



New Cimbrophlebiidae (Insecta: Mecoptera) from the Early Eocene at McAbee, British Columbia, Canada and Republic, Washington, USA

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Abstract

Four new scorpionfly species of the family Cimbrophlebiidae (Mecoptera) are described in the genus *Cimbrophlebia* Willmann from two localities of the far-western North American Early Eocene Okanagan Highlands: *C. flabelliformis* sp. n. and *C. Leahyi* sp. n. from McAbee, British Columbia, Canada; and *C. brooksi* sp. n. and *C. westae*, sp. n. from Republic, Washington, U.S.A. A further, partially preserved specimen of a large cimbrophlebiid from McAbee is treated as *Cimbrophlebia* sp. A. This is the first record of the extinct family in the Western Hemisphere, which was previously known with confidence from the Early Eocene of Denmark (*C. bittaciformis* Willmann) and the Jurassic of Germany (*Malmocimbrophlebia buergeri* Bechly & Schweigert and an undescribed genus and species); *Telobittacus fragosus* Zhang from Early Cretaceous of China may also belong to the family. These Okanagan Highlands occurrences further reflect Early Eocene cross-North Atlantic distributions that have been well documented in plants and mammals, and are increasingly seen in insects.

Key words: Mecoptera, Cimbrophlebiidae, Eocene, Okanagan Highlands, McAbee, Republic

Introduction

Cimbrophlebiidae is an extinct, little-known family of large scorpionflies (Mecoptera) considered to be the sister group of Bittacidae, which together form the infraorder Raptipeda (Willmann 1977, 1989). Bittacid and cimbrophlebiid wings are tipuliform, with much of their venation similar; both have long, slender legs, each bearing a single, large, raptorial tarsal claw (Willmann, 1989: Fig. 136). Cimbrophlebiid wings are easily distinguished from those of Bittacidae, however, by their long, branched 2A, which is short and unbranched in Bittacidae. Novokshonov (1997, 2002) considered the family to be a junior synonym of Bittacidae.

Cimbrophlebiids have only been confidently reported from Europe: an undescribed genus from the Jurassic (lower Toarcian) of Grimmen, Germany (Ansorge 1996, 2003); *Malmocimbrophlebia buergeri* Bechly & Schweigert, 2000, from the Late Jurassic Solnhofen limestone of Bavaria, Germany; and *Cimbrophlebia bittaciformis* Willmann, 1977, from the Early Eocene Fur Formation of Denmark. Novokshonov (1997) found that *Telobittacus fragosus* Zhang, 1993 (Early Cretaceous; Shaanxi Province, China), assigned to the Bittacidae, is very similar to *C. bittaciformis* and might belong to *Cimbrophlebia* Willmann.

The first occurrences of Cimbrophlebiidae from the Western Hemisphere are reported here, from two Early Eocene Okanagan Highlands localities in far-western North America. Four new species are described, all assigned to the genus *Cimbrophlebia*: *C. flabelliformis* and *C. Leahyi* from McAbee, British Columbia, Canada; and *C. brooksi* and *C. westae* from Republic, Washington, U.S.A. Another, partially preserved, large cimbrophlebiid from McAbee is treated as *Cimbrophlebia* sp. A. The occurrence of *Cimbrophlebia* in both North America and northern Europe in the Early Eocene is consistent with distribution patterns seen at that