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## Further notes on South American species of Baetidae (Ephemeroptera) assigned to *Moribaetis* Waltz & McCafferty, 1985

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### Abstract

The types of the remaining two South American species classified in *Moribaetis* Waltz & McCafferty, 1985 were studied. *Moribaetis comes* (Navás, 1912) is designated as a *nomen dubium* based on the lack of information in the original description, the damaged type and the resultant improbability of assigning specimens to this species. The type-material of *M. aneto* (Traver, 1971), on the other hand, is well-preserved. Based on the morphology of males and females, we propose a **new combination**, *Camelobaetidius aneto*. In conclusion, we consider the genus *Moribaetis* to be absent from South America.

**Key words:** American Interchange, *New Combination*, *Nomen Dubium*, *Camelobaetidius*

The genus *Moribaetis* Waltz & McCafferty, 1985 was created based on nymphs and imagoes in order to include three species originally described in the genus *Baetis* Leach, 1815 and one new species. *Moribaetis* was divided, in the same study, into two subgenera, *Mayobaetis* Waltz & McCafferty, 1985 and *Moribaetis* s.s. Lugo-Ortiz and McCafferty (1996) subsequently elevated the Central and South American *Mayobaetis* to generic rank based on phylogenetic considerations, thereby restricting the genus *Moribaetis* to only the Central American species, *M. maculipennis* (Flowers, 1979), *M. salvini* (Eaton, 1885) and *M. macaferti* Waltz, 1985 (in Waltz & McCafferty, 1985).

Lugo-Ortiz and McCafferty (1999), in an attempt to reassign all remaining South American species originally described in *Baetis* or *Pseudocloeon* Klapálek, 1905, transferred three such species to *Moribaetis*: *Baetis comes* Navás, 1912, *Baetis aneto* Traver, 1971 and *Baetis socius* Needham & Murphy, 1924.

The placement of the South American species in *Moribaetis* by Lugo-Ortiz and McCafferty (1999) was based on hind wing characteristics, such as the presence of three longitudinal veins, with the second vein bifurcate, and a pointed costal projection. Unfortunately, as argued by Domínguez et al. (2006), these characteristics are neither restricted to *Moribaetis* nor present in all species of the genus. The bifurcation of the second vein, for example, does not occur in the most recently described species from southwestern North America, *M. mimbresaurus* McCafferty, 2007. Aside from the lack of unique characters that could place the three species in question with confidence in *Moribaetis*, some species suffer from having type specimens and descriptions that are not helpful for distinguishing them. As a consequence, soon after the placement of these species in *Moribaetis*, McCafferty (2000) proposed *nomen dubium* status for *M. socius*, a species described based on a single female subimago (Needham & Murphy 1924).

A similar impediment also exists for *M. comes*, one of the many problematic species and specimens described by Longinos Navás (e.g., Navás 1915; 1930). Navás' description is brief, with a poorly informative illustration of a distorted hind wing (as previously indicated by Domínguez 1989; Hubbard 1991 and Hubbard & Peters 1981); the only reference to the type locality is São Paulo, Brazil (an area that comprises a large geographical range) (Fig. 1); and the species was based on a single male subimago (Fig. 4). The type is fragile (Figs. 2 and 3), on a pin, badly damaged, without an abdomen and, more importantly, without the hind wings (as noted by Alba-Tercedor & Peters 1985). Based on the lack of information in the description, the damaged type and the improbability of assigning specimens to this species by

Entomological Research Collection. One male imago on slide and three females (paratypes of *M. aneto*), URUGUAY, Prov. Paysandy, Santa Rita, Rio Uruguay, 8.xi.1955, also deposited in the Purdue University Entomological Research Collection.

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## References

- Alba-Tercedor, J. & Peters, W.L. (1985) Types and additional specimens of Ephemeroptera studied by Longinos Navás in the Museo de Zoología del Ayuntamiento, Barcelona, Spain. *Aquatic Insects*, 7, 215–227.  
<http://dx.doi.org/10.1080/01650428509361222>
- Demoulin, G. (1966) Contribution à l'étude des Éphéméroptères du Surinam. *Bulletin de l'Institute Royale des Sciences Naturelles de Belgique*, 42 (37), 1–22.
- Domínguez, E. (1989) Tipos de Ephemeroptera de L. Navás depositados en las colecciones entomológicas de Argentina. *Revista de la Sociedad Entomológica Argentina*, 45 (1–4), 271–274.
- Domínguez, E., Molineri, C., Pescador, M.L., Hubbard, M.D. & Nieto, C. (2006) *Ephemeroptera of South America*. Aquatic Biodiversity of Latin America (ABLA) Series, Pensoft, Sofia-Moscow, 642 pp.
- Eaton, A.E. (1885) A revisional monograph of recent Ephemeridae or mayflies. *Transactions of the Linnean Society of London*, 3, 13–52.  
<http://dx.doi.org/10.1111/j.1096-3642.1885.tb01550d.x>
- Flowers, R.W. (1979) A new species of *Baetis* from Panama (Ephemeroptera: Baetidae). *Pan-Pacific Entomologist*, 55 (3), 187–191.
- Hubbard, M.D. (1991) Longinos Navás, científico jesuita: additions and corrections to the Ephemeroptera. *Eos*, 66, 183–186.
- Hubbard, M.D. & Peters, W.L. (1981) Ephemeroptera. In: Hurlbert, S.H., Rodriguez, G. & Santos, N.D. (Eds.), *Aquatic Biota of Tropical South America, Part 1: Arthropoda*. San Diego State University, San Diego, California, pp. 55–63.
- Klapálek, F. (1905) Plecopteren und Ephemeriden aus Java, gesammelt von Prof. K. Kraepelin 1904. *Mitteilungen aus dem Naturhistorischen Museum in Hamburg*, 22, 103–107.
- Leach, W.E. (1815) Entomology. *Brewster's Edinburgh Encyclopaedia*, 9, 57–172.
- Lugo-Ortiz, C.R. & McCafferty, W.P. (1996) Phylogeny and classification of the *Baetodes* complex (Ephemeroptera: Baetidae), with description of a new genus. *Journal of the North American Benthological Society*, 15 (3), 367–380.  
<http://dx.doi.org/10.2307/1467283>
- Lugo-Ortiz, C.R. & McCafferty, W.P. (1999) Revision of South American species of Baetidae (Insecta: Ephemeroptera) previously placed in *Baetis* Leach and *Pseudocloeon* Klapálek. *Annales de Limnologie*, 35 (4), 257–262.  
<http://dx.doi.org/10.1051/limn/1999034>
- McCafferty, W.P. (1998) Ephemeroptera and the great American interchange. *Journal of the North American Benthological Society*, 17, 1–20.  
<http://dx.doi.org/10.2307/1468048>
- McCafferty, W.P. (2000) Notations on South American Baetidae (Ephemeroptera). *Entomological News*, 111 (5), 375–379.
- McCafferty, W.P. (2007) *Moribaetis mimbresaurus*, new species (Ephemeroptera: Baetidae): first representative of the genus north of Mexico. *Proceedings of the Entomological Society of Washington*, 109 (3), 696–699.
- Navás, L. (1912) Neuropteros nuevos de América. *Broteria (Serie Zoologica)*, 10, 194–202.
- Navás, L. (1915) Neuropteros sudamericanos. Segunda serie. *Broteria (Serie Zoologica)*, 13, 5–13.
- Navás, L. (1930) Insectos neotropicos 6a Serie (1). *Revista Chilena de Historia Natural*, 34, 62–75.
- Needham, J.G. & Murphy, H.E. (1924) Neotropical mayflies. *Bulletin of the Lloyd Library*, 24 (4), 1–79.
- Traver, J.R. (1971) Four new species of Neotropical *Baetis* (Ephemeroptera: Baetidae). *Proceedings of the Entomological Society of Washington*, 73 (1), 58–63.
- Traver, J.R. & Edmunds, G.F. Jr. (1968) A revision of the Baetidae with spatulate-clawed nymphs (Ephemeroptera). *Pacific Insects*, 10 (3–4), 629–677.
- Waltz, R.D. & McCafferty, W.P. (1985) *Moribaetis*: A new genus of Neotropical Baetidae (Ephemeroptera). *Proceedings of the Entomological Society of Washington*, 87 (1), 239–251.