

Arquivos de Zoologia

A REVIEW OF THE GENUS *TRICHODURA* MACQUART (DIPTERA, TACHINIDAE)

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ABSTRACT

The tachinid genus *Trichodura* Macquart (type-species, *anceps* Fabricius), as considered here, includes nine species, of which five are described as new. A lectotype is selected for *Trichodura recta* Schiner; *Trichodura vittata* Curran is placed in the synonymy of *lineata* Townsend. In the accompanying key to the known species of *Trichodura*, distinction between them is chiefly based on chaetotaxy of abdomen and color differences.

INTRODUCTION

Among the several genera of Tachinidae none is more striking than the South American genus *Trichodura* Macquart, by the fact that some males exhibit a curious tail, a cylindrical projection of abdominal tergite 5. The bizarre configuration of the male abdomen misled outstanding dipterologists of the past such as Fabricius, Wiedemann and Macquart, who misidentified the sexes, considering the tailed form to be the female.

Townsend (1919) proposed the genus *Trichoduroopsis* for *Trichodura recta* Schiner, and subsequently, in his Manual, presented a full description of both genera, erecting for them the tribe Trichodurini. In the present paper *Trichoduroopsis* is considered as synonymous with *Trichodura* Macquart.

The material studied belongs to the collection of the Museu de Zoologia da Universidade de São Paulo (MZUSP), the American Museum of Natural History (AMNH), the Naturhistorisches Museum in Vienna (NM), and the United States National Museum (USNM). The abbreviations given in parentheses above are used throughout the text in the listing of the studied material.

Thanks to the kindness of Dr. A. Kaltenbach, of the Naturhistorisches Museum in Vienna, I was able to borrow two specimens of *T. recta* Schiner, and to confirm its identity. I would also like to thank Dr. C. W. Sabrosky, Systematic Entomology Laboratory, USDA, Washington, D. C., for information on the United States National Museum material,

and Dr. Pedro Wygodzinsky, for the opportunity to study the valuable materials of the American Museum of Natural History, New York.

REPRODUCTIVE HABITS AND IMMATURE STAGES

Parasitic insects may be classified according to the deposition site of the egg or larva, and the larval feeding site. Pantel (1910) grouped the parasitic Diptera, mainly tachinids, in 10 groups, based upon the type of the female reproductive system, the type of egg deposited, and the incubation period. Several classifications have been outlined for the major groups of parasitic insects. Hagen (*in* DeBach, 1965) recognized four major groups of parasitic insects:

- (i) Eggs or larvae deposited apart from the host;
- (ii) Eggs or larvae deposited on or near the host;
- (iii) Eggs, or more rarely larvae, deposited in the host;
- (iv) Oviposition site correlated with sex of egg (not occurring in Diptera).

The study of the female reproductive system of *Trichodura* indicates that this group should be placed in Hagen's second group. Species of this genus are larviparous, and as is common among the Dexiinae, the first-instar larva is deposited near the host larva; it then penetrates the integument of the host, completing its development as an endoparasite. The mature larva emerges and drops to the ground to pupate. The hosts and details of the biology of the Trichodurini are not known so far.

Immature stages. The description presented here is made for the primary larva of *Trichodura longicauda*, sp. n. (Pl. 1): Stage I — Length: 0.99 mm; width: 0.18 mm. Cuticle transparent and colorless, with anterior spine bands almost complete on thoracic segments, but interrupted dorsally on the first seven abdominal segments; dorsal spine bands composed of flat cuticular pigmented plates; head or pseudocephalon bearing on each side a conspicuously convex antennal organ (Pl. 1, fig. 4); last seven segments bearing laterally transverse rows of sensorial hairs and a long, stout, sensorial hair, situated at a short distance behind the dorsal end of each row; buccopharyngeal armature (Pl. 1, Figs. 2-3) characterized by the broad anterior region, whose dorsal side is slightly convex, the dorso-anterior angle pointed, but obtuse; anterior region smaller than intermediate region; respiratory system metapneustic.

FIELD STUDIES

Trichodura Macquart is an inhabitant of the mountain forest, and very little is known about its habits. Field observations and collections were conducted seasonally from 1965 to 1966. The author collected two definite forms, *Trichodura friburguensis*, sp. n., and *T. longicauda*, sp. n., occurring side by side in Nova Friburgo, State of Rio de Janeiro, during summer (Dec.-Jan.). A thorough search of the area in other seasons revealed no *Trichodura*. Species of this genus are found resting on foliage near the ground inside the forest.

Close observation of the flight behavior of *Trichodura* calls for a particular comment. Males were more commonly encountered with than the females, and were active around dusk in preferred sites within the forest, resting over leaves of shrubs, where they remained still in watchful attitude. At times one individual took on the wing, and the others joined it in a rapidly ascending spiral flight; when the spiraling ended, they returned to their former "post". It is common to collect daily several specimens in such areas of aggregation. I never observed females in these aggregations, although they were frequently found flying alone at nearby areas. Mating was observed only once, when a female flew very close to the aggregation of which the male was a part. On another occasion, a male pursued a braconid of the approximately same size and coloration which had approached the aggregation site.

The station-taking habit of the males has been noted on numerous occasions in other muscoid genera, and is probably more widespread than generally thought. Townsend (1935) theorized that males of certain muscoids aggregate to await females. Although he did not go into detail about this behavior, he referred to it several times (*loc. cit.*, pp. 184, 217), and in effect concluded that males of many species whose larvae are parasitic of warm-blooded animals or which are hematophagous, "take station" on high points (mountain peaks, etc.), where they wait for the females.

Females of *Trichodura* have been observed spending several hours a day feeding over foliage of trees and shrubs with small nectaries. The reduced haustellum and large labella are in accordance with this observation, as they suggest that these flies get moisture (and food) from extra-floral nectaries, and possibly honeydew.

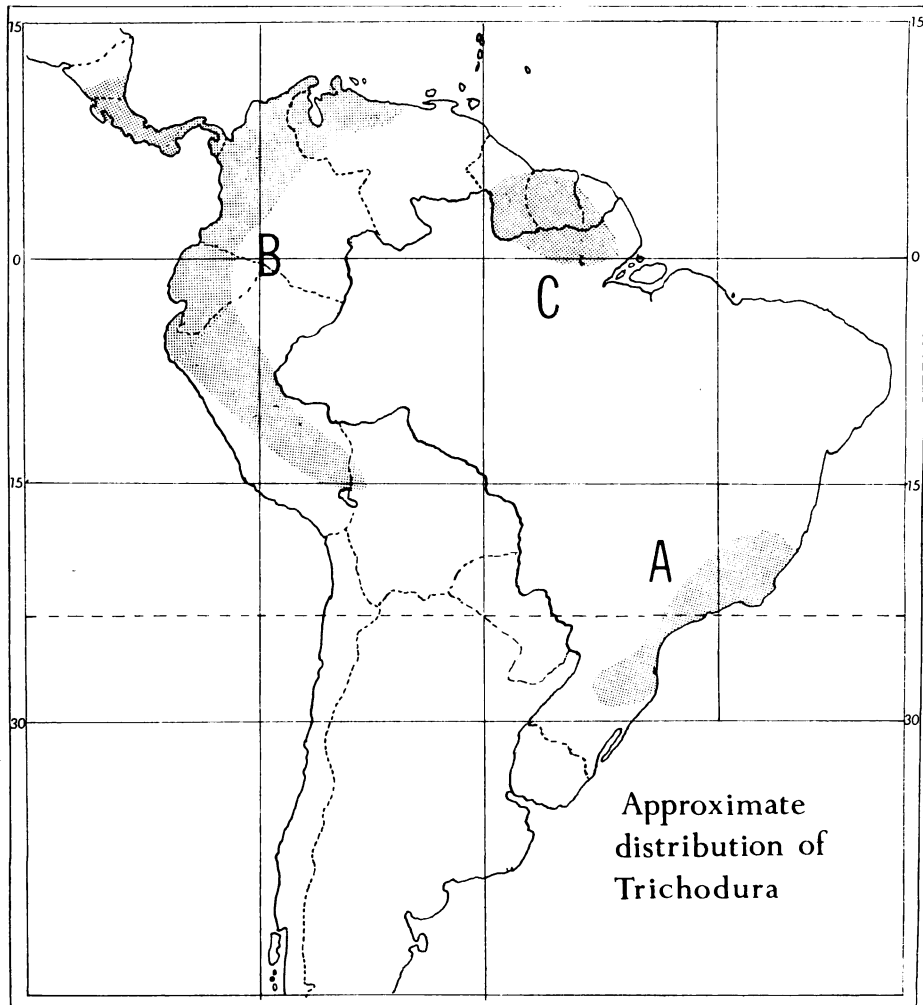
The thin and slender abdomen is a common characteristic of tachiinids living in humid forests, and occurs in many tribes, e.g. the Sophiini, Theresiini, and Urodexiini. Usually species living in open dry habitats are more heavily sclerotized than those living in moist habitats or more dense vegetation. Such a feature is certainly an adaptation for the conservation of moisture. The slender and relatively unsclerotized species of the forest would quickly die of desiccation in an open habitat; they do not occur in those, except under unusual circumstances.

GEOGRAPHICAL DISTRIBUTION

The tribe Trichodurini is strictly Neotropical. *Trichodura* has its center of distribution in South America, reaches its northernmost limit somewhere in Costa Rica, and the southernmost one in the Brazilian State of Santa Catarina.

The group presents a disjunct distribution in South America (map). According to the Trichodurini, South America may be divided in three generalized areas (A, B, and C), defined on the basis of endemic development and representative species, as explained below. Obviously, the boundary lines are only a rough approximation, since large areas are represented by relatively poor samples. Consequently I have taken physiography and climate into account in drawing my tentative conclusions.

Area "C" is located in the Amazon Valley, from the Guianas to northwestern Amapá; there occur three species, *T. guianensis* Townsend, *T. amazonensis*, sp. n., and *T. anceps* (Fabricius); these species are morphologically separated from all others, by the lack of a median black vitta on the abdomen. Area "B" is west of the Andes, where occur *T. recta* Schiner and other undescribed forms. The remaining species occur in area "A", in the southeastern Brazilian highlands, from the States of Rio de Janeiro to Santa Catarina. In this area is found the largest number of species. The species occurring in areas "A" and "B" are very closely related and both possess a median black vitta on the abdomen's dorsum.



I believe that more intensive collecting, particularly along the forested area of southeastern Brazil, in the Serras do Mar, Mantiqueira, and dos Órgãos would reveal many more species.

TECHNIQUES AND TAXONOMIC NOTES

The following techniques were used for the study of the male genitalia: the last few segments or the entire abdomen were removed from a relaxed specimen and boiled in a 10% solution of KOH for a few minutes. The genital structures were then transferred to 70% ethyl alcohol, where the macerated residues were gently flushed out. The preparation was removed from the alcohol and transferred to glycerin, and mounted on a slide with glycerin. Small pieces of broken slides were placed laterally to the genitalia to prevent squashing by the cover slip. Drawings and descriptions were made from those preparations. The genitalia was then transferred to a silicone rubber-stoppered genitalia vial, and mounted on the specimen pin.

In referring to the abdominal segmentation, "first tergite" is the first obvious segment, but morphologically it is the second tergum. For all thoracic and abdominal characters, using patterns of pollen or vittae the specimens should be viewed with the light striking the specimen slightly from the back.

The "tail" found on the fourth abdominal segment of the males presents a tremendous intraspecific variation in length and this character is not used here.

Genus *Trichodura* Macquart

Trichodura Macquart, 1843: 248 (1843: 91) (Type-species, *Musca anceps* Fabricius, by orig. des.).

Trichoduropsis Townsend, 1919: 169 (Type-species, *Trichodura recta* Schiner, by orig. des.).

Body elongate, very narrowed, coloration mostly yellow. Cheeks at least 0.5 of eye length. Parafacialia and cheeks bare. Facial carina strong, narrow above. Eyes bare and strongly oblique. Epistoma moderately warped forward. Haustellum about one-half times head height. Ocellars long and parallel. Palpi short and robust, with fairly abundant black hairs apically. Frontals stopping at base of antennae. Inner verticals long and reclinate; outer verticals small in female, absent in males. Females with two strong pairs of proclinate and one pair of reclinate orbitals. Vibrissae long, decussate, placed level with the anterior oral margin. Antennae reddish yellow, separated at base; second segment short, with a long bristle above; third segment 4 times as long as second. Arista long plumose to tip.

Thorax with a broad, transverse vitta, extending from the humeri to the side of scutellum. Scutellum reddish to brown, pollinose on middle. Acrosticals 0:1; dorsocentrals 3-4:3; humerals 2; intra-alars 3; post-humeral 1; sternopleurals 2. Scutellum with two marginals, apical pair

cruciate. Legs long, yellow; tibiae somewhat darkened apically; tarsi black. Prosternum bare. Wings hyaline.

Abdomen yellow, greatly narrowed and elongated in males, ovoconic in females. Male with the fourth segment usually prolonged into a slender cylindrical appendage, bearing several whorls of macrochaetae. First segment with a pair of median marginals (lacking in *T. sabroskyi*, sp. n., and *T. recta* Schiner), a pair of lateral marginals, and a row of lateral discals; second segment with a pair of median marginals and a pair of lateral marginals; third segment with a row of marginals (a pair of discals are found in *T. longicauda* and *T. anceps*).

KEY TO SPECIES

MALES

1. Abdomen with a dorsal median vitta extending on the whole length of tergites 1-3 2
 Abdomen without a dorsal median vitta on tergites 1-3 8
2. Abdomen without median marginals on first segment 3
 With a pair of median marginals on first segment 4
3. Sternopleura and mesopleura densely covered with long, black hairs; thorax entirely black laterally; abdomen conic, evenly tapering to the tip *sabroskyi*, sp. n.
 Sternopleura and mesopleura covered with scattered hairs; squama with long, black cilia on borders; thorax brown to reddish brown laterally; abdomen elongate, short caudate *recta* Schiner
4. Third antennal segment with a pair of discals; anal segment long caudate, bearing long bristles in all directions
 *longicauda*, sp. n.
 Third segment without discals 5
5. Lower squama small, evenly rounded; anal segment not caudate; small species (8-11 mm) *vidua* Schiner
 Lower squama large, subelyptical; anal segment long caudate; medium to large species (10-17 mm) 6
6. Outer forceps evenly brownish; sternopleura, hypopleura, and propleura usually tinged with black *lineata* Townsend
 Outer forceps deeply sclerotized at apex; sternopleura, hypopleura, and propleura entirely yellow 7
7. Median stripe of mesonotum distinct behind the suture; outer forceps with rounded apex in lateral view (Pl. 5, fig. 4); basiscutellum yellow *townsendi*, sp. n.
 Median stripe fused behind suture; outer forceps with a pointed curved apex (Pl. 5, fig. 3); basiscutellum brown to black
 *friburguensis*, sp. n.

8. Abdomen with a pair of discals on third segment
 *anceps* (Fabricius)
 Without a pair of discals on third segment *amazonensis*, sp. n.

FEMALES

1. Second abdominal segment with a pair of median marginals; lower squama without black cilia on outer margin 2
 Median marginals on second abdominal segment absent; lower squama with long black cilia on outer margins; sternopleura and hypopleura mostly black or brown *recta* Schiner
2. Abdomen tawny, irregularly and diffusely dusted with whitish pollen; all the hairs of the abdomen arising from a bare dark spot *lineata* Townsend
 Abdomen orange to yellow, not diffusely dusted with whitish pollen; the hairs do not arise from a bare, dark spot 3
3. Abdomen with a black median vitta on first segment 4
 No black median vitta on first segment *anceps* (Fabricius)
4. Abdomen dorsally with conspicuous black velvety spots 5
 Without black velvety spots 6
5. Fourth abdominal segment with a black velvety spot, interrupted in the middle *longicauda*, sp. n.
 Fourth segment without black velvety spot, which is confined to segments 2 and 3, and is incised in the middle *vidua* Schiner
6. Mesonotum mostly gray-whitish pollinose, with the median stripe fused behind the suture *friburguensis*, sp. n.
 Mesonotum rusty yellow pollinose, median stripe not fused behind the suture *townsendi*, sp. n.

***Trichodura amazonensis*, sp. n.**

This species is very closely related to *anceps* Fabricius, but readily distinguished from it by the following characters (alternatives for *anceps* in parentheses):

♂ — sternopleura bare (with a few pale hairs between the sternopleurals); infrascutellum yellow, not infuscated dorsally (infuscated dorsally); abdomen with a pair of discals on the third segment (discals present).

♀ — unknown.

Holotype ♂, Rio Amapari, Território do Amapá, Brasil, VI-IX.1959 (J. Lane) (MZUSP); paratype ♂, Upper Essequibo River, Guyana, 23.XII.1937 (W. G. Hassler) (AMNH).

Trichodura anceps (Fabricius)

(Pl. 2, fig. 3; pl. 3, fig. 4; pl. 5, fig. 2)

Musca anceps Fabricius, 1805: 296 (Type-locality: "South America").*Dexia anceps*; Wiedemann, 1830: 372.*Trichodura anceps*; Macquart, 1843: 248 (1843: 91); Wulp, 1885: 194, pl. 6, figs. 5-8; Aldrich, 1925: 115; Curran, 1934: 449 (occurrence in Bartica, Guyana).*Trichoduropsis guianensis* Townsend, 1919: 553 (Type-locality: Bartica, Guyana). *N. syn.*Differs from *amazonensis*, sp. n., as shown in the key; additional differentiating items as summarized below.

♂ — Head yellow (Pl. 2, figs. 1-3); front 0.16 of head width, silvery pollinose. Occipital fringe well developed, interrupted at the middle of the eye length.

Thorax yellow, rusty yellow pollinose; inner and outer vittae of mesonotum indistinct, when viewed from behind; humeri yellow; sternopleura yellow, with a few black hairs between the sternopleurals; propleura slightly infuscated in front of the anterior spiracle; infrascutellum infuscated dorsally; basiscutellum yellow; wings hyaline, tinged with yellow along R_1 and R_6 ; cell R_5 open at tip.

Abdomen yellow, without a black dorsal vitta (Pl. 2, fig. 3); first and second segments with a pair of marginals; third with a black round spot, laterally a pair of discals, and a row of marginals; fourth segment yellow, polished black laterally at the base, with a pair of discals, prolonged in a yellow tail bearing several bristles ventrally. Genitalia as in Pl. 5, fig. 2.

Length — 17.5 mm.

♀ — total length: 10-12 mm.

Front 0.22 of head width; parafrontalia brownish red, with golden pollen; cheeks yellow, silvery pollinose, tinged of orange on middle; upper half of occiput black.

Thorax mostly yellow in ground color; mesonotum brownish red on middle, dusted with rusty yellow pollen; inner thoracic vittae indistinct behind suture; propleura, sternopleura, and hypopleura wholly yellow; infrascutellum brownish red. Wings dark in the distal half, tinged with yellow around R_6 .

Abdomen yellow to orange without a median dorsal vitta on segments 1-3; third segment with two distinct velvety black spots (Pl. 4, fig. 4).

Material examined: *Guyana*: 2 ♂, Tukeit, 17.VII.1911 (AMNH); 1 ♀, Kaieteur, 4.VII.1911 (AMNH); 1 ♀, Bartica, IX.1922 (M. Lang) (AMNH). *Surinam*: 1 ♀, Poeloegoedoe, 30.VIII.1939 (Geijskes) (MZUSP). *Brazil*: *Amapá*: 1 ♂, 1 ♀, Serra do Navio, 24.IX.1957, 30.IX.1957 (K. Lenko) (MZUSP); *Amazonas*: 1 ♀, Manacapuru, X.1936 (MZUSP).

Distribution: Guyana, Surinam, Brazil (Amazonas, Amapá).

TAXONOMIC DISCUSSION

This species was originally described as *Musca anceps* Fabricius, and designated by Macquart (1843) as the type-species of *Trichodura*. There are two specimens still preserved in the Fabricius collection in Copenhagen, labelled "ex Am. mer. Schmidt". Macquart (*loc. cit.*) shows the abdomen lacking the median vitta. The exact locality of *anceps* cannot be determined with accuracy. Fabricius (1805: 296) says "in America meridionalis Dom. Smidt Mus. de Sehestedt". Zimsen (1964: 14), in her study of the type material of Fabricius, says: "In Fabricius' later works the insects from the West Indies are often mentioned as originating from Smidt. On old well preserved original labels from Sehestedt and Toender Lund's collection the name is spelled Schmidt. In the 1780's there lived a custom-house officer Adam Levin Smidt, and a surgeon, Johan Christian Schmidt, both of them employed in St. Croix. It is not certain who is meant".

Papavero (1971) provides new information on Smidt. According to this author, Smidt also visited "besides several West Indies islands certain places in the South American mainland, such as Essequibo and Demerara in the present British Guiana". This information is in complete agreement with the range of this species in South America.

Wulp (1885) studied both sexes of this species from Surinam. The drawings of the male sex given by this author are not accurate, as regards chaetotaxy; those of the female agree with our specimens.

According to Aldrich (1925: 115) *Trichoduroopsis guianensis* Townsend, from Guyana, represented by two females, the type being in the USNM, is certainly the female of *anceps*. Curran (1943) agrees with Aldrich in placing *guianensis* in the synonymy of *anceps*, on the basis of study of material of both sexes.

I studied 2 males, one from the Rio Amapari, Território do Amapá, Brazil, the other from the Essequibo River, Guyana, which are very close to *anceps*, differing mainly in the absence of the discal pair of the third abdominal segment (present in the type of *anceps*). These two specimens are described here as *T. amazonensis*.

***Trichodura friburguensis*, sp. n.**

(Pl. 3, fig. 6; pl. 4, fig. 5; pl. 5, fig. 3)

This species differs from the allied forms principally by the characters listed in the key. Other differences may be noted as follows:

♂ — Head yellow, white pollinose; front at vertex 0.16 of head width; frontals 6-8, not extending below base of antennae; antennae orange yellow; cheeks yellow, silvery pollinose; occipital fringe usually very weak below eye; palpi yellow, with a few hairs on tip; occipital hairs yellow.

Thorax black on dorsum, dusted with brown pollen; humeri yellow; dorsocentrals: 3:3; inner dark vitta on mesonotum fused behind suture; sternopleura yellow, with a few black hairs around the sternopleurals; hypopleura yellow, with about 6 hypopleurals; infrascutellum and basi-

scutellum black. Legs yellow; hind tibia slightly infuscated, pale yellow on middle; tarsi black. Wings hyaline, darkened on distal half, tinged with yellow before R_6 .

Abdomen yellow (Pl. 3, fig. 6), with a narrow black median vitta extending through the whole length of tergites 1-4, stopping before the "tail"; first and second segments with a pair of median marginals; third with a row of marginals, each one of the bristles dorsally encircled by a black spot at the base; fourth segment yellow, with a polished triangular spot prolonged into a slender "tail", bearing short macrochaetae on dorsal side and long bristles on the ventral side. Genitalia as in Pl. 5, fig. 3.

Length — 12.5-20 mm.

♀ — Head yellow; front at vertex 0.26 of head width; parafrofrontalia black above, tinged with golden pollen; thorax yellow, white pollinose; mesonotum black in the middle, dusted with golden pollen; infrascutellum black, with brown pollen; sternopleura yellow, with a few black hairs between the sternopleurals. Legs yellow; hind tibia infuscated on distal and proximal thirds. Wings hyaline, tinged with yellow on basal half, black on distal half. Abdomen polished yellow, with a black median vitta extending through tergites 1-3; fourth segment with a small black triangular spot on the middle; first and second segments with a pair of median marginals; third and fourth with a row of marginals (Pl. 4, fig. 5).

Length — 9-10 mm.

Material examined: *Brazil, Rio de Janeiro*: Muri, Nova Friburgo, 1-31.I.1965 (Gred & Guimarães), Holotype ♂ (MZUSP); Paratypes — 23 ♂ and 5 ♀, same locality of holotype, IV.1964, I.1965, XII.1965, I.1966 (Gred & Guimarães) (MZUSP); 6 ♂ and 4 ♀, idem, I-II.1966, IV.1964, I.1965 (Gred & Guimarães) (USNM); 1 ♀, Teresópolis I.1966 (Mello) (MZUSP).

***Trichodura lineata* Townsend**

(Pl. 3, fig. 8; pl. 4, fig. 6; pl. 5, fig. 1)

Trichodura lineata Townsend, 1934: 390 (Type-locality: Brazil, São Paulo, Itaquaquecetuba).

Trichodura vittata Curran, 1937: 333 (Type-locality: Brazil, São Paulo, Campos do Jordão). *N. syn.*

A dull reddish yellow species, with a wide median black vitta on the abdomen. The "tail" is mostly black dorsally.

♂ — Head yellow in ground color; front 0.11 of head width; parafrofrontalia and ocellar triangle black to brown, golden yellow pollinose; cheeks brownish red, silvery pollinose; occipital cilia black, extending weakly to the lower edge of the eyes.

Thorax black, rusty yellow pollinose on middle; humeri mostly yellow, dusted with yellow pollen; mesonotum with two inner dark me-

dian vittae between the dorsocentrals, interrupted at the suture, and two outer ones, broader, between the dorsocentrals and intra-alars; thorax with a broad black lateral stripe extending from the humeri to the lateral margins of the scutellum; scutellum reddish, with golden yellow pollen; sternopleura black in ground color, covered with scattered hairs between the sternopleurals; hypopleura black, with long hypopleurals; infrascutellum, basiscutellum, and metanotum black, dusted with brown pollen; squamma luteous, lightly infuscated; wings hyaline, strongly tinged with brown distally, with a yellow spot around R_6 .

Abdomen yellowish red, white to silvery pollinose, very narrowed and elongate, with a wide median black vitta extending through the whole length of tergites 1-4 (Pl. 2, fig. 8); first segment without median marginals; second with a pair of strong and erect median marginals; third with a row of marginals; fourth mostly black above, produced backwards into a long tail bearing several whorls of macrochaetae in all directions. Genitalia as in Pl. 5, fig. 1.

Length: 16-22 mm.

♀ — Head yellow; front 0.37 of head width; parafrontalia tawny with golden pollen; cheeks yellow, silvery pollinose; tinged of orange in the middle; upper half of occiput black, with a few black hairs.

Thorax mostly yellow; mesonotum black in the middle, dusted with rusty yellow pollen; propleura, sternopleura, hypopleura, and infra-scutellum tinged with black. Wings dark, with a yellow spot around R_6 .

Abdomen tawny, dusted with scattered white pollen (Pl. 4, fig. 6); first and second segments with a pair of marginals, encircled by a round black spot at the base; third and fourth with a row of marginals; first segment tinged with black dorsally, in the middle; third and fourth with two round black spots; fourth with a transverse black stripe at the proximal third.

Length: 8-11 mm.

Material examined: *Brazil, Rio de Janeiro*: 6 ♂, Itatiaia, Macieira, 1800 m, I.1948 (C. d'Andretta) (MZUSP); 1 ♀, Teresópolis, VII.1961 (R. Mello) (MZUSP); *São Paulo*: 6 ♂, 6 ♀, Campos do Jordão, 20.XI.1957 (K. Lenko) (MZUSP); 1 ♂, Campos do Jordão, Fazenda da Guarda, Pinheiro Sêco, 1750 m, 18.III.1964 (Rabello, Biasi & Travassos) (MZUSP); *Santa Catarina*: 5 ♂, 8 ♀, Rio das Antas, I.1953 (Camargo & d'Andretta) (MZUSP).

Distribution: Brazil (Rio de Janeiro, São Paulo, Santa Catarina).

TAXONOMIC DISCUSSION

This species is fairly common in the States of São Paulo and Santa Catarina.

The type-specimen of *vittata* Curran has been examined by the author in 1967, and proved to be the same as *lineata* Townsend.

Trichodura longicauda, sp. n.

(Pl. 3, fig. 1; pl. 4, fig. 3; pl. 5, fig. 6)

♂ — Head yellow, silvery pollinose; front at vertex 0.14 of head width; frontalia golden pollinose; occipital fringe interrupted at eye middle and extending down to oral profile; cheeks yellow, tinged with orange in the middle; antennae orange yellow; occipital hairs orange yellow.

Thorax yellow in ground color, rusty yellow pollinose; mesonotum with the inner dark vittae parallel, fused behind suture, outer vitta broad, before suture; humeri yellow; propleura tinged with black before the anterior spiracle, acrosticals 3:3; sternopleura yellow, bare; infra-scutellum and basiscutellum darkened above; Legs yellow; hind tibia slightly infuscated on distal third; Wings hyaline, tinged with yellow on basis; squama hyaline; upper lobe with black borders.

Abdomen (Pl. 3, fig. 1) yellow, with a dorsal black vitta through its entire length, interrupted just before the marginal row of the fourth segment; first and second segments with a pair of median marginals; third with a marginal row of about 8 bristles encircled by a black at the base, with a silvery pollinose area laterally near the anterior margin; fourth segment prolonged into a long and slender projection bearing several long macrochaetae in all directions. Genitalia as in Pl. 5, fig. 6.

Length — 11-20 mm.

♀ — Front at vertex 0.29 of head width; frontalia yellow, golden pollinose; parafrontalia brown to black, with golden pollen, covered with short coarse hairs.

Abdomen mostly yellow (Pl. 4, fig. 3).

Length — 9-15 mm.

Material examined: *Brazil, Rio de Janeiro*: Holotype ♂, Muri, Nova Friburgo, I.1966 (Gred & Guimarães) (MZUSP); Paratypes: 35 ♂, same locality, XII.1965, 22-24.XII.1964, 1-30.I.1965, I.1966 (Gred & Guimarães) (MZUSP); 12 ♂, same locality, 22-24.XII.1964, I.1965, I.1966 (Gred & Guimarães) (USNM); 9 ♂ same locality, I-II.1966 (J. H. Guimarães) (USNM); 1 ♀, Teresópolis, I.1964 (Mello) (MZUSP); *São Paulo*: 1 ♂, 2 ♀, Estação Biológica de Boracéia, Salesópolis, 14.II.1968 (Oliveira) (MZUSP); 4 ♀ São Paulo, Cantareira, (M. P. Barreto) (MZUSP); *Santa Catarina*: 1 ♀, Rio das Antas, I.1963 (Carmargo & d'Andretta) (MZUSP).

TAXONOMIC DISCUSSION

This species is close to *T. townsendi*, sp. n., differing by having a pair of discals on the third segment of the abdomen.

Trichodura recta Schiner

(Pl. 3, fig. 4; pl. 4, fig. 7)

Trichodura recta Schiner, 1868: 320, pl. 4, figs. 1a-d (Type-locality: Venezuela, as "South America"); Townsend, 1931: 95 (descriptive notes on types).

♂ — Head mostly orange yellow, dusted with yellow pollen; frontalia black with golden pollen; occiput ashy gray pollinose with a few black hairs dorsally.

Thorax black or brownish in ground color; hypopleura, sternopleura, mesopleura, infrascutellum and basiscutellum black; mesonotum and scutellum black, with brassy pollen on the middle, the former with two large black vittae, indistinct behind suture; humeri orange, with golden pollen; squamma hyaline, faintly infuscated; lower squamma with long and weak black cilia on borders. Wings clear, yellowish smoky in the basal region of the longitudinal veins. Legs yellow, tibiae brown to reddish on the middle.

Abdomen (Pl. 3, fig. 4) orange yellow, very elongate, with a continuous narrow black median vitta extending through the whole length of tergites 1-5; second segment without median marginals; third and fourth with one pair; fifth short caudate, subtriangular in lateral view, bearing long bristles on the ventral side.

Length — 16-22 mm.

♀ — Similar to male except for the following: front at vertex 0.28 of head width; parafacialia yellow, pale yellow pollinose.

Abdomen conic in dorsal view; first segment without marginals; second and third segments with a pair of median marginals; second to fourth segments with a velvety black transverse stripe on the dorsum near the anterior margins, followed by a narrow transverse pale yellow pollinose stripe, dorsal spots as in Pl. 4, fig. 7.

Length — 11 mm.

Material examined: 1 ♂, labelled "Schiner 1869, *recta* Schiner, det. BB, S. America, Alte Sammlung", which was selected and labelled as the Lectotype of the species (NM); 1 ♀, labelled "Lindig 1864 Venezuela, *recta* Schiner, det. BB", paralectotype (NM).

TAXONOMIC DISCUSSION

This species differs from all other, except *T. sabroskyi*, sp. n., by the lack of median marginals in the first segment of the male; both sexes have the border of the lower squamma ciliate; the male abdomen is short caudate, with long bristles only on the ventral side.

Schiner's description of *recta* was based upon 9 ♂ and 6 ♀, stated to be only from "South America". Dr. A. Kaltenbach informed me very recently (*in litt.*) that presently this species is represented in the Naturhistorisches Museum (Vienna) by 7 ♂ and 5 ♀, but none of the specimens belongs to the original material of the Novara Expedition. Two males are labelled "Schiner 1869" (Schiner's Novara paper was published in 1868), "S. America, *Trichodura recta*, det. B.B.". The remaining specimens were collected by Lindig in 1864 and also identified by Brauer & Bergenstamm. According to Dr. Kaltenbach, the original material of Schiner is apparently lost.

Schiner used many non-Novara specimens in his 1868 work, and in many places cites Lindig as collector, but he does not do so for *recta*.

I concur with Sabrosky (*in litt.*) that it is reasonable to accept the Lindig series as the syntypes of this species. Moreover, Brauer & Bergenstamm seem to have put their identification labels on everything; in the U. S. National Museum there are two old specimens of *recta* which came in the Townsend collection — Townsend got them himself in Vienna. The male is labelled "Venezuela, *recta* Schin./det. BB", and the female "*recta* Schin., det. B.B./S. America/Alte Sammlung".

According to Dr. Sabrosky (*in litt.*) the female specimen belongs to the original syntypic series.

Townsend (1931: 95) says "Male Ht and female At in Vienna"; however, since he did not put labels on the specimens, and in view of the number of specimens, he cannot be considered to have fixed a lectotype.

Through the kindness of Dr. A. Kaltenbach I have received for study two specimens labelled "Schiner 1869/*recta* Schin./det. B.B.", S. America. Alte Sammlung", a ♂; and "Lindig 1864", a ♀. The former specimen fits perfectly the original description, and also the data given by Schiner, so I am fixing it as the lectotype of this species.

***Trichodura sabroskyi*, sp. n.**

(Pl. 3, fig. 5)

♂ — Head brownish red in ground color; upper half of occiput and front black, dusted with brown pollen; front at vertex 0.12 of head width; ten pairs of frontals and a pair of long ocellars present; inner verticals short, the outer pair not developed; hairs of occiput yellow, with a few black hairs on the upper half; occipital cilia black and extending weakly to the lower edge of the eyes; cheeks reddish brown; facial carina strong, widening towards the epistoma; palpi and proboscis reddish yellow, the former with fairly abundant black hair apically; antenna reddish, arista with long brownish rays.

Thorax black in ground color; mesonotum dusted with brownish pollen in the middle, with indications of four opaque interrupted blackish vittae before suture; scutellum reddish, dusted with golden pollen; pleura black with whitish pollen; squamma faintly fuscous. Wings hyaline, strongly tinged with brown. Legs reddish; tibiae somewhat darkened apically.

Abdomen (Pl. 3, fig. 5) dull reddish yellow, dusted with whitish pollen, with a broad opaque black vitta extending from the base to the apex of the third segment; abdomen subconic, gradually tapering to tip; first segment without median marginals; second with a pair of erect median marginals; third with a row of marginals; fourth brown above, dusted with white pollen laterally.

Length — 12.5 mm.

Holotype ♂, *Brazil, Rio de Janeiro, Teresópolis*, 2.II.1960 (R. Mello) (MZUSP).

TAXONOMIC DISCUSSION

Slightly more robustly built than *recta*, from which it differs principally by the black sternopleura covered with long black hairs; the squamma does not have the long black cilia at the border as in *recta*.

This species is dedicated to Dr. C. W. Sabrosky.

***Trichodura townsendi*, sp. n.**

(Pl. 3, fig. 2; pl. 4, fig. 2; pl. 5, fig. 4)

♂ — Head yellow, silvery pollinose, darker at vertex; front at vertex 0.12 of head width; cheeks yellow, silvery to white pollinose; palpi yellow, with a few hairs on tip; occipital hairs yellow, with a few black hairs on top.

Thorax yellow, lateral stripes not reaching anteriorly the prosteronum; mesonotum blackish dorsally, rusty yellow pollinose; inner and outer dark vittae very distinct, interrupted at suture; infrascutellum black; basiscutellum yellow; sternopleura yellow, with scattered black hairs between the sternopleurals; squamma hyaline, lightly infuscated. Legs yellow, tarsi black. Wings hyaline, tinged with yellow basally.

Abdomen (Pl. 3, fig. 2) yellow, with a narrow median vitta extending through the whole length of tergites 1-4; first and second segments with a pair of median marginals; third with a row of about six marginals; fourth yellow, with a dorsal polished triangular spot at the base, prolonged in a slender and cylindrical appendage bearing long macrochaetae; the bristles of the dorsal side roughly half the size of the ventral ones. Genitalia as in Pl. 5, fig. 4.

Length — 17.5-19 mm.

♀ — Head yellow, golden pollinose; front 0.27 of head width; cheeks yellow, orange in the middle; occiput black on upper half.

Thorax yellow in ground color; mesonotum brown in the middle, golden pollinose; scutellum yellow, darkened at the sides; infrascutellum brown. Wings hyaline, black, tinged with yellow on the basal half.

Abdomen polished yellow, with a black median vitta extending through the whole length of tergites 1-3; fourth segment polished yellow above, silvery pollinose at the sides (Pl. 4, fig. 2).

Length — 11-14 mm.

Material examined: *Brazil, São Paulo*: Holotype ♂, Estação Biológica de Boracéia, Salesópolis, 9.I.1966 (J. H. Guimarães) (MZUSP). Paratypes: same locality, 1 ♂, 13.II.1965 (Rabello), 1 ♀, 16.III.1968 (Oliveira), 1 ♀, III.1949 (L. Travassos F.º & E. Rabello), 1 ♀, II.1949 (M. Carrera), 2 ♀, 7-11.IV.1955 (Werner), (MZUSP); *Guapiara*, 4.III.1958 (K. Lenko) (MZUSP); *Paraná*: Piraquara, II.1942 (Halschbach) (MZUSP).

TAXONOMIC DISCUSSION

This species is close to *T. friburguensis*, sp. n., differing mainly in the shape of the outer forceps.

Trichodura vidua Schiner

(Pl. 3, fig. 7; pl. 4, fig. 1)

Trichodura vidua Schiner, 1868: 321 (Type-locality: "Brazil", i. e., Rio de Janeiro).

♂ — Head yellow, silvery to white pollinose; front at vertex 0.22 of head width.

Thorax black dorsally, slightly infuscated laterally; humeri and prosternum yellow; sternopleura with a few black hairs between the sternopleurals; scutellum yellow, golden pollinose; infrascutellum and basiscutellum black. Wings hyaline, slightly infuscated towards apex; squamma small, subcircular in shape. Legs yellow, tarsi black.

Abdomen (Pl. 3, fig. 7) yellow, with a dorsal median vitta extending along segments 1-3; fourth segment not prolonged into a tail process; first and second segments with a pair of marginals; third and fourth with a row of marginals; fourth with a triangular, polished black spot dorsally on the basal half.

Length — 8-11 mm.

♀ — Front darkened, dusted with golden yellow pollen; front at vertex 0.32 of head width; cheeks tinged with yellow in the middle; occipital hairs yellow, with a few black hairs dorsally.

Thorax yellow laterally, white pollinose; mesonotum black, brownish pollinose; inner black vitta fused behind suture; humeri yellow; sternopleura yellow, with a few black hairs between the sternopleurals; infrascutellum and basiscutellum black, dusted with brownish pollen; squamma hyaline, small, subcircular. Legs yellow; tibiae slightly infuscated; tarsi black.

Abdomen ovoconic, orange yellow, silvery pollinose ventrally; first, second, and third segments with a pair of median marginals; fourth silvery pollinose laterally, with a row of marginals; black spots on abdomen as in Pl. 4, fig. 1.

Length — 7.5-10 mm.

Material examined: *Brazil, Rio de Janeiro*: 2 ♀, 1 ♂, Teresópolis, 20.XI.1939 (Freitas) (MZUSP); 2 ♀, Jussaral, Angra dos Reis, 26.X.1935 (S. Lopes & H. Lent) (MZUSP); 1 ♀, Itatiaia, 24.I.1948 (d'Andretta) (MZUSP); 1 ♀, Mangaratiba, III.1933 (Serv. Febre Amarela) (MZUSP); *Guanabara*: 1 ♀, Rio de Janeiro (Alto da Boa Vista), 28.I.1952 (Seabra) (MZUSP); Rio de Janeiro (Tijuca), 29.VIII.1939 (Freitas & Lopes) (MZUSP); *São Paulo*: 1 ♀, Campos do Jordão, Fazenda da Guarda, Pinheiro Sêco, 1750 m, 18.III.1964 (Rabello, Biasi & Travassos F.º) (MZUSP); 1 ♀, same locality, 31.III.1965 (N. Papavero, J. H. Guimarães & L. Travassos F.º) (MZUSP).

Distribution: Brazil (Rio de Janeiro, São Paulo).

TAXONOMIC DISCUSSION

This species was described by Schiner (1868) from a female, labelled "Brazil". According to Gans (1955), the naturalists of the Aus-

trian frigate Novara collected in Brazil only in Rio de Janeiro and its neighborhood, and in the city of Petrópolis, now in the State of Rio de Janeiro. This restricts the type-locality of *T. vidua* to the area comprised between those two cities.

Schiner's description mentions the characteristic M-shaped velvety black spot of the third abdominal tergite, which separates this species from the other known species. Both sexes have the lower squamma small, evenly rounded. The male has not the anal segment prolonged into a slender cylindrical appendage.

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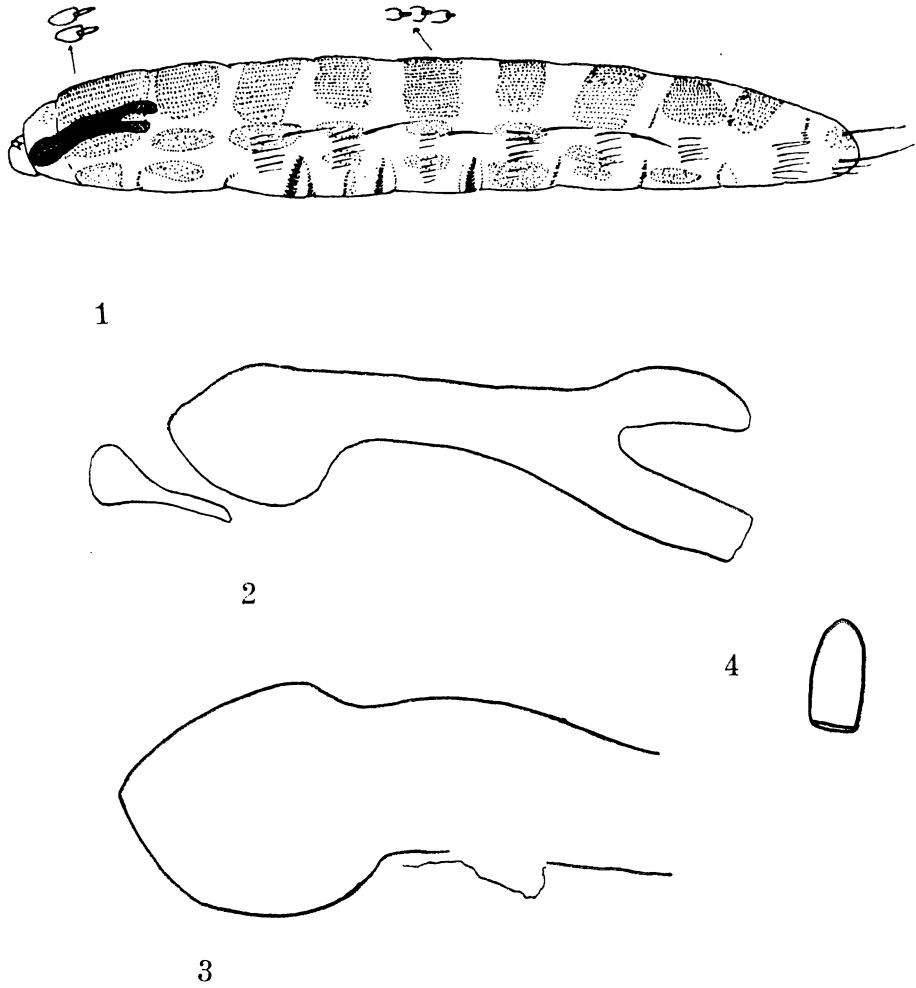


Plate 1. *Trichodura longicauda*, sp. n.: 1, primary larva, lateral view; 2, bucco-pharyngeal armature; 3, detail of anterior region of larva; 4, antennal organ.

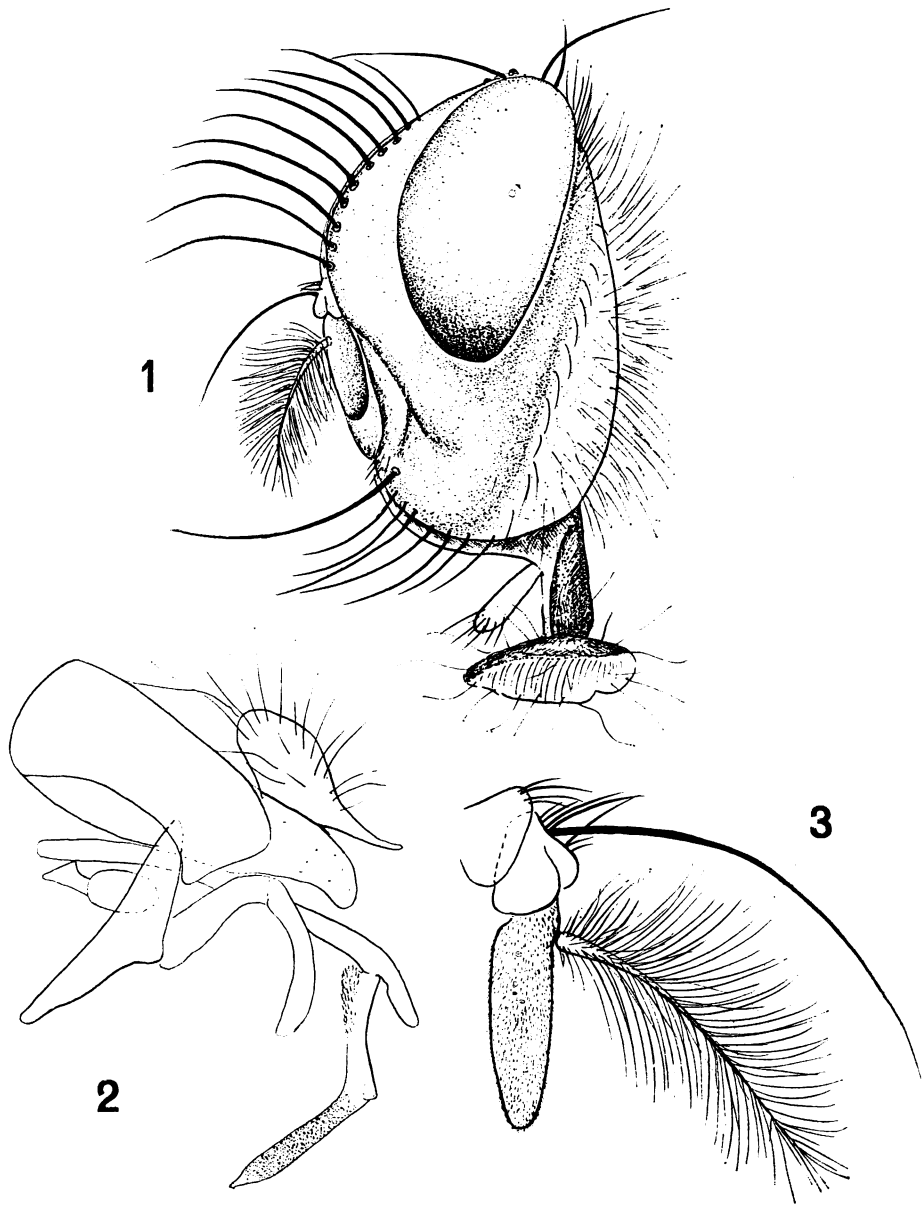


Plate 2. 1, *Trichodura anceps* (Fabricius), male head, lateral view; 2, *Trichodura townsendi*, sp. n., male genitalia, lateral view; 3, *Trichodura anceps* (Fabricius), male, detail of antenna.

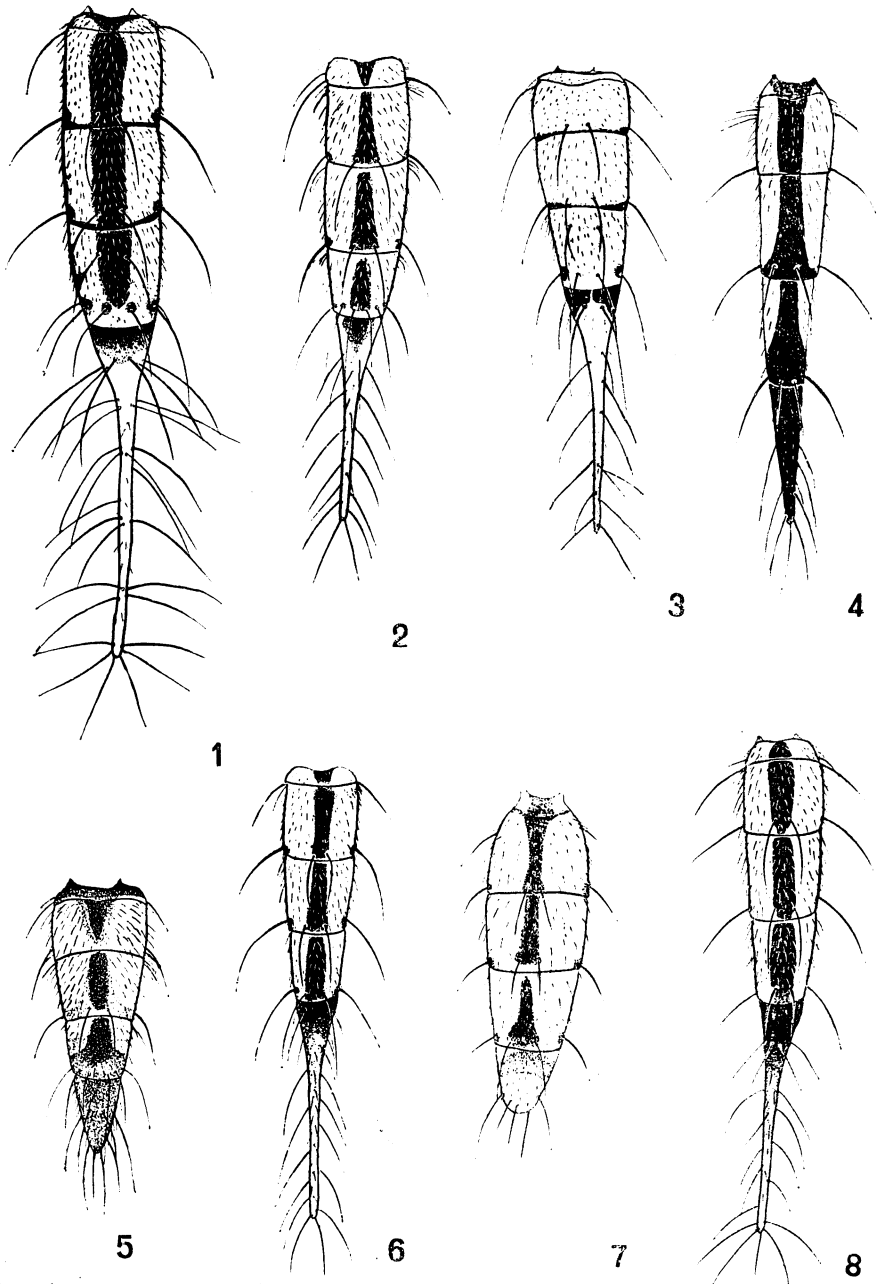


Plate 3. Male abdomen of *Trichodura*: 1, *longicauda*, sp. n.; 2, *townsendi*, sp. n.; 3, *anceps* (Fabricius); 4, *recta* Schiner; 5, *sabroskyi*, sp. n.; 6, *friburguensis*, sp. n.; 7, *lineata* Townsend; 8, *lineata* Townsend.

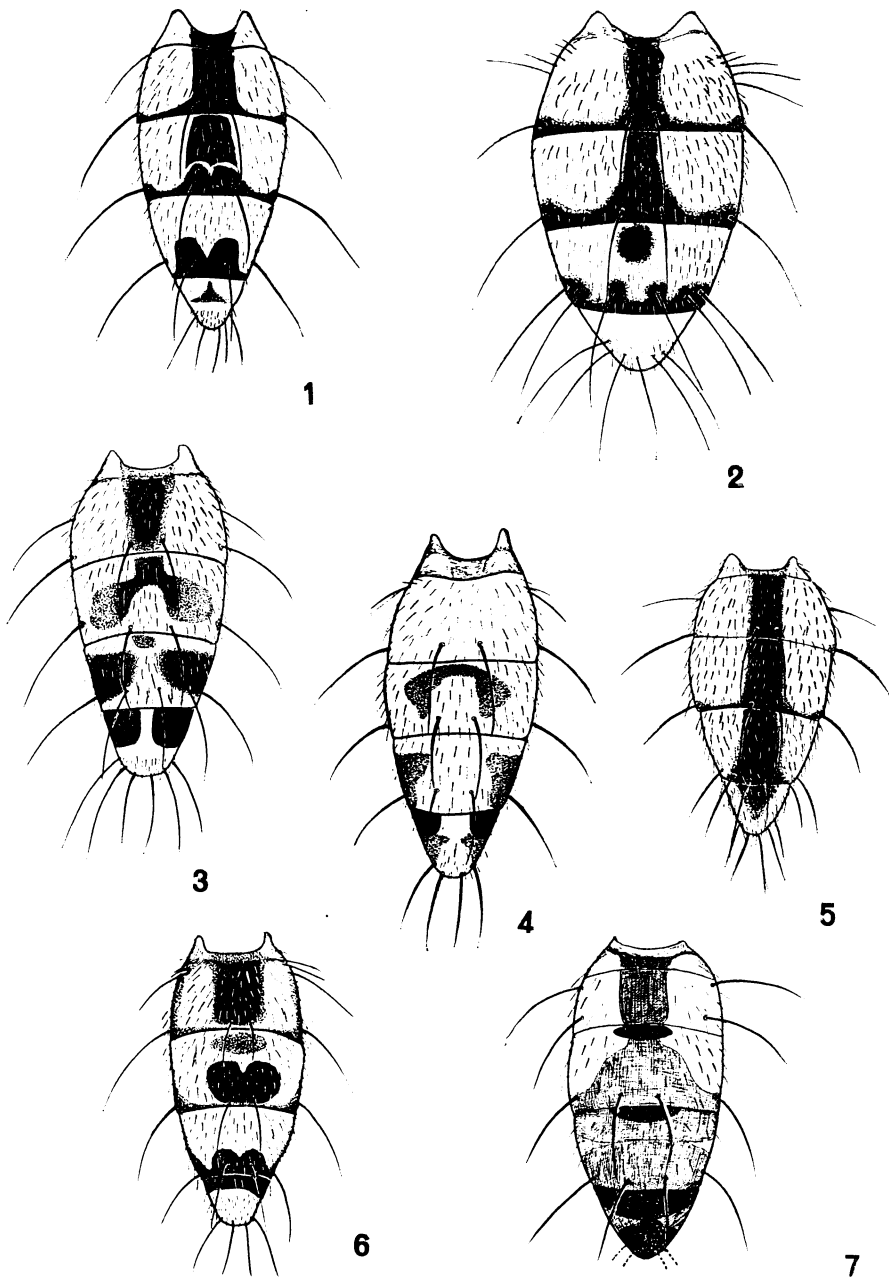


Plate 4. Female abdomen of *Trichodura*: 1, *vidua* Schiner; 2, *townsendi*, sp. n.; 3, *longicauda*, sp. n.; 4, *anceps* (Fabricius); 5, *friburguensis*, sp. n.; 6, *lineata* Townsend; 7, *recta* Schiner.

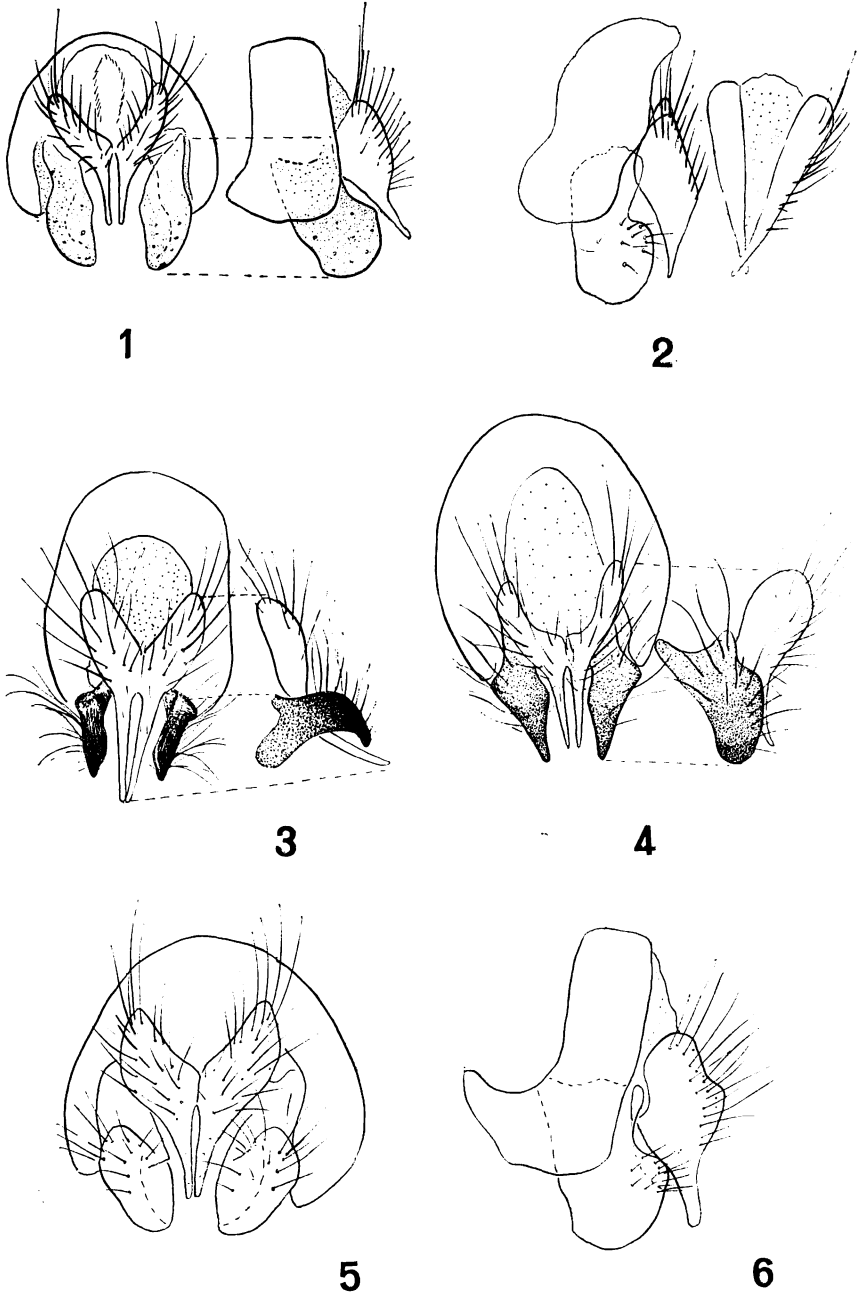


Plate 5. Male genitalia of *Trichodura*: 1, *lineata* Townsend; 2, *anceps* (Fabricius); 3, *friburguensis*, sp. n.; 4, *townsendi*, sp. n.; 5-6, *longicauda*, sp. n.