



## The nymph of *Atopopus tarsalis* Eaton, 1881 (Ephemeroptera, Heptageniidae): first description, ecology and behaviour

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### Abstract

The nymph of *Atopopus tarsalis* Eaton, 1881, type species of the genus, is described in detail for the first time. The egg stage is also presented. Endemic to Borneo, *A. tarsalis* nymphs exhibit a peculiar behaviour, being able to climb boulders and stay out of the water for periods of at least 20 minutes without dehydration. Hypotheses for such behaviour are briefly discussed such as drift and predation avoidance.

**Key words:** Borneo, nymph, egg, first description, behaviour, dehydration

### Introduction

The genus *Atopopus* Eaton was proposed by Eaton for an unusual heptageniid species from Borneo (Eaton 1881). The male imago of *A. tarsalis* Eaton presents tarsi much longer than the tibiae on all legs, but especially on the hind ones. This species was described from Labuan, an island (Wilayah Persekutuan Labuan) located some miles off the shores of Sabah (Malaysia). Later, another species was described under the name *A. tibialis* Ulmer from the Philippines (Ulmer 1920), based also on male imagos. The species described under the name *Atopopus spadix* Harker (Harker 1950) from Australia is in fact most probably a member of the family Leptophlebiidae (Hubbard & Campbell 1996). A third species, *A. edmundsi* Wang & McCafferty, was described from Sabah by Wang and McCafferty (1995) who also provide the first account of the nymph of the genus with the description of those of *A. tibialis* and *A. edmundsi*. In his recent monograph, Kluge partly illustrated the nymph of *A. tarsalis* (Kluge 2004, fig. 59A). Finally, *A. meyi* Braasch was recently described in the imaginal and larval stages from material collected in the Philippines (Braasch 2005).

Herein, we describe the nymph of the type species of the genus, *Atopopus tarsalis*, based on abundant material collected in East Kalimantan (Indonesia) during the PhD thesis of the second author (Derleth 2003). The first description of the eggs is also presented. Moreover, information on the ecological requirements of this species, as well as its very unusual behaviour is also presented.

### Description

#### *Atopopus tarsalis* Eaton, 1881

**Nymph.** Size: male, body length up to 12.3 mm, cerci length up to 14.8 mm; female, body length up to 14.9 mm, cerci length up to 15.5 mm.