



<http://dx.doi.org/10.11646/zootaxa.3900.2.8>

<http://zoobank.org/urn:lsid:zoobank.org:pub:4EBF3F0C-55B0-41D3-96FE-2B9E70D19EB1>

## Leptophlebiidae (Ephemeroptera) of the Serra do Tepequém, Roraima State, Brazil: new records and description of two new species

JAIME DE LIEGE GAMA NETO<sup>1,3</sup> & NEUSA HAMADA<sup>2</sup>

<sup>1</sup>Programa de Pós-graduação em Entomologia, Instituto Nacional de Pesquisas da Amazônia - INPA/Manaus

<sup>2</sup>Coordenação de Biodiversidade, Instituto Nacional de Pesquisas da Amazônia - INPA/Manaus

<sup>3</sup>Museu Integrado de Roraima – MIRR, Divisão de Pesquisas e Estudos Amazônicos, Boa Vista/Roraima

### Abstract

*Miroculis (Miroculis) eldorado* sp. nov. and *Ulmeritoides passorum* sp. nov. are described based on material from Serra do Tepequém, Roraima State, Brazil. Additional records of Leptophlebiidae genera and species are made. *Askola* Peters, 1969, *Farrodes* Peters, 1971, *Microphlebia* Savage & Peters, 1983, *Hydrosmilodon* Flowers & Dominguez, 1992, *Hagenulopsis minuta* Spieth, 1943 and *Simothraulopsis demerara* (Traver, 1947) are recorded for the first time in Roraima State. *Simothraulopsis janae* Mariano, 2010 is recorded for the first time in the Northern Brazil.

**Key words:** leptophlebiids, Neotropical, taxonomy, mayflies

### Introduction

Ephemeroptera is a small group of winged insects with about 375 genera and 3,000 species grouped in 37 families worldwide. In South America there are approximately 14 families and 450 species (Domínguez *et al.* 2006), with records of 318 species in Brazil, representing 10 families: Baetidae, Caenidae, Coryphoridae, Ephemeraeidae, Euthyplociidae, Leptohiphidae, Leptophlebiidae, Melanemerellidae, Oligoneuriidae and Polymitarciidae (Salles *et al.* 2014).

The families Baetidae and Leptophlebiidae stand out among the most speciose families, containing approximately 33% and 28% of the mayfly species recorded from Brazil, respectively (Salles *et al.* 2014). Leptophlebiidae has 89 species distributed among 25 genera, most within the genera *Askola* Peters, 1969, *Hermanella* Needham & Murphy, 1924, *Miroculis* Edmunds, 1963, *Simothraulopsis* Demoulin, 1966, *Thraulodes* Ulmer, 1920 and the *Ulmeritus*–*Ulmeritoides* complex (Salles *et al.* 2014; Salles & Domínguez 2012).

*Miroculis* has 12 species distributed among the subgenera *Miroculis s.s.* Savage & Peters, 1983, *Yaruma* Savage & Peters, 1983, *Atroari* Savage & Peters, 1983 and *Ommaethus* Savage & Peters, 1983. *Miroculis s.s.*, can be distinguished from the other subgenera by the dorsal portion of the eyes, with five to twenty facets in the longest row situated on a pedicel that is longer than wide (Peters *et al.* 2008). This subgenus has eleven species, with records in Brazil, Colombia, Peru, Suriname and Venezuela (Dominguez *et al.* 2013; Costa & Mariano 2013; Gama Neto & Hamada 2013; Lima *et al.* 2014; Salles *et al.* 2014).

The *Ulmeritus*–*Ulmeritoides* complex consists of the monophyletic genera *Ulmeritus* Traver, 1956 and *Ulmeritoides* Traver, 1959 (Domínguez 1995; Salles & Domínguez 2012). *Ulmeritoides* was first established as a subgenus of *Ulmeritus* (Traver 1959) and raised to genus by Domínguez (1991). Currently, it has twelve species distributed in Central and South America, seven of which have records in Brazil (Salles & Dominguez 2012; Salles *et al.* 2014).

Roraima State, in particular, has thirty-six species of mayfly distributed among the families Baetidae, Leptophlebiidae, Leptohiphidae and Oligoneuriidae, following the same pattern of Brazil with Baetidae being the most numerous (27 species), followed by Leptophlebiidae (6), Leptohiphidae (4) and Oligoneuriidae (2) (Salles *et al.* 2014).

## *Simothraulopsis demerara*

**Discussion.** this species has been recorded from the Brazilian Amazon region (Amapá and Pará States), but outside there, it was reported only from southeastern Brazil in Espírito Santo State (Salles *et al.* 2010). The finding of *S. demerara* in Roraima extends the distribution of this species further north in Brazil.

**Material examined.** One male imago, Brazil, Roraima State, Amajari municipality, Serra do Tepequém, second order stream (03°87'39.6"N/ 61°44'49.8"W), 30.v.2012–3.vi.2012, Gama Neto, J.L. coll. (INPA).

## *Simothraulopsis janae*

**Discussion.** This species has been reported only from northeastern Brazil, in Bahia and Pernambuco States (Salles *et al.* 2014). The finding of *S. janae* in Roraima represents the first record of this species from far northern Brazil and expands our knowledge of its range.

**Material examined.** 12 male imagos, Brazil, Roraima State, Amajari municipality, Serra do Tepequém, second order stream (03°87'39.6"N/ 61°44'49.8"W), 30.v.2012–3.vi.2012, Gama Neto, J.L. coll. (INPA).

## Acknowledgments

The authors wish to express their gratitude to Museu Integrado de Roraima (MIRR) for logistical support, to the projects CT-Amazônia/ CNPq (Process n. 575875/2008-9) and Pró-equipamentos/CAPES/INPA/Dcen; to CAPES for a doctoral scholarship awarded to Jaime de Liege Gama Neto; to CNPq for a research fellowship awarded to Neusa Hamada. We express gratitude to Frederico Falcão Salles and Eduardo Domínguez for confirming the new species of *Ulmeritoides* and to Eduardo Domínguez for scientific review of the manuscript.

## References

- Costa, S.S. & Mariano, R. (2013) Description of a new species of *Miroculis* Edmunds, 1963 (Ephemeroptera: Leptophlebiidae) from Brazil. *Zootaxa*, 3599 (5), 495–498.  
<http://dx.doi.org/10.11646/zootaxa.3599.5.7>
- Demoulin, G. (1966) Contribution à l'étude des Éphéméroptères du Surinam. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique*, 42 (37), 1–22.
- Domínguez, E. (1991) The status of the genus *Ulmeritus* (Ephemeroptera: Leptophlebiidae: Atalophlebiinae) and related taxa. In: Alba-Tercedor, J. & Sánchez-Ortega, A. (Eds.), *Overview and strategies of Ephemeroptera and Plecoptera*. Sandhill Crane Press, Gainesville, Florida, pp. 157–167.
- Domínguez, E. (1995) Cladistic analysis of the *Ulmeritus* – *Ulmeritoides* group (Ephemeroptera: Leptophlebiidae) with descriptions of five new species of *Ulmeritoides*. *Journal of the New York Entomological Society*, 103, 15–38.
- Dominguez, E., Molineri, C., Pescador, M.L., Hubbard, D.M. & Nieto, C. (2006) *Ephemeroptera of South America, Aquatic Biodiversity of Latin America* (ABLA Series). Sofia–Moscow, 646 pp.
- Dominguez, E., Molineri, C., Nieto, C., Hubbard, M.D., Pescador, M. & Zúñiga, M.C. (2013) Checklist of South American species of Ephemeroptera (update 23rd May, 2013). Available from: <http://www.ephemeroptera-galactica.com/cats.php> (Accessed 18 July 2014)
- Edmunds, G.F. Jr. (1963) A new genus and species of mayfly from Peru (Ephemeroptera: Leptophlebiidae). *Pan-Pacific Entomologist*, 39, 34–36.
- Flowers, R.W. & Domínguez, E. (1992) New genus of Leptophlebiidae (Ephemeroptera) from Central and South America. *Annals of the Entomological Society of America*, 85, 655–661.
- Gama Neto, J.L. & Hamada, N. (2013) A new species of *Miroculis* Edmunds, 1963 (Ephemeroptera, Leptophlebiidae) from northern Brazil. *Zootaxa*, 3734 (5), 597–600.  
<http://dx.doi.org/10.11646/zootaxa.3734.5.9>
- Lima, L.C.R., Raimundi, E.A., Pinheiro, U. & Salles, F.F. (2014) A new species of *Miroculis* Edmunds, 1963 (Ephemeroptera: Leptophlebiidae) from northeastern Brazil. *Zootaxa*, 3795 (4), 441–448.  
<http://dx.doi.org/10.11646/zootaxa.3795.4.4>
- Mariano, R. (2010) Two new species of *Simothraulopsis* Traver, 1947 (Ephemeroptera: Leptophlebiidae: Atalophlebiinae) from northeastern Brazil. *Aquatic Insects*, 32 (2), 129–134.

- Needham, J.G. & Murphy, H.E. (1924) Neotropical mayflies. *Bulletin of the Lloyd Library, 24 Entomological Series*, 4, 1–79.
- Peters, W.L. (1971) A revision of the Leptophlebiidae of the West Indies (Ephemeroptera). *Smithsonian Contributions to Zoology*, 62, 1–48.
- Peters, J.G., Domínguez, E. & Currea Dereser, A. (2008) Species of *Miroculis* from the Serranía de Chiribiquete in Colombia. In: Hauer, F.R., Stanford, J.A. & Newell, R.L. (Eds.), *International advances in the ecology, zoogeography and systematics of mayflies and stoneflies. Vol. 128*. University of California Publications in Entomology, pp. 295–305.
- Peters, W.L. (1969) *Askola froehlichii*, a new genus and species from southern Brazil (Leptophlebiidae: Ephemeroptera). *Florida Entomologist*, 52, 253–258.
- Salles, F.F. & Domínguez, E. (2012) Systematics and phylogeny of *Ulmeritus-Ulmeritoides* revisited (Ephemeroptera: Leptophlebiidae). *Zootaxa*, 3571, 49–65.
- Salles, F.F. & Lima, M.M. (2011) New species and new records of *Miroculis* Edmunds (Ephemeroptera: Leptophlebiidae) from Southeastern Brazil. *Zootaxa*, 2740, 53–58.
- Salles, F.F., Boldrini, R., Nascimento, J.C.M., Raimundi, E.A. & Shimano, Y.F. (2014) Ephemeroptera do Brasil. Available from: <http://www.ephemeroptera.com.br> (Accessed 19 november 2014)
- Salles, F.F., Cavalcante, J.M., Massariol, F.C., Angeli, K.B., Barcelos, S.P., Rúdio, J.A. & Boldrini, R. (2010) Primeiro levantamento da fauna de Ephemeroptera (Insecta) do Espírito Santo, Sudeste do Brasil. *Biota Neotropica*, 10 (1), 293–307.
- Savage, H.M. & Peters, W.L. (1983) Systematics of *Miroculis* and related genera from Northern South America (Ephemeroptera: Leptophlebiidae). *Transactions of the American Entomological Society*, 108, 491–600. <http://dx.doi.org/10.1111/j.1439-0469.1983.tb00281.x>
- Spieth, H.T. (1943) Taxonomic studies on the Ephemeroptera. III. Some interesting Ephemerids from Surinam and other Neotropical localities. *American Museum Novitates*, 1244, 1–13.
- Traver, J.R. (1947) Notes on Neotropical mayflies. Part II. Family Baetidae, subfamily Leptophlebiinae. *Revista de Entomologia*, 18, 149–160.
- Traver, J.R. (1956) A new genus of Neotropical mayflies (Ephemeroptera, Leptophlebiidae). *Proceedings of the Entomological Society of Washington*, 58 (1), 1–13.
- Traver, J.R. (1959) Uruguayan mayflies. Family Leptophlebiidae: Part I. *Revista de la Sociedad Uruguaya de Entomologia*, 3, 1–13.
- Ulmer, G. (1920) Neue Ephemeropteren. *Archiv für Naturgeschichte*, 85A (11), 1–80.