The polycentropodid genus *Cernotina* (Insecta, Trichoptera) in Miocene Dominican amber

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**Abstract.** A new polycentropodid caddisfly species is described from Miocene Dominican amber. The family Polycentropodidae is therefore represented in the Dominican amber with two species belonging to the genus *Cernotina*: *C. pulchra* Wichard, 2007, and *C. fossilinova* sp. nov. The endemic *C. danieli* Flint & Sykora, 2004, is the only representative of the genus occurring on Hispaniola today and is similar to the two fossil species. On the Caribbean islands altogether six extant species of the genus *Cernotina* are registered.

1 Introduction

The inclusion-rich Dominican amber originated in the Miocene on the Caribbean island Hispaniola. An overview of this rich amber *lagerstätte* was provided by Penney (2010) and Poinar (2010). Compared to the numerous embedded plants and animals, the percentage of caddisflies found in Dominican amber is very low, less than 0.1\%. However, studies of amber inclusions up to 2007 have identified 31 fossil caddisfly species belonging to 15 genera in 11 families (Wichard, 2007).

The Polycentropodidae is one of the 11 families in Dominican amber but is presented by only the genus *Cernotina* with a single species: *C. pulchra*. A second *Cernotina* species, *C. fossilinova* sp. nov., has now been added and is described here. These two extinct species are related to the extant *C. danieli*, which is endemically distributed on Hispaniola. The low diversity of the fossil Polycentropodidae found in Dominican amber is in stark contrast to its occurrence in Eocene Baltic amber where polycentropodids are much more common and diverse (Ulmer, 2013).
3 Systematic palaeontology

Order Trichoptera Kirby, 1815
Suborder Annulipalpia Martynov, 1924
Family Polycentropodidae Ulmer, 1903
Genus Cernotina Ross, 1938

Type species

Cernotina calcea Ross, 1938.

Genus diagnosis (detailed in Camargos, 2020)

Ocelli absent. Maxillary palps five-segmented, first and second segments short, third segment twice as long, fourth segment about as long as third segment. The fifth segment about twice as long as third or fourth segment; this terminal segment is narrower and annulated. Labial palps three-segmented, first and second segments short, third segment clearly longer and annulated. Forewing venation with forks II, IV, and V; discoidal closed. Hind wing venation with forks II and V; discoidal cell open. Tibial spurs: 2/4/4.

Cernotina fossilinova sp. nov.

Holotype

Kept in the amber collection of the Museum für Naturkunde, Berlin (MfN: inventory number MB.I. 8613, former Wichard collection). Fossil from Miocene, embedded in Dominican amber. Body well preserved; forewing and hind wing slightly twisted, and antennae and legs present. Male genitalia visible in ventral and right lateral view.

Type locality

Dominican Republic (Hispaniola). Exact locality unknown.

Type horizon

Uncertain. Most probably early Miocene (Burdigalium-Langhium, 20–15 Ma).

Etymology

Cernotina fossilinova sp. nov. is named after the new discovery in Dominican amber.

Diagnosis

Cernotina fossilinova sp. nov. corresponds to the general characteristics of the genus and is characterized by the combination of male genital structures. The genital structures correspond to those of the endemic C. danieli of Hispaniola in the shape of the inferior appendage with apicodorsal blackened hook and without basodorsal lobe. The new species shows further similarities to C. danieli by the shape of the broad pre-anal appendage (the dorsolateral processus sensu Camargos, 2020) but is rod-shaped at the tip and not pointed. The intermediate appendages of C. fossilinova sp. nov. are not membranous but erect and sclerotic.

Description

Cernotina fossilinova sp. nov. corresponds in general characteristics to the genus described in the genus diagnosis.

Wings: length of forewing: 3.8 mm. General wing venation typical of the genus (Oláh and Johanson, 2010, table 1; Camargos, 2020). However, in forewing discoidal cell probably open; crossvein m not visible. Forks II, IV, and V present, in which fork V short stalked; crossvein m-cu1 diagonal running; thyridium cell closed. Hind wing venation with forks II and V; discoidal cell open; hind wing without crossveins. The wings are uniformly fine hairy.

Male genitalia: this species bears similarities with C. danieli by the general shape of the inferior appendages with the blackened hook apicodorsal but without a dorsomesal row of small spinose setae. In side view the pre-anal appendage looks like a scale (dorsolateral process of the pre-anal appendage sensu Camargos, 2020), at the base wide and almost as long as the inferior appendage. In the middle of the rounded apical margin, a rod-shaped structure emerges mesad, which protrudes clearly above the scale and is darkly marked at apex. As far as visible as an amber inclusion, the intermediate appendage looks like a strong erect structure as long as the inferior appendage and is not membranous. The apex of the intermediate appendage is slightly capped and probably bearing very small warts.

4 Discussion

The genus Cernotina occurs in the Nearctic and Neotropical biogeographic regions with the greatest diversity in South America (Holzenthal and Calor, 2017); on the island Hispaniola only one endemic species is known: Cernotina danieli Flint & Sykora, 2004. A first extinct species was found in Miocene Dominican amber: Cernotina pulchra Wichard 2007. Compared with the extant species, the inferior appendages of C. pulchra are similar to the shape. Its inferior appendages are lacking an apicodorsal, blackened hook. But the primary differences between the two are seen in the pre-anal appendages, which is in C. pulchra widened basally,
Figure 1. *Cernotina fossilinova* sp. nov. (a) Male in right lateral view embedded in Dominican amber. (b) Fore- and hind-wing venations: II, IV, and V denote apical forks II, IV, and V; dc denotes discoidal cell; TC denotes thyridial cell; Sc, R1, R2+3, R5, M1+2, M3, M4, Cu1a, Cu1b, Cu2, and A denote fore- and hind-wing venations.
The new extinct *Cernotina fossilinova* sp. nov. from Miocene Dominican amber is very similar to the extant *C. danieli* and more distantly to the extinct *C. pulchra*. The pre-anal appendage of *C. fossilinova* is rather scale-shaped, broad basally, and apical rounded, in the middle rising like a thin rod, and at the end slightly thickening. The inferior appendages bear a apicodorsally blackened hook, as in *C. danieli*, but a low dorsomesal lobe with a row of small spinose setae is not visible.

The genus *Cernotina* is spread with about 70 recent species from North to South America (Holzenthal and Calor, 2017; Camargos, 2020). Only a few species can be found on the Caribbean islands; Botosaneanu (2002) listed six species: *C. cadeti*, *C. caliginosa*, *C. hastilis*, *C. lutea*, *C. mandeba*, and *C. mastelleri*. Flint and Sykora (2004) completed the species list with *C. danieli* from Hispaniola, discussed above. Thus, three endemic species are known from the Greater Antilles: *C. caliginosa* (Jamaica), *C. mastelleri* (Puerto Rico), and *C. danieli* (Hispaniola). The two extinct *Cernotina* species from the Dominican amber, *C. pulchra* and *C. fossilinova* sp. nov., raise the question of genus colonization of the Greater Antilles, which must have taken place during the Miocene or even earlier. The geological development of the Caribbean islands is complex in detail and still
provides an incomplete picture. However, early land bridges probably existed between North America, including Mexico, and the Greater Antilles (Ali, 2012; Burk, 1988; Coates and Obando, 1996) which allowed colonization of the islands and Hispaniola.

Data availability. The material included in this paper is deposited in the Museum für Naturkunde, Leibniz Institute for Evolution and Biodiversity Science Berlin, under the inventory number MB.I 8613.

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Competing interests. The authors declare that they have no conflict of interest.

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