



The genus *Labiobaetis* (Ephemeroptera: Baetidae) in China, with description of a new species

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Abstract

Five species of the genus *Labiobaetis* (Baetidae) are recognized from China based on mature nymphs, including a new species, *Labiobaetis ancoralis* **n. sp.** and a new combination, *Labiobaetis mustus* (Kang & Yang) **n. comb.** The new species differs from *L. multus* (Müller-Liebenau) and *L. pulchellus* (Müller-Liebenau & Hubbard) by the spatulate submarginal setae on labrum and the apical segment of maxillary palpus with a pronounced excavation near apex. Imago stage of *L. mustus* (Kang & Yang) **n. comb.** is described for the first time based on male and female imagoes reared from nymphs, which can be distinguished from other known imagoes of *Labiobaetis* by the color pattern of abdominal terga and hind wing having a tiny vestigial costal process. All Oriental species previously transferred to *Pseudocloeon* are re-assigned to *Labiobaetis* in the present paper. An identification key is provided to the known mature nymphs of Oriental *Labiobaetis* species.

Key words: mayfly, *Labiobaetis*, new species, new combination, taxonomy

Introduction

The genus *Labiobaetis* was originally erected by Novikova & Kluge (1987) as a subgenus of *Baetis* Leach, 1815 with *Baetis* (*Labiobaetis*) *atrebatinus* Eaton, 1870 as the type species. McCafferty & Waltz (1995) raised it to generic rank which incorporated most of those species previously considered in the *Baetis atrebatinus*, *B. propinquus* and *B. molawinensis* species groups (Müller-Liebenau 1969, 1973, 1984; Morihara & McCafferty 1979). Kang *et al.* (1994) established *Mullerbaetis* as a new subgenus of *Baetis* to include 12 Oriental species previously belonging to *Baetis*. Shortly thereafter, however, Kang & Yang (1996) were aware that the species assigned to *Mullerbaetis* were actually members of the subgenus *Labiobaetis*. *Mullerbaetis*, therefore, has been treated since as a junior synonym of *Labiobaetis* (Kang & Yang 1996; Waltz & McCafferty 1997). Lugo-Ortiz *et al.* (1999) subsequently synonymized *Labiobaetis* with *Pseudocloeon* Klapálek, 1905 according to the imago morphology and reassigned all species of *Labiobaetis* and some species of *Baetis* to *Pseudocloeon*. However, Gattolliat (2001) disagreed with the synonymy because the nymphal stage of the type species *P. kraepelini* remains unknown and the sclerotized median process between the forceps is absent in the type species (Waltz & McCafferty 1985), thereby retained the validity of the genus *Labiobaetis*. Up to present, *Labiobaetis* has been widely accepted as a valid genus (Fujitani *et al.* 2005; McCafferty *et al.* 2010; Kluge & Novikova 2011; Gattolliat & Staniczek 2011; Webb 2013), but until now the Oriental species of *Labiobaetis* still remain in *Pseudocloeon* (Lugo-Ortiz *et al.* 1999; Soldán & Yang 2003). Herein we reassign all the Oriental species previously transferred to *Pseudocloeon* to the genus *Labiobaetis*.

The genus *Labiobaetis*, which consists of about 60 species, is worldwide distributed except for the Neotropical region (McCafferty & Waltz 1995; Waltz & McCafferty 1997; Gattolliat 2001; Gattolliat & Staniczek 2011; Webb 2013). Twenty species are recorded from the Oriental region (Müller-Liebenau 1982, 1984; Kang *et al.* 1994; McCafferty & Waltz 1995; Fujitani *et al.* 2005), of which four species are known exclusively from imago stage (McCafferty & Waltz 1995). However, the species of *Labiobaetis* in China are poorly known, with only three

- 11 Abdominal terga II to IX each with a large contrasting anchor-shaped brown marking. *L. ancoralis* **n. sp.** (China)
 - Abdominal terga II to IX each with a pair of small cream submedial oblique dashes and a pair of small cream submedial dots in midregion *L. atrebatinus* *orientalis* (Kluge) (China, Japan, Korea, Russia)
- 12 Submarginal setae on labrum simple and glabrous. 13
 - Submarginal setae on labrum feathered 14
- 13 Posterior marginal spines on terga large; coloration of abdominal tergum V not paler than adjacent terga.
 *L. pulchellus* (Müller-Liebenau & Hubbard) *n. comb.* (Sri Lanka)
 - Posterior marginal spines on terga small; coloration of abdominal tergum V much paler than adjacent terga
 *L. multus* (Müller-Liebenau) *n. comb.* (Malaysia)
- 14 Hind wing pads about 1/3 the length of metanotum; terminal filament about 2/5 the length of cerci
 *L. borneoensis* (Müller-Liebenau) *n. comb.* (Malaysia)
 - Hind wing pads slightly shorter than the length of metanotum; terminal filament about 3/5 the length of cerci
 *L. operosus* (Müller-Liebenau) *n. comb.* (Malaysia)

Acknowledgements

This work was supported by the National Natural Sciences Foundation of China (No. 30170121) and National Key Science & Technology Specific Project (No. 2009ZX07211-009-02). The authors are grateful to anonymous referees for their comments and criticisms.

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