Open Access Articles

New species of the genera Dryophthorus Germ. and Stenommatus Woll. (Coleoptera: Dryophthoridae) in Dominican amber

The Faculty of Oregon State University has made this article openly available.
Please share how this access benefits you. Your story matters.

Citation	Poinar Jr., G., & Legalov, A. A. (2015). New species of the genera Dryophthorus Germ. and Stenommatus Woll.(Coleoptera: Dryophthoridae) in Dominican amber. Historical Biology, 27(5), 508-513. doi:10.1080/08912963.2014.892938
DOI	10.1080/08912963.2014.892938
Publisher	Taylor & Francis
Version	Accepted Manuscript
Terms of Use	http://cdss.library.oregonstate.edu/sa-termsofuse

New species of the genera *Dryophthorus* Germ. and *Stenommatus* Woll. (Coleoptera: Dryophthoridae) in Dominican amber

George Poinar, Jr.[a]* and Andrei A. Legalov[b]

[a]*Department of Zoology, Oregon State University, Corvallis, OR 97331, USA*

[b]*Institute of Systematics and Ecology of Animals, Siberian Branch, Russian Academy of Sciences, Frunze street, 11, Novosibirsk 630091, Russia*

* E-mail: poinarg@science.oregonstate.edu

Abstract

A new species of *Dryophthorus* (Coleoptera:Dryophthoridae**)** and two new species of *Stenommatus* (Coleoptera:Dryophthoridae**)** are described from Dominican amber. *D. microtremus* n. sp. is characterized by monochrome dorsal scales, nearly parallel sides of the pronotum, wide elytral intervals and the elytral apex only slightly narrowed. *S. tanyrhinus* n. sp. is characterized by an elongate rostrum 4.5 times as long as wide in the middle. *S. leptorhinus* is characterized by small body size, a thin rostrum 3.0 times as long as wide in the middle, wide striae and a narrow prosternal process. This brings the total number of species of Dryophthorini in Dominican amber to 5, which is more than half the number of extant species.

Keywords: Dominican amber, Coleoptera, Dryophthoridae, Dryophthorinae, new species, Tertiary weevils

Introduction

The weevil family Dryophthoridae is widely distributed, but reaches its greatest diversity in the tropics. The Tribe Dryophthorini in the subfamily Dryophthorinae contains only two extant genera and less than10 species, most of which occur in Mesoamerica (O'Brien and Webmir 1982). While both genera are absent today in the Dominican Republic, it appears that the Tribe was more diverse in the Tertiary since two species were previously described from Dominican amber (Davis and Engel 2006) and the present work describes another three species, bringing the total number of fossil species in Hispaniola to five, which is more than half of the extant species of Dryophthorini.

Materials and methods

The specimens were obtained from mines in the Cordillera Septentrional of the Dominican Republic. Dating of Dominican amber is still controversial with the latest purposed age of 20-15 mya based on foraminifera (Iturralde-Vinent and MacPhee 1996) and the earliest as 45-30 mya based on coccoliths (Cêpek in Schlee 1990). In addition, Dominican amber is secondarily deposited in sedimentary rocks, which makes a definite age determination difficult (Poinar and Mastalerz 2000). A range of ages for Dominican amber is possible since the amber is associated with turbiditic sandstones of the Upper Eocene to Lower Miocene Mamey Group (Draper et al. 1994). Dominican amber was produced by the leguminous tree, *Hymenaea protera* Poinar, 1991 (Poinar 1991) and a re-construction of the Dominican amber forest based on amber fossils indicated that the environment was similar to that of a present day tropical moist forest

(Poinar and Poinar 1999). Observations, drawings and photographs were made with a Nikon SMZ-10 stereoscopic microscope. Helicon Focus Pro X64 was used to stack photos for better clarity and depth of field.

Dryophthoridae Schoenherr, 1825

Dryophthorinae Schoenherr, 1825

Dryophthorus Germar, 1824

Dryophthorus microtremus Poinar and Legalov, n. sp. (Figs.1,2)

Description

Length body, 1.6 mm; length rostrum 0.3 mm. Body brown, naked, appearing silvery-shiny from cavities between specimen and internal surface of its impression.

Head. Rostrum somewhat elongate, 3.7 times as long as wide in middle, curved, slightly expanded at apex, punctate, lacking grooves and carinae; frons quite wide, flattened; eyes large, not protruding from contour of head, nor approximate on underside of head; vertex weakly flattened, punctate; temples short, punctate; antennae geniculate, inserted near middle of rostrum, short, not reaching middle of pronotum; scape elongate; funicle with 4 flagellomeres, antennal club apically truncate, tomentose on apical surface; 1st article of club elongated, other articles fused.

Pronotum. Pronotum somewhat elongate, 1.4 times as long as wide at apices, 1.1 times as long as wide in middle and at base; disk weakly narrowed at base, densely punctate, without striae and lateral carina.

Elytra. Elytra somewhat elongated, weakly convex, 1.8 times as long as wide at humeri, 1.6 times as long as wide in middle; 2.6 times as long as wide at apex, 2.1 times as long as pronotum; greatest width in middle; humeri weakly flattened; punctated striae regular, distinct, wide; punctures oval, dense; intervals convex, of equal width to striae.

Thorax. Prothorax densely punctate; precoxal part of prothorax elongate; 2.5 times as long as postcoxal part, 1.8 times as long as procoxal cavities; postcoxal part of prothorax short, 0.7 times as long as procoxal cavities; procoxal cavities round, separated; prosternal process 0.8 times as wide as procoxal cavities; mesocoxal cavities rounded, separated; metepisternum narrow; metathorax weakly convex, punctate; metacoxal cavities widened.

Abdomen. Abdomen convex; 1st and 2nd ventrites elongate, fused, of equal length; 3rd and 4th ventrites short, of equal length; 3rd ventrite 0.2 times as long as 2nd; 5th ventrite elongate, 4.4 times as long as 4th; pygidium not exposed.

Legs. Legs long; femora weakly clavate, without teeth; profemora length / width = 3.3; metafemora length / width = 4.1; trochanter triangular; tibiae slightly curved, with long mucro, weakly widened at apices; tarsi long, 5-jointed; 1st-4th tarsomeres trapezoidal; 5th tarsomere elongate; claws large, free, without teeth.

Type: Holotype deposited in the Poinar amber collection (accession Cur-14-119) maintained at Oregon State University, Corvallis, Oregon.

Type locality: Amber mine in the northern portion of the Dominican Republic.

Etymology: The specific epithet is formed from the Greek “micros” = small and the Greek “trema” = hole in reference to the dense oval punctures.

Diagnosis. The new species is similar to *Dryophthorus acarophilus* Davis and Engel, 2006 but differs in possessing wider elytral intervals and a slightly narrowed elytral apex.

Remarks. The new species is placed in the family Dryophthoridae based on the geniculate antennae with a compact shiny, antennal club, a funicle with 4 flagellomeres with the 5th-7th flagellomeres attached to the antennal club, the 1st article of club elongated with the other articles fused, the pronotum without a lateral carina and the 1st and 2nd ventrites fused. The separated procoxal cavities, funicle with 4 flagellomeres, tarsi 5-jointed, antennae inserted near the middle of the rostrum and the unexposed pygidium indicate placement in the subfamily Dryophthorinae. The laterally positioned eyes not approximate to each other on the underside of

the head, the apically truncate antenna1 club that is tomentose on its apical surface are characteristics of the genus *Dryophthorus*.

Stenommatus Wollaston, 1873

Remarks. The new species belong to the family Dryophthoridae based on their geniculate antennae, with compact, shiny, antennal clubs, funicles with 4 flagellomeres, 5-7th flagellomeres attached to the antennal clubs, 1st article of clubs elongated with other articles fused, pronotum without lateral carina, and 1st and 2nd ventrites fused. The separated procoxal cavities, funicle with 4 flagellomeres, 5-jointed tarsi, antennae inserted near the middle of the rostrum, and unpygidium exposed, indicate placement in the subfamily Dryophthorinae. The eyes being closely approximate to each other on the underside of head, apically subtruncate antennal club that is tomentose on its apical surface are characteristics of the genus *Stenommatus*.

Stenommatus tanyrhinus Poinar and Legalov, n. sp. (Figs. 3-5)

Description

Length body, 1.3 mm; length rostrum 0.3 mm.

Body black-brown, naked, appearing silvery-shiny from the presence of cavities between specimen and internal surface of its impression.

Head. Rostrum elongate, thin, 3.2 times as long as wide at apex, 4.5 times as long as wide in middle, 3.5 times as long as wide at base, 0.9 times as long as pronotum, curved, slightly expanded at apex, finely and densely punctate; without grooves and carinae; frons quite wide, flattened; eyes large, not protruding from contour of head, closely approximate to each other on underside of head; vertex weakly flattened, punctate; temples short, 0.7 times as long as eye length, punctate; antennae geniculate, inserted near middle of rostrum, short, not reaching middle of pronotum; scape 4.8 times as long as wide, 1.7 times as long as flagellum; funicle with 4 flagellomeres, 1st flagellomere fairly elongate, 2.0 times as long as wide, 0.6 times as narrow as scape width; 2nd-4th flagellomeres

trapezoidal; 2nd flagellomere 1.2 times as long as wide, 0.6 times as long as 1st; 3rd flagellomere 0.7 times as long as wide, 0.7 times as long as 2nd; 4th flagellomere 0.6 times as long as wide, equal in length to 3rd; 5-7th flagellomeres attached to antennal club; antennal club shiny, 0.9 times as long as flagellum, 3.0 times as long as and 1.9 times as wide as 4th flagellomere, apex subtruncate, tomentose on apical surface; 1st article of club elongated with other articles fused.

Pronotum. Pronotum elongate, 1.8 times as long as wide at apex, 1.3 times as long as wide in middle and 1.2 times as long as wide at base; disk weakly narrowed at base, densely punctate, without striae and lateral carina.

Elytra. Elytra slightly elongated and weakly convex, 1.8 times as long as wide at humeri, 2.0 times as long as wide in middle; 4.1 times as long as wide at apex, 1.7 times as long as pronotum; greatest width at humeri; humeri weakly flattened; punctated striae regular, distinct, wide; punctures oval, dense; intervals convex, short, 0.3-0.6 times as wide as striae.

Thorax. Prothorax densely punctate; precoxal part of prothorax elongate, 2.4 times as long as postcoxal part, 1.4 times as long as procoxae; postcoxal part of prothorax short; procoxal cavities round, separated; mesocoxal cavities rounded, separated; metepisternum narrow; metathorax weakly convex, punctate; metacoxal cavities widened.

Abdomen. Abdomen convex; 1st and 2nd ventrites elongate, fused; 3rd and 4th ventrites short; 5th ventrite elongate; pygidium not exposed.

Legs. Legs long; femora weakly clavate, without teeth; profemora length / width = 3.9; mesofemora length / width = 3.5; metafemora length / width = 4.6; trochanter triangular; tibiae almost curved, with mucro, weakly widened at apices; protibiae length / width = 5.0; mesotibiae length / width = 6.3; metatibiae length / width = 6.8; tarsi long, 5-jointed; 1st-4th tarsomeres trapezoidal; 5th tarsomere elongate; claws large, free, without teeth.

Type: Holotype deposited in the Poinar amber collection (accession Cur-14-10) maintained at Oregon State University, Corvallis, Oregon.

Type locality: Amber mine in the northern portion of the Dominican Republic.

Etymology: The specific epithet is taken from the Greek “tanyos” = long and the Greek “rhinos” = beak in reference to the long rostrum.

Stenommatus leptorhinus Poinar and Legalov, n. sp. (Figs.6,7)

Description

Length body, 1.4 mm; length rostrum 0.3 mm.

Body brown, naked, appearing silvery-shiny from the presence of cavities between specimen and internal surface of its impression.

Head. Rostrum slightly elongate, 3.0 times as long as wide in middle, 0.9 times as long as pronotum, curved, slightly expanded at apex, large and densely punctate; without grooves and carinae; frons quite wide, flattened; eyes large, not protruding from contour of head, closely approximate to each other on underside of head; vertex weakly flattened, punctate; temples short, punctate; antennae geniculate, inserted near middle of rostrum, short, not reaching middle of pronotum; scape elongate; funicle with 4 flagellomeres, 2nd-4th flagellomeres trapezoidal; antennal club compact, shiny, apex subtruncate, tomentose on apical surface.

Pronotum. Pronotum elongate, almost equal in length and width at middle; disk weakly narrowed at base, densely and roughly punctate, without striae and lateral carina.

Elytra. Elytra slightly elongated and weakly convex, 1.8 times as long as wide at humeri and in middle, 3.2 times as long as wide at apex, 2.4 times as long as pronotum; greatest width at humeri and middle; humeri weakly flattened; punctured striae regular, distinct, wide; punctures oval, dense; intervals convex, short, 0.4-0.6 times as wide as striae.

Thorax. Prothorax densely punctate; precoxal part of prothorax elongate; 1.2 times as long as postcoxal part, 1.4 times as long as procoxal cavities; postcoxal part of prothorax 1.2 times as long as procoxal cavities; procoxal cavities round, separated; prosternal process 0.4 times as wide as width of procoxal cavities; mesocoxal cavities rounded, separated; metepisternum narrow; metathorax weakly convex, punctate; metacoxal cavities widened.

Abdomen. Abdomen convex; 1st and 2nd ventrites elongate, fused; 2nd ventrite 0.8 times as long as 1st; 3rd and 4th ventrites short, equal in length; 5th ventrite elongate, 3.8 times as long as 4th; pygidium not exposed.

Legs. Legs long; femora weakly clavate, without teeth; profemora length / width = 4.5; mesofemora length / width = 4.3; metafemora length / width = 3.2; trochanter triangular; tibiae slightly curved, with long mucro, weakly widened at apices; metatibiae length / width = 9.7; tarsi long, 5-jointed; 1st-4th tarsomeres trapezoidal; 5th tarsomere elongate; claws large, free, without teeth.

Type: Holotype deposited in the Poinar amber collection (accession Cur-14-117) maintained at Oregon State University, Corvallis, Oregon.

Type locality: Amber mine (La Bucara) in the northern portion of the Dominican Republic.

Etymology: The specific epithet is from the Greek “lepto” = thin and the Greek “rhinos” = beak in reference to the thin rostrum.

The following key separates the 5 Dominican amber species of the tribe Dryophthorini:

1. Eyes closely approximate on underside of head; antennal club subtruncate at apex, bare on apical surface----------*Stenommatus*- 2

-. Eyes not approximate on underside of head; antennal club truncate apically, tomentose on apical surface--------*Dryophthorus*- 4

2. Rostrum elongate, 4.5 times as long as wide in middle ---------- *S. tanyrhinus* n. sp.

- Rostrum short, 1.7-3.0 times as long as wide in middle---------- 3

3. Body large (2.1 mm); rostrum thick, 1.7 times as long as wide in middle; striae narrow, with intervals as wide as striae; prosternal process wide, 0.6 times as wide as width of procoxal cavities---------- *S. pulverous* Davis et Engel, 2006

-. Body small (1.4 mm.); rostrum thin, 3.0 times as long as wide in middle; striae wide, with intervals 0.4-0.6 times as wide as striae; prosternal process narrow, 0.4 times as wide as width of procoxal cavities ---------- *S. leptorhinus* n. sp.

4. Elytral intervals narrow; apex of elytra distinctly narrowed------*D. acarophilus* Davis et Engel, 2006

- Elytral intervals wide; apex of elytra only slightly narrowed----------*D. microtremus* n. sp.

Discussion

According to O'Brien and Wibmer (1982), there are only 5 extant species in the genus *Dryophthorus* and four extant species in the genus *Stenommatus.* All of these are found in Mesoamerica except *Dryophthorus americanus*, which is distributed throughout Eastern North America (O'Brien and Wibmer 1982). There are no extant species of either genus in Hispaniola (Perez-Gelabert 2007).

The habitat for *D. americanus* is under pine bark and in wood piles and old, rotting logs (Blatchely and Leng 1916). It is likely that most species of the above genera occur in similar habitats. A phoretic uropodid mite is attached to the head of *S. leptorhinus*. This group of mites (Uropodidae) appear to occur in the same habitat as many members of the Dryophthoridae since some 17 uropodid mites were attached to the legs of the Dominican amber *Bicalcasura maculata* Poinar and Legalov (2013) and these mites were also noted by Davis and Engel (2006) on the Dominican amber *D. acarophilus* Davis and Engel and *S. pulverous* Davis and Engel (2006).

Acknowledgements

The study was partially supported by grant no. 12-04-00663-a of the Russian Foundation for Basic Research.

References

Blatchley WS, Leng CW. 1916. Rhynchophora or weevils of Eastern North America. The Nature Publishing Company, Indianapolis, Indiana, 692 pp.

Davis SR, Engel MS. 2006. Dryophthorine weevils in Dominican amber (Coleoptera: Curculionidae). Trans Kansas Ac Sc. 109: 191–198.

Davis SR, Engel MS. 2009. An Orthognathine weevil of the genus *Mesocordylus* in Dominican Amber Beitr Entomol. 59: 233–238.

Draper G, Mann P, Lewis JF. 1994. Hispaniola, pp. 129-150. *In* Donovan S. and Jackson TA. (eds.), Caribbean Geology: An Introduction. The University of the West Indies Publishers' Association, Kingston, Jamaica.

Iturralde-Vinent MA, MacPhee RDE. 1996. Age and Paleogeographic origin of Dominican amber. Science 273: 1850-1852.

O'Brien CW, Wibmer CJ. 1982. Annotated checklist of the weevils (Curculionidae sensu latu) of North America, Central America and the West Indies (Coleoptera: Curculionoidea). Mem American Entomol Inst. 34: 382 pp.

Perez-Gelabert DE. 2007. Arthropods of Hispaniola (Dominican Republic and Haiti): A checklist and bibliography. Zootaxa 1831: 1-530.

Poinar GO, Jr. 1991. *Hymenaea protera* sp.n. (Leguminosae, Caesalpinioideae) from Dominican amber has African affinities. Experientia 47: 1075-1082.

Poinar GO, Jr., Poinar R. 1999. The Amber forest. Princeton, NJ: Princeton University Press, 239 pp.

Poinar GO, Jr., and Mastalerz M. 2000. Taphonomy of fossilized resins: determining the biostratinomy of amber. Acta Geologica Hispanica 35: 171-182.

Poinar GO, Jr., Legalov AA. 2013. *Bicalcasura maculata* gen. n., sp. n. (Curculionoidea: Dryophthoridae) in Dominican amber. Historical Biology http://www.tandfonline.com/loi/ghbi20

Schlee D. 1990. Das Bernstein-Kabinett. Stuttg Beitr Naturkunde (C). No. 28, 100 pp.

Figures

Fig. 1. Dorsal view of *Dryophthorus microtremus* in Dominican amber. Bar = 280 µm.

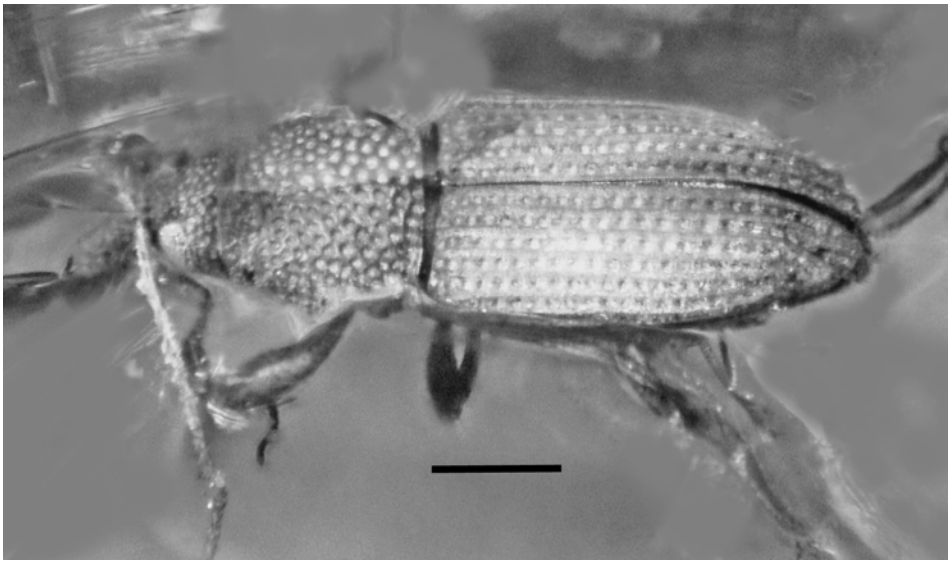


Fig. 2. Lateral view of *Dryophthorus microtremus* in Dominican amber. Bar = 280 µm.

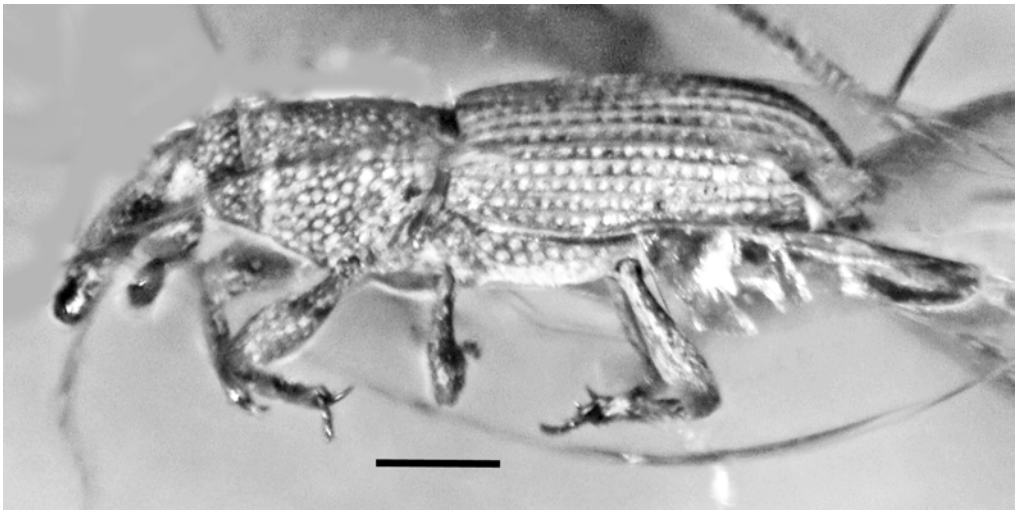


Fig. 3. Dorsal view of *Stenommatus tanyrhinus* in Dominican amber. Bar = 200 µm.

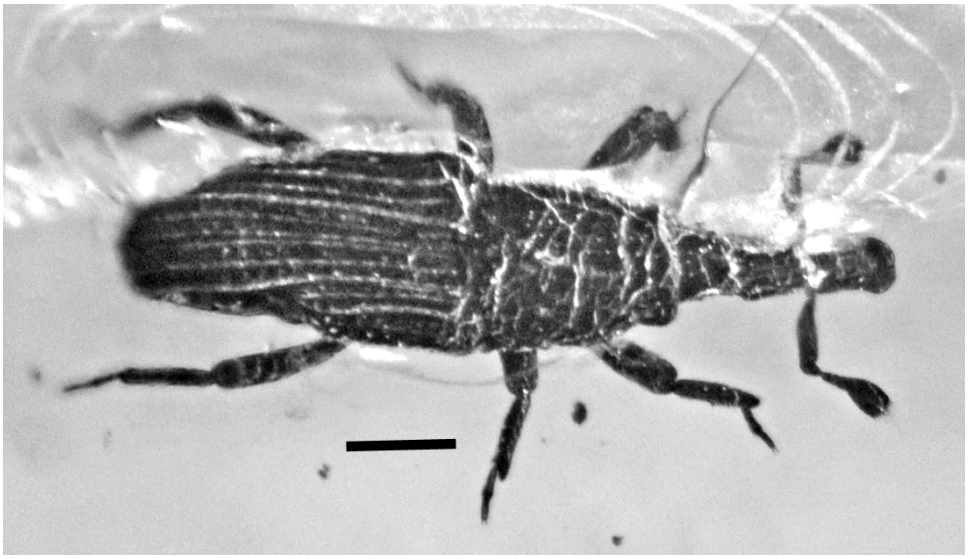


Fig. 4. Lateral view of *Stenommatus tanyrhinus* in Dominican amber. Bar = 220 µm.

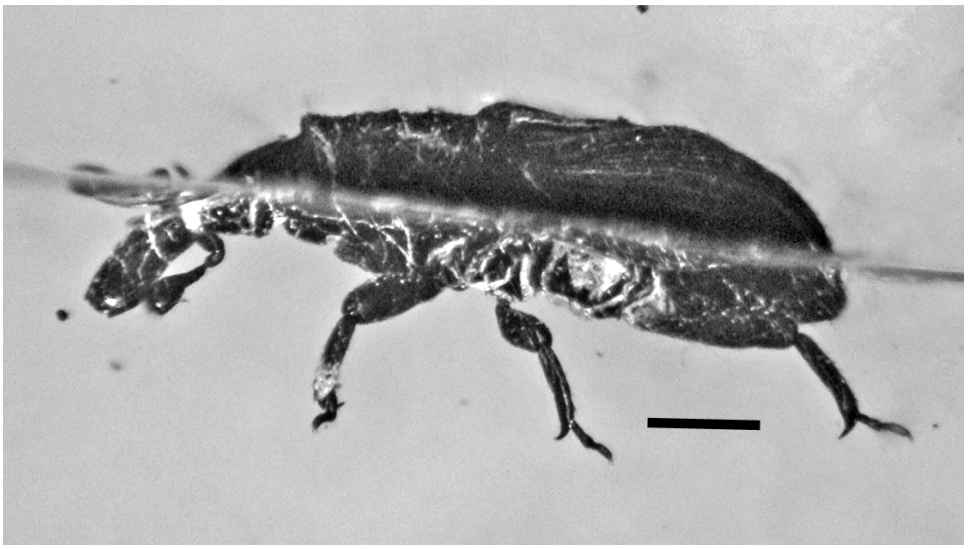


Fig. 5. Antenna (above) and fore tibiotarsus (below) of *Stenommatus tanyrhinus* n. sp. in Dominican amber. Note the four segmented funicle and subtruncate club with a tomentose apical surface. The first article of the club is elongate and the remaining articles are fused. Note the slightly curved tíbia with a mucro and the 5-jointed tarsi with the elongate 5th tarsomere and paired, free, toothless claws. Bar = 30 µm.

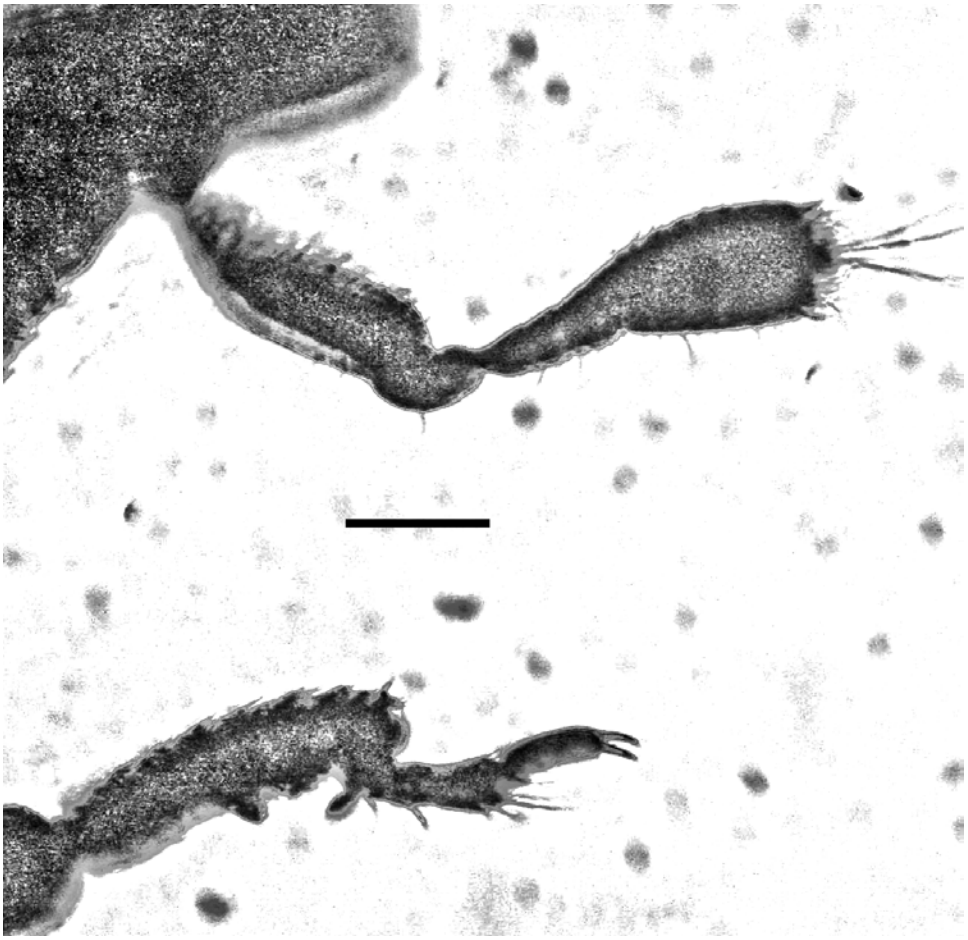


Fig. 6. Subdorsal view of *Stenommatus leptorhinus* in Dominican amber. Note uropodid mite attached to the head of the weevil. Bar = 300 µm.

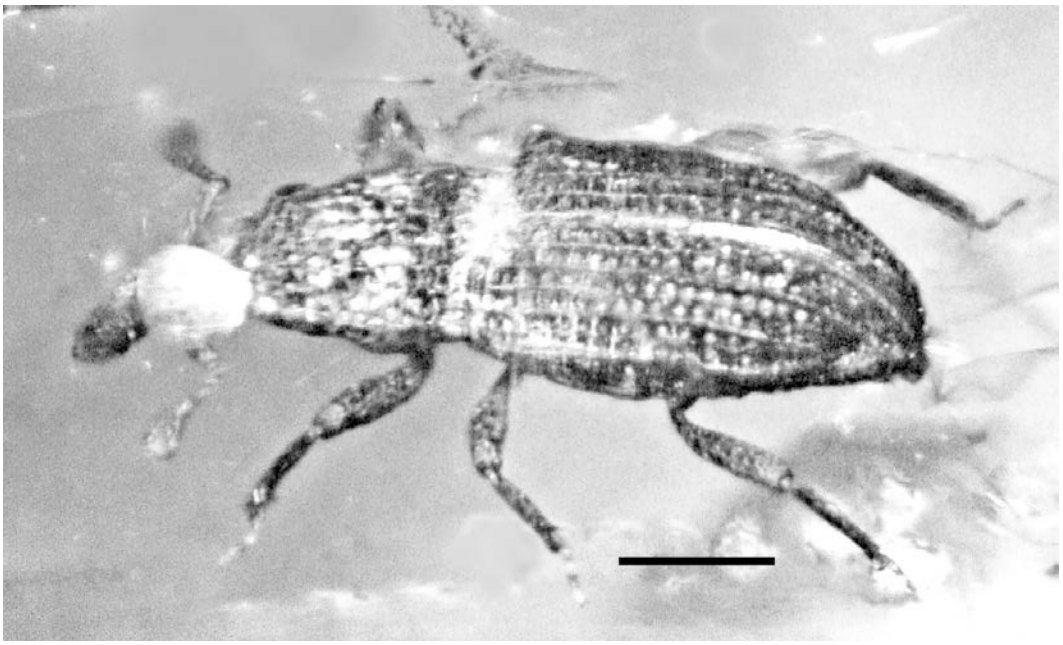
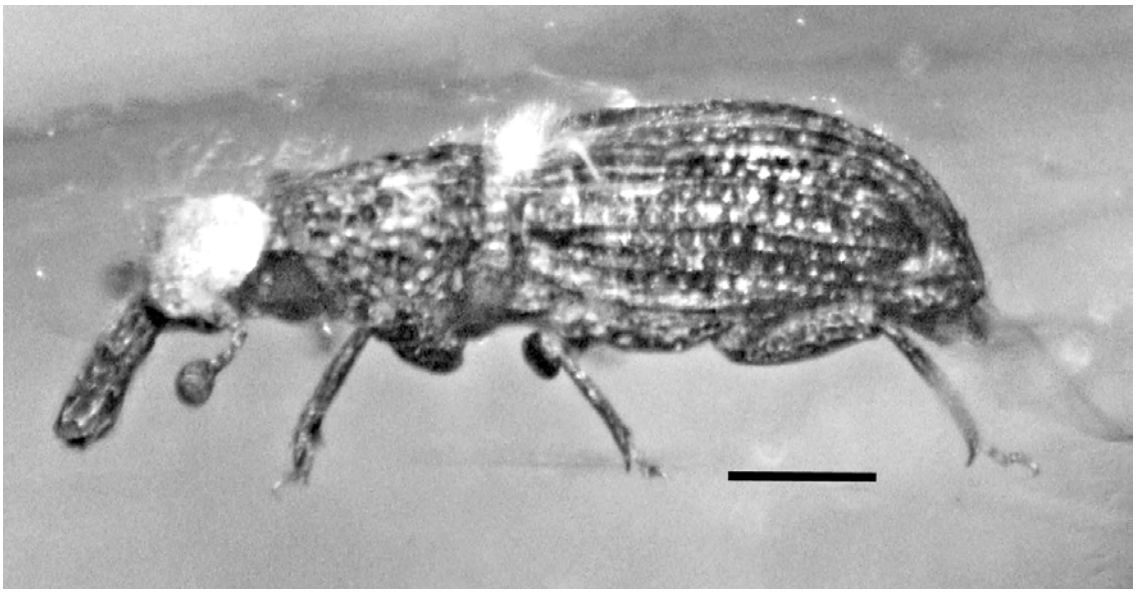


Fig. 7. Lateral view of *Stenommatus leptorhinus* in Dominican amber. Bar = 270 µm.



.

.