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Descriptions of a broad-nosed weevil (Eudiagogini: Curculionidae) and false ladybird beetle (Nilionini: Nilionidae) in Dominican amber

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A broad-nosed weevil, *Promecops tumidirostris* n. sp. (Eudiagogini: Curculionidae), and a false ladybird beetle, *Nilio dominicana* n. sp. (Nilionini: Nilionidae), are described from Dominican amber. *P. tumidirostris* can be distinguished from extant species by the greatly swollen apical portion of its rostrum, large eyes almost meeting on top of its head and a V-shaped suture separating the first and second abdominal sternites. *N. dominicana* differs from extant species by its small size and 18 elytral striae with small interstitial punctures. Neither tribe is represented in Hispaniola today, supporting earlier studies showing a greater biodiversity in the region during the mid-Tertiary than at present.

Keywords: broad-nosed weevil; Entiminae; Nilionidae; false ladybird beetle; Dominican amber; Tertiary beetles

Introduction

Weevils of the subfamily Entiminae (Curculionidae), together with those of the subfamilies Otiorynchinae and Brachyderinae, are known as short-nosed, short-snouted or broad-nosed weevils (O'Brien and Wibmer 1982; White 1983). Some broad-nosed weevils such as the alfalfa snout beetle, *Otiorynchus ligustici* (L.), the black vine weevil, *Otiorynchus sulcatus* (F.), and the clover root curculio, *Sitona hispidulus* (Fab.), are economic pests. The larvae normally feed on plant roots whereas the adults damage the foliage. The fossil broad-nosed weevil described here belongs to a tribe (Eudiagogini) restricted to the tropical, subtropical and warm-temperate regions of the Americas.

Members of the Nilionidae are curious, poorly known beetles that have their dorsum (prothorax and elytra) expanded to protect the underparts. They share this character with beetles from several other groups, such as tortoise beetles (Cassidinae: Chrysomelidae), some handsome fungus beetles (*Cremnodes* Gerst.: Endomychidae), some bark-gnawing beetles (Ostomidae) and ladybird beetles (Coccinellidae). The resemblance to the latter family is how nilionids acquired their common name, the false ladybird beetles. The fossil described here is one of the smallest members of the genus.

Materials and methods

The pieces of amber containing the Dominican specimens originated from mines in the northern mountain range (Cordillera Septentrional) of the Dominican Republic, between the cities of Puerto Plata and Santiago. Amber from this deposit was produced by *Hymenaea protera* Poinar (1991) (Fabaceae). Dating of Dominican amber is

controversial, with the youngest proposed age of 20–15 mya based on foraminifera (Iturralde-Vincent and MacPhee 1996) and the oldest as 45–30 mya based on coccoliths (Cêpek in Schlee 1990). Most of the amber is secondarily deposited in turbiditic sandstones of the Upper Eocene to Lower Miocene Mamey Group (Draper et al. 1994), so the amber could be older than the Miocene dates.

Descriptions

Curculionidae

Entiminae Schoenherr, 1823

Eudiagogini LeConte, 1874

Promecops Sahlberg, 1823

Promecops tumidirostris Poinar and Brown, n. sp.
(Figures 1–6)

The specimen is complete except for the tarsal segments on the left-hind leg. The sex is unknown.

Description. Length, 3.3 mm; integument dark, shiny, legs and antennae dark brown; entire body covered with scales.

Head. Short, broad; frons continuous with rostrum; rostrum broad, stout, flattened above, slightly longer than head; portion distal to scrobes swollen, apex emarginated, with several thick setae; scrobes deep, moderately curved, visible from above, directed beneath eyes but not extended beneath rostrum; eyes large, occupying almost full head width, approximate at mid-head; antenna 11 jointed, with

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Figure 1. Lateral view of *P. tumidirostris* in Dominican amber. Bar = 495 μm .

7-jointed funicle and distinct club; scape curved to fit scrobe; inserted slightly before base of scrobe.

Thorax. Subcylindrical, about as long as wide, sides rounded, widest slightly below middle; with very faint median impressed line; apical margin with emarginations behind eyes; ocular lobes weakly developed; disc covered with circular punctures arranged in irregular rows; scutellum transverse; elytra elongate, wider at base than thorax, sides parallel to apical fourth, then converging, covering entire abdomen; suture distinct; elytron with 10 striae with large, deep, square-rectangular punctures; intervals raised, each with row of decumbent setae; front coxae slightly separated; femora clavate, unarmed; tibial apex with mucrones; hind tibia with open corbel; tarsal claws approximate; tarsal formula: 5-5-5.

Abdomen. Tan, with five sternites, first two fused, separated by V-shaped impression.

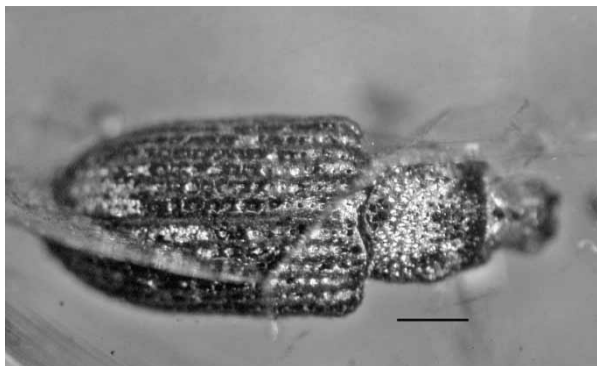


Figure 2. Dorsal view of *P. tumidirostris* in Dominican amber. Bar = 440 μm .

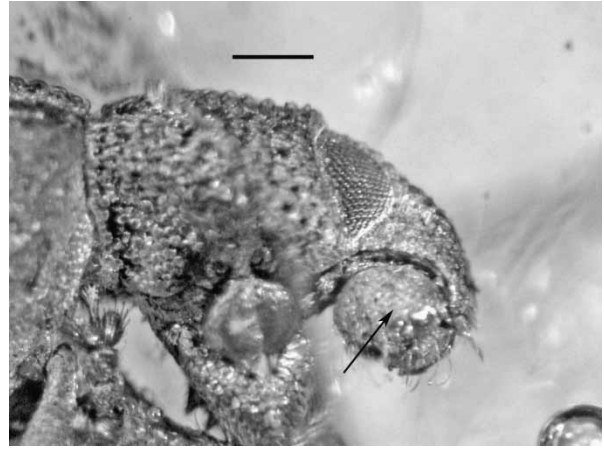


Figure 3. Lateral view of rostrum of *P. tumidirostris* in Dominican amber (arrow shows swollen apical portion of rostrum). Bar = 280 μm .

Type. Holotype deposited in the Poinar amber collection (Accession no. C-7-412) maintained at Oregon State University.

Type locality. Amber mines located between Santiago and Puerto Plata in the Cordillera Septentrional of the northern portion of the Dominican Republic.

Etymology. The specific epithet is taken from the Latin 'tumidus' for swollen and the Latin word for rostrum.

Diagnosis. The fossil has many characters found in members of the genus *Eudiagogus* Schoenherr, 1840, but that genus lacks elytral humeri and elytral setae and the apex

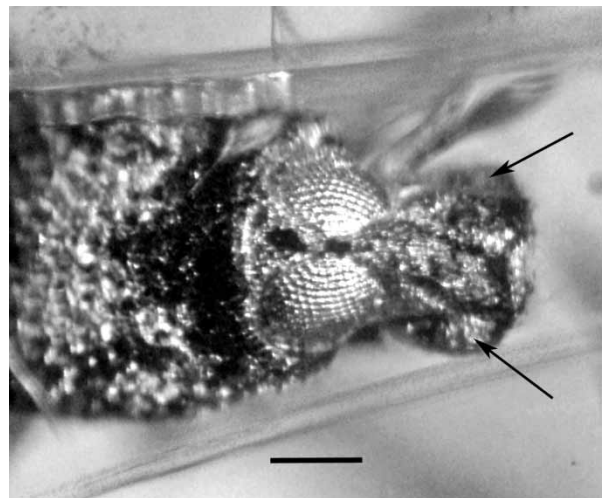


Figure 4. Dorsal view of head of *P. tumidirostris* in Dominican amber showing large eyes nearly meeting on top of head. Arrows show swollen apical portion of rostrum. Bar = 212 μm .

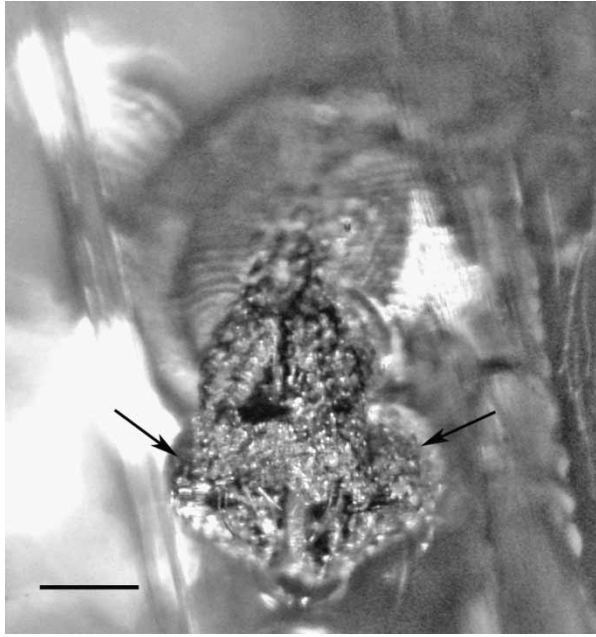


Figure 5. Dorsal view of *P. tumidirostris* in Dominican amber showing swollen apical portion of rostrum (arrows). Bar = 216 μm .

of the rostrum is not dilated (Voss 1934; Warner 1979). There are no records of Entiminae from Hispaniola today (Perez-Gelabert 2008); however, there are some 75 species of extant *Promecops* from the Americas (Blackwelder 1982) with some 14 species from Mexico, Central America and the West Indies (O'Brien and Wibmer 1982). On the basis of the generic reviews of Voss (1934, 1953), the fossil can be

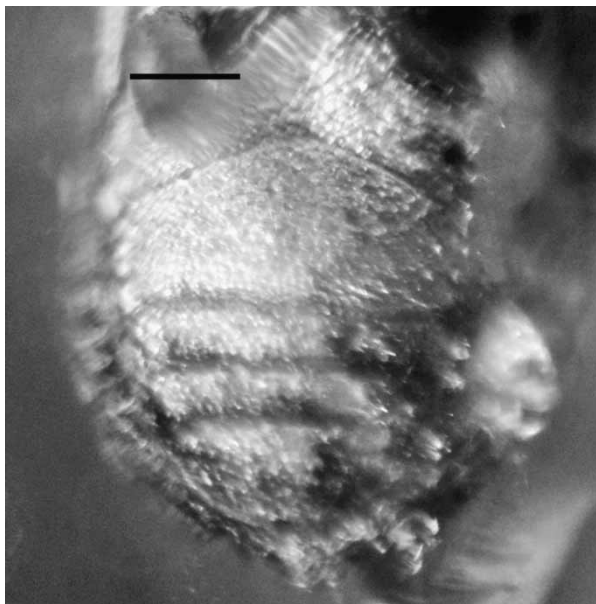


Figure 6. Ventrals of *P. tumidirostris* in Dominican amber showing angulate suture separating first and second sternites. Bar = 292 μm .

distinguished from extant *Promecops* by the following combination of characters: greatly swollen genae, large eyes almost meeting on top of head and V-shaped suture dividing the first and second abdominal sternites.

Nilionidae Thomson, 1860

Nilionini Thomson, 1860

Nilio Latreille, 1829

Nilio dominicana Poinar and Brown, n. sp. (Figures 7 and 8)

The specimen is complete except for the scutellum and adjoining elytra, which were accidentally removed during re-polishing. The sex is unknown.

Description. Body hemispherical, length, 3.7 mm; width, 3.2 mm; dorsum covered with long, erect, uniform setae.

Head. Bent inwards against prothorax; covered with short erect uniform setae and minute punctures; eyes oval, slightly emarginated in front; antennae outstretched, with 11 antennomeres; second antennomere very short, apical five antennomeres slightly broader and shorter than remainder.

Prothorax. Transverse, length, 0.785 mm; width, 2.85 mm; base wider than elytral base; anterior margin emarginated; lateral margins oblique, greatly explanated; meso and



Figure 7. Dorsum of *N. dominicana* in Dominican amber. Bar = 900 μm .



Figure 8. Ventrals of *N. dominicana* in Dominican amber. Bar = 780 μ m.

metasterna smooth, metallic, bearing small punctures; elytra surface metallic, elytron length, 2.9 mm, width, 3.2 mm; each elytron with nine punctuated striae; minute punctures between striae; legs short, anterior coxae contiguous; tarsal formula: 5-5-4; claws robust, strongly diverging.

Abdomen. Metallic with smooth surface except for small scattered punctures, five segmented.

Holotype. Deposited in the Poinar amber collection (Accession no. C-7-304) maintained at Oregon State University.

Type locality. Amber mines located between Santiago and Puerto Plata in the Cordillera Septentrional of the northern portion of the Dominican Republic.

Etymology. The specific epithet refers to the place of origin of the amber.

Comments. There are no records of Nilionidae from Hispaniola today (Perez-Gelabert 2008); however, extant

species of *Nilio* occur in Mexico and Central and South America (Blackwelder 1982). The 18 punctuated elytral striae with smaller punctures between the striae place *N. dominicana* in Thomson's (1860a, 1860b) species group of *N. suturalis* (Guérin), *N. lebasii* (Dej.), *N. sallei* Thomson, *N. rubrocastaneum* Thomson, *N. lafertei* Thomson and *N. collarius* Thomson. All of the above species range from 5 to 9 mm in length and are thus larger than *N. dominicana*. Pic (1918) described 11 new species, 9 of which ranged from 5 to 11 mm in length, which separate them from *N. dominicana*. Two smaller species, *N. minutus* Pic with a length of 4.5 mm and *N. punctatus* Pic, at 3 mm, fall within the range of the fossil. However, *N. minutus* has smooth elytral intervals and *N. punctatus* has strongly punctuated elytral striae, which separate them from *N. dominicana*. Bréthes (1920) described *N. margaritaceus*, which is 11 mm in length, clearly much longer than *N. dominicana*. A species depicted from an Amazon forest (Penny and Arias 1982) can easily be separated from *N. dominicana* by its short prothorax in relation to the elytral base. The combination of small size, very wide prothorax (slightly wider than the base of the elytra), 18 punctuated elytral striae and presence of interstitial punctures separate *N. dominicana* from extant species of *Nilio*.

Discussion

In general, adult Eudiagogini feed on the leaves of host plants, whereas the larvae feed on roots and pupate in the soil (Warner 1979). Very little is known about the biology of *Promecops* and whether they develop on a specific family of host plants, similar to members of *Eudiagogus* that appear to be restricted to the Fabaceae (Warner 1979; O'Brien and Kovarik 2000). It is possible that the adults and larvae of *P. tumidirostris* fed on the leaves and roots of the resin-producing *Hymenaea* tree; however, there are no extant records of these weevils on *Hymenaea*.

Very little is known about the biology of *Nilio* species. Ferrer and Ødegaard (2005) list *Calophyllum* (Clusiaceae) and *Anacardium* (Anacardiaceae) as adult host plants in Panama. Thomson (1860a) reported observations of earlier workers indicating that the adults occur on tree stumps and boletes (Boletaceae), suggesting that some species may be fungivorous. When touched, the adults cling tightly to the bark surface or fall to the ground, where they fold their legs against their body and feign death. They can emit a strong odour when disturbed, which undoubtedly serves as a defence because they are reported to walk slowly.

The presence of these two fossil taxa in Dominican amber supports the conclusion reached earlier (Poinar and Poinar 1999) that the insect fauna of the Tertiary forest in Hispaniola was much more diverse than that of the present day.

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