical genital sclerite that leads to the spermatheca (figs. 56, 103). There are no external characters that permit recognition of the females of this group, which encompasses *apterus, distinctus, testaceus, detectus, proximus, kapetus, twelfus, stubbus,* and *volcanus.* I have studied the females for only *proximus, apterus, kapetus,* and *twelfus.*

The *garus* group has one species, *garus,* in which the spermatheca has a duct leading to an external opening on the apical genital appendage of segment IX (fig. 144). The males, however, do not have the micropores on sternum VII so the species is excluded from the *apterus* group.

The *progenitor* group. The unique basal genital sclerites of the female (figs. 330, 362, 369, 376) and the absence of setae on the parameres (figs. 334, 378, 384) of the aedeagus define the *progenitor* group, which has been called *Litozoon.* There are no external characters that will permit inclusion of all of the species and of both sexes. Most of the species have four labral denticles but so do nearly all other New World species. One species lacks labral denticles, another has six, but neither has other obvious features by which separation as a group is possible. A large group with 16 species can be segregated by using the midbasal groove of sternum VIII (fig. 451) and the midapical internal carina of sternum VII; both characters are found in the male only and there are no characteristics of the female that support the group. The males of 20 of the species lack a basal transverse carina on sternum VIII (fig. 451); however, *lirellus* has this carina but should be included in the *progenitor* group. Further, *simatus* and *avisoideus* also lack this carina but, using characters of the genitalia, should not be included in the *progenitor* group. The species included in this group are *progenitor, fenyesi, lirellus, falcatus, ramosus, raius, culebrus, ascus, nevermanni, sifrus, clinus, catillus, pandus, buganus, ha-*

mulus, maritimus, intermedius, somphus, patulus, nutatus, and *virgosus.*

The *cleofanus* group with *cleofanus* and *divisus* has a midlongitudinal carina on the submentum and a uniquely "segmented" aedeagus (figs. 168, 179). The females have two genital sclerites that apparently have no group specific features.

The following five "groups" each include one species which is segregated because it is not clearly related to any other group, and because it displays one or more notably modified external structures.

The *scoliodontus* group. One species, *scoliodontus,* has remarkably modified mandibles (figs. 547, 548) and labrum (fig. 541). The aedeagus is distinctive but no more so than most other species. The female is unknown.

The *avisoideus* group. The antenna of *avisoideus* has two yellowish white apical articles that contrast with the nearly black body and remaining antennomeres (fig. 1). The aedeagus has a distinct configuration (fig. 551) but neither other external characters nor the single genital appendage of the female offer anything else useful for separating this species or for including it in another group.

The *bobelus* group. The fourth segment of the antenna of *bobelus* is swollen and has a blunt protuberance (fig. 564). The female is unknown.

The *prolixus* group. The last segment of the antenna of *prolixus* is elongate and the external secondary sexual characteristics are distinct (figs. 568, 570, 571). The female is unknown.

The *plancus* group. *Gnathymenus plancus* has a flattened body and is the only species that lacks parameres (fig. 574).

All of the remaining "groups" are based on male aedeagal or secondary sexual characteristics. Five are groups with two or more species; the remaining nine represent mere segregations of single species that cannot be placed elsewhere and cannot be circumscribed as a group.

The *sparsus* group. The aedeagus of *sparsus* is significantly different from other species (figs. 482, 483); however, the females are hardly separable from other species of the subtribe and neither the male or female exhibit distinctive external features. The species was originally segregated as the genus *Lithocaon,* to which *fenyesi* was added later. This second species is clearly related to the *progenitor* group, where it is now included.

The *vogelsangi* group includes *vogelsangi* and *rufoniger,* and is based on similarity of the aedeagus; both have a heavily sclerotized hook and a semisclerotized apical portion (figs. 243, 247). There are no external features to support this group. *Gnathymenus vogelsangi* was originally in the monotypic genus *Xanthornobium* and *rufoniger* in *Gnathymenus.* The females are unknown.

The *geocus* group contains *geocus, kestrus, nacodus,* and *brerus,* which share similarities of the form of the aedeagus (figs. 289, 307, 308, 326). The seventh sternite of all the males has a median notch (figs. 303, 306, 318, 329). The females known for two species share nothing that particularly distinguish them as a group.

The *bicolor* group, with *bicolor* and *angulus,* has an aedeagal configuration in which the aedeagus, in lateral view, is sinuate with the very apical portion sharply bent dorsally (figs. 253, 257). Beyond that there are no special features.

The *klimai* group. Sternite VII of the males of the *klimai* group, which contains *klimai, zarzus,* and *radulus,* has a broad shallow emargination and a large median patch of setae (figs. 278, 282, 287). The aedeagus of each species has the ostium in the broadly hollowed apicoventral portion, and the parameres are long. The females are unknown. Until the present work *klimai* was included in *Dolicaon.*

The *limus* group includes *limus* and *mergus,* both of which have an oblique row of spiniform setae on each side of a median emargination of sternite VII of the male (figs. 268, 273). The aedeagus of each species is similar to one another (figs. 263, 269). The females are unknown.

Five more groups, all monotypic, are found among the species with males pos-

TABLE 1
Species Groups of the Dolicaonina of the New World

Species Group	Number of Species	Group Identified by: External Characters of Both Sexes	Female Genital Characters	External Secondary Sexual Characters of Male	Aedeagus	Available Generic Name
thyma	3	yes	—	—	yes	—
trunca	2	—	—	—	yes	—
reddelli	3	yes	—	—	—	*Stenopholea*
papola	1	probably[a]	—	—	yes	—
hadra	1	—	—	—	yes	—
edenus	1	yes	yes	—	yes	—
obesus	5	yes	yes	—	yes	*Macrognathymenus*
umbus	2	yes	yes	—	yes	—
apterus	9	—	yes	yes	—	*Gnathymenus*
garus	1	—	yes	—	yes	—
progenitor	21	—	yes	yes	yes	*Litozoon*
cleofanus	2	yes	—	yes	yes	—
scoliodontus	1	probably[a]	—	—	yes	—
avisoideus	1	yes	—	—	yes	—
bobelus	1	probably[a]	—	—	yes	—
prolixus	1	probably[a]	—	yes	yes	—
plancus	1	yes	—	—	yes	—
sparsus	1	—	—	—	yes	*Lithocaon*
vogelsangi[a]	2	—	—	—	yes	*Xanthornobium*
geocus	4	—	—	yes	yes	—
bicolor	2	—	—	—	yes	—
klimai[a]	3	—	—	yes	yes	—
limus[a]	2	—	—	yes	yes	—
simatus	1	—	—	yes	yes	—
gomphus[a]	1	—	—	yes	yes	—
spereus	1	—	—	yes	yes	—
tungus	1	—	—	yes	yes	—
siagonus[a]	1	—	—	yes	yes	—
speccus	1	—	—	—	yes	—
fiscus	1	—	—	—	yes	—
spirus	1	—	—	—	yes	—

[a] Female unknown.

sessing particularly distinct secondary sexual characteristics of the abdomen. These are *simatus, gomphus, spereus, tungus,* and *siagonus*. The aedeagi of *tungus* (fig. 511) and *siagonus* (fig. 537) are particularly divergent. These five species have no characters that permits combining them as a single group or including them in some other group.

Three more monotypic groups are required based solely on the aedeagus, because *speccus, fiscus,* and *spirus* cannot be placed in other groups and do not as a group share characters that also are not found in all other species. The females are identifiable only by association with the males.

Based on the species groups discussed in the preceding paragraphs there are many options for handling the general species-group classification of the 78 New World species. However, several are more reasonable than

the others, among which are recognition of one, two, three, or 31 genera. The following paragraphs describe these classifications and their consequences.

THIRTY-ONE GENERA: Generic recognition of each species group requires 31 genera including 18 that are monotypic (table 1). Twelve of the monotypic genera are based exclusively on structures of the male, that is, the aedeagus or secondary sexual characteristics of the abdomen or both, and the females are identifiable only by association with the male. Twelve genera are recognizable by external characters found in both sexes but seven of these are monotypic, two have three species, two have two species, and one has five. This means that only 22 of 78 species can be placed in genera using external characters; the remaining 56 species in 19 genera rely on sexual characters. The known females can be sorted to genus for only 15 genera. These 15 genera encompass 53 of the New World species; 21 of them are in one genus. Six of the 31 species groups already have generic names; these include *Stenopholea* for *reddelli, Macrognathymenus* for the *obesus* group, *Gnathymenus* for the *apterus* group, *Litozoon* for the *progenitor* group, *Lithocaon* for *sparsus,* and *Xanthornobium* for the *vogelsangi* group. Twenty-five new names would be required for 17 monotypic genera and for eight other genera with two to five species each.

ONE GENUS: A polyphyletic genus would result if all the New World species were combined as one genus because the 11 species with long slender parameres seem to be more closely related to Old World species than to the other New World ones (see Cladistic Analysis). This one New World genus would be recognizable only by the characters that define the Dolicaonina. The Old World and New World species are separated as groups because of geography, not anatomy.

TWO GENERA: The 11 species of the *thyma, trunca, reddelli, papola, hadra,* and *edenus* groups might be placed in one genus and the remaining 67 species in another. These two groups are based on aedeagal characters and the females can be identified to genus only by characters of the species groups or by association with the male. The larger genus is monophyletic and would be named *Gnathymenus.* The smaller genus would be called *Stenopholea* but is polyphyletic because it includes *edenus,* which seems to be a sister taxon of the Old World genera *Jarrigeus* or *Serrolabis,* whereas the other species are related to *Scotonomus* and *Leptobium* (see Cladistic Analysis).

THREE GENERA: To rid the classification of a polyphyletic group, *edenus* can be segregated as a monotypic genus that is based on male genitalic characters. In this case *Stenopholea* has 10 species, *Gnathymenus* still has 67, and *edenus* requires a new generic name. Each of the genera are recognized only by genitalic characters of the male.

In my opinion, the best classification for the Dolicaonina of the world would have only one genus with 45 or more species groups, at least 25 of which would be monotypic. The genus would be called *Dolicaon,* would have 236 species, and would be characterized by what are now the subtribal characters. By having only one genus the problem of a polyphyletic New World genus is eliminated and the recognition of New World genera by genitalic characters would be circumvented. However, it is difficult to justify putting all the Old World species back into one genus simply to have one monophyletic, easily identified taxon.

Any other combination of New World species into genera also forces recognition of genera that are not monophyletic. Only by recognizing each of the 31 species groups as a genus, or by dividing the New World species into three genera, or alternatively, by including the New and Old World species in one genus, can polyphyletic genera be avoided.

I am therefore compelled to recommend that three genera be recognized for the Dolicaonina of the New World. Since these genera are based on aedeagal characters, the females will be identifiable only by association with species groups or with males. However, the three groups are monophyletic. The names of these genera are: *Gnathymenus, Stenopholea,* and *Acaratopus.*

CLADISTIC ANALYSIS

I present a discussion of the relationships of the genera and New World species of Dolicaonina, despite the irresolution of many of the branching points, so that it is clear what hypotheses of relationships are proposed, how they are supported, and where further study is needed. Phylogenetic conclusions for the groups are hampered by the paucity of variation among species except in the aedeagus, the characters of which sometimes are difficult to homologize. The following character states support the relationships illustrated in the cladograms. The numbers in parentheses in the succeeding paragraphs correspond to the numbers on the cladograms (figs. 3–6) and in table 2. Illustrations of the apomorphic character states can be found by referring to table 2.

MAXILLARY PALPUS: Among the Paederinae the broad, compressed, pubescent, apically truncate fourth segment of the maxillary palpus is unique to the Dolicaonina and the Paederina (1, 2). Elsewhere in the Staphylinidae only the paederine genus *Stereocephalus* has a compressed fourth segment of the maxillary palpus. However, in *Stereocephalus* this segment is glabrous, heavily sclerotized, and lamina-like apically (Herman, 1979, figs. 22, 23). In the Dolicaonina and Paederina this more lightly sclerotized palpal segment is wide at the apex (fig. 9). The fourth segment of the maxillary palpus of the Cryptobiina is nipple-like and is unique to the subtribe (3).

EYES: Nearly 60 percent of the New World species have reduced eyes and three species of these lack them (4). Correlated with the reduced eyes are reduced elytra, metathorax, and flying wings, which may be absent or reduced to minute pads, and loss of the dermal fringe of tergum VII. These reductions have occurred many times in the New World Dolicaonina and similar reductions occur among the Old World species.

PROTIBIAL COMBS: Among the Staphylinidae protibial combs (5) are found only in the subfamilies Paederinae and Staphylininae; in the latter they occur only among the Xantholinini. All species of the Paederinae have these combs but they are variously modified. At the extremes, the tibia may be slender and the combs distributed in a few short transverse rows or the tibia may be broad with a wide, deep excavation containing many diagonally placed combs. These combs are used for grooming.

PROFEMORAL PROCESS: *Acaratopus* and the *reddelli* group of species of *Stenopholea* have a large, triangular process on the ventral edge of the profemur (6) that probably is an aid in grooming.

MESOSPIRACULAR PERITREME: In the Dolicaonina the mesothoracic spiracles are found in a large, medially fused sclerite (7) that, in the Old World species, is partly or completely separated from the furcasternum, separated from the prohypomeron, and weakly sclerotized (fig. 17), and, in the New World species, is fused to the furcasternum, separated or fused to the prohypomeron (8) and strongly sclerotized. Blackwelder (1939, p. 95, couplet 2) referred to this sclerite as "independent sclerotization . . . ." I believe that this sclerite is an enlargement of the mesothoracic spiracular peritreme because the spiracle is found within the sclerite. Among some other paederine genera the spiracle is surrounded by a variously enlarged sclerite that is separated from the furcasternum, prohypomeron, and from the other peritreme (fig. 15). Within the Paederinae the enlarged medially fused mesothoracic peritremes occur in the Dolicaonina and the subtribe Pinophilina. Blackwelder (1936, p. 68) stated that, in *Pinophilus,* the sternal lobe [furcasternum] is fused to the lateral lobes [prohypomeron], and that the mesospiracles "are incorporated into the posterior lobe of the prosternum . . ." (p. 69). I disagree and interpret this sclerite with two spiracles to be an enlarged mesospiracular peritreme similar to that in the Dolicaonina because it is separated from the furcasternum by a suture. Other genera of the Pinophilini do have the furcasternum enlarged and fused to the hypomeron.

TABLE 2
Relative Plesiomorphy and Apomorphy of Characters

	Plesiomorphic	Apomorphic
1	Fourth segment of maxillary palpus conical	Fourth segment of maxillary palpus compressed and apically truncate (figs. 7, 8, 9, 71, 72, 583)
2	Fourth segment of maxillary palpus glabrous	Fourth segment of maxillary palpus pubescent (figs. 8, 71)
3	Fourth segment of maxillary palpus gradually tapered to apex	Fourth segment of maxillary palpus nipple-like, suddenly constricted near apex (fig. 27)
4	Eyes present	Eyes absent (fig. 581)
5	Protibia without combs	Protibia with rows of combs (figs. 11, 593)
6	Profemur without process on ventral edge	Profemur with triangular process on ventral edge (figs. 593, 605, 616)
7	Mesospiracular peritremes small and separated (fig. 15)	Mesospiracular peritremes enlarged and medially fused (figs. 10, 17)
8	Medially fused mesospiracular peritremes separated from prohypomeron (fig. 17)	Medially fused mesospiracular peritreme fused to prohypomeron (fig. 584)
9	Integument without sculpturing	Integument with pebbled sculpturing
10	Integument without sculpturing	Integument with sculpturing in form of fingerprints (figs. 642, 643)
11	Abdominal sternite IV without gland	Abdominal sternite IV with one median gland (figs. 20–22, 24, 25, 134, 316)
12	Abdomen with parasclerites separated from tergum and sternite	Abdomen cylindrical, with parasclerites fused to tergum and sternite
13	Abdominal sternite VII of male unmodified	Midlongitudinal ridge covered with stout setae (figs. 147, 165)
14	Abdominal sternite VII of male unmodified	Median depression covered with stout setae (figs. 278, 282, 287)
15	Abdominal sternite VII of male unmodified	Abdominal sternite VII of male with oblique rows of spiniform setae on each side of median emargination (figs. 268, 273)
16	Abdominal sternite VII of male unmodified	Sternite VII with one or two patches of micropores (figs. 62, 102)
17	Abdominal sternite VII of male unmodified	Sternite VII of male with rounded lobe on posterior margin (figs. 81, 90, 102)
18	Abdominal sternite VII of male unmodified	Sternite VII with truncate lobe on posterior margin (figs. 62, 69)
19	Abdominal sternite VII of male unmodified	Sternite VII with median notch (figs. 303, 306, 318)
20	Abdominal sternite VII of male unmodified	Sternite VII with median glabrous spot surrounded by setae (figs. 332, 343, 347)
21	Abdominal sternite VII of male unmodified	Sternite VII with midlongitudinal, subapical, internal carina
22	Abdominal sternite VIII without midbasal groove	Abdominal sternite VIII with midbasal groove (figs. 358, 372)

TABLE 2—(*Continued*)

	Plesiomorphic	Apomorphic
23	Abdominal tergum IX of female separated on ventral surface for entire length	Abdominal tergum IX of female fused ventrally for nearly entire length (fig. 50)
24	Abdominal tergum IX of female separated on ventral surface for entire length	Abdominal tergum IX of female fused ventrally at base (fig. 225)
25	Abdominal sternite IX of male symmetrical or slightly asymmetrical	Abdominal sternite IX of male distinctly asymmetrical (figs. 196, 219)
26	Abdominal genital appendages of female separated medially	Abdominal genital appendages of female fused medially (figs. 29, 30, 34)
27	Basal genital appendage of female simple, broad, long	Basal genital appendage of female reduced to one or two irregularly shaped sclerites (figs. 330, 407, 443)
28	Median lobe without midapical process	Median lobe with midapical process (figs. 194, 199, 226)
29	Median lobe without posteriorly directed processes	Median lobe with posteriorly directed processes (figs. 226, 236)
30	Median lobe without special setae	Median lobe with row of setae on each side of midventral ridges (figs. 153, 161)
31	Median lobe without hooked process	Median lobe with hooked process (figs. 243, 247)
32	Median lobe without lightly sclerotized, flattened apical portion	Median lobe with apical portion flattened and lightly sclerotized (figs. 243, 247)
33	Aedeagus more or less straight in lateral view	Aedeagus sinuate in lateral view (figs. 253, 257)
34	Aedeagus with straight apex	Aedeagus with apex hooked (figs. 253, 257)
35	Median lobe not segmented	Median lobe segmented (figs. 168, 179)
36	Aedeagus with long slender parameres free for most of length from median lobe	Aedeagus with short, broad parameres appressed to base of median lobe (figs. 57, 308, 334, 472)
37	Parameres with setae	Parameres without setae (figs. 334, 472)
38	Aedeagus with pump spot on ventral or basal surface	Aedeagus without pump spot
39	Median lobe with basal piece	Median lobe without basal piece (figs. 19, 58, 188, 487)
40	Basal piece entire	Basal piece separated medially (figs. 18, 26, 40, 207)
41	Median lobe without sclerite adjacent to anterior margin of basal foramen	Median lobe with elongate sclerite adjacent to anterior margin of basal foramen (figs. 13, 18, 19, 26, 40, 607)
42	Basal foramen not surrounded by collar	Basal foramen surrounded by heavily sclerotized collar (figs. 14, 16, 58, 333, 544)
43	Aedeagus without flagellum	Aedeagus with long, slender flagellum (figs. 12, 13, 40, 42)
44	Ventral sclerite of median lobe flat, but curved and ornate or unmodified	Ventral sclerite of median lobe inflated, with space between dorsal and ventral surfaces (fig. 28)

TABLE 2—(*Continued*)

	Plesiomorphic	Apomorphic
45	Ventral sclerite of median lobe separated from dorsal portion of median lobe	Ventral sclerite of median lobe fused indistinguishably with dorsal portion of median lobe
46	Ventral sclerite of median lobe without appendage	Ventral sclerite of median lobe with appendage (figs. 14, 16)
47	Ostium large, as wide and high as width and height of median lobe	Ostium small to minute (figs. 58, 152, 188)
48	Ostium not at end of stalk	Ostium at end of stalk (figs. 200, 204, 228, 236)
49	Median lobe without ostial stalk	Median lobe with flattened ostial stalk (fig. 201)
50	Median lobe without ostial stalk	Median lobe with cylindrical ostial stalk (figs. 206, 228, 236)
51	Ostium not at end of cone	Ostium at end of cone (fig. 58)
52	Ostium not in depression	Ostium in ventroapical depression
53	Aedeagus without articulated ostial sclerite	Aedeagus with articulated ostial sclerite, sclerite (a) bladelike (figs. 619, 630), or (b) rodlike (figs. 657, 676)
54	Ostium open, without operculum	Ostium covered by operculum (fig. 23)
55	Apical genital sclerite of female without opening into spermathecal duct	Apical genital sclerite of female with opening into spermathecal duct (figs. 79, 103, 144, 149, 164)

Among the Staphylinidae, enlarged mesospiracular peritremes are also found in the Tachyporinae (Tachyporini), Staphylininae (some Quediini), Aleocharinae (Falagriini), Habrocerinae (*Nominocerus*), Proteininae (*Megarthrus, Metopsia*), and Trichophyinae (*Trichophya*) where they are separated medially.

INTEGUMENTAL SCULPTURING: Most Paederina and Dolicaonina have a polished integument. A few species have pebbled integumental sculpturing (9) but, most importantly, one group of species of *Stenopholea* has sculpturing with the appearance of a fingerprint (10), a feature that is unique.

ABDOMINAL GLANDS: Abdominal sternite IV has a median gland in the species of Paederina, Cryptobiina, and Dolicaonina (11). Size and other details vary but the median position does not.

Elsewhere in the subfamily, a gland associated with the fourth segment is found in at least some species of *Scopaeus, Scimbalium,* and *Sunesta.* In *Scimbalium* and *Sunesta* there is a patch of micropores near the anterior margin and in a species of *Scopaeus* there is a single median gland. The restricted distribution of this glandular system suggests that it is a derived feature.

ABDOMINAL PARATERGITES: Seven species of *Gnathymenus* have the abdominal paratergites of segments III to VII fused to the terga and sterna producing a cylindrical abdomen (12). If carefully examined a depression separating the paratergites from the terga and sterna can be seen.

Elsewhere in the family this type of abdomen may be found in most Osoriinae, some Steninae, some Tachyporinae (*Sepedophilus*), some Paederinae (Procirrina, some *Paederus,* Cylindroxystini), some Euaesthetinae (Stenaesthetini), and some Staphylininae (*Descarpentriesiellus,* see Jarrige, 1978).

ABDOMINAL STERNITES: The males of many species of *Gnathymenus* have distinct, often highly modified abdominal sternites. The eighth sternum of the male always has a deep, median incision. Sternite VII may have distinctive ridges (13), depressions (14), rows of setae (15), micropores (16) that are probably openings to microglands, rounded (17) or truncate (18) lobes or notches (19) of the posterior margin, or glabrous spots surrounded by setae (20). One large group of species has a midlongitudinal carina on the inner surface of the seventh sternite (21) that is often difficult to see. This same group of species has a small groove at the middle of the base of the eighth sternum (22). Other abdominal sternites of some species of *Gnathymenus* are also modified. The males of the Old World species and of *Acaratopus* and *Stenopholea* have only the incision of the eighth sternum, the other sternites are unmodified.

SEGMENT IX: Most species of Dolicaonina have the ventral edges of the ninth tergum separated medially for the entire length in both sexes. The females of *Acaratopus* have the ventral edges of tergum IX fused for most of the length (23). In a group of species of *Gnathymenus* the females have the ventral base of the ninth tergum fused (24). In *Scotonomus,* tergum IX is nearly divided by tergum X. Tergum IX of the female of *Acaratopus* and of many males and females of the Old World genera is divided medially.

The ninth sternum of the males of the Dolicaonina is slightly to strongly asymmetrical. In one group of species of *Gnathymenus,* this asymmetry is sufficiently distinctive to be useful for defining the group (25).

The genital appendages of the ninth segment of the females of the Dolicaonina are fused medially (26); this character is unique among the Paederinae. There may be one or two appendages, one of which is more distad and ventrad of the other. These appendages may be simple sclerites or may have a complex configuration. In the progenitor group of *Gnathymenus* the basal sclerite is reduced to one or two small, distinctive, irregularly shaped sclerites (27). I am unable to homologize with confidence the genital sclerites of the females of the Dolicaonina with the valvifers, coxites, and styli of other groups of staphylinids. It is possible that the apical appendage represents the fused coxites and the basal appendage the fused valvifers. The irregularly shaped basal sclerites of the *progenitor* group may be further modified and reduced valvifers. The presence of only one appendage may represent the loss of either the valvifers or the coxites.

AEDEAGUS: Most of the characters useful for deducing relationships in this subtribe are found in the aedeagus, but which also has many other potentially useful processes, lobes, hooks, and other unique modifications that I cannot homologize.

The species of one group in *Gnathymenus* have a small midapical process that is distinctive (28) and some of these species have posteriorly directed processes (29). Two other species of *Gnathymenus* have two rows of setae on the ventral surface (30). Other species have distinctive hooks (31), and part of the median lobe is flattened and weakly sclerotized (32). Another group of two species has a sinuate aedeagus (33) that has the apical portion hooked (34). Many species and groups of species have a distinctive aedeagal configuration. Two species of *Gnathymenus* have a unique, peculiar "segmented" aedeagus (35); the apical half extends posteriorly from within the basal section.

PARAMERES: All species (except *Gnathymenus plancus*) of the Dolicaonina possess parameres. In the Old World, the species have long, slender, setigerous, readily visible parameres. Among the species in the New World two types of parameres exist. One type, similar to the parameres of species in the Old World, is found in *Stenopholea* and *Acaratopus*. The other type is found in the species of *Gnathymenus* which have short, broad, flattened parameres that are closely appressed to the surface of the median lobe (36); setae are present in about two-thirds of the species (37).

To view these compressed parameres easily and reliably a compound microscope is required. They are so difficult to see that

Fagel (1958, p. 9) and Coiffait and Saiz (1968, p. 372) thought that there were no parameres in *Gnathymenus*.

PUMP SPOT: One group of species in *Gnathymenus* lacks the membranous pump spot on the aedeagus (38) that is found in all other species of the subtribe and in most other Paederinae. The pump spot may or may not have a median sclerite.

BASAL PIECE: An aedeagal basal piece is found in most Old World species of the Dolicaonina but in few of those in the New World (39). Species of *Dolicaon, Pinobius, Serrolabis,* and *Jarrigeus* have a complete U-shaped basal piece. Species of *Acaratopus, Stenopholea, Leptobium,* and *Afracus* have two small sclerites on each side of the basal foramen (40) which I interpret as remnants of a divided basal piece. *Gnathymenus* and *Scotonomus* lack the basal piece. I was unable to examine other Old World species and none of the published illustrations of the aedeagus of Old World species show the basal piece, even in those species that I know possess this structure. The presence of a basal piece is plesiomorphic but separation into two pieces is apomorphic.

In the Staphylinidae this U-shaped basal piece is now known in the Omaliinae, Piestinae, Pseudopsinae, Micropeplinae, and Paederinae (Dolicaonina and Cryptobiina). It is also found in the Silphidae.

BASAL FORAMEN: Near the anterior margin of the basal foramen a small, slender sclerite is present in a few dolicaonine genera (41). In three dolicaonine genera the basal foramen is surrounded by a collar that is constricted from the sides at the base (42).

AEDEAGAL FLAGELLUM: In four genera of Dolicaonina the aedeagus has a long, slender, tapered flagellum (43).

VENTRAL SCLERITE OF AEDEAGUS: The ventral aedeagal sclerite of a few genera is inflated and ornate (44). In *Gnathymenus* it has apparently fused indistinguishably to the remainder of the median lobe (45). In another group the sclerite has a long appendage (46).

OSTIUM: Except for *Jarrigeus* and *Serrolabis,* the ostium of the Old World species is apical or subapical and as large as the width and depth of the median lobe. In *Gnathymenus* the ostium is small to minute (47) and often difficult to view even with a compound microscope. A group of species in *Gnathymenus* has the ostium at the end of a stalk (48) that may be flattened (49) or cylindrical (50) and a few other species have it at the apex of a cone (51). In one group of three species of *Gnathymenus* the ostium is in a hollow on the ventroapical surface (52). The ostium may be apical, subapical, near the basal foramen or somewhere between, and may be on the dorsal, ventral, or lateral side.

ARTICULATED OSTIAL SCLERITE: The ostium is as wide and deep as the median lobe and faces posteriorly in *Stenopholea, Leptobium,* and *Scotonomus.* These species have a sclerite articulated to the dorsal edge of the ostium (53). The sclerite may be bladelike (53a) or rodlike (53b) or it may have a lobe on the ventral surface that acts as an ostial operculum (54).

SPERMATHECA: In the New World some species of the Dolicaonina have a sclerotized spermatheca. Among the females of *Dolicaon, Jarrigeus, Leptobium,* and *Scotonomus* examined, all had a sclerotized spermatheca. Among a few species of *Gnathymenus* the spermathecal duct leads from the spermathecal capsule to a hole in the apical genital appendage (55). This peculiarity seems to be unique to these species.

The subfamily Paederinae is defined by the presence of protibial combs (5). This apomorphic character state is found only in one other group, the Xantholinini (of the Staphylininae), which may be the sister group or tribe of the Paederinae. Other characters that have been used to define the Paederinae are either plesiomorphic (for example, the pattern of sculpturing of the abdominal intersegmental membrane) or not common to all members of the subfamily and are widespread in the Staphylinidae (for example, the reduced fourth segment of the maxillary palpus). The Xantholinini are defined by the unique anteprosternal sclerites; the reduced prohypomeron and prothorax that overlaps the base of the elytra support relationship of the Xantholinini to the Staphylininae. I know

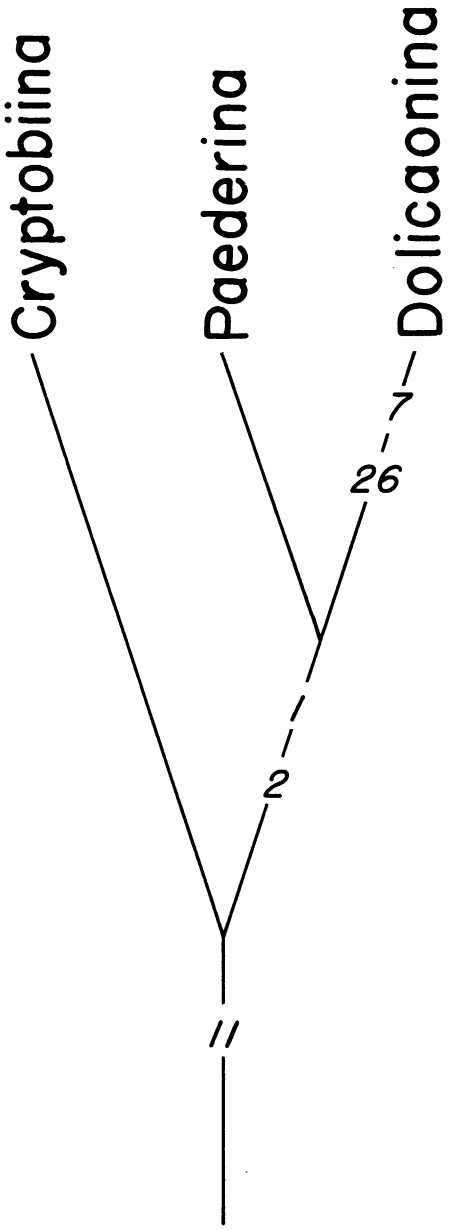


FIG. 3. Cladogram for three of the subtribes of the Paederinae. Numbers refer to characters in table 1.

of no other character present in, and unique to, the adults of the Paederinae that will separate the Paederinae from the Xantholinini. Resolution of this problem of relationships is beyond the scope of the present study but is discussed in a forthcoming analysis of the higher classification of the Paederinae.

The sister group of the subtribe Dolicaonina (fig. 3), which is defined by the large, medially fused, mesospiracular peritremal sclerites (7), and in the females, the medially fused genital appendages (26), is the subtribe Paederina. This relationship is supported by the shared possession of the compressed, pubescent, apically truncate fourth segment of the maxillary palpus (1, 2). Together, the Paederina and Dolicaonina form the sister group of the Cryptobiina because they all have a gland on the anterior margin of the abdominal sternite IV (11).

There are 17 genera described for the Dolicaonina; 14 are in the Old World and three in the New World. I have not examined specimens of seven Old World genera, namely *Afroscotonomus, Laavsnartius, Scotticus, Sudanus, Platydolicaon,* and *Liparopus* each with one species, and *Plathypodema* with two species. By using characters shown on the published illustrations, I can insert *Sudanus, Plathypodema, Platydolicaon,* and *Liparopus* into a cladogram. The published and/or illustrated characters for the other three genera are not adequate to suggest their relationships.

The cladogram (fig. 4) for the genera of the Dolicaonina begins with an unresolved polytomy of six branches. One clade, with *Dolicaon, Plathypodema,* and *Liparopus,* is supported by the inflated, ornate ventral sclerite of the aedeagus (44). *Platydolicaon* is included here because its species, like those of the other three genera, are large. The males of *Platydolicaon* are unknown but I suspect they have a similarly modified ventral sclerite of the aedeagus. The second clade, based on the presence of a sclerite basad of the basal foramen of the aedeagus (41), includes *Leptobium, Scotonomus, Stenopholea, Afracus, Serrolabis, Jarrigeus,* and *Acaratopus*. The *Jarrigeus* lineage with *Jarrigeus, Serrolabis, Acaratopus,* and *Sudanus* is based on the long flagellum (43) of the aedeagus. The flagellum of *Serrolabis* is enveloped basally by a membranous sac.

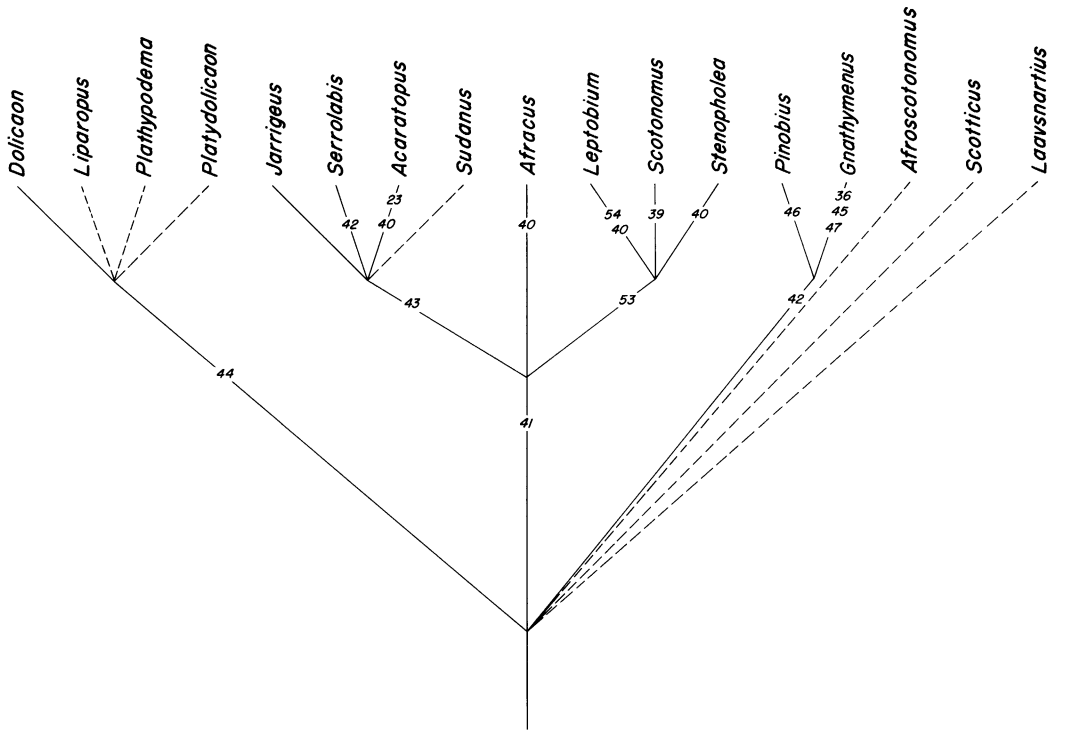


FIG. 4. Cladogram of the genera of the Dolicaonina. Numbers refer to characters in table 1. Broken lines refer to genera that I have not examined.

Acaratopus has a divided basal piece (40) and sternum IX of the female is fused ventrally (23), in contrast to the undivided basal piece and the ventrally divided ninth tergum of *Serrolabis* and *Jarrigeus*. *Serrolabis* has a collar surrounding the basal foramen (42), a feature that parallels that in *Pinobius* and *Gnathymenus*. *Jarrigeus* and *Serrolabis* are both African; *Acaratopus* is from Mexico. *Sudanus* may belong in the *Jarrigeus* clade. The labrum of *Sudanus wagneri* may have six labral denticles (Scheerpeltz, 1962, fig. 2) as does *Serrolabis* and the aedeagus may have a short flagellum (Scheerpeltz, 1962, fig. 3) or one that has been broken off. The *Leptobium* lineage is founded on the presence of an articulated ostial sclerite (53). In *Leptobium* this sclerite has the ventrobasal portion modified to form an operculum (54) that covers the ostium. *Scotonomus* has a broad flattened articulated sclerite and no operculum. *Stenopholea*, with a long, slender rodlike (53b) or bladelike (53a) articulated sclerite, also lacks an operculum. The basal piece in *Leptobium* and *Stenopholea* is divided but is absent in *Scotonomus* (39). *Leptobium* and *Scotonomus* are both from the Mediterranean region and *Stenopholea* is from Mexico, Brazil, and Ecuador. *Afracus* is a branch of an unresolved trichotomy.

The third clade includes *Pinobius* and *Gnathymenus* because both have a collar surrounding the basal foramen that is compressed at the juncture of the collar and the median lobe (42). *Pinobius* is known from the African, Oriental, and Australian regions. This genus may be defined by the appendiculate ventral sclerite (46) of the aedeagus and the long, spiniform hooks at the aedeagal ostium. *Gnathymenus* is found throughout the Neotropical region and is defined by the short, compressed parameres,

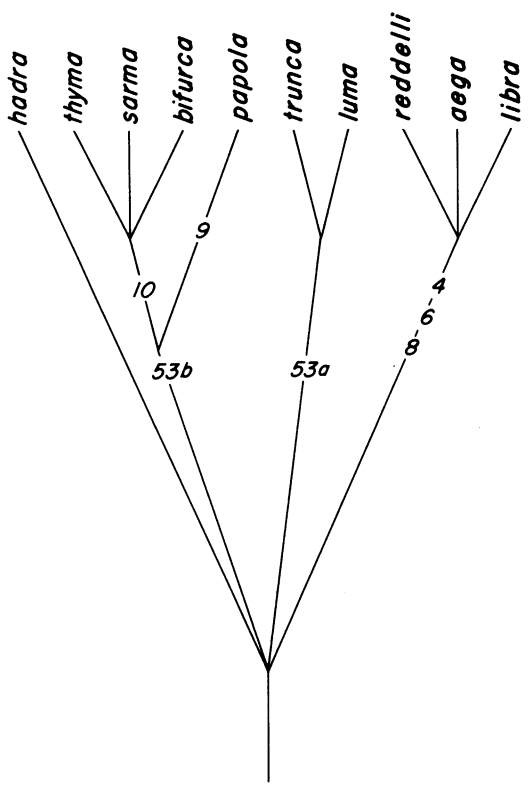


FIG. 5. Cladogram of the species of *Stenopholea*. Numbers refer to characters in table 1.

that are appressed to the median lobe (36), the small ostium (47), and the fusion of the ventral sclerite to the dorsal sclerite of the median lobe (45). *Serrolabis* also has a collar surrounding the basal foramen (42) but the presence of a flagellum seems to suggest relationship to *Jarrigeus*.

Stenopholea begins with an unresolved tetratomy (fig. 5). One lineage has only *hadra* and another has *trunca* and *luma* defined by the bladelike articulated ostial sclerite (53a). A third branch, with *reddelli, aega,* and *libra,* is based on the presence of a profemoral process (6), the fusion of the mesospiracular peritreme to the hypomeron (8), and the loss of eyes (4). These three species form an unsolved trichotomy. In contrast to *aega* and *libra, Stenopholea reddelli* has integumental sculpturing and is known only by the female, whereas both sexes are known for *aega* and *libra* and the integument is polished.

The clade embracing *thyma, sarma, bifurca,* and *papola* is defined by the rodlike (53b) articulated ostial sclerite. *Stenopholea papola* has pebbled ground sculpturing (9) and the other three species have integumental sculpturing that looks like the lines of a fingerprint (10). *Stenopholea thyma, sarma,* and *bifurca* form an unresolved trichotomy. *Stenopholea sarma* and *bifurca* have similar, complex genital appendages in the female and *sarma* has a lightly sclerotized articulated sclerite.

Gnathymenus begins with an unresolved polytomy of 21 branches (fig. 6). Eight branches include 54 species, 13 branches are single species of indeterminate relationships.

The first of the eight groups includes *cleofanus, divisus, speccus, flatrus, obesus, hyllus, twapicus,* and *pipus* and is defined by the absence of the pump spot of the aedeagus (38). This group has three branches, one with *speccus* from Colombia and another, with the Colombian species *cleofanus* and *divisus,* that is defined by the "segmented" aedeagus (35). The third clade includes the Chilean species *flatrus, obesus, hyllus, twapicus,* and *pipus* and is supported by the cylindrical abdomen (12), the fusion of the ventral base of sternite IX of the female (24), the presence of a midapical process on the aedeagus (28), and the strongly and characteristically asymmetrical ninth sternum of the male (25). One of the species, *obesus,* was segregated as the genus *Macrognathymenus. Gnathymenus flatrus* is the sister species of *obesus, hyllus, twapicus,* and *pipus,* a group based on the presence of the ostium at the end of a stalk (48). *Gnathymenus hyllus* and *twapicus* are sister species based on the presence of the posteriorly directed processes of the aedeagus (29) and together with *pipus,* each of which have a cylindrical ostial stalk (50), form the sister group of *obesus,* which has a flattened ostial stalk (49).

The second major clade in *Gnathymenus* includes *umbus, setosus, garus, proximus, testaceus, distinctus, detectus, twelfus, stub-*

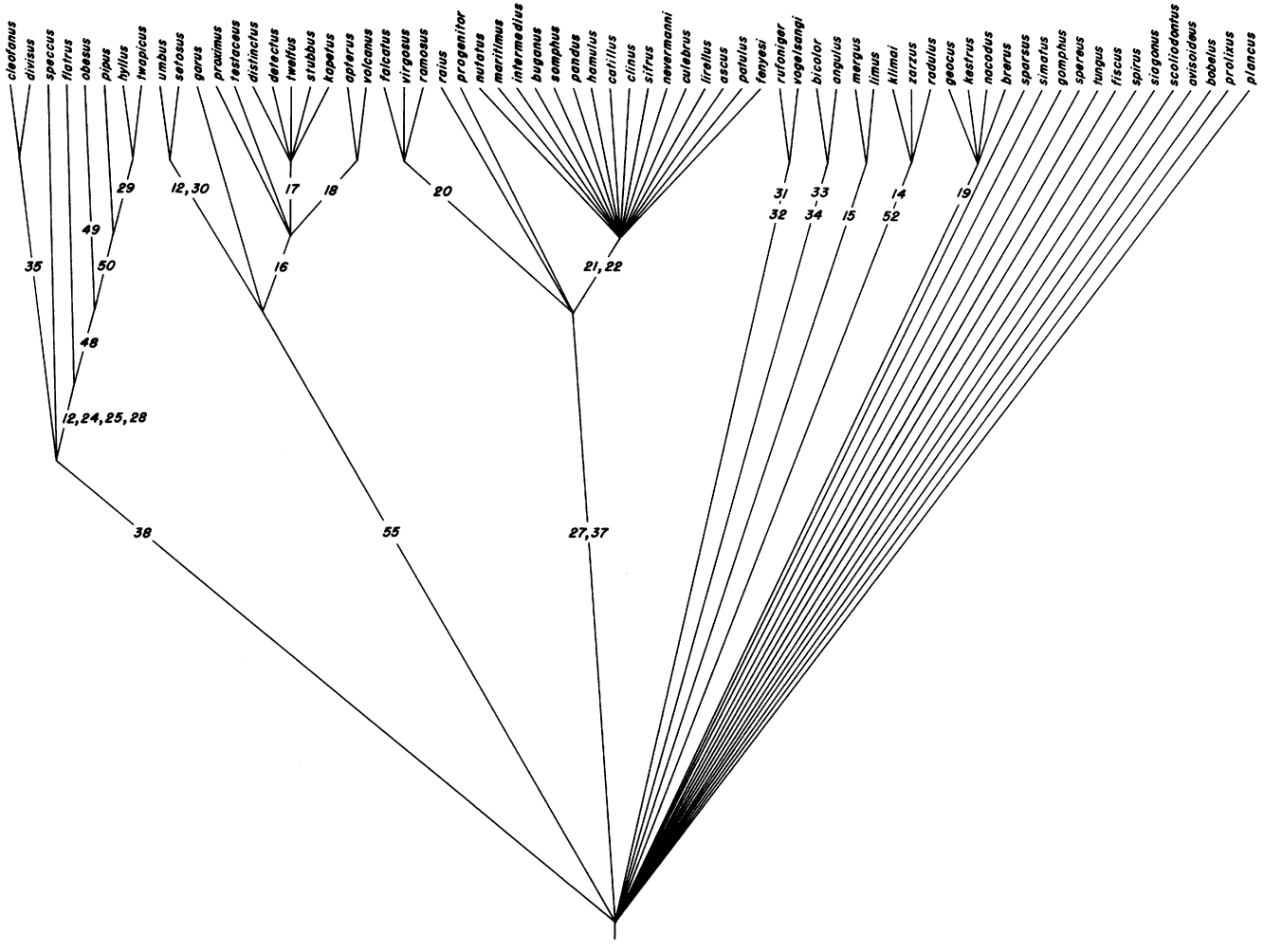
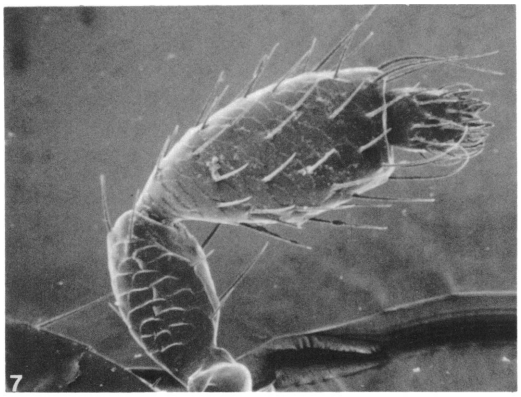
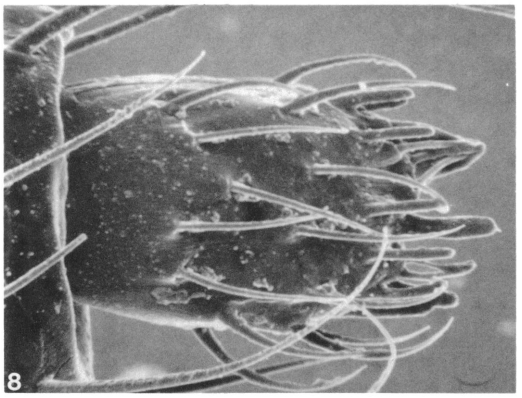
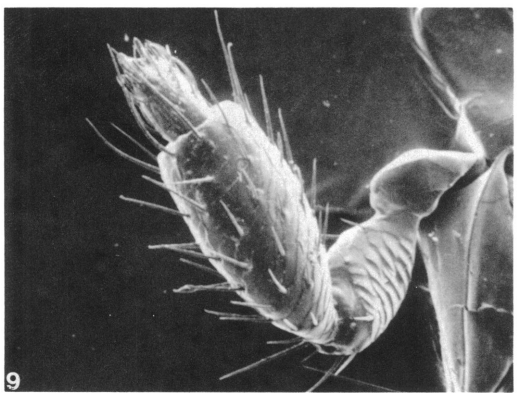
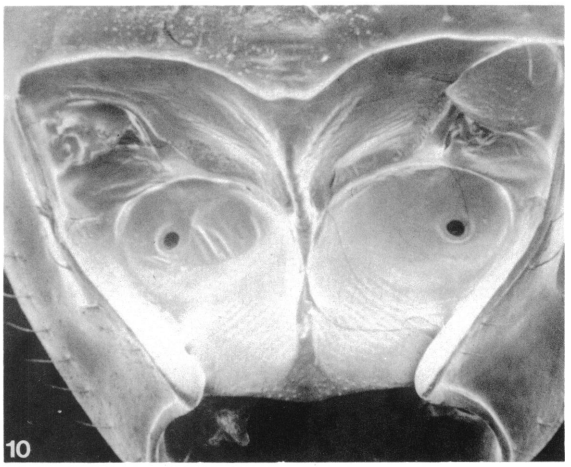


FIG. 6. Cladogram of the species of *Gnathymenus*. Numbers refer to characters in table 1.









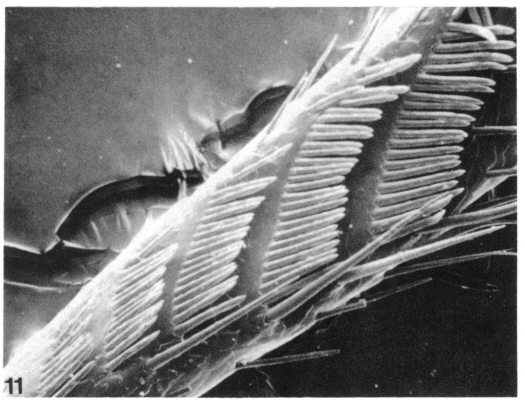
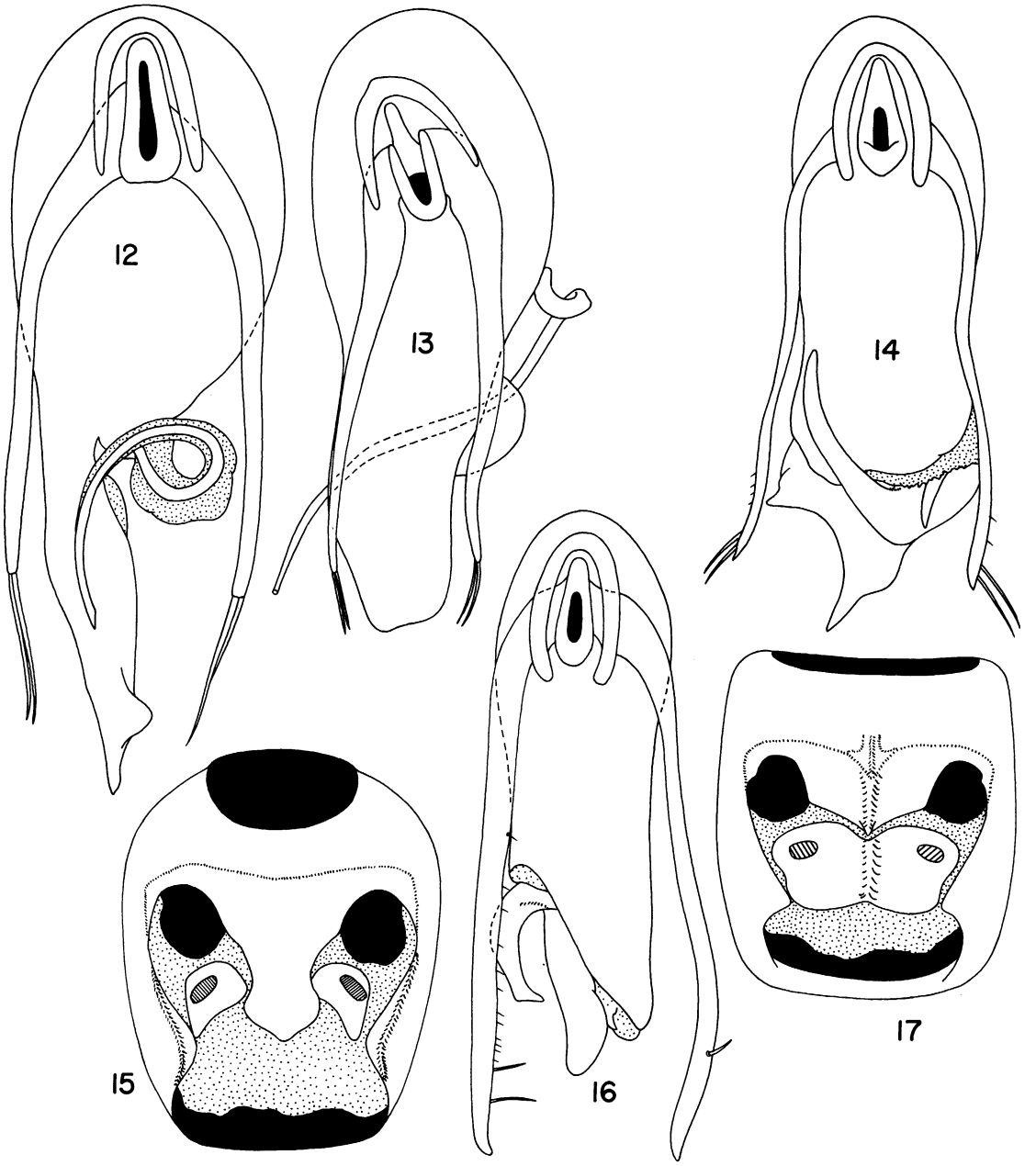


FIG. 7–9. *Stenopholea thyma*. Maxillary palpus. 7. Ventral view, 333×. 8. Fourth segment, 1332×. 9. Lateral view, 333×.

FIGS. 10, 11. *Gnathymenus kapetus*. 10. Prothorax, ventral view showing mesospiracular peritremes and mesospiracle, 130×. 11. Protibia, 333×.

bus, kapetus, apterus, and *volcanus,* because the females have an opening on the apical genital sclerite that leads to the spermatheca (55). *Gnathymenus umbus* and *setosus,* from Brazil, are sister species because they have a cylindrical abdomen (12) and two rows of setae on the ventral surface of the aedeagus (30). These two species are part of



FIGS. 12–17. Dolicaonina and Paederina. 12. *Serrolabis sulcicollis,* aedeagus, dorsal view. 13. *Jarrigeus devroeyi,* aedeagus, dorsal view. 14. *Pinobius* sp., aedeagus, dorsal view. 15. *Paederus* sp., prothorax, ventral view. 16. *Pinobius* sp., aedeagus, dorsal view. 17. *Leptobium densiventris,* prothorax, ventral view.

an unresolved trichotomy that includes *garus* from Colombia, as second branch, and all of the remaining species in the third. This third branch includes species that are all

from Chile and that is based on the presence of one or two patches of micropores on the central portion of sternite VII of the males (16). *G. apterus* and *volcanus* are sister species based on the truncate lobe of the posterior margin of sternite VII (18) and the similar configuration of the aedeagus. *Gnathymenus distinctus, detectus, twelfus, stubbus,* and *kapetus* all have a rounded lobe on the margin of sternite VII (17). Together with *proximus* and *testaceus,* the *apterus* clade and *distinctus* clade make up an unresolved tetratomy.

The next clade includes 21 species from Mexico, Costa Rica, and Panama and is supported by the modification of the basal genital appendages of the females into one or two variously shaped sclerites (27) and by the absence of setae on the parameres (37). The unresolved basal tetratomy consists of one branch with the Panamanian *raius,* a second branch with *progenitor* (known only by the male), a third branch with three species, and a fourth branch with 16 species. The third branch is supported by the presence of a glabrous spot surrounded by setae on sternites VI and VII of the male (20) and includes, in an unresolved trichotomy, the Costa Rican *virgosus* and the Panamanian *falcatus* and *ramosus*. The fourth clade with a cluster of 16 species is based on the presence, in the males, of a midapical internal carina on sternite VII (21), and a midbasal groove on sternum VIII (22). Two of the 16 species are from Mexico, eight from Costa Rica, and six from Panama.

Gnathymenus rufoniger and *vogelsangi,* from Venezuela, have the lightly sclerotized apical portion of the aedeagus flattened (32) and have a hook on the median lobe (31).

Gnathymenus geocus, kestrus, nacodus, and *brerus* have a median notch in sternite VII (19) and the form of the aedeagus is similar. *Gnathymenus brerus* is from Colombia; the others are from Ecuador. The aedeagi of the three species from Ecuador are more similar to one another than any one of them is to the aedeagus of *brerus*.

Gnathymenus bicolor and *angulus* have an aedeagus that is sinuate in lateral view (33) and has an apical hook (34). *Gnathymenus angulus* is from Ecuador and *bicolor* is from Bolivia.

Gnathymenus klimai, zarzus, and *radulus,* all from Brazil, have the ostium in a hollow of the ventral surface of the aedeagus (52), and the males have a patch of thick setae in a broad depression of sternite VII (14).

Gnathymenus limus and *mergus,* both from Colombia, have an oblique row of spiniform setae on each side of a broad median emargination of sternite VII in the male (15).

All of the remaining branches have one species, each of which has a distinctive aedeagus. *Gnathymenus bobelus* (fig. 564), *prolixus,* and *avisoideus* (fig. 1) have modified antennomeres, the labrum and mandibles of *scoliodontus* (figs. 541, 547, 548) are unique in the subtribe and the body of *plancus* is flattened.

DOLICAONINA

Figures 1–14, 16–19, 22–26, 28–689

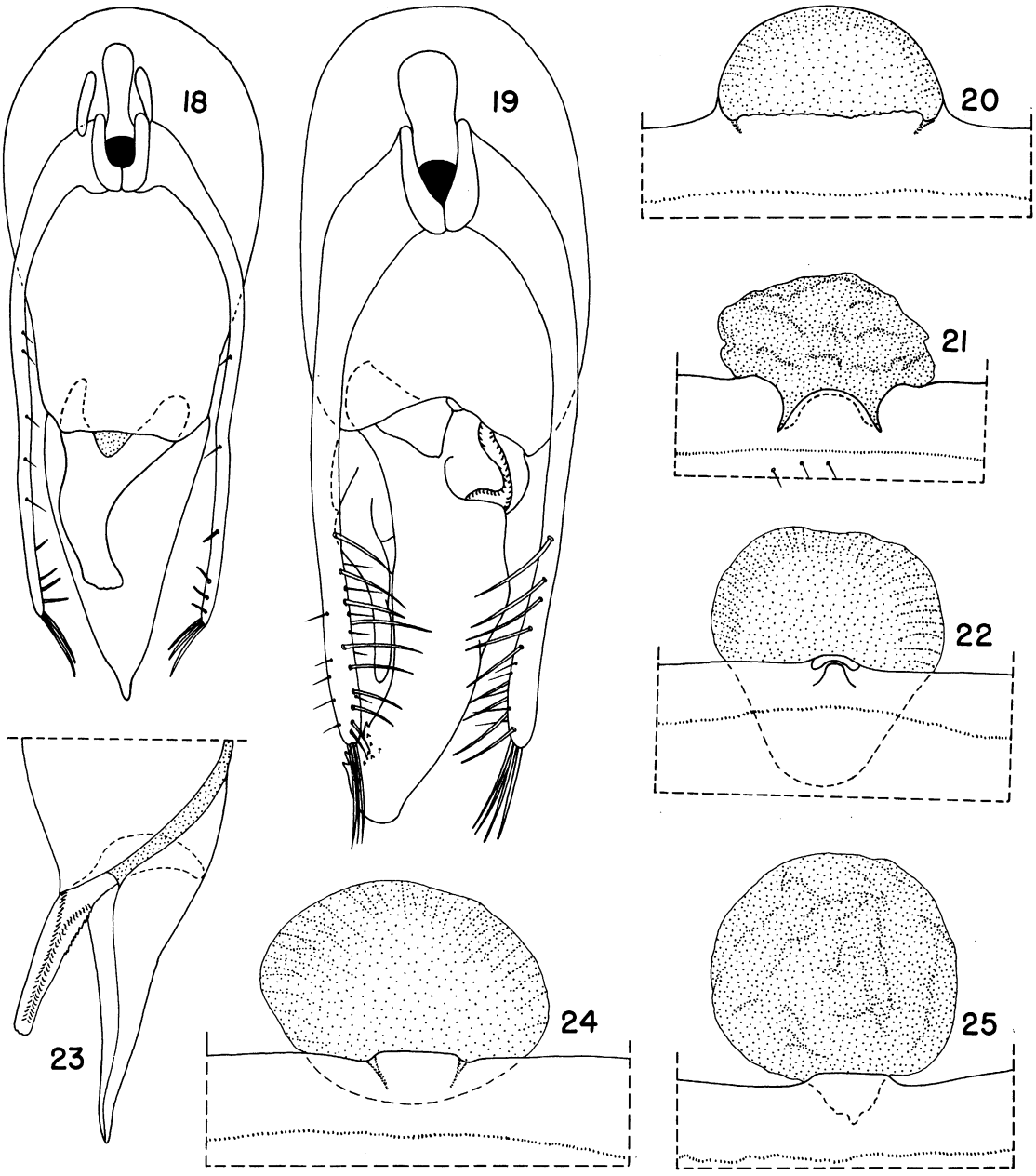
Dolicaonina Casey, 1905, pp. 20, 56–58.
Dolicaoni Blackwelder, 1944, p. 126.
Dolicai Fagel, 1958, pp. 10, 11. Herman, 1969, p. 7.

DIAGNOSIS: The members of this subtribe are recognized by the broad, compressed, truncate, pubescent fourth segment of the maxillary palpus (figs. 7–9, 71, 72, 583), and the enlarged, medially fused mesothoracic spiracular peritremes (figs. 10, 17, 137, 584).

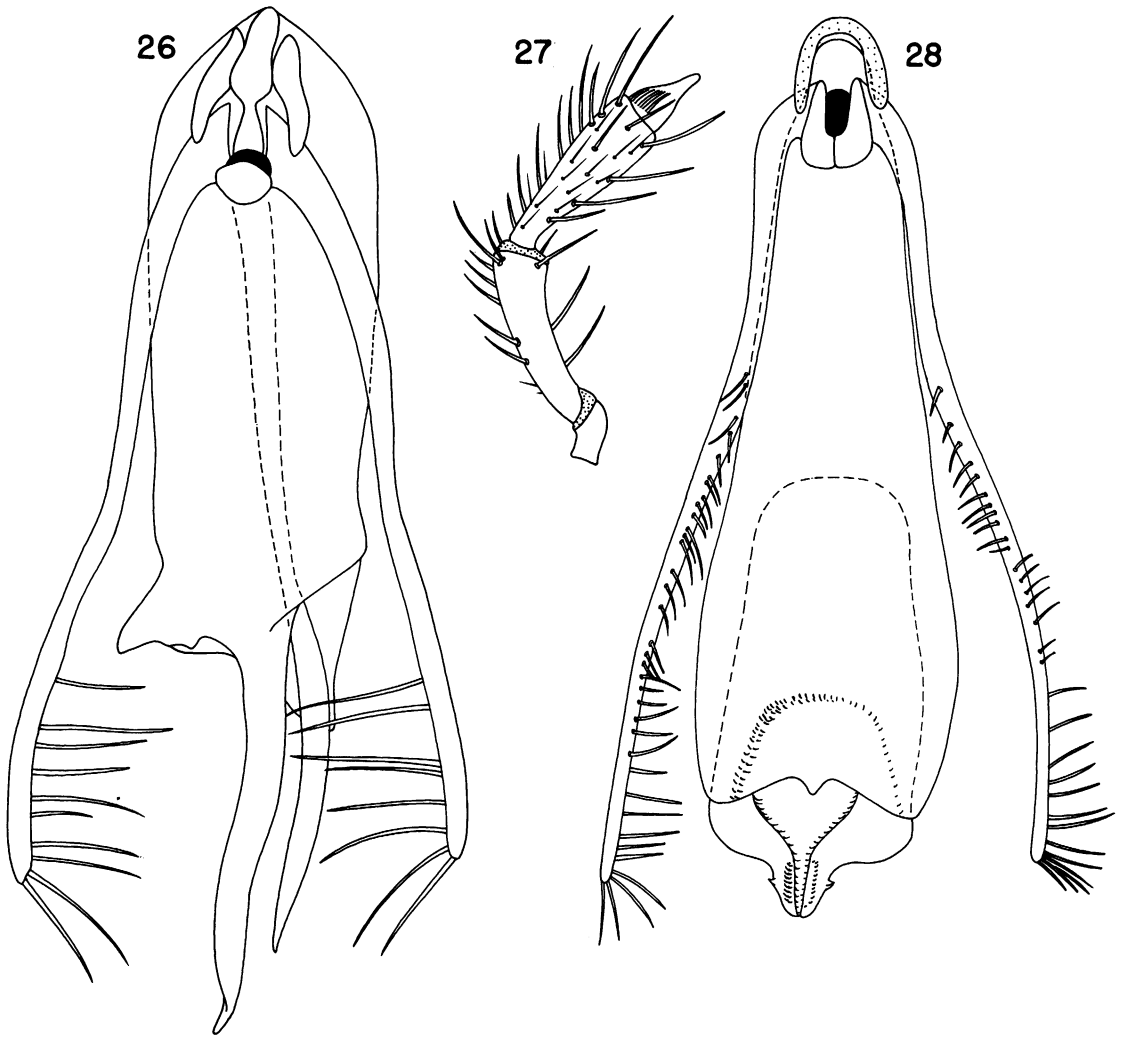
DESCRIPTION: Length 2.0 to 24.8 mm. Body subcylindrical to cylindrical, elongate, slender to moderately broad, and without trichobothria.

Head with distinct broadly rounded basal angles (fig. 1). Labrum denticulate and with moderately deep median emargination (fig. 413). Mandibles denticulate. Maxillary palpus (figs. 7–9) with fourth segment broad, compressed, apically truncate, and pubescent. First antennomeres not geniculate. Gular sutures separated for entire length and most approximate near middle. Neck width more than half as wide as width of head; ventral surface with triangular elevation.

Pronotum longer than wide. Furcasternum



FIGS. 18–25. Dolicaonina, Paederina, Cryptobiina. 18. *Leptobium gracilis*, aedeagus, dorsal view. 19. *Scotonomus solarii*, aedeagus, dorsal view. 20. *Homaeotarsus bicolor*, sternite IV, median portion of anterior margin showing gland. 21. *Paederus* sp., sternite IV, median portion of anterior margin to show gland. 22. *Jarrigeus devroeyi*, sternite IV, median portion of anterior margin to show gland. 23. *Leptobium gracilis*, aedeagus, lateral view of apical portion. 24. *Leptobium sparsum*, sternite IV, median portion of anterior margin to show gland. 25. *Scotonomus* sp., sternite IV, median portion of anterior margin to show gland.



FIGS. 26–28. Dolicaonina and Cryptobiina. 26. *Afracus laevicollis*, aedeagus, dorsal view. 27. *Ochthephilum* sp., maxillary palpus, ventral view. 28. *Dolicaon* nr. *sosia*, aedeagus, dorsal view.

short and with midlongitudinal carina (figs. 10, 137). Mesothoracic spiracular peritremes enlarged, fused medially, moderately strongly to strongly sclerotized, anteriorly fused to (figs. 10, 137) or separated from furcasternum (fig. 17) and laterally fused to (figs. 10, 584) or separated (fig. 688) from hypomeron. Mesospiracle moderately large to small. Elytra epipleural ridge absent. Protarsus with basal four articles expanded. Fourth mesotarsomere and metatarsomere not bilobed. Metatibia with ctenidium on both sides of apex.

Abdominal segments III to VII with or without laterotergites. Sternite IV with external opening of gland (figs. 22, 24, 25, 134, 316, 686) at middle of anterior margin. Sternite VIII of male with median incision (figs. 63, 599). Tergum IX separated midlongitudinally on dorsal portion of base (fig. 32) or

fused (figs. 221, 421, 507, 534, 673). Tergum X not covered by tergum IX (figs. 233, 449, 653).

Aedeagus usually with parameres (figs. 13, 14, 54, 57); absent in one species (fig. 574). Parameres long, slender, and separated for most of their length from median lobe (figs. 13, 43) or short, flattened, and appressed to base of median lobe (fig. 57). Basal piece present (figs. 12, 40) or absent (figs. 19, 124); if present, then entire (figs. 12–14) or medially separated (figs. 18, 26, 40). Ostium large or small.

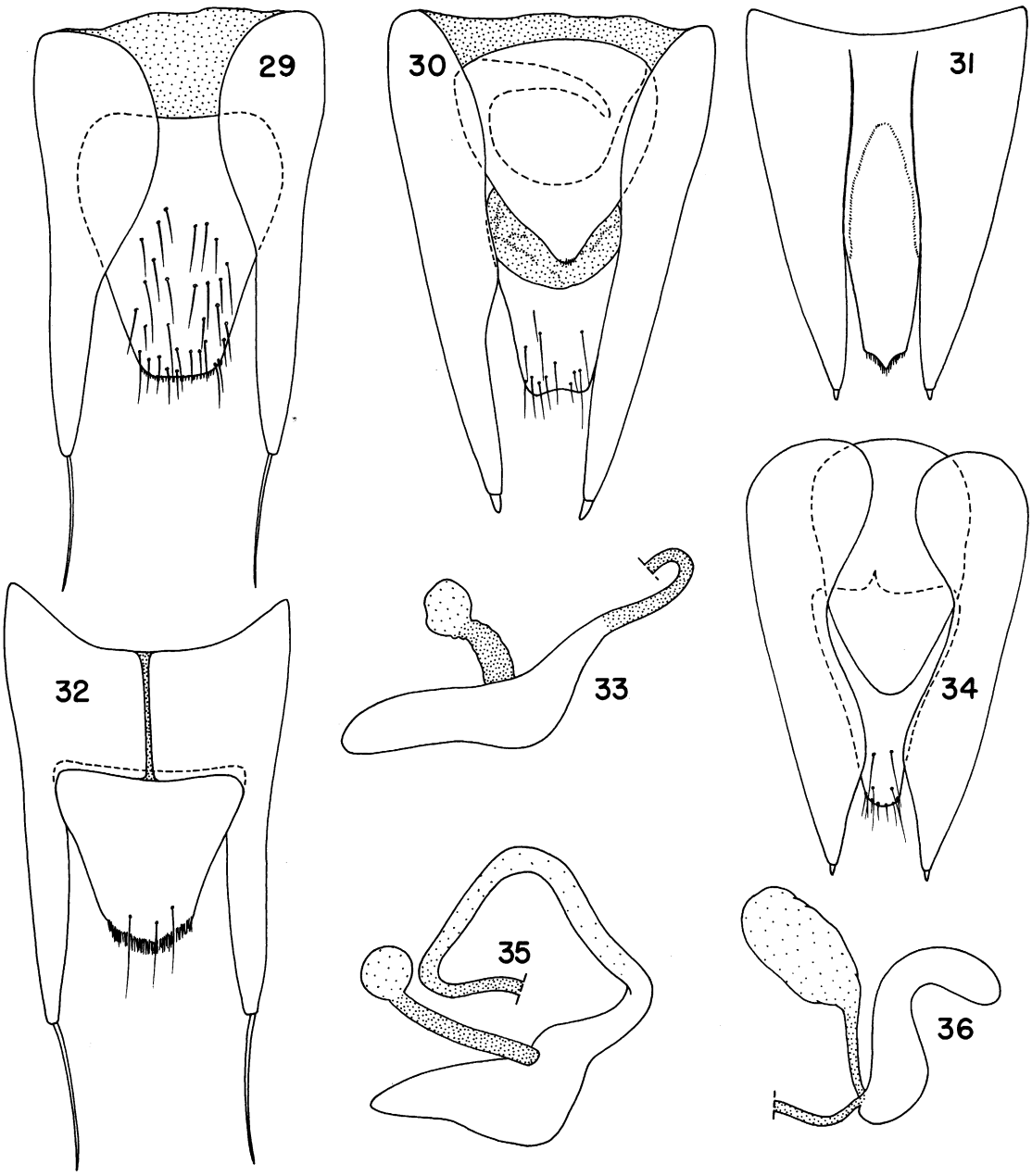
Female genital appendages midlongitudinally fused (figs. 29, 30, 34, 330).

DISCUSSION: The Old World species of the Dolicaonina are small to large (3.2 to 24.8 mm). *Scotonomus*, the Mediterranean region genus, at 3.2 to 51 mm., is similar in size to the New World species. The Old World species all have long, slender parameres, and, except for *Scotonomus* (fig. 19), have the aedeagal basal piece (figs. 12–14), which is a U-shaped sclerite in all but *Afracus* (fig. 26) and *Leptobium* (fig. 18), in which it is medially divided. Most or possibly all the Old World species have a sclerotized spermatheca (figs. 33, 35, 36). The middorsal division of tergum IX (fig. 32) of the male and female is found in some Old World genera. Only *Scotonomus* has conspicuously reduced eyes; the others have large eyes. None lack eyes. The mesothoracic spiracular peritreme is weakly sclerotized and unattached (fig. 17) or partially fused to the furcasternum.

By contrast the New World species are small (2.0 to 6.2 mm.), do not have a U-shaped aedeagal basal piece (figs. 40, 58, 607) and never have tergum IX divided middorsally in the males (fig. 176); in the females it is divided only in *Acaratopus* (fig. 49). The mesothoracic spiracular peritreme is fused to the furcasternum and is strongly sclerotized (fig. 10). The eyes of many species are reduced and four species lack eyes. The reduction of the eyes and elytra are correlated in the New World species. Many of the females do not have a sclerotized spermatheca and most of the males have short, compressed parameres that are appressed to the median lobe and difficult to see (figs. 57, 550).

KEY TO THE GENERA AND SPECIES OF THE DOLICAONINA OF THE NEW WORLD

1. Abdominal segments III to VI apparently without laterotergites, or with one pair of feebly separated laterotergites per segment 2
   Abdominal segments III to VI each with two pairs of laterotergites (fig. 1) 12
2(1). Sternum VIII with median incision (figs. 63, 484) . . . (males) 3
   Sternum VIII without median incision, margin broadly rounded . . . (females) 9
3(2). Sternum VII with median, longitudinal patch of short, thick setae (figs. 147, 165); posterior margin of sternum VII with shallowly emarginate median lobe (figs. 147, 165); aedeagus with row of laterally directed setae on apical third of median lobe (figs. 153, 161) 4
   Sternum VII without distinctive patch of setae described above (figs. 198, 241); posterior margin of sternum VII broadly, sinuously, and shallowly emarginate (figs. 198, 241); aedeagus without setae on median lobe (figs. 194, 199, 203, 236) 5
4(3). Aedeagus with 9 setae on each side of midventral ridge (figs. 160, 161); median lobe strongly constricted just basad of setose apical portion (fig. 160); Brazil ..... 13. *Gnathymenus setosus*
   Aedeagus with 14 or 16 setae on each side of midventral ridge (figs. 152, 153); median lobe weakly constricted just basad of setose apical portion (fig. 152); Brazil ..... 12. *Gnathymenus umbus*
5(3). Aedeagus with ostial stalk (figs. 201, 207, 237) or ostial cone (figs. 226, 227) on apical half of median lobe; abdominal color variable 6
   Aedeagus without ostial stalk on apical half of median lobe (figs. 194, 195); abdomen concolorous black; Chile ..... 17. *Gnathymenus flatrus*



FIGS. 29–36. Dolicaonina, females. 29. *Leptobium biguttulum*, segment IX, ventral view. 30. *Jarrigeus devroeyi*, segment IX, ventral view. 31. *Scotonomus* sp., segments IX and X, dorsal view. 32. *Leptobium biguttulum*, segments IX and X, dorsal view. 33. *Jarrigeus devroeyi*, spermatheca. 34. *Scotonomus* sp., segment IX, ventral view. 35. *Leptobium biguttulum*, spermatheca. 36. *Scotonomus* sp., spermatheca.

6(5). Aedeagus with broad, anteroposteriorly flattened ostial stalk (figs. 199, 201); apex of median lobe with three processes (figs. 199, 200); Chile ..... 18. *Gnathymenus obesus*

Aedeagus with cylindrical ostial cone or ostial stalk (figs. 207, 227, 237); apex of median lobe with one median process (figs. 203, 226, 234); Chile 7

7(6). Aedeagus with low, broad ostial cone (figs. 226, 227); Chile ..... 20. *Gnathymenus hyllus*

Aedeagus with long, slender ostial stalk (figs. 210, 237); Chile 8

8(7). Aedeagus with one pair of posterolaterally directed processes laterad of ostial stalk (fig. 236); median lobe in dorsal view with lateral margins gradually and sinuously divergent from near base apically toward ostial stalk (figs. 234, 236); abdomen bicolored black with segments VIII to X yellowish; Chile ..... 21. *Gnathymenus twapicus*

Aedeagus with two pairs of processes near ostial stalk (figs. 206, 210); median lobe in dorsal view with lateral margins swollen or parallel at middle (figs. 203–206); abdomen concolorous black; Chile ..... 19. *Gnathymenus pipus*

9(2). Tergum VIII broadly and shallowly emarginate, with or without median process (figs. 223, 230) 11

Tergum VIII with median U-shaped emargination (figs. 155, 158) 10

10(9). Tergum IX with dorsum fused midlongitudinally; external opening of spermatheca on basal half of apical genital sclerite (fig. 149); Brazil ..... 12. *Gnathymenus umbus*

Tergum IX with dorsum divided midlongitudinally; external opening of spermatheca on apical half of apical genital sclerite (fig. 164); Brazil ..... 13. *Gnathymenus setosus*

11(10). Abdomen concolorous black; Chile ..... 19. *Gnathymenus pipus*

Abdomen bicolored black with segments VIII to X yellowish; Chile ... 21. *Gnathymenus twapicus*, 20. *Gnathymenus hyllus*, 18. *Gnathymenus obesus*

12(1). Antennomere 4 enlarged and with blunt medially directed process (fig. 564); Brazil ..... 66. *Gnathymenus bobelus*

Antennomere 4 unmodified 13

13(12). Sternum VIII with median incision (figs. 63, 197, 336, 484) ... (males) ..... 14[1]

Sternum VIII with posterior margin entire, without median incision ... (females) ..... 81[2]

14(13). Aedeagus strongly expanded apically, with three acute processes on apex (fig. 119); ostium surrounded by setae (fig. 120); Chile ..... 9. *Gnathymenus testaceus*

Aedeagus and ostium not as described and illustrated above 15

15(14). Aedeagus long and slender, with short hooked process extending dorsally and laterally on right side (figs. 242, 243); Venezuela ..... 22. *Gnathymenus vogelsangi*

Aedeagus not as described and illustrated above 16

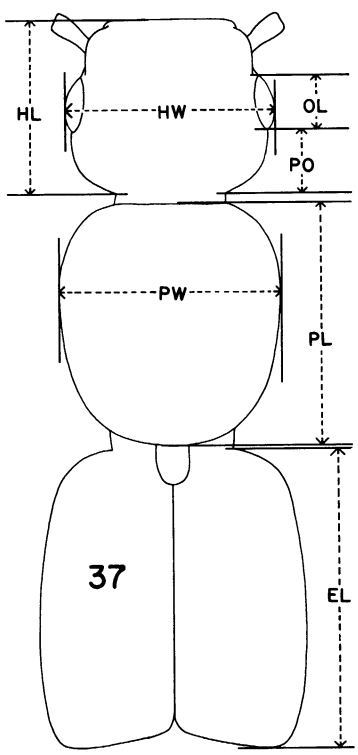
16(15). Sternum VIII with median incision shorter than two times basal length of segment as measured from base of incision to middle of basal margin of segment (figs. 39, 484, 599) 17

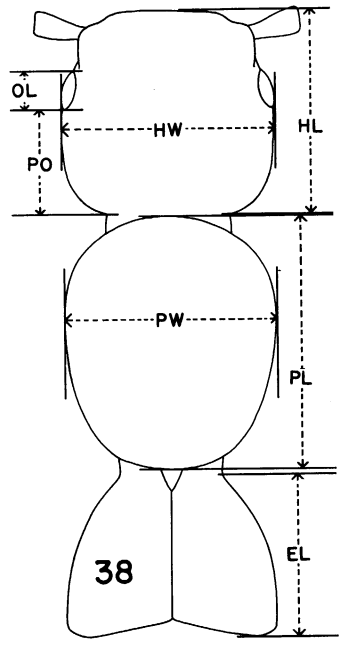
Sternum VIII with median incision two times or more longer than basal length of segment as measured from base of incision to middle of basal margin of segment (figs. 63, 336, 516) 28

17(16). Elytra (EL) longer (fig. 37) than pronotum (PL); tergum VII with dermal fringe on posterior margin; parameres of aedeagus long, slender and separated from median lobe for most of length (fig. 40, 619), or short, flat, broad, and appressed to median lobe (fig. 483), or absent (fig. 574) 18

[1] Males are unknown for *Gnathymenus progenitor* and *Stenopholea reddelli*.

[2] Females are unknown for *Gnathymenus bicolor, G. brerus, G. buganus, G. detectus, G. distinctus, G. flatrus, G. gomphus, G. kestrus, G. klimai, G. limus, G. mergus, G. nutatus, G. pandus, G. patulus, G. plancus, G. prolixus, G. radulus, G. rufoniger, G. scoliodontus, G. siagonus, G. stubbus, G. testaceus, G. virgosus, G. vogelsangi, G. volcanus, G. zarzus,* and *Stenopholea papola.*





FIGS. 37–38. Head, thorax, and elytra to show end points for measurements. 37. Long wing species. 38. Short wing species. HW, head width; HL, head length; OL, eye length; PO, postocular length; PL, pronotal length; PW, pronotal width; EL, elytral length.

Elytra (EL) shorter (fig. 38) than pronotum (PL); tergum VII without dermal fringe on posterior margin; parameres of aedeagus long, slender, and separated from median lobe for most of length (fig. 595) 21

18(17). Parameres long, slender, and separated from median lobe for most of length (fig. 619) 19

Parameres absent or short, flat, and appressed to median lobe (figs. 483, 574) 20

19(18). Median lobe with pointed apex (fig. 630), articulated process or dorsal edge of ostium with sinuo-truncate apex (figs. 630, 638); Brazil .... 73. *Stenopholea trunca*

Median lobe with rounded apex (figs. 619, 620); articulated process of dorsal edge of ostium with rounded apex (figs. 619, 620); Brazil .... 72. *Stenopholea luma*

20(18). Median lobe extremely slender with acute apex (figs. 576, 574); parameres absent (fig. 574); Brazil .... 68. *Gnathymenus plancus*

Median lobe broad in dorsal view with truncate apex (fig. 482); parameres short, broad, and appressed to median lobe (fig. 483); Panama..... ..... 56. *Gnathymenus sparsus*

21(17). Head and pronotum polished between punctures without ground sculpturing 22

Head and pronotum dully shining, with distinct ground sculpturing between punctures 25

22(21). Eyes reduced but present; profemur unmodified, edge facing folded femur gradually rounded; parameres stout (figs. 684, 685); Brazil .... 78. *Stenopholea hadra*

Eyes absent (fig. 46); profemur with blunt process near middle of inner edge (fig. 45); parameres slender (fig. 40) 23

23(22). Aedeagus with long, tapering flagellum extending from near middle of me-

dian lobe (fig. 40); metathorax without blunt, median process near apical margin; sternum VIII with narrow incision (fig. 39); Mexico ..... 1. *Acaratopus edenus*

Aedeagus without flagellum described and illustrated above (fig. 595); metathorax with blunt median process near apical margin (fig. 588); sternum VIII with moderately wide incision (fig. 599) 24

24(23). Apical portion of aedeagus twisted (fig. 595); Mexico ..... 70. *Stenopholea aega*

Apical portion of aedeagus straight (fig. 607); Mexico ..... 71. *Stenopholea libra*

25(21). Median lobe of aedeagus gradually tapering from middle to acute apex and without processes or lobes (fig. 676); Ecuador ..... 77. *Stenopholea papola*

Median lobe with one or more processes or lobes between middle and apex (figs. 644, 657) 26

26(25). Median lobe, in dorsal view, with right side of apical portion gradually curved to truncate lobe on left side (fig. 644); Brazil ..... 74. *Stenopholea thyma*

Median lobe, in dorsal view, with blunt, rounded apical process and with rounded lobe or process on left side (figs. 657, 665) 27

27(26). Articulated sclerite heavily sclerotized and bifurcate apically (figs. 657, 662); median lobe with large, broad lobe on left side (fig. 657); Brazil ..... 75. *Stenopholea bifurca*

Articulated sclerite lightly sclerotized and rounded apically (fig. 667); median lobe with short, slender, apically rounded process on side (fig. 665); Brazil ..... 76. *Stenopholea sarma*

28(16). Sternum VIII without transverse basal carina (figs. 336, 382) 29

Sternum VIII with transverse carina near base, carina slightly to strongly curved and entire (fig. 283) or separated medially (figs. 115, 508) 49

29(28). Elytra (EL) longer (fig. 37) than pronotum (PL); tergite VII with dermal fringe on posterior margin 30

Elytra (EL) shorter (fig. 38) than pronotum (PL); tergite VII without dermal fringe on posterior margin 42

30(29). Sternite VII with broad, median, moderately deep, glabrous depression margined laterally by setae (fig. 433); depression with margins of anterolateral sides moderately strongly ridged; aedeagus with broad, transverse, flattened, dorsally directed process at about apical third (fig. 429); apical third of aedeagus modified as median, posteriorly directed, apically expanded process (fig. 429); Panama ..... 49. *Gnathymenus sifrus*

Sternite VII flattened medially or with poorly developed, shallow depression lacking marginal ridges (figs. 371, 380); aedeagus variously modified but not as described and illustrated above 31

31(30). Sternite V with median, inverted V-shaped patch of moderately stout setae (figs. 373, 374); aedeagus bifurcate from just behind middle, one process directed to left and one to right (figs. 377, 378); Costa Rica ..... 42. *Gnathymenus intermedius*

Sternite V without V-shaped patch of setae; aedeagus variously modified but not as described and illustrated above 32

32(31). Aedeagus, in lateral view, with median lobe strongly curved ventrally; dorsal surface with two cariniform lobes or weak ridge near middle (figs. 361, 383) 33

Aedeagus, in lateral view, approximately straight, or bent slightly dorsally or ventrally; dorsal surface variously modified but not as described and illustrated above (figs. 472, 476) 34

33(32). Aedeagus with two cariniform lobes near middle (figs. 383, 384); Costa Rica ..... 43. *Gnathymenus buganus*

Aedeagus with weak, rounded ridge at about middle (fig. 361); Costa Rica ..... 40. *Gnathymenus nutatus*

34(32). Aedeagus with three flattened lobes of approximately equal length on apical margin (fig. 475); Mexico ..... 55. *Gnathymenus fenyesi*

Aedeagus variously modified but not as described and illustrated above 35

35(34). Aedeagus with apical eighth flattened and irregularly shaped (fig. 471); Costa Rica ..... 54. *Gnathymenus patulus*

Aedeagus variously modified but not as described and illustrated above 36

36(35). Aedeagus with two apical and one subapical processes; right apical process long, slender, slightly twisted, and apically hooked; left apical process short, broad, and flattened; subapical process on right side slender and dorsally directed (figs. 438–440); Costa Rica ..... 50. *Gnathymenus nevermanni*

Aedeagus not as described and illustrated above 37

37(36). Apical third of ventral surface of aedeagus with transverse, flattened lobe on posterior margin of broad shallow depression; dorsal surface of aedeagus with large, apically truncate swelling just distad of middle (figs. 363, 364); Costa Rica ..... 41. *Gnathymenus maritimus*

Apical third of ventral surface of aedeagus rounded; dorsal surface of aedeagus variously modified but not as described and illustrated above 38

38(37). Aedeagus with apical third of dorsal surface scooped-out (figs. 415, 422) 39

Aedeagus with apical third complexly multifurcate (figs. 333, 340, 345) 40

39(38). Aedeagus with large multifurcate process rising prominently from scooped-out apical third of dorsal surface (figs. 422, 423); Panama ..... 48. *Gnathymenus clinus*

Aedeagus with large process closely associated with surface of scooped-out apical third of dorsal surface (figs. 415, 416); Panama ..... 47. *Gnathymenus catillus*

40(38). Aedeagus with carinate lobe on dorsal surface just distad of middle (figs. 333, 334); apical half of aedeagus with three principal processes (fig. 333); Panama ..... 35. *Gnathymenus falcatus*

Aedeagus without carinate lobe on dorsal surface near middle; apical half of aedeagus with three or four principal processes (figs. 340, 345) 41

41(40). Left process of aedeagus sinuous in dorsal view (fig. 340); right process, in lateral view, curved dorsally (fig. 334); Costa Rica ..... 36. *Gnathymenus virgosus*

Left process of aedeagus strongly curved toward middle in dorsal view (fig. 345); right process, in lateral view, posteriorly directed (fig. 346); Panama ..... 37. *Gnathymenus ramosus*

42(29). Sternite VII with patch of short, stout, spiniform setae on each side of lobe of posterior margin and another patch of spiniform setae on each side of base of large, glabrous median depression (fig. 489); Venezuela ..... 57. *Gnathymenus simatus*

Sternite VII without spiniform setae 43

43(42). Aedeagus, in lateral view, strongly sinuate and with apical portion twisted into birdlike configuration (fig. 550); Colombia ..... 65. *Gnathymenus avisoideus*

Aedeagus variously modified but not as described and illustrated above 44

44(43). Aedeagus with slender, apically hooked, medially curved process arising from right side near apex (fig. 353); Panama .... 38. *Gnathymenus raius*

Aedeagus not as described and illustrated above 45

45(44). Aedeagus with apical third stout and strongly twisted and with dorsoventrally flattened, dorsoposteriorly directed, apically rounded process near middle of median lobe (figs. 445, 450); Panama ..... 51. *Gnathymenus culebrus*

Aedeagus not as described and illustrated above 46

46(45). Aedeagus with apical half of median lobe expanded and divided into four principal, posteriorly directed, variously modified processes of nearly equal length (fig. 464); Panama ..... 53. *Gnathymenus ascus*

Aedeagus with one main, posteriorly directed portion, processes short (figs. 393, 399, 409) 47

47(46). Aedeagus with ventrally hooked apex (fig. 410) and lateroventrally curved process on right side at about apical

fourth (fig. 409); Mexico ..... 46. *Gnathymenus hamulus*

Aedeagus not as described and illustrated above 48

48(47). Aedeagus with short, broad, blunt median process on left side (fig. 393); main portion of apical half of median lobe slender, curved, and extending beyond process (fig. 393); Costa Rica ..... 44. *Gnathymenus somphus*

Aedeagus without blunt, median process (fig. 399); median lobe sinuously straight and with short, slender, pointed, subapical process on right side (figs. 397, 399); Panama ..... 45. *Gnathymenus pandus*

49(28). Posterior margin of sternite VII with oblique row of spiniform setae on each side of broad emargination (figs. 268, 273) 50

Posterior margin of sternite VII not as described and illustrated above 51

50(49). Sternite VII with 9 spiniform setae on right side of emargination and 10 on left side (fig. 268); aedeagus with undivided process on middle of dorsal surface (fig. 263); Colombia ..... 26. *Gnathymenus limus*

Sternite VII with 2 spiniform setae on right side of emargination and 3 on left side (fig. 273); aedeagus with bifurcate process on middle of dorsal surface (fig. 269); Colombia ..... 27. *Gnathymenus mergus*

51(49). Elytra (EL) longer (fig. 37) than pronotum (PL); tergum VII with dermal fringe on posterior margin 52

Elytra (EL) shorter (fig. 38) than pronotum (PL); tergum VII without dermal fringe on posterior margin 64

52(51). Sternum VIII with basal transverse ridge complete, not divided at middle (fig. 275); sternite VII with large, median patch of spinelike setae (figs. 282, 287) 53

Sternum VIII with basal transverse ridge divided at middle (fig. 251); sternite VII with or without median patch of spinelike setae 55

53(52). Aedeagus with apical portion appearing as clawlike in lateral view (fig. 285) as result of processes on ventral edge; apical fifth strongly bent dorsally (fig. 285); elytra bicolored, dark basally and pale apically; Brazil ..... 30. *Gnathymenus radulus*

Aedeagus without processes on apical portion of ventral surface of median lobe (figs. 277, 280); apical portion slightly to moderately strongly bent dorsally (figs. 277, 280); elytra concolorous reddish brown 54

54(53). Aedeagus with apical quarter of median lobe strongly bent dorsally (fig. 280); sternite VII with setae of median patch short and moderately stout (fig. 282); Brazil ..... 29. *Gnathymenus zarzus*

Aedeagus with only apical ninth strongly bent dorsally (fig. 277); sternite VII with setae of median patch long and slender (fig. 278); Brazil ..... 28. *Gnathymenus klimai*

55(52). Sternite VII with V-shaped, median emargination of posterior margin (figs. 509, 540) 56

Sternite VII with posterior margin unmodified, or with median lobe, or broad rounded or sinuate emargination (figs. 249, 517) 57

56(55). Sternites VI and VII with dense patch of long setae on each side of median depression (fig. 540); aedeagus complex (figs. 536, 537); Colombia ..... 63. *Gnathymenus siagonus*

Sternites VI and VII without special patch of setae (fig. 509); aedeagus long, slender, tapered and simple (figs. 503, 504); Ecuador ..... 59. *Gnathymenus spereus*

57(55). Aedeagus with median lobe bifurcate from basad of middle, left process with hook on dorsomedial surface (figs. 247, 248); Venezuela ..... 23. *Gnathymenus rufoniger*

Aedeagus not as described or illustrated above 58

58(57). Sternite VI with patch of short, thick setae on round, median elevation (figs. 570, 571); sternum VIII with large U-shaped emargination of posterior margin, then with deep median incision (fig. 568); Colombia ..... 67. *Gnathymenus prolixus*

Sternite VI unmodified or with shallow, median depression bordered by se-

tae; sternum VIII with deep narrow incision only, not as described above (fig. 528) 59

59(58). Aedeagus with long, tapering, curved process extending dorsally from apical half of dorsal surface (figs. 526, 527); elytra bicolored, basal portion reddish brown, apical portion black; Panama ..... 62. *Gnathymenus spirus*

Aedeagus not as described and illustrated above; elytra concolorous reddish brown or black 60

60(59). Aedeagus, in dorsal view, with apex of median lobe spatulate (fig. 544); elytra reddish brown; Brazil ..... 64. *Gnathymenus scoliodontus*

Aedeagus not as described and illustrated above; elytra black 61

61(60). Aedeagus, in dorsal view, with apical portion of median lobe broad and with U-shaped emargination (fig. 511); sternite VII with broad, deep, sinuous emargination of posterior margin and with patch of short, stout, spiniform setae (fig. 517); Ecuador ..... 60. *Gnathymenus tungus*

Aedeagus, in dorsal view, with apical portion of median lobe narrow and entire, not emarginate (figs. 252, 256, 520); posterior margin of sternite VII shallowly sinuate, emarginate, or unmodified; median region of sternite VII with or without patch of spiniform setae (figs. 262, 525) 62

62(61). Aedeagus, in lateral view, with truncate apex (fig. 521); sternite VII with sinuous, shallow emargination of posterior margin and surface with small patch of short spinelike setae near apex on each side of middle (fig. 525); Venezuela ..... 61. *Gnathymenus fiscus*

Aedeagus, in lateral view, with rounded apex (figs. 253, 257); sternite VII truncate or obsoletely emarginate and surface without spinelike setae (fig. 262) 63

63(62). Aedeagus, in lateral view, with tip of dorsally bent apical portion of median lobe acute (fig. 257); median lobe sinuous in lateral view, with basal half bent dorsally and apical half bent ventrally (fig. 257); Ecuador ..... 25. *Gnathymenus angulus*

Aedeagus, in lateral view, with tip of dorsally bent apical portion of median lobe rounded (fig. 257); median lobe, in lateral view, strongly bent ventrally (fig. 257); Bolivia ..... 24. *Gnathymenus bicolor*

64(51). Sternite VII with posterior margin truncate, sinuo-truncate, or emarginate medially (figs. 173, 181, 303, 329, 497) 65

Sternite VII with posterior margin lobed medially (figs. 62, 80, 90, 117) 74

65(64). Sternite VII with deeper than wide emargination of posterior margin (figs. 303, 306, 318, 329) 66

Sternite VII with emargination of posterior margin wider than deep (fig. 497) or with truncate or sinuo-truncate posterior margin 69

66(65). Aedeagus with three slender, hooked processes on left side, apex with hooked process (figs. 325, 327); Colombia ..... 34. *Gnathymenus brerus*

Aedeagus without hooked processes 67

67(66). Aedeagus with median cariniform process on apical third of ventral surface (figs. 291, 296, 302); ostium near apex of dorsal surface (fig. 290); Ecuador ..... 31. *Gnathymenus geocus*

Aedeagus with smooth apical third of ventral surface (fig. 313); ostium near apex of dorsal or ventral surface (figs. 305, 313) 68

68(67). Aedeagus with ostium on dorsal surface (fig. 305); sternite VII with shallow depression wider than median marginal incision; Ecuador ..... 32. *Gnathymenus kestrus*

Aedeagus with ostium on ventral surface (fig. 313); sternite VII with shallow depression about as wide as median incision; Ecuador ..... 33. *Gnathymenus nacodus*

69(65). Sternite VII with dense patch of peglike or spinelike setae in broad, median depression (figs. 173, 181, 497, 500) 70

Sternite VII with unmodified setae (figs. 145, 186) 72

70(69). Sternite VII with dense patch of peglike setae in median depression (figs. 497, 500); aedeagus with two-tine forklike apex (fig. 501); aedeagus without segmented median lobe (fig. 502); Brazil ..... 58. *Gnathymenus gomphus*

Sternite VII with dense patch of spine-like setae in median depression (figs. 173, 181); aedeagus with rounded apex (figs. 167, 178); aedeagus "segmented" (figs. 168, 179) 71

71(70). Aedeagus without median process on apex of median lobe (fig. 167); sternite VII with small, median, U-shaped emargination of posterior margin (fig. 173); Colombia ..... 14. *Gnathymenus cleofanus*

Aedeagus with apex of median lobe extended into rounded median process (fig. 178); sternite VII with weakly sinuous posterior margin (fig. 181); Colombia ..... 15. *Gnathymenus divisus*

72(69). Right side of aedeagus with cylindrical, dorsolaterally directed process just distad of middle and flattened, laterally directed process at about apical quarter (figs. 457, 458); Costa Rica ..... 52. *Gnathymenus lirellus*

Aedeagus not as described and illustrated above 73

73(72). Aedeagus, in lateral view, with short apical and longer subapical hooked processes (fig. 189); Colombia..... 16. *Gnathymenus speccus*

Aedeagus gradually tapered to acute apex (figs. 141, 142); Colombia ..... 11. *Gnathymenus garus*

74(64). Sternite VII with lobe of posterior margin rounded (figs. 81, 90, 102) 75

Sternite VII with lobe of posterior margin truncate or emarginate (figs. 62, 69, 117, 128) 79

75(74). Aedeagus, in dorsal view, with apex broadly rounded (fig. 113); Chile ..... 8. *Gnathymenus distinctus*

Aedeagus, in dorsal view, with subacute apex (figs. 83, 91, 95, 107).... 76

76(75). Aedeagus, in dorsal view, strongly expanded basad of middle of median lobe (figs. 95, 107); parameres each with three or six setae (figs. 96, 108) 77

Aedeagus, in dorsal view, gradually expanded basad of middle of median lobe (figs. 83, 91, 113); parameres each with two setae (figs. 84, 92, 114) 78

77(76). Aedeagus, in lateral view, with subapical hook on ventral edge (fig. 108); parameres each with three setae (fig. 108); Chile ..... 7. *Gnathymenus detectus*

Aedeagus without subapical hook (fig. 96); parameres each with six setae (fig. 96); Chile ..... 6. *Gnathymenus twelfus*

78(76). Tergum VIII with posterior margin broadly truncate (fig. 86); aedeagus, in lateral view, with apical portion of median lobe moderately strongly bent ventrally (fig. 84); sternite VII with elongate callosity on lobe of posterior margin (fig. 81); Chile ..... 4. *Gnathymenus kapetus*

Tergum VIII with long, slender lobe on posterior margin (fig. 93); aedeagus, in lateral view, with apical portion of median lobe straight or slightly bent ventrally (fig. 92); sternite VII with curved carina at base of lobe of posterior margin, producing effect of presence of depression on lobe (fig. 90); Chile ..... 5. *Gnathymenus stubbus*

79(74). Aedeagus with ridge on each side extending posteriorly from ostium, and with midlongitudinal ridge extending anteriorly from apex (fig. 124); posterior margin of sternite VII with emarginate lobe (fig. 128); Chile ..... 10. *Gnathymenus proximus*

Aedeagus not as described above; posterior margin of sternite VII shallowly emarginate (fig. 117) or with slight median notch (fig. 62) 80

80(79). Aedeagus, in dorsal view, with lateral margins constricted adjacent to ostium (fig. 58); aedeagal carina on basal half of ventral surface abruptly truncate basally (fig. 57); Chile ..... 2. *Gnathymenus apterus*

Aedeagus, in dorsal view, with lateral margins parallel adjacent to ostium (fig. 66); aedeagal carina on ventral surface, rounded basally (fig. 68); Chile ..... 3. *Gnathymenus volcanus*

81(13). Elytra (EL) shorter (fig. 38) than pronotum (PL) 93

Elytra (EL) longer (fig. 37) than pronotum (PL) 82

82(81). Elytra completely darker than pronotum; elytra concolorous black, black with metallic blue sheen, or dark reddish brown; pronotum reddish 83

Elytra completely or in part concolor-

ous with or slightly paler than pronotum; elytra concolorous dark to light reddish brown to pale yellowish brown, or bicolored brown and pale reddish brown to yellowish brown 86

83(82). Head and pronotum reddish 85
Head black, pronotum reddish 84

84(83). Tergum VIII with posterior margin strongly produced into rounded lobe (fig. 518); tergum VIII with basal carina strongly produced posteriorly at middle; segments VIII to X black or dark reddish brown, concolorous with remainder of abdomen; Ecuador ....60. *Gnathymenus tungus*
Tergum VIII with posterior margin slightly and broadly lobed medially; tergum VIII with basal carina slightly curved; segments VIII to X yellowish brown, remainder of abdomen black or dark reddish brown .... 59. *Gnathymenus spereus*

85(83). Tergum VIII slightly wider than long; apical genital appendage broad, shield shaped, and with deep curving longitudinal groove near middle (figs. 522, 523); elytra with scattered, sparse punctation; Venezuela .... 61. *Gnathymenus fiscus*
Tergum VIII distinctly longer than wide; apical genital appendage elongate, and with obsolete, straight, median groove (fig. 261); elytra with moderately dense punctation; Ecuador .... 25. *Gnathymenus angulus*

86(82). Elytra concolorous, with at most diffuse darker infuscations 87
Elytra bicolored, with distinct transverse dark and pale areas..... 89

87(86). Apical genital appendage with apex emarginate (fig. 481); basal genital appendage enlarged basally and tapered apically (fig. 481); Panama ... . 56. *Gnathymenus sparsus*
Apical genital appendage rounded, truncate or weakly emarginate (figs. 362, 376, 621, 633); basal genital appendage reduced (figs. 362, 376), or enlarged basally and tapered apically (figs. 621, 633)..... 88

88(87). Basal genital appendage enlarged basally and tapered apically (figs. 621, 633) ..... 73. *Stenopholea trunca*, 72. *Stenopholea luma*
Basal genital appendage reduced to irregularly shaped sclerites (figs. 362, 376); Costa Rica ..... 42. *Gnathymenus intermedius*, 39. *Gnathymenus progenitor*

89(86). Genital appendages reduced to one small sclerite with deep, U-shaped basal emargination (fig. 531); elytra with apical portion dark reddish brown to black; Panama .... 62. *Gnathymenus spirus*
Apical genital appendage elongate and with setae on apical half (figs. 330, 389); basal genital appendage modified to one or more irregularly shaped sclerites (figs. 330, 389); elytra with apical portion black to dark reddish brown or pale reddish brown to yellowish brown 90

90(89). Apical genital sclerites trianguloid (fig. 330); apical half of elytra dark; Panama .... 35. *Gnathymenus falcatus*
Apical genital sclerite rectanguloid; apical half of elytra pale or dark ... 91

91(89). Apical half of elytra black to dark reddish brown; Panama .... 37. *Gnathymenus ramosus*
Apical portion of elytra pale reddish brown to yellowish brown 92

92(91). Elytra with basal portion black to dark reddish brown ..... 50. *Gnathymenus nevermanni*, 41. *Gnathymenus maritimus*
Elytra with dark reddish brown median transverse stripe and with basal and apical portions pale reddish brown to yellowish brown ..... 47. *Gnathymenus catillus*, 55. *Gnathymenus fenyesi*, 49. *Gnathymenus sifrus*, 48. *Gnathymenus clinus*

93(81). Head with ground sculpturing between punctation of dorsum 94
Head polished, without ground sculpturing between punctation of dorsum 99

94(93). Head with ground sculpturing on dorsum similar to whorl of fingerprint (fig. 642) 96
Head with pebbled ground sculpturing on dorsum 95

95(94). Eyes absent (fig. 581); profemur with prominent triangular process on in-

ner edge (fig. 593); Mexico ..... 69. *Stenopholea reddelli*

Eyes present but small; profemur without prominent triangular process; Ecuador ..... 77. *Stenopholea papola*

96(94). Genital appendages reduced to one sclerite (fig. 652); spermathecal gland with entrance to spermathecal capsule near middle (fig. 648); Brazil ..... 74. *Stenopholea thyma*

Genital appendages present as two variously modified sclerites (figs. 661, 675, 589); sclerotized spermatheca present or absent, but when present spermathecal gland with entrance to spermathecal capsule near spermathecal duct (figs. 663, 674) 97

97(96). Apical sclerite of genital appendages strongly modified with grooves and depressions on surface (fig. 671); basal sclerite simple (fig. 672); Brazil ..... 76. *Stenopholea sarma*

Apical sclerite of genital appendages simple (figs. 664, 689); basal sclerite complex (fig. 664) or simple (fig. 689) 98

98(97). Basal genital appendage simple and with apical margin of apical sclerite sinuo-truncate (fig. 689); sclerotized spermatheca absent; Brazil ..... 78. *Stenopholea hadra*[3]

Basal genital appendage complex (fig. 664), divided into two lobes and with one portion fused to paraprocts (tergum IX); apical margin of apical genital appendages emarginate (fig. 661); sclerotized spermatheca present (fig. 663); Brazil ..... 75. *Stenopholea bifurca*

99(93). Antenna with last two articles yellowish white, remaining articles dark reddish brown; body black to dark reddish brown; segment IX with genital appendages reduced to one sclerite (fig. 552); Colombia ..... 65. *Gnathymenus avisoideus*

Antenna with last two articles concolorous with remaining articles, yellowish brown to pale reddish brown; body color variable; genital appendages of segment IX present as one or more sclerites 100

100(99). Segment IX with dorsal surface divided midlongitudinally (fig. 49) and with ventral surface fused medially (fig. 50); Mexico ..... 1. *Acaratopus edenus*

Segment IX with dorsal surface fused medially (fig. 510) and with ventral surface divided midlongitudinally (figs. 55, 74) 101

101(100). Genital appendages reduced to one midlongitudinally incised sclerite (fig. 190); Colombia ..... 16. *Gnathymenus speccus*

Genital appendages present as two or more sclerites (figs. 55, 74, 389) 102

102(101). Basal genital appendage reduced to one or two small irregularly shaped sclerites (figs. 351, 389); basal genital sclerite(s) completely anterior to apical genital appendage 114

Basal genital appendage present as broad, simple sclerite (figs. 55, 606); basal genital appendage with apical portion overlying base of apical genital appendage (figs. 55, 606) 103

103(102). Sclerotized spermatheca present (fig. 61) 104

Sclerotized spermatheca absent 110

104(103). Eyes absent; profemur with prominent triangular process near base of inner edge (figs. 605, 616) 105

Eyes present but small; profemur with inner edge only slightly swollen 106

105(104). Spermatheca with one end strongly bent and strongly twisted (figs. 617, 618); spermathecal gland present (fig. 617); Mexico ..... 71. *Stenopholea libra*

Spermatheca with one end strongly bent and slightly twisted (fig. 604); spermathecal gland absent (fig. 604); Mexico ..... 70. *Stenopholea aega*

106(104). Apical genital appendage with midlongitudinal carina extending for most of length (fig. 126); Chile ..... 10. *Gnathymenus proximus*

Apical genital appendage without midlongitudinal carina (fig. 103) 107

107(106). Apical genital appendage with sinuous

[3] Since the dorsum of the head of this species has ground sculpturing only anterior to the eyes between the antennae, the females of the species are brought out in couplet 112.

subapical ridge (fig. 103); Chile ..... 6. *Gnathymenus twelfus*

Apical genital appendage without sinuous subapical ridge (fig. 56) 108

108(107). Apical genital appendage with large hole (fig. 144); tergum VIII with posterior margin broadly rounded; pronotum reddish; elytra black to dark reddish brown; spermatheca small and straight (fig. 139); Colombia ..... 11. *Gnathymenus garus*

Apical genital appendage with small hole (fig. 56); tergum VIII with truncate or arcuato-truncate lobe at middle of posterior margin (figs. 65, 78); pronotum black to dark reddish brown; elytra reddish; spermatheca moderately large and curved (figs. 60, 61, 82) 109

109(108). Apical genital appendage sinuous in lateral view (fig. 54); spermathecal capsule widest near entrance of spermathecal duct and tapered to end (figs. 60, 61); tergum VIII with lobe of posterior margin longer than width of apex (fig. 65); Chile ..... 2. *Gnathymenus apterus*

Apical genital appendage straight in lateral view (fig. 75); spermathecal capsule with end near entrance of spermathecal duct about same width as other parts of capsule (figs. 80, 82, 87); tergum VIII with lobe of posterior margin slightly wider at apex than length (fig. 78); Chile ..... 4. *Gnathymenus kapetus*

110(103). Submentum with midlongitudinal carina 111

Submentum without midlongitudinal carina 112

111(110). Apical genital appendage of segment IX with deep median incision of base (fig. 184); basal genital appendage constricted near middle (fig. 184); Colombia ..... 15. *Gnathymenus divisus*

Apical genital appendage of segment IX with base entire, not incised (fig. 170); basal genital appendage gradually tapered apically (fig. 170); Colombia ..... 14. *Gnathymenus cleofanus*

112(110). Basal genital appendage abruptly constricted at apical third then tapered to apex, apical third slender (fig. 494); Venezuela ..... 57. *Gnathymenus simatus*

Basal genital appendage gradually tapered to apex, apical third broad (figs. 293, 689) 113

113(112). Elytra pale reddish brown to yellowish brown; basal genital appendage with trianguloid apical portion (fig. 689); Brazil .... 78. *Stenopholea hadra*[4]

Elytra black to dark reddish brown; basal genital appendage with lateral margins of apical portion subparallel and with broadly rounded apex (figs. 293, 323) ..... 33. *Gnathymenus nacodus*, 31. *Gnathymenus geocus*

114(102). Elytra and segment VII dark reddish brown to black; Costa Rica ..... 52. *Gnathymenus lirellus*

Body concolorous yellowish brown to reddish brown ..... 44. *Gnathymenus somphus*, 53. *Gnathymenus ascus*, 51. *Gnathymenus culebrus*, 38. *Gnathymenus raius*, 46. *Gnathymenus hamulus*

ACARATOPUS, NEW GENUS

Figures 4, 39–50, 579

TYPE SPECIES: *Acaratopus edenus*, new species.

DIAGNOSIS: Males of this genus can be recognized by the long flagellum and medially divided basal piece of the aedeagus (figs. 40, 42) and the midlongitudinally fused basal portion of tergum IX. Males of the other two genera in the New World do not have an aedeagal flagellum, which in the Old World is found only in *Jarrigeus* and *Serrolabis*. The basal piece of *Jarrigeus* (fig. 13) and *Serrolabis* (fig. 12) is undivided. *Jarrigeus* has a serrate carina on the mesosternal process; *Acaratopus* does not. *Serrolabis* has six acute labral denticles and *Acaratopus* only four.

The female of *Acaratopus* has a middorsal division (fig. 49) and midventral fusion of segment IX (fig. 50); the latter condition is unique among the Dolicaonina.

[4] The females of this species are also brought out in couplet 97 because the head has ground sculpturing only between the antennae, and not over the entire surface.

DESCRIPTION: Length 3.5 mm. Body subcylindrical, elongate, and slender. Head and pronotum polished. Labrum denticulate. Mesospiracular peritreme strongly sclerotized and fused anteriorly to furcasternum (as in fig. 137). Mesospiracles small. Mesosternal process without serrate carina. Abdominal segments III to VII with laterotergites. Sternum VIII of male with moderately deep, moderately wide median incision (fig. 39); incision less than half as long as segment. Tergum IX of male with base of dorsal surface midlongitudinally fused and with ventral surface midlongitudinally separated. Tergum IX of female with basal of dorsal surface midlongitudinally divided (fig. 49) and with ventral surface fused to genital appendage (fig. 50). Sternum IX of male broad and slightly asymmetrical (fig. 44).

Aedeagus (figs. 40, 42, 43) with long, slender parameres; parameres separated from median lobe for most of their length and with apical setae. Median lobe with long, slender, tapering flagellum. Median lobe without articulated sclerite. Median lobe with basal piece; basal piece medially divided and with each part adjacent to lateral side of basal foramen. Basal foramen bordered anteriorly by thick, round sclerite and posteriorly by elongate, flattened sclerite. Ostium minute and at apex of flagellum.

ETYMOLOGY: From the Greek *akares* for small or tiny and *atopos* for out of place, referring to the size of the animal and to the fact that the only other species in the subtribe with a long aedeagal flagellum is found in the Old World.

1. **Acaratopus edenus**, new species
Figures 4, 39–50, 579

HOLOTYPE: Male. Mexico: Oaxaca: 3.5 mi. S Suchixtepec, 8000 ft. elevation, June 3, 1971, leaf litter, collected by S. Peck, deposited in the Field Museum of Natural History, Chicago.

PARATYPE: None.

DIAGNOSIS: The males of this eyeless species can be distinguished by the complex aedeagus (figs. 40, 42, 43) and the females by the elongate, sclerotized spermatheca (fig. 48).

DESCRIPTION: Length 3.5 mm.

Color pale reddish brown.

Head length (HL, figs. 37, 38, 46) slightly greater than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eyes absent. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum with moderately broad, apically truncate lobe adjacent to median emargination and with broad, dentiform lobe adjacent to lateral margin. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

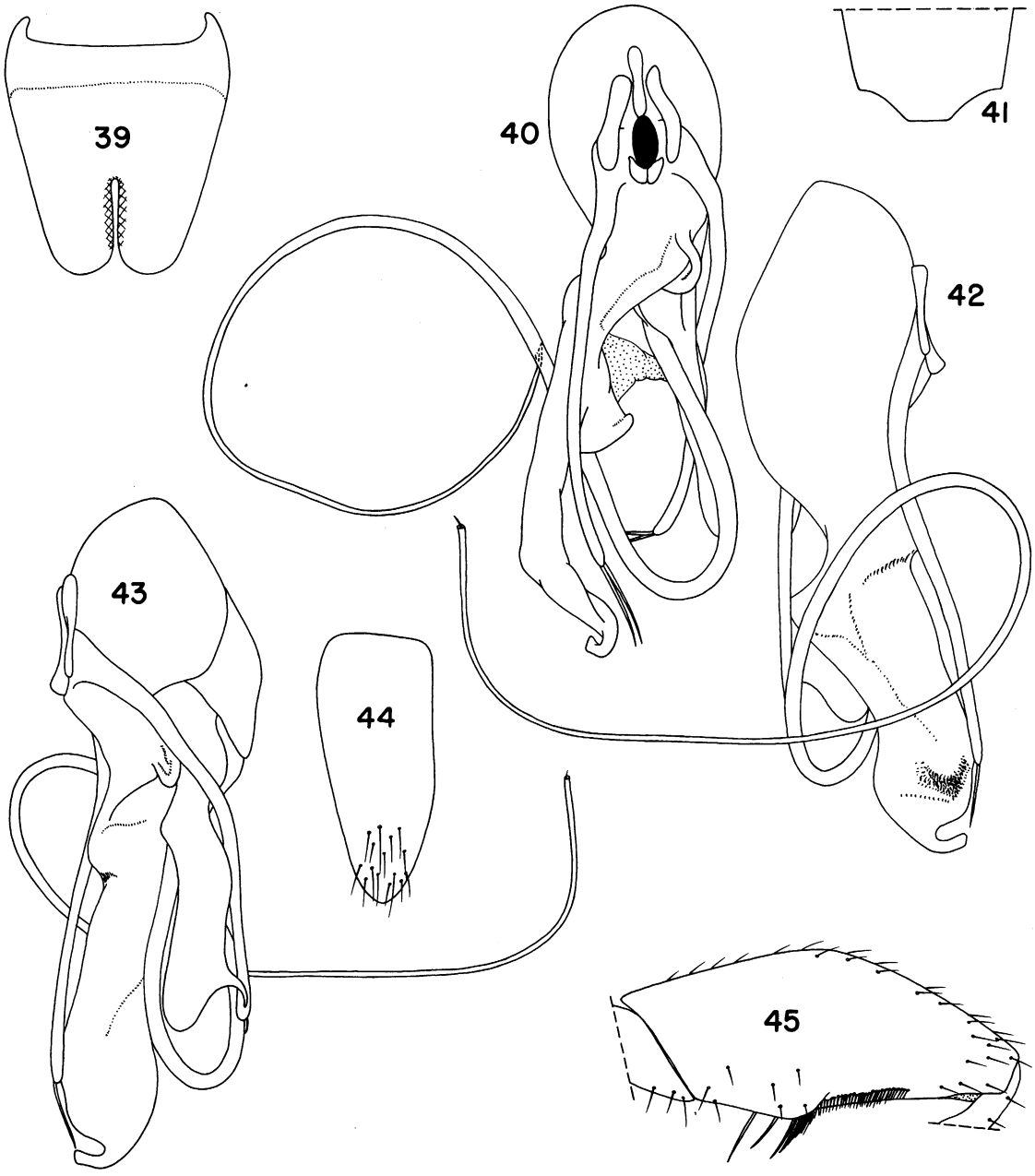
Pronotum strongly convex, widest anterior to transverse midline (fig. 46); surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur with moderately enlarged antennal cleaning process (fig. 45).

Elytra (EL, figs. 38, 46) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with broad, median, apically arcuato-truncate lobe on posterior margin (fig. 41).

Male. Sternites III to VI unmodified. Sternite VII without median depression, glabrous spot, spiniform setae, or micropores; posterior margin with obsolete median emargination; inner surface without midlongitudinal carina. Sternite VIII (fig. 39) with moderately deep, narrow median incision extending for about one-third length of segment; surface slightly beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 44) slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 40, 42, 43) with slender parameres; left paramere parallel to dorsal surface of median lobe and curved medially;



FIGS. 39–45. *Acaratopus edenus*. 39. Sternum VIII, male. 40. Aedeagus, dorsal view. 41. Tergum VIII, apical portion. 42. Aedeagus, left lateral view. 43. Aedeagus, right lateral view. 44. Sternite IX, male. 45. Profemur.

right paramere curved to ventral side of median lobe and curved medially. Median lobe, from near middle, elongate, asymmetrical, with dorsolateral apical hook, narrow in dor-

sal view (fig. 40), and wide in lateral view (fig. 42); right side with elongate, slender sclerite arising from near middle, sclerite broad in lateral view and ventral edge with posteriorly directed, subapical hook. Base of ventral surface of median lobe with large, oval pump spot; pump spot without median sclerite. Ostium at apex of flagellum.

Female. Sternites III to VIII unmodified. Segment IX with two genital appendages; basal appendage (figs. 47, 50) trianguloid with apical margin rounded, and weakly sclerotized; apical appendage fused to tergum IX and separated laterally for part of length, apical portion with scattered setae (fig. 50).

Spermatheca sclerotized, straight, elongate, and without spermathecal gland (fig. 48).

HABITAT AND DISTRIBUTION: This species is known only from the Mexican state of Oaxaca where it was collected from leaf litter at 8000 ft. (2438 m.) elevation (fig. 579).

ETYMOLOGY: From the Hebrew, *eden*, for delight or pleasure.

MATERIAL EXAMINED: Holotype and one female (FMHN).

GNATHYMENUS SOLIER

Figures 1, 6, 7–11, 37, 38, 51–578

Gnathymenus Solier, 1849, pp. 326–328. Lacordaire, 1854, pp. 152–153. Kraatz, 1857, pp. 666, 668; 1859, pp. 1, 7, 13, 14. Fairmaire and Germain, 1861, pp. 440–441. Fauvel, 1868, pp. 17–20; 1873, pp. 41–42; 1891, pp. 100–101. Lynch, 1884, p. 289. Eichelbaum, 1909, p. 138. Bernhauer, 1921, pp. 71–72. Blackwelder, 1939, p. 118; 1944, p. 122. Fagel, 1958, pp. 8, 9. Coiffait and Saiz, 1968, pp. 370–379. Saiz, 1974, pp. 231, 233.

TYPE SPECIES: *Gnathymenus apterus* Solier, by monotypy.

Lithocaon Sharp, 1886, p. 555. Eichelbaum, 1909, p. 145. Bernhauer, 1910, p. 374. Bierig, 1933, p. 482. Blackwelder, 1939, p. 119; 1944, p. 122. NEW SYNONYM.

TYPE SPECIES: *Lithocaon sparsus* Sharp, by monotypy.

Litozoon Bierig, 1938, pp. 176–177; 1943, pp. 161–163. Blackwelder, 1944, p. 122. NEW SYNONYM.

TYPE SPECIES: *Litozoon progenitor* Bierig, by original designation.

Xanthornobium Scheerpeltz, 1967, pp. 237–239. NEW SYNONYM.

TYPE SPECIES: *Xanthornobium vogelsangi* Scheerpeltz, by original designation.

Macrognathymenus Coiffait and Saiz, 1968, pp. 374, 378. NEW SYNONYM.

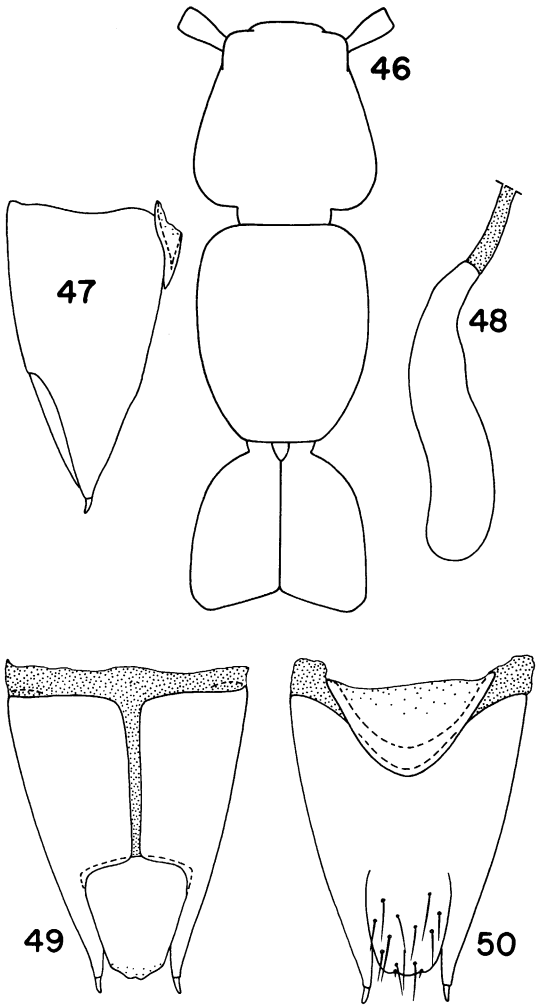
TYPE SPECIES: *Macrognathymenus obesus* (Fauvel), by monotypy.

DIAGNOSIS: Males of this genus can be separated from those of all the other genera of the Dolicaonina by the short to moderately long, flattened parameres that are appressed to the base of the median lobe (figs. 57, 201, 277). The New World genera *Stenopholea* and *Acaratopus* and all of the Old World genera have long, slender parameres that are separated from the median lobe for most of their length.

The females must be identified by association with the male.

DESCRIPTION: Length 2.0 to 6.2 mm. Body subcylindrical to cylindrical, elongate, and slender to moderately broad (fig. 1). Head and pronotum polished. Labral denticulation variable. Mesothoracic spiracular (figs. 10, 137) peritremes strongly sclerotized and fused anteriorly to furcasternum. Mesospiracles small. Mesosternal process without serrate carina. Abdominal segments III to VII with or without laterotergites. Sternum VIII (figs. 63, 324) of male with deep, narrow median incision, or moderately broad, moderately deep median incision; median incision usually longer than half as long as sternum. Tergum IX with base of dorsal surface midlongitudinally fused (fig. 143); ventral surface midlongitudinally separated (fig. 55) or fused (fig. 225) in female, and separated in male. Sternum IX of male slender to moderately broad and slightly (fig. 59) to strongly asymmetrical (fig. 196).

Aedeagus (figs. 57, 189, 384) with compressed parameres; parameres appressed to base of median lobe and with or without setae. Median lobe without basal piece, flagellum, or articulated sclerite near ostium. Basal foramen surrounded by heavily sclerotized collar (figs. 57, 199); connection of collar to median lobe strongly compressed laterally. Ostium usually minute (*sparsus* is only exception).



FIGS. 46–50. *Acaratopus edenus*. 46. Head and thorax, dorsal view. 47. Segment IX, female, lateral view. 48. Spermatheca. 49. Segments IX and X, female, dorsal view. 50. Segment IX, female, ventral view.

SYNONYMS: Some of my arguments for regarding *Lithocaon, Litozoon, Xanthornobium,* and *Macrognathymenus* as junior synonyms of *Gnathymenus* are found under Generic Classification. Briefly, if any or all of these generic names are recognized as valid taxa, to avoid having a paraphyletic group, *Gnathymenus,* then 15 monotypic genera and five genera with from two to four species each would have to be named.

Macrognathymenus, which was proposed originally as a monotypic subgenus of *Gnathymenus,* can be recognized by external and sexual characters of both males and females. There are five species included here. *Litozoon,* which until the present work had five species, can be recognized only by sexual characteristics of the males and females. This group, which I call the *progenitor* group, has 21 species. *Lithocaon* includes one species that can be recognized only by sexual characters of the male. *Xanthornobium* was proposed for one species, and another is related. This group is based on features of the aedeagus.

If the above four genera were recognized as valid, then *Gnathymenus* would either have all the other species less a few externally differentiated groups, or would be a taxon with nine species based on sexual characters of the males and females.

Gnathymenus is treated herein as a speciose genus based on characters of the aedeagus. To break it down so as to recognize other genera would produce an impossibly cumbersome classification.

2. *Gnathymenus apterus* Solier
Figures 6, 51, 57–65

Gnathymenus apterus Solier, 1849, p. 327. Coiffait and Saiz, 1968, pp. 370, 371, 373–376. Saiz, 1974, pp. 231, 233. (Type locality: Chile: [Valdivia, in the forest under moss and fallen leaves. Holotype belongs in the Muséum National d'Histoire Naturelle, Paris, but the curator was unable to find it. See the section labeled Type following the Discussion.)

Gnathymenus quadripartitus Fairmaire and Germain, 1861, p. 440. Fauvel, 1868, pp. 18, 19, 65. Coiffait and Saiz, 1968, p. 376. (Type locality: Chile: Chiloe et Puerto Montt. Lectotype, male, in the Institut Royal des Sciences Naturelle, Brussels, examined.)

DIAGNOSIS: Males of this species are distinguished from those of other species by characters of sternite VII (fig. 62) and the aedeagus (figs. 57, 58). The truncate lobe of the posterior margin and the oval depression

FIG. 51. Map of South America showing distribution of *Gnathymenus*. Open circles indicate two or more adjacent localities. Question marks indicate localities that were not found but that are thought to be near the position of the question mark.

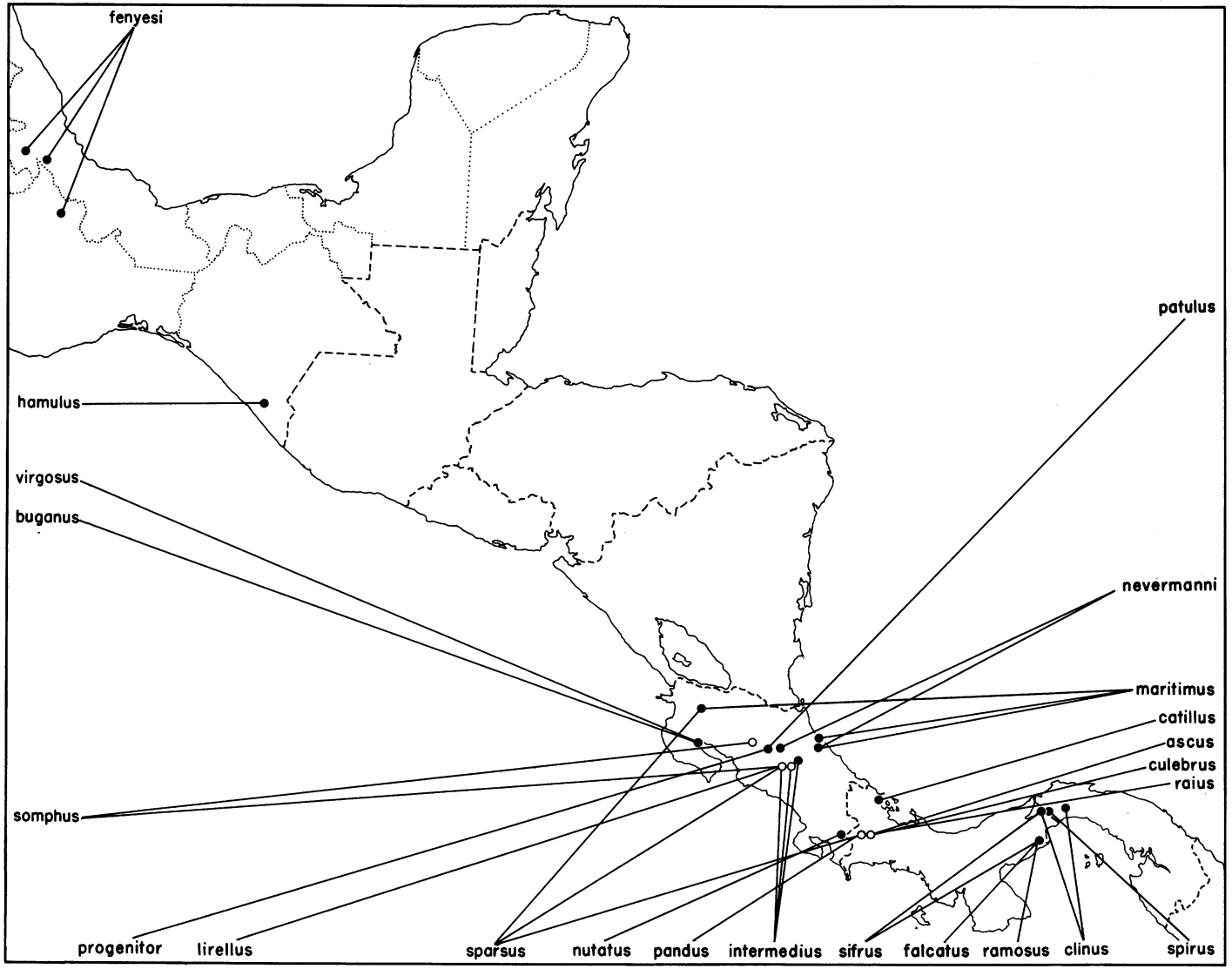


FIG. 52. Map of Central America and southern Mexico showing distribution of *Gnathymenus*. Open circles indicate two or more adjacent localities.

of sternite VII distinguishes this species from all but *G. volcanus* from which it can be separated by the constriction of the median lobe adjacent to the ostium (fig. 58), and the truncate lobe of the posterior margin tergum VIII (fig. 64).

The female has an elongate, apically truncate lobe on the posterior margin of tergum VIII (fig. 65), a sinuate apical genital sclerite (fig. 54), a truncate apex of the basal genital sclerite (fig. 55), and a spermatheca that is widest at the end with the spermathecal gland (figs. 60, 61).

DESCRIPTION: Length 3 to 4 mm.

Color blackish or reddish and blackish. Body entirely blackish with dark reddish brown legs or head, elytra and tip of abdomen (segments VII–X) reddish to orange, pronotum and most of abdomen black to dark reddish brown. Antennae and legs yellowish brown.

Head length (HL, figs. 37, 53) less than width of head (HW). Dorsum of head with coarse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length of head (PO). Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with truncate or sinuo-truncate lobe extending from median emargination to half across labrum. (Mandible not studied.) Antennomeres 4 and 11 unmodified.

Pronotum (fig. 53) strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and with scattered coarse punctures on lateral portion; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

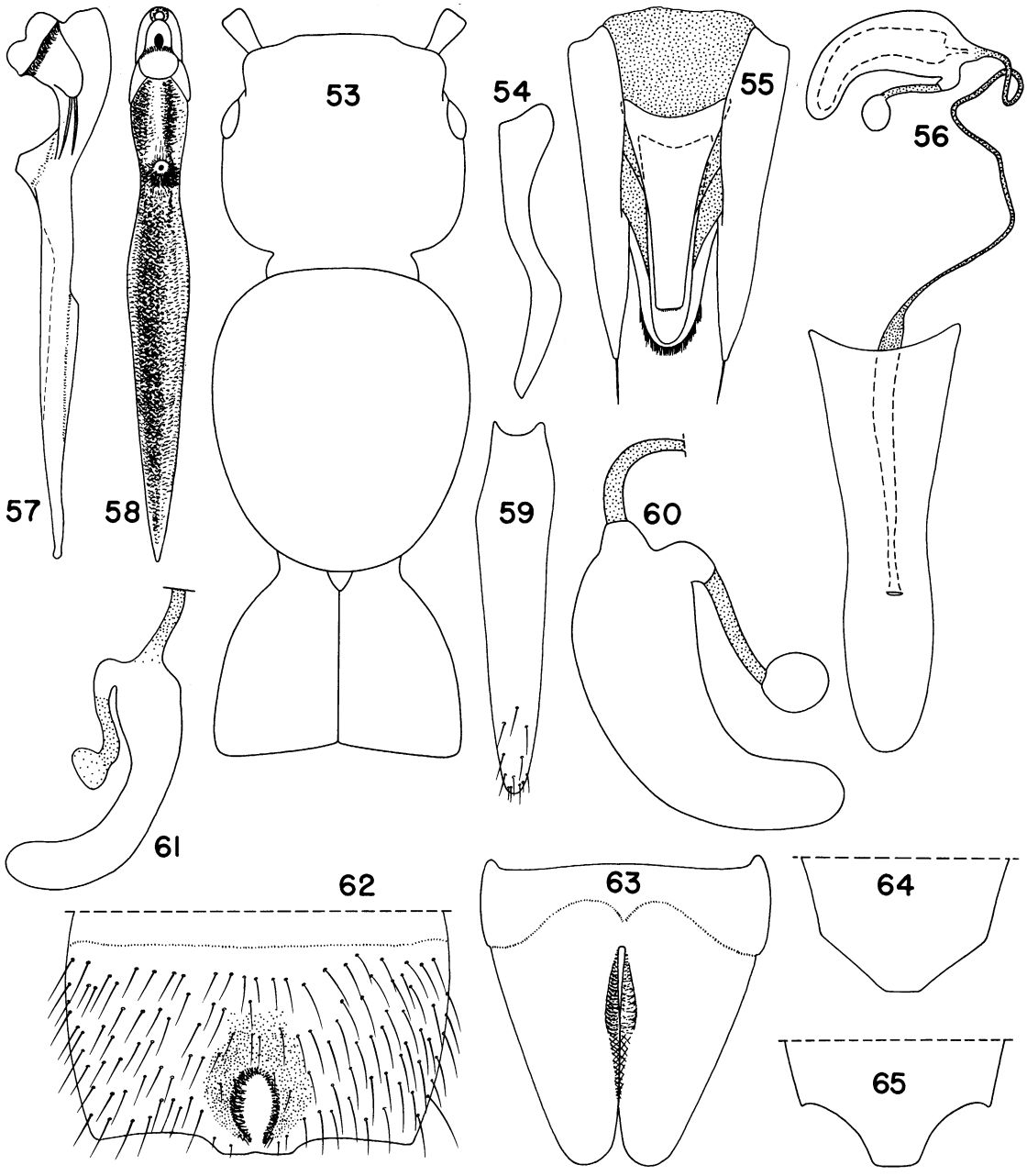
Elytra (EL, figs. 38, 53) shorter than length of pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture absent. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with posterior margin produced into truncate lobe; lobe of male broad with gradually sloping sides (fig. 64), lobe of female more slender, long, and with steeply sloping sides (fig. 65).

Male. Sternites IV to VI unmodified. Sternite VII (fig. 62) with oval median depression; depression bordered laterally and anteriorly by micropores (with dissecting microscope micropores appear to be abrasion of surface); posterior margin of sternite with broad median, apically truncate lobe with slight median emargination; sternite without median carina or inner surface. Sternum VIII (fig. 63) with deep, narrow median incision extending for about three-fourths the length of segment; incision bordered near middle by wide depression; basal carina slightly divided medially, each half strongly sinuate; base without median groove. Sternite IX (fig. 59) straight, only slightly asymmetrical; apical portion with moderately dense patch of setae.

Aedeagus (figs. 57, 58) with short, broad parameres; parameres with two setae near apex. Median lobe, in dorsal view, long, slender, straight, symmetrical and with lateral margins constricted adjacent to ostium (fig. 58), then tapered to apex; median lobe, in lateral view, with apical portion nearly straight; dorsal surface with broad, apically tapered, moderately deep median groove; ventral surface with midlongitudinal carina on apical half, basal end oblique. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot with median sclerite. Ostium near base on dorsal surface and surrounded by large cone (ostial cone).

Female. Sternites IV to VII unmodified. Sternum VIII with median posterior margin slightly produced. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX with two genital appendages (fig. 55); basal genital appendage elongate, slender, api-



FIGS. 53–65. *Gnathymenus apterus*. 53. Head and thorax, dorsal. 54. Apical genital appendage of segment IX, female, lateral view. 55. Segment IX, female, ventral view. 56. Apical genital appendage of segment IX with duct leading to spermatheca, female, ventral view. 57. Aedeagus, right lateral view. 58. Aedeagus, dorsal view. 59. Sternite IX, male. 60. Spermatheca. 61. Spermatheca. 62. Sternite VII, male, ventral view. 63. Sternum VIII, male. 64. Tergum VIII, apical portion, male. 65. Tergum VIII, apical portion, female.

cally truncate; apical genital appendage not longitudinally incised or divided, without setae, with rounded apex, and sinuate in lateral view (fig. 54).

Spermatheca (figs. 60, 61) sclerotized, capsule elongate to moderately elongate, widest near end with spermathecal duct then tapered to apex; duct to spermathecal gland located near spermathecal duct; external opening of spermathecal duct on apical genital appendage small, and on apical half (fig. 56).

HABITAT AND DISTRIBUTION: The species is known only from the south central Chilean provinces of Chiloe, Llanquihue, and Valdivia (fig. 51).

VARIATION: The size and color varies among the 18 specimens I studied. The two males and one female from Pargua and 10 specimens from Chepu are large (about 4 mm. long), the head and elytra are distinctly reddish and contrast sharply with the blackish pronotum. The females from Valdivia are small, about 3 mm. long, and the color pattern less contrasting; the head and elytra are reddish with dark infusions and the pronotum is dark reddish brown with blackish infusions. The male labeled as being from Chile is also small (head is missing) but the body is nearly black. Despite these color and size differences the specimens all seem to be conspecific.

DISCUSSION: The original description of *G. apterus* included a variation named "α" that was distinguished from the larger, blackish *apterus* by its small size and reddish head, pronotum, and elytra and black abdomen with a reddish apex. The type of "α" is a female. The spermatheca (fig. 61) is elongate and similar to that of some females of *kapetus* (figs. 80, 87). The shape of the apical genital sclerite of "α" is more similar to that of *apterus* (fig. 56) than *kapetus* (fig. 79) and is strongly sinuate in lateral view (fig. 54) and the apical half is "scooped-out" in both "α" and *apterus*. The form of the apical genital sclerite of *apterus* is unique and I therefore regard "var. α" to be conspecific with *apterus*.

Another specimen previously identified as *apterus* is a dark blackish male in the Gay Collection. It was determined by Fauvel as *G. apterus* and has the same constriction of the aedeagus adjacent to the ostial cone as is known in other males of *apterus*. Both this specimen and "var. α" are smaller than the other known specimens.

SYNONYMS: The lectotype of *Gnathymenus quadripartitus* has a reddish head, elytra, and abdominal apex, reddish brown pronotum, and dark reddish brown abdomen; the aedeagus is constricted adjacent to the ostium with the lateral margin at this point becoming almost a part of the ostial cone. I concur with Coiffait and Saiz (1968) who regarded *apterus* and *quadripartitus* as synonyms.

LECTOTYPE DESIGNATION: I am selecting as lectotype for *Gnathymenus quadripartitus* the male with an old, handwritten label as follows: "Chiloe et Puerto Montt" which is attached to a larger label that indicates the specimen is from Chile, belongs in the Institut Royal des Sciences Naturelles, and came from the Fauvel collection. Next is another old, handwritten label which reads "4-partitus Fairm." Below these are a collection label and a type label. To all of this I have added my lectotypic label.

The type locality given in the original description of *quadripartitus* (Fairmaire and Germain, 1861, p. 441) is Chiloé, Golfe de Reloncavi, but the label with the specimen reads "Chiloe et Puerto Montt." The province of Chiloe, according to current maps, is south of the Seno (or Golfo) Reloncavi. Puerto Montt is on the northern edge of Seno Reloncavi and both are in Llanquihue Province.

TYPE: The holotype of *Gnathymenus apterus* Solier, which belongs in the Muséum National d'Histoire Naturelle, Paris, was not found (N. Berti, personal commun.). Fagel (1958, p. 9) and Coiffait and Saiz (1968, p. 376) state that they studied a specimen of *Gnathymenus apterus* which was labeled as "Type" and which was in the Fauvel Collection in the Institut Royal des Sciences Naturelles, Brussels. Fauvel (1868, p. 20) said that he had seen a "type" of *apterus*

("L'espèce [*G. apterus*] dont j'ai vu un type de Solier . . . ."). I have studied this specimen but the evidence is inconclusive whether or not it is the type.

MATERIAL EXAMINED: Nine males, nine females. CHILE: *Chiloe:* Chiloe Island, Chepu, October 2, 1958 (3 males, 1 female), October 4, 1958 (2 males), October 15, 1958 (4 females), Fr. Kuschel (10, BMNH). *Llanquihue:* 5 km. N Pargua, February 28, 1976, T. Cekalovic (1 male, 1 female, CNC; 1 male, AMNH); Golfo de Reloncavi, Puerto Montt (lectotype male of *quadripartitus,* 1 female, IRSN). *Valdivia:* Valdivia (1 female, NMNH, type of *apterus* var. α; 1 female, IRSN, labeled as "type" *Gnathymenus apterus*).

3. **Gnathymenus volcanus**, new species
Figures 6, 51, 66–69

HOLOTYPE: Male. Chile: Valparaiso: Quillota, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: The male of this species may be distinguished from all others by characters of the aedeagus, and sternite VII. The oval depression and truncate lobe of the posterior margin of sternite VII (fig. 69) will separate the species from all but *G. apterus.* Adjacent to the ostium of the median lobe the lateral margins are nearly parallel and the lateral margin is separated from the ostial cone in this species, whereas in *apterus* the lateral margin is constricted adjacent to the ostial cone and the lateral margin of the median lobe is coincident with the lateral margin of the ostial cone (cf. figs. 58 and 66). Further, the patch of micropores of sternite VII of *G. volcanus* is separated mediobasally (fig. 69) rather than continuous as in *G. apterus* (fig. 62), and the posterior margin of tergum VIII is rounded in *G. volcanus* (fig. 67) rather than truncate as in *G. apterus* (fig. 64).

DESCRIPTION: Length 3.5 mm. Color reddish and reddish brown. Head and elytra reddish, pronotum and elytra reddish brown. Antennae and legs yellowish brown.

Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with coarse, scattered punctation on lateral side, midlongitudinal strip impunctate; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with low, rounded, midlongitudinal ridge. Labrum with U-shaped median emargination; anterior margin with broad, sinuotruncate lobe on each side of median emargination, extending from emargination to halfway across each half of labrum. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and with scattered, coarse punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron, sutures obsolete. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture absent. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII (fig. 67) with posterior margin produced into rounded lobe.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 69) with oval, median depression; depression bordered laterally by patch of micropores (with dissecting microscope appear to be abrasion of surface) that extend proximad of depression, micropores absent from midlongitudinal strip anterior to depression; posterior margin of sternite with broad, median, apically truncate, medially slightly emarginate lobe, inner surface without median carina. Sternum VIII with deep, narrow, median incision extending for about three-fourths length of segment; incision bordered near basal third by wide depression;

basal carina divided medially and with each half strongly sinuate; base without median groove. Sternite IX straight, only slightly asymmetrical; apical portion with scattered setae.

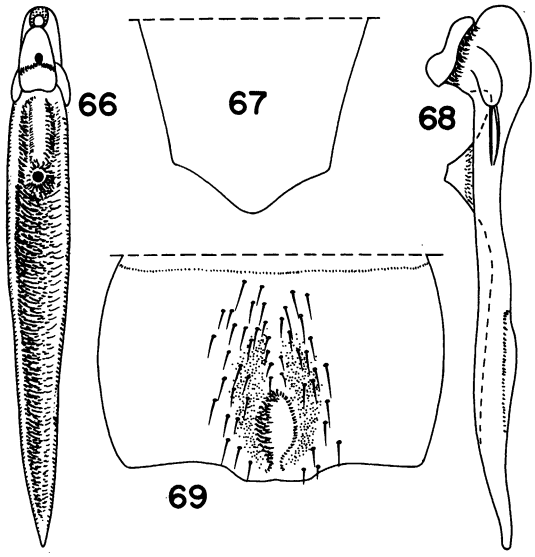
Aedeagus (figs. 66, 68) with short, broad parameres; parameres with two setae at apex. Median lobe, in dorsal view, long, slender, straight, symmetrical, and with lateral margins nearly parallel to beyond ostium then gradually tapered to apex; lateral margin adjacent to ostium nearly parallel, not constricted and separated from ostial cone by depression (fig. 66); median lobe, in lateral view, with apical portion nearly straight; dorsal surface with broad groove extending from ostium toward apex, groove deep for most of length; ventral surface with midlongitudinal carina on apical half, carina with basal end gradually rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with pump spot; circular pump spot with sclerite in middle (fig. 66). Ostium near base on dorsal surface and surrounded by large cone.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known from the north central Chilean province of Valparaiso (fig. 51).

ETYMOLOGY: From the Spanish, *volcan*, for volcano, referring to the shape of the ostial cone.

MATERIAL EXAMINED: Holotype.



FIGS. 66–69. *Gnathymenus volcanus*. 66. Aedeagus, dorsal view. 67. Tergum VIII, apical half, male. 68. Aedeagus, right lateral view. 69. Sternite VII, male.

4. **Gnathymenus kapetus**, new species
Figures 6, 10, 11, 51, 70–87

HOLOTYPE: Male. Chile: Concepcion: Hualpén, March 19, 1975, collected by T. Cekalovic, deposited in the American Museum of Natural History.

PARATYPES: Nine males with same data as holotype (AMNH).

DIAGNOSIS: The males are distinguished from the males of all other species by the lobe on the posterior margin of sternite VII, the elongate median depression, and short, low ridge near the apex of sternite VII (fig. 81), the form of the aedeagus, the narrow median groove of the dorsal surface of the aedeagus, the proximity of the ostium to the basal foramen, and the low ostial cone (figs. 83, 84). The female is identified by the position of the spermathecal opening on the apical genital sclerite, by the straight apical genital sclerite, and by characters in the Key.

DESCRIPTION: Length 2.6 to 3.5 mm.

Color reddish blackish, and reddish brown. Head reddish to orange, pronotum black to dark reddish brown to reddish and frequently with reddish anterior angles, elytra dark reddish brown to reddish to orange, abdomen black to dark reddish brown with segments VIII to X reddish to orange, legs and antennae yellowish brown.

Head length (HL, fig. 38, 73) and width (HW) approximately equal. Dorsum of head with coarse, scattered punctation on lateral portion; surface polished, without ground sculpturing. Eye length (OL) about fourtenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad, sinuously truncate lobe on each side of emargination and extending

to about halfway to lateral margin (figs. 76, 77). Mandible (fig. 70) with large, triangular median denticle and minute basal denticle. Antennomeres 4 and 11 unmodified.

Pronotum (fig. 73) strongly convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 73) shorter than length of pronotum (PL, fig. 38). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture absent. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII (figs. 78, 86) with posterior margin produced into truncate lobe.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 81) with elongate, anteriorly tapered, median depression; depression bordered laterally by long patch of micropores (with dissecting microscope appears to be abrasion of surface) and posteriorly by midlongitudinal short, low, rounded ridge; posterior margin of sternite with median, apically rounded, trianguloid lobe; inner surface without median carina. Sternum VIII (fig. 85) with deep, narrow, median incision extending about three-fourths the length of segment; incision bordered near middle by wide depression; basal carina divided medially and with each portion sinuous; base without median groove. Sternite IX straight, slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 83, 84) with short, broad parameres; parameres with two setae near apex. Median lobe, in dorsal view (fig. 83), long, slender, straight, symmetrical, constricted just posterior to apex of parameres and again near middle, then tapered to apex; median lobe, in lateral view, with apex curved ventrally, with ventral surface swollen slightly just posterior to middle; dorsal surface with groove extending from ostium to near apex, groove broad at ostium then strongly narrowed to near middle then widening again before tapering to apex, groove deep from ostium to just behind middle then becoming very shallow; collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot (fig. 83) with sclerite in middle. Ostium near base on dorsal surface and surrounded by low cone.

Female. Sternites IV to VII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 74) with two genital appendages; basal genital appendage elongate, slender, with posterior end rounded; apical genital appendage not longitudinally divided or incised, without setae, with rounded apex, and straight in lateral view (fig. 75).

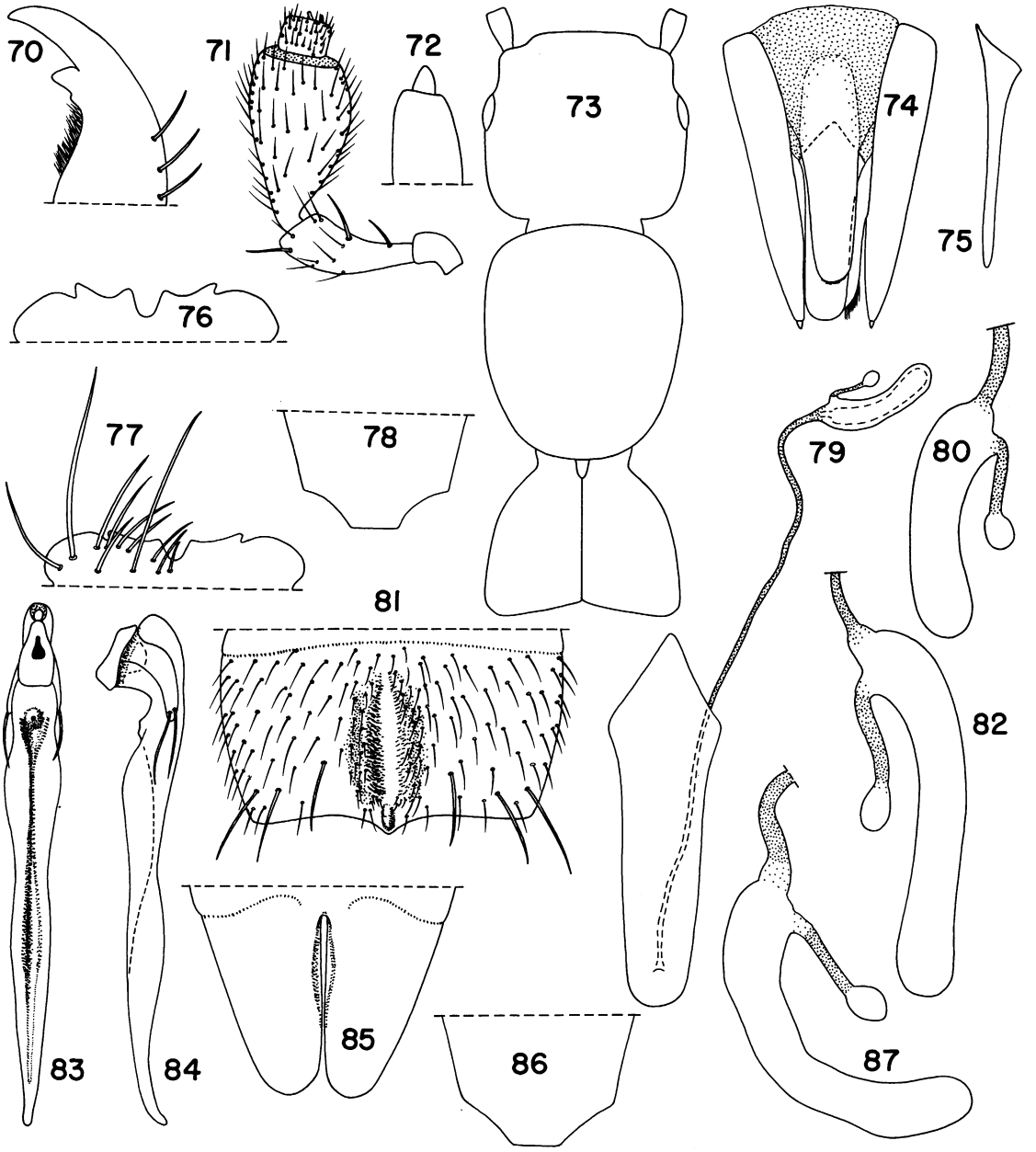
Spermatheca (figs. 80, 82, 87) sclerotized; capsule elongate, curved and of approximately equal diameter throughout; duct to spermathecal gland located near spermathecal duct; external opening of spermathecal duct on apical genital appendage small and subapical (fig. 79).

HABITAT AND DISTRIBUTION: The species is known only from the southern half of Chile, from Concepción, Malleco, and Magallanes Provinces (fig. 51). In Malleco specimens were collected from forest mushrooms at 200 m. elevation.

VARIATION: In specimens from Agua de la Gloria, the pronotum is reddish, the elytra reddish brown to dark reddish brown and the tip of the abdomen black. The length and curvature of the spermathecal capsule (figs. 80, 82, 87) varies but variation intergrades and is not correlated with variation of other features.

DISCUSSION: Although the provinces from which this species is known are widely separated, I find no characters to distinguish the specimens from the two provinces.

ETYMOLOGY: From the Greek, *kapetos*,



FIGS. 70–87. *Gnathymenus kapetus*. 70. Right mandible. 71. Maxillary palpus, ventral view. 72. Maxillary palpus, fourth segment and apex of third, lateral view. 73. Head and thorax. 74. Segment IX, female, ventral view. 75. Apical genital appendage, female, lateral view. 76. Labrum, setae removed. 77. Labrum. 78. Tergum VIII, apex, female. 79. Apical genital appendage and spermatheca, female, ventral view. 80. Spermatheca. 81. Sternite VII, male. 82. Spermatheca. 83. Aedeagus, dorsal view. 84. Aedeagus, right lateral view. 85. Sternum VIII, male. 86. Tergum VIII, apex, male. 87. Spermatheca.

for ditch or groove, referring to the groove on the dorsal surface of the aedeagus.

MATERIAL EXAMINED: One hundred twenty-seven specimens. CHILE: *Concepcion:* 13 km. SE Agua de la Gloria, August 24, 1968, C. W. O'Brien (23 males, 26 females, AMNH); Estero Nonguen, March 13, 1977 (4 males, 4 females, AMNH), April 21, 1977 (2 males, 2 females, AMNH); October 15, 1977 (2 males, 2 females, AMNH); December 11, 1977 (3 males, 2 females, AMNH); T. Cekalovic; Cerro Caracol, April 9, 1977, T. Cekalovic (2 males, 1 female, AMNH); Cerro Caracol, Miradol Aleman, March 25, 1973, T. Cekalovic (1 male, CNC); Hualpén (type series 10 males, 18 females, AMNH), April 8, 1977 (9 males, 10 females, AMNH); Parque Hualpén, December 10, 1971 (1 male, 4 females, CNC). *Magallanes:* Isla Riesco, Rocallosa, February 7, 1976, T. Cekalovic (1 male, CNC). *Malleco:* 15 km. W Victoria, 200 m., December 29, 1976, S. Peck, berlese of forest mushrooms (2 males, CNC).

5. **Gnathymenus stubbus**, new species
Figures 6, 51, 88–94

HOLOTYPE: Male. Chile: Concepcion: Copiulemu, September 26, 1971, T. Cekalovic, deposited in the American Museum of Natural History.

PARATYPES: None.

DIAGNOSIS: The male of this species may be distinguished by characters of the aedeagus, sternite VII, and tergum VIII. The aedeagus (figs. 91, 92) is straight, slender, has a straight apex, and a deep middorsal groove. Sternite VII (fig. 90) has a curved ridge near the base of the median lobe of the posterior margin. Tergum VIII (fig. 93) has a long, apically rounded lobe on the posterior margin.

DESCRIPTION: Length 3.5 mm.

Color reddish and blackish. Head and pronotum reddish. Elytra reddish brown, with dark brown infusions. Abdomen black. Antenna and legs yellowish brown.

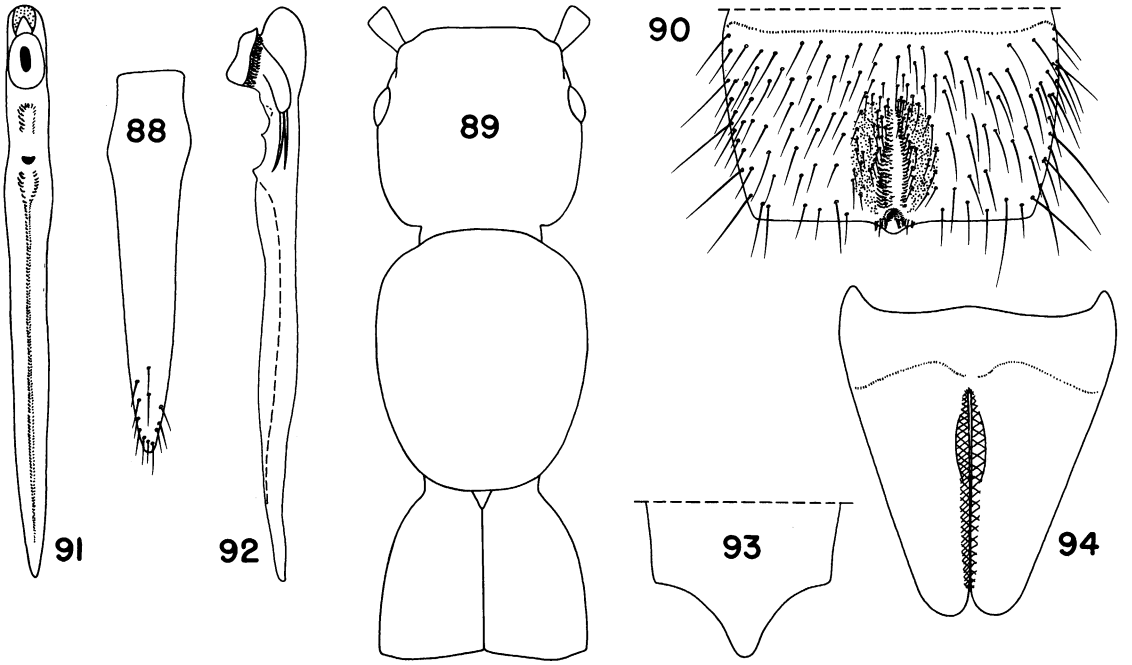
Head length (HL, figs. 38, 89) and width (HW) approximately equal. Dorsum of head with coarse scattered punctation on lateral portion; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with broad, midlongitudinal low, flat elevation. Labrum with U-shaped median emargination; anterior margin with two pairs of moderately distinct denticles; one adjacent to median emargination; second halfway to lateral margin. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum (fig. 89) strongly convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and with scattered coarse punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL) shorter than length of pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture absent. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe of posterior margin. Tergum VIII (fig. 93) with elongate, median, apically rounded lobe of posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 90) with elongate, anteriorly tapered median depression; depression bordered laterally by long patch of micropores (with dissecting microscope appear to be abrasion of surface) and posteriorly by low, semicircular ridge; semicircular ridge shallowly to deeply notched midbasally; posterior margin of sternite with median, apically rounded lobe; inner surface without median groove. Sternum VIII (fig. 94) with deep, narrow median incision extending for about three-fourths the length of segment; incision bordered at basal third by wide depression; basal carina divided medially with each half sinuous; base without median groove. Sternite IX (fig. 88) straight and only slightly



FIGS. 88–94. *Gnathymenus stubbus*. 88. Sternite IX, male. 89. Head and thorax. 90. Sternite VII, male. 91. Aedeagus, dorsal view. 92. Aedeagus, right lateral view. 93. Tergum VIII, male, apex. 94. Sternum VIII.

asymmetrical; apical portion with moderately dense setae.

Aedeagus (figs. 91, 92) with short, broad parameres; parameres with two setae at apex. Median lobe, in dorsal view, long, slender, straight, symmetrical, and slightly swollen at about basal third then gradually tapered to apex; median lobe, in lateral view, with apical portion straight or slightly sinuous; dorsal surface with groove extending from ostium to near apex; groove broad near ostium, then narrow and parallel to apex, groove deep for most of length; collar of basal foramen entirely sclerotized. Base of median lobe with pump spot; pump spot with median sclerite (fig. 91). Ostium near base on dorsal surface.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the central Chilean province of Concepcion (fig. 51).

ETYMOLOGY: From the Anglo-Saxon, *stubb,* for stump, referring to the rounded process of tergum VIII.

MATERIAL EXAMINED: Two males. CHILE: *Concepcion:* Coelemu, December 12, 1971, T. Cekalovic (1 male, CNC); Copiulemu (holotype male, AMNH).

6. **Gnathymenus twelfus**, new species
Figures 6, 51, 97–106

HOLOTYPE: Male. Chile: Malleco: 15 km. W Victoria, 200 m., December 29, 1976, S. Peck, deposited in the Canadian National Collection, Ottawa.

PARATYPES: Twenty-nine males, with same data as holotype (21 males, CNC; 6 males, AMNH).

DIAGNOSIS: Males of this species can be separated from other males by the features of the seventh sternum and aedeagus. Sternite VII (fig. 102) has a broad, ovoid depression, a small, low, transverse ridge at the

posterior margin of the depression, and a median lobe on the posterior margin. The aedeagus is sinuous in lateral view (fig. 96), the apex is hooked downward; in dorsal view (fig. 95) the aedeagus is suddenly expanded anterior to the middle, then constricted posterior to the middle, and the parameres each have six setae.

The female is readily distinguished by the presence of a sclerotized spermatheca and by the sinuate ridge near the apex of the apical genital sclerite (fig. 103).

DESCRIPTION: Length 3.0 to 4.1 mm.

Color reddish and blackish. Head, pronotum, and elytra reddish to reddish brown; abdomen black with segments VIII–X reddish brown. Legs and antenna yellowish brown.

Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with coarse punctation on lateral portion; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina, some specimens with low, rounded ridge. Labrum (fig. 104) with median, U-shaped emargination; anterior margin with broad truncate lobe adjacent to median emargination. Mandible (fig. 106) with large triangular median denticle and minute basal denticle. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and other coarse, scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and convergent toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL) shorter than length of pronotum (PL, fig. 38). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture absent. Metathoracic wing absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

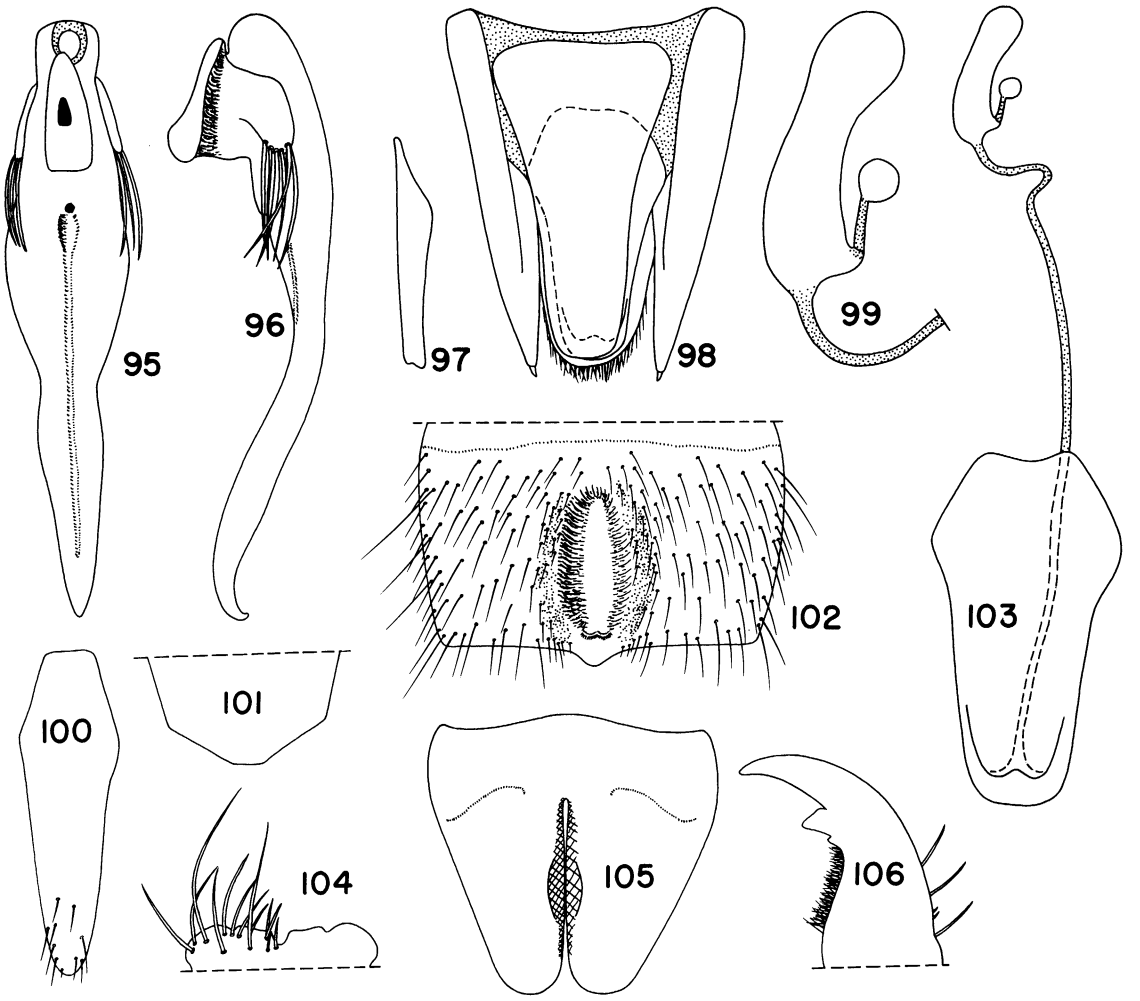
Abdominal segments III to VII each with one pair of laterotergites. Tergite VII without dermal fringe of posterior margin. Tergum VIII (fig. 101) with posterior margin produced into short truncate lobe.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 102) with oval median depression; depression bordered laterally by long patch of micropores (with dissecting microscope appears as abrasion of surface) and posteriorly by low, transverse, sinuous carina; posterior margin of sternite with median, apically rounded lobe; inner surface without median carina. Sternum VIII (fig. 105) with deep, narrow median incision extending for nearly three-fourths the length of segment; incision bordered near middle by wide depression; basal carina divided medially and with each portion sinuate; base without median groove. Sternite IX (fig. 100) straight, only slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 95, 96) with short, broad parameres; parameres with six setae near apex. Median lobe, in dorsal view, long, straight, symmetrical, with median third expanded, then constricted at base of apical third, then slightly expanded before tapering to apex; median lobe, in lateral view, sinuate, with apex deflexed ventrally, median third of lateral side carinate; dorsal surface with groove extending from ostium to near apex, groove widest at base with remainder narrow and parallel, groove moderately deep throughout to near apex. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot with median sclerite (fig. 95). Ostium near base on dorsal surface and surrounded by obsolete cone.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 98) with two genital appendages; basal genital appendage elongate, slender, with posterior end broadly rounded; apical genital appendage not longitudinally divided or incised; without setae, with arcuato-truncate apex, with sinuate ridge near apex, with external opening of spermatheca small, beneath sinuate ridge (fig. 103), and straight in lateral view (fig. 97).

Spermatheca (fig. 99) sclerotized, capsule



FIGS. 95–106. *Gnathymenus twelfus*. 95. Aedeagus, dorsal view. 96. Aedeagus, right lateral view. 97. Apical genital appendage, female, lateral view. 98. Segment IX, female, ventral view. 99. Spermatheca. 100. Sternite IX, male. 101. Tergum VIII, apex. 102. Sternite VII, male. 103. Apical genital appendage and spermatheca, female, ventral view. 104. Labrum. 105. Sternum VIII, male. 106. Right mandible.

moderately elongate, curved and of approximately equal diameter throughout; duct to spermathecal gland located near spermathecal duct; external opening of spermathecal duct on apical genital appendage, under sinuate ridge, large, and subapical (fig. 103).

HABITAT AND DISTRIBUTION: This species is known only from central Chile from Malleco Province (fig. 51) where it was collected from "forest mushrooms."

VARIATION: In some individuals the pronotum has a dark reddish brown cast, and is darker than the reddish head and elytra. This represents individual variation.

DISCUSSION: The female specimen labeled as being from "South America" was previously determined as *Gnathymenus quadripartitus*, a species for which the female is unknown. I have determined this female as *G. twelfus* rather than *Gnathymenus quad-*

ripartitus because the apical genital sclerite (fig. 103) has a sinuate ridge at the external opening of the spermatheca, a location characteristic of the females of *twelfus*. Although the female of *quadripartitus* is unknown, the coxites may be more similar to *G. apterus* than to *twelfus* because they are sister species.

ETYMOLOGY: From the Anglo-Saxon, *twelf*, for 12, referring to the 12 setae of the parameres.

MATERIAL EXAMINED: Twenty-nine males, 20 females. SOUTH AMERICA (1 female, FMNH). CHILE: *Malleco:* 15 km. W Victoria, 200 m. (type series 25 males, 16 females, CNC; 4 males, 3 females, AMNH).

7. *Gnathymenus detectus* Coiffait and Saiz

Figures 6, 107–110

Gnathymenus detectus Coiffait and Saiz, 1968, pp. 371, 374–376, 377. (Type locality. Holotype, without locality data, male, in the Museo Nacional de Historia Natural, Santiago, examined.)

DIAGNOSIS: Males of this species are distinguished from those of other species by the aedeagus (figs. 107, 108) that has the apical half sinuate in lateral view and the middle portion strongly expanded then constricted in dorsal view. The ventral surface has a subapical hook.

DESCRIPTION: Length about 3.5 mm.

Color reddish brown and black. Head, pronotum, elytra, legs, and antennae reddish brown; abdomen black.

Head length (HL, fig. 38) approximately equal to width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length of head (PO). Neck width 0.6 width of head. Submentum without median carina. (Labrum and mandibles are studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and with scattered punctures on lateral portion; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median carina or tubercle near apex.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with posterior margin arcuato-truncate.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 110) with elongate, oval depression; depression bordered laterally by micropores (with dissecting microscope micropores appear to be abrasion of surface); posterior margin of sternite with low, median, rounded lobe; sternite without median carina on inner surface. Sternite VIII (fig. 109) with deep, narrow median incision extending for about seven-tenths the length of segment; incision bordered near middle by depression and by beveled surface; basal carina divided medially, each half strongly sinuate; base without median groove. (Sternite IX not studied.)

Aedeagus (figs. 107, 108) with short, broad parameres; parameres with three subapical setae. Median lobe, in dorsal view, slender, symmetrical, gradually expanded from base to near middle, then strongly constricted just distad of middle, then gradually expanded to near apex, then tapered to apex, apex subacute; median lobe, in lateral view, with apical half strongly sinuate and with subapical hook on ventral edge; dorsal surface with median groove extending from ostium to near apex, lateral edges reflexed proximad of middle; ventral surface with low, fine, midlongitudinal carina at about middle. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot with median sclerite (fig. 107). Ostium near base on dorsal surface and surrounded by cone (ostial cone).

Female unknown.

HABITAT AND DISTRIBUTION: The locality for this species is not known.

MATERIAL EXAMINED: Holotype.

8. *Gnathymenus distinctus* Coiffait and Saiz

Figures 6, 111–115

Gnathymenus distinctus Coiffait and Saiz, 1968, pp. 371, 374, 375, 377. (Type locality: Holotype without type locality, in Museo Nacional de Historia Natural, Santiago, not examined.)

DIAGNOSIS: Males can be distinguished from those of other species by the form of the aedeagus (figs. 113, 114) and the rounded lobe on the posterior margin of sternite VII (fig. 112). The apex of the aedeagus is rounded, the dorsal surface has a median groove, and the ostium is surrounded by a cone.

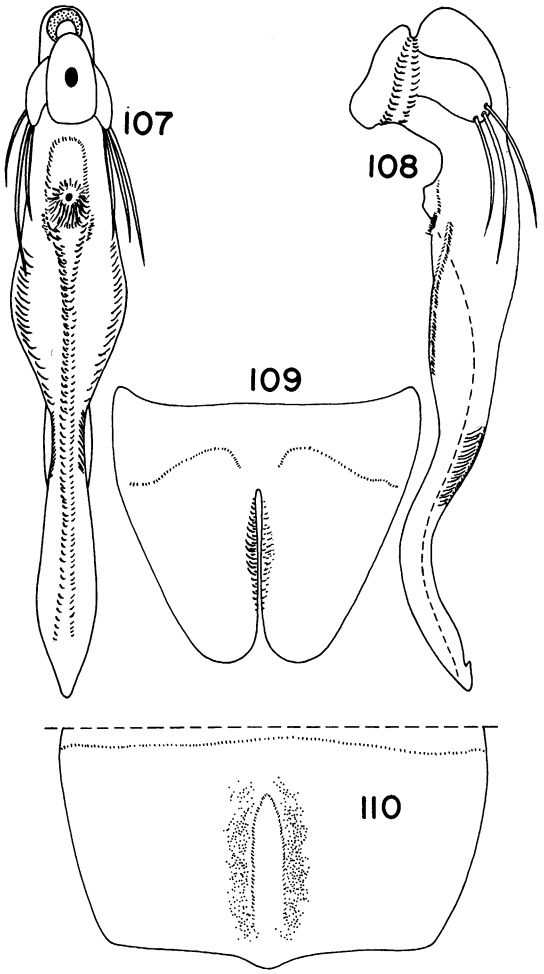
DESCRIPTION: Length about 3.2 mm.

Color reddish brown. Head, pronotum, and elytra reddish brown, elytra paler with orange cast. Abdomen dark reddish brown to nearly black. Legs and antennae reddish brown.

Head length (HL, fig. 38) less than width of head (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length of head (PO). Neck width 0.6 width of head. Submentum without median carina. (Labium and mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved, irregular row of punctures on disk and with scattered punctures on lateral portion; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxae. Metasternum without carina or tubercle near apex.



FIGS. 107–110. *Gnathymenus detectus*. 107. Aedeagus, dorsal view. 108. Aedeagus, right lateral view. 109. Sternum VIII, male. 110. Sternite VII, male, setae broken off.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with posterior margin rounded.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 112) with elongate, oval depression; depression surrounded laterally by setae and micropores (with dissecting microscope micropores appear to be abrasion of surface); posterior margin of sternite

with rounded lobe at middle; sternite without median carina on inner surface. Sternum VIII (fig. 115) with deep, narrow median incision extending for about three-fourths length of segment; incision bordered near middle by depression, surface adjacent to incision beveled; basal carina divided medially, each half strongly sinuate; base without median groove. Sternite IX (fig. 111) straight and slightly asymmetrical; apical portion with moderately dense patch of setae.

Aedeagus (figs. 113, 114) with short, broad parameres; parameres with two subapical setae. Median lobe, in dorsal view, elongate, straight, slender, and symmetrical; lateral margin expanded at about one-third from base then gradually convergent to constriction just beyond middle then gradually tapered to apex; apex rounded; median lobe, in lateral view, with apical half slightly curved dorsally; dorsal surface with apically expanded, median groove and with small patch of short, fine setae adjacent to ostial cone; ventral surface slightly rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot with median sclerite. Ostium near base on dorsal surface and surrounded by ostial cone.

Female not available for study.

HABITAT AND DISTRIBUTION: One of the specimens that I studied lacked locality data, the other gave only "South America." Coiffait and Saiz (1968, p. 377) examined one male of *distinctus* that had no aedeagus from Nahuelbuta, Malleco.

MATERIAL EXAMINED: Two males. One male, without locality (MNC), one male from "South America," without further data (BMNH).

9. *Gnathymenus testaceus* Coiffait and Saiz

Figures 6, 51, 116–121

Gnathymenus testaceus Coiffait and Saiz, 1968, pp. 371, 374, 375, 377, 378. (Type locality: Chile: [Ñuble]; Chillan, in the Museo Nacional de Historia Natural, Santiago, aedeagus of holotype examined.)

DIAGNOSIS: Males of this species are distinguished from those of all other species by characters of sternite VII and the aedeagus. Sternite VII (fig. 117) has a large median patch of short, stout setae. The aedeagus (fig. 119) is apically expanded and the apical margin has three long, acute processes; the ostium, on the ventral surface of the middle process, is encircled by setae (fig. 120).

DESCRIPTION: Length about 3 mm.

Color reddish brown with elytra slightly paler.

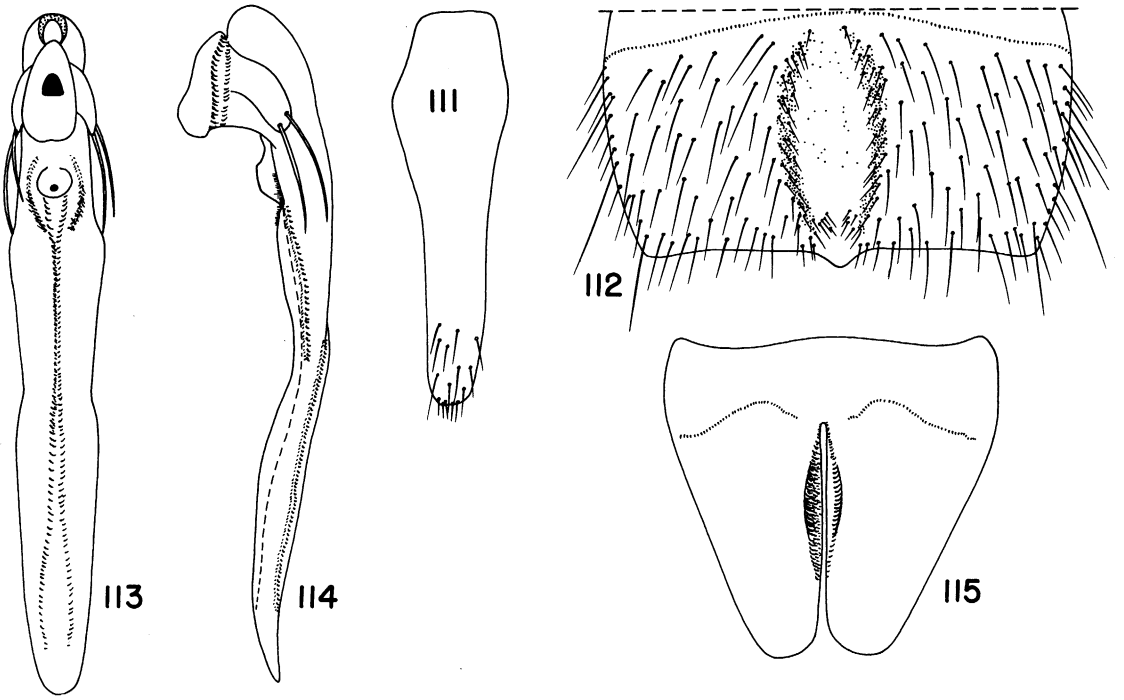
Head length (HL, fig. 38) and width (HW) of nearly equal length. Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-fourth of postocular length of head (PO). Neck width 0.6 width of head. Submentum without median carina. Labrum with U-shaped median emargination; anterior margin with two pairs of denticles. (Mandible not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median carina or tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 117) with elliptical median depression; base of depression with many short, stout setae; depression bordered laterally and anteriorly by setae and numerous micropores (with dissecting microscope mi-



FIGS. 111–115. *Gnathymenus distinctus*. 111. Sternite IX, male. 112. Sternite VII, male. 113. Aedeagus, dorsal view. 114. Aedeagus, right lateral view. 115. Sternum VIII, male.

cropores appear to be abrasion of surface); posterior margin of sternite broadly and shallowly emarginate; sternite without median carina on inner surface. Sternum VIII (fig. 121) with deep, narrow, median incision extending for about six-tenths the length of segment; incision with adjacent surface beveled; basal carina entire, not separated medially; base without median groove. Sternite IX (fig. 116) straight, slightly asymmetrical; apical portion with dense patch of setae.

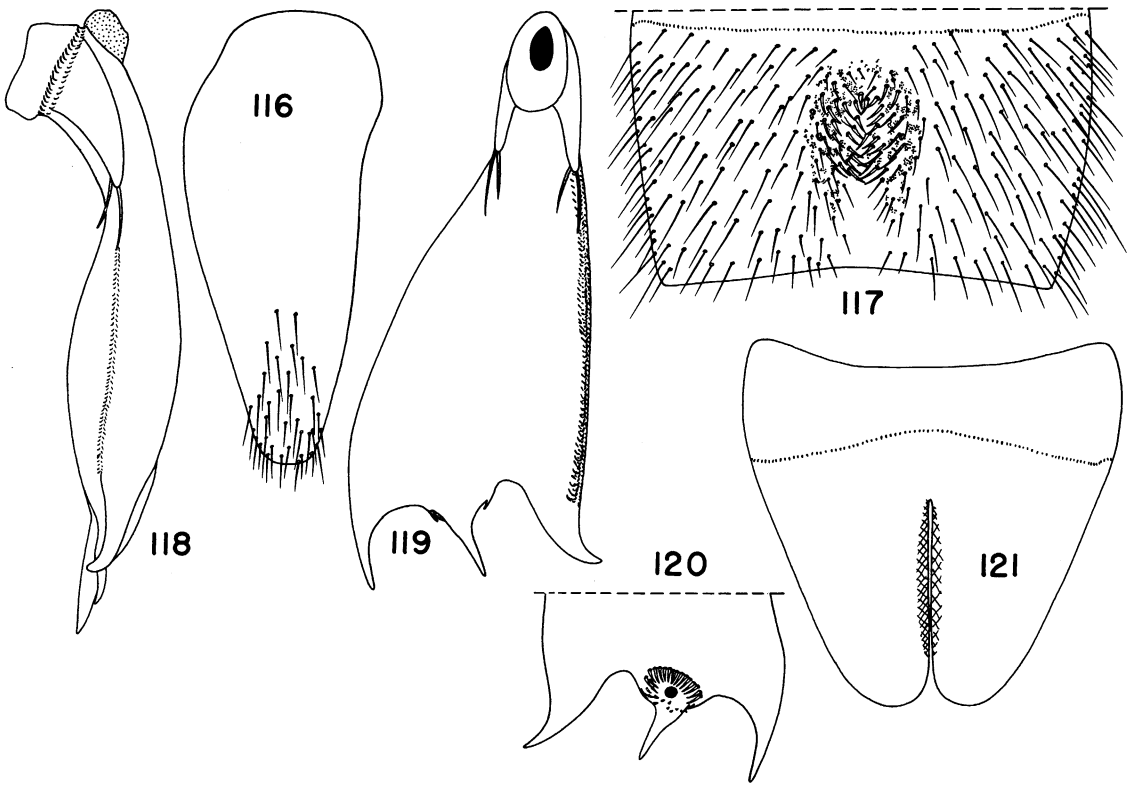
Aedeagus (figs. 118–120) with short, broad parameres; parameres with two setae at apex. Median lobe, in dorsal view, asymmetrical and expanded from base to apex; apex with three apically acute processes; processes bent to right; middle process, in lateral view, sinuous; right process, in lateral view, curved dorsally; dorsal surface broadly curved and with fine carina near right edge (see Discussion); ventral surface broadly curved. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium near apex, on ventral surface, beneath base of midapical process of median lobe; ostium surrounded by short stout setae (fig. 120).

Female not available for study.

HABITAT AND DISTRIBUTION: This species is known only from the south central Chilean province of Ñuble (fig. 51).

DISCUSSION: The aedeagal illustration given by Coiffait and Saiz (1968, p. 377, figs. 5, 6) shows what appear to be three carinae. The illustration was probably made from an aedeagus mounted on a slide which I was able to study. The middle "carina" is actually the internal duct leading from the basal foramen to the ostium. The two prominent lateral carinae are the result of the aedeagus being crushed by the cover slip. The only carina is the fine one on the right edge.

MATERIAL EXAMINED: One male and ae-



FIGS. 116–121. *Gnathymenus testaceus*. 116. Sternite IX, male. 117. Sternite VII, male. 118. Aedeagus, right lateral view. 119. Aedeagus, dorsal view. 120. Aedeagus, apex, ventral view. 121. Sternum VIII, male.

deagus of another specimen. CHILE: *Ñuble:* Chillan (1 male paratype, 1 aedeagus, MNC).

10. *Gnathymenus proximus* Coiffait and Saiz

Figures 6, 51, 122–131

Gnathymenus proximus Coiffait and Saiz, 1968, pp. 371, 374, 375, 377, 378. (Type locality: Chile: [Aconcagua]: Cerro Zapallar. Holotype, male, in the collection of Francisco Saiz, Universidad Catolica de Valparaiso, examined.)

DIAGNOSIS: Males of this species are distinguished from those of all others by the apically emarginate median lobe of abdominal sternite VII (figs. 128, 131), and the aedeagus which has a pair of ridges on the dorsal surface distad of the ostium and another, median ridge near apex (fig. 124). The female can be distinguished by the midlongitudinal carina on the apical genital appendage (fig. 126).

DESCRIPTION: Length approximately 3.2 mm.

Color reddish brown and dark reddish brown. Head and pronotum reddish brown; elytra and abdomen dark reddish brown with infusions of black; antennae and legs pale reddish brown.

Head length (HL, fig. 38) less than head width (HW). Dorsum of head with dense, coarse punctation on all but median strip; surface polished, without ground sculptur-

ing. Eye length (OL) about one-fourth of postocular length of head (PO). Neck width 0.6 width of head. Submentum with midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with small denticle adjacent to median emargination and with moderately large denticle between lateral margin and median denticle. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with dense, coarse punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum with median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with posterior margin produced into truncate lobe.

Male. Sternites IV to VI unmodified. Sternite VII (figs. 128, 131) with broad, round, shallow median depression; depression with micropores on all but narrow median strip, and with a few minute, stout setae near median strip; microporous area with setae; posterior margin broadly emarginate; emargination with median, apically emarginate lobe; inner surface without median carina. Sternum VIII (fig. 130) with deep, narrow median incision extending for about seven-tenths length of segment; basal carina entire, not separated medially; surface adjacent to incision beveled; base without median groove. Sternite IX slightly asymmetrical; apical portion with scattered setae (fig. 122).

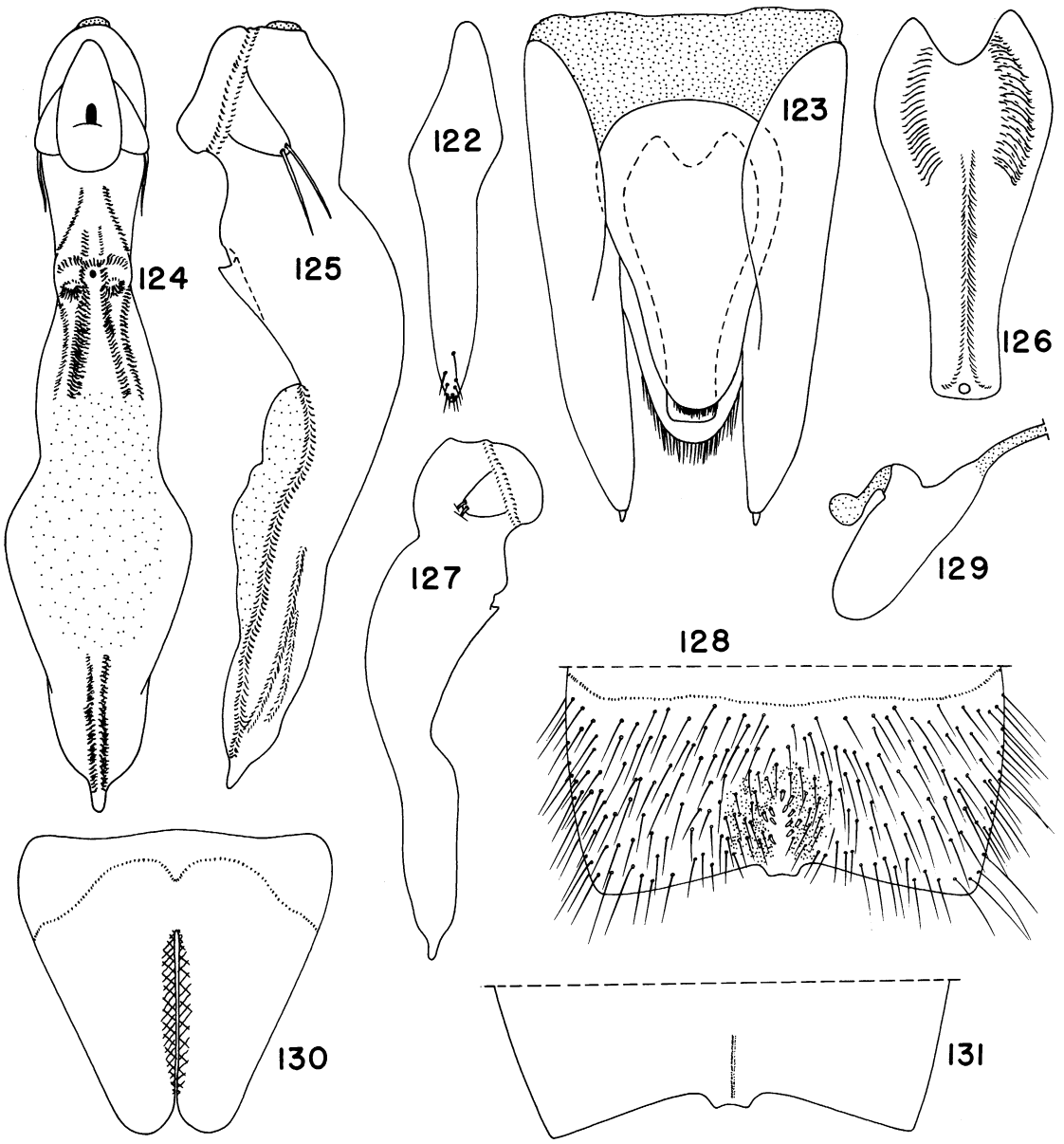
Aedeagus (figs. 124, 125, 127) with short, broad parameres; parameres with two subapical setae. Median lobe, in dorsal view, straight and symmetrical and with lateral margins constricted adjacent to ostium, then expanded, then constricted just distad of middle, then strongly expanded, then tapered toward apex, apex with elongate process; median lobe, in lateral view, bent dorsally; dorsal surface with middle of apical half lightly sclerotized and with midlongitudinal ridge on apical seventh; basal half of dorsal surface rounded ridge extending distad from each side of ostium, each ridge with pointed tubercle just distad of ostium; ventral surface with midlongitudinal carina for most of length and apical quarter with two carinae on each side of median carina. Collar of basal foramen entirely sclerotized. Base of median lobe with pump spots; pump spot with minute median sclerite. Ostium near base on dorsal surface in depression.

Female. Sternites IV to VII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 123) with two genital appendages; basal genital appendage broad basally, moderately broad apically and rounded apically; apical genital appendage with midlongitudinal carina, base broadly tumescent, apex truncate, and base broadly emarginate (fig. 126).

Spermatheca (fig. 129) sclerotized, capsule moderately elongate, widest near middle; duct to spermathecal gland near spermathecal duct; external opening of spermathecal duct on apical genital appendage, small, and near apex of genital appendage (fig. 126).

HABITAT AND DISTRIBUTION: This species is known only from the central Chilean province of Aconcagua (fig. 51) where it was collected at 700 m. (2296 ft.) elevation.

DISCUSSION: The type locality for *proximus* in the original publication is Ceno Zopallar in the province of Aconcagua. The locality on the label with the holotype is Cerro Zapallar. I am unable to find a Cerro Zapallar but can locate a town, Zapallar, near the southern part of the coast of Aconcagua. Near this town is a bluff named Morro de la Higuera which may be where the species was collected. The bluff is 692 m. high and the



FIGS. 122–131. *Gnathymenus proximus*. 122. Sternite IX, male. 123. Segment IX, female, ventral view. 124. Aedeagus, dorsal view. 125. Aedeagus, right lateral view. 126. Apical genital appendage, female, ventral view. 127. Aedeagus, holotype, left lateral view, from permanent slide preparation with cover slip depressing specimen. 128. Sternite VII, male. 129. Spermatheca. 130. Sternum VIII, male. 131. Sternite VII, holotype, male, from permanent slide preparation.

holotype was reported to have been collected at 700 m. elevation.

Figure 127 is drawn from a slide preparation that was used for the original description

and is included for comparison; it is impossible to see adequate surface detail from a permanent slide. The setae of sternite VII in figure 131 were missing.

MATERIAL EXAMINED: Three males, one female CHILE: *Aconcagua*: Cerro Zapallar, 700 m., January 26, 1961, collected by F. Saiz (4, FS).

11. **Gnathymenus garus,** new species
Figures 6, 51, 132–146

HOLOTYPE: Male. Colombia: [Cundinamarca]: Paramo de Monserrate, 5 km. E Bogotá, near Cerro del Rompedero, at 3175 m. elevation, October 14, 1968, from decayed leaves, collected by H. Sturm, deposited in the American Museum of Natural History.

PARATYPES: Thirty-five males, with same data as holotype (AMNH, FMNH, BM, CNC).

DIAGNOSIS: Males of this species are distinguishable from others by the unmodified posterior margin of sternite VII, the oval depression surrounded by setae on sternite VII (fig. 145) and the long, slender, apically acute, symmetrical aedeagus (figs. 141, 142).

The female is readily distinguished by the large opening of the spermatheca on the apical genital sclerite (fig. 144) and by the dense patch of microtricheae on the apex of the apical genital sclerite (fig. 144).

DESCRIPTION: Length 2.5 to 3.5 mm.

Color reddish and blackish. Head, pronotum, and abdominal segments VIII to X reddish to orange, elytra and abdomen black to dark reddish brown. Antennae and legs yellowish brown.

Head length (HL, figs. 38, 135) and width (HW) approximately equal. Dorsum of head with coarse, scattered punctation on lateral side from antennal base to neck; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum (fig. 146) with U-shaped median emargination; anterior margin with broad, sinuo-truncate lobe adjacent to median emargination. Mandible (fig. 136) with large, triangular median denticle and minute basal denticle. Antennomeres 4 and 11 unmodified.

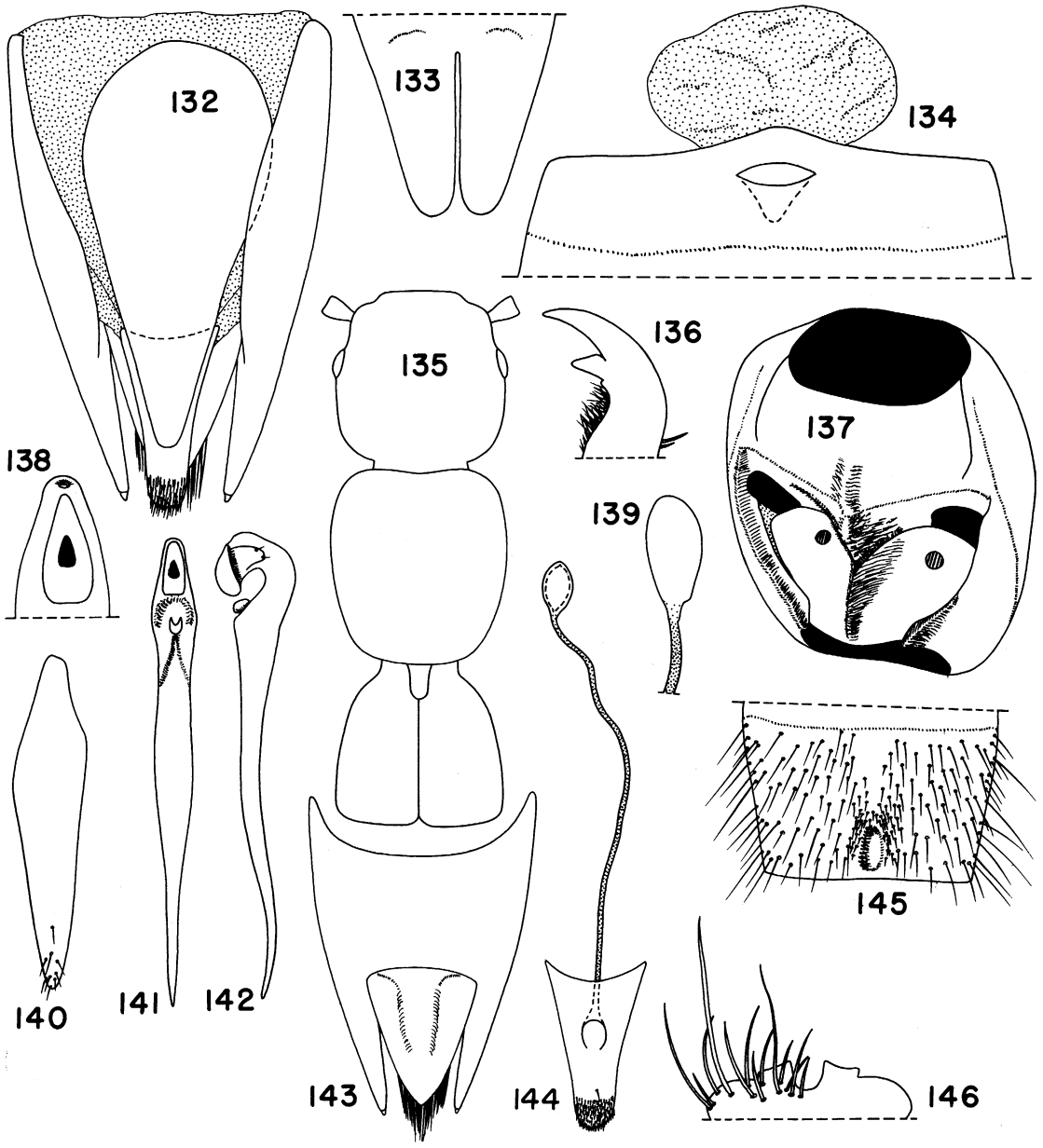
Pronotum (fig. 135) moderately convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and scattered coarse punctures on lateral portion; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme (fig. 137) with lateral edge narrowly separated from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 135) shorter than length of pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond apex of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe of posterior margin. Tergum VIII with posterior margin gently rounded.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 145) with median, oval depression; depression bordered anteriorly and laterally by short setae; micropores absent; posterior margin of sternite truncate to slightly emarginate; inner surface without median carina. Sternum VIII (fig. 133) with deep, narrow median incision extending for about two-thirds the length of segment; incision not bordered by depression; basal carina widely separated medially and reduced to small, crescent-shaped carina; base without median groove. Sternite IX (fig. 140) straight and slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 138, 141, 142) with short, broad parameres; parameres with two setae near apex. Median lobe, in dorsal view, long, slender, straight, symmetrical, slightly constricted just posterior to ostium, then slightly swollen, then tapered to apex; median lobe, in lateral view, with apical portion slightly



FIGS. 132–146. *Gnathymenus garus*. 132. Segment IX, female, ventral view. 133. Sternum VIII, male. 134. Sternite IV, anterior portion. 135. Head and thorax. 136. Right mandible. 137. Prothorax, left lateroventral view. 138. Aedeagus, base, anterodorsal view. 139. Spermatheca. 140. Sternite IX, male. 141. Aedeagus, dorsal view. 142. Aedeagus, right lateral view. 143. Segments IX and X, dorsal view. 144. Apical genital appendage and spermatheca, ventral view. 145. Sternite VII, male. 146. Labrum.

curved dorsally; dorsal surface with short, posteriorly divergent depression extending posteriorly from ostium, remainder of surface flat; collar of basal foramen entirely

sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite (fig. 138). Ostium near base on dorsal surface and not surrounded by cone.

Female. Sternites IV to VIII unmodified. Tergum IX (fig. 143) fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 132) with two genital appendages; basal genital appendage elongate, wide basally and strongly tapered apically to narrow, rounded apex; apical genital appendage not longitudinally divided or incised, with one subapical seta and numerous cuticular processes on apical portion, apex arcuato-truncate.

Spermatheca (fig. 139) sclerotized, capsule short and oval; spermathecal gland absent; external opening of spermathecal duct on apical genital appendage large, and near middle (fig. 144).

HABITAT AND DISTRIBUTION: This species is known only from the central Colombian province of Cundinamarca (fig. 51) where it was collected in the Cordillera Oriental at 3175 (10,416 ft.) and 3300 (10,826 ft.) m. elevation. It was collected in decayed leaves and under "Frailejones."

ETYMOLOGY: From the Anglo-Saxon, *gar,* for spear, referring to the long, slender, acute aedeagus.

MATERIAL EXAMINED: Forty-one males and 37 females. COLOMBIA: *Cundinamarca:* 15 km. E Bogotá, 3300 m., March 9, 1974, L. and N. Herman, from under "Frailejones" (2 males, AMNH); Paramo de Monserrate, 5 km. E Bogotá, near Cerro del Rompedero (type series 30 males, 28 females, AMNH; 2 males, 2 females, BM; 2 males, 2 females, CNC; 2 males, 2 females, FM); near Bogotá, Bosque de Chico (3 males, 3 females, NHMV).

12. **Gnathymenus umbus**, new species
Figures 6, 51, 147–156

HOLOTYPE: Male. Brazil: [São Paulo]: São Paulo, collector Mraz, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: Males of this species are distinguished from those of all others except *G. setosus* by the setose, midlongitudinal ridge of sternum VII (fig. 147) and the row of setae on each side of the apical portion of the ventral surface of the aedeagus (fig. 153). The shape of the apical portion of the median lobe, with large number of short setae on the apical third of the aedeagus and the more gradually constricted median portion of the median lobe permits separation of *G. umbus* from *G. setosus* (cf. figs. 152, 153 and 160, 161). The female has a sclerotized spermatheca, a duct leading from the spermatheca to an opening on the base of the apical genital sclerite (fig. 149), and a U-shaped emargination of tergum VIII (fig. 155). Both sexes have a cylindrical abdomen with obsoletely distinguished laterotergites.

DESCRIPTION: Length 4.5 mm.

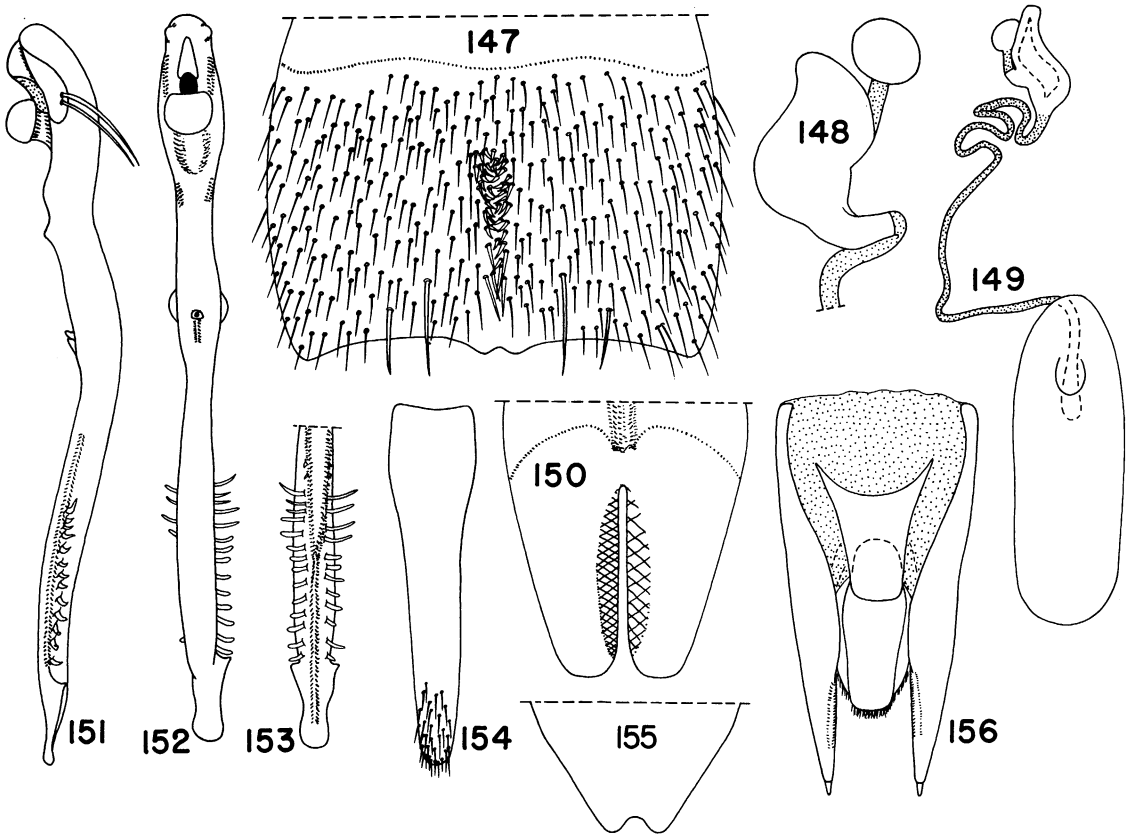
Color reddish brown.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with dense, coarse punctation on all but median spot; surface polished, without ground sculpturing. Eye length (OL) about one-fourth of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with triangular elevation. Labrum with U-shaped median emargination; anterior margin with broad, sinuotruncate lobe extending from median emargination to about halfway across labrum. Mandibles with second denticle triangular (mandible not dissected). Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with moderately dense, coarse punctation on all but midlongitudinal strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron; anterior suture present, lateral suture absent. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture absent. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VI with one pair of obsoletely distinguished laterotergites, sutures separating laterotergites obso-



FIGS. 147–156. *Gnathymenus umbus*. 147. Sternite VII, male. 148. Spermatheca. 149. Apical genital appendage and spermatheca, female. 150. Sternum VIII, male. 151. Aedeagus, right lateral view. 152. Aedeagus, dorsal view. 153. Aedeagus, ventral view, apical third. 154. Sternite IX, male. 155. Tergum VIII, female, apex. 156. Segment IX, female, ventral view.

lete; abdomen appearing cylindrical because of obsolescence of laterotergites; segment VII without laterotergites but tergum and sternum separated. Tergum VII without dermal fringe on posterior margin.

Male. Sterna IV to VI unmodified. Sternum VII (fig. 147) with elongate, low, midlongitudinal ridge; ridge covered with short, stout, spiniform, posteromedially directed setae; micropores absent; posterior margin with small, median, medially emarginate lobe; inner surface without median carina. Tergum VIII with posterior margin arcuatotruncate. Sternum VIII (fig. 150) with deep, narrow, median incision extending for about two-thirds length of segment; surface adjacent to incision beveled; basal carina separated medially, each half curved; base of sternum with broad, shallow midlongitudinal depression. Sternite IX (fig. 154) straight, slightly asymmetrical; apical portion with many setae.

Aedeagus (figs. 151–153) with short, broad parameres; parameres with two long subapical setae. Median lobe, in dorsal view, long, slender, with basal half straight and apical half twisted to left, symmetrical, and constricted at about basal third and again at about middle, constriction of apical third gradual, then more or less parallel to near

apex; apical portion suddenly expanded, then sinuously tapering to rounded apex. Median lobe, in lateral view, curved upward at about middle; dorsal surface without median groove but with broad depression distad of basal foramen; ventral surface with row of laterally directed short, flat setae, on each side of midlongitudinal carina of apical third; 14 setae on one side, 16 on other, basal two on each side minute. Collar of basal foramen modified anteriorly as thick, trianguloid sclerite and posteriorly as knoblike, stout, ventrally constricted process; anterior and posterior portions joined by membrane. Base of median lobe with minute, circular pump spot; pump spot lacking median sclerite. Ostium near middle on basal half at end of peglike stalk (fig. 152).

Female. Sternites IV to VIII unmodified. Tergum VIII (fig. 155) with median, U-shaped emargination of posterior margin; midapical strip glabrous. Tergum IX fused dorsally and midlongitudinally divided ventrally. Segment IX (fig. 156) with two genital appendages; basal genital appendage trapezoidal with apex truncate; apical genital appendage not longitudinally divided or incised, without setae but with cuticular processes at apex, apex broadly rounded to arcuato-truncate.

Spermatheca (fig. 148) sclerotized, capsule moderately long, widest near middle and tapered to both ends; duct to spermathecal gland located near middle of capsule; external opening of spermathecal duct small and on basal half of apical genital appendage (fig. 149).

HABITAT AND DISTRIBUTION: The species is known from the southeastern Brazilian province of São Paulo (fig. 51).

ETYMOLOGY: From the Latin, *umbo,* for rounded protuberance or knob, referring to the knob posterior to the basal foramen.

MATERIAL EXAMINED: One male, two females. BRAZIL: *São Paulo:* Estacion Biologica Boracea, Salesopolis, December 17–26, 1969, J. M. and B. A. Campbell (1 female, CNC, 1 female, AMNH); São Paulo (holotype, FMNH).

13. **Gnathymenus setosus**, new species

Figures 6, 51, 157–166

HOLOTYPE: Male. Brazil: São Paulo: Barueri, August 5, 1967, collector K. Lenko, deposited in the Naturhistorisches Museum, Vienna.

PARATYPES: None.

DIAGNOSIS: Males of this species can be separated from those of all other species except *G. umbus* by the setose, midlongitudinal ridge of sternum VII (fig. 165) and the row of setae on each side of the apical portion of the ventral surface of the aedeagus. *Gnathymenus setosus* is distinguished from *G. umbus* by the nine setae on each side of the ventral surface of the apical third (fig. 161), by the sudden constriction of the median lobe just anterior to the ventral setae (fig. 160), and by the shape of the apical portion of the median lobe. The female can be distinguished as indicated by the Key. Both sexes have a cylindrical abdomen with obsoletely distinguished laterotergites.

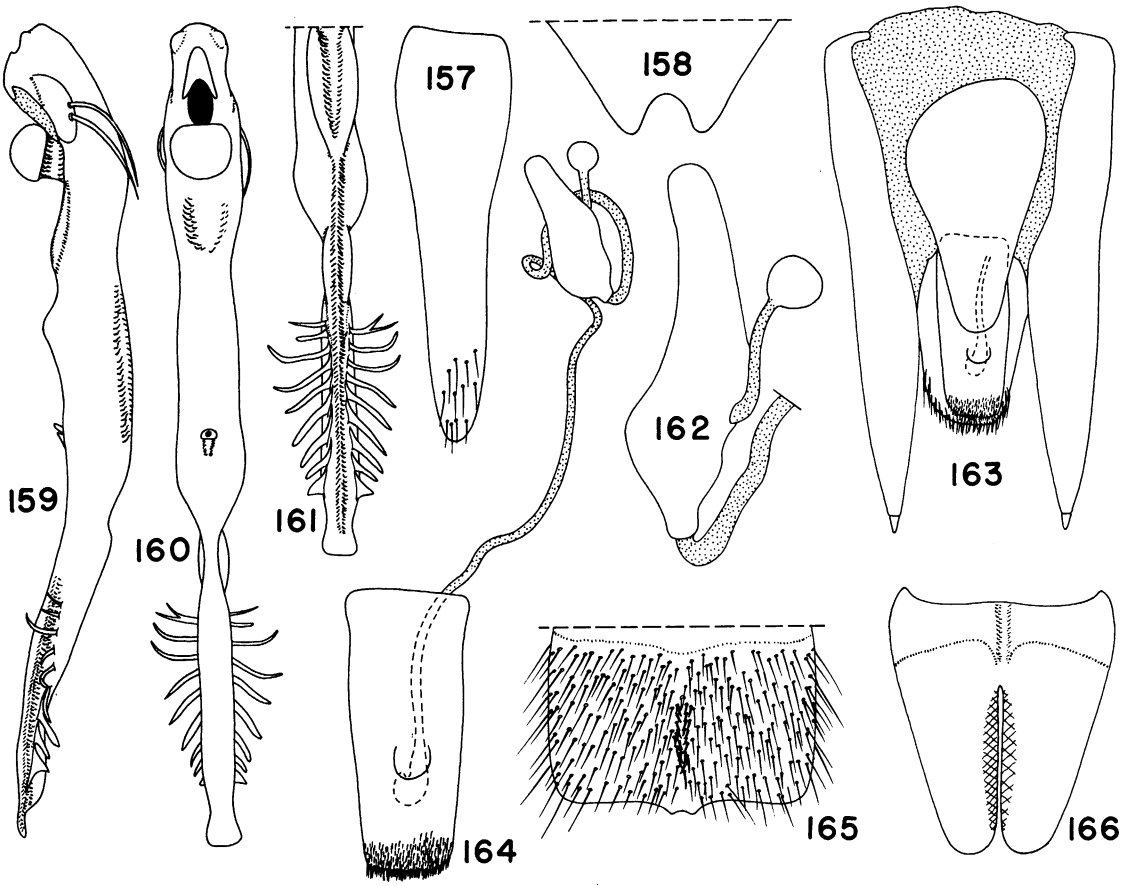
DESCRIPTION: Length about 4.5 mm.

Color reddish brown.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with moderately dense, coarse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-fourth of postocular length (PO). Neck width 0.6 width of head. Labrum with U-shaped median emargination; anterior margin with broad, sinuo-truncate lobe extending from median emargination to about halfway across labrum. Mandibles bidentate; second denticle large and triangular. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with moderately dense, coarse punctation on all but midlongitudinal strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without me-



FIGS. 157–166. *Gnathymenus setosus*. 157. Sternite IX, male. 158. Tergum VIII, female, apex. 159. Aedeagus, right lateral view. 160. Aedeagus, dorsal view. 161. Aegeagus, ventral view, apical two thirds. 162. Spermatheca. 163. Segment IX, female, ventral view. 164. Apical genital appendage and spermatheca, female, ventral view. 165. Sternite VII, male. 166. Sternite VIII, male.

dian fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VI each with one pair of obsoletely distinguished laterotergites; sutures separating laterotergites obsolete; abdomen appearing cylindrical because of obsolescence of laterotergites; segment VII without laterotergites, but tergum and sternum separated. Tergum VII without dermal fringe on posterior margin.

Male. Sterna IV to VI unmodified. Sternum VII (fig. 165) with elongate, low midlongitudinal ridge; ridge covered with short, stout, spiniform, posteromedially directed setae; micropores absent; posterior margin with moderately large, median, medially emarginate lobe; inner surface without median carinae. Tergum VIII with posterior margin arcuato-truncate. Sternum VIII (fig. 166) with deep, narrow, median incision extending for about seven-tenths length of segment; surface adjacent to incision beveled; basal carina separated medially, each half curved; base of sternum with broad, shallow

midlongitudinal depression. Sternite IX (fig. 157) straight, slightly asymmetrical; apical portion with many setae.

Aedeagus (figs. 159–161) with short, broad parameres; parameres with two long subapical setae. Median lobe, in dorsal view, symmetrical, long, slender and straight, apical portion not twisted, and constricted at about basal third and again at about apical third; constriction of apical third pronounced and sudden, then more or less parallel to near apex; apical portion constricted then expanded to rounded apex. Median lobe, in lateral view, curved dorsally from about middle; dorsal surface without median groove but with broad depression distad of basal foramen; ventral surface (fig. 161) with row of nine long flattened setae on each side of midlongitudinal carina of apical third; apical seta broad and triangular; midlongitudinal carinae of ventral surface ending anteriorly at broad elongate depression on elongate swelling. Collar of basal foramen modified anteriorly as thick trianguloid sclerite and posteriorly as stout, knoblike, ventrally constricted process; anterior and posterior portions connected by membrane. Base of median lobe with minute, circular pump spot; pump spot without median sclerite. Ostium near middle on basal half at end of peglike stalk (fig. 160).

Female. Sternites IV to VIII unmodified. Tergum VIII (fig. 158) with median U-shaped emargination of posterior margin; midapical strip glabrous. Tergum IX divided midlongitudinally dorsally (as in fig. 32), ventrally divided midlongitudinally. Segment IX (fig. 163) with two genital appendages; basal genital appendage pear-shaped with rounded apical margin; apical genital appendage trapezoidal and without setae but with many cuticular processes near apex, apex arcuatotruncate (fig. 164).

Spermatheca (fig. 162) sclerotized, capsule long, widest near base and tapered toward apex; duct to spermathecal gland located at about basal third; external opening of spermathecal duct large and on apical half of apical genital appendage (fig. 164).

HABITAT AND DISTRIBUTION: This species is known from the Brazilian province of São Paulo (fig. 51).

ETYMOLOGY: From the Latin, *setosus*, for bristly, referring to the two rows of setae on the aedeagus.

MATERIAL EXAMINED: Holotype and one female with same data as holotype (NHMV).

14. **Gnathymenus cleofanus**, new species

Figures 6, 51, 167–177

HOLOTYPE: Male. Colombia: [Cundinamarca]: 5 km. E Bogota, Paramo de Monserrate, near Cerro del Rompedero, 3175 m. elevation, October 14, 1968, from decayed leaves, collected by H. Sturm, deposited in the American Museum of Natural History.

PARATYPES: Three males with same data as holotype (AMNH).

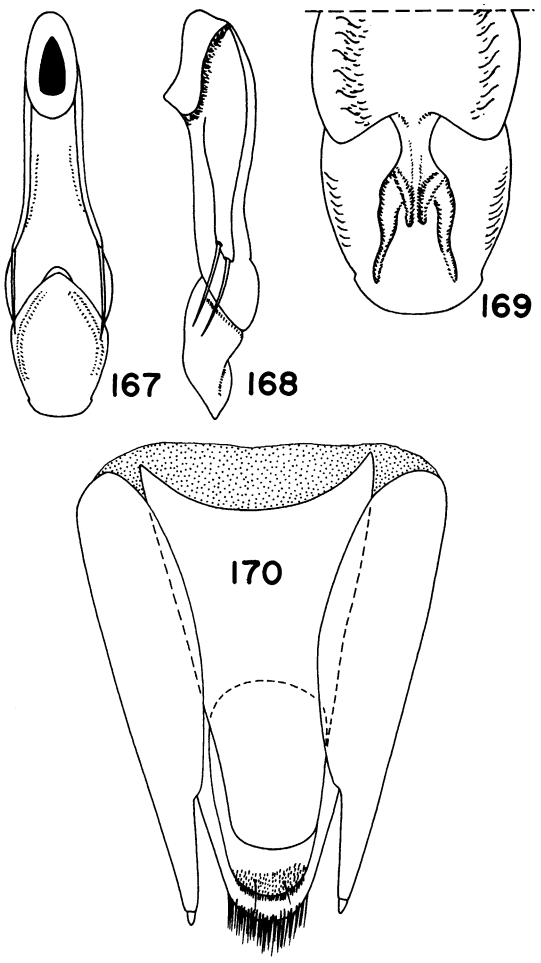
DIAGNOSIS: Males of this species can be separated from those of all other species except *divisus* by the "segmented" aedeagus (figs. 167, 168). From *divisus* this species can be distinguished by the absence of an apical lobe on the apical margin of the aedeagus (fig. 167) and by the U-shaped emargination of the posterior margin of sternite VII (fig. 173).

The female can be separated from *divisus* by the unincised apical genital sclerite (fig. 170) that has an apical patch of cuticular processes and from other species as indicated in the Key.

DESCRIPTION: Length 5.5 to 6.2 mm.

Color reddish, reddish brown, and black. Head reddish; prothorax reddish brown with blackish infusions; elytra and abdominal segments III to VII black to dark reddish brown; abdominal segment VII reddish brown basally and pale reddish brown to yellowish brown apically; abdominal segments VIII to X pale reddish brown to yellowish brown; legs reddish brown; antennae yellowish brown.

Head length (HL, figs. 38, 172) less than width (HW). Dorsum of head with coarse, scattered punctation over all of surface but narrow midlongitudinal strip; surface polished, without ground sculpturing; anterior margin of clypeus with strong, transverse ridge at middle of margin and extending for about one-fourth to one-third of width of



FIGS. 167–170. *Gnathymenus cleofanus*. 167. Aedeagus, dorsal view. 168. Aedeagus, right lateral view. 169. Aedeagus, ventral view, apical third. 170. Segment IX, female, ventral view.

head; ridge more strongly developed in male than in female. Eye length (OL) about one-fourth to one-third of postocular length (PO) of head. Neck width about 0.7 width of head. Submentum with midlongitudinal carina. Labrum (fig. 175) with U-shaped median emargination; anterior margin with one denticle adjacent to emargination and with second denticle between median denticle and lateral margins. Mandible (fig. 177) bidentate, basal denticle large. Antennomeres 4 and 11 unmodified.

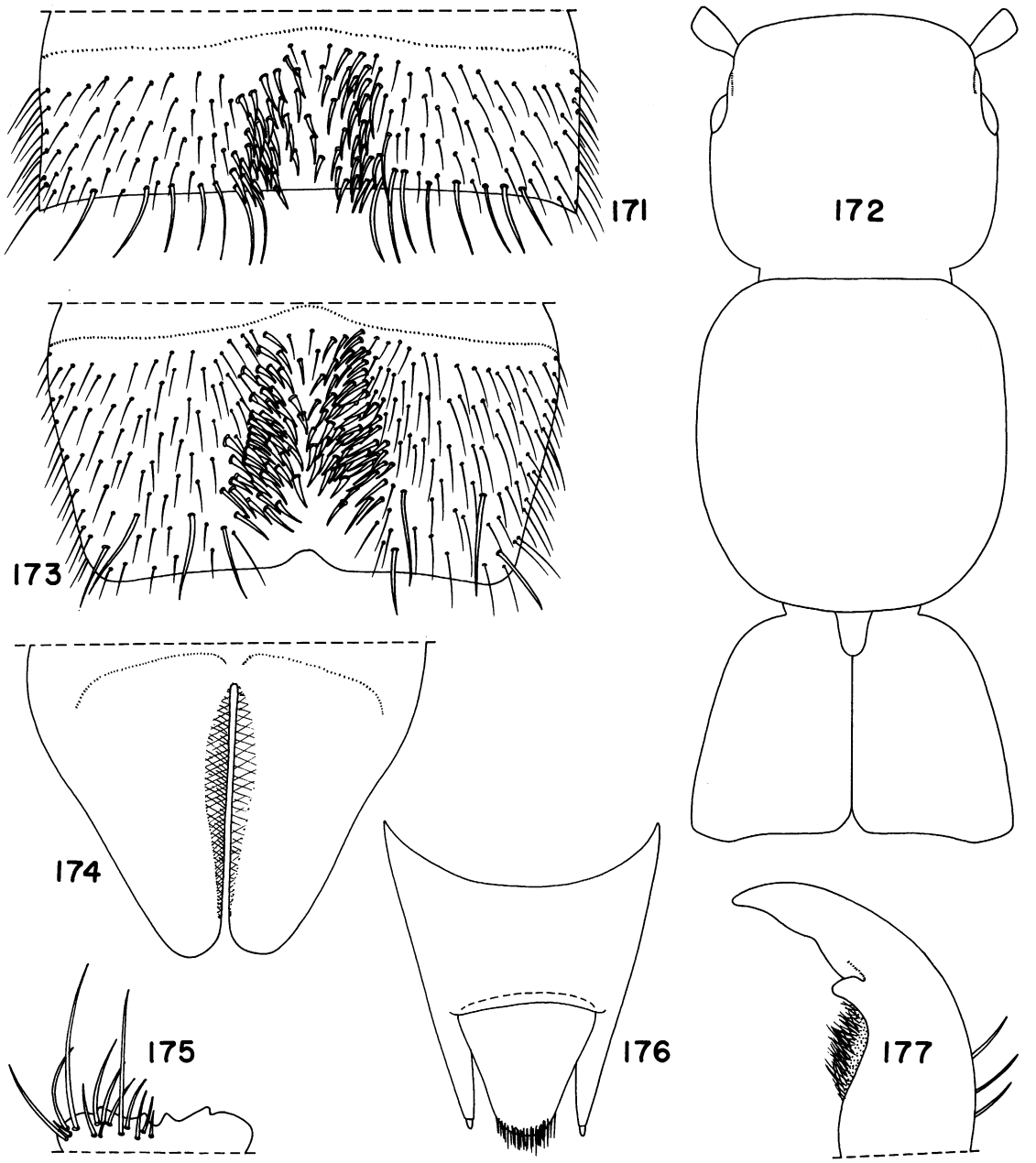
Pronotum (fig. 172) moderately strongly convex, widest anterior to transverse midline; surface with scattered, moderately sparse punctation over all of surface but for midlongitudinal strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 172) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings reduced to small stubs. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV and V each with shallow median, glabrous depression. Sternite VI with broad, moderately deep median depression; depression with numerous stout setae (fig. 171). Sternite VII (fig. 173) with broad, median, moderately deep depression; depression with approximately basal three-fourths covered with short, stout, spiniform setae; micropores absent; posterior margin of sternite with U-shaped median emargination; inner surface without median carina. Sternum VIII (fig. 174) with deep, narrow, median incision extending for about three-fourths the length of segment; surface adjacent to incision beveled; basal carina divided medially and with each half broadly curved; base without median groove. Sternite IX slightly asymmetrical, apical portion with scattered setae.

Aedeagus (figs. 167–169) with long, moderately broad parameres; parameres with two apical setae. Median lobe divided into two segments; apical segment slightly more than one-third of total length of median lobe, longer than wide, with lateral margins sharply and strongly rounded to gradually round-



FIGS. 171–177. *Gnathymenus cleofanus*. 171. Sternite VI, male. 172. Head and thorax. 173. Sternite VII, male. 174. Sternite VIII, male. 175. Labrum. 176. Segments IX and X, dorsal view. 177. Right mandible.

ed, with obsoletely developed process on lateral side of apical margin, ventral surface (fig. 169) with broad, apically divergent groove, groove with midlongitudinal carina.

Median lobe, in dorsal view, straight, symmetrical, expanded from base to middle of apical segment then strongly convergent to apical margin or expanded from base to apical portion of basal segment, then gradually convergent to broadly rounded apex. Median lobe, in lateral view, slightly curved dorsally. Dorsal surface of median lobe slightly and shallowly impressed. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium at basal end of groove on ventral surface of apical segment (apparently).

Female. Sternites IV to VIII not modified. Tergum IX (fig. 176) fused dorsally, ventrally separated midlongitudinally. Segment IX (fig. 170) with two genital appendages; basal appendage elongate and with arcuato-truncate posterior margin; apical appendage not divided or incised midlongitudinally, with two setae and numerous subapical cuticular processes and with broadly rounded posterior margin. Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species is known only from the central Colombian province of Cundinamarca (fig. 51) where is was collected at about 10,400 ft. (3175 m.) elevation from among decayed leaves.

DISCUSSION: I am not certain of the location of the ostium but it appears to be on the ventral surface of the apical segment at the base of the median divided groove.

ETYMOLOGY: From the Anglo-Saxon *cleofan* for cleave, referring to the notch on sternite VII.

MATERIAL EXAMINED: Holotype, three paratypes, and three females (AMNH).

15. **Gnathymenus divisus**, new species
Figures 6, 51, 178–185

HOLOTYPE: Male. Colombia: [Cundinamarca]: 18 km. NE La Aguadita, 7000 ft., July 7, 1970, J. M. Campbell; deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: Males of this species may be separated from those of all other species except *cleofanus* by the "segmented" aedeagus (figs. 178, 179). *G. divisus* can be distinguished from *cleofanus* by the narrow apical lobe (fig. 178) of the apical segment of the median lobe, by details of the ventral surface of the aedeagus (fig. 180) and by the slightly sinuate posterior margin of sternite VII (fig. 181).

Females are recognizable by the color and presence of two genital appendages on segment IX, the dorsal of which has a median incision of the base (fig. 184).

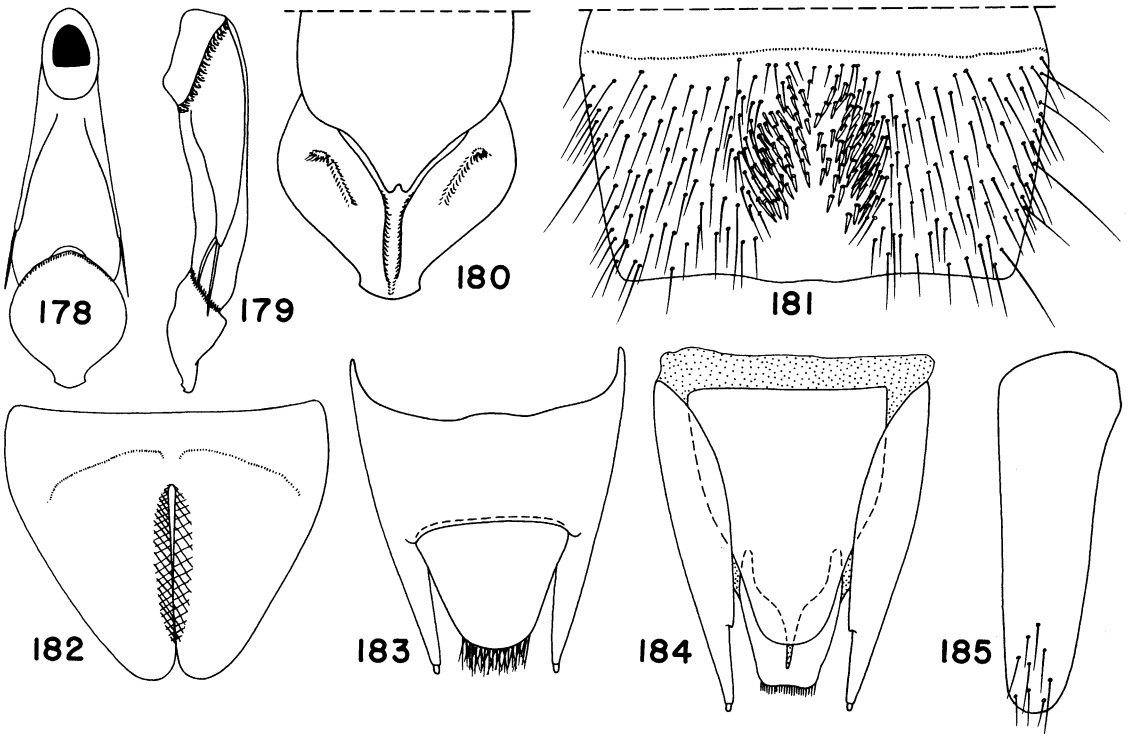
DESCRIPTION: Length approximately 6 mm.

Color reddish and reddish brown. Head and pronotum reddish; elytra and abdominal segments III to VI reddish brown; abdominal segments VII to X, legs and antenna pale reddish brown.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with coarse, scattered punctation on lateral portion; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.7 width of head. Submentum with well-developed midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad, sinuo-truncate lobe extending from median emargination to about halfway across labrum. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface with scattered, moderately coarse punctation on all but impunctate median strip; surface polished, without ground sculpturing; lateral margins gradually curved and tapering toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron, anterior suture distinct. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal ridge not examined.) Metathoracic wings probably absent (not studied). Metathorax reduced, hardly extending beyond posterior end of mesocoxae.



FIGS. 178–185. *Gnathymenus divisus*. 178. Aedeagus, dorsal view. 179. Aedeagus, right lateral view. 180. Aedeagus, ventral view, apical third. 181. Sternite VII, male. 182. Sternum VIII, male. 183. Segments IX and X, dorsal view. 184. Segment IX, female, ventral view. 185. Sternite IX, male.

Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergum VIII with posterior margin gradually rounded.

Male. Sternite IV unmodified. Sternite V with obsolete, median depression. Sternite VI with shallow, median depression, depression with setae. Sternite VII (fig. 181) with broad, shallow median depression; depression with basal three-fourths covered with short, stout, spiniform setae; micropores absent; posterior margin of sternite broadly and shallowly sinuate; inner surface without median carina. Sternum VIII (fig. 182) with deep, narrow median incision extending for about three-fourths the length of segment; surface adjacent to incision beveled; basal carina divided medially and with each portion broadly curved; base without median groove. Sternite IX (fig. 185) slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 178–180) with long, moderately broad parameres; parameres with two apical setae. Median lobe divided into two "segments"; apical segment more than one-third to the total length of median lobe, slightly longer than wide, with lateral margin strongly rounded, with moderately wide, broadly rounded apical knob, ventral surface (fig. 180) with apically tapering median groove and with posteromedially directed carina on each side of groove. Median lobe, in dorsal view, straight, symmetrical, expanded from base to middle of apical segment then strongly convergent to apical knob. Median lobe, in lateral view, slightly curved dorsally. Dorsal surface of median

lobe broadly and shallowly impressed. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium at basal end of groove on ventral surface of apical segment (apparently).

Female. Sternites IV to VIII unmodified. Tergum IX (fig. 183) fused dorsally, ventrally separated midlongitudinally. Segment IX (fig. 184) with two genital appendages; basal appendage broad, lateral margins apically convergent from about middle, and posterior end broadly rounded, apical appendage with deep midlongitudinal incision extending from base apically; apical margin sinuo-truncate.

Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species is known from the central Colombian province of Cundinamarca (fig. 51) where it was collected at 7000 ft. (2134 m.) elevation.

DISCUSSION: I am unable to find the ostium for certain but it seems to be on the ventral surface of the apical segment at the base of the groove.

ETYMOLOGY: From the Latin *divisus* for separate, referring to the divided aedeagus.

MATERIAL EXAMINED: Holotype and one female (CNC).

16. **Gnathymenus speccus**, new species
Figures 6, 51, 186–193

HOLOTYPE: Male. Colombia: Cauca: 12 km. E Silvia, 10,000 ft., July 15, 1970, J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: Males of this species can be distinguished from those of others by the two dorsally directed processes near the apex of the long, slender aedeagus (figs. 188, 189). Females have only one genital appendage on segment IX and this sclerite has a median incision of the base (fig. 190).

DESCRIPTION: Length 6 mm.

Color reddish brown with black infusions on the elytra particularly near the apex. Legs and antennae paler reddish brown.

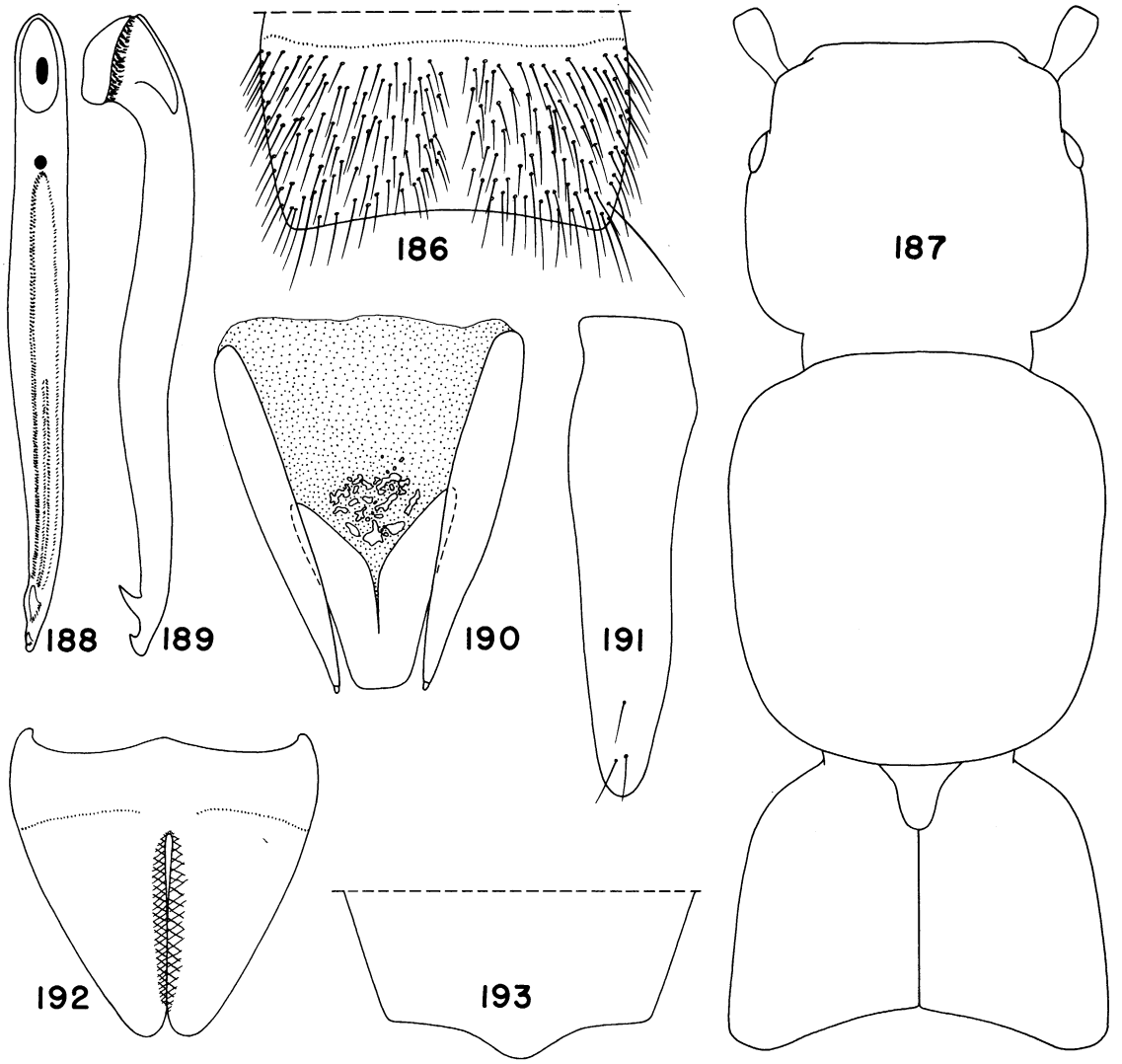
Head length (HL, figs. 38, 187) less than width (HW). Dorsum of head with coarse, scattered punctation on all but median stripe; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal ridge. Labrum with median U-shaped emargination; anterior margin with broad, sinuo-truncate lobe extending about two-thirds across labrum. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface without row of punctures on disk, punctures small, scattered over all of surface but for midlongitudinal impunctate strip; surface polished, without ground sculpturing; lateral margin nearly straight and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron; anterior suture distinct. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 187) from anterior to posterior margins, shorter than length of pronotum. Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings probably absent (not studied). Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII (fig. 193) with broadly rounded lobe of posterior margin, lobe of female narrower than that of male.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 186) with elongate, shallow median depression; depression bordered by unmodified setae; micropores absent; posterior margin slightly and broadly emarginate; inner surface without median carina. Sternum VIII (fig. 192) with deep, narrow, median incision extending for about two-thirds length of segment; surface adjacent to incision beveled; basal carina separated medially and with each portion broadly curved; base without median groove. Sternite IX (fig. 191) slightly asymmetrical; apical portion with a few scattered setae.



FIGS. 186–193. *Gnathymenus speccus*. 186. Sternite VII, male. 187. Head and thorax. 188. Aedeagus, dorsal view. 189. Aedeagus, right lateral view. 190. Segment IX, female, ventral view. 191. Sternite IX, male. 192. Sternum VIII, male. 193. Tergum VIII, female, apex.

Aedeagus (figs. 188, 189) with short, broad parameres; parameres without setae. Median lobe, in dorsal view, long, slender, slightly twisted to left, symmetrical and gradually tapering to apex; median lobe in lateral view, slightly sinuous; dorsal surface with broad, shallow median groove extending from ostium to near apex; dorsal surface with low, weakly developed, midlongitudinal carina extending from about middle to near apex; apical portion with large, subapical, apically acute, dorsally directed process and small, apical, apically acute, dorsally directed process. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium on dorsal surface, near base, and not surrounded by cone.

Female. Sternites IV to VIII unmodified.

Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 190) with one genital appendage; appendage triangulloid sclerite with midlongitudinal incision of base and with arcuato-truncate apical margin, setae absent; membrane anterior to genital appendage with scattered, irregularly shaped, small sclerites.

Spermatheca not evident as sclerotized capsule.

HABITAT AND DISTRIBUTION: This species is known only from the southwestern Colombian province of Cauca (fig. 51) where it was collected at 10,000 ft. (3048 m.) elevation.

ETYMOLOGY: From the Anglo-Saxon *specca* for spot, referring to the small sclerites near the genital appendage of the female.

MATERIAL EXAMINED: Holotype and one female (CNC).

17. **Gnathymenus flatrus**, new species
Figures 6, 51, 194–198

HOLOTYPE: Male. Chile: Concepcion: Copiulemu, November 26, 1971, collected by T. Cekalovic, deposited in Canadian National Collection, Ottawa.

PARATYPES: One male, with same data as holotype (AMNH).

DIAGNOSIS: This species may be separated from most others by the cylindrical abdomen that lacks laterotergites. From those species without laterotergites the males can be recognized by the absence of an ostial stalk, by the abruptly expanded apical third of the median lobe, and by the short parameres (figs. 194, 195).

DESCRIPTION: Length approximately 5 mm.

Color brownish red, reddish brown, and black. Head and pronotum brownish red; elytra reddish brown; abdomen black; antennae yellowish brown; legs pale reddish brown.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with coarse, scattered punctation except for broad median strip. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with midlongitudinal carina. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum with short median carina near apical margin.

Abdominal segments III to VII without laterotergites; abdomen cylindrical, segments III to VI each with tergum and sternum fused; segment VII with tergum and sternum separated. Tergum VII without dermal fringe on posterior margin.

Male. Sterna IV to VI with shallow median, glabrous depression near apical margin; sternum VII (fig. 198) with shallow median depression; depression with curved row of short setae near apical margin; micropores absent; posterior margin of sternite with shallow sinuate emargination; inner surface without median groove. Tergum VIII with broadly rounded lobe on posterior margin. Sternum VIII (fig. 197) with deep, narrow, median incision extending for about half length of segment; surface adjacent to incision beveled; basal carina connected medially, not separated, with median portion posteriorly produced, and with each half broadly sinuate; base without median groove. Sternite IX strongly asymmetrical; apical portion with scattered setae (fig. 196).

Aedeagus (figs. 194, 195) with short, basally broad, apically narrow parameres; parameres with two apical setae. Median lobe, in dorsal view, with basal two-thirds nearly parallel sided and without conspicuous expansion; apical third abruptly expanded, then gradually and slightly convergent to

truncate apical margin; apical margin with small median apically rounded lobe; median lobe, in lateral view, strongly bent dorsally; dorsal surface of basal two-thirds without midlongitudinal groove or longitudinal carina; dorsal surface of apical third flat and without dorsally or anteriorly directed processes; ventral surface without longitudinal carinae. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium on dorsal surface at base of abruptly expanded apical third of median lobe; ostium not at end of stalk.

Female unknown.

DISTRIBUTION AND HABITAT: This species is known from the south central Chilean province of Concepcion (fig. 51).

ETYMOLOGY: From the Old Norse *flatr* for flat, referring to the broad, flat, platform-like apical portion of the aedeagus.

MATERIAL EXAMINED: Holotype and one paratype.

18. *Gnathymenus obesus* Fauvel
Figures 6, 51, 199–202

Gnathymenus obesus Fauvel, 1868, p. 18. Coiffait and Saiz, 1968, pp. 374, 375, 377, 378. (Type locality: Chile: [Ñuble]: Chillán. Holotype, female, in the Institut Royal des Sciences Naturelles, Brussels, examined.)

DIAGNOSIS: This species can be separated from most others by the cylindrical abdomen that lacks laterotergites. The males are distinguished from those with a cylindrical abdomen by the aedeagus which has a broad, flattened ostial stalk and trilobed apex of the median lobe (fig. 201).

DESCRIPTION: Length 5.0 mm.

Color reddish brown. Head, pronotum, legs and antennae reddish brown. Elytra and abdomen dark reddish brown, nearly black.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with coarse, scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length of head (PO). Neck width 0.6 width of head. Submentum with median carina. Labrum with small U-shaped median emargination; anterior margin with large denticle near lateral margin. Mandibles bidentate. Antennomeres 4 and 11 unmodified.

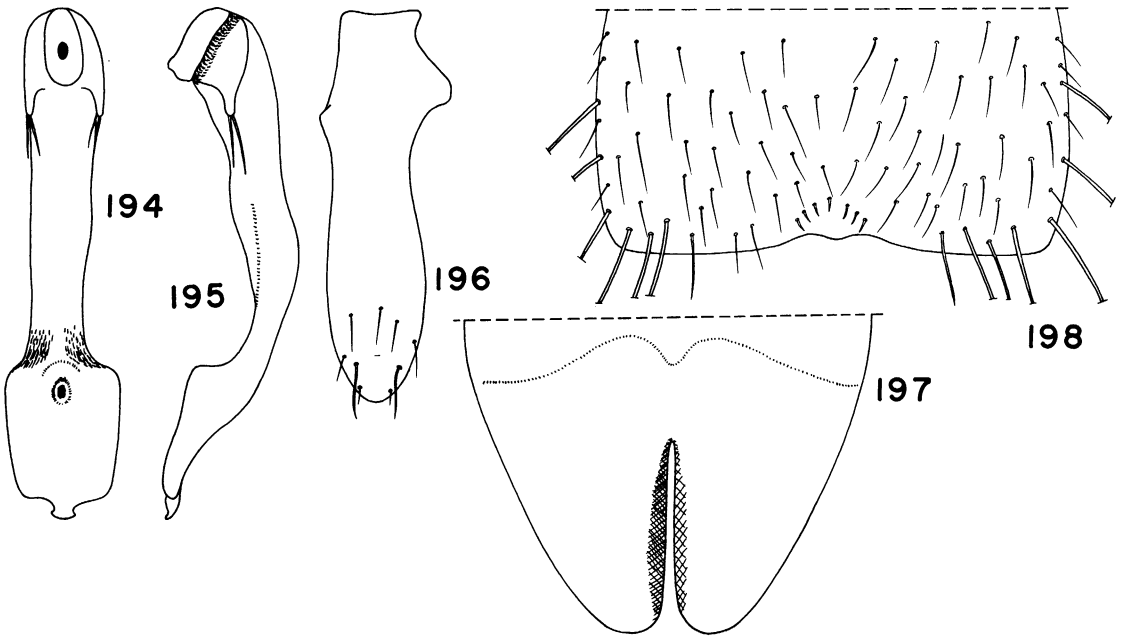
Pronotum strongly convex, widest anterior to transverse midline; surface with curved, irregular row of punctures near middle and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not examined.) Profemur without antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum. Mesosternum without median fovea; sternopleural ridge present but obsolete. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond apex of mesocoxa. Metasternum without median tubercle or carina.

Abdominal segments III to VII without laterotergites; abdomen cylindrical; segments III to IV each with tergum and sternum fused; segment VII with tergum and sternum separated; tergum VII without dermal fringe.

Male. Sterna IV to VI each with shallow median impression. Sternum VII with slight, shallow, median impression; posterior margin broadly and shallowly emarginate; micropores absent; inner surface without median carina. Tergum VIII with broadly rounded lobe on posterior margin. Sternum VIII with deep, narrow, median incision extending for about one-half length of segment; surface adjacent to incision beveled. (Sternite IX not examined.)

Aedeagus (figs. 199–202) with short, broad parameres; parameres with two apical setae. Median lobe, in dorsal view, expanded from just beyond middle to about apical seventh then convergent to apex; apical margin with two acute and one rounded lobes; lateral margins of apical half without laterally, dorsally, or ventrally directed lobes or processes; median lobe, in lateral view, slightly bent dorsally; dorsal surface with weak midlongitudinal carina, without midlongitudinal groove, and without posteriorly, anteriorly, or laterally directed processes near lateral margin; ventral surface without carinae. Bas-



FIGS. 194–198. *Gnathymenus flatrus*. 194. Aedeagus, dorsal view. 195. Aedeagus, right lateral view. 196. Sternite IX, male. 197. Sternum VIII, male. 198. Sternite VII, male.

al foramen surrounded by thick sclerotized collar; median lobe strongly compressed below collar. Base of median lobe without pump spot. Ostium (fig. 200) on posterior surface near apex of ostial stalk; ostial stalk long, broad, and flattened and apical margin with variously modified processes.

Female not dissected.

HABITAT AND DISTRIBUTION: This species is known only from the south central Chilean province of Ñuble (fig. 51).

DISCUSSION: *Gnathymenus obesus* is related to *hyllus, twapicus, flatrus,* and *pipus* in part because they all lack abdominal laterotergites. Females of these five species are nearly impossible to identify. Males are separable only by aedeagal characters and I can identify the females only if collected with the male—and then I only assume conspecificity.

The holotype of *obesus* is a female although it was mistakenly regarded as a male by Fauvel (1868). Coiffait and Saiz (1968, pl. XII, figs. 3, 4) illustrate the aedeagus of a male which they consider to be *obesus*. I have examined and illustrated that same male and regard it to be conspecific with the holotype of *obesus* because both specimens are from the same locality.

MATERIAL EXAMINED: One male, one female. CHILE: *Ñuble:* Chillan (1 male, MNC; 1 female holotype, IRSN).

19. **Gnathymenus pipus**, new species
Figures 6, 51, 203–225

HOLOTYPE: Male. Chile: Concepcion: Agua de la Gloria, August 25, 1968, collected by C. W. O'Brien, deposited in the American Museum of Natural History.

PARATYPES: Three males with same data as holotype (AMNH).

DIAGNOSIS: This species can be separated from most others by the absence of abdominal laterotergites. The males can be separated from those of other species with a cylindrical abdomen by the presence of the aedeagal ostium at the end of a long stalk (figs. 203, 207), the presence at about the apical third of one pair of laterodorsally directed

processes and another pair of anteriorly directed processes (fig. 206, 210). The lateral margins of the median lobe are strongly expanded near the middle (figs. 204, 205) to more or less parallel sided (fig. 206), although twisted, between the basal foramen and ostium.

Females are distinguished from among those species with a cylindrical abdomen by the large to moderately large trianguloid lobe of the posterior margin of sternum VIII (figs. 213, 216, 217, 220, 222) and by color.

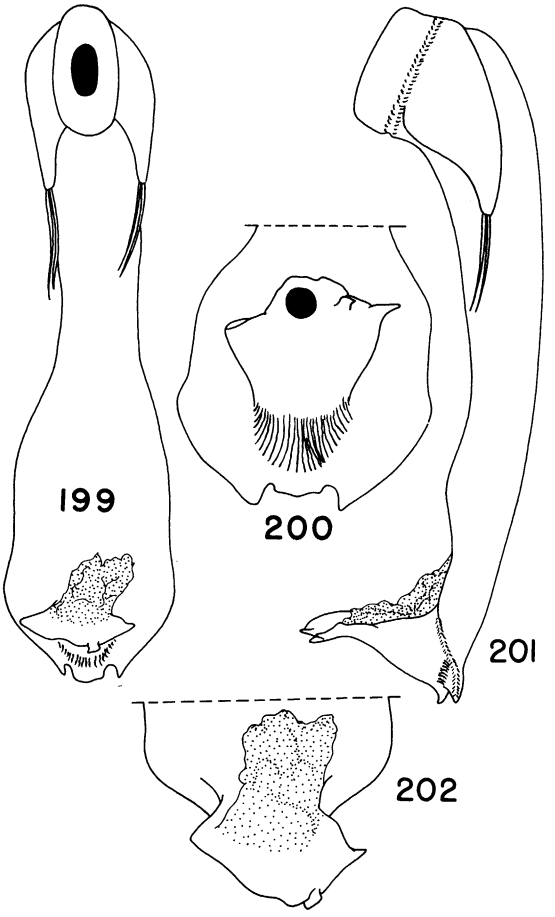
DESCRIPTION: Length 3.5 to 5 mm.

Color reddish, reddish brown, and black. Head and pronotum reddish to reddish brown; elytra dark reddish brown to reddish brown; abdomen dark reddish brown to black; antennae and legs pale reddish brown.

Head length (HL, figs. 38, 214) less than width (HW). Dorsum with scattered, coarse punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with small, rounded denticle adjacent to median emargination and with large, more acute denticle halfway between median emargination and lateral margin. Mandibles bidentate with large basal denticles. Antennomeres 4 and 11 unmodified.

Pronotum (fig. 214) strongly convex, widest anterior to transverse midline; surface with irregular, curved row of punctures on disk and with scattered coarse punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

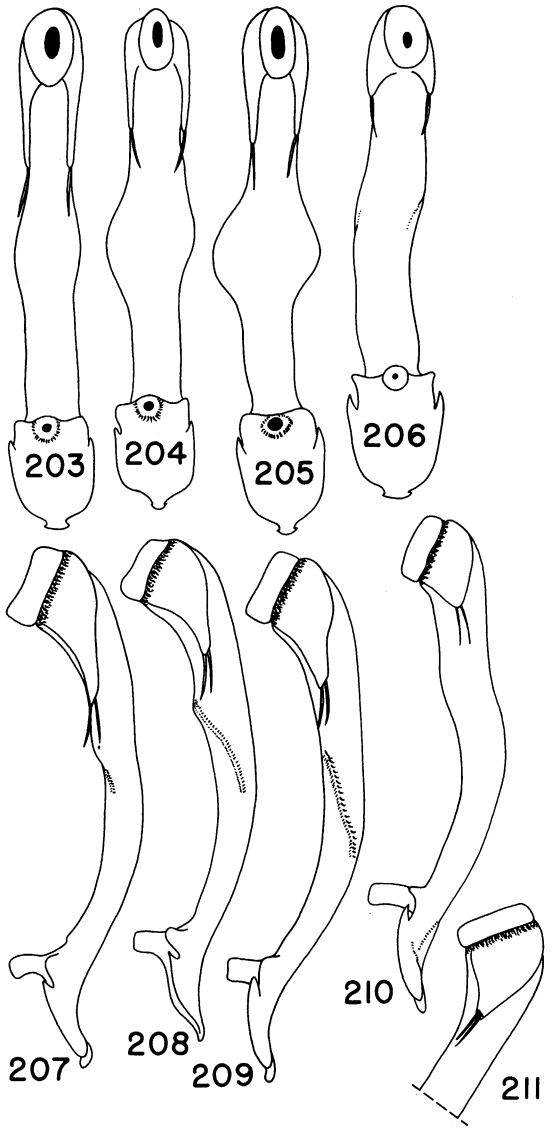
Elytra (EL, figs. 38, 214) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum with median, short, carina near apical margin.



FIGS. 199–202. *Gnathymenus obesus*. Aedeagus. 199. Dorsal view. 200. Posterodorsal view, apical fifth. 201. Right lateral view. 202. Anterodorsal view, apical fifth.

Abdominal segments III to VII without laterotergites; abdomen cylindrical; abdominal segments III to VI each with tergum and sternum fused; segment VII with tergum and sternum separated. Tergum VII with dermal fringe of posterior margin.

Male. Sterna IV to VI each with shallow, ovoid, median glabrous depression; depressions slightly increasing in size and depth from segment IV to VI. Sternum VII (fig. 215) with slight, shallow median impression; impression with a few, scattered, short setae; posterior margin shallowly emarginate



FIGS. 203–211. *Gnathymenus pipus*. Aedeagus. 203. Dorsal view, Tome, Chile. 204. Dorsal view, Florida, Chile. 205. Dorsal view, Agua de la Gloria, Chile. 206. Dorsal view, Coelemu, Chile. 207. Right lateral view, Tome, Chile. 208. Right lateral view, Florida, Chile. 209. Right lateral view, Agua de la Gloria, Chile. 210. Right lateral view, Coelemu, Chile. 211. Right lateral view, basal half, Agua de la Gloria, Chile.

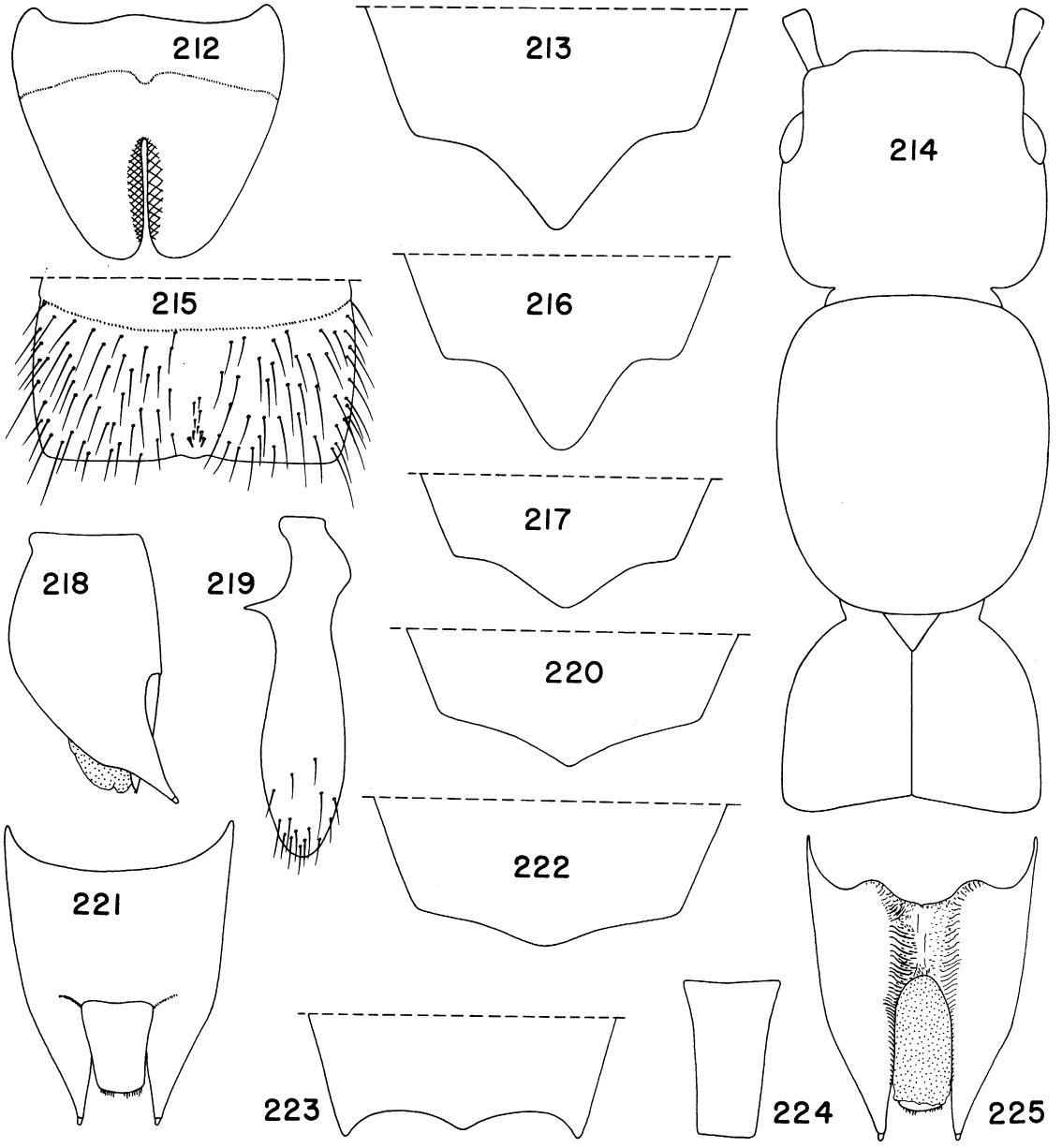
and sinuate medially; micropores absent; inner surface without median carina. Tergum VIII with broadly rounded lobe on posterior margin. Sternum VIII (fig. 212) with deep, narrow median incision extending for about one-half length of segment; surface adjacent to incision beveled; basal carina connected, not separated medially, with median portion posteriorly produced and with each half broadly sinuous; base without median groove. Sternite IX strongly asymmetrical, apical portion with scattered setae (fig. 219).

Aedeagus (figs. 203–211) with moderately long to short, broad parameres; parameres with two apical setae. Median lobe, in dorsal view, with basal third nearly parallel sided; middle third parallel sided (fig. 206) to strongly expanded near middle (fig. 205); apical third abruptly expanded, then gradually convergent to rounded apical margin; apical margin with small, median apically rounded lobe; median lobe, in lateral view, strongly bent dorsally; dorsal surface of basal two-thirds without midlongitudinal groove; dorsal surface of apical third broadly and shallowly impressed and with one pair of anteriorly directed processes and one pair of dorsolaterally directed processes on lateral margin; ventral surface without carinae. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium on dorsal surface at base of abruptly expanded apical third of median lobe at end of long, cylindrical ostial stalk.

Female. Sterna IV to VII unmodified. Tergum VIII with posterior margin broadly emarginate; emargination with small median lobe (fig. 223). Sternum VIII with moderately large (figs. 217, 220, 222) to large (figs. 213, 216), median, apically rounded triangular lobe on posterior margin. Tergum IX fused middorsally (fig. 221) and midventrally (fig. 225), and with median portion of ventral surface broadly and deeply impressed. Segment IX with one, rectangular genital appendage (fig. 224); genital sclerite without setae.

Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species



FIGS. 212–225. *Gnathymenus pipus*. 212. Sternum VIII, male, 213. Sternum VIII, female, apex, Tome, Chile. 214. Head and thorax. 215. Sternite VII, male. 216. Sternum VIII, female, apex, Coelemu, Chile. 217. Sternum VIII, female, apex, Agua de la Gloria, Chile. 218. Segment IX, lateral view. 219. Sternite IX, male. 220. Sternum VIII, female, apex, Agua de la Gloria, Chile. 221. Segments IX and X, dorsal view. 222. Sternum VIII, female, apex, Agua de la Gloria, Chile. 223. Tergum VIII, female, apex. 224. Genital appendage, female, ventral view. 225. Segment IX, female, ventral view, genital appendage removed.

is known only from the south central Chilean province of Concepcion (fig. 51).

VARIATION AND DISCUSSION: Among the 15 specimens (7 males, 8 females) studied, the variation of aedeagus (figs. 203–211) and sternum VIII (figs. 213, 216, 217, 220, 222) of the female is significant. Since all the known specimens lack flying wings, variation is not unexpected. I have considered these samples from four localities to be one rather than two species for the reasons given below.

The median lobe is parallel sided in the one male from Coelemu (fig. 206), slightly explanate in the one male from Tome (fig. 203), moderately explanate in the one male from Florida (fig. 204), and strongly explanate in the four males from Agua de la Gloria (fig. 205). The parameres are shortest in the male from Coelemu (fig. 210) and longest in the male from Tome (fig. 207); these two males exhibit the least explanate median lobe. Among the specimens from Florida and Agua de la Gloria which have the most explanate median lobe the parameres vary from short (figs. 209, 211) to moderately long (fig. 208).

Among the females, the posterior margin of sternum VIII has a large lobe in the two specimens from Coelemu (fig. 216) and Tome (fig. 213), and a moderately large to small lobe in the six specimens from Agua de la Gloria (figs. 217, 220, 222) and Florida. The two females with the large marginal lobe were collected with the two males from Coelemu and Tome that have the least explanate median lobe. Females from Agua de la Gloria, collected with males having the most explanate median lobe, have the smallest marginal lobe.

The form with the largest lobe of sternum VIII (females) and the least explanate median lobe (male) are represented by only two males and two females from two localities. Among the five males and seven females with the most explanate median lobe and smallest lobe of sternum VIII much variation of these two structures exists. Since the size of the lobe of sternum VIII is so variable among the females from Agua de la Gloria, and since the degree to which the median lobe is explanate seems to vary gradually, I consider all of the forms to be conspecific.

ETYMOLOGY: From the Anglo-Saxon *pipe* for pipe, referring to the long ostial stalk.

MATERIAL EXAMINED: Seven males, nine females. CHILE: *Concepcion:* Agua de la Gloria (type series; 6 females, AMNH); Tome, May 1, 1977, T. Cekalovic (1 male, 1 female, AMNH); 8 km. S Florida, April 5, 1973, T. Cekalovic (1 male, 1 female, CNC); Coelemu, December 12, 1971, T. Cekalovic (1 male, 1 female, CNC).

20. **Gnathymenus hyllus**, new species

Figures 6, 51, 226–233

HOLOTYPE: Male. Chile: Concepcion: Estero Nonguen, December 11, 1977, collected by T. Cekalovic, deposited in the American Museum of Natural History.

PARATYPES: 1 male with same data as holotype (AMNH).

DIAGNOSIS: The cylindrical abdomen distinguishes this species from most of the New World Dolicaonina. Males are distinguished from those with a cylindrical abdomen by the low cone surrounding the ostium (figs. 226–229), the broad median lobe (in dorsal view), and the absence of longitudinal carinae on the ventral surface.

The female is distinguishable by the characters in the Key.

DESCRIPTION: Length 4.5 to 5.0 mm.

Color reddish and reddish brown to black. Head reddish. Pronotum reddish brown to dark reddish brown. Elytra dark reddish brown to black. Abdominal segments III to VI dark reddish brown to black; segment VII reddish brown basally and yellowish brown apically; segments VIII to X yellowish to yellowish brown. Legs and antenna yellowish brown to reddish brown.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with coarse scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with

small denticle adjacent to median emargination and one larger denticle halfway between middle and lateral margin. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

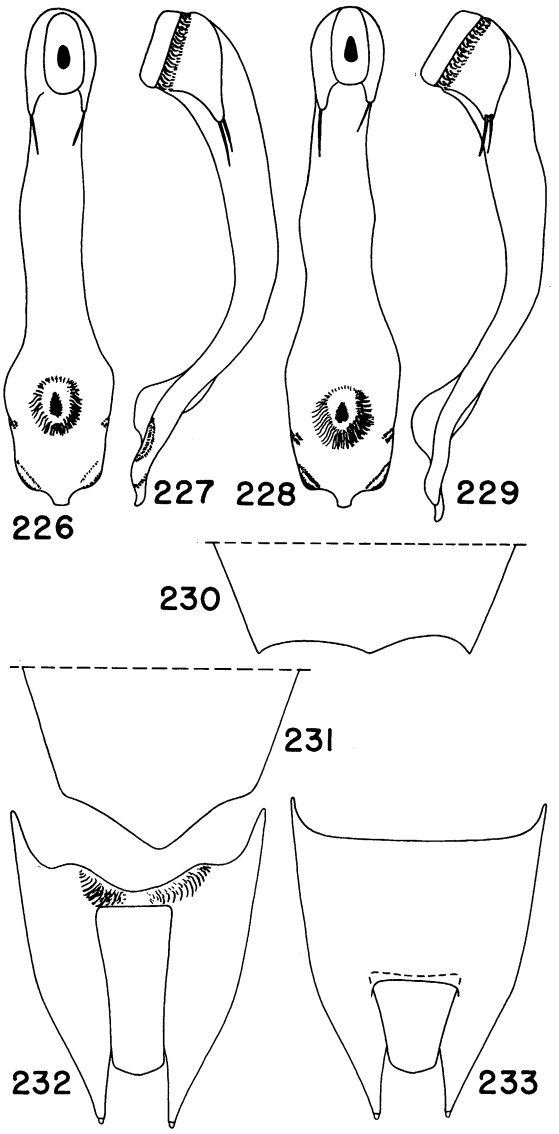
Pronotum strongly convex, widest anterior to transverse midline; surface with curved, irregular row of punctures and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present but obsolete. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond apex of mesocoxa. Metasternum with short carina near apical margin.

Abdominal segments III to VII without laterotergites; abdomen cylindrical; segments III to VI each with tergum and sternum fused; segment VII with tergum and sternum separated. Tergum VII without dermal fringe on posterior margin.

Male. Sterna IV to VI each with shallow median impression. Sternum VII with slight, shallow median impression; impression with a few, short, scattered setae; posterior margin shallowly emarginate and sinuate medially; micropores absent; inner surface without median carina. Tergum VIII with broadly rounded lobe on posterior margin. Sternum VIII with deep, narrow median incision extending for about one-half length of segment; surface adjacent to incision beveled; basal carina connected medially, not separated, with median portion posteriorly produced, and with each half broadly sinuous; base without median groove. Sternite IX strongly asymmetrical and with scattered subapical setae.

Aedeagus (figs. 226–229) with short, broad parameres; parameres with two apical setae. Median lobe, in dorsal view, with lateral margins sinuate to just beyond base half then strongly expanded before converging slightly to truncate apical margins; apical margin with small median, apically rounded lobe; median lobe, in lateral view, strongly bent



FIGS. 226–233. *Gnathymenus hyllus*. 226. Aedeagus, dorsal view. 227. Aedeagus, right lateral view. 228. Aedeagus, dorsal view. 229. Aedeagus, right lateral view. 230. Tergum VIII, female, apex. 231. Sternum VIII, female, apex. 232. Segment IX, female, ventral view. 233. Segment IX, dorsal view.

dorsally; dorsal surface without midlongitudinal groove or carina, with two, small, low, poorly developed rounded processes slightly beyond ostium near lateral margin; ventral surface without longitudinal carinae. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium on dorsal surface at about apical fourth and at end of low, broad, apically rounded cone.

Female. Sterna IV to VII unmodified. Tergum VIII (fig. 230) with posterior margin emarginate; emargination with small, median lobe. Sternum VIII (fig. 231) with moderately large, median, apically rounded, triangular lobe on posterior margin. Tergum IX fused middorsally (fig. 233) and midventrally, and with median portion of ventral surface broadly and deeply impressed. Segment IX (fig. 232) with one, rectangular genital appendage; genital sclerite without setae.

Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species is known only from the south central Chilean province of Concepcion (fig. 51).

ETYMOLOGY: From the Anglo-Saxon *hyll* for hill, referring to the rounded bump on the aedeagus that has the ostium.

MATERIAL EXAMINED: Holotype, paratype, and one female (AMNH) all with the same data.

21. **Gnathymenus twapicus**, new species
Figures 6, 51, 234–241

HOLOTYPE: Male. Chile: Concepcion: Hualpen, February 9, 1975, collected by T. Cekalovic, deposited in the American Museum of Natural History.

PARATYPES: One male, with same data as holotype (AMNH).

DIAGNOSIS: This species can be separated from most others by the cylindrical abdomen that lacks laterotergites. Males are distinguished from those with a cylindrical abdomen by the aedeagus (figs. 234, 236) that is gradually expanded apically beginning at about the end of the basal third. The ostium is at the end of a moderately long ostial stalk. The lateral margin has a small posteriorly directed process just posterior to the ostial stalk (figs. 236, 237). The ventral surface has longitudinal carinae.

The female can be recognized by the broad triangular lobe of the posterior margin of tergum VIII (fig. 239) and by the color pattern.

DESCRIPTION: Length 4.5 to 5.0 mm.

Color reddish, reddish brown, black, and yellowish. Head reddish. Pronotum reddish brown to dark reddish brown. Elytra dark reddish brown to black. Abdominal segments III to VI dark reddish brown to black; segment VII reddish brown basally to yellowish brown apically; segments VIII to X yellowish to yellowish brown. Legs and antenna yellowish brown to reddish brown.

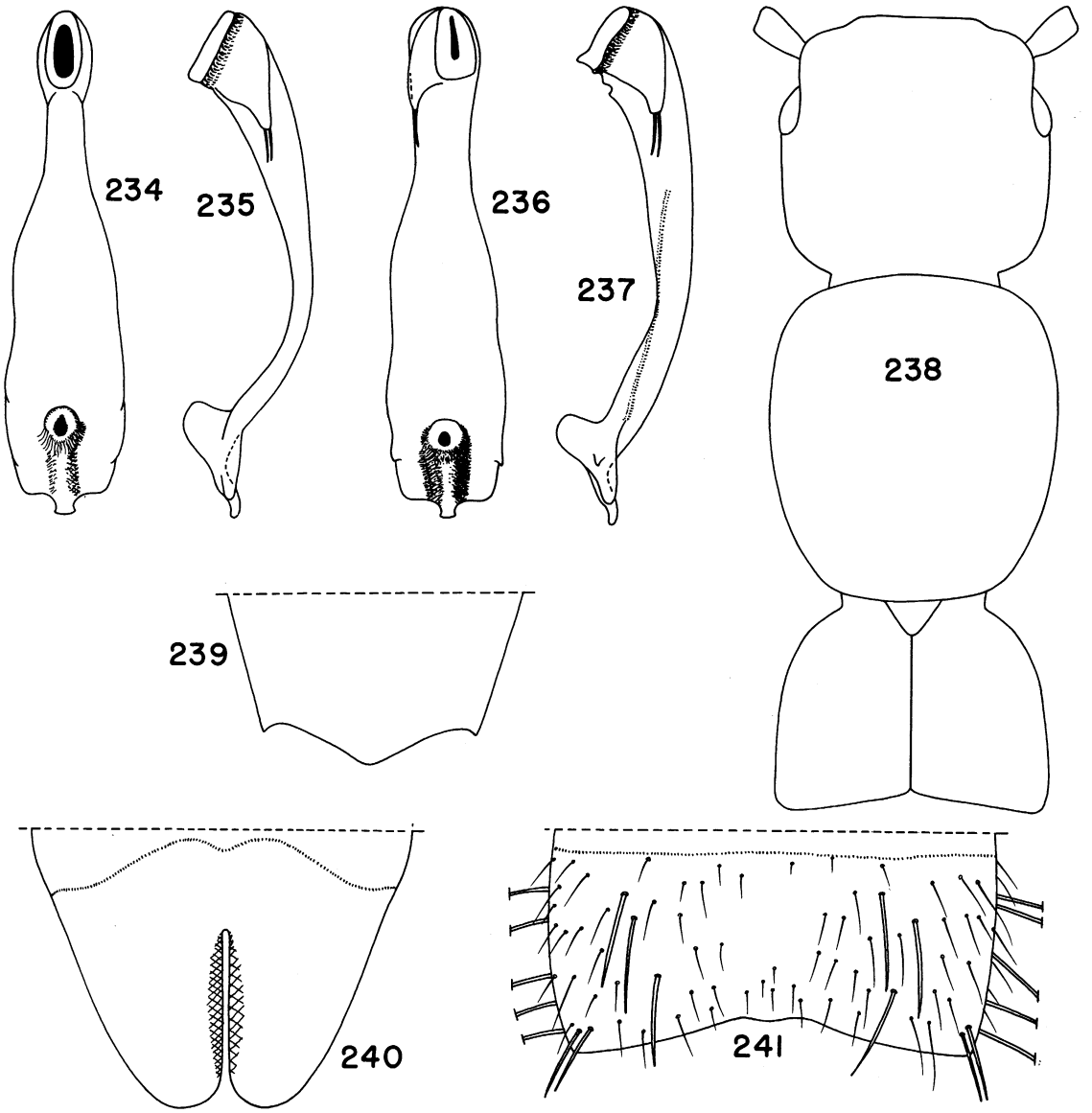
Head length (HL, figs. 38, 238) less than width (HW). Dorsum of head with coarse, scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.6 width of head. Submentum with midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with small denticle adjacent to median emargination and one larger denticle halfway between middle and lateral margin. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum (fig. 238) strongly convex, widest anterior to transverse midline; surface with curved, irregular row of punctures and scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without antennal cleaning process.

Elytra (EL, figs. 38, 238) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present but obsolete. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond apex of mesocoxa. Metasternum with short carina near apical margin.

Abdominal segments III to VII without laterotergites; abdomen cylindrical; segments III to VI each with tergum and sternum fused; segment VII with tergum and sternum separated; tergum VII without dermal fringe.

Male. Sterna IV to VI each with shallow median impression. Sternum VII (fig. 241)



FIGS. 234–241. *Gnathymenus twapicus*. 234. Aedeagus, dorsal view. 235. Aedeagus, right lateral view. 236. Aedeagus, dorsal view. 237. Aedeagus, right lateral view. 238. Head and thorax. 239. Tergum VIII, male. 240. Sternum VIII, male. 241. Sternite VII, male.

with slight, shallow, median impression; impression with a few, short, scattered setae; posterior margin shallowly emarginate and sinuate medially; micropores absent; inner surface without median carina. Tergum VIII (fig. 239) with broadly rounded lobe on posterior margin. Sternum VIII (fig. 240) with deep, narrow median incision extending for about one-half the length of segment; surface adjacent to incision beveled; basal carina connected medially, not separated, with median portion posteriorly produced, and

with each half broadly sinuous; base without median carina. Sternite IX asymmetrical, apical portion with scattered setae.

Aedeagus (figs. 234–237) with short, broad parameres; parameres with two apical setae. Median lobe, in dorsal view, expanded apically from about basal third to apex; apical margin truncate and with small, median, apically rounded lobe; median lobe, in lateral view, strongly bent dorsally; dorsal surface without midlongitudinal groove, with low midlongitudinal carina, and with small posterolaterally directed, distinct (figs. 236, 237) to poorly (figs. 234, 235) developed, process near lateral margin just posterior to ostium; ventral surface with longitudinal carina near each lateral margin. Collar of basal foramen entirely sclerotized. Base of median lobe without pump spot. Ostium on dorsal surface at about apical fourth and at end of moderately long, cylindrical ostial stalk.

Female as described for *hyllus*.

HABITAT AND DISTRIBUTION: This species is known only from the south central Chilean province of Concepcion (fig. 51).

ETYMOLOGY: From the Anglo-Saxon *twa* for two and *pic* for point and referring to the two posteriorly directed processes on the aedeagus.

MATERIAL EXAMINED: Two males, three females. CHILE: *Concepcion:* Hualpen (type series, 2 females, AMNH); Parque Hualpen, December 10, 1971, T. Cekalovic (1 female, CNC).

22. *Gnathymenus vogelsangi* (Scheerpeltz), new combination

Figures 6, 51, 242–246

Xanthornobium vogelsangi Scheerpeltz, 1967, pp. 240–242. (Type locality: Venezuela: Carret Chorosu, 1400 m., June 28, 1953, from nest of *Psarocolius viridis* [Conoto verde], collected by E. Vogelsang, in the Naturhistorisches Museum, Vienna, examined. See discussion of type locality below.)

DIAGNOSIS: Males of this species are separated from other species by the long dark elytra, the reflexed anterior margin of the labrum, and characters of sternite VII and the aedeagus (figs. 242–244).

DESCRIPTION: Length approximately 4.0 mm.

Color pale yellowish brown and reddish brown. Head, pronotum, antennae, and legs pale yellowish brown. Elytra and abdomen reddish brown.

Head length (HL, fig. 37) slightly less than width (HW). Dorsum of head with coarse, scattered, sparse punctation laterally and with median strip impunctate; surface polished, without ground sculpturing. Eye length (OL) about equal to postocular length (PO) of head. Neck width about 0.6 width of head. (Submentum not studied.) Labrum with small U-shaped median emargination; anterior margin with broad truncate lobe adjacent to median emargination and large rounded lobe adjacent to lateral margin; anterior margin reflexed. Mandible bidentate; large denticle near middle with bilobed apex. Antennomeres 4 and 11 unmodified.

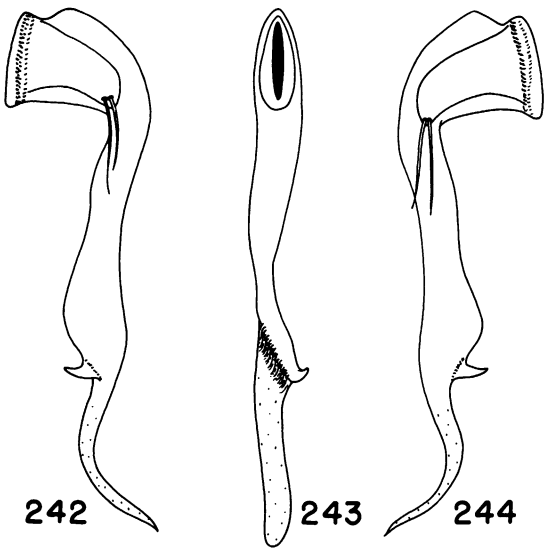
Pronotum strongly convex, widest slightly anterior to transverse midline; surface with curved row of coarse punctures on disk and with scattered, sparse punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not examined.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). (Mesosternum and mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxa. (Metasternum not studied.)

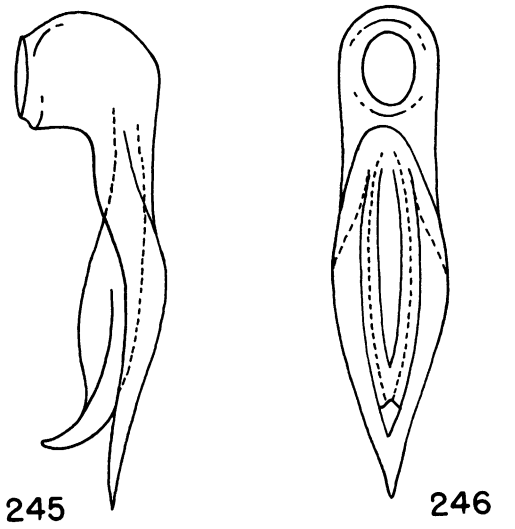
Abdominal segments III to VII each with two pairs of laterotergites. (Tergite VII and Tergum VIII damaged, not studied; see Discussion.)

Male. Since the holotype is damaged and fragile, the following description of the abdominal characters is translated and interpreted from Scheerpeltz, 1967, p. 241 (see Discussion at end of this description). To be consistent with the rest of the descriptions the Roman numerals in parentheses refer to the morphological designation of the abdomen.

". . . Second sternite [sternite IV] [with] . . . very small, roundish [midlongitudinal



FIGS. 242–244. *Gnathymenus vogelsangi*. Aedeagus. 242. Right lateral view. 243. Dorsal view. 244. Left lateral view.



FIGS. 245–246. *Gnathymenus vogelsangi*. Aedeagus, redrawn from Scheerpeltz, 1967. 245. Right lateral view. 246. Dorsal view.

impression]; . . . third sternite [V] [with] . . . somewhat larger, longer [midlongitudinal impression], . . . next sternite [VI] [with] still deeper and longer [midlongitudinal] impression; . . . penultimate sternite [VII] [with] fairly deep, longitudinal furrow-like impression, whose sides are somewhat more thickly punctate and have short dark setae; . . . last sternite [VIII] . . . [with] deep but narrow incision, which extends for about two-thirds of length of segment . . . ."

Aedeagus (figs. 242–244) with short, broad parameres; parameres with two setae near apex. Median lobe, in dorsal view, long, slender, asymmetrical, slightly sinuate, constricted near middle and gradually tapered to apex; apex rounded, apical fifth of median lobe lightly sclerotized, and strongly curved ventrally; dorsal surface with strong spiniform process on right side and directed laterodorsally; dorsal surface rounded to flattened, without median groove. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex of median lobe.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from Venezuela where it was collected from the hanging nest of a Conoto verde or green oropendola, *Psarocolius viridis*.

TYPE LOCALITY: I am unable to find the type locality, Carret Chorosú, Venezuela. The Venezuelan province was omitted from the label on the specimen and from Scheerpeltz's 1967 article. Since "Carret" is not a Spanish word, the word may be *Carretera* which means Highway and may refer to a highway going to a town, Chorosú.

Since the type locality cannot be found and since the beetle was collected from the nest of *Psarocolius viridis* (Green oropendola or Conoto verde) at about 1400 m. elevation, knowledge of the distribution of the bird may permit future collections. In Venezuela, *P. viridis* occurs from the northeastern into southern regions where it is known from the provinces Sucre and Delta south into southern Bolivar, then westward into Amazonas. It lives in forests of the tropical zone (Phelps and Phelps, 1963, p. 340).

DISCUSSION: As indicated by Scheerpeltz (1967, p. 242) the holotype (the only known specimen) of *Xanthornobium vogelsangi* is

damaged. Tergite VII and segments VIII–X are mangled and crushed and impossible to study. The specimen is incompletely sclerotized and pigmented and the abdomen appears to be very fragile. Since the specimen is in poor condition I did not remove it from the card mount to study the ventral surface and have relied on the description given by Scheerpeltz (1967) for characters of sternites IV to VIII.

The aedeagus is more problematical. It has been removed from the abdomen and illustrated by Scheerpeltz (1967, p. 242, fig. 2). The aedeagus had also been glued to the mounting card, and after soaking it off I found it also slightly damaged with small cracks in several places. More importantly, however, the aedeagus as illustrated by Scheerpeltz does not match the structure glued to the card. There are certain similarities: for example, the curved process on the dorsal surface and the dorsoventrally large base but there are also many inconsistencies. The following paragraphs refer to my illustration (figs. 242–244) and to those which I have redrawn (figs. 245, 246) from Scheerpeltz's 1967 work.

The length of the aedeagus is shown by Scheerpeltz as slightly over 1 mm. I measured it to be about 0.7 mm. I also find the aedeagus to be much narrower than he illustrates. Scheerpeltz does not show the long ventrally curved apical sixth which is lightly sclerotized, shows an acute (fig. 246) rather than rounded apex (fig. 243), shows the dorsal spiniform process to arise from the midline of the median lobe (fig. 246), whereas it actually arises to the right side of the midline (fig. 243). He states that the median lobe is composed of two plates or blades, the shorter of which ends in the spiniform process (figs. 245, 246) and that the ostium lies between the ends of these blades. He further says that the parameres are fused to the spiniform process. The median lobe is not composed of two plates, the parameres are short and appressed to the base of the median lobe (figs. 242, 244) and the ostium is at the apex of the ventrally curved portion of the median lobe.

Some of the small details (for example, parameres and ostium) are impossible to see without a compound microscope which I used at magnifications of 200× and 400×. Deficient optical equipment may account for some of the discrepancies of detail but not for the gross dissimilarities noted.

MATERIAL EXAMINED: Holotype.

23. *Gnathymenus rufoniger* Fauvel
Figures 6, 51, 247–251

Gnathymenus rufoniger Fauvel, 1891, p. 100. (Type locality: Venezuela: [Aragua]: Colonia Tovar. Hololectotype, designated here as the specimen with my lectotype label on it, in the Institut Royal des Sciences Naturelles, Brussels, examined.)

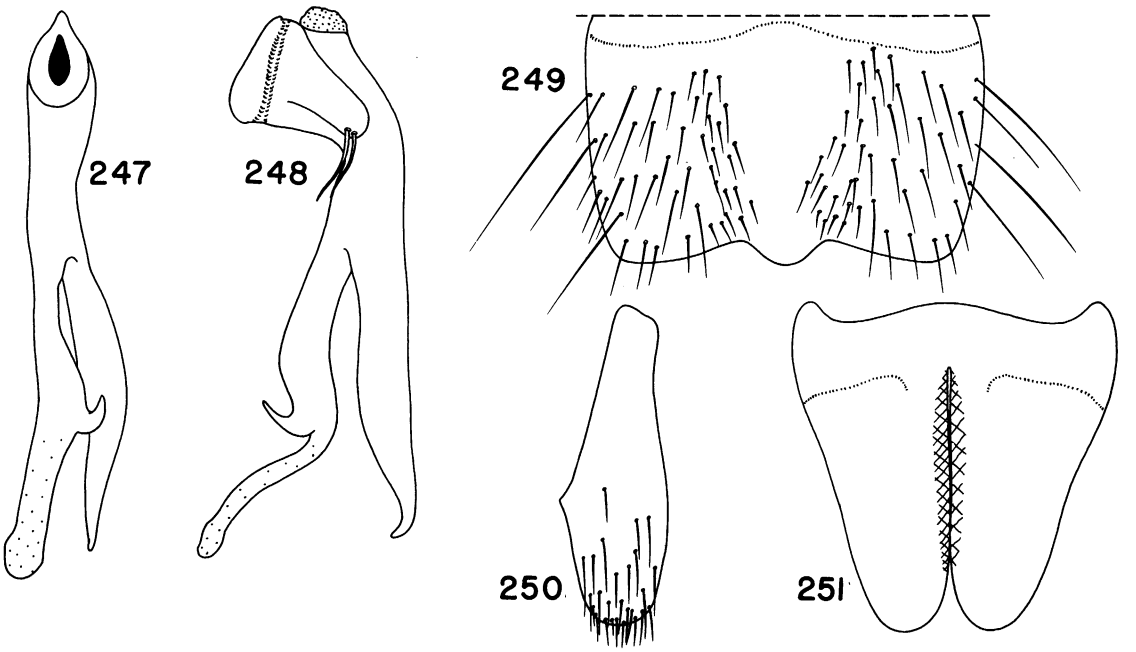
DIAGNOSIS: The males of this species are recognizable by the moderately deep, broad depression and rounded lobe on the posterior margin of sternite VII (fig. 249) and by the bifurcate aedeagus (figs. 247, 248). The left process of the aedeagus has a posteriorly hooked process on the mediodorsal surface.

DESCRIPTION: Length approximately 4 mm.

Color reddish and dark reddish brown. Head and pronotum reddish; elytra and abdomen dark reddish brown; antennae and legs pale reddish brown.

Head length (HL, fig. 37) slightly less than width. Dorsum of head with scattered, coarse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) slightly more than eight-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with small, median U-shaped emargination; anterior margin with moderately large denticle about one-third from lateral margin. Mandibles bidentate; median denticle large, basal denticle minute. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.



FIGS. 247–251. *Gnathymenus rufoniger*. 247. Aedeagus, dorsal view. 248. Aedeagus, right lateral view. 249. Sternite VII, male. 250. Sternite IX, male. 251. Sternum VIII, male.

Elytra (EL, fig. 37) longer than pronotum (PL). (Mesosternum and mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, reaching well beyond posterior margin of mesocoxa. Metasternum without median tubercle near apical margin.

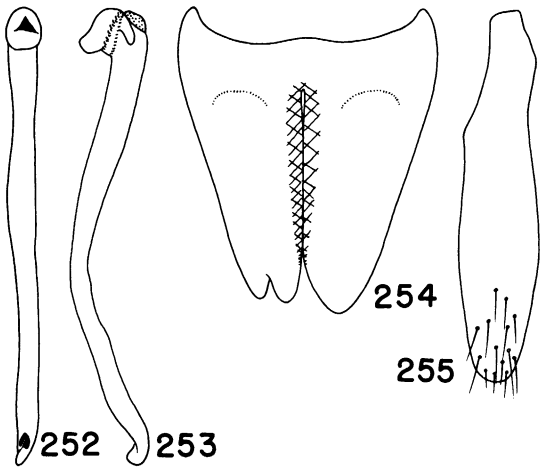
Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI each with shallow, glabrous median depression; depression of sternite VI bordered laterally by spiniform setae. Sternite VII (fig. 249) with large, broad, moderately deep, glabrous, median depression; depression bordered laterally by setae and without micropores; posterior margin broadly and shallowly emarginate and with large, apically rounded median lobe; inner surface without median carinae. Sternum VIII (fig. 251) with deep, narrow, median incision extending for about three-fourths length of segment; surface beveled adjacent to sternum VIII; basal carina present; divided medially and with each half sinuous; base without median groove. Sternite IX (fig. 250) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 247, 248) with short, broad parameres; parameres with two setae near apex. Median lobe asymmetrical, bifurcate from about basal third; process on right bladelike, slightly twisted, slender in dorsal view, broad in lateral view and ventrad of left process; left process cylindrical basally and flattened distally, with stout mediodorsally directed hook distad of middle, apical portion of left process more lightly sclerotized than basal portion. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex of left process.

HABITAT AND DISTRIBUTION: This species is known from the northern Venezuelan province of Aragua (fig. 51).

MATERIAL EXAMINED: VENEZUELA: *Aragua:* Colonia Tovar (type series 2 males, IRSN).



FIGS. 252–255. *Gnathymenus bicolor*. 252. Aedeagus, dorsal view. 253. Aedeagus, right lateral view. 254. Sternum VIII, male. 255. Sternite IX, male.

24. *Gnathymenus bicolor* Bernhauer
Figures 6, 51, 252–254

Gnathymenus bicolor Bernhauer, 1921, p. 71. (Type locality: Bolivia: Yuracaris. Holotype, male, in the Field Museum of Natural History, Chicago, examined.)

DIAGNOSIS: The long elytra, unmodified seventh sternite, and slender, apically rounded aedeagus (figs. 252, 253) separates the males of this species from all others. It is similar to *G. angulus* but details of the aedeagal structure permit separation.

DESCRIPTION: Length about 3.5 mm.

Color reddish and dark reddish brown. Head and pronotum reddish; elytra and abdominal segments III to VI dark reddish brown; basal two-thirds of segment VII reddish brown, apical third of segment VII and segments VIII to X yellowish brown; legs and antenna yellowish brown.

Head length (HL, fig. 38) slightly greater than width (HW). Dorsum of head with coarse scattered punctures on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about two-thirds of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad, obliquely sinuo-truncate lobe extending from emargination to halfway across labrum. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered punctures on disk and lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotal length (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, reaching well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with large, rounded lobe on posterior margin.

Male. Abdominal sternites IV to VI unmodified. Sternite VII unmodified, without median depression, internal carina, glabrous strip, micropores or modified setae; posterior margin truncate. Sternum VIII with deep narrow median incision extending for about eight-tenths length of segment; surface adjacent to median incision weakly beveled; basal carina separated medially, and with each half short and curved; base without median groove (fig. 254). Sternite IX asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 252, 253) with minute parameres; parameres without setae. Median lobe, in dorsal view, slender and slightly sinuous. Median lobe, in lateral view, strongly bent ventrally near middle and with apical portion bent dorsally; apex blunt and rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on dorsal surface near apex.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from Yuracaris, Bolivia (fig. 51).

DISCUSSION: One side of the posterior margin of sternum VIII (fig. 254) has a teratological notch.

TYPE LOCALITY: I was unable to find "Yuracaris" in Bolivia; however, there is a region called Yuracares that is north-northeast of La Paz (fig. 51) in or near the foothills of the Andes. One atlas labels this region "Yuracares Indians"; another simply "Yuracares." This may be the area from which *bicolor* was collected.

MATERIAL EXAMINED: Holotype.

25. **Gnathymenus angulus**, new species
Figures 6, 51, 256–262

HOLOTYPE: Male. Ecuador: Napo: 24 km. N Baeza, 1000 m. elevation, March 4, 1976, collected by J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: Males can be separated from those of other species by the long elytra, nearly truncate seventh sternite (fig. 262), and slender, apically hooked aedeagus (figs. 256, 257). The characters in the Key will separate the females.

DESCRIPTION: Length about 3.5 mm.

Color reddish and dark reddish brown. Head and pronotum reddish; elytra and abdominal segments III to VI dark reddish brown; basal two-thirds of segment VII reddish brown, apical third of segment VII and segments VIII to X yellowish brown; legs and antenna yellowish brown.

Head length (HL, figs. 38, 259) and width (HW) approximately equal. Dorsum of head with coarse scattered punctures on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about eight-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad, obliquely sinuotruncate lobe extending from emargination to halfway across labrum. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum (fig. 259) strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

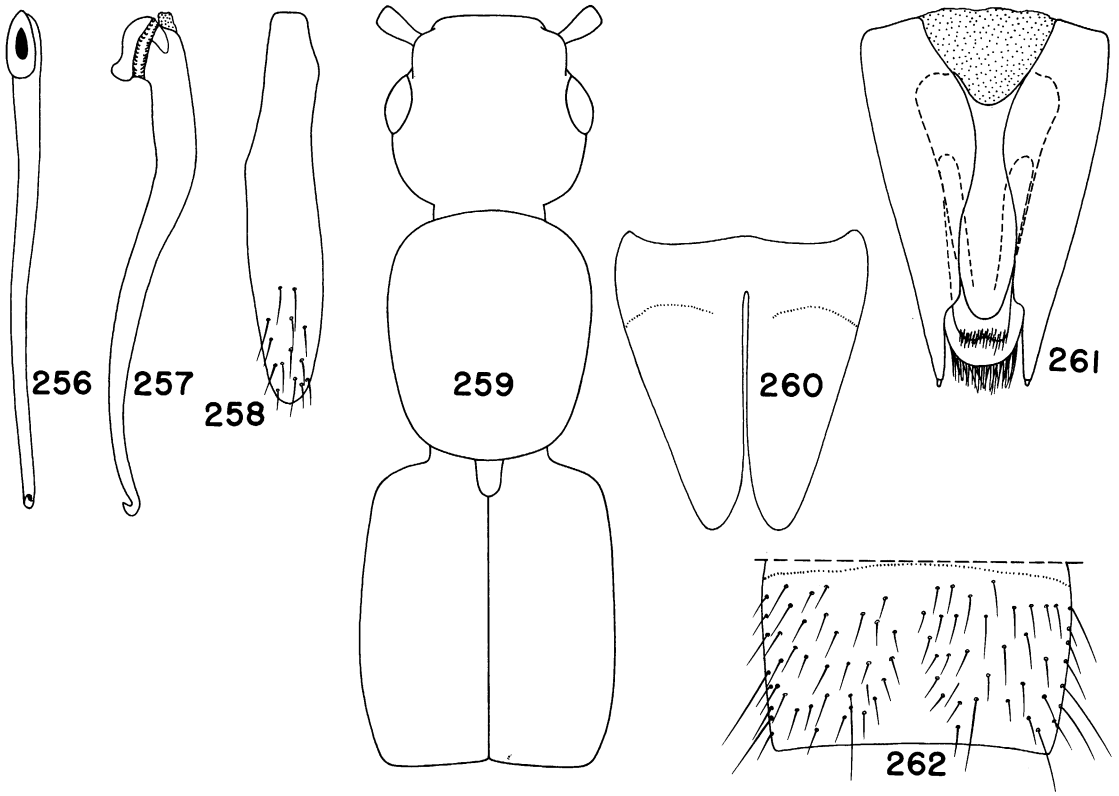
Elytra (EL, figs. 37, 259) longer than pronotal length (PL). Mesosternum without median fovea and sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, reaching well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with large, rounded lobe on posterior margin.

Male. Abdominal sternites IV to VI unmodified. Sternite VII (fig. 262) without median depression but with elongate, median, glabrous strip; micropores absent; posterior margin broadly and obsoletely emarginate; inner surface without median carina. Sternum VIII (fig. 260) with deep, narrow median incision extending for about eight-tenths length of segment; surface adjacent to incision obsoletely beveled; basal carina divided medially and with each half broadly curved; base without median groove. Sternite IX (fig. 258) asymmetrical; apical region with scattered setae.

Aedeagus (figs. 256, 257) with minute parameres; parameres without setae. Median lobe, in dorsal view, slender, slightly tapered and slightly sinuous; median lobe, in lateral view, slightly sinuous; apical portion hooked; apex acute; dorsal and ventral surfaces without grooves, carinae, or processes. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on dorsal surface near apex and beneath apical hook.

Female. Sternites IV to VIII not modified. Tergum IX fused dorsally, ventrally divided



FIGS. 256–262. *Gnathymenus angulus*. 256. Aedeagus, dorsal view. 257. Aedeagus, right lateral view. 258. Sternite IX, male. 259. Head and thorax. 260. Sternum VIII, male. 261. Segment IX, female, ventral view. 262. Sternite VII, male.

midlongitudinally. Segment IX (fig. 261) with two genital appendages; basal genital appendage longitudinally incised from base toward apex and with sinuo-truncate posterior margin; apical region of apical appendage without setae but with many cuticular processes.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the north central Ecuadorian Province of Napo (fig. 51) where it was collected at 1000 m. (3280 ft.).

ETYMOLOGY: From the Anglo-Saxon *angul* for hook, referring to the apically hooked aedeagus.

MATERIAL EXAMINED: Holotype and one female with same data as holotype (CNC).

26. **Gnathymenus limus**, new species

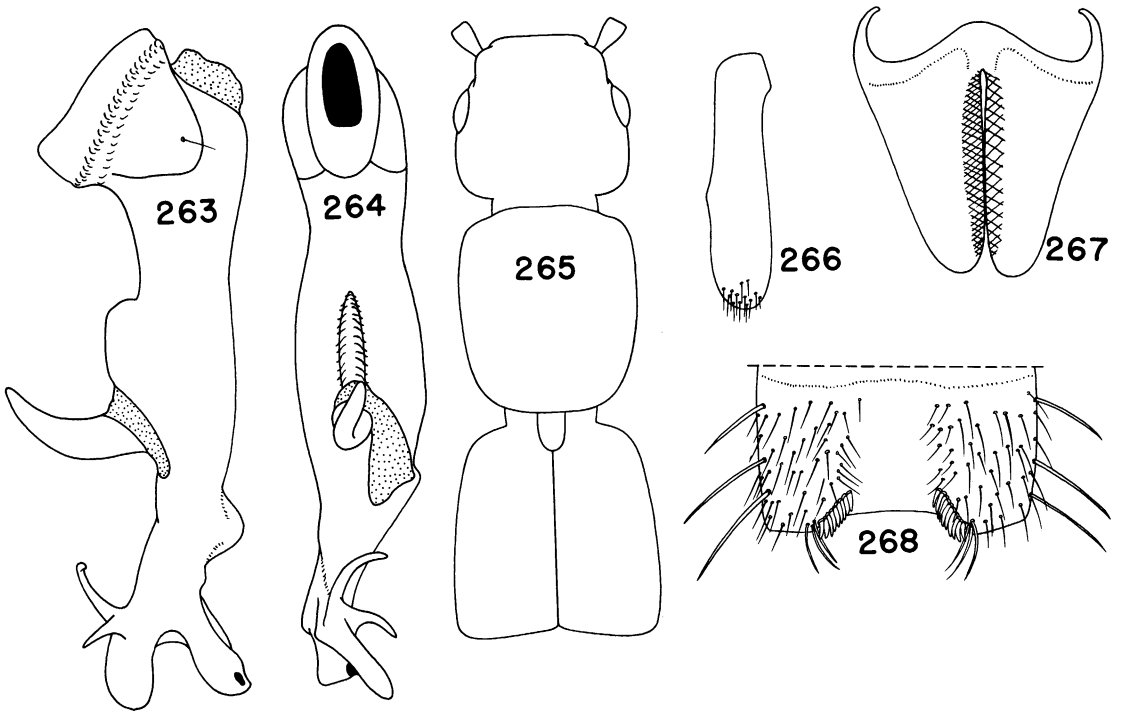
Figures 6, 51, 263–268

HOLOTYPE: Male. Colombia: Valle [del Cauca]: Pichinde, 5000 ft. elevation, July 19, 1970, J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: Males of this species can be separated from all others by the oblique row of short, stout, spiniform setae on each side of a broad emargination of the posterior margin of sternite VII (fig. 268). The aedeagus is uniquely modified with five processes on the median lobe (fig. 263).

DESCRIPTION: Length about 2.5 mm.



FIGS. 263–268. *Gnathymenus limus*. 263. Aedeagus, right lateral view. 264. Aedeagus, dorsal view. 265. Head and thorax. 266. Sternite IX, male. 267. Sternum VIII, male. 268. Sternite VII, male.

Color reddish brown. Head, pronotum, and abdomen reddish brown, elytra bicolored with basal half reddish brown and apical half dark reddish brown. Legs and antennae yellowish brown.

Head length (HL, figs. 37, 265) and width (HW) nearly equal. Dorsum with sparse, coarse, fine scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about seven-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with two denticles, one adjacent to median emargination and one about halfway between middle and lateral margin. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum (fig. 265) strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 265) slightly longer than pronotal length (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending far beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with

dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternite IV unmodified. Sternite V with small, shallow median, glabrous depression. Sternite VI with moderately broad, shallow, glabrous median depression. Sternite VII (fig. 268) with broad, shallow, median, glabrous depression; micropores absent; posterior margin broadly emarginate; emargination bordered laterally by oblique row of short, stout, spiniform setae; inner surface without median carina. Sternum VIII (fig. 267) with deep, narrow median incision extending for about eight-tenths length of segment; surface adjacent to incision beveled; basal carina divided medially with each half broadly curved and then strongly bent at medial end; base without median groove. Sternite IX (fig. 266) slightly asymmetrical and with patch of setae on apical portion.

Aedeagus (figs. 263, 264) with short, broad parameres; parameres with one seta. Median lobe asymmetrical, with five processes and, in dorsal view, slightly constricted on basal half; dorsal surface with short midlongitudinal carina near middle, with one, stout, spiniform, anterodorsally directed process just beyond middle and with membranous region near middle at base of spiniform process; apical region with cluster of two subapical and two apical processes; two subapical processes slender, dorsolaterally directed, curved, and on dorsal surface; one apical process posterodorsally directed, compressed in dorsal view, and broad in lateral view; one apical process posteroventrally directed and stout. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex of posteroventrally directed apical process.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the mountains of the western Colombian province of Valle del Cauca (fig. 51) where it was collected at 5000 ft. (1524 m.) elevation.

ETYMOLOGY: From the Latin *limus* for oblique, referring to the oblique rows of setae on sternite VII of the male.

MATERIAL EXAMINED: Holotype.

27. **Gnathymenus mergus**, new species
Figures 6, 51, 269–273

HOLOTYPE: Male. Colombia: Putomayo: Santa Rosa, (Kofan indian village), Rio San Miguel, 400 m., November 2–5, 1971, beating rotten vegetation along forest trail, collected by B. Malkin, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: Males of this species can be separated from those of all others except *limus* by the short, stout, spiniform setae on each side of a broad, shallow median emargination of the posterior margin of sternite VII (fig. 273). Three setae are on one side of the emargination (fig. 273) and two on the other; *limus* has more. The aedeagus has a forked process on the middle of the dorsal surface (fig. 269) and the apical portion is complex with an expanded, irregularly shaped, dorsal lobe (fig. 270).

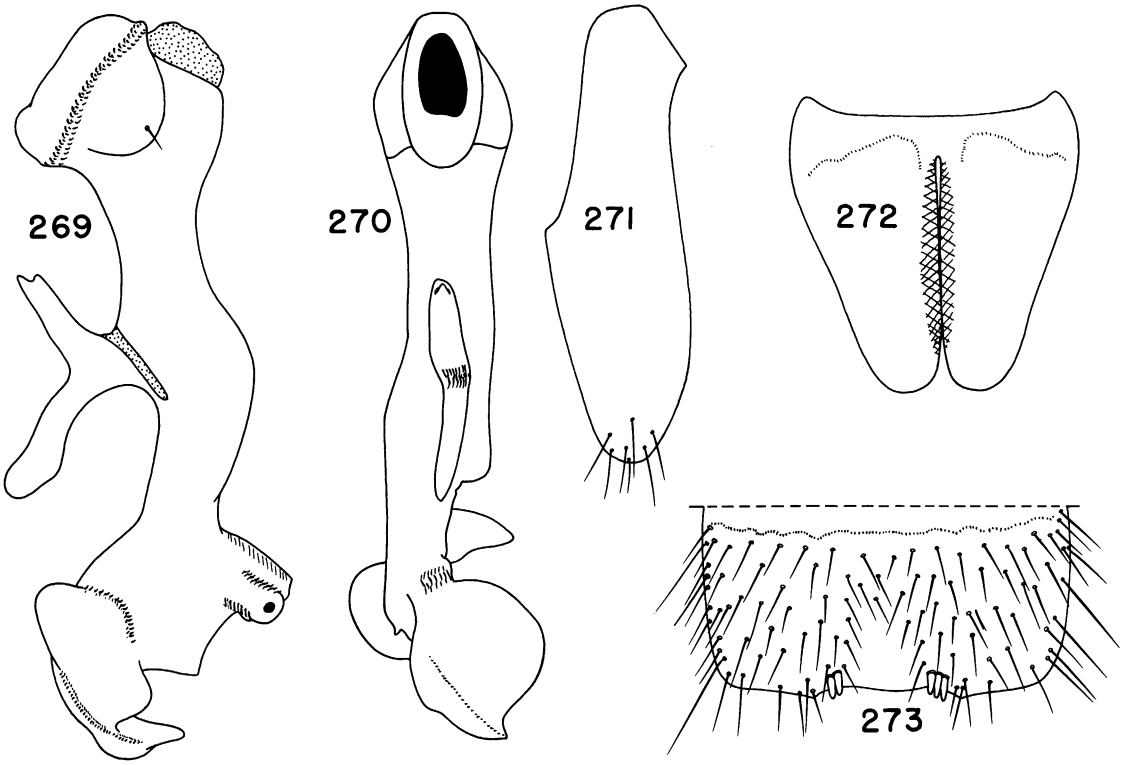
DESCRIPTION: Length about 2.6 mm.

Color reddish brown and yellowish brown. Head and pronotum pale reddish brown. Elytra bicolored, basal half yellowish brown, apical half dark reddish brown. Abdomen bicolored, segments III to VI yellowish brown, segments VII and VIII dark reddish brown. Legs and antennae yellowish brown.

Head length (HL, fig. 37) slightly less than head width (HW). Dorsum with sparse, coarse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) equal to postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface with irregular row of punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and distinctly converging toward base. (Mesothoracic spiracular peritreme not examined.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotal length (PL). Mesosternum without median



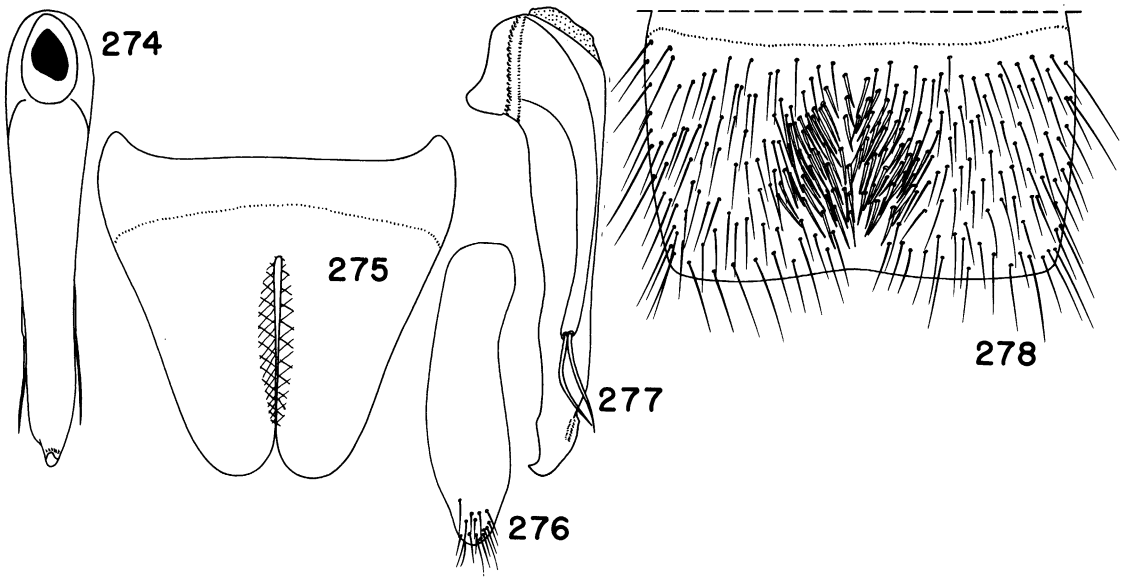
FIGS. 269–273. *Gnathymenus mergus*. 269. Aedeagus, right lateral view. 270. Aedeagus, right lateral view. 271. Sternite IX, male. 272. Sternum VIII, male. 273. Sternite VII, male.

fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending far beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 273) with broad, shallow, median, glabrous depression; micropores absent; posterior margin broadly and shallowly emarginate; emargination bordered laterally by short, stout, spiniform setae, two setae on right, three setae on left; inner surface without median carina. Sternum VIII (fig. 272) with deep, narrow median incision extending for more than eight-tenths length of segment; surface adjacent to incision beveled; basal carina divided medially with each half broadly curved then strongly bent at medial end; base without median groove. Sternite IX (fig. 271) asymmetrical and with patch of setae on apical portion.

Aedeagus (figs. 269, 270) with short, broad parameres; parameres with one seta. Median lobe asymmetrical; dorsal surface with large bifurcate process near middle, anterior projection notched at apex; dorsal surface membranous at base of bifurcate process; apical third with dorsal surface broadly expanded, expanded portion with apically produced, ventrally bent lobe; ventroapical portion with compressed median lobe and with compressed lobe on right side. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex of



FIGS. 274–278. *Gnathymenus klimai*. 274. Aedeagus, dorsal view. 275. Sternum VIII, male. 276. Sternite IX, male. 277. Aedeagus, right lateral view. 278. Sternite VII, male.

posterolaterally directed lobe on ventral edge of median lobe.

Female unknown.

HABITAT AND DISTRIBUTION: The species is known only from the Colombian province of Putomayo (fig. 51) where it was collected by beating rotten vegetation along a forest trail at about 400 m. (1312 ft.) elevation.

ETYMOLOGY: From the Latin *merga* for two-pronged pitch fork and referring to the bifurcate process on the dorsal surface of the aedeagus.

MATERIAL EXAMINED: Holotype.

28. *Gnathymenus klimai* (Bernhauer), new combination

Figures 6, 59, 274–278

Dolicaon klimai Bernhauer, 1927, p. 239. (Type locality: Brazil: [Guanabara]: Rio de Janeiro. Holotype, male, in the Field Museum of Natural History, Chicago, examined.)

DIAGNOSIS: The male of this species can be distinguished from those of other species by the long, concolorous elytra, moderately dense punctation of the pronotum, the median patch of long, stout setae on sternite VII (fig. 278), and the long parameres and apically hooked aedeagus (fig. 277).

DESCRIPTION: Length 5 mm.

Color reddish brown. Head and pronotum reddish brown, elytra slightly paler reddish brown and abdomen slightly darker reddish brown with infusions of brown. Legs and antennae pale reddish brown.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye (OL) slightly more than one-half of postocular length (PO) of head. Neck width six-tenths width of head. Submentum with broad midlongitudinal elevation. (Labrum and mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. Mesothoracic spiracular peri-

treme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 278) with broad, median patch of long, stout setae; median region without depression; micropores absent; posterior margin with broad, shallow median emargination; inner surface without median carina. Sternum VIII with deep, narrow median incision extending for about six-tenths the length of segment; surface adjacent to incision beveled; basal carina entire, not separated medially, and broadly curved; base without median groove. Sternite IX (fig. 276) asymmetrical and apical portion with scattered setae.

Aedeagus (figs. 274, 277) with long, moderately broad parameres; parameres with two long setae at apex. Median lobe, in dorsal view, slightly tapered toward apex. Median lobe, in lateral view, nearly straight and with apex hooked dorsally; ventral surface with slight subapical depression; dorsal surface rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with large circular pump spot; pump spot without median sclerite. Ostium on ventral surface and at apex of shallow subapical depression.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the eastern Brazilian province of Guanabara (fig. 51).

MATERIAL EXAMINED: Holotype.

29. **Gnathymenus zarzus**, new species
Figures 6, 51, 279–283

HOLOTYPE: Male. Brazil: [São Paulo]: São Paulo, collected by Mraz, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: One male with same data as holotype (AMNH).

DIAGNOSIS: The male of this species can be separated from those of other species by the long, concolorous elytra, the moderately dense punctation of the pronotum, the shallow median depression with short, stout, spiniform setae on sternite VII (fig. 282), and the long aedeagal parameres (fig. 280). It can be distinguished from *klimai* and *radulus* by characters given in the Key.

DESCRIPTION: Length 4 m.

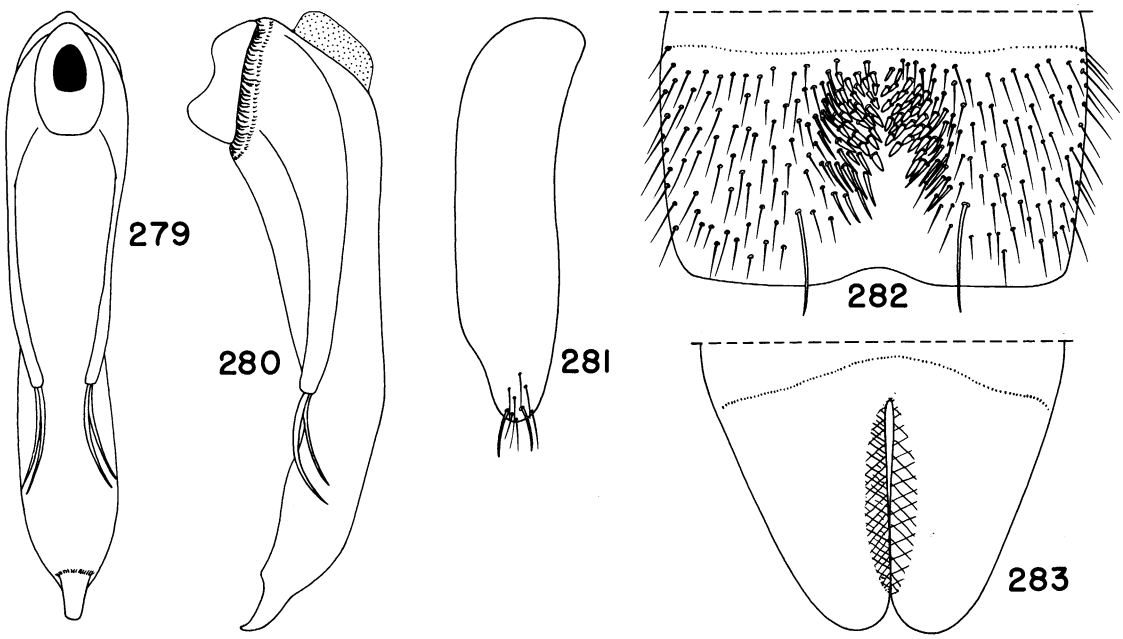
Color reddish brown. Head and pronotum reddish brown; elytra pale reddish brown; abdomen dark reddish brown; legs and antennae pale reddish brown.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about seven-tenths of postocular length (PO) of head. Neck width about 0.6 width of head. Submentum without midlongitudinal carina but with low, rounded, median tumescence. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface with moderately dense, scattered punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, reaching well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin rounded.



FIGS. 279–283. *Gnathymenus zarzus*. 279. Aedeagus, dorsal view. 280. Aedeagus, right lateral view. 281. Sternite IX, male. 282. Sternite VII, male. 283. Sternum VIII, male.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 282) with broad, shallow median depression; depression with short, stout, spiniform setae on basal two-thirds, apical third glabrous; micropores absent; posterior margin broadly and moderately deeply emarginate; inner surface without median carina. Sternum VIII (fig. 283) with deep, narrow median incision extending for about three-fourths length of segment; surface adjacent to incision beveled; basal carina entire, not divided medially, and broadly curved; base without median groove. Sternite IX (fig. 281) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 279, 280) with long, moderately broad, apically tapered parameres; parameres with two long apical setae. Median lobe, in dorsal view, more or less parallel sided. Median lobe, in lateral view, with apical fourth bent dorsally. Ventral surface of median lobe with broad depression on apical third; dorsal surface rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with large circular pump spot; pump spot without median sclerite. Ostium on ventral surface at apex of depression of apical third.

Female unknown.

HABITAT AND DISTRIBUTION: The species is known only from the southeastern Brazilian province of São Paulo (fig. 51).

ETYMOLOGY: From the Spanish *zarzus* for bramble, referring to the large patch of spine-like setae on sternite VII of the male.

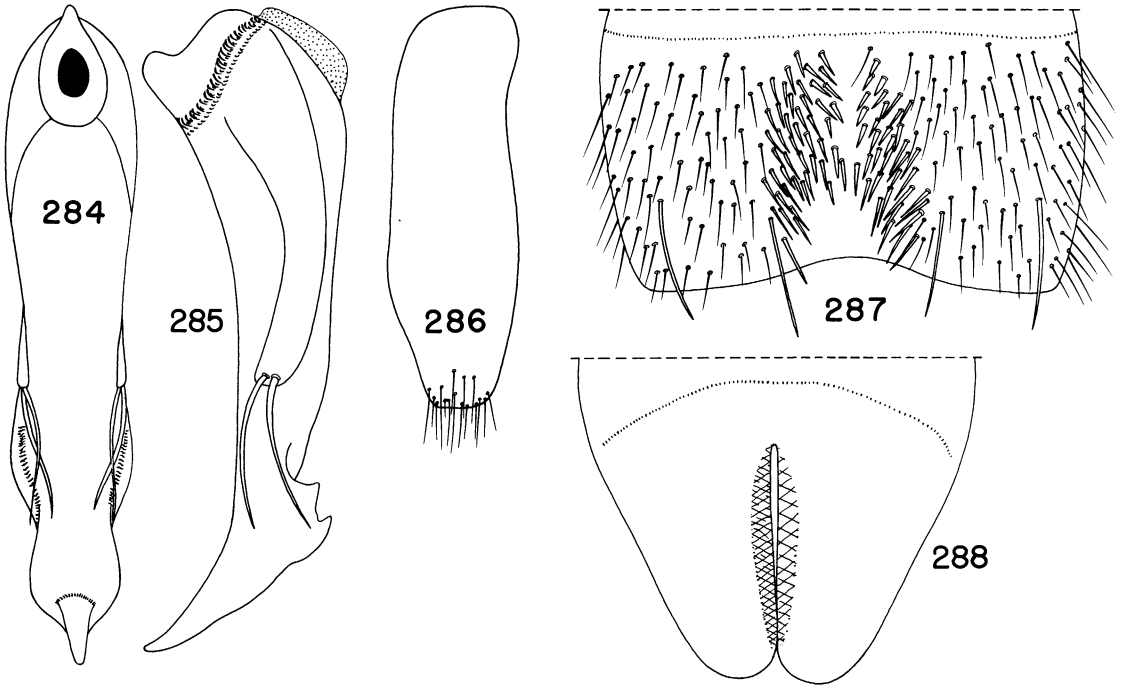
MATERIAL EXAMINED: Holotype and one paratype.

30. **Gnathymenus radulus**, new species
Figures 6, 51, 284–288

HOLOTYPE: Male. Brazil: [São Paulo]: São Paulo, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: Males of this species are separable from those of all others by the long bicolored elytra, the dense punctation on the



FIGS. 284–288. *Gnathymenus radulus*. 284. Aedeagus, dorsal view. 285. Aedeagus, right lateral view. 286. Sternite IX, male. 287. Sternite VII, male. 288. Sternum VIII, male.

pronotum, the form of the apical portion of the aedeagus (fig. 285), and the long parameres appressed to the median lobe. The broadly emarginate posterior margin of sternite VII and the median patch of spiniform setae are also helpful (fig. 287).

DESCRIPTION: Length 5 mm.

Color dark reddish brown and pale reddish brown. Head and pronotum dark reddish brown; elytra bicolored, basal half dark reddish brown and with area adjacent to suture dark reddish brown to apex, apical half pale reddish brown; abdomen dark reddish brown; legs and antennae pale reddish brown.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with dense, coarse, scattered punctation on all but median strip of anterior half; surface polished, without ground sculpturing. Eye length (OL) about two-thirds of postocular length (PO) of head. Neck width six-tenths width of head. Submentum with midlongitudinal carina but with low, rounded, median tubercle. Labrum with U-shaped median emargination; anterior margin with one small denticle adjacent to median emargination, with one medium denticle one-third from median emargination and one large denticle one-third from lateral margin. (Mandible not studied.) Antennomeres 4 and 11 unmodified.

Pronotum moderately convex, widest anterior to transverse midline; surface with scattered, dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end

of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments IV to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 287) with broad, shallow median depression; depression with narrow midlongitudinal and broad apical glabrous regions and with numerous short, stout, spiniform setae laterally; micropores absent; posterior margin broadly and shallowly emarginate; inner surface without median carina. Sternum VIII (fig. 288) with deep, narrow median incision extending for nearly two-thirds the length of segment; surface adjacent to incision beveled; basal carina entire, not divided medially, and broadly curved; base without median groove. Sternite IX (fig. 286) asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 284, 285) with long, broad parameres; parameres with two long setae. Median lobe, in dorsal view, slightly constricted near middle. Median lobe, in lateral view, broadly curved with apical fifth posterodorsally directed; lateral margin of ventral surface with two clawlike, subapical processes (fig. 285); dorsal surface rounded, ventral surface with depression between clawlike processes. Collar of basal foramen entirely sclerotized. Base of median lobe with large circular pump spot; pump spot without median sclerite. Ostium on ventral surface, subapical, and between clawlike processes of ventrolateral margin.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the southeastern Brazilian province of São Paulo (fig. 51).

ETYMOLOGY: From the Latin *radula* for scraper and referring to the configuration of the apical portion of the aedeagus in lateral view.

MATERIAL EXAMINED: Holotype.

31. **Gnathymenus geocus**, new species
Figures 6, 51, 289–304

HOLOTYPE: Male. Ecuador: Cotopaxi: NW Slope Mount Cotopaxi, 3500 m., July 26–August 5, 1969, collected by P. and B. Wygodzinsky, deposited in the American Museum of Natural History.

PARATYPES: None.

DIAGNOSIS: The short elytra and deep V-shaped incision of the posterior margin of sternite VII (fig. 303) permits separation of the males of this species from all others except *nacodus, brerus,* and *kestrus*. Males of *geocus* can be separated from those of *nacodus* by the broad, shallow impression on sternite VII anterior to the incision of the margin, by the aedeagal characters in the Key, and by the presence of three short carinae on the apical half of the ventral surface (figs. 291, 296). See the Key and diagnoses of *kestrus* and *brerus* for separation.

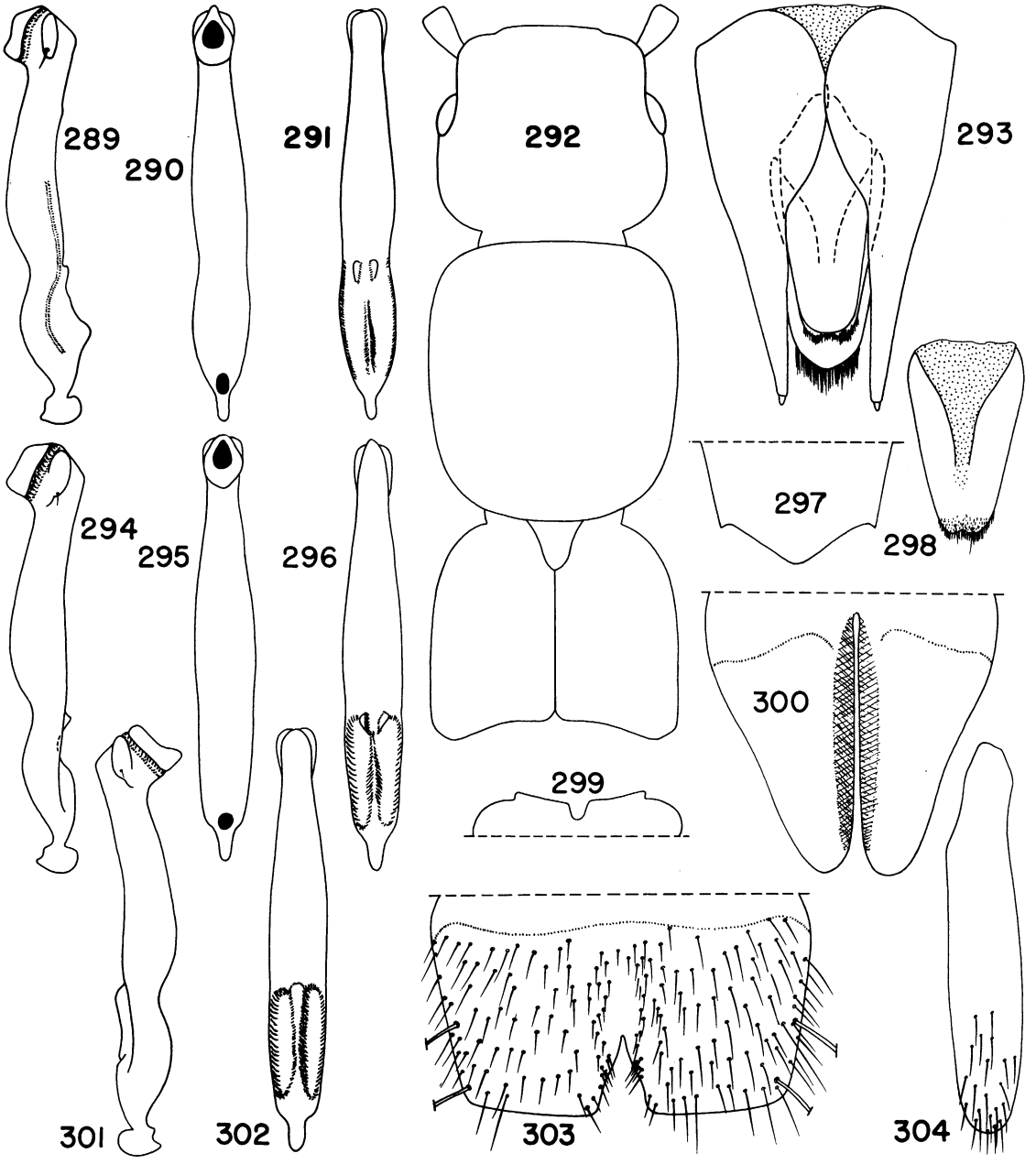
Females are distinguished by the characters in the Key but are indistinguishable from those of *nacodus*.

DESCRIPTION: Length 5.0 mm.

Color reddish and reddish brown to black. Head reddish; pronotum reddish brown with reddish and dark reddish brown infusions; elytra and abdomen dark reddish brown to black with apical segments (VIII to X) pale reddish brown; legs and antennae yellowish brown.

Head length (HL, figs. 38, 292) less than width (HW). Dorsum of head with coarse, scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) nearly one-half of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum (fig. 299) with U-shaped, median emargination; anterior margin with broad truncate lobe extending from median emargination to halfway to lateral margin. Mandible tridentate with large median and minute base denticles. Antennomeres 4 and 11 unmodified.

Pronotum (fig. 292) strongly convex, widest at or just anterior to transverse midline; surface with curved irregular row of punctures on disk and scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme with anterior portion of lateral margin fused to prohypomeron and posterior portion narrowly separated. Pro-



FIGS. 289–304. *Gnathymenus geocus*. 289. Aedeagus, right lateral view. 290. Aedeagus, dorsal view. 291. Aedeagus, ventral view. 292. Head and thorax. 293. Segment IX, female, ventral view. 294. Aedeagus, right lateral view. 295. Aedeagus, dorsal view. 296. Aedeagus, ventral view. 297. Tergum VIII, apex. 298. Apical genital appendage, female, ventral view. 299. Labrum, setae removed. 300. Sternum VIII, male. 301. Aedeagus, left lateral view. 302. Aedeagus, ventral view. 303. Sternite VII, male. 304. Sternite IX, male.

femur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 292) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII (fig. 297) with broadly rounded lobe on posterior margin.

Male. Sternites IV to VI each with small, shallow, median depression. Sternite VII (fig. 303) with broad (broader than marginal incision at widest), shallow median depression; depression with scattered setae; micropores absent; posterior margin of sternite with deep V-shaped emargination; emargination with acute basal angle; emargination bordered on each side by ridge; margin of emargination sinuous; inner surface without median carina. Sternum VIII (fig. 300) with deep, narrow median incision extending for about eight-tenths length of segment; surface adjacent to incision beveled; basal carina separated medially by incision of posterior margin; base without median groove. Sternite IX (fig. 304) slightly asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 289–291, 294–296, 301, 302) with minute parameres; parameres with one seta near apex. Median lobe, in dorsal view, straight, symmetrical, with sinuous lateral margins, constricted at about apical third, and with apical portion strongly constricted then parallel sided to apex; median lobe, in lateral view, more or less straight, dorsal edge constricted at about apical third; apical portion, in lateral view, hatchet-shaped (figs. 289, 294); dorsal surface smooth, without groove; ventral surface broadly impressed from about middle to apex (figs. 294, 301), impression occasionally inflated (fig. 289); ventral surface (figs. 291, 296) with short carina at base of impression on each side of midlongitudinal line at about one-third from apex, and with short midlongitudinal carina at about one-fifth from apex. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium near apex on dorsal surface and without surrounding cone or stalk.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 293) with two genital appendages; basal genital appendage with rounded posterior margin; apical genital appendage (fig. 298) midlongitudinally incised from base, with a few setae among numerous cuticular processes near apex, and with apical margin slightly emarginate.

Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species is known from the north central Ecuadorian province of Cotopaxi (fig. 51). Specimens were collected from a paramo at 11,000 ft. (3350 m.) in the moss and shrub litter and at 11,480 ft. (3500 m.) from debris near a small stream.

VARIATION: The apical half of the ventral surface of the aedeagus is "inflated" (fig. 289) or impressed (figs. 294, 301) although I have seen only one specimen with the inflated condition (the holotype). All other aedeagal features are the same whether the aedeagus is inflated or impressed. One specimen from 11,000 ft. elevation of Volcan Cotopaxi has one median carina (fig. 302) on the ventral surface and lacks the usual two additional shorter carinae (figs. 291, 296). Both of these differences I interpret to be individual variation and regard the specimens to be conspecific.

ETYMOLOGY: From the Anglo-Saxon *geoc* for yoke.

MATERIAL EXAMINED: Eight males, four females. ECUADOR: *Cotopaxi:* NW slope Mount Cotopaxi, 3500 m. (holotype male, 1 female, AMNH); Volcan Cotopaxi, NNE Latacunga, 11,000 ft., June 23, 1975, paramo moss-shrub litter, S. and J. Peck (5 males, 2 females, CNC; 2 males, 1 female, AMNH).

32. **Gnathymenus kestrus**, new species

Figures 6, 51, 305–307

HOLOTYPE: Male. Ecuador: [Pichincha]: Quito, 1930, collected by R. Benoist, depos-

ited in the Field Museum of Natural History, Chicago.

PARATYPES: One male with same label data (AMNH).

DIAGNOSIS: This species is similar to *geocus, brerus,* and *nacodus*. Males of each of the three species have a V-shaped median emargination of the posterior margin of sternum VII. *Gnathymenus kestrus* can be distinguished from both by the rounded base of the emargination of sternite VII (fig. 306), but aedeagal characters are more reliable. The ostium (fig. 305) is on the dorsal surface in *kestrus,* thereby separating it from *nacodus*. The ventral aedeagal surface is smooth, and the apex of the median lobe (fig. 307) is hooked in *kestrus,* whereas in *geocus* the ventral surface has a median carina and the apex is hatchet shaped. See the diagnosis of *brerus* for separation.

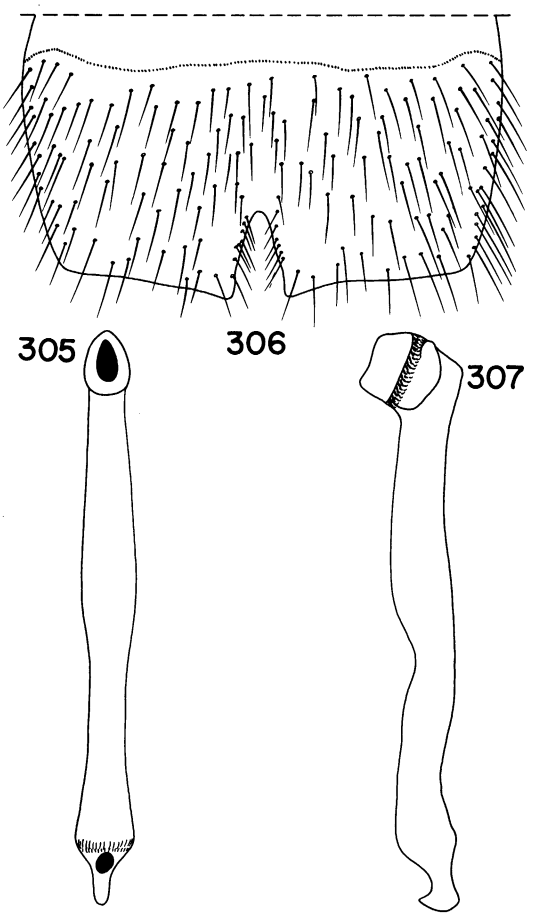
DESCRIPTION: Length 4.1 mm.

Color reddish and reddish brown to black. Head reddish; pronotum reddish with reddish brown infusions; elytra reddish brown with black infusions; abdomen dark reddish brown to black with apical segments (VIII to X) pale reddish brown; legs and antennae yellowish brown.

Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with coarse, scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) about one-half of postocular length (PO) of head. Neck with 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped, median emargination; anterior margin with broad truncate lobe extending from median emargination to halfway to lateral margin. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest at or just anterior to transverse midline; surface with scattered punctures on lateral side of disk; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal ridge not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.



FIGS. 305–307. *Gnathymenus kestrus*. 305. Aedeagus, dorsal view. 306. Sternite VII, male. 307. Aedeagus, right lateral view.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with broadly rounded lobe on posterior margin.

Male. Sternites IV to VI each with small, shallow, median depression. Sternite VII (fig. 306) with broad, shallow median depression; depression with scattered setae; micropores absent; posterior margin of sternite with U-shaped emargination; emargination

with rounded basal angle; emargination not bordered by ridge; margin of emargination sinuous; inner surface without median carina. Sternum VIII with deep, narrow median incision extending for about eight-tenths the length of segment; surface adjacent to incision beveled; basal carina separated medially by incision of posterior margin; base without median groove. Sternite IX slightly asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 305, 307) without seta on minute parameres. Median lobe, in dorsal view, straight, symmetrical, constricted distad of middle then gradually expanded to near apex then strongly constricted adjacent to ostium then gradually tapered to apex; median lobe, in lateral view, with dorsal edge constricted at about middle; apical portion beyond ostium, in lateral view, hooked; dorsal surface smooth and rounded; ventral surface nearly flattened, without carinae. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on dorsal surface near apex.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the north central Ecuadorian province of Pichincha (fig. 51).

ETYMOLOGY: From the Greek *kestra* for a kind of hammer with one end pointed, referring to the shape of the apical portion of the aedeagus in lateral view.

MATERIAL EXAMINED: Holotype and paratype.

33. **Gnathymenus nacodus**, new species
Figures 6, 51, 308–323

HOLOTYPE: Male. Ecuador: [Pichincha]: 15 km. E Tandapi, 2300 m., June 7, 1976, moss litter, collected by S. Peck, deposited in the Canadian National Collection, Ottawa, Ontario.

PARATYPES: Thirteen males, with same data as holotype (9 males, CNC; 4 males, AMNH).

DIAGNOSIS: The deep V-shaped emargination of the posterior margin of sternite VII (fig. 318) permits separation of the males of this species from all others except *G. kestrus, G. geocus,* and *G. brerus*. Males of *nacodus* can be separated from those of *geocus* by the narrow, shallow impression on sternite VII anterior to the incision of the margin, by the aedeagal characters in the Key, and by the smooth ventral surface of the aedeagus. See diagnoses for *kestrus* and *brerus*.

Females are distinguished by the characters in the Key but are indistinguishable from *geocus*.

DESCRIPTION: Length 3.5 to 5.5 mm.

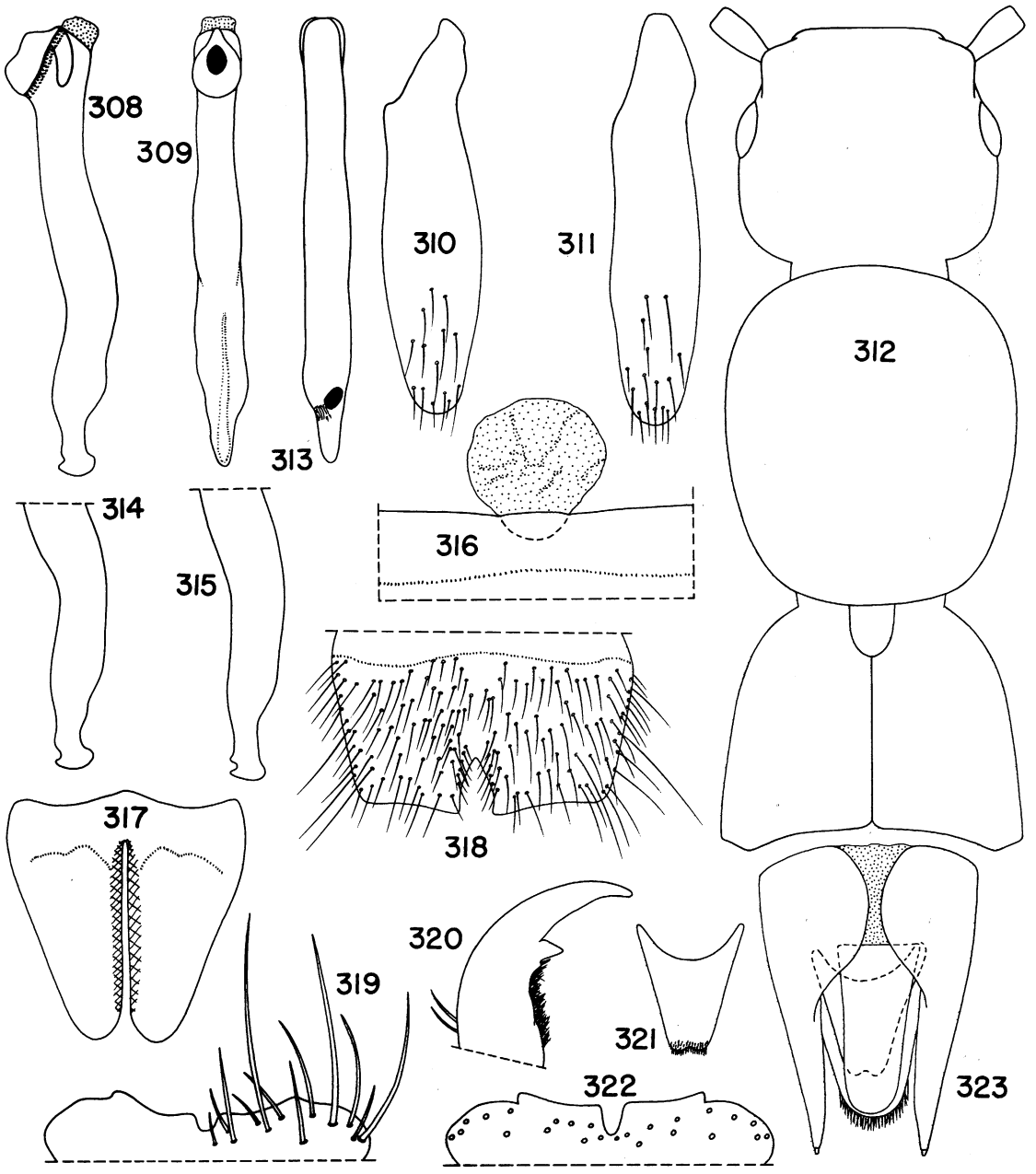
Color reddish and reddish brown to black. Head reddish; pronotum reddish brown with reddish and dark reddish brown infusions; elytra and abdomen dark reddish brown to black, segments VIII to X of abdomen pale reddish brown; legs and antennae pale reddish brown.

Head length (HL, figs. 38, 312) less than width (HW). Dorsum of head with coarse scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing. Eye length (OL) is slightly less than one-half postocular length (PO). Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum (figs. 319, 322) with U-shaped, median emargination; anterior margin with denticle halfway between median emargination and lateral margin. Mandibles tridentate, median denticle large, basal denticle minute (fig. 320).

Antennomeres 4 and 11 unmodified.

Pronotum (fig. 312) strongly convex, widest at or just anterior to transverse midline; surface with curved irregular row of punctures on disk and scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme with anterior portion of lateral margin fused to prohypomeron and posterior portion narrowly separated. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 312) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesoster-



FIGS. 308–323. *Gnathymenus nacodus*. 308. Aedeagus, right lateral view. 309. Aedeagus, dorsal view. 310. Sternite IX, male. 311. Sternite IX, male. 312. Head and thorax. 313. Aedeagus, ventral view. 314. Aedeagus, right lateral view, apical half. 315. Aedeagus, right lateral view, apical half. 316. Sternite IV, anterior margin, median portion. 317. Sternum VIII, male. 318. Sternite VII, male. 319. Labrum, setae removed from left side. 320. Left mandible. 321. Apical genital appendage, female, ventral view. 322. Labrum, setae removed. 323. Segment IX, female, ventral view.

nal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with broadly rounded lobe on posterior margin.

Male. Sternites IV to VI each with shallow, glabrous, median depression. Sternite VII (fig. 318) with narrow, (narrower than marginal incision at widest), shallow, glabrous, median depression; micropores absent; posterior margin of sternite with moderately deep, V-shaped emargination; emargination bordered on each side by ridge; inner surface of sternite without median carina. Sternum VIII (fig. 317) with deep, narrow median incision extending for about eight-tenths the length of segment; surface adjacent to incision beveled; basal carina separated medially by marginal incision; base without median groove. Sternite IX (figs. 310, 311) asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 308, 309, 313–315) with minute parameres; parameres without setae. Median lobe, in dorsal view, straight and slightly asymmetrical, lateral margin sinuous and strongly constricted at about apical seventh then gradually convergent to rounded apex; median lobe, in lateral view, slightly bent just beyond middle; apical portion, in lateral view, hatchet shaped (figs. 308, 314, 315); dorsal surface smooth, without groove; ventral surface smooth and without carinae. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium near apex on lateroventral (fig. 313) surface and without surrounding cone or stalk.

Female. Sternites IV to VIII unmodified. Tergum IX (paraprocts) fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 323) with two genital appendages; basal genital appendage with rounded posterior margin; apical genital appendage (fig. 321) midlongitudinally incised from base, with a few setae among numerous cuticular processes near apex, and with apical margin slightly emarginate.

Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species is known from the north central Ecuadorian province of Pichincha (fig. 51) where it was collected at 9300 ft. (2830 m.) from bamboo and moss litter, at 7540 ft. (2300 m.) where it was found in moss litter, and at 9840 ft. (3000 m.) elevation.

VARIATION: Slight individual variation exists in the form of the hatchet-shaped apical portion of the median lobe (figs. 308, 314, 315).

ETYMOLOGY: From the Anglo-Saxon *nacod* for naked, referring to the smooth, polished aedeagal surface.

MATERIAL EXAMINED: Twenty-three males, 27 females. ECUADOR: *Pichincha:* 10 km. W Aloag, 3000 m., March 17, 1976, J. M. Campbell (2 males, 3 females, CNC); 15 km. E Tandapi, 2300 m. (type series 10 males, 12 females, CNC; 4 males, 3 females, AMNH); 35 km. E Tandapi, 9300 ft., June 24, 1975, bamboo and moss shrub litter, S. and J. Peck (6 males, 8 females, CNC; 1 male, 1 female, AMNH).

34. **Gnathymenus brerus**, new species

Figures 6, 51, 324–329

HOLOTYPE: Male. Colombia: [Cundinamarca]: El Palacio paramo about 40 km. ONO [ENE] Bogota, 3200 to 3550 m., January 4, 1968, collected by H. Sturn, deposited in the Naturhistorisches Museum, Vienna.

PARATYPES: Two males, with same data as holotype (NHMV, AMNH).

DIAGNOSIS: The deep U-shaped emargination of the posterior margin of sternite VII (fig. 329) permits separation of the males of this species from all others except *geocus, kestrus,* and *nacodus*. The four slender processes on the apical fourth of the aedeagus (figs. 325–327) separates *brerus* from the three aforementioned species.

DESCRIPTION: Length about 4.2 mm.

Color reddish and reddish brown to black.

Head reddish; pronotum reddish brown; elytra and abdomen dark reddish brown to black. Legs and antennae pale reddish brown.

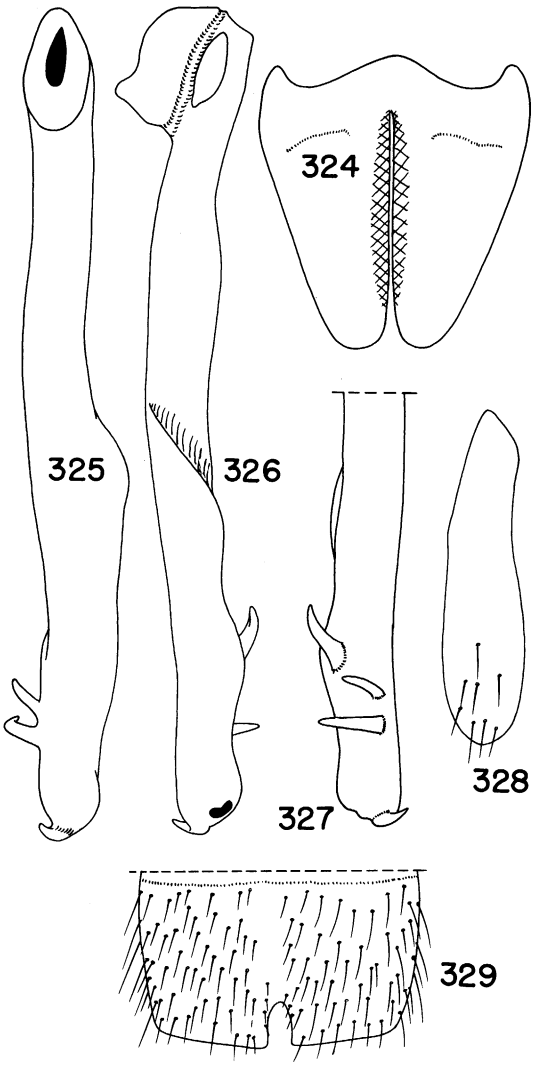
Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with coarse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) slightly less than one-half of postocular length (PO). Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination and with two denticles on each side of emargination. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest at about transverse midline; surface with scattered punctation on all but midlongitudinal strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not studied.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded lobe on posterior margin.

Male. Sternites IV and V unmodified. Sternite VI with broad, median, glabrous spot bordered by dense patch of setae. Sternite VII (fig. 329) without median depression, but narrow median strip without setae; micropores absent; posterior margin of sternite with moderately deep, U-shaped emargination; emargination not bordered by ridge; inner surface of sternite without median carina. Sternum VIII (fig. 324) with deep, narrow, median incision extending for about eight-tenths length of segment; surface adjacent to incision beveled; basal carina separated medially by marginal incision; base without median groove. Sternite IX (fig. 328) asymmetrical and with scattered setae on apical portion.



FIGS. 324–329. *Gnathymenus brerus*. 324. Sternum VIII, male. 325. Aedeagus, dorsal view. 326. Aedeagus, right lateral view. 327. Aedeagus, ventral view, apical half. 328. Sternite IX, male. 329. Sternite VII, male.

Aedeagus (figs. 325–327) with small parameres without setae. Median lobe, in dorsal view, straight and asymmetrical, left lateral

margin sinuous to hooked apex, right lateral margin concave just basad of middle then sinuous to apical hook. Apical quarter of median lobe with four hooks; apical hook curved dorsolaterally to left; next two hooks arising from left lateral margin and curved ventrally; basal hook arising from left lateroventral edge and curved ventrally in posteromedial direction. Median lobe, in lateral view, slightly, curved ventrally; right side with oblique depression and carina at about middle; dorsal and ventral surfaces smooth and rounded, without carinae on grooves. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on right side of apex (fig. 326) and not surrounded by cone or stalk.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known from the Colombian province of Cundinamarca (fig. 51) where it was collected at 3200 to 3550 m. (10,449 to 11,657 ft.) elevation.

ETYMOLOGY: From the Anglo-Saxon *brer* for thorns, referring to the four slender, pointed processes on the aedeagus.

MATERIAL EXAMINED: Holotype and two paratypes.

35. **Gnathymenus falcatus**, new species
Figures 6, 52, 330–338

HOLOTYPE: Male. Panama: Panama: Cerro Campana, 3200 ft. elevation, February 14–23, 1976, cloud forest leaf litter, collected by A. Newton, deposited in the Museum of Comparative Zoology, Harvard University, Cambridge.

PARATYPES: Three males, with same data as holotype (2 males, MCZ; 1 male, AMNH).

DIAGNOSIS: The male can be distinguished by characters of the seventh sternite (fig. 332) and aedeagus (figs. 333, 334). The females are separated by the triangular apical genital sclerite (fig. 330). The species has long bicolored elytra.

DESCRIPTION: Length 2.3 to 2.5 mm.

Color pale and dark reddish brown. Head and pronotum reddish brown. Elytra bicolored, reddish brown basally and dark reddish brown apically. Abdomen bicolored, segments pale reddish brown but for dark reddish brown seventh segment.

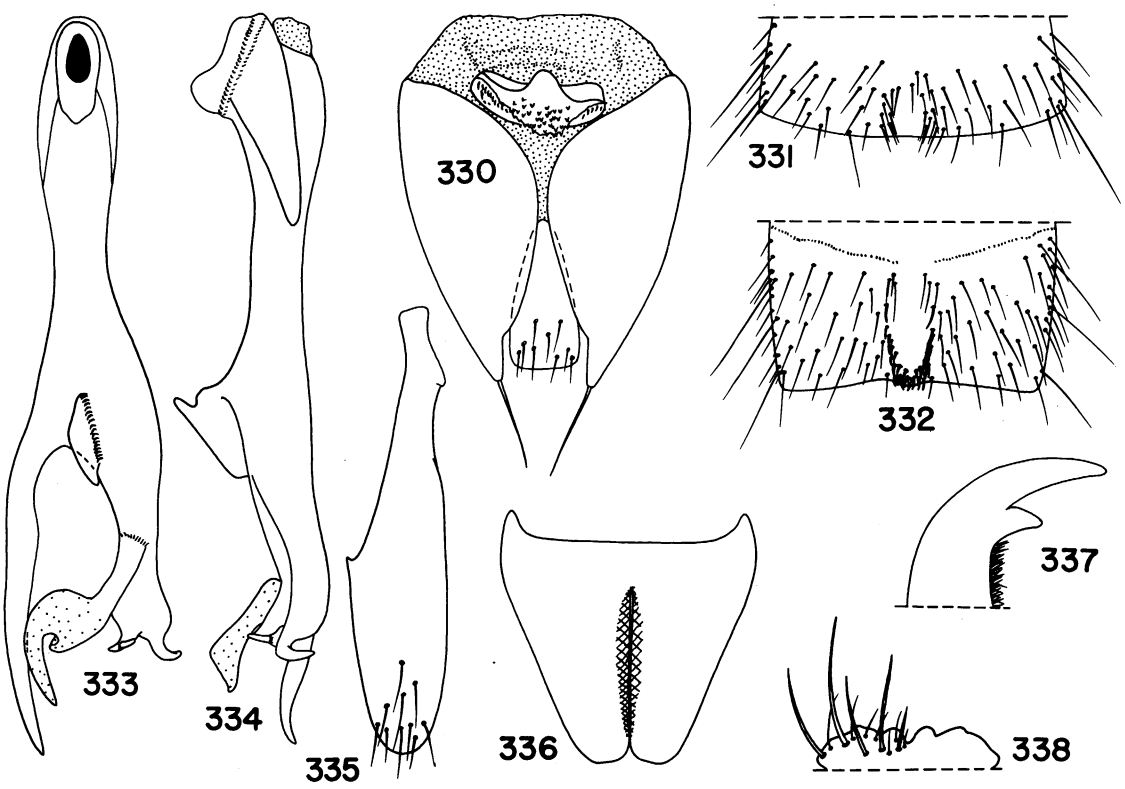
Head length (HL, fig. 37) less than width (HW). Dorsum of head with sparse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about seven-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 338) with U-shaped median emargination; anterior margin with moderately large denticle adjacent to median emargination and small denticle between median denticle and lateral margin. Mandibles (fig. 337) bidentate, basal denticle large. Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface with row of punctures on disk and sparse, scattered punctation on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and convergent toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings present. Metathorax well developed, extending well beyond apical end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV and V unmodified. Sternite VI (fig. 331) with glabrous median spot near apical margin surrounded laterally and basally by long setae. Sternite VII (fig. 332) with long ovoid, slightly impressed, glabrous median spot surrounded posteriorly and laterally by short, stout setae; sternite without micropores; inner surface without midlongitudinal carina; posterior margin



FIGS. 330–338. *Gnathymenus falcatus*. 330. Segment IX, female, ventral view. 331. Sternite VI, male. 332. Sternite VII, male. 333. Aedeagus, dorsal view. 334. Aedeagus, right lateral view. 335. Sternite IX, male. 336. Sternum VIII, male. 337. Left mandible. 338. Labrum, setae removed from right side.

broadly emarginate and with small, apically rounded lobe at middle. Sternite VIII (fig. 336) with deep, narrow, median incision extending for about eight-tenths length of segment; surface beveled adjacent to incision; basal carina absent; base without median groove. Sternite IX (fig. 335) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 333, 334) with moderately long, moderately broad, parameres; parameres without setae. Median lobe, in dorsal view, slightly constricted at about basal third then expanded apically; apical third bifurcate; left process long, slender, and tapered apically; right process with medially direct, hooked, lightly sclerotized process arising from near middle; apical portion of right process trifurcate, right side of apical region with process hooked lateroventrally, left side of apical region with one dorsally directed process and one medioventrally hooked process; dorsal surface of median lobe with laminiform process near middle, laminiform process with emarginate, posterior margin. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on ventral surface of lightly sclerotized, hooked, medially directed process.

Female. Sternites IV to VIII unmodified. Tergum IX dorsally fused and ventrally divided midlongitudinally. Segment IX (fig. 330) with two genital appendages; basal appendage transverse with broad median

impression and with basal tumosity covered with spicules; distal appendages trianguloid with scattered apical setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian province of Panama (fig. 52) where it was collected at 3200 ft. elevation (975 m.) from leaf litter in a cloud forest.

ETYMOLOGY: From the Latin *falcatus* for sickle-shaped, referring to the shape of one of the aedeagal processes.

MATERIAL EXAMINED: Holotype, three paratypes, and five females with same data as holotype (holotype, 2 paratypes, 3 females, MCZ; 1 paratype, 2 females, AMNH).

35. **Gnathymenus virgosus**, new species

Figures 6, 52, 339–344

HOLOTYPE: Male. Costa Rica: Puntarenas: Osa Peninsula, 5 km. W Rincon de Osa, 8° 42′ N, 83° 31′ W, 50 m. elevation March 24–30, 1973, wet primary forest floor litter, collected by J. Wagner and J. Kethley, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: One male with same data as holotype (AMNH).

DIAGNOSIS: Males of this species can be separated from those of all others by the aedeagus (figs. 339–341), the most prominent features of which are the three long posteriorly directed processes. The aedeagus of *virgosus* is similar to that of *falcatus* but differs in details (compare figs. 333–335 and figs. 339–341).

DESCRIPTION: Length approximately 2.1 mm.

Color pale to dark reddish brown. Head and pronotum reddish brown. Elytra bicolored, reddish brown basally and dark reddish brown apically. Abdomen bicolored pale reddish brown with dark reddish brown seventh segment.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with sparse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about three-fourths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. (Mandibles and labrum not studied.) Antennomeres 4 and 11 unmodified.

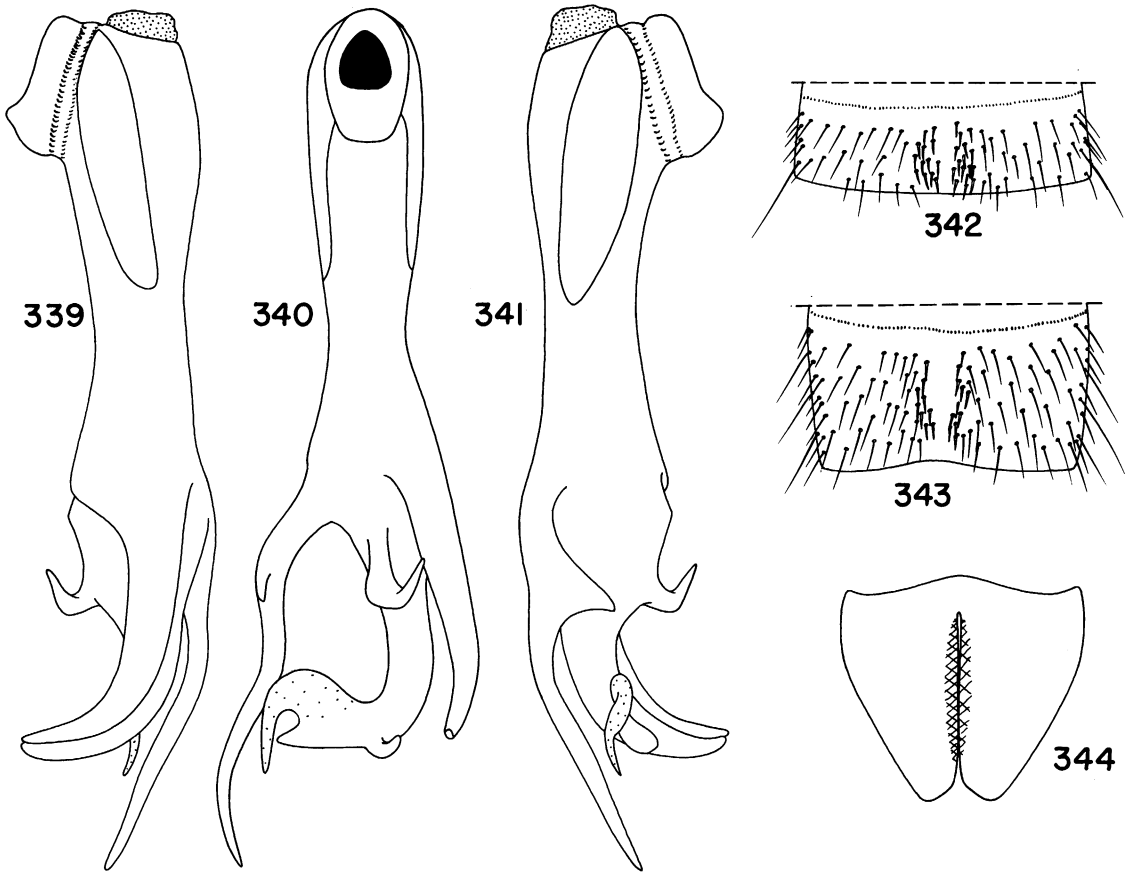
Pronotum moderately strongly convex; widest anterior to transverse midline; surface with scattered punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV and V unmodified. Sternite VI (fig. 342) with narrow glabrous spot near apical margin surrounded anteriorly and laterally by dense patch of short, thick setae. Sternite VII (fig. 343) with ovoid, median glabrous spot surrounded laterally by short, thick setae; sternite without micropores; inner surface without midlongitudinal carina; posterior margin broadly emarginate. Sternite VIII (fig. 344) with deep, narrow, median incision extending for about eight-tenths length of segment; surface beveled adjacent to incision; basal carina absent; base without median groove. Sternite IX strongly asymmetrical; apical portion with a few scattered setae.

Aedeagus (figs. 339–341) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, slightly constricted just basad of middle then expanded apically; expanded apical portion divided into three major processes; right process long, slender, and strongly curved dorsally; left process long, slender, sinuous, slightly curved dorsally, and with dorsally directed triangular lobe near base;



FIGS. 339–344. *Gnathymenus virgosus*. 339. Aedeagus, right lateral view. 340. Aedeagus, dorsal view. 341. Aedeagus, left lateral view. 342. Sternite VI, male. 343. Sternite VII, male. 344. Sternite VIII, male.

middle process with large, dorsolaterally curved process arising from near base; median process curved to left, with bifid apex, right apical process slender and curved dorsally, left apical process broad, curved dorsally, and with thinly sclerotized, hooked lobe. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on ventral surface of lightly sclerotized hooked lobe of median process.

Female unknown.

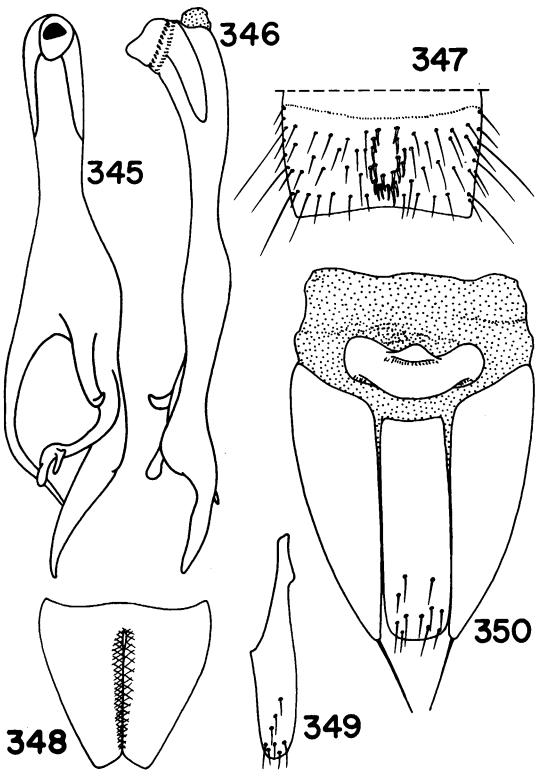
HABITAT AND DISTRIBUTION: This species is known from the Costa Rican province of Puntarenas (fig. 52) where it was collected from wet leaf litter.

ETYMOLOGY: From the Latin *virgosus* for full of twigs or bushy, referring to the multifurcate aedeagus.

MATERIAL EXAMINED: Holotype and one paratype.

37. **Gnathymenus ramosus**, new species
Figures 6, 52, 345–350

HOLOTYPE: Male. Panama: [Panama]: Cerro Campana, 2900 ft. elevation, July 29,



FIGS. 345–350. *Gnathymenus ramosus*. 345. Aedeagus, dorsal view. 346. Aedeagus, right lateral view. 347. Sternite VII, male. 348. Sternum VIII, male. 349. Sternite IX, male. 350. Segment IX, female, ventral view.

1970, collected by J. M. Campbell, deposited in Canadian National Collection, Ottawa.

PARATYPES: One male, Panama: Panama: Cerro Campana, Aug. 9, 1969 from *Ganoderma* sp. collected by J. F. Lawrence (MCZ).

DIAGNOSIS: Males of this species can be recognized by the long, bicolored elytra, the patch of short, stout setae on sternite VII (fig. 347), and the four variously modified processes of the apical half of the aedeagus (fig. 345). The female is distinguished as indicated in the Key.

DESCRIPTION: Length 2.1 mm.

Color reddish brown. Head and pronotum pale reddish brown. Elytra bicolored, basal three-fifths pale reddish brown, apical two-fifths dark reddish brown. Abdomen pale reddish brown but with bicolored seventh segment, seventh segment dark reddish brown basally and pale reddish brown apically. Legs and antennae yellowish brown.

Head length (HL, fig. 37) slightly less than width (HW). Dorsum of head with sparse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about seven-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of discal punctures and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). (Mesosternum and metasternum not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to V unmodified. Sternite VI with small, oval, median, flattened spot bordered laterally by long, moderately stout setae. Sternite VII (fig. 347) with oval patch of short, stout setae surrounding median flattened oval spot and without median depression or micropores; posterior margin broadly and weakly emarginate; inner surface without midlongitudinal carina. Sternum VIII (fig. 348) with deep, narrow, median incision extending for about three-fourths the length of segment; basal carina absent. Sternite IX (fig. 349) asymmetrical and apical portion with scattered setae.

Aedeagus with short, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, with apical two-thirds

expanded and divided into four various modified processes; left process attenuate apically and curved medially; right process broad in lateral view, compressed, apically tapered and medially curved; median process apically attenuate and dorsally curved; right median process slender, with lobed apex and curved medially. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium at apex of apically lobed apical process.

Female. Sternites IV to VIII unmodified. Tergum IX dorsally fused and ventrally divided midlongitudinally. Segment IX (fig. 350) with two genital appendages; basal appendage transverse and with one transverse depression anteriorly and another posteriorly; apical appendage rectanguloid with rounded apical margin, with scattered subapical setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian province of Panama (fig. 52) where a specimen was collected at 2900 ft. (884 m.) elevation. Two specimens were taken from fungi, one from *Polyporus licnoides* and another from *Ganoderma* sp.

ETYMOLOGY: From the Latin *ramosus* for branchy, referring to multifurcate aedeagus.

MATERIAL EXAMINED: Two males, one female. PANAMA: *Panama:* Cerro Campana July 29, 1970 (holotype, CNC), August 29, 1969, from *Polyporus licnoides,* J. F. Lawrence (1 female, MCZ), from *Ganoderma* sp., J. F. Lawrence (1 male, paratype, MCZ).

38. **Gnathymenus raius**, new species
Figures 6, 52, 351–357

HOLOTYPE: Male. Panama: Chiriqui: El Mirador, Finca Collins near Boquete, 6000 ft. elevation, June 25, 1976, cloud forest leaf litter, collected by A. Newton, deposited in the Museum of Comparative Zoology, Harvard University, Cambridge.

PARATYPES: One male with same data as holotype (AMNH).

DIAGNOSIS: The aedeagus (figs. 353–355) will distinguish the males of this species from others. The female can be identified as indicated by the Key.

DESCRIPTION: Length 3.1 to 3.4 mm.

Color pale reddish brown.

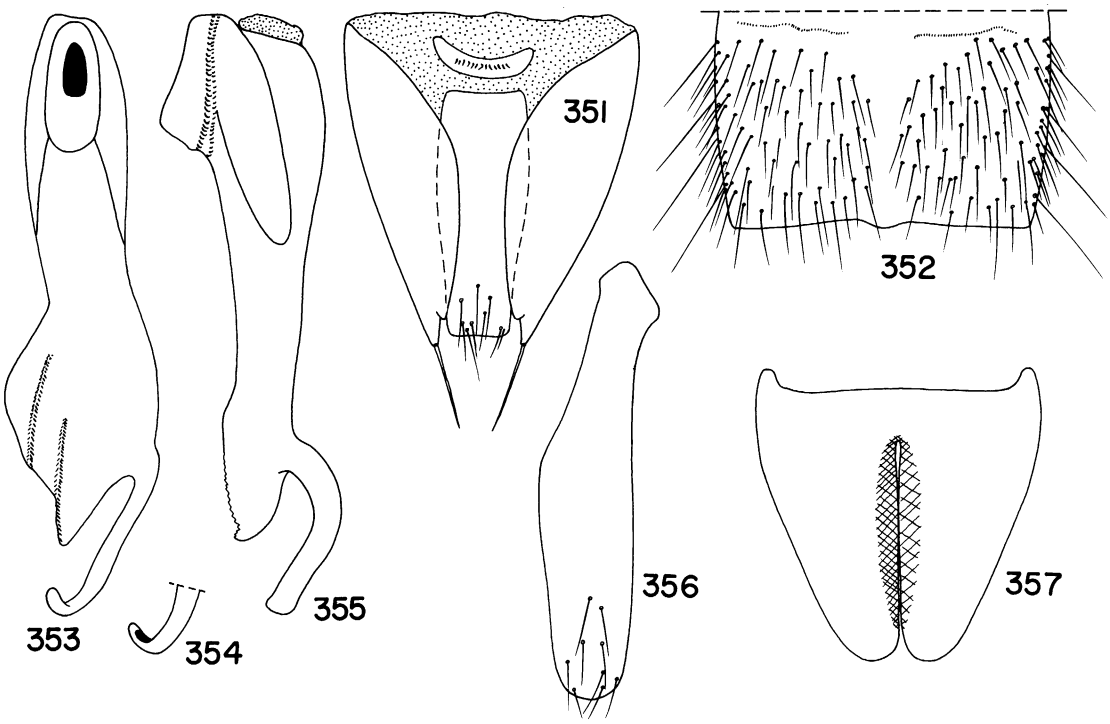
Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about four-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with two denticles on each side of emargination. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum moderately convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 352) with narrow, median glabrous stripe, and without spiniform setae, micropores, or median depression; inner surface without midlongitudinal carina; posterior margin with small, median, apically rounded lobe. Sternite VIII (fig. 357) with deep, narrow median incision extending for about eight-tenths the length of segment; surface beveled adjacent to incision; basal ca-



FIGS. 351–357. *Gnathymenus raius*. 351. Segment IX, female, ventral view. 352. Sternite VII, male. 353. Aedeagus, dorsal view. 354. Aedeagus, apex of process, ventral view. 355. Aedeagus, right lateral view. 356. Sternite IX, male, 357. Sternum VIII, male.

rina absent; base without median groove. Sternite IX (fig. 356) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 353–355) with moderately broad, moderately long parameres; parameres without setae. Median lobe, in dorsal view, constricted near middle; left side of apical half strongly curved to broadly pointed apex: right side strongly curved and with long, subapical, anteriorly directed process, process at apex ventromedially curved; dorsal surface with two low carinae on apical half. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium at apex of process arising on right side of median lobe (fig. 354).

Female. Sternites IV to VIII unmodified. Tergum IX dorsally fused and ventrally divided midlongitudinally. Segment IX (fig. 351) with two genital appendages; apical appendage rectanguloid with scattered apical setae; basal appendage narrow with transverse depression.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian province of Chiriqui (fig. 52) where it was collected from leaf litter in a cloud forest at 6000 ft. elevation (1829 m.).

ETYMOLOGY: From the Latin *raia,* referring to the ray-shaped apical region of the aedeagus.

MATERIAL EXAMINED: Holotype, one paratype, one female with same data as holotype (holotype, 1 female, MCZ; paratype male, AMNH).

39. *Gnathymenus progenitor* (Bierig), new combination
Figures 6, 52, 362

Litozoon progenitor Bierig, 1938, p. 177; 1943, pp. 161, 162. (Type locality: Costa Rica: [Heredia]: Vara Blanca. Holotype, female, in the Field Museum of Natural History, Chicago, examined.)

DIAGNOSIS: This species, known only from the female holotype, can be distinguished as indicated by the Key.

DESCRIPTION: Length approximately 2.5 mm.

Color reddish brown with base of seventh abdominal segment darker reddish brown.

Head length (HL, fig. 37) slightly greater than width. Dorsum of head with sparse, scattered punctation on all but median strip; surface polished; without ground sculpturing. Eye length (OL) about three-fourths of postocular length of head (PO). Neck width about 0.6 width of head. Submentum without midlongitudinal carina. (Labrum not studied.) Mandibles tridentate, basal denticle minute, median denticle large. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of discal punctures and with scattered punctation on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). (Mesosternum and mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded lobe on posterior margin.

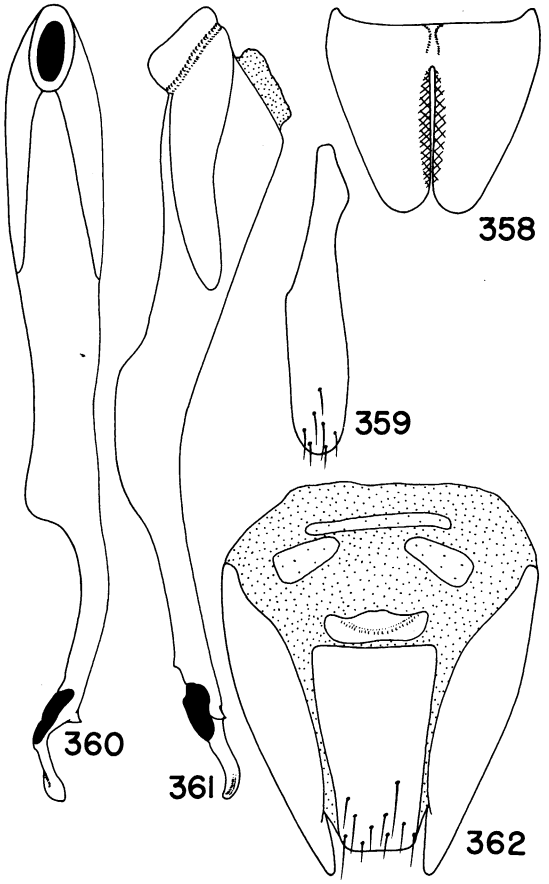
Male unknown.

Female. Sternites III to VIII unmodified. Tergum IX fused dorsally and midlongitudinally divided ventrally. Segment IX (fig. 362) with two genital appendages; basal appendage divided into four sclerites, basal three sclerites thinly sclerotized, apical sclerite strongly sclerotized and with transverse depression; apical appendage trapezoidal and with scattered setae on apical portion.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Costa Rican province of Heredia (fig. 52).

DISCUSSION: The female holotype has not



FIGS. 358–361. *Gnathymenus nutatus*. 358. Sternum VIII, male. 359. Sternite IX, male. 360. Aedeagus, dorsal view. 361. Aedeagus, right lateral view.

FIG. 362. *Gnathymenus progenitor*. Segment IX, female, ventral view.

yet been associated with the male and the species must be considered to be poorly known.

MATERIAL EXAMINED: Holotype.

40. **Gnathymenus nutatus**, new species
Figures 6, 52, 358–361

HOLOTYPE: Male. Costa Rica: Puntarenas: Organization of Tropical Studies Station, 5 km. SW Finca Las Cruces, La Fila, 4700 ft. elevation, March 21, 1973, from mixed floor litter, palm fibers, and log mold, collected by J. Wagner and J. Kethley, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: Characters of the aedeagus (figs. 360, 361), particularly the downward curve of the aedeagus, the smooth dorsal surface, and the configuration of the apex, and the long, concolorous elytra, and basal groove of sternum VIII (fig. 358) will permit the separation of the males of this species from all others.

DESCRIPTION: Length approximately 2.6 mm.

Color reddish brown; elytra unicolored.

Head length (HL, fig. 37) greater than width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about three-fourths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without median carina. Labrum with two denticles on each side of median emargination. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and convergent toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Mesosternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII without median depression, spiniform setae, or micropores, with narrow, median, glabrous region; inner surface with midlongitudinal carina on apical fourth, carina visible externally through sternite as dark line; posterior margin obsoletely sinuate at middle. Sternite VIII (fig. 358) with deep, narrow median incision extending for about three-fourths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short midlongitudinal groove. Sternite IX (fig. 359) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 360, 361) with moderately long, broad parameres; parameres without setae. Median lobe, in dorsal view, with basal two-thirds approximately straight and apical third twisted to left and sinuous; apical portion bent to right; left lateral side strongly constricted at apical third; dorsal surface with low, obsolete, rounded ridge at about middle; median lobe bent ventrally; apical portion flattened and with subapical triangular process on right side. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium subapical on dorsal surface.

Female unknown.

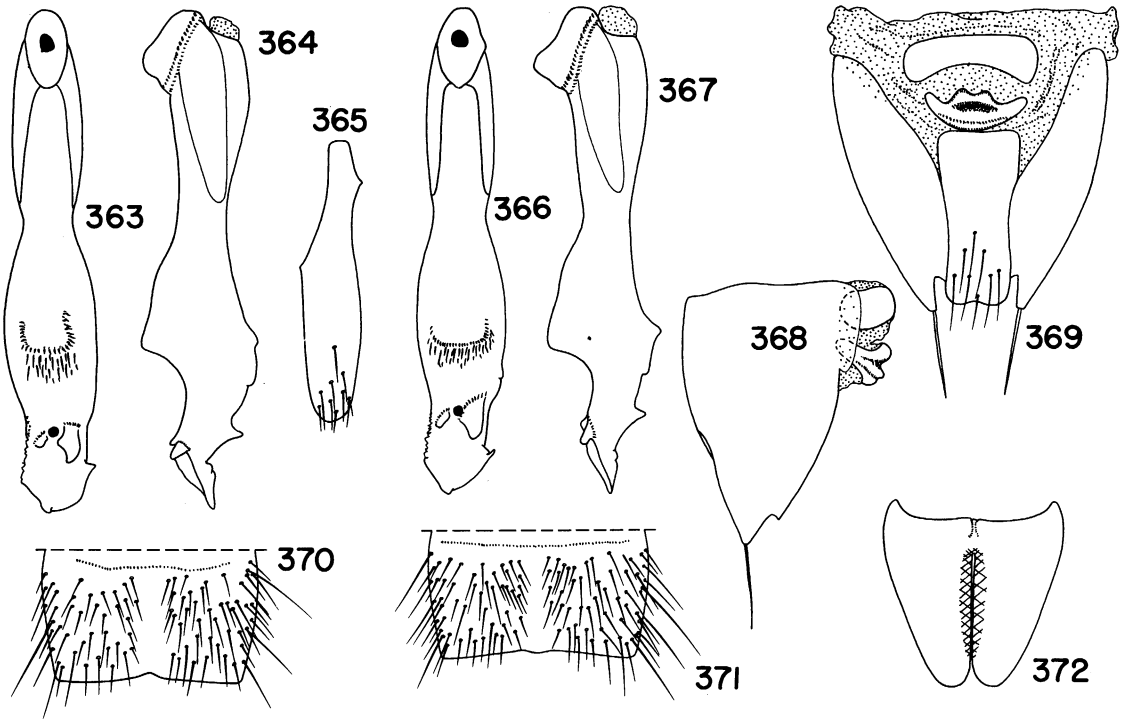
HABITAT AND DISTRIBUTION: This species is known from the Costa Rican province of Puntarenas (fig. 52) where it was collected at 4700 ft. (1432 m.) elevation from mixed forest floor litter, palm fibers, and log mold.

ETYMOLOGY: From the Latin *nutatus* for droop, referring to the ventrally bent aedeagus.

MATERIAL EXAMINED: Holotype.

41. *Gnathymenus maritimus* (Bierig), new combination
Figures 6, 52, 363–372

Litozoon maritimus Bierig, 1943, p. 162. (Type locality: Costa Rica: [Limon]: Boca del [Rio]



FIGS. 363–372. *Gnathymenus maritimus*. 363. Aedeagus, dorsal view. 364. Aedeagus, right lateral view. 365. Sternite IX, male. 366. Aedeagus, dorsal view, holotype. 367. Aedeagus, right lateral view, holotype. 368. Segment IX, female, lateral view. 369. Segment IX, female, ventral view. 370. Sternite VII, male. 371. Sternite VII, male, holotype. 372. Sternum VIII, male.

Parismina. Holotype, female, in the Field Museum of Natural History, Chicago, examined.)

DIAGNOSIS: The males of this species are recognized by the long, bicolored elytra, and by the configuration and details of the aedeagus (figs. 363, 364). The females are distinguished as indicated by the Key.

DESCRIPTION: Length 2.7 mm.

Color reddish brown. Head and pronotum pale reddish brown. Elytra bicolored, with narrow basal strip pale reddish brown then with broad, dark reddish brown strip then with broad, pale reddish brown strip across apical portion. Abdomen pale reddish brown with slightly darker seventh segment. Legs and antennae yellowish brown.

Head length (HL, fig. 37) and width (HW) approximately equal. Dorsum of head with sparse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about eight-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum with U-shaped, median emargination; anterior margin with denticle adjacent to median emargination and another between median denticle and lateral margin. (Mandible not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with irregular, curved row of discal punctures and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from pro-

hypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed and extending well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV and V unmodified. Sternite VI with broad, shallow, seta-covered median depression. Sternite VII with broad, shallow, median depression; depression with setae on all but median strip; surface without micropores or spiniform setae; inner surface with midlongitudinal carina on apical portion, carina visible externally through sternite as dark line; posterior margin with shallow median emargination (fig. 370) or minute, median, apically rounded lobe (fig. 371). Sternite VIII (fig. 372) with deep, narrow median incision extending for about seven-tenths the length of segment; surface beveled adjacent to impression; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 365) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 363, 364, 366, 367) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, constricted just before middle; dorsal surface abruptly angulate and depressed at about apical third; depressed apical third with moderately large dorsoposteriorly directed process on right and smaller, dorsoposteriorly directed process on left; lateral margins of apical third microserrate on left, with posterolaterally directed process on right, and with small process at apex; ventral surface broadly and shallowly scooped out at about apical third. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on dorsal surface of depressed apical third at about apical sixth.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally; ventrally divided midlongitudinally. Segment IX (figs. 368, 369) with two genital appendages; basal appendage divided into two sclerites, anterior sclerite broad with entire margins, posterior sclerite with anterior margin strongly sinuate and posterior margin broadly curved; apical appendage rectanguloid with scattered setae on apical portion.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known from the Costa Rican (fig. 52) provinces of Limon, where it was collected by "sifting moist dead leaves" (translated from Bierig, 1943) and from the nest of a bird, and Guanacaste, where it was taken from log mold.

VARIATION: One of the two males from Guanacaste has a shallow but distinct median emargination of the posterior margin of sternite VII (fig. 370) rather than a small, median lobe (fig. 371). These males are otherwise indistinguishable. All the species thus far discussed have been differentiated at least by aedeagal characters, although not always by external features; the two forms of *maritimus* have nearly identical aedeagi (compare figs. 363, 364 and 366, 367). The second male from Guanacaste collected at the same time as the first has a small median lobe. I regard the specimen with an emarginate seventh sternite to represent individual, not geographical, variation.

DISCUSSION: This original description of this species was based on a unique female. Most females of the Dolicaonina are difficult to identify and difficult to associate with conspecific males. Bierig identified a male from Hamburg Farm as *maritimus* and designated it as a metatype. Externally the two specimens are similar in color, form, and integumental sculpturing. The two males from Guanacaste are conspecific with the metatype from Hamburg Farm.

MATERIAL EXAMINED: Five males, one female. COSTA RICA: *Limon:* Boca de [Rio] Parismina, June 19, 1938, A. Bierig (holotype, FMNH); Hamburg Farm, Reventazón, Limon Plain, from nest of bird, F. Nevermann (1 male, FMNH). *Guanacaste:*

Canas, Miravalles Volcano, (10° 42′ N, 85° 7′ W), April 8, 1973, from log mold on slope, J. Wagner and J. Kethley (2 males, FMNH; 2 males, AMNH).

42. *Gnathymenus intermedius* (Bierig), new combination

Figures 6, 52, 373–382

Litozoon intermedius Bierig, 1943, p. 161. (Type locality: Costa Rica: [Cartago]: Tapanti, from a shrub of thick (dense) foliage. Holotype, male, in the Field Museum of Natural History, Chicago, examined.)

Litozoon macropterus Bierig, 1943, p. 161. (Type locality: Costa Rica [Cartago]: Santa Cruz de Turrialba, from foliage in a moist grove of trees. Holotype, female, in the Field Museum of Natural History, Chicago, examined.) NEW SYNONYM.

DIAGNOSIS: The broad, glabrous median regions on sternites VI (fig. 375) and VII (fig. 380), the inverted V-shaped median patch of setae on sternite V (figs. 373, 374), and the bifurcate aedeagus (figs. 377, 378) distinguishes the males of this species from all others. The females are separated as indicated by the Key.

DESCRIPTION: Length 3.5 mm.

Color reddish brown. Head and pronotum pale reddish brown. Elytra bicolored, pale reddish brown with darker reddish brown spot near middle. Abdomen pale reddish brown, with dark reddish brown seventh segment. Legs and antennae pale reddish brown.

Head length (HL, fig. 37) and width (HW) approximately equal. Dorsum of head with scattered, sparse punctation on all but broad median strip; surface polished, without ground sculpturing. Eye length (OL) about three-fourths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with irregular, curved row of discal punctures and scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

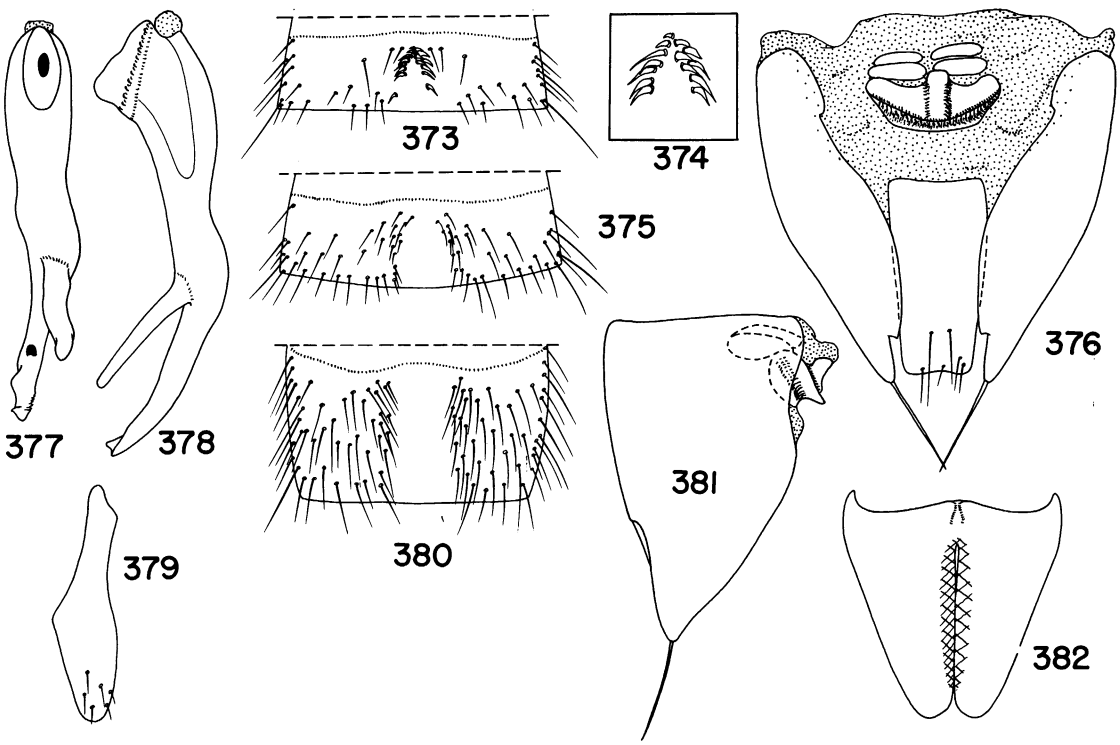
Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternite IV unmodified. Sternite V (figs. 373, 374) with median, inverted, V-shaped patch of short, stout spiniform setae. Sternite VI (fig. 375) with broad, shallow, median depression; depression margined laterally by setae. Sternite VII (fig. 380) with broad, shallow median depression margined laterally by setae; sternite without micropores or spiniform setae; inner surface with midlongitudinal carina on apical third, carina visible externally through sternite as dark line; posterior margin truncate. Sternite VIII (fig. 382) with deep, narrow, median incision extending for about eight-tenths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 379) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 377, 378) with moderately long, broad parameres; parameres without setae. Median lobe bifurcate from just beyond middle with long, stout, dorsoposteriorly directed, apically rounded process on right; apical third of median lobe strongly curved dorsally, apex obliquely truncate and with microridges on right of apical portion. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium subapical and on dorsal surface of curved, apical third of median lobe.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (figs. 376,



FIGS. 373–382. *Gnathymenus intermedius*. 373. Sternite V, male. 374. Sternite V, male, median portion enlarged. 375. Sternite VI, male. 376. Segment IX, female, ventral view. 377. Aedeagus, dorsal view. 378. Aedeagus, right lateral view. 379. Sternite IX, male. 380. Sternite VII, male. 381. Segment IX, female, lateral view. 382. Sternum VIII, male.

381) with two genital appendages; basal appendage divided into five sclerites, largest pentagonoid with deep transverse impression, smaller sclerites ovoid; apical appendage rectangular and with scattered subapical setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Costa Rican province of Cartago (fig. 52) where it was collected from "foliage in a moist grove of trees" and "a shrub of thick foliage" (habitat data translated from Bierig, 1943) where they were collected at 1100 m. (3608 ft.) and 1000 m. (3280 ft.).

SYNONYMS: The holotype of *intermedius* is a male and that of *macropterus* is a female. It is normally difficult to associate the males and females, except by collecting data (same locality, date, collector, habitat), in the Dolicaonina. However, both types have long elytra with a small, median dark spot, and both have similar integumental sculpturing, and although they are not from the same locality they were collected only 27 km. (by air) apart. Further, in the Bierig collection a male, determined as *macropterus* by Bierig and designated as a metatype, is conspecific with the male of *intermedius*. I conclude, therefore, that *macropterus* and *intermedius* are synonyms.

MATERIAL EXAMINED: Two males, one female. COSTA RICA: *Cartago:* Cervantes, May 19, 1940 (1 male, FMNH); Santa Cruz de Turrialba, 1100 m. elevation, May 28, 1939, A. Bierig (1 female, holotype of *Litozoon macropterus,* FMNH); Tapanti, 1100 m. elevation, July 22, 1939, A. Bierig (1

male, holotype of *Litozoon intermedius*, FMNH).

43. **Gnathymenus buganus**, new species
Figures 6, 52, 383–387

HOLOTYPE: Male. Costa Rica: Puntarenas: Osa Peninsula, 5 km. W Rincon de Osa (8° 42′ N, 83 ° 31′ W), 50 m. elevation, March 24–30, 1973, from old epiphytic humus, sticks, and leaves near floor, collected by J. Wagner and J. Kethley, deposited in Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: The long, bicolored elytra, and twisted aedeagus (figs. 383, 384) with two dorsal cariniform processes help to identify this species.

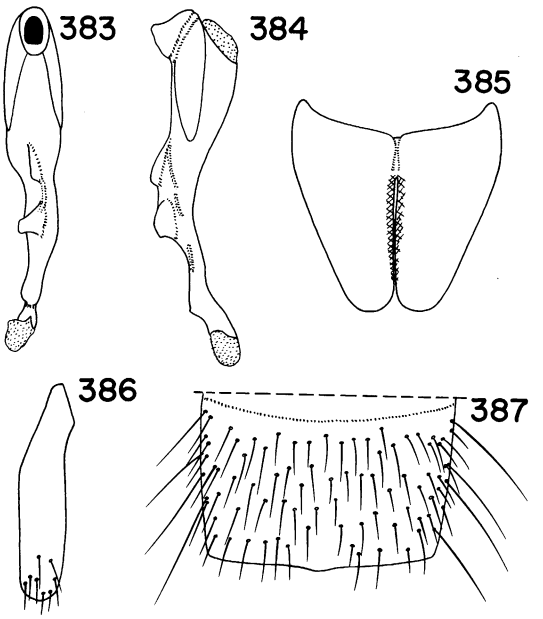
DESCRIPTION: Length 2.1 mm.

Color reddish brown. Head, pronotum, and abdomen reddish brown. Elytra bicolored, with basal two-thirds dark reddish brown and apical third pale reddish brown. Legs and antennae yellowish brown.

Head length (HL, fig. 37) slightly less than width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about two-thirds of postocular length (PO) of head. Neck width six-tenths width of head. Submentum without median carina. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and convergent toward base. Mesothoracic spiracular peritreme fused anteriorly to furcasternum and narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Mesosternum without median tubercle near apical margin.



FIGS. 383–387. *Gnathymenus buganus*. 383. Aedeagus, dorsal view. 384. Aedeagus, right lateral view. 385. Sternum VIII, male. 386. Sternite IX, male. 387. Sternite VII, male.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 387) without median depression, spiniform setae, or micropores, with small, median, apical glabrous spot; inner surface with midlongitudinal carina on apical fifth, carina visible externally through sternite as dark line; posterior margin with minute median lobe. Sternite VIII (fig. 385) with deep, narrow median incision extending for about two-thirds length of segment; surface beveled adjacent to incision; basal carina absent; base with short midlongitudinal groove. Sternite IX (fig. 386) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 383, 384) with moderately long, broad parameres; parameres without setae. Median lobe, in dorsal view, sinuous and twisted slightly to left; dorsal surface with two cariniform processes near middle,

anterior process long and laterodorsally directed and posterior process short and dorsally directed; median lobe bent ventrally. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium at apex.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the Osa peninsula of Costa Rica (fig. 52) where it was collected from old epiphytic humus, sticks, and leaves near the forest floor.

ETYMOLOGY: From the Anglo-Saxon *bugan* for bend, referring to the bent, sinuous aedeagus.

MATERIAL EXAMINED: Holotype.

44. **Gnathymenus somphus**, new species
Figures 6, 52, 388–396

HOLOTYPE: Male. Costa Rica: [Alajuela]: Zarcero, June 1943, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: Two males with same locality as holotype but collected on September 15, 1943 (FMNH, AMNH).

DIAGNOSIS: The males of this species can be separated from those of all other species by the shape and details of the aedeagus (figs. 393, 394). The females can be identified as indicated in the Key.

DESCRIPTION: Length 2.1 to 2.5 mm.

Color pale reddish brown often with darker infusions.

Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about three-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 395) with U-shaped median emargination; anterior margin with two denticles on each side of median emargination; denticles of similar size and shape. Mandibles (fig. 390) with three denticles; median denticle large, basal denticle minute. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

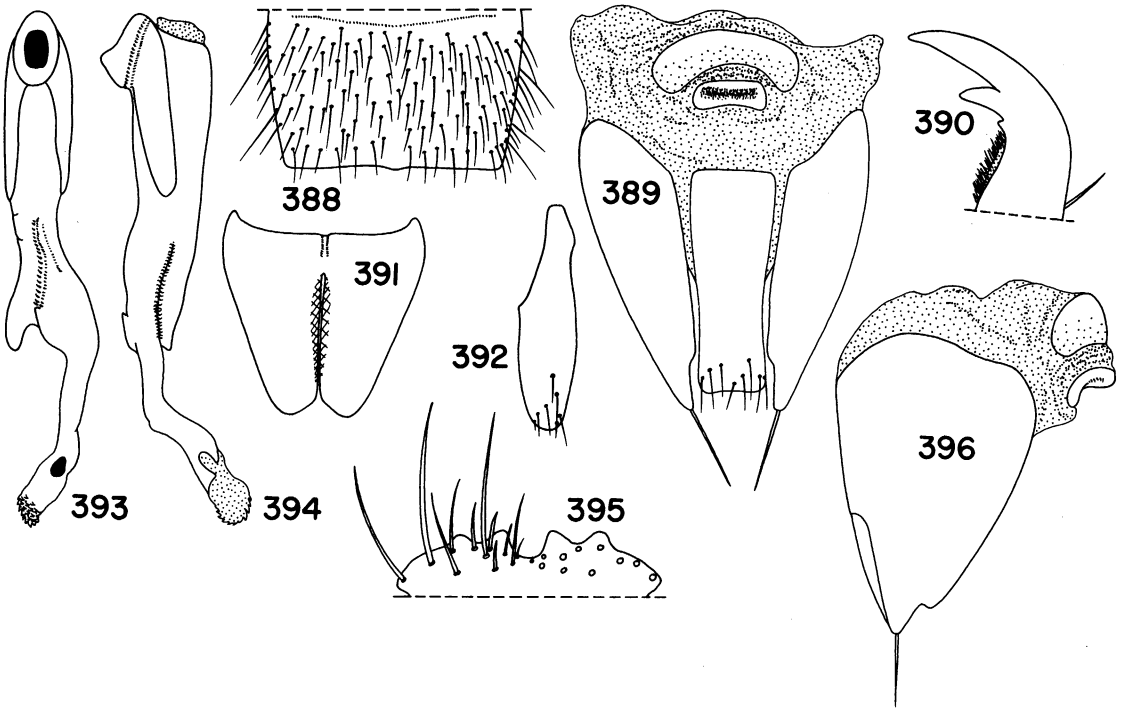
Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridges present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe of posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 388) with small median glabrous spot near apical margin and without median depression, spiniform setae, or micropores; inner surface with midlongitudinal carina on apical portion, carina visible externally through sclerite as dark line; posterior margin with minute median lobe or truncate. Sternite VIII (fig. 391) with deep, narrow median incision extending for about three-fourths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 392) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 393, 394) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, slightly constricted near middle and with apical half bent first to right then strongly curved toward middle; left side, just beyond middle of median lobe, with short, apically rounded, dorsoventrally flattened, posteriorly directed process; apical two-fifths of median lobe curved ventrally. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on dorsal surface and subapical.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided



FIGS. 388–396. *Gnathymenus somphus*. 388. Sternite VII, male. 389. Segment IX, female, ventral view. 390. Right mandible. 391. Sternum VIII, male. 392. Sternite IX, male. 393. Aedeagus, dorsal view. 394. Aedeagus, right lateral view. 395. Labrum, setae removed from right side. 396. Segment IX, female, lateral view.

midlongitudinally. Segment IX (figs. 389, 396) with two genital appendages; basal appendage divided into two sclerites, anteriormost sclerite broad, curved, and lightly sclerotized, posteriormost narrower, more strongly sclerotized and broadly depressed across middle; apical appendage rectangular and with scattered setae on apical portion.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Costa Rican provinces of Alajuela, Cartago, and San Jose (fig. 52).

ETYMOLOGY: From the Greek *somphos* for spongy.

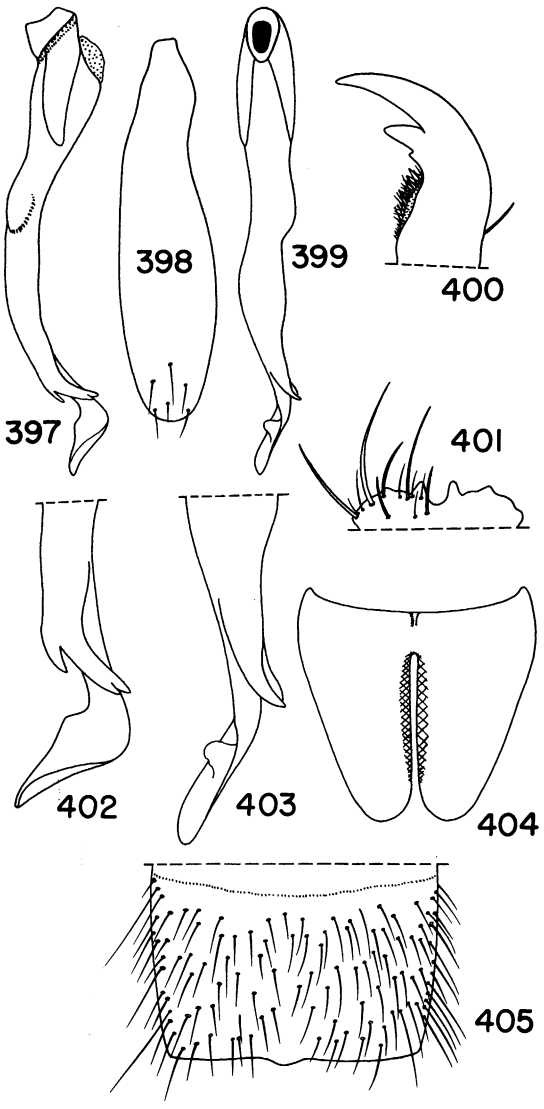
MATERIAL EXAMINED: Nine males, three females. COSTA RICA: *Alajuela:* Zarcero, June 1943 (holotype, 1 female, FMNH), September 15, 1943 (1 male, 1 female, FMNH; 1 male, AMNH); Pendiente sur de Poas [south slope of Poas], May 18, 1941 (1 male, FMNH). *Cartago:* Carpintera, June 16, 1940 (1 male, FMNH), June 18, 1939 (1 male, AMNH), September 5, 1939 (1 male, FMNH), January 21, 1940 (1 male, FMNH). *San Jose:* Tablazo, December 15, 1940 (1 male, FMNH).

45. **Gnathymenus pandus**, new species
Figures 6, 52, 397–405

HOLOTYPE: Male. Panama: Chiriqui: 2 km. W Cerro Punta, Baldwin Forest, 1760 m. elevation, June 5, 1977, collected by S. and J. Peck, deposited in the Canadian National Collection, Ottawa.

PARATYPES: Eight males with same data as holotype (6 males, CNC; 2 males, AMNH).

DIAGNOSIS: The configuration of the ae-



FIGS. 397–405. *Gnathymenus pandus*. 397. Aedeagus, right lateral view. 398. Sternite IX, male. 399. Aedeagus, dorsal view. 400. Right mandible. 401. Labrum, setae removed from right side. 402. Aedeagus, right lateral view, apical third, enlarged. 403. Aedeagus, dorsal view, apical third, enlarged. 404. Sternum VIII, male. 405. Sternite VII, male.

deagus (figs. 397, 399) will separate the males of this species from those of all other species. Females can be distinguished as indicated by the Key.

DESCRIPTION: Length 2.6 mm.

Color pale reddish brown with abdominal segment seven darker reddish brown.

Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 401) with U-shaped median emargination; anterior margin with long denticle adjacent to median emargination and with small, less distinct denticle between median denticle and lateral margin. Mandibles (fig. 400) tridentate, median denticle large, basal denticle minute. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and convergent toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL); elytra lightly fused along suture. Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with weak dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 405) with small, median, glabrous spot near apex, without median depression, spiniform setae, or micropores; inner surface with midlongitudinal carina on apical portion, carina visible externally through sternite as dark line; posterior margin with small, apically rounded, median lobe. Sternite VIII (fig. 404) with deep, narrow, median incision extending for about three-fourths the length of segment; surface

beveled adjacent to incision; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 398) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 397, 399, 402, 403) with moderately long, moderately broad parameres; parameres without setae. Median lobe in dorsal view slightly sinuous, and in lateral view strongly bent ventrally; dorsal surface with tumescence on laterodorsal side near middle; apical fifth with short, ventrolaterally directed process on right dorsal surface, process apically bifurcate or unmodified; apical portion of median lobe lightly sclerotized, and with elongate, irregular, spatulate apical portion. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium subapical on left lateral side of spatulate apical portion.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian province of Chiriqui (fig. 52) where it was collected at 1760 m. (5774 ft.) elevation.

ETYMOLOGY: From the Latin *pando* for stretch or extend, referring to the stretched out apical half of the aedeagus.

MATERIAL EXAMINED: Holotype, and eight paratypes (7 males, CNC; 2 males, AMNH).

46. **Gnathymenus hamulus**, new species
Figures 6, 52, 406–413

HOLOTYPE: Male. Mexico: Chiapas: 8 mi. N Pueblo Nuevo Solistahuacán, 6000 ft. elevation, August 26–27, 1973, cloud forest leaf litter, collected by A. Newton, deposited in the Museum of Comparative Zoology, Harvard University, Cambridge.

PARATYPES: One male with same data as holotype (AMNH).

DIAGNOSIS: The short elytra, large eyes and aedeagal characters will permit separation of the males from other species. The females can be separated as indicated by the Key.

DESCRIPTION: Length about 2.5 mm.

Color dark reddish brown and nearly black. Head reddish brown. Pronotum and elytra reddish brown to dark reddish brown. Abdomen dark reddish brown to nearly black. Legs and antennae reddish brown.

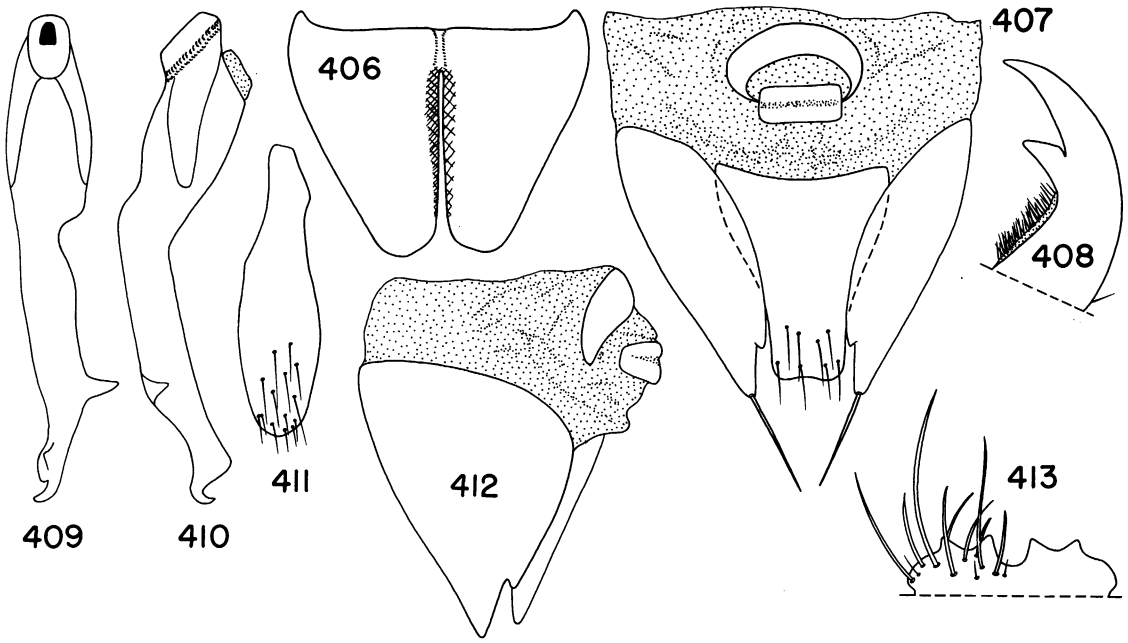
Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with sparse, scattered punctation on all but broad median strip; surface polished, without ground sculpturing. Eye length (OL) about six-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 413) with U-shaped median emargination; anterior margin with two acute denticles on each side of median emargination. Mandibles (fig. 408) bidentate; basal denticle large. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with row of punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings reduced to minute pads. Metathorax reduced, hardly extending beyond posterior end of mesocoxa. Metasternum without median tubercle.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII with small, median glabrous spot and without micropores, median depression, or spiniform setae; inner surface with midlongitudinal carina near apical margin, carina visible externally through sternite as dark line; posterior margin broadly and obsoletely emarginate. Sternite VIII (fig. 406) with deep, narrow, median incision extending for about eight-tenths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short, median groove.



FIGS. 406–413. *Gnathymenus hamulus*. 406. Sternum VIII, male. 407. Segment IX, female, ventral view. 408. Right mandible. 409. Aedeagus, dorsal view. 410. Aedeagus, right lateral view. 411. Sternite IX, male. 412. Segment IX, female, lateral view. 413. Labrum, setae removed from right side.

Sternite IX (fig. 411) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 409, 410) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, strongly compressed near middle and with apical portion bent toward left; right side with broad, apically acuminate, dorsoventrally flattened, laterally directed process near apical fifth; apical half bent ventrally; apex with hook curved ventrally and to left. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium at apex below apical hook.

Female. Sternites IV to VIII unmodified. Tergum IX dorsally fused and ventrally divided midlongitudinally. Segment IX (figs. 407, 412) with two genital appendages; basal appendage divided into two sclerites, anterior sclerite curved, broad, and lightly sclerotized, posterior sclerite narrower, more strongly sclerotized, and broadly depressed across middle; apical appendage trapezoidal and with scattered setae on apical portion.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Mexican state of Chiapas (fig. 52) where it was collected from leaf litter in a cloud forest at 6000 ft. elevation (1829 m.).

ETYMOLOGY: From the Latin *hamulus* for little hook, referring to the hooked apex of the aedeagus.

MATERIAL EXAMINED: Holotype, one paratype, and five females (holotype, 4 females, MCZ; 1 male, 1 female, AMNH).

47. **Gnathymenus catillus**, new species
Figures 6, 52, 414–421

HOLOTYPE: Male. Panama: Bocas del Toro: Almirante, dam on Nigua Creek, March 23, 1959, collected by H. S. Dybas, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: This species can be separated from the others by the characters given in the Key. The aedeagus is particularly diagnostic (figs. 415, 416). The female can be identified by characters given in the Key.

DESCRIPTION: Length 3 mm.

Color pale reddish brown and yellowish brown. Head, pronotum, and abdomen pale reddish brown. Elytra bicolored with transverse, yellowish brown basal and apical strips and pale reddish brown median strip. Legs and antenna yellowish brown.

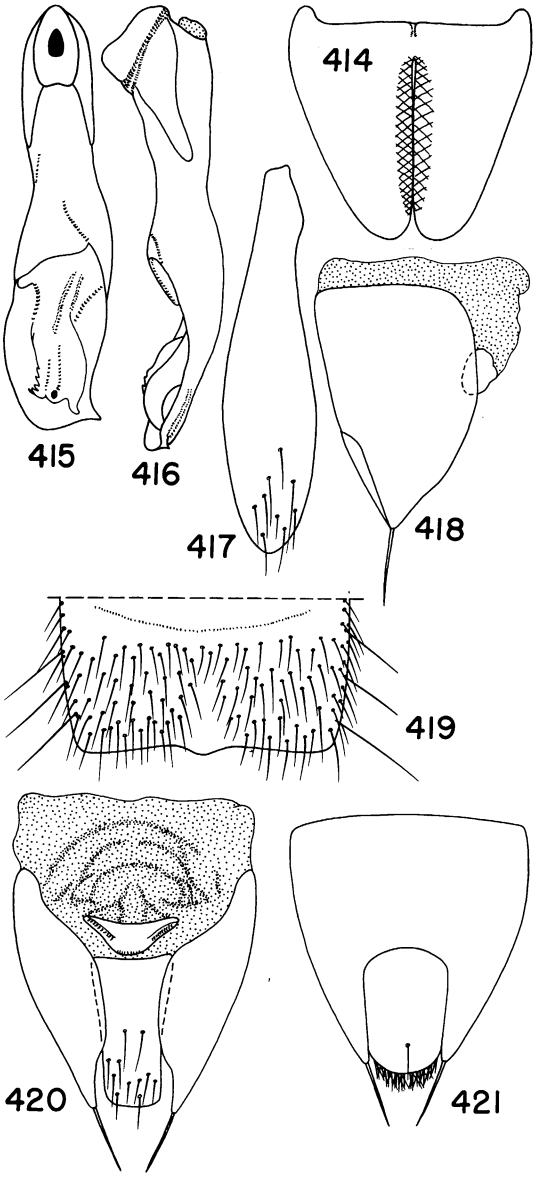
Head length (HL, fig. 37) and width (HW) approximately equal. Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about seven-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum with low, rounded midlongitudinal ridge. Labrum with U-shaped median emargination; anterior margin with two denticles, one each side of median emargination. Mandibles bidentate, with a large denticle near middle. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 419) with median apical portion glabrous, without median depression, spiniform setae, or micropores; inner surface with midlongitudinal carina near apical margin, carina visible externally through sternite as



FIGS. 414–421. *Gnathymenus catillus*. 414. Sternum VIII, male. 415. Aedeagus, dorsal view. 416. Aedeagus, right lateral view. 417. Sternite IX, male. 418. Segment IX, female, lateral view. 419. Sternite VII, male. 420. Segment IX, female, ventral view. 421. Segment IX, dorsal view.

dark line; posterior margin with small, rounded median lobe. Sternite VIII (fig. 414) with deep, narrow median incision extending for about eight-tenths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short midlongitudinal groove. Sternite IX (fig. 417) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 415, 416) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, expanded from about middle to broadly rounded apical margin; right latero-apical margin with laterally directed process; apical half (approximately) broadly "scooped-out" and with variously modified sclerite in middle. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on dorsal surface, median, and subapical.

Female. Sternites IV to VIII unmodified. Tergum IX (fig. 421) dorsally fused and ventrally divided midlongitudinally. Segment IX (figs. 418, 420) with two genital appendages; basal sclerite small and trianguloid; apical sclerite elongate and trapezoidal and with scattered setae apically.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from Panama (fig. 52) where the collecting label indicates it may have been taken from *Polyporus lignosus*.

ETYMOLOGY: From the Latin *catillus* for small bowl or dish, referring to the dishlike apical portion of the aedeagus.

MATERIAL EXAMINED: Holotype and two females with same data as holotype (FMNH).

48. **Gnathymenus clinus**, new species
Figures 6, 52, 422–427

HOLOTYPE: Male. Panama: Canal Zone: Barro Colorado Island, February 1976, from *Trametes scabrosa,* collected by A. Newton, deposited in the Museum of Comparative Zoology, Harvard University, Cambridge.

PARATYPES: None.

DIAGNOSIS: The bicolored elytra that are only slightly longer than the pronotum and characters of the aedeagus (figs. 422, 423) and seventh sternite (fig. 425) separates the males of this species from all others. The females are distinguished as indicated in the Key.

DESCRIPTION: Length about 2.7 mm.

Color pale reddish brown; elytra bicolored, reddish brown basally, pale reddish brown apically and with transverse, median, reddish brown stripe.

Head length (HL, fig. 37) and width (HW) approximately equal. Dorsum of head with scattered, sparse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about two-thirds of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with two denticles on each side of emargination. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum moderately convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) slightly longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segment III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III and IV unmodified. Sternites V and VI slightly more setose medially than on other areas. Sternite VII (fig. 425) with median patch of long, moderately stout setae, with small median glabrous spot near apical margin, and without median

depression, micropores, or spiniform setae; inner surface with median carina near apical margin, carina visible externally through sternite as dark line; posterior margin with small, median, apically rounded lobe. Sternite VIII (fig. 427) with deep, narrow median incision extending for about eight-tenths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short, median groove. Sternite IX (fig. 426) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 422, 423) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, with apical third expanded; dorsal surface of apical third depressed or spoonlike; left lateral margin of apical third broadly rounded, right lateral margin more shallowly rounded with small protuberance near base; apical margin with two protuberances, small one on left and larger one on right; apical third of dorsal surface with prominent, broad, flattened, dorsoposteriorly directed process; process with four variously modified lobes; first lobe, beginning on left side, laterally directed and tapering apically from broad base, second lobe curved lateroposteriorly and tapering from broad base and with apex bent ventrally, third lobe sinuous, slender and posteriorly directed, fourth lobe sinuous, apically truncate, posteriorly directed and ventrally curved. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on dorsal surface of dorsoposteriorly directed process and subapical.

Female. Sternites III to VIII unmodified. Tergum IX dorsally fused, ventrally divided midlongitudinally. Segment IX (fig. 424) with two genital appendages; basal appendage divided into two sclerites, anterior sclerite large and broad, posterior sclerite narrower and with broad depression across middle; apical appendage trapezoidal and with scattered setae on apical portion.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known from Barro Colorado Island in Panama where it was collected from *Trametes scabrosa* and from the Panamanian province of Panama where it was collected from *Daedalea elegans*.

ETYMOLOGY: From the Latin *clino* for slant or slope and referring to the dorsoposteriorly slanted process of the aedeagus.

MATERIAL EXAMINED: Four males, one female. PANAMA: *Canal Zone:* Barro Colorado Island (holotype, MCZ). *Panama:* Cerro Azul, 2000 ft. elevation, June 22, 1976, on *Daedalea elegans,* A. Newton (1 male, AMNH; 2 males, 1 female, MCZ).

49. **Gnathymenus sifrus**, new species

Figures 6, 52, 428–435

HOLOTYPE: Male. Panama: Canal Zone: Barro Colorado Island, November 1952 to March 1953, J. Zetek, deposited in the American Museum of Natural History.

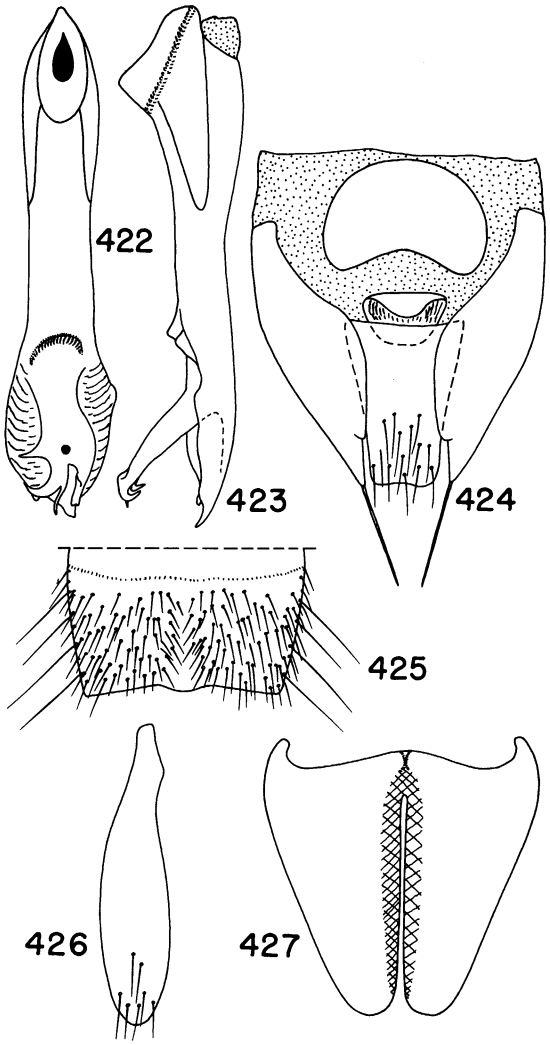
PARATYPES: None.

DIAGNOSIS: Males of this species are easily recognized by the deep, oval median depression of sternite VII (fig. 433), the small median tubercle of sternite VI, and the configuration of the aedeagus (figs. 429, 430). The females are identified as indicated in the Key.

DESCRIPTION: Length 2.0 to 2.6 mm.

Color reddish brown. Head and pronotum reddish brown. Elytra bicolored, basal and apical portions reddish brown, middle with transverse dark reddish brown strip. Abdomen bicolored, reddish brown with base of seventh segment dark reddish brown. Legs and antennae pale reddish brown.

Head length (HL, fig. 37) and width (HW) approximately equal. Dorsum of head with sparse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about three-fourths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without median carina or ridge. Labrum (fig. 434) with U-shaped median emargination; anterior margin with two large denticles on each side of median emargination. Mandibles (fig. 431) bidentate; basal denticle large. Antennomeres 4 and 11 unmodified.



FIGS. 422–427. *Gnathymenus clinus*. 422. Aedeagus, dorsal view. 423. Aedeagus, right lateral view. 424. Segment IX, female, ventral view. 425. Sternite VII, male. 426. Sternite IX, male. 427. Sternum VIII, male.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered, moderately dense puncation on all but median strip; surface polished, without ground sculpturing; lateral margins curved and gradually converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to V unmodified. Sternite VI with low, rounded, glabrous, median tubercle. Sternite VII (fig. 433) with large, deep, oval median depression; depression without setae but margined with setae; depression with low, apical, midlongitudinal ridge and with shallow, midlongitudinal depression at anterior margin; sternite without micropores or spiniform setae; inner surface with midlongitudinal carina on apical portion; posterior margin with small median lobe. Sternite VIII (fig. 428) with deep, narrow, median incision extending for about nine-tenths the length of segment; surface adjacent to incision beveled; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 435) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 429, 430) with moderately long, moderately broad parameres; parameres without setae. Median lobe in dorsal view slightly expanded toward apex then strongly constricted at about apical quarter; dorsal surface with broad, medially divided, transverse laminiform ridge at about apical quarter; apical quarter slender then apically expanded then tapered to hooked apex. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium at apex of lightly sclerotized process originating below dorsal, transverse ridge of median lobe.

Female. Sternites II to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 432) with two genital appendages; basal appendage divided into two sclerites, anterior sclerite nar-

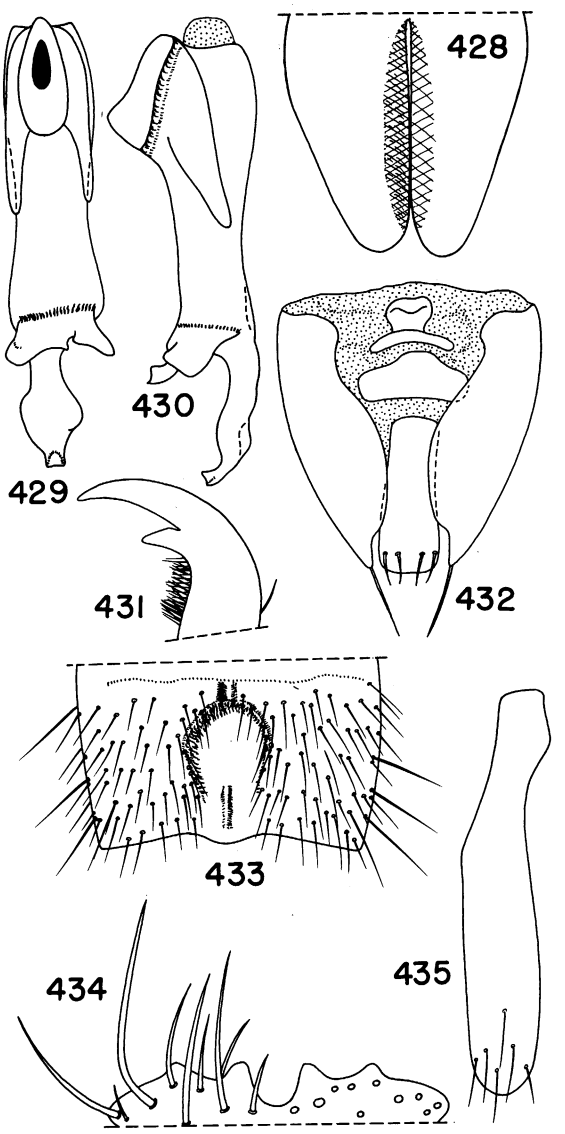
rower basally than distally and with broad depression near apex, posterior sclerite rectanguloid and with scattered apical setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian Canal Zone and the province of Panama (fig. 52) where 12 of the 18 known specimens were collected from the following fungi: *Favolus* sp. (2 specimens), *Trametes scabrosa* (3 specimens), *Polyporus licnoides* (1 specimen), *Fomes sclerodermeus* (1 specimen), *Auricularia mesenterica* (3 specimens), *Ganoderma* sp. (1 specimen) and *Phellinus* sp. (1 specimen). One specimen was taken from under the crust of a palm log, three others from under the bark of logs, and one was collected by fogging the canopy of *Luehea seemannii* with pyrethrin.

ETYMOLOGY: From the Arabic *sifrus* for empty and referring to the depression on sternite VII that is devoid of features.

MATERIAL EXAMINED: Thirteen males, six females. PANAMA: *Canal Zone:* Barro Colorado Island (holotype, AMNH); 5 mi. NW Gamboa (9° 10′ N, 79° 45′ W), October 23–24, 1975, canopy of *Luehea seemannii* with pyrethrin fog, T. L. Erwin (1 male, AMNH); Barro Colorado Island, June–October 1943 (1 male, USNM), under crust of palm log, January 21, 1959, H. S. Dybas (1 male, FMNH), under bark of rotting logs, February 4, 1976, A. Newton (2 males, 2 females, MCZ), from *Favolus* sp., February 1976, A. Newton (1 female, MCZ), from *Trametes scabrosa,* February 1976, A. Newton (1 male, 1 female, AMNH; 1 female, MCZ), under bark of rotting log, February 5, 1976, A. Newton (1 male, MCZ), from *Polyporus licnoides,* July 2, 1969, J. F. Lawrence (1 male, MCZ), from *Fomes sclerodermeus,* February 10, 1968, J. F. Lawrence (1 male, MCZ), from *Auricularia mesenterica,* February 17, 1968, J. F. Lawrence (1 male, AMNH; 1 male, 1 female, MCZ), from *Ganoderma* sp., July 14, 1969, J. F. Lawrence (1 female, MCZ). *Panama:* Cerro Campana, from *Phellinus* sp., August 9, 1969, J. F. Lawrence (1 male, MCZ).

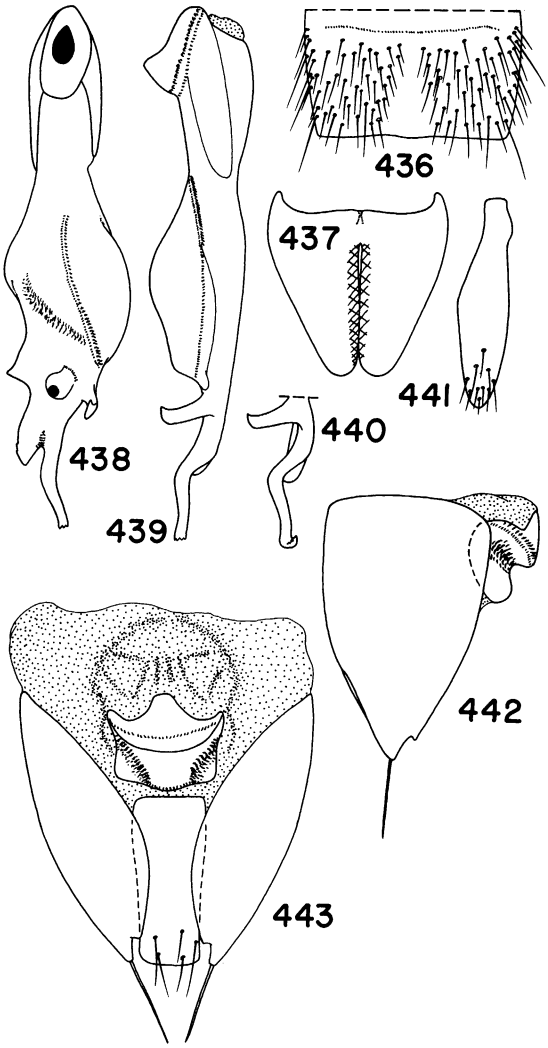


FIGS. 428–435. *Gnathymenus sifrus.* 428. Sternum VIII, male. 429. Aedeagus, dorsal view. 430. Aedeagus, right lateral view. 431. Right mandible. 432. Segment IX, female, ventral view. 433. Sternite VII, male. 434. Labrum, setae removed from right side. 435. Sternite IX, male.

50. *Gnathymenus nevermanni* (Bierig), new combination

Figures 6, 52, 436–443

Litozoon nevermanni Bierig, 1943, p. 163. (Type locality: Costa Rica: [Limon]: Hamburg Farm,



FIGS. 436–443. *Gnathymenus nevermanni*. 436. Sternite VII, male. 437. Sternum VIII, male. 438. Aedeagus, dorsal view, apex broken. 439. Aedeagus, right lateral view, apex broken. 440. Aedeagus, right lateral view of apical portion, unbroken. 441. Sternite IX, male. 442. Segment IX, female, lateral view. 443. Segment IX, female, ventral view.

Reventazon, Ebene Limon [Limon Plains], from under bark. Holotype, male, in the Field Museum of Natural History, Chicago, examined.)

DIAGNOSIS: The form of the aedeagus (figs. 438–440) permits separation of the males of this species from all others. The females can be distinguished by the characters in the Key.

DESCRIPTION: Length 2.6 mm.

Color reddish brown. Head and pronotum reddish brown. Elytra tricolored, base with narrow, poorly differentiated, reddish brown strip, then with broad dark reddish brown strip, then with pale reddish brown apical quarter. Abdomen dark reddish brown. Legs and antennae pale reddish brown.

Head length (HL, fig. 37) and width (HW) approximately equal. Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about eight-tenths of postocular length (PO) of head. Neck width six-tenths width of head. Submentum without midlongitudinal ridge. Labrum with two denticles on each side of median emargination. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII (fig. 436) with small, midapical, glabrous spot, without median depression, spiniform setae, or micropores; inner surface with midlongitudinal carina on apical third, carina visible externally through sternite as dark line; posterior margin with obsolete median swelling. Sternite VIII (fig. 437) with

deep, narrow median incision extending for about three-fourths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short midlongitudinal groove. Sternite IX (fig. 441) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 438–440) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, constricted at basal third then strongly expanded then sinuously tapered to apex, with four processes along margin; left lateral margin with short, broad, dorsolaterally directed process; apical margin with short broad process on left and long, slender, sinuous, apically hooked process on right (fig. 440); right margin with long, slender, dorsally directed process; right lateral side with long explanate ridge; dorsal surface with ridge on right side. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on dorsal surface at about apical fourth and at apex of short tubercle.

Female. Sternites IV to VII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (figs. 442, 443) with two genital appendages; basal sclerite large, irregularly pentagonal, and with deep transverse groove; apical sclerite rectanguloid and with scattered setae apically.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Costa Rican provinces (fig. 52) of Limon, where one specimen was collected from under loose bark, and Heredia, where four specimens were taken from serrate-leaved bromeliads that had been cut, beaten, and stripped.

DISCUSSION: The long, slender apical process on the aedeagus of the holotype has the hooked apical portion broken off (figs. 439, 440).

MATERIAL EXAMINED: Four males, one female. COSTA RICA: *Limon:* Hamburg Farm, Reventazon, Ebene Limon (holotype, FMNH). *Heredia:* Organization of Tropical Studies La Selva Field Station, Puerto Viejo de Sarapiqui, Rio Puerto Viejo (10° 26′ N, 83° 59′ W), March 5–11, 1973, from serrate-leaved bromeliads, cut, beaten, and stripped, J. Wagner and J. Kethley (2 males, 1 female, FMNH; 1 male, AMNH).

51. **Gnathymenus culebrus**, new species

Figures 6, 52, 444–453

HOLOTYPE: Male. Panama: Chiriqui: Finca Lerida, March 14, 1959, collected by Henry Dybas, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: Eight males. Panama: Chiriqui: Finca Lerida, March 14, 1959, Henry Dybas (2 males, FMNH; 1 male, AMNH), March 17, 1959, 5650 ft. elevation (2 males, FMNH; 3 males, AMNH).

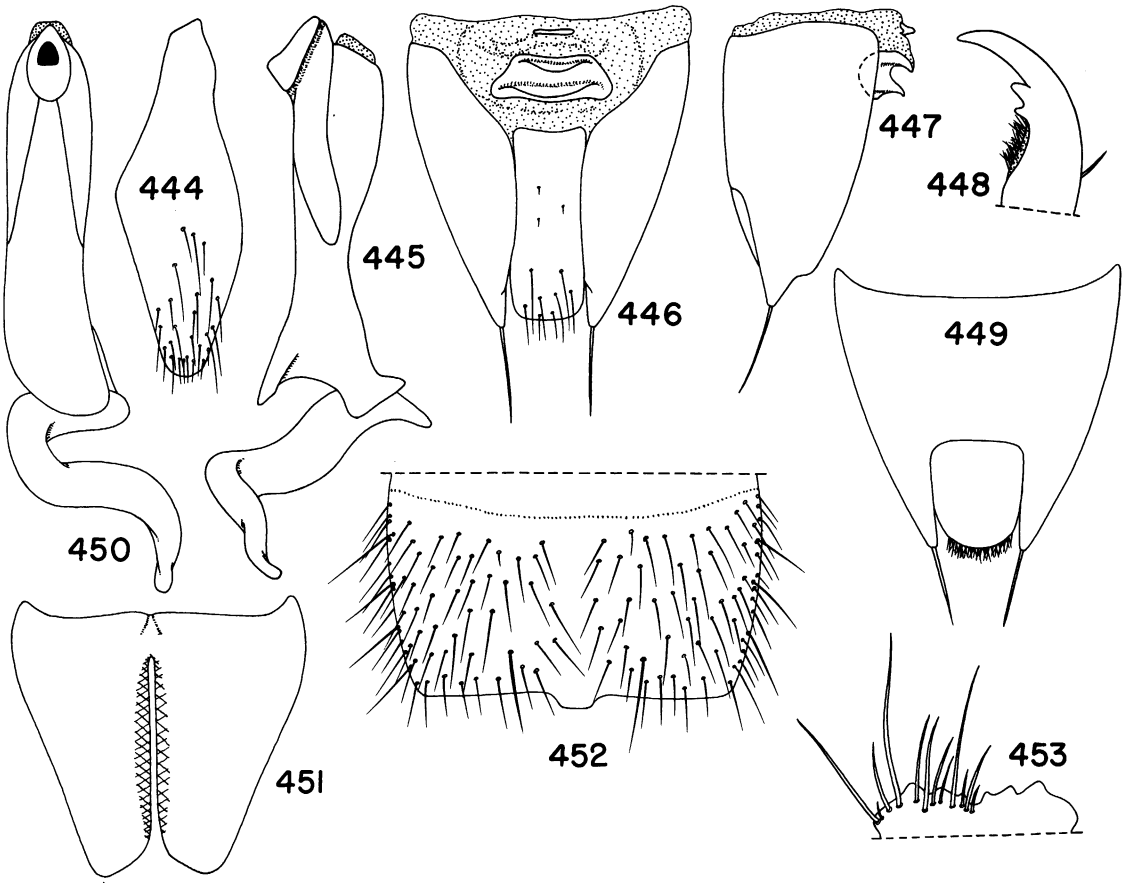
DIAGNOSIS: The small, truncate or rounded median lobe of the posterior margin of sternite VII (fig. 452) and the long, twisted, apical third of the median lobe of the aedeagus (figs. 445, 450) separates the males of this species from all others. The characters in the Key distinguish the females.

DESCRIPTION: Length 2.1 mm.

Color reddish brown to pale reddish brown.

Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-fourth of postocular length (PO) of head. Neck width about six-tenths width of neck. Submentum without median carina or ridge. Labrum (fig. 453) with U-shaped median emargination; anterior margin with three apically rounded, poorly defined denticles on each side of midline; one denticle adjacent to median emargination, one about one-third from median emargination, and one about one-third from lateral margin. Mandibles (fig. 448) tridentate, median denticle moderately large, basal denticle small. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.



FIGS. 444–453. *Gnathymenus culebrus*. 444. Sternite IX, male. 445. Aedeagus, right lateral view. 446. Segment IX, female, ventral view. 447. Segment IX, female, lateral view. 448. Right mandible. 449. Segment IX, dorsal view. 450. Aedeagus, dorsal view. 451. Sternum VIII, male. 452. Sternite VII, male. 453. Labrum, setae removed from right side.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridges present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VIII (fig. 452) with narrow, median, glabrous strip, and without median depression, spiniform setae, or micropores; posterior margin with small median lobe with truncate or rounded apical margin; inner surface with midlongitudinal carina on apical portion, carina visible externally through sternite as dark line. Sternite VIII (fig. 451) with deep, narrow median incision extending for about three-fourths length of segment; surface beveled adjacent to incision; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 444) asymmetrical, apical portion with scattered setae.

Aedeagus (figs. 445, 450) with moderately long, moderately broad parameres; parameres without setae. Median lobe with

broad, apically rounded, dorsoventrally flattened lobe on dorsal surface at about two-thirds from base; apical third bent ventrally and with broad ventrolateral lobe on right and slender, acuminate, ventrolateral process on left, then median lobe twisted and attenuated apically. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium near apex of twisted, apical third of median lobe.

Female. Sternites IV to VIII unmodified. Tergum IX (fig. 449) fused dorsally, ventrally divided midlongitudinally. Segment IX (figs. 446, 447) with two genital appendages; basal sclerite small, trapezoidal and with deep median, transverse depression; apical sclerite elongate and with scattered setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian province of Chiriqui (fig. 52) where it was collected at 5650 ft. (1722 m.) elevation.

ETYMOLOGY: From the Spanish *culebra* for snake and referring to the long, twisted apical portion of the aedeagus.

MATERIAL EXAMINED: Holotype, eight paratypes, five females. Females with same data as holotype (3 females, FMNH; 2 females, AMNH).

52. **Gnathymenus lirellus**, new species
Figures 6, 52, 454–461

HOLOTYPE: Male. Costa Rica: [Cartago]: San Isidro-La Estrella, 1600 m. elevation, September 28, 1941, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: The reddish brown body with dark reddish brown elytra and seventh abdominal segment, and the configuration of the aedeagus (figs. 457, 458) permits separation of the males of this species from those of all other species. The females are distinguished as indicated in the Key.

DESCRIPTION: Length 2.7 mm.

Color reddish brown. Head and pronotum reddish brown with orange tinge. Elytra dark reddish brown with paler basal strip. Abdomen reddish brown, seventh segment dark reddish brown. Legs and antennae yellowish brown.

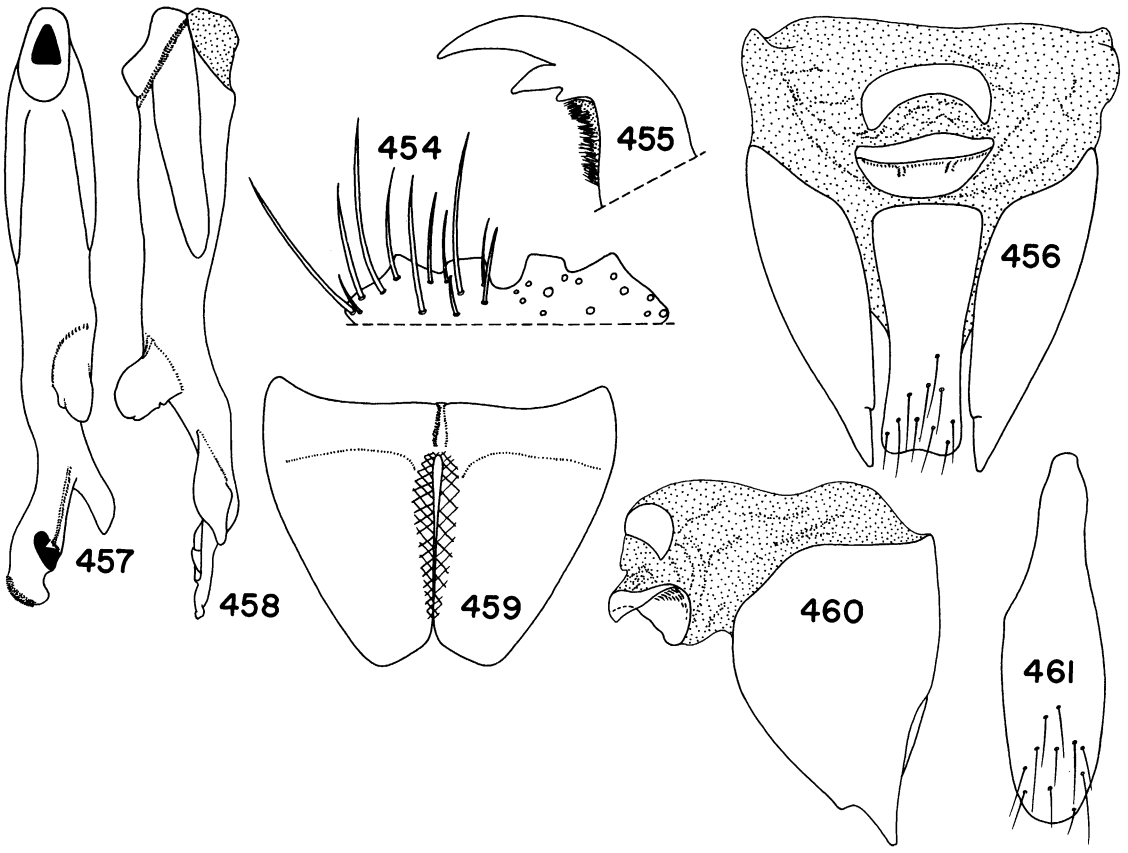
Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with scattered, sparse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about six-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentun without midlongitudinal carina. Labrum (fig. 454) with U-shaped median emargination; anterior margin with broad, obliquely truncate lobe adjacent to median emargination and another, larger, acute denticle between median denticle and lateral margin. Mandibles (fig. 455) tridentate, median denticle large, basal denticle small. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of discal punctures and with scattered, sparse punctation on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII without median depression, micropores, or spiniform setae; inner surface with midlongitudinal carina on apical portion, carina visible externally through sclerite as dark line; posterior margin truncate. Sternite VIII (fig. 459) with deep, narrow median incision extending for about three-fourths the length of segment; surface beveled adjacent to incision; basal carina present and divided medially with each half curved; base with



FIGS. 454–461. *Gnathymenus lirellus*. 454. Labrum, setae removed from right side. 455. Right mandible. 456. Segment IX, female, ventral view. 457. Aedeagus, dorsal view. 458. Aedeagus, right lateral view. 459. Sternum VIII, male. 460. Segment IX, female, lateral view. 461. Sternite IX, male.

short, midlongitudinal groove. Sternite IX (fig. 461) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 457, 458) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, slightly bent to left near apex; dorsal surface with two processes on right, dorsolateral side; proximal process at just beyond middle, posterodorsally directed, and moderately compressed; distad process at about apical fifth, dorsoventrally flattened and lateroposteriorly directed. Collar of basal foramen entirely sclerotized. Base of median lobe with circular membranous spot that lacks central sclerite. Ostium on right side of dorsal surface and subapical.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (figs. 456, 460) with two genital appendages; basal appendage divided into two sclerites, anterior sclerite broad and curved, posterior sclerite broad and with broad and deep depression across entire width; apical appendage elongate, rectanguloid and with scattered setae on apical portion.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Costa Rican prov-

ince of Cartago (fig. 52) where at the type locality it was collected at 1600 m. elevation (5249 ft.).

DISCUSSION: The type locality San Isidro-La Estrella is south of the city Cartago. In Costa Rica there are several towns with the name San Isidro or Estrella but only near Cartago are these two towns near each other. All of the other specimens came from the province of Cartago.

ETYMOLOGY: From the Latin *lirella* for a small ridge thrown up by a plow and referring to the transverse ridge of sternum VIII.

MATERIAL EXAMINED: One male, five females. *Costa Rica: Cartago:* San Isidro-La Estrella, 1600 m., September 28, 1941 (1 male holotype and 1 female, FMNH), October 16, 1941 (1 female, FMNH, 1 female, AMNH); Pacayas, April 22, 1940 (1 female, FMNH); Torito (Turrialba), February 13–16, 1939, (1 female, FMNH).

53. **Gnathymenus ascus**, new species
Figures 6, 52, 462–470

HOLOTYPE: Male. Panama: Chiriqui: Finca Lerida near Boquete, 5650 ft. elevation, March 14, 1959, from forest floor litter, chips in logging area, collected by H. S. Dybas, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: Twelve males, Panama: Chiriqui: Finca Lerida near Boquete, 5650 ft. elevation, March 14, 1959, forest floor litter, chips in logging area, H. S. Dybas (4 males, FMNH; 2 males, AMNH), forest floor litter and wood chips in logging area (2 males, FMNH; 1 male, AMNH), forest floor litter at base of stump (2 males, FMNH; 1 male, AMNH).

DIAGNOSIS: The males of this species are readily distinguished by characters of the aedeagus (figs. 463–465). The females are separated as indicated in the Key.

DESCRIPTION. Length 2.6 mm.

Color pale reddish brown.

Head length (HL, fig. 38) less than width (HW). Dorsum of head with dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-fifth of postocular length (PO) of head. Neck width six-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 469) with U-shaped median emargination; anterior margin with small denticle adjacent to median emargination and large denticle between median denticle and lateral margin. Mandibles (fig. 470) tridentate; median denticle large, basal denticle small. Antennomeres 4 and 11 unmodified.

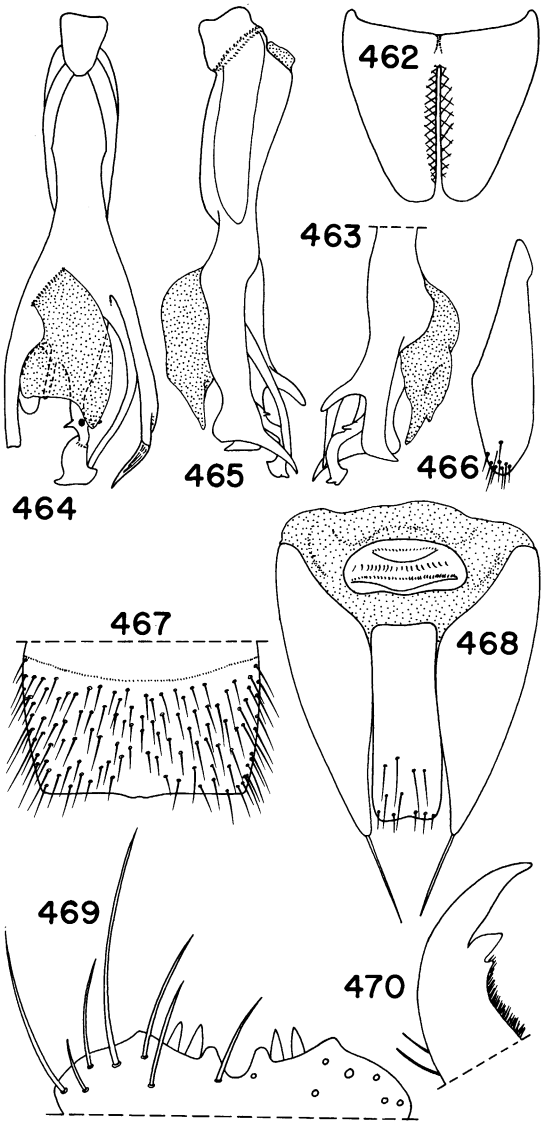
Pronotum moderately strongly convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII (fig. 467) with small, median, glabrous spot near apex, without median depression, micropores, or spiniform setae; inner surface with midlongitudinal carina on apical portion, carina visible externally through sternite as dark line; posterior margin with minute median, sinuate lobe. Sternite VIII (fig. 462) with deep, narrow median incision extending for about three-fourths the length of segment; surface beveled adjacent to incision; basal carina absent; base with short, midlongitudinal groove. Sternite IX (fig. 466) asymmetrical; apical portion setose.

Aedeagus (figs. 463–465) with moderately long, moderately broad parameres; parameres without setae. Median lobe with four, posteriorly directed, variously modified processes on apical half; process (fig. 465) on



FIGS. 462–470. *Gnathymenus ascus*. 462. Sternum VIII, male. 463. Aedeagus, left lateral view, apical half. 464. Aedeagus, dorsal view. 465. Aedeagus, right lateral view. 466. Sternite IX, male. 467. Sternite VII, male. 468. Segment IX, female, ventral view. 469. Labrum, setae removed from right side. 470. Left mandible.

right side broad in lateral view, slender and medially curved in dorsal view, and with apex truncate but with ventral edge of apex drawn out and attenuate; process on right side of middle long, slender, and curved medially; median process irregularly shaped, with several short processes and with broad sinuate apex; process (fig. 463) on left side broad in lateral view, slender in dorsal view, with slender, acuminate process extending ventrally from ventral edge, and with truncate apex; dorsal surface of median lobe with large membranous sac arising from near middle. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium subapical and on dorsal surface of irregularly shaped median process.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 468) with two genital appendages; basal sclerite small, trapezoidal, and with deep, median transverse depression; apical sclerite rectanguloid and with scattered setae apically.

HABITAT AND DISTRIBUTION: This species is known only from the Panamanian province of Chiriqui (fig. 52) where it was collected at 5650 and 6000 ft. elevation (1722 and 1829 m.) from forest floor litter and wood chips in a logging area, from litter at the base of a stump, and from leaf litter in a cloud forest.

ETYMOLOGY: From the Greek *ascos* for bag or sac, referring to the large membranous sac on the dorsal surface of the aedeagus.

MATERIAL EXAMINED: 16 males, 17 females. PANAMA: *Chiriqui:* Finca Lerida near Boquete, 5650 ft. elevation (9 males, 10 females, FMNH; 4 males, 5 females, AMNH); El Mirador, Finca Collins, near Boquete, 6000 ft. elevation, June 25, 1976, cloud forest leaf litter, A. Newton (2 males, 2 females, MCZ; 1 male, AMNH).

54. **Gnathymenus patulus,** new species

Figures 6, 52, 471–474

HOLOTYPE: Male. Costa Rica: Heredia: Organization of Tropical Studies La Selva Field Station, Puerto Viejo Sarapiqui, Rio Puerto Viejo (10° 26′ N, 83° 59′ W), March 5–11, 1973, from white fungus-encrusted stump with passalids, collected by J. Wagner

and J. Kethley, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: The long bicolored elytra and characters of the aedeagus (figs. 471, 472) permit separation of the males of this species from those of all others.

DESCRIPTION: Length approximately 2.5 mm.

Color reddish brown. Head, pronotum, and abdomen reddish brown. Elytra bicolored, pale reddish brown on narrow basal strip and on broader apical strip and dark reddish brown between. Legs and antennae pale reddish brown.

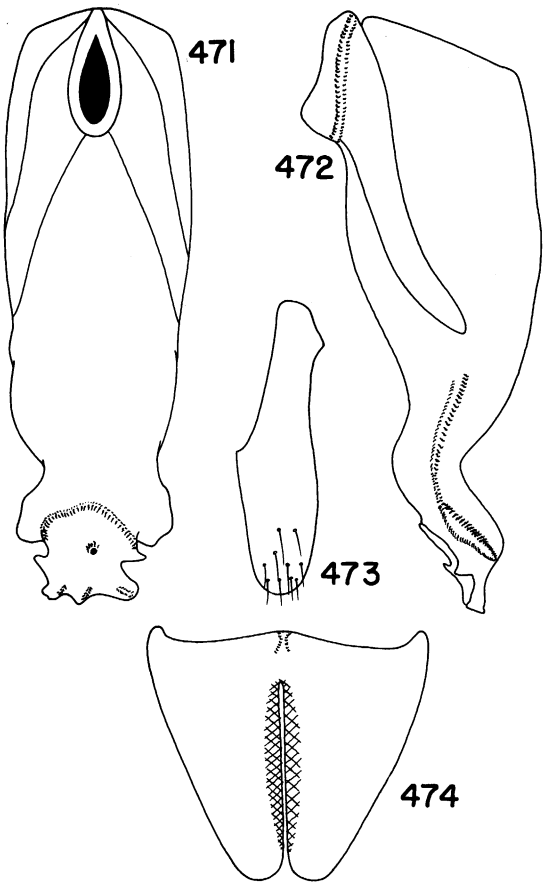
Head length (HL, fig. 37) slightly less than width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about six-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. (Labrum and mandibles not studies.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergum VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI with median patch of moderately dense pubescence. Sternite VII with elongate, median glabrous spot and without median depression, micropores, or spiniform setae; inner surface with midlongitudinal carina near apical margin, carina visible through sternite as dark line; posterior margin with obsoletely rounded median lobe. Sternite VIII (fig. 474) with deep, narrow median incision extending for about eight-tenths the length of segment; surface beveled adjacent to incision; basal carina absent; base with median groove. Sternite IX (fig. 473) asymmetrical; apical portion with scattered setae.



FIGS. 471–474. *Gnathymenus patulus*. 471. Aedeagus, dorsal view. 472. Aedeagus, right lateral view. 473. Sternite IX, male. 474. Sternum VIII, male.

Aedeagus (figs. 471, 472) with long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, strongly constricted at about apical fifth then expanded, apical eighth irregularly shaped, flattened, and with five lobes, bordered basally by curved ridge, and with dorsal surface

broadly depressed. Median lobe, in lateral view, with dorsal edge concave at about apical third and ventral edge concave at about apical fifth; lateral side with curved ridge on apical third. Collar of basal foramen entirely sclerotized. Base of median lobe with large circular pump spot; pump spot without median sclerite. Ostium on dorsal surface subapical, and surrounded by low nipple.

Female unknown.

HABITAT AND DISTRIBUTION: This species known from the Costa Rican province of Heredia (fig. 52) where it was collected from a white fungus-encrusted stump with passalid beetles.

ETYMOLOGY: From the Latin *patulus* for spread out, referring to the flattened, irregularly shaped apical portion of the aedeagus.

MATERIAL EXAMINED: Holotype.

55. *Gnathymenus fenyesi* (Bernhauer), new combination
Figures 6, 52, 475–480

Lithocaon fenyesi Bernhauer, 1910, p. 374. (Lectotype, female, designated here as the specimen with the following labels: "Cordoba Mex. Ver. Dr. A. Fenyes/Lithocaon/fenyesi Brh. Typus" [the second and third labels are handwritten], and my lectotype label; in the Field Museum of Natural History, Chicago, examined.)

DIAGNOSIS: The long, bicolored elytra, slight modification of sternite seven (fig. 479), and the aedeagal (figs. 475, 476) characters distinguish the males of this species from the others. Females are identified as indicated in the Key.

DESCRIPTION: Length 2.5 to 3.0 mm.

Color reddish brown. Head, pronotum, and abdomen reddish brown. Elytra bicolored, reddish brown to yellowish brown basally and apically and with transverse slightly darker reddish brown median stripe. Abdomen bicolored reddish brown with segments VII to X dark reddish brown. Legs and antennae pale reddish brown.

Head length (HL, fig. 37) slightly less than width of head (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about three-fourths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with two denticles on each side of emargination. Mandibles bidentate; basal denticle large. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI (fig. 479) with median patch of moderately dense pubescence. Sternite VII (fig. 479) with elongate, median glabrous spot and without median depression, micropores, or spiniform setae; inner surface with midlongitudinal carina near apical margin, carina visible externally through sternite as dark line; posterior margin with small, apically rounded, median lobe. Sternite VIII (fig. 477) with deep, narrow median incision extending for about three-fourths length of segment; surface beveled adjacent to incision; basal carina absent; base with short, median groove. Sternite IX (fig. 480) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 475, 476) with moderately long, moderately broad parameres; parameres without setae. Median lobe, in dorsal view, slightly constricted near middle then slightly expanded before tapering slightly to broad, trilobed apex; apical portion with two slender lateral lobes and one broad median

lobe; lobes curved dorsad; dorsal surface at about apical quarter abruptly and deeply depressed; dorsal surface with two long, low ridges extending anteriorly from depression. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot that lacks median sclerite. Ostium on dorsal surface, subapical, and surrounded by low ridge.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 478) with two genital appendages; basal appendage broad, pentagonal, and with shallow median depression; apical appendage elongate, rectanguloid and with scattered setae near apex.

Sclerotized spermathecal capsule absent.

HABITAT AND DISTRIBUTION: This species is known from the Mexican provinces of Oaxaca and Vera Cruz (fig. 52). In Oaxaca, a male was collected at 1600 ft. elevation (488 m.) from *Ganoderma* sp.

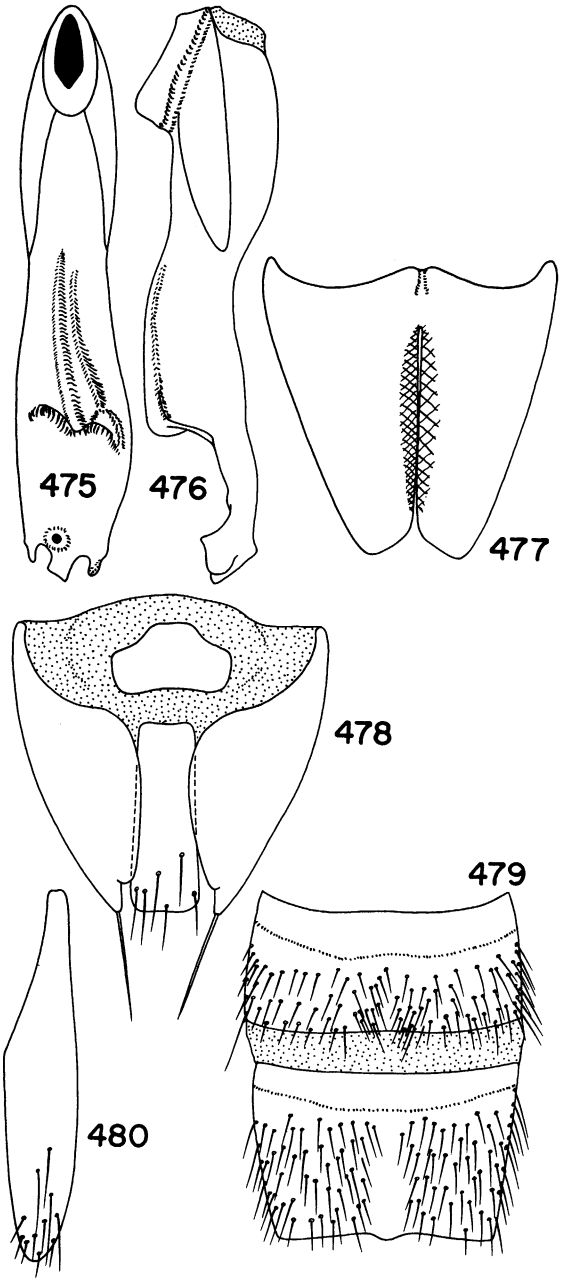
DISCUSSION: This species was originally described in *Lithocaon* which then included *sparsus*. However, *fenyesi* is more closely related to species of the *progenitor* group.

MATERIAL EXAMINED: Two males, one female. MEXICO: *Oaxaca:* 4.5 mi. S Valle Nacional, 1600 ft. elevation, August 16, 1973, from *Ganoderma* sp., A. Newton (1 male, MCZ). *Vera Cruz:* Cordoba, A. Fenyes (1 female, holotype, FMNH); Motzorongo, Flohr (1 male paratype, BMNH).

56. *Gnathymenus sparsus* (Sharp), new combination
Figures 6, 52, 481–486

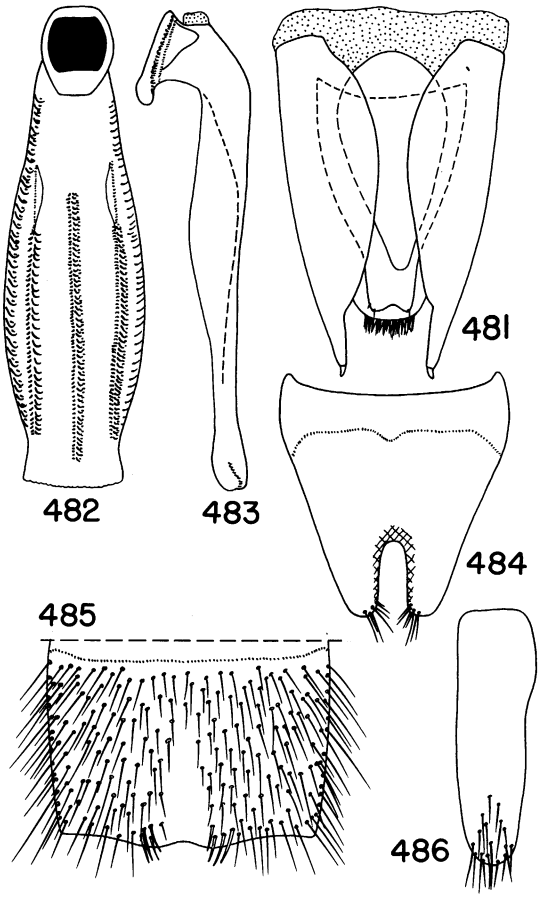
Lithocaon sparsus Sharp, 1886, p. 555. Bierig, 1933, p. 481, 482, 483, 489. (Type locality: Panama: [Chiriqui]: Volcan de Chiriqui, 2000 to 3000 ft. elevation. Lectotype, male, designated here as specimen with following labels "V. de Chiriqui, 2–3000 ft. Champion./B.C.A. Col. I.2. Lithocaon sparsus, Sharp./Lithocaon sparsus" [third label folded and handwritten] and with my lectotype label; in British Museum [Natural History], London, examined.)

DIAGNOSIS: The males can be recognized by the broad, moderately deep incision of sternum VIII (fig. 484), the sinuate posterior margin of sternite VII (fig. 485), and the broad, apically truncate aedeagus (fig. 482).



FIGS. 475–480. *Gnathymenus fenyesi*. 475. Aedeagus, dorsal view. 476. Aedeagus, right lateral view. 477. Sternum VIII, male. 478. Segment IX, female, ventral view. 479. Sternites VI and VII, male. 480. Sternite IX, male.

The females are identified as indicated in the Key.



FIGS. 481–486. *Gnathymenus sparsus*. 481. Segment IX, female, ventral view. 482. Aedeagus, dorsal view. 483. Aedeagus, right lateral view. 484. Sternum VIII, male. 485. Sternite VII, male. 486. Sternite IX, male.

DESCRIPTION: Length about 5.5 mm.

Color reddish brown. Head and pronotum dark reddish brown; elytra slightly paler than head; pronotum and abdomen brownish, with reddish brown infusions; legs and antennae reddish brown.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) six-tenths to seven-tenths of postocular length (PO) of head. Neck width about six-tenths width of head. Submentum with broad, midlongitudinal ridge. Labrum with U-shaped, median emargination; anterior margin with denticle adjacent to median emargination and with denticle between median denticle and lateral margin. Mandible bidentate, with large denticle near middle. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline, surface with scattered, moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 485) with elongate slightly flattened, median, glabrous region on apical half; median depression absent; micropores absent; inner surface without median carina; posterior margin with median region sinuate; surface with several subapical, thickened setae laterad of median glabrous region. Sternum VIII (fig. 484) with moderately broad, moderately deep emargination extending for about one-third length of segment; surface beveled adjacent to emargination; basal carina entire, not divided medially, slightly produced posteriorly at middle; base without median groove. Sternite (fig. 486) IX asymmetrical and with setae on apical portion.

Aedeagus (fig. 482, 483) with small, broad parameres; parameres without setae. Median lobe, in dorsal view, expanded from base to

just beyond middle then slightly convergent to truncate apex; dorsal surface broadly and deeply impressed for nearly entire length and with three longitudinal carinae, one median and one on each side of midline; ventral surface slightly rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex of median lobe.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 481) with two genital appendages; basal genital appendage elongate, tapered apically, apex rounded; apical genital appendage not longitudinally divided or incised, apical margin shallowly emarginate, with a few apical setae.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: This species is known from Panama and Costa Rica (fig. 52). Two Costa Rican specimens were collected from log mold. In Panama the species was collected on the sandy banks of a mountain stream at 2000 to 3000 ft. (610 to 914 m.) elevation (Sharp, 1886, p. 555). Bierig (1933, p. 482) found one specimen under the bark of a fallen tree that was almost decayed in a dark, humid virgin forest at 4500 ft. (1372 m.) elevation.

VARIATION: The two specimens from Miravalles Volcano in Costa Rica have slightly smaller eyes than all the other known specimens. The elytra of the specimen from Tapanti, Costa Rica are about one-fourth longer than the pronotum, whereas the elytra of the other known specimens are about one-fifth longer than the pronotum.

MATERIAL EXAMINED: Four males, three females. PANAMA: *Chiriqui:* Volcan Chiriqui, 2500–4000 ft., Champion (1 paratype female, FMNH); 2000–3000 ft., Champion (lectotype male, 1 paratype female, BMNH); 1500 m., July 1930 (1 male, FMNH).

COSTA RICA: *Cartago:* [Hacienda] Tapanti, April 6, 1941 (1 male, FMNH). *Guanacaste:* [Las] Cañas, Miravalles Volcano (10° 42′ N, 85° 7′ W) April 8, 1973, log mold on slope, J. Wagner and J. Kethley (1 male, AMNH; 1 female, FMNH).

57. **Gnathymenus simatus**, new species

Figures 6, 51, 487–495

HOLOTYPE: Male. Venezuela: Aragua: Rancho Grande, 15 km. N Maracay, 1500 m. elevation, February 21, 1971, cloud forest, S. Peck, deposited in the Canadian National Collection, Ottawa.

PARATYPES: Nine males, with same data as holotype (6 males, CNC; 3 males, AMNH).

DIAGNOSIS: The male of this species may be separated from those of others by characters of sternite VII and the aedeagus. Sternite VII (fig. 489) has four patches of short, stout, darkly pigmented setae, two near the apex and two near the base of a broad, ovoid, median depression, and a large, broadly rounded lobe on the posterior margin. The form of the aedeagus is diagnostic (figs. 487, 488).

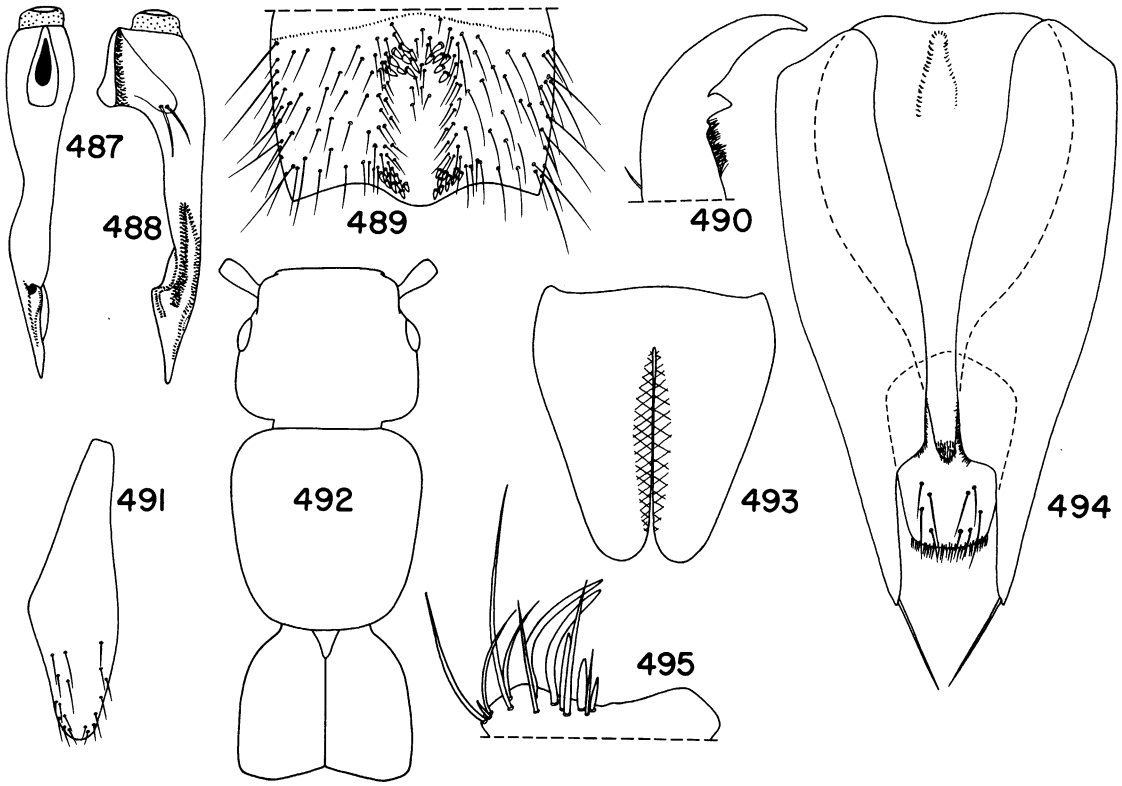
The females have the basal genital appendage abruptly tapered near the apex.

DESCRIPTION: Length 2.2 to 3.5 mm.

Color pale reddish brown and reddish brown. Head, pronotum, elytra, and abdominal segments VII to X reddish brown, often with darker infusions; abdomen segments III to VI pale reddish brown to yellowish brown; legs and antennae yellowish brown.

Head length (HL, figs. 38, 492) less than width (HW). Dorsum of head with moderately coarse, scattered punctation on lateral regions; surface polished, without ground sculpturing. Eye length (OL) about four-tenths postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum (fig. 495) with anterior margin broadly emarginate for most of width, median emargination obsolete; surface with four pairs of flattened setae. Mandible (fig. 590) with large obliquely truncate, median denticle and minute basal denticle. Antennomeres 4 and 11 unmodified.

Pronotum (fig. 492) moderately strongly convex, widest anterior to transverse mid-



FIGS. 487–495. *Gnathymenus simatus*. 487. Aedeagus, dorsal view. 488. Aedeagus, right lateral view. 489. Sternite VII, male. 490. Right mandible. 491. Sternite IX, male. 492. Head and thorax. 493. Sternum VIII, male. 494. Segment IX, female, ventral view. 495. Labrum, setae removed from right side.

line; surface with curved row of moderately coarse punctures on disk and with smaller, scattered punctures on lateral region; surface polished, without ground sculpturing; lateral margins nearly straight and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 492) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture absent. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum with low, apically acute, median tumescence between mesocoxae.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with broadly rounded median lobe.

Male. Sternites IV to VI each with small median, glabrous depression; each depression larger distally. Sternite VI bordered laterally by thicker setae. Sternite VII (fig. 489) with elongate, oval, glabrous, median depression; depression bordered laterally by setae; depression bordered anterolaterally and posterolaterally by patch of short, stout, darkly pigmented, spiniform setae; micropores absent; posterior margin with large,

broadly rounded, median lobe; inner surface without median carina. Sternum VIII (fig. 493) with deep, narrow median incision extending for about three-fourths length of segment; surface near incision beveled; basal carina absent; basal groove absent. Sternite IX (fig. 491) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 487, 488) with short, broad parameres; parameres with two setae near apex. Median lobe, in dorsal view, slender, nearly straight, asymmetrical, left side constricted near middle, right side less strongly constricted or nearly straight then tapering to acute apex; apical portion bent slightly to right; median lobe, in lateral view, with apical fifth flattened on dorsal edge and right side with groove on apical half; apical half slightly curved dorsally; dorsal surface with groove on apical fifth extending posteriorly from ostium, groove broadest near ostium and tapered posteriorly; ventral surface rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot with median sclerite in middle. Ostium at about apical fifth on dorsal surface.

Female. Sternites IV to VIII unmodified. Tergum IX (paraprocts) fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 494) with two genital appendages; basal genital appendage broad basally, abruptly constricted at about apical third, apical third slender and tapered to apex and with small patch of cuticular processes; apical genital appendage not longitudinally divided or incised, with scattered setae and with apical margin broadly rounded.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: The species is known only from the northern Venezuelan state of Aragua (fig. 51) where it was collected in cloud forests at about 4900 ft. (1500 m.) elevation.

ETYMOLOGY: From the Latin *simatus* for flattened, referring to the broad, flat labral setae.

MATERIAL EXAMINED: Ten males, eight females. Type locality (7 males, 6 females, CNC; 3 males, 2 females, AMNH).

58. **Gnathymenus gomphus**, new species

Figures 6, 51, 496–502

HOLOTYPE: Male. Brazil: [São Paulo]: Estacion Biologica Boracea, Salesopolis, December 17–26, 1969, J. M. and B. A. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: The male of this species is readily discriminated from those of other species by the U-shaped emargination of the posterior margin of sternite VII (fig. 497), the broad median depression with two patches of numerous peg setae on sternite VII (figs. 497, 500), and the forked apex and deeply grooved base of the aedeagus (fig. 501).

DESCRIPTION: Length 4.0 mm.

Color yellowish brown, legs and antennae paler.

Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with coarse, scattered punctation; surface polished, without ground sculpturing. Eye length (OL) slightly more than one-fourth of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped, median emargination; anterior margin with broad denticle adjacent to median emargination. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with scattered, coarse punctation over all but midlongitudinal strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base (fig. 496). Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than length of pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with one pair of laterotergites. Tergite VII with-

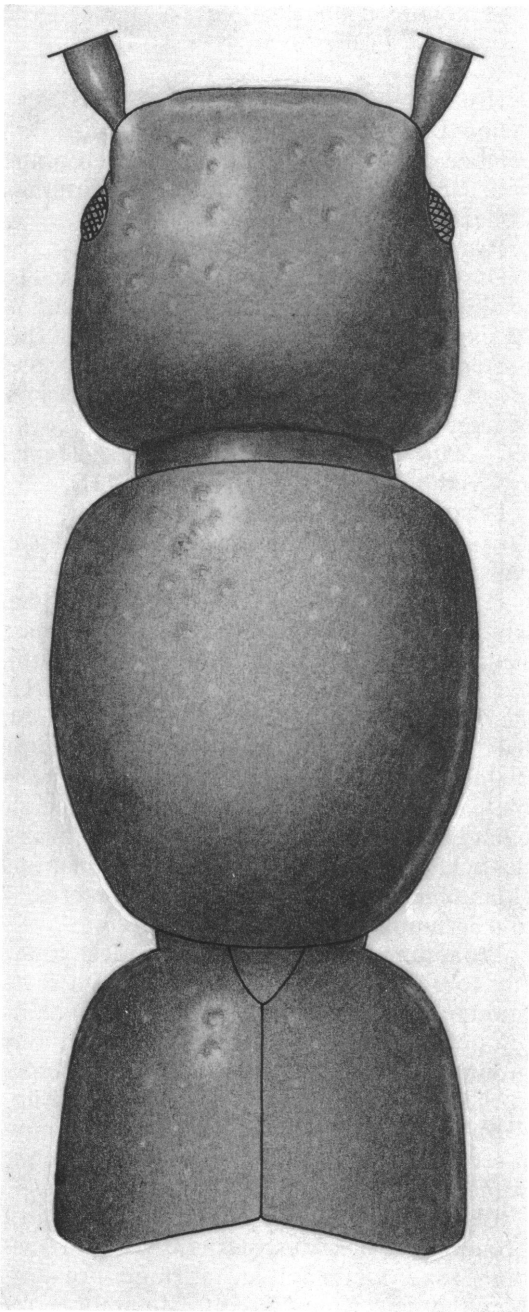
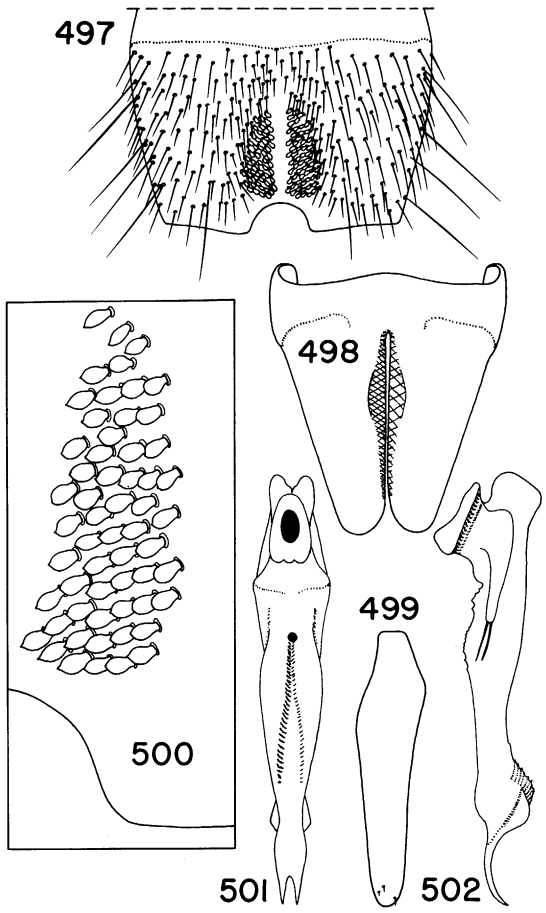


FIG. 496. *Gnathymenus gomphus*. Head and thorax.

out dermal fringe of posterior margin. Tergum VIII with posterior margin strongly rounded.



FIGS. 497–502. *Gnathymenus gomphus*. 497. Sternite VII, male. 498. Sternum VIII, male. 499. Sternite IX, male. 500. Sternite VII, male, left median portion of apex. 501. Aedeagus, dorsal view. 502. Aedeagus, right lateral view.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 497) with broad, oval depression; depression with large patch of numerous peg setae (fig. 500) on each side of midlongitudinal, glabrous strip; micropores absent; posterior margin of sternite with moderately deep, U-shaped emargination; inner surface without median carina. Sternum VIII (fig. 498) with deep, narrow median incision extending for about three-fourths length of segment; incision bordered near basal half by wide depression; basal carina present and widely separated medially, with each half curved; base without median

groove. Sternite IX (fig. 499) straight, slightly asymmetrical; apical portion with a few, scattered setae.

Aedeagus (figs. 501, 502) with moderately long, slender parameres; parameres with two apical setae. Median lobe, in dorsal view, long, slender, straight, symmetrical, and slightly constricted adjacent to ostium, then again near apex, median lobe generally tapering from basal foramen to apex; apex of median lobe forked, with each tine tapered to acute tip; base of median lobe dorsoventrally grooved; median lobe, in lateral view, with apex curved ventrally, subapical portion swollen, swollen portion laterally compressed; dorsal surface with apically divergent groove extending from ostium to over halfway to apex, groove moderately deep basally and increasingly shallow apically. Collar of basal foramen entirely sclerotized. Base of median lobe with narrow pump spot; pump spot without median sclerite. Ostium near basal foramen on dorsal surface and not surrounded by cone.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the southeastern Brazilian province of São Paulo (fig. 51).

ETYMOLOGY: From the Greek, *gomphos*, for peg, referring to the peglike setae of sternite VII.

MATERIAL EXAMINED: Holotype.

59. **Gnathymenus spereus**, new species
Figures 6, 51, 503–510

HOLOTYPE: Male. Ecuador: Napo: 3 km. NW Coyuja, 2500 m. elevation, February 29, 1976, collected by J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: Three males with same data as holotype (2 males, CNC; 1 male, AMNH).

DIAGNOSIS: The males of this species are separable from those of other species by the long elytra with a metallic blue sheen, the beveled anterior cephalic margin, the broad V-shaped emargination of the posterior margin of sternite VII (fig. 509) and the slender, sinuous (in lateral view) aedeagus (fig. 504).

The females can be identified by the characters in the Key.

DESCRIPTION: Length approximately 3.7 mm.

Color black, reddish, and metallic blue. Head black with slight bluish cast; pronotum reddish; elytra dark metallic blue, almost black; abdominal segments III to VII black and VIII to X reddish brown; antennae and legs reddish brown.

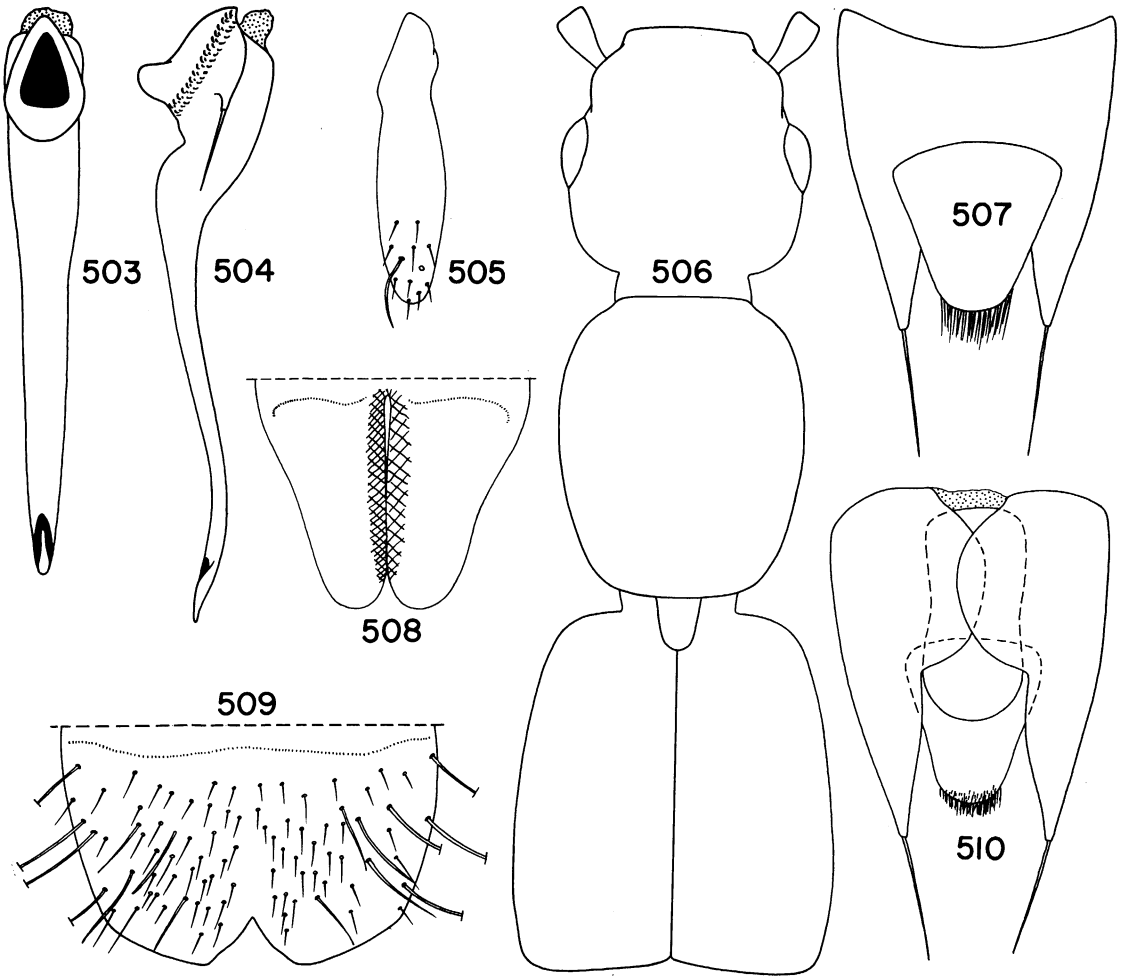
Head length (HL, figs. 37, 506) slightly greater than width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Clypeal region of head strongly beveled in male, and slightly beveled in female. Eye length (OL) about seven-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad truncate lobe extending from emargination to about halfway across median lobe. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 506) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV to VI with shallow, glabrous, median impressions, impressions increasingly deep and broad from IV to VI. Sternite VII (fig. 509) with long, narrow, shallow median impression; central region with scattered, unmodified setae; micropores absent; posterior margin with broad, deep, V-shaped, median emargination; inner surface without median carina. Sternum VIII



FIGS. 503–510. *Gnathymenus spereus*. 503. Aedeagus, dorsal view. 504. Aedeagus, right lateral view. 505. Sternite IX, male. 506. Head and thorax, male. 507. Segment IX, dorsal view. 508. Sternum VIII, male. 509. Sternite VII, male. 510. Segment IX, female, ventral view.

(fig. 508) with deep, narrow median incision extending for about nine-tenths the length of segment; surface adjacent to incision slightly beveled; basal carina divided medially and with each half sinuous; base without median groove. Sternite IX (fig. 505) asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 503, 504) with short, broad parameres; parameres with one seta at apex. Median lobe, in dorsal view, gradually tapered apically; median lobe, in lateral view, sinuous and flattened; dorsal and ventral surfaces without median groove or carina. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on dorsal surface at apex.

Female. Sternites IV to VIII unmodified. Tergum IX (fig. 507) fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 510) with two genital appendages; basal genital appendage broad, and apically rounded;

apical genital appendage not longitudinally divided or incised, without setae and with rounded apex.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the north central Ecuadorian province of Napo (fig. 51) where it was collected at 2500 m. elevation (8200 ft.).

ETYMOLOGY: From the Anglo-Saxon *spere* for spear, referring to the long, slender, spearlike aedeagus.

MATERIAL EXAMINED: Four males, five females, type locality (2 males, 4 females, CNC; 1 male, 1 female, AMNH).

60. **Gnathymenus tungus**, new species
Figures 6, 51, 511–518

HOLOTYPE: Male. Ecuador: Pich[incha]: 18 km. E Mindo, 2500 m. elevation, March 1, 1976, collected by J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: Two males with same data as holotype (CNC, AMNH).

DIAGNOSIS: Males of this species can be separated from those of other species by the long elytra and by characters of the seventh sternite and aedeagus. The posterior margin of the seventh sternite (fig. 517) has a moderately deep, median emargination that has a small, acute, median lobe. The aedeagus, in lateral view (fig. 512), has an obliquely truncate apex and in dorsal view (fig. 511) has the apex medially emarginate.

The females are distinguished by the characters given in the Key.

DESCRIPTION: Length 3.5 mm.

Color black, reddish, and reddish brown. Head, elytra, and abdomen black to dark reddish brown; pronotum reddish to orangish; legs reddish brown; antennomeres 1–8 reddish brown, 9–11 yellowish brown.

Head length (HL, figs. 37, 514) slightly greater than width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about six-tenths of postocular length (PO). Neck width 0.6 width of head. Submentum without mid-longitudinal carina. Labrum with U-shaped median emargination; anterior margin with obliquely truncate lobe extending from median emargination to halfway across labrum. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

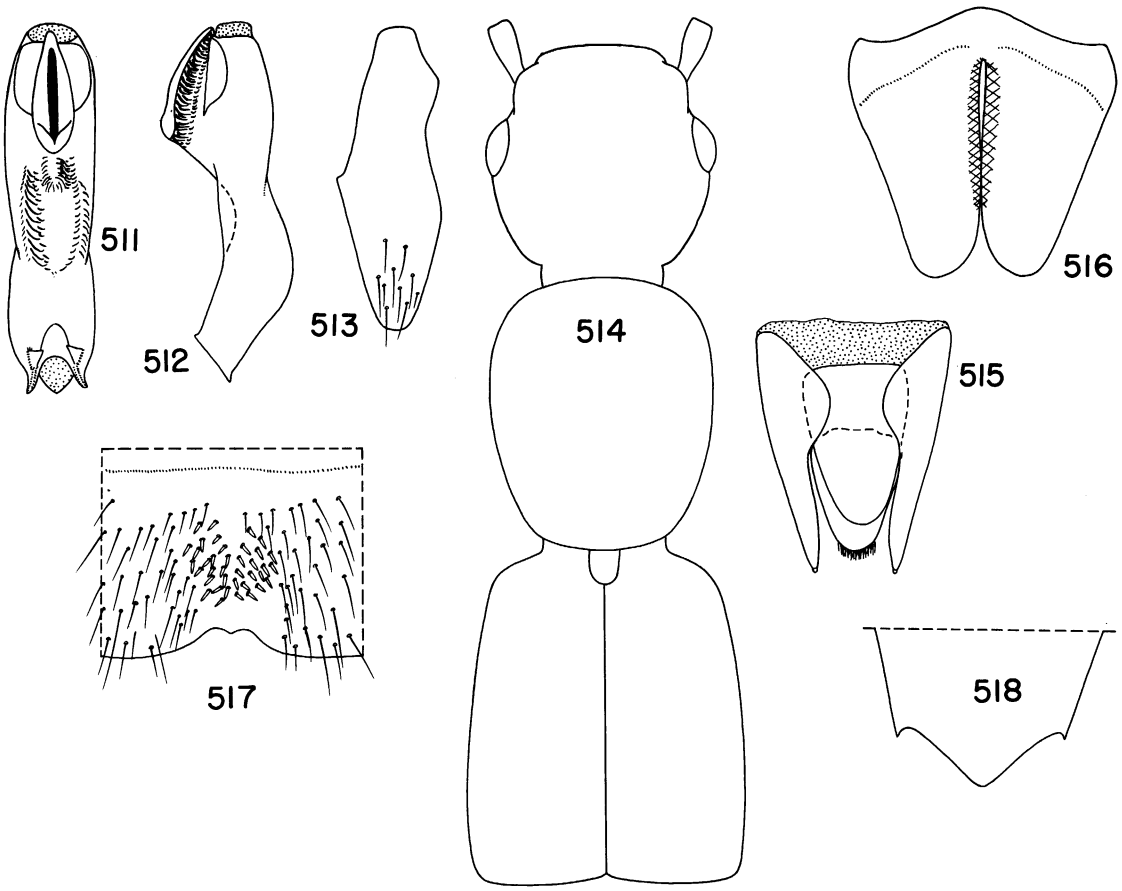
Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 514) longer than pronotum (PL). Mesosternum without median fovea, sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings present. Metathorax well developed, reaching well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII of male with broadly rounded posterior margin and of female with apically rounded trianguloid lobe on posterior margin (fig. 518).

Male. Sternites IV to VI each with broad, shallow, glabrous, median impression; impression increasingly large from IV to VI. Sternite VII (fig. 517) with broad, shallow median impression; impression with patch of short, stout, spiniform setae; micropores absent; posterior margin broadly and moderately deeply emarginate, emargination with small, acute, median lobe; inner surface without median carina. Sternum VIII (fig. 516) with deep, narrow median incision extending for about eight-tenths the length of segment; surface adjacent to incision weakly beveled; basal carina divided medially and each half slightly sinuous; base without median groove. Sternite IX (fig. 513) asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 511, 512) with short, broad



FIGS. 511–518. *Gnathymenus tungus*. 511. Aedeagus, dorsal view. 512. Aedeagus, right lateral view. 513. Sternite IX, male. 514. Head and thorax. 515. Segment IX, female, ventral view. 516. Sternum VIII, male. 517. Sternite VII, male, midapical portion. 518. Tergum VIII, female, apex.

parameres; parameres without setae. Median lobe, in dorsal view, constricted slightly at about apical third; dorsal surface with broad depression at about middle and apical portion with deep, broad U-shaped depression; apex with broad U-shaped emargination; median lobe, in lateral view, with apical half bent dorsally and with apex obliquely truncate; ventral surface broadly and shallowly impressed. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex between two apical processes formed by emargination of apex.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 515) with two genital appendages; basal genital appendage trianguloid, and with rounded apical margin; apical genital appendage not divided or incised midlongitudinally, without setae and with apical margin rounded.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: This species is known from the north central Ecuadorian province of Pichincha (fig. 51) where it was collected at 2500 and 2700 m. (8200 and 8860 ft.).

ETYMOLOGY: From the Anglo-Saxon *tunge* for tongue, referring to the tongue-like midapical lobe of the aedeagus.

MATERIAL EXAMINED: Four males, one female. ECUADOR: *Pichincha:* 18 km. E Mindo, 2500 m. (type series, CNC, AMNH); 19 km. NW Nono, 2700 m., March 1, 1976, J. M. Campbell (1 male, 1 female, CNC).

61. **Gnathymenus fiscus**, new species
Figures 6, 51, 519–525

HOLOTYPE: Male. Venezuela: [Aragua]: Rancho Grande, March 4, 1949, collected by A. M. Nadler, deposited in the American Museum of Natural History.

PARATYPES: One male with same data as holotype (AMNH).

DIAGNOSIS: Males of this species are distinguishable from those of other species by the sinuate, slightly emarginate, posterior margin of sternite VII (fig. 525), the shallow median depression bordered laterally by an elongate patch of setae of sternite VII, and the long elytra. Further, in dorsal view, the aedeagus is twisted to the right (fig. 520) and in lateral view the apex is truncate (fig. 521).

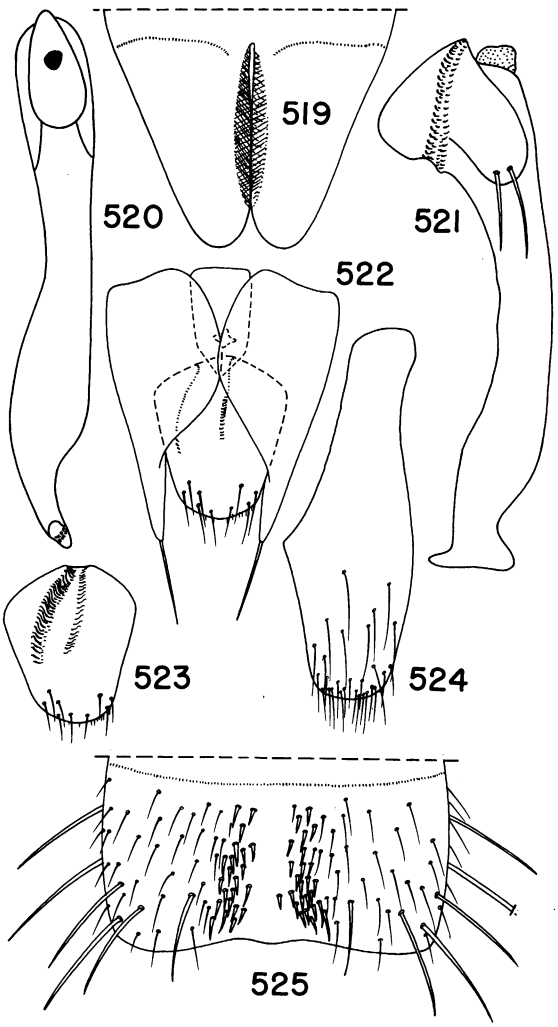
The female is particularly identifiable by the broad, oblique depression on the apical genital sclerite.

DESCRIPTION: Length 3.5 to 4.1 mm.

Color reddish and dark reddish brown. Head and pronotum reddish; elytra and abdomen dark reddish brown; abdomen darker than elytra; legs and antennae yellowish brown.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) approximately equal to postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum with small median U-shaped emargination; anterior margin with broad, obliquely truncate lobe extending over median two-thirds of anterior margin. (Mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and scattered punctation on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from hy-



FIGS. 519–525. *Gnathymenus fiscus*. 519. Sternum VIII, male. 520. Aedeagus, dorsal view. 521. Aedeagus, right lateral view. 522. Segment IX, female, ventral view. 523. Apical genital sclerite, female, ventral view. 524. Sternite IX, male. 525. Sternite VII, male.

pomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotal length (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV to VI each with small, shallow, glabrous, median depression; depressions each increasingly large and prominent toward apex of abdomen. Sternite VII (fig. 525) with moderately broad, elongate, shallow, median depression; depression bordered laterally by patch of short, small, spiniform setae; micropores absent; posterior margin with slight, sinuate emargination; inner surface without median carina. Sternum VIII (fig. 519) with deep, narrow median incision extending about eight-tenths length of segment; incision with adjacent surface slightly beveled; basal carina divided medially, separated by median incision, and with each half slightly curved; base without median groove. Sternite IX (fig. 524) slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 520, 521) with short, broad parameres; parameres with two apical setae. Median lobe, in dorsal view, with left side slightly pinched near middle, with apical quarter twisted to right; median lobe, in lateral view, bent dorsally, slightly pinched near apex; apex truncate and with dorsally and ventrally directed processes; dorsal surface with slight subapical ridge; ventral surface rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on ventral surface near apex and just anterior to ventrally directed, apical process.

Female. Sternites IV to VII unmodified. Tergum IX fused dorsally and midlongitudinally divided ventrally. Segment IX (fig. 522) with two genital appendages; basal genital appendage small, and lightly sclerotized; apical genital appendage (fig. 523) without midlongitudinal incision, with moderately broad, elongate depression extending obliquely from base toward apex; posterior margin broadly rounded and apical portion with scattered setae.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the northern Venezuelan province of Aragua (fig. 51) where it was collected at 1100 m. (3608 ft.) elevation.

ETYMOLOGY: From the Anglo-Saxon *fisc* for fish, referring to the fishtail-like shape of the aedeagal apex in lateral view.

MATERIAL EXAMINED: Four males, one female. VENEZUELA: *Aragua:* Rancho Grande (type series, AMNH); Rancho Grande, 1100 m., February 18–19, 1971, H. and A. Howden (2 males, 1 female, CNC).

62. **Gnathymenus spirus**, new species

Figures 6, 52, 526–535

HOLOTYPE: Male. [Panama]: Canal Zone: 5 mi. NW Gamboa (9° 10′ N, 79° 45′ W), 100 m. elevation, October 23, 1975, collected by T. L. Erwin, deposited in the American Museum of Natural History, courtesy of T. L. Erwin.

PARATYPES: None.

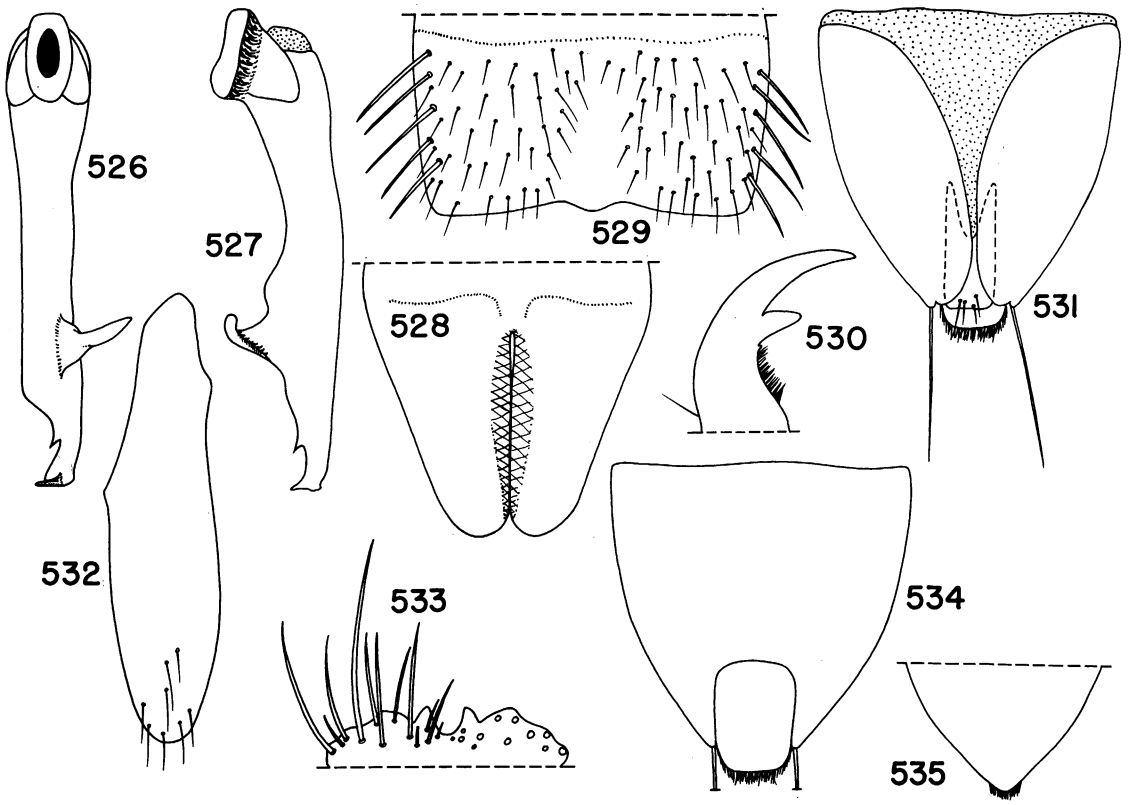
DIAGNOSIS: Males of this species can be separated from those of other species by the long, bicolored elytra and the spiniform, dorsolaterally directed process on the dorsal surface of the aedeagus (figs. 526, 527).

The form of the single genital appendage of segment IX (fig. 531) makes the female readily recognizable. Both sexes have large eyes, about one-third longer than postocular length of head.

DESCRIPTION: Length about 2.2 mm.

Color pale reddish brown and dark reddish brown. Head and pronotum pale reddish brown. Elytra bicolored, basal portion pale reddish brown, apical portion dark reddish brown, nearly black. Abdomen bicolored, reddish brown with dark reddish brown segment VII.

Head length (HL, fig. 37) slightly less than



FIGS. 526–535. *Gnathymenus spirus*. 526. Aedeagus, dorsal view. 527. Aedeagus, right lateral view. 528. Sternum VIII, male. 529. Sternite VII, male. 530. Left mandible. 531. Segment IX, female, ventral view. 532. Sternite IX, male. 533. Labrum, setae removed from right side. 534. Segment IX, dorsal view. 535. Sternum VIII, female, apex.

width (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-third longer than postocular length (PO) of head. Neck width 0.6 width of head. Submentum without mid-longitudinal carina. Labrum (fig. 533) with U-shaped median emargination; anterior margin with large denticle adjacent to median emargination and with broad lobe adjacent to median denticle. Mandible tridentate with large, triangular, median denticle and minute basal denticle (fig. 530). Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with curved row of coarse punctures on disk and scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with broadly rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 529) with broad, median, flattened, elongate, glabrous region; micropores absent; posterior margin sinuate medially and with small, apically rounded median lobe; inner surface without median carina. Sternum VIII (fig. 528) with deep, narrow, median incision extending for about three-fourths length of segment; surface adjacent to incision beveled; basal carina divided at middle, each half slightly sinuous and with median end strongly bent posteriorly; base without median groove. Sternite IX asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 526, 527) with short, broad parameres; parameres without setae. Median lobe, in dorsal view, with apical eighth strongly bent to left and with small acute apical and small subapical processes. Dorsal surface of median lobe with large, apically attenuate, laterodorsally directed process; ventral surface rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex.

Female. Sternites IV to VIII unmodified. Tergum IX (fig. 534) fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 531) with one, small apically truncate genital appendage; genital appendage with deep median emargination of base and with scattered apical setae.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: The species is known only from the Canal Zone of Panama (fig. 52) where it was collected from the forest canopy by fogging *Luehea seemannii* with pyrethrin.

ETYMOLOGY: From the Anglo-Saxon *spir* for tapering spine, referring to the spinelike process on the right side of the aedeagus.

MATERIAL EXAMINED: Holotype and one female with same data as holotype (AMNH).

63. **Gnathymenus siagonus**, new species
Figures 6, 51, 536–540

HOLOTYPE: Male. Colombia: Valle [del Cauca]: Soladito, 6700 ft. elevation, July 13, 1970, collected by J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: The long elytra, V-shaped emargination of the posterior margin of sternite VII (fig. 540), the dense patch of setae on each side of the middle of sternites VI and VII, and the complex aedeagus (figs. 536, 537) will distinguish the males of the species from all others.

DESCRIPTION: Length about 3.8 mm.

Color reddish brown; head darker than remainder of body; however, specimen apparently incompletely pigmented.

Head length (HL, figs. 37, 538) and width (HW) approximately equal. Dorsum of head with coarse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about eight-tenths of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. (Labrum and mandibles not studied.) Antennomeres 4 and 11 unmodified.

Pronotum (fig. 538) strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and scattered sparse punctation on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. (Mesothoracic spiracular peritreme not studied.) Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 538) longer than pronotal length (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed and extending well beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin broadly rounded.

Male. Sternites IV and V with shallow, glabrous median depression. Sternite VI with shallow median setose depression, surface adjacent to depression with dense patch of long setae. Sternite VII with shallow, glabrous median depression; micropores absent; depression bordered laterally by dense patch of setae; posterior margin with V-shaped, basally acute emargination; emar-

gination not bordered by ridge; inner surface without median carina. Sternum VIII with deep, narrow, median incision extending for about eight-tenths length of segment; surface adjacent to incision beveled; basal carina divided medially and with each half broadly curved; base without median groove. Sternite IX (fig. 539) asymmetrical, apical portion with setae.

Aedeagus (figs. 536, 537) with short, broad parameres; parameres with two long, prominent setae near apex. Median lobe, in dorsal view, broad and more or less parallel basally and expanded near middle; dorsal surface with low midlongitudinal carina extending from near basal foramen to about apical third and ending at moderately broad and moderately deep median depression; median lobe, in lateral view, with ventral edge strongly constricted near middle and with deep, elongate, oblique depression on apical half; apical portion with dorsally hooked median process. Collar of basal foramen entirely sclerotized. Base of median lobe with large circular pump spot; pump spot without median sclerite. Ostium on ventroapical surface.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the western Colombian province of Valle del Cauca (fig. 51) where it was collected at 6700 ft. (2042 m.) elevation.

ETYMOLOGY: From the Greek *siagon* for jaw, referring to the jawlike apex of the aedeagus.

MATERIAL EXAMINED: Holotype.

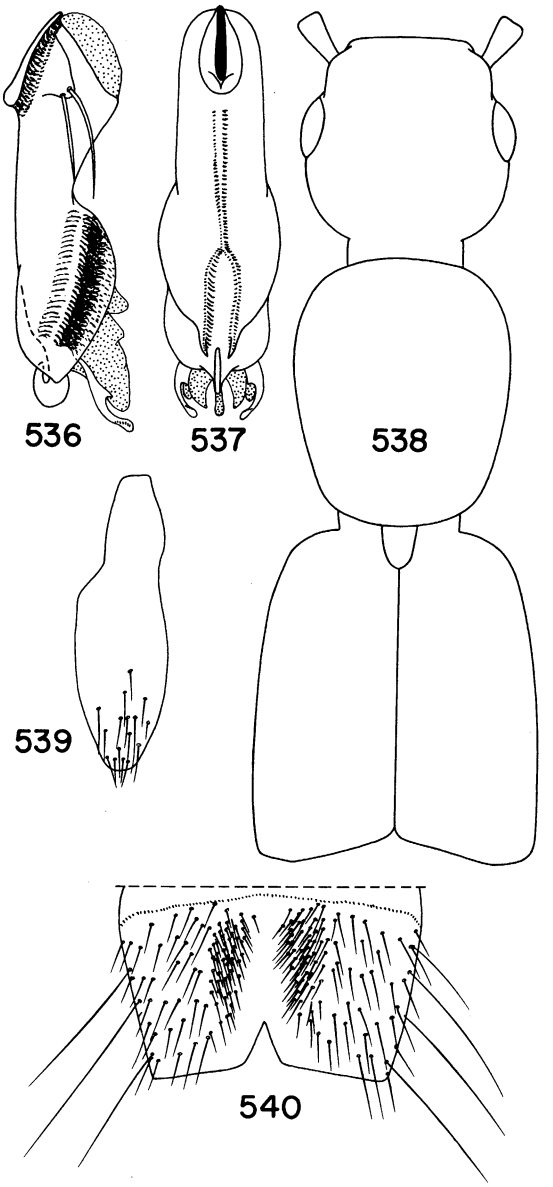
64. **Gnathymenus scoliodontus**, new species

Figures 6, 51, 541–548

HOLOTYPE: Male. Brazil: [São Paulo]: São Paulo, October 1907, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: None.

DIAGNOSIS: Males of this species can be separated from those of all other species by the long elytra, the spatulate apex (fig. 544) of the aedeagus (in dorsal view), by the truncate lobes of the labrum (fig. 541), and by the large, twisted basal denticle of the right mandible (fig. 548).



FIGS. 536–540. *Gnathymenus siagonus*. 536. Aedeagus, right lateral view. 537. Aedeagus, dorsal view. 538. Head and thorax. 539. Sternite IX, male. 540. Sternite VII, male.

DESCRIPTION: Length 3.1 mm.

Color pale reddish brown.

Head length (HL, fig. 37) less than width (HW). Dorsum of head with sparse, scattered punctation on all but broad, median strip; surface polished, without ground

sculpturing. Eye length (OL) approximately equal to postocular length (PO) of head. Neck width nearly six-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 541) with two pairs of lobes on anterior margin; median pair long and with truncate apex; lateral pair short and with arcuo-truncate apex. Mandibles (figs. 547, 548) asymmetrical and tridentate; left mandible with large median denticle and more slender, slightly twisted basal denticle; right mandible with large median denticle and larger, longer, strongly twisted basal denticle. Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest anterior to transverse midline; surface with curved row of discal punctures, and sparse, scattered punctation on lateral side; surface polished, without ground sculpturing; lateral margin gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal sclerites III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 543) with median patch of posteromedially directed setae and without median depression; micropores absent; posterior margin with broad, shallow median emargination; inner surface without median groove. Sternum VIII (fig. 542) with deep, narrow median incision extending for about two-thirds length of segment; surface beveled adjacent to incision; basal carina divided medially and with each half strongly curved; base without median groove. Sternite IX (fig. 545) asymmetrical and with scattered setae on apical portion.

Aedeagus (figs. 544, 546) with broad, short parameres; parameres with two setae near apex. Median lobe, in dorsal view, tapered from base toward apex; apex spatulate; dorsal surface with spiniform process at about apical fifth; ventral surface with large, broad ridge at about middle; median lobe sinuous in lateral view with apex bent dorsally. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on ventral surface of spatulate apex.

Female unknown.

HABITAT AND DISTRIBUTION: The species is known only from the southeastern Brazilian provinces of São Paulo and Santa Catarina (fig. 51).

ETYMOLOGY: From the Greek, *scolios,* for bent, and *odontos,* for tooth, and referring to the bent mandibular denticle.

MATERIAL EXAMINED: Two males. BRAZIL: *Santa Catarina:* Nova Teutonia, 27° 11′ S, 52° 23′ W, F. Plaumann (1 male, FMNH). *São Paulo:* São Paulo (holotype, FMNH).

65. **Gnathymenus avisoideus**, new species

Figures 1, 6, 51, 549–556

HOLOTYPE: Male. Colombia: Magd-[alena]: San Lorenzo, 41 km. S S[an]ta Marta, 7000 ft. elevation, May 2, 1973, collected by J. M. Campbell and H. Howden, deposited in the Canadian National Collection, Ottawa.

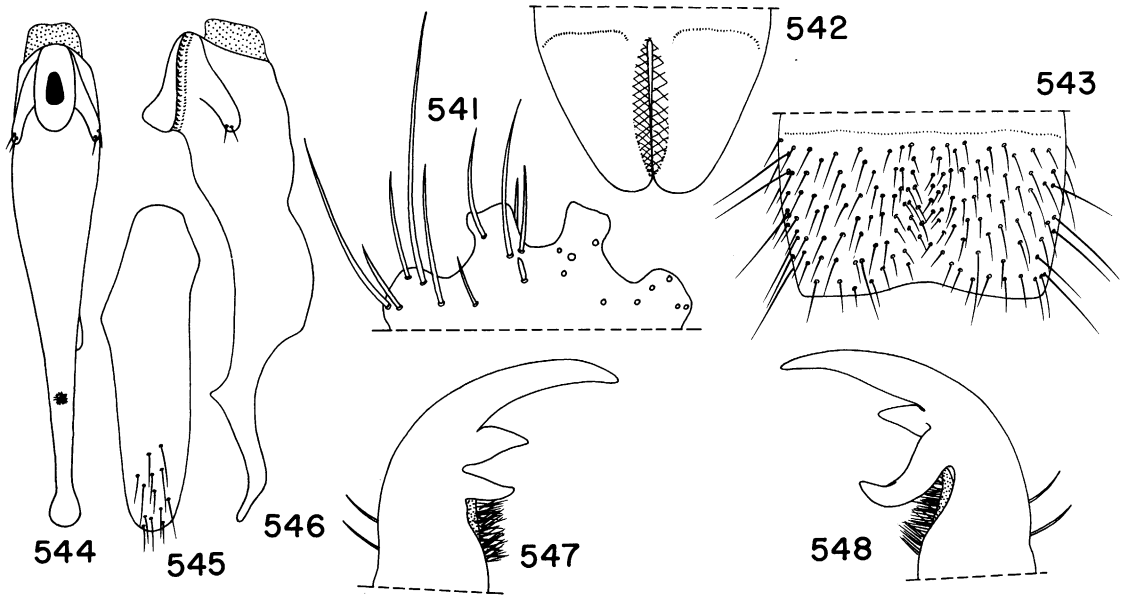
PARATYPES: Twenty-six with same data as holotype (20, CNC; 6, AMNH).

DIAGNOSIS: This species is distinguishable from all others by the black to dark reddish brown body, with dark reddish brown antennae that have the last two segments yellowish (fig. 1). In the males the posterior margin of abdominal sternite VII (fig. 554) is entire and the apical portion of the aedeagus is twisted and beaklike (figs. 550, 551). The female is distinguished by color.

DESCRIPTION: Length 2.7 to 3.5 mm.

Body color black to dark reddish brown; legs dark reddish brown; antennae dark reddish brown with segments 10 and 11 yellowish.

Head length (HL, figs. 1, 38) longer than



FIGS. 541–548. *Gnathymenus scoliodontus*. 541. Labrum, setae removed from right side. 542. Sternum VIII, male. 543. Sternite VII, male. 544. Aedeagus, dorsal view. 545. Sternite IX, male. 546. Aedeagus, right lateral view. 547. Left mandible. 548. Right mandible.

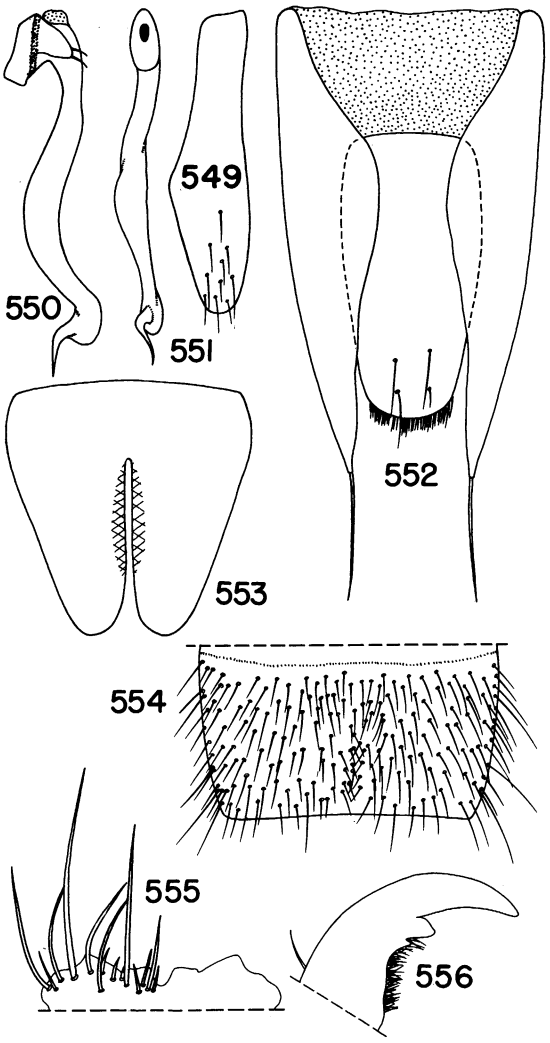
wide (HW). Dorsum of head with scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-third of postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. Labrum (fig. 555) with U-shaped median emargination; anterior margin with moderately broad lobe adjacent to median emargination and with larger, obliquely truncate lobe between median lobe and lateral margin. Mandible (fig. 556) with large, median triangular denticle and minute basal denticle. Antennomeres 4 and 11 unmodified.

Pronotum (fig. 1) strongly convex, widest at or slightly anterior to transverse midline; surface without row of discal punctures, punctation moderately dense on all but glabrous median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to hypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 1, 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture obsolete. Metathoracic wings absent. Metathorax reduced, hardly reaching beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 554) with median region slightly flattened, with small, median patch of posteromedially directed setae, and without modified setae or micropores; posterior margin entire; inner surface without median carina. Sternite VIII (fig. 553) with deep, narrow median incision extending for about seven-tenths length of segment; surface beveled adjacent to incision; basal carina absent; base without median groove. Sternite IX (fig. 549) slightly asymmetrical and with scattered setae apically.



FIGS. 549–556. *Gnathymenus avisoideus*. 549. Sternite IX, male. 550. Aedeagus, right lateral view. 551. Aedeagus, dorsal view. 552. Segment IX, female, ventral view. 553. Sternum VIII, male. 554. Sternite VII, male. 555. Labrum, setae removed from right side. 556. Left mandible.

Aedeagus (figs. 550, 551) with short, broad parameres; parameres with two apical setae. Median lobe, in dorsal view, asymmetrical, swollen near middle, apical portion twisted slightly and attenuate; median lobe, in lateral view, sinuous, swollen near middle and near apex, apical portion dorsally then posteriorly directed, attenuate and beak-shaped; dorsal surface rounded, ventral surface slightly flattened. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium near apex beneath beak-shaped apical portion.

Female. Sternites IV to VIII unmodified. Tergum IX fused dorsally and midlongitudinally divided ventrally. Segment IX (fig. 552) with one genital appendage; genital appendage elongate, apical margin rounded and with scattered setae on apical region.

Spermathecal capsule not sclerotized.

HABITAT AND DISTRIBUTION: The species is known only from the northern Colombian province of Magdalena (fig. 51) where it was collected at 7000 ft. (2134 m.) in the Sierra Nevada de Santa Marta.

ETYMOLOGY: From the Latin *avis* for bird and the Latin suffix *-oideus* for likeness, referring to the birdlike configuration of the aedeagal apex.

MATERIAL EXAMINED: Holotype and 26 paratypes.

66. **Gnathymenus bobelus**, new species
Figures 6, 51, 557–565

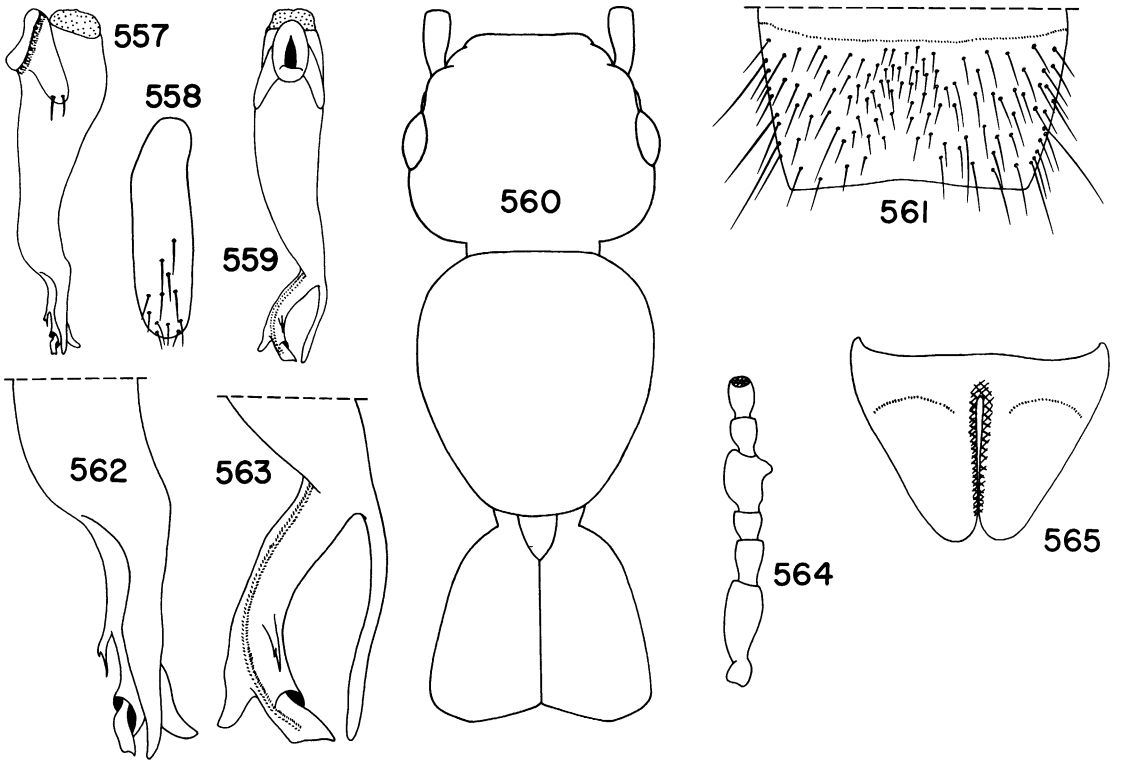
HOLOTYPE: Male. Brazil: [Paraná]: Ribeira,[5] 900 m., February 15, 1970, J. M. and B. A. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: One male with same data as holotype (AMNH).

DIAGNOSIS: Males of this species are separable from those of all others by the modified fourth antennomere (fig. 564). Of additional help are the cordiform pronotum (fig. 560) and the complex apical quarter of the aedeagus (figs. 562, 563).

DESCRIPTION: Length 2.7 mm.

[5] The label reads "PR" and "Riberao." I assume PR refers to Paraná since the collectors, J. M. and B. A. Campbell, were in that province near Curitiba eight days earlier where they collected *Stenopholea bifurca* and since on the locality label of *S. bifurca* the provincial name is also given as "PR." However, I was unable to find a "Riberao" anywhere in Brazil. At the border of Paraná and São Paulo is a Ribeira which may be the locality where the specimens were collected.



FIGS. 557–565. *Gnathymenus bobelus*. 557. *Aedeagus*, lateral view. 558. Sternite IX, male. 559. Aedeagus, dorsal view. 560. Head and thorax. 561. Sternite VII, male. 562. Aedeagus, right lateral side, apical third, enlarged. 563. Aedeagus, dorsal view, apical third, enlarged. 564. Antennomeres 1–6. 565. Sternum VIII, male.

Color reddish brown. Head and pronotum pale reddish brown; elytra reddish brown; abdomen bicolored, segments III to VI pale reddish brown, segments VII to X darker reddish brown; legs and antennae yellowish brown.

Head length (HL, figs. 38, 560) less than width (HW). Dorsum of head with scattered, sparse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about six-tenths of postocular length (PO) of head. Neck width about half width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad, truncate lobe. (Mandibles not studied.) Antennomere 4 enlarged and with medially directed, apically round process near apex of article (fig. 564); article 11 unmodified.

Pronotum (fig. 560) strongly convex, cordiform and widest near anterior margin; surface with row of discal punctures and with scattered, sparse punctation on lateral side; surface polished, without ground sculpturing; lateral margin gradually curved and strongly convergent basally. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 560) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly reaching beyond end of me-

socoxae. Metasternum without median tubercle near apical margin.

Abdominal segment III to VII each with two pairs of laterotergites. Tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV and V unmodified. Sternite VI with moderately dense median patch of moderately long setae. Sternite VII (fig. 561) with small median patch of slightly shorter setae; micropores absent; median region without depression; posterior margin with slight, broad, median emargination; inner surface without median carina. Sternum VIII (fig. 565) with deep, narrow, median incision extending for about three-fourths the length of segment; surface beveled adjacent to incision; basal carina divided medially and with each half short and curved; base without median groove. Sternite IX (fig. 558) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 557, 559, 562, 563) with short, broad parameres; parameres with two setae. Median lobe, in dorsal view, gradually tapered from base to about apical quarter (figs. 562, 563) then divided into two main processes; right process slender in dorsal view and broader in lateral view; left process thicker and with two smaller subapical processes, one dorsal and one ventrolateral. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium at apex of left apical process of median lobe (fig. 563).

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the southeastern Brazilian province of Paraná (fig. 51) where it was collected at 900 m. (2953 ft.).

ETYMOLOGY: From the Middle English, *bobel,* for bubble, referring to the enlarged fourth antennomere.

MATERIAL EXAMINED: Holotype and one paratype.

67. **Gnathymenus prolixus**, new species
Figures 6, 51, 566–572

HOLOTYPE: Male. Colombia: [Valle del Cauca]: Anchicaya, 7000 ft., July 23, 1970, collected by J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: Males of this species may be separated from all others by the oval elevation covered with short, stout spiniform setae on sternite VI (figs. 570, 571), the broad emargination of the apical seventh of sternite VIII (fig. 568), the configuration of the aedeagus (figs. 566, 567), and the elongate last antennomere.

DESCRIPTION: Length about 3 mm.

Color reddish brown; elytra bicolored reddish brown with broad darker reddish brown strip across central portion. Legs and antennae yellowish brown.

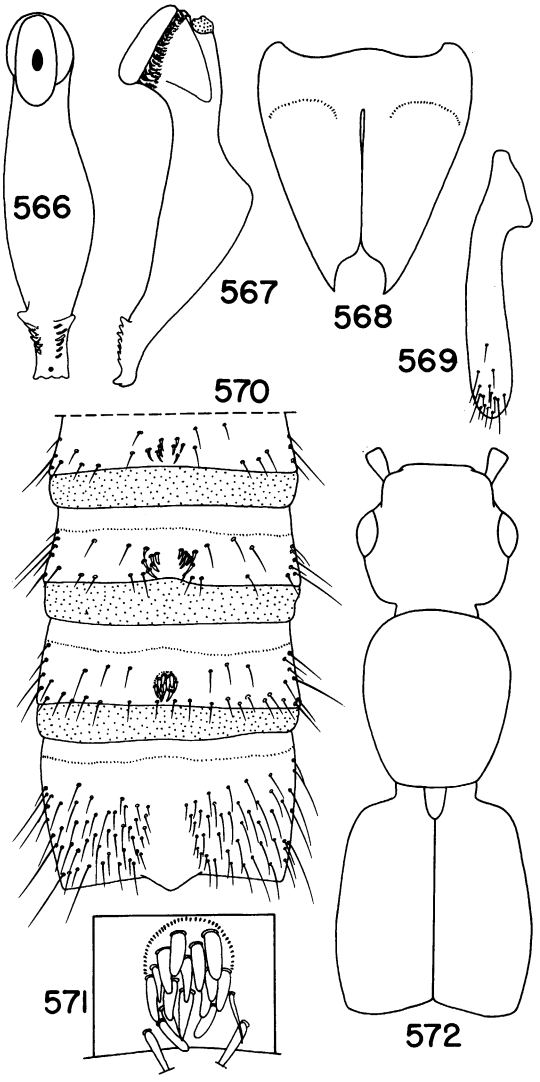
Head length (HL, figs. 37, 572) and width (HW) approximately equal. Dorsum of head with sparse, scattered punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) slightly longer than postocular length (PO) of head. Neck width 0.6 width of head. Submentum without midlongitudinal carina. (Labrum and mandibles not studied.) Antennomere 4 unmodified; antennomere 11 elongate, slightly longer than eighth, ninth, and tenth antennomeres combined.

Pronotum (fig. 572) strongly convex, widest anterior to transverse midline; surface with curved row of punctures on disk and with scattered punctures on lateral side; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 572) longer than pronotal length (PL). Mesosternum without median fovea; pleurosternal ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with broadly rounded posterior margin.

Male. Sternite IV (fig. 570) with small median cluster of short, stout setae. Sternite V



FIGS. 566–572. *Gnathymenus prolixus*. 566. Aedeagus, dorsal view. 567. Aedeagus, right lateral view. 568. Sternum VIII, male. 569. Sternite IX, male. 570. Sternites IV–VII, male. 571. Sternite VI, median portion, enlarged, male. 572. Head and thorax.

(fig. 570) with patch of short, stout, spiniform setae on each side of median glabrous spot. Sternite VI (fig. 570) with oval median elevation covered with short, stout, spiniform setae (fig. 571). Sternite VII (fig. 570) with broad, shallow glabrous median depression; depression bordered laterally by setae; posterior margin with median, apically rounded, trianguloid lobe; inner surface without median carinae. Sternum VIII (fig. 568) with broad, U-shaped median emargination of posterior margin; emargination about one-seventh length of segment; segment with narrow, median incision extending from base of apical emargination for slightly more than four-sevenths of segment; emargination and incision combined extending for about three-fourths length of segment; surface adjacent to median incision obsoletely beveled; base without median groove. Sternite IX (fig. 569) strongly asymmetrical and with scattered setae apically.

Aedeagus (figs. 566, 567) with short, broad parameres; parameres without setae. Median lobe, in dorsal view, slightly constricted near base then slightly expanded before tapering to trapezoidal apical portion; trapezoidal apical portion with laterally directed process on basal angle, with row of transverse denticles along lateral margin, and with laterodorsally directed process on apical angle; apex sinuotruncate; median lobe, in lateral view, strongly swollen near middle on ventral surface; ventral surface with broad, shallow depression on apical half, depression with low midlongitudinal ridge. Collar of basal foramen entirely sclerotized. Base of median lobe with circular pump spot; pump spot without median sclerite. Ostium on dorsal surface near apex.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the western Colombian province of Valle del Cauca (fig. 51) where it was collected at 7000 ft. (2134 m.) elevation.

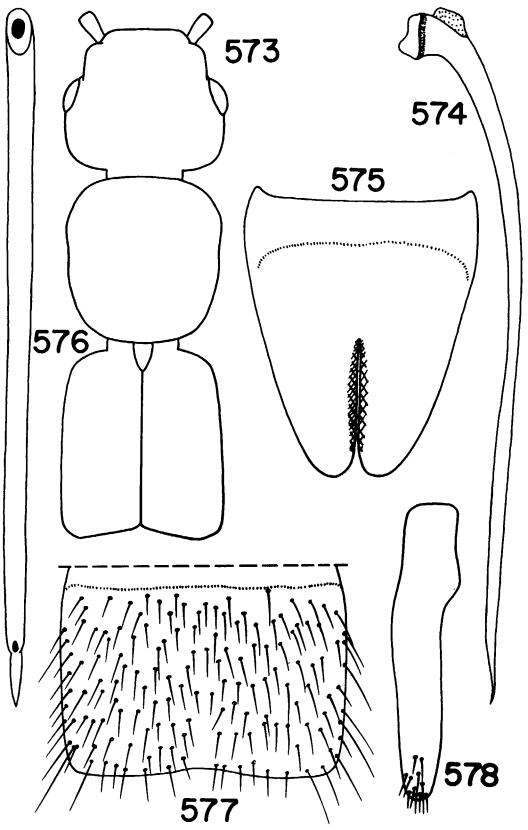
ETYMOLOGY: From the Latin *prolixus* for stretched out or long, referring to the elongate last antennomere.

MATERIAL EXAMINED: Holotype.

68. **Gnathymenus plancus**, new species

Figures 6, 51, 573–578

HOLOTYPE: Male. Brazil: Federal District: 7 km. NE Brasilia, December 9–10, 1969, collected by J. M. and B. A. Campbell, deposited in the Canadian National Collection, Ottawa.



FIGS. 573–578. *Gnathymenus plancus*. 573. Head and thorax. 574. Aedeagus, right lateral view. 575. Sternum VIII, male. 576. Aedeagus, dorsal view. 577. Sternite VII, male. 578. Sternite IX, male.

PARATYPES: None.

DIAGNOSIS: The males of this species are separable from those of other species by the dorsoventrally depressed body, the long elytra, the constriction (fig. 573) near the middle of the pronotal lateral margin, the long thin aedeagus and the absence of parameres (figs. 574, 576).

DESCRIPTION: Length 5 mm.

Color reddish brown. Head and pronotum reddish brown; elytra pale reddish brown; abdomen dark reddish brown; legs and antennae pale reddish brown.

Head length (HL, figs. 37, 573) less than width (HW). Dorsum of head with scattered, sparse punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about six-tenths of postocular length (PO) of head. Neck width one-half width of head. Submentum without midlongitudinal carina. Labrum with shallow median emargination and with two apically rounded denticles, one adjacent to median emargination and second near middle. (Mandible not studied.) Antennomeres 4 and 11 unmodified.

Pronotum weakly convex, dorsoventrally depressed, widest anterior to transverse midline; surface with scattered, sparse punctation on all but median strip; surface polished, without ground sculpturing; lateral margins (fig. 573) constricted just anterior to transverse midline and convergent basally. Mesothoracic spiracular peritreme narrowly separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 573) longer than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not studied.) Metathoracic wings present. Metathorax well developed, extending well beyond posterior end of mesocoxae. Metasternum without median tubercle near apical margin.

Abdominal segments III to VII each with two pairs of laterotergites. Tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin rounded.

Male. Sternites IV to VI unmodified. Sternite VII (fig. 577) without median depression, modified setae, or micropores; posterior margin with slight median emargination; inner surface without median carina. Sternite VIII (fig. 575) with deep, narrow median incision extending for about one-half the length of segment; surface beveled adjacent to incision; basal carina entire, not separated medially, and broadly curved; base without median groove. Sternite IX (fig. 578) asymmetrical; apical portion with scattered setae.

Aedeagus without parameres (fig. 574). Median lobe, in dorsal view (fig. 576), symmetrical, slender, nearly parallel-sided to near apex then slightly constricted and tapered to acute apex; median lobe, in lateral

view (fig. 574), thin and tapered to acute apex; dorsal and ventral surfaces slightly rounded. Collar of basal foramen entirely sclerotized. Base of median lobe with large, circular pump spot; pump spot without median sclerite. Ostium on dorsal surface near apex.

Female unknown.

HABITAT AND DISTRIBUTION: This species is known from the eastern Brazilian province of Paraná and the Federal District (fig. 51). Although I have no collecting data, the depressed body suggests a subcortical habitat.

ETYMOLOGY: From the Latin *planca,* for board or slab, referring to the flattened body.

MATERIAL EXAMINED: Two males. BRAZIL: *Federal district:* 7 km. NE Brasilia (holotype, CNC). *Paraná:* Guarapuava, November 1959, M. Schneider (1 male, CNC).

STENOPHOLEA HERMAN
Figures 4, 5, 7–9, 579–689

Stenopholea Herman, 1969, p. 2.

TYPE SPECIES: *Stenopholea reddelli* Herman, by original designation.

DIAGNOSIS: Males of this genus can be recognized by the medially divided basal piece (figs. 595, 665) and articulated sclerite (figs. 595, 607, 657) of the aedeagus, and the middorsally fused tergum IX (fig. 653). In the New World *Acaratopus* has an aedeagal flagellum (fig. 40). *Stenopholea* does not. *Gnathymenus* has compressed parameres that are appressed to the base of the median lobe (fig. 567), whereas *Stenopholea* has long, slender parameres (fig. 595) that are separated from the median lobe for most of their length. Among the Old World genera only *Leptobium* and *Scotonomus* have the articulated sclerite of the aedeagus (figs. 18, 19). In *Leptobium* the articulated sclerite has an ostial operculum (fig. 23) but in *Stenopholea* it does not. *Scotonomus* lacks the aedeagal basal piece (fig. 19), has setae on the medial side of the parameres, an elongate tergum X that nearly divided the dorsal portion of segment IX, and eyes reduced to one facet. *Stenopholea* has setae only at the apex of the parameres and the eyes are either absent or composed of more than one facet.

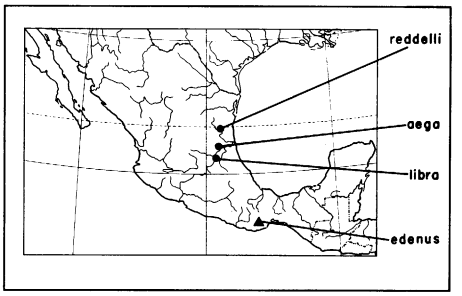


FIG. 579. Map of Mexico showing distribution of *Acaratopus* (triangle) and *Stenopholea* (dots).

Females of *Stenopholea* can be identified only by association with the male.

DESCRIPTION: Length 2.1 to 5.0 mm. Body subcylindrical, elongate, and slender (fig. 581). Head and pronotum polished or sculptured. Labral denticulation variable. Mesothoracic spiracular peritreme strongly sclerotized and fused anteriorly to furcasternum (figs. 584, 688). Mesospiracles small. Mesosternal process without serrate carina. Abdominal segments III to VII with laterotergites. Sternum VIII of male with moderately deep, moderately wide median incision (fig. 599); median incision less than half as long as segment. Tergum IX (fig. 653) with base of dorsal surface midlongitudinally fused; ventral surface midlongitudinally separated in male and female. Sternum IX of male broad and symmetrical to slightly asymmetrical.

Aedeagus (figs. 595, 607, 630, 644, 684) with long, slender parameres; parameres separated from median lobe for most of length and with apical setae. Median lobe with basal piece and articulated sclerite, but without flagellum. Basal piece medially divided (fig. 595) and each part adjacent to lateral side of basal foramen. Basal foramen bordered anteriorly by thick, anteriorly rounded sclerite and posteriorly by elongate, flattened sclerite. Articulated sclerite variously modified and without ostial operculum (see fig. 23). Ostium as wide and high as median lobe.

DISCUSSION: The articulated sclerite of the aedeagus of *S. sarma* and *S. hadra* are more modified than in the other species of *Steno-*

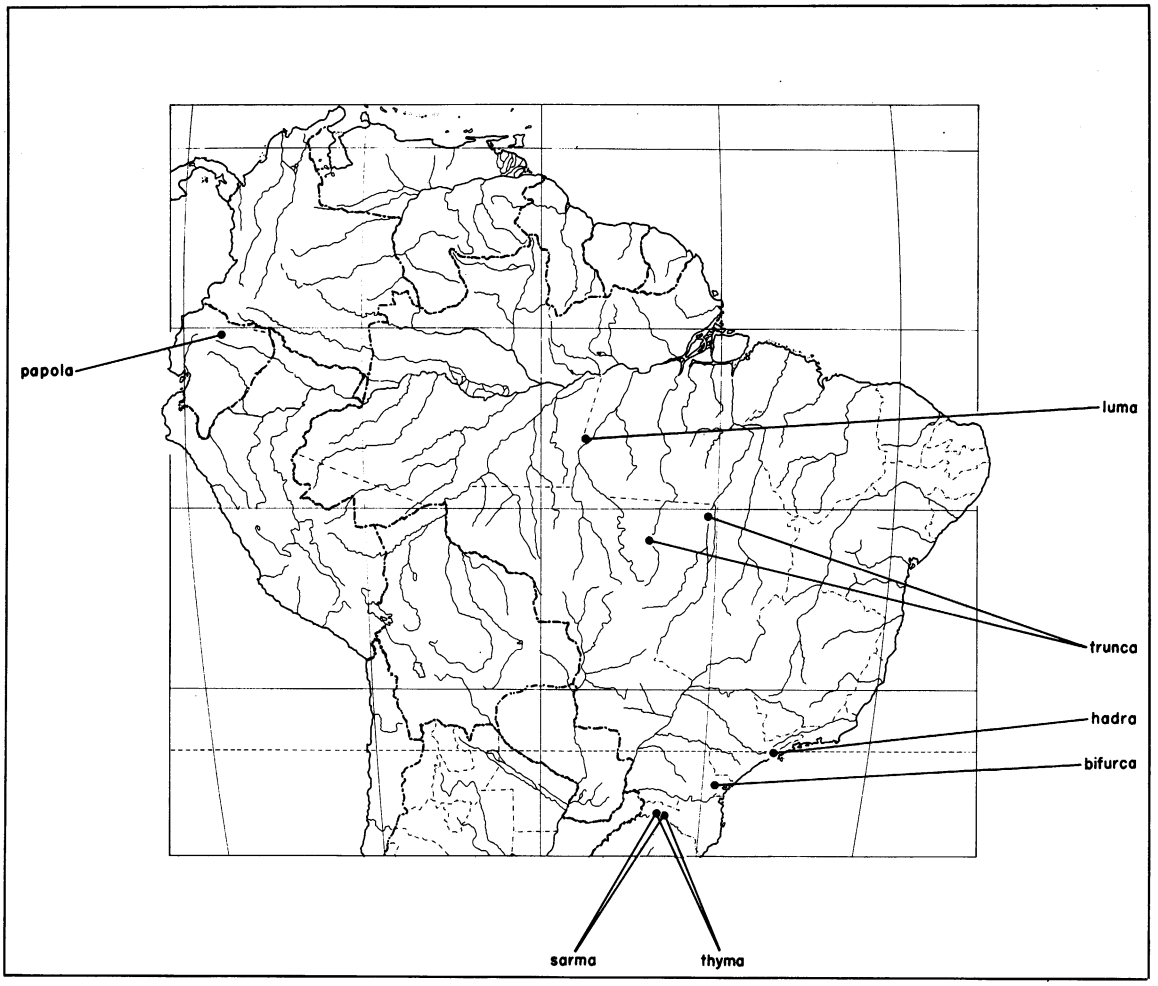


FIG. 580. Map of northern South America showing distribution of *Stenopholea*.

pholea. For details see the discussion sections that accompany the descriptions of these species.

The male of the type species, *S. reddelli*, is unknown, but I assume it will have the aedeagal features characteristic of the group.

69. *Stenopholea reddelli* Herman
Figures 5, 579, 581–594

Stenopholea reddelli Herman, 1969, p. 4 (Type locality: Mexico: Tamaulipas, Rancho del Cielo, Mine Cave, June 3, 1967, J. Reddell and R. W. Mitchell. Holotype, female, in the American Museum of Natural History, examined.)

DIAGNOSIS: The absence of eyes, short elytra, strongly angulate anterior pronotal angle (figs. 581, 587), median tubercle near the apical margin of the metasternum (fig. 588), and the granulate ground sculpturing will distinguish this species from the others.

DESCRIPTION: Length 5 mm.

Color yellowish brown.

Head length (HL, figs. 38, 581) and width (HW) approximately equal. Dorsum of head with moderately dense punctation on all but median strip; surface shining dully, with dense granulate ground sculpturing. Eyes absent (fig. 582). Neck width about six-tenths

width of head. Submentum without mid-longitudinal carina. Labrum (fig. 594) with V-shaped median emargination; anterior margin with small, acute denticle between median emargination and lateral margin. Mandibles (figs. 585, 586) asymmetrical; left mandible with apically bifurcate denticle near middle; right mandible with one apically bifurcate denticle and one small denticle closely appressed to mandible, both near middle. Antennomeres (fig. 589) 4 and 11 unmodified.

Pronotum (fig. 581) strongly convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface shining dully and with dense granulate ground sculpturing; lateral margins gradually curved and convergent toward base; anterior angles strongly angulate (fig. 587). Mesothoracic spiracular peritreme (fig. 584) fused laterally to prohypomeron. Profemur with enlarged, triangular antennal cleaning process near middle (fig. 593).

Elytra (EL, figs. 38, 581, 590) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum with median, spiniform tubercle between mesocoxae and near apical margin (fig. 588).

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Unknown.

Female. Sternites III to VIII unmodified. Segment IX (fig. 591) with one genital appendage; genital appendage trapezoidal, with broad V-shaped incision of anterior margin and with scattered setae on apical portion.

Spermathecal capsule sclerotized, and strongly bent; spermathecal gland membranous; spermathecal duct near duct of spermathecal gland (fig. 592).

HABITAT AND DISTRIBUTION: This species is known only from the Mexican state of Tamaulipas (fig. 579) where it was collected in a cave.

DISCUSSION: The male of this species is unknown but may have the same modified

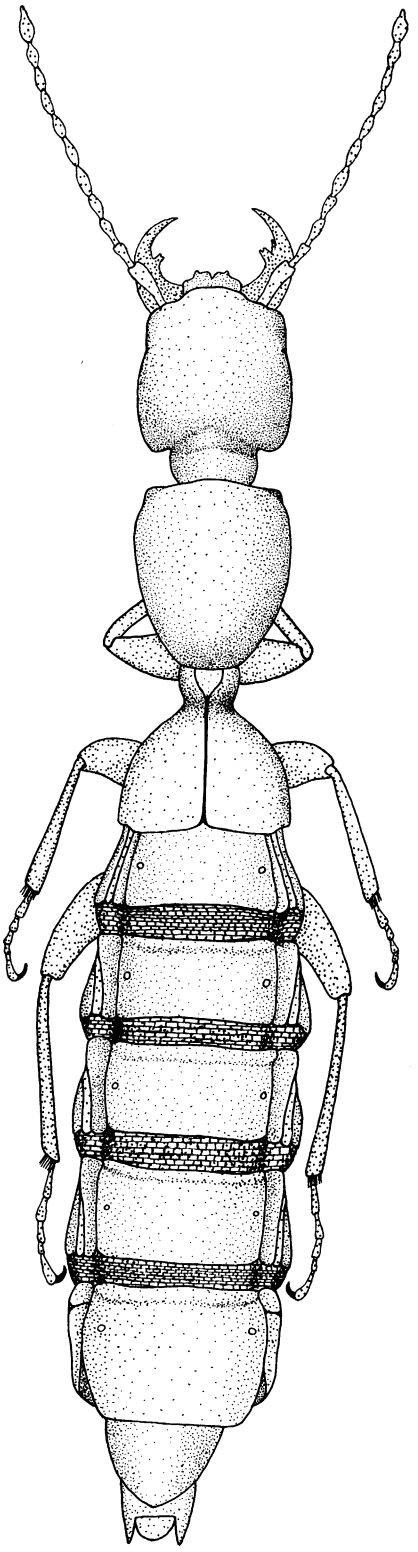
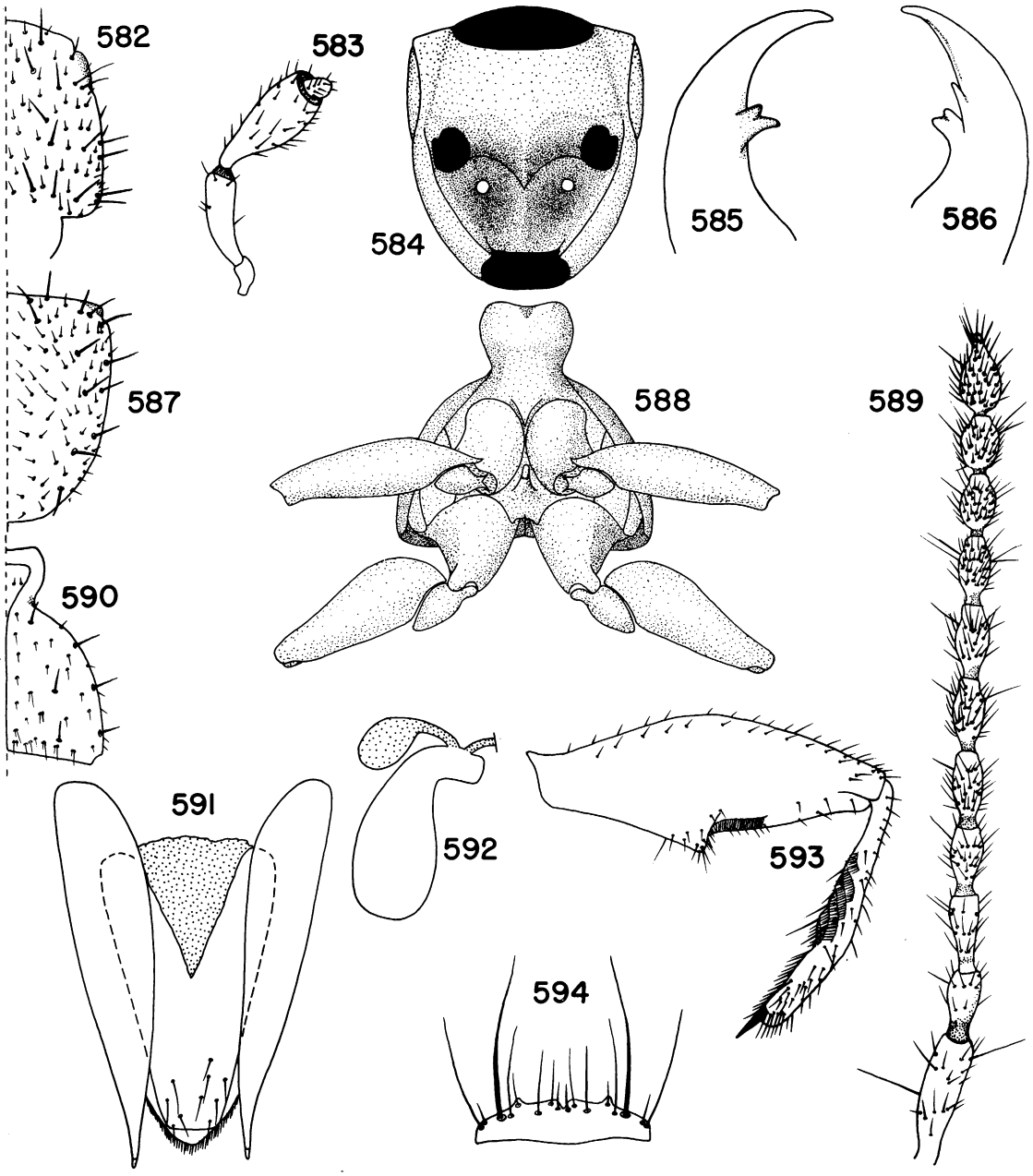


FIG. 581. *Stenopholea reddelli.*



FIGS. 582–594. *Stenopholea reddelli*. 582. Head, right half. 583. Maxillary palpus. 584. Prothorax, ventral view. 585. Left mandible. 586. Right mandible. 587. Pronotum, right half. 588. Pterothorax, ventral view. 589. Antenna. 590. Right elytron. 591. Segment IX, female, ventral view. 592. Spermatheca. 593. Profemur and protibia. 594. Labrum.

profemur (fig. 593), anterior pronotal angle (figs. 581, 587), and midventral metathoracic tubercle (fig. 588) that are found on the female. The strongly angulate anterior pro-

notal angle is unique in the subtribe; in all other species the angle is rounded.

When described (Herman, 1969), I suggested that *reddelli* was "the first likely troglobitic staphylinid described from the New World . . . ." Since the species has not been found subsequently in any Mexican caves, despite numerous attempts by James Reddell and associates, and since there are two blind, wingless, depigmented species related to *reddelli* but found in leaf litter, the suggestion that it is a troglobitic is uncorroborated. *Stenopholea reddelli* may be only an accidental cave occupant and may actually occur in ground litter outside of caves.

MATERIAL EXAMINED: Holotype.

70. **Stenopholea aega**, new species
Figures 5, 579, 595–606

HOLOTYPE: Male. Mexico: San Luis Potosi: 51 mi. NNW Ciudad de Valles, El Salto, July 6, 1969, tropical deciduous forest leaf litter, collected by S. and J. Peck, deposited in the American Museum of Natural History.

PARATYPES: Two males with same data as holotype (2 males, AMNH).

DIAGNOSIS: The absence of eyes, short elytra, absence of ground sculpturing, cariniform median metasternal tubercle, enlarged profemoral antennal cleaner (fig. 605), small size, broad labral denticle (fig. 600), and aedeagal (figs. 595–598) characters will separate the males of this species. The females are separable by some of the above characters and features of the spermatheca (fig. 604) and genital appendages of segment IX (fig. 606).

DESCRIPTION: Length 2.2 to 2.6 mm.

Color pale reddish brown.

Head length (HL, fig. 38) slightly greater than width (HW). Dorsum of head with moderately dense punctation on all but narrow median strip; surface polished, without ground sculpturing. Eyes absent. Neck width about two-thirds width of head. Submentum without midlongitudinal carina. Labrum (fig. 600) with median V-shaped emargination; anterior margin with broad, apically truncate lobe. Left mandible (fig. 602) bidentate, with moderately large median denticle, right mandible (fig. 603) tridentate, median denticle evident as minute swelling; basal denticle moderately large. Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest approximately at middle; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur with enlarged, triangular antennal cleaning process (fig. 605).

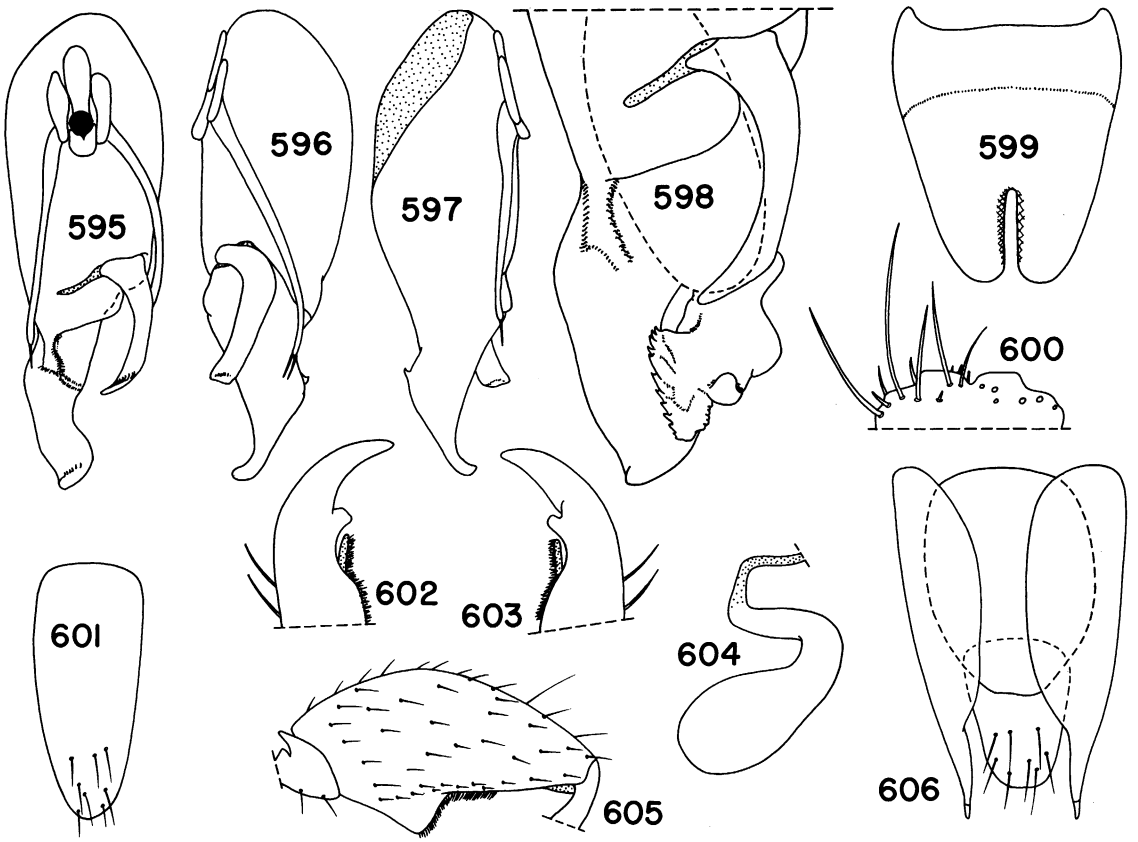
Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum with median carina near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII without median glabrous spot, median depression, micropores, or spiniform setae; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 599) with moderately deep, moderately wide median incision extending for slightly more than one-third length of segment; surface beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 601) slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 595–598) with slender parameres. Median lobe broad with apical third asymmetrical and tapered to rounded, dorsally curved apex; lateral margins of apical third without distinct processes; dorsal edge of ostium with apically rounded, medially curved articulated sclerite (figs. 595, 596). Base of median lobe with large pump spot; pump spot without median sclerite. Ostium as large as width of median lobe and with many sclerites and processes of complex armature of internal sac exposed at opening (fig. 598).

Female. Sternites III to VIII unmodified. Segment IX (fig. 606) with two genital ap-



FIGS. 595–606. *Stenopholea aega*. 595. Aedeagus, dorsal view, exposed armature of internal sac omitted. 596. Aedeagus, right lateral view. 597. Aedeagus, left lateral view. 598. Aedeagus, dorsal view, apical half enlarged, exposed armature of internal sac included. 599. Sternum VIII, male. 600. Labrum, setae removed from right side. 601. Sternite IX, male. 602. Left mandible. 603. Right mandible. 604. Spermatheca. 605. Profemur. 606. Segment IX, female, ventral view.

pendages; basal appendage irregularly ovoidal, thinly sclerotized and with sinuous posterior margin; apical appendage trapezoidal and with scattered setae on apical portion.

Spermatheca (fig. 604) sclerotized; distal portion elongate and bent; spermathecal gland absent.

HABITAT AND DISTRIBUTION: This species is known only from the Mexican state of San Luis Potosi (fig. 579) where it was collected from leaf litter in a tropical deciduous forest.

ETYMOLOGY: From the Anglo-Saxon *aeg*, for egg, referring to the egg-shaped sclerite of the internal sac.

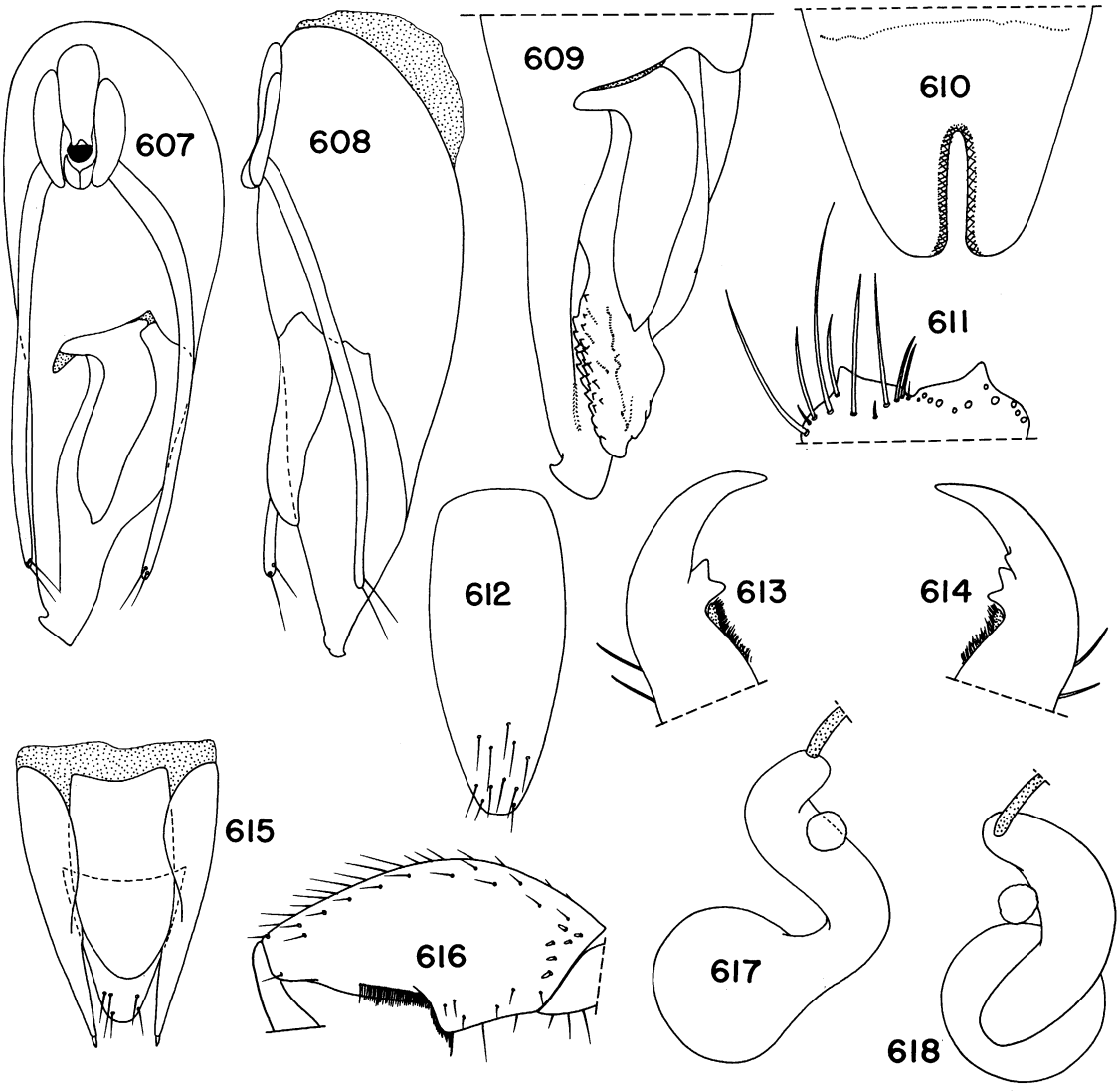
MATERIAL EXAMINED: Holotype, two paratypes, and eight females (AMNH).

71. **Stenopholea libra**, new species
Figures 5, 579, 607–618

HOLOTYPE: Male, Mexico: Queretaro: 18 mi. E Landa de Matamoros, 5300 ft. elevation, July 14, 1969, pine and oak leaf litter, collected by S. and J. Peck, deposited in the American Museum of Natural History.

PARATYPES: Eight males with same data as holotype (6 males, AMNH; 1 male, CNC; 1 male, FMNH).

DIAGNOSIS: The absence of eyes, short elytra, median subapical cariniform tubercle of the metasternum, the profemoral process (fig. 616) and the details and general configuration of the aedeagus (figs. 607–609) per-



FIGS. 607–618. *Stenopholea libra*. 607. Aedeagus, dorsal view, exposed armature of internal sac omitted. 608. Aedeagus, right lateral view. 609. Aedeagus, dorsal view, apical half, enlarged, exposed armature of internal sac included. 610. Sternum VIII, male. 611. Labrum, setae omitted from right side. 612. Sternite IX, male. 613. Left mandible. 614. Right mandible. 615. Segment IX, female, ventral view. 616. Profemur. 617. Spermatheca, view of side. 618. Spermatheca, view from top.

mits separation of the males of this species. Females can be separated as indicated in the Key. In contrast to *Stenopholea reddelli, libra* has a polished head and pronotum, and is smaller.

DESCRIPTION: Length 2.6 to 3.1 mm.

Color pale reddish brown.

Head length (HL, fig. 38) slightly greater than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eyes absent. Neck width about two-thirds width of head. Submentum without median carina. Labrum (fig. 611) with U-shaped, median emargination; anterior margin with acute denticle between median

emargination and lateral margin. Mandibles asymmetrical; left mandible (fig. 613) with three denticles, two denticles on bifurcate median process; right mandible (fig. 614) with three denticles, one small denticle and two larger ones on bifurcate process. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest anterior to transverse midline; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins gradually curved and converging toward base. Mesothoracic spiracular peritreme fused laterally to prohypomeron. Profemur with enlarged antennal cleaning process (fig. 616).

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal and metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum with cariniform tubercle near apical margin.

Abdominal tergite VII without dermal fringe of posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII with median depression, median glabrous spot, spiniform setae, or micropores; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 610) with moderately deep, moderately wide median incision extending for about four-tenths length of segment; surface beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 612) slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 607–609) with slender parameres. Median lobe broad basally and gradually tapered apically, and asymmetrical; apical margin acute; left lateral margin of apical third broadly curved to subapical hook; right lateral margin sinuate; dorsal edge of ostium with long, tapering, apically acute articulated sclerite. Base of ventral surface of median lobe with large pump spot; pump spot without median sclerite. Ostium as large as dorsoapical width of median lobe and with sclerites and processes of armature of internal sac exposed at opening (fig. 609).

Female. Sternites III to VIII unmodified. Segment IX (fig. 615) with two genital sclerites; basal appendage slightly emarginate basally and without setae; apical appendage trianguloid, apically rounded, and with scattered setae on apical portion.

Spermatheca sclerotized with bulbous distal end; proximal portion with two bends; spermathecal gland closely associated with spermathecal capsule and near spermathecal duct (figs. 617, 618).

HABITAT AND DISTRIBUTION: This species is known only from the Mexican state of Queretaro (fig. 579) where it was collected at 5300 ft. elevation (1615 m.) from pine and oak leaf litter.

ETYMOLOGY: From the Latin, *libra*, for balance.

MATERIAL EXAMINED: Holotype, eight paratypes, and 20 females (holotype, 6 paratypes, 20 females, AMNH; 1 paratype, CNC; 1 paratype, FMNH).

72. **Stenopholea luma**, new species
Figures 5, 580, 619–629

HOLOTYPE: Male. Brazil: Para: Jacareacanga, January 1970, at light, collected by F. R. Barbosa, deposited in the American Museum of Natural History.

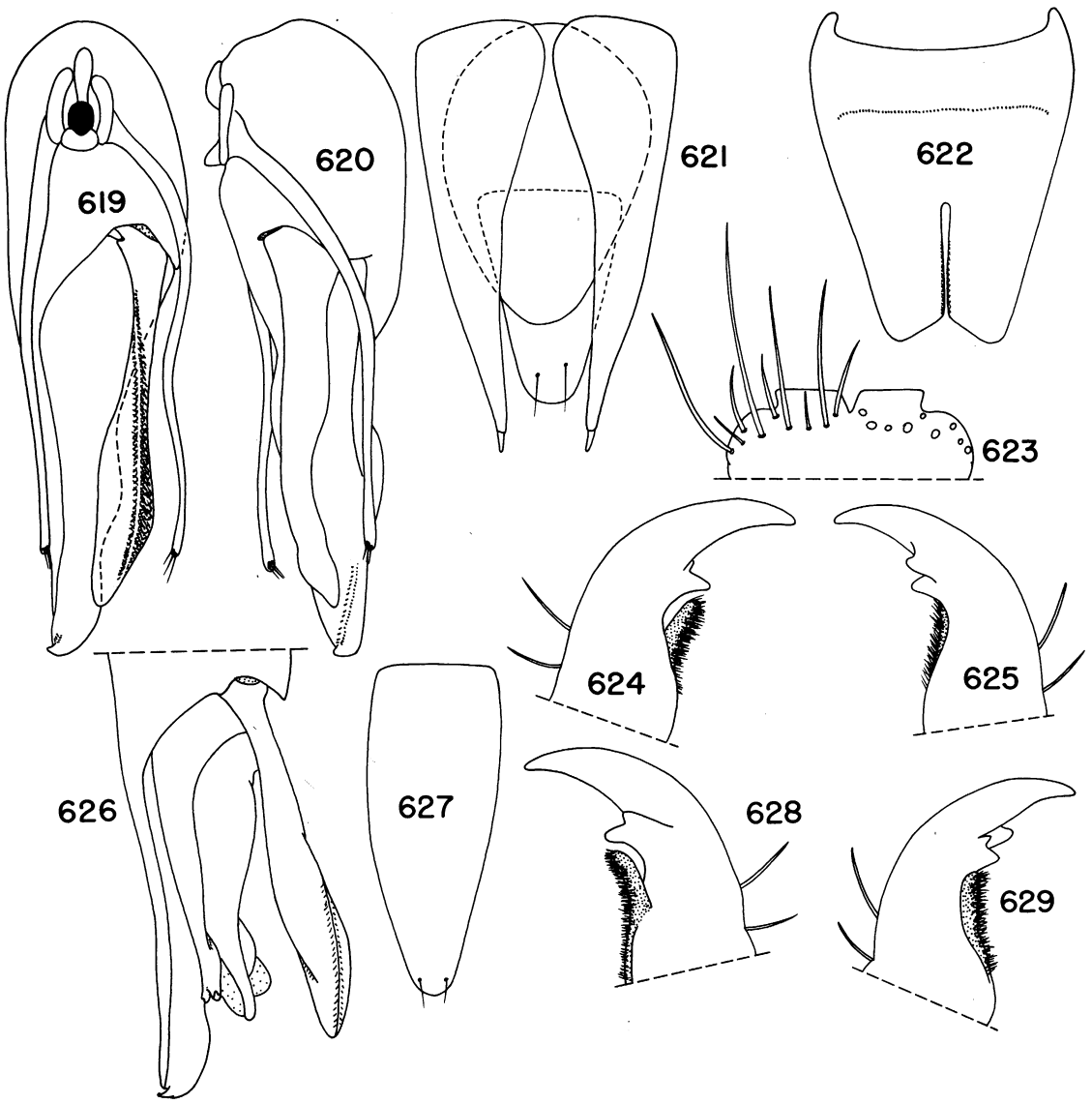
PARATYPES: Twelve males with same data as holotype (10 males, AMNH; 1 male, CNC; 1 male, FMNH).

DIAGNOSIS: The male of this species can be distinguished from those of other species by characters of the aedeagus. It is similar to *S. trunca* from which it can be separated by the rounded apex of the median lobe and the rounded apex of the process articulated to the dorsal edge of the ostium (figs. 619, 620). The female can be identified as indicated by the characters in the Key. Among the species of *Stenopholea, luma* is one of only two species with long elytra and large eyes.

DESCRIPTION: Length 2.5–3.0 mm.

Color pale reddish brown, elytra pale.

Head length (HL, fig. 37) slightly greater than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface polished, without ground



FIGS. 619–629. *Stenopholea luma*. 619. Aedeagus, dorsal view, exposed armature of internal sac omitted. 620. Aedeagus, right lateral view. 621. Segment IX, female, ventral view. 622. Sternum VIII, male. 623. Labrum, setae omitted from right side. 624. Left mandible, dorsal view. 625. Right mandible, dorsal view. 626. Aedeagus, dorsal view, apical half, exposed armature of internal sac included. 627. Sternite IX, male. 628. Left mandible, ventral view. 629. Right mandible, ventral view.

sculpturing. Eye length (OL) about two-thirds postocular length (PO) of head. Neck width about seven-tenths width of head. Submentum without midlongitudinal carina. Labrum (fig. 623) with V-shaped median emargination; anterior margin with broad apically truncate lobe on each side of median emargination. Mandibles asymmetrical; right (figs. 625, 629) mandible with three denticles, two denticles near middle on ventromesial edge, third on dorsomesial edge; left (figs. 624, 628) mandible with two denticles on

"process" on ventromesial edge. Antennomeres 4 and 11 unmodified.

Pronotum moderately convex, widest at about median half; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins nearly parallel at median half. Mesothoracic spiracular peritreme moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) longer than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture present. Metathoracic wings present. Metathorax well developed, extending well beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII with dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII without median depression, median glabrous spot, micropores, or spiniform setae; posterior margin truncate; inner surface without midlongitudinal carina. Sternite VIII (fig. 622) with moderately deep, moderately wide, median incision extending for nearly one-half the length of segment; surface weakly beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 627) slightly asymmetrical; apical portion with two setae.

Aedeagus (figs. 619, 620, 626) with slender parameres. Median lobe elongate, broad basally, tapered apically, and asymmetrical; apex rounded but with subapical hook dorsolaterally directed; dorsal edge of ostium with curved, elongate, apically rounded, basally articulated sclerite arising from near middle on right side. Ventral surface of base of median lobe with large, oval pump spot; pump spot with median sclerite. Ostium as large as dorsoapical width of median lobe and with many sclerites of complex armature of internal sac exposed at opening (fig. 626).

Female. Sternites III to VIII unmodified. Tergum IX fused dorsally, ventrally divided midlongitudinally. Segment IX (fig. 621) with two genital appendages; basal appendage flattened and egg-shaped; apical sclerite trapezoidal with apical margin rounded and with two subapical setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Brazilian province of Para (fig. 580).

ETYMOLOGY: From the Latin, *luma,* for thorn.

MATERIAL EXAMINED: Fourteen males, seven females: BRAZIL: *Para:* Jacareacanga, December 1968, M. Alvarenga (1 male, AMNH), January 1970, F. R. Barbosa (type series, AMNH, CNC, FMNH; 7 females, AMNH).

73. **Stenopholea trunca**, new species

Figures 5, 580, 630–641

HOLOTYPE: Male. Brazil: Mato Grosso: Xingu National Park, November 1963, collected by M. Alvarenga, deposited in the American Museum of Natural History.

PARATYPES: Seven males with same data as holotype (5 males, AMNH; 1 male, CNC; 1 male, FMNH).

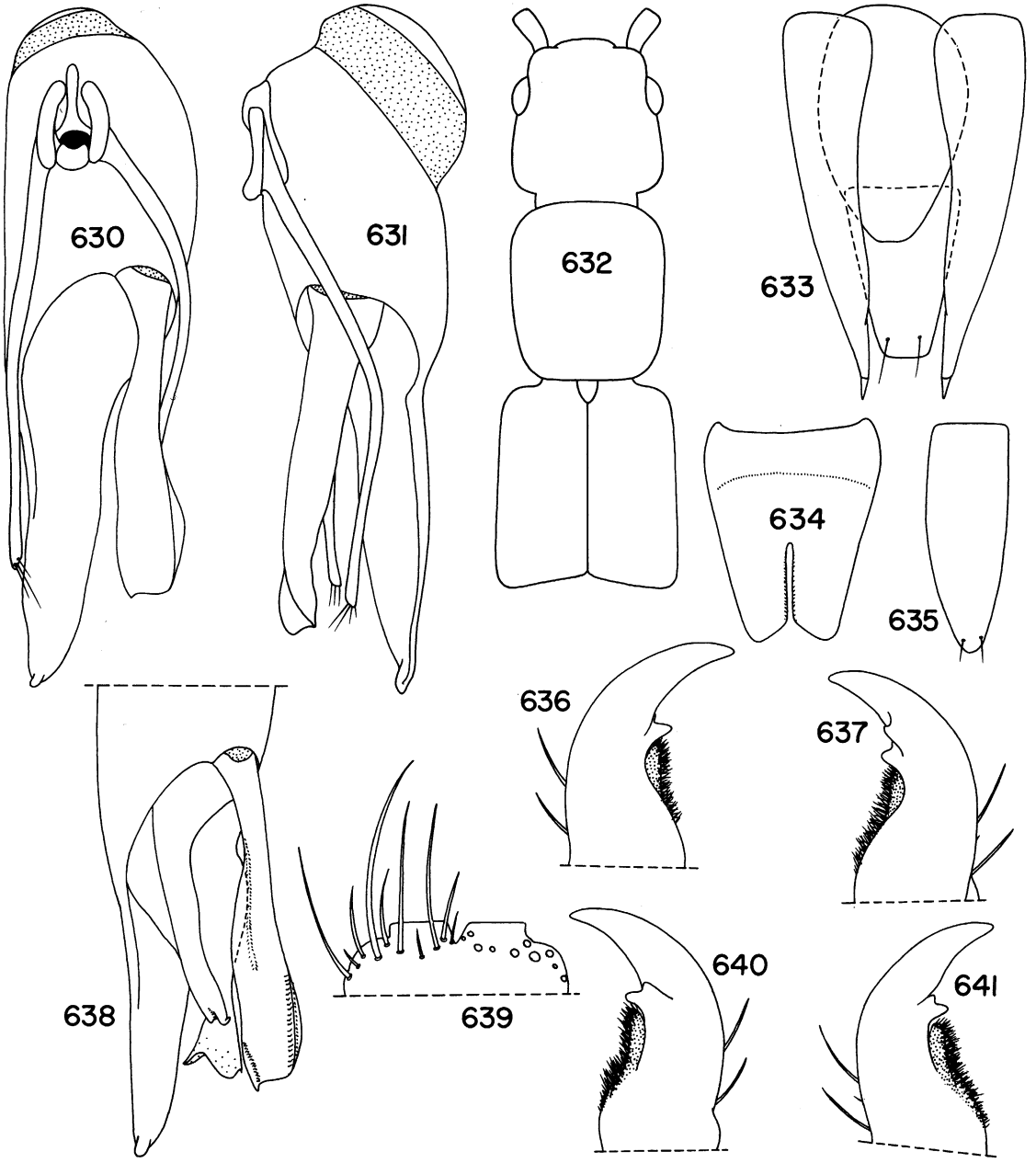
DIAGNOSIS: Males can be distinguished from those of all other species by the configuration of the aedeagus. It is similar to *S. luma.* Among the species of *Stenopholea, S. trunca* is one of only two with long elytra and large eyes. *Stenopholea trunca* has a truncate articulated ostial sclerite (fig. 630), whereas in *S. luma* it is tapered. The female is identified as indicated in the Key.

DESCRIPTION: Length 2.5 to 3.0 mm.

Color pale reddish brown.

Head length (HL, figs. 37, 632) and width (HW) approximately equal. Dorsum of head with moderately dense punctation on all but median strip; surface polished, without ground sculpturing. Eye length (OL) about one-half postocular length (PO) of head. Neck width about six-tenths width of head. Submentum without midlongitudinal carina.

Labrum (fig. 639) with V-shaped median emargination; anterior margin with broad, apically truncate lobe on each side of median emargination. Mandibles asymmetrical; right



FIGS. 630–641. *Stenopholea trunca*. 630. Aedeagus, dorsal view, exposed armature of internal sac omitted. 631. Aedeagus, right lateral view. 632. Head and thorax. 633. Segment IX, female, ventral view. 634. Sternum VIII, male. 635. Sternite IX, male. 636. Left mandible, dorsal view. 637. Right mandible, dorsal view. 638. Aedeagus, dorsal view, apical half, exposed armature of internal sac included. 639. Labrum, setae omitted from right side. 640. Left mandible, ventral view. 641. Right mandible, ventral view.

(figs. 637, 641) mandible with four denticles, two denticles near middle on ventromesial edge, third on dorsomesial edge; left (figs. 636, 640) mandible with three denticles, two denticles on "process" on ventromesial edge.

Antennomeres 4 and 11 unmodified.

Pronotum (fig. 632) moderately convex, widest at median half; surface with dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins nearly parallel at median half. Mesothoracic spiracular peritreme moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 37, 632) longer than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. Mesosternal-metasternal suture present. Metathoracic wings present. Metathorax well developed, extending well beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII with dermal fringe on posterior margin. Tergum VIII with posterior margin rounded.

Male. Sternites III to VI unmodified. Sternite VII without median depression, micropores, spiniform setae, or glabrous spot; posterior margin truncate; inner surface without midlongitudinal carina. Sternite VIII (fig. 634) with moderately deep, moderately wide median incision extending for nearly one-half the length of segment; surface weakly beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 635) slightly asymmetrical; apical portion with two setae.

Aedeagus (figs. 630, 631, 638) with slender parameres. Median lobe elongate, broad basally, tapered apically, and asymmetrical; apex pointed; dorsal edge of ostium with curved, elongate, apically sinuo-truncate articulated sclerite arising from near middle on right side. Ventral surface of base of median lobe with large, oval pump spot; pump spot with large central sclerite. Ostium as large as dorsoapical width of median lobe and with many sclerites of complex armature of internal sac exposed at opening (fig. 638).

Female. Sternites III to VIII unmodified. Segment IX (fig. 633) with two genital appendages; basal appendage flattened and with apically flattened egg-shaped profile; apical sclerite trapezoidal with apical margin arcuato-truncate and with two subapical setae.

Spermatheca not sclerotized.

HABITAT AND DISTRIBUTION: This species is known only from the Brazilian provinces of Para and Mato Grosso (fig. 580).

ETYMOLOGY: From the Latin, *truncus*, for cut off, referring to the nearly truncate articulated ostial sclerite.

MATERIAL EXAMINED: Nine males, 11 females. BRAZIL: *Mato Grosso:* Santa Teresinha opposite Macauba, November 24, 1964, B. Malkin (1 male, FMNH); Xingu National Park (type series, AMNH, CNC, FMNH, 11 females, AMNH).

74. **Stenopholea thyma**, new species

Figures 5, 7–9, 580, 642–656

HOLOTYPE: Male. Brazil: Santa Catarina: Nova Teutonia, August 1953, collected by F. Plaumann, deposited in the Field Museum of Natural History, Chicago.

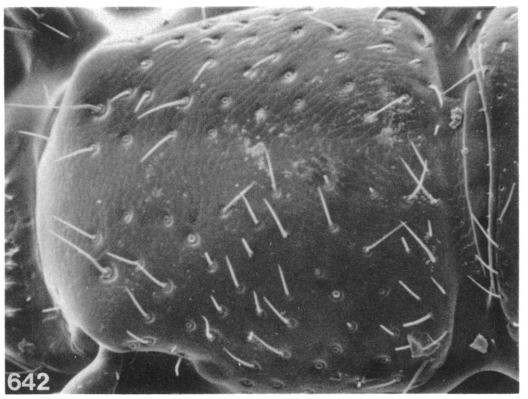
PARATYPES: Fifty-two males, with same locality but with following dates: August 1953 (10 males, FMNH; 5 males, AMNH); October–December 1952 (5 males, FMNH; 2 males, AMNH); October 1954 (1 male, FMNH); May 1954 (6 males, FMNH; 3 males, AMNH); December 1953 (8 males, FMNH; 2 males, AMNH); 27° 11′ S, 52° 23′ W, 300–500 m., June 1954 (3 males, FMNH), July 1961 (4 males, CNC); no date (1 male, CNC); May 1960 (2 males, CNC).

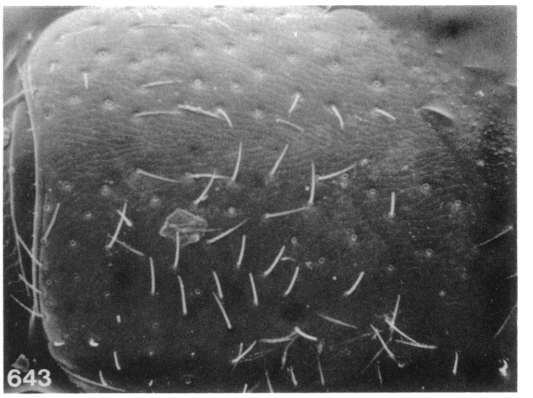
DIAGNOSIS: The small eyes, short elytra, ground sculpturing (figs. 642, 643) on the head and pronotum, flattened median spot on abdominal sternite VI, and characters of the aedeagus (figs. 644, 645, 649) separate the males of this species from all others. The female can be separated by the characters in the Key.

DESCRIPTION: Length 2.1 to 3.1 mm.

Color pale reddish brown.

Head length (HL, figs. 38, 646) slightly less than width (HW). Dorsum of head with mod-





FIGS. 642–643. *Stenopholea thyma*. 642. Head, 133×. 643. Pronotum, 133×.

erately dense punctation on all but median strip; surface shining, with whorled ground sculpturing resembling fingerprints (fig. 642). Eye length (OL) about one-tenth postocular length (PO) of head. Neck width nearly three-fourths width of head. Submentum without midlongitudinal carina. Labrum (fig. 655) with U-shaped median emargination; anterior margin with large, apically truncate, broad lobe adjacent to emargination. Mandibles asymmetrical; left (figs. 650, 651) mandible with four denticles, three at about middle, one median denticle minute, second and third on process arising from ventromesial edge; right (figs. 654, 656) mandible with four denticles, three at about middle, one minute denticle on dorsal surface and two moderately large denticles on ventral edge. Antennomeres 4 and 11 unmodified.

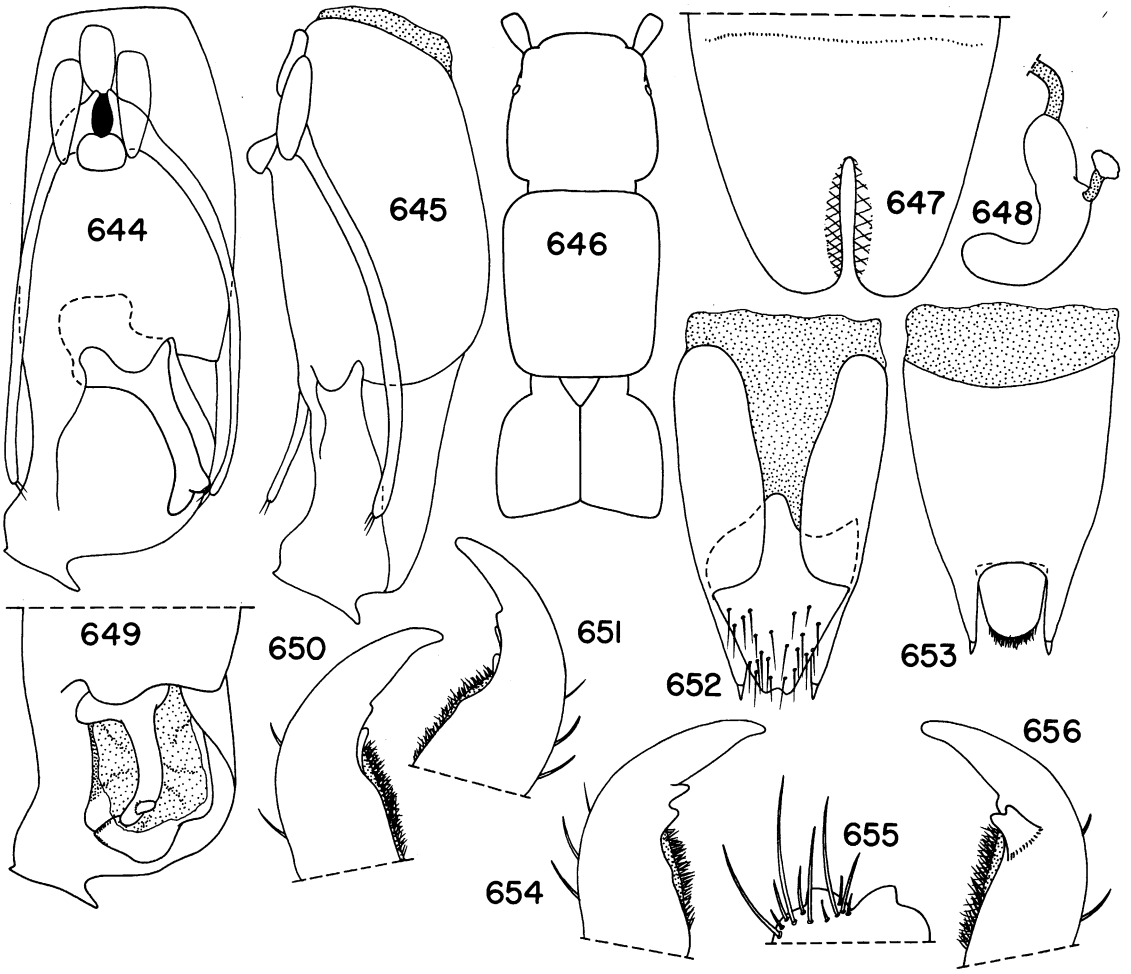
Pronotum (fig. 646) moderately strongly convex, widest at about median two-thirds; surface with dense punctation on all but narrow median strip; surface shining, with elongate ground sculpturing (fig. 643); lateral margin with median half approximately parallel. Metathoracic spiracular peritreme moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, figs. 38, 646) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to V unmodified. Sternite VI with moderately broad, median, flattened spot. Sternite VII with broad median flattened spot and without median glabrous spot, micropores, or spiniform setae; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 647) with moderately deep, moderately wide median incision extending for about four-tenths length of segment; surface beveled adjacent to incision; basal carina entire; not divided medially; base without median groove. Sternite IX asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 644, 645, 649) with slender parameres. Median lobe broad basally and apically; right margin of apical third broadly curved to apical margin; apical margin broadly rounded on right toward left; left side with broad, apically truncate margin; left lateral margin of apical third sinuate and curved dorsally; dorsal edge of ostium with articulated sclerite; articulated sclerite long, slender, rodlike, and apically bifurcate. Base of median lobe with large pump spot; pump spot without median sclerite. Ostium as large as width of median lobe and with many sclerites and processes of com-



FIGS. 644–656. *Stenopholea thyma*. 644. Aedeagus, dorsal view, exposed armature of internal sac omitted. 645. Aedeagus, right lateral view. 646. Head and thorax. 647. Sternum VIII, male. 648. Spermatheca. 649. Aedeagus, dorsal view, apical half, exposed armature of internal sac included. 650. Left mandible, dorsal view. 651. Left mandible, ventral view. 652. Segment IX, female, ventral view. 653. Segment IX, dorsal view. 654. Right mandible, ventral view. 655. Labrum, setae omitted from right side. 656. Right mandible, dorsal view.

plex armature of internal sac at exposed opening (fig. 649).

Female. Sternites III to VIII unmodified. Segment IX (fig. 652) with one genital sclerite; sclerite trianguloid, with sinuate basal margin and emarginate apical margin and with scattered setae on apical portion.

Spermatheca sclerotized; distal portion bent; spermathecal gland about one-third of length of spermatheca from spermathecal duct (fig. 648).

HABITAT AND DISTRIBUTION: *Stenopholea thyma* is known only from the southeastern Brazilian province of Santa Catarina (fig. 580).

ETYMOLOGY: From the Greek, *thymos*, for mind.

MATERIAL EXAMINED: 136 specimens.

BRAZIL: *Santa Catarina:* Nova Teutonia, F. Plaumann (34 males, 49 females, FMNH; 12 males, 20 females, AMNH; 7 males, 8 females, CNC); Chapeco, 27°07'S, 52°36'W, 600 m., July 1960, F. Plaumann (3 males, 2 females, CNC; 1 male, AMNH).

75. **Stenopholea bifurca**, new species
Figures 5, 580, 657–664

HOLOTYPE: Male. Brazil: [Paraná][6]: San Jose dos Pinheiros, [near] Curitiba, 975 m. elevation, February 7, 1970, collected by J. M. and B. A. Campbell, deposited in Canadian National Collection, Ottawa.

PARATYPES: Two males with same data as holotype (1 male, CNC; 1 male, AMNH).

DIAGNOSIS: This species can be distinguished by the small eyes, short elytra, fingerprint ground sculpture, characters of the aedeagus (figs. 657, 658, 662), and the complex genital appendages of the female (figs. 661, 664).

DESCRIPTION: Length 2.6 to 3.0 mm.

Color pale reddish brown.

Head length (HL, fig. 38) and width (HW) approximately equal. Dorsum of head with moderately dense punctation on all but median strip; surface strongly shining, with ground sculpturing similar to whorls of fingerprints. Eye length (OL) about one-fourteenth of postocular length (PO) of head. Neck width seven-tenths width of head. Submentum without midlongitudinal carina. Labrum with U-shaped median emargination; anterior margin with broad, obliquely truncate lobe. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest at median third; surface with dense punctation on all but narrow median strip; surface strongly shining, with ground sculpturing similar to fingerprints; lateral margins with median third approximately parallel. Mesothoracic spiracular peritreme moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 37) shorter than pronotum (PL). Mesosternum without median fovea; sternopleural ridge present. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII without median glabrous spot, depression, spiniform setae, or micropores; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 659) with moderately deep, moderately wide median incision extending for about one-third length of segment; surface adjacent to incision strongly beveled and with beveling wider and deeper near apical portion of incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 660) slightly asymmetrical; apical portion with scattered setae.

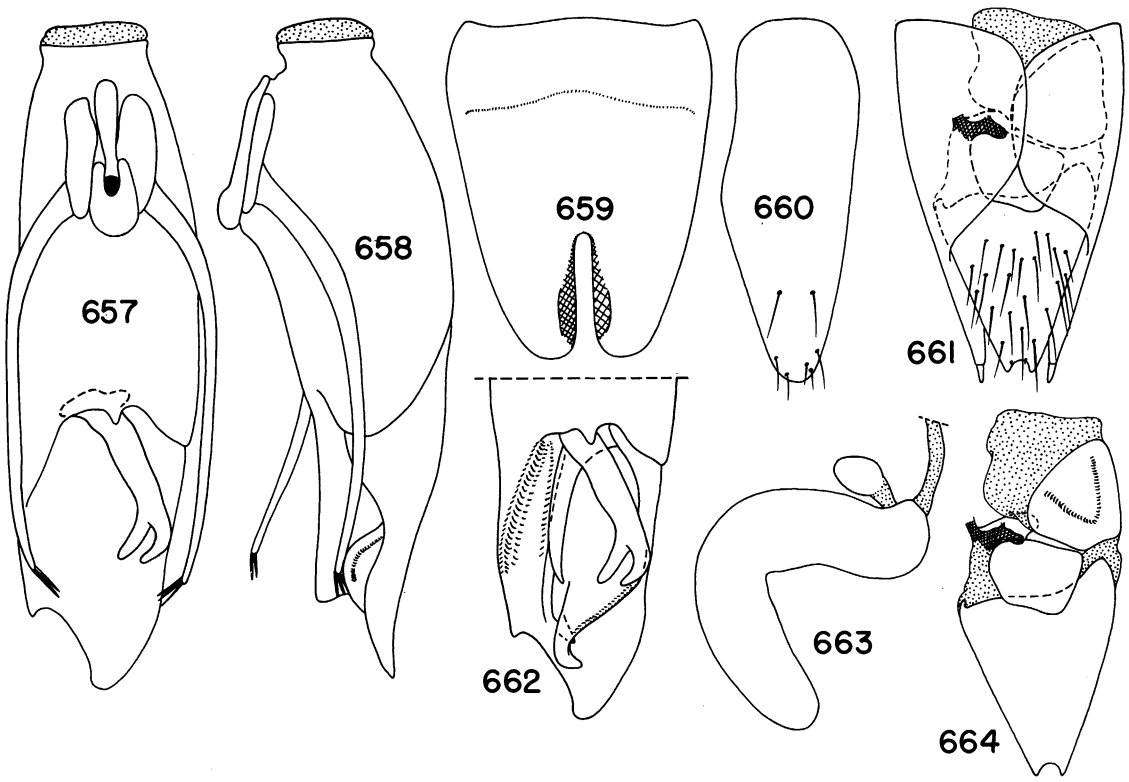
Aedeagus (figs. 657, 658, 662) with slender parameres. Median lobe broad and asymmetrical; apical portion strongly tapered to rounded apex; left lateral margin of apical portion curved dorsally and truncate apically; dorsal edge of ostium with long, slender, rodlike, apically bifurcate articulated sclerite. Base of median lobe with large pump spot; pump spot without median sclerite. Ostium as large as dorsoapical width of median lobe and with many sclerites and processes of complex armature of internal sac exposed at opening (fig. 662).

Female. Sternites III to VIII unmodified. Segment IX (figs. 661, 664) with two genital appendages; basal appendage divided into to lobes and fused at one spot to right side of tergum IX; apical sclerite trianguloid, with emarginate posterior margin and with many setae.

Spermatheca sclerotized, strongly bent at middle, and with spermathecal gland near spermathecal duct (fig. 663).

HABITAT AND DISTRIBUTION: This species is known only from the southeastern Brazilian province of Paraná (fig. 580) where it was collected at 975 m. (3199 ft.) elevation.

[6] The label reads "PR" which I assume refers to Paraná since Curitiba is in that province.



FIGS. 657–664. *Stenopholea bifurca*. 657. Aedeagus, dorsal view, exposed armature of internal sac omitted. 658. Aedeagus, right lateral view. 659. Sternum VIII, male. 660. Sternum IX, male. 661. Segment IX, female, ventral view, cross-hatched region is fused to sternite. 662. Aedeagus, dorsal view, apical half, exposed armature of internal sac included. 663. Spermatheca. 664. Genital appendages, female, ventral view, cross-hatched portion is area of fusion to sternite IX.

ETYMOLOGY: From the Latin, *bis* for two and *furca* for fork, referring to the bifurcate apex of the articulated ostial sclerite.

MATERIAL EXAMINED: Holotype, two paratypes, and six females with same data as holotype (holotype, 1 paratype, 4 females, CNC; 1 paratype, 2 females, AMNH).

76. **Stenopholea sarma**, new species
Figures 5, 580, 665–675

HOLOTYPE: Male. Brazil: Santa Catarina: Nova Teutonia, October to December 1952, collected by F. Plaumann, deposited in the Field Museum of Natural History, Chicago.

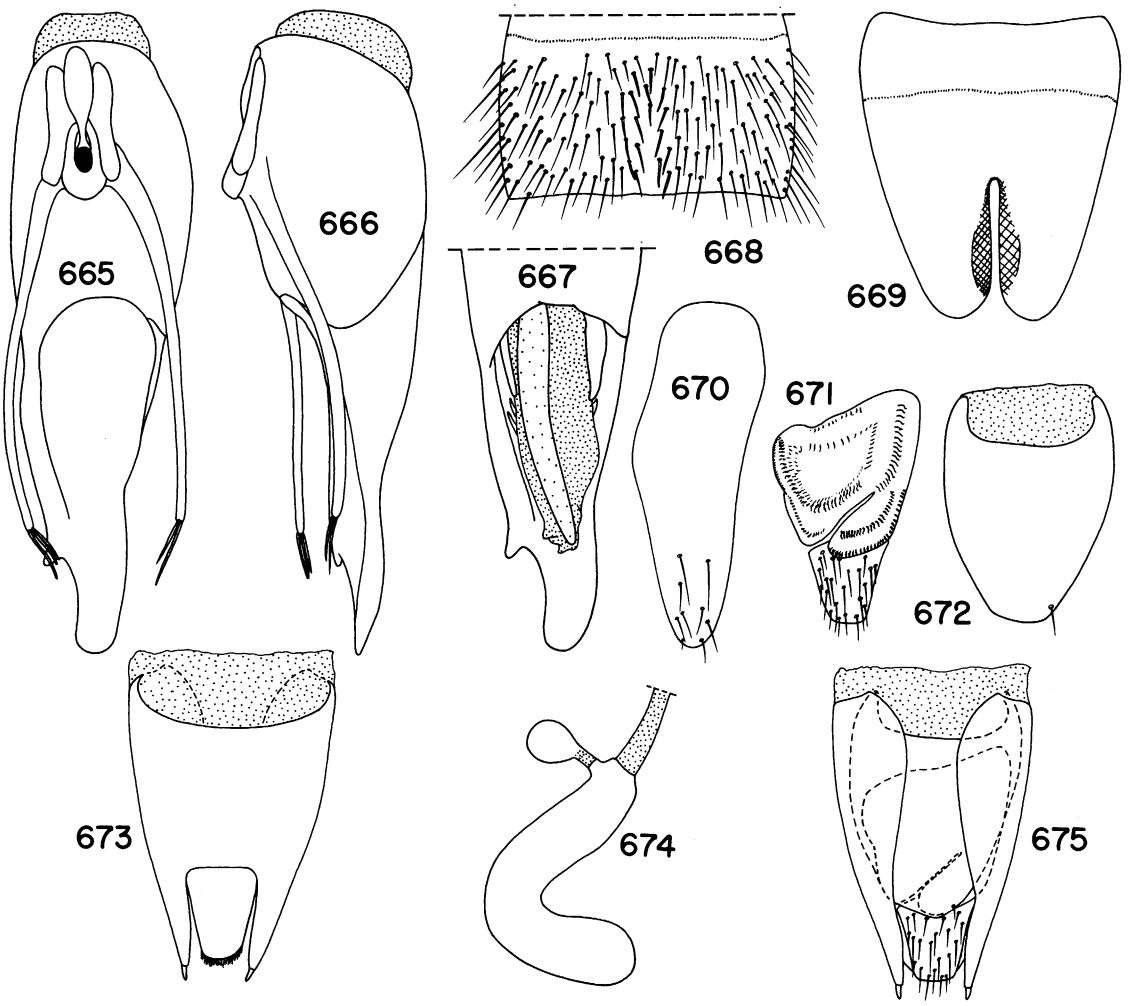
PARATYPES: None.

DIAGNOSIS: Males of this species can be separated from those of all other species by the aedeagus (figs. 665–667) and the females are recognizable by the characters in the Key. Both sexes have small eyes, short elytra, and cephalic ground sculpturing that is similar to fingerprints.

DESCRIPTION: Length 3.5 mm.

Color pale reddish brown.

Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface strongly shining, with ground sculpturing similar to whorls of fingerprints. Eye length (OL) about one-tenth postocular length (PO) of head. Neck width nearly three-fourths width of head. Submentum without midlongitudinal carina. Labrum with



FIGS. 665–675. *Stenopholea sarma*. 665. Aedeagus, dorsal view, articulated sclerite and exposed armature of internal sac omitted. 666. Aedeagus, right lateral view. 667. Aedeagus, dorsal view, apical half, articulated sclerite and exposed armature of internal sac included. 668. Sternite VII, male. 669. Sternum VIII, male. 670. Sternite IX, male. 671. Apical genital sclerite, female, ventral view. 672. Basal genital sclerite, female, ventral view. 673. Segment IX, dorsal view. 674. Spermatheca. 675. Segment IX, female, ventral view.

U-shaped median emargination; anterior margin with broad, obliquely truncate lobe. (Mandible not examined.) Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest at median three-fifths; surface with dense punctation on all but narrow median strip; surface strongly shining, with ground sculpturing similar to fingerprints; lateral margins with median three-fifths approximately parallel. Mesothoracic spiracular peritreme moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic

wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII (fig. 668) with small, median, elongate glabrous spot near apex, with slightly stouter setae at median region, and without micropores, spiniform setae, or median depression; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 669) with moderately deep, moderately wide median incision extending for almost one-half of length of segment; surface adjacent to incision strongly beveled and with beveling wider and deeper near apical portion of incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 670) asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 665–667) with slender parameres. Median lobe broad basally, gradually tapered apically, and asymmetrical; apical margin rounded; left lateral margin with short, subapical process; dorsal edge of ostium without articulated sclerite. Base of median lobe with large pump spot; pump spot without median sclerite. Ostium as large as width of median lobe and with many sclerites and processes of complex armature of internal sac exposed at opening (fig. 667).

Female. Sternites III to VIII unmodified. Segment IX (fig. 675) with two genital appendages; basal appendage (fig. 672) broadly emarginate basally, rounded apically and with one seta; apical appendage (fig. 671) with ridges and broad depressions, and oblique lateral incision on basal two-thirds, apical third with scattered setae and arcuato-truncate posterior margin.

Spermatheca sclerotized, with basal portion strongly hooked, and with spermathecal gland near spermathecal duct (fig. 674).

HABITAT AND DISTRIBUTION: This species is known from the southeastern Brazilian province of Santa Catarina (fig. 580).

DISCUSSION: The aedeagal articulating sclerite may be represented by the lightly sclerotized, flattened, elongate sclerite that is appressed to the membranous sac that extends from the ostium.

ETYMOLOGY: From the Greek, *sarmos,* for heap of earth.

MATERIAL EXAMINED: Two males, four females. BRAZIL: *Santa Catarina:* Nova Teutonia (holotype and 1 female, FMNH); Chapeco (27° 07′ S, 52° 36′ W), 600 m. elevation, November 1960, F. Plaumann (1 male, 2 females, CNC; 1 female, AMNH).

77. **Stenopholea papola**, new species

Figures 5, 580, 676–680

HOLOTYPE: Male. Ecuador: Napo: 24 km. N Baeza, 1000 m. elevation, March 4, 1976, collected by J. M. Campbell, deposited in the Canadian National Collection, Ottawa.

PARATYPES: None.

DIAGNOSIS: The small eyes and prominent, granulate ground sculpturing of the head and distinctive aedeagus (figs. 676, 677, 679) permit separation of this species from all others.

DESCRIPTION: Length 2.5 mm.

Color reddish brown.

Head length (HL, fig. 38) greater than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface shining dully, with prominent, microgranulate ground sculpturing. Eye length (OL) about one-tenth of postocular length (PO) of head. Neck width about seven-tenths width of head; ventral surface with triangular elevation. Labrum with median, U-shaped emargination; anterior margin with two denticles on each side of median emargination. (Mandibles not examined.) Antennomeres 4 and 11 unmodified.

Pronotum moderately strongly convex, widest at middle two-thirds; surface with dense punctation on all but median strip; surface shining dully, with microgranulate ground sculpturing; lateral margins with median two-thirds parallel. Mesothoracic spiracular peritreme moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum (PL). Mesosternum without median fovea or sternopleural ridge. (Mesosternal-metasternal suture not examined.) Metathoracic wings absent. Metathorax reduced, hardly extending beyond posterior end of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites IV to VI unmodified. Sternite VII without median depression, spiniform setae, micropores, or glabrous spot; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 680) with moderately deep, moderately wide median incision extending for about one-fourth length of segment; surface beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX (fig. 678) nearly symmetrical; apical portion with scattered setae.

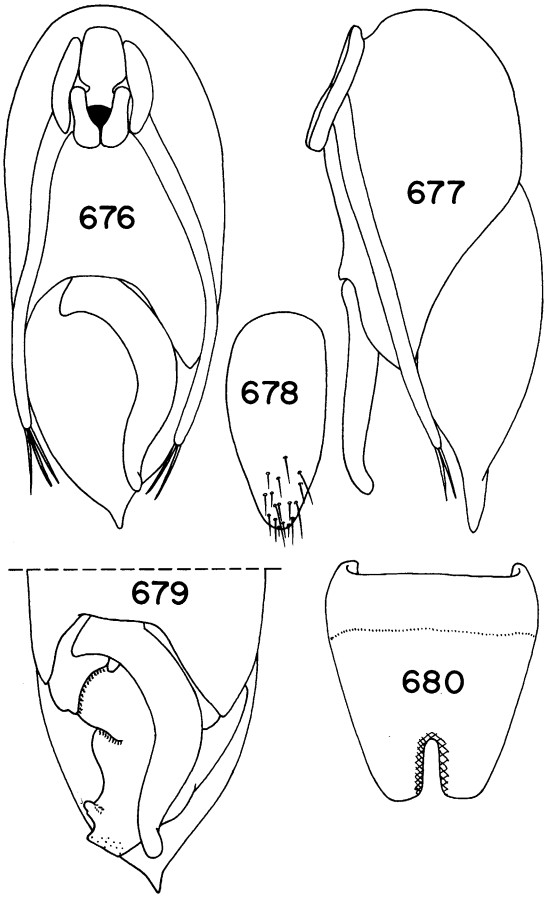
Aedeagus (figs. 676, 677, 679) with slender parameres. Median lobe broad, short, slightly asymmetrical and with attenuate apex; dorsal edge of ostium with curved, slender, tapered, rodlike articulated sclerite arising from near middle. Base of ventral surface of median lobe with large, ovoid pump spot; pump spot without median sclerite. Ostium as large as dorsoapical width of median lobe and with sclerites of complex armature of internal sac exposed at opening (fig. 679).

Female unknown.

HABITAT AND DISTRIBUTION: This species is known only from the Ecuadorian province of Napo (fig. 580).

ETYMOLOGY: From the Anglo-Saxon *papol,* for pebble, referring to the pebbled cephalic sculpturing.

MATERIAL EXAMINED: Holotype.



FIGS. 676–680. *Stenopholea papola.* 676. Aedeagus, dorsal view, exposed armature of internal sac omitted. 677. Aedeagus, right lateral view. 678. Sternite IX, male. 679. Aedeagus, dorsal view, apical half, exposed armature of internal sac included. 680. Sternum VIII, male.

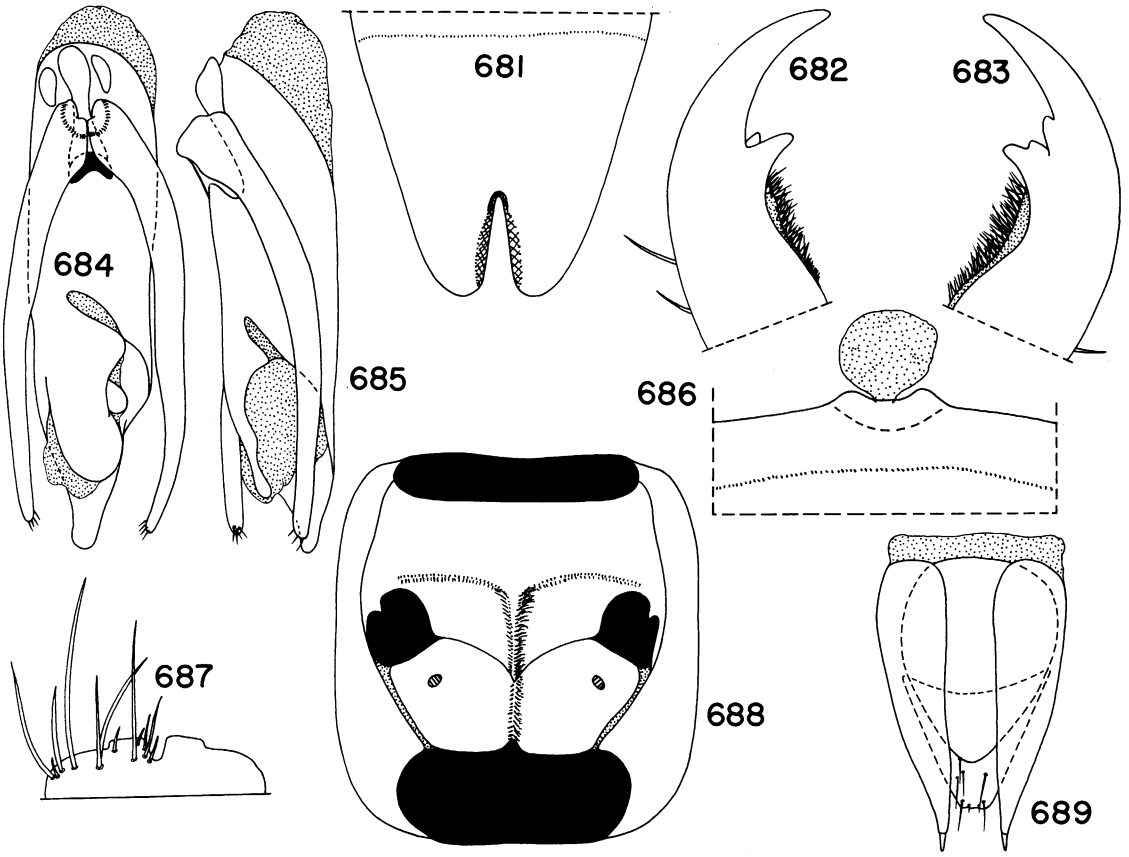
78. **Stenopholea hadra**, new species
Figures 5, 580, 681–689

HOLOTYPE: Male. Brazil: [São Paulo]: São Paulo, collected by Mraz, deposited in the Field Museum of Natural History, Chicago.

PARATYPES: Six males, with same data as holotype (3 males, FMNH; 2 males, AMNH; 1 male, BMNH).

DIAGNOSIS: The long, stout parameres (figs. 684, 685) and posteriorly divergent margins of the incision of sternum VIII (fig. 681) separates the males from all other species. Females can be distinguished as indicated in the Key. Both sexes can be recognized further by the small eyes surrounded by black pigmentation and short elytra.

DESCRIPTION: Length 2.1 to 2.6 mm.



FIGS. 681–689. *Gnathymenus hadra*. 681. Sternum VIII, male. 682. Left mandible. 683. Right mandible. 684. Aedeagus, dorsal view. 685. Aedeagus, right lateral view. 686. Sternite IV, midanterior margin showing gland. 687. Labrum, setae omitted from right side. 688. Prothorax, ventral view. 689. Segment IX, female, ventral view.

Color pale reddish brown; eye surrounded by black pigmentation.

Head length (HL, fig. 38) slightly less than width (HW). Dorsum of head with moderately dense punctation on all but median strip; surface polished, with weak ground sculpturing only on front of head between antennae. Eye length (OL) about one-tenth of postocular length (PO) of head. Neck width about three-fourths width of head. Submentum without midlongitudinal carina. Labrum (fig. 687) with U-shaped median emargination; anterior margin with broad, obliquely truncate lobe. Mandibles asymmetrical; right (fig. 683) mandible with four denticles, median denticle small, basal two denticles closely associated; left (fig. 682) mandible with three denticles, basal two denticles closely associated. Antennomeres 4 and 11 unmodified.

Pronotum strongly convex, widest at median half; surface with moderately dense punctation on all but median strip; surface polished, without ground sculpturing; lateral margins with median half approximately parallel. Mesothoracic spiracular peritreme (fig. 688) moderately widely separated laterally from prohypomeron. Profemur without enlarged antennal cleaning process.

Elytra (EL, fig. 38) shorter than pronotum

(PL). Mesosternum without median fovea; sternopleural ridge present. Mesosternal-metasternal suture present. Metathoracic wings absent. Metathorax reduced, hardly extending beyond apex of mesocoxa. Metasternum without median tubercle near apical margin.

Abdominal tergite VII without dermal fringe on posterior margin. Tergum VIII with rounded posterior margin.

Male. Sternites III to VI unmodified. Sternite VII without median depression, median glabrous spot, micropores, or spiniform setae; posterior margin truncate; inner surface without median carina. Sternite VIII (fig. 681) moderately deep, moderately wide median incision extending for about one-third length of segment; margins of incision posteriorly divergent; surface beveled adjacent to incision; basal carina entire, not divided medially; base without median groove. Sternite IX slightly asymmetrical; apical portion with scattered setae.

Aedeagus (figs. 684, 685) with stout parameres. Median lobe broad with apical portion tapered to rounded apex and asymmetrical; lateral margins without distinct processes, dorsal edge of ostium with reduced articulated sclerite. Basal foramen covered by base of parameres. Ventrobasal end of median lobe with large pump spot; pump spot without median sclerite. Ostium as large as apical width of median lobe and with armature of internal sac exposed at opening.

Female. Sternites III to VIII unmodified. Segment IX (fig. 689) with two genital appendages; basal appendage egg-shaped with rounded apex narrower than rounded base; apical appendage trapezoidal with apex truncate, apical portion with scattered setae.

Sclerotized spermatheca absent.

HABITAT AND DISTRIBUTION: This species is known only from the southeastern Brazilian province of São Paulo (fig. 580).

DISCUSSION: The articulating sclerite of the aedeagus may be represented by the large, sclerotized lobe that extends from the apical third of the median lobe but that is fused to the median lobe.

ETYMOLOGY: From the Greek, *hadros,* for thick or stout, referring to the stout parameres.

MATERIAL EXAMINED: Holotype, five paratypes, and eight females with same data as holotype (holotype, 3 paratypes, 6 females, FMNH; 2 paratypes, 2 females, AMNH; 1 paratype, BMNH).

Lobrathium distans (Sharp), new combination

Dolicaon distans Sharp, 1876, p. 247 [Holotype from "Amazons," in the British Museum (Natural History). Type examined.]

Sharp's description of *Dolicaon distans* was the first report of the genus in the New World. Although he indicated (1876, p. 247) that *distans* was very different from any species previously included in *Dolicaon* he thought that *distans* was similar in appearance to the South African *Dolicaon lathrobioides* and that it "appears to offer all the recorded characters of the genus." He did not specify these characters. I have examined the holotype of *distans* and did not find even the characters that define the subtribe that includes *Dolicaon*. Sharp's *distans* has a conical fourth segment of the maxillary palpus and small, separated mesothoracic spiracular peritremes. Neither of these are characters of the Dolicaonina so that *distans* must be excluded from *Dolicaon* and Dolicaonina. The bilobed labrum indicates the species may belong in the Lathrobiina and the presence of an elytral epipleural ridge suggests inclusion in *Lobrathium*. This transfer is provisional pending further study of the paederine genera.

In an article discussing changes in abundance and habitat in response to inundation of the forest floor in the Amazonian region, Irmler (1979, p. 6) refers to "*Lathrobium distans* (Sharp)." Since Sharp described nothing in *Lathrobium* which he named *distans,* I assume that the *distans* to which Irmler alludes is the one described in *Dolicaon*.

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