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## *Tricorythopsis nupem*: a new species for the Atlantic forest from southeast Brazil (Ephemeroptera: Leptohiphidae)

VINÍCIUS ALBANO ARAÚJO<sup>1,2</sup> & LUCIMAR GOMES DIAS<sup>3,4</sup>

<sup>1</sup>Instituto de Biodiversidade e Sustentabilidade (NUPEM), Universidade Federal do Rio de Janeiro (UFRJ), Macaé, Rio de Janeiro, Brazil.

<sup>3</sup>Departamento de Ciências Biológicas, Facultad de Ciencias Exactas y Naturales, Grupo de investigación BIONAT, Universidad de Caldas, Caldas, Colombia.

<sup>2</sup>✉ [vialbano@gmail.com](mailto:vialbano@gmail.com); <https://orcid.org/0000-0001-9387-7378>

<sup>4</sup>✉ [lucimar.dias@ucaldas.edu.co](mailto:lucimar.dias@ucaldas.edu.co); <https://orcid.org/0000-0001-6480-7688>

*Tricorythopsis* Traver, 1958 is a neotropical genus of the Leptohiphidae (Ephemeroptera, Ephemeroptera), with 19 species described (Molineri 2001; Dias & Salles 2005; Dias et al. 2008, 2009; Lima et al. 2011; Belmont et al. 2011, 2012, 2015; Domínguez et al. 2019). The genus comprises species of approximately two or three millimeters, and can be considered one of the smallest members of the order (Molineri 1999, 2001; Dias & Salles 2005; Dias et al. 2006, 2008, 2009; Belmont et al. 2011, 2015).

The adults of the genus are distinguished by the following combination of characteristics: 1) hind wings absent; 2) veins of the Cu and MP sectors forming two consecutive triads; 3) styliger plate posteriorly projected at the base of each forceps; 4) bi-segmented forceps, with conical distal segment directed outward; 5) females with very short caudal filaments, which do not exceed the length of the last three abdominal segments combined; 6) and females generally without fore legs (except for the coxae and trochanters), which are generally lost in the subimaginal skin (Molineri 2001; Dias et al. 2006; Domínguez et al. 2006).

The nymphs of the genus can be differentiated by: 1) maxillary palp reduced to one or two segments with apical seta; 2) abdominal gills present on segments II–VI; 3) opercular gill on segment II oval with a slightly sclerosed transverse line in the middle zone, except in *T. spongicola* Lima, Salles & Pinheiro, 2011 and *T. rondoniensis* (Dias, Cruz & Ferreira, 2009); 4) gill formula 5, 4, 4, 2, 1; 5) relatively small and robust nymphs, which generally do not exceed 3 mm in length; 6) tarsal claws with a pair or more denticles near the apex (Molineri 2001; Domínguez et al. 2006; Dias et al. 2006; Belmont et al. 2011).

Currently, the genus has 16 species registered from Brazil (Dias & Salles 2005; Dias et al. 2008, 2009; Lima et al. 2011; Belmont et al. 2011, 2015), and in this work a new species is described for the Atlantic forest from Southeastern Brazil.

The material used in this study was collected in Córrego da Luz, a tributary of the Macaé River. Collection authorization was in accordance with Brazilian law (SISBIO-73921-1). The material was collected qualitatively with manual net and preserved in ethyl alcohol 96%.

The mouthparts and legs were dissected and mounted on microscope slides using Euparal®. The type material is deposited in the following institutions: Colección Entomológica del Programa de Biología de la Universidad de Caldas, Caldas, Colombia (CEBUC) and Coleção Entomológica José Alfredo Pinheiro Dutra (DZRJ), Departamento de Zoologia, Universidade Federal do Rio de Janeiro/UFRJ. Pictures were taken using a Leica M205C stereomicroscope with an attached Leica MC-170HD camera.

### *Tricorythopsis nupem* sp. n. (Figs 1–3)

#### Diagnosis.

The nymphs of *Tricorythopsis nupem* sp. n. (Figs. 1–3) can be distinguished from the other species of the genus by the following combination of characteristics: femora wide and bordered with long setae; median and posterior femora with median transversal row of setae on dorsal surface (Fig. 3A–C); tarsal claws with nine or ten small marginal den-

ticles and two rows of 5–6 + 3–5 large submarginal denticles (Fig 3D); dorsal tubercles on abdominal segments V–VII; abdominal colour pattern as in Fig. 1A.



**FIGURE 1.** *Tricorythopsis nupem* sp. n.: habitus of mature female nymph (holotype).

#### **Description of the nymph.**

Length. Body: 2–2.6 mm; mesonotum: 0.5–0.8 mm; caudal filaments: 1.8. General colouration whitish or pale yellowish shaded with dark grey or brown marks (Fig. 1).

**Head.** Colouration pale yellow (Fig. 1). Mouthparts pale yellow (Fig. 2); maxillary palp bi-segmented (though not always evident as Fig. 2D) and with apical seta (Fig. 2D–F). Antenna translucent.

**Thorax.** General colouration whitish or pale yellowish with greyish and brown marks (Fig. 1). Pronotum widely shaded with dark grey, except for whitish marks on anterolateral corners and anteromedially (Fig. 1). Mesonotum and mesoescutellum whitish or pale yellow shaded with light grey, with greyish and brown marks between wing pads (Fig. 1). Wing pads black in mature nymph. Sterna and pleura whitish. Legs: coxae without projections. Femora whitish or pale yellow shaded with grey, dorsal region with circular whitish marks irregularly distributed (Fig. 3A–C); femora relatively wide, with total length (tl in Fig. 3A)/ maximum width (mw, same figure) ratio forelegs = 1,4–1,5 and mid and hind legs = 1,7–1,9; femora bordered with long setae (Fig. 3A–C); fore femur with subdistal transversal row of long setae; mid and hind femora with median transversal row of setae on dorsal surface (Fig. 3B–C). Tibiae whitish with two transversal light grey band in basal and median region (Fig. 3A–C). Tarsi whitish with subbasal transversal light grey band; tarsal claws with nine or ten small marginal denticles, and two rows of 5–6 + 3–5 large submarginal denticles (Fig. 3D).

**Abdomen.** Yellow shaded with grey, with brown marks on submedian and median zones of terga I–VI; terga VII–IX almost completely covered with darker marks (Fig. 1). Sterna whitish yellow, with greyish lateral marks. Terga V–VII with median tubercles. Lateral margins of abdominal segments II–IX expanded; segments VI–IX with posterolateral projections bordered with setae. Operculate gills shaded with grey, darker at base and with two median marks, paler toward apex (Fig. 3E); remaining gills completely shaded with light grey. Caudal filaments grey or brown with pale yellowish bands intercalated.

**Adults.** Unknown.

**Etymology.** The epithet is an apposition to the acronym of the Institute of Biodiversity and Sustainability (NUPEM / UFRJ), previously known as Center for Ecology and Socio-Environmental Development of Macaé.

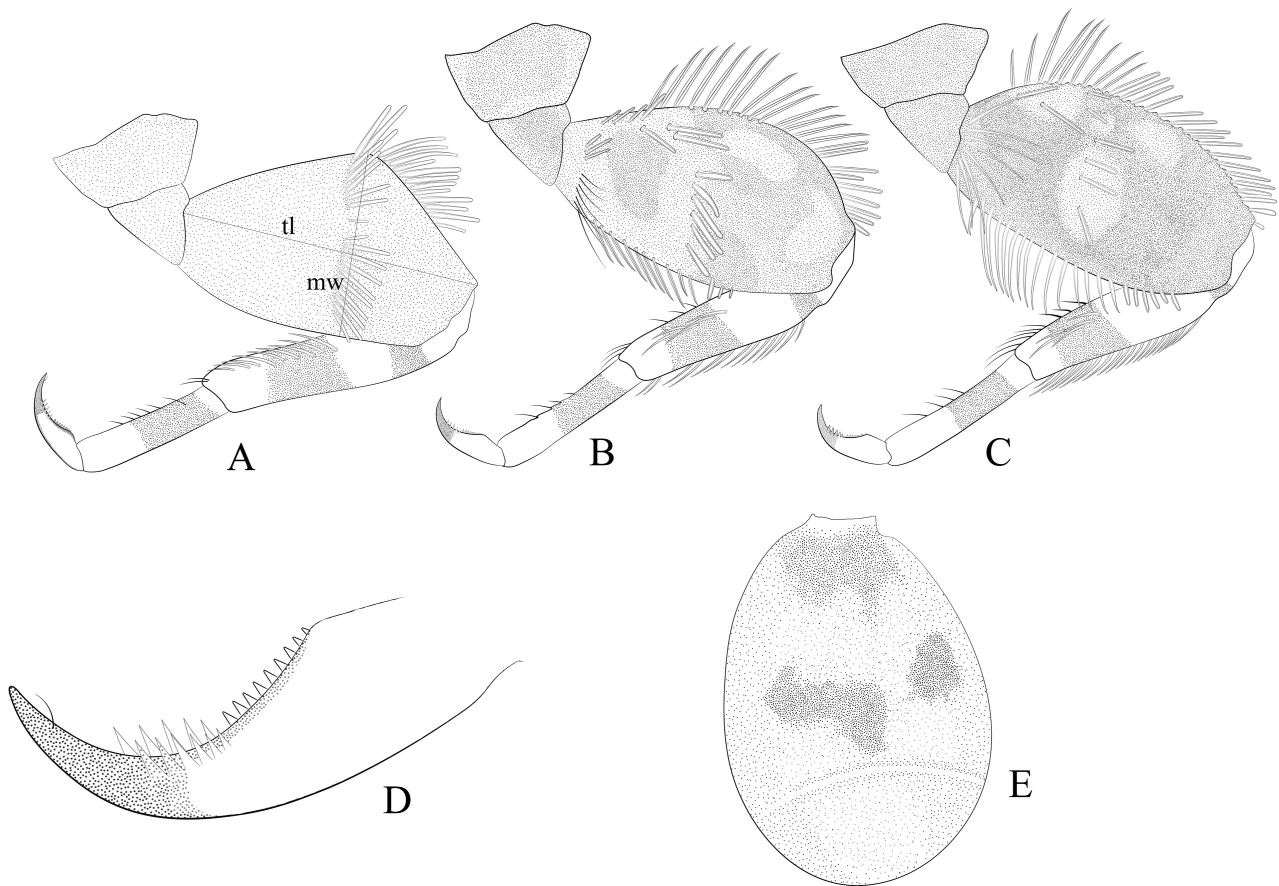
**Material.** Holotype: mature female nymph; Brazil, Rio de Janeiro state; Casimiro de Abreu; Municipal Natural Park Córrego da Luz (22°26'56.217" S 42°12'19.304" W); Vinícius Albano Araújo, Amanda Soares Miranda and Lucas Cauã Macedo Chabalgoity colls (DZRJ). Paratypes: four nymphs (three mature females and one immature male), same data as holotype (CEBUC).

**Distribution.** Brazil, Rio de Janeiro.



**FIGURE 2.** *Tricorythopsis nupem* sp. n., mouthparts: A, labrum (dorsal view); B, left mandible (dorsal view); C, right mandible (dorsal view); D, detail of maxillary palp; E, left maxilla (dorsal view); F, right maxilla (dorsal view); G, hypopharynx (dorsal view); H, labium (dorsal view), with detail of glossae and paraglossae.

**Discussion.** *Tricorythopsis nupem* sp. n., *T. araponga*, Dias & Salles, 2005 and *T. rondoniensis* are the only species of the genus in which the femora of the nymphs are bordered with long setae and dorsal tubercles are present on abdominal segments (*T. rondoniensis* on terga III-VII, *T. araponga* and *T. nupem* on terga V-VII). Nevertheless, the new species can be distinguished from *T. araponga* and *T. rondoniensis* by the number of marginal denticles of the tarsal claws (9–10 in the new species versus 4–6 in *T. araponga* and 5–6 *T. rondoniensis*). Additionally, *T. nupem* sp. n. is the only of these species with a median transversal row of setae on dorsal surface of the mid and hind femora.



**FIGURE 3.** *Tricorythopsis nupem* sp. n.: A, foreleg; B, mid leg; C, hind leg; D, tarsal claw; E, operculate gill (dorsal view). Abbreviations: tl= total length and mw = maximum width (see text).

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### References

- Belmont, E.L., Salles, F.F. & Hamada, N. (2011) Three new species of Leptohiphidae (Insecta: Ephemeroptera) from Central Amazon, Brazil. *Zootaxa*, 3047 (1), 43–53. <https://doi.org/10.11646/zootaxa.3047.1.2>
- Belmont, E.L., Salles, F.F. & Hamada, N. (2012) Leptohiphidae (Insecta, Ephemeroptera) do Estado do Amazonas, Brasil: novos registros, nova combinação, nova espécie e chave de identificação para estágios ninfais. *Revista Brasileira de Entomologia*, 56 (3), 289–296. <https://doi.org/10.1590/S0085-56262012005000054>
- Belmont, E.L., Cruz, P.V. & Hamada, N. (2015) A new species of *Tricorythopsis* Traver, 1958 (Leptohiphidae) and occurrence of *Pannota* (Insecta: Ephemeroptera) species in Amapá state, Brazil. *Zootaxa*, 4007 (1), 104–112. <https://doi.org/10.11646/zootaxa.4007.1.7>
- Dias, L.G. & Salles, F.F. (2005) Three new species of *Tricorythopsis* (Ephemeroptera: Leptohiphidae) from southeastern Brazil. *Aquatic Insects* 27(4), 235–241. <https://doi.org/10.1080/01650420500336657>
- Dias, L.G., Salles, F.F., Francischetti, C.N. & Ferreira, P.S.F. (2006) Key to the genera of Ephemeroptera from Brazil. *Biota Neotrop.* Available from: <http://www.biotaneotropica.org.br/v6n1/pt/fullpaper?bn00806012006+en> (accessed 1 November 2020) <https://doi.org/10.1590/S1676-06032006000100015>
- Dias, L.G., Salles, F.F. & Ferreira, P.S.F. (2008) New species of *Tricorythopsis* Traver (Ephemeroptera: Leptohiphidae) from

- northern Brazil. *Studies on Neotropical Fauna and Environment*, 43 (3), 237–241.  
<https://doi.org/10.1080/01650520701553826>
- Dias, L.G., Cruz, P.V. & Ferreira, P.S.F. (2009) A new species of *Tricorythodes* Ulmer (Ephemeroptera: Leptohiphidae) from Northern Brazil. *Annales de Limnologie*, 45 (2), 127–129.  
<https://doi.org/10.1051/limn/2009009>
- Domínguez, E., Molineri, C., Pescador, M.L., Hubbard, M.D. & Nieto, C. (2006) *Ephemeroptera of South America Aquatic Biodiversity of Latin America. Vol. 1*. Pensoft, Sofia and Moscow, 644 pp.
- Domínguez, E., Molineri, C., Nieto, C. & Zúñiga, M.D.C. (2019) *Lista de especies de Ephemeroptera Sudamericanas*. Available from: <http://ibn-conicet.gob.ar/ephemeroptera-sudamericanas/> (accessed 18 March 2020)
- Lima, L.R., Salles, F.F. & Pinheiro, U.S. (2011) New species of Leptohiphidae (Ephemeroptera) from northeastern Brazil. *Zootaxa*, 3050 (1), 63–68.  
<https://doi.org/10.11646/zootaxa.3050.1.4>
- Molineri, C. (2001) El género *Tricorythopsis* (Ephemeroptera: Leptohiphidae): nuevas combinaciones y descripción de nuevas especies y estadios. *Revista de la Sociedad Entomológica Argentina*, 60, 217–238.