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ORIGINAL ARTICLE

New species of *Tricorythopsis* Traver (Ephemeroptera: Leptohyphidae) from northern Brazil

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Two new species of *Tricorythopsis* Traver (Ephemeroptera: Leptohyphidae) are described based on nymphs from northern Brazil. *Tricorythopsis yucupe* sp. n. is distinguished by the pronotum with lateral margins expanded; forewing pads elevated just before apex and keel shaped; coxae with projections; femora with short setae; tarsal claws with three to five marginal denticles, and two rows of 1–2 + 1 submarginal denticles; dorsal tubercles present on terga 7–9; colour pattern. *Tricorythopsis bahiensis* sp. n. is distinguished by the wide femora bordered with long setae; tarsal claws with three or four marginal denticles, and two rows of 5 + 3–4 submarginal denticles; dorsal tubercles absent in abdominal segments; colour pattern.

Duas novas espécies de *Tricorythopsis* Traver (Ephemeroptera: Leptohyphidae) são descritas baseadas em ninfas do norte do Brasil. *Tricorythopsis yucupe* sp. n. é distinguido pelo pronoto com margens laterais expandidas; extremidade das tecas alares elevadas em forma de quilha; projeção nas coxas presentes; fêmures com cerdas curtas; garra tarsal com 3–5 dentículos marginais e duas fileiras de 1–2 + 1 dentículos submarginais; tubérculos dorsais presentes nos tergos abdominais 7–9; padrão de coloração. *Tricorythopsis bahiensis* sp. n. é distinguido pelo fêmur largo, bordeado com longas cerdas; garra tarsal com 3–4 dentículos marginais pequenos e duas fileiras de 5 + 3–4 dentículos submarginais; ausência de tubérculos abdominais; padrão de coloração.

Keywords: Leptohyphidae; new species; northern Brazil; *Tricorythopsis*

Introduction

Leptohyphidae (Ephemeroptera) is currently represented in Brazil by seven genera and 26 species (Dias & Salles 2005, 2006; Domínguez et al. 2006; Siegloch & Froehlich 2006). Among these, the strictly Neotropical genus *Tricorythopsis* Traver is one of the most representative of the family, not only in South America but specially in Brazil. Of the 11 presently described species of *Tricorythopsis*, the following are recorded from Brazil: *T. artigas* Traver, *T. gibbus* (Allen), *T. minimus* (Allen), *T. undulatus* (Allen), *T. sigillatus* Molineri, *T. araponga* Dias & Salles, *T. baptistai* Dias & Salles, *T. pseudogibbus* Dias & Salles and *T. yacutinga* Molineri (Molineri 2001; Dias & Salles 2005; Siegloch & Froehlich 2006).

The nymph of this genus is differentiated from the other genera of Leptohyphidae by its small size, generally less than 3 mm, and by the possession of a transversal and poorly sclerotized line in the operculate gills. The adults are differentiated by the presence of two consecutive triads of veins in the cubital and medial sectors of the fore wings, and by the bi-segmented forceps, with the distal segment conical and outside directed (Traver 1958; Molineri 2001).

We describe in the present paper two additional new species of *Tricorythopsis* from Brazil, which constitute the first record of the genus from the northern region of country.

Materials and methods

The nymphs were preserved in 80% ethanol. Mouthparts and legs of nymphs were mounted on microscope slides in Euparal and drawn with a camera lucida attached to a stereo microscope. The material is deposited in the following institutions: Invertebrate Collection of the Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (INPA); Invertebrate Collection of the Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil (MNRJ); Laboratório de Entomologia, Departamento de Zoologia, Instituto de Biologia, Universidade Federal do Rio Janeiro, Brazil (DZRJ); Instituto-Fundación Miguel Lillo, San Miguel de Tucumán,

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Tucumán, Argentina (IFML); and Museu Regional de Entomologia, Universidade Federal de Viçosa, Minas Gerais, Brazil (UFVB).

Results

Tricorythopsis yucupe sp. n.

Description

Nymph

Length of male: body, 3.0–3.2 mm; mesonotum, 1–1.2 mm; caudal filaments, 1.8 mm. Length of female: body, 3.5–3.8 mm; mesonotum, 1.2 mm; caudal filaments, 1.7–1.9 mm.

General. Coloration dark brown, with yellowish marks (Figure 1). Large size, more than 3 mm (species of the genus often are less than 3.0 mm).

Head. Yellowish brown, except posterior margin, darker brown (Figure 1). Mouthparts yellowish; maxillary palp bi-segmented with short apical seta (Figure 2).

Thorax. General coloration dark brown with pale yellowish regions. Pronotum dark brown, with pale yellowish marks in submedian regions and lateral margins; lateral margins expanded (Figure 1). Mesonotum dark brown, submedian region with pale yellowish marks (Figure 1). Forewing pads elevated just before apex, keel shaped (Figure 1, 3). Pleura and sterna dark brown, with yellowish marks. Legs: Coxae with projections, hind coxae with projection absent or reduced (Figures 4–6). Femora of all legs dark brown, except for a median yellowish zone; fore femora with subdistal transversal row of setae; femora narrow (at least two times longer than wide), and with short setae (Figures 4–7). Tibiae yellowish with median transversal brown band (Figures 4–6). Tarsal claws yellow, with three to five large marginal denticles, and two rows of 1–2 + 1 submarginal denticles; and with apical seta (Figure 8).

Abdomen. Dark brown, except for a yellowish zone on terga 4–7 near operculate gills (Figure 1). Median dorsal tubercles present on terga 7–9 (Figure 1). Lateral margins of segments 3–9 laterally expanded; segments 5–9 with posterolateral projections. Sterna yellowish, with brown marks. Operculate gills yellow, base and lateral margins shaded with brown (Figure 9); remaining gills completely shaded with light grey. Caudal filaments yellow.

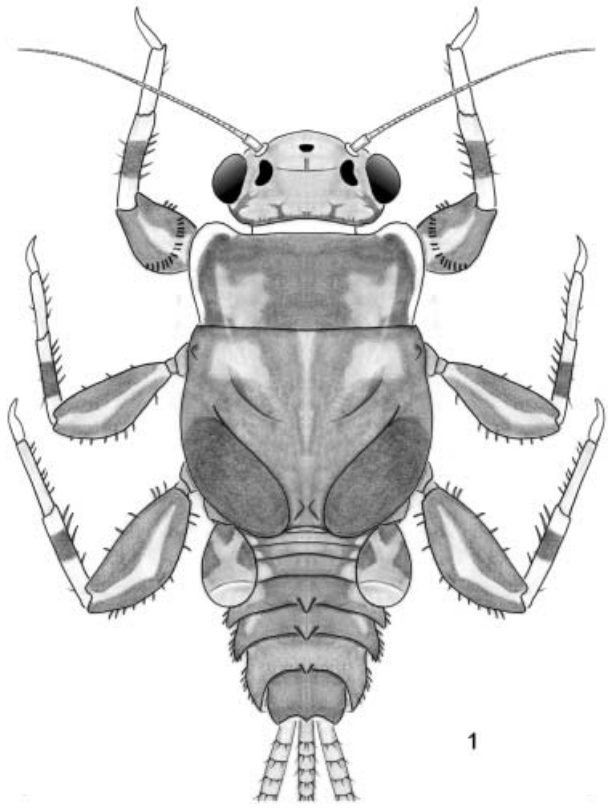


Figure 1. *Tricorythopsis yucupe* sp. n. Nymphal habitus (dorsal view).

Adult

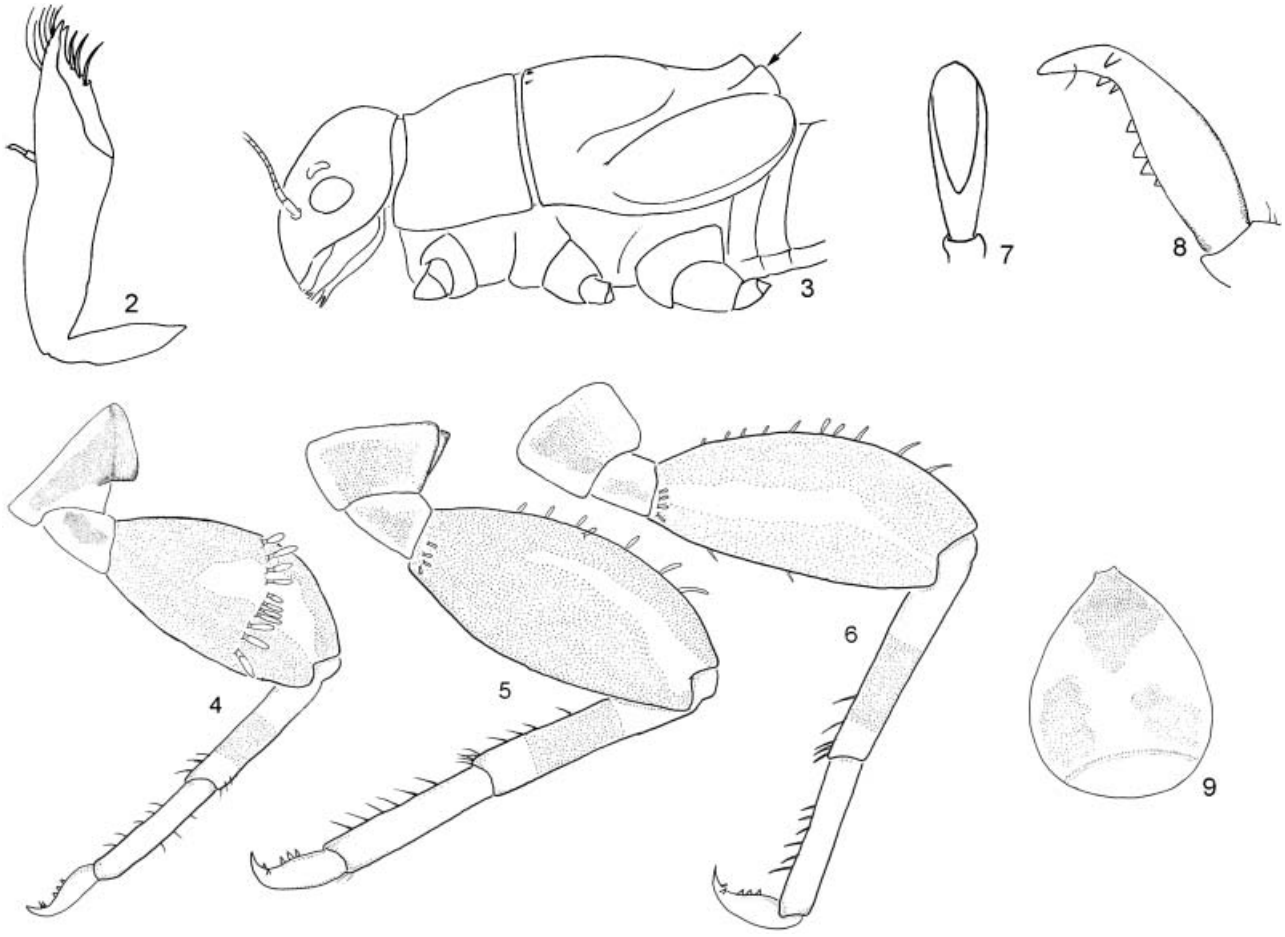
Unknown.

Diagnosis

(1) Pronotum with lateral margins expanded (Figure 1); (2) forewing pads elevated just before apex and keel shaped (Figures 1, 3); (3) coxae with projections (Figures 4–6), hind coxae with projection absent or reduced; (4) femora narrow (at least two times longer than wide), and with short setae (Figure 7); (5) tarsal claws with three to five marginal denticles, and two rows of 1–2 + 1 submarginal denticles (Figure 8); (6) tubercles present on terga 7–9 (Figure 1); (7) abdominal colour pattern (Figure 1).

Discussion

Tricorythopsis yucupe sp. n. is the third species of *Tricorythopsis* in which the nymphal forewing pads is elevated just before the apex; the others are *T. gibbus* and *T. pseudogibbus.* However, the shape of the elevation, the location of the dorsal tubercles on abdominal segments, colour pattern and the number of denticles on the tarsal claws, distinguish *T. yucupe* sp. n. from these possibly related species. Besides



Figures 2–9. *Tricorythopsis yucupe* sp. n. (2) Maxilla (dorsal view). (3) Thorax (lateral view). (4) Foreleg. (5) Mid leg. (6) Hind leg. (7) Detail of femoral setae. (8) Foreclaw (detail). (9) Operculate gill (dorsal view).

these characteristics, the reduced maxillary palp of *T. gibbus* and *T. pseudogibbus* and the large size of *T. yucupe* sp. n. (species of the genus often are less than 3.0 mm), allow the differentiation between them.

Material

Holotype: one nymph, Brazil, Roraima state, Rio Ereu, riffle litter, 24 October 2004, N. Hamada, F. F. Salles coll. (INPA). Paratypes: two nymphs, same data as holotype (INPA); two nymphs, same data as holotype (DZRJ); two nymphs, same data as holotype (MNRJ); three nymphs, Brazil, Roraima state, Contigo, 23 October 2004, N. Hamada coll. (IFML).

Other material studied

Three nymphs, Brazil, Amazonas state, Presidente Figueiredo, 8 October 2003, N. Hamada, F. F. Salles coll. (INPA)l two nymphs, Brazil, Amazonas state, Presidente Figueiredo, 7 October 2003, N. Hamada, F. F. Salles coll. (INPA); three nymphs, Brazil, Roraima state, Surumu, 22 March 2002, N. Hamada coll. (UFVB).

Distribution

Brazil: Roraima and Amazonas.

Etymology

"Yucupe", an indigenous name from the Tupi Guarani language. *Yu*, spine and *cupe*, back; the epithet is an apposition to the forewing pads projection of the new species.

Tricorythopsis bahiensis sp. n.

Description

Nymph

Length of male: body, 2.4–2.7 mm; mesonotum, 0.6–0.9 mm; caudal filaments, 1.1–1.7 mm. Length of female: body, 3.0–3.1 mm; mesonotum, 1.0–1.3 mm; caudal filaments, 1.7 mm.

General. Coloration yellow shaded with grey (Figure 10).

Head. Yellow with posterior region shaded with grey (Figure 10). Mouthparts uniformly yellowish; maxillary palp bi-segmented with apical seta (Figure 16).

Thorax. Pronotum yellow shaded with grey, except for yellowish marks in lateral and submedian region (Figure 10). Mesonotum and mesoescutellum yellow shaded with light grey, darker between wing pads (Figure 10). Sterna whitish. Pleura whitish shaded with grey. Legs: coxae without projections. Femora of all legs yellow shaded with grey, except in the median region, yellowish (Figures 11–13); fore femora with subdistal transversal row of setae; femora wide (at least as wide as long), bordered with long setae (Figures 11–14). Tibiae yellowish with transversal light grey band in median region (Figures 11–13). Tarsi yellowish with subbasal transversal light grey band; tarsal claws with three or four marginal denticles, with two rows of large submarginal denticles, one side with five and the other with three or four denticles (Figure 15).

Abdomen. Yellow shaded with grey on terga 1–5; terga 6–9 with darker marks in submedian and median zones (Figure 10). Sterna whitish yellow, with greyish dorsolateral marks. Lateral margins of abdominal segments 2–9 expanded; segments 6–9 with posterolateral projections bordered with setae. Operculate gills completely shaded with grey, darker at base, paler toward apex (Figure 17); remaining gills completely shaded with light grey. Caudal filaments yellowish, basal region grey.

Adult

Unknown.

Diagnosis

(1) Femora wide (at least as wide as long), and bordered with long setae (Figures 11–13); (2) tarsal claws with three or four small marginal denticles, and two rows of 5 + 3–4 submarginal denticles (Figure 15); (3) dorsal tubercles absent in abdominal segments (Figure 10); (4) abdominal colour pattern as in Figure 10.

Discussion

Tricorythopsis bahiensis sp. n., as well as *T. yacutinga* and *T. araponga*, presents the nymphal femora bordered with long setae. Nevertheless, while the tarsal claws with marginal denticles distinguish the new species from *T. yacutinga*, the absence of dorsal tubercles in abdominal segments distinguishes it from *T. araponga*.

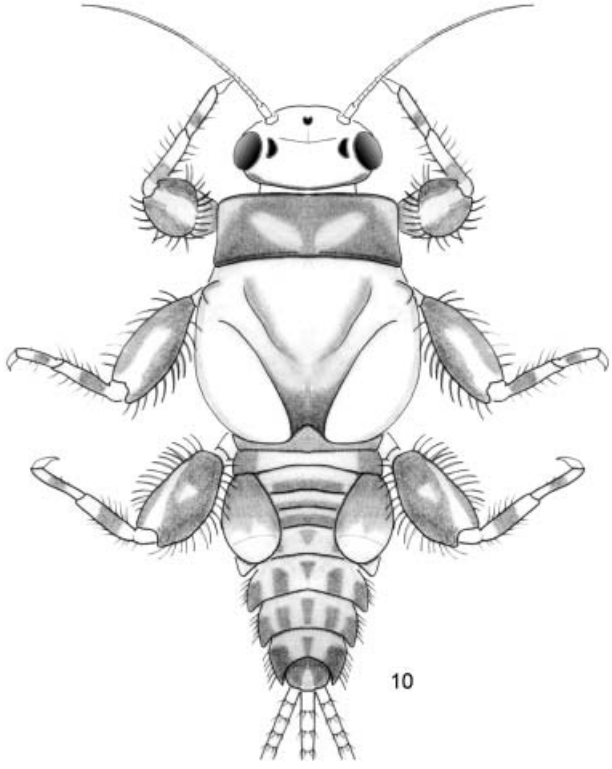


Figure 10. *Tricorythopsis bahiensis* sp. n. Nymphal habitus (dorsal view).

Material

Holotype: one nymph, Brazil, Bahia state, 13°31′25.1″S, 44°43′30.7″W, Correntina, Comunidade da Prainha, Rio Arrojado, 5 August 003, N. Hamada, F. F. Salles coll. (INPA). Paratypes: one nymph, same data as holotype (DZRJ); one nymph, same data as holotype (DZRJ); two nymphs, same data as holotype (MNRJ); two nymphs, same data as holotype (IFML).

Other material studied. Ten nymphs, Brazil, Roraima state, 03°21.0′38″N, 59°54′255″W, Arraiá, 22 March 2001, N. Hamada coll. (INPA); three nymphs, Amazonas state, Presidente Figueiredo, 14 October 2003, N. Hamada, F. F. Salles coll. (INPA); one nymph, same data as holotype, except 3 August 2003 (UFVB).

Distribution

Brazil: Bahia, Amazonas and Roraima.

Etymology

The epithet of the new species is a reference to Bahia, the state where the holotype was found.

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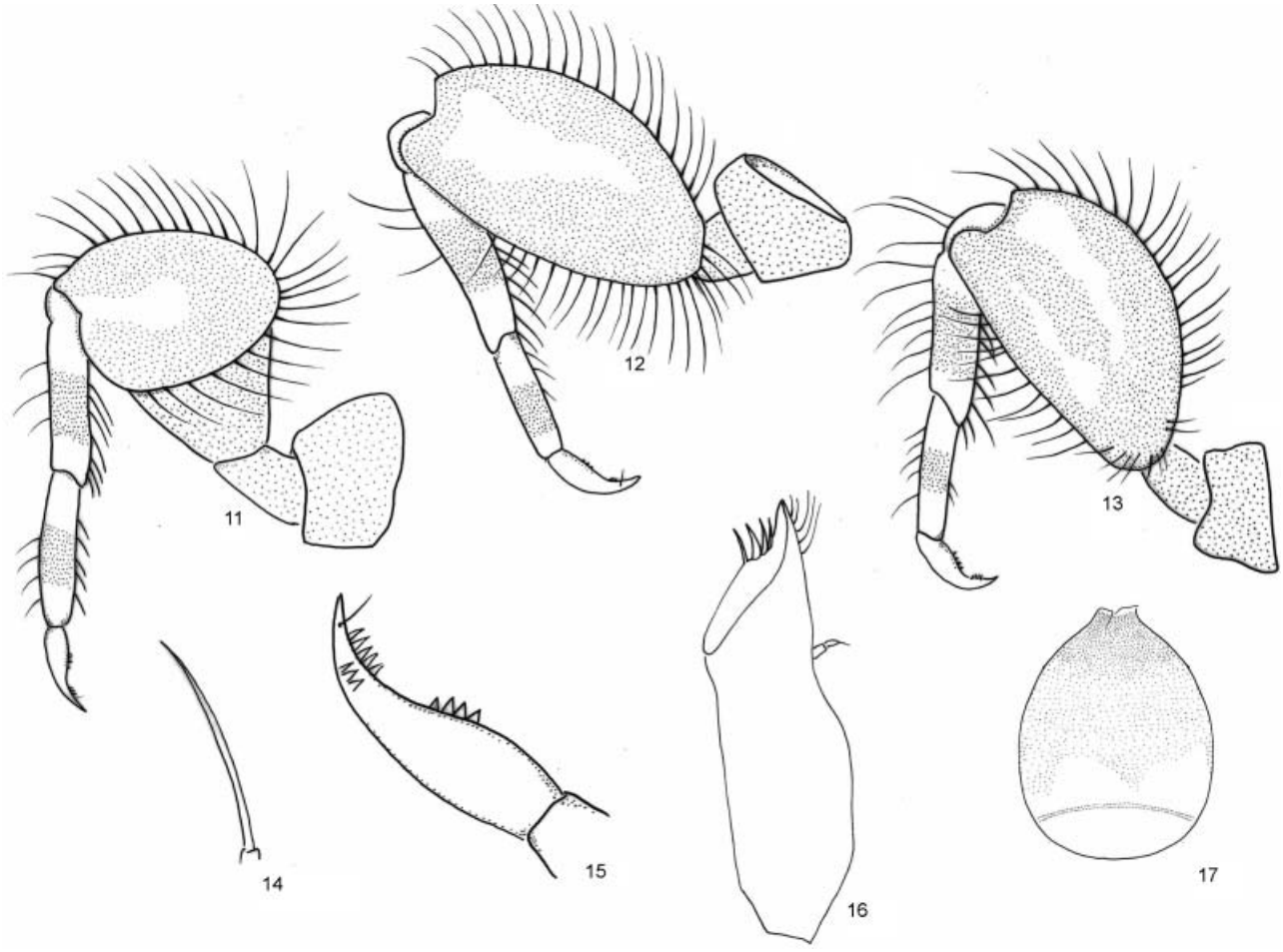

Figures 11–17. *Tricorythopsis bahiensis* sp. n. (11) Foreleg. (12) Mid leg. (13) Hind leg. (14) Detail of femoral setae. (15) Foreclaw (detail). (16) Maxilla (dorsal view). (17) Operculate gill (dorsal view).

part of the specimens from the northern region of Brazil, and for helping F.F.S. in collecting trips in Amazonas, Bahia, and Roraima, where the material studied in the present work was found. We also would like to thank the CNPq for providing funds to L.G.D. to conduct postgraduate studies at the Universidade Federal de Viçosa.

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