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A new species of *Allotriopsis* Champion
from Guatemala (Coleoptera: Elateridae)

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A new species of *Allotriopsis* Champion from Guatemala (Coleoptera: Elateridae)

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Abstract. *Allotriopsis schusteri* Fuller (Coleoptera: Elateridae), **new species**, is described from cloud forest habitat in Zacapa Department, Guatemala, and compared with *Allotriopsis nasalis* Champion from Quezaltenango Department, Guatemala.

Key words. Biodiversity, Dicrepidiina, Senodoniini.

Resumen. Se describe *Allotriopsis schusteri* Fuller (Coleoptera: Elateridae), **nueva especie**, del hábitat del bosque nuboso en el departamento de Zacapa, Guatemala, y se compara con *Allotriopsis nasalis* Champion del departamento de Quezaltenango, Guatemala.

Palabras clave. Biodiversidad, Dicrepidiina, Senodoniini.

ZooBank registration. urn:lsid:zoobank.org:pub:B937D1BC-3F0F-40CB-B11D-81924EB1D729

Introduction

George Champion collected insects in Guatemala between March 1879 and April 1881, as part of the Biologia Centrali-Americana project (Champion 1907), and subsequently authored the sections on Elateridae in that work (Champion 1894–1897). One of the taxa he proposed is the somewhat enigmatic genus *Allotriopsis* Champion, which he considered the only New World representative of the otherwise east Asian group Allotriini (now a synonym of Senodoniini). The only included species, *Allotriopsis nasalis* Champion, is known only from the holotype, a male collected in 1880. Little else is known about the specimen. The original description of *A. nasalis* lists the type locality only as “Cerro Zunil, 4000 ft.” and “in the vicinity of the coffee-plantation Las Nubes” (Champion 1896: 490). The label on the specimen gives the elevation as “4–5000 ft.” [1219–1524m]. Champion (1907) describes the type locality as “Finca of Las Nubes, on the Pacific slope of the Cerro Zunil, above Mazatenango (4050 ft). Coffee plantations, with dense forest above.” Selander and Vaurie (1962) give an approximate latitude and longitude for Las Nubes as 14° 40'N, 91° 28'W. The exact date and elevation at which the specimen was found is uncertain. Champion did not put dates on his specimen labels, and he visited Finca Las Nubes twice in 1880 (Aug. 20–Sept. 9; Nov. 19–Dec. 14). He regarded his recorded elevations as “approximate” and “Probably too low in many cases.” (Champion 1907). Since Champion (1896) notes the specimen was collected in a forest clearing, it was probably collected above 1500m, which at the time was the upper elevational limit of coffee cultivation.

Allotriopsis was retained in the Senodoniinae by subsequent cataloguers (Schwarz 1906–1907, as Allotriini; Schenkling 1927; Blackwelder 1944, as Lepturoidini, Senodoniina). Fuller (2012) transferred the genus to Elaterinae based on the hypognathous mouthparts, and tentatively grouped it with the genera of Dicrepidiini, based on the strong resemblance of the frontoclypeal region to that of *Dicrepidius* Eschscholtz and the presence of ventrodistal lobes on tarsomeres 1–4. Kundrata et al. (2019) also tentatively placed *Allotriopsis* in the Dicrepidiini. Since I have not identified any other characters that either support or refute this interpretation, the genus is tentatively retained in what is now Ampedini, Dicrepidiina (Fuller 2023).

In 2015, while identifying elaterids in the collection of Universidad del Valle de Guatemala, Guatemala, I found one specimen of *Allotriopsis* collected by Jack Schuster in 1995, 115 years after Champion found his specimen of *A. nasalis*. Although I initially identified the specimen as *A. nasalis*, differences in details of morphology and locality left me with lingering doubts the two specimens were conspecific, despite the small sample size. Side by side comparison of the male genitalia (Fig. 12) has convinced me I cannot treat the two specimens as

conspecific, and as part of my studies on the elaterid biodiversity of Guatemala, I am describing this new specimen as a new species.

Materials and Methods

Genitalia were dissected and cleared using the methods of Becker (1956). Dissected genitalia are stored in glycerine in microvials attached to the specimen. Illustrations were made from tracings of digital photographs. For photography, genitalia preparations were immersed in clear gel hand sanitizer. Photographs of specimens were compiled using Picolay (<http://www.picolay.de>). Label data are presented verbatim; individual labels are separated by a forward slash (/). Body length is measured in dorsal aspect from the anterior margin of the head to the apex of the elytra. Body width is measured across the elytral humeri. Midlength of a structure is the length along the longitudinal axis of the body halfway between the lateral margins at midwidth. Midwidth of a structure is the length along the transverse axis of the body halfway between the anterior and posterior margins at the midlength.

The holotypes of *A. nasalis* and *A. schusteri*, **new species**, are deposited in the Natural History Museum, London (NHML), and Florida State Collection of Arthropods, Gainesville, FL (FSCA), respectively.

Terms. The lateral surface of the mesoventrite anterad the mesocoxae is called the lateral wing after Guryeva (1974). The coxal rest (“anterior articulating surface” of Guryeva (1974)) is described as “ventral” if it occupies part of the anteroventral surface of the lateral wing. Use of anterior tentorial pits follows Fuller (2021). Calculation of the ocular index of the eyes follows Becker (1974); a smaller number indicates larger eyes. Interpretation of wing venation follows Calder (1996, fig. 301).

Systematics

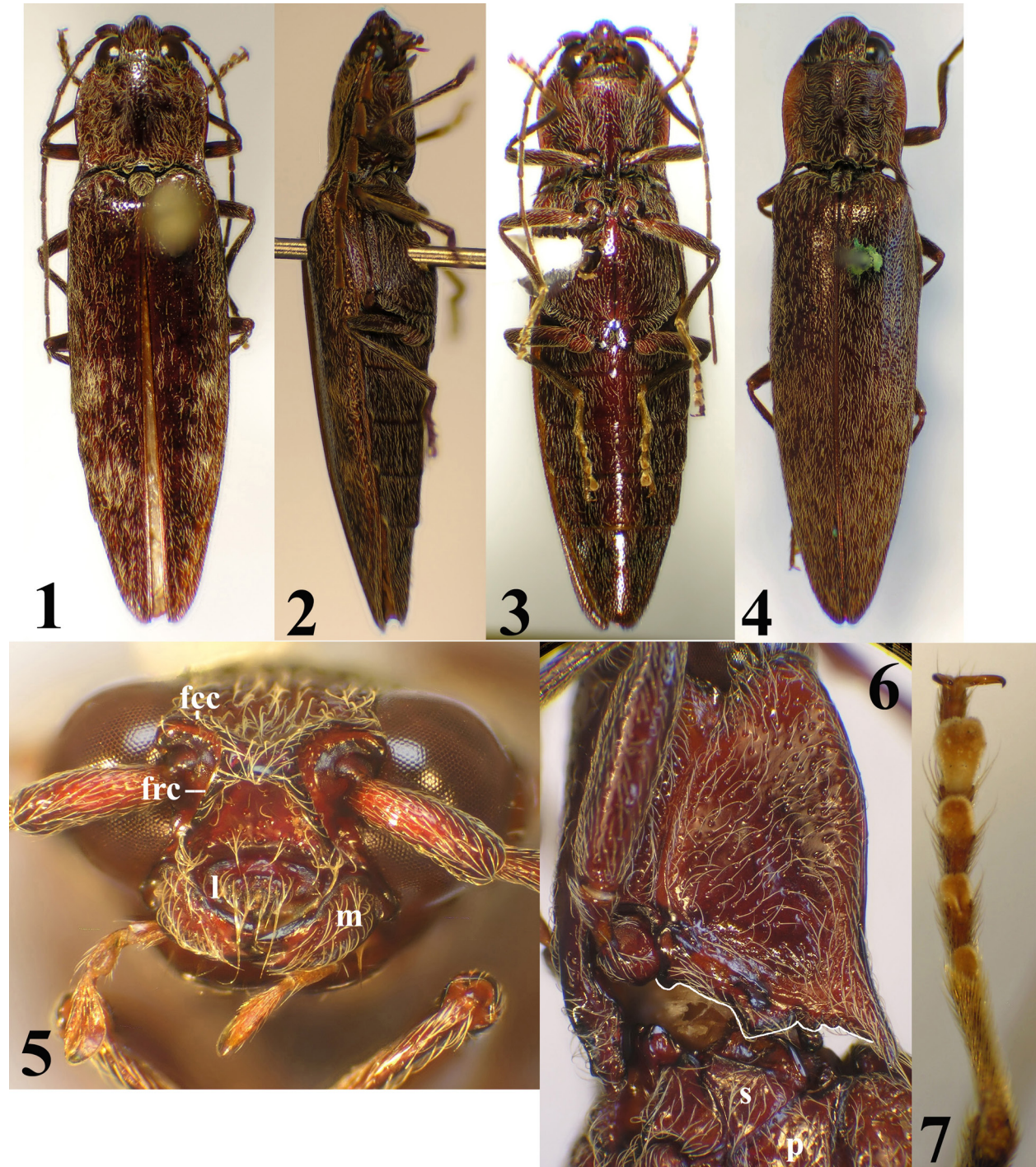
Allotriopsis schusteri Fuller, new species

Fig. 1–16

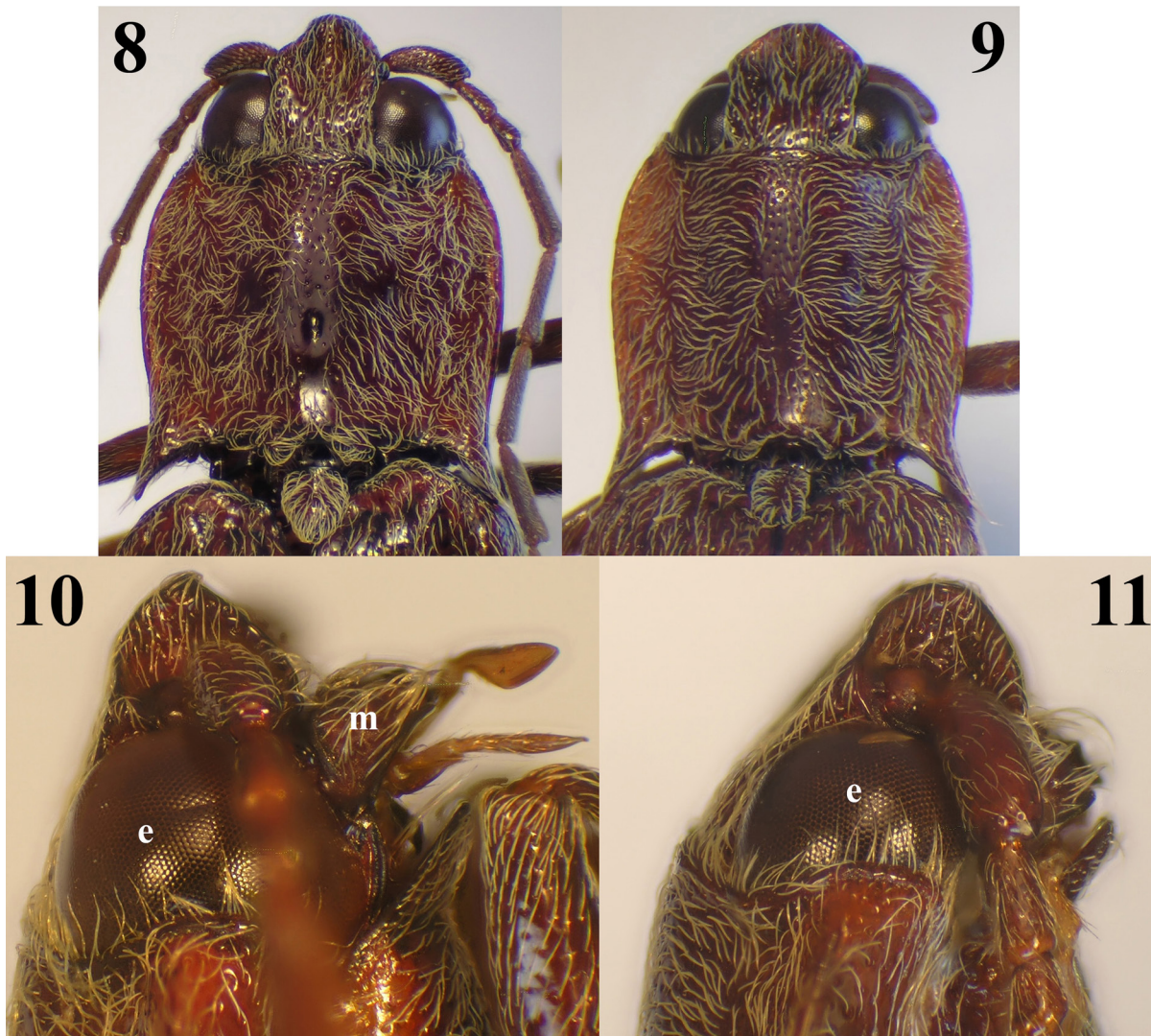
Type material. Holotype male (FSCA): “GUATEMALA. Zacapa. above La Unión. 22 XII 1995, 1480 m. E.B. Cano #” [crossed out] “Schuster” [handwritten] “Bosque nuboso” / “HOLOTYPE. *Allotriopsis schusteri* n. sp., desig. E.R. Fuller, 2025”.

Diagnosis. The two species of *Allotriopsis* closely resemble each other. Externally *A. schusteri* is distinguished from *A. nasalis* by having larger eyes (ocular index 40 vs. 44; Fig. 8, 9), the projection of the frontoclypeal carina is narrower and more pointed in dorsal aspect (Fig. 8) and bluntly pointed in lateral aspect (Fig. 10), the scutellar shield is flat, and the setae on the elytra form distinct patches in the apical half (Fig. 1). In *A. nasalis*, the projection of the frontoclypeal carina is shorter and more rounded in dorsal (Fig. 9) and lateral aspects (Fig. 11), and the scutellar shield is concave. Champion (1896) states the setae form patches on the elytra in *A. nasalis*, but that is not obvious on the holotype (Fig. 4). The antennae are longer in *A. nasalis*, reaching the anterior margin of abdominal ventrite 3 at rest; in *A. schusteri* the antennae at rest reach the anterior margin of abdominal ventrite 2. Although the two specimens are about the same length (15.25 mm vs. 14.25 mm), the aedeagus of *A. schusteri* is visibly shorter (2.0 mm vs. 2.75 mm) than that of *A. nasalis* in side-by-side comparison (Fig. 12). In *A. schusteri*, the basal piece is not as deeply notched, the anteroventral margin of the lateral lobes is not as produced, and the apical $\frac{1}{4}$ of the lateral lobes is narrower.

Description. Holotype male (Fig. 1–3). Length 15.25 mm, elytron 11.25 mm; width 4.0 mm. Body elongate, narrow, attenuated anteriorly and posteriorly. Uniformly reddish brown except antennomeres 4–11 light brown; cuticle smooth and shiny except as noted; setae thin, hair-like, apex tapered and acute, about 4–5 puncture diameters long, dull white throughout, appressed, many setae strongly curved, orientation as noted. Head (Fig. 5). Frons flat posterad midpoint of eye, with deep subquadrate diamond-shaped pit anterad midpoint of eye; antero-lateral margins of frontal pit raised into thin, sharp, projecting frontoclypeal carina, carina curved ventrally adjacent to midlength of frons and continuous with thin, sharp, raised, posteroventrally directed carina across

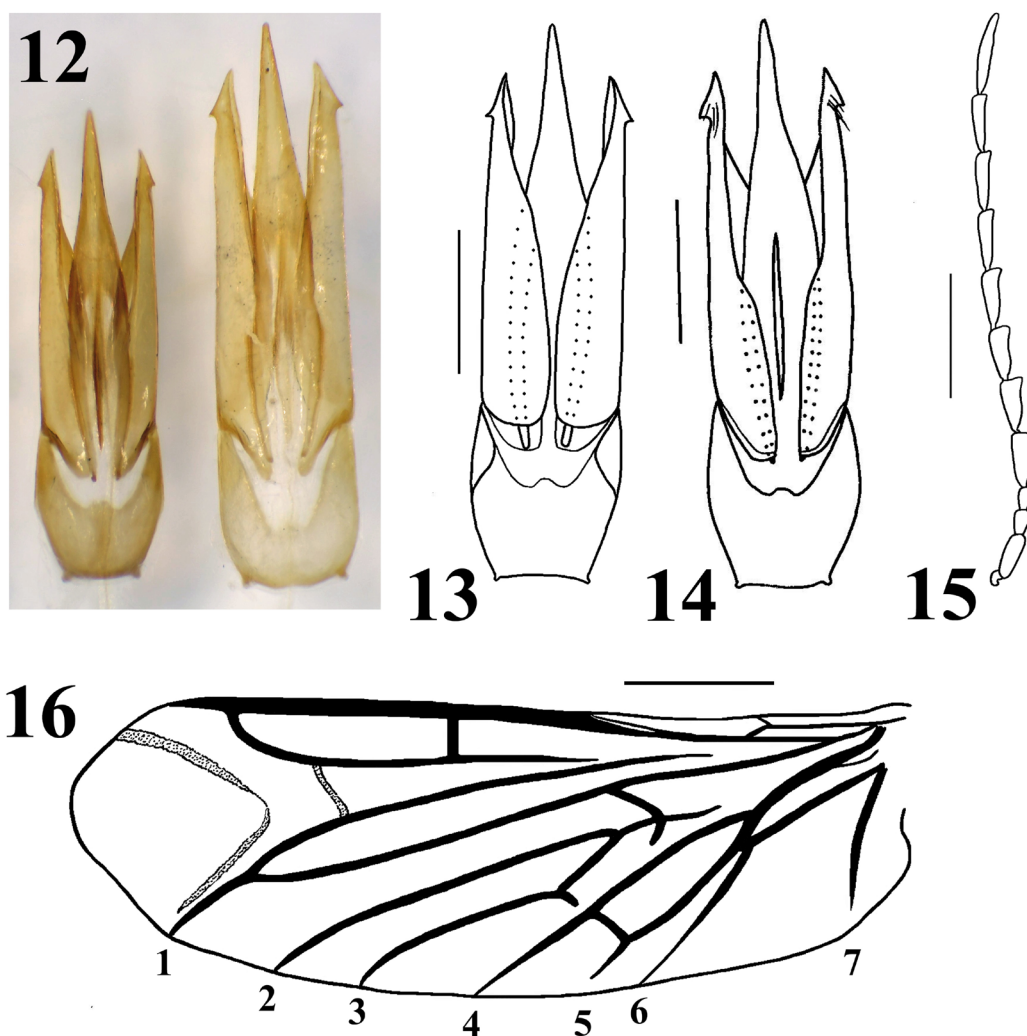


Figures 1–7. *Allotriopsis* spp. characters. 1–3) *Allotriopsis schusteri*, habitus. 1) Dorsal. 2) Lateral. 3) Ventral. 4) *Allotriopsis nasalis*, habitus, dorsal. 5–7) *Allotriopsis schusteri* characters. 5) Head, frontal. 6) Hypomerite, posterior margin highlighted. 7) Mesotarsus, ventral. Abbreviations: fcc – frontoclypeal carina; frc – frontoclypeal region carina; l – labrum; m – mandible; s – mesepisternum; p – mesepimeron.



Figures 8–11. *Allotriopsis* spp. characters. **8)** *Allotriopsis schusteri*, head, dorsal. **9)** *Allotriopsis nasalis*, head, dorsal. **10)** *Allotriopsis schusteri*, head, lateral. **11)** *Allotriopsis nasalis*, head, lateral. Abbreviations: e – eye; m – mandible.

frontoclypeal region, carina reaching anterior margin at lateral margin of labrum, curved carinae joined transversely at midlength of frons by rounded, projecting ridge that is about half width of frontal pit; frontoclypeal region completely divided by posterolaterally directed carinae, cuticle concave laterally and anteriorly; punctures shallow, circular, simple, almost contiguous, on anterior portion of frontoclypeal region punctures almost contiguous with nearest neighbour but much of cuticle unpunctured; setae directed anteriorly; anterior tentorial pits subequal in size to frontal punctures, circular, situated ventrad antennal sockets. Eyes convex, not projecting laterad anterolateral angle of pronotum; ocular index 40. Labrum (Fig. 5) with dorsal surface excavate laterally and posteriorly forming transverse elongate knob anteriorly, knob about $\frac{2}{3}$ width of labrum; cuticle appears rough and irregular but punctures obscure. Mandibles symmetrical, with large subapical tooth. Antenna (Fig. 15) long, filiform, at rest extending to anterior margin of abdominal ventrite 2. Antennomere 1 with setae about half length of frontal setae, directed distally. Antennomeres 4–10 elongate subtriangular, distal angle produced, on left side distal angle produced more on antennomeres 4 and 7, on right side, produced more on antennomere 7. Cuticle of antennomeres 4–11 microrugose, subshiny; punctures minute, setae dense, very short, appressed. Prothorax. Pronotum (Fig. 8) convex, broadly flattened, basal declivity absent; in dorsal aspect hind angles divergent,



Figures 12–16. *Allotriopsis* spp. characters. **12)** Male genitalia of *Allotriopsis schusteri* (left) and *Allotriopsis nasalis* (right). **13–16)** *Allotriopsis schusteri* characters. **13)** Male genitalia, dorsal. **14)** Male genitalia, ventral. **15)** Antenna. **16)** Wing venation. Wing venation abbreviations: 1 – RP+MP₁₊₂; 2 – MP₃; 3 – MP₄+CuA₁; 4 – CuA₂; 5 – CuA₃₊₄+AA₁₊₂; 6 – AA₃₊₄; 7 – AP₃₊₄. Scale bars: Fig. 13, 14 = 0.5 mm; Fig. 15, 16 = 2.0 mm.

elongate, narrow, apex acute, carinate, carina short, low, obscured by setae, straight, directed towards mesal margin of hind angles, not meeting posterior margin, in lateral aspect carina extending anteriorly to about level of posterior margin of procoxae; basal sublateral incisures small, short, subtriangular, not extending anterad posterior margin; lateral pronotal carina thickened, rounded, projecting laterally, smooth and shiny; cuticle with a pair of shallow concavities midwidth at level of eye; punctures slightly smaller than frontal punctures, dense and contiguous laterally, grading to separated by about 1.5 times own diameters posteromesally, posterior half of midlength smooth and shiny with shallow concavity at level of anterior margin of procoxae; setae adjacent to lateral carina and on hind angles directed posterolaterally, other setae directed more or less anteromesally; in lateral aspect lateral carina slightly sinuate on longitudinal plane, reaching apex of hind angles, separated from anterior margin by 1–2 punctures; in lateral aspect hind angles directed slightly posterodorsally, apex acute, with tuft of erect setae apicolaterally. Hypomeron (Fig. 6) subtriangular; surface irregularly sinuate, convex posteromesally, concave laterally and anteriorly; anterior margin broadly truncate, about $\frac{1}{3}$ width of eye; anteromesal angle flat; mesal margin slightly convex, with narrow smooth border and shallow submarginal groove, both inconspicuous, smooth border widening to about width of procoxae laterad procoxae, fading out posteriorly adjacent to

mesepisternum; posterolateral angle projecting posterolaterally, tapered to an acute apex; posterior margin with a pair of small subtriangular notches adjacent to anterolateral projection of mesepimeron, mesal notch deeper, notches bordered mesally by a subtriangular projection adjacent to suture between mesepimeron and mesepisternum, projection about half as long as basal width, apex broadly rounded; posteromesal angle slightly produced, apex broadly rounded, only slightly constricting procoxal cavities posteriorly; lateral margin projecting shelf-like laterally; punctures slightly larger than lateral pronotal punctures, almost contiguous with nearest neighbour anteriorly but not dense, grading to subequal in size and less dense than lateral pronotal punctures posteromesally; setae directed away from procoxal cavities. Prosternum convex, flattened along midlength, posterolateral half concave anterad procoxa; anterior lobe directed anteroventrally, sharply defined posteriorly by transverse groove, anterior margin transverse, linear, slightly thickened, smooth and shiny, lateral margins oblique, not thickened, lateral margin of prosternum slightly concave; anterolateral angle projecting, subrectangular, apex obliquely truncate and directed posteriorly; posterolateral angle subrectangular with apex angled posteriorly, projection continuous with narrow, thickened, darkly pigmented anterior and mesal margin of procoxal cavity, margin bordered by submarginal groove that extends onto posterolateral projection of prosternum, coxal cavity margin uniform in width mesad posterolateral projection; lateral punctures subequal in size and density to anterior hypomeral punctures, grading to subequal in size to posteromesal hypomeral punctures posteromesally; cuticle glabrous and impunctate along midlength between procoxae; setae directed anteriorly. Intercoxal process elongate, subtriangular in cross section; ventral surface curved posterodorsally, reduced to a carina, length about $\frac{3}{4}$ length of dorsal surface, apex bluntly pointed, slightly projecting ventrally; dorsal surface with lateral margin slightly projecting laterally, in ventral aspect spear-shaped, widest just posterad procoxae, apex rounded and setose; punctures subequal in size to posteromesal prosternal punctures; setae directed more or less ventrally. Pterothorax. Scutellar shield subtriangular to subpentagonal, lateral and posterior margins obscured by setae; dorsal surface flat, angled slightly anteroventrally on same plane as anterior declivity of elytra; anterior margin linear, darkly pigmented, projecting anteriorly; setae dense, obscuring details of cuticle, directed posterolaterally to posteriorly. Elytra elongate, narrow, lateral margins subparallel in basal half, converging to subtruncate apices in apical half, setae obscuring apex; anterior margin convex, darkly pigmented, projecting anteriorly; anterior declivity short, shallowly sloped, not distinct, not excavate around scutellar shield; humerus with very small pit anteriorly; elytra convex, broadly flattened across mesal $\frac{2}{3}$; punctate, not striate in basal half, vaguely striate in apical half, striae punctures not distinguishable from interval punctures; sutural interval angled dorsomesally; setae forming distinct patches in apical half, directed posteriorly. Epipleuron club-shaped, margins subparallel adjacent to metepisternum; expanded and rounded anteriorly; gradually narrowed adjacent to metacoxa, narrow and at best shallowly grooved adjacent to abdominal ventrites 1–4 with ventral carina sharp, dorsal carina weak; gradually widened with more prominent dorsal carina overhanging margin adjacent to abdominal ventrite 5, dorsal and ventral carinae meeting at apex with end of ventral carina weak and densely setose; punctures and setae as on elytron. Mesoventrite with surface of lateral wings flat, angled anterolaterally; coxal rests ventral, bordered laterally by a darkly pigmented, anteriorly-directed projection, projection with apex rounded; posterolateral angle broadly truncate; posterior intercoxal process subquadrate, width less than half width of mesocoxa, concave, depressed below level of mesocoxa, posterior margin concave; mesoventral cavity with margins convex, elevated and subcarinate immediately anterad mesocoxae, posteroventral margin of cavity rounded with subquadrate notch along midlength; punctures minute, sparse; setae directed posteriorly. Mesepisternum subtriangular, forming a small anterolateral part of margin of mesocoxal cavity; anteromesal angle excavate, continuous with excavation of coxal rests; anterior $\frac{1}{3}$ of sclerite deeply, transversely grooved, groove sparsely setose, anterior and posterior margins of groove steep and sharply defined, lateral margin grading into shallower and less sharply defined anterolateral groove, groove punctate; punctures and setae as on mesoventrite. Mesepimeron subtriangular, tapered posteriorly; sclerite forming lateral margin of mesocoxal cavity, mesal margin darkly pigmented with longitudinal microstriae; surface of sclerite flat to slightly concave; anterolateral angle produced, about as long as basal width, apex bluntly pointed; punctures small, larger than on mesoventrite, variably separated by 1–2 times own diameters. Meso-metaventral suture visible between mesocoxa, shallowly transversely grooved. Metaventrite convex, flattened along midlength; median sulcus visible from apex of posterior intercoxal process to $\frac{3}{4}$ length to mesocoxal cavities; anterior margin with narrow, sharp marginal carina and submarginal

groove adjacent to mesocoxa, both fading out slightly laterad mesocoxa; anterior intercoxal process subquadrate, surface mostly flat, anterior marginal ridge and groove around mesocoxal cavity extending to anterior margin of intercoxal process, anterior margin concave and on about same level as posterior intercoxal process of mesoventrite; posterior intercoxal process with midlength grooved to apex; lateral punctures same size as lateral prosternal punctures, slightly smaller along midlength, almost contiguous throughout; setae directed posteriorly. Metepisternum subrectangular, slightly tapered posteriorly; punctures as on metaventrite. Wing venation (Fig. 16). Legs. Prothorax. Coxa globular, cuticle microrugose, punctures obscure, setae variable, up to slightly shorter than prosternal setae, fine. Trochanter elongate-subtriangular, slightly longer than diameter of coxa, broadly longitudinally articulating with femur; punctures minute, sparse; setae subequal in shape and length to prosternal setae, directed distally. Femur elongate-subrectangular, slightly flattened, at rest distal end extending past lateral margin of hypomerion; anterior margin slightly convex; posterior margin concave distally, margin opposing tibia flattened, slightly grooved almost to trochanter, margins of groove not carinate; punctures as on trochanter. Tibia elongate-subrectangular, subequal in length to femur, narrow, flattened; two stout tibial spurs present, subequal in size; punctures minute, denser than on femur; posterior setae shorter and denser than femoral setae. Tarsus (as in Fig. 7) with tarsomeres 1–4 laterally flattened with ventrodiscal lobes, tarsomere 5 slightly dorsoventrally flattened; ventral surface basal lobes of tarsomeres 1–3 with dense setae; lobe of tarsomere 1 small, indistinctly visible dorsally; lobe of tarsomeres 2–4 visible dorsally; tarsomere 5 subequal in length to tarsomere 1, tarsomeres 2, 3 and 4 each slightly shorter than preceding tarsomere, tarsomere 2 about $\frac{3}{4}$ length of tarsomere 1; claws simple, without setae. Mesothorax. Mesotrochantin visible, transversely elongate, narrow, widened laterally, in contact with posterolateral angle of mesoventrite, posteromesal angle of mesepisternum and anteromesal angle of mesepimeron. Coxa subglobular, slightly elongate, punctures and setae as on procoxa. Trochanter as on prothorax except articulation with femur slightly more oblique. Femur, tibia and tarsus as on prothorax except femur flatter, curved to contour of body. Metathorax. Coxal plate with posterior margin gradually declivous laterally from trochanteral insertion, about half as wide laterally as mesally; punctures and setae as on adjacent metaventrite. Trochanter elongate-oval, distal end slightly produced, broadly, obliquely articulating with femur anteriorly; punctures about same size and density as on metacoxal plate, setae directed distally. Femur, tibia and tarsus as on mesothorax except femur oblique basally, produced along trochanter, femur at rest extends past lateral margin of elytra, anterior and posterior margins subparallel, linear. Abdomen convex, all ventrites slightly concave laterally; lateral margins tapered posteriorly from ventrite 3, convexity of ventrites decreasing from ventrite 1 to ventrite 5; posterolateral angle of ventrites 1–4 with small tuft of setae; ventrites 2–4 with midlengths subequal; punctures of ventrites 1–4 anterolaterally subequal in size and density to lateral metaventral punctures, grading to minute and sparse along midlength; setae same shape, length and orientation as on metaventrite; ventrite 5 elongate subtriangular, longer than basal width, posterior margin slightly recurved, broadly rounded, lateral and posterior punctures as in lateral punctures of ventrite 4, grading to minute and sparse anteromesally. Tergite 9 subrectangular, slightly wider than median length; posterior margin evenly concave; cuticle longitudinally microstriate; punctures sparse, minute. Tergite 10 subtriangular, apex produced nipple-like; anterior margin slightly sinuate, anterolateral angle produced and overlain by posterolateral angle of tergite 9; cuticle longitudinally microstriate; punctures not visible; setae short, fine, visible only along apical margin. Sternite 9 somewhat spear-shaped, lateral margins more-or-less convex; anterior margin broadly rounded, slightly nipple-like at midlength; posterior margin produced with bluntly pointed apex; cuticle smooth and shiny; punctures minute, sparse, restricted to posterior half; setae subequal in shape and length to posterolateral setae of tergite 9; anterior margin of sclerite appears double, with a broad submarginal transverse band of lightly pigmented cuticle, and a marginal bar sclerite thickened at midlength. Aedeagus (Fig. 13, 14); apical expansion of lateral lobes with 4 long ventral setae, without visible dorsal setae; basal struts robust, somewhat foliaceous, extending slightly anterad anteroventral margin of lateral lobes; lateral lobes distinctly separated along midlength ventrally, separated by about width of endothecal sclerite dorsally; in lateral aspect median lobe gradually curved posteroventrally.

Female and immature stages. Unknown.

Etymology. The species is named in honour of the late Jack C. Schuster, entomologist, educator, musician.

Discussion

The holotype of *A. schusteri* was collected in cloud forest habitat, in Sierra del Espiritu Santo, Zacapa Department, in southeast Guatemala. The type locality of *A. nasalis* is in the Western Volcanic Range, in Quezaltenango Department, in northwest Guatemala. Schuster and Cano (2008) and Monzón Sierra (2023) have proposed centers of species endemism in the Scarabaeoidea in Guatemala. The two interpretations vary in detail based on the vagility of the taxa studied but agree on the broader patterns. The type locality of *A. schusteri* is in area 7b of Schuster and Cano (2006) or zone 4b of Monzón Sierra (2023), while that of *A. nasalis* is in area 4b of Schuster and Cano (2006) or zone 2a/b of Monzón Sierra (2023). The Sierra del Espiritu Santo and the Western Volcanic Range are separated by the dry barrier of the Motagua River valley.

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