

Papéis Avulsos de Zoologia

PAPÉIS AVULSOS ZOOL., S. PAULO, 30 (18): 267-288

20.I.1977

A REVISION OF THE GENUS *PARATHERESIA* TOWNSEND (DIPTERA: TACHINIDAE, THERESIINI)

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ABSTRACT

The Neotropical genus Paratheresia Townsend (Diptera, Tachinidae, Theresiini) is revised. A key is given to the 11 species (7 new) recognized as valid. Distributional and biological data are summarized.

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1. INTRODUCTION

The Neotropical genus *Paratheresia* Townsend was described by Townsend (1915) based on *Paratheresia signifera* Townsend from Peru (= *Sarcophaga claripalpis* Wulp, 1896). This genus, close to *Eutheresia* Townsend and *Theresia* Robineau-Desvoidy, was placed together with *Billaea* Robineau-Desvoidy and some related groups in the Tribe Theresiini, subfamily Proseninae (Townsend, 1936). The Theresiini are almost cosmopolitan and have been recorded as parasites of wood or stalkboring coleopterous larvae of Cerambycidae, Curculionidae, Lucanidae and lepidopterous borers of the family Pyralidae (*Diatraea* spp.).

The identity of species belonging to the complex *Paratheresia* Townsend constitutes one of the most difficult problems in the systematics of the Tachinidae. The group belongs to one of the familiar tachinid complexes, of which no consistent diagnostic differences have been observed in the male genitalia, chaetotaxy, proportions, etc., and which differs mainly in color and host association. The variations occurring in samples a single locality or reared from the same hosts is so high,

that in most cases it is almost impossible to find a harmonious set of characters which may be consistent through the series.

Townsend (1936) recognized four species of *Paratheresia* based in coloration only. Later (1939b) he published a more elaborate study of what he called "supergen^{us} *Paratheresia*" a group comprising three valid genera: *Parabillaea* Townsend, *Paratheresia* Townsend and *Bathytheresia* Townsend. According to his classification, *Parabillaea* and *Bathytheresia*, both monotypic, were recognized as parasites of weevil grubs; in the genus *Paratheresia* 7 species were recognized: *rufiventris* Townsend, *brasiliensis* Townsend, *argentaurea* Townsend, *claripalpis* Wulp, *signifera* Townsend, *diatraeae* Brèthes and *pernambucensis* Townsend. Prior to publication of Emden's (1949) paper the nomenclatural status of species of this complex was little less than chaotic; in that paper the 7 species recognized by Townsend were reduced to 2, *claripalpis* Wulp and *brasiliensis* Townsend.

In the present paper 11 species are recognized in this complex, 7 of which described as new.

Certain species of *Paratheresia* (viz. *claripalpis*) are parasitoid of gramminaceous stem-borers of the genus *Diatraea* (Pyralidae) in Tropical America and have been the object of extensive colonization efforts for the biological control of this pest; a historical review of these attempts has been presented by Townsend (1936: 148) and Bennett (1969).

It seems certain that in this group there are strains or races belonging morphologically within the limits of what the entomologists call "species", but which differ markedly in their choice of hosts, as well in other behavioural characteristics.

Nevertheless, whilst admitting the desirability of recognizing these host-specific forms as distinct, the writer does not deem the investigations having proceeded far enough yet to justify such a change. In practical terms a conservative attitude to the formal naming of taxa is appropriate in situations of uncertainty.

ABREVIATIONS

- AMNH American Museum of Natural History, New York
 BM British Museum (Natural History), London
 CNC Canadian National Collection, Ottawa, Canada
 LM Estación Experimental Agrícola de "La Molina", Lima, Peru
 USNM National Museum of Natural History, Smithsonian Institution, Washington, D.C.

2. ACKNOWLEDGMENTS

The author is deeply indebted to Dr. C. W. Sabrosky, U.S. Department of Agriculture, Washington, D.C. for much helpful advice and assistance and for criticism of the manuscript. I also extend my thanks to: Drs. D. M. Wood (CNC); P. Wygodzinsky (AMNH); Nelsilia Gama Saraceni, O. Terán, A. O. Roccia, Copersucar, São Paulo; Artur F. Mendonça F.^o and Egle A. M. de Arruda, Planalsucar, IAA,

Brasil; Fred Bennett, Commonwealth Institute of Biological Control, Trinidad W. I. and Eurípedes Menezes (UFRRJ) for the loan of material.

Genus *Paratheresia* Townsend

Paratheresia Townsend, 1915. Type-species, *P. signifera* Townsend (orig. des.); Townsend, 1936: 148; 1938: 402; 1939a: 546; Sabinosky in Emden, 1949: 507; Guimarães, 1971: 37.

Bathytheresia Townsend, 1928: 146. Type-species, *B. bassleri* Townsend; 1936: 148; 1938: 391; 1939a: 546.

Parabilaea Blanchard, 1937: 44. Type-species, *P. Rhynchophorae* Blanchard (orig. des.); Townsend, 1938: 431; 1939a: 546.

Theresia, authors not Robineau-Desvoidy, *partim*.

Genus of Theresiini with the following combination of characters: Eyes bare. Frontals short, fine, in a row of 15 to 17 cruciate bristles extending from ocellar triangle to a point opposite the first antennal segment. Inner verticals reclinate and nearly parallel. Parafrontalia usually with a row of very fine hairs; two or three reclinate orbitals in female. Parafacialia bare, less than facial plate width in male but at least facial plate width in female. Vibrissae strong, with a small group of short black cilia above. Ocellars strong. Clypeus sunken. No facial carina but only a low ridge on median line. Epistoma protruding abruptly forward almost to the level of the base of antennae. Antennae with the third segment about twice as long as second; arista slightly longer than third antennal segment, slightly thickened at base but tapering to beyond the middle, moderately long plumose on both sides with rather widely spaced hairs on tip. Haustellum short, about as long as antennae; slender in male, stout clavate in female, with numerous black hairs.

Thorax narrower than head, slightly longer than wide. Mesonotum usually with polished black stripes. Acrostichals 2: 1; dorsocentrals 3: 4 (2: 3 in *shannoni* sp. n.); humerals 3 or 4 in line; posthumeral 1; intraalars 1: 2; supraalars 1: 3; notopleurals 2; sternopleurals 2 or 3. Propleura thickly pilose. Barrete sparsely setose with 7 to 8 bristles on the posterior margin. Scutellum gently convex, rounded behind with two strong laterals, a pair of weak cruciate apicals and one or two weak discals. Wings clear, costal vein infuscated; *r-m* about middle of discal cell; R 4+5 slightly bent downward ending with an acute bent. Costal spine absent. Legs with tarsi equal in length to the tibiae; all tarsi slender; claws and pulvilli short in male; hind tibiae ciliated in male.

Abdomen slightly longer than thorax, long ovate in female; T 1+2 excavated to posterior borders; T 1+2 and T 3 without discals or marginals; T 4 and T 5 with a row of marginals. Genitalia of type II; distiphallus of *Dexia* subtype; posterior parametre of C type (cf. Verbeke, 1963).

Distribution. Neotropical (except Chile and southern Argentina), U.S.A. (Florida).

4. KEY TO THE SPECIES
(BASED ON MALES)

1. Thorax and abdomen thickly dusted, with whitish to yellowish pollen; mesonotum usually with distinct black vittae .. 2
 Thorax and abdomen shining black, thinly dusted with whitish pollen; mesonotum without distinct vittae, except for two linear median stripes between the presutural acrostichals and dorsocentrals; claws and pulvilli elongate *korterae*
- 2 (1). Two sternopleurals; abdomen elongate, subcylindrical, with distinct pollinose triangles on abdominal T 1+2 to T 5 .. 3
 Three sternopleurals; abdomen ovoconic to subtriangular ... 5
- 3 (2). Front narrow at vertex (0.08-0.11 of head width); gena narrow in profile (0.12-0.19 of eye height) 4
 Front not narrowed (0.17 of head width); gena wide (0.35 of eye height); surstyli broad, subtriangular in profile (fig. 11) *giacomeli*
- 4 (3). Surstyli narrow and elongate (fig. 20); parafacialia narrow, about as wide as parafrontalia *plawmanni*
 Surstyli broad, subtriangular in profile (fig. 17); parafacialia distinctly wider than parafrontalia *friburgensis*
- 5 (2). Mesonotum with three to five linear thoracic vittae 6
 Mesonotum with three distinct broad thoracic vittae 7
- 6 (3). Prescutum with one distinct median inner vitta; ocellars long and strong; claws and pulvilli elongate; surstyli subquadrate in profile, rounded at apex (fig. 19) ... *shannoni*
 Prescutum with three narrow and elongate vittae on middle; ocellars normal in size; claws and pulvilli short; surstyli broad, spatulated, ogival in profile (figs. 10, 12)
 *rufiventris*
- 7 (5). Surstyli falciform (figs. 16, 18) 8
 Surstyli broad at base, oval to ogival in profile 9
- 8 (7). Surstyli more or less uniform in width; abdomen reddish brown, yellowish on tip (parasite of curculionid grubs) ..
 *menezesi*
 Surstyli with a round protuberance at base in lateral view; abdomen reddish brown, darkened on apex (parasite of cerambycid grubs) *cerambycinora*
- 9 (7). Parafrontalia silvery; parafacialia golden pollinose with a rather abrupt line of demarcation opposite the bases of antennae; surstyli subtriangular in profile (fig. 13) *argentaurea*
 Parafrontalia and parafacialia concolorous, varying from silvery to golden pollinose; abdomen yellowish to dark brown in ground color; surstyli usually elongate, more or less rounded at apex in profile 10
- 10 (9). Robust species; front broad at vertex (0.23 to 0.25 of head width); parasite of curculionid grubs *rhynchophorae*
 Small to medium sized species; frontalia less than 0.22 of head width *claripalpis*

5. DESCRIPTION OF SPECIES

Paratheresia claripalpis (Wulp)

(Figs. 21-24, 29)

- Sarcophaga claripalpis* Wulp, 1896: 280. Type-locality, Mexico, Chilpancingo, Guerrero (BM).
- Paratheresia claripalpis* (Wulp); Aldrich, 1930: 34; Townsend, 1936: 145; 1939a: 547; Sabrosky *in* Emden, 1949: 507; Thompson, 1960: 218 (larva); 1963: 522; Guimarães, 1971: 37.
- Theresia claripalpis* (Wulp); Aldrich, 1934: 107.
- Paratheresia signifera* Townsend, 1915: 66. Type-locality, Peru, Rio Chira, near Sullana (USNM); Box, 1929: 199; Aldrich, 1929: 33; 1930: 34; Townsend, 1936: 145, 150; 1938: 632; 1939a: 547.
- Paratheresia brasiliensis* Townsend, 1917: 222. Type-locality, Brazil, Mato Grosso, Chapada dos Guimarães (USNM); Townsend, 1936: 145, 150; 1939a: 547; Souza, 1942: 12, 16. N. comb.
- Sarcophaga diatraeae* Brèthes, 1927: 165. Type-locality, Argentina, Tucumán (MLP, paratypes in BM and USNM).
- Bathytheresia bassleri* Townsend, 1928: 146. Type-locality, Peru, Ushpacyacu River, 1,300 ft. (USNM); Townsend, 1936: 150; 1939a: 546.
- Paratheresia diatraeae* (Brèthes); Aldrich, 1929: 34; Townsend, 1936: 145, 150; 1939b: 547.
- Paratheresia bassleri* Townsend, 1929: 367. Type-locality, Peru, Ushpacyacu River (USNM); Townsend, 1936: 150; 1939a: 547; Sabrosky *in* Emden, 1949: 504.
- Paratheresia pernambucensis* Townsend, 1939a: 548. Type-locality, Brazil, Pernambuco, Tapera (USNM); Sabrosky *in* Emden, 1949: 506.

Head width slightly less than twice the length from occiput to base of antennae. Front at vertex 0.15-0.21 of head width in male; 0.32-0.46 in females. Head densely gray to silvery pollinose. Parafrontalia and parafacialia with a faint bronze tinge in male. Parafrontalia usually tinged with golden pollen in female. Genae grooves and parafrontalia near eye brownish red in ground color. Antennae inserted below the middle of the eye. Frontal vitta and ocellar triangle dark brown to black. Antennae and aristae dark brown; second antennal segment reddish. Haustellum dark brown, labella yellowish. Palpi orange, almost as long as antennae. Facial plate well sunk with a gently swollen median elevation becoming more acute toward the base of the antennae; epistoma protruding forward.

Thorax slightly narrower than head. Mesonotum thickly whitish pollinose with three rather broad polished black vittae; the inner one extending between the acrostichals to scutellum, widening slightly posteriorly; outer vittae extending from the inner angle of the humerus between the dorsocentrals and the line of the intraalars to the scutellum. Scutellum grey pollinose, slightly convex, rounded behind. Pleura grey pollinose; mesopleura blackish on borders. Sternopleurals 3. Legs dark brown; tarsi slender, claws and pulvilli small. Wings clear, veins brown. Cell R 5 broadly open well before wing tip; *r-m* about middle of discal cell; vein M with an acute bend.

Abdomen longer than thorax including scutellum, reddish brown to yellowish in male, dark brown in female. Genitalia with surstylus broad, more or less ovoid in profile (figs. 21-24, 29).

Distribution. Neotropical Region (except Chile, and Southern Argentina). USA (Florida, Louisiana, introd.).

Considerable confusion has existed concerning the identity of this species; the adults are extremely variable in size and coloration, and it would be difficult to present a comprehensive description of its characters that would definitively exclude other species.

The above description however should be taken as a guide for identification, was based in the study of about 420 specimens reared from *Diatraea* spp. from several localities in South America. Unfortunately the male genitalia in this group is not the only sure criterion for diagnosis but their examination should be resorted to wherever there is an element of doubt.

A considerable literature has accumulated upon this species, its habits and life history, hosts, in different countries which it would be impossible to review even briefly in these pages. In spite of this mass of published data, however, the writer believes that there is no other tachinid of such importance in the Neotropical Region about which so little fundamental knowledge is available.

Sarcophaga claripalpis Wulp. Described from 1 male and 4 females from "Mexico, Chilpancingo, Guerrero, 4,600 ft." and Northern Yucatan all of which are preserved in British Museum. Aldrich (1930) stated that all specimens were conspecific except the female from N. Yucatan which proved to be a sarcophagid. A male, somewhat damaged by dermestids was studied in considerable details and designated as lectotype by Emden (1949).

Paratheresia signifera Townsend. According to Aldrich (1929) this species was reared at Tucumán, Argentina in 1911 to 1913 by Rosenfeld and Barber from the sugarcane borer *Diatraea saccharalis*, being discussed and figured by these authors without a scientific name (cf. Rosenfeld & Barber, 1914); Townsend (1915) described this species from a single female which he found resting on tree trunk in Peru. Sabrosky in Emden (1949) studied the type material and pronounced it to be a synonym of *P. claripalpis*.

Paratheresia brasiliensis Townsend. According to Emden (1949) this species differs markedly from *claripalpis* mainly by the densely fuscous-dusted and therefore not shining vittae of the mesonotum. Sabrosky in Emden (*loc. cit.*) stated that there are no reliable differences for separating the females of *rhynchophorae* and *brasiliensis* tentatively suggesting the two species as conspecific. I have received for study from the AMNH males and females, besides the female paratype of *P. brasiliensis*; the material above belongs the topotypic series collected by H. H. Smith in Chapada, MT, Brazil. All specimens examined presented the normal shining vittae on mesonotum as in *claripalpis* so I prefer to consider *P. brasiliensis* as synonymous of *P. claripalpis* until more data are available.

Paratheresia diatraeae (Brèthes). According to Emden (1949) the male genitalia of a specimen in BM belonging to the original type series (reared from *Diatraea saccharalis* in Tucumán, Northern Argentina) is identical with those of *P. claripalpis* Wulp. Both Aldrich (1929)

and Box (1929) stated that *diatraeae* and *signifera* are synonym I agree with Emden (*loc. cit.*: 503) that *signifera*, *diatraeae* and *claripalpis* cannot be considered separate forms.

Bathytheresia bassleri Townsend. According to Emden (1949) this species may be the same as *P. claripalpis*. The main feature for distinguishing *Bathytheresia* from *Paratheresia* is the width of the vertex in the female. According to Sabrosky *in* Emden (*loc. cit.*) the female holotypes of both species present exactly the same width of vertex (0.28 times the width of the head).

Paratheresia bassleri Townsend. According to Emden (1949) this species cannot be separated morphologically from *claripalpis* on external characters only. The holotypes of *P. signifera* and *P. bassleri* (said to have brassy scutellum) were set side by side under the microscope by Sabrosky *apud* Emden (*loc. cit.*) who did not find any difference in the color of scutellum.

Paratheresia pernambucensis Townsend. Described from 1 male and 1 female from Tapera, Pernambuco. This species presenting light abdomen and golden head was reported as doubtful synonym of *P. claripalpis* by Sabrosky *in* Emden (1949).

Material studied. West Indies, Trinidad. 25 males, 18 females (ex. *D. saccharalis*), (CNC, MZSP). Brazil. Pará: Santarém, 1 male (MZSP); Pará: Fazenda Taperinha, 1 male (MZSP). Rio Grande do Norte: Ceará Mirim, 1 female (MZSP); Mato Grosso: Chapada, 7 males, 2 females (AMNH); Três Lagoas, 2 males (MZSP); Rio Papagaio, 1 male (MZSP); Bodoquena, 1 male (MZSP); Salobra, 1 male; Maracaju, 1 male (MZSP). Goiás: Anápolis, 1 male (MZSP); Jataí, 1 male (MZSP); Campinas, 1 male, 1 female (MZSP); Santa Helena, 1 male, 3 females (ex. *D. saccharalis*), (MZSP). Minas Gerais: Cambuquira, 1 male (MZSP); Serra do Cipó, 1 male (MZSP). Rio de Janeiro: Guaratiba, 4 males (MZSP); Itatiaia, 3 males (MZSP); Nova Friburgo, 22 males, 2 females (on tree trunks, MZSP); Teresópolis, 2 males (MZSP). São Paulo: Araçatuba, 2 males (MZSP); Barueri, 1 male (MZSP); Campos do Jordão, 1 female (MZSP); Caraguatatuba, 2 males (MZSP); Cássia dos Coqueiros, 1 male (MZSP); Ilha dos Búzios, 1 male (MZSP); Rio Claro, 1 male (MZSP); Salesópolis, 1 male, (MZSP); Ribeirão Preto, 30 males, 55 females (Ex. *D. saccharalis*) (MZSP). Paraná: Iguacú, 1 male (MZSP). Santa Catarina: Nova Teutônia, 29 males, 15 females (MZSP, CNC). Rio Grande do Sul: São João de Montenegro, 1 male (MZSP). Colombia. Cali, 5 males, 6 females (Ex. *D. saccharalis*), (MZSP). Peru. Avispas, 1 male, 3 females (CNC, MZSP); Cuzco, 1 male (CNC). Ecuador, Loja, 1 female (MZSP). Bolivia. Santa Cruz, 11 males, 5 females (MZSP) (Ex. *Diatraea saccharalis*) (MZSP). Paraguay. Asunción, 1 male (MZSP).

***Paratheresia giacomeli*, sp. n.**

(Figs. 9, 11 and 27)

Male. Total length 9 mm

Head yellow, pale yellow pollinose. Front at vertex 0.17 of head width. Parafrontalia narrow, covered with small black cilia. Frontalia

black. Ocellars slender and divergent. Inner verticals decussate; outer verticals small and distinct from postocular row. Genae 0.35 of eye height, whitish pollinose, covered with short black cilia. Antennae reddish brown. Facialia dark brown, with few black setulae above vibrissae. Palpi slender and clavate.

Thorax black, thickly whitish pollinose. Mesonotum with three broad vittae. Acrostichals 3:2; dorsocentrals 3:4. Sternopleurals 2. Wings hyaline; epaulet and subepaulet black. Calypteres hyaline, thinly dusted with testaceous pollen.

Abdomen long, ovoconic, dusted with thickly black pollinose triangles on T 1+2 to T 5 (fig. 27). Genitalia with surstyli broad, subtriangular in profile (figs. 9, 11).

Holotype male, Sta. Felicidade, Curitiba, Paraná, Brazil, 16.X. 1973, F. Giacomel leg. [Ex larvae of *Trypanidium dimidiatum* Thoms., Cerambycidae (MZSP)].

Paratheresia menezesi, sp. n.

(Figs. 4, 16)

Male. Total length 7-10 mm

Head yellow, pale yellow to golden pollinose. Front at vertex 0.18 to 0.20 of head width. Parafrontalia covered with black hairs. Ocellar triangle black, covered with elongate cilia; ocellars fine and elongate, hardly differentiated from ocellar triangle hairs. Frontals 15. Antennae yellowish; third segment brownish, yellowish on base. Facialia yellow, tinged with brown around vibrissae, with a group of small black cilia above vibrissae. Genae 0.28 of eye height, pale yellow to golden pollinose, covered with a few black elongate hairs. Palpi yellow. Occiput black, silvery pollinose, covered with dense whitish hairs and few black cilia behind postocular row.

Thorax dark brown to black, dusted with thick white to pale yellow pollen, more dense on humeral calli and notopleura. Mesonotum with three distinct black vittae. Acrostichals 3:2; dorsocentrals 3:3 to 3:4; sternopleurals 2:1. Wings hyaline; calypteres white, faintly testaceous pollinose. Legs black.

Abdomen dark brown, thickly covered with white and testaceous pollinose triangles; abdominal T 5 reddish on tip; T 4 and T 5 with a row of median marginals. Cerci yellow; surstyli sclerotized, falciform with a rounded protuberance at base (figs. 4, 16).

Holotype male, Itaguaí, Rio de Janeiro, Brazil, 23.XI.1974, E. Menezes (Ex larvae of *Homalinotus coriaceus* (Gyll.), Curculionidae). Paratypes. 7 males, 13 females, same data as holotype, all teneral; 5 males, 3 females, São Gonçalo, Rio de Janeiro, Brazil, A. F. Lima (MZSP, UFRRJ); 11 males, Muri, Nova Friburgo, Rio de Janeiro, XII.1971, Gred & Guimarães (MZSP).

Paratheresia kosteræ, sp. n.
(Figs. 2 and 15)

Male. Total length 9-10 mm

Head yellow pollinose. Front at vertex 0.16-0.17 of head width. Frontalia subtriangular, broad at base of antennae, widening toward apex. Frontals 8-12 converging towards apex. Parafrontalia narrow, covered with scattered black setulae. Inner verticals strongly decussate; outer verticals not differentiated from postocular cilia; ocellars proclinate and divergent. Occiput black, whitish pollinose, covered with yellow and black hairs. Antennae yellow. Parafacialia broad, yellow pollinose. Genae 0.27-0.32 of eye height, golden pollinose with few small cilia above vibrissae. Palpi yellow.

Thorax shining black, thinly dusted with whitish pollen, more dense on humeral calli and prescutum. Mesonotum without distinct vittae except for two linear median stripes between the presutural acrostichals and dorsocentrals. Acrostichals 1:1; dorsocentrals 3:4; humerals 4. Prescutum with two narrow black vittae between the acrostichals and dorsocentrals and inconspicuous black triangular spots below the anterior posthumeral. Sternopleurals 2:1. Scutellum black, thinly pollinose, with a pair of basal, subapical and apical bristles and a row of irregular discals. Legs black; trochanters yellow; claws and pulvilli elongate. Wings hyaline; epaulet black; subepaulet and base of costa yellow. Calypteres whitish, thinly testaceous pollinose.

Abdomen black, ovoconic, thinly covered with whitish pollen; abdominal T 4 and T 5 with a row of median marginals. Cerci yellow; surstyli curved, black, enlarged at base, tapering toward apex (figs. 2, 15).

Holotype male, paratype male, Muri, Nova Friburgo, Rio de Janeiro, Brazil, XII.1975, Gred & Guimarães (MZSP).

This species differs from all other belonging to the genus *Paratheresia* by presenting a shining black thorax without distinct median vittae on mesonotum. It was collected by the author resting on tree trunk in Muri, Nova Friburgo, Rio de Janeiro.

Paratheresia argentaura Townsend
(Fig. 6, 13)

Paratheresia argentaura Townsend, 1939a: 547, 548. Type-locality, Brazil, Mato Grosso, Maracaju (LM); Sabrosky *in* Emden (1949): 507, 508.

The principal characters of this species have been mentioned in the generic discussion and the key. The type specimen was examined by Sabrosky *in* Emden (1949) who pronounced it to be a doubtful synonym of *P. claripalpis*. The genitalia of a male specimen tentatively assigned to this species shows to be a distinct species (fig. 13). The silvery parafrontalia and golden parafacialia with a rather abrupt line of demarcation opposite the base of antennae distinguish this species from its congeners. Other salient items may be briefly listed as follows: Front at vertex 0.11 of head width in male, 0.28 in female. Gena 0.29 of eye height in male. Occiput black, silvery pollinose. Thorax blackish, silvery pollinose. Thoracic vittae as in *claripalpis*.

Material examined. 1 male Dep. San Martin, Salta, Argentina (MZSP); 1 female, Lassance, Minas Gerais (MZSP).

***Paratheresia cerambycivora*, sp. n.**

(Figs. 1, 18, 25)

Male. Total length 7-8 mm

Head yellow, golden yellow pollinose. Parafrontalia blackish toward vertex. Front at vertex 0.17-0.19 of head width. Inner verticals long and parallel; outer verticals slender, hardly differentiated from postocular row. Frontalia black, broad at base of antennae, widening toward vertex. Antennae yellow; third segment brownish red below arista. Parafacialia as broad as facial plate. Vibrissae strong with a cluster of small black cilia above. Genae broad, 0.32 of eye height. Palpi yellow.

Thorax thickly pale yellow pollinose; mesonotum with three broad thoracic vittae (fig. 25). Pleura whitish pollinose; sternopleurals 3. Legs black.

Abdomen reddish brown, with a black median vitta, extending from T 1+2 to T 4; T 5 black, reddish on apex; T 3 and T 4 with yellow pollinose triangles on middle and on sides (fig. 25). Surstyli falciform, elongate (figs. 1, 18).

Female. Total length 8-10 mm

Differs from male in the following.

Head golden. Front at vertex 0.28 of head width. Parafrontalia broad with three reclinate orbitals. Ocellars long and divergent. Palpi yellow, strongly clavate. Abdomen blackish, yellowish on tip.

Holotype male, Juçara, Paraná, Brazil, 14.XI.1974, F. Giacomel (MZSP). Paratypes, 7 males, 2 females, same data as holotype (MZSP); 7 males, Nova Teutônia, Santa Catarina, 4.VI.1971, F. Plaumann (MZSP).

This species differs from other species of the genus mainly by the shape of genitalia, with a characteristic falciform surstylus (fig. 1, 18).

***Paratheresia plaumanni*, sp. n.**

(Fig. 3 and 20)

Male. Total length 8 mm

Head yellow, pale yellow pollinose, darkening toward vertex. Front at vertex 0.08 of head width. Inner verticals slender and decussate; outer verticals small, hardly differentiated from postocular row. Ocellar weak and elongate. Frontals 10, slender and convergent. Parafrontalia narrow, covered with few black cilia below the postocular row. Antennae yellow; third segment reddish brown below aristae. Facial plate sunken, whitish pollinose with a gentle median elevation between the insertion of antennae. Facialia yellow with a group of few small black cilia above vibrissae. Peristomal setae small and slender. Genae narrow, 0.12 of eye height, yellow, covered with small black hairs below eye margin. Palpi yellow, slightly clavate.

Thorax elongate. Mesonotum thickly dusted with pale yellow pollen. Thoracic vittae patterned as in *claripalpis*. Sternopleurals 2. Mesonotum yellow pollinose. Calypteres broad, hyaline. Legs reddish brown; claws and pulvilli short.

Abdomen black, elongate, subcylindrical with whitish silvery pollinose triangles on middle of T 1+2 to T 5. Surstyli elongate, fal-ciform in profile (figs. 3 and 20).

Holotype male. Nova Teutônia, Santa Catarina, Brazil, VIII.1967, F. Plaumann col. (MZSP).

***Paratheresia friburgensis*, sp. n.**

(Figs. 17, 28)

Male. Total length 10-11 mm

Head yellow, golden pollinose. Front darkened, 0.10-0.11 of head width. Ocellars slender, proclinate. Inner verticals strong, and decusate; outer verticals small, hardly differentiated from postocular row. Facial plate silvery pollinose. Vibrissae long, with few black cilia above. Antennae yellowish, dark brown below vibrissae. Genae narrow, about 0.17-0.19 of eye height. Palpi yellow, slightly clavate.

Thorax black, pale yellow pollinose. Mesonotum elongate, with three broad black vittae (fig. 28). Sternopleurals 2. Legs black. Calypteres hyaline, testaceous pollinose.

Abdomen black, elongate, thinly whitish pollinose; T 3 to T 5 thickly silvery pollinose on sides with indistinct golden pollinose triangles on middle (fig. 28). Genitalia with cerci broad, subtriangular in profile (fig. 17).

Holotype male, Muri, Nova Friburgo, Rio de Janeiro, Brazil, 1-31 January 1965. Gred & Guimarães (MZSP); paratype male, same data as type (MZSP).

Differs from all other species by the following combination of characters: abdomen black, elongate; front narrow at vertex; genae narrow, about 2/5 of eye height; two sternopleurals.

***Paratheresia shannoni*, sp. n.**

(Figs. 7, 19 and 26)

Male. Total length 8-9.5 mm

Head yellow, silvery pollinose. Front at vertex 0.17 of head width. Ocellar long and divergent, as strong as frontals. Parafacialia with small black cilia. Palpi and antennae yellow. Genae broad, 0.37 of eye height, covered with small black bristles. Facial plate silvery pollinose, gently warped on middle.

Thorax dark brown, densely whitish pollinose. Mesonotum with three narrow black vittae (fig. 26). Dorsocentrals 2:3. Sternopleurals 3. Legs slender, reddish brown, uniformly covered with pale yellow pollen; T 5 with two small polished areas in frontal view (fig. 26). Genitalia with surstyli broad, subquadrangular in profile with rounded apex (fig. 19).

Holotype male. Maracaju, Mato Grosso, Brazil, II.1937, Shannon & Lane (MZSP). Paratype male, same data as holotype (MZSP).

***Paratheresia rufiventris* Townsend**

(Figs. 10, 12)

Paratheresia rufiventris Townsend, 1929: 367. Type locality, Peru, Ushpayacu River, 1300 ft. (LM, examined); Townsend, 1939b: 150; 1939a: 547.

Male. Total length 8 mm

Head yellow, silvery pollinose. Front at vertex 0.22 of head width. Ocellars small and slender. Frontalia dark brown, broad above base of antennae, widening toward apex. Antennae yellow, reddish brown below arista. Genae 0.28 of eye height. Palpi yellow.

Thorax black, thickly white pollinose. Mesonotum with five slender thoracic vittae; outer pair interrupted at suture, inner pair elongate. Sternopleurals 3.

Abdomen rufous, pale yellow pollinose. Surstyli broad, spatulated, ogival in profile (figs. 10, 12).

Material examined. 1 male, Ushpayacu, Peru (Holotype of *Paratheresia rufiventris* Townsend) deposited at Estação Experimental Agrícola de "La Molina", Lima, (Peru).

The holotype pinned in an ordinary sewing needle is in fair condition but has lost the left leg. It is labeled as follows: Ushp. IX on sweat/ type /*Paratheresia rufiventris* TT, male/.

***Paratheresia rhynchophorae* (Blanchard)**

(Figs. 5, 14)

Parabillaea rhynchophorae Blanchard, 1937: 44. Type-locality, Argentina, San Ignacio, Misiones; Townsend, 1938: 431; 1939a: 546; Candia & Simmonds, 1965: 127 (Host records); Bennett & Maharaj (1969): 63 (host records).

Paratheresia rhynchophorae (Blanchard); Sabrosky in Emden, 1949: 507, 508 (as synonym of *P. brasiliensis*); Guimarães, 1971: 38.

Male. Total length 11-13 mm

Robust species, very similar to *claripalpis* except as follows: Front broad at vertex (0.19-0.31 of head width). Frontalia dark brown, broad at base of antennae, widening toward apex. Surstyli broad elongate, ogival in profile (figs. 5, 14). Palpi yellow, not strongly clavate at tip as in *claripalpis*. Abdomen dark brown, pale yellow pollinose, with two broad triangular polished areas on T 3 and T 4; T 5 mostly polished on middle.

Material examined. Bolivia, 1 male, 3 females reared from *Rhynchophorus palmarum*, (MZSP); 2 females, Trinidad, Ex *Rhynchophorus palmarum* (CNC); 1 female, Bolivia, Santa Cruz (CNC).

6. HOST RECORDS OF *Paratheresia* spp.

The following list is based on recorded hosts of *Paratheresia* in the literature and upon reared parasite material examined and identified during the present revision. In the tabulation of the host records that follows the names of Tachinidae and hosts are listed alphabetically.

***Paratheresia cerambycivora*, sp. n.**

Cerambycidae

Taeniotes pulvurulentus (Oliv.)

Orig., F. Giacomel, 1974, Brazil, Paraná, Juçara. Ex larvae

***Paratheresia claripalpis* (Wulp)**

Castniidae

Eupalemides daedalus (Cram.)

Emden, 1949: 505, Surinam.

Pyralidae

Diatraea buskella Dyar & Heinrich

Box, 1953: 29, Venezuela.

Diatraea centrella (Möschler)

Box, 1952c: 15, 17, 20, 46, Venezuela.

Diatraea dyari Box

Box, 1953: 30, Northern Argentina.

Diatraea flavipenella Box

Mendonça Filho, 1972: 31, Brazil (Alagoas).

Diatraea impersonatella (Walker)

Box, 1953: 30, Venezuela, Trinidad, Guyana, Peru.

Diatraea lineolata (Walker)

Box, 1953: 30, Venezuela.

Diatraea pediparbata Dyar

Box, 1952: 9, Venezuela.

Diatraea rosa Heinrich

Box, 1952: 9, Venezuela.

Diatraea rufescens (Box)

Box, 1953: 30, Bolivia; Terán, 1963: 24, Bolivia.

Diatraea saccharalis (F.)

Aldrich, 1929: 33, Argentina, Peru (as *P. signifera*); Box, 1949: 21, Venezuela; Carbonell, 1937: 11, Uruguay; Jaynes, 1930: 676, Argentina, Peru; Myers, 1935: 230, Guyana; Parker, 1953: 49, Brazil; Risco, 1956: 841, Peru; Souza, 1942, Brazil, Rio de Janeiro.

Diatraea tabernella Dyar

Risco, 1961: 6, Peru.

Dorotopera atroparsellus (Walker)

Risco, 1963: 67, Venezuela, Peru.

Curculionidae

Acrotomopus atropunctellus Boheman

Jaynes, 1931: 560, Northern Argentina.

Metamasius bilobus Hustache

Orig. Terán, 1975. Ex larvae, in sugarcane, Bolivia (Santa Cruz).

***Paratheresia giacomile*, sp. n.**

Cerambycidae

Trypanidium dimidiatum Thomson

Orig. F. Giacomel, 1974. Ex larvae. Brazil, Paraná (Curitiba, Sta. Felicidade).

***Paratheresia menezesi* sp. n.**

Curculionidae

Homalinotus coriaceus (Gyllentall)

Orig. E. Menezes, 1974, Brazil (Rio de Janeiro, Itaguaí and São Gonçalo). Ex larvae attacking *Coccus* spp.

***Paratheresia rhynchophorae* (Blanchard)**

Curculionidae

Rhina barbirostris (F.)

Emden, 1949: 507, Trinidad.

Rhynchophorus palmarum (L.)

Bennett & Maharaj, 1969: 63, Trinidad; Blanchard, 1973: 46, Argentina; Candia & Simmonds, 1965: 127, Bolivia; Emden, 1949: 507, Brazil (São Paulo).

The problem of parasite-host relationships in *Paratheresia* is more complex than originally supposed. Owing to the existence of physiological races, we cannot be sure that parasites identified as belonging to a given species will successfully attack hosts other than the one from which they were reared, or that a strain from an area will survive and multiply in another area if climatic conditions are very different.

The phenomenon of insect parasitoids sometimes being more strongly attracted by the habitat of the host than by the host itself has been discussed by several authors (Cushman, 1926; Townes, 1962 and Guimarães, 1972).

Paratheresia claripalpis seems to be a very adaptable species, occurring over a wide range of conditions from Mexico to Northern Argentina, attacking a considerable number of hosts other than *Diatraea* spp. including the cane-boring weevil, *Acrotomopus atropunctellus* Bohemann in Northern Argentina and *Metamasius bilobus* in Bolivia. According to Emden (1949), since all Theresiini are regularly parasitic in larvae of Coleoptera "... one would logically expect the original host of *Paratheresia claripalpis* to have been not a lepidopterous but

a coleopterous larva, and presumably one which like *Acrotomopus* has adapted itself to the sugarcane habitat shared with *Diatraea*. Granted such to have been the case the parasite would have transferred itself to *Diatraea*, now its main host, only secondarily”.

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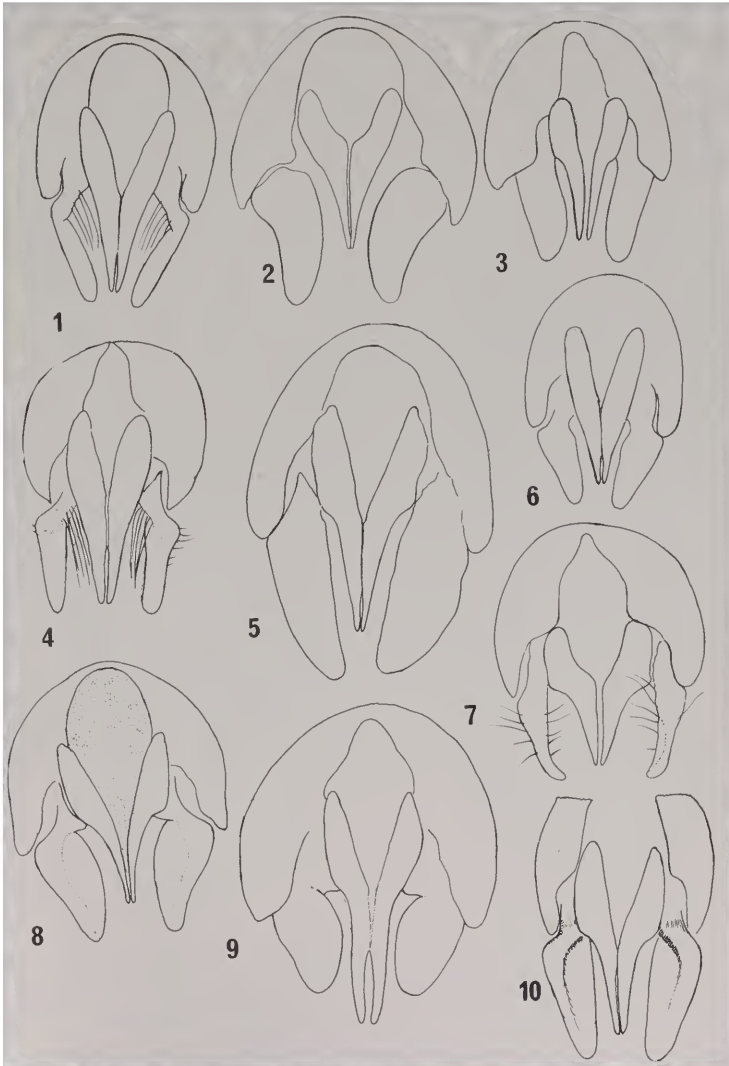
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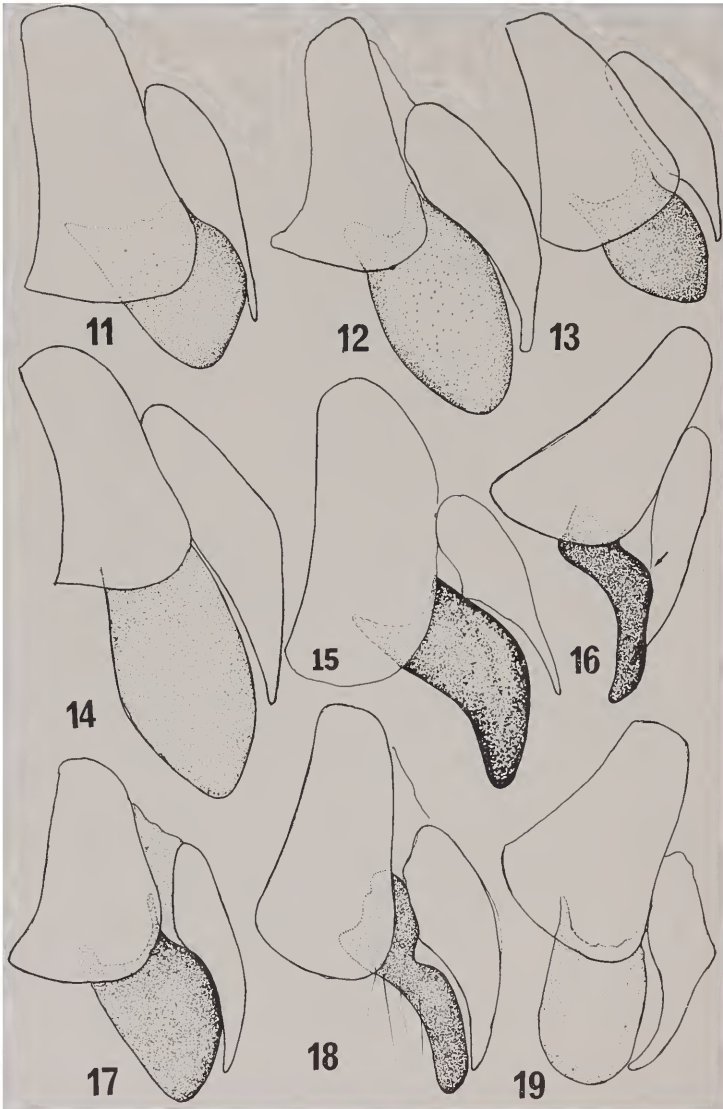
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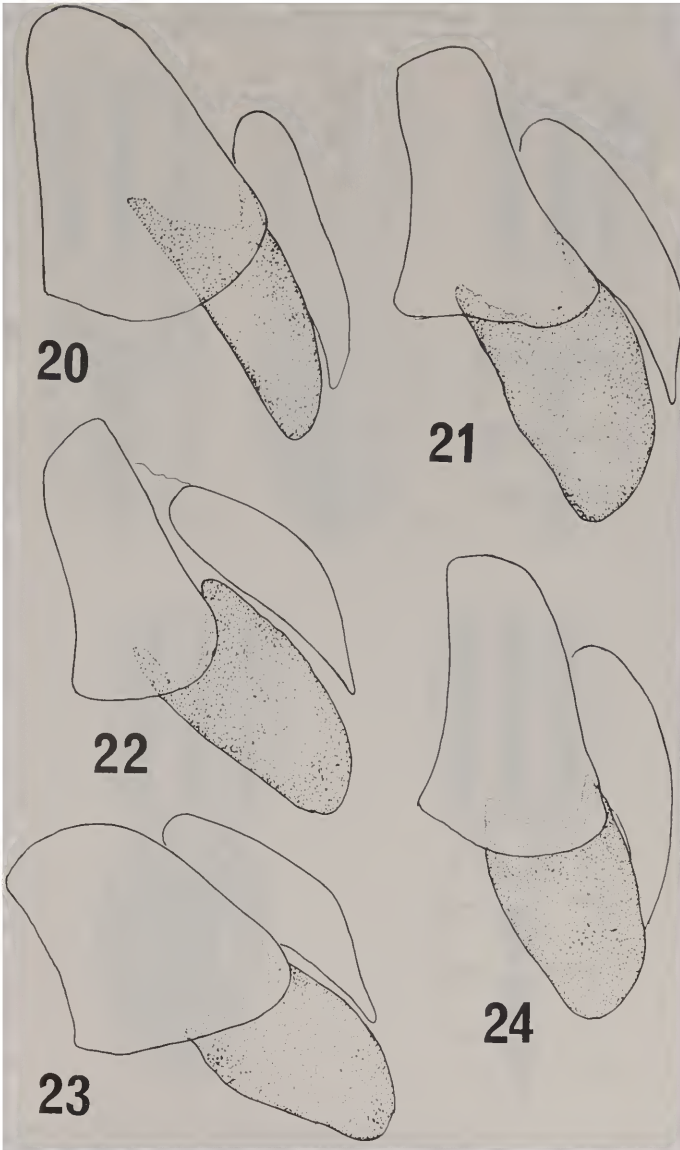
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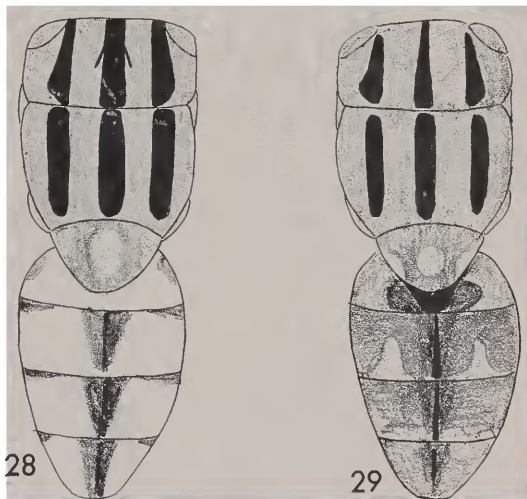
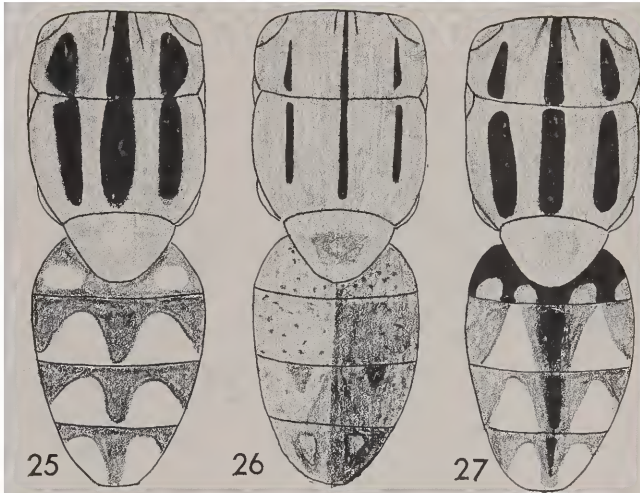
Paratheresia; male genitalia, frontal view. Fig. 1: *cerambycivora*, sp. n.; Fig. 2: *kosteræ*, sp. n.; Fig. 3: *plaumanni*, sp. n.; Fig. 4: *menezesi*, sp. n.; Fig. 5: *rhynchophoræ*; Fig. 6: *argentaurea*; Fig. 7: *shannoni*, sp. n.; Fig. 8: *menezesi*, sp. n.; Fig. 9: *giacomeli*, sp. n.; Fig. 10: *rufiventris*.



Paratheresia; male genitalia, lateral view. Fig. 11: *giacomelli* sp. n.; Fig. 12: *rufiventris*; Fig. 13: *argentaurea*; Fig. 14: *rhynchophorae*; Fig. 15: *kosteriae*, sp. n.; Fig. 16: *menezesi*, sp. n.; Fig. 17: *friburgensis*, sp. n.; Fig. 18: *cerambycivora*, sp. n.; Fig. 19: *shannoni*, sp. n.



Paratheresia; male genitalia, lateral view. Fig. 20: *plaumanni*, sp. n.
Figs. 21-24: *claripalpis*.



Paratheresia; thorax and abdomen, dorsal view. Fig. 25: *cerambycivora*, sp. n.; Fig. 26: *shannoni*, sp. n.; Fig. 27: *giacomeli*, sp. n.; Fig. 28: *friburgensis*, sp. n.; Fig. 29: *claripalpis*.

