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New and little known Coleoptera (Silvanidae: Silvaninae)  
from Central and South America

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## New and little known Coleoptera (Silvanidae: Silvaninae) from Central and South America

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**Abstract.** The following Silvaninae (Coleoptera: Silvanidae) are included: *Synobius* Sharp, 1899, with its species, *Synobius lobicollis* Sharp, 1899 and *Synobius lobatus* (Grouvelle, 1896); *Neocorimus thomasi*, **new genus** and **new species**; *Austronausibius wagneri* (Grouvelle) **new combination**, a species originally placed in *Nausibius* Lentz by Grouvelle (1913); a third species of *Pensus* Halstead, 1973, is described, *Pensus hirtus* **new species**, and a short key given for distinguishing it from the already known species, *Pensus gilae* (Casey) and *Pensus guatemalensis* (Sharp); also *Coccidotrophus* Schwarz and Barber, 1921, including *Coccidotrophus socialis* Schwarz and Barber, 1921, *Coccidotrophus cordiae* Barber, 1928, *Coccidotrophus wheeleri* (Schwarz and Barber) **new combination** (a species originally placed in *Eunausibius* Grouvelle by Schwarz and Barber (1921)) plus two new species, *Coccidotrophus platyops*, **new species**; *Coccidotrophus trinidadensis*, **new species** making a total of five in this genus; other taxa included are, *Eunausibius* Grouvelle, 1913, with its described and a new species as follows, *Eunausibius tenebrionoides* (Grouvelle), *Eunausibius jatahyensis*, **new species**, *Eunausibius elongatus* (Grouvelle); and finally *Annomus bolivianus*, **new genus** and **new species**. Additionally, taxonomic changes are made for two species originally described in *Eunausibius*: *Nausibius lophius* (Parsons) **new combination** (= *Eunausibius lophius* Parsons) and *Nausibius salutaris* (Parsons) **new combination** (= *Eunausibius salutaris* Parsons). Descriptions, diagnoses, and illustrations (habitus and male genitalia line drawings plus four color habitus photographs) are provided.

**Key words.** New species, *Coccidotrophus*, *Eunausibius*, *Nausibius*, *Pensus*, *Synobius*.

**ZooBank registration.** urn:lsid:zoobank.org:pub:18BA3511-66C2-4EF9-AE74-040A88E15BC3

### Introduction

The Silvanidae (Silvaninae) of Central and South America are not well known. There are, however, various studies that contain descriptions of a reasonable number of Silvaninae taxa found in this part of the world, including those of Sharp (1899), Grouvelle (1881, 1889, 1896, 1913), Reitter (1878), Schwarz and Barber (1921), Barber (1928), Parsons (1974) and Halstead (1973, 1993). Of these, Sharp's and Grouvelle's studies are wide ranging and therefore of particular interest. The author has been working on the subfamily for many years and, amongst loans of material collected in Central and South America, has found a large number of undescribed species, mostly species of *Ahasverus* Gozis (sensu lato; at least one new genus to be erected) and *Nausibius* Lentz, two genera from this part of the world currently being studied. The following account includes descriptions of a few new taxa, and redescriptions of other little-known ones.

### Materials and Methods

Male genitalia preparations were made as follows: Dry specimens were soaked in warm water to soften intersegmental membranes and avoid damage to parts. The specimen was then placed ventral side up and held down with all of the abdomen exposed by using the tip of the left forefinger. The whole abdomen was removed by carefully lifting it vertically away from the elytra with a dissecting needle held in the right hand until it became detached from the thorax. To clear the abdomen, it was put in 10% aqueous potassium hydroxide solution (one pellet to 2.5 ml of water) contained in a flat bottomed, ½ inch glass specimen tube that had been numbered for recognition with a diamond stylus. The tube was placed with others in a small beaker at the bottom of which was a single layer of small glass balls (to disperse bubbles) and enough water to be level with the KOH solution in the tubes. The beaker was placed on a hot plate and the water gradually brought to the boil and then boiled for 4 minutes.

After this, the cleared abdomen was removed, the genitalia dissected out and mounted in Berlese Fluid on a slide beneath a coverslip. The empty abdomen, after soaking in water to remove the KOH, was placed by the specimen on the card mount. Illustrations were drawn from the slide preparations using a monocular microscope, either with a squared graticule in the eyepiece and graph paper, or by projecting the image onto paper. The genitalia and associated parts were finally also placed on the card mount in a small drop of the water/alcohol soluble resin, dimethyl hydantoin formaldehyde. Line habitus illustrations were made by drawing a sketch of the specimen, recording measurements on it and re-drawing the image on graph paper. Color habitus photographs were kindly taken by Dr. Michael C. Thomas (FSCA), using a Leica Z16 APO microscope equipped with a JVC KY-F75U3-CCD camera and controlled by Syncrosopy AutoMontage® software.

Data for types and other specimens are recorded here verbatim and are surrounded by quotes. A single forward slash ( / ) indicates data on separate labels. Type specimens were labelled with their name and status, 'D. G. H. Halstead det.' and the year, plus an additional small circular label, either with 'HOLOTYPE' and a red border or 'PARATYPE' and a yellow one, as appropriate.

Measurements were made using a filar micrometer or a stepped graticule in the right eye piece when using a binocular microscope (both micrometer and graticule were calibrated with a micrometer slide). These were as follows: *head length* (medial) from back of vertex to clypeal apex, *head breadth* (maximum) either across eyes or back of head (stated in description); *pronotal length* (medial) from anterior margin to margin of basal foramen; *pronotal breadth* (medial) maximum excluding anterior angles and, if present, lateral teeth; *elytral length* sutural length including scutellar shield; *elytral breadth* maximum across combined elytra; *body length* was obtained by addition of head, pronotal and elytral lengths; *body breadth*, used in descriptions, is that of the elytra at their broadest point.

The following acronyms have been used for depositories:

- CAS** California Academy of Sciences, San Francisco, USA.
- FSCA** Florida State Collection of Arthropods, Gainesville, Florida, USA.
- MACN** Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina.
- MIZP** Museum & Institute of Zoology, Polish Academy of Sciences, Warszawa, Poland.
- MNHN** Muséum National d'Histoire Naturelle, Paris, France.
- NHML** The Natural History Museum, London, UK.
- USNM** (U. S. National Museum) National Museum of Natural History, Washington, D.C., USA.
- WSU** Washington State University, Department of Entomology, Pullman, Washington, USA.

## **Synobius Sharp**

*Synobius* Sharp 1899: 558.

**Discussion.** *Synobius* Sharp is a little-known genus containing two described species, *Synobius lobicollis* Sharp, 1899, described from Panama, and *Synobius lobatus* (Grouvelle, 1896), from Brazil. Grouvelle originally described his species in *Nausibius* and, although differing from this genus in general facies, it does seem to be more closely related to it than any other in the family. Grouvelle (1913) transferred his species to *Synobius* remarking that an examination of the figures of *S. lobicollis* and *S. lobatus* showed these species were very closely related. Indeed, one of the labels that he attached to his holotype following the establishment of the new genus by Sharp, suggests he thought that they might be conspecific.

Sharp, when describing the genus, remarked that it was apparently allied to *Nausibius*, *Cathartus* Reiche and *Hapalips* Reitter (the last of these is now placed in the Erotylidae). He stated that '... the greatest peculiarity of the genus is the peculiar, glabrous, rigid antennae.' and drew attention to the fact that the structure of the sterna is that normal in the 'Silvanides'. In his accompanying species description, Sharp anticipated a myrmecophilous or termitophilous habit for this insect. The habitat data on the majority of specimens examined (see descriptions below) tends to confirm an inquiline relationship as they were found in nests of bees of the genus *Trigona* Jurine (Apidae).

**Diagnosis.** This genus (Fig. 1–17, 123), as represented by the two known species, may be distinguished from *Nausibius* by its antennae, which have a very small, narrow terminal segment; the pronotum, which is without lateral teeth, has a strong indentation before the anterior angles that form rounded and in front slightly declivous

lobes; and the elytra, which lack obvious striae (an unusual condition in *Nausibius* although it does occur). The tarsi in *Synobius* are simple (Fig. 2) and there are no antennal grooves on the head. Obvious secondary sexual characters have not been found although with larger individuals, more transverse pronota may be indicative of females, as is often the case in *Nausibius* and some other silvanine genera.

Apart from the types in the MNHN (*S. lobatus*) and NHML (*S. lobicollis*) the species are known to the author only from a small number of specimens from Nevermann's collection made in the 1930s and now mainly in the USNM, but also NHML and MIZP (just *S. lobicollis* in these last two depositories). Nevermann believed that his material represented two new species and labelled the specimens as such but did not publish descriptions. Comparison of Nevermann's specimens with *S. lobatus* and *S. lobicollis* has shown that they represent these two extremely similar and very obviously closely related taxa, which are maintained here as distinct species and redescribed.

### ***Synobius lobatus* (Grouvelle)**

(Fig. 1–8, 123)

*Nausibius lobatus* Grouvelle 1896: 207 (type examined).

*Synobius lobatus* (Grouvelle): Grouvelle 1913: 371.

*Synobius reichenspergeri* Nevermann (manuscript name, unpublished - see below).

**Diagnosis.** See *S. lobicollis*.

**Description.** This description, including measurements, is based on 7 specimens with data label information as recorded below. Length 4.60–5.24 mm; length to breadth ratio (breadth, maximum across elytra) 27.5–29.5:10.0; dark red-brown, moderately shining, sub-depressed; fine, short, recumbent golden pubescence present, most obvious on elytra.

**Head.** Breadth (across eyes) to length ratio, 14.1–16.3:10; punctures fine, setiferous; sides in front of eyes initially straight then forming obtuse angle, raised above antennal insertions; transverse, weakly arcuate impression across greater part of head between frons and vertex; clypeal region somewhat convex; temples absent; eyes small, separated dorsally by 10–12× width of eye in dorsal view; antennae, length to total body length ratio 10:39–44, slightly clubbed, antennomere 11 (apical) very small, 8–10 (particularly 9 and 10) a little broader than 3–7 (Fig. 3); ventral prominence beneath antenna slightly broader than that of *S. lobicollis* (see Fig. 12 for *S. lobicollis*).

**Pronotum.** (Fig. 1, 7–8) Slightly to more obviously transverse (not trapezoidal in specimens seen), medial breadth to midline length, 10.6–13.8:10.0, transversely less convex than elytra; margins with narrow rim; anterior angles forming lobes, laterally rounded, in front slightly declivous, smaller compared with pronotum than lobes of *S. lobicollis*; side margins of pronotum very shallowly, irregularly undulating; posterior angles only slightly produced; very shallow (inconspicuous) depressions on each side of disc towards anterior and posterior angles, a more obvious transverse depression towards base.

**Tarsi.** (Fig. 2) Simple, not lobed, basal three tarsomeres each slightly smaller than previous one, tarsomere 4 very small, pretarsus about as long as basal three.

**Elytra.** Ratio of length to greatest breadth (latter across basal quarter), 18.2–17.4:10.0, gradually curved to apex from greatest breadth; very narrowly explanate at sides before marginal rim; not obviously striate, 9 rows of punctures present although obscured by rows of very fine golden, recumbent setae (3 rows between each row of punctures) originating in low tubercles; humeri with short, curved, impressed line. Scutellar shield with transverse ridge joining raised basal margin of elytra.

**Male genitalia.** Parameres (Fig. 4–6) long, sides almost parallel for much of length, 6× as long as broad, setae restricted to apical part, outer margin with longest setae (6 or 7 in specimens seen), apex with a few shorter setae, inner margin bearing much shorter and finer setae (Fig. 6); median lobe longer than broad (Fig. 4–5), gradually tapered from base to rounded apex, degree of taper variable, a few small fine setae across middle; median strut very broadly expanded and almost semi-circular at apex then strongly narrowed to basal bifurcation where one thirteenth of breadth across apex; tegminal struts also broad at their apical junction; about 16 rods on each side towards ostium; internal sac with spines and, near ejaculatory duct, sclerites as in *S. lobicollis* (Fig. 16); sternites 8 and 9 similar to those of *S. lobicollis* (Fig. 17), with caudal margins straight, mainly short setae along them, at corners a few long setae (3 or 4 in specimens examined).

**Material examined.** **Holotype** male “Rio Grande do Sul / Type / TYPE / Museum Paris 1917 Coll.Grouvelle / lobatus ty Grouv [Grouvelle’s handwriting, black ink] / *Synobius lobicollis* Sharp v. prob. [handwritten, purple ink]” [dissected] (MNHN).

**Other material.** (7 total) 7 specimens labelled by Nevermann “*Synobius Reichenspergeri* new species m.” [manuscript name, unpublished] as follows: 1 male, “Brasilien Est. Paraná Rio Negro 26. v. 36 slg. Nevermann [top of green label] Wilte O. F. M. col. Reichensperger ded. 10. viii. 36 [reverse of this label, all handwritten / Nest von Trigona [cream label, handwitten] / Cotype [pink print] / *Synobius Reichenspergeri* new species m. / det. Nevermann 1936 / 49 / Nevermann Collection 1940 / USNM 2045653” (USNM); 4, including male and female mounted together plus two separately mounted females, sex written on the cards, all with data as above but without “49” and with date on top of green label “15. vii. 36” and that on reverse of this label “19. x. 36” (USNM); 1 male, (on card male sign and “No. 94a”) “Brasilien Est. Paraná Rio Negro 15. vii. 36 [top of green label] San Antonio Coleg. A. Reichensperger leg. Erh. 19. x. 36 [reverse of this label] / im Nest von Trigona / TYPE [red label] / Nevermann Collection 1940 / *Synobius Reichenspergeri* new species m. det. Nevermann 1936 / USNM 2045653” (USNM); 1 male, genitalia mounted on a separate card beneath card point holding specimen “Paraná Rio Negro 15. vii. 36 Collegia San Antonio [on top of green label] Erhalten 19.x. 36 A. Reichensperger leg. [on reverse of this label] / im nest von Trapua Bienc Trigona / Cotype [pink label] / Nevermann Collection 1940 / *Synobius Reichenspergeri* new species m. det. Nevermann 1936 / USNM 2045653” (USNM).

### ***Synobius lobicollis* Sharp**

(Fig. 9–17)

*Synobius lobicollis* Sharp 1899: 558 (type examined).

*Synobius trigonaphilus* Nevermann (manuscript name, unpublished - see below)

**Diagnosis.** The most obvious character for separating this species from *S. lobatus* is that provided by the lobed anterior angle of the pronotum, which in *S. lobicollis* is larger in comparison with the rest of the pronotum. Other useful characters are also of a comparative nature. Generally, the overall appearance of the pronotum in *S. lobicollis* is less transverse and usually somewhat trapezoidal (as figured by Sharp (1899)) (compare Fig. 9–10 with 7–8), the latter tendency does not seem to be a characteristic of *S. lobatus*. The transverse depression on the head is more arcuate in *S. lobicollis* (at least in specimens seen). The male genitalia of *S. lobicollis* and *S. lobatus* are very similar but the median strut and tegminal struts in specimens examined provide what appear to be good characters for distinguishing the species. *Synobius lobicollis* (Fig. 14) has the median strut broadly expanded at the apex then narrowed to the basal bifurcation where it is one sixth of the apical breadth and its tegminal struts terminate in a narrow apex, whereas *S. lobatus* has the median strut very broadly expanded and almost semicircular at the apex then strongly narrowed to the basal bifurcation where it is one thirteenth of the apical breadth, its tegminal struts terminate in a broad rounded apex. Some additional comparisons are made in the following description.

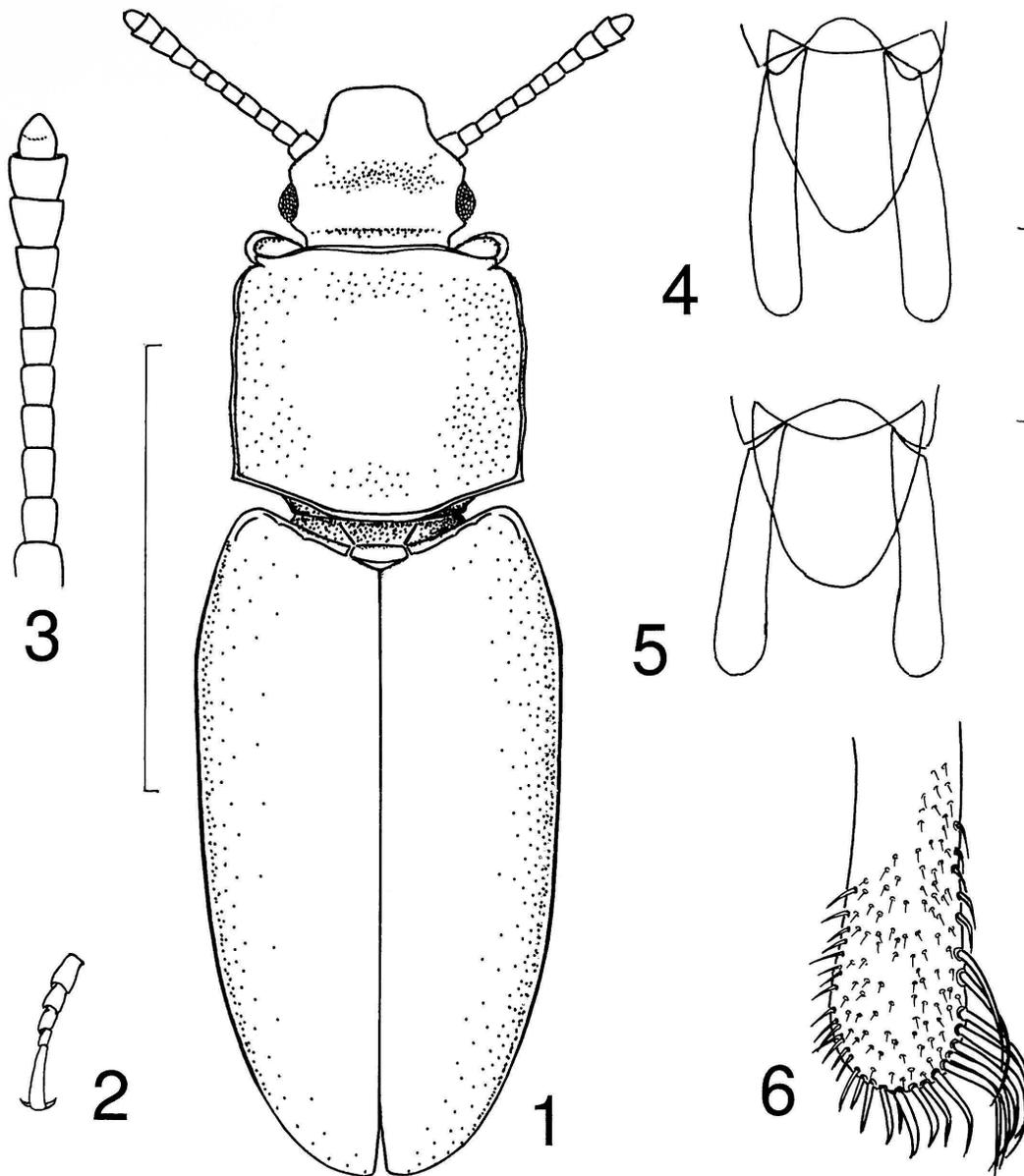
**Description.** This description is based on 8 specimens, as listed below, and the measurements on 6 of them. Length of body, 4.50–4.81 mm; length to breadth ratio (breadth, maximum across elytra) 28.1–30.1:10.0; color and pubescence as in *S. lobatus*.

**Head.** Breadth (across eyes) to length ratio, 13.8–15.7:10.0; overall form, including puncturation and pubescence, similar to *S. lobatus*; depression across median half of area between frons and vertex obviously arcuate; clypeal region somewhat convex; temples absent; eyes small, separated dorsally by 6.8–9.3× width of eye in dorsal view, slightly less widely spaced than in *S. lobatus*; antennae, length to body length ratio, 10.0:40.2–45.2, closely similar to those of *S. lobatus*.

**Pronotum.** Medial breadth to mid-line length ratio, 10.5–11.2:10.0, not conspicuously transverse (appearing slightly elongate) mostly trapezoidal becoming slightly narrower anteriorly (Fig. 9–11), obviously more depressed than elytra; margins with narrow rim; anterior angles forming prominent lobes; disc with shallow lateral depressions on each side of disc running into slightly deeper transverse depression situated towards base

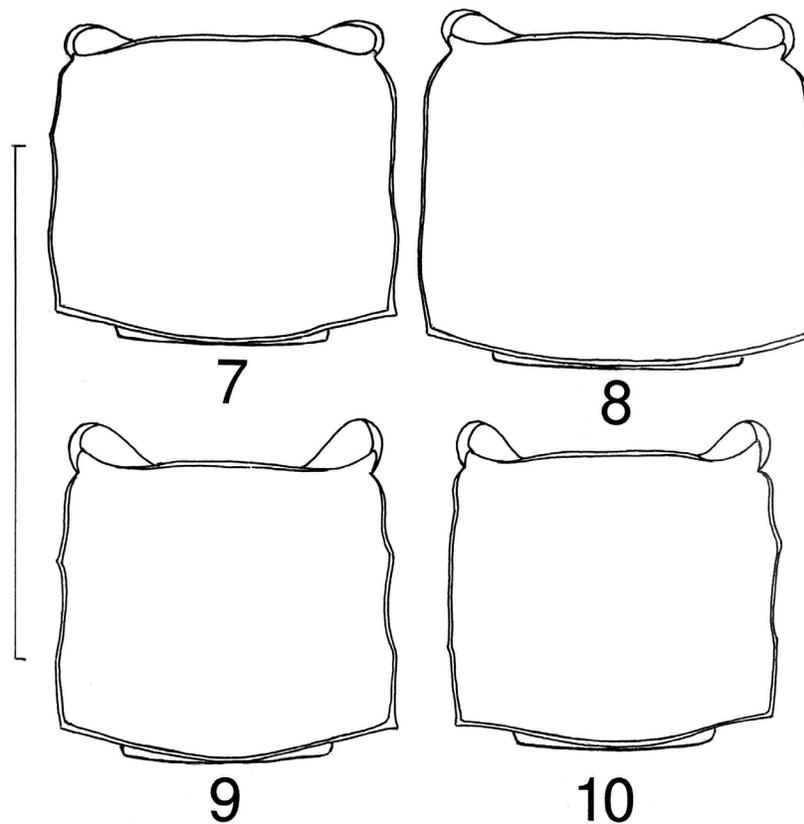
**Elytra.** Length to greatest breadth ratio, 17.0–18.4:10.0, pubescence and other characteristics similar to those of *S. lobatus*.

**Male genitalia** (Fig. 14–17). Parameres long, slightly less than 6× as long as broad, apical part of outer margin including outer part of apex, bearing 10–11 long setae (a few appeared spatulate on one paramere of the



**Figures 1–6.** *Synobius lobatus* (Grouvelle), male. **1)** Habitus. **2)** Metatarsus. **3)** Antenna, enlarged (1–3 holotype). **4–6)** Genitalia. **4–5)** Parameres and median lobes to show variation. **4)** Narrower median lobe, specimen from Brazil, Est. Paraná, Rio Negro. **5)** Broader median lobe, holotype specimen from Brazil, Rio Grande do Sol. **6)** Paramere, enlarged apical region. Scale lines for Figure 1 = 2.0 mm, for Figures 4 and 5 = 0.2 mm.

genitalia illustrated), inner half of apex with a few slightly shorter broader setae, inner margin with a few much smaller fine setae (Fig. 15); median lobe longer than broad, apex broad, sides shallowly emarginate; median strut broadly expanded at apex then narrowed to basal bifurcation where one sixth of breadth across apex; tegminal struts narrowed to apical junction; 10–12 rods on each side towards ostium; sternites 8 and 9 (Fig. 17), 8 with caudal margins straight, mainly short setae along them, at corners a few long setae (5 and 4 specimens examined), 9 with very short fine setae, as illustrated.



**Figures 7–10.** *Synobius* spp. pronota. 7–8) *S. lobatus* (Grouvelle). 7) Male, 8) Female. 9–10) *S. lobicollis* Sharp, both male. Scale line = 2.0 mm.

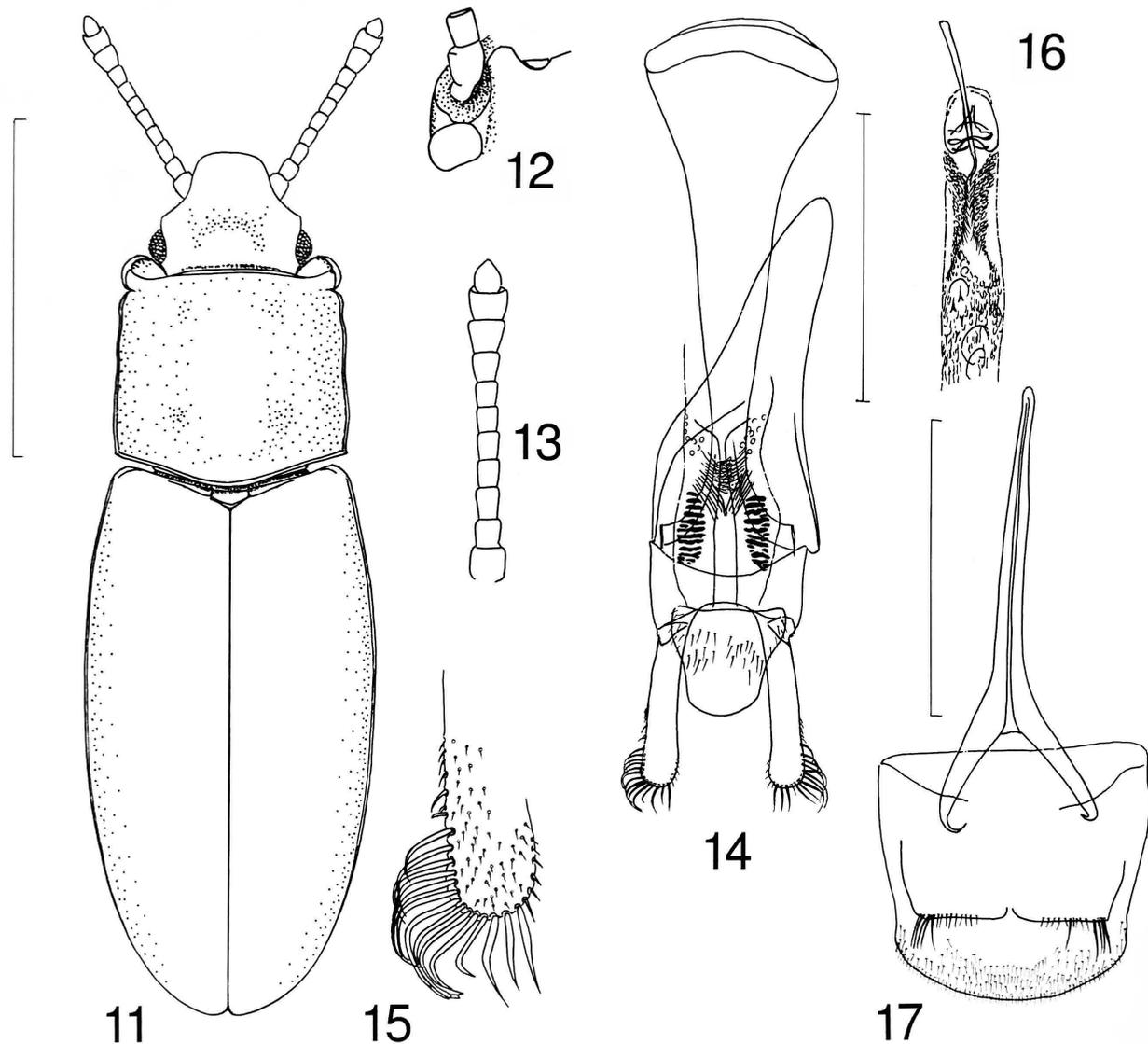
**Material examined. Holotype** (sex indet.) “*Synobius lobicollis* Type D. S. Bugaba [handwritten by Sharp] / Type [circular, red-bordered label] / Sp. figured [printed] / Bugaba Panama Champion [printed] / B.C.A., Col. II, I” (NHML).

**Other material.** (7 total) 4 specimens labelled by Nevermann ‘*Synobius trigonaphilus* new species m’ [manuscript name, unpublished] as follows (\*No habitat labels, only locality and determination labels on these specimens): 1 male, mounted on a card point with male sign on point and genitalia mounted on a separate card point beneath “COSTA RICA F. NEVERMANN [printed] 28. viii. 36 [green label] / HAMBURG FARM REVENTAZON EBENE LIMON [green label, printed] / im nest von *Trigona* [handwritten] / TYPE [red label, printed] / *Synobius trigonaphilus* new species m. det. Nevermann 1936 [manuscript name, unpublished] / USNM 2045653” (USNM); 1 male\* with same data labels as above and male sign on card point but not dissected, also with “apparently nom. nudum REB 1940” (USNM); 1 male \* with same data as above and male sign on card point, also on a protective card beneath point “94d” (USNM); 1 female\* with same data labels, female sign on card point, also an additional card point bearing a specimen of *Trigona* (USNM). 1 female “COSTA RICA F. NEVERMANN 28. viii. 36 [green label printed except date] / Cotype [red label] / *Synobius trigonaphilus* new species m. det. Nevermann 1936 [manuscript name, unpublished] / Mus Zool Polonicum Warsawa 12 / 45” (MIZP). 1 female and 1 male, mounted on the same card, male dissected, genitalia mounted on the same card by the author (NHML, with data labels as for MIZP specimen, plus circular yellow-bordered Co-type label and “Brit Mus 1937-365”, accession label).

### ***Neocorimus* Halstead, new genus**

**Type species.** *Neocorimus thomasi* Halstead, **new species**, here designated.

**Discussion.** Over two decades ago, Dr. Roger G. Booth (NHML) drew my attention to a silvanid from North



**Figures 11–17.** *Synobius lobicollis* Sharp, male. **11)** Habitus. **12)** Head, anterior lateral region showing antennal base and eye. **13)** Antenna, enlarged. **14–17)** Genitalia and associated sternites. **14)** Genitalia, without internal sac. **15)** Paramere, enlargement of apical half. **16)** Internal sac, apical third. **17)** Sternites 8 and 9. Scale lines for Figure 11 = 2.0 mm, for Figures 14 and 16–17 = 0.5 mm.

Venezuela, a recent accession at the time, that he had identified as representing a new genus near to *Acorimus* Halstead, 1980. The latter genus, *Corimus* Halstead, 1980, *Afrocorimus* Halstead, 1980, and *Dentirotaeorimus* Yoshida et al., 2017, have somewhat flattened bodies and broad explanate elytral margins and occur in the Old World. The external facies of the specimen from North Venezuela are most similar to those of the currently monotypic African genus, *Metacorimus* Halstead, 1997 but the genitalia are totally different, the parameres and other structures being most like those found in the New World silvanine *Nausibius sahlbergi* Grouvelle, 1896, to which it may be more closely related. Differences between the male genitalia of *Neocorimus thomasi* and *Nausibius sahlbergi* are as follows: the parameres of *Neocorimus thomasi* are relatively longer and slightly narrower than in *Nausibius sahlbergi*, they have their tooth flange (Fig. 23, 24) on the apical third and the tooth is relatively large, prominent and without an accompanying seta, whereas *Nausibius sahlbergi* has the flange on the apical quarter and the tooth is associated with a seta; the anterior margin of the median lobe of *Neocorimus thomasi* has margins

curved to an apical point (Fig. 23) but *Nausibius sahlbergi* lacks a point, the margins being only slightly angled to the apex; also the median strut of *Neocorimus thomasi* is a little shorter than that of *Nausibius sahlbergi*. However, external characters, including the presence of deep ventral antennal grooves on the head, the secondary sexual characters of the legs and the general body form of this new taxon are entirely different. Therefore, a new genus is erected here to accommodate this very interesting beetle that perhaps evolved from the same line as *N. sahlbergi*.

See below for additional morphological comparisons.

**Diagnosis.** Although similar in general facies to the currently monotypic African genus *Metacorimus*, the antennae in this new genus have a much more gradually developed club consisting of 5 segments whereas that in *Metacorimus* is 3-segmented. In *Neocorimus* (known species) the presumed secondary sexual characters are restricted to the legs (meso- and metatrochanters) whereas in *Metacorimus* (known species) there is a setiferous pit on the submentum, pro- and mesofemora have prominences and the metatibiae also exhibit secondary sexual characters. In *Neocorimus* (known species) the last abdominal ventrite lacks a fine marginal line while one is present in *Metacorimus*. *Neocorimus* is easily distinguished from similar Old World genera by antennal, tarsal and pronotal characters (Halstead 1980, 1997).

**Description.** Characters which seem to have generic significance are as follows:

Body short, depressed and broad, pronotal and elytral margins broadly explanate; head transverse, eyes widely separated dorsally, temple absent (hind margin of head in line with that of eye), antenna with penultimate segment largest, all of basal segment hidden from above by margin of head, 5 apical segments forming very gradually developed club; deep ventral antennal grooves present, which are almost straight and somewhat convergent to front (known species without setiferous pit on submentum of male); pronotum with anterior angles produced in front and lateral limit indicated by indentations, sides probably always without strong teeth (only undulating towards base in known species); femoral line absent; epipleuron very broad, at apex moderately incurved to suture; legs, tarsi simple (without lobed segments), secondary sexual characters present (limited to trochantal teeth in the known species).

**Etymology.** Greek prefix, neo: new, plus the generic name, *Corimus*.

### ***Neocorimus thomasi* Halstead, new species**

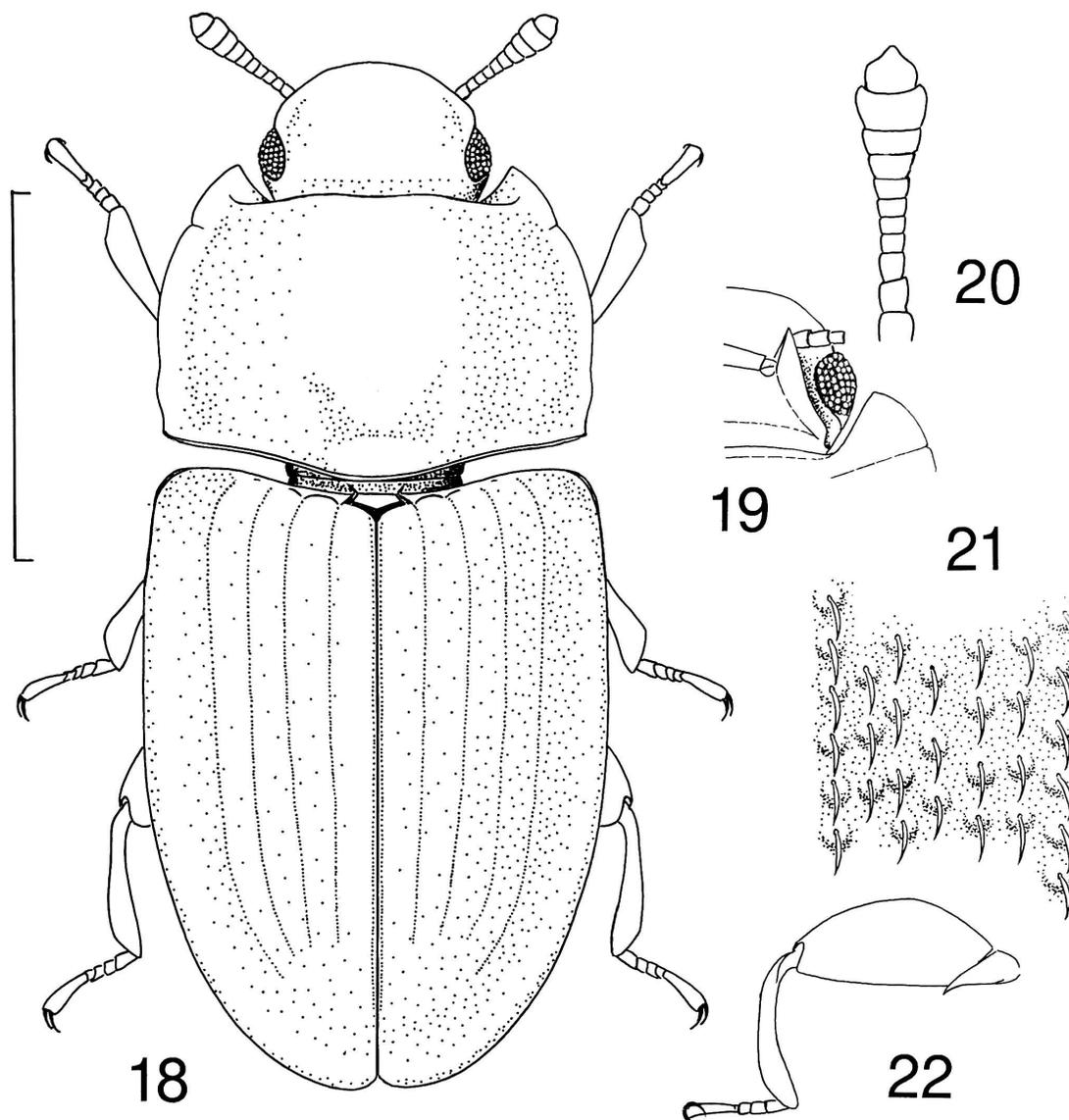
(Fig. 18–27)

**Description.** The following description is based on a single male specimen. Length 2.7 mm; ratio of length to breadth 22:10. Dark brown, moderately shining, lateral margins of elytra and appendages appearing slightly lighter than rest of body; pubescence short, recumbent and golden.

**Head.** Twice as broad as long; very slightly depressed on each side by eyes (Fig. 18); front margin slightly raised; clypeus virtually straight; eyes of moderate size, about twice as long as broad, separated dorsally across head by about 7× breadth of eye in dorsal view; antenna short with very gradually developed club of five antennomeres, 9 shorter and more transverse than 10, 10 larger than other antennomeres, 11 slightly longer than 10 and with pointed apex, antennomere 1 and base of 2 hidden from above by margin of head (Fig. 18–19); punctures fine (all setiferous) on frontal triangle, larger but shallow on each side towards eyes; deep, ventral antennal grooves present, inner margins of grooves almost straight and moderately convergent from base (behind eyes) to front (Fig. 19); dense puncturation and long setae on submentum near mentum (without secondary sexual setiferous pit).

**Pronotum.** Transverse (ratio of breadth to length 15:10), strongly narrowed to apex, slightly narrowed to base (Fig. 18), nearly as broad across base as base of elytra; anterior margin very slightly sinuate (raised on each side); anterior angles produced, lateral limit indicated by inconspicuous indentations; sides explanate, lateral margin gently curved medially, shallowly undulating before base; disc with shallow depression medially before base; base with narrow marginal rim; punctures dense but shallow becoming larger towards sides where puncturation is reticulate, large and oval on explanate margins (largest longer than twice an eye facet diameter); sides of prosternum strongly declivous on each side near middle, giving impression that prosternum is prolonged to apical third.

**Elytra.** Short, ratio of length to breadth 12:10; striae absent, only rows of setiferous tubercles present including 5 rows of closely aligned setiferous tubercles consisting of 1 row along suture plus 4 slightly raised rows on

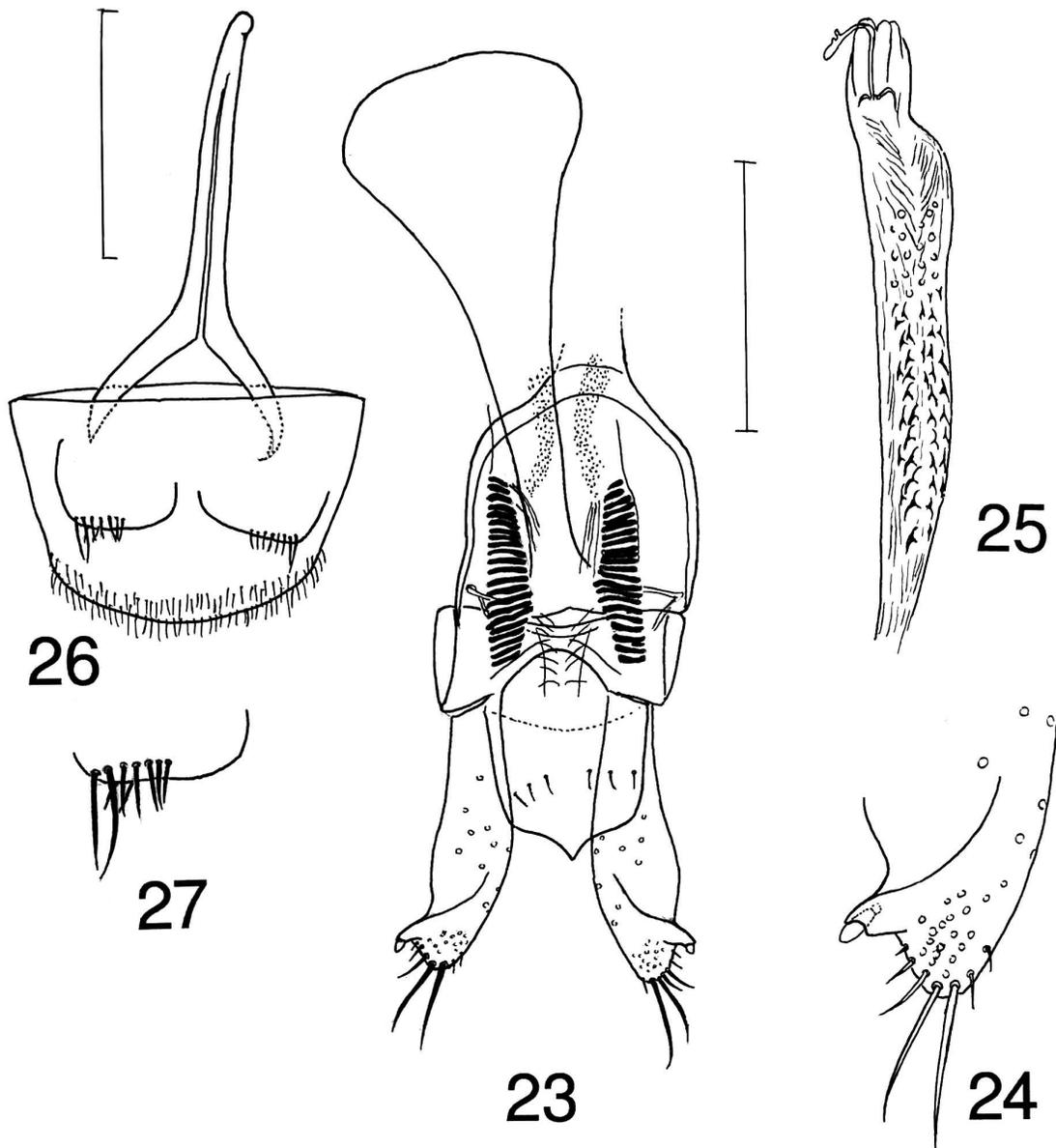


**Figures 18–22.** *Neocorimus thomasi* new genus, new species, male holotype. **18)** Habitus, closely aligned raised rows of tubercles indicated by dots on elytra. **19)** Head, part, in latero-ventral view to show antennal groove. **20)** Antenna, enlarged. **21)** Elytral disc, small part enlarged to show rows of tubercles on part of mid-region including second and third rows. **22)** Hind leg. Scale line =1.0 mm.

disc (latter apparently equivalent to raised interstriae such as are found in *Metacorimus mroczkowskii* Halstead and other Silvaninae), 4 or 5 uneven rows (Fig. 21 shows a small part of elytron, including mid-region of second and third raised rows) and 6 or 7 uneven rows between margin of disc and upturned explanate lateral margin; all setae directed caudally.

**Legs.** In male (female, unknown but characters given here are assumed to be secondary sexual ones), mesotrochanter with apex of trochanter (by inner side of femur) very slightly produced (inconspicuous); metatrochanter with apex slightly but obviously produced and recurved (Fig. 22).

**Male genitalia** (Fig. 23–27). Parameres curved, with two long apical setae plus a few short setae at apex, toothed prominence on apical third (Fig. 23–24); area towards ostium with about 22 rods on each side; median strut short, apically broad; median lobe with point at apex, line of 6 short setae (3 on each side) across middle of



**Figures 23–27.** *Neocorimus thomasi* new genus, new species, male holotype, genitalia and associated sternites. 23) Genitalia without internal sac. 24) Paramere, apex enlarged. 25) Internal sac. 26) Sternites 8–9. 27) Sternite 8, part enlarged. Scale lines = 0.2 mm.

ventral side; internal sac with many small caudally directed spines (Fig. 25); sternite 8 with two long and 6 or 7 shorter setae on each side (Fig. 26–27).

**Material examined.** **Holotype** male “N. VENEZUELA Estado Aragua P. Nac. Henri Pittier, Campo Experimental CENIAP Pozo del Diablo 400m / FOG 16. 11. v. 1990 Gallery forest. *Cassia grandis* J. G. Davies / Tray 16 / 355 / Bristol University Exped. Brit. Mus. Nat. Hist. 1992-6.” (NHML).

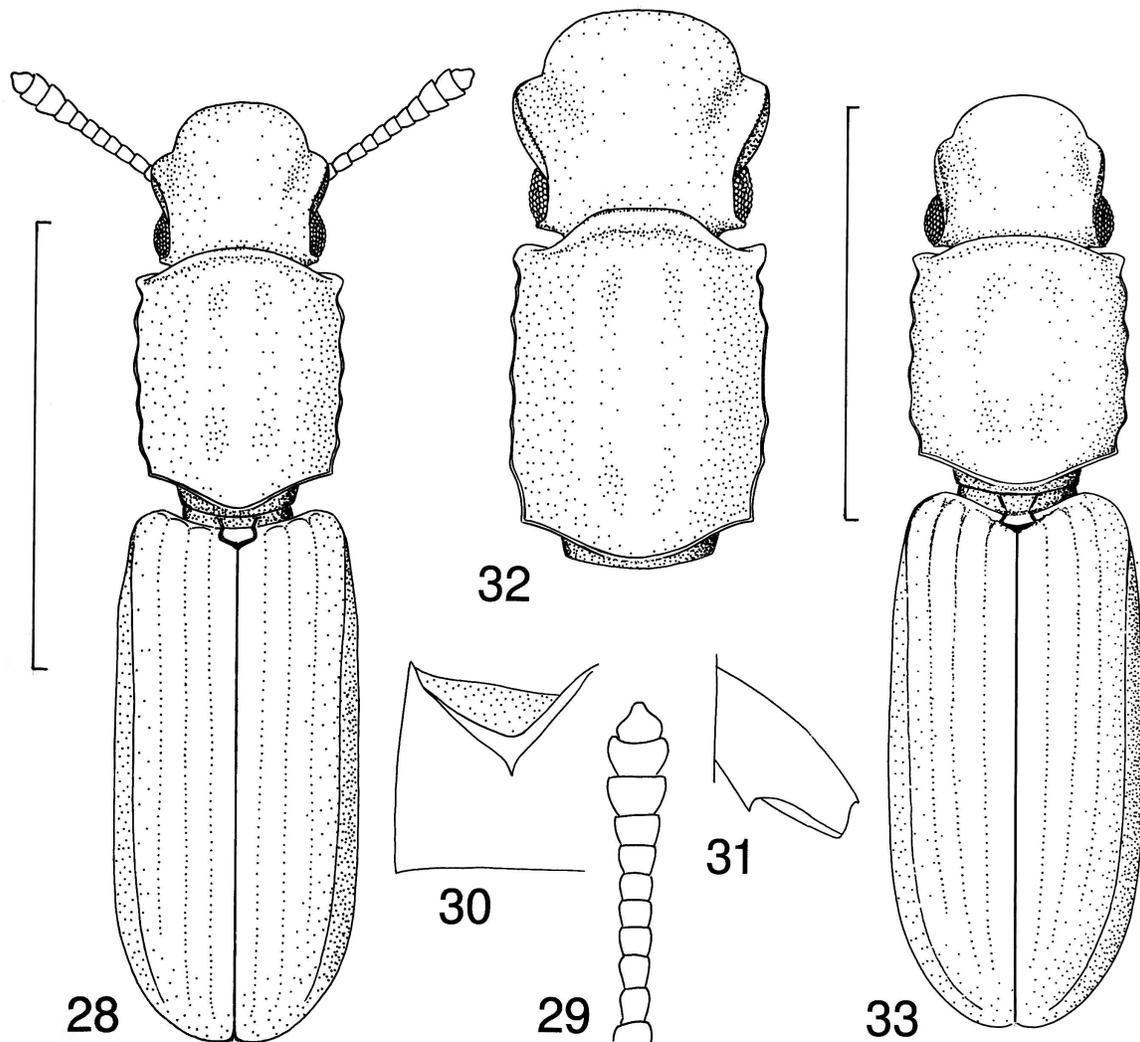
**Etymology.** This species is named in honour of the late Dr. Michael C. Thomas. Michael was an excellent taxonomist whose beetle studies covered various families. He became primarily interested in some of the cucujoid families including the Silvanidae, Cucujidae, and Laemophloeidae, on which he published the results of several very important, major taxonomic studies.

***Austronausibius* Halstead***Austronausibius* Halstead 1980: 320.***Austronausibius wagneri* (Grouvelle), new combination**

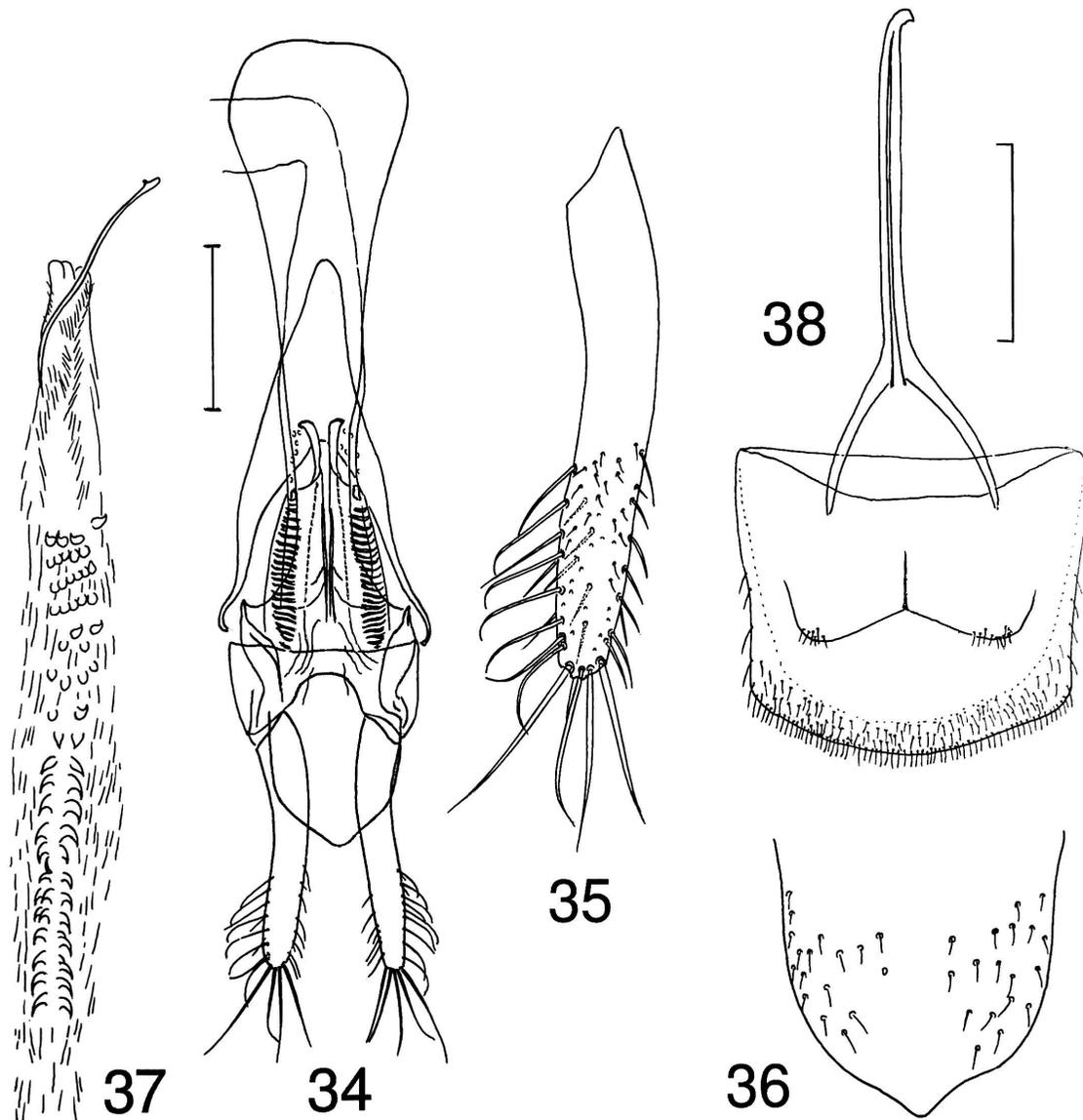
(Fig. 28–38)

*Nausibius wagneri* Grouvelle 1913: 316 (type examined).

**Discussion.** Many years ago, Dr A. O. Bachmann (MACN), following a request, kindly sent a small number of mainly unidentified Argentinian silvanids to the author. These included three male specimens which, apart from the strongly developed genae, compared well with *Nausibius wagneri* Grouvelle, a species described from one female collected in Argentina and not recorded since. Grouvelle's name label on the type specimen is as follows, "Aausibius wagneri ty. Grouv.", probably showing that at some point he had intended to erect a new genus for this beetle. The three males have the general facies of beetles placed in *Austronausibius*, particularly of males of *A. leai* Halstead and *A. aemulus* Halstead, and consequently *N. wagneri* is here transferred to *Austronausibius*. This



**Figures 28–33.** *Austronausibius wagneri* (Grouvelle). 28) Habitus, small male. 29) Antenna, enlarged. 30) Abdominal ventrite (right half). 31) Metafemur, part showing tooth. 32) Head and pronotum of large male. 33) Habitus, female holotype. Scale lines for Figures 28 and 32–33 = 2.0 mm.



**Figures 34–38.** *Austronausibius wagneri* (Grouvelle), male genitalia and associated sternites. 34) Genitalia without internal sac. 35) Paramere, enlarged. 36) Median lobe enlarged. 37) Internal sac. 38) Sternites 8–9. Scale lines = 0.2 mm.

genus seems to be predominantly an Australian genus as species previously placed in it are all from this continent. *Austronausibius wagneri* is so far the only member of the genus that has been found outside Australia and currently the only species known to occur in South America.

**Diagnosis.** *Austronausibius wagneri* is readily distinguished from other known species of *Austronausibius* by the form of the male genitalia, particularly the relatively straight parameres and the arrangement of their setae.

**Description.** The following description is based on the female type and 3 males, one larger than the other two, measurements and ratios are given for all four specimens, males in ascending order of size. Length, female 4.5 mm (Grouvelle gives 4.2 mm), males 4.2, 4.2, 5.7 mm, ratio breadth to length, female 10:36, males 10:39, 39, 43. Dark brown, head moderately shining, rest of body appearing duller due to puncturation and pubescence (cuticle shining), moderately depressed, setae golden.

**Head.** Genae expanded and raised, slightly in female seen (Fig. 33), moderately to very strongly in males (Fig. 28–32); ratio of length of head to breadth across genae female, 10:13, males, 10:27, 27, 40; clypeus and frontal region convex, depression present between this region and genae (above antennal insertions); eyes not very prominent but more so than temple, eyes dorsally separated by 9.3× (female), 7.4, 8.0, 9.9× (males) breadth of eye in dorsal view; temple less than tenth length of eye; antenna (Fig. 29), ratio of length (excluding pedicel, which is largely hidden beneath gena) to that of body, female 10:58, males 10:54, 56, 64, antennomere 11 terminating in a small process; puncturation strong (punctures deep) and dense, punctures generally separated by diameter or less, except towards clypeus and vertex where separated by slightly more than diameter and at sides towards eyes where punctures become reticulate; interspaces shining. Ventrally, head with long setae, much longer than elsewhere on underside of body; large shallow cavity on each side produced by expansion of genae (for accommodation of antennae).

**Pronotum.** More elongate in males than in female seen, ratio of length to breadth 13, 13, 14:10 (males), 12:10 (female); puncturation dense, reticulate except along mid-line and medially before raised region where there are a few punctures more widely separated (although interspaces shining overall impression dull) basal two thirds of longitudinal mid-line slightly raised to form a weak ridge, rest of disc broadly depressed on each side of mid-line, depressions deepest towards base; anterior margin slightly raised, most obviously so at sides; lateral teeth moderately developed, anterior tooth more prominent than others, which are obtuse (Fig. 28, 32–33).

**Elytra.** Elongate, ratio of length to breadth, female 20:10, male 21, 22, 22:10; disc convex; interstriae 3, 5 and 7 raised, 3 raised slightly on basal two thirds, others obviously raised for greater part of length; 9 forms margin of declivity, somewhat carinate; setae arranged in herringbone pattern although not very obviously so; apex slightly curved in to suture.

**Legs.** Male metafemora with a strong tooth on inner margin (Fig. 31); tarsi simple (third tarsomere not produced beneath fourth).

**Abdomen.** First ventrite with femoral line very short (Fig. 30).

**Male genitalia** (Fig. 34–38). Internal sac with teeth arranged in the form of an armature (Fig. 37); median strut gradually broadened to apex; area towards ostium with about 22 rods on each side; parameres long, 4 or 5 long setae at apex, shorter setae along outer margin of apical half, much shorter finer setae along inner margin; median lobe with fine short setae on dorsal surface, apex pointed; sternites 8 and 9 (Fig. 38), sternite 8 with several short fine setae towards each side.

**Material examined. Holotype** female “Rep. Arg. Chaco Sant [green label, Grouvelle’s handwriting] / Type [orange printed label] / Museum Paris 1917 Coll. Grouvelle [recent Paris Mus. label] / Anausibius Wagneri ty. Grouv. [Grouvelle’s handwriting, see Discussion above]” (MNHN).

**Other material.** (3 total) 1 male “Bañado Tucum. Weiser / Col. C. BRUCH / Mus. Arg. Cs. Nat.” (dissected, MACN); 1 male “La Cienega (Belén) Catamarca I. 1926 Weiser Wolters leg. / Col. C. BRUCH / Mus. Arg. Cs. Nat.” (dissected, MACN); 1 male with same data as previous specimen except date “XII. 1925” (not dissected, MACN).

### ***Pensus* Halstead**

*Pensus* Halstead 1973: 77

**Discussion.** *Pensus* was erected by the author to accommodate two species previously placed in *Silvanus*, *Silvanus gilae* Casey (1884: 72) and *Silvanus guatemalensis* Sharp (1889: 560). The general appearance of the genus is similar to that of *Silvanus*, but *Pensus* differs in that antennomere 8 is much smaller than both antennomeres 7 and 9 (Fig. 41), whereas in *Silvanus* it is only slightly smaller than 7. In addition, and of particular importance, *Pensus* males have genitalia with the median lobe apically rounded, not terminating in a small or large point as in *Silvanus*, and parameres that are not forked apically as they are in *Silvanus*.

Several years after creating a new genus for the two described species, a single male of a new one was discovered amongst undetermined silvanids received from the CAS collections. This species has longer, much more obvious pubescence than the two already allocated, and unlike them, it lacks setiferous ocellate punctures (i.e., punctures are without a raised margin) on the head and pronotum (compare Fig. 40 with Fig. 47 and 50). Comparatively recently, Dr. M. C. Thomas (FSCA) sent two females of the new species collected by his colleagues, and an additional six specimens, including both sexes, on behalf of R. S. Zack (WSU). Habitats for members of

the genus on data labels include “Under bark of log”, “oak forest” and “under the bark of *Quercus guatemalensis*”. Some of the specimens were collected in the cloud forests of Guatemala.

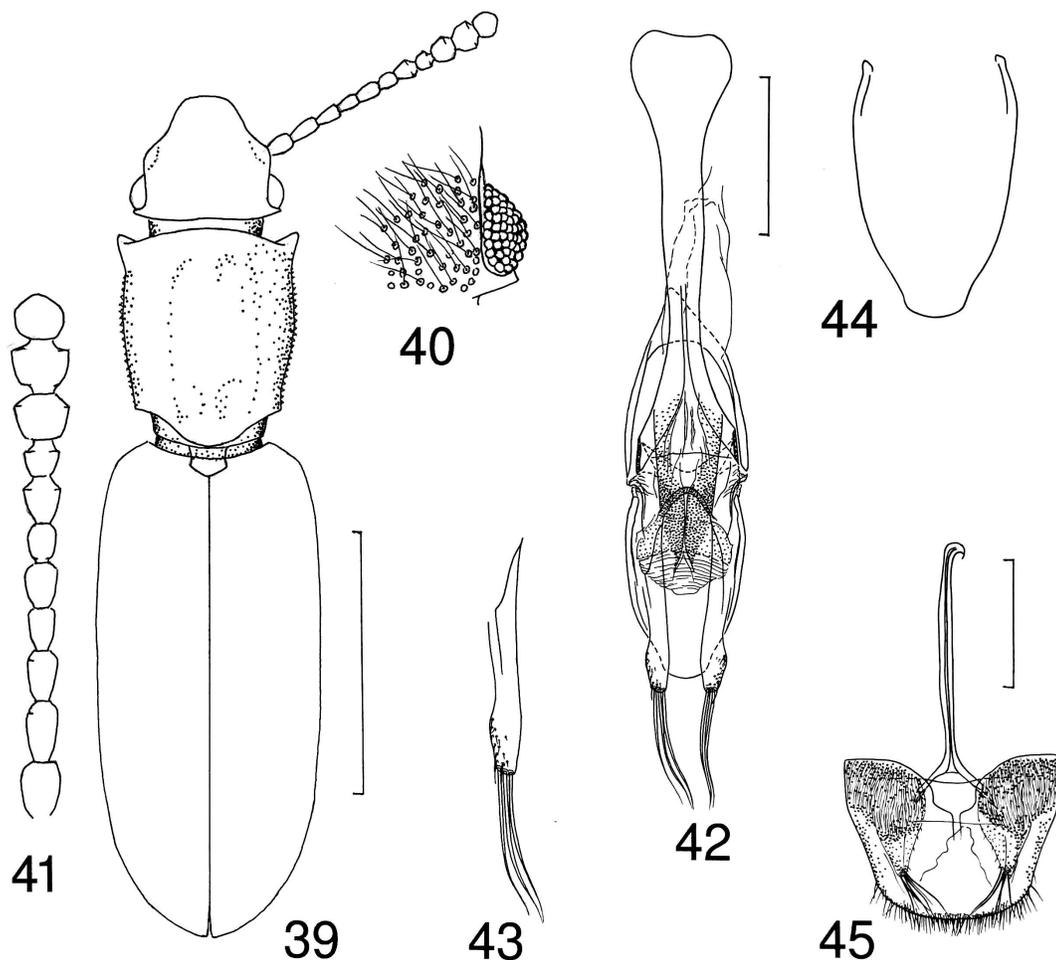
Important external characters for distinguishing the three species of *Pensus* so far known are provided by the form of the dorsal punctures and the length of their setae (this character separates *P. hirtus* from the other two), also the presence of small temples in contrast to their virtual absences (this character separates *P. gilae* from *P. guatemalensis*). Other external parts, including eye size and pronotal shape can vary. In the latter case the sides may be straighter and more parallel than illustrated here (Halstead (1973) includes additional illustrations for *P. gilae* and *P. quatemalensis*). Thus, although indicative these other parts are too variable to be used alone in determining species. The male genitalia, in particular the parameres, are of value in confirming identifications.

The new species is described below followed by a key for the identification of the three known species.

### *Pensus hirtus* Halstead, new species

(Fig. 39–45, 124)

**Description.** This description is based on the type series of 3 males and 6 females. Length of body, 2.94–3.96 mm; length to breadth ratio (breath, maximum across elytra), 33.0–38.7:10.0; dark brown, glossy; head and pronotum



**Figures 39–45.** *Pensus hirtus*, new species. 39) Habitus. 40) Part of head enlarged to show, eye, temple, part of punctation and pubescence. 41) Antenna, enlarged. 42–45) Male genitalia and associated sternites. 42) Genitalia without internal sac. 43) Paramere, enlarged. 44) Median lobe, enlarged. 45) Sternites 8–9. Scale lines for Figure 39 = 1.0 mm, for Figures 42 and 45 = 0.2 mm.

slightly darker than elytra; dorsal pubescence, consisting of long suberect setae, obvious but may become slightly rubbed; ventral pubescence also easily seen; spaces between punctures smooth, without ocellate punctures.

**Head.** Breadth (across eyes) to length ratio, 11.94–14.63:10.00; punctures deep, mostly slightly larger than eye facets and each bearing one long, fine seta, interspaces smooth (glossy); temples very short, only slightly longer than an eye facet but easily seen (Fig. 39, 40, 124); eyes small, dorsally separated across head by 7.3–9.8× breadth; antennae about a third as long as body.

**Pronotum.** Length to breadth ratio 12.02–13.67:10.00, pronotum in males very slightly more elongate than in females; ratio of pronotal breadth across anterior angles to head breadth across temples 12:10; anterior angles moderately developed; disc slightly depressed each side on apical two thirds. more obvious depressions on basal third (Fig. 39); puncturation on anterior region similar to that on head, becoming denser with larger punctures posteriorly; punctation between disc and sides of pronotum also dense with larger punctures.

**Elytra.** Length to greatest breadth ratio, 19.5–22.5:10.0; disc with 6 rows of punctures forming striae; lateral declivity with about 3 rows; long setae, as elsewhere, but arising from very small punctures on surface between rows of punctures (Fig. 124).

**Legs.** In female simple; in male there are secondary sexual characters as follows: metatrochanter with minute spine near apex; metafemur with prominent ridge on proximal side (hardly visible in dorsal view); metatibia moderately curved, proximal side with series of transverse ridges, appearing as conspicuous row of spines along most of the dorsal and ventral margins of the ridge.

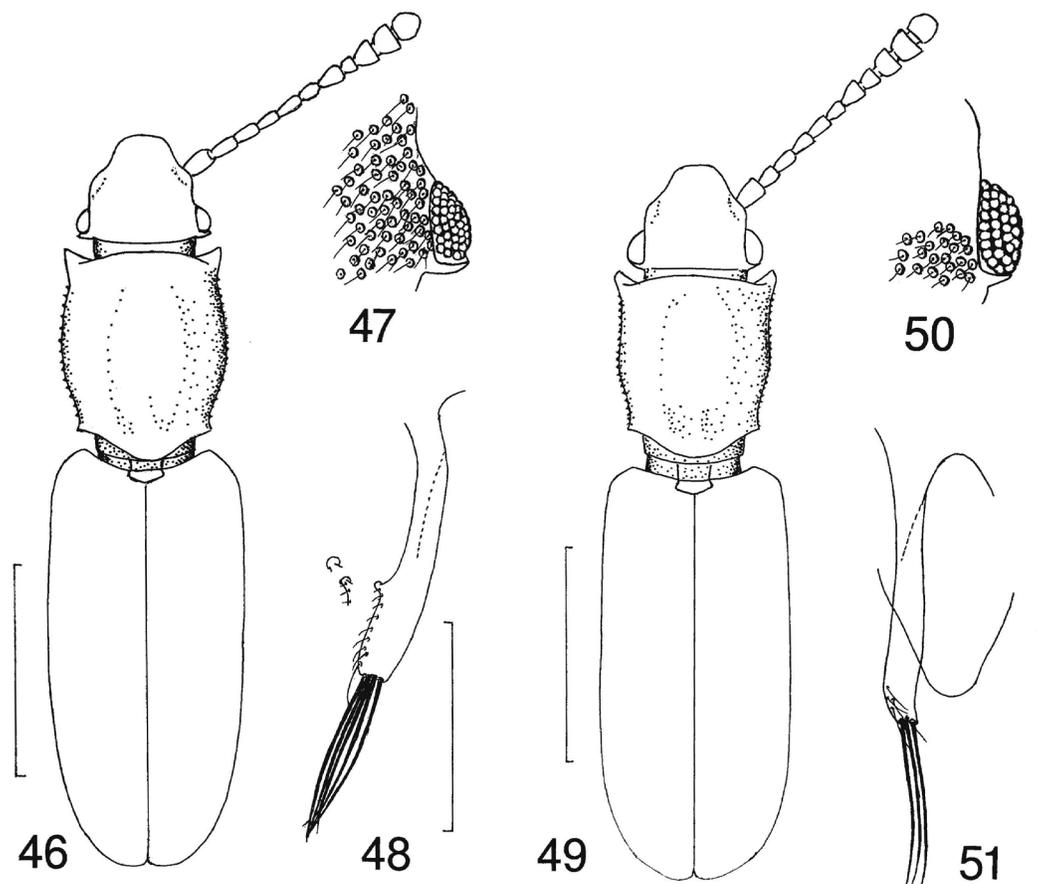
**Male genitalia** (Fig. 43–45). Internal sac with long armature (as in other known *Pensus* spp. see Halstead 1973, Fig. 80, not illustrated here); parameres subparallel to apical third then slightly curved out on distal margin before tapering to apex, a number of minute setae present along the former, apical margin bears long setae, 3 in only specimen dissected (Fig. 42–43); median lobe tapering to broad apical region (Fig. 44); sternite 8 with each part narrowed to apex and bearing bunch of setae, sternite 9 with apical margin fringed with short setae (Fig. 45).

**Materials examined. Holotype** male “Jabali, S. slope of Sierra de las Minas (N. of Cabanas) / Dept Zacapa VII: 28; 48 GUAT. Elev. 5500ft. / Under bark of log / CNHM Guatemala Zool. Exped. (1948) R. D. Mitchell leg.” (CAS). The holotype was dissected, and the genitalia illustrated. It has lost much of the long pubescence.

**Paratypes.** (8) Two males and four females, “GUATEMALA: Zacapa Dept.: Santa Cruz Marble Quarry rd NeE of Teculután 1539m 17 May 2006. N 15° 04.454' W 89° 41.074' R. S. Zack collector” (WSU, FSCA). 1 female, “GUATEMALA: Dept. Zacapa, Sierra de los Minas, “El Naranjo” S. slope below San Lorenzo Mine, vic 15.07329, –89.68481, 1600–1700m 21-24-v-2010, P. Skelley, G. Steck & B. Sutton, oak forest” (FSCA). 1 female, “GUATEMALA: Zacapa, Sierra de las Minas, 8km NW San Lorenzo, 6-vi-2007 cloud forest. B. Sutton, Monzon & Camposeco” (FSCA).

### Identification key to *Pensus* species

1. General appearance of head, pronotal disc and elytra smooth, glossy, punctures (Fig. 40) simple (not ocellate); dorsal pubescence very conspicuous, consisting of long suberect setae (Fig. 40, 124); eyes small, temples short (Fig. 39, 40); male genitalia as in Fig. 42–45, parameres subparallel to apical third where broadest, then narrowing to apical margin which has a few long setae; body length 2.94–3.96 mm; GUATEMALA ..... ***Pensus hirtus* Halstead, new species**
- General appearance of head and pronotal disc rough, punctures ocellate (Fig. 47, 50); dorsal pubescence much less conspicuous, setae more recumbent; temples very short but fairly obvious and eyes small (Fig. 46, 47) or temples virtually absent and eyes usually large (Fig. 49, 50) ..... **2**
- 2(1). Temples virtually absent, eyes usually large (Fig. 49, 50); dorsal pubescence short, particularly inconspicuous on elytra; body length 3.09–3.64 mm; parameres (Fig. 51) without minute prominence on outer margin, apical margin with 3 long setae in specimen dissected but number may vary; GUATEMALA and COSTA RICA ..... ***Pensus guatemalensis* (Sharp)**
- Temples small but fairly obvious, eyes small (Fig. 46, 47); dorsal pubescence of moderate length; body length 2.76–3.77 mm; outer margin of parameres with minute prominence at beginning of row of fine setae (prominence sometimes difficult to see due to orientation of parameres in preparations)



**Figures 46–51.** *Pensus* spp. **46–48)** *P. gilae* (Casey). **46)** Habitus. **47)** Part of head enlarged to show, eye, temple, part of puncturation and pubescence. **48)** Genitalia, paramere with variants of lateral prominence inset. **49–51)** *P. guatemalensis* (Sharp). **49)** Habitus. **50)** Part of head enlarged to show, eye, temple, part of puncturation and pubescence. **51)** Genitalia, paramere and median lobe. Scale lines for Figures 46 and 49 = 1.0mm, for Figures 48 and 51 = 0.2 mm.

(Fig. 48 and variants of prominence inset), apical margin with 3–5 long setae; USA, Colorado and Arizona, MEXICO and GUATEMALA (new distribution record) . . . . . *Pensus gilae* (Casey)\*

\*Four specimens of *P. gilae* (two of each sex), received from Dr M. C. Thomas, were examined recently. These represent the new distribution record for Guatemala given above. They bear the following data “GUATEMALA: Zacapa, Sierra de Los Minas, “El Naranjo” S slope below San Lorenzo Mine, vic 15.07329, - 89.68481, 1600-1700m, 21-24-v-2010, P. Skelley, G. Steck & B. Sutton, oak forest.” (FSCA). Dissection of the genitalia of the male *P. gilae* from Guatemala showed they had the simple form of the median lobe like that illustrated here for the other two species (see Fig. 44, 51, and in Halstead 1973 fig. 82). They did not have the very obvious constriction of the sides of the lobe before its apex as shown for *P. gilae* in fig. 79, 81 of Halstead (1973), suggesting that this constriction might be an artefact.

### ***Coccidotrophus* Schwarz and Barber**

*Coccidotrophus* Schwarz and Barber 1921: 189

**Discussion.** This genus was erected to accommodate one species, *C. socialis* Schwarz and Barber, 1921. The authors also described another species in the same paper which they placed in *Eunausibius* Grouvelle, *E. wheeleri* Schwarz and Barber, 1921. The latter species is transferred to *Coccidotrophus* in the current contribution (see

below). A third species, *C. cordiae* Barber, was described in 1928. A few years ago, Dr. M. C. Thomas sent a specimen of a new species described here as *C. trinidadensis*, **new species**, and more recently, when examining the silvanid accessions in the NHML, the author discovered another new species also described here and named *Coccidotrophus platyops*, **new species**. In addition, more detailed descriptions, including habitus and genitalia illustrations, are presented below for the three previously known species.

Biologically, *Coccidotrophus* is of particular interest as *C. socialis*, *C. wheeleri* and *C. cordiae* have all been found living with mealybugs (*Pseudococcus* spp. (Pseudococcidae)) in myrmecodermatia (cavities in plant tissue used by ants). *Coccidotrophus socialis* and *C. wheeleri* occur in fusiform swellings of the leaf petioles of young specimens (1.5–7.0 ft. high) of the ant-tree, *Tachigalia paniculata* Aubl. If there are no entry holes to these swellings, they are made by the adult beetles. Both adults and larvae feed on nutritive parenchyma within the swellings and on honeydew, which like ants they solicit from the mealybugs by stroking them with their antennae. Wheeler (1921) gave a very detailed and interesting account of the feeding behaviour and biology of *C. socialis*, a species that he found to be very common where it occurred in Guyana (then 'British Guiana'), and also some information on the comparatively rare *C. wheeleri*. In addition, he included a short account of them illustrated with photographs, in his book on social insects (Wheeler 1928). The larvae and pupae of these two species were described by Böving (1921) who confirmed their allocation to the Silvanidae. *Coccidotrophus cordiae*, was first discovered by Dr. W. M. Mann in Bolivia during 1921–1922 where it was attending mealybugs in hollow swellings at the base of twigs of an ant-sheltering tree, *Cordia alliodora* Ruiz and Pavon (Barber 1928). Far more recently it has been collected with mealybugs on this tree in Ecuador and Colombia (see re-description of the species below). Regarding the two new species, the only biological / habitat information available is that for *C. platyops*, which was collected from the tree *Micropholis guyanensis* in Brazil.

**Diagnosis.** Body elongate and overall appearance sub-cylindrical. Head with ventral antennal grooves moderately developed and slightly convergent (Fig. 57, 63), antennae short with an obvious club and funiculus composed of short, robust antennomeres. Profemora broader than other femora. Tarsomeres robust and simple. Last abdominal ventrite of the male may have a large, obvious median depression (Fig. 72), present in *C. socialis* and *C. cordiae* but absent in *C. wheeleri*, *C. platyops* and *C. trinidadensis*. Where males of *C. socialis* and *C. cordiae* have this depression, conspecific females may have an inconspicuous, slight depression. Other secondary sexual character that are present on legs of the male include the following: tibiae all with a small apical spine on proximal margin (*C. socialis*); metafemora with small prominence on proximal margin and metatibiae with a small apical spine on same margin (*C. wheeleri*, Fig. 62); metafemora with or without a very small prominence on proximal margin, tibiae all with a small spine on inner apex (*C. cordiae*, Fig. 70); metatibiae with an apical spine and minute teeth along proximal margins (*C. platyops*, Fig. 81); tibiae all with a small apical spine (*C. trinidadensis*, Fig. 85). Male genitalia have parameres that are not obviously articulated, and the ostium borders generally with a row of conspicuous rods but they may be just darkly sclerotized (Fig. 75–77).

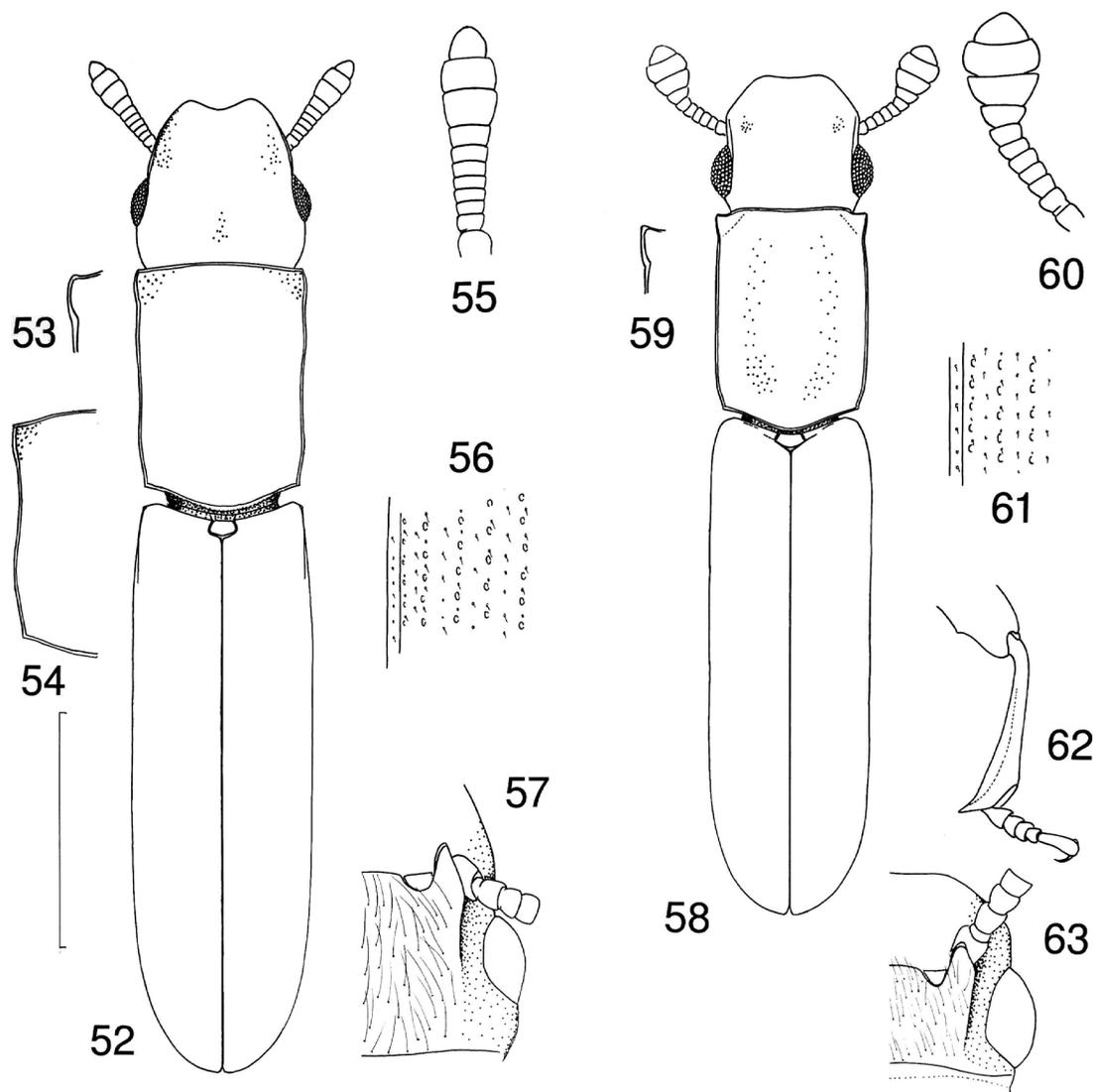
The appearance of *Coccidotrophus* species is most similar to that of *Eunausibius* Grouvelle, however *Coccidotrophus* species are more elongate having longer and more cylindrical elytra and longer pronota than *Eunausibius* species. In addition, the known *Coccidotrophus* all have puncturation on at least some part of the pronotum and head that is elongate and appears to be derived from pairs of punctures (Fig. 85). The known *Eunausibius* lack such punctures, typical round punctures being found on head and pronotum.

### ***Coccidotrophus socialis* Schwarz and Barber**

(Fig. 52–57, 64–66)

*Coccidotrophus socialis* Schwarz and Barber 1921: 189 (types examined).

**Description.** This description is based on two male paratypes and takes into account data from the original description. The illustration of half of the pronotum of a specimen of *C. socialis*, with sides very obviously narrowed to the middle (Fig. 54), was made from a photograph showing all characteristics of the species. The specimen illustrated was collected in Ecuador with *C. cordiae* but has not been seen by the author. Length of the two specimens examined 4.1 and 4.3 mm, length to breadth ratios, 54 and 56:10, Schwarz and Barber (1921) gave length as 3.5–4.5 mm, breadth 0.6–0.8 mm (i.e., presumably length to breadth ratio of 58–56:10); general appearance sub-cylindrical, dark to reddish brown, shining and glabrous.



**Figures 52–63.** *Coccidotrophus* spp., all paratypes except figure 54. 52–57) *C. socialis* Schwarz and Barber, male. 52) Habitus. 53) Anterior pronotal angle, semi-lateral view. 54) Pronotum (left half), variant with strongly incurved sides. 55) Antenna, enlarged. 56) Elytron, small part including sutural margin enlarged to show rows of punctures. 57) Head, part of left side to show antennal groove. 58–63) *C. wheeleri* (Schwarz and Barber), male. 58) Habitus. 59) Anterior pronotal angle, semi-lateral view. 60) Antenna, enlarged. 61) Elytron, small part including sutural margin to show rows of punctures. 62) Hind leg enlarged, showing small femoral prominence etc. 63) Head, part of left side to show antennal groove. Scale line = 1.0 mm.

**Head.** Slightly broader than long, tapering from in front of eyes to broad, v-shaped emargination, lateral margins (in front of eyes) moderately raised; shallow depressions present above antennal insertions, vertex with very shallow, longitudinal depression; basal half of head rugose and papillate, papillae minute, well separated and each bearing a short, fine (inconspicuous) seta, apical half with normal, sparser puncturation, punctures each with a short, fine seta; eyes in dorsal view rounded, small with small facets, dorsally separated by 8.6× or 10× breadth of eye in dorsal view; antennae robust, funicular segments strongly transverse, apical segments forming narrow club; antennal grooves (beneath head) relatively short (Fig. 57).

**Pronotum.** Elongate, length to breadth ratio 14.5–15.0:10, slightly to obviously narrowed to middle (Fig. 52, 54), all margins with narrow rim, apical rim less obvious than others, small depressions present by anterior

angles; disc more or less flat; anterior angles only slightly developed, not produced in front (semi-lateral view Fig. 53); narrow, medial, longitudinal impunctate region extending to apical quarter, puncturation on rest of dorsal side with moderately dense puncturation consisting of elongate, elliptical punctures appearing to be derived mainly from pairs of punctures, some punctures in short rows (puncturation similar to that of *C. trinidadensis*, Fig. 85), interspaces shining.

**Elytra.** About 3× as long as broad with narrow rim along suture and sides; each elytron with 9 rows of punctures forming striae, a microscopic puncture bearing a minute seta present in front of each stria puncture and a regular interstria row of these punctures (Fig. 56).

**Legs.** Male tibiae all with a small apical spine on proximal margin, no other secondary sexual characters present on legs.

**Abdomen.** Femoral lines on first abdominal ventrite extending to about caudal half; male, last abdominal ventrite with broad depression (similar to although not as deep as that of *C. cordiae* Fig. 72), apical margin of depression with obvious rim.

**Male genitalia.** (Fig. 64–66) Parameres broadest on basal half, moderately tapered to rounded apex, with 7–8 long, mainly apical setae but one long seta half-way along outer edge of one paramere in specimen dissected, a similar number of short, fine setae in a group on outer edge within basal half and some of variable size along inner edge and towards apical long setae; median lobe gradually tapered to broad apparently slightly emarginate apex (apex difficult to see in slide preparation); area towards ostium with about 20 rods on each side (Fig. 64); internal sac (Fig. 65) with long sclerite at apex; sternite 8 on each side of apical margin with a few long setae towards middle followed by many very short setae (Fig. 66).

**Material examined.** Two male specimens examined, one dissected, “Kartabo. Bartica Distr. Brit. Guiana W M Wheeler 1920 / socialis Sz&B Paratype no 24070 USNM [red label]” (Additional type specimens are in the NHML and USNM).

**Distribution and habitat.** Guyana (types) and Ecuador. Associated with coccids in myrmecodermati on the ant-tree *Tachigalia paniculata*.

### ***Coccidotrophus wheeleri* (Schwarz and Barber), new combination**

(Fig. 58–63, 67–69)

*Eunausibius wheeleri* Schwarz and Barber 1921: 192 (paratypes examined).

**Description.** This redescription is based on two paratypes, one of each sex. Measurements, ratios etc., are given for the male specimen first. Length 3.32 mm (male), 3.30 mm (female), length to breadth ratios, 53 and 51:10, Schwarz and Barber (1921) give length as 3.5–3.0 mm, breadth 0.75–0.60 mm (i.e., presumably ratios of 47–50:10); general appearance sub-cylindrical, color yellowish brown, shining, appearing glabrous.

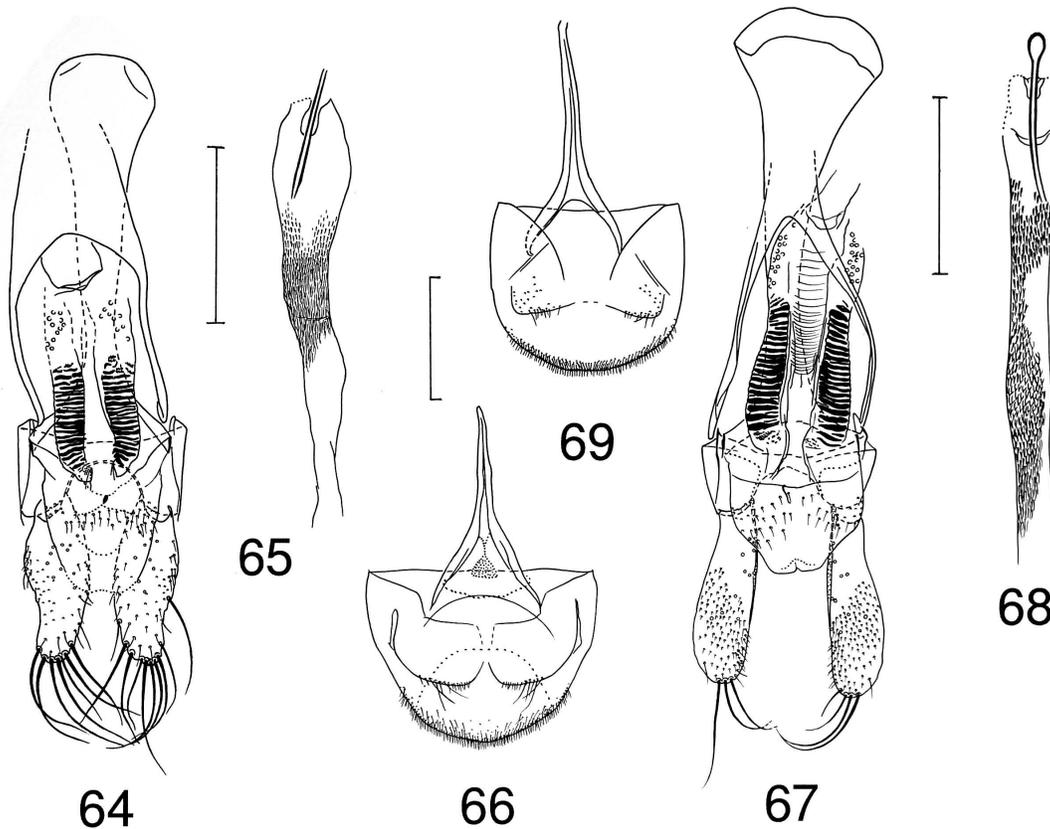
**Head.** Slightly longer than broad, margins in front of eyes sub-parallel before converging to front of head at midway; front of head weakly emarginate; obvious depressions present above insertion of antennae; eyes prominent, large with large facets, dorsal eye separation 6× breadth of eye in dorsal view; antennae robust, funicular segments transverse, club well developed with large segments; antennal grooves (beneath head) relatively long in comparison with head (Fig. 63); puncturation, moderately dense, less so between depressions, punctures include some paired ones also some arranged in short curved lines.

**Pronotum.** Elongate, length to breadth ratio 14.5–15.0:10.0, sides almost straight from base of anterior angles to just before obtuse posterior angles, all margins with rim; disc with shallow longitudinal depressions on each side, deepest towards base; anterior angles weakly developed, very slightly produced forward, a very small depression encompassed by them (Fig. 58); median longitudinal line impunctate, elsewhere puncturation moderately dense, in general similar to that of *C. socialis* with punctures elongate, tending to be arranged in short lines some of them curved.

**Elytra.** About 3× as long as broad with narrow rim along suture and sides (Fig. 61).

**Legs.** Male metafemora with small prominence on inner (proximal) margin and metatibiae with a small apical spine on proximal margin (Fig. 62); female without these characters.

**Abdomen.** Femoral lines on first abdominal ventrite extending to about posterior quarter of ventrite; last abdominal ventrite convex medially, without a ridge along the edge.



**Figures 64–69.** *Coccidotrophus* spp., paratypes, male genitalia and associated sternites. **64–66)** *C. socialis* Schwarz and Barber. **64)** Genitalia without internal sac. **65)** Internal sac. **66)** Sternites 8–9. **67–69)** *C. wheeleri* (Schwarz and Barber). **67)** Genitalia without internal sac. **68)** Internal sac. **69)** Sternites 8–9. Scale lines = 0.2 mm.

**Male genitalia.** (Fig. 67–69) Parameres rounded apically, 3 or 4 long setae at apex, group of very short setae along apical half of inner margins, many minute setae on surface as illustrated; median lobe with sides convergent to apex from basal half (it seems that apex has become bent over in preparation), irregular group of setae across middle; about 20 rods on each side of area towards ostium (Fig. 67); internal sac with various modified setae, as illustrated (Fig. 68); sternite 8 with a few short setae (Fig. 69).

**Material examined.** One male and one female paratype, both with the same data labels: “Kartabo, Bartica Distr. Brit. Guiana W M Wheeler 1920 # 442 Aug 9 / wheeleri U. S. N. M. Paratype 24071 [red label]” (USNM). Additional types are in the USNM.

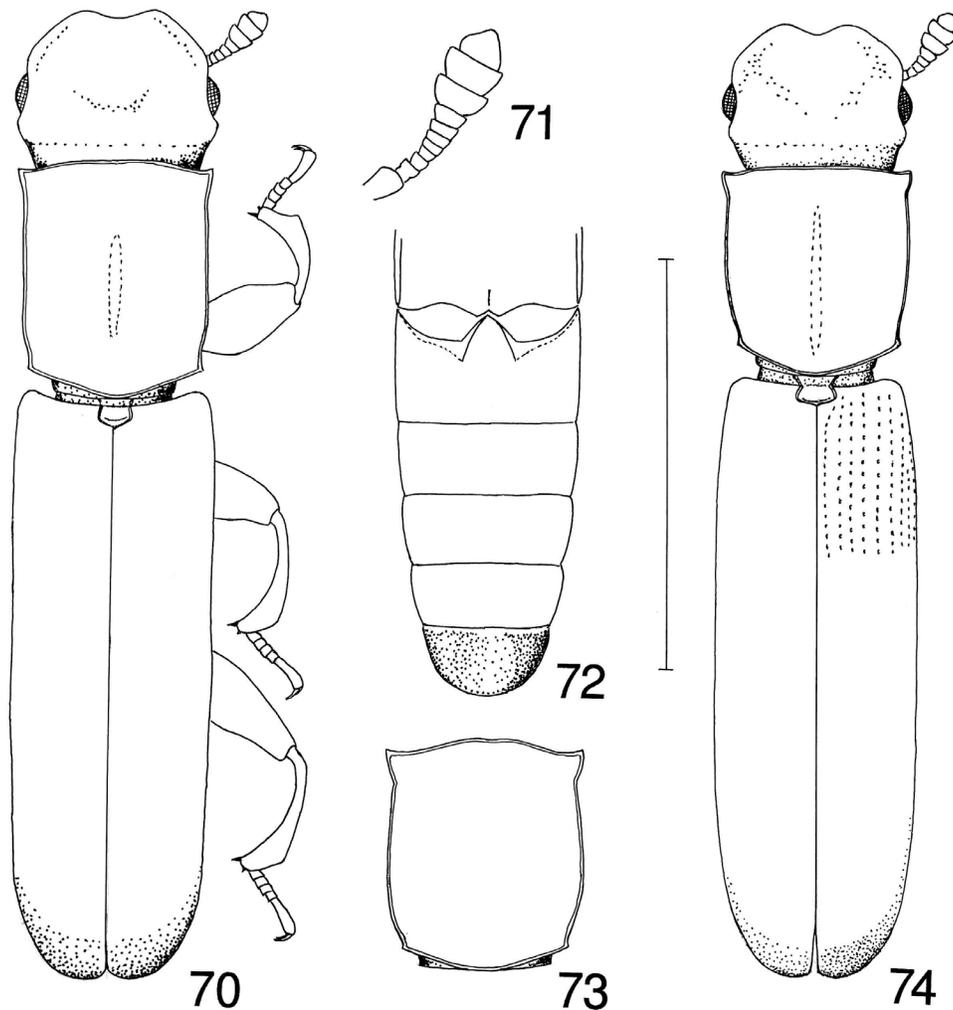
### *Coccidotrophus cordiae* Barber

(Fig. 70–79)

*Coccidotrophus cordiae* Barber 1928: 167.

*Coccidotrophus huachianus* Barber (unpublished name, see “Materials examined”).

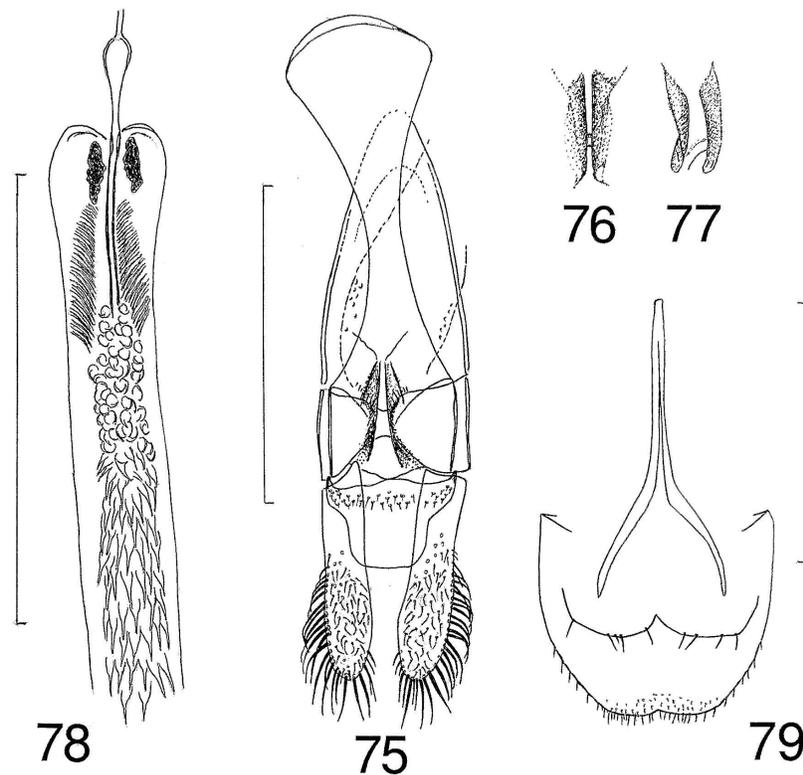
**Description.** The following redescription is based on the 3 Bolivian types plus 2 additional female specimens from there, 2 males and 3 females from Colombia, and a series of 36 specimens, including both sexes, from Ecuador. Measurements and ratios are given for each of the 3 type specimens (male holotype first, the larger then smaller female paratype “allotype”) and as a range (including the types) for all of 10 specimens measured which included largest and smallest seen. Length, types: 4.7, 4.3, 4.2 mm, all specimens: 5.9–4.2 mm; elongate, total length to maximum elytral breadth, types: 48.4, 45.6, 44.6:10.0, all specimens: 49.0–45.1:10.0; general appearance sub-cylindrical, very dark brown, shiny, glabrous.



**Figures 70–74.** *Coccidotrophus cordiae* Barber. 70) Habitus, male; Ecuador specimen. 71) antenna, enlarged. 72) Abdomen and base of metasternum of male. 73) Pronotum of female, form with more rounded sides. 74) Habitus male, holotype (Bolivia). Scale line = 2.0 mm.

**Head.** Transverse (breadth to length ratio, about 15:10); anterior margin moderately emarginate, lateral margins slightly raised in front of eyes, slight depression above antennal insertions; densely punctured, particularly towards eyes and back of head, becoming rough behind eyes, in front region of head punctures comparatively smaller and more widely separated, in general many punctures seem to be derived from pairs of punctures; surface between punctures shallowly microreticulate, less shining than rest of body; eyes in dorsal view small, dorsal separation variable, types 13x–11x, all specimens 11–17× maximum breadth of eye in dorsal view, facets fine; antennae robust, two or three basal antennomeres hidden from above, 9 and 10 transverse, more so in some specimens than in others (compare Fig. 71 and 74); antennal grooves (beneath head) slightly convergent, most similar to those of *C. wheeleri* (Fig. 63).

**Pronotum.** Transversely convex; slightly longer than broad, length to breadth of types: male 11.5, females 12.1, 11.6:10.0, all specimens 12.1–13.3:10.0; margins with rim in all specimens; anterior angles slightly produced in front; shape of pronotum a little variable, some larger females with sides obviously more rounded before posterior angles (Fig. 73); surface medially with ill-defined, longitudinal, narrow impunctate region (indicated by broken line on Fig. 70), rest of pronotum mainly with longitudinally arranged punctures apparently derived from pairs of punctures, far less dense than puncturation on head; surface between punctures strongly shining, surface



**Figures 75–79.** *Coccidotrophus cordiae* Barber, male genitalia and associated sternites, all holotype from Bolivia except Figures 76–77. 75) Genitalia without internal sac, holotype. 76–77) Dark sclerotized areas bordering ostium of two other specimens both from Colombia. 78) Internal sac. 79) Sternites 8–9. Scale lines = 0.5 mm.

microsculpture present but difficult to see. Slight depressions, apparently abnormal, are present on basal third of the disc of holotype, and allotype, which seems to be teneral, has a large abnormal discal depression.

**Elytra.** Elongate, 3× as long as broad, with slight rim along suture mainly on apical third and narrow marginal rim, latter mostly hidden in dorsal view; each elytron with 9 rows of punctures forming striae, eighth fine, ninth obsolete; a microscopic puncture bearing a minute seta in front of each strial puncture.

**Legs.** Male metafemora with or without extremely small prominence on inner proximal margin (as shown in Fig. 70); all tibiae with a small spine on inner apex (Fig. 70). Female without these structures.

**Metasternum.** With a short longitudinal median carina just before forked apex (Fig. 72), not present in other species seen.

**Abdomen.** Femoral line, on first abdominal ventrite, joining marginal line of coxal cavity forming a triangular area. Last abdominal ventrite of male with an obvious broad, deep median depression (Fig. 72), that of female slightly depressed, not conspicuously so.

**Male genitalia.** (Fig. 75–79) Parameres with long setae at apex and along apical three fifths of outer margin, number variable, about 9–17 (Bolivian holotype about 16–17) rest of outer margin without setae, surface with many short setae, parameres may be slightly more tapered to a narrower apex than illustrated; median lobe broad, apex very slightly rounded, sides sub-parallel from apex to basal half then sinuate to base, band of short setae present towards base (Fig. 75); area towards ostium without conspicuous bordering rods, only darker sclerotized borders developed (Fig. 75–77); internal sac with pair of sclerites at apex near ejaculatory duct, two groups of fine spines (basal half of spines broad) below sclerites, followed medially by some transparent sickle shaped spines

with an inner median tooth, these within similarly transparent fine spines that cover the basal half of the sac (Fig. 78); sternite 8 with a few long marginal setae, sternite 9 with some short marginal setae and a group of minute ones present at apex (Fig. 79).

**Distribution and habitat.** As far as the author is aware, this species has only been found in Bolivia, Colombia and Ecuador. According to Barber (1928) the types were collected in hollow swellings (myrmecodomatia) at the forking of twigs of an ant-sheltering tree, *Cordia alliodora* Ruitz and Pavon, where the beetles were attending coccids. The specimens from Colombia and Ecuador were also found in this habitat with coccids. Apart from tropical transition forest, habitat data was not recorded for “the other two” Bolivian specimens mentioned below.

**Material examined. Types:** As a result of enquiries made by the author over two decades ago, Dr. John M. Kingsolver discovered three types, 1 male and 2 females (the original description of *C. cordiae* was based on three specimens including one male) all with the USNM Type No. 26488, the number recorded by Barber (1928) for *C. cordiae*, and with all characters described by him. However, Dr. Kingsolver found these specimens were labelled “Coccidotrophus huachianus Barber” [manuscript name] not *C. cordiae*, and “Tachigalia” not *Cordia alliodora* as given in the description. Nevertheless, the locality label includes Huachi, which is correct, and Dr. Kingsolver was sure that these three specimens must represent the type series of *C. cordiae*. He thought that both the name and host labels were probably a lapsus and placed explanatory labels, one for the holotype and one for the paratypes in the trays containing them. Having examined these specimens, the author agrees with Dr. Kingsolver and accepts them as the types of *C. cordiae*. The **holotype** and paratypes in the USNM bear the following data labels: “no 7a ex stem Tachigalia [handwritten] / Huachi RIO BENI BOLIV Sept. W M MANN / MULFORD BIOLOGICAL EXPLORATION 1921-22 [printed] / Coccidotrophus huachianus Barber [unpublished name, handwritten] U.S.N.M. Type No. 26488 [red type label]”; “Type” [holotype], allotype and paratype, being so labelled. However, the paratype lacks the “MULFORD BIOLOGICAL EXPLORATION 1921-22 [printed]” label.

**Other material.** (43 total) 1 female, “Bolivia Santa Cruz, 3.7km SSE Buena Vista, Hotel Fauna & Flora, 405m 5-15. x. 2001 17° 29.949’S, 63° 33.152’W coll. M. C. Thomas & B. K. Dozier tropical transition forest” (FSCA); 1 female, “Bolivia Omapini [spelling?] 15. 8. 89” (FSCA). The 2 males and 3 females seen from Colombia has locality and habitat labels as follows: “Kolumbien Villavicencio (Meta) 20. II. 76 / ex Cordia alliodora zus mit larven pupen- Pseudococcidae” (FSCA, MIZP, NHML). Specimens from Ecuador (36) are labelled as follows “ECUADOR: Yasuni, La Catolica Stn, 0°40’ 44.4” S 76°23’ 58.7” W 13-JAN 2009. E. Pringle collr. ex. Lowland rainforest on *Cordia alliodora* in assoc w. *Azteca* sp. & pseudococcid. EGP62” or with the same data except for a different EGP number, either 69 or 72 (FSCA).

### *Coccidotrophus platyops* Halstead, new species

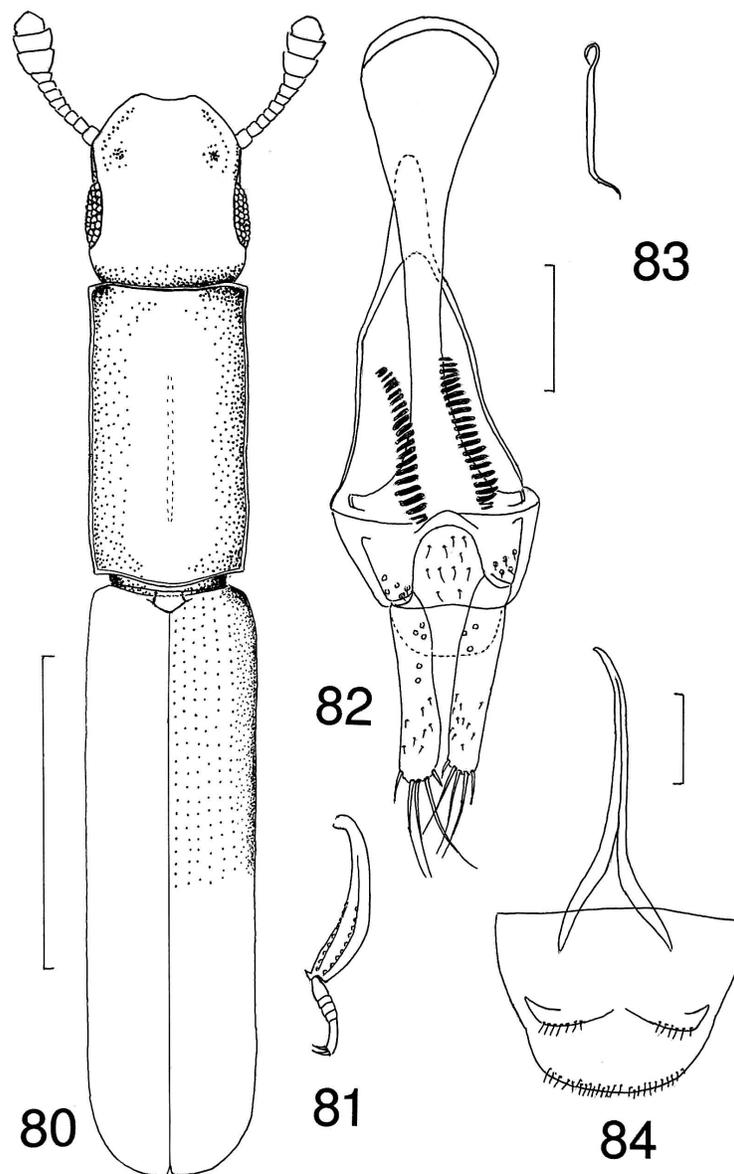
(Fig. 80–84)

**Description.** The following description is based on one male specimen. Length 3.41 mm, total length to maximum elytral breadth ratio, 64:10; general appearance sub-cylindrical, very elongate, shining, glabrous and castaneous.

**Head.** Elongate, length to breadth ratio, 12:10, sides in front of eyes slightly divergent before converging to apical shallow emargination; small deep depression above each antennal insertion; eyes, in lateral view large and flat, in dorsal view appearing long and flat (Fig. 80), separation about 9× maximum breadth of eye in dorsal view, in ventral view also large, separated by 5× ventral diameter; temples rounded to base of head; antennae robust, very short, about one seventh of body length, inserted beneath genae, only base of scape hidden from above, club with large broad segments (Fig. 80); antennal grooves shallow and inconspicuous, similar to those of *C. socialis* (Fig. 57); dorsal puncturation on basal third moderately dense, consisting of crescentic chains of small, elongate punctures, punctures on rest of head, particularly frons, becoming rounded.

**Pronotum.** Elongate, length to maximum breadth ratio, 19:10; sides almost straight but very slightly narrowed medially and inconspicuously rounded before posterior angles, all margins narrowly rimmed; anterior angles inconspicuous, not produced in front, very slightly produced laterally; posterior angles obtuse; disc medially with narrow, longitudinal impunctate line, elsewhere with elongate punctures apparently derived from pairs of punctures.

**Prosternum and metasternum.** Sides each with shallow depressions.



**Figures 80–84.** *Coccidotrophus platyops*, new species, male holotype. **80)** Habitus. **81)** Metatibia and tarsus. **82–84)** Genitalia and associated sternites. **82)** Genitalia, without most of internal sac. **83)** Sclerotized structure at apex of internal sac. **84)** Sternites 8–9. Scale lines for Figures 80–81 = 1.0 mm, for Figures 82–84 = 0.1 mm.

**Elytra.** Very elongate, 3.5× as long as broad, parallel sided, rounded to apex, a narrow rim present along suture and sides of elytra (on latter hidden from above); striae consisting of small, shallow punctures (as found in other species) although smaller punctures on interstitial areas irregular and less obvious.

**Legs.** Male metafemora with small tooth on proximal ventral margin at about apical fifth; tibiae moderately curved; metatibiae with very small apical spine plus rows of 8–9 minute teeth along inner margins (Fig. 81), almost certainly an additional secondary sexual character.

**Abdomen.** First ventrite with femoral lines present on basal half. Last ventrite not depressed.

**Male genitalia.** (Fig. 82–84) Parameres elongate, about 5× as long as broad, surface of apical half with several minute, inconspicuous setae, apices with 3 long setae plus shorter one at outer margin and much smaller seta at inner margin; median lobe difficult to see in the slide preparation made but appears to be broad (see dotted line); area towards ostium with about 22 rods on each side (Fig. 82); internal sac, only small sclerotized structure from its apex illustrated (Fig. 83) due to damage while making preparation, rest of sac is similar to that of *C. wheeleri* (see Fig. 68); sternite 8 with a few short setae on each side (Fig. 84).

**Material examined. Holotype** male “BRAZIL Am. Reserva Ducke 26km NE Manaus Hurtado, J. C. G. / Micropholis guyanensis 01. ix. 1995 / Tree N° 155 Tray N° 5 / C 101.4 / Silvanidae det. N. P. Lord 2010” (NHML).

**Etymology.** The name refers to the flat dorsal appearance of the large eyes.

### ***Coccidotrophus trinidadensis* Halstead, new species**

(Fig. 85–90)

**Discussion.** The only specimen of this new species known to the author was sent by Dr. M. C. Thomas. Although at present there is no information on habitat, its elongate form etc. is closely similar to that of other *Coccidotrophus* species suggesting that it may utilize similar habitats.

**Diagnosis.** *Coccidotrophus trinidadensis* is most similar to *C. platyops* but the eye size and the head shape, the deep very conspicuous and convergent antennal grooves beneath it and the form of the male genitalia of *C. trinidadensis* readily distinguish it from *C. platyops*.

**Description.** The following description is based on a single male specimen. Length 4.37 mm, total length to maximum elytral breadth ratio, 10:6; general appearance sub-cylindrical, very elongate, shining, glabrous and castaneous

**Head.** Slightly broader than long, ratio of about 12:10, large part of head flat; neck with large, shallow, circular punctures; sides with lateral carina from above eyes to front, latter not emarginate, without obvious depression above antennal insertions; moderately densely punctate with pairs of punctures that are rounder than those on pronotum; eyes appearing small in dorsal view (difficult to see unless head slightly tilted), in ventral view very large with bordering deep and convergent antennal grooves (similar to those in *Eunausibius* spp., see Fig. 101); temples angled to base of head; antennae with club antennomeres 9 and 10 broader and much larger than rest, antennomere 1 hidden by side of head.

**Pronotum.** Long, nearly 2× as long as broad, length to breadth ratio, 19:10, greatest breadth towards base, sides slightly sinuate to middle; anterior angles only slightly developed, breadth across these angles similar to that across temples of head; posterior angles obtuse; disc with pairs of punctures (Fig. 85), medially on front half some pairs separate, but towards sides of disc and from anterior to posterior margin of pronotal declivities the pairs tend to join up forming irregular and sometimes curved lines.

**Prosternum, metasternum and abdominal ventrites 1 and 2.** Sides of prosternum shallowly depressed forming longitudinal medial ridge on apical half; sides of metasternum and abdominal ventrites 1 and 2 also depressed (for ventrites see Fig. 86). Depressions apparently for accommodating folded legs.

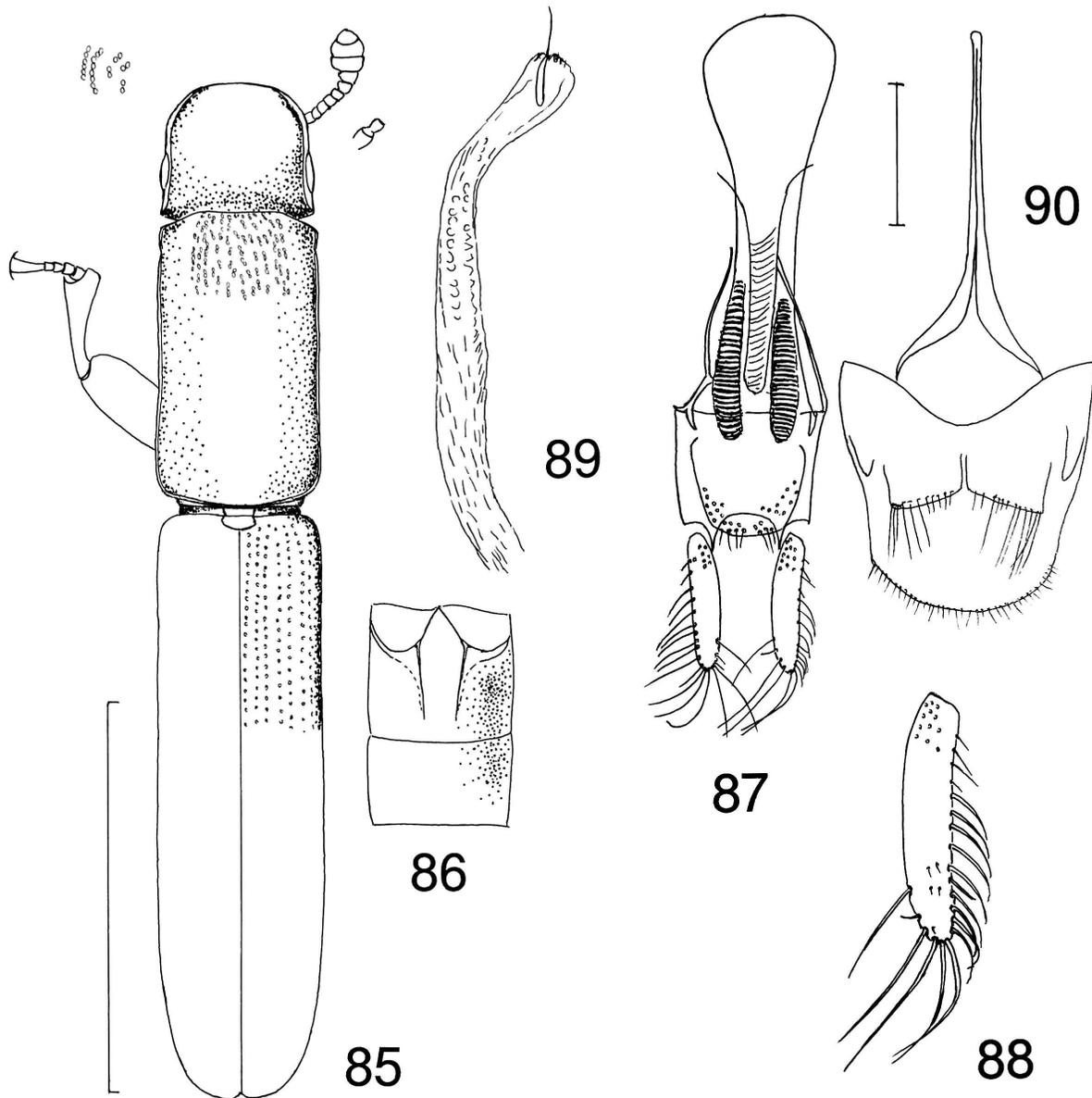
**Abdomen.** First abdominal ventrite with femoral lines extending to caudal fifth (Fig. 86).

**Legs.** Tibiae have a small apical spine, protibiae (Fig. 85) are particularly wide apically; metafemora have a deep groove on basal half of underside, folded metatibiae are received by this groove, proximal side of groove is weakly carinate, possibly a secondary sexual character.

**Elytra.** Virtually parallel sided and sub-cylindrical, length to breadth ratio, 10:36; nine rows of punctures forming striae, only seven visible in dorsal view (Fig. 85).

**Male genitalia.** (Fig. 87–90) Parameres elongate, about 5× as long as broad, outer margin straight, inner narrowing to apex from about basal half, apical third with a few very small setae, each outer margin with about 14 setae of moderate length becoming longer at apex, with a few short ones on remaining margin; median lobe large, slightly rounded apically, with a few marginal apical setae on each side; area towards ostium with about 25–27 rods on each side; internal sac with an indication of a poorly developed armature; sternite 8 on each side with 6 or 7 long setae and 5 short ones (Fig. 90).

**Material examined. Holotype** male “TRINIDAD: Talparo July 6–22-1988 Coll, H. L. Dozier.” (FSCA).



**Figures 85–90.** *Coccidotrophus trinidadensis* new species, male holotype. **85)** Habitus, inset illustrations of a few paired head punctures, also antennomeres 1–2; other puncture illustrations given as examples of pronotal paired punctures and elytral stria punctures. **86)** First and second abdominal ventrites. **87–90)** Genitalia and associated sclerites. **87)** Genitalia, without most of internal sac. **88)** Paramere enlarged. **89)** Internal sac. **90)** Sternites 8–9. Scale lines for Figures 85–86 = 2.0 mm, for Figures 87, 89–90 = 0.2 mm.

### *Eunausibius* Grouvelle

*Eunausibius* Grouvelle 1913: 314.

**Discussion.** Two species originally described in *Eunausibius* by Parsons (1974) are transferred to *Nausibius* as follows: *Nausibius lophius* (Parsons) **new combination** (= *Eunausibius lophius* Parsons) and *Nausibius salutaris* (Parsons) **new combination** (= *Eunausibius salutaris* Parsons) and *Eunausibius wheeleri* Schwarz and Barber, is placed in *Coccidotrophus* (see above in this paper). The description of one new species discovered during this study makes a total of three within *Eunausibius*.

**Diagnosis.** Body elongate, moderately cylindrical, total length within species belonging to the genus can show considerable variation; for *E. jatahyensis* **new species**, the range of the eight specimens examined (the type series) is 3.71–9.60 mm, and that of seventeen of *E. elongatus* 3.00–5.43 mm. Head with deep convergent antennal grooves beneath (Fig. 101). Antenna short with first antennomere hidden beneath genal margin and a gradually to more obviously developed club of four segments. Pronotum with anterior angles not strongly developed but lateral limit either defined by an inward expansion of the lateral pronotal rim joining a short impressed line (Fig. 91, 98–99) or just a small impression on the lateral rim. Males of the three known species with a small metafemoral tooth (see Fig. 103) and metatibiae striate on proximal side. Elytra each with 9 rows of punctures forming striae or punctate striate. Striae terminating before elytral apex, 6 and 7 of equal length and shorter than rest. *Eunausibius* and *Coccidotrophus* are similar genera, for comparisons see the genus diagnosis for the latter.

### ***Eunausibius tenebrionoides* (Grouvelle)**

(Fig. 91–94)

*Nausibius tenebrionoides* Grouvelle 1896: 193 (type examined).

*Eunausibius tenebrionoides* (Grouvelle); Grouvelle 1913: 314.

**Diagnosis.** See “Diagnosis” for *Nausibius jatahyensis* new species, a very similar species.

**Description.** *Eunausibius tenebrionoides* is known only from the male holotype. Length 6.4 mm, elongate, total length to elytral breadth ratio 43.8:10.0, general appearance sub-cylindrical, dark brown, moderately shining, dorsum glabrous.

**Head.** Slightly transverse (10.0:10.9), moderately raised medially on anterior half, slight depressions above antennal insertions, punctures small and separate on middle of head becoming larger and confluent laterally towards eyes; eyes in dorsal view flat, small, length: head length, 10:36, separated from front of head by 2× length of eye; antenna with 4-segmented club, last segment small, first antennal segment hidden beneath genal margin.

**Pronotum.** Elongate, 13.3:10.0; lateral margins straight, parallel; lateral rim fine, inwardly produced as very short fine line below anterior angle; anterior angle slightly curved before apical margin; densely punctured, punctures confluent producing predominantly longitudinal rugosity, particularly obvious laterally where punctures become obsolete (pronotum without an obvious medial, longitudinal impunctate region).

**Elytra.** Elongate, 24.4:10.0, sub-cylindrical, glabrous (at least in type); 9 rows of punctate striae on each elytron, including 2 on lateral declivity; interstriae mostly with single row of very small punctures, surface uneven with deep micro-reticulation as in *E. jatahyensis*; arrangement of elytral punctures similar to that of *E. jatahyensis* (see Fig. 102) but setae absent; fine impressed line present along sutural side of first punctate stria, near elytral apices (Fig. 91).

**First abdominal ventrite.** Femoral line strongly produced, extending to apical third of ventrite (Fig. 92).

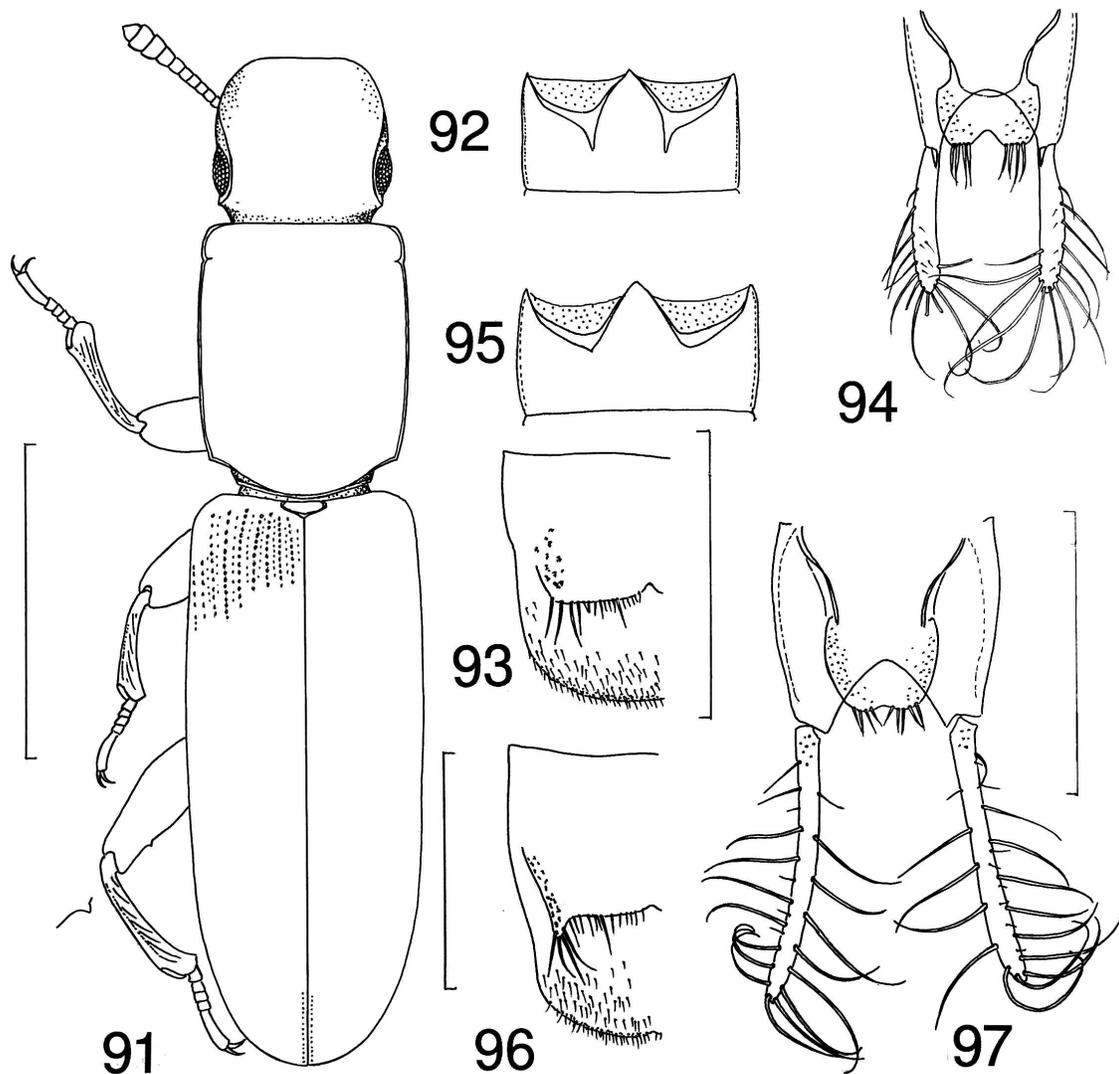
**Legs, male.** Metafemora with extremely small tooth, all tibiae with fine striae on inner side (Fig. 91).

**Male genitalia.** (Fig. 93–94) With median strut and internal sac similar to *E. elongatus* (see Fig. 108), also rods similar but 25–26 on each side; median lobe short, deeply emarginate and with 4 comparatively long setae on each side; parameres moderately long, setae present along outer margin and apical third of inner margin, those at apex very long (Fig. 94); sternites 8 and 9 transverse, 8 rounded at sides, not produced (Fig. 93).

**Taxonomic notes.** The specimen in the MNHN labelled as “tenebrionoides” also “*Eunausibius tenebrionoides*” by Grouvelle, and bearing an old printed “Type” label (as other Grouvelle types) is a male (as figured by Grouvelle in the original description). It has the character states described by Grouvelle, of which the pronotal puncturation is particularly significant, but the locality of Bahia, which is on the specimen, is wrong for that recorded by Grouvelle (1896) who gives “Matusinhos (Minas Geraes)”. However, the specimen is here accepted as the holotype because there is no evidence to suggest that Grouvelle based his description on more than one specimen and the published locality record seems to be a mistake.

**Material examined. Holotype** male “S. Antonio da Barra Pr. de Bahia Gounelle 11-12. 88 [printed] / Type [printed] / *Nausibius tenebrionoides* Grouv. [handwritten on squared paper] / tenebrionoides Grouv. [Grouvelle’s handwriting on green label] / *Eunausibius tenebrionoides* Grouv. [Grouvelle’s handwriting on green label]” (MNHN).

**Distribution.** Brazil.



**Figures 91–97.** *Eunausibius* spp. **91–94)** *E. tenebrionoides* (Grouvelle), male holotype. **91)** Habitus, inset enlarged view of metafemoral spine. **92)** First abdominal ventrite. **93–94)** Genitalia and associated sternites. **93)** Sternites 8–9. **94)** Parameres and median lobe. **95–97)** *E. jatahyensis*, new species, male holotype. **95)** First abdominal ventrite. **96–97)** Genitalia and associated sternites. **96)** Sternites 8–9. **97)** Parameres and median lobe. Scale lines for Figures 91, 92 and 95 = 2.0 mm, for Figures 93–97 (94 and 97 to same scale) = 0.5 mm.

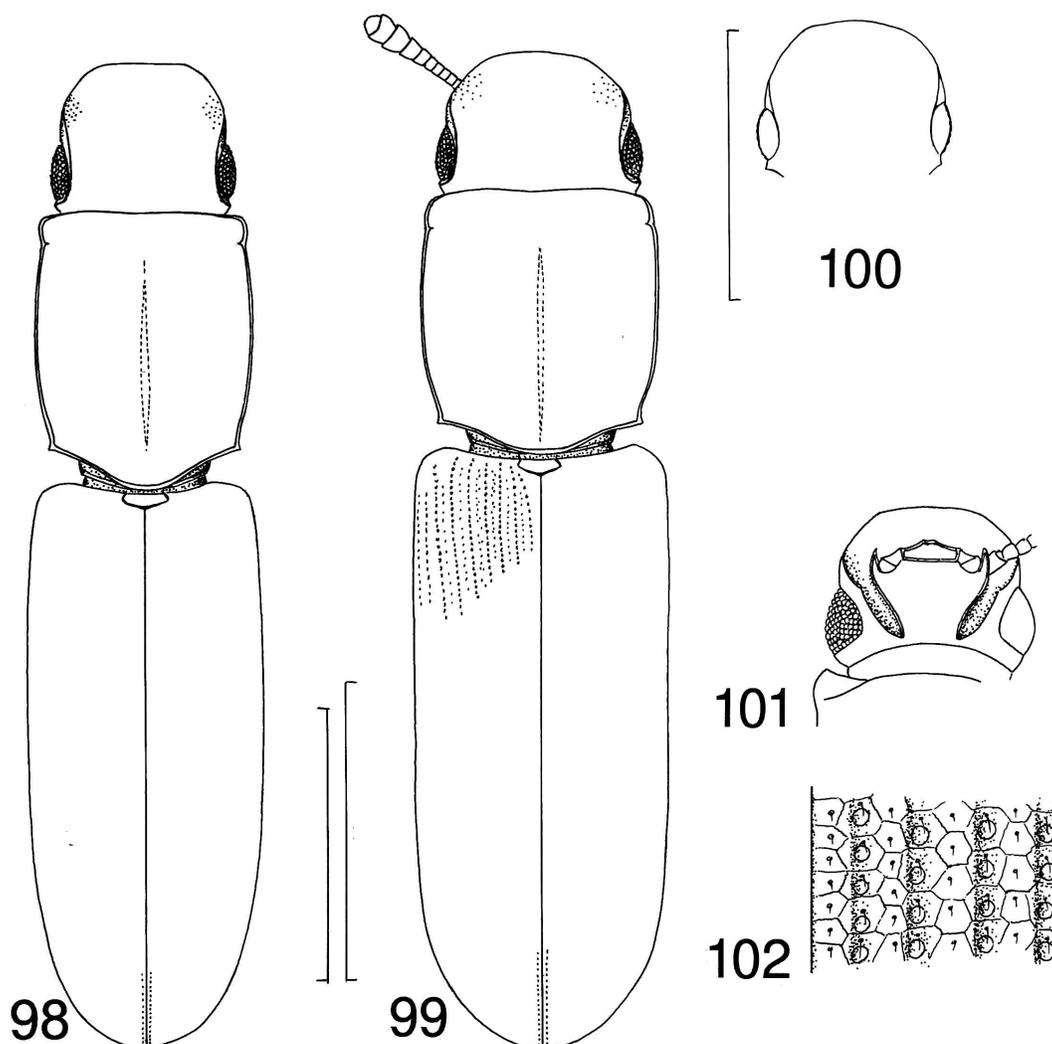
### *Eunausibius jatahyensis* Halstead, new species

(Fig. 95–102, 125)

**Diagnosis.** Although externally *E. jatahyensis* is very similar to *E. tenebrionoides*, males are easily recognised by genitalia, most particularly the form of the parameres which are much longer than in *E. tenebrionoides* and have a different setal arrangement (compare Fig. 97 with 94). In addition, the sternites 8 and 9 differ (compare Fig. 96 with 93). External characters include comparatively larger eyes than those of *E. tenebrionoides* (at least of the holotype of that species) and the general facies of the new species being a little more robust than *E. tenebrionoides*.

**Description.** Based on 8 specimens, including 3 males and 5 females (the type series).

Length, male holotype 7.31 mm, range including the other two males, 4.1–9.6 mm, females (rest of types) 3.71–7.47 mm. Elongate, males tend to be slightly more so than female but there is overlap, breadth to length



**Figures 98–102.** *Eunausibius jatahyensis*, new species, types. Dots on pronotal disc show position of narrow, medial impunctate region. **98)** Habitus, holotype male (Jatahy). **99)** Habitus, paratype female (Jatahy). **100)** Head, paratype female with smaller eyes dorsal view (Minas Gerais). **101)** Head of holotype, ventral view to show eyes plus deep antennal grooves. **102)** Elytron, small part enlarged (margin of suture on left) to show strial punctures, also very short, fine setae. Scale lines = 2.0 mm.

ratios, males 38.2–44.5:10.0 and females 36.0–40.2:10.0, sub-cylindrical, dark brown, shining, appearing glabrous but very fine and short setae borne by all punctures on dorsum.

**Head.** Slightly to more obviously shorter than broad, ratio of length to breadth across eyes 10.0:11.4–15.3; slightly raised medially on anterior half, slightly depressed above antennal insertions; punctures fine on raised area of head, becoming larger towards sides and posterior, at sides separated by less than diameter, none confluent; eyes generally large, moderately flat, dorsally separated across head by 8.9–13.3× breadth of eye in dorsal view; temple very small; antenna short, with gradually developed 4-segmented club (Fig. 99), apical segment small; ventral side of head with deep convergent antennal grooves as in the other two known species (Fig. 101).

**Pronotum.** Elongate, males tending to be more so than females, length to breadth ratios, male 12.0–13.8:10.0, females 11.0–12.1:10.0; lateral margins more or less straight and parallel; lateral rim fine, very weakly produced below anterior angle forming a short inconspicuous line (Fig. 98–99); anterior angle slightly curved to

apical margin; posterior angle small but dorsally prominent; disc with longitudinal, narrow impunctate region present medially, extending from base or basal sixth to near apical fifth, very short and difficult to see in small specimens, rest of puncturation dense, laterally with many of punctures forming confluent groups producing longitudinal rugosity, interspaces more or less micro-reticulate.

**Elytra.** Sub-cylindrical, elongate 2.0–2.5× as long as broad; 9 rows of conspicuous punctate striae on each elytron, including 2 on lateral declivity; interstriae with fine even micro-reticulation and mostly with single row of fine punctures (Fig. 102) but, particularly in females, some regions with irregular double row; apical quarter of each elytron with fine impressed line along sutural side of first punctate stria.

**Legs, male.** Metafemora with tooth of moderate size and metatibiae striate on proximal side.

**First abdominal ventrite.** With femoral line angled to a variable degree, as or more than shown in Fig. 95, but not long as in *E. elongatus* (Fig. 104).

**Male genitalia.** (Fig. 96–97) With median strut and internal sac similar to *E. elongatus* (see Fig. 108–109) but with 25–26 chitinous rods on each side; median lobe of moderate length, shallowly emarginate and with 4–5 short setae on each side; parameres long with long setae along apical two thirds of both margins, a few shorter ones nearer base (Fig. 97); sternites 8 and 9 appearing moderately elongate, sternite 8 produced at sides (Fig. 96)

**Material examined. Holotype** male “Jatahy Prov. Goyaz Brés[il]” (MNHN, Paris).

**Paratypes** (7): 1 female, “Mineiro Goyaz Brésil” (MNHN, Paris); 1 female: “BRAZIL: Minas Gerais Larvas-Campus UFPA at light xii 2001 Leg.FZ Vaz-de-mello.” (FSCA); 1 male and 1 female, “BOLIVIA: Santa Cruz Amboro National Park Los Volcanes, c. 1000m 18° 06': W 63° 36' 29 / xi-12 / xii / 2004 / MV light Sheet on stream beach Barclay, M. V. L. & Mendel, H. BMNH(E) 2004-280 (NHML); 1 female, “BOLIVIA: Santa Cruz, 3.7 km SSE Buena Vista, Hotel Flora & Fauna, 405m 5-15-xi-2001 17° 29.949' S; 63° 33.152' W coll. M. C. Thomas & B. K. Dozier tropical transition forest” (FSCA); 1 male, “BOLIVIA S. Cruz Dpt. 4km Bermajo 10-12. xii 2015 Wappes Kuckartz & Skillman / Refugio Volcanes EL 1045-1350m 18° 06' W”; 1 female, “PARAGUAY: Canindeyu Mbaracayu Reserve 19-23-XI-2016 185m coll J. B. Heppner / Eunausibius” (FSCA).

**Distribution.** Brazil, Bolivia and Paraguay.

**Etymology.** Name derived from Jatahy (Goiás, Brazil), the holotype locality.

### *Eunausibius elongatus* (Grouvelle)

(Fig. 103–119)

*Nausibius elongatus* Grouvelle 1896: 192 (type examined)

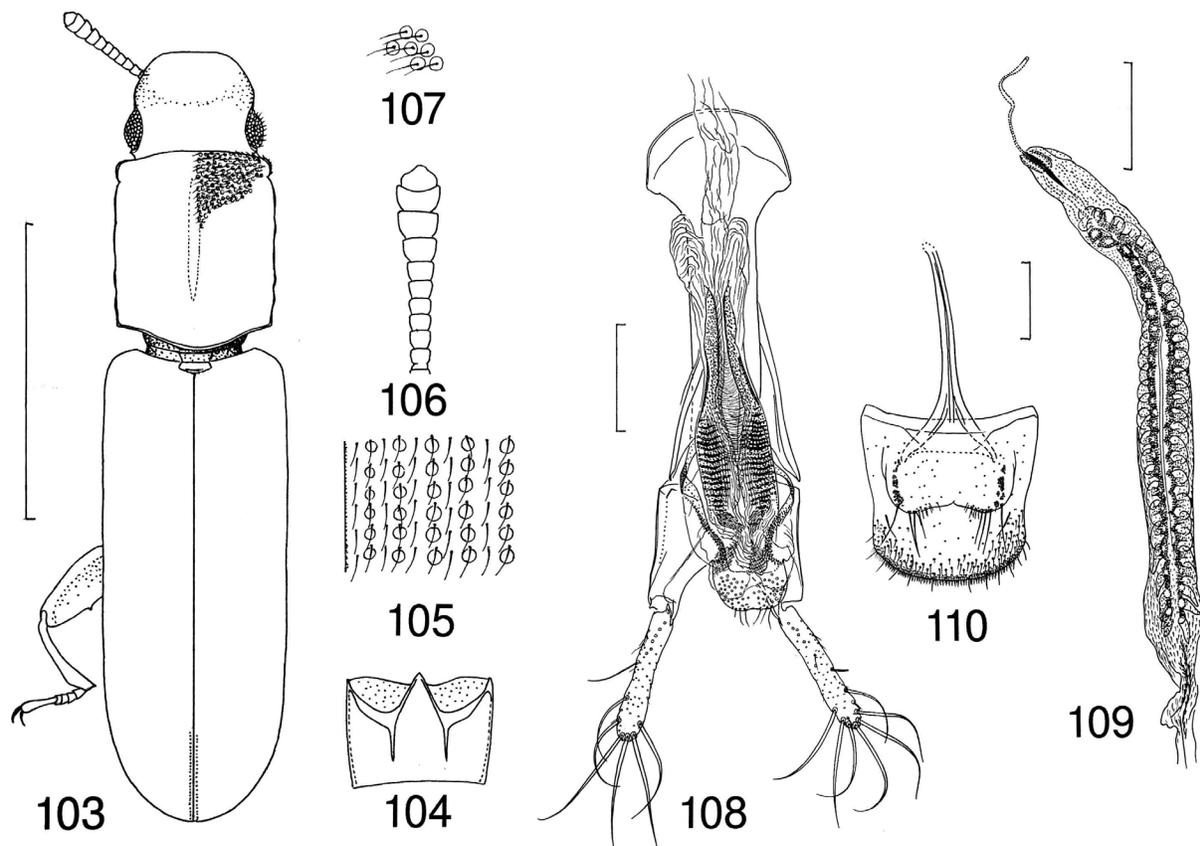
*Eunausibius elongatus* (Grouvelle); Grouvelle 1913: 314.

**Diagnosis.** *Eunausibius elongatus* is readily distinguished from the other two congeneric species (*E. tenebrioides* and *E. jatahyensis*) by the conspicuous pubescence on the dorsal side including setae between the eye facets.

**Description.** Known to the current author from the holotype and 16 specimens found amongst Silvaninae sent on loan by Dr. M. C. Thomas. Measurements and ratios are based on the holotype and 9 of the additional specimens. Length 3.00–5.43 mm, elongate, ratio of total length to elytral breadth, 37.0–43.5:10.0, general appearance sub-cylindrical, very dark brown (almost black), dorsum pubescent, setae long, dark golden.

**Head.** Generally transverse, ratio of breadth to length, 10.0–12.2:10.0, moderately raised medially on anterior half, slightly depressed above antennal insertions; punctures small on raised region, larger elsewhere (not confluent); eyes prominent, separated across head by 4.8–7.6× breadth of eye in dorsal view, about half as long as head, obvious setae present between eye facets; antenna usually with a gradually developed 4-segmented club but this may be somewhat abruptly developed, the comparative length of antennomere 7 is also a little variable (Fig. 106, 111, 113, 116).

**Pronotum.** Elongate, ratio of length to breadth, 11.4–12.8:10.0; lateral margins usually more or less smooth (Fig. 111, 112, 115) although holotype has about 4 very weak, ill-defined irregular prominences in addition to anterior and posterior angles (Fig. 103); anterior angles poorly developed; posterior angles dorsally slightly bent upwards; lateral rims very fine, not produced beneath anterior angles; puncturation dense but not confluent or rugose, punctures with conspicuous setae (Fig. 103) median longitudinal impunctate area present (limits of area shown by dots on Figures).



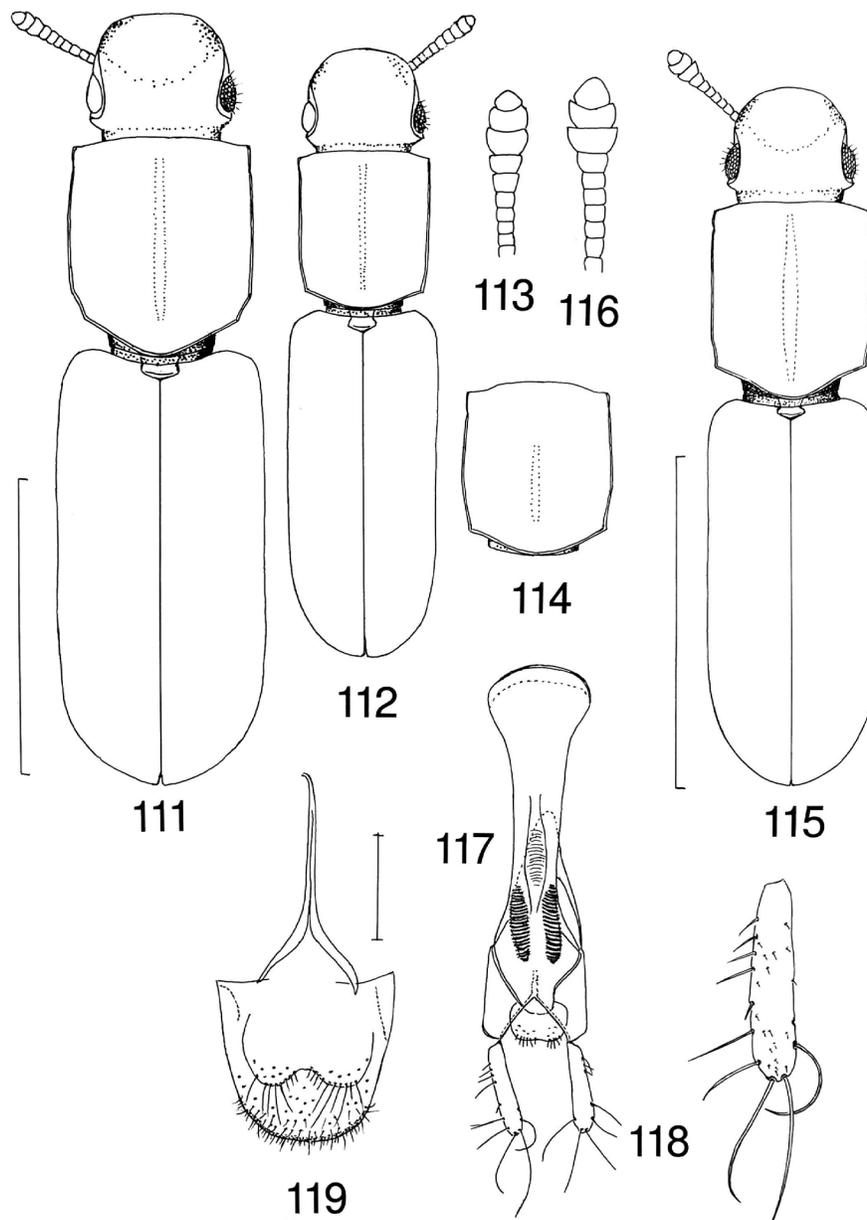
**Figures 103–110.** *Eunausibius elongatus* (Grouvelle), male. **103)** Habitus, dots on pronotal disc show position of narrow, medial impunctate region. An example of the pronotal puncturation is included. **104)** First abdominal ventrite. **105)** Elytron, small part enlarged (margin of suture on left) to show strial punctures with associated comparatively long, conspicuous setae, each above a strial puncture and similar setae in a line on interstriae. **106)** Antenna, enlarged. **107)** Pronotal punctures, an enlargement of some of those near the anterior margin to show their setae. **108–110)** Genitalia and associated sternites. **108)** Genitalia without internal sac. **109)** Internal sac. **110)** Sternites 8–9. Scale lines for Figure 103 (104 also to same scale) = 2.0 mm, for Figures 108–110 = 0.2 mm.

**Elytra.** Sub-cylindrical, elongate, length to breadth ratio, 21.0–26.2:10.0; 9 rows of punctures forming striae on each elytron, including 2 on lateral declivities, interstriae with single row of fine punctures; all setae long and sub-decumbent, those associated with strial punctures, slightly longer and less decumbent than those born on interstitial punctures (Fig. 105); apical fifth with ill-defined fine line along sutural side of first punctate stria (Fig. 103).

**First abdominal ventrite.** Femoral line may be very strongly produced, reaching apical sixth of ventrite (Fig. 104), however it is of variable development, occasionally not developed but forms margin of metacoxal cavity.

**Legs, male.** Metafemora with small tooth on proximal side (Fig. 103), metatibiae with a few ill-defined oblique striae.

**Male genitalia.** Seven male specimens were dissected and it was found that, as with external characters, the male genitalia are somewhat variable in this species. The parameres vary in length and breadth, the apex of the median strut varies in shape, sometimes broader and more rounded with its margin thicker, the length of the rods varies, as does the shape of sternites 8 and 9. This range of form of these structures, as observed in the seven specimens, is shown in the illustrations for two of them (Fig. 108–110, 117–119). More details regarding these and other parts of the genitalia are as follows: Area towards ostium with about 18–19 rods on each side; median



**Figures 111–119.** *Eunausibius elongatus* (Grouvelle). All specimens from Bolivia, Santa Cruz. **111)** Habitus, broad male specimen. **112)** Habitus, small male specimen. **113)** Antenna of 112 enlarged. **114)** Pronotum of female. **115)** Habitus, narrow male specimen. **117–119)** Male genitalia and associated sclerites. **117)** Genitalia of 115 (internal sac not included). **118)** Paramere, enlarged. **119)** Sternites 8–9. Scale lines for Figures 111–112 and 115 (114 also to same scale) = 2.0 mm., for Figures 117 and 119 = 0.2 mm.

lobe broad, lateral margins moderately curved to apex, apical margin straight or slightly emarginate with a few fine setae; internal sac with complex armature (Fig. 109); parameres moderately long, sides almost parallel before being rounded to apex, a few (5–7) long setae towards apex, also a few shorter setae on basal half of outer margin.

**Material examined.** **Holotype** male from BRAZIL: “S. Antonio da Barra Pr de Bahia Gounelle 11–12. 88 [printed] /

Type [printed] / sill antin orty femorah / *Nausibius elongatus* Grouv. [handwriting on squared paper] / HOLOTYPE [printed, red label] / *N. elongatus* ty Grouv. [Grouvelle's handwriting, green label]" (dissected: MNHN, Paris).

**Other material.** (16 total) 16 specimens from PANAMA, BOLIVIA and PARAGUAY as follows: 1 male "Ancon, C. Z. 9 May '73 Panama H. Stockwell / LIGHT TRAP / H. Stockwell Collection" (dissected, FSCA); 1 male (dissected), 1 sex indet. "BOLIVIA: Santa Cruz 3.7m SSE Buena Vista. Hotel Flora & Fauna, 430 m 14-19-X-2000 coll. M. C. Thomas tropical transition forest" (FSCA); 1 males (dissected), 1 female (genitalia exposed), 1 sex indet. (no abdomen) "BOLIVIA: Santa Cruz 3.7m SSE Buena Vista, Hotel Flora & Fauna 5-15-XI-2001 17° 29.949' S; 63° 33, 152' W, coll. M. C. Thomas & B. K. Dozier tropical transition forest" (dissected, FSCA); 1 male (dissected) "BOLIVIA Santa Cruz Potrerillo de Guandá 16-22-XII-2004 coll.: E. Nearns. UV Trap." (FSCA); 3 specimens, sex indet., "BOLIVIA SANTA CRUZ Res, Privada Potrerillos de Guendá; -17° 40.26 -63° 27.44; black light; 10-29 / XI / 2006; B. K. Dozier (FSCA); 1 female "BOLIVIA: Santa Cruz Amboro National Park Los Volcanes, c. 1000m S. 18° 06':W 63° 36' 20 / xii / 2004 / MV Light Sheet on stream beach Barclay M. V. L. & Mendel, H. BMNH (E) 2004-280" (NHML); 1 male (dissected) "BOLIVIA S. Cruz Dept. 20km N. Camiri 5,6,10 December 2012 Wappes, Bonaso, Skillman / Road to Eyti 1250m 6-8 km E Hwy 9 19° 52' S 63° 29W " (FSCA); 2 females "PARAGUAY: Cordillera Dept. Caacupé Campamento Jack Morment; UV light trap S 25° 22.116' WO 57° 07.917' 11-14-XI-2016, J. E. Eger 812ft, permit #271 / 2016" (FSCA); 1 male "PARAGUAY: Cordillera Campamento Jack Morment, 11-14-XI-2016, J. E. Eger coll. / S 25° 22.116' WO 57° 07.917' 812ft, permit #271 / 2016 At MV & UV Light" (FSCA).

### ***Annomus* Halstead, new genus**

**Type species.** *Annomus bolivianus* Halstead, **new species**, here designated.

**Discussion.** Two specimens (male and female) of a new, small Bolivian beetle belonging to the Silvaninae were kindly sent to the author by Dr. M. C. Thomas for study and description. The relationship with other genera within the subfamily is not clear. However, this new genus has head and pronotal puncturation that is reminiscent of the widespread *Monanus* (*Monanus*) *concinulus* (Walker) and also several other members of this subgenus. Of course, the pronotum of *Monanus* species (both those of *Monanus* (*Monanus*) and *Monanus* (*Monanops*)) differs from that of the new genus in many characters including for example in having lateral marginal denticles, about 8-14, not 5 large teeth, and having quite different genitalia with a long and thin median strut (Halstead 1993), unlike the broad and relatively short one of *Annomus*.

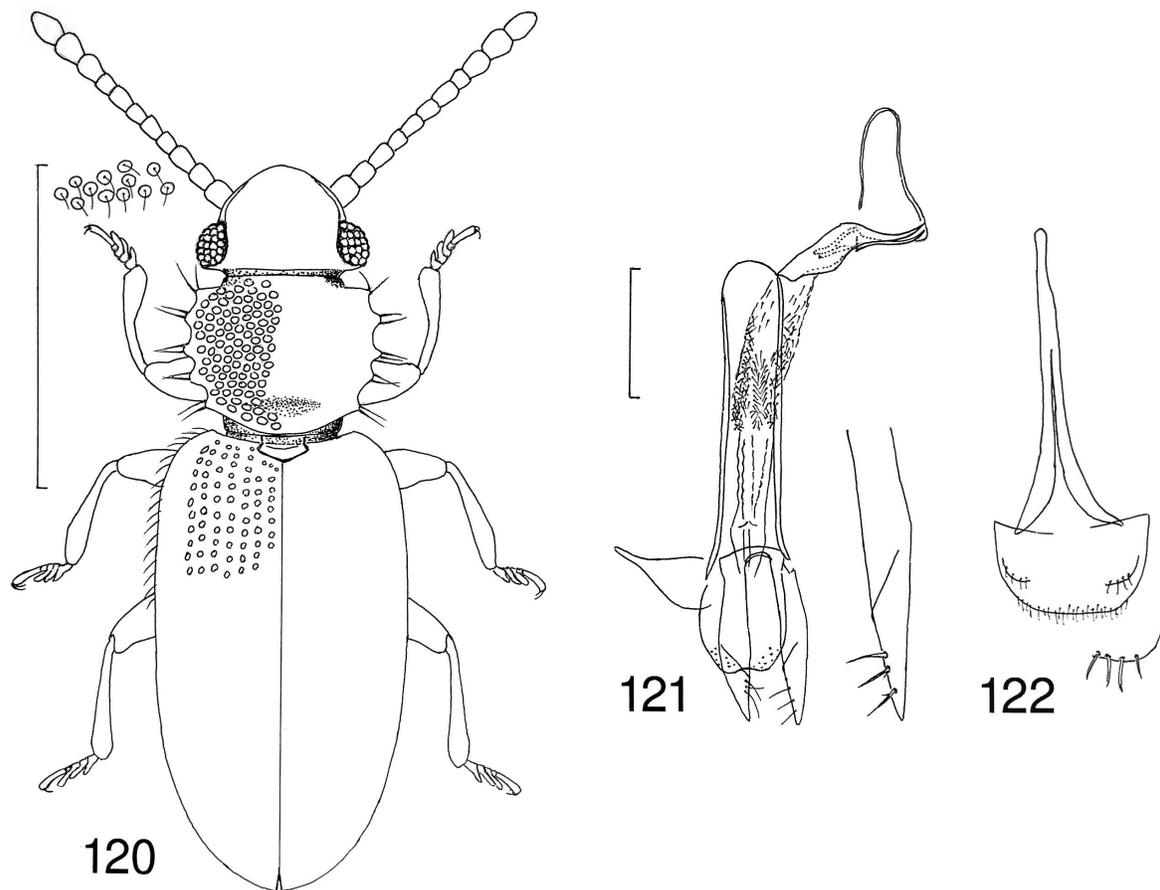
**Diagnosis.** Characters which, apart from the general facies probably have significance for recognition of other members of *Annomus*, include the following: male genitalia of similar form to that illustrated (Fig. 121-122); a pair of setae on each pronotal lateral tooth; large punctures producing reticulation on pronotum; eyes large and prominent, equally exposed above and below; tarsal formula 5-5-5, with tarsomeres 1-3 each produced below to form an obvious lobe (Fig. 120).

### ***Annomus bolivianus* Halstead, new species**

(Fig. 120-122, 126)

**Description.** This description is based on two specimens, one of each sex, from the same locality and exhibiting very little variation in body measurements. Nevertheless, measurements are included for both, those for the holotype (male) first. Length 2.18 mm (both types the same length) length to breadth ratios, 28:10, 26:10; pubescence obvious; color dark brown.

**Head.** Breadth (across eyes) to length ratio of both specimens, 10:15; sides in front of eyes gradually converging to rounded apex; margins slightly raised above antennal insertions; eyes extremely large and very prominent; temples virtually absent; pubescence semi-recumbent directed towards middle from each side, particularly on vertex; vertex densely punctured with large, shallow punctures each with central seta, as on pronotum; antennal length to total body length ratios, 10:30, 10:25, apical antennomeres 9-11 forming a club, antennomere 8 smaller than 7 and 9, 4 shorter than 3, scape moderately robust, base hidden; maxillary and labial palps as in *Silvanus* spp. (Halstead 1973).



**Figures 120–122.** *Annomus bolivianus*, new genus, new species, male holotype. **120)** Habitus, inset enlargement of some punctures on anterior pronotum to show setae. **121)** Genitalia, inset enlargement of apical region of paramere. **122)** Sternites 8–9. Scale lines for Figure 120 = 1.0 mm, for Figures 121–122 = 0.2 mm.

**Pronotum.** (Fig. 120) Broader than long, greatest breadth excluding teeth to length ratios, 11.7:10.0, 12.6:10.0; sides with 5 teeth, those at anterior and posterior angles not as prominent as others, each tooth with two long apical setae; densely punctured as on vertex of head; transverse somewhat oval depression present medially at basal quarter.

**Scutellar shield.** Broad.

**Elytra.** Length (both types)  $1.7\times$  maximum breadth; sides gradually tapered to apices, outer margins with a row of fringing setae, coarser, more erect and prominent than others, becoming shorter towards apices; striae punctures deep with area around each shallowly depressed, forming 9 rows of striae punctures on each elytron, 7 visible in dorsal view plus 2 before the lateral margin, punctures gradually becoming smaller after basal third and becoming indistinct towards apices (part of rows on basal third illustrated on Fig. 120, for details see Fig. 126).

**Thoracic sternae.** All parts densely punctured (particularly the mesosternal process) consisting of large punctures separated by less than one diameter.

**Legs.** Tarsomeres 1–3, produced below, each forming a conspicuous lobe; protibiae abruptly expanded on apical half (Fig. 120).

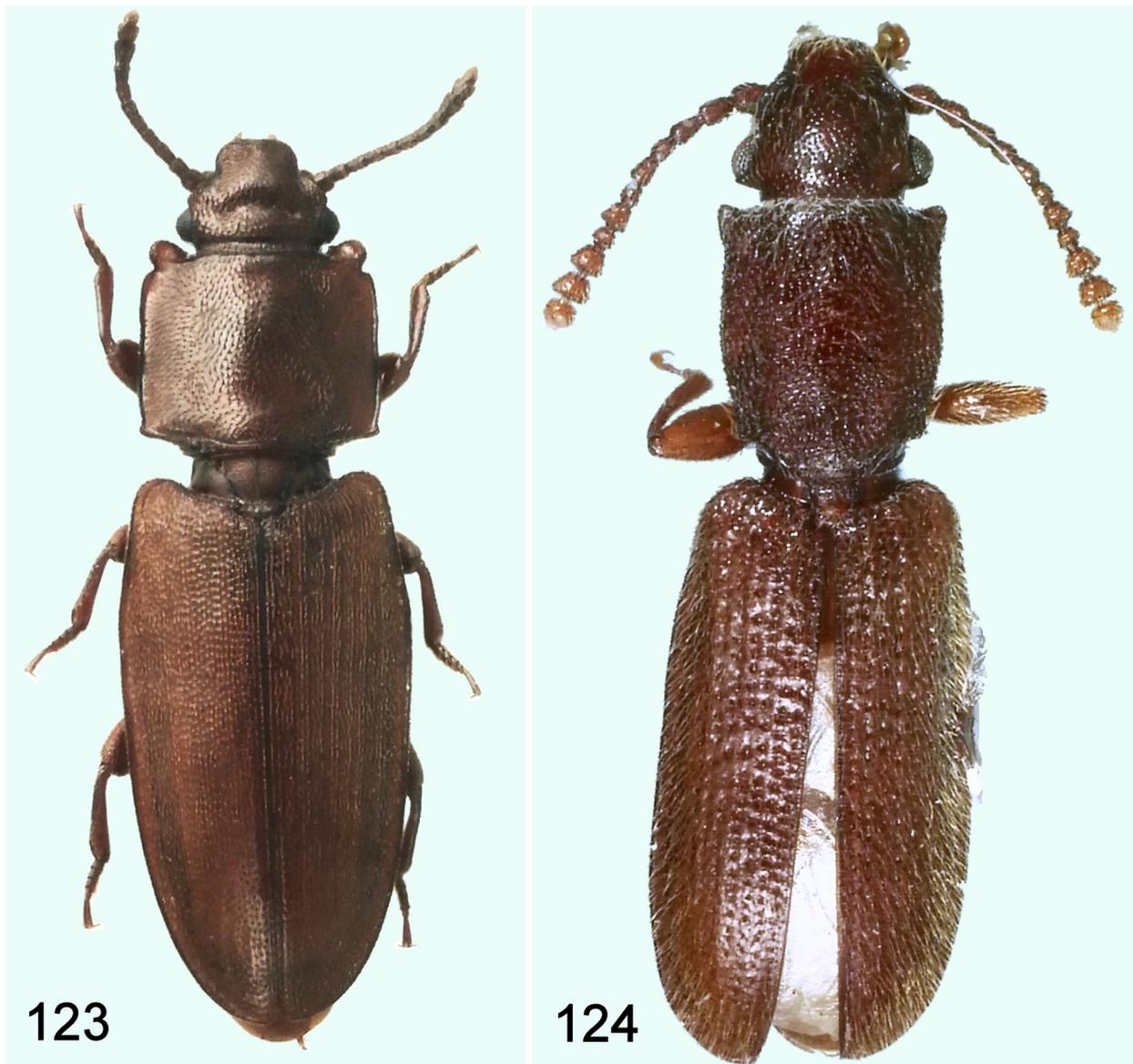
**Procoxal cavities.** Closed behind.

**First abdominal ventrite.** Without femoral lines.

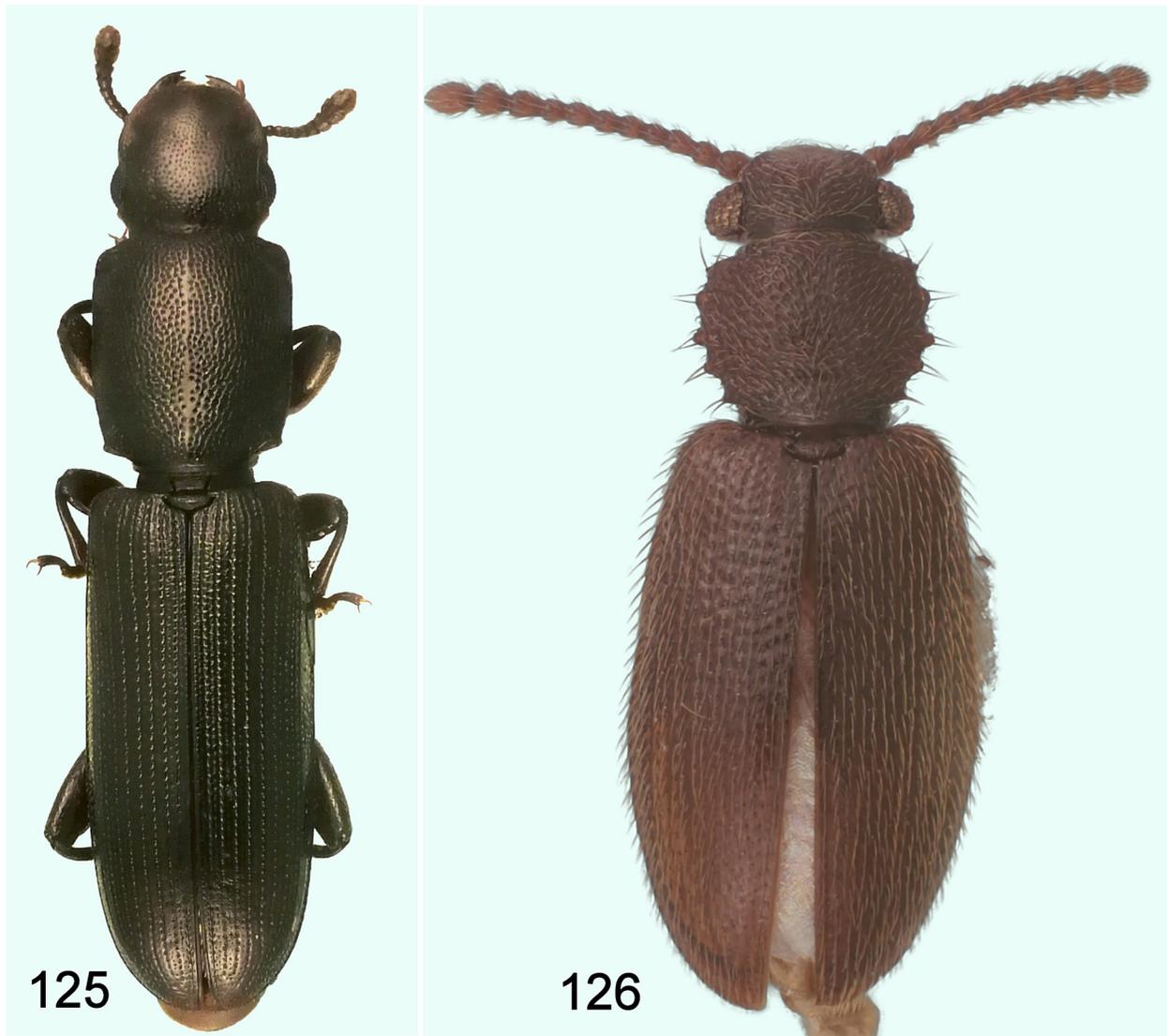
**Male genitalia.** (Fig. 121–122) Parameres at outer side of apical half bent over towards middle and consequently apices appear pointed, each paramere with 3 setae on margin; median lobe large, shallowly emarginate at apex; median strut broad, parallel sided to rounded apex; internal sac with spines as illustrated, pair of pointed sclerites near apex before ejaculatory duct, without an armature of rods; sternite 8 bearing a few short setae at sides (Fig. 122).

**Material examined.** Holotype (male) and paratype (female) both with same locality and collecting data, “BOLIVIA: El Beni Beni Stn, Palm Camp NE San Borja, 25–30 July 1988. T. Erwin ex: Fogging canopy”. The holotype is deposited in the USNM; the paratype in the FSCA. The holotype also has the following determination label, “new genus new species Silvaninae det M. C. Thomas 2010”.

**Etymology.** The generic name *Annomus* is an anagram of *Monanus*.



Figures 123–124. Color habitus photographs. 123) *Synobius lobatus* (Grouvelle). 124) *Pensus hirtus*, new species.



**Figures 125–126.** Color habitus photographs. **125)** *Eunausibius jatahyensis*, new species. **126)** *Annomus bolivi-  
anus*, new genus, new species.

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Last July (2019) I sent this paper to Dr. Michael C. Thomas (FSCA) for consideration as a contribution to *Insecta Mundi*. He read it and forwarded copies to two reviewers. Later on, Dr. Paul E. Skelley (FSCA) contacted me with the sad news that Mike Thomas had died on the 4<sup>th</sup> October 2019. He also told me that he would be happy to take on the responsibility of assisting with the preparation of this paper for publication. I wish to thank Paul Skelley for all of his editorial help, and both him and the reviewers, including Dr. Michael Karner (Frankfurt am Main, Germany) and Dr. Takahiro Yoshida (Ehime University, Matsuyama, Ehime, Japan) for their very constructive and helpful criticism of my manuscript.

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and other sources, and sending them on loan to me. Also, Max Barclay and Roger Booth and their colleagues at the NHML, who have always found time to be particularly helpful during my visits to work with the collections and this has been much appreciated.

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