

This article was downloaded by: [Научная библиотека СПбГУ]

On: 27 March 2014, At: 09:42

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Aquatic Insects: International Journal of Freshwater Entomology

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/naqi20>

Description of the imago of *Traverella longifrons* Lugo-Ortiz & McCafferty, 1996 (Ephemeroptera: Leptophlebiidae)

Rodolfo Mariano ^a, R. Wills Flowers ^b & Janice Peters ^c

^a Universidade de São Paulo, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Departamento de Biologia, Laboratório de Entomologia Aquática, Ribeirão Preto, SP, Brazil

^b Center for Biological Control, Florida A&M University, Tallahassee, FL, USA

^c Entomology, CESTA, Florida A&M University, Tallahassee, FL, USA

Published online: 13 Aug 2010.

To cite this article: Rodolfo Mariano, R. Wills Flowers & Janice Peters (2010) Description of the imago of *Traverella longifrons* Lugo-Ortiz & McCafferty, 1996 (Ephemeroptera: Leptophlebiidae), *Aquatic Insects: International Journal of Freshwater Entomology*, 32:3, 191-194, DOI: [10.1080/01650424.2010.483234](http://dx.doi.org/10.1080/01650424.2010.483234)

To link to this article: <http://dx.doi.org/10.1080/01650424.2010.483234>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Description of the imago of *Traverella longifrons* Lugo-Ortiz & McCafferty, 1996 (Ephemeroptera: Leptophlebiidae)

Rodolfo Mariano^{a,*}, R. Wills Flowers^b and Janice Peters^c

^aUniversidade de São Paulo, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Departamento de Biologia, Laboratório de Entomologia Aquática, Ribeirão Preto, SP, Brazil;

^bCenter for Biological Control, Florida A&M University, Tallahassee, FL, USA; ^cEntomology, CESTA, Florida A&M University, Tallahassee, FL, USA

(Received 23 June 2009; final version received 24 January 2010)

In 1996, Lugo-Ortiz & McCafferty described the species *Traverella longifrons* from Costa Rica based on nymphs previously known under the informal epithet *Traverella* sp. B Allen (1973) from Honduras and Mexico. Here the imago of *T. longifrons* Lugo-Ortiz & McCafferty (1996) is described based on reared material from Panamá and additional material from Honduras.

Keywords: Neotropical; Ephemeroptera; Leptophlebiidae; imago; *Traverella longifrons*

Introduction

The family Leptophlebiidae (Ephemeroptera) is probably the most diverse in the Neotropics, with approximately 40 genera and 150 species, all belonging to the subfamily Atalophlebiinae. Some genera are monotypic, while others are species-rich (Domínguez, Molineri, Pescador, Hubbard and Nieto 2006).

The *Hermanella* group is composed of the following genera: *Hermanella* Needham & Murphy, 1924; *Hydromastodon* Polegatto & Batista, 2007; *Hydrosmilodon* Flowers & Domínguez, 1992; *Hylister* Domínguez & Flowers, 1989; *Leentvaaria* Demoulin, 1966; *Needhamella* Domínguez & Flowers, 1989; *Paramaka* Savage & Domínguez, 1992; and *Traverella* Edmunds, 1948. Kluge (2007) reduced all genera of the group to subgenera to fit his circumscriptional nomenclatural system; however, we prefer to follow a more conventional nomenclatural arrangement here. Within the *Hermanella* group are many species with adult stages undescribed, including *Traverella longifrons* Lugo-Ortiz & McCafferty, 1996.

Traverella was established for *Thraululus albertanus* McDunnough, 1931, by Edmunds (1948) based on reared imagines and nymphs from Utah. He described and transferred many species to *Traverella*. In 1973, Allen reviewed *Traverella* nymphs from North and Central America, redescribed species and created some informal epithets (e.g. A, B, C), some of which were later formally named. Presently 13 species are attributed to *Traverella* although some are inadequately described so placement

*Corresponding author. Email: rodolfo@usp.br or rodolfomls@gmail.com

is dubious: *T. albertana* (= *T. castanea* Kilgore & Allen, 1973); *T. bradleyi* (Needham & Murphy, 1924); *T. calingastensis* Domínguez, 1995; *T. holzenthali* Lugo-Ortiz & McCafferty 1996; *T. lewisi* Allen, 1973; *T. montium* (Ulmer, 1943); *T. nervosa* (Eaton, 1992); *T. presidiana* (Traver, 1934); *T. promifrons* Lugo-Ortiz & McCafferty, 1996 (= species C of Allen); *T. sallei* (Navás, 1935); *T. valdemari* (Esben-Petersen, 1912); *T. versicolor* (Eaton, 1892); and *T. longifrons* Lugo-Ortiz & McCafferty, 1996 (= species B of Allen). Only seven of these species are described in the male imaginal stage. The genus is classified in two subgenera, *Traverella* (*Traverella*) with 12 species and *Traverella* (*Zonda*) Domínguez, 1995, with one species *T. (Zonda) calingastensis*. In this paper we describe the adult stages of *Traverella longifrons* based on reared material from Panama and additional imagines from Honduras. The material is deposited in the Florida Agricultural & Mechanical University, Tallahassee, FL, USA (FAMU) and the United States Natural History Museum, Washington, DC (USNM).

Taxonomy

Traverella longifrons Lugo-Ortiz & McCafferty, 1996 (Figure 1A–E)

Material examined. 1 ♂ imago, reared: Panama: Bocas del Toro Prov., Rio Teribe at Zegla, 24-IV-1985, R.W. Flowers & A. Gonzalez 3 ♂ imago: same data except 21-IV-1985, all deposited at FAMU. 1 ♂ imago, Panama: Darien, Rio Tuirá at Rio Pucuro, 16–17 Feb 1985, J. Louton, deposited at USNM.

Male imago (in alcohol and styliger plate in glycerin)

Length. Body 6.5–7.4 mm; forewings 7.6–8.0 mm; hind wings 1.1–1.3 mm.

Head. Upper portion of eyes grey, lower portion black; antennae pale.

Thorax. Terga and sterna brown-yellowish with sutures dark brown. *Wings* (Figures 1A and B) hyaline, with bases shaded black; maximum width of forewings three times length of forewings; maximum width of hind wings two times the length of hind wings; maximum length of forewings 6 1/2 length of hind wings. Forewings (Figure 1A): costal membrane basal to bulla without cross veins; 115–120 cross veins in membrane. Hind wings (Figure 1B): base of costal projection broad, apex located slightly more than 1/2 distance from base to apex of wing. *Legs.* Foreleg with coxa and trochanter brown-yellowish; femur yellowish with apical and medial black maculae; tibia black, except pale apically; tarsomeres pale. Middle and hind legs with coxa and trochanter yellowish; femur, tibia and tarsus with same pattern as foreleg.

Abdomen (Figure 1C). Tergum I tinged black, terga II–VI translucent with a black posterior band, tergum VII tinged grey with a black posterior band, terga VIII–X yellow-brownish with a black posterior band; sterna I–VI hyaline; sterna VII–X yellowish. *Genitalia* (Figure 1D, E) yellowish; styliger plate with two long, thin, dorsally recurved spine-like projections; segments II and III of forceps short, segment II of forceps 1/7 to 1/8 length of segment I; penes divided in apical third, with a long, curved spine at apex. Cerci with broad black bands at the first segments.

Remarks

The imago of *T. longifrons* is very similar to two other species, *T. presidiana* and *T. albertana*. The styliger plate has similar projections with two fine, long spines projecting posteriorly, but the abdominal colour pattern is different from

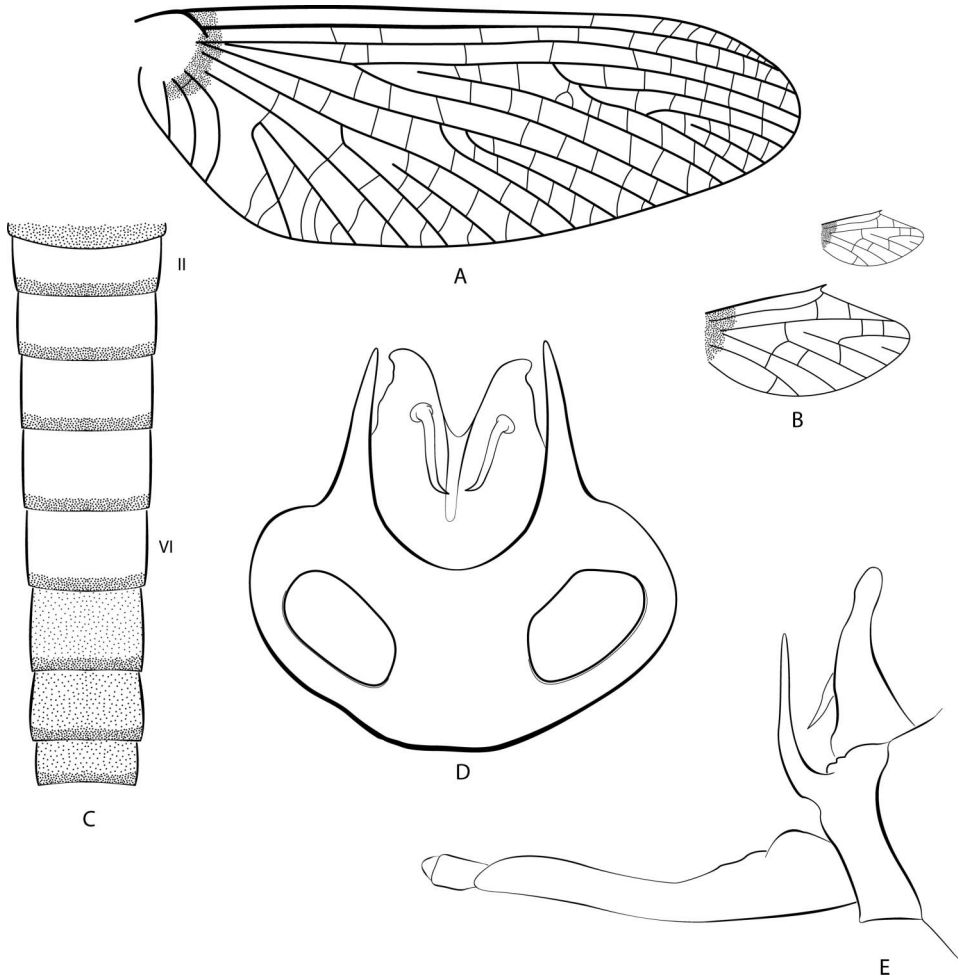


Figure 1. *Traverella longifrons*. (A) Forewing; (B) hind wing (scale and enlarged); (C) abdominal colour pattern; (D) styliiger plate (caudal view); (E) styliiger plate (lateral view).

T. presidiana which has a pale brown or yellowish-white abdomen; in *T. longifrons* and in *T. albertana* most terga are translucent. The shape of penes of *T. longifrons* is different from *T. albertana*: in *T. longifrons* the apex is rounded, in *T. albertana* the apex is concave.

The main differential character present in the nymph is the shape of clypeal projection. In *T. longifrons* this is a distinct long, triangular fronto-clypeal process (see figure 4 in Allen 1973 or figure 41 in Lugo-Ortiz and McCafferty 1996); in *T. presidiana* this is a large and spatulate projection; and in *T. albertana* it is a small projection.

The colour pattern of the male imago of *Traverella longifrons* strongly resembles *T. versicolor*, a species described from Caché, Costa Rica and Chiriqui, Panamá (Eaton 1892) from female imagines and subimagines and placed in *Traverella* by Edmunds (1950). Although *T. longifrons* is a potential synonym, the female described by Eaton has not yet been associated with males or by rearing from the

nymph. *Traverella longifrons* is thus a potential synonym of *T. versicolor*, but we defer from formalising this status until the missing stages are associated.

Acknowledgements

The first author was supported by São Paulo State Research Foundation (FAPESP Grant No. 05/53874-1) while completing the paper.

References

- Allen, R.K. (1973), 'Generic revisions of mayfly nymphs. I. *Traverella* in North and Central America (Leptophlebiidae)', *Annals of the Entomological Society of America*, 66, 1287–1295.
- Domínguez, E., Molineri, C., Pescador, M.L., Hubbard, M.D., and Nieto, C. (2006), 'Ephemeroptera of South America', in *Aquatic Biodiversity in Latin America (ABLA)* (Vol. 2), eds. J. Adis, J.R. Arias, G. Rueda-Delgado and K.M. Wantzen, Sofia-Moscow: Pensoft.
- Eaton, A.E. (1892), 'Fam. Ephemeridae', *Biologica Centrali-Americana*, 38, 1–16.
- Edmunds, G.F. (1948), 'A new genus of mayflies from Western North America (Leptophlebiinae)', *Proceedings of the Biological Society of Washington*, 61, 141–148.
- Edmunds, G.F. (1950), 'Notes on Neotropical Ephemeroptera. I. New and little known Leptophlebiidae', *Revista de Entomologia*, 21, 551–554.
- Kluge, N. (2007), 'A new taxon Hermanellonota, or subtribe Hermanellini subtr. n. (Ephemeroptera: Leptophlebiidae: Hagenulini), with description of three new species from Peruvian Amazonia', *Russian Entomological Journal*, 16, 385–398.
- Lugo-Ortiz, C.R., and McCafferty, W.P. (1996), 'New species of Leptophlebiidae (Ephemeroptera) from Mexico and Central America', *Annales de Limnologie*, 32, 3–18.