



## A new genus and first Cenozoic fossil record of moth lacewings (Neuroptera: Ithonidae) from the Early Eocene of North America

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### Abstract

A new genus and species *Allorapisma chuorum* **gen. sp. nov.** is described from the Early Eocene locality at Republic, Washington, U.S.A. The forewing venation of *Allorapisma* is most similar to that of the genus *Principiala* Makarkin & Menon from the Early Cretaceous of Brazil and Britain. A new, informal suprageneric taxon consisting of these genera is proposed, the *Principiala* group. The habitats of extant and fossil Ithonidae are briefly discussed.

**Key words:** Ithonidae, Eocene, Okanagan Highlands

### Introduction

The family Ithonidae is traditionally considered to be among the most primitive within the order. Today, it consists of 35 named species in seven genera (Tillyard 1919; Riek 1974; Barnard 1981; Yang 1993; Penny 1996), discontinuously distributed globally (Fig. 1). Their larvae are thought to be saprophagous or phytophagous-succivorous (Gallard 1932; Faulkner 1990a, b; Oswald *et al.* 2002), whereas those of other neuropterans are known to be predaceous, with the possible exception of Polystoechotidae. It has been suspected that the family is relictual, although the first fossil ithonid was only recently described, *Principiala incerta* Makarkin & Menon from the Early Cretaceous of the Crato Formation of Brazil (Makarkin & Menon 2007). Some features of wing venation found in *P. incerta* are quite different from those of extant taxa, however, it is confidently placed in the family based on a set of distinctive head and thorax characters (*e.g.*, very short antennae; large, shield-like pronotum; head almost entirely retracted under pronotum), together with other wing character states. Another species of *Principiala* was recently discovered in the British Early Cretaceous Upper Weald Clays (Jepson *et al.*, submitted). The discovery reported here of two specimens from the Early Eocene of North America (Republic, Washington, U.S.A.) with venation similar to that of *Principiala* is noteworthy. Below, we describe a new genus and species based on these specimens, and discuss its systematic position within the family and the habitats of ithonids (extant and fossil).

### Material and methods

The specimens described here are from exposures of the Tom Thumb Tuff Member of the Klondike Mountain Formation in town of Republic, Ferry County, in northeastern Washington (USA), assigned a date of  $49.42 \pm 0.54$  Ma, *i.e.*, Early Eocene (Ypresian) (Greenwood *et al.* 2005; Moss *et al.* 2005).

We follow the traditional (*sensu* Wootton 2003) venational terminology of Comstock (1918) in the recent interpretation of Oswald (1993), Makarkin & Menon (2005), Archibald & Makarkin (2006), and Wedmann &