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

S. BRUCE ARCHIBALD

Department of Biological Sciences, Simon Fraser University, 8888 University Drive, Burnaby, BC, V5A 1S6, Canada.
E-mail: sba48@sfu.ca

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 cimbrophlebid 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