

**Redescriptions of six Therevidae from
the Americas, described by J. C. Fabricius
and L. Bellardi. (Diptera).**

By

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Some recent investigations in old European type-collections forming part of a planned revision of the Palaearctic and Ethiopian Therevidae have given me an opportunity to fix the identity of some species from the Americas, described partly by J. C. Fabricius in 1805, partly by L. Bellardi in 1861. The type-material of the two Fabrician species is in the Zoological Museum of Copenhagen. The type-material of four of the five species of Therevidae described by Bellardi was located in the Torino Museum, from where it was kindly lent me for study by Prof. U. Parenti, assistant director of the museum. The type of the fifth of Bellardi's species: *Psilocephala univittata*, which was not represented in the Bellardi collection of the Torino Museum, was located in the Bigot collection of the British Museum (Nat. Hist.). This has not been treated.

The present paper must be seen also as a step towards a more sound classification of the members of the family Therevidae. The detailed descriptions of the male terminalia follow the outlines given in an earlier paper (Lyneborg, 1968a), in which the apparently comparatively generalized male terminalia of *Thereva* Latr., *Psilocephala* Zett., and *Dialineura* Rond. were described, the descriptions being based on the respective type-species only. It is evident that none of the six species redescribed in the following can be assigned to the genera *Thereva* and *Psilocephala* as was done by the earliest authors. It is therefore not possible to give a relevant binomen to any of the species, with the exception of "*Psilocephala*" *sumichrasti* Bell. which has recently (Cole, 1960)

been placed in the genus *Furcifera* Kröber, 1911 (syn. *Epomyia* Cole, 1923). This is probably a correct assignment, but the species was evidently misinterpreted by Cole.

The following redescriptions also contain a number of measurements. These are all exact, 100 units being equal to 1 mm. The length of the wing was measured from humeral cross-vein to the wing-tip.

1. **senilis** Fabricius.

Biblio senilis Fabricius, 1805, Syst. ant.: 68, 10.

a. Type-material.

There are two specimens, a male and a female, in Fabricius' Copenhagen collection. They are apparently conspecific. The female is labelled "B.senilis /a Am.mer. Schmidt"; the male bears no labels. Both specimens are cleft by an enormous pin, but otherwise they are in a rather good condition, though the male has lost its right third antennal joint and right p_1 . In the Kiel collection is a strongly damaged specimen labelled "senilis". This is a male and conspecific with the male in the Copenhagen collection. It is obvious from Fabricius' description that he has only seen the male. I therefore designate the male in the Copenhagen collection (originating from the Sehestedt & Tønder-Lund coll.) as the lectotype of *Biblio senilis* F., 1805, and the specimen has been labelled accordingly.

Regarding the type-locality: "America meridionali, Dom. Schmidt" the following information can be given. This statement of origin is very often found in Fabricius' books from 1792 and onwards, and refers most probably to the German-Danish surgeon J. C. Schmidt (ca. 1728—1807) who spent some years on St. Croix in the West Indies in the last decades of the 17th century (Henriksen, 1921—37: 127). He brought home a collection which became a part of the extensive Sehestedt & Tønder-Lund collection and was treated by Fabricius in the following years. It is evident that "Am.mer." is not St. Croix or any of the other small islands then under Danish administration (see also p. 395). Schmidt (or Smidt as Fabricius spelled the name) must have had sources which have provided him with South American material. Fairchild (1966: 17) has clearly demonstrated that nearly all the Fabrician species of Tabanidae from "America meridionali" have since been taken in Surinam or the Guianas. Therefore, the type-locality of *senilis* may probably be in the same area.

b. Redescription of male lectotype. (Figs. 1—8).

Length. Total: 6.9 mm.

Head. Length 90, height 130, width 150. Eye: length 70, height 125. Gena 5, frontal protuberance 5, occipital protuberance 15. Antennal insertion 90:40. Antennae: first joint 16:10, second joint 8:10, third joint 30:11. Style 13, two-jointed with short spine apically. Proboscis reaches to level of antennal base. Palpi about half as long as proboscis, mainly with dark hairs. Eyes practically touching for a short distance, then rapidly separating, facial margins nearly parallel. Head covered with whitish dust, central parts of occiput more greyish. Frons and face bare. Occiput with whitish pubescence which is especially long on lower part. About 10 postocular setae on each side, and more ventrally about 3 additional setae. First, second and base of third antennal joint yellowish; first joint with whitish dust also. Rest of third joint brownish-black. First joint with a black seta dorsally and ventrally near tip, moreover short, black hairs.

Thorax. Mesonotum: length 200, width 130. 3 n, 2 sa, 1 pa setae. No dc setae can be seen because of the enormous pin. Also pattern of mesonotum is difficult to describe because of this pin. It is predominantly whitish-grey with three darker bands. Pubescence short and sparse, composed of both blackish and whitish hairs. Scutellum: length 50, width 90. Its colour whitish-grey, pubescence whitish, 2 setae. Pleura whitish-grey with whitish pubescence.

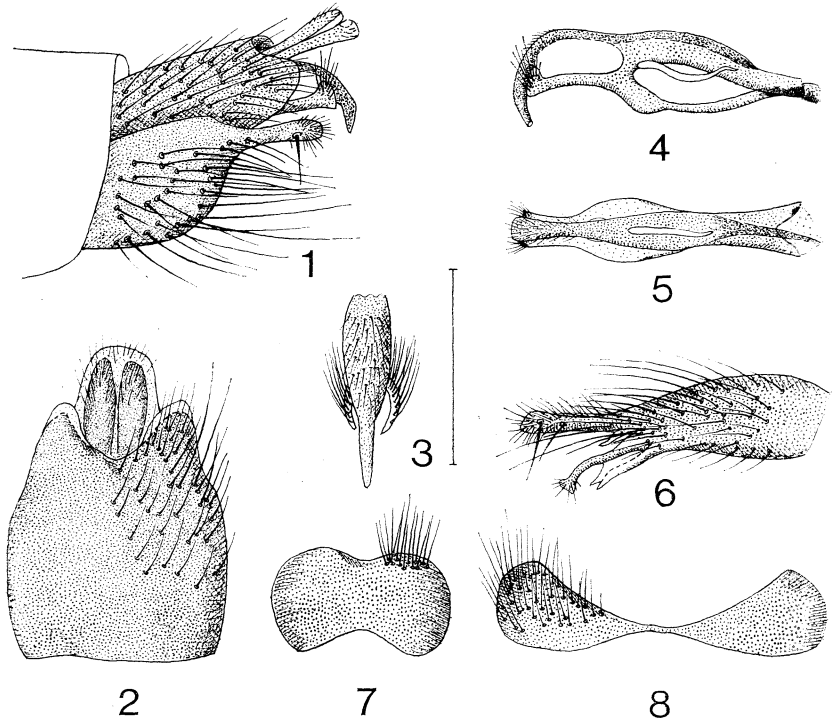
Wing. Length 550, width 225. Basal vein of discal cell oblique. Cell M_3 broadly open. Vein r_4 S-curved but remarkably straight in basal half. Index of cell R_4 210:65. Vein r_1 without hairs on dorsal surface. Ground colour hyaline with greyish tinge. Stigma not distinct. Veins brownish. Halteres light brownish.

Legs. f_1 and f_2 without av setae, on f_1 a single short pv seta near middle. f_3 with 2 short av setae, one at middle, and one near tip; a few much shorter pv setae in apical half. t_1 with 2—3 ad, pd, and pv setae, most of which are shorter than width of t_1 . Only one ad and one pd setae are about as long as width of t_1 . Length of t_1 175, width 13. t_2 and t_3 with rows of ad, pd, av and pv setae of which the pv setae are short and few. — Coxae whitish-grey. Femora, tibiae and tarsi of a uniformly brownish coloration without darkened tips. All femora with whitish scaly hairs dorsally, which become blackish towards tips. f_1 ventrally with erect whitish

hairs; blackish hairs are intermixed on posterior part and near tip of anterior part. f_2 and f_3 ventrally with blackish and brownish hairs some of which may be scaly. Tarsi dark brownish. Claws and pulvilli normal.

Abdomen. Length 400, width 115. All tergites silvery-white with whitish pubescence, hindmarginal hems not distinct. All sternites brownish with slightly dust and broad yellowish-white hindmarginal hems on sternites 2—5. Sternites 1—3 with whitish hairs, the following with blackish hairs.

Terminalia. Epandrium and gonocoxites dark brownish with blackish hairs. Epandrium (Fig. 2) about as long as broad, anterior margin straight, posterior margin with a moderately deep incision. Gonocoxite with a long, dorsal, distal process which



Figs. 1—8. Male terminalia of lectotype of "*Bibio*" *senilis* F. — 1. Terminalia in lateral view. 2. Epandrium, cerci and paraprocts in dorsal view. 3. Phallus in caudal view. 4. Aedeagus in lateral view. 5. Aedeagus in dorsal view. 6. Right gonocoxite and its appendages in ventral view. 7. Sternite 8. 8. Tergite 8. Scale: 1 mm for Fig. 3, 0.5 mm for other figures.

overhangs posterior margin of epandrium. Also tip of phallus and the aedeagal processes project beyond level of epandrium (Fig. 1). Gonapophysis without a free end, indicated only as a narrow rod. The stylus (Fig. 6) is comparatively short and narrow, its tip slightly bifurcate (seen in another view). Between stylus and the distal process of the gonocoxite is an additional structure similar to the stylus, but much shorter. The ventral lobe is a broad, weakly sclerotized plate. Cerci and paraprocts of nearly same length, both overhang posterior margin of epandrium. Cerci divided, paraprocts fused. Aedeagus free. The phallus in lateral view (Fig. 4) has a very long and narrow proximal part which is parallel to the longitudinal axis of the aedeagus. Then it suddenly curves for about 60° to the longitudinal axis and the distal part is again curved for about 60° . Seen dorsally (Fig. 5) the phallus is narrow in its proximal part and slightly wider before curving down. It is distinctly set with microtrichia. In caudal view (Fig. 3) the phallus gradually narrows. The dorsal apodeme in lateral view (Fig. 4) is slightly downcurved, seen dorsally (Fig. 5) gradually widening distally. The ventral apodeme in lateral view (Fig. 4) converges towards the dorsal apodeme and is slightly longer than this apodeme; in dorsal view (Fig. 5) it gradually narrows towards the distal end. From the base of the ventral apodeme two long processes reach the distal part of the phallus. These processes bear a dorsal group of hairs in their distal end. The ejaculatory apodeme is very short and rudimentary.

c. Description of the female.

Length. Total: 6.0 mm.

Head. Length 80, height 105, width 135. Eye: length 60, height 100. Gena 5, frontal protuberance 5, occipital protuberance 15. Antennal insertion 70:35. Width of frons at level of upper ocelli 20, and at level of antennae 50. Antennae: first joint 15:9, second joint 8:10, third joint 29:11. Style 12. Frons whitish-grey dusted, in upper half with short, blackish hairs. Also rest of head whitish-grey dusted. Face bare. Occiput with whitish pubescence below, about 8 postocular setae and about 3 setae more ventrally. Other characters as in male.

Thorax. Mesonotum: length 150, width 125. 2-3 n, 2 sa, 1 pa setae. dc setae not present. Mesonotum whitish-grey with three dark brownish bands. Other characters as in male.

Wing. Length 460, width 160. Index of cell R_4 210: 65. Otherwise as described for male.

Legs. f_1 and f_2 without av setae, but with a single short pv seta. f_3 with 3—4 short av setae in apical half, and some still shorter pv setae. Chaetotaxy of tibia as in male. Length of t_1 150, width 12. — Coxae whitish-grey. Femora, tibiae and tarsi of a uniformly brownish coloration without darkened tips. All femora dorsally with whitish scaly hairs which become blackish towards tips; ventrally mostly blackish hairs. Claws and pulvilli normal.

Abdomen. Length 375, width 110. Tergites mostly brownish-black with rather distinct hindmarginal hems on tergites 2 and 3, and with silvery-white areas as follows: narrow lateral spots following hind margins of tergites 1—3, and lateral parts of tergites 5 and 6 leaving only a narrow middle band brownish and undusted. Pubescence pale only on lateral parts of tergite 1 and on the silvery-white spots of tergites 2 and 3; otherwise blackish. Sternites brownish with pale hairs on sternites 1—3, blackish on sternites 4—7. Terminal spines of ovipositor long and narrow.

d. Systematical position.

Bibio senilis F., 1805, is a primary homonym of *Bibio senilis* Panzer (1798: 22). Panzer's species is an empidid of the genus *Hilara*. The Fabrician *Bibio senilis* then requires a new specific name. Both Kröber (1912: 245) and Cole (1923: 72, 1965: 351) placed their *senilis* Fabr. in the genus *Psilocephala* Zett. This is evidently wrong, as will appear from a comparison of the description above of the male terminalia of the lectotype of *senilis* with the description of the male terminalia of the type-species of *Psilocephala: imberbis* Fallén, 1814 (cf. Lyneborg, 1968a). Consequently, the *Bibio senilis* F. requires a complete new binomen. This will not be created here.

Kröber (1912: 245) records his *Psilocephala senilis* F. on the basis of a female specimen from Georgia and a male specimen from Brazil. If this female specimen is conspecific with a pair from Florida (Archbold Biol. Sta.) recently sent me as *Ps.? senilis* F. by Prof. Maurice T. James, then it is not the Fabrician species, though a very nearly related species which is apparently undescribed.

Only a few suggestions concerning a possible affinity to other Therevidae shall be expressed here. At the moment it is only pos-

sible to term a few characters in the male terminalia as definitely apomorphic. The peculiar aedeagal processes arising from the base of the ventral apodeme do not belong to the basic type of the aedeagus in Therevidae. Similar processes have so far only been seen in the Palaearctic species *Thereva annulata* F. and in *Thereva vialis* Osten-Sacken and a few other species occurring in the western part of North America. This group of species is certainly of monophyletic origin and may in the future be treated as a separate genus. It does not seem that *senilis* is closely related to this group of species, as it is more advanced in other respects. Among these, first of all the loss of a free end of the gonapophysis must be mentioned (cf. Lyneborg, 1968a). Also the presence of an additional small structure close to the stylus must be noted.

2. **abdominalis** Fabricius.

Bibio abdominalis Fabricius, 1805, Syst. ant.: 68, 12.

a. Type-material.

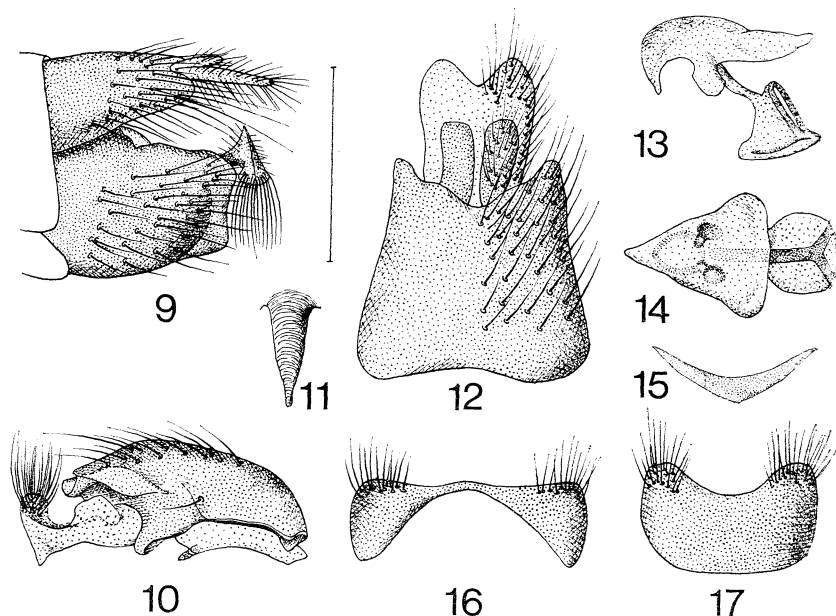
There are two male specimens in the Fabrician Copenhagen collection (originating from the Sehestedt and Tønder-Lund coll.). The specimens are conspecific. The first specimen is labelled "B. abdominalis /a Am. Ins. Schmidt". It is in a rather good condition, though cleft by a thick pin. The left third antennal joint and left p_3 are missing. The second specimen bears no labels and is in less good condition, as it lacks the left antenna, right p_1 and p_3 , and left p_1 and p_2 . In the Kiel collection is a third specimen labelled "abdominalis". It is conspecific with the two other specimens, and has lost the head, both p_1 , and right p_2 . All specimens agree well with the original description. The labelled specimen from the Copenhagen collection is hereby designated as the lectotype of *Bibio abdominalis* F., 1805, and has been so labelled. It is re-described below.

Regarding the location of the type-locality there is a disagreement between the original label and the statement in Fabricius' description. According to the information given on p. 390, "Am. Ins. Dom. Schmidt" certainly refers to St. Croix or another island in the West Indies. Therefore, records of *abdominalis* F. (as a *Thereva* or *Psilocephala*) by later authors (e.g., Wiedemann, 1821: 113, 1828: 236) from South America (Brazil) certainly refer to other species.

b. Redescription of male lectotype. (Figs. 9—17).

Length. Total: 6.5 mm.

Head. Length 85, height 110, width 160. Eye: length 55, height 105. Gena 5, frontal protuberance 5, occipital protuberance 30. Antennal insertion 85:25. Antennae: first joint 24:16, second joint 8:12, third joint 27:15. Style 10, one-jointed (?) with short apical spine. Proboscis reaches to level of second antennal joint. Palpi little more than half as long as proboscis; with few pale hairs. Eyes clearly touching for a distance which equals more than height of ocellar tubercle, then rapidly separating. Frons with greyish-brown dust, and some long blackish hairs. Face bare. Gena with a small group of short blackish hairs. Occiput with whitish dust and with whitish pubescence; about 12 short postocular setae and further 10 setae below these. First and second antennal joints covered with greyish-brown dust; first joint with several black setae dorsally and ventrally. Third joint yellowish near base



Figs. 9—17. Male terminalia of lectotype of "*Bibio*" *abdominalis* F. — 9. Terminalia in lateral view. 10. Right gonocoxite and its appendages in ventral view. 11. Phallus in caudal view. 12. Epandrium, cerci and paraprocts in dorsal view. 13. Aedeagus in lateral view. 14. Aedeagus in dorsal view. 15. Hypandrium in ventral view. 16. Tergite 8. 17. Sternite 8. Scale: 1 mm for Fig. 11, 0.5 mm for other figures.

blackish around middle and more brownish in the apical half, which is much narrower than the basal half.

Thorax. Mesonotum: length 180, width 150. 3n, 2 sa, 1 pa setae. 2 pairs of dc setae. Mesonotum of a dull greyish-brown colour with only indistinct darker bands. Pubescence very sparse. Scutellum: length 40, width 90, coloured as mesonotum, 4 setae. Pleura greyish with sparse whitish pubescence.

Wing. Length 370, width 160. Basal vein of discal cell oblique. Cell M_3 closed. Vein r_4 S-curved. Index of cell R_4 120:65. Vein r_1 without hairs on dorsal surface. Ground colour hyaline with greyish-brown tinge. Stigma and veins dark brownish. Halteres yellowish.

Legs. f_1 with 1—2 av setae. f_2 without av setae. f_3 with 3—4 av setae in apical half. t_1 with few but strong ad and pv setae, and few much shorter pd setae. The strongest of the ad setae twice as long as width of t_1 . Length of t_1 125, width 10. t_2 with 2 strong ad and 1 (-2) strong av setae which are longer than width of t_2 . Moreover, 5—6 pd and about 3 pv setae the length of which approximately equally the width of t_2 , t_3 with rows of ad, pd and av setae; pv setae absent or at most 1—2 short hairlike setae. — Coxae greyish. Femora greyish with whitish scaly hairs dorsally and normal whitish hairs ventrally. Tibiae and tarsi yellowish-brown with slightly darkened tips. Claws and pulvilli normal.

Abdomen. Length 300—350, width 140—150. All tergites are covered by silvery-white dust and whitish pubescence. In caudal and lateral view the ground coloration is clearly visible, the hind parts of the tergites being yellowish-brown and the fore parts dark greyish. Hindmarginal hems are distinct and whitish on tergites 2 and 3. All sternites also covered by silvery-white dust, in lateral and caudal view with a distinct yellowish-brown coloration.

Terminalia. Epandrium and gonocoxites yellowish-brown with slight whitish dust; with rather sparse pubescence. Epandrium (Fig.12) basally broader than long, both anterior and posterior margins moderately incised. Gonocoxite (Fig. 9) distinctly longer than epandrium, its distal part broadly lamellate. Gonapophysis with a very short free end, not visible in lateral view. The brush-shaped apex of the stylus is very conspicuous in external view (Fig. 9). Seen ventrally (Fig. 10) the stylus has a large, ventral, lamellate extension. The ventral lobe is small. Hypandrium (Fig.

15) is comparatively large. The paraprocts are nearly twice as long as the cerci and fused; both structures overhang hind margin of epandrium. The cerci are divided. The aedeagus is free. The phallus is in lateral view (Fig. 13) short and curved for more than 90° to the longitudinal axis of the aedeagus; the tip not up-curved. Seen caudally (Fig. 11) it gradually narrows. Seen dorsally (Fig. 14) the phallus and the dorsal apodeme together form a broad triangular shield. The ventral apodeme is formed as two strongly diverging rounded flanges. The ejaculatory apodeme is as long as the rest of the aedeagus. It consists of a stem and an enormous bulbous head distally. The head is formed by three sclerotized plates which are at right angles to each other.

c. Systematical position.

The species seems in external characters to represent a most generalized therevid. The elongated paraprocts are no doubt an apomorph character which seems, however, to occur by convergence also in other parts of the family, e.g., in East-Palaeartic species of *Dialineura* Rond. (cf. Lyneborg, 1968b). Also the strongly reduced gonapophysis and the peculiar shape of the ventral and ejaculatory apodemes may be of some importance for further study.

3. *crassicornis* Bellardi.

Thereva crassicornis Bellardi, 1861, Saggio di ditt. messic. 2: 88, 1.

a. Type-material.

A male specimen with an old label of "165" and a recently written label of "T. crassicornis Bell. ♂. No. 165. Messico (Truqui)" was received from the Torino Museum. This specimen is in fairly good condition, though somewhat mouldy and discoloured on head and thorax. All right legs and both third antennal joints are lost. The specimen agrees closely with the detailed original description, and there can be no doubt that it represents the holotype. I have labelled it accordingly.

b. Redescription of male holotype. (Figs. 18—23).

Length. Total: 10.4 mm.

Head. Length 140, height 145, width 235. Eye: length 95, height 125. Gena 20, frontal protuberance 25, occipital protuberance 20. Antennal insertion 100:45. Antennae: first joint 80:35, second joint 10:15, third joint absent. Proboscis reaches to end of first third of first antennal joint. Palpi distinctly shorter. Ocellar

triangle rather small. Eyes very narrowly separated. — The head is discoloured, but all parts seem to be greyish to yellowish-grey dusted. Frons with long, blackish hairs; face with shorter blackish hairs. Pubescence of gena and lower part of occiput golden-yellow. About 7 long, thin postocular setae, and about 10 stouter occipital setae. Antennae blackish, first and second joints with greyish dust and long blackish hairs.

Thorax. Mesonotum: Length 250, width 185. 3 n, 2 sa, 1 pa setae. dc setae cannot be seen. Colour pattern cannot be stated due to discoloration. Pubescence partly composed of long, blackish hairs, partly of short, depressed, golden-yellow hairs. Scutellum: length 250, width 110. Its colour dark (as mesonotum), pubescence long and golden-yellow, 4 setae. Also pleura discoloured, their pubescence long and golden-yellow.

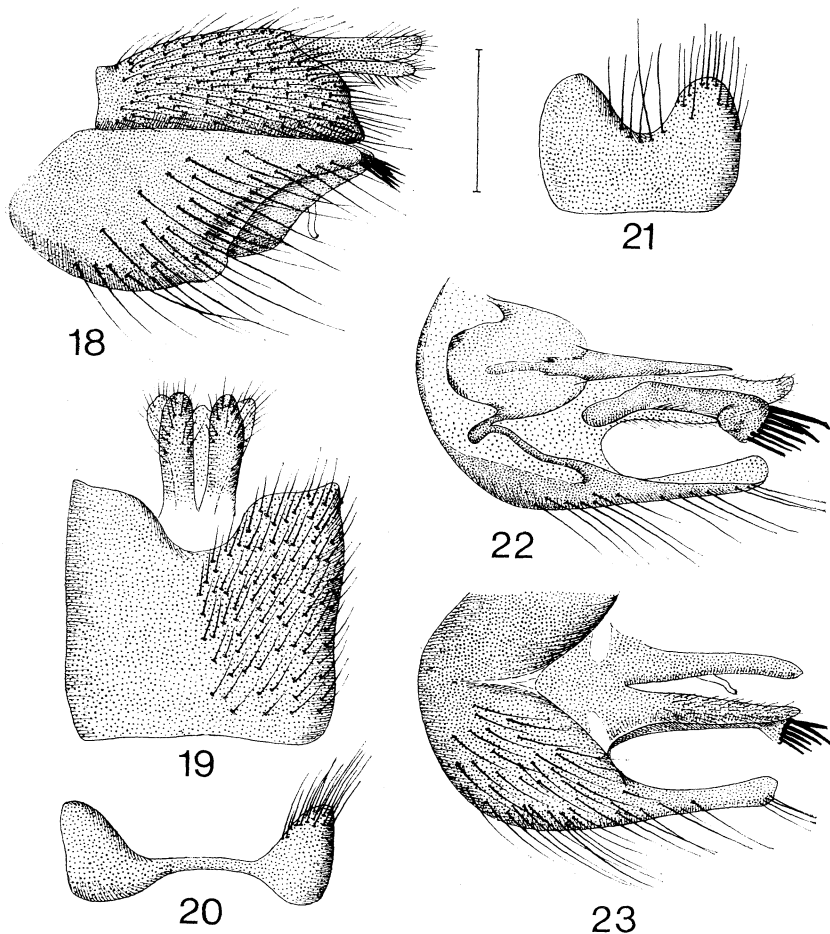
Wing. Length 700, width 275. Basal vein of discal cell oblique. Cell M_3 closed and with a short stalk. Vein r_4 starting with a straight part, then followed by a deep bend. Cell R_4 with an index of 235:120. — Colour slightly brownish with darker stigma, veins dark brownish. Knob of halteres brownish-black.

Legs. f_1 with 2 av, f_2 with 1 av + 1 pv setae. f_3 with 6—7 rather short av setae, and some still shorter pv setae in apical two-thirds. t_1 with some ad, pd and pv setae, some of which are longer than tibial diameter. Length of t_1 225, width 20. t_2 and t_3 with some ad, pd, av and pv setae, of which pv setae to t_3 are very short. — Legs all pale brownish, tibiae most pale. f_1 and f_2 with long yellowish hairs, f_3 with short, adpressed, yellowish and blackish hairs. Claws and pulvilli small.

Abdomen. Length 660, width 180. Tergites largely clear reddish-yellow with blackish rhomboid spots on segments 2—6. Seen dorsally these spots reach the fore corners of each tergite, while at the hind margins they occupy about one third of the entire width of the tergites. The spots are separated from actual hind margins by rather broad hems of reddish-yellow coloration. Pubescence on the blackish spots short and blackish, on the reddish-yellow areas longer and yellowish. Sternites exclusively reddish-yellow, with long and sparse pubescence.

Terminalia. Both epandrium and gonocoxites reddish-yellow, with blackish hairs which are short on epandrium, long on gonocoxites. Epandrium (Fig. 19) nearly square, with a moderately deep incision in posterior margin. Gonocoxite (Fig. 18) exactly as

long as epandrium, projecting as a rather long, dorsal, lamellate process. In lateral view (Fig. 18) the extremely large ventral lobe, the tip of phallus and the strong spines of the stylus are visible. Gonapophysis without free end, its rod (Fig. 22) connected with the lateral part of dorsal apodeme of aedeagus. Hypandrium completely lacking (or fused with the gonocoxites?). These are fused for a long distance ventrally (Fig. 23). The styli are placed



Figs. 18—23. Male terminalia of holotype of "*Thereva*" *crassicornis* Bell. — 18. Terminalia in lateral view. 19. Epandrium, cerci and paraprocts in dorsal view. 20. Tergite 8. 21. Sternite 8. 22. Left gonocoxite, its appendages and aedeagus in dorsal view after removing the epandrium. 23. Right gonocoxite and its appendages in ventral view. Scale: 0.5 mm.

close to the midline, their distal end with a dorsal process, and with some very stout spines directed downwards. The ventral lobes are very long. They lie close together, are fused at the base (Fig. 23), then form a long, deep fork. Cerci and paraprocts long and of equal length. The paraprocts are fused. Both elements protrude much beyond epandrium. The phallus (Fig. 22) has a long and narrow proximal part, seen laterally it curves for about 90° to the longitudinal axis, ending in a long, narrow, slightly upcurved tip (Fig. 18). The dorsal apodeme (Fig. 22) is oval, connected with the rod of the gonapophysis, and is about four times wider than the proximal part of the phallus. It has a median keel, and its distal end is upcurved. Both ventral and ejaculatory apodemes are rudimentary.

c. Systematical position.

Crassicornis Bell. shows a number of characters in the male terminalia which may be termed apomorphic if compared with the apparently generalized (with a number of plesiomorph characters) terminalia described for *Thereva* and other genera (Lyneborg, 1968a). These apomorph characters can be summarized as follows: gonocoxites fused ventrally; a free hypandrium not present; gonapophysis without a free terminal end; its rod with a strongly sclerotized connection to the aedeagus; the ventral lobes strongly enlarged and fused basally (corresponding to the fusion of the gonocoxites).

Most of these characters (except the large ventral lobes) are also found in *Furcifera sumichrasti* Bell. (see p. 407 and figs. 31-37). A connection between the basal rod of the gonapophysis and the aedeagus, combined with the loss of a free terminal end of the gonapophysis, is also found in a group of Ethiopian, Palaearctic and Oriental genera (e.g., *Phycus* Walk.). This group is also represented in the New World (*Ataenogera* Kröb. and *Pherocera* Cole). In this group of genera the gonocoxites are, however, fully separated (a plesiomorph character), but some surely apomorph characters in the wings separate it from the genera represented by *crassicornis* and *sumichrasti*.

4. *argentata* Bellardi

Thereva argentata Bellardi, 1861, Saggio di ditt. messic. 2: 89,2.

a. Type-material.

A male specimen bearing two old labels, "166" and "Cordova,

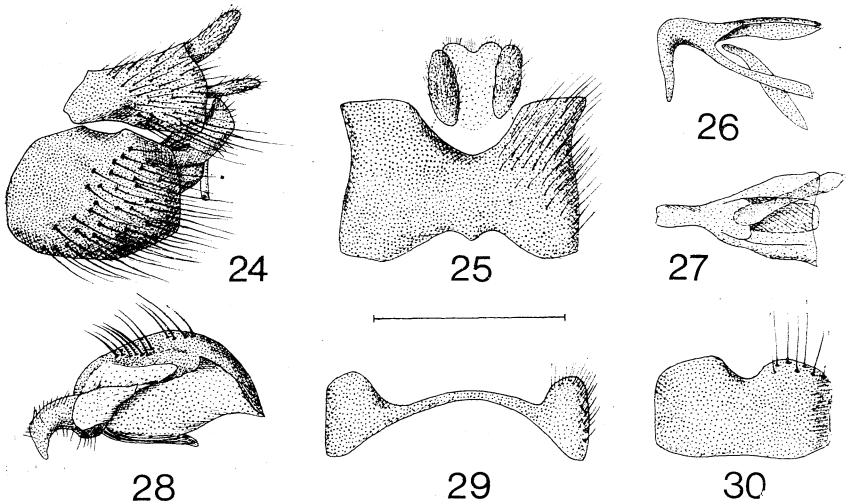
t.c.", and a new label "T. argentata Bell. ♂. No. 166. Messico (Cordova). (Saussure)" was received from the Torino Museum. The specimen is in fairly good condition though slightly mouldy and discoloured. The right third antennal joint, left wing, right p_1 , the tibia and tarsus of right p_3 , and whole left p_3 are lost.

Bellardi only described the male sex, apparently on the basis of more specimens, as he stated the types to be in "Collezioni di Saussure e Bellardi". Consequently I hereby designate the above-mentioned specimen in the Torino Museum as lectotype and have labelled it accordingly.

b. Redescription of male lectotype (Figs. 24—30).

Length. Total: 6.1 mm.

Head. Length 100, height 135, width 180. Eye: length 75, height 120. Gena 15, frontal protuberance 10, occipital protuberance 15. Antennal insertion 85:50. Antennae: first joint 29:11, second joint 9:14, third joint 44:16. Style 10, incerted on exterior part of apex of third joint; number of joints cannot be seen. Proboscis reaches to level of antennal bases. Palpi slightly shorter than proboscis, brownish-grey with long, whitish pubescence. Eyes touch for a



Figs. 24—30. Male terminalia of holotype of "*Thereva*" *argentata* Bell. — 24. Terminalia in lateral view. 25. Epandrium, cerci and paraprocts in dorsal view. 26. Aedeagus in lateral view. 27. Aedeagus in dorsal view. 28. Right gonocoxite and its appendages in ventral view. 29. Tergite 8. 30. Sternite 8. Scale: 0.5 mm.

short distance. Frons mostly shiny blackish with long, black hairs. Face, genae and occiput whitish-grey dusted. Face bare, genae with short black hairs, while occiput has long, whitish pubescence. About 20 postocular + occipital setae on each side. Antennae blackish, first joint distinctly greyish dusted and with moderately long, blackish setae and hairs.

Thorax. Mesonotum: length 175, width 150. 3 n, 2 sa, 1 pa setae. dc setae seem absent. Mesonotum blackish with a faint, greyish dusting, but obviously without any distinct pattern. Pubescence long (ca. 25) and whitish. Scutellum: length 45, width 80, coloured as mesonotum, 4 setae. Pleura greyish dusted, but pteropleuron more shiny; pubescence long and whitish.

Wing. Length 455, width 165. Basal vein of discal cell oblique. Cell M_3 closed and stalked. Vein r_4 S-curved. Index of cell R_4 135:65. Vein r_1 without hairs on dorsal surface. Ground colour hyaline with greyish-yellow tinge. Veins very pale and stigma not distinct. Halteres blackish.

Legs. f_1 and f_2 have 1 av seta near middle; pubescence on anterior surfaces pale and scaly, on posterior surfaces long and composed of both pale and blackish hairs. f_3 with a row of long av setae, near apex 2 short pv setae. t_1 with 2—3 ad, pd and pv setae, some of which are longer than width of t_1 . Length of t_1 150, width 20. t_2 with rows of setae of all four positions, but pd setae short and hairlike. t_3 absent. Femora blackish with slight, greyish dust. t_1 blackish-brown, t_2 yellowish-brown with darkened tip. Tarsi coloured as corresponding tibiae. Claws and pulvilli normal.

Abdomen. Length 335, width 160. The broad and flat abdomen is, when viewed from above, entirely silvery-white dusted, only the extreme margin is blackish. The pubescence is whitish, adpressed on the central parts, more outstanding laterally. In lateral view the lateral parts of the tergites appear shiny blackish, only extreme hind parts of tergites 2 and 3 show a little dusting. Tergites 2 and 3 have distinct whitish hind-marginal hems. The sternites are blackish with only slight dust and with long, pale hairs.

Terminalia. Epandrium and gonocoxites blackish with blackish hairs. Epandrium (Fig. 25) shorter than wide, incised in both anterior and posterior margins. Gonocoxite (Fig. 24) distinctly shorter than epandrium, i.e., no projecting hind part. The two gonocoxites are fused for a rather long distance ventrally. The

gonapophysis is present as a long rod, and its free end is represented by a minute tubercle with some hairs. Both stylus and ventral lobe (Fig. 24) are visible in an external, lateral view. The stylus (Fig. 28) is shaped as a broad hook. The ventral lobe (Fig. 28) large and lamellate. Cerci and paraprocts of equal length, distinctly protruding beyond level of epandrium. The paraprocts fused, forming a heart-shaped sclerite. The aedeagus is free. Phallus rather broad basally, seen laterally (Fig. 26) it suddenly curves for about 90°, ending in a rather straight, gradually narrowing, tip. The dorsal apodeme is, seen laterally (Fig. 26), straight, formed by two ridges. Seen dorsally (Fig. 27) it is triangular. Ventral apodeme of same length as dorsal apodeme. Ejaculatory apodeme a little projecting beyond level of distal end of dorsal apodeme, seen dorsally slightly thickened in both ends.

c. Systematical position.

It is at present difficult to give exact information on the relationship of *argentata* Bell. It certainly shows some relation to *Thereva* Latr. and allied genera (cf. Lyneborg, 1968a) in the characters of the male terminalia; this relation, however, is apparently based on plesiomorph characters: gonapophysis with a free end (though very minute); its rod not connected with the aedeagus. Also the presence of 2 supraalars, 2 pairs of scutellars, and some characters in the wing are in common. The combination of a few definitely apomorph characters such as the obvious strongly reduced antennal style, the shortened epandrium, and the fusion of the gonocoxites ventrally may be of some value for further attempts in placing the species. These characters are not found in *Thereva plebeja* L.

5. *sumichrasti* Bellardi.

Psilocephala Sumichrasti Bellardi, 1861, Saggio di ditt. messic. 2: 91,2.

a. Type-material.

Three specimens, two males and a female, were received from the Torino Museum. The first male bears an old label, "167", and a recently written label, "*Psilocephala sumichrasti* Bell. Messico. Tuxpango (Sumichrast) 167". The second male bears an old label, "Sumichrast/ Orizaba". The female has a small green label with "Orizaba". All specimens are in fairly good condition. Bellardi described only the male sex, and stated the type-locality

to be "Tuxpango presso Orizaba". Both males (and certainly also the female) obviously belong to the type-series collected by Sumichrast, and agree closely with the description by Bellardi. I hereby designate, and have labelled accordingly, the male labelled "167" as the lectotype of *Psilocephala Sumichrasti* Bellardi, 1861.

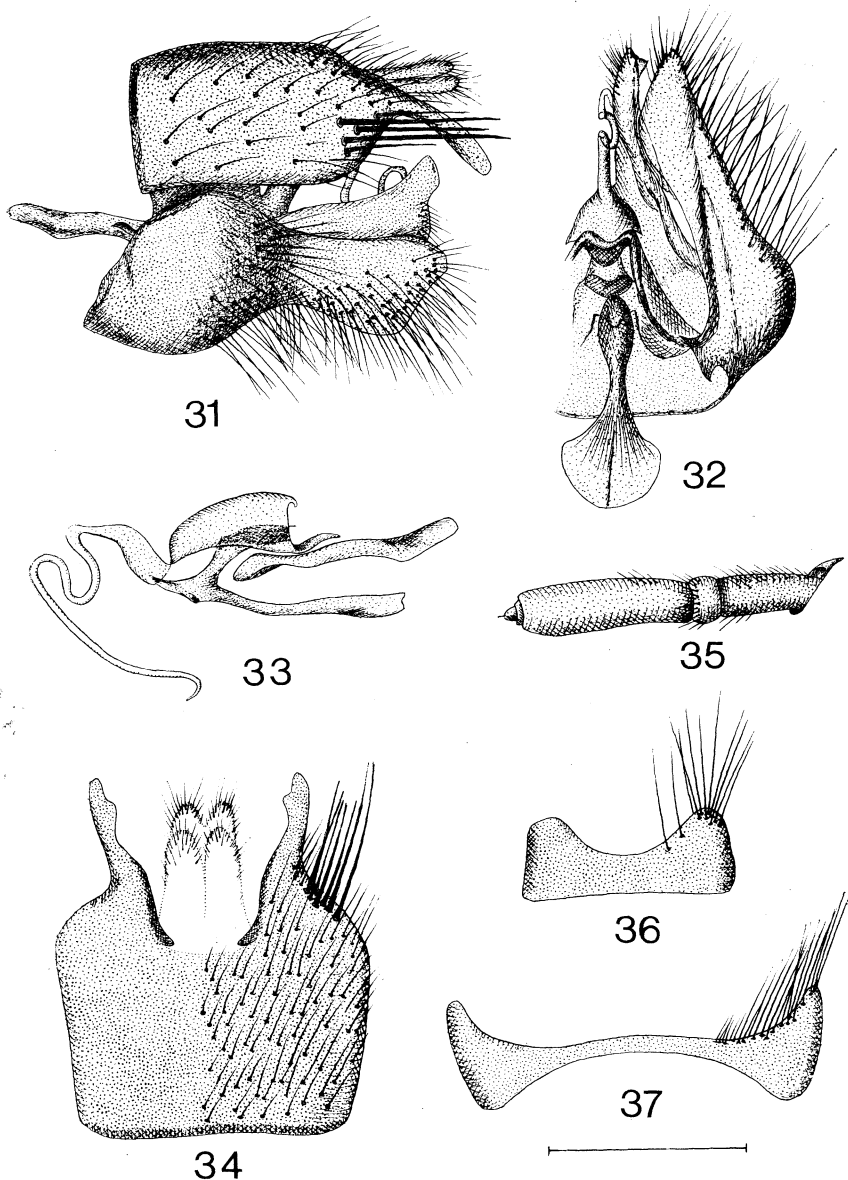
b. Redescription of male lectotype. (Figs. 31—37).

Length. Total: 6.9 mm.

Head. Length 105, height 145, width 175. Eye: length 85, height 140. Gena 5, frontal protuberance 10, occipital protuberance 10. Antennal insertion 85:90. Antennae: first joint 25:10, second joint 8:10, third joint 47:14. Style 5, apically inserted (Fig. 35). Proboscis does not reach level of antennal bases. Palpi about as long as proboscis. Eyes contiguous for a distance equal to height of ocellar tubercle. — The head shows a silvery-white dusting, uppermost part of frons velvet black. Frons and face bare. Gena with rather short, dark hairs. Occiput with longer, whitish hairs. 6 postocular setae which continue in a row of occipital setae with vertical position. Antennae dirty yellowish, first joint with only short pubescence (Fig. 35).

Thorax. Mesonotum: length 220, width 160. 3 n, 2 sa, 1 pa setae. dc setae absent. Mesonotum with a greyish median band (width ca. 60) flanked by two blackish bands which are about 30 wide. The lateral parts of mesonotum greyish. Pubescence moderately long (ca. 15) and pale. Scutellum: length 40, width 70, with a distinct transverse ridge. Seen from behind the part of scutellum caudal to this ridge is brownish-black and densely covered with black dots, indicating sockets of setulose hairs. Only a few of these hairs are intact. They are black and nearly as long as the four marginal setae. This means that the entire hind half of scutellum has a dense covering of long, black, setulose hairs. In dorsal view the entire scutellum is black (not shiny), and seen from in front the part anterior to the ridge has a greyish-brown toment. The pleura are greyish with a brownish-black undusted band from wing-base to hypopleuron.

Wing. Length 480, width 190. Basal vein of discal cell oblique. Cell M_3 closed and stalked. Vein r_4 nearly straight basally, ending in a deep curve. Index of cell R_4 150:70. Vein r_1 without hairs on dorsal surface. Ground colour greyish-brown, with a brownish stigma and a brownish area between r-m and fork of r_{4+5} reaching from costa to m_1 . Knob of halteres dirty yellowish.



Figs. 31—37. Male terminalia and antenna of lectotype of "*Psilocephala*" *sumichrasti* Bell. — 31. Terminalia in lateral view. 32. Left gonocoxite, its appendages and aedeagus in dorsal view after removing the epandrium. 33. Aedeagus in lateral view. 34. Epandrium, cerci and paraprocts in dorsal view. 35. Antenna. 36. Sternite 8. 37. Tergite 8. Scale: 0.5 mm.

Legs. f_1 and f_2 with a single av setae. f_3 with some short av setae in apical two-thirds, and some still shorter pv setae in apical third. t_1 with ad, pd, and pv setae of which the pv are fewest but strongest. Length of t_1 180, width 15. t_2 and t_3 with rows of ad, pd, av and pv setae, the ad and pd of t_3 being particularly numerous though not long. Fore tarsi thickened. Coxae brownish-black, with slight greyish dust. Femora mainly yellowish-brown, dorsal surfaces darker brownish. Pubescence pale. Tibiae yellowish-brown, t_1 darkened at apex, and t_3 darkened in apical half. Fore tarsi blackish, other tarsi yellowish-brown. Claws and pulvilli comparatively small.

Abdomen. Length 300, width 150. Seen from in front the tergites are silvery-grey dusted. Seen from behind the central parts of the tergites 1—3 are brownish-black, while the lateral parts and also the tergites 4—5 are silvery-grey dusted. In lateral view tergite 3 has the fore corners brownish-black. Tergite 2 shows a very broad, whitish, hindmarginal hem. Sternites greyish. All hairs pale. Segments 6—7 are not visible in the type, obviously being telescopically inserted in the other segments.

Terminalia. Both epandrium and gonocoxites are entirely reddish-yellow with yellowish pubescence; epandrium with some strong setae (Figs. 31 and 34). Epandrium (Fig. 34) with anterior margin straight and a deep incision into posterior margin, which is strengthened by two long, narrow processes. Gonocoxite (Fig. 31) slightly shorter than epandrium, formed by a semiglobular basal part bearing a long and broad, distal process. The two gonocoxites are ventrally fused for a long distance (Fig. 32). Gonapophysis without a free end, forming only a sclerotization along dorsal margin of proximal half of the gonocoxite and with a very strongly sclerotized connection to the aedeagus (Fig. 32). The stylus is distinctly visible in lateral view (Fig. 31), reaching to level of distal end of the gonocoxite, and forming a broad sclerite of a rather complex shape (see also Fig. 32). Also the aedeagus with its strongly sinuate phallus is visible in lateral view. The ventral lobes lie close together ventral to the proximal part of phallus, and arise from the fused ventral margin of the coxites. They are pointed, lamellate structures (not shown in any of the figures). Paraprocts slightly longer than cerci, not overhanging distal processes of epandrium. Both structures are weakly sclerotized and partly fused. A hypandrium is not visible. The aedeagus

itself shows a complicated construction. In lateral view (Fig. 33) the phallus is formed as a very long and gradually narrowing tube which is strongly sinuate. Seen dorsally (Fig. 32), the proximal part of the phallus is short and broad. To its proximal margin is attached the dorsal apodeme, which in lateral view is short and high, forming two lateral, curved and well-sclerotized plates which are fused to the rod of gonapophysis. The central area of the dorsal apodeme is poorly sclerotized. The ventral apodeme is longer than the dorsal apodeme; seen ventrally it is formed by two long, narrow sticks, the distal ends of which are shaped as a shovel. The ejaculatory apodeme is longer than rest of aedeagus, its distal end is broad and rounded (Fig. 32), though weakly sclerotized. Dorsal to the proximal end of the ejaculatory apodeme and arising from proximal part of ventral apodeme is a rounded sclerotization forming half part of a funnel. The tergite 8 (Fig. 37) and sternite 8 (Fig. 36) are both comparatively small; this tendency to reduction may obviously be associated with the telescopic nature of the last abdominal segments.

c. Systematical position.

Cole (1923: 31) placed the species in his new genus *Epomyia*. Later, Cole (1960: 168) treated *Epomyia* as a synonym *Furcifera* Kröber, 1911. Whether this action was correct shall not be discussed here. It is, however, evident that Cole has misinterpreted Bellardi's species. This will appear by comparison of fig. 3c by Cole (1960) with fig. 31 of the present paper. Bellardi's species seems to come near to *Furcifera hardyi* Cole, 1960 (= *Epomyia flavipes* Hardy, 1943). Both species have the erect pile on scutellum and about the same dimensions in the antennae. The legs of the lectotype of *sumichrasti* seem darker than described for *hardyi*, though it is worth mentioning that the male syntype (with terminalia identical to those of the lectotype) has legs which may be termed yellowish (except for the tarsi of p_1).

It seems as though *sumichrasti* in several respects represents a most advanced therevid. It clearly shows a number of apomorph characters which are also found in *crassicornis* Bell. (see p. 401). These are as follows: gonocoxites fused ventrally; a free hypandrium not present; gonapophysis without a free terminal end; its rod with a strongly sclerotized connection to the aedeagus; and tergite 8 and sternite 8 relatively much reduced. Further apomorph characters are found in the shaping of the scutellum, in the com-

plexity of the aedeagus, and also in the telescopic abdomen. A dissection of the holotype to *Cyclotelus pruinosus* Walker, 1850 from South America have shown male terminalia of the same basic structure as described for *sumichrasti*.

6. *nigra* Bellardi

Psilocephala nigra Bellardi, 1861, Saggio di ditt. messic. 2: 92, 3.

a. Type-material.

A male specimen with an old label, "169", and a new label, "*Psilocephala nigra* Bell. 168. Messico (Semper)", was received from the Torino Museum. The specimen was in good condition; only the third antennal joints were missing. It agrees well with the description. Bellardi described only the male sex, and apparently only on one specimen. The specimen in the Torino Museum must then represent the holotype, and I have labelled it so.

b. Redescription of male holotype. (Figs. 38—44).

Length. Total: 10.6 mm.

Head. Length 140, height 160, width 220. Eye: length 105, height 135. Gena 25, frontal protuberance 15, occipital protuberance 20. Antennal insertion 100:60. Antennae: first joint 38:16, second joint 10:16, third joint lost. Proboscis reaches to level of second antennal joint. Palpi distinctly shorter than proboscis. Eyes narrowly separated for a short distance. — Head dark greyish with exclusively blackish pubescence. About 12 postocular setae and a similar number of occipital setae. First and second antennal joints blackish.

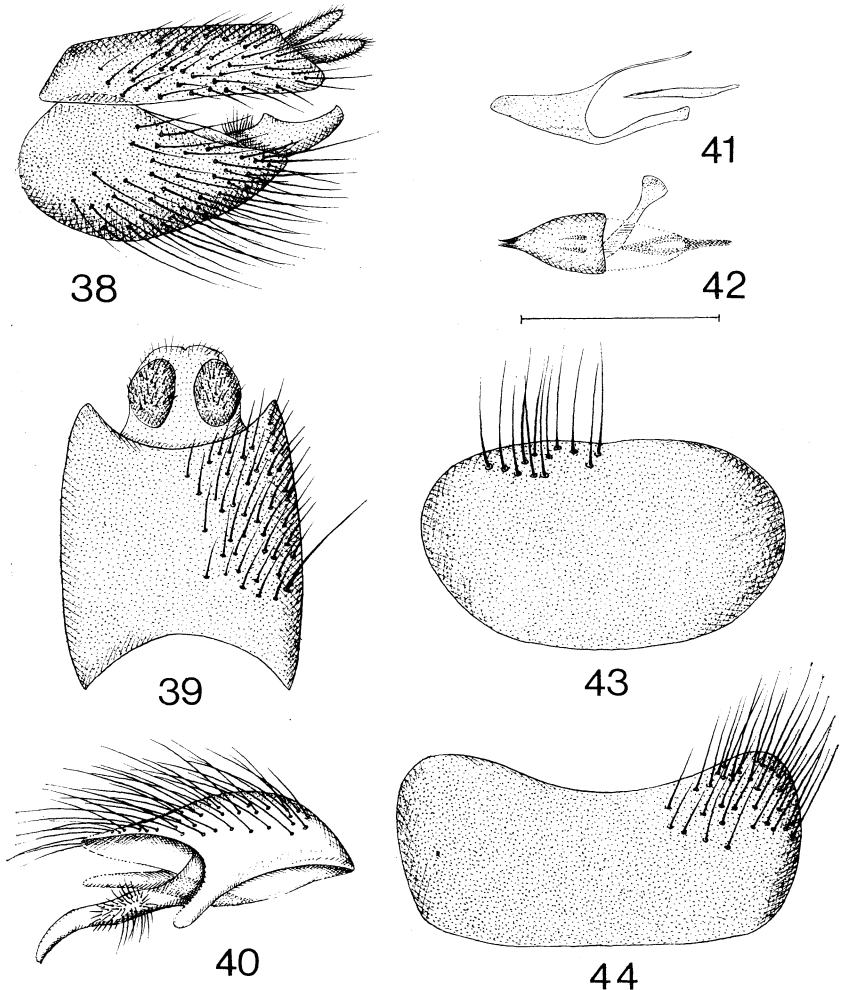
Thorax. Mesonotum: length 250, width 190. 5 n, 1 sa, 1 pa setae. No dc setae are visible. Scutellum: length 50, width 90, 2 setae. Entire thorax blackish with short blackish pubescence.

Wing. Length 720, width 260. Basal vein of discal cell oblique. Cell M_3 broadly open. Vein r_4 forms a very narrow S. Cell R_4 with an index of 215:85. Colour extensively dark brownish, with blackish stigma and veins. Halteres blackish.

Legs. All femora without setae. t_1 with rows of few and short pd and pv setae, also a single short ad is visible. All setae are shorter than width of t_1 . Length of t_1 210, width 25. t_2 and t_3 with rows of few and short ad, pd, av, and pv setae. All legs intensively blackish with exclusively short, blackish pubescence. Claws and pulvilli comparatively small.

Abdomen. Length 650, width 180. All tergites and sternites blackish with blackish hairs. Segments 2—5 show dirty yellowish hindmarginal hems. The pubescence of the last sternites is somewhat elongated and crassate.

Terminalia. Epandrium and gonocoxites are comparatively small; blackish with blackish pubescence. Tergite 8 (Figs. 44) and



Figs. 38—44. Male terminalia of holotype of "*Psilocephala*" *nigra* Bell. — 38. Terminalia in lateral view. 39. Epandrium, cerci and paraprocts in dorsal view. 40. Right gonocoxite and its appendages in ventral view. 41. Aedeagus in lateral view. 42. Aedeagus in dorsal view. 43. Sternite 8. 44. Tergite 8. Scale: 0.5 mm.

sternite 8 (Figs. 43) are comparatively large. Epandrium (Fig. 39) nearly square, with moderately deep incision in both anterior and posterior margins. Gonocoxite slightly shorter than epandrium. Gonapophysis with a long free end (without hairs) which reaches to level of distal end of gonocoxite, in lateral view, however, only narrowly visible (Fig. 38). Hypandrium is present as a ventral triangular sclerite between bases of the gonocoxites. These are not fused ventrally. The stylus (Figs. 38 and 40) projects beyond level of distal end of gonocoxite. The ventral lobe is formed as a rather long, narrow, lamellate process (Fig. 40). Paraprocts slightly longer than cerci. Both structures project beyond level of epandrium. Cerci divided, paraprocts fused. The aedeagus (Figs. 41—42) is free and remarkable simple and weakly sclerotized. The phallus is formed as a short funnel. The dorsal apodeme is reduced to a weak flap attached to the proximal end of phallus. Also the ventral and ejaculatory apodemes are reduced.

c. Systematical position.

"*Psilocephala*" *nigra* Bell. is normally treated as a synonym of "*Thereva*" *lugubris* Macquart, 1840, described from Chile. Whether this is correct shall not be commented on here. Both were placed in the new genus *Melanothereva* by Malloch (1932).

The species is most interesting as it seems to possess an unusually rich number of plesiomorph characters, both in the external structures and in the male terminalia, thus representing an apparently very generalized therevid. These in my opinion plesiomorph characters shall shortly be summarized: eyes separated (though only narrowly), 1 supraalar only; 1 pair of scutellars only; cell R_4 long (index about 2.5); cell M_3 broadly open; basal vein of discal cell oblique; femora without setae; tibiae with few and short setae; male terminalia comparatively small; sclerites of segment 8 comparatively large; gonocoxites not fused ventrally; a free hypandrium present; gonapophysis with a free terminal end; aedeagus free (i.e. no connection to basal rod of gonapophysis).

The lack of hairs on the stylus and also the apparently strongly reduced aedeagus may be termed apomorph characters and may be of some importance for future study of the relationship of the species.

Summary

The paper presents redescrptions of the holotypes or lectotypes of six species of Therevidae from the Americas. The two were described by J. C. Fabricius in 1805 as *Bibio senilis* and *B. abdominalis*, the remaining four by L. Bellardi in 1861 as *Thereva crassicornis*, *Th. argentata*, *Psilocephala sumichrasti* and *Ps. nigra*. Apart from the opportunity for fixing the identity of the species in question, the study made it possible to further elaborate the knowledge of the male terminalia in Therevidae, which no doubt will prove to be of great value for a reclassification of the family.

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