

A new species of *Tricorythodes* Ulmer, 1920 (Ephemeroptera: Leptoxyphidae) and first record of *Tricorythodes quizeri* Molineri, 2002 from Brazil

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A new species of *Tricorythodes* Ulmer, 1920 (Ephemeroptera: Leptoxyphidae) is described and illustrated based on larvae from Brazil. *Tricorythodes sallesi* sp. nov. is distinguished from other species of the genus due to the presence of a distinctive spine-like anterolateral projection of the pronotum, besides its tarsal claw morphology and colouration pattern. In addition, the species *Tricorythodes quizeri* Molineri, 2002 is recorded for the first time from Brazil. Habitat and ecological information associated with these two species are commented.

Keywords: taxonomy; Pannota; new species; new record; Ephemeroptera; *Tricorythodes*

Introduction

Tricorythodes Ulmer, 1920 is a diverse Pan-American genus of the Leptoxyphidae. The genus is represented by 18 species in South America (Molineri 2002; Dias and Salles 2006; Molineri and Zúñiga 2006; Emmerich 2007). There are six species recorded from Brazil: *T. arequita* Traver, 1959; *T. barbatus* Allen, 1967; *T. bullus* Allen, 1967; *T. cristatus* Allen, 1967; *T. molinerii* Dias and Salles, 2006; and *T. santarita* Traver, 1959 (Dias et al. 2007).

The larvae of this genus are differentiated from the other genera of the family by their body, legs and operculate gills covered with long setae, and by the operculate gills that generally have a triangulate shape. The adults are dipterous mayflies with very broad wings and with a basal swelling in the second joint of the forceps of the male (Molineri 2002). In the present paper, we describe a new species of *Tricorythodes* based on larvae and record for the first time *Tricorythodes quizeri* Molineri from Brazil.

Materials and methods

The material was preserved in 80% ethanol. Body parts of larvae were mounted on microscope slides in euparal and drawn with a camera lucida attached to a

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stereo-microscope. The length of the body, mesonotum and caudal filaments were measured in mature larvae.

The material is deposited in the following institutions: Invertebrate Collection of the Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil (MNRJ); Instituto-Fundación Miguel Lillo, San Miguel de Tucumán, Tucumán, Argentina (IFML); Entomological Collection of the Departamento de Zoologia, Instituto de Biologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil (DZRJ); Museu Regional de Entomologia, Universidade Federal de Viçosa, Minas Gerais, Brazil (UFVB); and Coleção Zoobotânica James A. Ratter, Universidade do Estado de Mato Grosso, Nova Xavantina, MT, Brazil (CZNX).

Systematic account

Tricorythodes sallesi sp. nov. (Figures 1–12)

Material examined. Holotype: 1 larva, Brazil, Mato Grosso state, Nova Xavantina, Córrego do Papagaio, S 15° 27' 32" - W 52° 24' 42", 14/vii/2005, De Souza, D.P. and Cabette, H.S.R. cols. (MNRJ). Paratypes: 1 larva, same data as holotype (MNRJ). 2 larvae, same data as holotype (DZRJ). 2 larvae, same data as holotype (IFML). Other material. 2 larvae, same data as holotype, except, 20/xi/ 2005 (UFVB). 2 larvae, same data as holotype, except, 20/xi/ 2005 (CZNX).

Mature larva

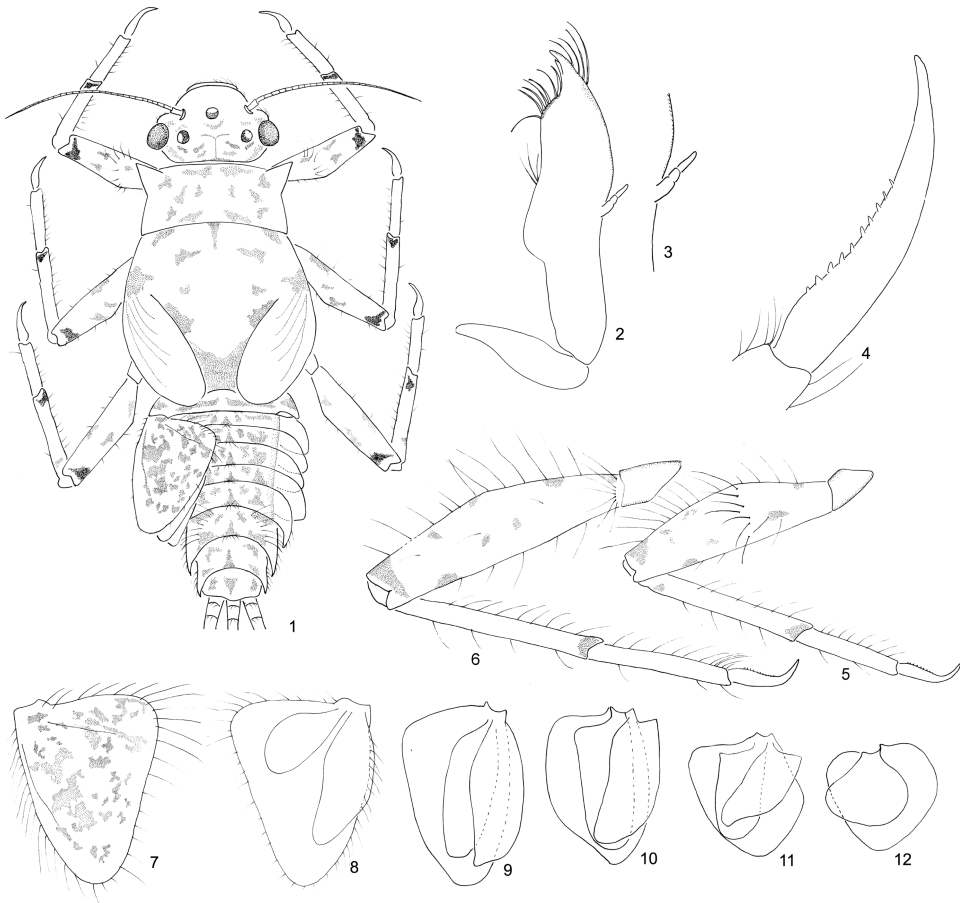
Length. Body, 4.0–5.5 mm; mesonotum, 1.3–2.0 mm; caudal filaments, 2.6–3.0 mm ($n = 5$). General colouration yellowish with blackish diffuse marks (Figure 1).

Head. Genal projection slightly developed. Colouration yellowish with blackish diffuse marks (Figure 1). Antennae yellowish-translucent. Mouthparts yellowish; maxillary palp three-segmented without apical seta (Figures 2 and 3); median region of mentum and labrum shaded with black.

Thorax. General colouration yellowish with blackish diffuse marks (Figure 1). Pronotum with anterolateral spine-like projection (Figure 1); colouration yellowish with blackish diffuse marks, more intense on submedian regions (Figure 1). Mesonotum yellowish with blackish diffuse marks, except in forewing pads, whitish (Figure 1); sometimes with a reddish mark in the base of the forewing pads. Metanotum, pleurae and sterna yellowish with blackish marks. Legs narrow and long; colouration yellowish, dorsal region of all femora with blackish diffuse marks; with a large blackish mark on subapical region of all femora and tibiae (Figures 5 and 6); tarsi without marks; dorsum of forefemora with a transverse row of setae on submedian region (Figure 6); tarsal claws with 10–12 marginal denticles and without submarginal denticles (Figure 4).

Abdomen. General colouration yellowish with blackish diffuse marks. Terga with more intense marks on median and lateral regions of all segments (Figure 1). Sterna yellowish shaded with blackish marks, lateral regions of sterna III–VI shaded with grey. Lateral margins of abdominal segments III–VII expanded; segments VII–IX with posterolateral projections and with a row of setae on posterior margin (Figure 1). Operculate gills triangular, yellowish with blackish or reddish diffuse marks (Figure 7), operculate gills formed by three lamellae (Figure 8); remaining gills as in Figures 9–12. Caudal filaments yellowish with whorls of setae at joints.

Adults. Unknown.



Figures 1–12. *Tricorythodes sallesi* sp. nov. (1) Larval habitus (dorsal view), (2) maxilla (dorsal view), (3) maxillary palp (detail), (4) foreclaw (detail), (5) hind leg, (6) foreleg, (7) operculate gill (dorsal view), (8) operculate gill (ventral view), (9–12) gills III–VI (ventral view).

Etymology

This species is dedicated to Dr Frederico Falcão Salles, Universidade Federal do Espírito Santo, in recognition of his numerous important contributions to the study of Ephemeroptera from Brazil.

Diagnosis

T. sallesi sp. nov. can be distinguished from other species of the genus by the following combination of characters: (1) maxillary palp three-segmented without apical setae (Figures 2 and 3); (2) pronotum with spine-like anterolateral projection (Figure 1); (3) legs with subapical blackish marks on femora and tibia, tarsi without marks (Figures 5 and 6); (4) dorsum of fore femora with a transversal row of setae in the submedian region (Figure 6); (5) tarsal claws with 10–12 marginal denticles and without submarginal denticles (Figure 4); (6) operculate gills triangular, yellowish with blackish diffuse marks (Figure 7); (7) lateral margins of abdominal segments 3–7 expanded, segments 7–9 with posterolateral projections (Figure 1).

Discussion

Larvae of *T. sallesi* sp. nov. show affinities with *T. mirca* Molineri, 2002 and *T. arequita* Traver, 1959. These species possess similar colour pattern, formed by pigmented marks distributed irregularly and blackish marks present on the apex of femora and tibia. Based on the general morphologic aspects of the body, femora narrow-elongate, fore femora more than twice as long as broad and tarsal claw morphology, the new species appears more related to *T. bullus* Allen, 1967 and *T. cristatus* Allen, 1967. However, *T. sallesi* sp. nov. can easily be separated from these related species (and all other of the genus) by the presence of the unique spine-like anterolateral projections on the pronotum and absence of dorsal tubercles in the head and thorax. An additional difference between these three species is the number of denticles on the tarsal claws.

Tricorythodes quizeri Molineri, 2002; a new record from Brazil

Tricorythodes quizeri Molineri 2002, p. 290.

Material examined. 3 larvae, Brazil, Mato Grosso state, Nova Xavantina, Córrego da Mata, S 14° 59' 59" - W 52° 26' 29", 12/i/2005, De Souza, D.P. and Cabette, H.S.R. cols. (MNRJ). 2 larvae, Brazil, Mato Grosso state, Nova Xavantina, Córrego do Papagaio, S 15° 27' 32" - W 52° 24' 42", 14/vii/2005, De Souza, D.P. and Cabette, H.S.R. cols. (DZRJ).

Tricorythodes quizeri was described by Molineri (2002) from Santa Cruz in Bolivia based on larvae and adults. We studied larvae of *T. quizeri* from Mato Grosso, a Brazilian State close to the type locality of this species in Bolivia. These larvae do not show marked differences with the type material and can be distinguished from all other species of the genus by the same original characters described in Molineri (2002).

Ecological data

The two species were collected in streams at Cerrado biome, Nova Xavantina, Mato Grosso state. This zone is of hot and sub-humid tropical climate, with mean air temperatures of 25°C and mean annual precipitation of 1750 mm. The sampling points have original riparian vegetation (between 10 and 15 m of width), despite some areas influenced by grass with cattle exploitation. The water temperature of the streams varied from 20 to 24°C, values for dissolved oxygen ranged from 5.9 to 7.2 mg/L and pH varied from 6.6 to 7.5. Mean values for the Habitat Integrity Index (Nessimian et al. 2008) varied from 0.66 to 0.89, corresponding to streams with relatively good water quality. *T. sallesi* sp. nov. and *T. quizeri* were found to be frequently associated with the marginal bank with submerged root substrate deposited in zones with some detritus. As in many species of *Tricorythodes*, the collected specimens also have detritus retained among the setae of the body.

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