



SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

Riethia manauara n. sp., an Amazonian Chironomid (Diptera: Chironomidae) from Brazil

CSO NEUBERN, S TRIVINHO-STRIXINO, FL SILVA

Lab de Entomologia Aquática, Depto de Hidrobiologia, Univ Federal de São Carlos, São Carlos, SP, Brasil

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Correspondence

FABIO L DA SILVA, Lab de Entomologia Aquática, Depto de Hidrobiologia, Univ Federal de São Carlos, CP 676, São Carlos, SP, Brasil; fabelha@hotmail.com

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Abstract

One new species of *Riethia* Kieffer, *Riethia manauara* n. sp., is described and figured as male, pupa and larva. The generic diagnosis for pupae and larvae are emended. The specimens were collected from water systems in the Amazon Rainforest in northern Brazil.

Introduction

The genus *Riethia* was erected by Kieffer in 1917 based on specimens from Australia. It includes non-biting midges whose larvae inhabit the bottom of lotic and lentic systems associated with sandy and fine particulate organic matter. Prior to the present study, *Riethia* comprised six species described, all of which, except *Riethia truncatocaudata* (Edwards) were known only from the Australasian region (Trivinho-Strixino *et al* 2009).

Riethia species were described by a few authors based on adult males (Kieffer 1917, Edwards 1931, Freeman 1961). A tentative key to larvae and pupal exuviae which included many undescribed species from Australia was provided by Cranston (2000). In the Neotropical region, Ospina-Torres (1992) and Wiedenbrug (2000) recognized some pupal exuviae of *Riethia* in Brazil. Trivinho-Strixino *et al* (2009) redescribed the male of *R. truncatocaudata*, including descriptions of the previously unknown immatures and female, and considered it to be a senior synonym of *Riethia melanoides* (Edwards).

Although these publications have elucidated the status

of some *Riethia* species, a comprehensive revision of the genus remains unavailable. In the present study, one new species of *Riethia* is described in all stages and generic diagnoses to the immature stages (Trivinho-Strixino *et al* 2009) are emended.

Material and Methods

Larvae were collected using a hand net in aquatic systems in the Amazon rainforest in northern Brazil. Specimens examined were slide-mounted in Euparal, and the morphological terminology and abbreviations followed Sæther (1980), except for the term “taenia” used for any broad flattened seta on pupae according to Langton (1994). Measurement methods followed Epler (1988). Metrics are given as the value of the holotype [in brackets], followed by the range with the number of measured specimens in parenthesis if it differs from the number (n) stated at the beginning of the description. Adult were examined in the teneral condition, and thus legs and wings could not be measured completely.

The type material is deposited in the “Coleção de Referência do Laboratório de Entomologia Aquática (LEA), Universidade Federal de São Carlos (UFSCar)”, São Carlos, Brazil and in the “Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia (INPA)”, Manaus, Brazil.

***Riethia* Kieffer**

Riethia Kieffer, 1917: 203.

Type species. Riethia stictoptera Kieffer

Emended diagnosis. Based on the Amazonian specimens, the generic description of *Riethia* to pupa and larvae (Trivinho-Strixino *et al* 2009) must be emended (in bold) as follows: pupa with transverse band of dorsal spines on conjunctives III/IV and IV/V present or **absent**. Pedes spurii B present or **absent**. Larva may have antenna with five or **six** segments. Lauterborn organs on apex of 2nd or **2nd and 3rd segments**.

***Riethia manauara* n. sp.**

Type material. Holotype male with larval and pupal exuviae, BRAZIL: state of Amazonas, Manaus, Lago Catalão, INPA - Base Flutuante de Pesquisa, 10/vii/2008, CSN Oliveira & LM Fusari (LEA). Paratypes: one male with pupal exuviae, same data as holotype (INPA); two larvae, state of Amazonas, Manaus, 11/ix/2003, S Couceiro (LEA); two larvae as previous except for 1993 (LEA).

Etymology. Named after the district of Manaus in the state of Amazonas, where specimens were collected.

Diagnostic characters. *Riethia manauara* differs from other species of *Riethia* (described and not formally described) by the combination of the following characters. **Male:** hypopygium with superior volsella hooklike, basally pubescent; distal margin with about six long simple setae. Median volsella short, with two simple setae. Inferior volsella with flattened scales; numerous apically pectinate and three distally non-pectinate. **Pupa:** cephalothorax strongly granulose. Hook row extending nearly on 1/3 the width of tergite II. Conjunctives III/IV and IV/V bare. Longitudinal creases extending the full length of tergites II-VI. **Larva:** antenna with six segments. Lauterborn organs on apex of 2nd and 3rd segments.

Male (n = 2 unless otherwise stated)

Size. Total length [5.47] 5.25-5.47 mm. Wing length [2.27] (1) mm. Total length/wing length [2.41] (1).

Color. Head, antenna and maxillary palp pale brown. Thorax brown with scutellum pale brown. Wings unmarked. Legs yellow and spurs brown. Abdomen pale brown with dark brown marks. Hypopygium brown.

Head. Antenna with 13 flagellomeres, AR 2.32 (1),

flagellum 1125 (1) μ m long. Temporal setae 15-[16], uniserial. Tentorium 217-[231] μ m long. Stipesn75-[85] μ m long. Clypeus with [29]-34 setae. Palpomere lengths 1-5 (in μ m): [51]; [62]-70; 123-[137]; 137-[154]; 192 (1).

Thorax. Anteprenotal lobes reduced, separated medially, each lobe with [9]-11 lateral setae. Acrostichals 10 (1), uniserial; dorsocentrals uniserial 11-[13]; prealars 4 (1); scutellars biserial 14-[15].

Wing. Width [0.56] (1) mm. Brachiolum with [2] setae (1). Squama with [13] (1) setae.

Legs (Fig 1). Mid and hind leg spurs paired, subequal in length. Tibial spur lengths (μ m): fore 72-[106] (Fig 1a); mid [110]-113 (Fig 1b), hind [97]-106 (Fig 1c).

Hypopygium (Figs 2-3). Tergite IX truncate, without anal point. Laterosternite IX with [3]-4 setae. Transverse sternapodeme [143]-154 μ m long. Phallapodeme [69]-95 μ m long. Gonocoxite 192 (1) μ m long. Superior volsella hooklike, basally pubescent, with six simple setae. Median volsella short, broad, bearing two simple setae. Inferior volsella [92]-106 μ m long, with nine simple setae and 18 flattened scales: 15 apically pectinate and three distal ones broadened and non-pectinate (Figs 2-3). Gonostylus 260-[277] μ m long. HR 0.73 (1).

Pupa (n = 2 unless otherwise stated)

Size. Abdomen 5.47-[5.55] mm long.

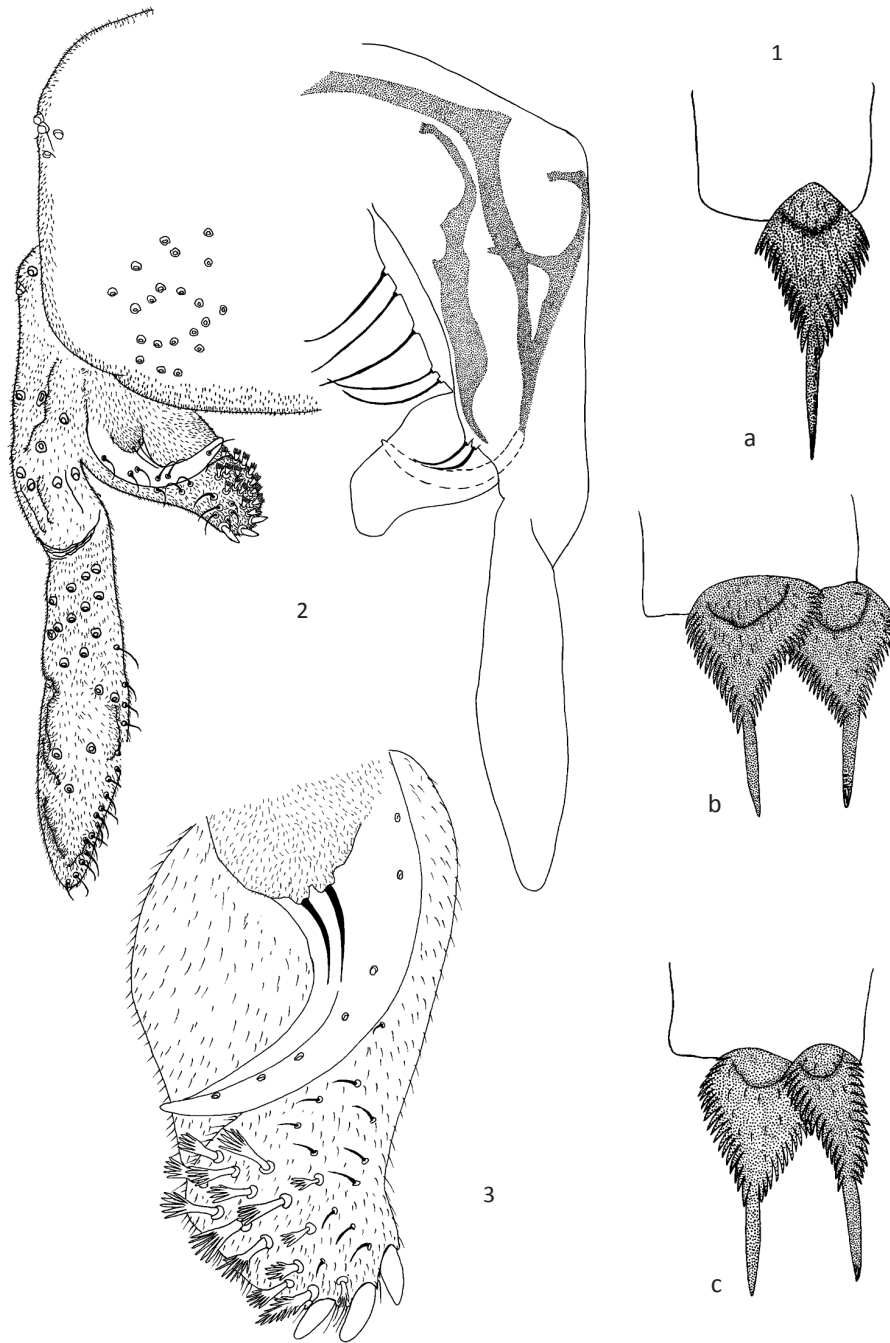
Color. Exuviae brown.

Cephalothorax. Antennal sheath usually without pearl row. Frontal setae and cephalic tubercles absent. Frontal warts not discernible. Wing sheath [1.69]-1.75 mm long. Thorax strongly granulose; anteprenotals [2], longest setae 132 (1) μ m long; precorneals [3], Pc₂ [108] μ m; dorsocentrals [4]. Distance Dc₁-Dc₂ [38]-38 μ m; Dc₂-Dc₃ 281-[288] μ m; Dc₃-Dc₄ [19]-38 μ m. Thoracic horn elongate, about [550] (1) μ m, with lateral spinules along whole length.

Abdomen (Fig 4). Tergite I bare; II-VI with anterior transverse band of strong shagreen connecting with longitudinal creases extending the full length of segments. Hooklets row, interrupted medially, extending nearly on 1/3 the width of tergite II. Pedes spurii B present on segment II. Pedes spurii A present in segment IV. Tergite VIII with posterolateral comb, usually with 4-[6] marginal teeth (Fig 5). Segments I-V with 0, 3, 3, 3, 3 L setae, respectively; segments VI-VII with four taeniae; segment VIII with five taeniae. Anal lobe [500] μ m long, with complete fringe of about 140 taeniae in multiple rows; with anterior shagreen. Genital sac [331]-350 μ m long.

4th instar larva (n = 5 unless otherwise stated)

Color. Head and antenna yellow; mentum and postoccipital margin brown; apical tooth of mandible pale, inner teeth



Figs 1-3 *Riethia manauara* n. sp. male. 1) Tibial spurs: a. fore, b. mid, c. hind; 2) Hypopygium, left: dorsal aspect, right: ventral aspect; 3) Superior, median and inferior volsella.

dark brown. Abdomen and claws yellow.

Head 138-[188] μm long, 438-[569] (3) μm wide.

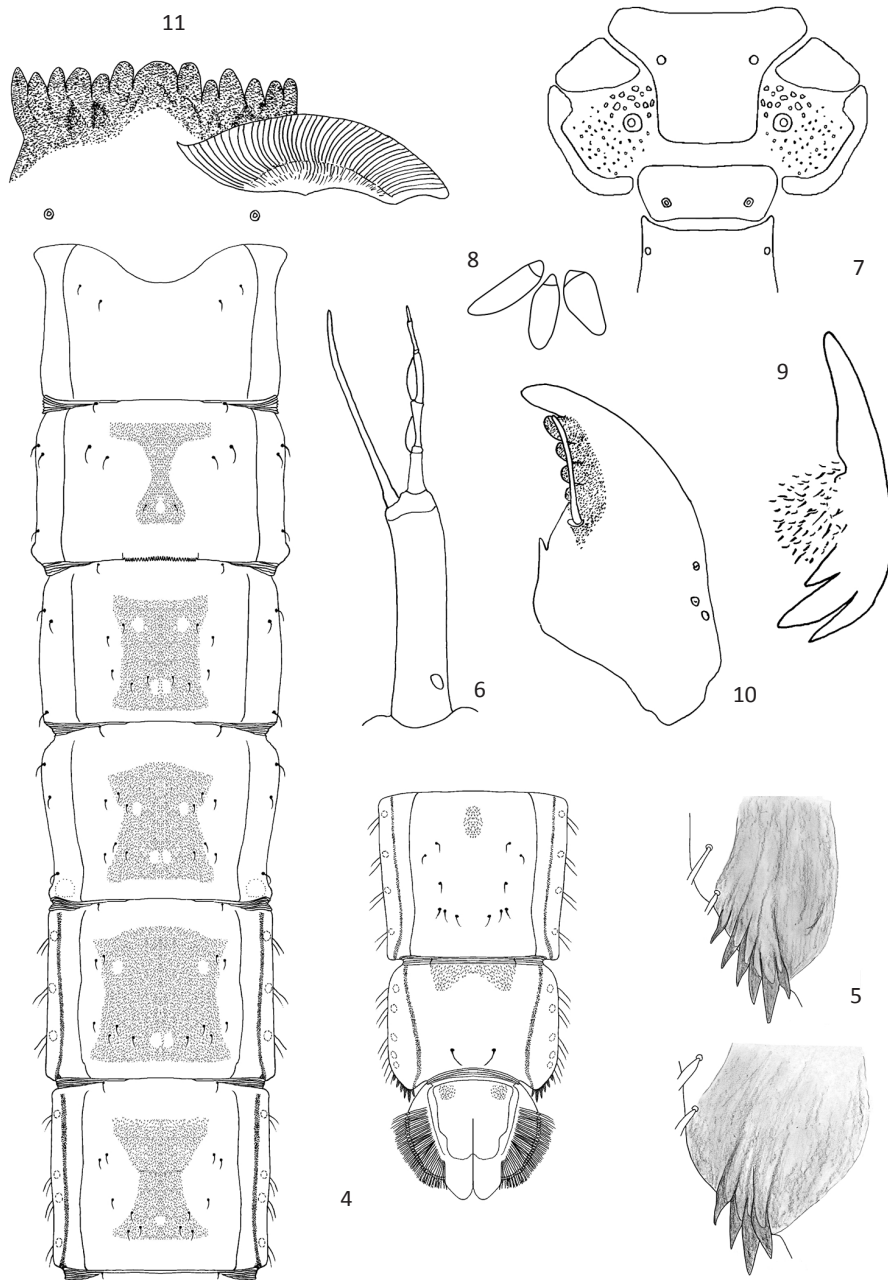
Antenna (Fig 6). [180] 154-202 (3) μm , with six segments, basal segment [85]-105 (4) μm long, AR [0.88]-1.32. Lauterborn organs 15-20 (3) μm long, on apex of 2nd and 3rd segments. Blade [83] 81-127 surpassing 6th segment.

Labrum (Figs 7-9). Dorsal sclerites of head as in Fig 7. SI plumose, arising from common base; SII narrow. Pecten epipharyngis composed of 3 plates (Fig 8). Seta premandibularis simple; premandible [67] μm long, trifid

with two large apical teeth and one smaller proximal teeth; brush present (Fig 9).

Mandible (Fig 10). Length [139] 129-159 μm , with one strong apical tooth and four small inner teeth. Seta subdentalis [41] 40-51 μm long, extending to base of apical tooth, inserted on mid-surface of mola, but lying along the inner surface. Outer margin smooth; mola with [2]-3 spines; Pecten mandibularis absent and dorsal tooth absent.

Mentum (Fig 11). Width [117]-154 μm , with rounded median tooth and five pairs of lateral teeth, 2nd lateral



Figs 4-11 *Riethia manauara* n. sp. pupa (4-5) and larva (6-11). 4) Abdominal tergites; 5) Posterolateral comb on tergite VIII; 6) Antenna; 7) Frontal apotome and labral sclerites; 8) Pecten epipharyngis; 9) Premandible; 10) Mandible; 11) Mentum and ventromental plate.

tooth smaller than 1st and 3rd. Ventromental plates [123]-189 µm wide, nearly touching medially.

Abdomen. Anterior and posterior parapod with simple claws. Lateral tubules absent. Procercus short, with two setae lateral and with about eight setae. Anal tubules slender, 268 (1) µm long.

Remarks

The male of *R. manauara* resembles *R. truncatocaudata* (Edwards 1931) and one Australian undescribed species ('kakadu type') (Cranston 2000) by the morphology of the superior volsella and the possession of the flattened,

apically pectinate scales on the inferior volsella, but the three broadened and non-pectinate scales at the apex of the volsella in *R. manauara* separate these species. The pupa of *R. manauara* can be distinguished easily from other *Riethia* species including formally undescribed species (Ospina-Torres 1992, Cranston 2000, Wiedenbrug 2000) by conjunctives the tergal III/IV and IV/V lacking any transverse band of dorsal spines. The larva of *R. manauara* seems to be related to *R. truncatocaudata*, but differs in antenna morphology, with six segments and Lauterborn organs alternate on the apices of the 2nd and 3rd segments.

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