

**Zeitschrift:** Mitteilungen der Schweizerischen Entomologischen Gesellschaft = Bulletin de la Société Entomologique Suisse = Journal of the Swiss Entomological Society

**Herausgeber:** Schweizerische Entomologische Gesellschaft

**Band:** 76 (2003)

**Heft:** 3-4

**Artikel:** First report of Scatopsidae (Diptera) from Belize, with description of 3 new species

**Autor:** Haenni, Jean-Paul / Rapp, Mathieu

**DOI:** <https://doi.org/10.5169/seals-402845>

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## First report of Scatopsidae (Diptera) from Belize, with description of 3 new species.

JEAN-PAUL HAENNI<sup>1</sup> & MATHIEU RAPP<sup>2</sup>

<sup>1</sup> Muséum d'histoire naturelle, rue des Terreaux 14, CH-2000 Neuchâtel, Switzerland

<sup>2</sup> Institut de Zoologie, Université de Neuchâtel, rue Emile-Argand 11, CH-2000 Neuchâtel, Switzerland

*Psectrosciara stradivarius* sp. nov., *Thripomorpha chaboti* sp. nov. and *Colobostema bijleveldi* sp. nov. from the Shipstern Nature Reserve (Corozal district, Belize) are described and figured. These species represent the first report of the family Scatopsidae (Diptera) from this country.

Keywords: Diptera, Scatopsidae, Belize, taxonomy, new species, *Psectrosciara*, *Thripomorpha*, *Colobostema*

### INTRODUCTION

The Diptera from Belize have been hardly investigated and are very poorly known, except for some families of agricultural or medical importance. In the course of the master work of one of us (M. R.), a fly biodiversity survey with a comparative approach of the dipterous fauna of two tropical forests types was undertaken in the Shipstern Nature Reserve, Corozal district, Northern Belize. During 3 months of field work, from June to August 2002, Diptera were trapped by mean of Malaise traps and other methods in a tropical wet forest (Yucatecan medium-sized semi-evergreen forest) and a tropical dry forest (low semi-deciduous *Pseudophoenix sargentii* forest), both at sea-level. As far we know, the latter type of forest is found out of the Shipstern Reserve only in some sites scattered on the Yucatecan peninsula in Mexico, and may thus represent the greatest intrinsic conservation value of the study site. Results of these faunistical-ecological investigations, which yielded about 10'000 specimens of Diptera, will be published elsewhere.

Occurrence of Scatopsidae in Belize is attested here for the first time. However they appear very poorly represented in the forests prospected, at least during the trapping period, since only 8 specimens were collected.

Little attention has been given till now to these small, rather inconspicuous midges in Central America. The few published papers consist mainly in scattered descriptions of new taxa and include Duda (1928) and Cook (1955a, b, 1956a-c, 1957, 1958, 1975, 1978). According to Cook's list of Neotropical Scatopsidae (1967), 24 species have been recorded so far from the Neotropical region North of South America. The present generic placement of most of these species is discussed in Amorim & Haenni (1997). However the true number of species occurring in the region should be far more important, as can be seen by the numerous still undescribed species studied by Amorim (1982) in his pylogenetic study of the family, and by the preliminary survey of the fauna of Costa Rica (Amorim 1997) indicating that 16 species (of which 12 undescribed) are known from this country. Unidentified species of 4 genera of Scatopsidae have also been recorded from Nicaragua

(Maes 1993), and unidentified Scatopsidae from a Jamaican cave by Stringer & Meyer-Rochow (1996, 1997).

## MATERIAL AND METHODS

After capture, the flies have been preserved and stored in 70% alcohol, then sorted at family level and kept in individual vials in the same medium. For taxonomic study, the specimens have been partly cleared in KOH 10%, dissected and finally mounted on microscopic slide in Euparal or returned in vials with alcohol. Drawings have been completed by M. R. All specimens are deposited in the collection of the Muséum d'histoire naturelle de Neuchâtel, Switzerland (MHNN).

## RESULTS

The 8 specimens collected represent 6 or 7 different species belonging to 5 genera as follows: *Psectrosciara* Kieffer, 1911 (1 species), *Thripomorpha* Enderlein, 1905 (1 species), *Parascatopse* Cook, 1955 (1 species), *Colobostema* Enderlein, 1926 (2, or possibly 3 species) and *Rhexoza* s. l. Enderlein, 1936 (1 species). Of these, *Parascatopse* and *Rhexoza* are each represented only by female specimens which identity can not be established safely for the moment, since several species of these genera are known from this region in male sex only. *Psectrosciara* and *Thripomorpha* are each represented by male specimens pertaining to new species, which are described below. Finally *Colobostema* is represented by at least one species in male sex which is new to science and described below, and by 2 types of females which possible association with the above male remains uncertain. Their description should thus await discovery of more material.

## TAXONOMY

### *Psectrosciara stradivarius* sp. n. (Figs 1-6)

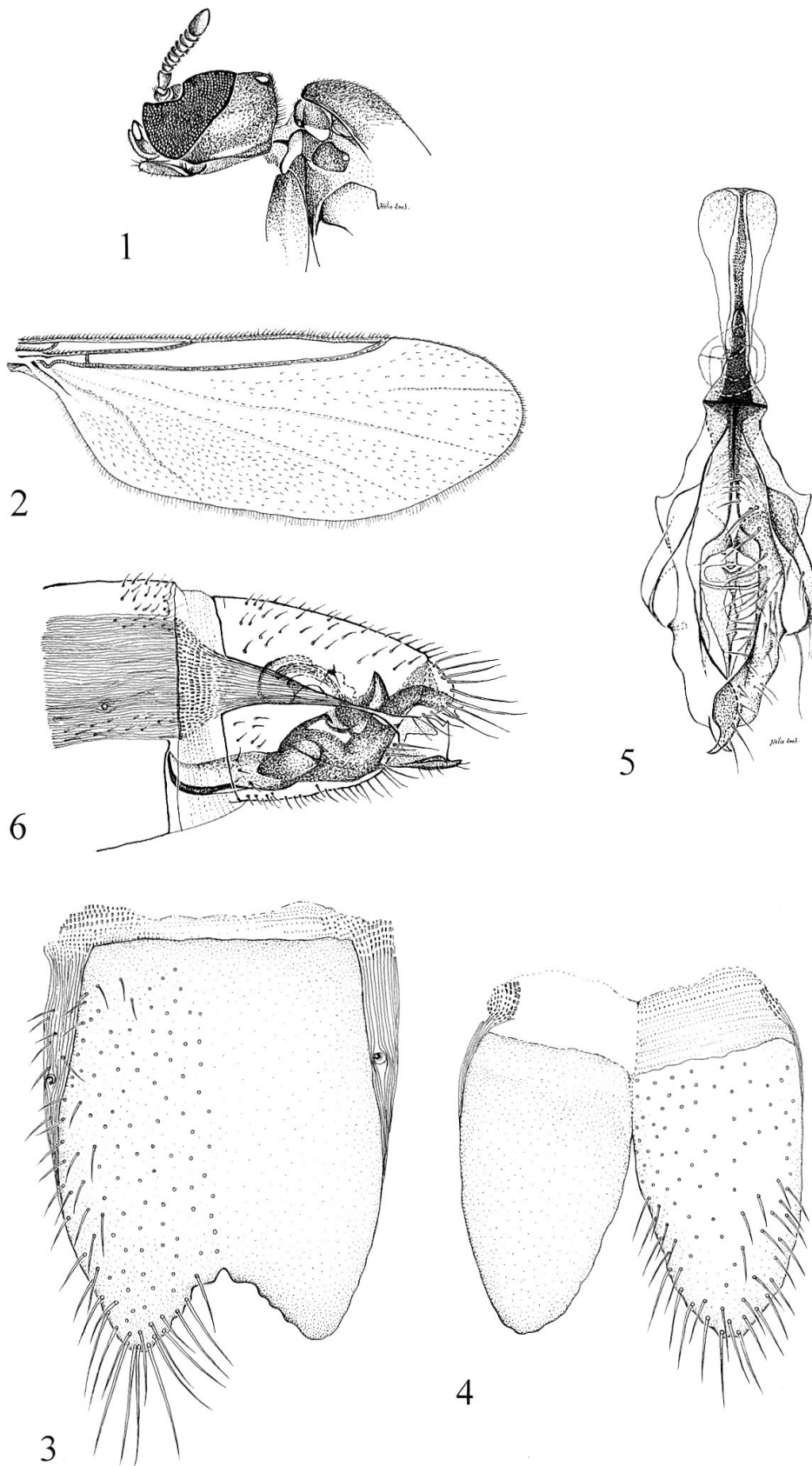
*Type material.* Holotype ♂, labelled: "BELIZE, Shipstern Nature Reserve, forêt dense mésophile (Xopol), 24-27.VII.2002, plot 401, M. Rapp leg.". "*Psectrosciara stradivarius* sp. nov. Haenni & Rapp, 2003, holotype". GPS coordinates: <18°14'48" N; 88°14'42" W>; elevation; 1-2m. Specimen dissected and mounted on microscopic slide, deposited in MHNN.

*Description.* Male. 3.0 mm (body somewhat distended due to alcohol preservation); brown in general colour, head jet black, shining, anterior tibia and all tarsi blackish-brown, general pilosity short and dense, light brownish, darker on legs; wings slightly tinged, with brown anterior veins.

Head (Fig. 1) about 1.5 times longer than high; eyes broadly meeting over antennae; anterior ocellus absent; antenna short, with flagellum 8-segmented, regularly widening towards apex, club-shaped, last segment somewhat longer than the 3 preceding ones; palpus elongate bearing an apical, well visible sensory pit; labella of proboscis elongate.

Thorax strongly compressed laterally, notum brown with lighter humeri and a lighter narrow median longitudinal line reaching behind middle of scutellum; pleura shining, devoid of microtrichia; anterior spiracle on a separate sclerite (Fig. 1).

Wings (Fig. 2) 2.0 mm long; membrane slightly tinged with brownish, due to dense micropilosity on most of surface except in anterior cells; anterior veins brown; posterior veins translucent, bearing dense rows of macrosetae; macrosetae numerous on membrane posterior to  $R_{4+5}$ , denser after  $CuA_2$ . Basal portion of  $M_1$  absent, base of  $M$  hardly traceable.



Figs 1-6: *Psectrosciara stradivarius* sp. nov., male holotype. 1: Head and anterior part of thorax (side view); 2: Wing; 3: Tergite 7; 4: Sternite 7; 5: Genital capsule (ventral view); 6: Apex of abdomen with genitalia (side view).

Legs. Anterior and posterior femora strongly inflated, all tibiae club-shaped, especially those of anterior and posterior legs; basitarsus of all legs somewhat inflated, clearly longer than the 3 following tarsal segments, and also clearly longer than half of corresponding tibia; all basitarsi with a dense ventral pilosity mixed with rows of short spinules which are more developed on fore legs; last tarsal segment produced dorsally apically in a triangular, apically truncate, setae bearing projection, which is more developed on fore legs.

Abdomen densely pilose on tergites and sternites but devoid of micropilosity; tergites narrow, longer than wide, sternites broader, transverse; pregenital segment 7 pilose as rest of abdomen; tergite (Fig. 3) elongate, nearly twice as long as wide, with a rounded, undulated posterior emargination; sternite (Fig. 4) elongate, hardly longer than wide, almost entirely divided into 2 lobes only narrowly jointed at level of basal unsclerotized region.

Genitalia (Figs 5-6) elongate, with gonostyles toothed both ventrally and dorsally at apex; parameres elongate, pointed and curved apically.

Female. Unknown.

*Distribution and ecology.* The species is known only from Northern Belize (Shipstern Reserve), where it was caught by a Malaise trap operated within a Yucatecan medium-sized semi-evergreen forest.

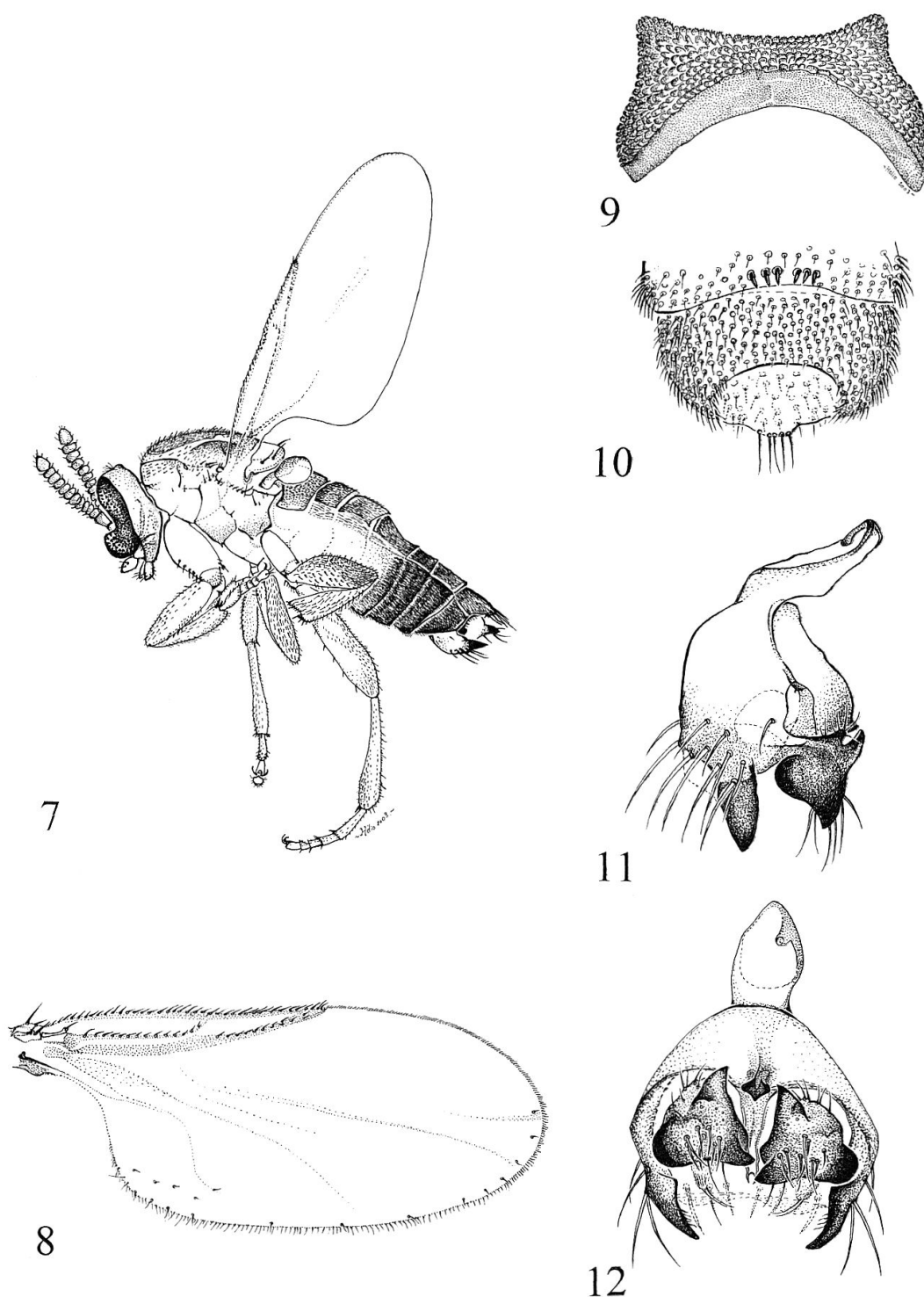
*Comments.* The new species clearly belongs to the *scatopsiformis*-group of species as defined by Cook (1958). The genitalia of *P. stradivarius* strongly resembles those *P. scatopsiformis* Enderlein, from Panama and Costa-Rica, *P. californica* (Cole) from southern USA (Arizona, Texas) and Mexico, and *P. elongata* Cook, from southern USA (Texas), and these 4 species obviously represent a complex of sister species within the *scatopsiformis*-group. *Psectrosciara stradivarius* may be easily distinguished from *P. californica*, *P. elongata* and *P. scatopsiformis* by the shape of the apex of the gonocoxites, which is toothed both ventrally and dorsally (Fig. 6).

*Etymology.* The name, used as an apposition, refers to the shape of the genital capsule of the male, which remembers that of a violin.

### ***Thripomorpha chaboti* sp. n.** (Figs 7-12)

*Type material.* Holotype ♂, labelled: "BELIZE, Shipstern Landing, Shipstern Nature Reserve, M2, 9-15.VIII.2002, M. Rapp leg.", "*Thripomorpha chaboti* sp. nov. Haenni & Rapp, 2003, holotype". GPS coordinates: <18°13'56" N; 88°10'56" W>; elevation: 1-2m. Specimen dissected and mounted on microscopic slide, deposited in coll. MHNN.

*Description.* Male (Fig. 7). 1.25 mm (in alcohol); bicolourous, largely yellow in general colour with general dark pilosity except on occiput, pleura and fore coxa largely devoid of pilosity, shining. Head fulvous, with palpi and labella yellow, antennae brown except scape yellow, eyes black. Notum yellow with 4 brown longitudinal stripes, the median broadest, extending from anterior part of notum to level of wing bases, largely confluent except in anterior half of notum where they are separated by a narrow yellow stripe; lateral stripes narrower, extending from hind margin of postpronotal lobes to hind margin of notum; scutellum and pleura yellow. Legs yellow, somewhat brownish on hind tibiae and femora; empodia yellowish, claws black. Wings hyaline, with anterior veins brown, the posterior hyaline, concolourous with membrane, hardly visible; halteres greyish-yellow with slightly



Figs 7-12: *Thripomorpha chaboti* sp. nov., male holotype. 7: Habitus (side view); 8: Wing; 9: Tergite 1; 10: Apex of abdomen (ventral view, genitalia exerted); 11: Genital capsule (side view); 12: Genital capsule (ventral view).

infuscated stem. Abdomen brown in general colour, darkening towards apex, but sternites 1 to 3 yellow and sternite 4 partly yellowish laterally. Genital capsule contrasting fulvous yellow, brown at apex with well visible long dark setae.

Head. Eyes broadly holoptic, eye bridge as high as ocellar triangle width; flagellum of antennae 10-segmented, slightly longer than head height, last flagello-



mere twice as long as other segments, as long as pedicel; palpus oval, apically rounded.

Thorax twice as long as wide and almost as high as long; notum with 1 prescutellar intraalar, 2 postsutural supraalar, 4 conspicuous marginal scutellar that are stronger than any other thoracic setae; pleura largely bare, except for 1 meral seta ventrally to the base of insertion of halter, a distinctive row of 4 anepimeral setae along dorsal margin (increasing in size from front, the posterior one stronger than the meral seta), 2 dorsoposterior anepisternal (the posterior twice as long as the anterior one) and a row of 4 microsetae along anterior insertion of wing.

Wings (Fig. 8) 1.0 mm long; base of  $M_1$  largely absent; only one macroseta present on  $CuA_2$ , but some present along the wing margin in the apical region and along the posterior margin, and 4 macrosetae on membrane posteriorly to anal vein. Halteres devoid of setae on stem.

Legs. Hind legs stronger and longer than anterior and median pairs, with gently enlarged femora; anterior margin of coxa 1 with a row of conspicuous setulae, posterior margin of all coxae with several conspicuous setulae; remaining parts of all legs densely clothed with fine setulae, all tibiae with a short but well visible ventroapical spur along with a series of black setulae; first tarsomere with a ventroapical patch of black setulae, more developed on median legs.

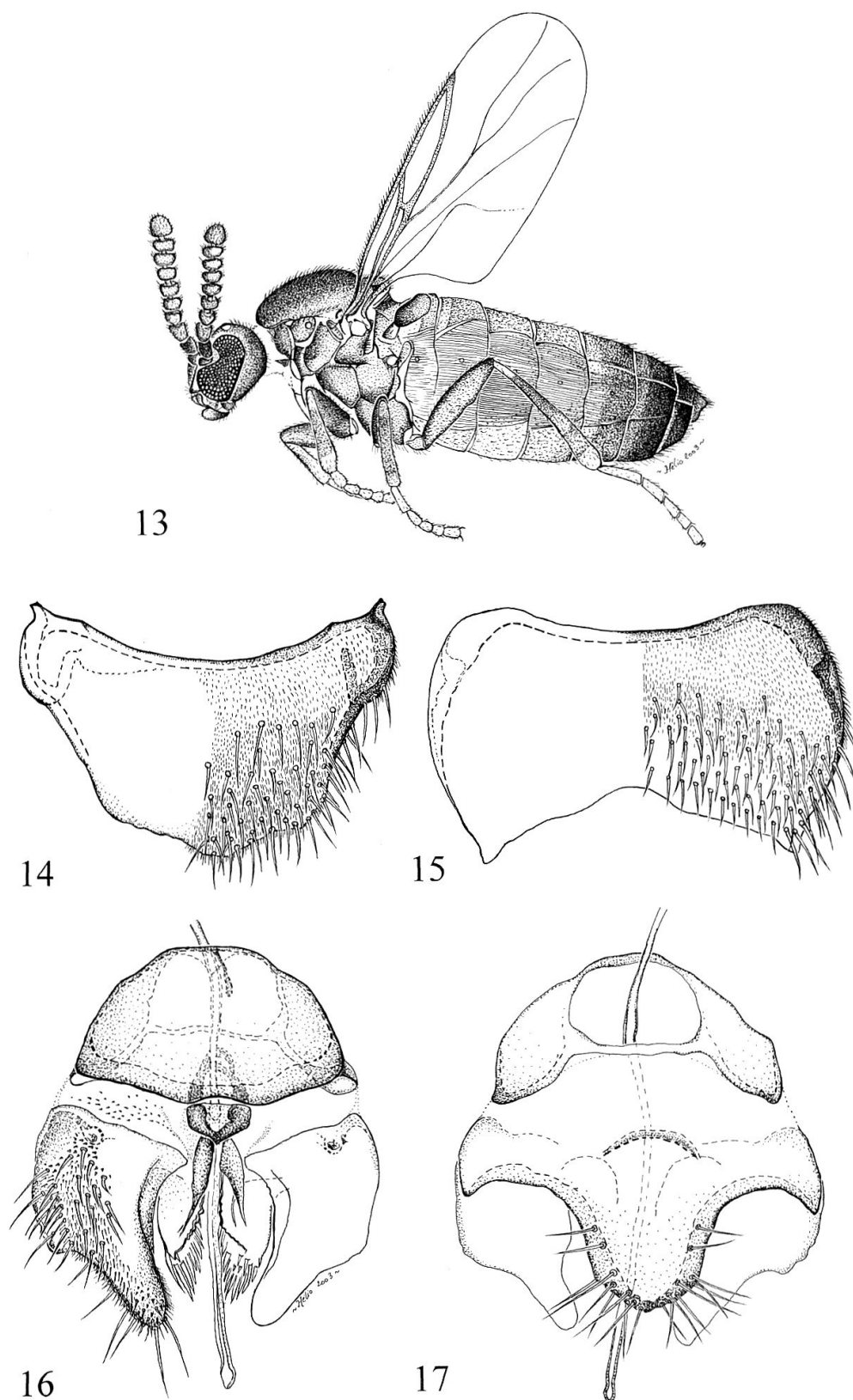
Abdomen. Tergite 1 (Fig. 9) divided transversally, the anterior part bearing the microreticulation typical of the genus; sternite 6 with a row of 6 short spinose setae medially at posterior margin; tergite 7 slightly produced posteriorly into a median triangular projection with a row of elongate setae along margin, sternite 7 concave posteriorly, shallowly emarginated, both sclerites densely beset with setae arising from enlarged basal sockets (Fig. 10). Genital capsule elbowed in lateral view (Fig. 11), basally narrow, strongly widened at middle in dorsal view (Fig. 12); gonostyles massive, with several acute projections; penis short, unobscured; epandrium with 2 apically acute lateral posterior projections bearing several strong setae (Fig. 12).

Female. Unknown.

*Distribution and ecology.* The species is known only from Northern Belize (Shipstern Reserve), where it was caught by a Malaise trap operated within a Yucatecan medium-sized semi-evergreen forest with specific dominance of *Orbigyna cohune* (known as "Cohune forest").

*Comments.* *Thripomorpha chaboti* is the third species of the genus to be recorded from the Neotropical region. It resembles *T. blantoni* (Cook, 1955), from Panama, which displays a similar reduction of wing venation and vestiture of macrosetae on membrane and posterior veins, as well as a unique and unusual colour pattern among the known species of the genus (body bicolourous, predominantly yellow). *Thripomorpha chaboti* may be easily distinguished from *T. blantoni* by the convex, medially produced posterior margin of tergite 7, by the posteriorly directed, apically pointed lateral projections of epandrium, by the structure of the genital capsule and by the shape of the gonocoxites (Figs 11-12).

*Etymology.* The new species is named in honour of Robert Chabot, Professor of Invertebrate Zoology at the University of Québec at Rimouski (UQAR, Québec, Canada) whose excellent teaching was the starting point for the junior author's deep interest in insects.



Figs 13-17: *Colobostema bijleveldi* sp. nov., male holotype. 13: Habitus (side view); 14: Tergite 7; 15: Sternite 7; 16: Genital capsule (ventral view); 17: Genital capsule (dorsal view).



***Colobostema bijleveldi* sp. n.** (Figs 13-17)

*Type material.* Holotype ♂, labelled: "BELIZE, Shipstern Nature Reserve, plot 100", forêt sèche à *P. sargentii*, 1-4.VI.2002, M. Rapp leg.", "*Colobostema bijleveldi* sp. nov. Haenni & Rapp, 2003, holotype". GPS coordinates: <18°18'52" N; 88°11'01" W>; elevation: 1-2m. Specimen dissected and mounted on microscopic slide, deposited in MHNN.

Paratype ♂, same data as holotype, but 30.VII-1.VIII.2002. Specimen preserved in alcohol, deposited in MHNN.

*Description.* Male (Fig. 13) 1.7 mm; nearly entirely dull blackish in general colour due to the presence of a dense micropilosity, meso- and methoracic pleura brownish, paler than prothoracic pleura, occiput and abdomen; antennae paler than head, entirely brown except darkened scape; palpi and labella light brown; wings very slightly tinged with brownish, all veins contrasting brown, the anterior darker, halter knob light brown with lighter stem bearing a single setula; legs brownish, with tibia 1 and 2 appearing annulated, lighter at base and extreme apex, tibia 3 also annulated but with an additional median lighter area, all tarsi lighter; body and legs covered with a dense short pilosity, absent only on most of pleura and inner parts of coxae shining.

Head rounded, hardly higher than long, with eyes separated on frons above antennae; flagellum of antenna as long as  $R_{4+5}$ , 8-segmented; last flagellomere rounded, about 1.5 times longer than preceding one; palpi and labella short and rounded.

Thorax massive, only slightly shorter than wide, square-shaped anteriorly, the postpronotal lobes somewhat projecting in dorsal view.

Wings (Fig. 13) 1.4 mm long; membrane densely micropilose on whole surface; anterior veins  $R_1$ ,  $R_{4+5}$  and R-M broadened and thickened on most of their length, bearing irregularly arranged rows of short setae on dorsal surface, fork of M symmetrical, with no indication of a bend on  $M_1$ .

Abdomen. Pregenital segment with a complete narrow basal sclerotized ring; tergite 7 massive, broadly quadrangular, medially hardly produced in a short rounded projection (Fig. 14), sternite 7 with a shallow V-shaped posterior emargination (Fig. 15); genital capsule (Figs 16-17) massive, with gonostyles shortened, rounded apically, parameres bearing a peculiar comb of dense, somewhat flattened bristles (Fig. 16); penis elongate; sternite 9 in the shape of a simple, broadly triangular projection (Fig. 17).

Female unknown.

*Distribution and ecology.* The species is known only from Northern Belize (Shipstern Reserve), where it was caught by a Malaise trap operated within a low semi-deciduous *Pseudophoenix sargentii* forest.

*Comments.* The new species and *C. variatum* Cook, from southern USA (Texas, Louisiana, Florida) (Cook 1956c) are the only members of the genus bearing a complex comb of stout setae on the parameres (Fig. 16). *Colobostema bijleveldi* may be easily distinguished by the shape of the tergite 7, which massive posterior projection (Fig. 14) is unique among the New World *Colobostema*.

*Etymology.* The new species is named in honour of our dear friend Caspar Bijleveld, Neuchâtel, an enthusiastic conservationist and entomologist, who initiated the biodiversity survey of the Shipstern Nature Reserve.

## ACKNOWLEDGEMENTS

The authors are pleased to gratefully thank Caspar Bijleveld, director of the Papiliorama Swiss Tropical Gardens, Kerzers (Switzerland), also in charge of the Shipstern Nature Reserve, who made possible this first survey of the dipterofauna of the Reserve and provided accomodation and laboratory facilities during the field work in Belize.

## RÉSUMÉ.

Première mention de la famille des Scatopsidae (Diptera) pour le Belize, avec la description de 3 espèces nouvelles. - *Psectrosciara stradivarius* sp. nov., *Thripomorpha chaboti* sp. nov. et *Colobostema bijleveldi* sp. nov., de la Réserve naturelle de Shipstern (Corozal district, Belize), sont décrites et illustrées. Ces espèces représentent la première mention de la famille des Scatopsidae (Diptera) pour ce pays.

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(received September 11, 2003; accepted October 15, 2003)