

A plesiomorphic gasteruptiid wasp in Cenomanian amber from Myanmar (Hymenoptera: Gasteruptiidae)



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ABSTRACT

The first definitive Burmese amber fossil of the family Gasteruptiidae *s.str.* (Evanoioidea) is described and figured from a male entombed in amber from the Hukawng Valley, Myanmar. The Cenomanian-aged fossil is plesiomorphic in many respects when compared to the modern subfamilies Hyptiogastrinae and Gasteruptiinae. The genus *Hypselogastrion* Engel, gen. nov. (type species: *Hypselogastrion simplex* Engel and Wang, sp. nov.), is segregated into the extinct subfamily Hypselogastrinae Engel, subfam. nov., owing the more enriched wing venation, aulcid-like mesoscutal sculpturing, non-clavate metatibia, and absence of U-shaped notauli. The affinities of *H. simplex* among other living and fossil Aulaciformes are discussed.

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1. Introduction

Wasps of the evanoid family Gasteruptiidae comprise a distinctive group of species that may be found in most regions of the world. The elongate metasoma, clavate metatibiae, and often long neck created by elongation of the propleura, give them a characteristic appearance among the Evanoioidea (Crosskey, 1962; Mason, 1993; Jennings and Austin, 2002; Macedo, 2009). The approximately 500 modern species (Jennings and Austin, 2004; Aguiar et al., 2013) are segregated into two subfamilies, the nearly cosmopolitan Gasteruptiinae and the largely Gondwanan Hyptiogastrinae (Jennings and Austin, 2002; Macedo, 2009, 2011; Zhao et al., 2012; van Achterberg and Talebi, 2014). Gasteruptiids are more cleptoparasitic than they are truly parasitoids, although their biology tends to blur the distinctions between these two modes of life. Their immatures start off as a predator of the host's

immature, before moving on to devour the host's provisions as a cleptoparasite (Jennings and Austin, 2004). The hyptiogastrines are largely confined to short-tongued bees as their hosts, while gasteruptiines may be found attacking a variety of bee families as well as apoid wasps and Vespidae (Crosskey, 1962; Carlson, 1979; Engel, 1995; Jennings and Austin, 2004).

There have been no definitive fossil records for the Gasteruptiidae *s.str.*, although some authors have treated gasteruptiids and the related family Aulacidae as a single group (e.g., Rasnitsyn, 1980), or even conceived them more broadly than this (e.g., Rasnitsyn, 1991a; Zhang and Rasnitsyn, 2004). Under such a system, various fossils have been attributed to Gasteruptiidae *s.l.*, but most of these would all fall within Aulacidae in the more narrowed sense that these groups are usually used (e.g., Crosskey, 1951, 1962; Mason, 1993; Jennings and Austin, 2000; Grimaldi and Engel, 2005). The sole exceptions are those compression fossils of the genera *Kotujellites* Rasnitsyn and *Kotujisca* Rasnitsyn, both of which apparently share with modern gasteruptiids peculiar U-shaped notauli (Rasnitsyn, 1991b).

Here we report the discovery of a new fossil gasteruptiid from the Cenomanian amber of the Hukawng Valley in northern

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Myanmar. Although it appears comparatively modern in habitus (Fig. 1A), a number of particular morphological details reveal the species to be plesiomorphic when compared to the subfamilies Gasteruptiinae and Hyptiogastrinae. The species is described herein and its implications are discussed.

2. Material and methods

A single male was discovered in an oval piece of Upper Cretaceous (Cenomanian) amber from mines near the village of Noije Bum of the Hukawng Valley, not far from Tainang, and westward of Myitkyna, Kachin State. The piece was trimmed along its upper end in order to provide a direct dorsal view of the wasp, but the individual is situated near the other surfaces and prevents preparation from other directions. The face abuts the curved edge of the piece and the antennae are incomplete, with the left breaching the amber

surface at the base of the first flagellomere, while the right antenna has the first four flagellomeres present, as well as the base of the fifth (Fig. 1). The venter of the wasp parallels the other thin, rounded edge of the amber piece, with the tarsi and portions of some of the tibiae lost at the surface, although the majority of the right metatibia is preserved. The wings are reclined back over the body and partially folded (naturally, as in modern gasteruptiids), and the metasoma is extended directly posterad in line with the long axis of the body (Fig. 1). The amber is remarkably clear and without debris, although a few bubbles and internal flows within the amber do render some views distorted. Overall, virtually every detail of the wasp can be observed.

The amber of the Hukawng Valley has been dated to the earliest Cenomanian based on radiometric dates obtained from occluded sediments (Shi et al., 2012), and the locality has been mapped and overviewed geologically by Cruickshank and Ko (2003). Descriptive

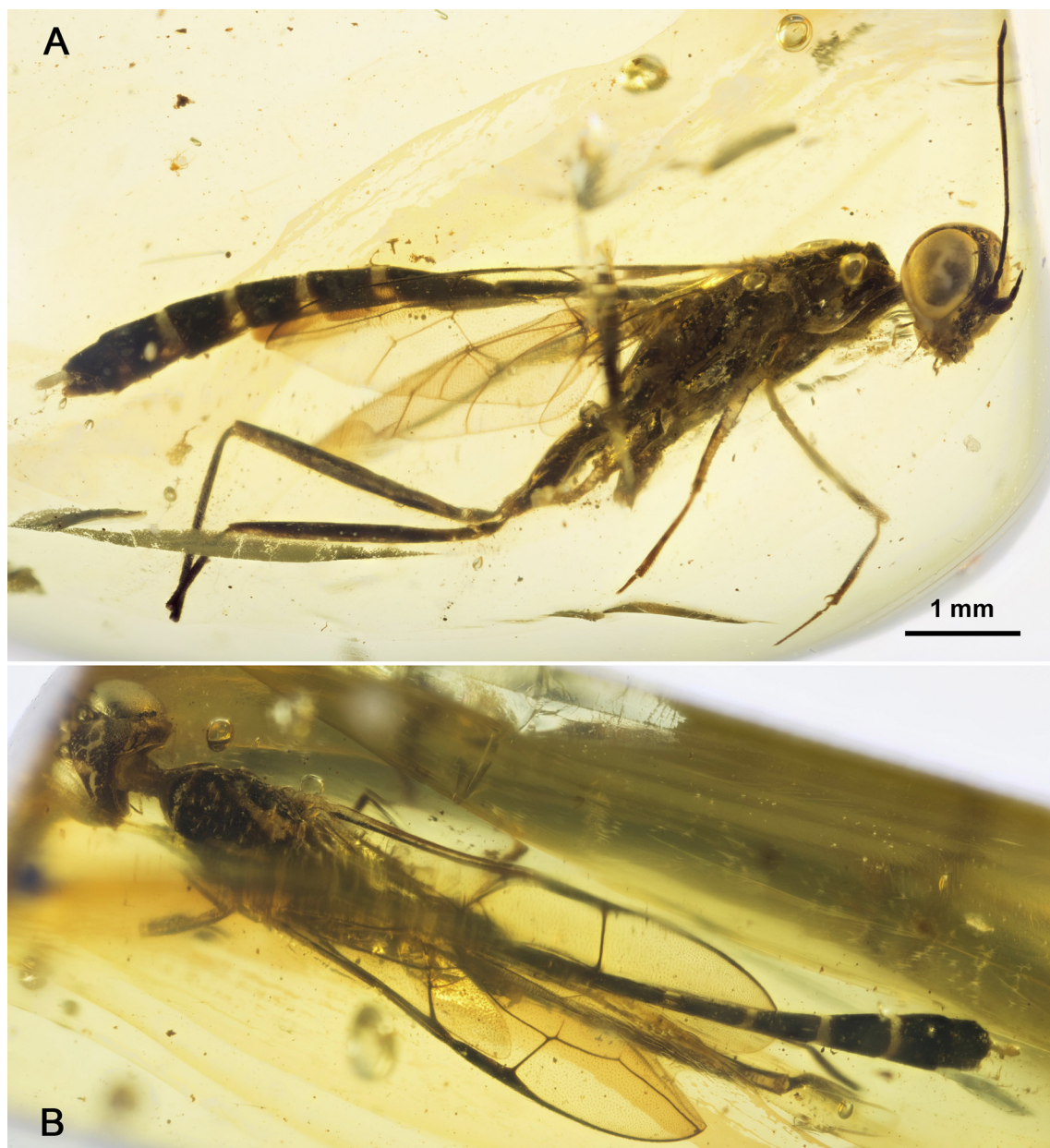


Fig. 1. Microphotographs of holotype male (NIGP 163537) of *Hypselogastrion simplex* Engel and Wang, sp. nov. (both images to the same scale). A, Right lateral view. B, Dorsal view.

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