

## THREE NEW SPECIES OF NEOTROPICAL SARCOPHAGIDAE (DIPTERA)

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*Three new species of Neotropical Sarcophagidae are described. Miltogrammatinae: Oebalia costarica sp. n. (Costa Rica) and Senotainia trifida sp. n. (Chile), of which the latter is the first representative of the subfamily with a tripartite phallotreme. Sarcophaginae: Johnsonia woodorum sp. n. (Costa Rica, Panama).*

Key words: Neotropical Region – Sarcophagidae – *Oebalia costarica* sp. n. – *Senotainia trifida* sp. n. – *Johnsonia woodorum* sp. n.

The Neotropical fauna of Sarcophagidae is remarkably skewed compared to that of the other biogeographical regions. The subfamily Miltogrammatinae is sparsely represented, and although recent revisionary papers, e. g. Pape (1987, 1989, in press), has added significantly to the known fauna, it is still considerably smaller than that of the Nearctic Region. This may be explained by the less extensive dry areas, like shrublands and semideserts, which usually support a wide variety of solitary aculeate Hymenoptera that may serve as hosts for the mostly cleptoparasitic Miltogrammatinae. Moreover, the humid, tropical rainforests of Central America may have acted as a dispersion barrier (assuming that the origin of the subfamily occurred outside the Neotropics). The subfamily Sarcophaginae, on the other hand, is extremely diversified, and although the Neotropical Region probably is the least known of the biogeographical regions, the fauna is richer than that of any other region.

The following three species of Neotropical Sarcophagidae, each one easily separated from its congeners, were recovered during extensive sorting of unidentified Neotropical Sarcophagidae during a one year predoctoral fellowship at the United States National Museum of Natural History, Washington, D. C. (USNM).

### MATERIALS AND METHODS

Descriptive terminology follows that used in Pape (1989), and depositories for material discussed in the text are given by the following acronyms.

CAS: California Academy of Science, San Francisco, USA.

CNC: Canadian National Collection of insects and related arthropods, Ottawa, Canada.

MIUC: Museo de Insectos, Universidad de Costa Rica, San José, Costa Rica.

USNM: National Museum of Natural History, Washington, D. C., USA.

ZMUC: Zoologisk Museum, University of Copenhagen, Denmark.

### Descriptions of species

#### *Oebalia costarica* sp. n.

Figs 1-4.

*Etymology* – The species epithet is a noun in apposition. Named for the type locality.

*Type material* – Holotype ♂, COSTA RICA: San José, Ciudad Universitaria, 12.xi.1964, G. Fuentes (MIUC).

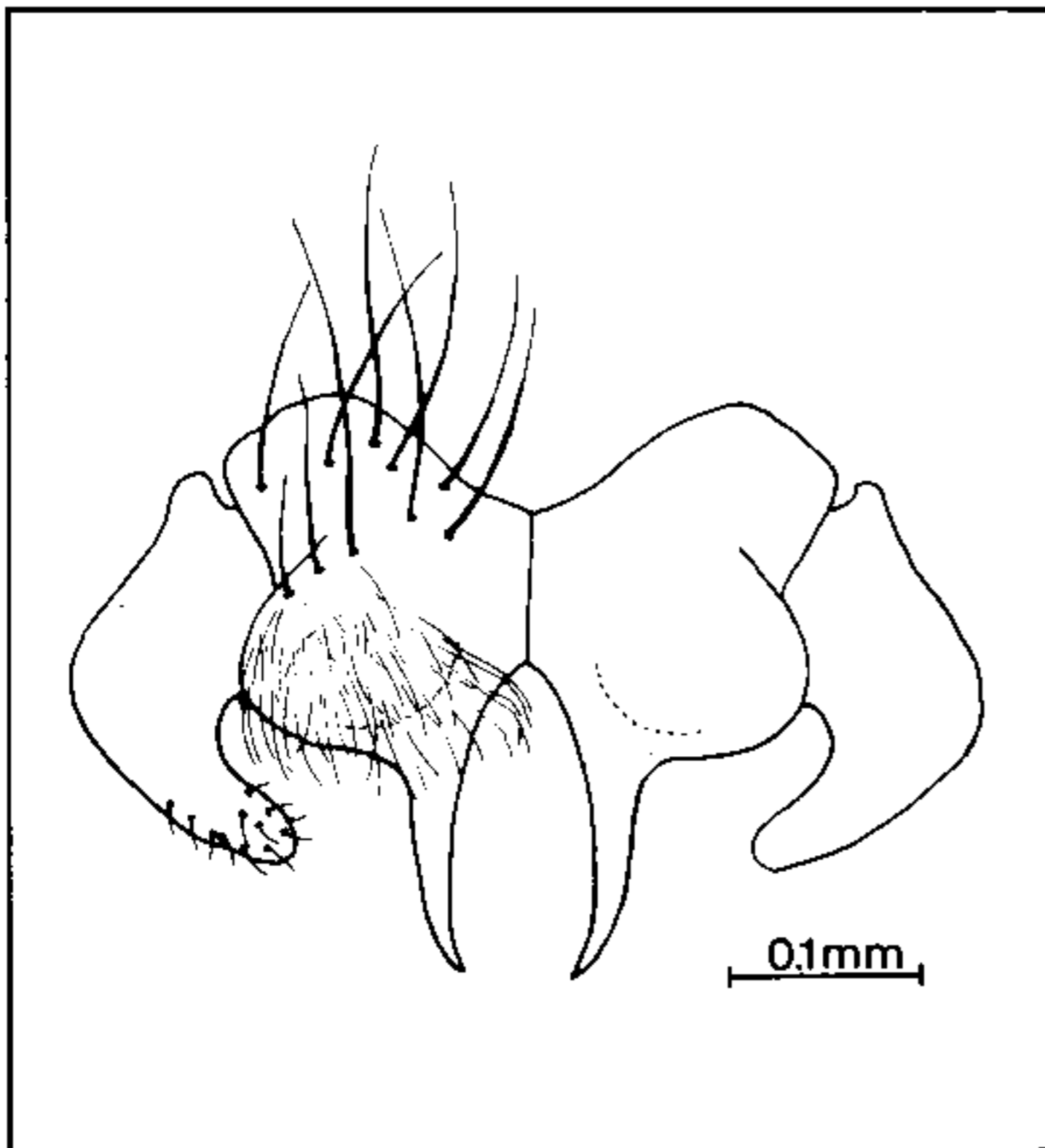
*Male* – *Head* – Frons slightly protrudent, fronto-orbital plate with 2 proclinate and 1 reclinate orbital bristles and scattered setulae in entire length. Parafacial plate with a few scattered setulae in upper half. Gena and postcranium with black setae. Vibrissa well developed, 3-4 bristly supravibrissal setae irregularly arranged just above vibrissa, facial ridge with a row of setae in lower 0.7. Arista thickened in proximal 0.7 and shorter than first flagellomere. Anterior part of fronto-orbital plate and most of parafacial plate silvery grey microtomentose with a faint golden or olive tinge. Gena silvery grey microtomentose, occiput sparsely grey microtomentose. Frontal vitta dark reddish anteriorly, black at vertex. Antenna greyish black. Palpus brownish black.

— *Thorax* — Greyish with a faint olive tinge on posterior part of scutum, presutural area with a pair of black stripes between the dorsocentral bristles and a broad, more diffuse, black stripe lateral to these. Chaetotaxy: acrostichals = 0 + 1, dorsocentrals = 1-2 + 3, intra-alars = 1 + 2, supra-alars = 1 + 3. — *Wing* — Tegula black, basicosta yellow. Costal spine not differentiated. — *Legs* — Black or blackish brown with sparse grey microtomentum. — *Abdomen* — Black with grey microtomentum, tergite 1+2 almost devoid of microtomentum, T3-T4 with a band of microtomentum in about anterior half, T5 microtomentose almost to hind margin. — *Terminalia* — Cercus slender and less arched than usual for the genus. Cercal base with a distinct hump that is densely beset with hairlike setae. Aedeagus of the characteristic *Oebalia*-type with paired dorsal processes extending beyond the acrophallus, but differing from all other species in the pair of spike-like processes that originate from the dorsal surface of the basiphallus and slant posteriorly and downwards (when the aedeagus is oriented vertically).

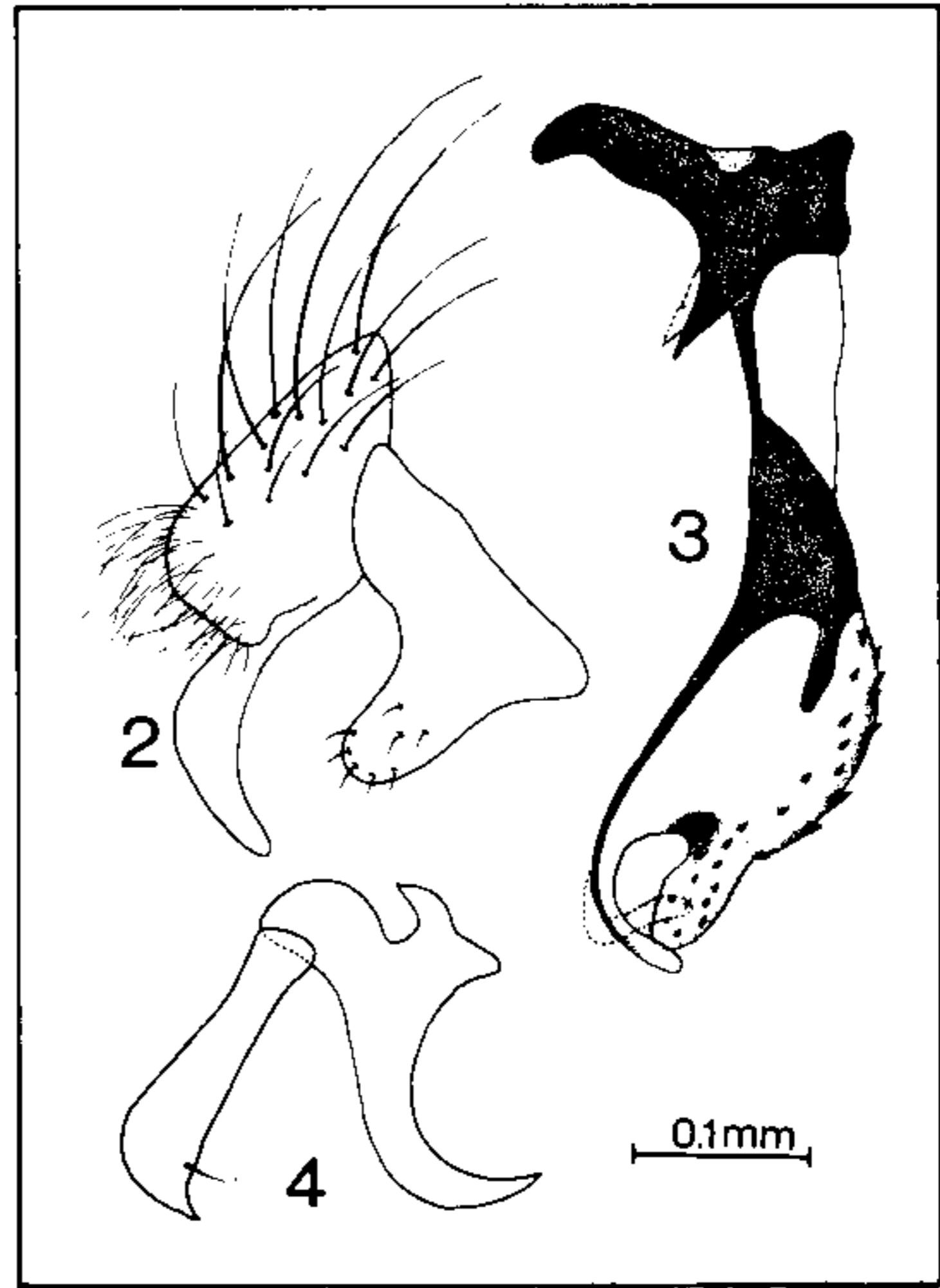
Length — 4.7 mm.

Female — Unknown.

*Distribution* — Neotropical — Costa Rica.



*Oebalia costarica* — Fig. 1: male surstyli and cerci in posterior view, vestiture of right half omitted.



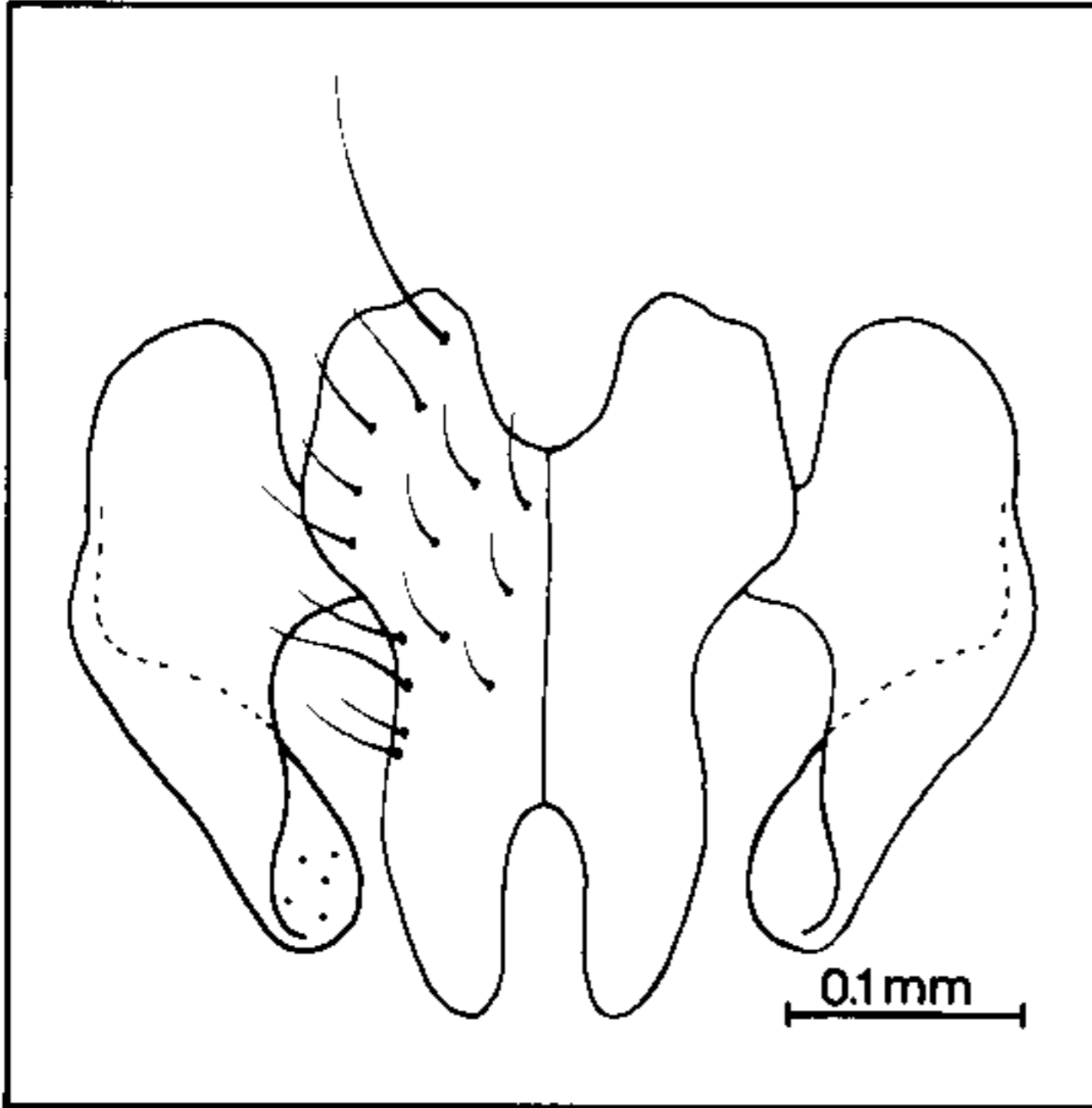
*Oebalia costarica*. Male terminalia — Fig. 2: right cercus and surstylus, lateral view. Fig. 3: aedeagus. Fig. 4: right paramere and gonopod, lateral view.

*Remarks* — American *Oebalia* were reviewed by Pape (1989) and shown to contain three species, one of which was described from Chile. *Oebalia costarica* differs from its American congeners and from all other species of the genus in the short cercal prong, the hairlike setae of the cercal base and the processes of the aedeagal base as described above. Of characters in the external morphology, the long, non-bristly setal row of the facial ridge, which occupies the lower 0.7, may separate the species from the other American species, in which this row either consists of bristly setae (*O. minuta* (Fallén)) or occupies at most the lower 0.5 (remaining two species). More specimens are needed, however, to evaluate the infra-specific variation of this character state.

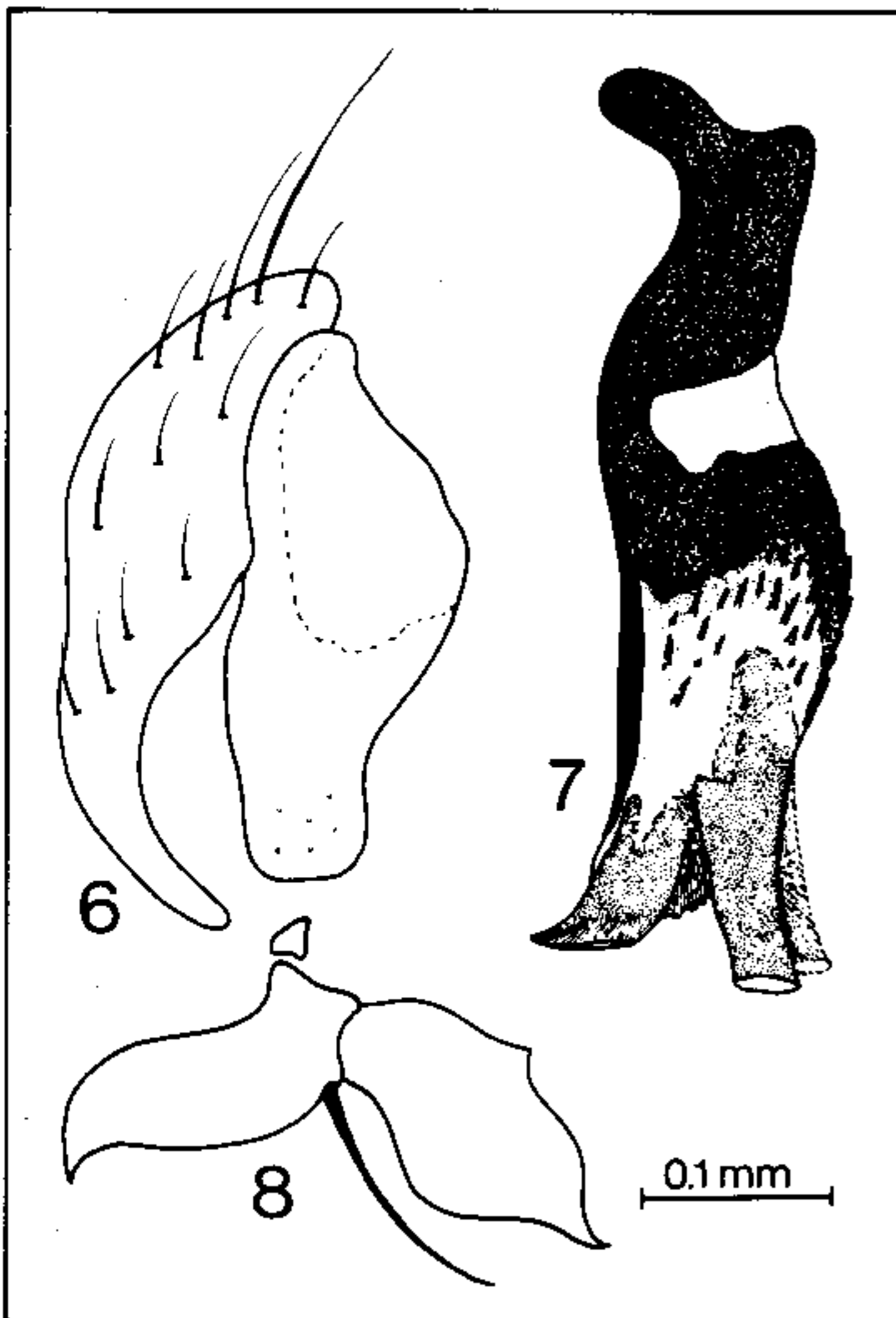
*Senotainia trifida* sp. n.

Figs 5-8.

*Etymology* — The species epithet is a Latin adjective, from *tri-* = thrice, and *-fid* = suffix denoting division into parts. The name refers to the tripartition of the acrophallus which is unique within the Miltogrammatinae.



*Senotainia trifida* – Fig. 5: male surstyli and cerci in posterior view, vestiture of right half omitted.



*Senotainia trifida*. Male terminalia – Fig. 6: right cercus and surstylus, lateral view. Fig. 7: aedeagus. Fig. 8: right paramere and gonopod, lateral view.

**Type material** – Holotype ♂, CHILE: Santiago Prov., Quebrada de la Plata, 33°30'S-70°55'W, near Maipú, 510 m, 10.ii.1966, M. E.

Irwin (CAS). Paratype: Santiago Prov., La Rinconada, 33°34'S-71°14'W, 1 ♂, 4.iii.1966, M. N. Hichins (ZMUC).

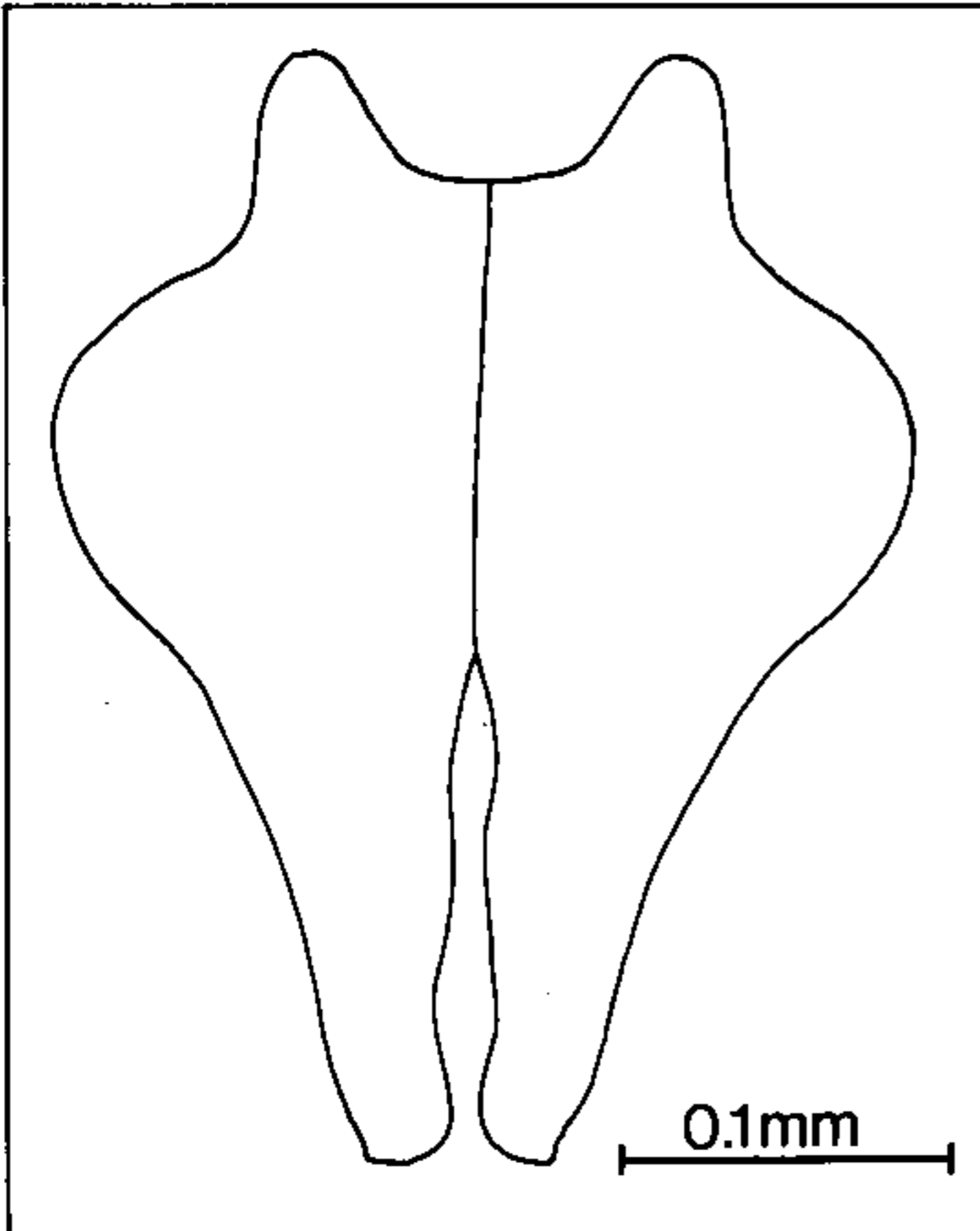
**Male – Head** – Frons at level of anterior ocellus 0.4x head width. Frontal vitta narrowing towards lunule. Vertical, ocellar, frontal, and orbital (2 proclinate, 1 reclinate) bristles well developed. Fronto-orbital plate without setosity in addition to the bristles mentioned except for a few very short and inconspicuous setae in lower part (profrons). Parafacial plate with some very short, scattered and indistinct setulae. Vibrissa well developed, facial ridge with 4-5 supravibrissal setae. Gena sparsely setose. Antenna of medium length, first flagellomere 2.2x as long as pedicel. Arista about as long as first flagellomere. Proboscis of medium length, prementum about 2x as long as palpus. Groundcolour of anterior part of head light brown; vertex, gena and postcranium blackish. Microtomentum of frontal vitta brown, of fronto-orbital plate silvery-grey with brownish tinge, and of parafacial plate, gena and postcranium (except for median occipital sclerite which is black and almost devoid of microtomentum) silvery grey. Distal third of pedicel light brown, antenna otherwise black. Palpus light brown to yellow. – **Thorax** – Chaetotaxy: acrostichals = 1-2 (weak) + 1, dorsocentrals = 1 + 2-3, intra-alars = 0 + 1, supra-alars = 2 + 2, humerals = 2 (the median may be weak). Scutellum with laterals: 2, apicals: 1, and a somewhat weak pair of discals. Notopleuron without setae in addition to the usual two bristles. Microtomentum greyish brown; a black stripe is indicated between the dorsocentral and intra-alar bristles. – **Wing** – Tegula black or blackish brown, basicosta yellowish brown. Costal spine not differentiated, base of  $R_4 + 5$  with a single seta. – **Abdomen** – Tergite 1 + 2 without median marginal bristles, T3 with a pair of weak semierect median marginals, T4-T5 with a complete row of marginals. Microtomentum grey, T3-T4 with three dorsal blackish brown spots which coalesce at posterior margin. – **Terminalia** – Cercus curved in lateral view, surstylus broad and truncated apically. Aedeagus with a tripartite acrophallus, the lateral ducts positioned a little anterior to the median.

**Length** –  $\approx$  4 mm (estimated value, length obscured by dissection of terminalia).

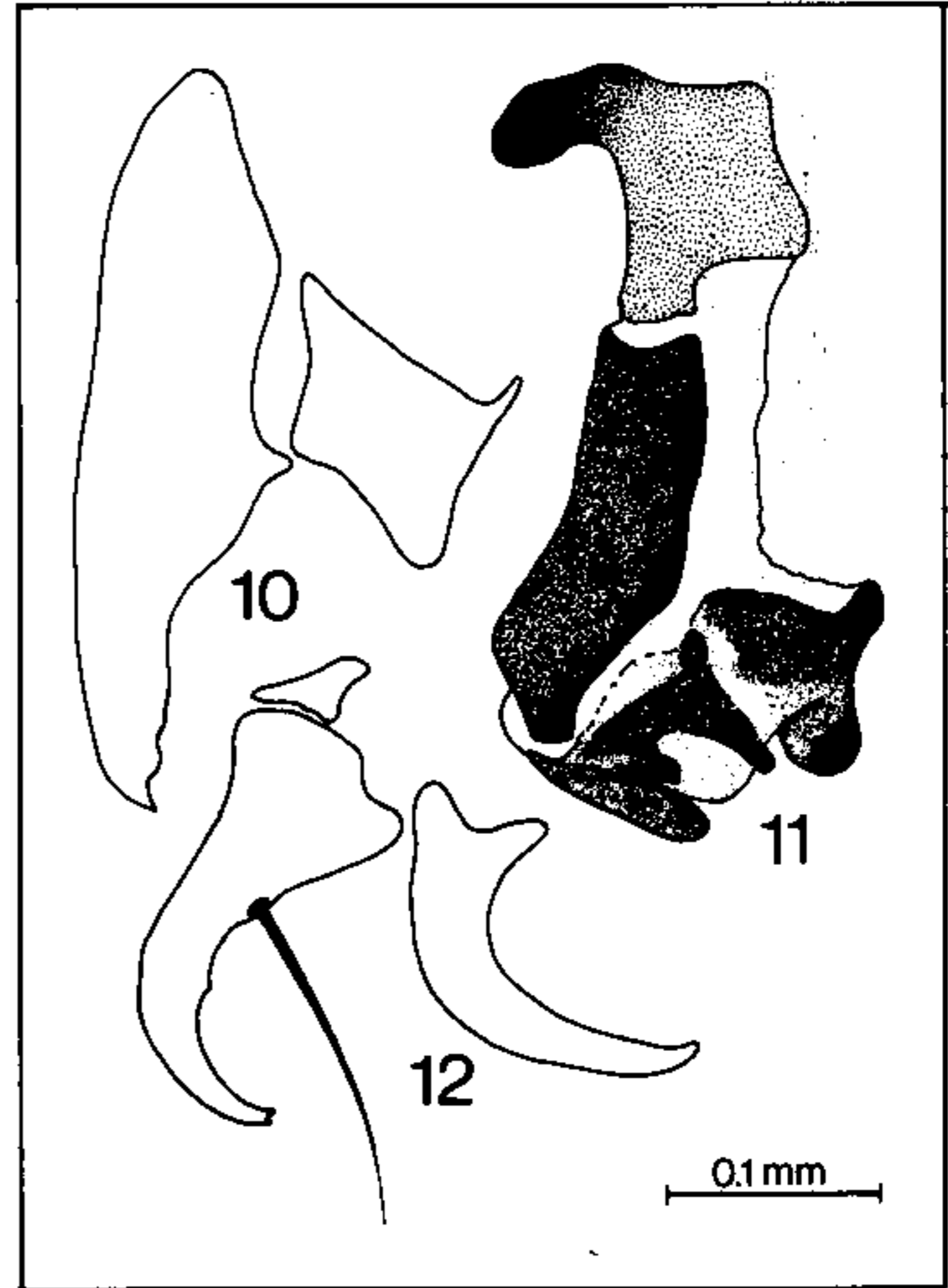
**Female** – Unknown.

*Remarks* – Few species of *Senotainia* Macquart occur in the Neotropical Region and the large majority of these are widespread in the New World (Lopes, 1969). The genus is highly in need of a revision, and the isolated description of *S. trifida* is presented because this species is the first representative of the subfamily Miltogrammatinae with a tripartite acrophallus. Within the Sarcophagidae, a tripartite acrophallus has seemingly evolved twice: In *S. trifida* described above and in the subfamily Sarcophaginae. In the latter taxon only few genera show an apparently plesiomorphic single phallotreme, e. g. *Blaesoxipha* Loew, *Emdenimyia* Lopes, and *Ravinia* Robineau-Desvoidy, but as their most probable sister groups all possess a typical tripartite acrophallus, these instances are best regarded as secondary (i. e. homoplasies). Tripartition occurs scattered throughout the Diptera and has evolved several times. Thus, within the Tachinidae family-group (Tachinidae sensu Griffiths, 1972, Oestroidea sensu McAlpine et al., 1981) it is also found in one subgroup of the Rhinophoridae (Tschorsnig, 1985; Pape, 1986) and scattered in the Tachinidae (e. g. Andersen, 1988).

*Johnsonia woodorum* sp. n.  
Figs 9-12



*Johnsonia woodorum* – Fig. 9: male cerci in posterior view, vestiture omitted.



*Johnsonia woodorum*. Male terminalia – Fig. 10: right cercus and surstylus, lateral view, vestiture omitted. Fig. 11: aedeagus. Fig. 12: right paramere and gonopod, lateral view.

*Etymology* – A noun in the genitive; named for Mr and Mrs Wood, the collectors of the holotype.

*Type material* – Holotype ♂, COSTA RICA: Puntarenas Monteverde, 1500 m, 24-29.ii.1980, G. & M. Wood (CNC). Paratypes: 4 ♂, data as holotype (2 in ZMUC, others in CNC and USNM); PANAMA: Chiriquí, Prov., Bambito, S. of Cerro Punta, 1554 m, 1 ♂, 22.iv. 1976, Rentz, Carter & Mullinex (CAS).

*Male* – *Head* – Eye large. Narrowest part of frons, at level of lateral ocelli, 0.28-0.29x head width. Frontal vitta slightly narrowing towards lunule. Fronto-orbital plate at vertex as broad as frontal vitta at lunule, at lunule as broad as frontal vitta at vertex. Inner vertical bristle about 2.5x as long as outer vertical, ocellar bristle weak, postocellar bristle intermediate in size between outer vertical and strongest postocular seta. Row of frontals with two very long and strong bristles alternating with three much weaker bristles. One strong proclinate and one reclinate orbital bristle are aligned with

the row of frontals. Fronto-orbital plate with a few scattered setulae in addition to the bristles; parafacial plate narrow, with a weak row of setulae. Vibrissa strong, a single well developed subvibrissal seta and strong genal bristles. Gena narrow, with a few black setae, postgenal and occipital setae black, postcranium with only a few yellowish to hyaline setae on hypostomal bridge beneath occipital foramen. Arista distinctly plumose. — *Thorax* — Chaetotaxy: acrostichals = 2 + 0, dorsocentrals = 1 + 3, intra-alars = 1 + 2, supra-alars = 1 + 2, post-alars = 2. Scutellum with a very strong pair of diverging, subapical marginals, a weak pair of basal marginals, and a pair of weak discals and apicals. Proanepisternum bare, katapisternals 1:1. Metathoracic spiracle small and triangular, but posterior lappet still distinct. — *Legs* — Posterior trochanter without setulae on posterior surface; posterior tibia without elongated setae. — *Wing* — Tegula blackish brown, basicoxa light brown. Costal spine weak. R<sub>1</sub> setose in almost entire length, R<sub>2</sub> + R<sub>3</sub> setose beyond crossvein r-m, and CuA<sub>1</sub> setose at base. Wing membrane slightly infuscated along the veins. Lower calyptere tongue shaped and diverging from scutellum. — *Abdomen* — Slender, almost cylindrical. Silvery microtomentum covering anterior 0.3-0.4 of tergites 3-4, anterior 0.5 of T5; abdomen otherwise shining black. Abdominal bristles long and strong; T1 + 2 with a pair of median marginals and lateral discals and marginals; T3 with a pair of median marginals and lateral marginals; T4-T5 with a complete row of marginals. — *Terminalia* — Shining black. Aedeagus rather compact with a short, blunt prolongation of the basiphallus.

Length — 5.5-7.0 mm.

Female — Unknown.

*Distribution* — Neotropical — Costa Rica, Panama.

*Remarks* — Some differences of opinion exist regarding the definition of the genus *Johnsonia*. Downes (1965) applied a broad concept and included *Sthenopyga* Aldrich as a subgenus, while Lopes (1969) and Shewell (1987) considered this as a distinct genus. A thorough discussion of generic limits is beyond the scope of the present paper and it is sufficient to mention that *J. woodorum* fits perfectly as a member of *Johnsonia* in the most restricted sense. This is a monophyletic group

corroborated by a slender body, a setose wing vein CuA<sub>1</sub>, very long anterior frontal bristles, and at least one long genal bristle. Hall (1933) provided a key to the five species of this group known to him, and Hallock (1938) produced a new key incorporating the single species described by Reinhard (1937). Lopes (1975) recently added yet another species. *Johnsonia woodorum* is easily separated from all other species of *Johnsonia* s. str. by the shining black abdomen with silvery transverse bands and the entirely black terminalia.

#### RESUMO

Três novas espécies de Sarcophagidae (Diptera) neotrópicas — *Oebalia costarica* sp. n. (Costa Rica), *Senotainia trifida* sp. n. (Chile), e *Johnsonia woodorum* sp. n. (Costa Rica, Panama) são descritas.

Palavras-chave: Neotropica — Sarcophagidae — *Oebalia costarica* sp. n. — *Senotainia trifida* sp. n. — *Johnsonia woodorum* sp. n.

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