



Fossil Eucharitidae and Perilampidae (Hymenoptera: Chalcidoidea) from Baltic Amber

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Abstract

Palaeocharis rex **n. gen.** and sp. (Eucharitidae: Eucharitinae) and *Perilampus pisticus* **n. sp.** (Perilampidae: Perilampinae) are described from Baltic amber. *Perilampus renzii* (Peñalver & Engel) is transferred to Torymidae: *Palaeotorymus renzii* **n. comb.** *Palaeocharis* is related to *Psilocharis* Heraty based on presence of one anellus, linear mandibular depression, dorsal axillular groove, free prepectus and a transverse row of hairs on the hypopygium. This fossil is unique in comparison with extant Chalcidoidea because there are two foretibial spurs instead of a single well-developed calcar. *Perilampus pisticus* is placed into the extant *Perilampus micans* group because the frenum and marginal rim of the scutellum are visible in dorsal view and the prepectus forms a large equilateral triangle. The phylogenetic placement of both genera is discussed based on an analysis of both a combined morphological and molecular (28S and 18S) and morphology-only matrix. Morphological characters were used from an earlier study of Eucharitidae (Heraty 2002), with some characters revised to reflect variation in Perilampinae. Baltic amber is of Eocene age, which puts the age of divergence of these families at more than 40 mya.

Key words: amber, phylogeny, Eocene, ribosomal DNA, morphology, ant, parasitoid

Introduction

Chalcidoidea represent one of the most recent explosive radiations of insects, and is estimated to contain as many as 375,000 to 500,000 species (Heraty & Gates 2003, Noyes 2003). Little is known about the early evolution of the superfamily. Their proposed origin is during the late Jurassic or early Cretaceous (~163–144 mya) (Yoshimoto 1975; Schlee and Glöckner 1978, Zherichin & Sukacheva 1973, Roskam 1992; Rasnitsyn 2002). The first fossils referable to Chalcidoidea (Mymaridae; the proposed sister group of the remaining chalcidoids) are known from Campanian Cedar Lake amber (83–74 mya). Khutelchalcididae was described from late Jurassic or early Cretaceous deposits (Rasnitsyn *et al.* 2004), but its placement in Chalcidoidea was rejected by Gibson *et al.* (2007). The proposed sister group of Chalcidoidea, the Mymarommatoidea, are known from late to middle Cretaceous Albian-Cenomanian deposits (~100 mya) (Schlüter 1978, Fursov *et al.* 2002, Engel & Grimaldi 2007; Gibson *et al.* 2007).

The known diversity of Chalcidoidea during the Cretaceous is surprisingly low, with only two families currently recognized, Mymaridae and Tetracampidae (summarized in Yoshimoto 1975, Darling & Sharkey 1990, Engel & Grimaldi 2007). *Enneagmus* Yoshimoto, the sole trichogrammatid wasp described from Cretaceous amber, recently was transferred to Mymaridae (Huber 2005). Taxa described as Tetracampidae by Yoshimoto likely do not belong to this family, but their true affinities are uncertain (Gumovsky and Perkovsky 2005). Chalcididae illustrated by Whalley (1981) likely belong to this same group (J.S. Noyes, personal communication). Machado *et al.* (2001) originally proposed an origin of 90 mya for the fig-pollinating