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The First Calopterini from Dominican Amber
(Coleoptera: Lycidae)**

Authors: Ferreira, Vinicius S., and Tettamanzi, Lorenzo

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***FALSOCERATOPRION FUMAGALLIAE*, NEW GENUS AND SPECIES: THE FIRST CALOPTERINI FROM DOMINICAN AMBER (COLEOPTERA: LYCIDAE)**

VINICIUS S. FERREIRA
Natural History Museum of Denmark
Zoological Museum, University of Copenhagen
Universitetsparken 15, 2100 Copenhagen, DENMARK
vinicius.sfb@gmail.com
 <https://orcid.org/0000-0001-8748-0358>

AND

LORENZO TETTAMANZI
Associazione Culturale “Centro Studi Naturalistici”, presso Centro “Generazioni”
Via IV Novembre 20, 20833 Paina di Giussano, ITALY
tettamanzilorenzo@gmail.com

ABSTRACT

Falsoceratoprion fumagalliae Ferreira, **new genus** and **new species**, the first discovered Calopterini fossil, is described from Dominican amber. The new genus is diagnosed, described, illustrated, and compared with other Dominican amber Lycidae and closely related extant genera.

Keywords: Leptolycini, Thonalmini, Platerodini, Neotropical, Elateroidea

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INTRODUCTION

Lycidae are particularly known for their involvement in mimicry-ring relationships and aposematism studies (e.g., Darlington 1938; Eisner *et al.* 2008), and for having lineages known or suspected to be affected by the pedomorphic syndrome (see Ferreira *et al.* 2018; Ferreira and Silveira 2020). Despite incremental advances focused on the phylogenetics of Lycidae (e.g., Bocak and Bocakova 2008; Kazantsev 2013; Masek *et al.* 2018), there is still much ground to cover on the taxonomic and biological aspects of this group, especially regarding the fossil record of this family.

The described Lycidae fossil record encompasses both impressions and amber inclusions. Of these, a total of 11 species have been described from amber from various deposits, including Cretaceous Burmese amber (two species), Eocene Baltic amber (five species), Miocene Dominican amber (three species) and from Miocene Mexican amber (one species); detailed lists of amber Lycidae may be found in Kazantsev (2020), Li *et al.* (2021), and Ferreira *et al.* (2022). The recent posting of photographs of a Dominican amber Lycidae specimen on Facebook groups by Enrico Bonino was brought to

VSF's attention by Fabrizio Fanti. So far, all known described Dominican amber Lycidae belong to the tribe Leptolycini. Examination of some of these photographs revealed the existence of an undescribed genus from Dominican amber belonging to the tribe Calopterini, for which, importantly, no fossils are known. Upon contacting the owner of the specimen, a collaborative proposal was established, and the description of this new taxon is herein presented.

MATERIAL AND METHODS

The exact locality of the specimen is unknown, but samples from Dominican amber are from the Oligocene-Miocene horizon, for which the deposition age is somewhere between 15 and 30 My (see discussions in Fanti and Pankowski 2021; Grimaldi 1994, 1996; Grimaldi and Engel 2004; Iturralde-Vinenti and MacPhee 2019; Poinar 2010). The specimen was compared with existing literature on West Indian and Neotropical Lycidae (Bocakova 2003, 2005; Ferreira and Ivie 2017, 2022; Kazantsev 2009, 2013, 2017; Leng and Mutchler 1922). Morphological terminology follows Bocak and Bocakova (1990), Kazantsev (2005), and Lawrence

et al. (2011). Photos of the specimen were taken by Enrico Bonino (Extreme macro and Paleontology), following the protocol described on his website (<https://enrico-bonino.eu>): images were produced with a camera SONY A7R II using an objective Mitutoyo 5× and a light system from Ogglab (www.mjkzz.de/collections/light-solutions); images were stacked using Helicon Focus and enhancements to images were made in Adobe Photoshop® CC. The examined specimen will be deposited in the collection of the Civic Museum of Fossils of Besano (Besano, VA, Italy).

RESULTS

Family Lycidae Laporte, 1836
Subfamily Lycinae Laporte, 1836
Tribe Calopterini Green, 1949

Genus *Falsoceratoprion* Ferreira, new genus
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Fig. 1

Type Species. *Falsoceratoprion fumagalliae* Ferreira, new species.

Etymology. The name refers to the similarity of the new genus to the Neotropical mainland genus *Ceratoprion* Gorham, 1884. *Falso* is a Latin word meaning false, deceiving.

Differential Diagnosis. *Falsoceratoprion* can be separated from all other known West Indian Lycidae (extant and fossil) by the combination of the following characteristics: distinctly serrate antennae (vs. subserrate or pectinate in *Thonalmus* Bourgeois, 1883; distinctly serrate in *Mesopteron* Bourgeois, 1905; subserrate, filiform, flabellate or pectinate in the Leptolycini), with the pedicel multiple times shorter than antennomere 3 (vs. variable across the different genera, usually pedicel and antennomere 3 subequal in length, with exceptions in the Leptolycini [pedicel much shorter than antennomere 3 in *Cessator* Kazantsev, 2009 and *Dominopteron* Kazantsev, 2013]); the apparently developed mouthparts (vs. standard mouthparts in all *Thonalmus* and *Mesopteron*; Leptolycini, with weakly developed mandibles that are seemingly absent, with either strongly reduced or absent labial palps).

Falsoceratoprion also has a subtrapezoidal pronotum, bearing an obscure fovea in the posterior portion (vs. usually subpentagonal in *Thonalmus*, bearing a distinct longitudinal carina in the anterior half and a cell in the posterior region; bearing a strongly visible longitudinal carina, entire through its full extent in *Mesopteron*; variable shapes in Leptolycini); the smooth elytra, not bearing any transverse costae nor presenting strongly developed cells (vs. overall strongly developed, irregular cells

in *Thonalmus*; distinctly subquadrate and strongly developed cells in *Mesopteron* and *Dominopteron*; smooth elytra in all other Leptolycini); the strongly setose and dehiscent elytra (vs. variable across the groups, expanded apically or only weakly dehiscent in *Thonalmus*, usually glabrous; parallel-sided and bearing short setation in several *Mesopteron*; variable in the Leptolycini, which are overall dehiscent and densely setose in *Electropteron* Kazantsev, 2013) and for bearing three distinctly visible costae that are fused apically (vs. three costae in *Thonalmus* and *Mesopteron*; variable in the Leptolycini, but usually two-costate).

From the described Lycidae genera occurring on the Neotropical mainland, *Falsoceratoprion* is superficially similar to *Ceratoprion*, *Ceratolycus* Kazantsev, 2017, and *Aplopteron* Kazantsev, 2017, differing from these genera by possessing normally developed mouthparts (vs. weakly developed and strongly reduced labial palps in the mentioned genera), a densely setose body (vs. glabrous in the mentioned genera) and the pronotum not possessing a median longitudinal carina (vs. presence of a longitudinal carina in the mentioned genera, which has a cell in *Ceratolycus* and *Aplopteron*).

Description of Male. General coloration and setation: Thorax, head, coxae, base of femora and basal third of elytra pale yellow, remainder of body brown, body densely setose throughout (Fig. 1). **Head:** As long as wide, widest at eyes (Fig. 1A), hypognathous (Fig. 1B), frons posterior to antennal insertion strongly bulging (Fig. 1A), apparently concave behind eyes (Fig. 1A). Eyes hemispherical, projecting anterolaterally, coarsely granulate (Fig. 1). **Mouthparts:** Maxillary palp apparently four segmented (Fig. 1A); terminal maxillary palpomere elongate, spatulate (Fig. 1A). **Antenna:** With 11 antennomeres, from antennomere 3–10 distinctly serrate; densely setose, dorsoventrally flattened, inserted in gibbous prominence at anterior distal portion of head (Fig. 1); if in resting position, longer than body (Fig. 1); scape pyriform, approximate at base, subconical; pedicel *ca.* 4× shorter than scape; antennomeres 4–10 subequal, slightly increasing in length towards apex (Fig. 1A); antennomere 11 narrowly rounded apically (Fig. 1A). **Thorax:** Pronotum trapezoidal, transverse, lateral edges moderately developed (Fig. 1), posteriorly apparently bearing a weakly developed median fovea, median longitudinal carina apparently absent (Fig. 1A). **Elytra:** Dehiscent, weakly ligulate, 3-costate, with short bristle-like setae throughout (Fig. 1A); costae weakly developed, subparallel; costa I discontinued medially, costae II+III subapically fused (Fig. 1A). **Abdomen:** With eight ventrites; ventrite 7 shallowly notched medially; ventrite 8 lanceolate, apically blunt, *ca.* 4× longer than ventrite 7, *ca.* one-fourth longer than tergite 9 (Fig. 1B). **Length (head + pronotum + elytra):** 3.3 mm. **Width (across humeri):** 0.7 mm.



Fig. 1. *Falsoceratoprion fumagalliae*, new genus and new species. A) Dorsal view, B) Ventral view. Scale bar = 0.5 mm.

***Falsoceratoprion fumagalliae* Ferreira,
new species**

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Fig. 1

Examined Material. Holotype: *Falsoceratoprion fumagalliae* Ferreira, new species. DOMINICAN AMBER: Oligo-Miocene, Dominican Republic. Specific locality: Unknown. The specimen is a well-preserved amber bead that had been polished prior to study. It will be deposited in the collection of the Civic Museum of Fossils of Besano (Besano, VA, Italy).

Description and Diagnosis. The diagnosis and description of *F. fumagalliae* is coextensive with the generic description and diagnosis.

Etymology. This species is named after Lorenzo Tettamanzi's grandmother, Giuseppina Fumagalli (1928–2017), who, together with her husband Silvio, has always encouraged and supported, with enormous love and enthusiasm, her grandson Lorenzo's passion for collecting fossils and minerals.

DISCUSSION

The absence of a median pronotal carina in *Falsoceratoprion* initially led us to think that this genus belonged to the tribe Leptolycini, which is endemic to the West Indies, where Dominican amber deposits originate (Masek *et al.* 2018). While the absence of a median pronotal carina is not exclusive to the Leptolycini, it can be diagnostic for this tribe when combined with the reduced mandibles, labial palps and simplified male genitalia of most genera of this clade (which includes absent parameres and/or a simple lanceolate median lobe; see Ferreira and Ivie 2022). However, a closer examination of the morphological features of *Falsoceratoprion* and comparison with the literature and specimens of Calopterini and Leptolycini allowed us to provide a justification for the placement of the genus in the Calopterini as currently understood (*i.e.*, including several mainland Neotropical genera that have been historically treated as belonging to Leptolycini but are in fact Calopterini [all new genera listed in Kazantsev 2017; see discussion section in Ferreira and Silveira 2020]).

Falsoceratoprion's combination of apparent fully developed mouthparts (Fig. 1B), its well-defined 3-costate elytra (Fig. 1A) and strongly serrate antennae (Fig. 1) has never been encountered in any "true" Leptolycini (*i.e.*, West Indian Leptolycini). While these characters are not synapomorphic in Calopterini, they can be used to characterize the tribe as currently understood. The only defining character of Calopterini not present in *Falsoceratoprion* is the strongly developed median pronotal longitudinal

carina, which is indistinct in *Falsoceratoprion*; however, this character can be plastic within the tribe (*e.g.*, see review of pronota in Bocakova 2003). Even though *Falsoceratoprion*'s placement in the Calopterini is tentative, with its description we expect to draw attention to the fossil record of this group in Dominican amber, with the hope that more fossil specimens of this tribe will be found in the future. The discovery of *Falsoceratoprion* provides direct evidence of Calopterini with apparent paedomorphic features in the Oligocene-Miocene horizon. This fossil's potential inclusion in future phylogenetic analyses as a calibration point can improve estimates regarding the timing of origin for the Calopterini and an understanding of the tribe's biogeography.

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