

A new *Baetis*-complex genus (Ephemeroptera: Baetidae) from the Afrotropical Region

C.R. Lugo-Ortiz* & W.P. McCafferty

Department of Entomology, Purdue University, West Lafayette, Indiana 47907, U.S.A.

Glossidion gen. n. is described from larvae from Uganda. The genus is distinguished by cleft mandibular incisors, short glossae and subrectangular paraglossae, and smooth posterior margin of the terga. *Glossidion* belongs to the *Baetis* complex of genera and is hypothesized to be closely related to *Labiobaetis* Novikova & Kluge. Two species, *G. demoulini* sp. n. and *G. mysticum* sp. n., are described, and their diagnoses are discussed.

Key words: Ephemeroptera, Baetidae, *Glossidion*, new genus, new species.

INTRODUCTION

The *Baetis* complex (Ephemeroptera: Baetidae) is a distinct monophyletic group of genera, all of which share the apomorphic femoral villopore in the larval stage (McCafferty & Waltz 1990). This villopore was illustrated by Waltz & McCafferty (1987: Figs 1, 4, 5, 17). The degree of development of the villopore, however, varies within certain genera, as recently shown in *Labiobaetis* Novikova & Kluge (McCafferty & Waltz 1995; Lugo-Ortiz & McCafferty 1997b). Waltz & McCafferty (1997) also indicated that all known larvae in the *Baetis* complex have lost the plesiomorphic tuft of setae between the molae and prosthecae of the mandibles. All known adults in the complex have double marginal intercalaries in the forewings, but cannot be reliably distinguished from most other adult baetids with similar venation.

Acentrella Bengtsson, *Baetiella* Uéno, *Baetis* Leach, *Barbaetis* Waltz & McCafferty, *Demoreptus* Lugo-Ortiz & McCafferty, *Gratia* Thomas, *Heterocloeon* McDunnough, *Labiobaetis*, *Liebebiella* Waltz & McCafferty, *Platybaetis* Müller-Liebenau, and *Tanzaniella* Gillies belong to the *Baetis* complex of genera. Except for Antarctica, New Zealand, South America, and remote oceanic islands, the *Baetis* complex is cosmopolitan and appears to have originated as a clade in the Northern Hemisphere. Although possibly of Laurasian origin, we do not yet have evidence of the age of the complex.

Within the *Baetis* complex of genera, only *Baetis*, *Demoreptus*, *Labiobaetis*, and *Tanzaniella* are known

from the Afrotropical Region (Lugo-Ortiz & McCafferty 1997a). This fauna encompasses species originally described in various genera (Barnard 1932, 1940; Crass 1947; Kimmins 1960; Demoulin 1970; Kopelke 1980; Gillies 1991, 1993, 1994; Lugo-Ortiz & McCafferty 1997a,b). Gillies (1994) transferred all Afrotropical species assigned to *Pseudocloeon* Klapálek to *Baetis*, but Lugo-Ortiz & McCafferty (1997b) showed that several species of *Baetis* belong to *Labiobaetis*. It is possible that additional species currently assigned to *Baetis* in the Afrotropical Region represent different evolutionary lineages not necessarily related to the *Baetis* complex. Lugo-Ortiz & McCafferty (1997a) showed that all Afrotropical species assigned to *Acentrella* are referable to *Demoreptus*.

Here we describe a new Afrotropical genus of Baetidae referable to the *Baetis* complex, based on two new species collected in Uganda. We also discuss possible phylogenetic relations of the new genus within the *Baetis* complex. Except where otherwise noted, the specimens studied are in the Institute Royal des Sciences Naturelles de Belgique in Brussels.

Glossidion gen. n.

Type species: *Glossidion mysticum* sp. n.

Species included: *Glossidion demoulini* sp. n. (larva) and *Glossidion mysticum* sp. n. (larva).

Description of larva

Head. Labrum (Figs 1, 4) with anterior margin almost straight, with slight anteromedial

*To whom correspondence should be addressed:
e-mail: carlos_lugo-ortiz@entm.purdue.edu

emargination. Hypopharynx (Fig. 5) with lingua apicomediaally pointed and narrow superlinguae. Left mandible (Fig. 6) with one set of broad-based, medially-cleft incisors; prostheca narrow, apically denticulate; tuft of setae between prostheca and mola absent. Right mandible (Fig. 7) with one set of broad-based, medially-cleft incisors; prostheca narrow, apically denticulate; tuft of setae between prostheca and mola absent. Maxillae (Figs 2, 8) basally narrow, with four blunt denticles on crown of galealaciniae; palps two-segmented. Labium (Figs 3, 9) with glossae shorter than paraglossae; paraglossae broad, subrectangular; palps three-segmented; palp segments 1 and 2 narrow-elongate; palp segment 2 with small distomedial projection; palp segment 3 ovoid.

Thorax. Legs (Fig. 10) held close to body; femora dorsally with two rows of long, thick, simple setae and ventrally with few minute, simple, apically-pointed setae; villopore present; tibiae ventrally with abundant minute, simple, apically-pointed setae and dorsally with abundant minute, fine, simple setae; tarsi ventrally with row of simple, apically pointed setae increasing in length distally, and dorsally with abundant minute, fine, simple setae; tarsal claws (Fig. 11) with one row of denticles.

Abdomen. Terga (Fig. 12) with scale bases scattered over entire surface; posterior marginal spines absent. Gills (Figs 13, 14) on segments 1–7, plate-like, broad, poorly tracheated, held dorso-laterally, marginally serrate and with short, fine, simple setae. Paraprocts (Fig. 15) with marginal spines. Cerci with abundant setae medially; medial caudal filament with abundant setae laterally.

Adult. Unknown.

Etymology. The generic name is a Greek diminutive for lip, and is in reference to the small glossae. The gender is neuter.

Distribution. Uganda.

Remarks. Within the *Baetis* complex, *Glossidion* is distinguished by the cleft mandibular incisors (Figs 6, 7), short glossae relative to the paraglossae, subrectangular paraglossae (Fig. 9), and smooth posterior margin of the terga (Fig. 12).

Glossidion is possibly related to *Labiobaetis*. In both genera, the villopore is reduced, the paraglossae are subrectangular, and the labial palps tend to be long and slender. Moreover, there is at least one species in *Labiobaetis* that has short glossae as in *Glossidion* (Lugo-Ortiz & McCafferty

1997b), but no other species in any other genera in the *Baetis* complex has such a characteristic. In some species currently assigned to *Labiobaetis* the villopore is not apparent; presumably it has been secondarily lost or reduced to a vestige. Male adults of *Labiobaetis* demonstrate to various degrees a plesiomorphic sclerotized plate between the genital forceps (Moriyama & McCafferty 1979: Figs 12–15, 18; Durfee & Kondratieff 1997: Fig. 2). Whether or not *Glossidion* males prove to have this characteristic will be of considerable importance in determining the phylogenetic position of *Glossidion* within the *Baetis* complex. McCafferty & Waltz (1995) discussed the possible phylogenetic significance of this characteristic.

***Glossidion demoulini* sp. n., Figs 1–3**

Baetis sp. no. 6 Demoulin 1964: 280 (in part).

Description of larva

Length. Body: 7.0 mm; caudal filaments broken.

Head. Coloration medium-yellow-brown, without distinct pattern. Labrum (Fig. 1) almost parallel-sided, dorsally with submedial pair of long, fine, simple setae and anterior submarginal row of seven or eight long, fine, simple setae. Hypopharynx similar to Fig. 5. Left mandible similar to Fig. 6. Right mandible similar to Fig. 7. Maxillae (Fig. 2) with segment 1 approximately 0.60 times length of segment 2; segment 2 apically bulbous, extending well beyond galealaciniae. Labium (Fig. 3) with glossae approximately 0.50 times length of paraglossae, uniformly broad; paraglossae apically with 4–5 subparallel rows of long, fine, simple setae; palp segment 1 approximately 1.19 times length of segment 2; palp segment 3 slightly bulbous.

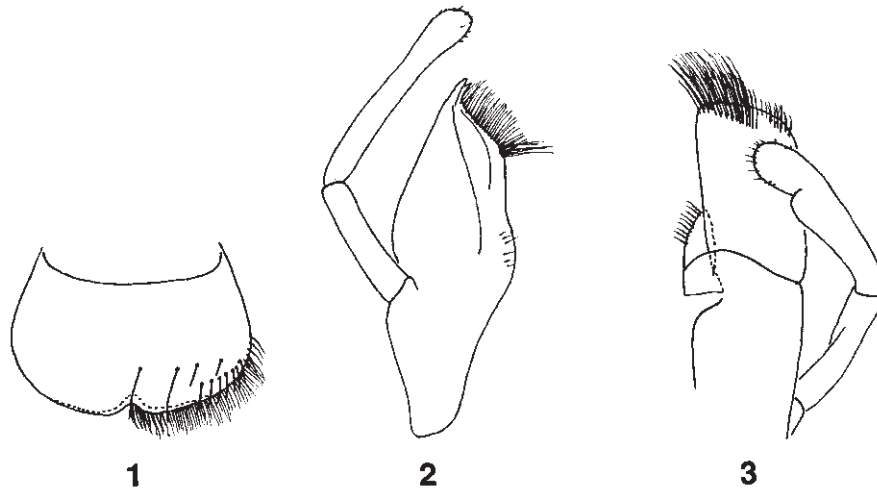
Thorax. Coloration medium-yellow-brown, without distinct pattern. Hind-wing pads present. Legs (as in Fig. 10) pale-yellow-brown; tarsal claws (as in Fig. 11) with 12–14 denticles.

Abdomen. Coloration medium-yellow-brown, without distinct pattern. Terga as in Fig. 12. Gills as in Figs 13, 14. Paraproct (as in Fig. 15) with 6–8 marginal spines. Caudal filaments pale-brown.

Adult. Unknown.

Etymology. This species is named after Georges Demoulin, who recognized its distinctiveness more than 30 years ago.

Type material examined. Holotype: larva, UGANDA, Waldzone, Ruwenzori, Mohamaffluss, 1500 m, H. Löffler, no date.



Figs 1–3. *Glossidion demoulini*, larva. 1, labrum; 2, right maxilla; 3, labium (ventral). Redrawn from Demoulin (1964).

Distribution. Uganda.

Remarks. *Glossidion demoulini* differs from *G. mysticum* sp. n. in having the lateral margins of the labrum almost parallel to each other (Fig. 1), apically bulbous maxillary palp segment 2 (Fig. 2), and shorter and more robust glossae (Fig. 3).

Demoulin (1964) indicated that he examined six larvae and one female subimago from the Mohama River at an elevation of 2200 m and one larva from the Budjuku River at an elevation of 3800 m and assigned those specimens to his *Baetis* sp. no. 6. He also indicated that he examined an additional larva from the Mohama River at an elevation of 1500 m, but considered it to be a variant of his *Baetis* sp. no. 6. Our examination of the material upon which Demoulin (1964) based his descriptions has revealed that, except for the Budjuku River larva, his reported locality data are not consistent with the material as it is labeled. According to the collection data on the labels, only one larva was collected from the Mohama River at an elevation of 2200 m, whereas all other larvae and the female subimago were collected from the same river at an elevation of 1500 m. The actual larval specimen upon which Demoulin (1964) based his figures of *Baetis* sp. no. 6 belongs to the 1500 m series from the Mohama River. We take that specimen to represent his concept of that species, and we have designated it as the type of *G. demoulini*. We cannot assign the larva collected at 2200 m from the Mohama River nor the larva from the Budjuku River to either species described here

because their mouthparts are missing and there are no other larval structures that facilitate a reliable identification. Nor can we assign the female subimago to either species because it was not reared. All other larvae, however, are referable to *G. mysticum* sp. n.

***Glossidion mysticum* sp. n.**, Figs 4–15

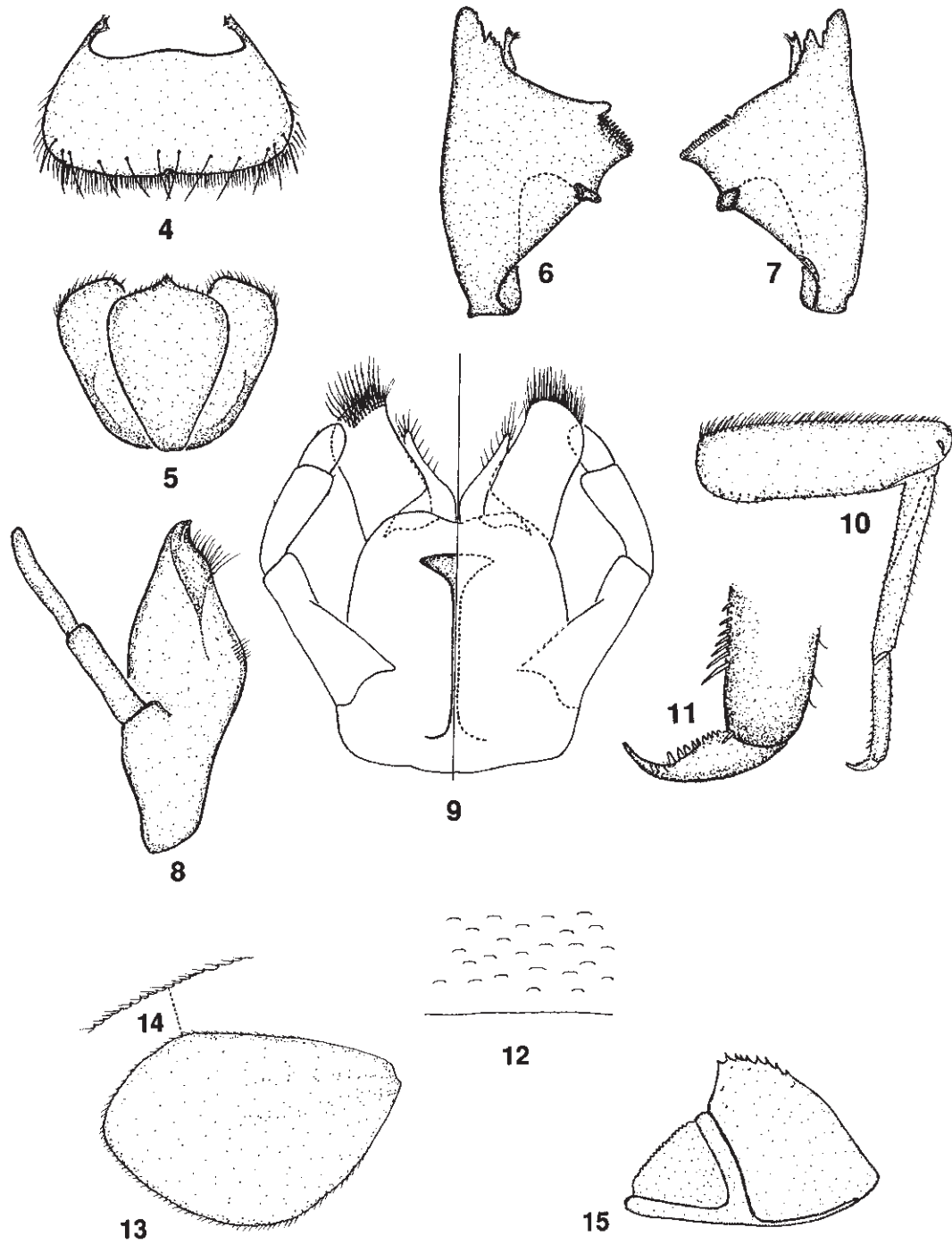
Baetis sp. no. 6 Demoulin 1964: 280 (in part).

Description of larva

Length. Body: 8.0–8.3 mm; caudal filaments broken.

Head. Coloration pale-yellow-brown, without distinct pattern. Labrum (Fig. 4) with conspicuously divergent lateral margins, dorsally with submedial pair of long, fine, simple setae and anterior submarginal row of 4–6 long, fine, simple setae. Hypopharynx as in Fig. 5. Left mandible as in Fig. 6. Right mandible as in Fig. 7. Maxillae (Fig. 8) with segment 1 approximately 0.88 times length of segment 2; segment 2 apically narrow, slightly extending beyond galealacinae. Labium (Fig. 9) with glossae approximately 0.81 times length of paraglossae, basally broad, apically narrow; paraglossae apically with four or five subparallel rows of long, fine, simple setae; palp segment 1 approximately 1.38 times length of segment 2; palp segment 3 slightly narrow.

Thorax. Coloration pale-yellow-brown, without distinct pattern. Hind-wing pads present. Legs (Fig. 10) pale-yellow-brown; tarsal claws (Fig. 11) with 9–10 denticles.



Figs 4–15. *Glossidion mysticum*, larva. **4**, labrum; **5**, hypopharynx; **6**, left mandible; **7**, right mandible; **8**, right maxilla; **9**, labium (left = ventral; right = dorsal); **10**, left foreleg; **11**, tarsal claw; **12**, tergum 4 (detail); **13**, gill 4; **14**, gill margin (detail); **15**, paraplect.

Abdomen. Coloration pale-yellow-brown, without distinct pattern. Terga as in Fig. 12. Gills as in Figs 13, 14. Paraprocts (Fig. 15) with eight or nine marginal spines. Caudal filaments cream to pale-yellow-brown.

Adult. Unknown.

Etymology. The specific epithet is Latin for mysterious.

Type material examined. Holotype: larva, UGANDA, Waldzone, Ruwenzori, Mohamaf Fluss, 1500 m, H. Löffler, no date. Paratypes: 4 larvae, same data as holotype (one larva deposited in the Purdue Entomological Research Collection, West Lafayette, Indiana, U.S.A.).

Additional material examined. Larva, same data as holotype.

Distribution. Uganda.

Remarks. *Glossidion mysticum* is distinguished from *G. demoulini* by the labrum having conspicuously divergent lateral margins (Fig. 4), apically narrow maxillary palp segment 2 (Fig. 8), and longer and narrower glossae (Fig. 9). See Remarks under *G. demoulini* for discrepancies in the locality data provided by Demoulin (1964).

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