

## Recharacterization of *Rhynchoheterotricha* Freeman (Diptera, Sciaroidea), with description of *R. chandleri* sp. n. from South Africa

HEIKKI HIPPA & PEKKA VILKAMAA

Heikki Hippa, Swedish Museum of Natural History, PO Box 50007, SE-104 05, Stockholm, Sweden;

E-mail: heikki.hippa@nrm.se

Pekka Vilkaa, Finnish Museum of Natural History, Zoological Museum, PO Box 17, FI-00014 University of Helsinki, Finland; e-mail: pekka.vilkamaa@helsinki.fi

### Abstract

*Rhynchoheterotricha chandleri* sp. n. is described from South Africa. It differs from the earlier known *R. stuckenbergae* Freeman by having a setose wing membrane and a proboscis that is only about half the height of the head rather than about three times as long as the head. Through a detailed morphological analysis, the genus is recharacterized. The previously unknown female morphology is presented.

**Key words:** *Rhynchoheterotricha*, Sciaroidea, new species, morphology

### Introduction

Freeman (1960) established the genus *Rhynchoheterotricha* for a new species, *R. stuckenbergae*, from South Africa, of which only the male was known. He noted that the new genus was related to *Heterotricha* Loew, known both as fossil and recent species from the Southern Hemisphere, and that it was more similar to the South American species described by him earlier (Freeman 1951) than to the other species of the *Heterotricha* group, at that time known from New Zealand and South Africa. Later, Chandler (2002) erected a new genus *Chiletricha* for the South American species and regarded it as the sister group of *Rhynchoheterotricha*. The same conclusion was reached by Hippa & Vilkaa (2005), who made a cladistic analysis of all the main groups of recent and fossil Sciaroidea.

In the analysis of Hippa & Vilkaa (2005), an unnamed and undescribed species known to us from both sexes was used to represent *Rhynchoheterotricha*; the genus,

however, remains unplaced within a family. The aim of the present paper is to describe that species, which expands the morphological knowledge of *Rhynchoheterotricha*, especially by presenting the undescribed female characters that in the *Heterotricha* group have unusually high phylogenetic importance.

### Material and methods

The material was collected by Malaise traps and preserved in ethanol. One male is still in alcohol, the others are mounted on slides in Euparal or Canada balsam, using conventional methods. The drawings were made with the aid of a drawing tube attached to a compound microscope (Leitz Diaplan); Fig. 4A was made with the aid of a stereomicroscope (Wild M5). Much of the descriptive information is included in the figures and is not repeated in detail elsewhere. The notation for wing veins (Fig. 1D) follows that of Chandler (2002). The type material is deposited in the Swedish Museum of Natural History, Stockholm (NRM).

### Genus *Rhynchoheterotricha*

*Rhynchoheterotricha* Freeman, 1960: 75. Type-species *Rhynchoheterotricha stuckenbergae* Freeman, 1960: 77, by original designation and monotypy

#### *Characters*

The genus was well characterized by Freeman (1960) and especially by Chandler (2002), concerning the nongenitalic morphology. The long proboscis, more than three times as long as the height of the head and as long as the front tibia, characterizing the type species, does not apply to all species. The new species described below has a distinct proboscis but it is short, scarcely more than half the height of the head (Fig. 1A). As pointed out by Freeman (1960) and Chandler (2002), the structure of the proboscis in *Rhynchoheterotricha* is rare in Sciaroidea: the ventral part of the head basal from the maxillary palpi, but not any of the mouthparts, is elongated, a condition otherwise found in the genus *Gnoriste* Meigen (Mycetophilidae). Freeman (1960) mentioned that *Rhynchoheterotricha* has a “mid-pleural pit,” as in the Sciaridae and *Heterotricha*. This is not correct; neither *Heterotricha* nor *Rhynchoheterotricha* have the pleural pit in the same sense as the Sciaridae (Hippa & Vilkamaa 2005). *Rhynchoheterotricha stuckenbergae* differs from all other species in the *Heterotricha* group by lacking setae on the wing membrane, but the new species has a setose wing membrane (Fig. 1D), similar to the species of *Chiletricha* Chandler. The characters of the male hypopygium have previously been only roughly described and analyzed. Tergite 9 is well developed and has apically a sublateral and submedial pair of deeply cut lobes (Fig. 3A). The lobes bear megasetae on

the ventral surface, most of the megasetae being apically bifid (Fig. 3B). Sternite 9 is practically absent, represented by a few setae (Fig. 3D). The gonocoxites are elongated; ventrally, they are narrowly separated throughout and bear apicoventrally a flattened ovate lobe. The gonocoxal apodemes are separate, short, and end far posterior to the anterior margin of the hypopygium. The gonostyli are rather small and slightly bilobed, without an apical tooth or megasetae. The gonostyli move in a dorsoventral plane rather than in a horizontal plane. The parameres are medially united, forming a complicated plate (tegmen) with lobes (Fig. 3C), and the parameral apodemes are subparallel with the gonocoxal apodemes and as long as these. Dorsally, from the tegmen, there is a medial finger-like process, probably belonging to segment 10 (Fig. 3C). The aedeagus is complicated, with a distinct aedeagal apodeme (Fig. 3 C). Female sternite 8 (Fig. 4A) is enlarged, with a sublateral zone of long setae and with most of the setae on the apical part being geniculate with or without a tooth- or heel-like appendix at the geniculation (Fig. 4B). The cercus is unusually heavily sclerotized and two-segmented, with both segments apicodorsally drawn into a claw-like projection in lateral view (Fig 4A). The spermathecae (Fig. 4A) are two in number and sclerotized, without pale spot-like areas (pores).

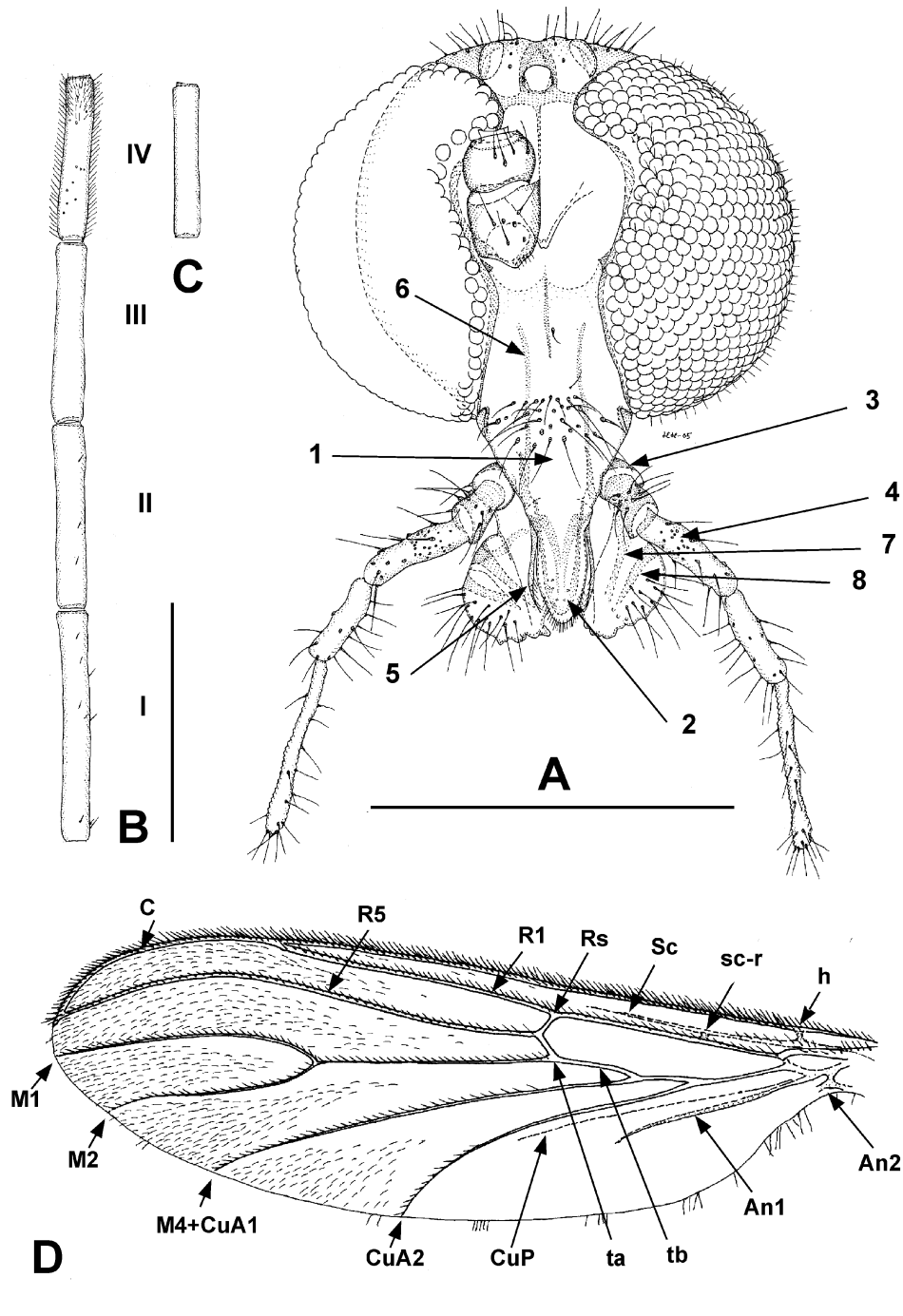
#### Discussion

*Rhynchoheterotricha* is distinguished from all other genera of the *Heterotricha*-like flies by having a proboscis, short in *R. chandleri* but in any case distinct. The other characters are much as in *Chiletricha*. The males of *Rhynchoheterotricha* differ by having two pairs of lobes posteriorly on tergite 9 instead of only one pair. In *R. chandleri* (very probably also in *R. stuckenbergae*), the megasetae on tergite 9 are split (Fig. 3B). In those species of *Chiletricha* that we have studied, the megasetae are normal. The female of *R. chandleri* differs from the females of *Chiletricha* by having an apicodorsal process on both segments of the cercus. In the females of *Chiletricha*, the basal segment of the cercus is also unusually modified, but it is produced on the whole dorsal part, not only apicodorsally, and the apical segment of the cercus is simple except for the unusual elongation. We have seen several unidentified females of *Chiletricha*, all of which have the long setae of sternite 8 normal, not geniculate, and with the appearance as in the drawings by Chandler (2002). We have also briefly seen a female from Australia, which resembles those of *Chiletricha* by lacking the special characters of *Rhynchoheterotricha*.

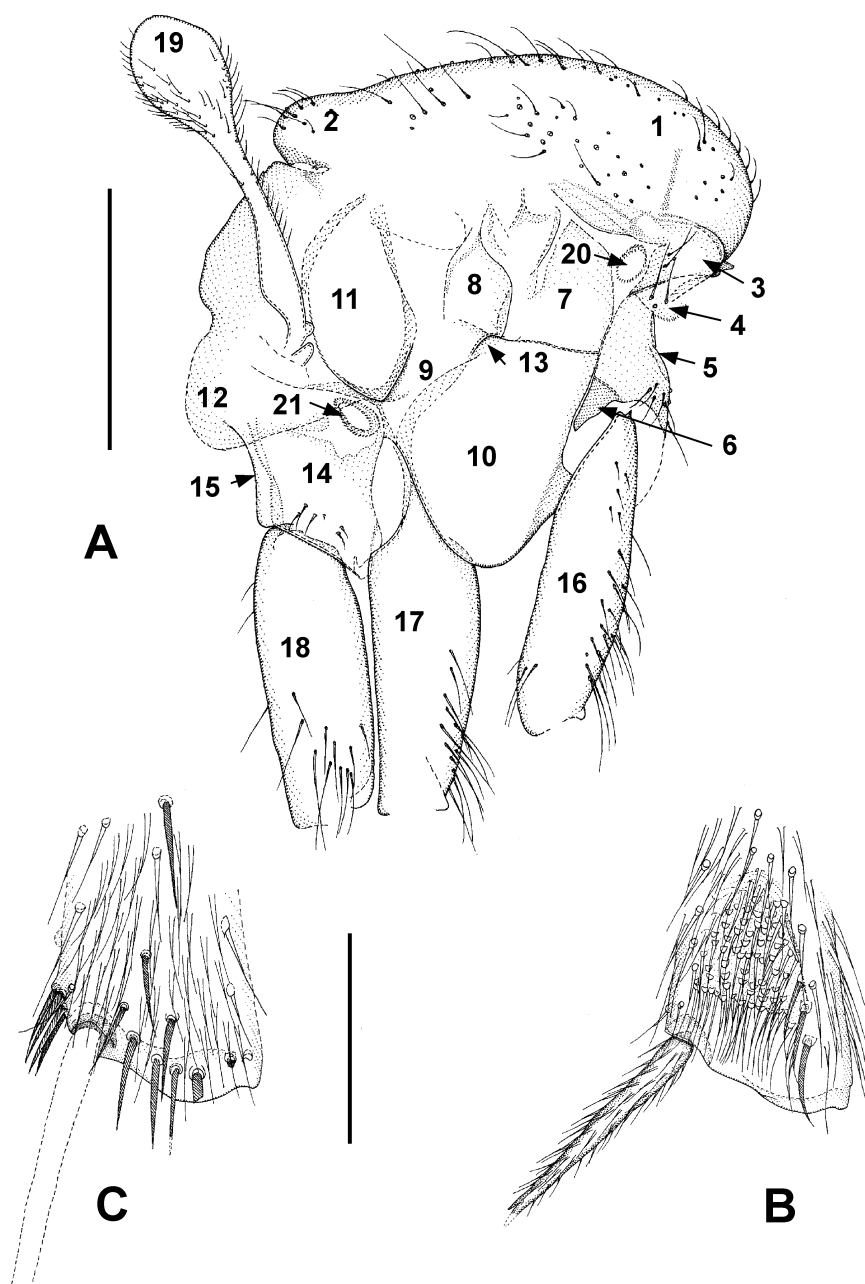
#### *Rhynchoheterotricha chandleri* sp. n.

##### Material examined

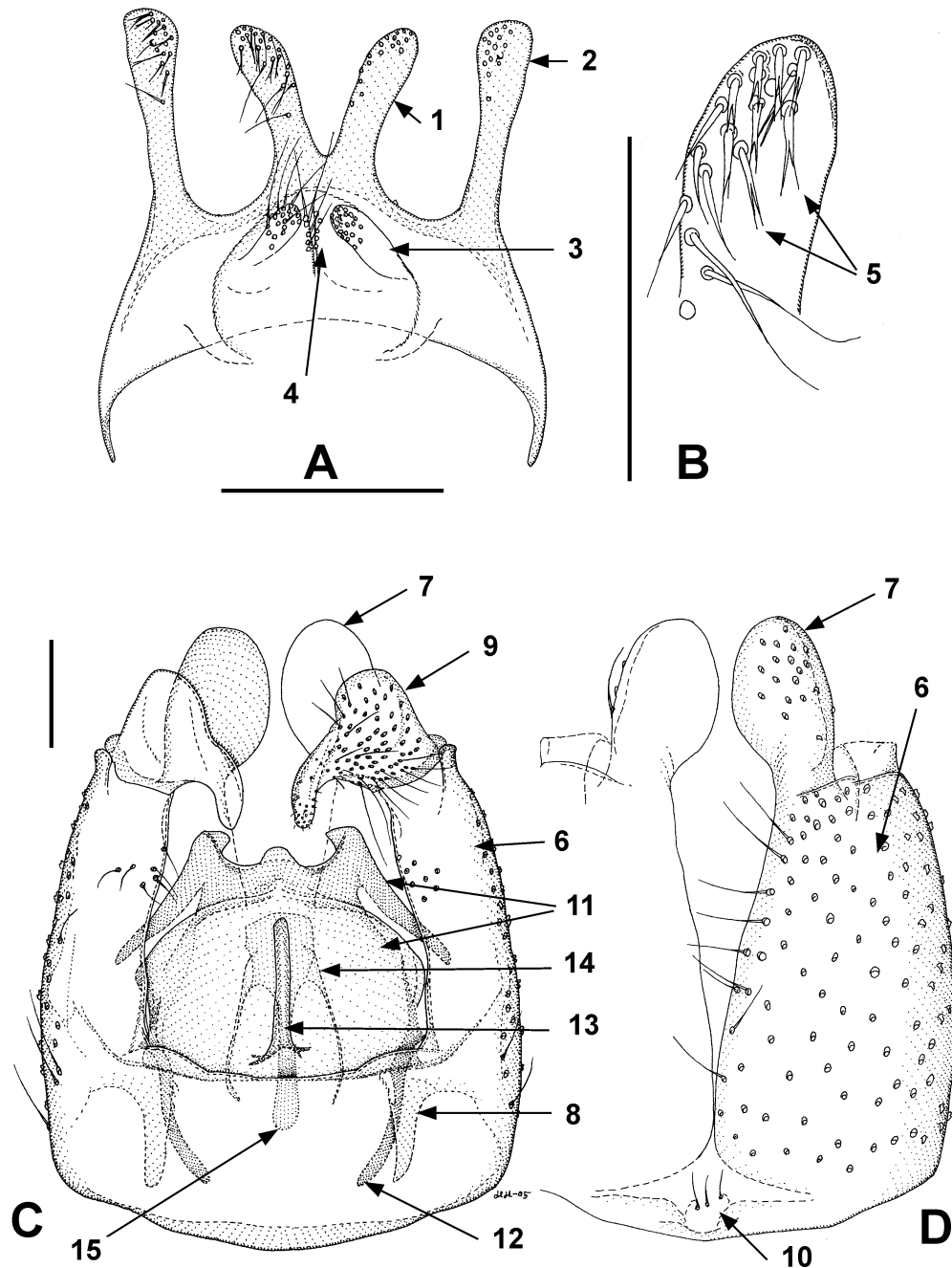
**Holotype male:** REPUBLIC OF SOUTH AFRICA, Cape Province, Tsitsikama For. Res. (33.58° S, 23.54° E), moist, tall, indigenous forest with *Podocarpus* sp., 14–19 Oct. 1994, by Malaise trap, M. Söderlund leg. (NRM) **Paratypes:** two males and one female with same data as holotype (NRM).



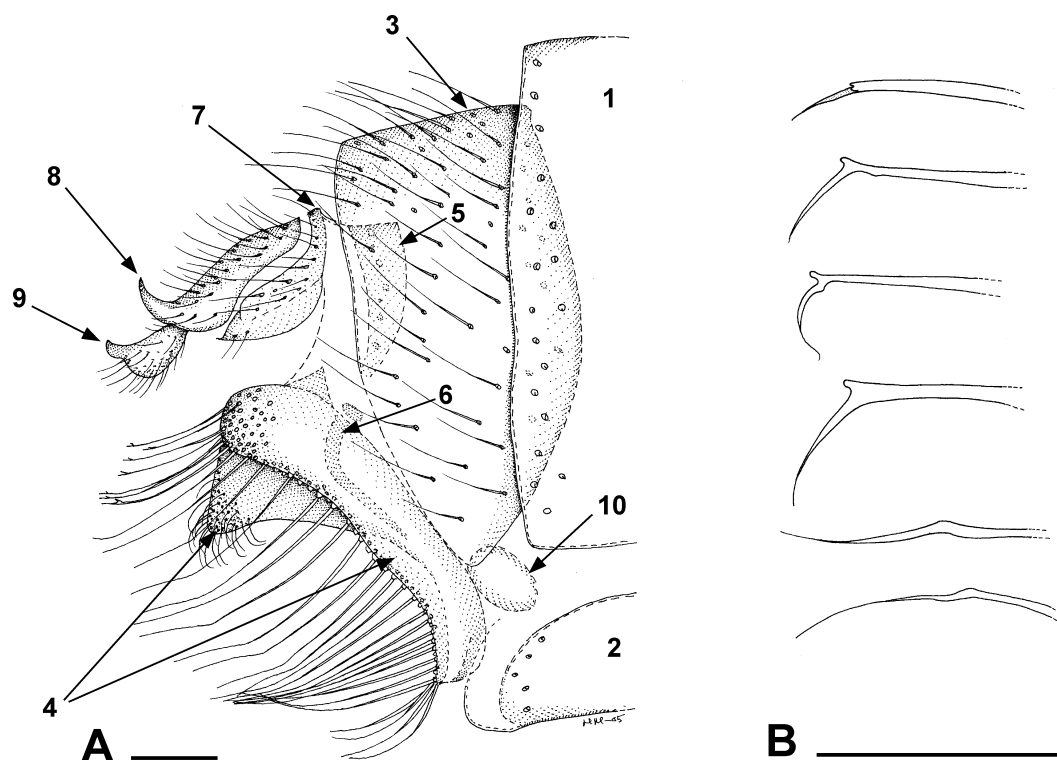
**FIGURE 1.** *Rhynchoheterotricha chandleri* sp. n. **A.** Head of male, frontal view. **B.** Basal flagellomeres of male, ventral view. **C.** Flagellomere 4 of female, lateral view. **D.** Wing of male, dorsal view. Scale for A, B, and C = 0.50 mm, for D = 0.10 mm. 1 = face, 2 = clypeus, 3 = palpomere 1, 4 = hyaline sensilla on palpomere 3, 5 = lacinia, 6 = premental apodeme, 7 = labellomere 1, 8 = labellomere 2.



**FIGURE 2.** *Rhynchoheterotricha chandleri* sp. n. **A.** Thorax of male, lateral view. **B.** Apical part of male tibia 1, prolateral view. **C.** Apical part of male tibia 3, retrolateral view. Scale for A = 0.50 mm, for B and C = 0.10 mm. The poorly visible and partly broken spur in C and the reconstructed apical part of the spur in C are drawn in broken lines. 1 = scutum, 2 = scutellum, 3 = postpronotum, 4 = anteprenotum, 5 = proepisternum, 6 = proepimeron, 7 = anepisternum, 8 and 9 = anepimeron, 10 = preepisternum 2 (katapisternum), 11 = laterotergite, 12 = phragma, 13 = pleural pit, 14 = episternum 3, 15 = epimeron 3, 16–18 = coxa 1–3, 19 = halter, 20 = anterior spiracle, 21 = posterior spiracle.



**FIGURE 3.** *Rhynchoheterotricha chandleri* sp. n. (holotype male). **A.** Tergite 9 with associated structures, ventral view. **B.** Posterior submedial lobe of tergite 9, ventral view. **C.** Hypopygium with tergite 9 removed, dorsal view. **D.** Part of hypopygium, ventral view. Scale = 0.10 mm. 1 = submedial lobe, 2 = lateral lobe, 3 = cercus, 4 = hypoproct, 5 = split setae, 6 = gonocoxa, 7 = apicoventral lobe of gonocoxa, 8 = gonocoxal apodeme, 9 = gonostylus, 10 = sternite 9, 11 = tegmen, 12 = parameral apodeme, 13 = finger-like process, 14 = aedeagus, 15 = aedeagal apodeme.



**FIGURE 4.** *Rhynchoheterotricha chandleri* sp. n. **A.** Apical part of female abdomen, lateral view. **B.** Apical part of elongated setae on female sternite 8. Scale = 0.10 mm. 1 = tergite 7, 2 = sternite 7, 3 = tergite 8, 4 = sternite 8, 5 = tergite 9, 6 = sternite 9, 7 = tergite 10, 8 = basal segment of cercus, 9 = apical segment of cercus, 10 = spermatheca.

### Description

**Male.** Almost unicolorous brown, notum with lateral part and narrow submedial stripe indistinctly paler, femora slightly paler than other parts of legs. Setae of body and extremities dark. Head, Fig. 1A. Basal antennal flagellomeres, Fig. 1B. Thorax, Fig. 2A. Femora shorter than tibiae (tibia/femur of fore leg 1.6), basitarsomere 1 as long as tibia 1. Trichia (non-socketed setae) and setae (socketed setae) of tibiae equally long, tibia 1 without stronger and longer spinose setae except for apex, tibia 2 with few, tibia 3 with many spinose setae laterally. Apical part of tibia 1, Fig. 2B. Apical part of tibia 3, Fig. 2C. Wing, Fig. 1D, hyaline brown, wing length 3.8–3.9 mm. Hypopygium, Figs. 3A–D.

**Female.** Similar to male except for normal sexual dimorphism. Flagellomere 4, Fig. 1C. Wing length 4.5 mm. Terminalia, Figs. 4A and B: setae on sternite 8 concolorous with other body setae.

*Etymology*

The species name is dedicated to Peter Chandler, Melksham, UK, in recognition of his invaluable contribution to the study of the *Heterotricha* group.

*Discussion*

*Rhynchoheterotricha chandleri* is distinguished from *R. stuckenbergae* by the short proboscis, which is only about half the height of the head, not several times longer, and by having the membrane widely setose on the apical half of the wing. In the male hypopygium, the characters of the appendages on tergite 9 distinguish the two species. In *R. stuckenbergae* the lateral ones are broader than the medial ones and the latter are widely separated from each other, whereas in *R. chandleri* the lateral appendages are narrow, similar to the medial ones, and the latter are close to one another so that they have a short common base.

**Acknowledgements**

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