



## The dipterous Leptophlebiidae of Borneo (Insecta, Ephemeroptera)

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### Abstract

This paper deals with two mayfly species (Ephemeroptera) belonging to the family Leptophlebiidae and inhabiting a lowland dipterocarp forest in East Kalimantan (Indonesia). *Isca lea* **sp. nov.** is relatively abundant in our study site and differs from all other known species by its 7<sup>th</sup> gill composed of two lamellae instead of one. A peculiar species previously identified as *Dipterophlebiodes* sp. (Leptophlebiinae) belongs to a new genus *Kilariodes* **gen. nov.** (Atalophlebiinae), characterized, among others, by the shape of the mandibles and of the labrum. *Kilariodes marifae* **sp. nov.** is extremely rare and has been found in a single stream. Both new species lack posterior wings or wing pads.

**Key words:** New species, new genus, Indonesia, East Kalimantan, *Isca*, *Dipterophlebiodes*, *Kilariodes*

### Introduction

The first leptophlebiid species recorded in the island of Borneo was by Ulmer (1939) who described the new genus and species *Simothraululus seminiger* Ulmer, 1939. Later, Demoulin (1954) mentioned the following species. *Hagenulus karnyi* Ulmer, 1939, now *Choroaterpes* (*Euthraululus*) *karnyi* (Ulmer, 1939) according to Peters & Edmunds (1970), *Habrophlebiodes prominens* Ulmer, 1939, *Hagenulus* (?) *duliti* **sp. nov.**, now *Sulu duliti* (Demoulin, 1954) according to Grant & Peters (1993), and *Dipterophlebiodes sarawacensis* **gen. nov. sp. nov.** Among these five species, nymphs of *S. seminiger*, *S. duliti* and *D. sarawacensis* are still unknown, although Peters (1972) described for the first time the nymph of an unnamed species of *Dipterophlebiodes* from West Malaysia. Based on this statement, it is obvious to say that our knowledge of the Leptophlebiidae of the third largest island in the world is fragmentary, at the best.

The mayfly fauna studied by Derleth (2003) in a lowland dipterocarp forest in East Kalimantan (Indonesia) has been the subject of a first synthesis proposed by Sartori *et al.* (2003). Among the Leptophlebiidae, these authors mentioned the presence of the genera *Choroaterpes* Eaton, 1881, *Habrophlebiodes* Ulmer, 1939, *Dipterophlebiodes* Demoulin, 1954, *Isca* Gillies, 1951 (recorded for the first time from Borneo), as well as an unknown genus which could represent the nymph of either *Simothraululus* Ulmer, 1939 or *Sulu* Grant & Peters, 1993.

Both genera *Isca* and *Dipterophlebiodes* present the peculiarity to be dipterous, i.e. at the adult stage, hind wings are missing, a character already visible in mature nymphs where hind wing pads are absent on the metathorax.

The primitive objective of this study was to describe the species of the genus *Isca*, as well as the presumed nymph of *Dipterophlebiodes sarawacensis*. But it rapidly appeared that what we considered as nymphs of *Dipterophlebiodes* belong in fact to an unknown and yet undescribed new genus.

This work is the following of several publications on the Ephemeroptera biodiversity of Bulungan forest, Malinau District, East Kalimantan, Indonesia (Sartori & Gattolliat 2003; Jacobus & Sartori 2004; Sartori *et al.* 2007; 2008).

Holotypes and most of the paratypes of the new species are deposited in the Museum of Zoology, Lausanne, Switzerland (MZL); paratypes also housed in the Arthropod Collection of Florida A & M University, Tallahassee, USA (FAMU) as well as in the Museum of Zoology, Bogor, Indonesia (LIPI).