

NOTES ON THE MALE GENITALIA OF SPECIES OF *RAVINIA* AND *CHAETORAVINIA* (DIPTERA: SARCOPHAGIDAE)

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Based on scanning electron microscope (SEM) studies, the male genitalia of three species of Ravinia and two species of Chaetoravinia (Diptera: Sarcophagidae, subtribe Raviniina) are described and compared.

Key words: Diptera – Sarcophagidae – Raviniina – male genitalia – fine structure

In previous studies on the male genitalia of members of the genus *Ravinia* Lopes (1946) described differences in the appearance of the glans of *R. sueta* (Wulp, 1895) from Mexico and *R. ochracea* (Aldrich, 1916) from southern U. S. A. Later, Lopes & Kano (1968) studied copulation in *R. belforti* (Prado & Fonseca, 1932) and found that movements of the lateral plates of the paraphallus drew the female signum (bearing the apertures of the spermathecae and accessory glands) towards the glans.

Males of the genera *Ravinia*, *Andinoravinia* and *Oxyvinia* have a shared apomorphic character: the inner margins of the fifth abdominal sternite are almost parallel and are covered with short, densely arranged, spinous hairs. The fifth sternite of species of *Chaetoravinia* is of a different appearance.

Herein, we present the results of scanning electron microscope (SEM) studies on five members of the subtribe Raviniina: *R. aurigena* (Townsend, 1912); *R. aureopyga* (Hall, 1928); *R. belforti*; *C. advena* (Walker, 1852) *C. effrenata* (Walker, 1861).

The genus *Ravinia* is represented by five species in South America. *R. aurimaculata* (Townsend, 1915), *R. aurigena* and *R. ollantaytambensis* (Hall, 1928) are Peruvian species, the latter two also having been recorded from northern Chile. *R. aureopyga* occurs in Chile, Argentina, Paraguay and southern Brazil. *R. belforti* is widely distributed in Brazil and has

also been recorded in Columbia, Guyana and Trinidad. Of the species of *Chaetoravinia* selected for study, *C. advena* has been recorded in Brazil (between the states of Bahia and Rio Grande do Sul), Argentina and Bolivia, whereas *C. effrenata* is known from U. S. A., Mexico, Caribbean islands, Colombia and northern Brazil (Roraima).

Ravinia aurimaculata is distinguished from the other South American species by its silvery yellow head and golden genae, with a conspicuous gold spot (as the specific name implies) behind the humeri. The male of *R. ollantaytambensis* has a distinctive, strongly curved penis (Hall, 1928). The other three species are also distinguished by genitalic features. *R. aureopyga* has a conspicuous swelling on the dorsum of the penis, at the level of the lateral plates. *R. aurigena*, *R. belforti* and are very similar to one another but can be identified specifically by examination of the glans. Despite their close relationship, there are no doubts the *R. aurigena* and *R. belforti* are distinct species.

Material was prepared for SEM examination by the method describe by Leite & Williams (1988).

Ravinia aureopyga (Hall, 1928)

Figs 1-4

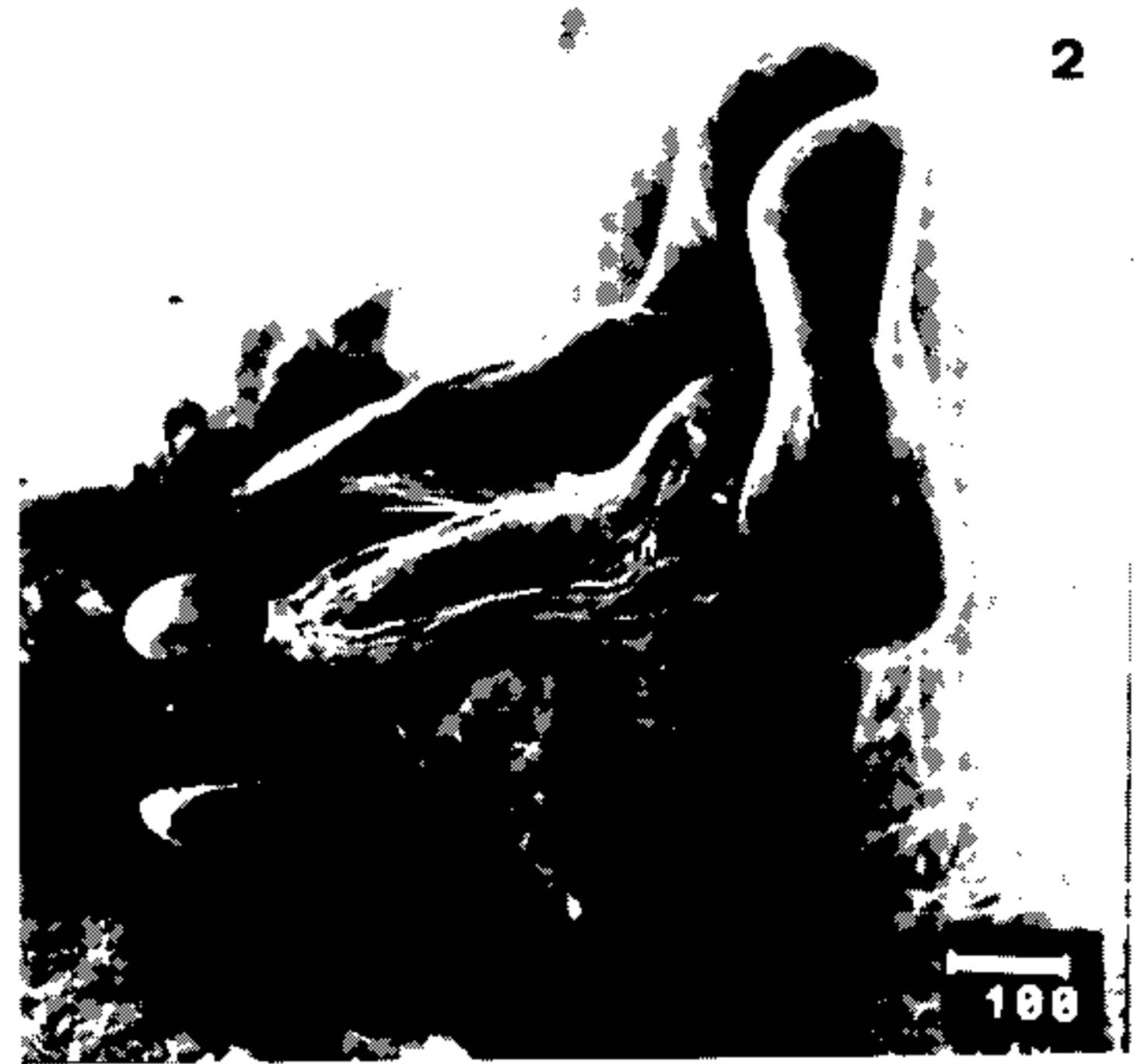
Sarcophaga aureopyga Hall, 1928: 339, fig. 10. Type locality: Chile, Angol. Distribution: Chile, Argentina, Paraguay, Brazil (Rio Grande do Sul).

Euravinia lherminieri Desvoidy of Branchard, 1942: 162, fig. 13a-e.

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SEM photographs of the male genitalia of *Ravinia aureopyga* (Hall) – Fig. 1: penis, apical view. Figs 2, 3: penis, lateral view. Fig. 4: penis, oblique view. – Bar = μm .

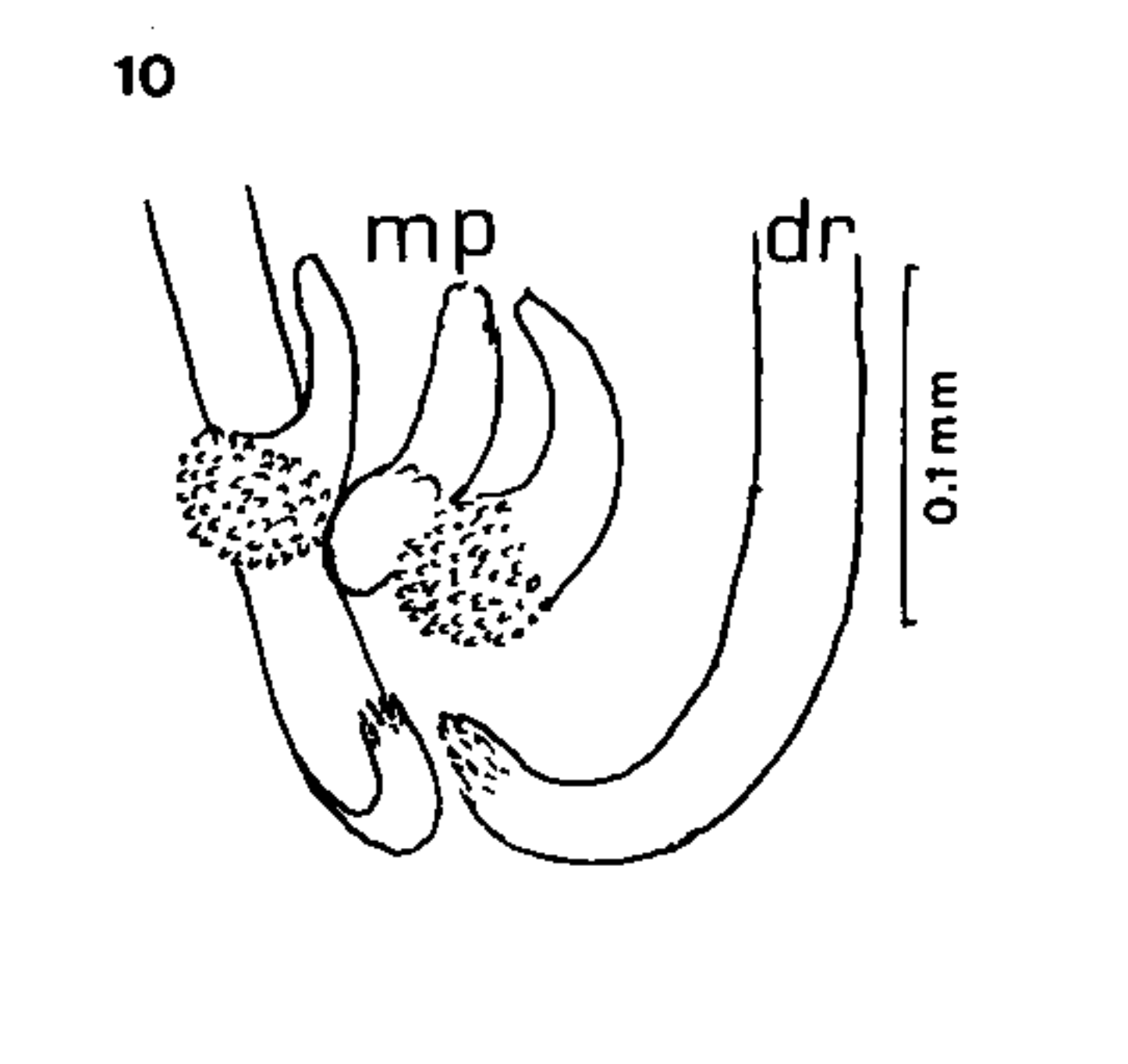
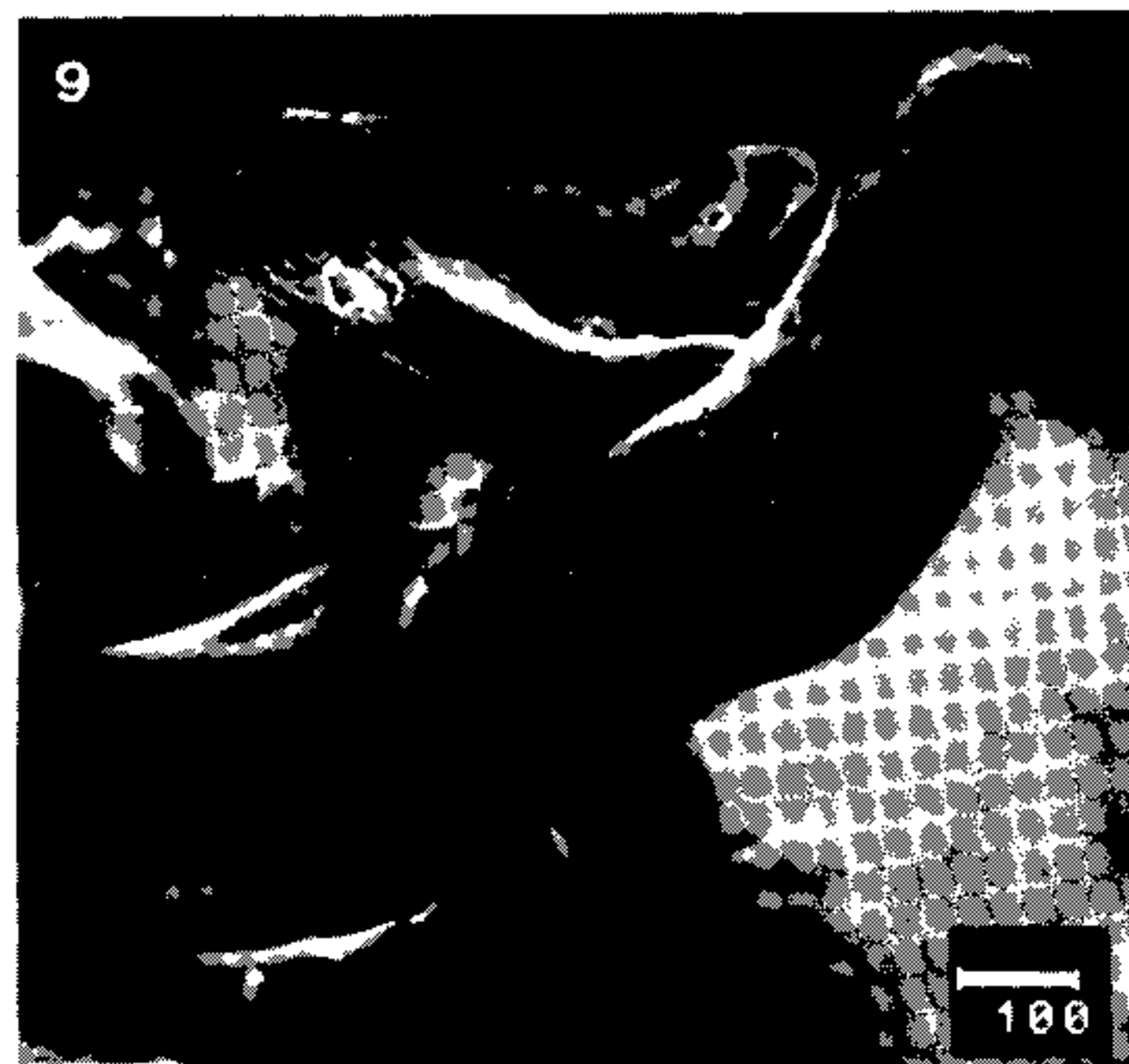
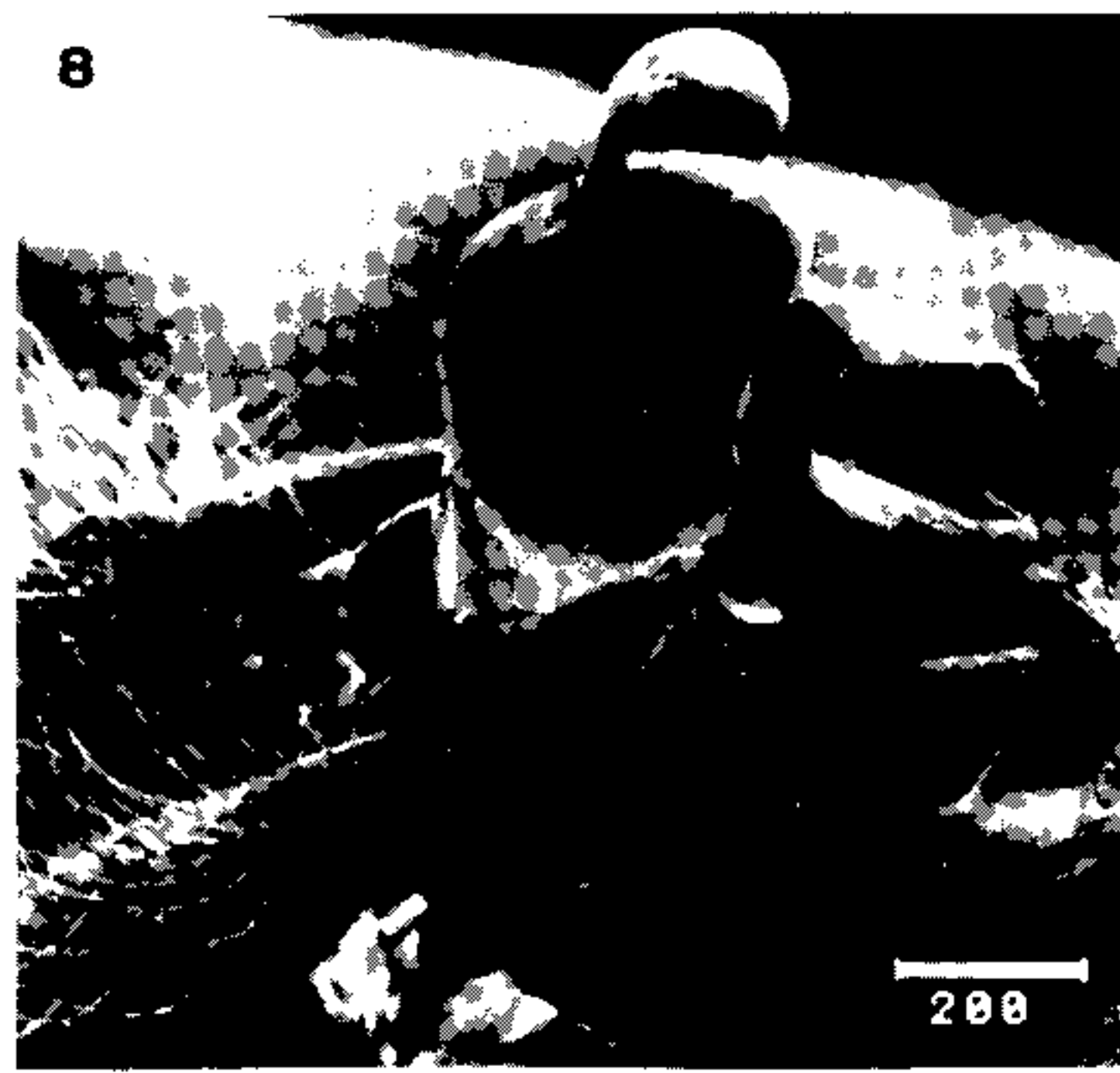
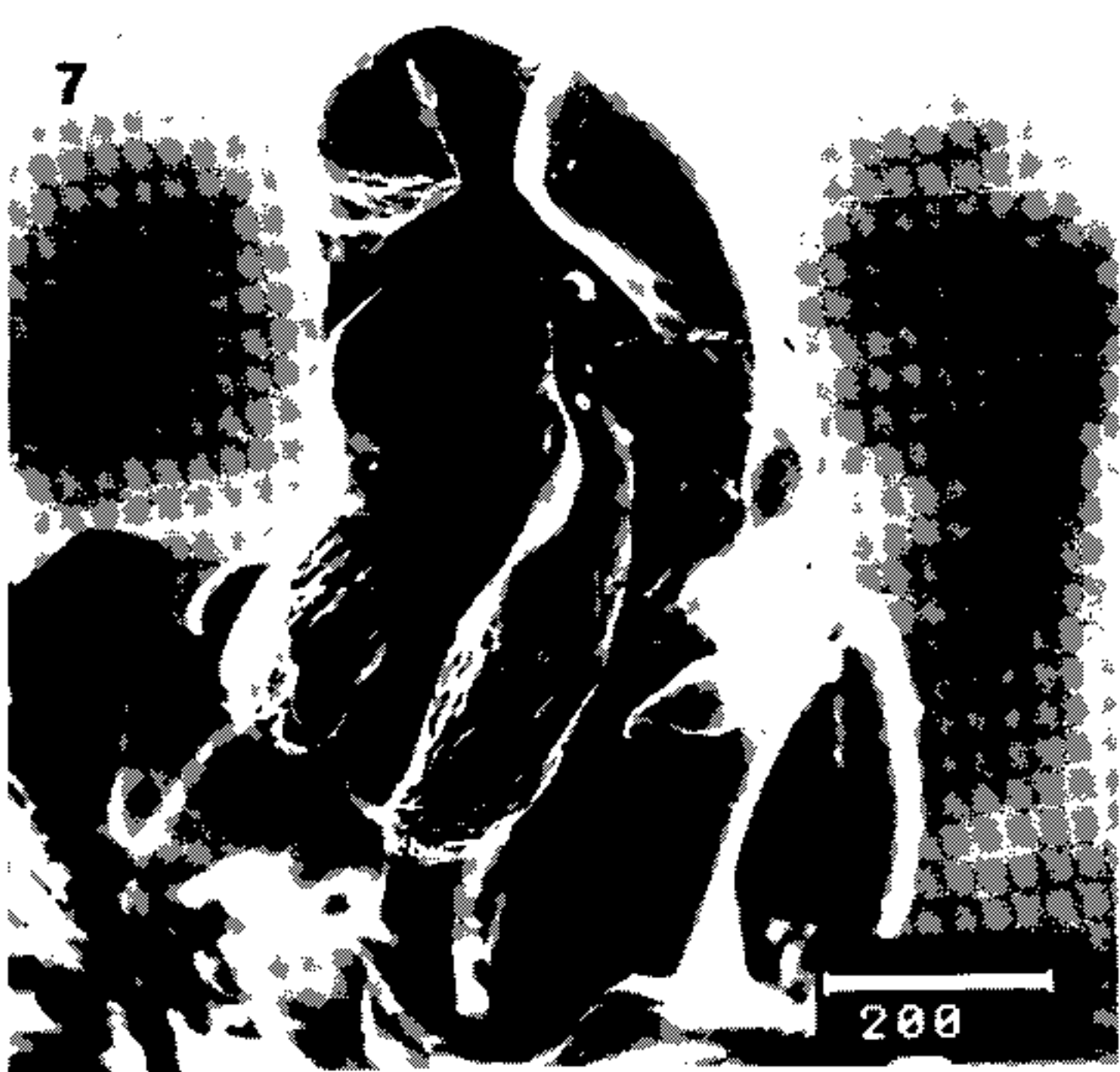
The most characteristic feature of this species is the swelling on both sides of the penis, at the level of the lateral plates (Figs 1-4). In the other species studied herein, there are only rounded region in this position (Fig. 8). The apical plate is united to the paraphallus and has a broadly furrowed apex, readily seen in Figs 1-4. The lateral plates are more slender than those of the other species examined and bear two basal apophyses, the proximal articulating with the paraphallus and distal apophysis being free and used, in copulation, to draw the vaginal wall so as to connect the signum to the glans. The ventralia is small, hardly visible in Fig. 3. Palpi genitalium bear long hairs the base almost to the tip; there hairs are visible in all of Figs

1-4. In the other species studied, the hairs of the palpi genitalium are limited to the base.

Ravinia belforti (Prado & Fonseca, 1932)
(Figs 5-10)

Euravinia belforti Prado & Fonseca, 1932: 39, fig. 7. Type locality: Brazil, São Paulo. Distribution: Colombia (Bogota, Villavicencio), Trinidad, Brazil (Mato Grosso, Goias, Minas Gerais, Rio de Janeiro, São Paulo, Paraná), Argentina (Misiones).

Euravinia sueta Wulp of Branchard, 1942: 164, fig. 14a-d.



SEM photographs of the male genitalia of *Ravinia belforti* (Fonseca & Prado) – Fig. 5: cerci and penis, dorsal view. Fig. 6: penis, apical view. Fig. 7: penis and phallic forcipes, apical view Fig. 8: penis and phallic forciepes, oblique view. Fig. 9: penis and phallic forcipes, lateral view. – Bar = μm . Fig. 10: glans (drawn with camera lucida).

Cerci and surstyli with long hairs, the apices of the cerci pointed and bare (Figs 5 and 8). Penis rounded dorsally, at the level of the lateral plates and, dorsally, with a small apical crest (Fig. 8). The lateral plate is clearly visible in Fig. 6. It is somewhat thick with a slender, free, apical apophysis which serves to draw the vaginal wall into contact with the glans. Fig. 9 shows that this apophysis has two internal concavities and part of the glans is visible between the lateral plates. The palpi genitalia, visible in Figs 7-9, have curved and flattened tips and hairs (not shown in the photographs) limited to the base. The characteristic glans consists of a pair of slender sticks (the dorsal rods of Roback, 1954), reaching the ventralia anteriorly and, near the median process, the tip bearing small spines (Fig. 10, dr). The median process (Fig. 10, mp) is composed of paired rounded rods with lateral spines and an intermediate bare structure.

Ravinia aurigena (Townsend, 1912)
(Figs 11-16)

Sarcophaga aurigena Townsend, 1912: 357. Type locality: Peru, Piura. Distribution: Ecuador, Peru, Chile. Hall, 1928: 334, 344 and fig. 12.

Trixosarcophaga aurigena Townsend, 1917: 191.

Ravinia aurigena Roback, 1954: 74, figs 233 and 234. Lopes, 1968: 51, figs 1 and 2 (holotype female examined). Lopes & Tibana, 1982: 136 (Chile, Arica).

The material identified by Hall (1928) as *aurigena* was collected in Panama and, most probably, is not conspecific with Townsend's material. Roback (1954) did not mention the provenience of the material studied but the holotype female examined by Lopes (1968) cannot be distinguished from specimens collected in Ecuador, Peru and northern Chile (Arica).

The appearance of the penis is very similar to that of *R. belforti* but the apex is slightly different and the lateral plates are more slender. The most notable difference between *aurigena* and *belforti* concerns the appearance of the glans. In *aurigena*, the dorsal rods are not strongly curved and the tips bear only a few,

very small, spines. The lateral pieces of the median process are almost triangular in shape and the intermediate structure bears a pair of curved lateral rods (Fig. 16).

The two species also differ in the appearance of the abdomen, with a slightly uniform yellowish silver pollinosity in *aurigena* but with a more intense brownish yellow pollinosity in *belforti*.

Chaetoravinia advena (Walker, 1852)
(Figs 17-19)

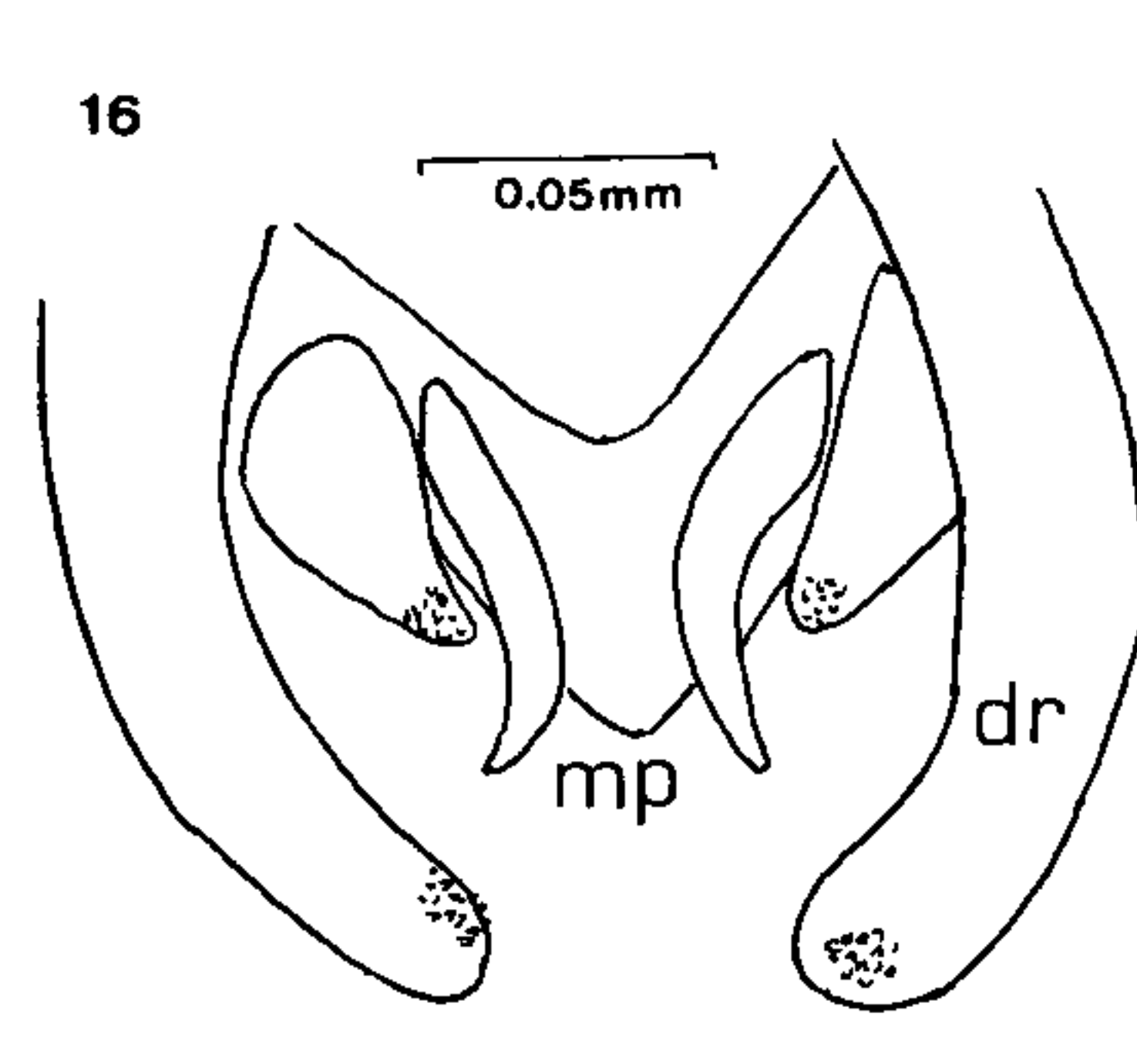
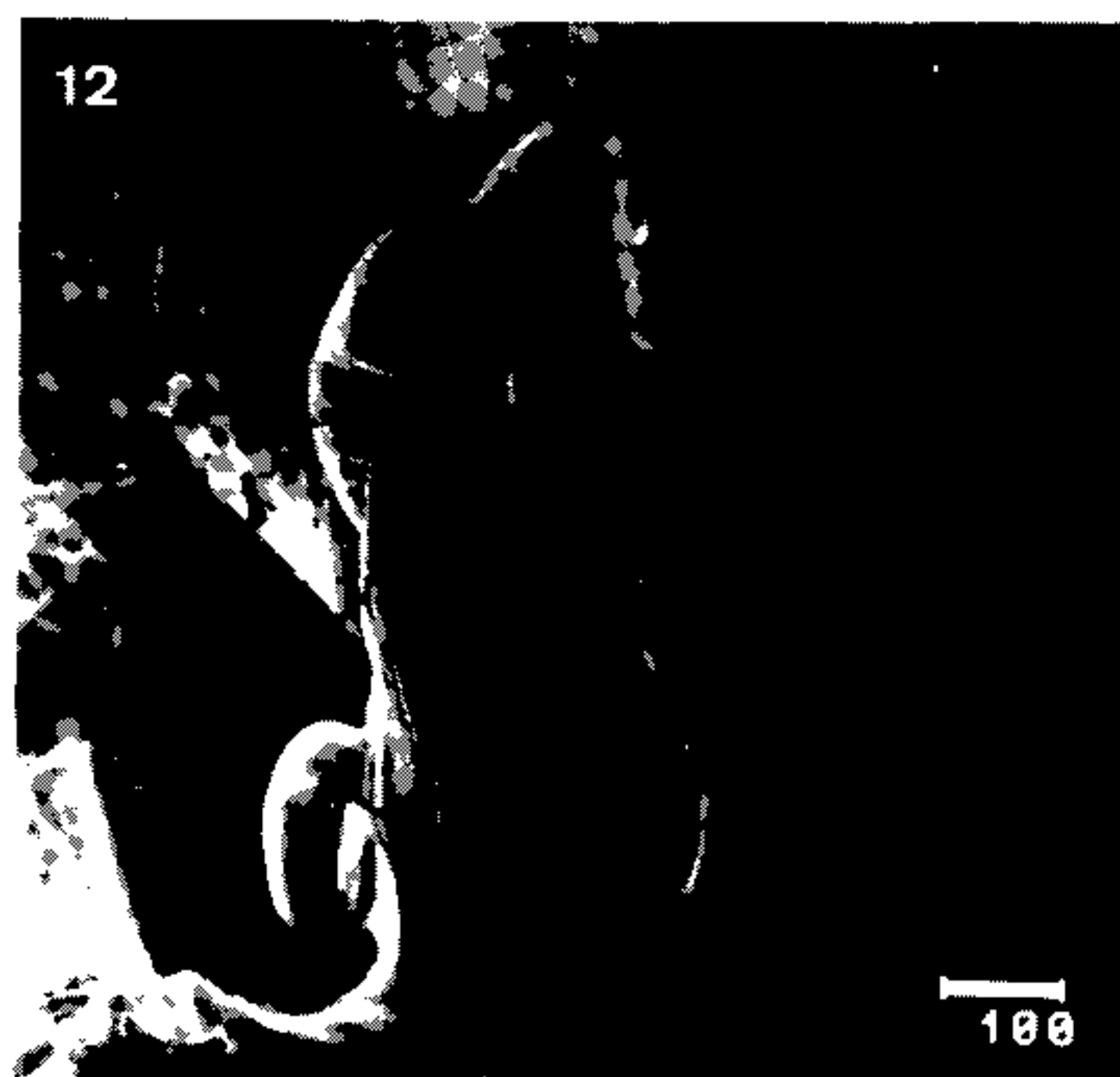
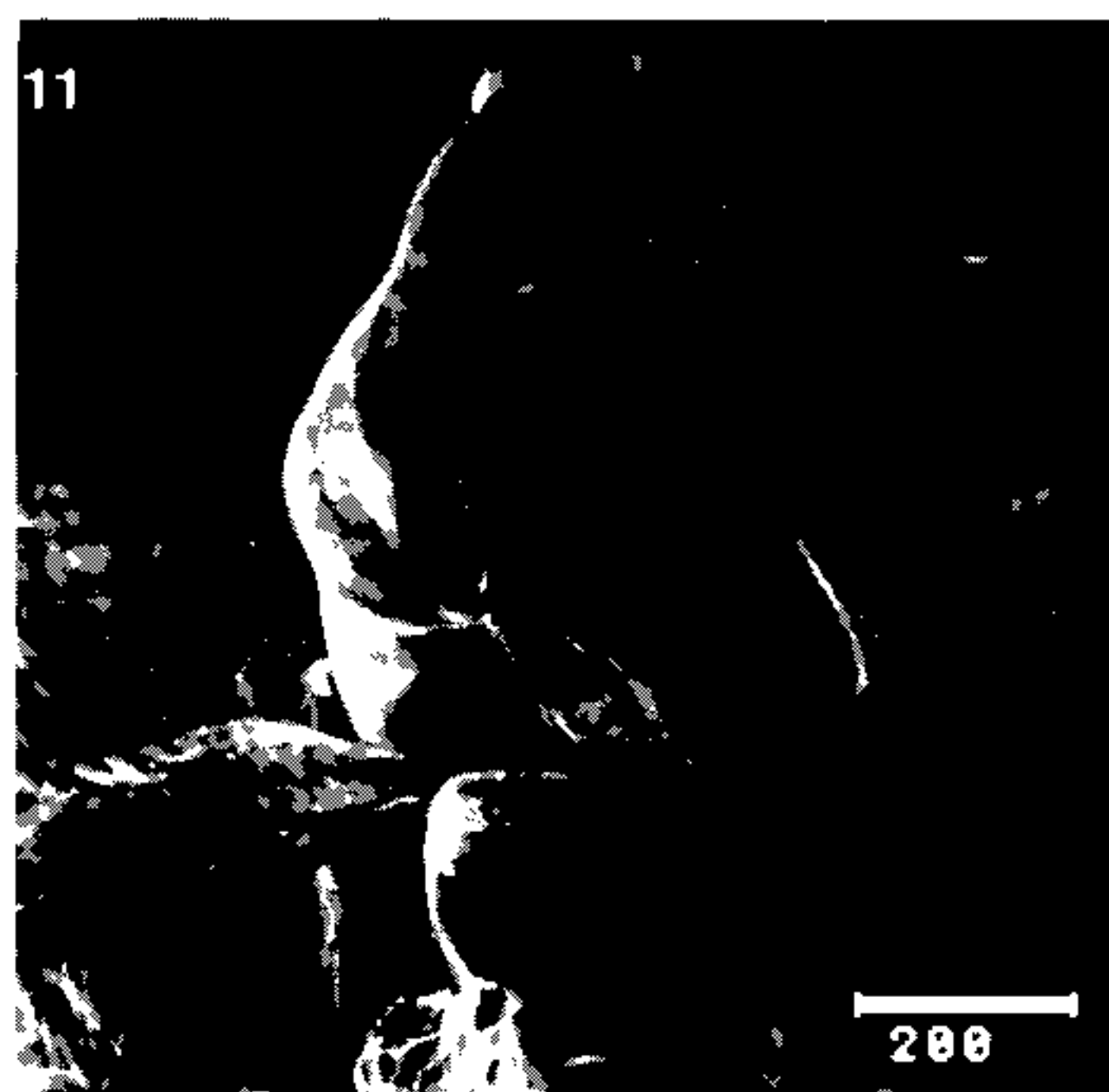
Sarcophaga advena Walker, 1852: 324. Type locality: "Brazil". Distribution: Bolivia (Chaco), Brazil (Mato Grosso, Minas Gerais, Bahia, Espírito Santo, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), Argentina (Misiones). Lopes, 1976: 629 and figs 1-3 (male holotype examined).

Sarcophaga contermina Walker, 1852: 327. Type locality: "Brazil". Lopes, 1976: 629 (female holotype examined).

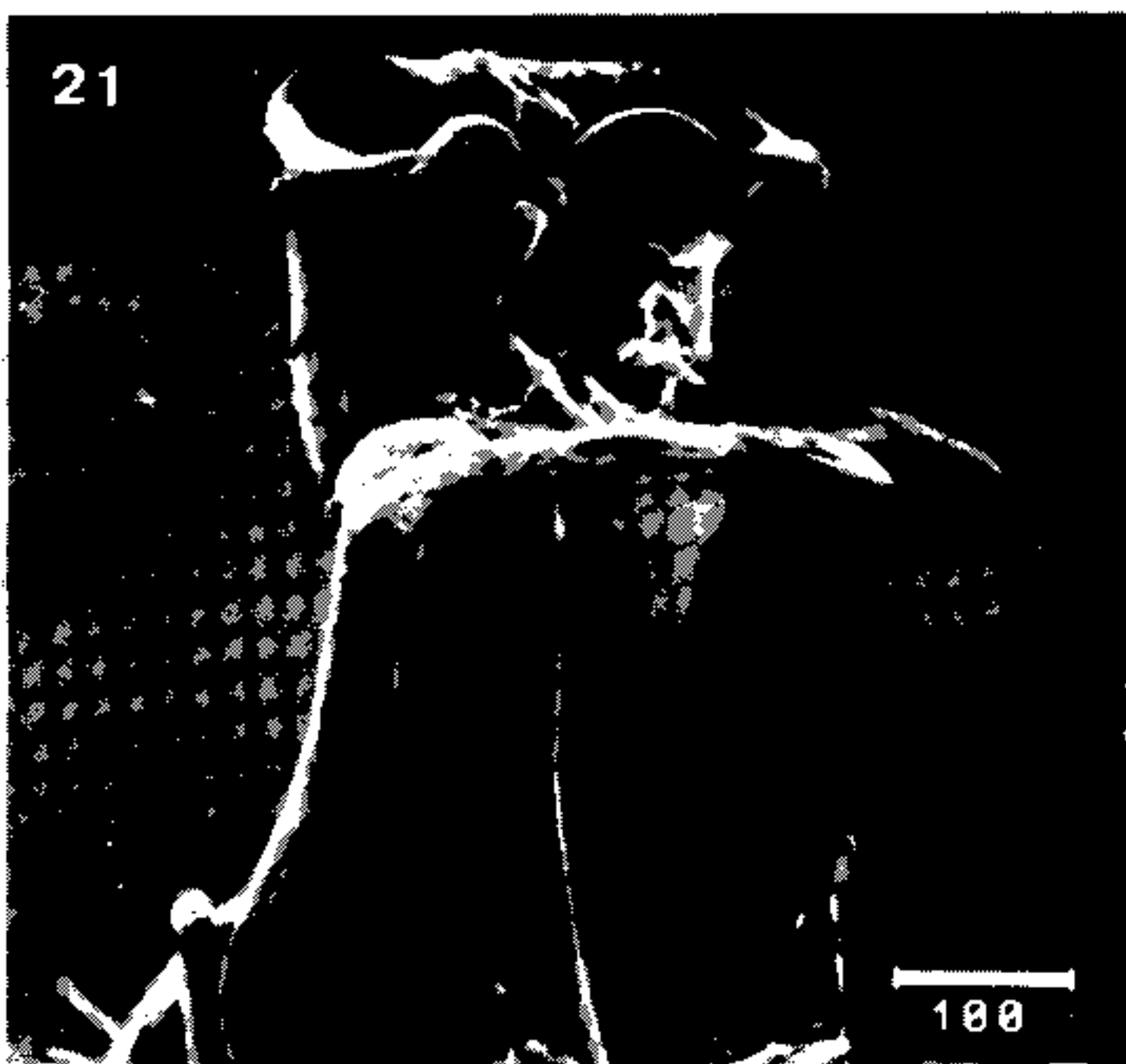
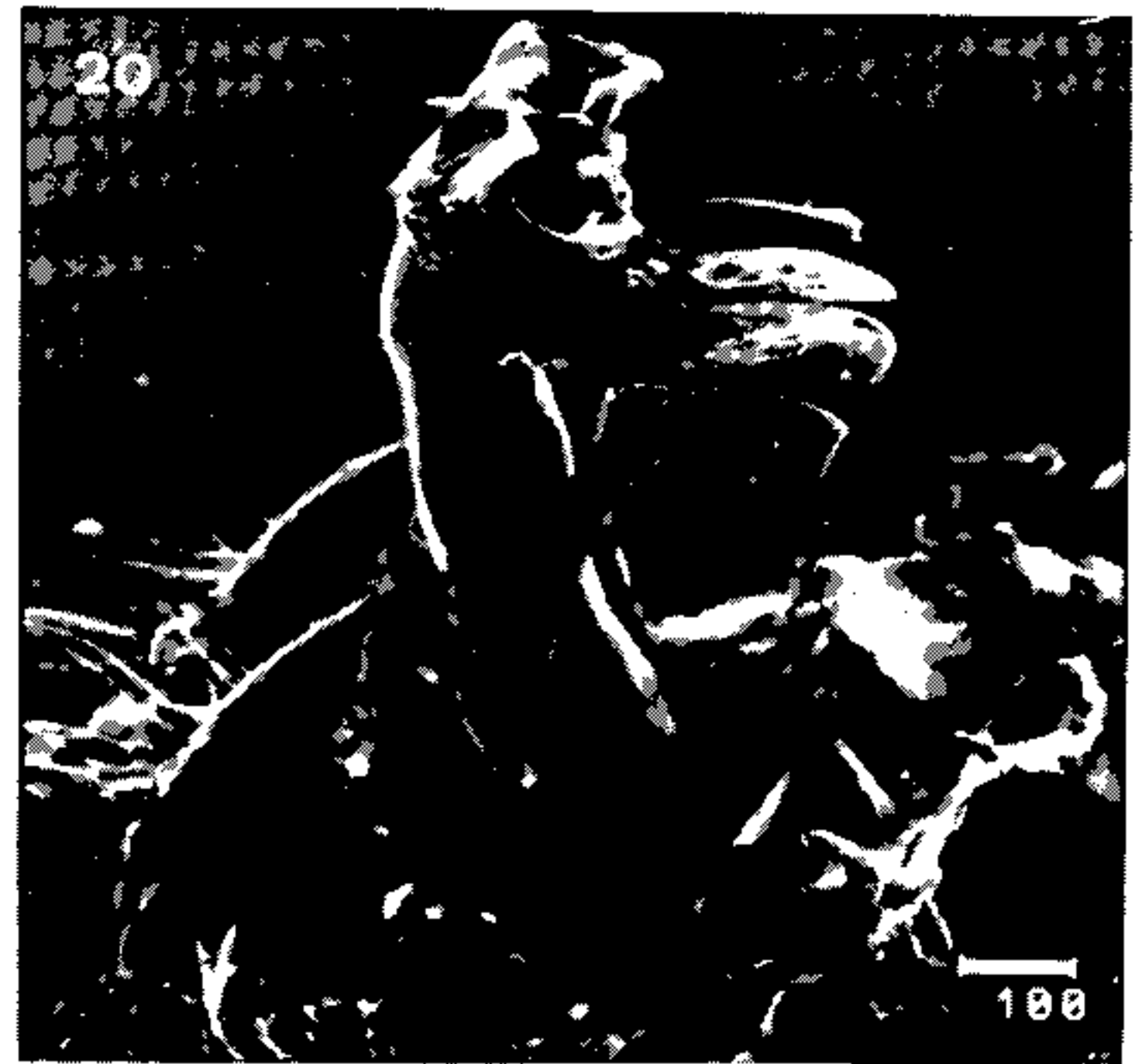
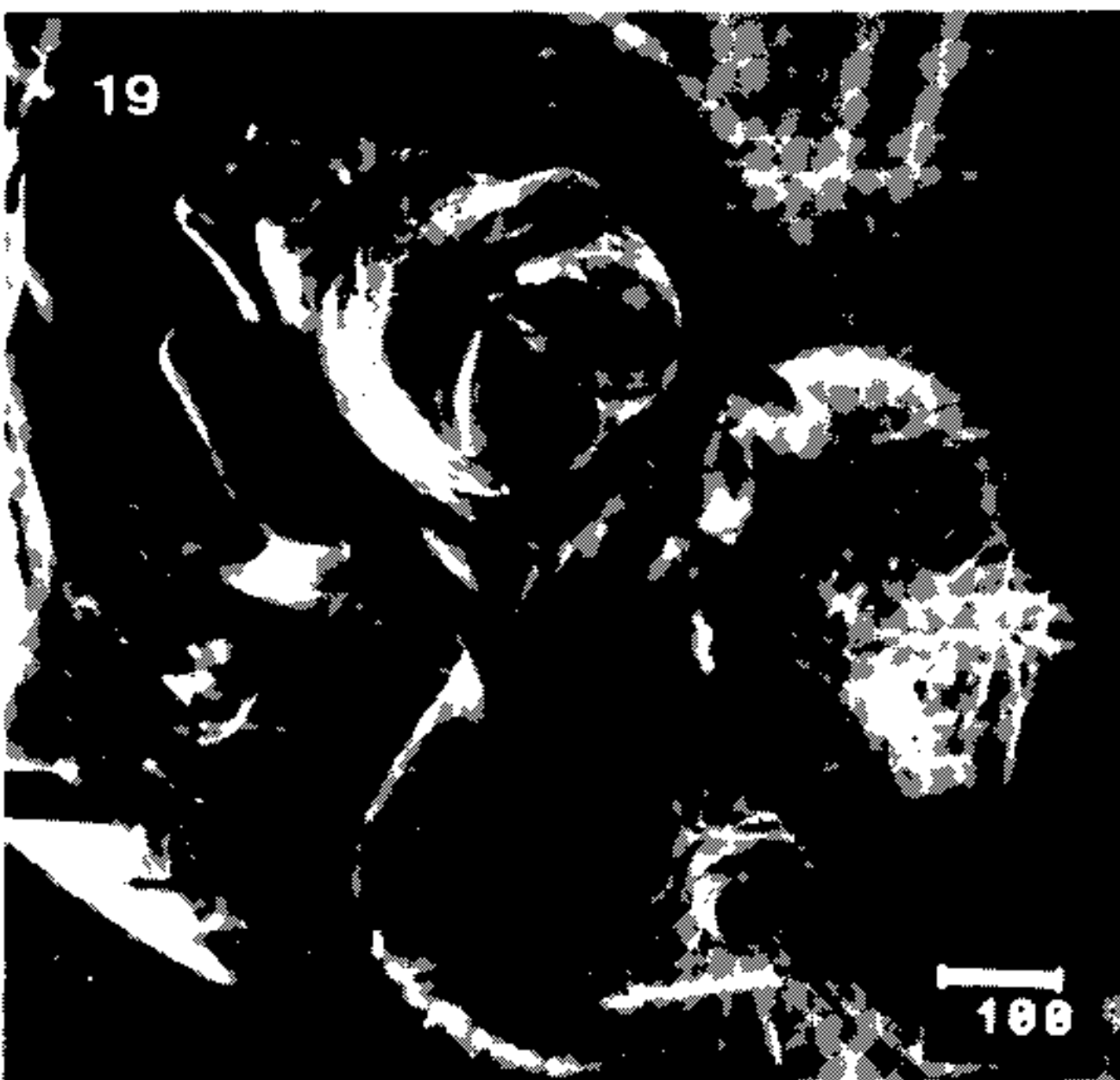
Catasarcophaga trivittata Townsend, 1927: 220 and 295. Type locality: Brazil, São Paulo. Lopes, 1932: 46 Plate 3, figs 1-5 (paratype examined).

Sarcophaga (Chaetoravinia) townsendi Engel, 1931: 149, fig. 18. Type locality: Bolivia (Chaco).

This species, with *C. errabunda* (Wulp), *C. postnoda* Dodge, *C. dampfi* Lopes and *C. almeidai* Lopes, belongs to a group characterized by a greatly developed apical plate of the paraphallus. This feature, shown in Fig. 18, is composed of a pair of conspicuous rounded anterior lobes; the posterior part of the apical plates bearing a median lobe, with the anterior parts almost touching one another; the median process (shown in Fig. 19); the lateral plates inserted near the ventralia (and clearly visible in Fig. 18), with the extremities almost touching. Anteriorly, the ventralia is bilobed and concave with granulated dorsal margins (Fig. 18). The palpi genitalia is curved with flattened apices (Fig. 17). The cerci are the most characteristic feature of the male genitalia, showing a large base and two points on each cercus (Fig. 17).



SEM photographs of male genitalia of *Ravinia aurigena* (Townsend) – Fig. 11: cerci and penis, oblique view. Fig. 12: penis, apical view. Fig. 13: penis, dorsal view. Fig. 14: penis, anterior view. Fig. 15: penis, lateral view. – Bar = μm . Fig. 16: glans (drawn with camera lucida).



SEM photographs of male genitalia of *Chaetoravinia advena* (Walker) (Figs 17-19) and *C. effrenata* (Walker) (Figs 20-22) – Fig. 17: cerci and penis, anterior view. Fig. 18: apex of the penis, anterior view. Fig. 19: penis and cerci, apical view. Fig. 20: cerci and penis, lateral view. Fig. 21: penis and phallic forcipes, oblique view. Fig. 22: penis and palpi genitalium, apical view. – Bar = μm .

Chaetoravinia effrenata (Walker, 1861)
(Figs 20-22)

Sarcophaga effrenata Walker, 1861: 309. Type locality: "Mexico". Distribution: U. S. A., Mexico, Colombia, Jamaica, Dominican Republic, Cuba, Brazil (Roraima). Aldrich, 1930: 20-30 (type examined). Roback, 1954: figs 227-229. Rohdendorf, 1970: 97, fig. 16a, b. Lopes, 1975: 475.

Sarcophaga xanthopyga Wulp, 1895: 272. Type locality: "Mexico".

Sarcophaga conjungens Wulp, 1895: 272. Type locality: "Mexico".

Sarcophaga adamsi Hall, 1928: 345, fig. 17. Type locality: "Jamaica". Dodge, 1956: 186, fig. 18 (female).

This species, like others of the genus, has a tubular median process (visible in Fig. 21) and styli, sometimes with spinous apices are represented by "dorsal rods". The complex apical plate, enterely united to the paraphallus, has a pair of long, curved distal apophyses and a pair of short apophyses directed towards the apex. The appearance of the apical plate is clearly shown in Figs 20-22. A pair of reduced, pointed lateral plates is visible in Fig. 22 and occupy the base of the broad, bilobed ventralia. The palpi genitalium is elongate (Fig. 21) with curved, broad apices (Fig. 22).

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