Cretevania bechlyi sp. nov., from Cretaceous Burmese amber
(Hymenoptera: Evaniiidae)

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Abstract

The fossil evaniid wasp Cretevania bechlyi sp. nov., is described based on a well preserved female specimen from Cretaceous Burmese amber. The new species is placed in the genus Cretevania Rasnitsyn, 1975 based on the elongation of the mid and hind trochantellus, the fore wing venation (e.g. first marginal cell triangular and broad, 2m-cu absent, second submarginal cell separated from first discal cell), the shape of the petiole (subcylindrical with distal extension) and other distinct morphological features. Cretevania bechlyi sp. nov. differs from all previously described species in having just 10 flagellomeres (11 in other members of the genus) and in the presence of notauli (absent in other species). The new species represents the first species of Cretevania from Burmese amber and significantly expands the known morphological diversity of Mesozoic Evaniidae.

Key words: fossil, Myanmar, systematic palaeontology, Evanioidea

Introduction

Ensign or hatchet wasps (family Evaniiidae) are distinctive solitary predators on cockroach eggs in oothecae (e.g., Deans 2005). They have a uniquely shaped metasoma with a tubular petiole and a shortened, laterally compressed gaster (sensu abdominal segments posterior to abdominal segment 2—URI: http://purl.obolibrary.org/obo/HAO_0000369). The world fauna comprises about 650 species in 22 extant and 12 fossil genera (Deans 2005; Deans et al. 2012; Jennings et al. 2012). Several fossil species have been described from Mesozoic ambers ranging from the Early to Late Cretaceous (e.g., Rasnitsyn 1975; Basibuyuk et al. 2000a, 2000b, 2002; Deans et al. 2004; Engel 2006; Pérez-de la Fuente et al. 2012), in addition to relatively derived species in Tertiary ambers (e.g., Brues 1933; Nel et al. 2002a, 2002b; Sawoniewicz & Kupryjanowicz 2003; Jennings et al. 2012 and summary therein). Several other evaniids have been described from non-amber deposits, mostly Early to Late Cretaceous as summarized in Jennings et al. (2012).

The dating of Burmese amber has been reviewed most recently by Shi et al. (2012), who concluded a late Albian—early Cenomanian age. Two evaniid species have been described from Burmese amber: Sorelevania deansi Engel 2006, and Mesevania swinhoei Basibuyuk & Rasnitsyn 2000 (in Basibuyuk et al. 2000b). The most species-diverse fossil evaniid genus is Cretevania Rasnitsyn, 1975, which is mainly characterized by its fore wing venation and the shape of the hind legs and petiole (Pérez-de la Fuente et al. 2012). To date, 14 species of this genus have been recorded from different Cretaceous deposits of amber and compression rocks from Eurasia and the Middle East, the highest diversity being known from Spain (Peñalver et al. 2010, Pérez-de la Fuente et al. 2012).

Herein we provide the description of a new species of Cretevania from Lower Cretaceous (late Albian—early Cenomanian) Burmese amber, thus significantly expanding the known paleogeographic range of this extinct fossil evaniid genus.
**Material and methods**

The amber specimen, which had been previously polished, was immersed in 50% glycerol in distilled water and photographs were taken using a Visionary Digital BK plus imaging system with a Canon EOS 5D Mark II 21.1 megapixel camera. Images were produced using Zerene Stacker, Zerene Systems LLC, software and cropped and resized in Photoshop CS5.

Anatomical terminology follows the Hymenoptera Anatomy Consortium (http://glossary.hymao.org); wing venation terminology follows Deans & Huben (2003). The methods outlined in Peñalver et al. (2010) were used to calculate the pterostigmal and wing cell ratios.

**Systematic Palaeontology**

**Superfamily Evanioidea Latreille, 1802**

**Family Evaniidae Latreille, 1802 (as Evaniales)**

[See Deans 2005 for full taxonomic history of the family]

**Genus Cretevania Rasnitsyn, 1975**

**Type species.** Cretevania minor Rasnitsyn, 1975 from Late Santonian Yantardakh amber (Taimyr, Russia; see Zherikhin & Eskov 1999).

[See Peñalver et al. (2010) for the generic diagnosis, and Pérez-de la Fuente et al. (2012) for a list of included species.]

**Cretevania bechlyi** Jennings, Krogmann & Mew, sp. nov.

Figures 1–3.

**Holotype:** Specimen SMNS BU-2, in Cretaceous amber from Myanmar (Burma). Deposited in the State Museum of Natural History Stuttgart.

Small wasp distinguished from other Cretevania by absence of notauli; antennae with 10 flagellomeres, not broader distally; petiole very long and thin, 11.8× longer than wide, and the following combination of fore wing characters: (1) pterostigma 4.5× longer than wide, (2) first submarginal cell 2.85× longer than wide, (3) vein 2RS nearly straight, (4) first marginal cell 4.4× longer than wide at base, (5) 1CU 1.9× length 1m-cu, (6) 1r-rs straight (i.e., not concave), arising near the pterostigma apex, (7) vein 2M nearly concave subbasally, (8) vein 2CU+3CU slightly changing its slope distally, and (9) wing apex rounded.

**Etymology.** The species epithet is named for Günter Bechly (State Museum of Natural History Stuttgart).

**Description.** Female fully winged and of small body size (total length 4.0 mm); body and gaster dark brown. Head 0.70 mm in height, mesosoma 1.35 mm in length, metasoma 2.2 mm in length; head 2.0× as wide as long; vertex 0.40× head width; compound eye 0.75 mm in height, distance between eyes 0.52 mm; distance of lateral ocellus to compound eye 0.08 mm; occipital carina narrow, complete; malar space 0.27× height of compound eye; antennae inserted slightly above mid-line of eye, toruli almost touching; distance from torulus to eye 0.12 mm; antennae uniformly thickened, with 10 flagellomeres; scape 0.45 mm in length; pedicel 2.5× longer than wide, 0.09 mm in length, first flagellomere 0.21 mm in length; flagellomeres longer than wide. Mesoscutum and mesoscutellum apparently smooth; notauli approximately parallel, percurrent, each notaulus indicated by shallow groove; propodeum areolate. Petiole subcylindrical, long and thin, length 11.8× max. width, 0.73× length of the remaining metasoma (i.e, gaster), distal third of petiole ventrolaterally expanded; gaster smooth, elliptical. Fore wing venation relatively complete: first marginal cell 4.4× longer than wide at base; first submarginal cell triangular and broad (length 2.85× max. width); 2m-cu absent; second submarginal cell separated from first discal cell; 3M and 2CU+3CU extending to wing margin; 1r-rs straight and near the pterostigma apex; pterostigma narrow, about 4.5× as long as wide; 3RS+4RS straight; 1m-cu nearly aligned with 2RS; 2cu-a angled towards wing base; 2m-cu absent; 1CU straight; 1CU 1.9× length 1m-cu. Legs elongate; hind leg robust; hind tibia slightly wider.
apically; distance between fore and mid coxae about equal to distance between mid and hind coxae, pretarsal claws short, slender, simple, arolium present. Mid and hind trochantellus conspicuously enlarged. Ovipositor exserted, dorsally bent over metasoma, 2.65 mm in length.

FIGURES 1–2. Cretevania bechlyi Jennings, Krogmann & Mew, sp. nov. (1) lateral habitus (right side); (2) dorsal habitus. Scale bars = 1 mm.

Discussion

The fore wing vein pattern in Evaniidae is an important taxonomic character. Most fossil evaniids have a relatively complete fore wing venation (see, for example, Basibuyuk et al. 2002; Deans et al. 2004; Rasnitsyn & Brothers 2007; Peñalver et al. 2010). Cretevania bechlyi sp. nov. has a fore wing venation (see Fig. 3) that corresponds well with the generic diagnosis of Cretevania (see Peñalver et al. 2010) and is most similar to that of C. alonsoi Peñalver, Ortega-Blanco, Nel & Delclòs 2010 from Albian Peñacerrada I amber (Burgos Province, Spain) and C.
montoyai Peñalver, Ortega-Blanco, Nel & Delclòs 2010 from Albian San Just amber (Teruel Province, Spain) (Peñalver et al. 2010).

The robust hind legs, the hind tibial shape, and other hind leg characteristics are similar to other species of the genus Cretevania (see Peñalver et al. 2010).

Cretevania bechlyi has a very long and thin petiole (see Figs 1, 2); other members of the genus have a petiole length : max. width between 3.6 and 7.2× (Peñalver et al. 2012). The ventrolateral extension of the distal portion of the petiole (Figs 1, 2) is most similar to that found in C. alonsoi and C. alcalai (see Peñalver et al. 2010, Figs 5, 6d).

As is the case with other Cretevania where the ovipositor is present, C. bechlyi has a long, curved and upturned ovipositor (Figs 1, 2; see also, for example, Peñalver et al. 2010).

We place the new species in Cretevania mainly based on the elongation of the mid and hind trochantellus, the fore wing venation (e.g. first marginal cell triangular and broad, 2m-cu absent, second submarginal cell separated from first discal cell) and the shape of the petiole (subcylindrical with distal extension). However, the fact that C. bechlyi has just 10 flagellomeres (see Figs 1, 2) compared with 11 in other members of the genus and notauli (absent in other Cretevania species) suggests that the generic diagnosis in Peñalver et al. (2010) should be expanded to encompass this new species. The alternative would be to erect a new genus, a step we are reluctant to take at present. Such a step should only be considered after further material becomes available from Burmese amber and other Cretaceous deposits which would allow a better understanding of the distribution and polarities of morphological characters in evaniid genera.

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References


