

# The first Mesozoic palmetto beetle (Coleoptera: Smicripidae) in Upper Cretaceous Burmese amber



Chenyang Cai <sup>a,\*</sup>, Diying Huang <sup>b</sup>

<sup>a</sup> Key Laboratory of Economic Stratigraphy and Palaeogeography, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing 210008, China

<sup>b</sup> State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing 210008, China

## ARTICLE INFO

### Article history:

Received 16 January 2016

Received in revised form

7 March 2016

Accepted in revised form 3 April 2016

Available online 4 April 2016

### Keywords:

Coleoptera

Smicripidae

*Smicrips*

Cenomanian

Burmese amber

## ABSTRACT

Fossil smicripid beetles are very rare. Here we describe and figure the first Mesozoic representative of Smicripidae. *Smicrips cretacea* sp. nov., a new species belonging to the extant *Smicrips* LeConte is preserved in the Upper Cretaceous amber from northern Myanmar. Our discovery suggests that *Smicrips* is an ancient group, originating at least in the earliest Late Cretaceous. Together with other two fossil *Smicrips* species from the Eocene of Europe, it reinforces the hypothesis that the Recent distribution of Smicripidae is relict, and the family was more widespread in the Mesozoic and early Cenozoic than it is in the Recent.

© 2016 Elsevier Ltd. All rights reserved.

## 1. Introduction

The monogeneric family Smicripidae (or palmetto beetles) is a small group of small-sized (1.0–1.9 mm long) cucujoid beetles, with only six described extant species endemic to the New World tropics and subtropics: *Smicrips chontalena* (Sharp) (Guatemala, Nicaragua), *S. distans* (Sharp) (Guatemala), *S. exilis* Murray (Hispaniola, Guadeloupe, St. Vincent, Grenada), *S. mexicana* (Sharp) (Mexico), *S. palmicola* LeConte (Cuba, Puerto Rico, U.S.A.), and *S. texana* (Casey) (U.S.A.) (Price, 2002; Cline, 2010). Little is known about the habits of these minute beetles. The biology of the group is mainly derived from *Smicrips palmicola* LeConte in Florida. The adults of the species have been collected in abundance on *Sabal palmetto* (Walter) Loddiges ex Schultes and Schultes (Arecaceae); larvae are typically found in association with decaying plant matter, in leaf litter near the adult host (Price, 2002; Cline, 2010). This small group has been previously shifted between Nitidulidae and Monotomidae, and sometimes considered to be a subfamily of

Nitidulidae (Lawrence and Newton, 1995). Members of the Nitidulidae group (or nitidulid series) including Kateretidae, Smicripidae and Nitidulidae, form a monophyletic group (Leschen et al., 2005). A phylogenetic study based on morphological data of adults and larvae suggests that *Smicrips* LeConte was far removed from Kateretidae + Nitidulidae, and recovered as the sister group to *Rentonellum* Crowson (Cleroidea: Trogossitidae) (Lawrence et al., 2011). Recently, a large-scale phylogenetic study for Cucujoidea based on molecular data suggests that Smicripidae is a sister group to Nitidulidae + Kateretidae (Robertson et al., 2015). Only a synapomorphy uniting members of the family is recognized, i.e., the strongly curved and deeply impressed frontoclypeal suture in adults. In addition, the apically strongly convex and lightly sclerotized labrum is another potential synapomorphy (Cline, 2010). In general, adults of Smicripidae can be separated from other beetle families by the following combination of characters: 1) Head not narrowed behind the eyes; 2) Antennae 11-segmented, with a 3-segmented, capitate club; 3) Frontoclypeal suture distinctly impressed and curved; 4) Maxillae with single lobe; 5) Labial palpi 2-segmented; 6) Procoxal cavities externally open behind; 7) Elytra truncate exposing two abdominal tergites; 8) Abdomen with five ventrites, caudal ventrite equal in length to preceding four combined (Price, 2002).

\* Corresponding author. Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, 39 East Beijing Road, Nanjing 210008, China. Tel.: +86 02583282156.

E-mail address: [cycal@nigpas.ac.cn](mailto:cycal@nigpas.ac.cn) (C. Cai).

Fossil smicripids are exceptionally rare, and they are confined to the Cenozoic. To date, only two fossil species belonging to the extant genus *Smicrips* are described. Kirejtshuk and Nel (2008) described the first fossil smicripid, *Smicrips europeus* Kirejtshuk and Nel, from the lowermost Eocene Oise amber (ca. 53 Ma). Recently, the second fossil species, *Smicrips gorskii* Bukejs and Kirejtshuk, was described from the upper Eocene Baltic amber (Bukejs and Kirejtshuk, 2015). Fossil smicripids from the Mesozoic are not yet known to the present. Here, we describe the first Mesozoic and therefore the earliest fossil record of Smicripidae based on a very well-preserved individual in the Upper Cretaceous Burmese amber.

## 2. Material and methods

The new species is known from one individual preserved in a transparent piece of Burmese amber. The Burmese amber has been known as a valuable source of specimens of different groups or organisms for over a century. A diversity of organisms has been described, such as fungi, conifers, angiosperms, nematodes, birds (feathers), onychophorans, spiders, ticks, and especially insects (e.g. Grimaldi et al., 2002; Ross et al., 2010). The specimen is derived from amber deposits in the Hukawng Valley of northern Myanmar, currently considered as earliest Cenomanian in age (ca. 99 Ma; see details in Shi et al., 2012). The amber has been prepared, including cut with a hand-held saw and polished with sand papers with different grain sizes and with polishing powder. The type specimen is housed in the Nanjing Institute of Geology and Palaeontology, CAS, Nanjing, China. Observations and photographs were taken using a Zeiss Axio Imager 2 compound microscope with a digital camera attached. Photomicrographs with green background are taken using green fluorescence as light source attached to a Zeiss Axio Imager 2 compound microscope. The nomenclatural acts established herein are registered under

ZooBank LSID urn:lsid:zoobank.org:pub:5CA1E6ED-A536-4AE1-A281-0A10FB72D2F7.

## 3. Systematic palaeontology

Order Coleoptera Linnaeus, 1758

Family Smicripidae Horn, 1879

Genus *Smicrips* LeConte, 1878

Type species: *Smicrips palmicola* LeConte, 1878

***Smicrips cretacea* sp. nov.**

Figs. 1–3

*Etymology.* The specific epithet derives from the Cretaceous age of the fossil. The species is registered under LSID urn:lsid:zoobank.org:act:4712A06A-D906-4320-BF0E-0C89CDC4D47F.

*Holotype.* NIGP163547, lowermost Cenomanian, Hukawng Valley, northern Myanmar; deposited in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing, China.

*Diagnosis.* The new species is distinguished by the following combination of characters: 1) body surface glabrous, with fine microsculpture on dorsal surfaces of head, pronotum and elytra; 2) frontoclypeal suture distinctly impressed, deeply U-shaped (Fig. 3); 3) head long, with eyes anteriorly located; 4) pronotum subquadrate, as long as it is wide; and 5) posterior fourth of pronotum with a pair of short, slightly oblique grooves (Fig. 3).

*Description.* Body small, 1.28 mm long (from apex of mandible to abdominal apex), parallel-sided, flattened; color dark brown. Sex unknown.

Head large (Fig. 2A, B), 0.33 mm long and 0.26 mm wide, very slightly narrowed behind eyes (Fig. 2B). Eye rounded, laterally convex, with about 55 ommatidia (Fig. 2E). Antenna long, with 11

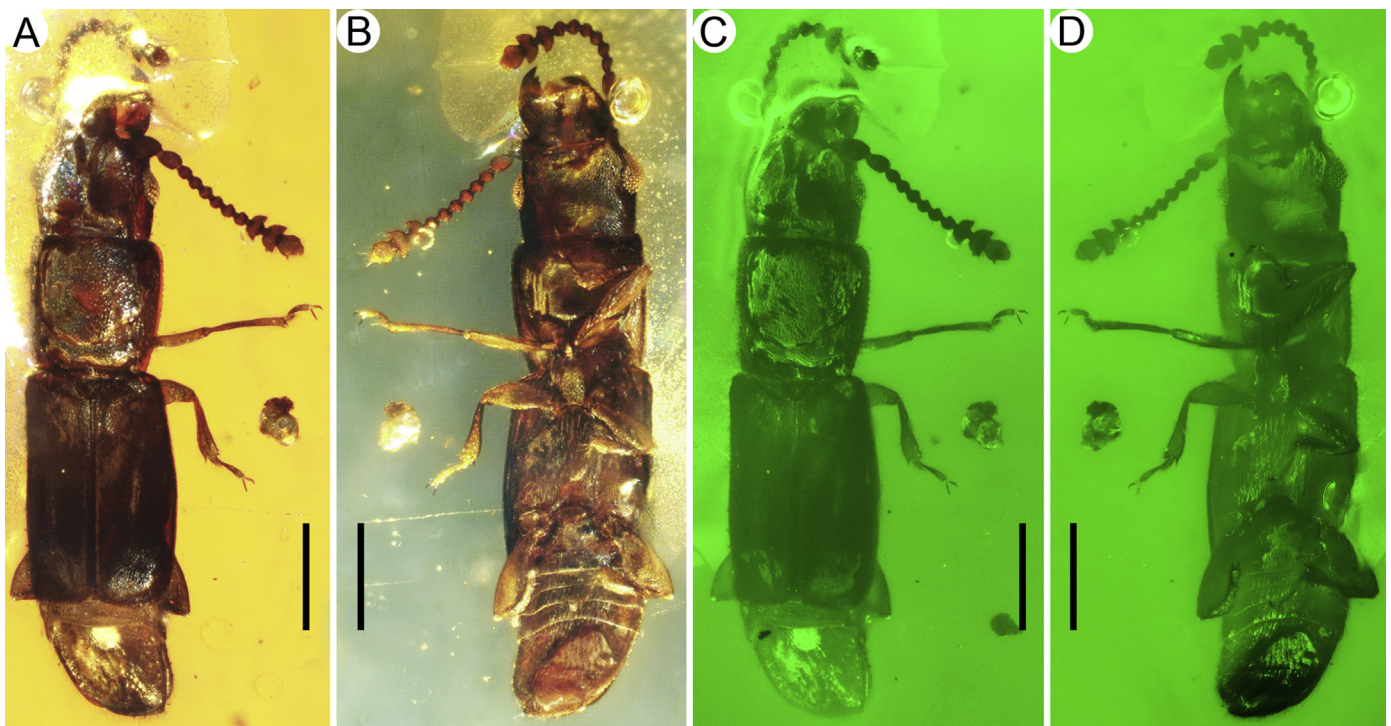


Fig. 1. Microphotographs of holotype (NIGP163547) of *Smicrips cretacea* sp. nov., in Upper Cretaceous amber from Myanmar. A and B under normal reflected light; C and D using fluorescence as light source. A and C, Dorsal view; B and D, Ventral view. Scale bars: 200  $\mu$ m.

Download English Version:

<https://daneshyari.com/en/article/4746881>

Download Persian Version:

<https://daneshyari.com/article/4746881>

[Daneshyari.com](https://daneshyari.com)