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Philonthus furvus Nordmann, 1837 and its allies in Mexico and Central America (Coleoptera: Staphylinidae)

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Abstract

The Mexican and Central American species associated with *Philonthus furvus* Nordmann, 1837 are reviewed. Nine species are treated, two of them, *P. oenotrus* and *P. melampus*, both from Mexico, are described as new. *Philonthus flohri* Sharp, 1876 is removed from synonymy with *P. furvus*. All species are described and illustrated, and a key is added to aid in their identification. All available records from Mexico and Central America, and biological data for the species are provided. Lectotypes are designated for: *P. flohri* Sharp, 1876; *P. sallaei* Sharp, 1885; *P. fissilis* Sharp, 1885; *P. nigerrimus* Erichson, 1840.

Introduction

This paper results from my current work on the revision of the genus *Philonthus* Stephens, 1829 and related genera of America north of Mexico. Because of the similarity of a group of species from the southwestern United States to the widely distributed species *P. furvus* Nordmann 1837, it was necessary to establish the identity of these species by studying the Sharp's original material of several related species occurring south of the United States border. The opportunity was used to designate the lectotypes, redescribe and illustrate these species, to describe a couple of new species, and to present a key to aid in their identification.

At this time, it is not possible to characterize this group of species based on a cladistical analysis. It is used here only for convenience and it may not even be monophyletic. It includes large individuals of the general habitus of *P. politus* Linné, 1758 with four punctures in each dorsal row on the pronotum, but with the posterior basal line on the visible tergites 2 and 3 straight at middle; the coloration of the body is dark, piceous-black to black, usually with a metallic lustre on the head, pronotum and especially on the elytra; the sublateral rows on the pronotum have two punctures each, and each elytron bears one subhumeral and one lateral long seta.

The material studied is mostly deposited in the Canadian National Collection, Ottawa (CNCC), some specimens are in the Field Museum of Nat-

ural History, Chicago, Illinois (FMNH) and in the United States National Museum of Natural History, Washington, D.C. (USNM).

Key to species

1. Epipleuron, lateral and apical margin of each elytron testaceous. Aedoeagus as in Figs. 4-6. Length 9.8 - 12.6 mm . . . *P. oenotrus* spec. nov.
- No more than epipleuron of each elytron variably paler. Aedoeagi different 2
2. Apical portion of median lobe of aedoeagus in lateral view with subapical tooth (Figs. 12, 27, 33, 45, 52, 59) 3
- Apical portion of median lobe of aedoeagus in lateral view without subapical tooth (Figs. 20, 39) 8
3. Legs very long, hind tibia about as long as pronotum at midline. Aedoeagus as in Figs. 58-60. Length 10.8 - 13.5 mm *P. melampus* spec. nov.
- Legs moderately long, hind tibia shorter than pronotum at midline. Aedoeagi different . . . 4
4. Head, pronotum and elytra black, without any metallic lustre; elytral epipleura entirely black 5
- Head, pronotum and elytra black, with metallic lustre; if lacking metallic lustre, then elytral epipleura distinctly paler than elytra 6
5. Elytra alutaceous due to coarse and dense microsculpture of irregular ridges on interspaces between punctures. Rows of sensory peg setae on underside of paramere moderately long (Fig.

- 53). Tergite 10 of female genital segment emarginate (Fig. 54). Length 9.8 - 14.0 mm
 *P. alutaceus* Horn
- Elytra not alutaceous, microsculpture on interspaces between punctures fine and not dense. Rows of sensory peg setae on underside of paramere long (Fig. 46). Tergite 10 of female genital segment not emarginate (Fig. 47). Length 9.8 - 12.8 mm *P. nigerrimus* Er.
6. Sternite 9 of male genital segment bilobed apically, with lobes characteristically, stylus-like narrowed (Fig. 10). Median lobe of aedoeagus with lateral margins slightly bisinuate (Fig. 11). Usually three interocular punctures on each side of head, or at least unilaterally. Length 8.7 - 13.6 mm *P. furvus* Nordm.
- Sternite 9 of male genital segment bilobed apically, with lobes not stylus-like narrowed (Figs. 25, 32). Median lobe of aedoeagus with lateral margins not bisinuate (Figs. 26, 33). Usually two interocular punctures on each side of head . 7
- 7 Sternite 9 of male genital segment short and wide (Fig. 32). Sensory peg setae on underside of paramere of aedoeagus forming two short longitudinal rows (Fig. 34). Length 11.8 mm
 *P. griseolus* Sharp
- Sternite 9 of male genital segment long and narrow (Fig. 25). Sensory peg setae on underside of paramere forming two long longitudinal rows (Fig. 28). Length 9.3 - 10.8 mm
 *P. sallaei* Sharp
8. Sterna and abdominal sternites with golden-yellowish pubescence extending usually to lateral portion of each elytron and to abdominal paratergites. Paramere of aedoeagus short and wide, widely subtruncate apically (Figs. 19, 21). Length 9.0 - 10.8 mm *P. flohri* Sharp
- Sterna nad abdominal sternites with dark pubescence. Paramere of aedoeagus elongate and narrow, obtusely rounded apically (Figs. 38, 40). Length 11.8 - 12.0 mm *P. fissilis* Sharp

Philonthus oenotrus spec.nov.

Figures 1 - 7

Description: Black, head and pronotum with slight, dark metallic lustre, elytra with distinct bronze-metallic lustre; epipleuron, lateral and apical margin of each elytron testaceous; abdomen iridescent; maxillary and labial palpi piceous-black, last segment of maxillary palpus mostly indefinitely paler at apex; antennae black; legs

piceous-black. Head of rounded quadrangular shape with obtuse hind angles, slightly wider than long (ratio 1.17) and narrower than pronotum (ratio 1.15) (female and small males) to distinctly wider than long (ratio 1.40) and about as wide as pronotum (large males); eyes large, tempora as long as length of eyes seen from above to feebly longer (ratio 1.13) (large males); lateral and medial interocular punctures approximate, distance separating medial and lateral interocular punctures about 2.5 times larger than distance separating medial interocular punctures; temporal area with a few scattered punctures; entire dorsal surface with fine and dense microsculpture of transverse and oblique waves. Antenna moderately long, segment 2 shorter than segment 3, segments 4-6 longer than wide, becoming gradually shorter, segment 7 as long as wide, outer segments vaguely wider than long, last segment shorter than two preceding segments combined. Pronotum wider than long (ratio 1.14), narrowed posteriad; lateral margins each strongly sinuate posteriorly in front of basal margin; dorsal rows each with four punctures, sublateral rows each with two punctures; microsculpture similar to that on head. Scutellum densely punctate and pubescent. Elytra moderately long, at suture moderately (ratio 1.20), at sides distinctly (ratio 1.40) longer than pronotum at midline, somewhat widened posteriad; each elytron with 1 subhumeral and 1 lateral long seta; punctation dense and moderately fine, interspaces between punctures along transverse axis no more than twice as large as diameters of punctures; pubescence fine, piceous; surface between punctures without microsculpture. Abdomen with tergite 7 (fifth visible) with distinct whitish apical seam of palisade fringe; posterior basal line on visible tergites 2 and 3 straight; punctation of tergites finer and somewhat sparser than that on elytra, becoming inconspicuously sparser toward apex of each tergite, and in general toward apex of abdomen; elevated area between two basal lines on tergites 2 and 3 punctate; pubescence piceous; surface between punctures with exceedingly fine and dense microsculpture of transverse striae.

Male. First four segments of front tarsus slightly dilated, hardly sub-bilobed, each with modified pale setae ventrally; segment two about one third narrower than apex of tibia, segment four narrower than preceding three segments. Sternite 7 not appreciably sinuate medio-apically; sternite 8 with medio-apical emargination similar to that of

P. furvus, but somewhat wider and less deep (Fig. 1). Genital segment with tergite 10 bilobed, each lobe with three apical and one subapical seta (Fig. 2); sternite 9 bilobed, with lobes fairly short (Fig. 3). Aedoeagus (Figs. 4-6) with median lobe narrowed into short apical part with narrowly arcuate apex, in lateral view with inconspicuous subapical tooth on face adjacent to paramere; paramere narrow and relatively short, parallel-sided or vaguely narrowed toward arcuate apex, apex by far not reaching apex of median lobe; sensory peg setae on underside of paramere forming two short longitudinal rows; four minute setae at apical margin, two similar but somewhat longer setae on underside of paramere laterad of each row of sensory peg setae; internal sac simple, without larger sclerotized structures.

Female. First four segments of front tarsus similar to those of male but even less dilated; segment two about half as wide as apex of tibia. Genital segment with second gonocoxite with minute stylus bearing two long setae; tergite 10 rather short and wide, minutely produced in middle of apical margin, with several, mostly fine, apical setae and two subapical setae (Fig. 7).

Length 9.8 - 12.6 mm.

Type material. Holotype (male) and allotype (female): MEXICO: Chiapas: "MEX., 9500", Mt. Tzontehuitz Chis. V-17-1969 J.M. Campbell". Both holotype and allotype in the Canadian National Collection, Ottawa (CNC No 20750). Paratypes: MEXICO: Chiapas: same data as holotype (CNCC) 2 males.

Bionomics. The specimens of the original series were taken by sifting deciduous leaf litter in a cloud forest.

Distribution. *Philonthus oenotrus* is at present known only from Mt. Tzontehuitz in the state of Chiapas in Mexico.

Discussion. *Philonthus oenotrus* may be easily recognized by the distinctive coloration of the elytra, in addition to the sexual characters.

Etymology. The specific name is the name of *Oenotrus*, -i, m, the king of the Sabines.

Philonthus furvus Nordmann Figures 8 - 15

Philonthus furvus Nordmann, 1837:88; Erichson, 1840: 434; Horn, 1884: 181; Sharp, 1885: 398 (ex parte); Hatch, 1957: 195, 209; Smetana, 1965b: 12, fig.3, 13; 1965a: 3

Philonthus comptus Haldeman, 1852: 375

Description: Piceous to piceous-black or black, head and pronotum with slight, dark metallic lustre, elytra sometimes brownish-piceous, with distinct greenish or greenish-bronze metallic lustre, elytral epipleura each to various extent paler, brownish to brownish-testaceous, pale coloration in general inconspicuous and not sharply delimited, most noticeable near humerus and often limited to humeral and subhumeral area; abdomen iridescent; maxillary and labial palpi dark brown to piceous-black, last segment of maxillary palpus often paler; antennae piceous to piceous-black; legs piceous-black with more or less paler tarsi. Head of rounded quadrangular shape with obtusely rounded hind angles, moderately wider than long (ratio 1.25) and narrower than pronotum (ratio 1.19) (females and small males) to distinctly wider than long (ratio 1.39) and about as wide as pronotum (large males); eyes large, tempora about as long as length of eyes seen from above; additional setiferous puncture mediad of each medial interocular puncture, at least on one side of head (see discussion); temporal area with sparse and not coarse punctation; entire dorsal surface with fine and dense microsculpture of transverse and oblique waves. Antenna moderately long, segment 2 shorter than segment 3, segments 4-7 distinctly longer than wide, becoming gradually shorter, segment 8 slightly longer than wide, segments 8 and 9 about as long as wide, last segment shorter than two preceding segments combined; in female antenna shorter, particularly segments 4-8. Pronotum about as long as wide, about equally narrowed both posteriad and anteriad; lateral margins each distinctly sinuate posteriorly in front of basal margin; dorsal rows each with four punctures, sublateral rows each with two punctures; microsculpture similar to that on head. Scutellum densely punctate and pubescent. Elytra moderately long, at suture vaguely (ratio 1.09), at sides appreciably (ratio 1.30) longer than pronotum at midline, somewhat widened posteriad; each elytron with 1 subhumeral and 1 lateral long seta; punctation fine and dense, interspaces between

punctures along transverse axis mostly about twice as large as diameters of punctures; pubescence fine, piceous; surface between punctures with more or less fine microsculpture consisting of irregular ridges, microsculpture gradually becoming coarser toward apical margin of elytra. Abdomen with tergite 7 (fifth visible) with distinct whitish apical seam of palisade fringe; posterior basal line on visible tergites 2 and 3 straight or no more than vaguely, arcuately extended at middle; punctation of tergites similar to that on elytra, becoming sparser toward apex of each tergite, and in general toward apex of abdomen; elevated area between two basal lines on tergites 2 and 3 punctate; pubescence piceous; surface between punctures with exceedingly fine and dense microsculpture of transverse striae.

Male. First four segments of front tarsus strongly dilated, sub-bilobed, each densely covered with modified pale setae ventrally; segment two as wide as apex of tibia, segment four narrower than three preceding segments. Sternite 7 slightly sinuate at middle of apical margin; sternite 8 with moderately wide and deep, obtusely triangular medio-apical emargination partially filled by semimembranous extension (Fig. 8). Genital segment with tergite 10 subtruncate apically, with several apical setae (Fig. 9); sternite 9 bilobed apically, with branches characteristically narrowed (Fig. 10). Aedoeagus (Figs. 11-13) long and narrow; median lobe narrowed into obtuse apex, with each lateral margin slightly bisinuate, in lateral view with inconspicuous subapical tooth on face adjacent to paramere; paramere narrow and elongate, more or less gradually narrowed toward obtuse apex, apex not reaching apex of median lobe; sensory peg setae on underside of paramere forming two short longitudinal rows joined along apical margin; two minute setae at each lateral margin below apex, two similar setae on underside of paramere laterad of each row of sensory peg setae; internal sac simple, without larger sclerotized structures.

Female. First four segments of front tarsus similar to those of male but less dilated; segment two about one fourth narrower than apex of tibia. Genital segment with second gonocoxite with minute stylus bearing two long setae (Fig. 15); tergite 10 fairly wide and strongly narrowed, with medio-apical portion pigmented; apex subtruncate to subemarginate, with numerous apical setae (Fig. 14).

Length 8.7 - 13.6 mm.

Type material. *Philonthus furvus*. Nordmann (1837: 88) described the species from specimens from Mexico ("Habitat in Mexico". D. Depe). I have not seen the original material; the concept of the species used here preserves the concept of Erichson (1840), followed in North America by Horn (1884). See the discussion for details.

Philonthus comptus. Haldeman (1852: 375) described the species from a single specimen collected by R. Kern, apparently at Santa Fe, New Mexico (see Haldeman, 1852: 366).

Distribution. *Philonthus furvus* is a widely distributed species. It is transcontinental in the northern portion of the North American continent, ranging from Newfoundland, the Maritime provinces, Maine and New York westward through Ohio, Michigan, the prairies and British Columbia to Yukon Territory; in the west, its distributional range extends through the Cordilleran mountain system considerably south into Mexico.

Material studied (5 specimens): MEXICO: Mexico: Ocoyonaca, 9400', 17.VII.69, J.M. Campbell (CNCC)2; Salazar, 10000', 17.VII.69, J.M. Campbell (CNCC)2; km 10, Volc. Popocatepetl, 10000', 9.V.71, J.M. Campbell (CNCC)1.

Bionomics. In North America, *Philonthus furvus* is a distinctly hygrophilous species, occurring in all kinds of wet habitats, such as edges of lakes and ponds, marshes and swamps, banks of rivers and creeks, wet forests, seepages, etc. Specimens were collected by sifting dead vegetation and various other debris, wet moss and leaf litter, by treading floating mats of vegetation (*Carex*, moss, including *Sphagnum*, grasses, etc.) into water, in or around beaver houses, and in muskrat nests; some specimens were taken in an alkali marsh, in rotting plant debris in the described habitats, rarely even in decaying mushrooms or on carcasses, or at black light.

Philonthus furvus is rare in Mexico; it seems to occur only at very high elevations of about 3000 m. The specimens from the volcano Popocatepetl were taken in an extremely dry area by sifting debris from under cut logs; the debris represented the only reasonably moist habitat there.

Discussion. *Philonthus furvus* can best be distinguished from similar species, in addition to the character states of the aedoeagus, by the com-

bination of two external character states: the inconspicuously and not sharply delimited paler elytral epipleura, and the presence of three interocular punctures on the head, at least unilaterally. The latter character state is reasonably reliable and is present in all Mexican specimens seen; however, specimens with only two interocular punctures on each side of the head do occur rarely in North America, particularly among the eastern populations of the species.

The interpretation of this species posed difficulties for earlier authors, mainly because they were not able to recognize that actually an entire complex of species was confused under this name in western North America, and in Mexico. Consequently, Sharp's concept of this species (Sharp, 1885: 398) included several species.

Philonthus flohri Sharp Figures 16 - 22

Philonthus flohri Sharp, 1876: 429
Philonthus furvus var. *flohri* Sharp, 1885:398

Description: In all characters very similar to *P. furvus*, but different as follows: black, dorsal surface without metallic lustre; elytral epipleura each entirely yellowish-testaceous, pale color sharply delimited against dorsal side of elytron; sterna and abdominal sternites with golden-yellowish pubescence extending usually to lateral portion of each elytron and to abdominal paratergites; pubescence on legs (not spines) also golden-yellowish. No additional interocular punctures on head, medial and lateral interocular punctures rather approximate, distance separating medial interocular punctures about 2.4 times larger than distance separating medial and lateral punctures.

Male. First four segments of front tarsus similar to those of *P. furvus* but less dilated. Secondary sexual characters on sternites 7 and 8 similar to those of *P. furvus*, but medio-apical emargination of sternite 8 somewhat less deep and more obtuse (Fig. 16). Genital segment with tergite 10 short, emarginate, with numerous apical setae (Fig. 17); sternite 9 rather short and wide, with apical branches short and stout (Fig. 18). Aedeagus (Figs. 19-21) shorter and stouter than that of *P. furvus*; median lobe narrowed into obtusely rounded apex, in lateral view without subapical tooth on face adjacent to paramere; paramere short

and wide, broadly subtruncate apically, apex by far not reaching apex of median lobe; sensory peg setae on underside of paramere numerous, irregularly arranged along apical margin of paramere; four minute setae at apical margin of paramere, two similar setae at each lateral margin just below apex; internal sac similar to that of *P. furvus*.

Female. First four segments of front tarsus similar to those of *P. furvus* but less dilated. Genital segment with tergite 10 less narrowed, moderately emarginate apically, with less numerous (usually six) apical setae (Fig. 22).

Length 9.0 - 10.8 mm.

Type material. Sharp (1876: 429) described the species from five specimens taken in the vicinity of Mexico City. I have seen all five specimens deposited in the collection of the British Museum (Natural History), London. They are labelled as follows: Spec. No. 1 and 2 (two males on one plate): "Type" (two round labels with red margin)/"Mexico, near the city. Flohr."/ "B.C.A. Col.I.2 *Philonthus furvus*, Nordm. v. *flohri* Sharp."/ "Sharp Coll. 1905.-313./" *Philonthus Flohri* Types DS. Mexico."/ "No 1114 examined by Prof. Thaxter for Laboulbeniaceae". Spec. No. 3 and 4 (male and female on one plate): " = *P.furvus* var." (on plate with beetles), otherwise same set of labels as specimens 1 and 2 minus label concerning Laboulbeniaceae. Spec. No. 4 (male): "Mexico, near the city. Flohr."/ "B.C.A. Col.I.2 *Philonthus furvus*, Nordm. v. *flohri* Sharp."/ "Sharp Coll. 1905.- 313" / " *Philonthus Flohri* Ind.typ. D.S. Mexico".

All specimens studied are conspecific. The first three males were dissected, the abdominal segment 8, the genital segment and the aedeagus were glued to the plate with the beetles. The first male is hereby designated as the Lectotype of *Philonthus flohri*; the label "Lectotype (left) *Philonthus flohri* Sharp, A. Smetana des. 1990" has been attached to the plate with specimens No. 1 and 2.

Distribution. *Philonthus flohri* is at present known only from Mexico.

Material studied (20 specimens): MEXICO: Guerrero: Chilpacingo, 4000', VII., H.H. Smith (FMNH)1. Oaxaca: Hwy 175, 3.5 mi S Suchixtepec, 8000', 2. and 3.VI.71, D.E. Bright, S. Peck (CNCC)14. Puebla: state label only (FMNH)4. "Mexico" (FMNH)1.

Bionomics. Little is known about the habitat requirements of this species. The specimens from near Suchixtepec were taken from dung and carrion traps.

Discussion. Sharp (1885:398) downgraded *P. flohri* to a variety of *P. furvus* and assigned to it specimens with elytral epipleura uniformly dark. In fact, the elytral epipleura in *P. flohri* are distinctly pale, as described above. In the specimens of Sharp's original series, the elytral epipleura are apparently secondarily darkened (killing method?), but even there the slightly paler color is detectable under strong light. The description of the pubescence given by Sharp (l.c.) for *P. furvus*, actually applies to *P. flohri*.

An undescribed species, occurring mainly in the southwestern United States, is in most external characters extremely similar to *P. flohri* but both species differ drastically in the shape of the aedoeagus.

Philonthus sallaei Sharp
Figures 23 - 29

Philonthus sallaei Sharp, 1885: 398, pl.X,fig.5

Description: In all characters similar to *P. furvus*, but different as follows: head, pronotum and elytra with faint, dark metallic lustre; elytral epipleura entirely dark, concolorous with elytra. Head more angulate, with obtusely angulate, distinct hind angles, in large males larger and more transverse (ratio 1.46); punctures on occipital area on average more numerous and coarser; tempora each with oblique, punctate furrow, appearing usually as minute dent at hind angle in dorsal view; no additional interocular punctures. Antenna shorter, with outer segments transverse. Pronotum with lateral margins each more distinctly sinuate posteriorly in front of basal margin. Punctuation of elytra in general sparser and somewhat coarser, pubescence black, interspaces between punctures without microsculpture, elytra therefore appearing more glossy. Pubescence of abdomen black, punctuation of abdominal tergites sparser and more evenly distributed.

Male. First four segments of front tarsus similar to those of *P. furvus*, but considerably less dilated, first three segments only hardly subbilobed and each with only a few modified pale setae ventrally; segment two about one third

narrower than apex of tibia. Secondary sexual characters on sternites 7 and 8 similar to those of *P. furvus*, but medio-apical emargination of sternite 8 wider and obtusely arcuate (Fig. 23). Genital segment with tergite 10 more or less emarginate apically, with numerous apical setae (Fig. 24); sternite 9 similar to that of *P. furvus* but with branches shorter and not modified (Fig. 25). Aedoeagus (Figs. 26-28) elongate; median lobe more or less parallel-sided, anteriorly tapered into narrow apical portion with subacute apex, in lateral view with small subapical tooth on face adjacent to paramere; paramere long and narrow, almost rod-like, with arcuate apex distinctly not reaching apex of median lobe; sensory peg setae on underside of paramere forming two long, slightly irregular longitudinal rows; four minute setae at apical margin, two similar setae on underside of paramere laterad of each row of sensory peg setae; internal sac similar to that of *P. furvus*.

Female. First four segments of front tarsus similar to those of male but still less dilated, segment two only slightly more than half as wide as apex of tibia. Genital segment with tergite 10 similar to that of *P. furvus*, but more tapered toward narrowly arcuate apex, medio-apical portion not appreciably pigmented (Fig. 29).

Length 9.3 - 12.8 mm.

Type material. Sharp (1885: 398) described the species from specimens from Mexico (La Parada). The three specimens in the Sharp collection in the British Museum (Natural History), London, are labelled as follows: Spec. No.1 (male): "*Philonthus sallaei*. Type D.S. Parada. Mexico. Sallé." (on plate with beetle)/"Type"/ (round label with red margin)/"Parada."/"Mexico.Sallé Coll."/ "B.C.A. Col.I. 2.*Philonthus sallaei*, Sharp." Spec. No.2 (female): "*Philonthus sallaei*. D.S. Parada. Mexico. Sallé." (on plate with beetle)/"Mexico. Sallé."/ "B.C.A. Col.I.2. *Philonthus sallaei*, Sharp."/"Sharp Coll. 1905.-313." Spec.No.3 (female): "*Philonthus sallaei*. var. Parada. Mexico. Sallé." (on plate with beetle)/ + three additional labels identical to those of Spec.No.2.

All specimens studied are conspecific. The male specimen was dissected, and the genital segment and the aedoeagus were glued to the plate with the beetle. The first female specimen was dissected, and the genital segment was glued to the plate with the beetle. All specimens of this original series are to some extent incomplete. The male

specimen is hereby designated as the lectotype of *Philonthus sallaei*; the label "Lectotype *Philonthus sallaei* Sharp A. Smetana des. 1990" has been attached to it. The specimen is missing right middle tarsus and left hind tarsus.

Distribution. *Philonthus sallaei* is at present known only from several localities in Mexico.

Material studied (43 specimens): MEXICO: Mexico: Km 10, V. Popocatepetl, 10000', 7.V.71, J.M. Campbell (CNCC)3. Oaxaca: Llano de Las Flores, km 80, Hwy. 175, 22.V.69, H.F. Howden (CNCC)3; 52 mi N Oaxaca, 17.V.71, D.E. Bright (CNCC)2; 20 km N Oaxaca, 9500', 7.VI.71, S. Peck (CNCC)8; 1.5 mi W of km 20 Rt. 175, N Oaxaca, 9000', 31.V. - 1.VI.71, H. F. Howden (CNCC)1; 56 mi S Valle Nacional, 10000', 16.-25.V.71, S. Peck (CNCC)26.

Bionomics. Little is known about the habitat requirements of this species. Most specimens seen were taken from under carrion and from human dung and carrion traps, mostly at high mountain elevations.

Discussion. *Philonthus sallaei* may fairly easily be distinguished from *P. furvus* by the character states mentioned above, particularly by those concerning the head, and by the sexual characters.

Philonthus griseolus Sharp Figures 30 - 34

Philonthus griseolus Sharp, 1885: 399

Description: In all characters very similar to *P. furvus*, but different as follows: coloration paler, rather rufo-piceous, head, pronotum and elytra with faint metallic lustre, elytral epipleura concolorous with elytra, not paler; maxillary and labial palpi, first segment of piceous antennae and legs rufo-brunneous, medial faces of middle and hind tibiae darkened. Head with coarse punctures on each side behind eye more numerous; eyes more convex and relatively larger, vaguely longer than tempora (ratio 1.17); no additional punctures between interocular punctures. Pronotum appearing narrower due to strong constriction behind middle; lateral margins each strongly sinuate posteriorly in front of basal margin. Punctuation of elytra and of abdomen in general finer than in

most specimens of *P. furvus*; pubescence of elytra and abdomen paler, brunneous.

Male. First four segments of front tarsus similar to those of *P. furvus* but less dilated, segment two about one fourth narrower than apex of tibia. Sternite 7 vaguely sinuate at middle of apical margin; sternite 8 with medio-apical emargination similar to that of *P. furvus*, but somewhat less deep (Fig. 30). Genital segment with tergite 10 emarginate apically, with several apical setae (Fig. 31); sternite 9 short and very wide, bilobed, with two long and strong subapical setae (Fig. 32). Aedoeagus (Figs. 33, 34) with median lobe rather suddenly constricted into narrow apical portion with obtusely rounded apex, in lateral view with subapical tooth on face adjacent to paramere; paramere elongate, middle portion parallel-sided, anteriorly tapered toward narrowly arcuate apex, apex not reaching apex of median lobe; sensory peg setae on underside of paramere forming two short, somewhat irregular, longitudinal rows joined along apical margin of paramere; two minute setae at each lateral margin near apex, two similar setae on underside of paramere laterad of each row of sensory peg setae; internal sac inconspicuous, without larger sclerotized structures.

Length 11.8 mm.

Type material. Sharp (1885: 399) described the species from a single specimen from Costa Rica (Irazu). The male holotype in the collection of British Museum (Natural History) is labelled as follows: "*Philonthus griseolus* Type D.S. Irazu 6-7000ft. Rogers." (on plate with beetle)"/"Type" (round label with red margin)"/"Irazu, Costa Rica. Rogers."/"B.C.A.Col.I.2. *Philonthus griseolus*, Sharp."/"Sharp Coll. 1905.-313."

The specimen was dissected; abdominal segment 8, the genital segment and the aedoeagus were mounted separately into Canada balsam on small transparent plates attached to the pin with the beetle. The specimen is missing most of the left front tarsus and the entire left hind tarsus.

Distribution. *Philonthus griseolus* is at present known only from the type locality Irazu (Cartago) in Costa Rica.

Material studied: the holotype.

Bionomics. Nothing is known about the habitat requirements of this species.

Discussion. The only specimen of this species known at present (the holotype) seems to be discolored; the natural coloration is very likely darker, similar to that of *P. furvus*.

Philonthus fissilis Sharp
Figures 35 - 40

Philonthus fissilis Sharp, 1885: 399

Description. In all characters quite similar to *P. furvus* and different mainly in sexual characters. Coloration similar to that of *P. furvus*, elytra with bronze metallic lustre, each elytral epipleuron pale brownish, pale color not sharply delimited against dorsal side of elytron (see discussion). Eyes somewhat smaller, tempora longer than length of eyes seen from above (ratio 1.29); no additional punctures between interocular punctures. Punctuation of abdominal tergites in general finer, sparser and more equally distributed over each tergite.

Male. First four segments of front tarsus similar to those of *P. furvus* but distinctly less dilated, segment two about one third narrower than apex of tibia. Sternite 7 vaguely sinuate at middle of apical margin; sternite 8 with medio-apical emargination wider, slightly shallower and more obtuse (Fig. 35). Genital segment with tergite 10 wide, strongly narrowed toward apex, emarginate apically, with several apical setae (Fig. 36); sternite 9 similar to that of *P. furvus*, but with branches not suddenly narrowed (Figs. 37). Aedeagus (Figs. 38-40) similar to that of *P. griseolus* but smaller, median lobe more parallel-sided, with narrowed apical portion shorter, in lateral view without subapical tooth on face adjacent to paramere; paramere much shorter and narrower, by far not reaching narrowed apical portion of median lobe; sensory peg setae on underside of paramere forming two short longitudinal rows joined at apical margin of paramere and curved slightly medially posteriorly; four minute setae at apex of paramere, two somewhat longer setae on underside of paramere laterad of each row of peg setae; internal sac inconspicuous, without larger sclerotized structures.

Female unknown.

Length 11.8 - 12.0 mm.

Type material. Sharp (1885: 399) described the species from two specimens from Guatemala

(Tonicapan). I have seen both specimens deposited in the collection of the British Museum (Natural History), London. They are labelled as follows: Spec. No. 1 (male): "Philonthus fissilis. Type. D.S. Tonicapan 8500-10500 ft. Champion"/"Type" (round label with red margin)/ "Tonicapan, 8-10,000 ft./ Champion."/"B.C.A.Col.I.2. Philonthus fissilis, Sharp."/"Sharp Coll. 1905.-313.". Spec. No.2 (male): "Philonthus fissilis D.S. Tonicapan 8500-10500 ft. Champion" (on plate with beetle)/ + three additional labels identical to those of Spec. No.1.

Both specimens are conspecific; they were both dissected. The genital segment of the first specimen was glued to the plate with the beetle, and the aedeagus was mounted in Canada balsam on a small transparent plate attached to the pin with the beetle. The sternite 8, the genital segment and the aedeagus of the second specimen were mounted separately in Canada balsam on small transparent plates attached to the pin with the beetle. The first specimen is hereby designated as the lectotype of *Philonthus fissilis*; the label "Lectotype Philonthus fissilis Sharp A. Smetana des. 1990" has been attached to it.

Distribution. *Philonthus fissilis* is at present known only from the type locality Tonicapan in Guatemala .

Material studied: see Type material.

Bionomics. Nothing is known about the habitat requirements of this species.

Discussion. *Philonthus fissilis* to some extent resembles *P. californicus* Mannerheim, 1843; however the latter species differs by the aedeagus with the median lobe bearing, in lateral view, a distinct subapical tooth on the face adjacent to the paramere.

Philonthus nigerrimus Erichson
Figures 41 - 47

Philonthus nigerrimus Erichson, 1840: 434; Sharp, 1885: 398

Description. In all characters similar to *P. furvus* but different as follows: deep black, dorsal surface without any metallic lustre, elytral epipleura black; antennae entirely black. Head with hind angles entirely rounded, inapparent; no additional inter-

ocular punctures; medial and lateral interocular punctures approximate, distance separating medial punctures about three times larger than distance separating medial and lateral punctures. Antenna only feebly incrassate toward apex, outer segments as long as wide. Pronotum as long as wide, but appearing narrower than that of *P. furvus*. Punctuation of elytra in general finer and denser, interspaces between punctures along transverse axis mostly no more than equally large as diameters of punctures; pubescence black; surface between punctures with microsculpture similar to that in *P. furvus*, but in general denser and more pronounced, elytra therefore appearing duller. Punctuation of abdominal tergites finer, equally distributed over each tergite; pubescence black.

Male. First four segments of front tarsus similar to those of *P. furvus*. Secondary sexual characters on sternites 7 and 8 similar to those of *P. furvus*, but medio-apical emargination on sternite 8 somewhat wider and deeper (Fig. 41). Genital segment with tergite 10 slightly emarginate, with numerous apical setae (Fig. 42); sternite 9 similar to that of *P. furvus*, but branches shorter and not modified (Fig. 43). Aedoeagus (Figs. 44-46) larger; median lobe tapered into narrowly arcuate apex, with distinct subapical tooth on face adjacent to paramere; paramere long, subparallel-sided, broadly arcuate apically, not quite reaching to level of subapical tooth of median lobe; sensory peg setae on underside of paramere forming two long, somewhat irregular longitudinal rows, with sensory peg setae becoming gradually more distant from each other and situated more toward midline of paramere in direction away from apex of paramere; four minute setae at apex of paramere, two similar setae on underside laterad of each row of sensory peg setae; internal sac similar to that of *P. furvus*.

Female. First four segments of front tarsus distinctly less dilated than those of male, in general same as those of *P. furvus*. Genital segment similar to that of *P. furvus* but medio-apical portion of tergite 10 not appreciably pigmented (Fig. 47).

Length 9.8 - 12.8 mm.

Type material. Erichson (1840: 434) described the species from specimens from Mexico ("Habitat in Mexico, Dom. C. Ehrenberg"). The Erichson collection in the Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany, contains two male specimens under the name *P. nigerrimus*. They are

labelled as follows: Spec. No. 1: "6033"/"nigerrimus Er. Ehrbg."/"Zool.Mus. Berlin". Spec. No. 2: "Mexico Ehrenbg. I-Nr. 6033"/"Zool.Mus. Berlin". Both specimens are conspecific and intact.

The first specimens was dissected, and the genital segment and the aedoeagus were glued to a plate attached to the pin with the beetle. The specimen is hereby designated as the lectotype of *P. nigerrimus*; the label: "Lectotype *Philonthus nigerrimus* Erichson A. Smetana des. 1990" has been attached to it.

Distribution. *Philonthus nigerrimus* is known only from Mexico.

Material studied (34 specimens): MEXICO: Mexico: km 10, Volc. Popocatepetl, 10000' 9.V.71, J.M. Campbell (CNCC)30; Ixta-Popo Nat. Park, 10000', 9.V.71, D.E. Bright (CNCC)3. Veracruz: Las Vigas, Hoege (USNM)1.

Bionomics. Little is known about the habitat requirements of this species. The specimens from the volcano Popocatepetl were collected, together with *P. furvus*, in an extremely dry area by sifting debris from under cut logs; the debris represented the only reasonably moist habitat around. The specimens from Ixta-Popo N.P. were taken from under bark.

Discussion. *Philonthus nigerrimus* is in all characters equally similar to *P. alutaceus*, which is in Mexico known at present only from Baja California. *Philonthus alutaceus* differs easily, in addition to the sexual characters (see Figs. 41-54), by the denser and coarser microsculpture on the interspaces between the punctures on the elytra, giving the surface of the elytra a duller appearance.

Philonthus alutaceus Horn Figures 48 - 54

Philonthus alutaceus Horn, 1884: 183; Fall, 1901: 68; Arnett, 1960, 1968: 238, fig. 13.15, 239, fig. 16.15

Description. In all characters similar to *P. furvus* but different as follows: in general larger and more robust. Black, dorsal surface without any metallic lustre, elytral epipleura black. No additional interocular punctures on head; medial and lateral

interocular punctures rather distant, distance separating medial interocular punctures about 1.9 times larger than distance separating medial and lateral punctures. Scutellum with dense and rather coarse, submeshed microsculpture. Interspaces between punctures on elytra with dense and coarse microsculpture of irregular ridges, surface of elytra therefore appearing dull.

Male. First four segments of front tarsus similar to those of *P. furvus*, but somewhat more dilated. Secondary sexual characters on sternites 7 and 8 similar to those of *P. furvus*, but medio-apical emargination on sternite 8 somewhat wider and deeper (Fig. 48). Genital segment with tergite 10 wide and rather large, distinctly emarginate apically, with numerous apical setae at each side of emargination (Fig. 49); sternite 9 as in Fig. 50. Aedoeagus (Figs. 51-53) similar to those of *P. californicus* and *P. inachus*, but with apex of paramere in lateral view reaching to level of subapical tooth of median lobe in *P. alutaceus*; paramere in general longer, with sensory peg setae on underside forming two longer longitudinal rows, with sensory peg setae becoming gradually more distant from each other in direction away from apex of paramere.

Female. First four segments of front tarsus about same as those of *P. furvus*. Genital segment with tergite 10 larger and wider, emarginate apically, with several apical setae at each side of emargination (Fig. 54).

Length 9.8 - 14.0 mm.

Type material. Horn (1884:183) described the species from specimens from "southern regions of California". I have not seen the original material, but there is no doubt that this species as it is interpreted here is the species which Horn described.

Distribution. *Philonthus alutaceus* is distributed in the United States in California, from about the Mendocino and Plumas counties southward to southern California, eastward to Arizona, and in Mexico in Baja California.

Material studied (1 specimen): MEXICO: Baja California Norte: Tecate, 11.VI.50, I. Moore (CNCC)1.

Bionomics. Little is known about the habitat requirements of this species. In the United States, a

few specimens were collected among sedges on wet soil, and from floating flood debris on a small creek. Fall (1901:68) gives "a low, marshy spot near Pomona" as its habitat.

Discussion. *Philonthus alutaceus* can rather easily be recognized by the character state of the uniformly black coloration, in combination with the character state of the elytra appearing dull due to the dense and coarse microsculpture on the interspaces between the punctures. The only other Mexican species, resembling *P. alutaceus* is *P. nigerrimus*. For a comparison of these two species, see the discussion under the latter.

Philonthus melampus spec. nov.

Figures 55 - 61

Description. Piceous to piceous-black, head black, elytra brunneous to dark brunneous, with epipleura inconspicuously paler, pronotum sometimes brunneo-piceous, apical margins of abdominal tergites usually vaguely paler; head and pronotum with dark greenish metallic lustre, elytra with strong bronze metallic lustre; abdomen strongly iridescent; maxillary and labial palpi testaceo-rufous; antennae piceous with last segment usually feebly paler, first three segments each either entirely testaceo-rufous, or testaceo-rufous with apex dark; legs testaceo-brunneous. Head of rounded quadrangular shape with obtusely rounded hind angles, slightly wider than long (ratio 1.14), about as wide as pronotum, usually vaguely dilated posteriad behind eyes; eyes rather small, tempora longer than length of eyes seen from above (ratio 1.40); medial and lateral interocular punctures rather distant, distance separating medial interocular punctures about 1.8 larger than distance separating medial and lateral punctures; temporal area with scattered fine punctures; entire dorsal surface with very fine and dense microsculpture of transverse and oblique waves, with intermixed microscopical punctures. Antenna moderately long, segment 2 shorter than segment 3, segments 4-7 longer than wide, gradually becoming shorter, segments 8-10 about as long as wide, last segment shorter than two preceding segments combined. Pronotum about as long as wide, about equally narrowed both anteriorly and posteriorly; lateral margins each distinctly sinuate posteriorly in front of basal margin; dorsal rows each with four punc-

tures, sublateral rows each with two punctures; microsculpture similar to that on head. Scutellum punctate and pubescent. Elytra short, at suture slightly shorter (ratio 0.90), at sides vaguely shorter (ratio 0.94) to about as long as pronotum at midline, somewhat widened posteriad; each elytron with 1 subhumeral and 1 lateral long seta; punctation fine and sparse, interspaces between punctures along transverse axis three to four times larger than diameters of punctures; pubescence fine, brunneous; surface between punctures with fine microsculpture of short striae radiating from punctures, small area near latero-apical angle of each elytron micro-rugulose in some specimens. Wings non-functional, fully extended only about twice as long as elytra. Abdomen with tergite 7 (fifth visible) without whitish apical seam of palisade fringe, or with seam indistinct, rudimentary; posterior basal line on visible tergites 2 and 3 straight; punctation of tergites somewhat finer and sparser than that on elytra, about equally distributed over each tergite and in general not becoming gradually sparser toward apex of abdomen; elevated area between two basal lines on tergites 2 and 3 sparsely punctate; pubescence brunneous; surface between punctures with exceedingly fine and dense microsculpture of transverse striae. Legs very long, hind tibia about as long as pronotum at midline.

Male. First four segments of front tarsus slightly dilated, slightly sub-bilobed, each with modified pale setae ventrally; segment two about one third narrower than apex of tibia, segment four narrower than preceding three segments. Hind tibia slightly curved and thickened in apical half, median face bearing numerous strong spines. Sternite 8 with wide, not deep, obtusely triangular emargination partially filled by semimembranous extension (Fig. 55). Genital segment with tergite 10 with apex subtruncate and minutely emarginate at middle, bearing about 4 strong apical setae at each side of emargination (Fig. 56); sternite 9 bilobed, lobes short (Fig. 57). Aedeagus (Figs. 58-60) long and narrow, median lobe attenuate into long, subacute apical portion, in lateral view with small tooth on face adjacent to paramere; paramere elongate, tapered into narrowly arcuate apex by far not reaching apex of median lobe; sensory peg setae on underside of paramere forming two fairly long longitudinal rows; two minute setae at apex, three similar setae on underside of paramere

laterad of each row of sensory peg setae; internal sac simple, without larger sclerotized structures.

Female. First four segments of front tarsus not appreciably different from those of male. Hind tibia simple, not modified. Genital segment with second gonocoxite with minute stylus bearing one long seta; tergite 10 strongly narrowed, with medio-apical portion pigmented, apex subtruncate, with six to eight apical setae (Fig. 61).

Length 10.8 - 13.5 mm.

Type material. Holotype (male) and allotype (female): MEXICO: Chiapas: "MEX., 9500', Mt. Tzontehuitz Chis., V.27.1969 J.M. Campbell". Both holotype and allotype in the Canadian National Collection, Ottawa (CNC No 20751). Paratypes: MEXICO: Chiapas: same data as holotype (CNCC) 23; same data as holotype, but date 19.V.69 (CNCC)1.

Distribution. *Philonthus melampus* is known only from Mt. Tzontehuitz in the state of Chiapas in Mexico.

Bionomics. The specimens of the original series were collected by sifting deciduous leaf litter and fresh wood chips in a cloud forest

Discussion. *Philonthus melampus* is a distinctive species. It may readily be recognized, in addition to the sexual characters, by its general habitus featuring short elytra, very long legs with male posterior tibiae sexually modified, rudimentary or missing whitish apical seam of palisade fringe on abdominal tergite 7, in combination with the coloration (see the description).

Etymology. The specific name is the name of *Melampus-podis*, m, the son of *Amythaon*, a celebrated physician and soothsayer.

Acknowledgments

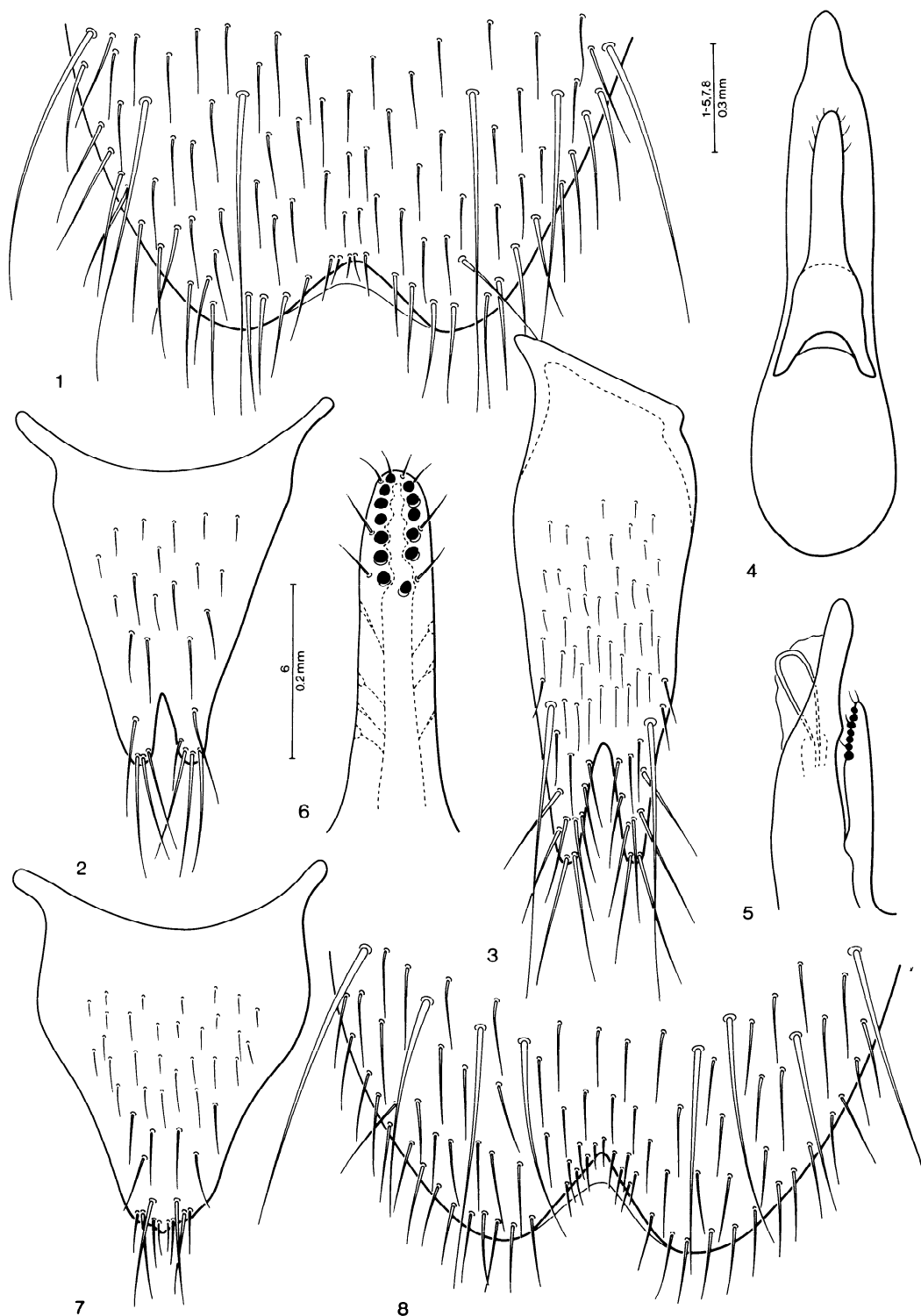
The original specimens of the species described by Sharp have been made available to me through the kindness of Mr. R. Aldridge, British Museum (Natural History), London. His assistance is gratefully acknowledged.

The comments of my colleagues, Drs. D.E. Bright and J.M. Campbell at the Biological Resources Division, that eventually led to the improvement of the manuscript, were greatly appreciated. Mr. Go Sato from the same institution carefully

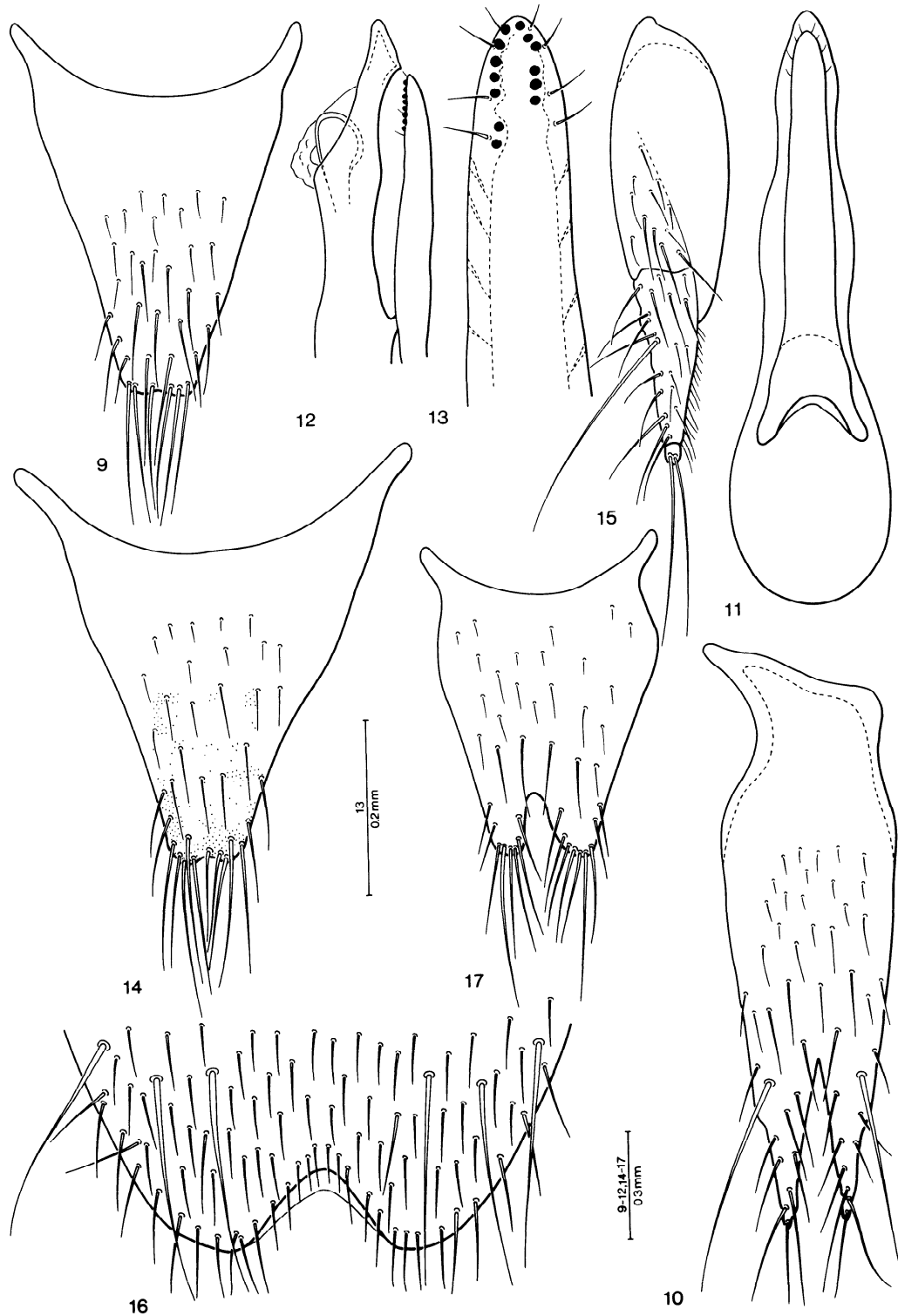
finished all the drawings in this paper; his help contributed to the overall appearance of the paper.

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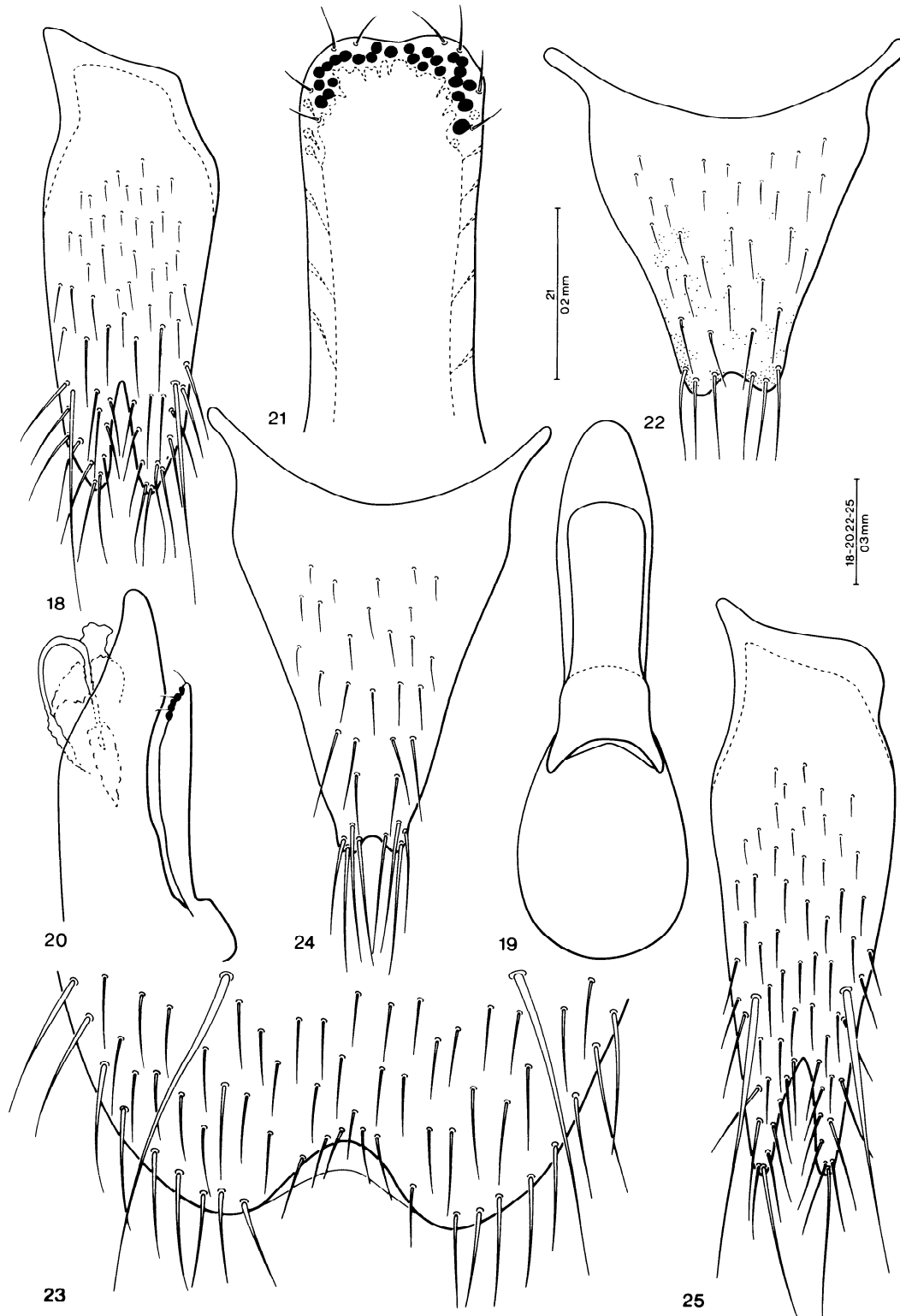
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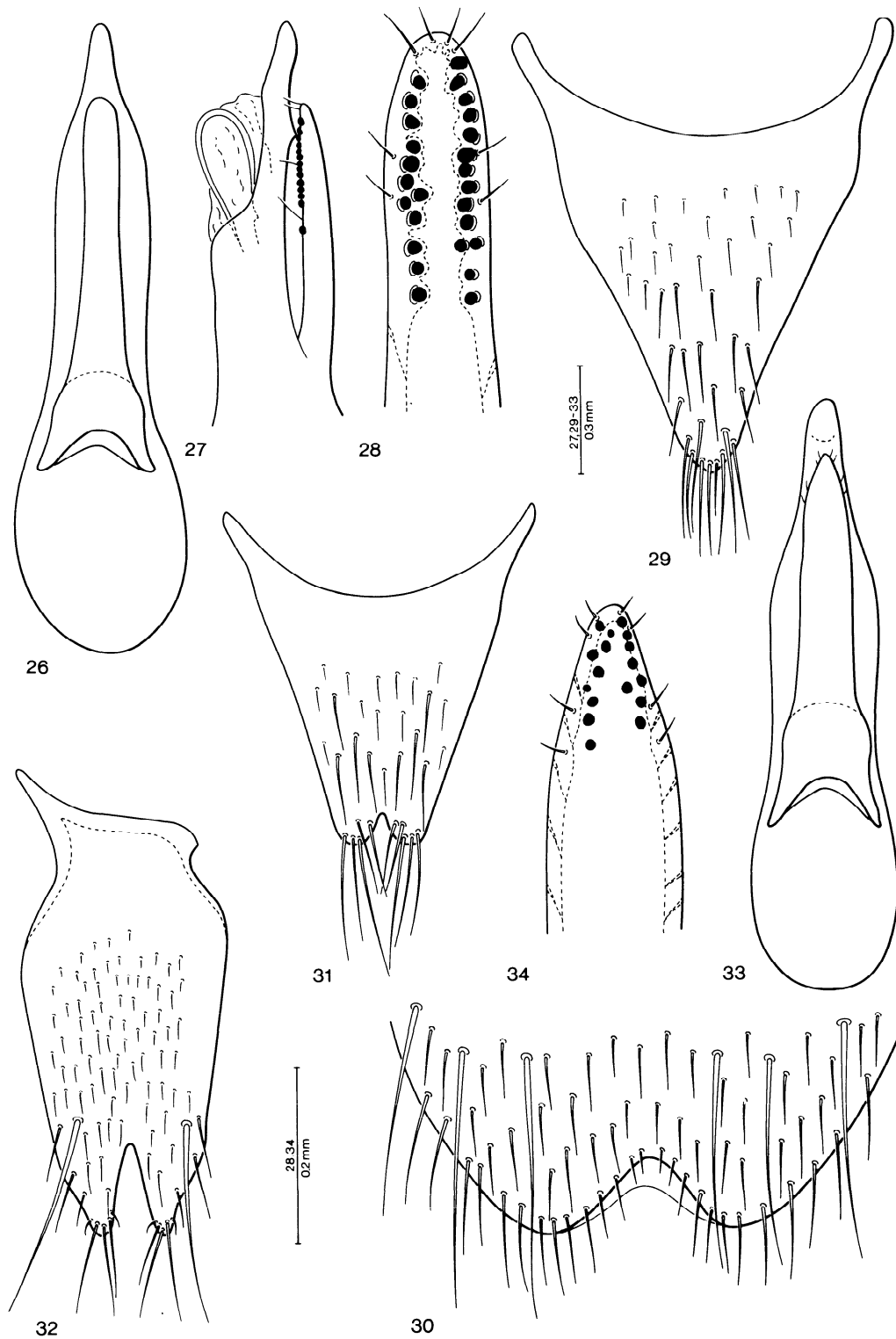
Figures 1-8. 1-7, *Philonthus oenotrus*: 1, male sternite 8; 2, tergite 10 of male genital segment; 3, sternite 9 of male genital segment; 4, aedoeagus, ventral view; 5, apical portion of aedoeagus, lateral view; 6, apical portion of paramere, underside with sensory peg setae; 7, tergite 10 of female genital segment. 8, *Philonthus furvus*: male sternite 8.



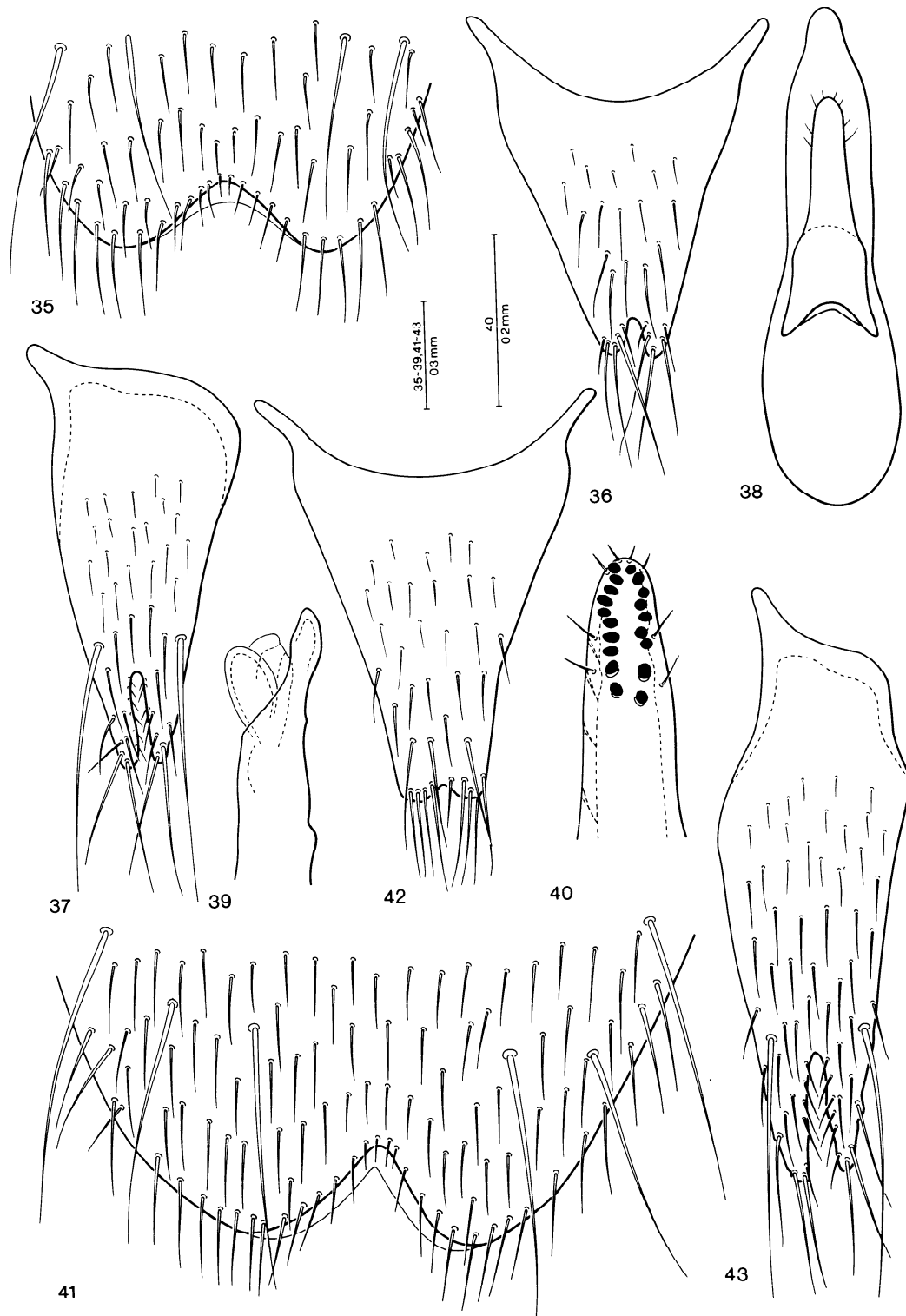
Figures 9-17. 9-15, *Philonthus furvus*: 9, tergite 10 of male genital segment; 10, sternite 9 of male genital segment; 11, aedoeagus, ventral view; 12, apical portion of aedoeagus, lateral view; 13, apical portion of paramere, underside with sensory peg setae; 14, tergite 10 of female genital segment; 15, gonocoxite of female genital segment. 16, 17, *Philonthus flohri*: 16, male sternite 8; 17, tergite 10 of male genital segment.



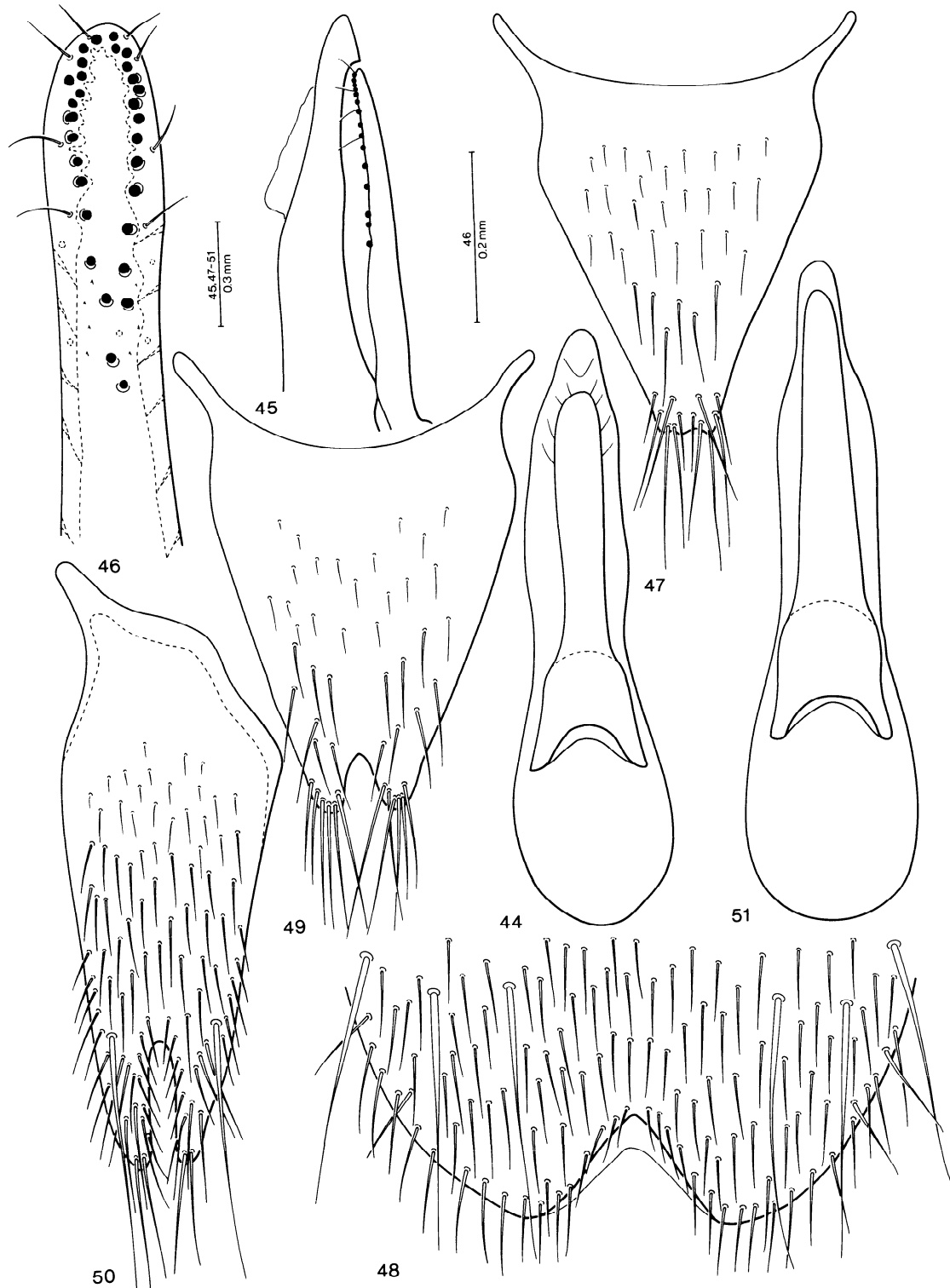
Figures 18-25. 18-22, *Philonthus flohri*: 18, sternite 9 of male genital segment; 19, aedoeagus, ventral view; 20, apical portion of aedoeagus, lateral view; 21, apical portion of paramere, underside with sensory peg setae; 22, tergite 10 of female genital segment. 23-25, *Philonthus sallaei*: 23, male sternite 8; 24, tergite 10 of male genital segment; 25, sternite 9 of male genital segment.



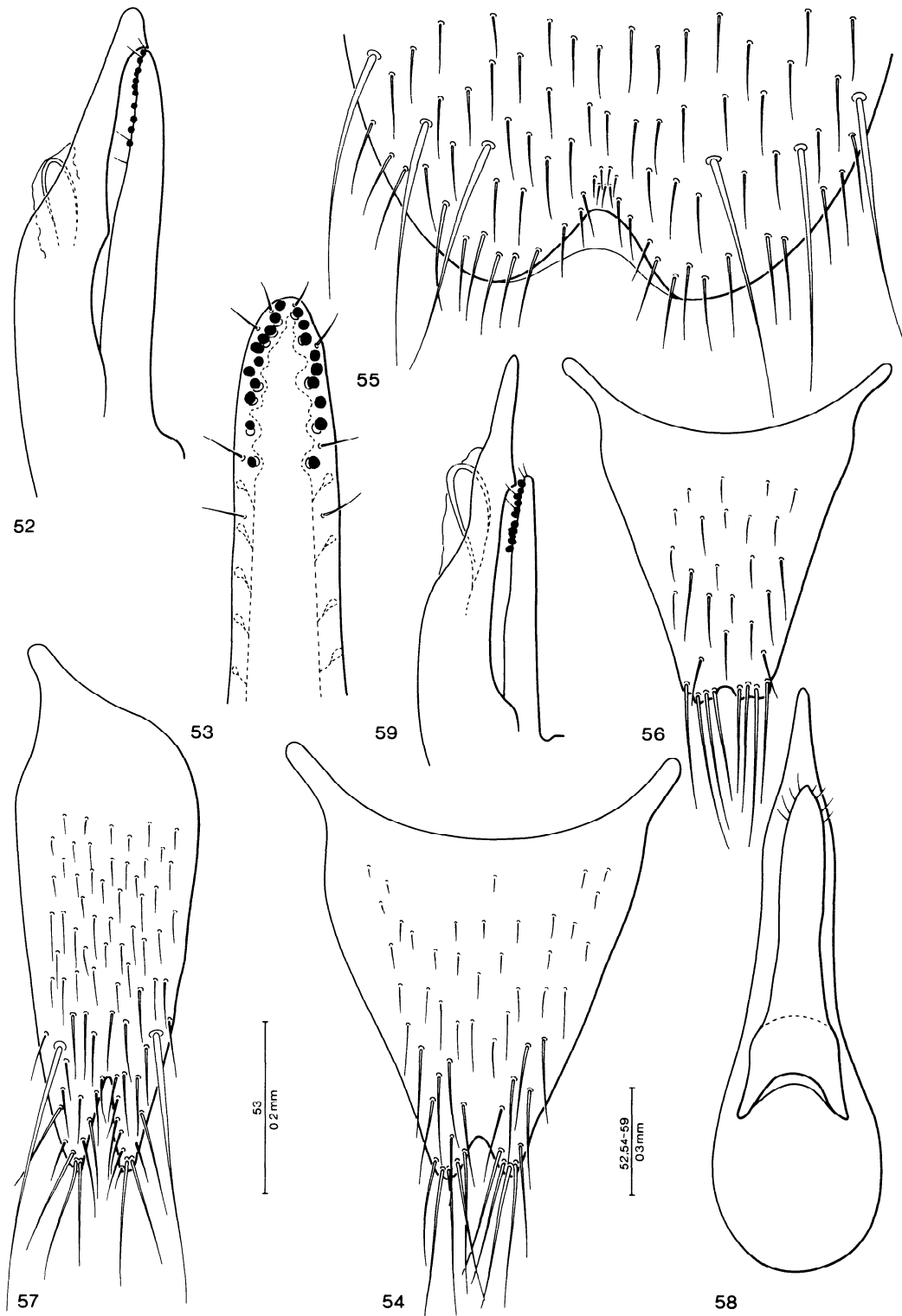
Figures 26-34. 26-29, *Philonthus sallaei*: 26, aedeagus, ventral view; 27, apical portion of aedeagus, lateral view; 28, apical portion of paramere, underside with sensory peg setae; 29, tergite 10 of female genital segment. 30-34, *Philonthus griseolus*: 30, male sternite 8; 31, tergite 10 of male genital segment; 32, sternite 9 of male genital segment; 33, aedeagus, lateral view; 34, apical portion of paramere, underside with sensory peg setae.



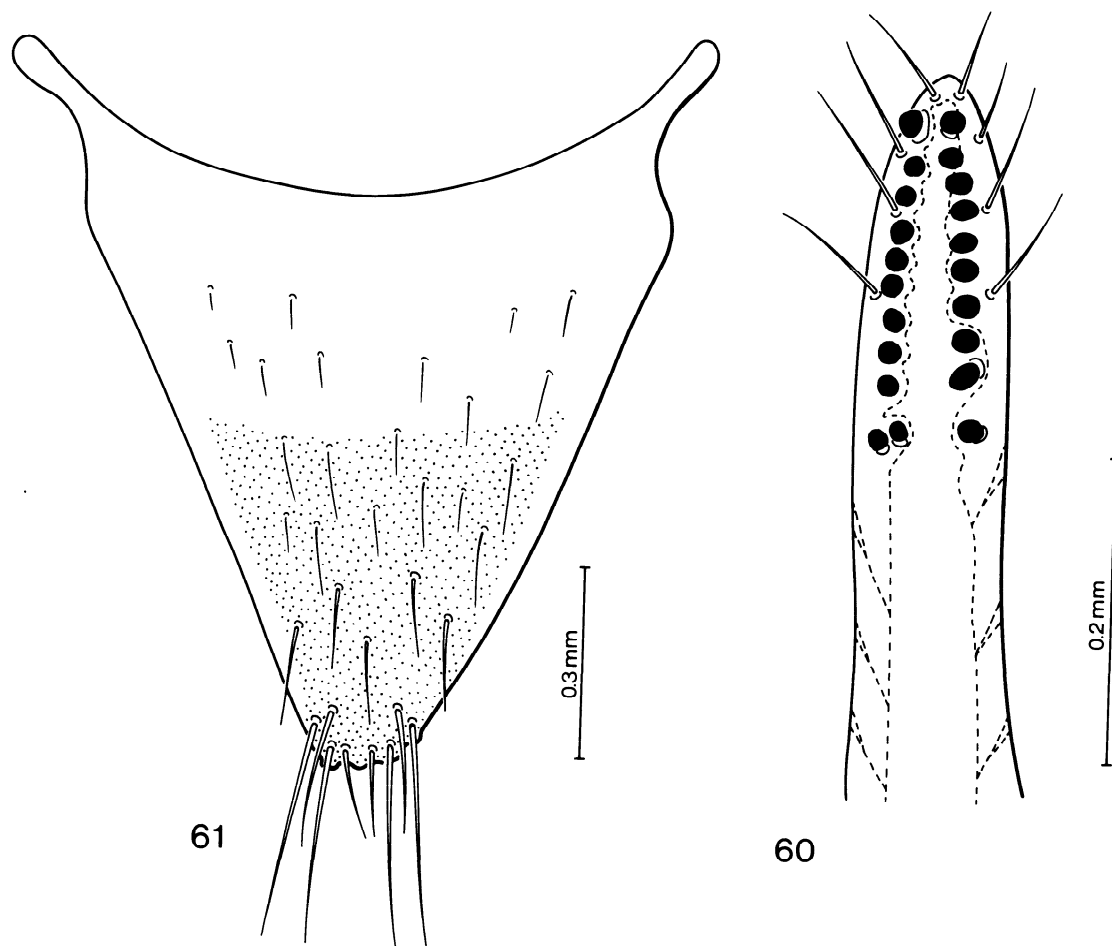
Figures 35-43. 35-40, *Philonthus fissilis*: 35, male sternite 8; 36, tergite 10 of male genital segment; 37, sternite 9 of male genital segment; 38, aedeagus, ventral view; 39, apical portion of aedeagus (paramere removed), lateral view; 40, apical portion of paramere, underside with sensory peg setae. 41-43, *Philonthus nigerrimus*: 41, male sternite 8; 42, tergite 10 of male genital segment; 43, sternite 9 of male genital segment.



Figures 44-51. 44-47, *Philonthus nigerrimus*: 44, aedeagus, ventral view; 45, apical portion of aedeagus, lateral view; 46, apical portion of paramere, underside with sensory peg setae; 47, tergite 10 of female genital segment. 48-51, *Philonthus alutaceus*: 48, male sternite 8; 49, tergite 10 of male genital segment; 50, sternite 9 of male genital segment; 51, aedeagus, ventral view.



Figures 52-59. 52-54, *Philonthus alutaceus*: 52, apical portion of aedeagus, lateral view; 53, apical portion of paramere, underside with sensory peg setae; 54, tergite 10 of female genital segment. 55-59, *Philonthus melampus*: 55, male sternite 8; 56, tergite 10 of male genital segment; 57, sternite 9 of male genital segment; 58, aedeagus, ventral view; 59, apical portion of aedeagus, lateral view.



Figures 60-61. *Philonthus melampus*: 60, apical portion of paramere, underside with sensory peg setae; 61, tergite 10 of female genital segment.