

Short Communication

A new record of *Potamanthellus caenoides* Ulmer, 1939 (Ephemeroptera: Neoephemereidae) from the Chalakudi River, Southern Western Ghats of India

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Abstract: As part of an ongoing study on the benthic macro-invertebrates of Chalakudi River basin, of the Southern Western Ghats of India, we establish a new record of a mayfly larva (*Potamanthellus caenoides*). Larva of *Potamanthellus caenoides* Ulmer, 1939 is recorded for the first time from the upstream of Chalakudy River. The specific location, sample and brief ecological notes are appended.

Article history:

Received 4 January 2019

Accepted 23 February 2019

Available online 25 February 2019

Keywords: Ephemeroptera, New record, Chalakudy River, Southern Western Ghats.

Introduction

Ephemeroptera is a biogeographically significant archaic order of aquatic insects abounding in several enigmatic families in the Pantropical region, especially in the Oriental Realm. Neoephemeridae is a small group of mayflies presently confined to Holarctic and Oriental regions. Bae (1998) recognized only three genera of mayflies viz., *Potamanthellus* Lestage, 1930 (seven species), *Neoephemera* McDunnough, 1925 (five species) and *Ochernova* Bae, 1998 (one species), synonymizing *Leucorhoenanthus* Lestage, 1930 (one species) with *Neoephemera*. This is not accepted by Kluge (2004), and Bauernfeind and Soldán (2012).

Larvae of Neoephemeridae have unique operculate gills on the second abdominal segment that are fused medially. The larvae of *Potamanthellus* are distinguished from those of *Neoephemera* and *Ochernova* by their densely setate mouthparts, lack of well-developed lateral expansions of the pronotum and mesonotum, and possession of rows of long setae on the caudal filaments (Bae, 1998). However, the larvae of *Potamanthellus* cannot be differentiated from *Leucorhoenanthus* by any plesiomorphic or apomorphic traits. Based on our larval collections of

Ephemeroptera from the Chalakudy River of the Western Ghats, and subsequent taxonomical examinations, we establish a new record of *Potamanthellus caenoides* (Ulmer, 1939), which is a significant range extension to South Asia from its known range viz., Sumatra Island located in Southeast Asia. Differential diagnosis of *P. caenoides* is verified based on the larval descriptions given (Ulmer, 1939) and subsequent revisionary studies (Bae, 1998).

Materials and Methods

The material was collected from the up-streams of Chalakudy River, near Valpparai and Sholayar in the south-western region of the Western Ghats of peninsular India, by Kick/Dip Net Methods and by direct hand picking (Needham and Needham, 1969) and (Pennak, 1989). The specimens were preserved in 90% ethanol. Some specimens were mounted on slides to enable detailed microscopic observations.

Results

Potamanthellus caenoides Ulmer, 1939

Taxonomic Status: accepted; kingdom: Animalia; phylum: Arthropoda; class: Insecta; order: Ephemeroptera; family: Neoephemeridae; taxon rank:

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species; genus: *Potamanthellus*; specific epithet: *caenoides*

Country: India; State Province: Kerala & Tamil Nadu; locality: Valparai; verbatim Latitude: 10°18'38.8"N; verbatim Longitude: 076°56'45.1"E; sampling Protocol: Hand picking; year: 2018; month: April; day: 18; habitat: Cascade; individual Count: 4; sex: male & female; life Stage: Larva; identified by O.A. Banazair & G. Christopher.

Diagnosis: *Potamanthellus caenoides* is distinguished from other species of *Potamanthellus* by the following combination of characters in larvae: (i) a distinct diagonal ridge on operculate gills, (ii) distinct tubercles on abdominal terga 6-8, (iii) dorsal fore-femora with transverse row of setae (iv) relatively small body size (<8 mm), and (v) relatively short caudal filaments that possess strongly developed lateral setae. *Potamanthellus caenoides* is distinguished from closely related species *P. ganges* by the following characters: (i) posteromedian tubercle on abdominal terga 1-2 and 6-8 distinct, (ii) rows of hair like setae strongly developed and mature body ca. 6-8 mm, and (iii) dorsal fore-femora with transverse row of setae (Fig. 1).

Distribution: Indonesia (Sumatra (Ulmer, 1939), Java, Bali, Lombok and Flores), Malaysia (Malay Peninsula, Sabah and Sarawak), Philippines (Mindanao), Thailand (Bae, 1998), Vietnam (Nguyen and Bae, 2003) and India (Southern Western Ghats).

Ecology: The larvae of *P. caenoides* occur in moderately fast flowing mountain streams and rivers ranging 850-935 m in altitude. The substrates consist of relatively coarse particles (boulder 30%, cobble 20%, pebble 20% and gravel and sand 30%), fallen leaves and detritus. The water temperature in April ranges 18-23°C.

Taxon discussion: Presently this genus consists of seven species viz. *P. amabilis* (Eaton, 1892), *P. caenoides* (Ulmer, 1939), *P. chinensis* (Hsu, 1936), *P. edmundsi* (Bae, 1998), *P. ganges* (Bae, 1998), *P. shaowuensis* (Gui et al., 1999) and *P. uncutibius* (Nguyen and Bae, 2003). However, two species viz. *P. ganges* is known from India from the tributary of Ganges (Bae, 1998). *Potamanthellus caenoides*



Figure 1. *Potamanthellus caenoides*, collected from the Chalakudi River.

(Ulmer, 1939) is from the southern Western Ghats and *P. caenoides* (Ulmer, 1939) is a new record from Chalakudi River.

Acknowledgments

The authors express their gratitude to Dr. A.P. Thomas and Dr. S. Prasanth Narayan for their valuable suggestions. Thanks are also to the Kerala Forests and Wildlife Department for permitting to do field work in Vazhachal Forest. The research work was financially supported by UGC Maulana Azad National Fellowship (MANF).

Conflict of interest

The authors declare that they have no conflict of interest.

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