

New Dermestidae (Coleoptera) from Dominican Amber

GEORGE POINAR, JR. AND JIŘÍ HÁVA

Abstract

New taxa of Dermestidae (Coleoptera) from Dominican amber are described, illustrated and compared. Included is the new genus and species, *Limniattagenus electron* gen. n, sp. n. and five additional new species: *Cryptorhopalum macieji* sp. n., *Cryptorhopalum kaliki* sp. n., *Caccoleptus (Bicaccoleptus) prokopi* sp. n., *Caccoleptus (Caccoleptus) electron* sp. n. and *Attagenus electron* sp. n. Together with earlier fossils from this amber source, there are now representatives of six dermestid genera in Dominican amber (*Attagenus* LATREILLE, 1802, *Limniattagenus* gen. n., *Amberoderma* HÁVA & PROKOP, 2004, *Caccoleptus* SHARP, 1902, *Apsectus* LECONTE, 1854 and *Cryptorhopalum* GUÉRIN-MÉNEVILLE, 1838). Representative larval forms are also depicted. Since only two extant genera of Dermestidae (*Dermestes* LINNAEUS, 1758 and *Trogoderma* LATREILLE, 1829) are known from Hispaniola, it would appear that the biodiversity of this beetle family in Hispaniola was greater in the Paleogene than it is today.

Key words: Taxonomy, new taxa, Coleoptera, Dermestidae, Dominican amber.

1. Introduction

The skin and carpet beetle family (Dermestidae) currently contains 1480 species and subspecies worldwide (HÁVA 2014). Adult dermestid beetles are quite small, very compact, oval to convex and usually dark except for patches of grey or brown hairs. The head is small and usually deflexed, the antennae are 9–11 segmented with the last 1–3 segments forming a club that is often concealed in a cavity under the prothorax. The legs are generally short and the tarsi 5-segmented. The larvae are quite variable and many are remarkable for the long hairs covering their dorsum. The fossil record of this family is sparse and amber from the Dominican Republic provides a unique source of fossil biota from the West Indies during the Paleogene. A preliminary study of Dermestidae in Dominican amber was made by HÁVA & PROKOP (2004). The present study adds to this work six new species along with the description of a new genus. Two dermestid larvae are also depicted from this amber source.

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2. Material and methods

The fossils originated from amber mines in the northern mountain range (Cordillera Septentrional) of the

Dominican Republic between Puerto Plata and Santiago. The amber was produced by the extinct tree legume, *Hymenaea protera* Poinar that was probably widely abundant in the Caribbean and Central America at this time (POINAR 1991). Dating of Dominican amber is still controversial, with the youngest proposed age of 20–15 mya based on foraminifera (ITURRALDE-VINENT & MACPHEE 1996) and the oldest of 45–30 mya based on coccoliths (CEPEK 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). DILCHER et al. (1992) suggested that “...the amber clasts, from all physical characteristics, were already matured amber at the time of re-deposition into marine basins. Therefore, the age of the amber is greater than Miocene and quite likely is as early as late Eocene”. The issue is further complicated by the discovery of Early Oligocene amber in Puerto Rico and Maastrichtian-Paleocene amber in Jamaica (ITURRALDE VINENT 2001), indicating that the dating of Caribbean amber is still unresolved. Observations 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. The classification used here follows that presented in the world catalogue of HÁVA (2014). The type locality of all specimens are amber mines in the northern mountain range (Cordillera Septentrional) of the Dominican Republic. All specimens are deposited in the POINAR amber collection maintained at Oregon State University, Corvallis, OR 97331, USA.

3. Descriptions

Subfamily Attageninae

Tribe Attagenini

Genus *Attagenus* LATREILLE, 1802

Attagenus electron sp. n.

Figs. 1–4

Type: Holotype (unsexed): Accession # C-7-60A.

Ety mology: Named after the Greek word electron.

Diagnosis: The new species is similar to the Dominican amber *Attagenus ambericus* HÁVA & PROKOP, 2004, but differs from it by the prominently raised side edges of the pronotum (Fig. 3) and structure of the antennae (Fig. 4).

Description: Body very flat (Figs. 1–2). Head and pronotum light brown; elytra dark brown; head finely punctate, with long black erected pubescence; palps entirely brown; frontal median ocellus present; antennae with 11 antennomeres, antennal club with 3 antennomeres entirely light brown. Pronotum finely punctate like head, with long black erect pubescence and prominently raised side edge delineated by fine demarcation line (Fig. 3, arrow). Scutellum triangular, finely punctate as in pronotum, with short black pubescence. Elytra finely punctate, cuticle unicolorous, dark brown with two fasciae composed of whitish setae. Apex of each elytron with long blackish pubescence. Legs brown with black pubescence; protibia with very short brown spines. Meso-metasternum with short black pubescence. Abdominal sternites with long black pubescence.

Genus *Limniattagenus* nov.

Type species: *Limniattagenus electron* sp. n. (by monotypy).

Ety mology: Name taken from a combination of the two generic names *Limnichus* (Coleoptera: Limnichiidae) and *Attagenus* (Coleoptera: Dermestidae).

Diagnosis: The new genus is similar to the extant genera *Attagenus* LATREILLE, 1802 and *Novelsis* CASEY, 1900 but differs from both by the very narrow metaventral coxae and structure of the antennae.

Limniattagenus electron sp. n.

Figs. 5–7

Ety mology: Named after the Greek word electron.

Type: Holotype (unsexed): Accession # C-7-60B.

Description: Body very flat (Figs. 5–6). Head and pronotum light brown; elytra dark brown. Head finely punctate with long black erected pubescence; palps entirely brown; frontal median ocellus present; antennae with 11 antennomeres, antennal club with 3 antennomeres (Fig. 7), antennomeres I–VIII light brown, IX–XX dark brown. Pronotum finely punctate like head, with long black erected pubescence; prosternal process long, broad (Fig. 6); scutellum triangular, finely punctate like pronotum, with short black pubescence; meso-metaventrite with short black pubescence; metaventral coxa very narrow. Elytra finely punctate, surface unicolorous, dark brown with two fasciae of whitish setae; apex of elytra with long blackish pubescence. Legs brown with black pubescence; protibia with very short brown spines. Abdominal sternites with long black pubescence.

Subfamily Megatominae

Tribe Megatomini

Genus *Amberoderma* HÁVA & PROKOP, 2004

Amberoderma beali HÁVA & PROKOP, 2004

Figs. 8–9

Material examined: One specimen. Accession # C-7-60C.

Remarks: This species is only known from Dominican amber (HÁVA & PROKOP 2004).

Genus *Cryptorhopalum* GUÉRIN-MÉNEVILLE, 1838

Cryptorhopalum jantarticum HÁVA & PROKOP, 2004

Figs. 10–11

Material examined: One specimen. Accession # C-7-60D.

Remarks: This species is only known from Dominican amber (HÁVA & PROKOP 2004).

Cryptorhopalum macieji sp. n.

Figs. 12–13

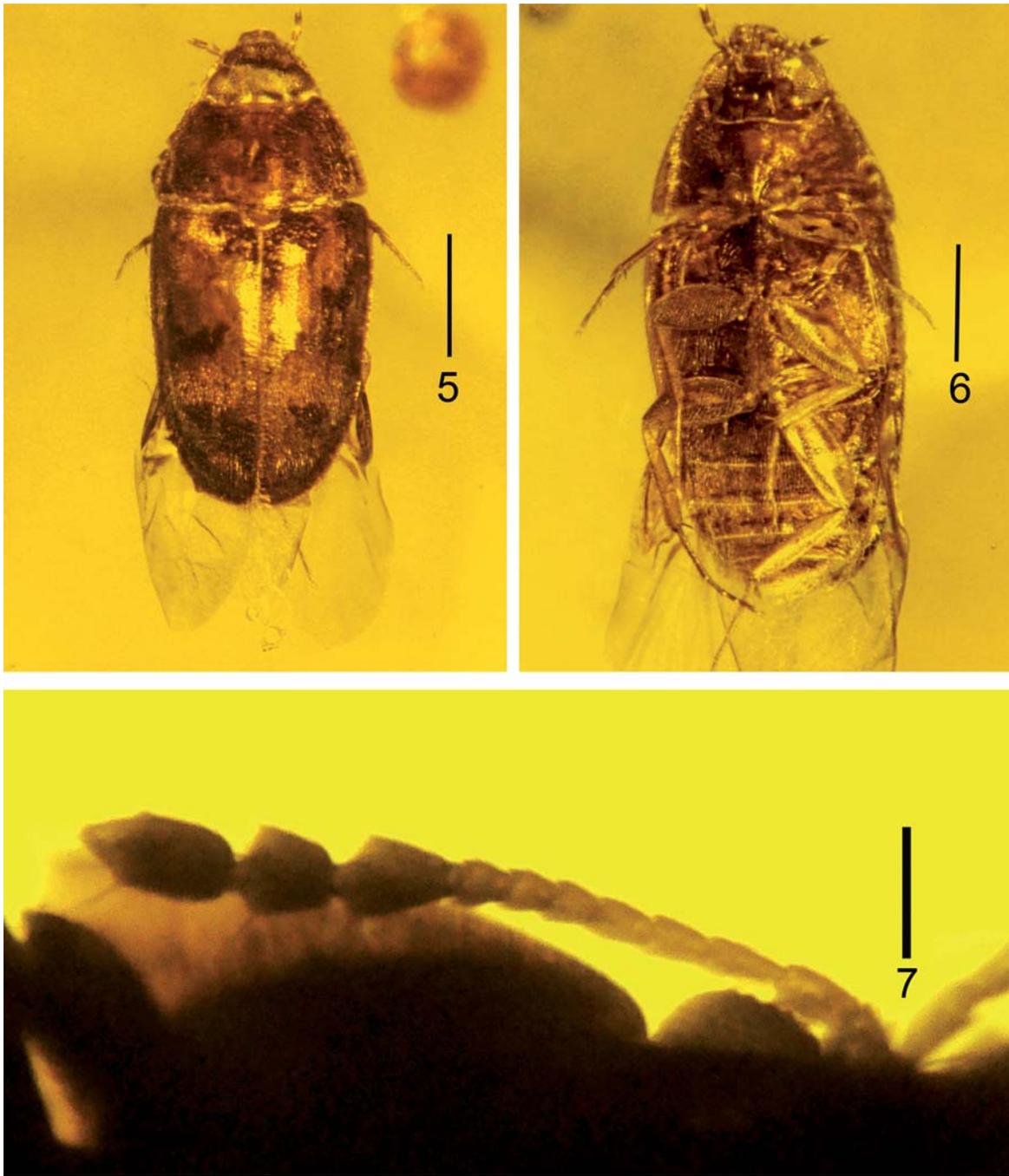
Ety mology: Dedicated to the memory of the specialist in Dermestidae, MACIEJ MROCZKOWSKI (Poland).

Type: Holotype (unsexed). Accession # C-7-60E.

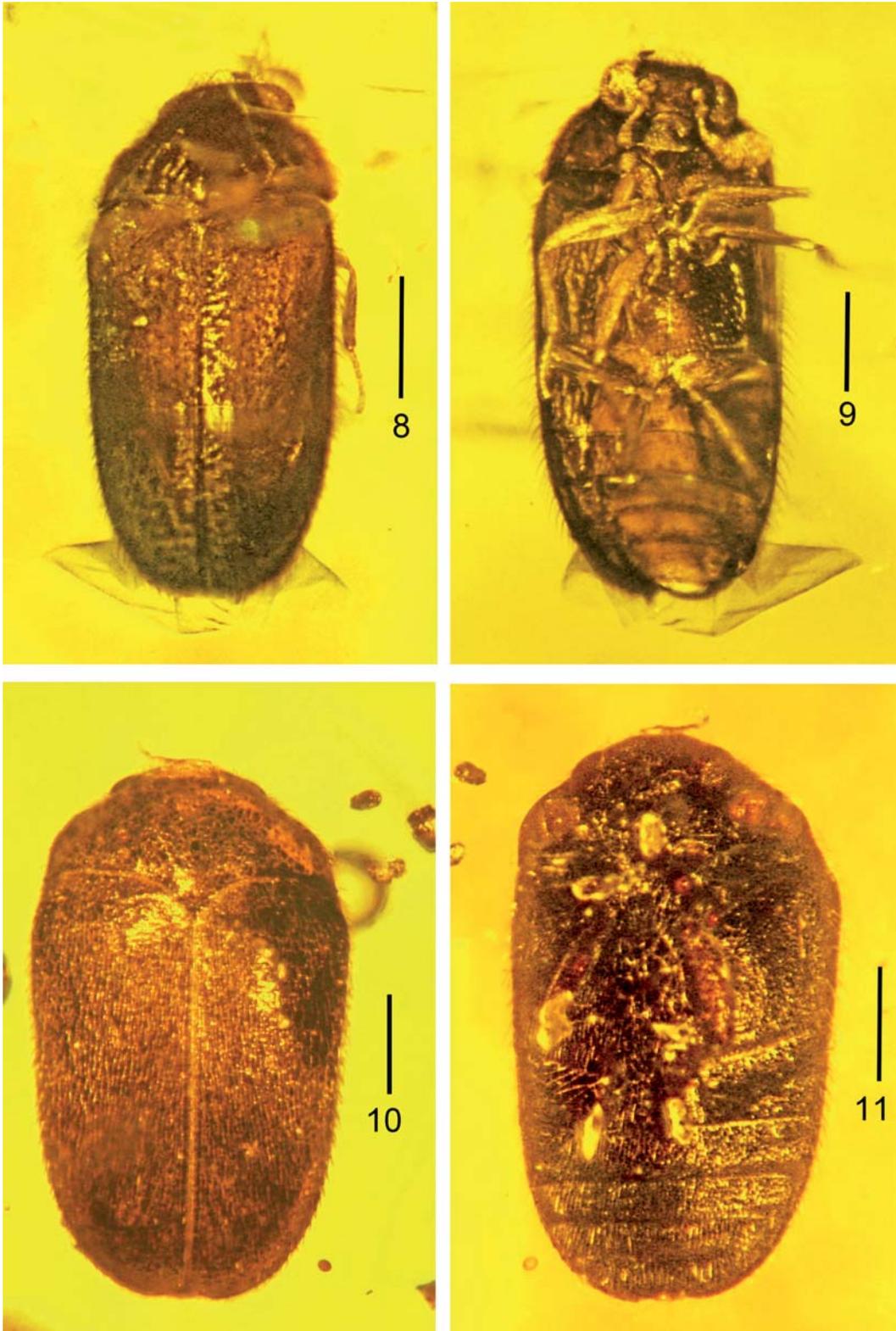
Diagnosis: The new species belongs to the “*C. electron* species group” and differs from other species in this group by the black antennal club and broad hypomeron barely reaching the antennal fossa (see following key).



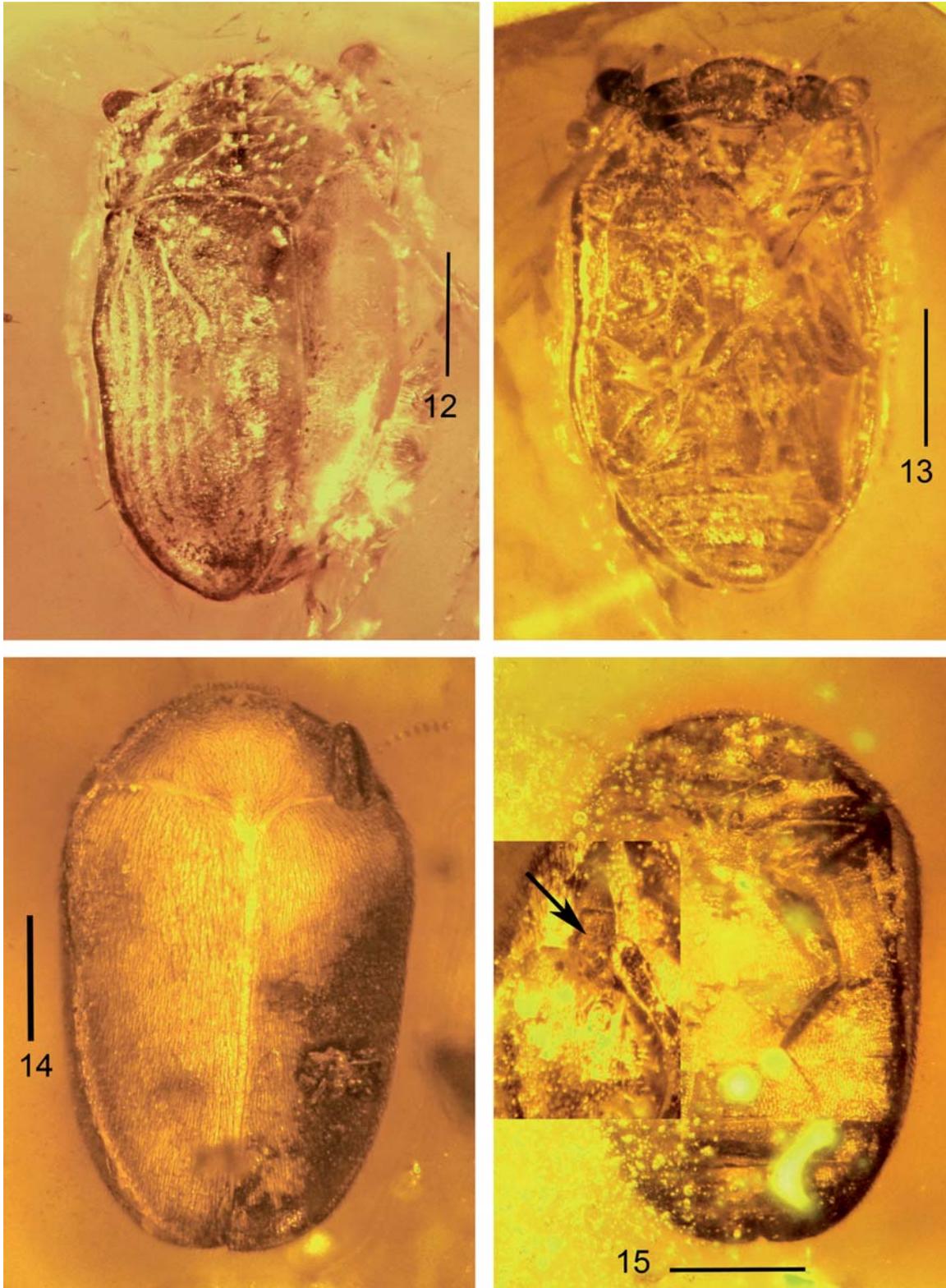
Figs. 1–4. *Attagenus electron* sp. n., in Dominican amber. **1.** Dorsum. Bar = 850 μ m. **2.** Ventrum. Bar = 870 μ m. **3.** Outer edge of pronotum. Arrow shows demarcation line at base of raised edge of pronotum. Bar = 255 μ m. **4.** Antennae. Bar = 34 μ m.



Figs. 5–7. *Limniattagenus electron* gen. n., sp. n. in Dominican amber. **5.** Dorsum. Bar = 590 μm . **6.** Ventrum. Bar = 590 μm . **7.** Antenna. Bar = 194 μm .



Figs. 8–11. 8. Dorsum of *Amberoderma beali* HÁVA & PROKOP in Dominican amber. Bar = 422 μ m. 9. Ventrum of *Amberoderma beali* HÁVA & PROKOP in Dominican amber. Bar = 330 μ m. 10. Dorsum of *Cryptorhopalum jantarticum* HÁVA & PROKOP in Dominican amber. Bar = 367 μ m. 11. Ventrum of *Cryptorhopalum jantarticum* HÁVA & PROKOP in Dominican amber. Bar = 408 μ m.



Figs. 12–15. **12.** Dorsum of *Cryptorhopalum macieji* sp. n., in Dominican amber. Bar = 675 μ m. **13.** Ventrum of *Cryptorhopalum mroczkowskii* sp. n., in Dominican amber. Bar = 628 μ m. **14.** Dorsum of *Cryptorhopalum kaliki* sp. n., in Dominican amber. Bar = 980 μ m. **15.** Ventrum of *Cryptorhopalum kaliki* sp. n., in Dominican amber. Arrow in insert shows club. Bar = 1000 μ m.

Description: Body oval (Fig. 12). Head black, coarsely punctate with recumbent pubescence, eyes large with microsetae; antennae black, with 11 antennomeres, antennal club with 3 antennomeres. Frontal median ocellus present. Pronotum black, finely punctate with short recumbent pubescence, lateral margins not visible from above. Hypomeron broad, not reaching antennal fossae. Scutellum triangular with short pubescence. Cuticle of elytra black, without fasciae, covered only with recumbent pubescence. Pro- and metaventrite with short recumbent pubescence. Metaventrite with lateral carinae. Legs black, all tibiae and femora lacking black spines along shaft. Abdominal sternites finely punctate with short recumbent pubescence.

Cryptorhopalum kaliki sp. n.
Figs. 14–15

Ety m o l o g y: Dedicated to the memory of the specialist in Dermestidae, VLADIMÍR KALÍK (Czech Republic).

Ty p e: Holotype (unsexed): Accession # C-7-60F.

D i a g n o s i s. The new species belongs to “*C. electron* species group” and differs from other species in this group by the black antennal club and narrow hypomeron barely reaching the antennal fossa (see following key).

Description: Body oval (Fig. 14). Head black, coarsely punctate with recumbent pubescence; eyes large with microsetae; antennae black, with 11 antennomeres, antennal club with 3 antennomeres (Fig. 15, insert). Frontal median ocellus present. Pronotum black, finely punctate with short recumbent pubescence, lateral margins not visible from above. Hypomeron broad, not reaching antennal fossae. Scutellum triangular with short pubescence. Cuticle on elytra black, without fasciae, covered only with recumbent pubescence. Pro- and metaventrite with short recumbent pubescence; metaventrite with lateral carinae. Legs black, all tibiae and femora lacking black spines along shaft. Abdominal sternites finely punctate with short recumbent pubescence.

Key to Dominican amber members of the “*Cryptorhopalum electron* species group”:

- 1 (6) – Antennal club brown
- 2 (5) – Hypomeron narrow
- 3 (4) – Hypomeron not reaching antennal fossae
..... *C. electron* BEAL
- 4 (3) – Hypomeron reaching antennal fossa
..... *C. dominicanum* HÁVA & PROKOP
- 5 (2) – Hypomeron broad, not reaching antennal fossae
..... *C. americum* HÁVA & PROKOP
- 6 (1) – Antennal club black,
- 7 (10) – Hypomeron broad
- 8 (9) – Hypomeron not reaching antennal fossae
..... *C. jantarticum* HÁVA & PROKOP
- 9 (8) – Hypomeron barely reaching antennal fossa
..... *C. macieji* sp. n.

- 10 (7) – Hypomeron narrow, barely reaching antennal fossae
..... *C. kaliki* sp. n.

Genus *Caccoleptus* SHARP, 1902

Caccoleptus (Bicaccoleptus) prokopi sp. n.
Figs. 16–18

E t y m o l o g y: Dedicated to our friend and colleague JAKUB PROKOP (Prague, Czech Republic).

Ty p e: Holotype (unsexed): Accession # C-7-60G.

D i a g n o s i s: Based on the number of antennomeres, the new species would be placed in the subgenus *Bicaccoleptus* HÁVA, 2004. It differs from Recent species by its brown antennae, the antennal club composed of 5 angular antennomeres with a rectangular 9th antennomere that is laterally enlarged and a suboval 11th antennomere.

Description: Body brown, oval (Figs. 16–17). Head brown, coarsely punctured with erect pubescence; maxillary palps brown; eyes very large with microsetae; antennae brown, 11 antennomeres, club with 5 antennomeres of triangular shape, 9th antennomere rectangular, laterally enlarged but rather short, 11th antennomere suboval in shape (Fig. 18). Antennal cavity closed, broad. Frontal median ocellus present. Pronotum brown, finely punctate with long erect pubescence, lateral margins visible from above. Scutellum small, triangular with short pubescence. Cuticle of elytra brown, without fasciae, covered only with erect pubescence. Each elytron with very large protuberance on humeri, densely foveolate, apical part finely punctate. Pro- and metaventrite with short pubescence. Prosternal process long, narrow. Metaventrite with lateral carinae. Legs brown, all tibiae very long, lacking spines along shaft. Abdominal sternites finely punctate with short pubescence. First visible abdominal ventrite with post-coxal line.

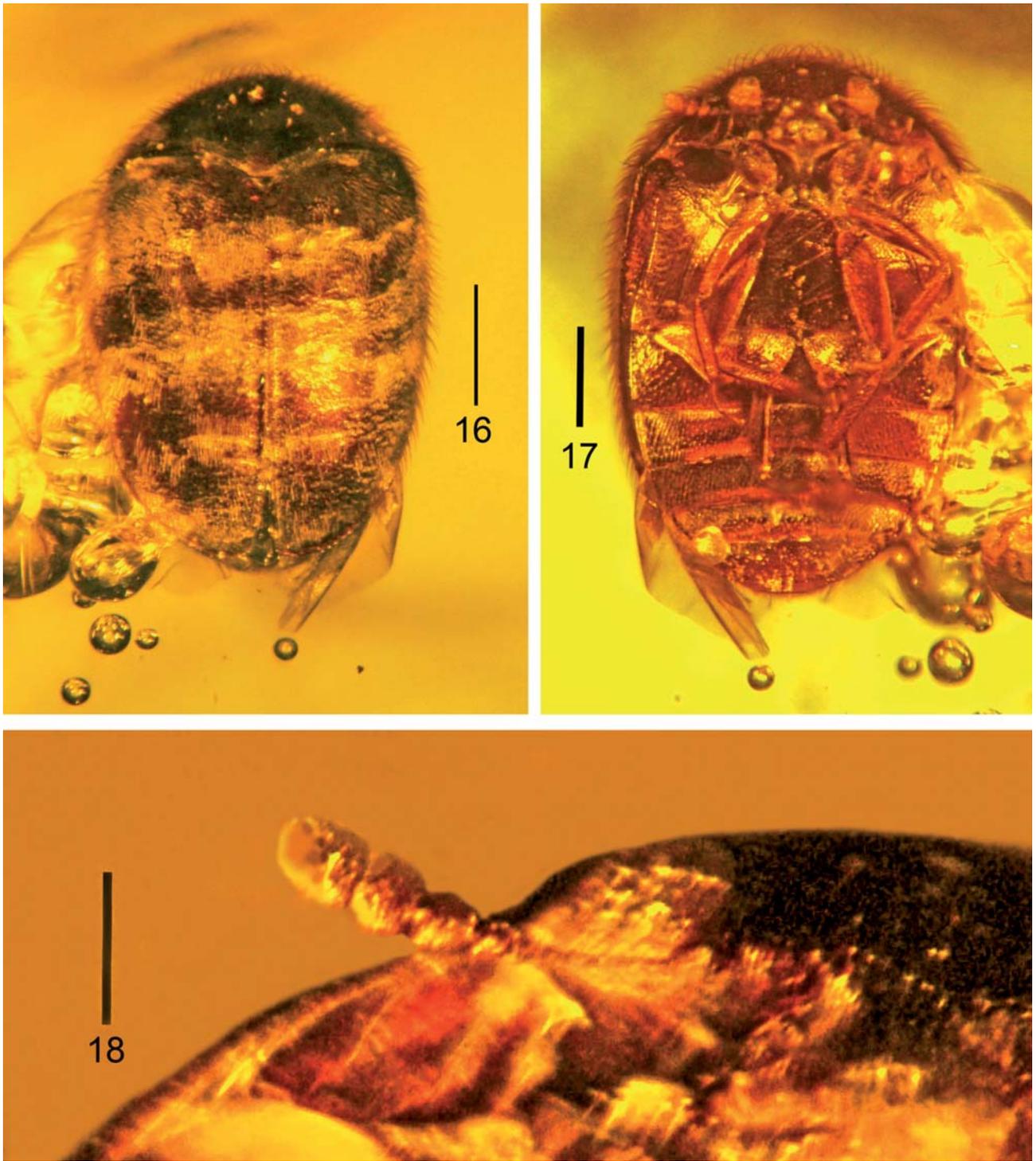
Caccoleptus (Caccoleptus) electron sp. n.
Figs. 19–20

E t y m o l o g y: Named after the Greek word electron.

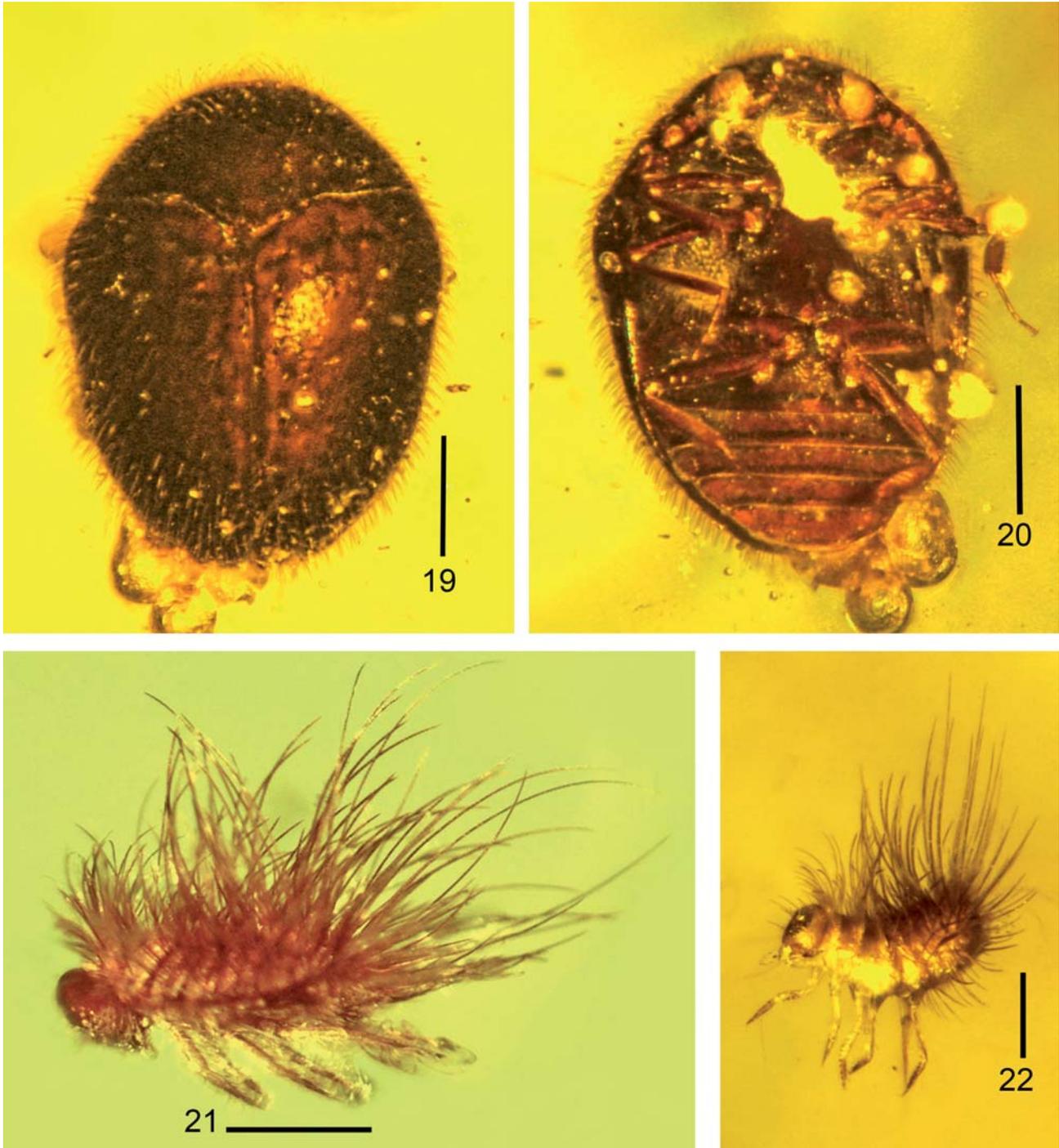
Ty p e: Holotype (unsexed): Accession # C-7-60H.

D i a g n o s i s: Based on the number of antennomeres, the new species would be placed in the subgenus *Caccoleptus* s. str. It differs from previous species in having a triangular 9th antennomere, rectangular 10th antennomere and suboval 11th antennomere.

Description: Body brown, oval (Figs. 19–20). Head brown, coarsely punctured with erect pubescence; maxillary palps brown; eyes very large with microsetae; antennae brown, 10 antennomeres, club with 5 antennomeres; 9th antennomere of triangular shape, 10th antennomere



Figs. 16–18. *Caccoleptus prokopi* sp. n. in Dominican amber. **16.** Dorsum. Bar = 550 μm . **17.** Ventrum. Bar = 388 μm . **18.** Antenna. Bar = 16 μm .



Figs. 19–22. 19. Dorsum of *Caccoleptus electron* sp. n., in Dominican amber. Bar = 460 μ m. 20. Ventrum of *Caccoleptus electron* sp. n., in Dominican amber. Bar = 460 μ m. 21. Larva of *Apsectus* sp. in Dominican amber (accession # C-7-7A). Bar = 400 μ m. 22. Second larva of *Apsectus* sp. in Dominican amber (accession # C-7-7B). Bar = 380 μ m.

rectangular, laterally enlarged but rather short, 11th antennomere suboval. Antennal cavity closed, broad. Frontal median ocellus present. Pronotum brown, finely punctate with long erect pubescence, lateral margins visible from above. Scutellum small, triangular with short pubescence. Cuticle on elytra brown, without fasciae, and covered only with erect pubescence. Pro- and metaventrite with short pubescence. Prosternal process long, narrow. Metaventrite with lateral carinae. Legs brown, all tibiae very long without spines along shaft. Abdominal sternites finely punctate with short pubescence. First visible abdominal sternite with post-coxal line.

Dermestid larvae

Isolated dermestid larvae also occur in Dominican amber. The most common are species of the genus *Apsectus* LECONTE, 1854, which are relatively short but bear elongate setae, some of which are as long as the body (Figs. 21–22).

4. List of Dermestidae known from Dominican amber

Subfamily Attageninae

Tribe Attagenini

Genus *Attagenus* LATREILLE, 1802

Attagenus ambericus HÁVA & PROKOP, 2004

Attagenus electron sp. n.

Genus *Limniattagenus* nov.

Limniattagenus electron gen. n., sp. n.

Subfamily Megatomiinae

Tribe Megatomini

Genus *Amberoderma* HÁVA & PROKOP, 2004

Amberoderma beali HÁVA & PROKOP, 2004

Genus *Caccoleptus* SHARP, 1902

Caccoleptus (Caccoleptus) electron sp. n.

Caccoleptus (Bicaccoleptus) prokopi sp. n.

Genus *Cryptorhopalum* GUÉRIN-MÉNEVILLE, 1838

Cryptorhopalum ambericum HÁVA & PROKOP, 2004

Cryptorhopalum dominicanum HÁVA & PROKOP, 2004

Cryptorhopalum jantarticum HÁVA & PROKOP, 2004

Cryptorhopalum kaliki sp. n.

Cryptorhopalum macieji sp. n.

Subfamily Trinodinae

Genus *Apsectus* LECONTE, 1854

Apsectus sp. (larva)

5. Discussion

Currently, only two extant genera are represented in Hispaniola (PEREZ-GELABERT 2000), *Dermestes* LINNAEUS,

1758 and *Trogoderma* LATREILLE, 1829. At least half of the 6 species in the latter genus have been introduced. The presence of *Attagenus* LATREILLE, 1802, *Amberoderma* HÁVA & PROKOP, 2004, *Caccoleptus* SHARP, 1902, *Cryptorhopalum* GUÉRIN-MÉNEVILLE, 1838, *Apsectus* LECONTE, 1854 and *Limniattagenus* gen. n. in Dominican amber suggest that the biodiversity of Dermestid beetles in Hispaniola was more diverse in the Tertiary than it is today.

Dermestids are quite heterogenous regarding their feeding habits. While those most familiar to humans develop on skins, caracasses, dried meats, decaying fruits, carpets and fecal matter, some members have quite specialized habitats. Some Australian taxa live in ant nests and a few have even selected the cases of praying mantids as developmental sites (LAWRENCE & BRITTON 1991). The dermestids that became trapped in amber may have lived on refuse under the bark of the amber-producing tree. This is because dermestid larvae also occur in Dominican amber (Figs. 21–22), suggesting that the developmental site of some dermestids was associated with the amber tree. It is known that mature dermestid larvae can form pupation chambers in wood. Another possibility is that development occurred in the nest of an insect or possibly a vertebrate such as a bird or mammal. Since adult dermestids visit flowers, finding them in amber does not indicate that their developmental site was associated with the amber tree.

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