Revision, phylogeny and historical biogeography of the genus *Apodrosus* Marshall, 1922 (Coleoptera: Curculionidae: Entiminae)

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Abstract

The Caribbean weevil genus *Apodrosus* Marshall, 1922 is revised, including a redescription of *A. argentatus* Wolcott, 1924 and *A. wolcotti* Marshall, 1922 and description of 11 new species: *A. adustus*, sp.n. (Bahamas), *A. andersoni*, sp.n. (Dominican Republic), *A. artus*, sp.n. (Dominican Republic), *A. earinusparsus*, sp.n. (Dominican Republic), *A. empherefasciatus*, sp.n. (Bahamas), *A. epipolevatus*, sp.n. (Puerto Rico), *A. eximius*, sp.n. (Dominican Republic), *A. mammuthus*, sp.n. (Mona Island, Turks and Caicos Islands), *A. quisqueyanus*, sp.n. (Dominican Republic), *A. stenoculus*, sp.n. (Dominican Republic) and *A. viridium*, sp.n. (Dominican Republic). A key to the species and illustrations of external and internal structures are provided. *Apodrosus* is characterized as a monophyletic group by two unreversed synapomorphies – i.e., the presence of a median fovea on the apex of abdominal sternum VII and a J- or Y-shaped spermatheca – and is furthermore differentiated from related taxa by a unique combination of diagnostic features including the presence of premucro, a complete tegminal plate in males, the absence of longitudinal sclerites in the genital chamber of females, and an apical projection on the spermathecal cornu. A phylogenetic reconstruction of 20 taxa (7 outgroup, 13 ingroup) and 25 morphological characters yielded a single most parsimonious cladogram (L=61 steps, CI=42, RI=74) with the ingroup topology (*A. artus*, (*A. andersoni*, (*A. earinusparsus*, (*A. epipolevatus*, *A. wolcotti*))), (*A. eximius*, (*A. argentatus*, *A. mammuthus*), (*A. viridium*, (*A. stenoculus*, (*A. quisqueyanus*, (*A. adustus*, *A. empherefasciatus*))))). The phylogeny indicates that *Anypotactus bicaudatus* Champion (Anypotactini Champion) is the sister group to *Apodrosus*, thereby calling into question the traditional tribal placement of this genus in the Polydrusini. The host plant associations of most species remain uncertain. A reconstruction of the historical biogeography of *Apodrosus* suggests that post-GAARlandia (Greater Antillean+Aves Ridges land span) vicariance was an important factor in the diversification of the higher-elevation inhabiting *A. artus-A. wolcotti* clade. Conversely, the species richness of the lower-elevation inhabiting *A. eximius-A. empherefasciatus* clade is most plausibly explained through a series of independent and likely more recent colonization events from the ancestral source area of southwestern Hispaniola to several smaller western Caribbean islands, or – in the case of Hispaniola – within-island areas of endemism.

Keywords

Caribbean, cladistics, morphology, taxonomy, colonization, evolution, Hispaniola
Introduction

The Caribbean entimine weevil genus *Apodrosus* (Coleoptera: Curculionidae: Entiminae) was erected in 1922 by Sir Guy A. K. Marshall who considered it closely related to the continental *Polydrusus* Germar, 1817 (cf., O’Brien & Wibmer 1982) based on several shared features. These include: a relatively small size for entimines (3–7 mm); a strongly reduced mandibular scar which is otherwise characteristic of the subfamily (Thompson 1992, Marvaldi 1997; Oberprieler et al. 2007); the exposed maxillae which are visible along the sides of the pedunculate prementum; the well developed elytral humeri and wings; and the connate tarsal claws. Marshall (1922: 59) consequently placed *Apodrosus* in the tribe Polydrusini Schoenherr where it has remained until present (O’Brien & Wibmer 1982; Alonso-Zarazaga & Lyal 1999). He furthermore provided workable diagnostic features for *Apodrosus*, in particular the presence of a median furrow on the head and a triangular epistome on the rostral apex which is bare and smooth.

Prior to this study only two species were placed in the genus: *A*. *argentatus* Wolcott, 1924 and the type species *A*. *wolcotti* Marshall, 1922, both originally described from Puerto Rico (Wolcott 1924: 130). Beyond these brief descriptions, a few publications have presented new information on possible host plant associations of the species of *Apodrosus* (e.g., Wolcott 1924, 1948; Martorell 1976). Wolcott (1941) first documented the presumed occurrence of *A*. *argentatus* on Mona Island (see also Ramos 1946; Franz et al. 2009); however, according to the present study this record corresponds to another new species in the genus. Subsequently *A*. *argentatus* was also reported from the Bahamas (Turnbow & Thomas 2008), though not (until now) from Hispaniola (cf., Perez-Gelabert 2008). However, no taxonomic revision of any species of *Apodrosus* has been undertaken since the mid-1920s.

Here we offer a thoroughgoing revision of the genus, made necessary in part through the acquisition of specimens pertaining to 11 new species – originating from Puerto Rico, Mona Island and the Turks and Caicos Islands, Hispaniola, and the Bahamas – that were either recently collected or represented in various museum collections. We provide a redescription of *Apodrosus*, a key to all 13 species now contained within the genus, descriptions and illustrations of the species, host plant and distributional information, a phylogenetic analysis based on external and internal morphological features and using a suitable set of outgroup taxa, and a historical biogeographic reconstruction of the ingroup species (Ronquist 1997). In light of the new phylogenetic and historical biogeographic results we discuss the likely mechanisms for the diversification of *Apodrosus* in western Caribbean region.

Materials and methods

**Taxonomic descriptions**

The descriptive approach used in this study follows Franz & Girón (2009). The morphological terminology is generally in accordance with Torre-Bueno (Nichols 1989); with specific terms adopted for characterizing the apex of the rostrum (Vaurie 1963),
mouthparts (Ting 1936; Morimoto & Kojima 2003), metendosternite (Velásquez de Castro 1998), wing venation (Zherikhin & Gratshev 1995), tibial apices and abdominal segments (Thompson 1992), and male and female terminalia (Howden 1995; Velásquez de Castro 1997; Wanat 2007). All observations and dissections were performed using Leica MS5 and MZ16 stereomicroscopes (magnification 7–115×) and an Olympus BX41 compound microscope (magnification 20–400×), each equipped with an ocular graticule for measurements of lengths. The overall length was measured in lateral view from the apex of the rostrum to the posterior margin of the elytra. Characters mentioned as part of the genus-level redescription are not repeated in the individual species accounts unless they vary among species. The species descriptions were abbreviated to highlight features with diagnostic and phylogenetic relevance. They are primarily based on males but make reference to variations in females where necessary. The species key, descriptions and figures are for the most part arranged in phylogenetic sequence.

The habitus photographs were taken with a Microptics XLT imaging system using a Canon EOS-1 camera. Scanning electron micrographs were produced with a JEOL 5410LV system. Line drawings of internal structures were traced either from digital images taken through the Olympus compound microscope or from sketches produced with a camera lucida attached to it. The simplified line sketches were scanned and redrawn using an illustration software program while highlighting features with diagnostic and phylogenetic significance.

Specimens

Labels for type specimens include the genus name and species epithet, a gender symbol, and the authors and year. They are colored red for holotypes and yellow for all the paratypes. The insect collection codens are adopted from Arnett et al. (1993), as follows:

AMNH – American Museum of Natural History, New York, NY, USA
CMNC – Canadian Museum of Nature, Ottawa, ON, Canada
CWOB – Charles W. O’Brien Collection, Green Valley, AZ, USA
FSCA – Florida State Collection of Arthropods, Gainesville, FL, USA
MEBT – Museum of Entomology and Tropical Biodiversity, Río Piedras, PR, USA
MHND – Museo Nacional de Historia Natural, Santo Domingo, Dominican Republic
NMNH – National Museum of Natural History, Washington, DC, USA
RHTC – Robert H. Turnbow, Jr. Collection, Fort Rucker, AL, USA
UPRM – Invertebrate Collection, University of Puerto Rico, Mayagüez, PR, USA

Phylogenetic analysis

All 13 species of Apodrosus were distinguished as such through application of the phylogenetic species concept (sensu Wheeler & Platnick 2000) and were included as ingroup taxa in the phylogenetic analysis. Suitable outgroup taxa (cf., Nixon & Carpenter 1993) include representative species from the following tribes:
(1) Anypotactini Champion – *Anypotactus bicaudatus* Champion, 1911, with a similar general appearance and *Polydacrys scannerius* (Klug 1829), a Caribbean representative of the tribe; (2) Polydrusini – *Cautoderus nigrocinctus* Champion, 1911, *Polydrosodes conicus* Champion, 1911, *Polydrusus mutabilis* (Champion 1911), and *Polydrusus peninsularis* (Horn 1894), representing presumed close relatives of *Apodrosus* according to Marshall (1922); and (3) Sitonini Gistel – *Sitona californicus* (Fåhraeus 1840) which was chosen to root the phylogeny. Preference was given to outgroup taxa from Caribbean and Central American regions.

The character matrix was compiled and edited using ASADO (Nixon 2008). The characters were numbered following the sequence of the taxonomic descriptions. Autapomorphies for species of *Apodrosus* are presented in the individual species accounts descriptions yet were excluded from the cladistic analysis. The most parsimonious cladogram and character state optimizations were identified in a comprehensive search strategy using the parsimony ratchet (Nixon 1999) as implemented in TNT (Goloboff et al. 2008; spawned out of ASADO), based on the following commands: (1) ratchet settings – 200 iterations per replication, 4% up-/down-weighted; (2) drift settings – 100 iterations per replication; (3) tree fusion settings – 10 rounds, 200 MB max RAM; (4) general settings – 1000 tree to hold; (5) analyses – ratchet, drift, sectorial search, tree fusion, TBR-max; and (6) xmult settings – 3 hits, 5 consense. The single resulting cladogram and character state transformations were examined in ASADO under various optimizations. Bremer branch support values (Bremer 1994) were calculated in NONA (Goloboff 1999) with the commands hold 20000, suboptimal 15 and bsupport 15.

**Historical biogeography**

Based on the preferred phylogenetic hypothesis, a historical biogeographic reconstruction was performed in order to analyze likely patterns of vicariance and colonization among the species of *Apodrosus* in the western Caribbean region. Suitable areas of endemism were identified using established criteria (cf., Morrone 2009). Given the presumed importance of relatively recent island colonization events, an event-based method was chosen initially to optimize inferred ancestral areas of endemism along the internal cladogram nodes (“dispersal-vicariance analysis” – DIVA 1.1; see Ronquist 1997). In a second step, component analysis (Nelson & Platnick 1981; Page 1988, 1990 – COMPONENT 1.5; Morrone 2009) was employed to identify potentially congruent general area cladograms under assumption 2 which minimizes the relative input of widespread species in establishing area relationships. The results were compared and reconciled with the predominant biogeographic scenario for the Caribbean region (Iturralde-Vinent 2006).

**Systematics**

*Apodrosus* Marshall, 1922: 59

* = *Apodrusus* Marshall (in Wolcott 1924: 130 – error)
Type species


**Diagnosis**

*Apodrosus* is a genus of relatively small sized (3-7 mm), often metallic colored, exclusively (western) Caribbean entimine weevils with phanerognathous mouthparts (i.e., the maxillae are visible along the sides of the prementum; Fig. 2A), without a postocular lobe and vibrissae, and with the humeri and wings being well developed. Species of *Apodrosus* may resemble those of members of the Anypotactini and Polydrusini. According to Marshall (1922: 59), the genus shares with the strictly continental *Polydrusus* “its more salient characteristics”, including a laterally situated antennal scrobe and connate claws (see also Anderson 2002). However, *Apodrosus* can be distinguished from *Polydrusus* and other polydrusine genera by a particular combination of characters including a median furrow on the head (e.g., Fig. 8B); a large, bare, and smooth triangular area formed by the epistome on the rostrum (e.g., Fig. 1B); the presence of premacro; the presence of a median fovea on the ventral sternum VII; and an either J- or Y-shaped female spermatheca (e.g., Figs 5D and 13G). *Apodrosus* is furthermore distinguished from an undescribed though apparently closely related genus that also occurs at higher elevations in the Hispaniolan Cordillera by having a well defined epistome, well developed elytral humeri, and fully developed wings (pers. obs.). Finally, *Apodrosus* differs from *Anypotactus* Schoenherr in having connate (as opposed to free) claws.

**Redescription**

**Body.** Length 2–6 mm; length in dorsal view 2–3-times longer than greatest width which is either at humeri or at mid-point to second third of elytra (e.g., Fig. 1A); shape usually subrectangular; dorsal outline in lateral view subplane to strongly convex (e.g., Fig. 1C). Integument dark brown, paler or more reddish or yellowish on legs, lighter in teneral specimens; surface smooth to undulated; vestiture heterogeneous to uniform, composed of small, circular to elongate, appressed, contiguous, mostly non-overlapping (excepting lateral and apical regions of elytra), white to brown or green, iridescent (yellowish, reddish or greenish), with ribbed surface scales, and short and recurvate or long and erect setae, regularly and sparsely arranged throughout.

**Head.** Shape in dorsal view subconical (e.g., Fig. 1B). Eyes in dorsal view slightly to strongly projected from the surface of the head (e.g., Figs 10B and 11B), inner margins converging apically; in lateral view elliptical, 1.4–1.9-times longer than wide; eyes 0.3–0.6-times width and 0.6–0.8-times length of head in lateral view; separated from anterior margin of prothorax by 0.3–0.7-times greatest diameter of eye; ocular sclerite well defined all around the eye; imaginary line of anterior margin of eyes usually impressed. Frons trapezoidal (e.g., Fig. 13B), shortest distance between eyes 0.2–0.5-times greatest width of pronotum; with a mesal longitudinal furrow of variable length and depth, furrow apically linear or bifurcated. Rostrum in dorsal view nearly as long as head, 1–1.5-times longer than wide, lateral margins parallel (or converging towards
apex or mesally slightly emarginate – rostrum mesally constricted –); median region of rostrum flat to slightly produced; epistomal area well defined (e.g., Fig. 2B), large, triangular, glabrous and shiny, usually extending to antennal insertion, apically with 3–5 setae situated on each side; nasal plate (on the apical margin of epistome) not always defined, if so, then flat to concave, finely puncturate, variable in size. Rostrum in lateral view slightly curved downwards, length 1–1.6-times its basal width; antennal insertion apicad of mid length of rostrum; scrobe curved downwards by 40–70°, well defined throughout, deep, glabrous, initiating in apicodorsal region, ending in basiventral region, posteriorly or ventrally directed, extending at least to anterior

Fig. 1. Apodrosus wolcotti, habitus of female. (A) dorsal view; (B) head, frontal view; (C) lateral view; (D) ventral view. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise
margin or at most to anterior third of eye, separated from it (at shortest distance) by 1.2–2.7-times width of scrobe; ventral surface (Fig. 2A) with scarce long suberect setae; gular suture clearly visible, with a shallow basal pit, continuing as shallow to deep lateral subgenal sutures with anterior and posterior pits clearly defined.

Mouthparts. Mandibles glabrous and shiny; each mandible with 1–2 long, laterally positioned setae, with pharyngeal process 0.9–1.6-times length of mandible; mandibular scar (Fig. 2A) (strongly) reduced, not always clearly visible, apicoventrally situated; deciduous process (Fig. 2B), if present, short and sickle-shaped. Maxillae (Fig. 2A

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![Fig. 2. (A) Apodrosus epipolevatus, head, ventral view; (B) A. argentatus, mandibles with deciduous processes attached; (C) A. wolcottii, right maxilla, ventral view; (D) A. wolcottii, labial prementum, ventral view. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise](image-url)
and 2C) visible along the sides of the prementum, with cardo slender, 3–4-times longer than its greatest width, apically widened, roundly and strongly curved at junction with stipes; stipes with 1–4 lateral setae; palpiger usually with one long lateral seta, surface covered with short, sparse setae, fused with galeo-lacinial complex; the latter mesally extending (at least) to apex of maxillary palpomere I or (at most) to midpoint of maxillary palpomere III; galea apically widely rounded, usually with 4–8 tongue-like apically narrowed setae at apex and often with a basal tuft of shorter, narrower, apically rounded setae; lacinia with 3–5 lacinial teeth and two to several or many long fine setae at base; maxillary palps 3-segmented, maxillary palpomeres of variable lengths, I and II usually with 1–2 mesal lateral setae; apex of palpomere III with papillae. Labium (Fig. 2A and 2D) with prementum not covering the maxillae; prementum subquadrate to rectangular, 1.1–1.9-times longer than wide, with external surface smooth or reticulate; labial palps 3-segmented, inserted near the apex of prementum; palpomeres often apically gradually reducing in size; frequently labial palpomere I with 1 long lateral or ventral seta, III with papillae; postmentum projected as a peduncle.

**Antennae.** 12-segmented, reddish to yellowish, light brown; antennal scape slender, apically widened, extending (in repose) to second third of eyes up to beyond posterior margin of eyes, though not reaching anterior margin of prothorax, passing far below eye, with scarce and sparse fine setae, almost glabrous; funicle 7-segmented, often as long as scape; funicular antennomere I apically widened, usually longer and thicker than II; II usually cylindrical, longer than remaining antennomeres; funicular antennomeres III–VII clavate, progressing from elongate to equilateral, similar in shape and length; antennal club 4-segmented, finely and densely pilose, 0.5–0.8-times length of funicle, 2–3-times longer than wide; club segments I and IV usually similar in length, II and III each slightly longer.

**Thorax.** Pronotum transverse to cylindrical (e.g., Figs 1A and 6A), greatest width at apical third or at midpoint; dorsal surface usually smooth (in some species slightly transversally impressed at anterior third), shallowly and sparsely puncturate, each puncture with a seta; lateral margins subparallel, slightly rounded near midpoint; posterior margin straight to bisinuate, 1–1.3-times width of anterior margin; prothorax in lateral view cylindrical, dorsal outline usually straight, 1.3–1.6-times longer than ventral outline, with anterior margin straight, postocular setae absent; scutellum conspicuous, variously shaped, shiny, usually with scarce setae, almost glabrous. Prosternum and metasternum nearly the same length (e.g., Fig. 1D), mesosternum 0.5–0.9-times length of prosternum and strongly inflected in relation to pro- and metasternum (e.g., Fig. 1D); procoxal cavities contiguous, positioned slightly closer to anterior than to posterior margin of prosternum. Mesosternum with mesocoxal cavities each 3–5-times wider than intercoxal process. Mespimeron and mesepisternum triangular, suture separating them foveate ventrad of midpoint. Metasternum with a median posterior fovea either well developed or reduced, each lateral portion mesally and posteriorly produced (in lateral view, metasternum gradually produced posteriorly), usually each terminating abruptly as a horizontal plica; distance between posterior margin of
mesocoxae and anterior margin of metacoxae 0.6–0.9-times length of prosternum; distance separating metacoxal cavities 0.5–0.6-times width of each metacoxal cavity. Metendosternite (Fig. 3A) with furcal arms longer than stalk, positioned nearly at 120° (or 60°) in relation to horizontal axis (=imaginary straight line connecting hemiducts); ventral margin of stalk 1.3–3.6-times its dorsal width; anterior tendons inserted at midpoint or slightly closer to midline than to base of furcal arms.

**Legs.** Uniformly and densely covered with scales, except on posterior surface of metafemora; femora unarmed, 1.0–1.5-times length of pronotum, mesofemur slightly shorter; tibiae straight, slightly curved inwards at apical 1/6, without denticles, usually with spiniform setae on ventral margin; mucro shorter than tarsal claws, premucro present; apex of protibiae with anterior margin oblique, with an apical fringe of fine, spiniform setae, setae increasing in length towards dorsal margin; metatibiae with anterior margin oblique, with an apical fringe of yellowish or brownish, fine, spiniform setae, setae increasing in length towards dorsal margin, and with a flange shielding tarsal insertion outwardly (corbel semi-enclosed); surface surrounding tarsal condyle glabrous and shiny; tarsi
ventrally densely covered with setae, with tarsomeres I and II subtriangular, I slightly longer than II, III bilobed, 2-times wider than II, IV short, 0.2-times width of II, V shorter than I+II combined; claws connate, simple, subparallel.

_Elytra_ (e.g., Figs 1A and 6A). Length in dorsal view 1.1–2-times their greatest width, which is 1.5–1.9-times wider than pronotum; anterior margins straight to sinuate; humeri present, roundly angulate; humeral region 1.5–1.6-times width of posterior margin of pronotum; lateral margins usually parallel, divergent on basal two-thirds, then straightly to roundly converging to apex; apex widely to narrowly rounded; in lateral view with dorsal outline subplane to strongly convex; posterior declivity gradual, widely rounded to nearly straight; with 10 complete elytral striae, separated from each other by a distance similar to width of a metatibia; punctures deep and glabrous, separated from each other longitudinally by distance similar to the length of each puncture; striae IX and X either completely separated along their entire length by a more or less uniform distance, or fused in mid region along the second third of elytra; intervals uniformly covered with scales, sometimes forming different color patterns, with recurvate and decumbent or straight and erect setae regularly arranged in rows along mid region of elytral intervals; interval X flat to produced along second fifth or sixth of elytra.

_Wings_ (Fig. 3B). Fully developed, 1.2–2.5-times length of elytra, 3–3.7-times longer than wide; costal margin from nearly straight to emarginate along basal half and slightly rounded thereafter; apex widely to acutely rounded, usually as wide as base (distal of alar sclerites); alar venation usually well developed: R and Rr well defined and rs distinct, darkened; radial window (_W_) defined; R3 weakly defined, not reaching alar margin; pst distally narrowed, not reaching alar margin; mst weakly defined; h conspicuous, not reaching alar margin; radial and medial margins nearly straight; Mr, Cu and Cu1 well defined, af distinct; cubital margin nearly straight; 1A1 and 1A2 slightly visible near margin; 2A well defined, vanishing at margin; 3A usually short, at most reaching mid length towards margin of wing, intersecting or not with 2A; 4A visible as a vanishing light stripe; anal area with margin usually rounded; medial, cubital and anal margins with a fringe of short and fine setae separated from each other by distance similar to the length of a seta.

_Abdomen_. Venter (e.g., Fig. 1D) scarcely to densely covered with scales; segments V–VII separate; posterior margin of IV slightly rounded in mid region; VII with anterior margin 1.9–2.5-times wider than its length, usually with a median posterior fovea; ♂: posterior margin of III mesally slightly acutely emarginate, IV 1.2–2-times longer than V to VI jointly, IV 1-1.4x length of VII, posterior margin of VII widely rounded; ♀: posterior margin of III mesally roundly emarginate, IV usually longer than in males, IV 1.4–2-times length of VII, VII posterior margin rounded, slightly narrower than in males.

_Terminalia_. Male with tergum VII (Fig. 4A) transverse to slightly elongate, with two meso-lateral, longitudinally aligned, transversely striate stripes extending to posterior margin, continuing laterally into an area with fine, appressed spines, mesal area
basally wider than a strigulate stripe, posteriorly widened, with simple or multifid setae particularly concentrated in posterior area; anterior margin of tergum VII rounded to triangular; posterior margin laterally rounded, mesally emarginate to rounded. Tergum VIII (Fig. 4B) transverse to equilateral, with anterior margin rounded to mesally acutely emarginate; surface usually evenly convex; posteriorly coarse puncturate, with setae; posterior margin from slightly emarginate in mid region and laterally widely rounded to widely rounded. Sternum VIII (Fig. 4C) forming an entire sickle-shaped plate, usually with spiculum relictum forming a forked process. Sternum IX (spiculum gastrale) (Fig. 4D) with apodeme 1.1–1.6-times longer than aedeagus, anteriorly expanded into an asymmetrical, irregular lamina, posteriorly rounded, narrowly truncate; furcal arms opposed, semi-oval to triangular, variable in degree of sclerotization, separated from stylus yet connected to it by a membrane. Tegmen (Fig. 4E) with tegminal apodeme 0.6–1-times length of aedeagus; basal piece fused with tegminal plate forming a simple ring; tegminal plate simple or mesally slightly projected posteriorly. Aedeagus in dorsal view (Fig. 4F) 3.3–5-times longer than its greatest width, parallel sided to mesally narrowed or apically slightly widened; apex variable. Endophallus with at least a pair of variously shaped, opposed and sclerotized areas positioned near apex, closing the ostium, and 1–2 single or paired sclerites near midpoint; usually without teeth, if present, accommodated in usually a pair of rows of few (3–6) and stepwise alternating or many and contiguous, directed to median longitudinal axis of aedeagus. Aedeagus in lateral view (Fig. 4G) dorsally convex, length 7–10-times its greatest width; dorsal and ventral outlines not uniformly curved, convergent basally. Aedeagal apodemes
0.8–1.1-times length of aedeagus, anteriorly widened; curved at some point, thereafter nearly straight towards base of aedeagus.

**Female.** With tergum VII transverse to slightly elongate, without strigulate stripes; lateral areas with fine, appressed spines; anterior margin rounded; posterior margin mesally emarginate to rounded; marginal area coarsely puncturate, with simple or multifid setae in distal third. Tergum VIII subtriangular, transverse to elongate, anterior margin emarginate, apical margin usually rounded and apical area puncturate, with setae. Sternum VIII (Fig. 5A) slightly shorter than ventral sterna III–VII jointly, lamina occupying posterior one-fourth to one-fifth, triangular, sagittate, rhomboidal or

**Fig. 5.** *Apodrosus wolcotti*, female terminalia. (A) sternum VIII; (B) and (C) coxites in dorsal and lateral view, respectively; (D) spermatheca.
semicircular, with rounded corners; usually median longitudinal region more sclerotized than basal sides, apicolateral areas upwardly plicate, apex with punctures and setae. Coxites+styli (Fig. 5B and 5C) 0.8–1.6-times length of lamina of sternum VIII, stylus 2.4–3.6-times longer than its greatest width, obovate, inserted apicodorsally, with 2–5 apical setae. Genital chamber 0.6–0.8-times length of sternum VIII. Spermatheca (e.g., Figs 5D and 13G) 1.2–1.8-times longer than wide, J- or Y-shaped; cornu nearly straight, length similar to greatest width of spermatheca, usually perpendicular to ramus, with an abruptly narrowed apical projection; margin between cornu and ramus nearly straight; ramus usually longer and wider than collum, apically truncate to rounded, separated from collum by a straight lateral margin; collum usually laterally produced above mid-length of corpus, generally apically narrowed, truncate; surface usually striate, particularly on cornu and ramus.

Etymology

Noun in apposition. Possibly named by Marshall (1922) to express a close affinity to *Polydrusus*, with the Greek term *apo* meaning “related to” and *drosos* meaning “dew, drop” (cf., Brown 1956) which may allude to the weevils’ body shape in dorsal view.

Key to the species of *Apodrosus*

1. Posterior margin of epistome projected basad of rostrum as a carinate stripe; antennal scape surpassing posterior margin of eyes .................................2
1’. Posterior margin of epistome not projected; antennal scape usually not or merely reaching posterior margin of eyes...........................................6

2(1). Lateral profile of metasternum posteriorly strongly projected ..................3
2’. Lateral profile of metasternum posteriorly only slightly produced; body narrow in dorsal view (3.2-times longer than wide); vestiture composed of yellowish brown, black and green, iridescent (yellowish, reddish) scales, with recurvate, lanceolate brown setae (Fig. 6)..........................*A. artus* sp.n.

3(2). Surface of elytra produced basad of midpoint of interval X.................4
3’. Surface of elytra flat along interval X; in dorsal view shield-shaped; elytral striae IX and X fused along their second third; vestiture composed of brown, coppery and green, iridescent (greenish to yellowish) scales, with erect setae; apex of aedeagus uniformly rounded (Fig. 7).........................*A. andersoni* sp.n.

4(3). Surface of elytra strongly produced basad of midpoint of interval X; nasal plate indistinct.................................................................5
4’. Surface of elytra slightly produced along basal fourth of interval X; nasal plate visible; eyes strongly projected; vestiture composed of dark brown, light brown and green, iridescent (reddish) scales, with long, erect and apically truncate, brown and whitish setae (Fig. 8)..................*A. earinusparsus* sp.n.

5(4). Elytral striae IX and X completely separated along their entire length; scale coverage of legs with color pattern; dorsal outline in lateral view subplane to

convex; integument surface slightly tuberculate; vestiture composed of brown, light brown to white, iridescent (greenish, yellowish to reddish) scales, with recurvate, semi-erect setae (Fig. 9)……………………………A. epipolevatus sp.n.

5’. Elytral striae IX and X fused along their second third; scale coverage of legs uniformly colored; dorsal outline in lateral view convex to strongly convex; integument surface slightly undulate; vestiture composed of dark brown, light brown to white, iridescent (reddish) scales, with recurvate, decumbent, brown setae (Fig. 1)………………………………………………A. wolcotti Marshall

6(1’). Antennal scape not or merely reaching posterior margin of eyes………………7

6’. Antennal scape surpassing posterior margin of eyes; eyes strongly projected; vestiture composed of gray and light green, iridescent (greenish to reddish) scales; apex of aedeagus uniformly endophallus (Fig. 10)…………A. eximius sp.n.

7(6). Eyes in dorsal view large and flattened; elytral striae IX and X completely separated along their entire length; vestiture composed of white, light brown or silvery scales…………………………………………………………….8

7’. Eyes in dorsal view mid-sized and produced; elytral striae IX and X fused along their second third; vestiture composed of brown, white or green scales……………………………………………………………………………9

8(7). Nasal plate indistinct; body length 3–5 mm; in dorsal view 2-times its greatest width which is at midpoint of elytra, shape subrectangular; aedeagus without denticulate pads on endophallus (Fig. 11)………………A. argentatus Wolcott

8’. Nasal plate visible; body length 6 mm; in dorsal view, shield-shaped, 2.8x longer than its greatest width which is at anterior third of elytra; aedeagus with a pair of denticulate pads positioned apicad of midpoint of aedeagus (Fig. 12)……………………………………………………………..A. mammuthus sp.n.

9(7’). Median furrow of head apically bifurcated………………………………………10

9’. Median furrow of head reduced, linear; body length 2.5–3.5 mm; vestiture composed of green and pink (on legs), iridescent (reddish) scales, with straight, erect, yellowish setae (Fig. 13)………………………………………..A. viridium sp.n.

10(9). Rostrum mesally constricted; interval X of elytra slightly produced along second fifth……………………………………………………………………11

10’. Rostrum without a mesal constriction; interval X of elytra flat; eyes narrow in lateral view; vestiture uniformly composed of green and white (on legs) iridescent (reddish) scales, with recurvate, decumbent, brown setae (Fig. 14)……………………………………………………………A. stenoculus sp.n.

11(10). Legs coverage uniformly colored; cornu and ramus of spermatheca forming an acute angle of 40–60°………………………………………………………………………………12

11’. Legs coverage not uniformly colored; vestiture composed of white and brown, iridescent (yellowish, reddish to greenish) scales, with recurvate, decumbent, yellowish setae; cornu and ramus of spermatheca forming an angle of nearly 90° (Fig. 15)……………………………………………………………………A. quisqueyanus sp.n.

12(11). Vestiture composed of white and light brown, iridescent (yellowish to reddish) scales; spermatheca with a constriction between cornu and corpus (Fig. 16)……………………………………………………………A. empherefasciatus sp.n.
12’. Vestiture uniformly composed of brown, iridescent (reddish) scales and white scales on the ventral surface; spermatheca not constricted between cornu and corpus (Fig. 17)..........................A. adustus sp.n.

Apodrosus artus Girón & Franz sp.n. (Fig. 6)

Diagnosis

*Apodrosus artus* is characterized by the combination of a relatively narrow body shape (3.2-times longer than wide), the absence of a carinate striped projection on the

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**Fig. 6.** *Apodrosus artus.* (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively. This figure is published in colour in the online version of this journal, which can be accessed via [http://www.brill/ise](http://www.brill/ise)
posterior margin of the epistome, an antennal scape that surpasses the posterior margin of eyes, an only slightly produced metasternum (in lateral profile), an irregularly colored vestiture composed of yellowish brown, black and green, iridescent (yellowish, reddish) scales and with recurvate, lanceolate brown setae, and an aedeagus apex with a mesal, laterally acutely offset projection. This species may be differentiated from *A. andersoni* by its more narrow body shape and parallel-sided elytra with recurvate setae, and from *A. earinusparsus* by a lighter coloration and elytra with recurvate setae. *Apodrosus viridium* has a similar body shape but lacks the irregularly colored scale coverage and presents erect elytral setae.

**Specimens examined**

Holotype ♂ “DOMIN. REP., Prov. La Vega, Jarabacoa-Constanza Rd., Km. 16, 1150 m, 11 Apr 1992, M. A. Ivie, D. S. Sikes & W. Lanier, beating guava” (CMNC); paratypes, same label information as holotype (CMNC: 1 dissected ♂); “DOMIN. REP., La Vega Prov., 2.6-6.4 Km E. of Manabao, 4-VI-1994, coll. M. C. Thomas” (CMNC: 1 ♂).

**Description**

Body length 3.5–4 mm; in dorsal view (Fig. 6A) 3.2-times longer than greatest width which is at second third of elytra, shape subrectangular; dorsal outline in lateral view slightly convex. Integument surface slightly undulated; vestiture composed of yellowish brown, black and green, iridescent (yellowish, reddish) scales, with recurvate, lanceolate brown setae. Eyes (Fig. 6B) 1.3-times longer than wide, projected, 0.5-times width and 0.7-times length of head in lateral view, separated from anterior margin of prothorax by 0.4-times greatest diameter of eye; line of anterior margin of eyes slightly impressed; shortest distance between eyes (dorsal view) 0.4-times greatest width of pronotum; median furrow (Fig. 6B) linear, narrow and shallow, extending from anterior margin of eyes and reaching anterior margin of pronotum. Rostrum (Fig. 6B) slightly longer than wide; epistome (Fig. 6B) apically with 2–3 setae situated on each side; nasal plate weakly defined, flat. Length of rostrum in lateral view 1.4-times its basal width; antennal insertion apicad of midpoint of rostrum; scrobe curved downwards by 65º, directed posteriorly at end, reaching anterior third of eye, separated from it by 1.5-times width of scrobe. Mandibles with 2 lateral seta. Antennae reddish brown; antennal scape extending beyond posterior margin of eyes, though not reaching anterior margin of prothorax; funicular antennomere I 1.6-times longer than II; antennal club 0.6-times length of funicle, 2.5-times longer than wide. Pronotum (Fig. 6A) cylindrical, slightly longer than wide, greatest width apicad of midpoint; dorsal surface shallowly puncturate, each puncture with a curved, lanceolate brown seta; posterior margin slightly bisinuate, as wide as anterior margin; prothorax in lateral view with dorsal outline 1.5-times length of ventral outline; scutellum subcircular, rugose and glabrous. Mesosternum 0.6-times length of prosternum (Fig. 6D); mesocoxal cavities 3.4-times width of intercoxal process. Metasternum with lateral portions posteriorly produced (in lateral profile gradually ascending towards posterior third, thereafter
descending roundly, posterior face glabrous); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of prosternum. Legs with profemora 1.2-times length of pronotum; tibiae with spiniform setae along ventral margin; claws apically divergent. Elytra in dorsal view (Fig. 6A) 1.9-times their greatest width which is 2.2-times wider than pronotum; anterior margins sinuate; humeral region of elytra 1.7-times width of posterior margin of pronotum; lateral margins parallel until second third, thereafter convergent; apex acutely rounded; in lateral view (Fig. 6C) with dorsal outline slightly convex; posterior declivity gradually descending; striae IX and X fused along their second third; intervals completely covered with scales, with dark and light areas forming an irregular pattern; interval V slightly produced at posterior declivity; interval X flat; with recurvate, lanceolate brown setae. Venter (Fig. 6D) with green scales, denser on sides, scarce and elongate in mid region; segment IV slightly longer than V and VI jointly; ♂: IV as long as VII, VII with anterior margin 2.2-times wider than its length, posterior margin of VII widely rounded.

**Terminalia.** Male with tergum VII 1.2-times wider than its mesal length, posteromesal area with setae; anterior margin nearly triangular, mesally narrowly rounded, posterior margin mesally emarginate. Tergum VIII transverse, 1.3-times wider than its mesal length, with anterior margin mesally roundly emarginate; posterior margin widely rounded. Sternum VIII with posterior margin nearly straight, spiculum relictum lightly sclerotized, forming a forked process with base 4.5-times longer than wide, 4.5-times longer than arms. Spiculum gastrale with apodeme 1.4-times longer than aedeagus, each furcal arm sclerotized, reniform. Tegmen with tegminal apodeme 0.6-times length of aedeagus; tegminal plate simple. Aedeagus in dorsal view (Fig. 6E) 3.8-times longer than its greatest width; apex roundly truncate, laterally acutely off set. Endophallus with a pair of small sclerites positioned at apical third and a reduced sclerite at basal third. Aedeagus in lateral view (Fig. 6F) almost acutely convex, 11-times as long as its greatest width. Aedeagal apodemes slightly longer than aedeagus.

**Female.** Unknown.

**Variation**

The scale coloration pattern is irregular and displays some variation between specimens.

**Etymology**

Named in reference to the narrow body shape, with Latin adjective *artus* meaning “narrow” (Brown 1956).

**Natural history**

*Apodrosus artus* is known to occur in the Central Cordillera at an altitudinal range of 1000–1150 m, in the La Vega province of the Dominican Republic, northeast of Pico
Duarte, the highest elevation of the Hispaniola (Fig. 18B). Adults have been taken on guava (*Psidium guajava* Linnaeus, Myrtaceae).

*Apodrosus andersoni* Girón & Franz sp.n. (Fig. 7)

**Diagnosis**

*Apodrosus andersoni* is characterized by the combination of a shield-shaped body which is widest at the second third of the elytra, the absence of a carinate striped projection

![Fig. 7. *Apodrosus andersoni*. (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise]
on the posterior margin of the epistome, an antennal scape that surpasses the posterior margin of the eyes, a posteriorly strongly produced metasternum (in lateral profile), a fusion of elytral striae IX and X along their second third, a flat surface along interval X of the elytra, an irregularly colored vestiture composed of brown, coppery and green, iridescent (greenish to yellowish) scales and with erect setae, and a continuously and uniformly rounded aedeagal apex. This species may be differentiated from *A. artus* by its shield-shaped body (particularly in females) with diverging lateral margins of the elytra, accompanied by erect (as opposed to recurvate) elytral setae. Furthermore, it differs from *A. earinusparus* by having a lighter coloration and a shorter and shallower median furrow on the head, as well as a fusion of elytral striae IX and X along their second third.

**Specimens examined**

Holotype ♀ “DOMINICAN REPUBLIC, Pedernales, 60 Km. N.W. Cabo Rojo, 1200 m, Las Abejas, cloud forest, 30.IX.1991, sweep, Masner & Peck, 91-354” (CMNC); paratypes, same label information as holotype (CMNC: 2 ♂, including 1 dissected, 1 dissected ♀).

**Description**

Body length 3–3.5 mm; in dorsal view (Fig. 7A) 2.4-times longer than greatest width which is apicad of midpoint of elytra, shape escudate; dorsal outline in lateral view convex. Integument surface smooth; vestiture composed of brown, coppery and green, iridescent (greenish to yellowish) scales, with erect setae. Eyes (Fig. 7B) 1.5-times longer than wide, projected; 0.5-times width and 0.6-times length of head in lateral view, separated from anterior margin of prothorax by 0.7-times greatest diameter of eye; line of anterior margin of eyes slightly impressed; shortest distance between eyes (in dorsal view) 0.3-times greatest width of pronotum; median furrow (Fig. 7B) linear, deep, extending from mid-length of rostrum and slightly exceeding posterior margin of eyes. Rostrum (Fig. 7B) 1.1-times longer than wide, constricted at midpoint; epistome apically with 2–4 setae situated on each side; nasal plate not defined. Length of rostrum in lateral view 1.4-times its basal width; antennal insertion at midpoint of rostrum; scrobe curved downwards by 60°, directed ventrally at end, extending to anterior margin of eye, separated from it by width of scrobe. Mandibles with 2 lateral setae. Antennae light brown; antennal scape extending beyond posterior margin of eye, not reaching anterior margin of prothorax; funicular antennomere I 1.5-times longer than II; antennal club 0.6-times length of funicle, 2.9-times longer than wide. Pronotum (Fig. 7A) subquadrate, slightly longer than wide, greatest width at midpoint; dorsal surface shallowly puncturate, each puncture with a curved, spatulate brown seta; posterior margin nearly straight, 1.1-times wider than anterior margin; prothorax in lateral view with dorsal outline 1.8-times length of ventral outline; scutellum oval and glabrous. Mesosternum (Fig. 7D) 0.8-times length of prosternum. Metasternum with lateral portions posteriorly produced (in lateral profile gradually ascending towards posterior third, thereafter descending roundly, posterior face
covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of prosternum. Legs with profemora 1.2-times length of pronotum. Elytra in dorsal view (Fig. 7A) 1.6-times their greatest width which is 1.6-times wider than pronotum; anterior margins sinuate; humeral region 1.5-times width of posterior margin of pronotum; apex acutely rounded; in lateral view (Fig. 7C) with dorsal outline convex; posterior declivity gradual; striae IX and X fused along their second third; intervals completely covered with scales, forming a coppery/green irregular pattern, with brown spots on intervals I, III and V near midpoint of elytra; interval X flat; with erect, linear, apically truncate, brown setae. Venter (Fig. 7D) with elongate, scattered, greenish scales, denser at sides of segments III and IV; VII with anterior margin 1.9-times wider than its length; ♂: IV 1.1-times longer than V and VI jointly, as long as VII, VII with posterior margin rounded; ♀: IV 1.4-times longer than V and VI jointly, 1.7-times length of VII, VII with posterior margin mesally narrowed.

**Terminalia.** Male with tergum VII 1.4-times wider than its mesal length, with setae on posterior margin; anterior margin rounded; posterior margin nearly straight. Tergum VIII 1.4-times wider than its mesal length; anterior margin nearly straight; posterior margin widely rounded. Sternum VIII with scapus relictum as a forked process with base 1.8-times longer than wide, arms narrow, linear, 1.2-times longer than base. Scapus gastrale with apodeme 1.6-times longer than aedeagus, each arm sickle-shaped. Tegmen with tegminal apodeme nearly 0.7-times length of aedeagus; tegminal plate simple. Aedeagus in dorsal view (Fig. 7E) 4-times longer than its greatest width, slightly constricted apicad of midpoint; apex straight, laterally rounded. Endophallus with a pair of light plates near apex and a pair of parentheses-shaped sclerites positioned near midpoint. Aedeagus in lateral view (Fig. 7F) 8.6-times longer than its greatest width. Aedeagal apodemes 1.2-times length of aedeagus.

**Female.** With tergum VII suboval, slightly longer than wide, posterior margin rounded. Tergum VIII subtriangular and nearly as wide as long. Sternum VIII with lamina semicircular, occupying posterior one fourth. Coxites+styli nearly as long as lamina of sternum VIII, stylus 3-times longer than its greatest width, with 2 long and 2–3 shorter apical setae. Genital chamber 0.7-times length of sternum VIII. Spermatheca (Fig. 7G) 1.5-times longer than wide, J-shaped; ramus apically truncate, laterally rounded; collum short, narrower than ramus, apically truncate; surface striate.

**Variation**

Little variation was noted among the examined specimens, other than a sexually dimorphic body shape with the males being slightly narrower than females.

**Etymology**

Patronymic; named after weevil taxonomist Dr. Robert Anderson (Canadian Museum of Nature) whose strong support is gratefully acknowledged.
Natural history

*Apodrosus andersoni* is known to occur in a cloud forest habitat at 1200 m in Cabo Rojo, in northwest section of the Pedernales province, Dominican Republic (Fig. 18B). The host plant associations remain unknown.

*Apodrosus earinusparsus* Girón & Franz sp.n. (Fig. 8)

**Diagnosis**

*Apodrosus earinusparsus* is characterized by the combination of a visible nasal plate, strongly projected eyes, a complete separation of elytral striae IX and X along their

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**Fig. 8.** *Apodrosus earinusparsus*. (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise
entire length, a slightly produced surface along interval X of the elytra, predominantly
dark brown scales interspersed with green speckles and long, erect and apically trunc-
cate, brown and whitish setae, and a truncate mesal projection of the aedeagal apex.
This species may be differentiated from *A. artus* by its shield-shaped body accompanied
by erect elytral setae and the completely separated elytral striae IX and X. It furthermore differs from *A. andersoni* by its darker coloration and a longer and deeper median
furrow on the head.

**Specimens examined**

Holotype ♀ “HAITI, Dept. Sud-Oueste, Parc National La Visite, Morne La Visite,
2100 m, 12-V-1984, M. C. Thomas” (CMNC); paratypes, same label information as
male holotype (CMNC: 2 ♂; including 1 dissected; FSCA: 5 ♂; 2 ♀); “HAITI, Dept. Sud-Oueste, Parc Nat’l La Visite, between pk. Hdqtrs./ & Morne d’Enfer, 14-V-1984,
M. C. Thomas” (CMNC: 1 ♂); “HAITI, Dept. Sud-Oueste, Massif de la Selle, Morne
d’Enfer, 1850 m, 15-V-1984, M. C. Thomas” (CMNC: 1 dissected ♀); “HAITI, Dept. Sud-Oueste, Massif de la Selle, saddle between d’Enfer & Fe de Noir, 1700 m, 16-V-1984,
M. C. Thomas” (CMNC: 1 dissected ♀); “HAITI, Dept. Sud-Oueste, Massif de la Selle, Morne d’Enfer, 1850 m, 16-V-1984, M. C. Thomas” (FSCA: 2 ♂).

**Description**

Body length 3.5–4.5 mm; in dorsal view (Fig. 8A) 2.8-times longer than greatest width
which is at second third of elytra, shape escudate; dorsal outline in lateral view convex.
Integument surface slightly undulated; vestiture composed of dark brown, light brown
and green, iridescent (reddish) scales, with long, erect and apically truncate, brown and
whitish setae. Eyes (Fig. 8B) 1.3-times longer than wide, strongly projected, 0.5-times
width and 0.5-times length of head in lateral view, separated from anterior margin of
prothorax by 0.8-times greatest diameter of eye; line of anterior margin of eyes
impressed; shortest distance between eyes (in dorsal view) 0.4-times greatest width of
pronotum; median furrow (Fig. 8B) linear, deep, extending from apical fifth of rostrum
to posterior margin of eyes. Rostrum (Fig. 8B) 1.2-times longer than wide, mesally
narrowed; epistome apically with 5 setae situated on each side; nasal plate well defined,
flat. Length of rostrum in lateral view 1.4-times its basal width; antennal insertion at
apical third of rostrum; scrobe curved downwards by 50°, directed posteriorly at end,
not reaching anterior margin of eye, separated from it by width of scrobe. Mandibles
with 2 long and 1 very short lateral seta. Antennae reddish brown; antennal scape
extending beyond posterior margin of eye, not reaching anterior margin of prothorax;
funicular antennomere I slightly longer than II; antennal club 0.4-times length of
funicle, 2.5-times longer than wide. Pronotum (Fig. 8A) subquadrate, as long as wide,
with greatest width at apical third; dorsal surface deeply puncturate, with curved,
brown setae; posterior margin bisinuate, 1.2-times wider than anterior margin; pro-
thorax in lateral view with dorsal outline 1.4-times length of ventral outline; scutellum
oval, glabrous. Mesosternum (Fig. 8D) 0.6-times length of prosternum. Metasternum
with lateral portions posteriorly produced (in lateral profile gradually ascending towards
posterior third, thereafter descending abruptly, posterior face glabrous); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of prosternum. Legs with profemora 1.5-times length of pronotum; tibiae with scarce, long, spiniform setae along ventral margin; claws divergent. Elytra in dorsal view (Fig. 8A) 1.9-times their greatest width which is 1.6-times wider than pronotum; anterior margins sinuate; humeral region 1.6-times width of posterior margin of pronotum; apex acutely rounded; in lateral view (Fig. 8C) with dorsal outline slightly undulated; posterior declivity gradually descending in males, distinct in females; striae IX and X completely separated along their entire length; intervals covered with scales, with a dark, transversely inverted V-shaped band basad of midpoint, surrounded by green scales and dark spots at margins; interval IV produced at basal sixth and at posterior declivity; interval IX slightly produced along basal fourth; with long, erect, apically truncate brown and yellowish setae. Venter (Fig. 8D) with elongate, green scales on sides, mid region almost glabrous; posterior margin of VII widely rounded; ♂: IV 1.3-times longer than V and VI jointly, as long as VII, VII with anterior margin 2.3-times wider than its length; ♀: IV 1.6-times longer than V and VI jointly, 1.6-times length of VII, VII with anterior margin 1.8-times wider than its length.

**Terminalia.** Male with tergum VII as long as wide; anterior margin nearly triangular, mesally narrowly rounded; posterior margin mesally slightly emarginate; posterior and marginal areas with simple setae. Tergum VIII transverse, 2-times wider than its mesal length; anterior margin mesally narrowly rounded; posterior margin mesally slightly emarginate, laterally rounded. Sternum VIII with spiculum relictum not developed. Spiculum gastrale with apodeme 1.4-times longer than aedeagus, each furcal arm semicircular. Tegmen with tegminal apodeme nearly 0.6-times length of aedeagus; tegminal plate mesally slightly posteriorly projected. Aedeagus in dorsal view (Fig. 8E) 3.9-times longer than its greatest width, slightly narrowed apicad of midpoint; apically narrowed, apex mesally abruptly truncate. Endophallus with a pair of lateral plates at apical fourth, with a small median sclerite and a pair of elongate, irregular lateral sclerites basad of midpoint. Aedeagus in lateral view (Fig. 8F) 8.4-times longer than its greatest width; apex dorsally slightly produced. Aedeagal apodemes as long as aedeagus.

**Female.** With tergum VII slightly wider than long; posterior margin rounded. Tergum VIII 1.4-times wider than long. Sternum VIII with lamina triangular, occupying posterior one fifth. Coxites+styli as long as lamina of sternum VIII, stylus 3.6-times longer than its greatest width, with one long apical seta. Genital chamber 0.4-times length of sternum VIII. Spermatheca (Fig. 8G) 1.7-times longer than wide, J-shaped; cornu roundly curved towards collum, margin between cornu and ramus slightly emarginate; ramus apically narrowed; collum apically widely rounded; surface striate.

**Variation**

The examined specimens vary primarily in size and also slightly in their coloration patterns.
Etymology
Noun in apposition. Named for the predominantly dark brown coloration interspersed with green speckles, with *earinus* meaning “green, the color of the spring” and *sparsus* meaning “strewn, sprinkled” (Brown 1956).

Natural history
*Apodrosus earinusparsus* is known to occur at an elevation range of 1700–2100 m, in the central region of the Department Sud-Ouest of Haiti (Fig. 18B). The host plant associations remain unknown.

*Apodrosus epipolevatus* Girón & Franz sp.n. (Fig. 9)

Diagnosis
*Apodrosus epipolevatus* is characterized by the combination of subplane to convex dorsal outline in lateral view, an indistinct nasal plate, a slightly tuberculate surface of the elytra, an alternating color pattern of scale vestiture on the legs, a strongly produced surface of the elytra basad of the midpoint of interval X, a complete separation of elytral striae IX and X along their entire length, and a vestiture composed of brown and light brown to white, iridescent (greenish, yellowish to reddish) scales, and with recurvate, semi-erect setae. This species may be differentiated from *A. wolcottii* by its smaller size, the slightly tuberculate elytral surface, and the completely separated elytral striae IX and X.

Specimens examined
Holotype ♀ “Puerto Rico (USA), Bosque Estatal Toro Negro, Cerro de Punta, 1330 m, N 18°10.2' W 66°35.31'0", Beating/ sweeping plants/ Mar 15/2008, Leg. J. Cardona, N. Franz, J. Girón, A. Mazo” (UPRM); paratypes, same label information as holotype (CMNC: 2 ♂, 1 ♀; CWOB: 2 ♂, 1 ♀; MEBT: 2 ♂; NMNH: 2 ♂, 1 ♀; UPRM: 2 ♂); “PUERTO RICO, Guilarte For. Res., Hwy. 131 & 158, July 23-1979, G.B. Marshall” (UPRM: 1 ♀); “PUERTO RICO, Carib. N. F., El Toro Negro, D., Hwy. 143, K16H4, 7-21-1979, C.W.O’Brien/ on Rubus sp.” (UPRM: 1 ♀); “PUERTO RICO, Carib. N. F., El Toro Negro, D., Hwy. 143, K16H4, 7-21-1979, G.B. Marshall” (UPRM: 1 ♂); “Puerto Rico (USA), Bosque Estatal Toro Negro, Cerro de Punta, 1330 m, N 18°10.333’ W 66°35.513’/ Beating/sweeping plants, Leg. Cardona, Castellanos, Franz & Girón; Jan-04-2008” (UPRM: 4 ♂, 4 ♀); “Puerto Rico (USA), Bosque Estatal Toro Negro, Cerro de Punta, 1320 m, N 18°10.32’ W 66°35.53’/ beating/sweeping plants, leg. N. Franz & J. Girón, VIII-07-2007” (UPRM: 2 ♂, including dissected, 1 ♀; MEBT: 1 ♀); “Puerto Rico (USA), Bosque Estatal Toro Negro, Cerro Monte de Jayuya, 1320 m, N 18°10.064’ W 66°34.596’/ Beating/sweeping plants, Leg. Cardona, Castellanos, Franz & Girón; Jan-04-2008” (UPRM: 4 ♀); “USA, Puerto Rico, Bosque Estatal Toro Negro, Biol. Stat. UPRM, 935 m, N 18°10‘43’ W 66°29‘19”/ beating/sweeping plants, leg. N. Franz & J. Girón, VIII-07-2007” (UPRM: 1 ♀);

**Description**

Body length 2–4 mm; in dorsal view (Fig. 9A) 2.5-times longer than greatest width which is at basal third of elytra, shape escudate; dorsal outline in lateral view subplane in males, convex in females. Integument surface slightly tuberculate; vestiture composed of brown and light brown to white, iridescent (greenish, yellowish to reddish) scales, with recurvate, semi-erect setae. Eyes (Fig. 9B) 1.5-times longer than wide, projected; 0.6-times width and 0.7-times length of head in lateral view, separated from anterior margin of prothorax by 0.5-times greatest diameter of eye; line of

![Fig. 9. Apodrosus epipolevatus. (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise](http://www.brill/ise)
anterior margin of eyes slightly impressed; shortest distance between eyes (in dorsal view) 0.3-times greatest width of pronotum; median furrow (Fig. 9B) linear, deep, extending from mid length of rostrum to posterior margin of eyes. Rostrum (Fig. 9B) 1.1-times longer than wide, constricted at midpoint; apical half with a shallow V-shaped impression; epistome apically with 2-3 setae situated on each side; nasal plate not defined. Length of rostrum in lateral view 1.4-times its basal width; antennal insertion at apical fourth of rostrum; scrobe curved downwards by 45°, directed ventrally at end, extending to anterior margin of eye, separated from it by 1.2-times width of scrobe. Mandibles with 2 lateral setae, pharyngeal process 1.6-times longer than mandible. Maxillae with cardo 3-times longer than its greatest width; stipes with 2-3 lateral setae; galeo-lacinial complex mesally extending to midpoint of maxillary palpmere II, apex with 4-5 tongue-like apically narrowed setae and a tuft of shorter and apically rounded setae, with 3 lacinial teeth and 4 long fine setae at base of lacinia; maxillary palpmere I slightly longer than II, II slightly longer than III; II and III with 2 mesolateral setae. Labium with prementum 1.9-times longer than wide, apex slightly roundly produced in mid region, with external surface sculptured. Antennae yellowish brown; antennal scape extending beyond posterior margin of eye, not reaching anterior margin of prothorax; funicular antennomere I as long as II; antennal club 0.6-times length of funicle, 2.2-times longer than wide. Pronotum (Fig. 9A) subquadrate, slightly wider than long, greatest width at midpoint; dorsal surface slightly depressed at apical third, shallowly puncturate, each puncture with a curved, spatulate brown seta; posterior margin slightly bisinuate, 1.2-times wider than anterior margin; prothorax in lateral view with dorsal outline 1.7-times length of ventral outline; scutellum subcircular, with scarce setiform scales. Mesosternum (Fig. 9D) 0.5-times length of prothorax. Metasternum with lateral portions mesally produced (in lateral profile mesally roundly produced); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of metasternum. Metendosternite with furcal arms 1.4-times longer than stalk, positioned at 120° in relation to horizontal axis; length of ventral margin of stalk 3.1-times its dorsal width. Legs with profemora 1.3-times length of pronotum; claws subparallel. Elytra in dorsal view (Fig. 9A) 1.6-times their greatest width which is 1.6-times wider than pronotum; anterior margins sinuate; humeral region 1.5-times width of posterior margin of pronotum; lateral margins subparallel until midpoint, thereafter convergent; apex roundly truncate; in lateral view (Fig. 9C) with dorsal outline subplane to convex; posterior declivity gradual; striae IX and X completely separated along their entire length; intervals completely covered with oval scales, forming an irregular dark/light pattern; interval III with three elevations (at base, at second and at third fifth); interval V with two elevations (at second and at third fifth); interval X strongly produced along basal third; with recurvate, spatulate, brown setae. Wings nearly as long as elytra, 3.1-times longer than wide; costal margin emarginate along basal third; apex rounded; alar venation reduced, only R, Cu and 2A, defined, vanished apically; radial, medial and cubital margins nearly straight; anal area with margin slightly emarginate. Venter with elongate, scattered, greenish scales, denser at sides; IV 1.5-times longer than V and VI jointly; median posterior pit of segment VII reduced to absent; VII with anterior margin 2-times wider than its length; ♂: IV
as long as VII; VII posterior margin rounded; ♀: IV 1.4-times length of VII; VII posterior margin slightly narrowed mesally.

**Terminalia.** Male with tergum VII 1.5-times wider than its mesal length, mesal area with setae on distal half; anterior margin with mesal area projected, truncate; posterior margin nearly straight, posterior area with long multifid setae. Tergum VIII 1.5-times longer than its mesal length, with anterior margin acutely emarginate; apical margin rounded. Sternum VIII with posterior margin emarginate; spiculum relictum as a linear process 5.2-times longer than wide, with apical fourth darker. Spiculum gastrale with apodeme 1.2-times longer than aedeagus, each arm sclerotized, narrowly oval, with parallel inner margins. Tegmen with tegmental apodeme nearly 0.6-times length of aedeagus; tegmental plate simple. Aedeagus in dorsal view (Fig. 9E) 5-times longer than its greatest width, slightly constricted apicad of midpoint; apex mesally roundly set off. Endophallus with a pair of lateral plates at apical fifth, with a light, elongate, median sclerite, with a pair of vertical rod-like sclerites positioned near midpoint, between these with 1 n-shaped sclerite. Aedeagus in lateral view (Fig. 9F) 8-times longer than its greatest width. Aedeagal apodemes 0.9-times length of aedeagus.

**Female.** With tergum VII 1.6-times wider than long, posterior margin rounded. Tergum VIII nearly trapezoidal, 1.5-times wider than long. Sternum VIII with lamina rhomboidal, occupying posterior one fourth. Coxites+styli nearly as long as lamina of sternum VIII, stylus 3.6-times longer than its greatest width, with 3-4 long apical setae. Genital chamber 0.7-times length of sternum VIII. Spermatheca (Fig. 9G) 1.8-times longer than wide, J-shaped; ramus apically truncate, laterally rounded; surface striate.

**Variation**

The examined specimens vary mainly in their color pattern which is either slightly spotted or uniformly colored. There is also slight variation in the degree of projection of the elytral elevations.

**Etymology**

Noun in apposition. Named after the Greek *epipole* signifying “surface” and the Latin *levatus* signifying “raise” (Brown 1956), thus referring to the characteristic elytral elevations of this species.

**Natural history**

*Apodrosus epipolevatus* occurs at some of the highest elevations of the Puerto Rico Central Cordillera (Cerro de Punta, Monte Jayuya, Carite) (Fig. 19A). Under laboratory conditions the oviposition pattern corresponds to “type a” according to Emden (1950; cited by Marvaldi 1999), in which the eggs are laid separately and randomly; the egg shell is white when recently oviposited, becoming darker during subsequent
days. The observed eggs hatched within 14-16 days. Only first instar larvae were obtained at that time. The host plant associations remain unknown.

**Apodrosus wolcotti** Marshall 1922: 59 (Figs 1 and 3–5)

**Diagnosis**

*Apodrosus wolcotti* is characterized by the combination of a slightly undulate integument surface, an indistinct nasal plate, large and strongly projected eyes, strongly convex elytra (particularly in females) which are furthermore strongly produced basad of the midpoint of interval X, a fusion of elytral striae IX and X along their second third, a vestiture composed of dark brown and light brown to white, iridescent (reddish) scales and with recurvate, decumbent, brown setae; and non-projected spermathecal cornu. This species may be differentiated from *A. epipolevatus* by its larger size and slightly undulate elytral surface. Furthermore, it differs from *A. earinusparsus* by its recurvate elytral setae and coverage coloration without green speckles.

**Specimens examined**

“PUERTO RICO, 3 mi S. Maricao, II-9-1969/ at night, L. & C. W. O’Brien” (CWOB: 1 ♂); “PUERTO RICO, II-9-1969, 5 mi S. Maricao, C. W. O’Brien” (CWOB: 1 ♂); “PUERTO RICO, Hwy. 120, K10H2, Maricao For. Res., July 25, 1979, L. B. O’Brien” (CWOB: 1 ♀); “USA, Puerto Rico, Bosque Estatal Maricao, N 18°09′24″, W 66°59′52″, 750 m, general collecting, leg. N. Franz, III-23-2006” (UPRM: 3 ♀); “USA, Puerto Rico, Bosque Estatal Maricao, N 18°08′26″, W 66°58′20″, 820 m, beating at night, leg. N. Franz, V-10-2006” (UPRM: 3 ♀, including 1 dissected); “USA, Puerto Rico, Bosque Estatal Maricao, S. Alto Descanso, 760 m, N 18°09′27″, W 66°59′56″/ beating at night, leg. N. Franz, J. Conde, J. Metcalf & S. Ríos, VI-21-2006” (UPRM: 1 ♀); “USA, Puerto Rico, Bosque Estatal Maricao, Rt. 120, Km 13.1, 830 m, N 18°08′26″, W 66°58′24″/ beating plants, leg. N. Franz & J. Metcalf, VII-14-2006” (UPRM: 2 ♂, including 1 dissected, 1 ♀); “USA, Puerto Rico, Bosque Estatal Maricao, Rt. 120, Km 9.2, 690 m, N 18°08′04″, W 66°57′18″/ Beating plants, leg. N. Franz & J. Metcalf, VII-28-2006” (UPRM: 2 ♂, 1 ♀); “USA, Puerto Rico, Bosque Estatal Maricao, Rt. 120, Km 9.2, 680 m, N 18°08′04″, W 66°57′18″/ leg. Castellanos, Crespo, Franz, Rivera, Tamaris, Yussef, IX-09-2006” (UPRM: 3 dissected ♂, 1 ♀); “Puerto Rico, (USA), Bosque Estatal Maricao, Route 120, Km 9.2, 670 m/ N 18°08′05″, W 66°57′29″/ beating plants at night, leg. N. Franz, XII-22-2006” (UPRM: 2 dissected ♂, 1 ♀); “PUERTO RICO, Maricao, Bosque Estatal Maricao, N 18°9′30″, W 66°59′53″, 480 m, beating plants, Dec 9/[20]08, Leg. J. Girón, A. Mazo” (UPRM: 1 ♀); “Puerto Rico, Maravilla, Finca Mayol/ 18-VII-71, J. Micheli/ at light/ #11/Compared with type ♀, *Apodrosus wolcotti* Mshl” (CWOB: 1 ♀); “PUERTO RICO, Guajataca For. Res., July 27, 1979/ Collector: G. B. Marshall” (CWOB: 1 ♂, 1 ♀); “PUERTO RICO, Barrio Carrizales, Indiera Alta, 21-V-1987, N. Virkki” (CWOB: 1 ♂); “Adjuntas, VI-1-1934, C. M. Matos” (UPRM: 1 ♀); “Puerto Rico, (USA), Bosque Estatal Toro Negro, Cerro de Punta, 1330 m/ N 18°10′33″, W 66°35′51″/ Beating/

Redescription

Body length 4-6 mm; in dorsal view (Fig. 1A) 3-times longer than greatest width which is at second third of elytra, shape escudate; dorsal outline in lateral view convex in males, strongly convex in females. Integument surface slightly undulated; vestiture composed of dark brown and light brown to white, iridescent (reddish) scales, with recurvate, decumbent, brown setae. Eyes (Fig. 1B) 1.5-times longer than wide, strongly projected, 0.5-times width and 0.7-times length of head in lateral view, separated from anterior margin of prothorax by 0.3-times greatest diameter of eye; line of anterior margin of eyes slightly impressed; shortest distance between eyes 0.3-times greatest width of pronotum; median furrow (Fig. 1B) linear, deep, extending from anterior third of eyes beyond their posterior margin though not reaching anterior margin of pronotum. Rostrum 1.5-times longer than wide; epistome apically with 3-4 setae situated on each side; nasal plate not defined. Length of rostrum in lateral view 1.3-times its basal width; antennal insertion near apical third of rostrum; antennomere I as long as II; antennal club 0.8-times length of funicle, 2.5-times longer than wide. Pronotum (Fig. 1A) transverse, 1.3-times wider than long, greatest width at basal third; dorsal surface shallowly puncturate, each puncture with a curved, spatulate, brown seta; posterior margin slightly bisinuate, 1.3-times
wider than anterior margin; prothorax in lateral view with dorsal outline 1.5-times length of ventral outline; scutellum subcircular, with scarce setiform scales. Mesosternum (Fig. 1D) 0.6-times length of prosternum. Metasternum with lateral portions posteriorly strongly produced (in lateral profile gradually ascending towards posterior fourth, thereafter descending roundly, posterior face covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.9-times length of prosternum. Metendosternite (Fig. 3A) with furcal arms 1.3-times longer than stalk, positioned nearly at 120° in relation to horizontal axis; ventral margin of stalk 2.2-times its dorsal width. Legs with profemora 1.5-times length of pronotum; tibiae with short, curved setae along ventral margin; claws slightly divergent. Length of elytra in dorsal view (Fig. 1A) 1.7-times their greatest width which is 1.7-times wider than pronotum; anterior margins sinuate; humeral region 1.6-times width of posterior margin of pronotum; lateral margins subparallel until second third, thereafter convergent; apex acutely rounded; in lateral view (Fig. 1B) with dorsal outline strongly convex, particularly in females; posterior declivity gradually descending; striae IX and X fused along their second third; intervals completely covered with oval scales, usually darker along anterior half, thereafter lighter; interval X strongly produced along second fifth; with recurvate, spatulate, brown setae. Wings (Fig. 3B) 2.2-times length of elytra, 3-times longer than wide; costal margin emarginate along basal third; apex rounded; cubital margin slightly rounded; alar venation well developed, 3A intersecting with 2A; 4A not defined; anal area with margin slightly emarginate. Venter (Fig. 1D) with elongate, apically truncate, whitish scales, denser on sides, scarce in mid region; IV 1.5-times longer than V and VI jointly; posterior margin of VII widely rounded; ♂: IV 1.4-times length of VII, VII with anterior margin 2-times wider than its length; ♀: IV 1.8-times length of VII, VII with anterior margin 2.5-times wider than its length.

Terminalia. Male with tergum VII (Fig. 4A) 1.4-times wider than its mesal length; anterior margin nearly triangular, mesally narrowly truncate, posterior margin mesally emarginate, posterior area with long bifid setae. Tergum VIII (Fig. 4B) transverse, 1.9-times wider than its mesal length, with anterior margin acutely emarginate; posterior margin mesally slightly emarginate, laterally rounded, with setae on posterior half. Sternum VIII (Fig. 4C) with posterior margin mesally emarginate, spiculum relictum present, forming a forked process with base as long as arms, 2-times longer than wide, arms darker from midpoint to apex. Spiculum gastrale (Fig. 4D) with apodeme 1.6-times longer than aedeagus, each furcal arm sclerotized, suboval, both with parallel inner margins, emarginate at junction with apodeme. Tegmen (Fig. 4E) with tegminal apodeme 0.9-times length of aedeagus; tegminal plate simple. Aedeagus in dorsal view (Fig. 4F) 3.8-times longer than its greatest width, parallel sided; apex set off, projected laterally, mesally strongly emarginate. Pedon with an oval elongate opening extending from mid length nearly to apex. Endophallus with a pair of apically opposed, elongate, irregular plates, with a median semi-triangular sclerite positioned at apical third, and with 2 lateral irregular rows of 10-30 triangular, narrow teeth, each row with apices of teeth directed mesally. Aedeagus in lateral view (Fig. 4G) 7.6-times longer than its greatest width; apex dorsally projected. Aedeagal apodemes 0.8-times length of aedeagus.
Female. With tergum VII as long as wide; posterior margin rounded. Tergum VIII subtrapezoidal, 1.6-times longer than wide. Sternum VIII (Fig. 5A) with lamina spatulate, occupying posterior one fourth. Coxites+styli (Fig. 5B and 5C) 1.6-times length of lamina of sternum VIII, stylus 3.1-times longer than its greatest width, with 1 long and 3-4 shorter apical setae. Genital chamber 0.6-times length of sternum VIII. Spermatheca (Fig. 5D) 1.8-times longer than wide, J-shaped; cornu roundly curved towards ramus; margin between cornu and ramus roundly emarginate; ramus apically truncate, almost laterally situated, nearly opposed to collum; collum apically narrowed; surface of cornu striate, reticulate on collum.

Variation

The examined specimens vary mainly in size and coloration pattern, displaying either a defined lighter posterior area preceded by a dark transversal band, or a uniform coloration.

Natural history

*Apodrosus wolcotti* occurs mainly at higher elevations of the Puerto Rican Central Cordillera, at 300-1320 m above sea level (Fig. 19A). According to Wolcott (1924), the adults feed on *Inga vera* Willd. (Fabaceae) and are found resting on coffee leaves (*Coffea arabica* Linnaeus, Rubiaceae). Martorell (1976) lists the following additional putative host plant species of *A. wolcotti*: *Inga fagifolia* (Linnaeus) Willd. ex Benth. (Fabaceae) and *Vanilla fragrans* Ames (Orchidaceae).

*Apodrosus eximius* Girón & Franz sp.n. (Fig. 10)

Diagnosis

*Apodrosus eximius* is characterized by the combination of a mesally constricted rostrum, strongly projected eyes, a long antennal scape which surpasses the posterior margin of the eyes, the presence of a carinate striped projection on the posterior margin of the epistome, an integument covered with gray and light green, iridescent (greenish to reddish) scales, and posterior femora uniformly colored. This species may be differentiated from *A. argentatus* by its strongly projected eyes, the mesally constricted rostrum, and a more uniformly colored (as opposed to spottily patterned) scale coverage of elytra.

Specimens examined

Holotype ♂ “DOMINICAN REPUBLIC, La Altagracia Province, Guaraguao, 0-5 m, 3.VII.2006, 18°19.994′ N, 68°48.710′ W, leg. A. Konstantinov” (NMNH); paratypes “D. R., La Romana, Bayahíbe, Parque Nacional del Este, Guaraguao Station, main trail, 2 m, N 18°19′52.7″ W 68°48′40.7″/ Jun 01/2008, (RD 1-1), leg. N. Franz, J. Girón, A. Mazo, S. Navarro” (CWOB: 1 ♂, 1 ♀; MHND: 1 ♂, 1 ♀; UPRM: 2 ♂, 2 ♀).
Description

Body length 3.5–4.5 mm; in dorsal view (Fig. 10A) 3-times longer than greatest width which is at midpoint of elytra, shape escudate; dorsal outline in lateral view convex. Integument surface smooth; vestiture composed of gray and light green, iridescent (greenish to reddish) scales, with recurvate, semi-erect setae. Eyes (Fig. 10B) 1.5-times longer than wide, strongly projected; 0.6-times width and 0.5-times length of head in lateral view, separated from anterior margin of prothorax by 0.6-times greatest diameter of eye; line of anterior margin of eyes slightly impressed; shortest distance between eyes (in dorsal view) 0.4-times greatest width of pronotum; median furrow (Fig. 10B) linear, deep, extending from anterior to posterior margin of eyes. Rostrum (Fig. 10B)
1.1-times longer than wide, constricted at midpoint; epistome apically with 4 setae situated on each side, extending posteriorly as a longitudinal narrow keel nearly to midpoint of rostrum; nasal plate weakly defined, large, flat. Length of rostrum in lateral view 1.3-times its basal width; antennal insertion at apical third of rostrum; scrobe curved downwards by 40°, directed ventrally at end, extending to anterior margin of eye, separated from it by 1.6-times width of scrobe. Mandibles with 2 lateral setae. Antennae yellowish brown; antennal scape extending beyond posterior margin of eye, not reaching anterior margin of prothorax; funicular antennomere I slightly longer than II; antennal club 0.6-times length of funicle, 2.8-times longer than wide. Pronotum (Fig. 10A) subquadrate, slightly wider than long, greatest width at midpoint; dorsal surface slightly depressed at apical third, shallowly puncturate, each puncture with a curved, spatulate whitish seta; posterior margin nearly straight, 1.1-times wider than anterior margin; prothorax in lateral view with dorsal outline 1.6-times length of ventral outline; scutellum suboval, with setiform scales. Mesosternum (Fig. 10D) 0.6-times length of pronotum. Metasternum with lateral portions posteriorly produced (in lateral profile roundly produced at third fourth); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.8-times length of prosternum. Legs with profemora 1.2-times length of pronotum; claws subparallel. Elytra in dorsal view (Fig. 10A) 1.6-times their greatest width which is 1.7-times wider than pronotum; anterior margins nearly straight; humeral region 1.7-times width of posterior margin of pronotum; lateral margins slightly diverging until mid length, thereafter roundly convergent; apex roundly truncate; in lateral view (Fig. 10C) with dorsal outline convex; posterior declivity gradually descending; striae IX and X completely separated along their entire length; intervals completely covered with scales, scale color gray to pinkish on dorsal surface and pale green along sides; interval X slightly produced along basal fourth; with recurvate, spatulate, grayish setae. Venter (Fig. 10D) nearly uniformly covered with greenish scales; VII with anterior margin 1.8-times wider than its length; ♂: IV 1.8-times longer than V and VI jointly, 1.2-times length of VII, VII with posterior margin rounded; ♀: IV 2.4-times longer than V and VI jointly, 1.7-times length of VII, VII with posterior margin mesally narrowed.

Terminalia. Male with tergum VII 1.2-times wider than its mesal length, mesal area with setae on posterior half; anterior margin triangular, mesally rounded; posterior margin emarginate. Tergum VIII 1.4-times wider than long, with anterior margin emarginate; posterior margin nearly straight. Sternum VIII with posterior margin rounded; spiculum relictum absent. Spiculum gastrale with apodeme 1.3-times longer than aedeagus, each arm sclerotized, oval, with parallel inner margins. Tegumen with tegminal apodeme nearly 0.5-times length of aedeagus; tegminal plate not strongly developed. Aedeagus in dorsal view (Fig. 10E) 4.3-times longer than its greatest width, slightly constricted near midpoint; apex rounded, mesally acute. Endophallus with a pair of light, elongate, lateral sclerites near apex, with a pair of irregular sclerites positioned apicad of midpoint, and with two lateral rows of lightly sclerotized teeth, teeth more strongly sclerotized basad of base of aedeagus. Aedeagus in lateral view (Fig. 10F) 8.3-times longer than its greatest width. Aedeagal apodemes 0.8-times length of aedeagus.
Female. With tergum VII 1.1-times wider than long, posterior margin rounded. Tergum VIII nearly trapezoidal, 1.5-times wider than long. Sternum VIII with lamina narrow, semi-circular, occupying posterior one fourth. Coxites+styli 0.8-times length of lamina of sternum VIII, stylus 3-times longer than its greatest width, with 1-2 long apical setae and 2 anteapical, shorter setae. Genital chamber 0.7-times length of sternum VIII. Spermatheca (Fig. 10G) 1.6-times longer than wide, y-shaped; ramus apically rounded; surface slightly striate.

Variation
The examined specimens were mostly teneral; scale coloration varies from dark gray to light brown in teneral specimens to light gray and green in fully pigmented specimens.

Etymology
Named from the Latin eximius meaning “exceptional, uncommon” (Brown 1956), based on the perceived rarity of this species (in comparison to others) during the authors’ 2008 field trip to the Dominican Republic.

Natural history
*Apodrosus eximius* is known to occur at very low elevations (0-5 m) in the southeastern peninsula of the Dominican Republic (Parque Nacional del Este and Guaraguao; Fig. 18B). The host plant associations remain unknown.

*Apodrosus argentatus* Wolcott 1924: 130 (Fig. 11)
= *Apodrusus argentatus* (in Wolcott 1924: 130 – error)

Diagnosis
*Apodrosus argentatus* is characterized by the combination of large and flattened eyes, an indistinct nasal plate, an evenly distributed vestiture composed mainly of whitish (or silvery) to light brown and black, iridescent (greenish to pinkish) scales forming a spotty pattern in the mid region of elytra, and a complete separation of elytral striae IX and X along their entire length. This species may be differentiated from *A. eximius* by its large and flattened eyes, a parallel-sided (as opposed to constricted) rostrum, and the spottily patterned scale coverage in the mid region of the elytra. It furthermore differs from *A. mammuthus* by its smaller size, shorter and wider (as opposed to elongate) head, and the lack of a pair of denticled pads on the endophallus positioned apicad of the midpoint of the aedeagus.

Specimens examined
“DOM. REP., Independencia, Postrer Rio, Hwy 48, 8-29-1997, C. W. O’Brien” (CWOB: 4 ♂); “DOM. REP., Independencia, 8 Km W. Duverge, 8-29-1997, P. W.
Fig. 11. Apodrosus argentatus. (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise.
& Marshall” (CWOB: 30 ♂, 21 ♀); “DOMINICAN REPUBLIC, Monte Cristi Prov., 5.3 Km N Villa Elisa, 26 May 1992, R. Turnbow” (CMNC: 1 ♂; RHTC: 1 ♂, 1 ♀); “DOMINICAN REPUBLIC, Monte Cristi, 4.8 Km N Villa Elisa, mv+bl, 31 May 1994, R. Turnbow” (RHTC: 1 ♂); “DOMINICAN REPUBLIC, Monte Cristi, 5 Km N Villa Elisa, 31 May 1994, R. Turnbow” (RHTC: 1 ♂, 2 ♀); “DOMINICAN REPUBLIC, Monte Cristi, 4.8 Km N Villa Elisa, 2 June 1994, R. Turnbow” (RHTC: 1 ♂); “DOMINICAN REPUBLIC, Monte Cristi, 5 Km N Villa Elisa, 3 June 1994, R. Turnbow” (RHTC: 1 ♂); “DOM. REP., S. J., 28 Km SE. San Juan, August 6 1979, C. W. O’Brien” (CWOB: 9 ♂, including 1 dissected, 6 ♀, including 1 dissected); “DOM. REP., S. J., 16 Km SE. San Juan, August 8 1979, C. W. O’Brien” (CWOB: 3 ♂, 3 ♀); “DOM. REP., S. J., 28 Km SE. San Juan, August 8 1979, C. W. O’Brien” (CWOB: 3 ♂, including 1 dissected, 3 ♀); “DOM. REP., Pto. Plata, 6 Km W. Puerto Plata, V-28-1978, C. W. & L. B. O’Brien & Marshall” (CWOB: 1 ♀); “DOM. REP., Azua, 20 Km E. Azua, August 6 1979, G. B. Marshall” (CWOB: 9 ♂, 10 ♀); “DOM. REP., Azua, 20 Km E. Azua, August 6 1979, L. B. O’Brien” (CWOB: 1 ♀); “DOMINICAN REP., Bani, 4 Nov 1973, J. & S. Klapperich” (CWOB: 2 ♀); “DOMINICAN REP., Bani, 2-III-1974, J. & S. Klapperich” (CWOB: 1 ♂); “D. R., Ázua, El Número, Rd. Bani to Ázua, Km 21, dry forest (middle of trail), 190 m, N 18°22′8.6″, W 70°30′41.8″/ Jun 07 2008, (RD 7-2), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro, G. de los Santos” (UPRM: 10 ♂, including 1 dissected; 4 ♀, including 1 dissected); “Faro de Cabo Rojo, P. R., IV-20-1929/ Coll: S. T. Danforth” (UPRM: 2 ♂); “Faro de Cabo Rojo, P. R., June-12-1943, Coll: J. A. Ramos” (UPRM: 1 ♂); “PUERTO RICO, Cabo Rojo, light house, 4-I-1988, N. Virkki” (CWOB: 4 ♂); “PUERTO RICO, Cabo Rojo, Faro de Cabo Rojo, 140 m, N 17°56′3″, W 67°11′30″, Beating plants, Dec 9-2008, Leg. J. Girón, A. Mazo” (UPRM: 7 ♂, 4 ♀); “Mayaguez, P. R., I-1936, Coll: J. A. Ramos” (UPRM: 1 ♂); “Puerto Rico (USA), Bosque Estatal Susúa, nr. Quebrada Peces, 180 m, N 18°03.99′, W 66°54.50′/ on vegetation at night, leg. N. Franz, J. Girón & C. Castellanos, IX-29-2007” (UPRM: 6 ♂, 4 ♀); “Puerto Rico, Lajas, Llanos, Laguna Cartagena, National Wildlife Refuge/ Feb 03-2008, Leg. J. Cardona, N. Fanz, J. Girón, A. Mazo (UPRM: 20 ♂, 16 ♀); “Puerto Rico, La Parguera, 18-VI-1969, W. C. Gagné” (CWOB: 1 ♂); “Inular Forest Guanica, P. R., VII 25-26, 1969, H. & A. Howden” (CMNC: 14 ♂, 19 ♀; FSCA: 1 ♂); “San Juan, August 8 1979, C. W. O’Brien” (CWOB: 3 ♂, 3 ♀); “DOM. REP., S. J., 28 Km SE. San Juan, August 8 1979, C. W. O’Brien” (CWOB: 3 ♂, including 1 dissected, 3 ♀); “DOM. REP., Pto. Plata, 6 Km W. Puerto Plata, V-28-1978, C. W. & L. B. O’Brien & Marshall” (CWOB: 1 ♂); “DOM. REP., Azua, 20 Km E. Azua, August 6 1979, G. B. Marshall” (CWOB: 9 ♂, 10 ♀); “DOM. REP., Azua, 20 Km E. Azua, August 6 1979, L. B. O’Brien” (CWOB: 1 ♂); “DOMINICAN REP., Bani, 4 Nov 1973, J. & S. Klapperich” (CWOB: 2 ♀); “DOMINICAN REP., Bani, 2-III-1974, J. & S. Klapperich” (CWOB: 1 ♂); “D. R., Ázua, El Número, Rd. Bani to Ázua, Km 21, dry forest (middle of trail), 190 m, N 18°22′8.6″, W 70°30′41.8″/ Jun 07 2008, (RD 7-2), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro, G. de los Santos” (UPRM: 10 ♂, including 1 dissected; 4 ♀, including 1 dissected); “Faro de Cabo Rojo, P. R., IV-20-1929/ Coll: S. T. Danforth” (UPRM: 2 ♂); “Faro de Cabo Rojo, P. R., June-12-1943, Coll: J. A. Ramos” (UPRM: 1 ♂); “PUERTO RICO, Cabo Rojo, light house, 4-I-1988, N. Virkki” (CWOB: 4 ♂); “PUERTO RICO, Cabo Rojo, Faro de Cabo Rojo, 140 m, N 17°56′3″, W 67°11′30″, Beating plants, Dec 9-2008, Leg. J. Girón, A. Mazo” (UPRM: 7 ♂, 4 ♀); “Mayaguez, P. R., I-1936, Coll: J. A. Ramos” (UPRM: 1 ♂); “Puerto Rico (USA), Bosque Estatal Susúa, nr. Quebrada Peces, 180 m, N 18°03.99′, W 66°54.50′/ on vegetation at night, leg. N. Franz, J. Girón & C. Castellanos, IX-29-2007” (UPRM: 6 ♂, 4 ♀); “Puerto Rico, Lajas, Llanos, Laguna Cartagena, National Wildlife Refuge/ Feb 03-2008, Leg. J. Cardona, N. Fanz, J. Girón, A. Mazo (UPRM: 20 ♂, 16 ♀); “Puerto Rico, La Parguera, 18-VI-1969, W. C. Gagné” (CWOB: 1 ♂); “La Parguera, P. R., July 28, 1969, H. & A. Howden” (CMNC: 28 ♂, 31 ♀; FSCA: 2 ♂, 1 ♀); “Puerto Rico (USA), Lajas, La Parguera, Rte. 324 Km 6.3, 25 m, N 17°58.50′, W 66°59.15′/ attracted to Hg/UV lights, leg. N. Franz & C. Molini, I-01-2007” (UPRM: 5 ♂, 7 ♀); “Lajas, P. R., 4 Sept 1948, Coll: Doittreau” (UPRM: 1 ♂); “Yauco, P. R., XI-1934, Coll: V. Biaggi” (UPRM: 1 ♂, 1 ♀); “Santa Rita, P. R., June 1914, E. G. Smyth, coll. Ac. No. -1” (CWOB: 2 ♂); “Insular Forest Guanica, P. R., July-1934, Coll: F. Mora” (UPRM: 1 ♂); “Guánica Insular Forest, P. R., Nov 6, 1953/J. Maldonado Capriles Coll.” (UPRM: 1 ♂); “PUERTO RICO, Guanica Forest, II-20-1969, night, L. & C. W. O’Brien” (UPRM: 1 ♂); “Guanica Forest, P. R., VII 25-26, 1969, H. & A. Howden” (CMNC: 14 ♂, 19 ♀; FSCA: 1 ♂); “Guanica Forest, P. R., VII 27, 1969,
Redescription

Body length 3–5 mm; in dorsal view (Fig. 11A) 2-times greatest width which is at midpoint of elytra; dorsal outline in lateral view subplane to slightly convex. Integument surface smooth; vestiture uniformly composed of white to light brown and black, iridescent (greenish to pinkish) scales, with recurvate, decumbent, brown setae. Eyes (Fig. 11B) 1.5-times longer than wide, slightly projected, 0.5-times width and 0.7-times length of head in lateral view, separated from anterior margin of prothorax by 0.3-times greatest diameter of eye; line of anterior margin of eyes flat; shortest distance between eyes (in dorsal view) 0.3-times greatest width of pronotum; median furrow (Fig. 11B) linear, deep, extending from anterior margin of eyes beyond their posterior...
margin, though not reaching anterior margin of pronotum. Rostrum (Fig. 11B) 1.1-
times longer than wide; median dorsal region slightly produced; epistome apically with
3–4 setae situated on each side, extending posteriorly as a longitudinal narrow keel to
midpoint of rostrum; nasal plate not defined. Length of rostrum in lateral view 1.1-
times its basal width; antennal insertion approximately at midpoint of rostrum; scrobe
curved downwards by 45°, directed posteriorly at end, extending to anterior third of
eye, separated from it by 1.3-times width of scrobe. Mandibles with 2 lateral setae,
pharyngeal process 0.9-times length of mandible. Maxillae with cardo 4-times longer
than its greatest width; stipes with 2 long lateral setae; galeo-lacinial complex mesally
extending to midpoint of maxillary palpomere II, with 6–8 tongue-like apically nar-
rrowed setae at apex, a basal tuft of narrower and shorter setae, 3 lacinial teeth, and a
tuft of long fine setae at base of lacinia; maxillary palpomeres similar in length, I and
II with 2 mesal long lateral setae. Labium with prementum slightly longer than wide,
with external surface sculptured. Antennae light brown; antennal scape extending to
posterior margin of eye; funicular antennomere I 1.3-times longer than II; antennal
club 0.8-times length of mandible. Pronotum (Fig. 11A) sub-
quadrate, slightly wider than long, greatest width at apical third; dorsal surface shallowly puncturate, each puncture with a curved, spatulate, brown seta; posterior margin slightly bisinuate, 1.2-times wider than anterior margin; prothorax in lateral view with
dorsal outline 1.4-times length of ventral outline; scutellum subcircular, covered with
scales. Mesosternum (Fig. 11D) 0.8-times length of pronotum. Metasternum with
lateral portions posteriorly produced (in lateral profile gradually ascending towards
posterior fourth, thereafter descending roundly, posterior face covered with scales);
distance between posterior margin of mesocoxae and anterior margin of metacoxae
0.8-times length of pronotum. Metendosternite with furcal arms 1.5-times longer
than stalk, positioned at nearly 120° in relation to horizontal axis; ventral margin of
stalk 2.7-times its dorsal width. Legs with profemora 1.2-times length of pronotum;
tibiae with fine, long setae along ventral margin; claws subparallel. Elytra in dorsal view
(Fig. 11A) 1.8-times their greatest width which is 1.4-times wider than pronotum;
posterior margins slightly sinuate; humeral region 1.5-times width of posterior margin
of pronotum; apex roundly truncate; in lateral view (Fig. 11C) with dorsal outline
subplane to slightly convex; posterior declivity distinct, rounded; striae IX and X com-
pletely separated along their entire length; intervals completely covered with oval scales
forming a pattern of alternating darker and lighter areas (each with ±20 scales) in mid
region; interval X slightly produced at second sixth; with recurvate, spatulate, brown
setae. Wings 1.8-times length of elytra, 3.5-times longer than wide; costal margin
slightly emarginate along basal half; apex rounded, slightly narrower than base; cubital
margin slightly rounded; alar venation well developed, 3A intersecting with 2A; 4A as
a dark though not sclerotized stripe; anal area with margin slightly emarginate. Venter
(Fig. 11D) with long, erect, setiform scales, apically truncate; ♂: IV 1.5-times longer
than V and VI jointly, 1.1-times length of VII, VII with anterior margin 2-times wider
than its length, posterior margin widely rounded; ♀: IV 1.8-times longer than V and
VI jointly, 1.7-times length of VII, VII with anterior margin 2.5-times wider than its
length, posterior margin slightly narrowed mesally.
Terminalia. Male with tergum VII 2.1-times wider than its mesal length, mesal area 1.5-times wider than a strigulate stripe, with scarce setae; anterior margin with mesal area roundly projected, posterior margin emarginate. Tergum VIII 1.7-times wider than its mesal length; anterior margin slightly emarginate; surface with an anteapical, concave, rounded fold; posterior margin widely rounded. Sternum VIII with spiculum relictum forming a forked process with base 3-times longer than wide and as long as each arm, arms darker for the most part. Spiculum gastrale with apodeme 1.1-times longer than aedeagus, each furcal arm sclerotized, subtriangular to oval, with parallel inner margins, corners rounded. Tegmen with tegminal apodeme 0.7-times length of aedeagus; tegminal plate posteriorly slightly projected as a central triangle, roundly pointed. Aedeagus in dorsal view (Fig. 11E) 4.2-times longer than its greatest width, slightly narrowed basad of midpoint; apex set off, mesally widely projected, apically roundly truncate, with a dark margin continuously and broadly rounded; mesal region of apex with longitudinal sculptured stripes; apex of lateral margins roundly angulated. Endophallus with a pair of lateral, longitudinal, opposed plates positioned near apex; with an elongate, rhomboidal, median sclerite, positioned apicad of midpoint of aedeagus; with a pair of dark opposed, sickle-shaped sclerites positioned basad of midpoint, between these with a pair of lighter, smaller sclerites; and with 2 lateral rows of 3–6 stepwise alternating triangular teeth. Aedeagus in lateral view (Fig. 11F) 10-times longer than its greatest width. Aedeagal apodemes 0.8-times length of aedeagus.

Female. With tergum VII 1.3-times wider than its mesal length, posterior margin rounded. Tergum VIII nearly trapezoidal, 1.4-times wider than long. Sternum VIII with semicircular lamina, occupying posterior one fifth. Coxites+styli nearly as long as lamina of sternum VIII, stylus 2.6-times longer than its greatest width, with 3–4 apical, long setae. Genital chamber 0.8-times length of sternum VIII. Spermatheca (Fig. 11G) 1.5-times longer than wide, Y-shaped; cornu slightly shorter than greatest width of spermatheca; ramus apically truncate; collum apically narrowed; surface striate at flexion point of cornu and collum, scale-like at external apex of collum.

Variation

The examined specimens vary mainly in color pattern, often having three unaligned dark spots at or apicad of midpoint of elytra on intervals III, V and VII.

Natural history

Apodrosus argentatus has the widest distributional range among all species of the genus, occurring primarily in lower-elevation (-13 m to 280 m) and dry forest habitats in the northern and southwestern regions of the Dominican Republic (new record), southwestern Puerto Rico, Vieques Island (new record), and St. Croix (new record) (Fig. 19B). Turnbow and Thomas (2008: 30) have reported this species from Andros Island (Forfar Field Station, Maidenhair Coppice and Stafford Creek), however these specimens correspond to A. empherefasciatus; therefore the previous (2008) record must be now be considered an error (emended record, misidentification). Conversely, previous
report of *A. argentatus* occurring on Mona Island (e.g., Wolcott 1941, 1948; Ramos 1946; Franz et al. 2009) must now be regarded as erroneous (emended record, misidentification), since the species in question is the closely related *A. mammuthus*. The adults of *A. argentatus* have been reported feeding on *Dalbergia ecastophyllum* Taub. (Fabaceae) and *Guaicum sanctum* Linnaeus (Zygophyllaceae) (Wolcott 1924), although the actual host range is assumed to be much wider (pers. obs.). Martorell (1976) lists the following additional putative host plant species of *A. argentatus*: *Cassia polyphylla* Jacq. (Fabaceae), *Colubrina elliptica* (Sw.) Briz. & W.L. Stern (Rhamnaceae), *Conocarpus erectus* Linnaeus (Combretaceae), *Gossypium barbadense* Linnaeus (Malvaceae), *Guaiacum officinale* Linnaeus (Zygophyllaceae) and *Tamarindus indica* Linnaeus (Fabaceae).

![Fig. 12. *Apodrosus mammuthus.*](image)

(A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. This figure is published in colour in the online version of this journal, which can be accessed via [http://www.brill/ise](http://www.brill/ise)
Apodrosus mammuthus Girón & Franz sp.n. (Fig. 12)

Diagnosis

Apodrosus mammuthus is characterized by the combination of its large size (at 6 mm it is the largest species in the genus), a long and escutate body form which is 2.8-times longer than its greatest width in dorsal view, which is at the anterior third of the elytra, a visible nasal plate, only slightly projected eyes, and a vestiture composed of white iridescent (reddish) scales and with curved, decumbent white setae. This species may be differentiated from the otherwise very similar A. argentatus by its more elongate head, and the aedeagus with a pair of denticulate pads on the endophallus positioned apicad of midpoint, and a thickened apical margin.

Specimens examined

Holotype ♀ “PUERTO RICO, Mona Island, Bajura Los Cerezos, 45 m, N 18°5′18″, W 67°54′4″, May 22 2008, Leg. N. Franz” (UPRM); paratypes, same label information as holotype (CWOB: 1 ♂, 1 ♀; MEBT: 1 ♂, 1 ♀; UPRM: 3 ♂, 1 dissected ♀); “TURKS & CAICOS ISLS., Grand Turk; North Wells, 21°29′50″N, 71°08′20″W, 7 February 2001/ At black light in mixed scrub near salt pond; Coll. W. E. Steiner & J. M. Swearingen” (NMNH: 1 dissected ♂); “Mona Id., P. R., Coll: Martorell/ April 1/40 Acc# 283-40/ on Colubrina colubrina” (UPRM: 1 ♂); “PUERTO RICO, Mona Island, near Playa Pájaros, 35 m, at night, N 18°3′52″, W 67°52′12″, May 18-20, 2008, Leg. N. Franz” (UPRM: 2 ♂, including 1 dissected, 1 dissected ♀); “PUERTO RICO, Mona Island, Playa Sardinera, 0 m, N 18°5′19″, W 67°56′17″, May 20-24, 2008, Leg. N. Franz” (UPRM: 4 ♂, 1 ♀); “PUERTO RICO, Mona Island, Sendero Capitán, 40 m, at night, incl. Hg/UV lights, N 18°5′16″, W 67°56′16″, May 20, 2008, Leg. N. Franz” (UPRM: 6 ♂, including 1 dissected, 3 ♀, including 1 dissected).

Description

Body length 6 mm; in dorsal view (Fig. 12A) 2.8-times longer than greatest width which is at basal third of elytra, shape escutate; dorsal outline in lateral view (Fig. 12C) slightly convex. Integument surface smooth; vestiture composed of white iridescent (reddish) scales, with curved, decumbent setae. Eyes (Fig. 12B) 1.7-times longer than wide, slightly projected; 0.5-times width and 0.6-times length of head in lateral view, separated from anterior margin of prothorax by 0.5-times greatest diameter of eye; line of anterior margin of eyes flat; shortest distance between eyes (in dorsal view) 0.2-times greatest width of pronotum; median furrow (Fig. 12B) linear, deep, extending from anterior margin of eyes to their posterior margin. Rostrum (Fig. 12B) 1.1-times longer than wide; epistome apically with 2–4 setae situated on each side, extending posteriorly as a longitudinal narrow keel nearly to base of rostrum; nasal plate visible (though poorly defined), flat. Length of rostrum in lateral view 1.3-times its basal width; antennal insertion apicad of midpoint of rostrum; scrobe curved downwards by 45°, directed posteriorly at end, extending to midpoint of eye, separated from it by width of scrobe. Mandibles with 2 lateral setae. Antennae light brown; antennal scape extending to posterior margin of eye; funicular antennomere I 1.1-times longer.
than II; antennal club 0.5-times length of funicle, 2.5-times longer than wide. Pronotum (Fig. 12A) subquadrate, slightly wider than long, greatest width at midpoint; dorsal surface shallowly puncturate, each puncture with a curved, white seta; posterior margin bisinuate, 1.4-times wider than anterior margin; prothorax in lateral view with dorsal outline slightly convex, 1.5-times length of ventral outline; scutellum suboval, covered with scales. Mesosternum (Fig. 12D) 0.6-times length of prothorax. Metasternum with lateral portions posteriorly produced (in lateral profile gradually ascending towards posterior fourth, thereafter descending roundly, posterior face covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of prothorax. Legs with profemora 1.1-times length of pronotum; claws divergent. Elytra in dorsal view (Fig. 12A) 1.7-times their greatest width which is 1.6-times wider than pronotum; anterior margins sinuate; humeral region 1.5-times width of posterior margin of pronotum; apex rounded; in lateral view (Fig. 12C) with dorsal outline convex; posterior declivity gradually rounded (not angulate); striae IX and X completely separated along their entire length; intervals covered with white, gray and light brown scales forming a spot pattern on anterior and apicad of midpoint areas of elytra; interval X produced apicad of basal sixth; with curved, decumbent setae. Venter (Fig. 12D) with gray scales denser on sides and scattered setae; ♂: IV 1.6-times longer than V and VI jointly, slightly longer than VII, VII with anterior margin 1.9-times wider than its length, posterior margin widely rounded; ♀: IV 1.8-times longer than V and VI jointly, 1.6-times length of VII, VII with anterior margin 2.2-times wider than its length, posterior margin rounded.

Terminalia. Male with tergum VII 1.5-times wider than its mesal length, mesal area 1.4-times wider than a strigulate stripe, with scarce setae; anterior margin with mesal area roundly projected, posterior margin emarginate. Tergum VIII 1.4-times wider than its mesal length; anterior margin slightly emarginate with a mesal deep and narrow emargination; surface with an antepical, concave, rounded fold; posterior margin widely rounded. Sternum VIII with spiculum relictum forming a forked process with base 1.5-times longer than wide and as long as each arm, arms darker for the most part. Spiculum gastrale with apodeme 1.1-times longer than aedeagus, each furcal arm sclerotized, sub-oval, with parallel inner margins. Tegmen with tegminal apodeme 0.6-times length of aedeagus; tegminal plate posteriorly widely and roundly slightly projected. Aedeagus in dorsal view (Fig. 12E) 3.5-times longer than its greatest width, slightly narrowed basal of midpoint, apically slightly widened; apex roundly triangular, with narrow round lateral corners, mesally thickened; mesal region of apex with longitudinal stripes. Endophallus with a pair of lateral, equilateral, opposed plates positioned near apex, a pair of denticulate pads positioned apicad of midpoint, and an elongate, rhomboidal, median sclerite, positioned at midpoint of aedeagus; with a pair of dark opposed, sickle-shaped sclerites positioned basal of midpoint, between these with a pair of smaller sclerites and with 2 lateral rows of 5-6 stepwise alternating triangular teeth. Aedeagus in lateral view (Fig. 12F) 9.2-times longer than its greatest width. Aedeagal apodemes 0.8-times length of aedeagus.
Female. With tergum VII as wide as its mesal length, posterior margin rounded. Tergum VIII nearly trapezoidal, 1.6-times wider than long. Sternum VIII with semi-oval lamina, occupying posterior one fifth. Coxites+styli slightly shorter than lamina of sternum VIII, stylus 3.2-times longer than its greatest width, with 3-4 apical, long setae. Genital chamber 0.6-times length of sternum VIII. Spermatheca (Fig. 12G) 1.5-times longer than wide, Y-shaped; cornu slightly shorter than greatest width of spermatheca; ramus apically truncate; collum apically narrowed; surface not particularly sculptured.

Variation

The examined specimens vary little beyond slight differences in scale coverage, with some abraded specimens appearing darker. There are only minimal inter-population differences in aedeagal structure.

Etymology

Named after giant mammoths (genus *Mammuthus*) since it is the largest species presently assigned to the genus. The species epithet is to be treated as a noun in apposition.

Natural history

*Apodrosus mammuthus* occurs in coastal shrubby habitats (0–55 m) on Grand Turk of the Turks and Caicos Islands, as well as on Mona Island, Puerto Rico (previously misidentified as *A. argentatus*; see above) (Fig. 18B). On Mona Island the adults have been taken on *Colubrina colubrina* Millsp. (Rhamnaceae).

*Apodrosus viridium* Girón & Franz sp.n. (Fig. 13)

Diagnosis

*Apodrosus viridium* is characterized by the combination of a relatively small size (2.5–3.5 mm), a reduced and linear median furrow on the head, a shiny green uniform scale coverage (excepting the legs which have pink scales), and straight, erect, yellowish setae on the elytra. This species may be differentiated from *A. artus* by its uniformly green colored dorsal vestiture. It furthermore differs from the similarly colored *A. stenoculus* by the presence of a linear median furrow on the head, long erect elytral striae, and widely oval (as opposed to narrow, linear) eyes in lateral view.

Specimens examined

Holotype ♀ “D. R., Santiago, Cordillera Septentrional, 4.0 Km N of Jacagua on Rd. to Pico Diego de Ocampo, 460 m; N 19°32’40.4”, W 70°42’45.9”/ Jun 15-2008 (RD 16-3), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro”; paratypes “DOMINICAN REP, Bani, 4 Nov. 1973, J. & S. Klapperich” (CWOB: 1 ♀); “DOM. REP., S. R., 9

Description

Body length 2.5–3.5 mm; in dorsal view (Fig. 13A) 3.2-times longer than greatest width which corresponds to humeri, shape subrectangular; dorsal outline in lateral...
view subplane. Integument surface smooth; vestiture composed of green and pink, iridescent (reddish) scales, with straight, erect, yellowish setae. Eyes (Fig. 13B) 1.7-times longer than wide, projected, 0.4-times width and 0.8-times length of head in lateral view, separated from anterior margin of prothorax by 0.3-times greatest diameter of eye; line of anterior margin of eyes impressed; shortest distance between eyes (in dorsal view) 0.4-times greatest width of pronotum; median furrow (Fig. 13B) linear, apically shallow, basally deep, extending from basal third of rostrum and surpassing posterior margin of eyes though not reaching anterior margin of pronotum. Rostrum (Fig. 13B) slightly longer than wide, sides slightly constricted at mid length; epistome apically with 3–5 setae situated on each side, extending posteriorly as a longitudinal narrow keel to almost midpoint of rostrum. Length of rostrum in lateral view 1.6-times its basal width; antennal insertion approximately at mid length of rostrum; scrobes curved downwards by 45°, directed ventrally at end, extending to anterior fourth of eye, separated from it by width of scrobe. Mandibles with 2 lateral setae, pharyngeal process 1.4-times longer than mandible. Maxillae with cardo 3.3-times longer than its greatest width; stipites with 1 long lateral seta; galeo-lacinial complex mesally nearly extending to apex of maxillary palpomere I, with an apical mid-sized setae, followed by 6-7 tongue-like apically rounded, mid-sized setae, 5 lacinial teeth, and a tuft of long fine setae at base of lacinia; maxillary palpomere III slightly longer than I; III longer than II; I and II each with a mesolateral seta. Labium with prementum sub-quadrate, slightly longer than wide, lateral margins rounded, anterior margin slightly projected in mesal region; in lateral profile with ventral surface slightly depressed at base, then continuously upwardly curved to apex, not strongly sculptured. Antennae yellowish brown; antennal scape extending beyond posterior margin of eye though not reaching anterior margin of prothorax; funicular antennomere I 1.6-times longer than II; antennal club 0.6-times length of funicle, nearly 2.3-times longer than wide. Pronotum (Fig. 13A) subquadrate, slightly wider than long, with greatest width near midpoint; dorsal surface shallowly puncturate, each puncture with a short, erect, yellowish seta; posterior margin nearly straight, 1.2-times wider than anterior margin; prothorax in lateral view with dorsal outline slightly convex, 1.4-times length of ventral outline; scutellum subcircular, with scarce scales. Mesosternum (Fig. 13D) 0.8-times length of prosternum. Metasternum with lateral portions mesally slightly produced (in lateral profile slightly elevated at midpoint); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.6-times length of prosternum. Metendosternite with furcal arms 1.2-times longer than stalk, positioned at 120° in relation to horizontal axis; ventral margin of stalk 3.2-times its dorsal width. Legs covered with pink iridescent scales; profemora slightly longer than pronotum; tibiae with long spiremiform setae along ventral margin; claws subparallel, with inner margins clearly divergent. Elytra in dorsal view (Fig. 13A) 1.9-times their greatest width which is 1.4-times wider than pronotum; anterior margins sinuate; humeral region 1.4-times wider than posterior margin of pronotum; lateral margins parallel; apex roundly narrowed; in lateral view (Fig. 13C) with dorsal outline subplane; posterior declivity distinct, rounded; striae IX and X fused along their second third; intervals completely covered with green scales; interval X not produced; with straight, erect setae. Wings nearly 2-times length of elytra, 3.2-times longer than wide; costal margin
emarginate along basal half; apex rounded; radial and medial margins slightly and uniformly rounded; Mr short, af weakly defined; cubital margin slightly rounded; 3A almost reaching basal third of length towards margin of wing, not intersecting with 2A. Venter (Fig. 13D) covered with scales, denser on sides; VII with anterior margin 1.9-times wider than its length; ♂: IV 1.3-times longer than V and VI jointly, as long as VII, posterior margin of VII rounded; ♀: IV 1.9-times longer than V and VI jointly, 1.6-times longer than VII, posterior margin of VII mesally narrowed.

Terminalia. Male with tergum VII slightly longer than wide, mesal area with simple setae extending from basal fourth to apex; anterior margin rounded, mesally slightly narrowed, posterior margin mesally straight, laterally rounded. Tergum VIII transverse, 1.3-times wider than its mesal length, anterior margin straight, mesally strongly emarginate; posterior margin nearly straight in mid region, laterally widely rounded. Sternum VIII with posterior margin emarginate, with long lateral setae; spiculum rectum present as a forked process with base 1.6-times wider than arms which are 4-times longer than base. Spiculum gastrale with apodeme 1.3-times longer than aedeagus, furcal arms parallelogram shaped, lightly sclerotized. Tegmen with tegminal apodeme nearly 0.6-times length of aedeagus, tegminal plate simple. Aedeagus in dorsal view (Fig. 13E) 4-times longer than its greatest width, mesally narrowed; apex rounded, mesally roundly set off. Endophallus with a pair of boomerang-like sclerites positioned nearly at apical third, with a small, horizontally oriented, slightly downwardly curved sclerite basad of midpoint, and with a basal patch of small, light, tooth-like sclerotizations and another set of darker, small sclerotizations basad of midpoint of aedeagal apodemes. Aedeagus in lateral view (Fig. 13F) 7-times longer than its greatest width. Aedeagal apodemes slightly shorter than aedeagus.

Female. With tergum VII slightly wider than long; posterior margin mesally emarginate. Tergum VIII subtriangular, 1.5-times wider than long. Sternum VIII with lamina subtriangular, occupying posterior one fourth. Coxites+styli slightly longer than lamina of sternum VIII, stylus 3-times longer than its greatest width, with 2-3 apical setae. Genital chamber 0.6-times length of sternum VIII. Spermatheca (Fig. 13G) 1.2-times longer than wide, J-shaped; cornu as long as greatest width of spermatheca; ramus apically truncate, laterally rounded; collum apically irregular; surface of collum and ramus striate.

Variation
The examined specimens showed only very slight variations on size and tone of green scales.

Etymology
Noun in apposition. Named for the green iridescent scale coloration and relatively small body size, with *viridis* meaning “green”, combined with the diminutive suffix *-ium* (Brown 1956).
Natural history

*Apodrosus viridium* occurs at relatively low elevations (150–255 m) in the northwestern and central southern regions of the Dominican Republic (Fig. 18B). The host-plant associations remain unknown.

**Apodrosus stenoculus** Girón & Franz sp.n. (Fig. 14)

Diagnosis

*Apodrosus stenoculus* is characterized by the combination of having a rostrum without a mesal constriction, an apically bifurcated median furrow on the head, linearly narrowed eyes in lateral view, and a uniform scale coverage which is green throughout yet

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**Fig. 14.** *Apodrosus stenoculus*. (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; (D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. This figure is published in colour in the online version of this journal, which can be accessed via http://www.brill/ise
with white to pinkish scales on legs and with recurvate, decumbent, light brown setae. This species may be differentiated from *A. viridium* by having an apically bifurcated (as opposed to linear) median furrow on the head and narrow (as opposed to widely oval) eyes in lateral view while lacking long erect elytral setae. It furthermore differs from *A. quisqueyanus* by virtue of the general uniformly colored scale coverage and a mesally non-constricted rostrum.

**Specimens examined**

Holotype ♀ "D. R., Independencia, Lake Enriquillo National Park, La Azufrada, 4 km east of La Descubierta; -20 m, N 18°33′45.9″ W 71°41′53.1″/ Jun 11/2008 (RD 11-1), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro" (UPRM); paratypes, same label information as holotype (AMNH: 5 ♂, 5 ♀; CMNC: 5 ♂, 5 ♀; CWOB: 5 ♂, 5 ♀; MEBT: 5 ♂, 5 ♀; MHND: 5 ♂, 5 ♀; NMNH: 5 ♂, 5 ♀; UPRM: 97 ♂, including 1 dissected, 48 ♀, including 1 dissected); “DOM. REP., Independencia, Postrr Rio, Hwy 48, 8-29-1997, C. W. O’Brien” (CWOB: 1 ♂); “DOM. REP., Independencia, 8 km W. Duverge, 8-29-1997, C. W. O’Brien” (CWOB: 6 ♂, 4 ♀); “DOM. REP., Independencia, ESE Jimaní, La Florida, 18°24′ N, 71°44′ W, 20 m, moist site, 14 Apr 1993, M. A. Ivie, D. Sikes, W. Lanier” (CMNC: 2 ♂); “D. R., Independencia, Sierra de Neyba, 8.0 Km inwards from Rd. Neyba to La Descubieta, Sección El Guayabal, 280 m, N 18°35′58.6″ W 71°38′17.8″/ Jun 10/2008 (RD 10-4), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro” (UPRM: 2 ♂, 2 ♀); “REPUBLICA DOMINICANA, Barahona, Barahona, 1 September 1983, W. E. Clark” (CWOB: 2 ♂, 2 ♀); “REPUBLICA DOMINICANA, Bar., 6 Km N.W. Fundacion, 1 September 1983, W. E. Clark” (CWOB: 14 ♂, 9 ♀); “D. R., Barahona, Rd. 46, Barahona to Duvergé, Km 44.5, dry shrub hábitat, 30m, N 18°13′53.1″ W 71°9′5.7″/ Jun 10/2008 (RD 10-1), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro” (UPRM: 1 ♂); “Bani, 65m, 20.2.1971/ Rep. Dominic., J. & S. Klapperich” (CWOB: 1 ♀).

**Description**

Body length 3.5–5 mm; in dorsal view (Fig. 14A) 2.6-times longer than greatest width which is at mid length of elytra, shape subrectangular; dorsal outline in lateral view subplane. Integument surface smooth; vestiture uniformly composed of green and white iridescent (reddish) scales, with recurvate, decumbent, light brown setae. Eyes in dorsal view (Fig. 14B), 1.9-times longer than wide, projected; in lateral view (Fig. 14C), linearly narrow, 0.3-times width and 0.7-times length of head, separated from anterior margin of prothorax by 0.6-times greatest diameter of eye; line of anterior margin of eyes flat; in dorsal view, shortest distance between eyes 0.8-times greatest width of pronotum; median furrow (Fig. 14B) apically bifurcated, shallow, extending between anterior and posterior margin of eyes. Rostrum (Fig. 14B) nearly as long as wide, lateral margins slightly concave at mid length; epistome apically with 3-5 setae situated on each side, extending posteriorly as a longitudinal narrow keel almost to base of rostrum. Rostrum in lateral view slightly longer than its basal width; antennal insertion near apical third of rostrum; scrobe curved downwards by 45°, directed ventrally
at end, extending to anterior third of eye, separated from it by 2-times width of scrobe. Mandibles with 2-3 lateral setae, pharyngeal process as long as mandible. Maxillae with cardo 3-times longer than its greatest width; stipes with 3 long lateral setae; galeo-lacinial complex mesally nearly extending to apex of maxillary palpomere II, apex with scarce mid-sized setae, with 6-7 tongue-like apically rounded setae and a tuft of shorter and apically rounded setae, with 4 lacinial teeth and scarce long and fine setae at base of lacinia; maxillary palpomere I with 1 mesal lateral seta; II with 2 mesal lateral setae. Labium with prementum subquadrate, slightly longer than wide, apically widened, slightly projected at apical mesal region, corners widely rounded; in lateral profile with ventral surface slightly depressed at base, then abruptly roundly produced, continuing upwardly straight to apex, not strongly sculptured. Antennae reddish brown; antennal scape nearly extending to posterior margin of eye; funicular antennomere I 1.4-times longer than II; antennal club 0.6-times length of funicle, 2.6-times longer than wide. Pronotum (Fig. 14A) subquadrate, slightly wider than long, greatest width at mid length; dorsal surface shallowly puncturate, each puncture with a curved, spatulate brownish seta; posterior margin bisinuate, 1.1-times wider than anterior margin; pro-thorax in lateral view with dorsal outline 1.5-times length of ventral outline; scutellum subcircular, with scales. Mesosternum (Fig. 14D) 0.6-times length of prosternum. Metasternum with lateral portions posteriorly produced (in lateral profile gradually ascending towards posterior fourth, thereafter descending roundly, posterior face covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of prosternum. Metendosternite with furcal arms 1.2-times longer than stalk, nearly positioned at 110° in relation to horizontal axis; ventral margin of stalk 1.8-times its dorsal width. Legs covered with white, iridescent reddish scales; profemora slightly longer than pronotum; claws subparallel. Elytra in dorsal view (Fig. 14A) 1.7-times their greatest width which is 1.5-times wider than pronotum; anterior margins sinuate; humeral region 1.5-times wider than posterior margin of pronotum; lateral margins parallel; apex acutely rounded; in lateral view (Fig. 14C) with dorsal outline subplane; posterior declivity distinct, rounded; striae IX and X fused along their second third; intervals completely covered with green scales; interval X not produced along basal third; with recurvate, spatulate setae. Wings 2.2-times length of elytra, 3.2-times longer than wide; costal margin emarginate along basal half; apex narrowly rounded; cubital margin slightly rounded; 3A not intersecting with 2A. Venter densely covered with scales; VII with anterior margin 2.1-times wider than its length; posterior margin of VII rounded; ♂: IV 1.4-times longer than V and VI jointly, 1.2-times longer than VII; ♀: IV 2.1-times longer than V and VI jointly, 1.6-times longer than VII.

Terminalia. Male with tergum VII pentagonal, slightly longer than wide, mesal area with multifold setae on distal fourth; anterior margin subtriangular, mesally narrowly rounded, posterior margin mesally slightly emarginate, laterally rounded. Tergum VIII transverse, 1.5-times wider than its mesal length. Sternum VIII without spiculum relictum. Spiculum gastrale with apodeme 1.4-times longer than aedeagus, each furcal arm lightly sclerotized, sickle-shaped. Tegmen with tegminal apodeme nearly 0.8-times
length of aedeagus; tegminal plate mesally posteriorly produced. Aedeagus in dorsal view (Fig. 14E) 4-times longer than its greatest width; apex rounded. Internal sac with a pair of opposed, comma-shaped sclerites positioned near apical fourth, and a pair of parentheses-like sclerites apicad of midpoint; without teeth. Aedeagus in lateral view (Fig. 14F) 8.3-times longer than its greatest width. Aedeagal apodemes slightly longer than aedeagus.

**Female.** With tergum VII slightly longer than wide, with multifid anteapical and unifid apical setae. Tergum VIII suboval, 1.4-times longer than wide. Sternum VIII with semicircular lamina occupying posterior one fifth. Coxites+styli nearly as long as lamina of sternum VIII, stylus 2.4-times longer than its greatest width, with 4-5 long apical setae. Genital chamber 0.7-times length of sternum VIII. Spermatheca (Fig. 14G) 1.4-times longer than wide, J-shaped; margin between cornu and ramus emarginate; distance between cornu and base of corpus longer than width of cornu; ramus apically rounded; surface of cornu striate.

**Variation**

The examined specimens vary primarily in size and also somewhat in the tone of the green scale color.

**Etymology**

Noun in apposition. Named for the narrowed eyes as apparent in lateral view, with *steno* meaning “narrow” and *oculus* meaning “eye” (Brown 1956).

**Natural history**

*Apodrosus stenoculus* occurs at various lower-elevation sites (-30 m to 280 m) in the southwestern Dominican Republic (Fig. 18B). Most specimens were collected on legume species in open dry habitats along the shore of the hyper-saline Lake Enriquillo.

**Apodrosus quisqueyanus** Girón & Franz sp.n. (Fig. 15)

**Diagnosis**

*Apodrosus quisqueyanus* is characterized by the combination of having an apically bifurcated median furrow on the head, a mesally constricted rostrum, and an irregular scale coloration pattern composed of white and brown, iridescent (yellowish, reddish to greenish) scales with recurvate, decumbent, yellowish setae. This species may be differentiated from of *A. stenoculus* by its more widely oval (as opposed to narrow) eyes in lateral view, a mesally constricted rostrum, and irregularly colored scale coverage.

**Specimens examined**

Holotype ♀ “D. R., Pedernales, Las Cuevas, Bahía de las Aguilas Station, afternoon & night collecting (incl. Hg & UV lights), 40 m, N 17°51′43.8″ W 71°38′18.3″/ Jun
08/2008, (RD 8-3), Leg. N. Franz, J. Girón, A. Mazo, S. Navarro” (UPRM); para-
types, same label information as holotype (AMNH: 3 ♂, 4 ♀; CMNC: 3 ♂, 4 ♀; 
CWOB: 3 ♂, 4 ♀; MEBT: 3 ♂, 4 ♀; MHND: 3 ♂, 4 ♀; NMNH: 3 ♂, 4 ♀; UPRM: 
9 ♂, including 1 dissected, 8 ♀, including 1 dissected); “D. R., Pedernales, Sierra de 
Bahoruco, Km 10.5 Rd. Cabo Rojo to Aceitillar, night collecting (incl. Hg & UV 
lights), 100 m, N 18°0′36.1″ W 71°38′48.1″/ Jun 09/2008, (RD 9-5), Leg. N. Franz, 
J. Girón, A. Mazo, S. Navarro” (UPRM: 16 ♂, including 1 dissected, 9 ♀, including 
1 dissected); “REP. DOMINICANA, 3 Km S. E. Pedernales, 9 July 1985, W. E. Clark” 
(CWOB: 6 ♂, including 1 dissected, 8 ♀, including 1 dissected ); “DOMINICAN 
REPUBLIC, Pedernales Prov., 25.5 Km N. Cabo Rojo, 12-21-V-1992, coll. M. C. 
Thomas” (FSCA: 1 ♂, 1 ♀); “DOMINICAN REP.: Prov. Pedernales, 25.5 Km N. of

Fig. 15. Apodrosus quisqueyanus. (A) habitus, dorsal view; (B) head, frontal view; (C) habitus, lateral view; 
(D) habitus, ventral view; (E) and (F) aedeagus in dorsal and lateral view, respectively; (G) spermatheca. 
This figure is published in colour in the online version of this journal, which can be accessed via http:// 
www.brill/ise
Body length 3–5.5 mm; in dorsal view (Fig. 15) 2.8-times longer than greatest width which is at humeri, shape subrectangular; dorsal outline in lateral view subplane. Integument surface smooth; vestiture uniformly composed of white and brown, iridescent (yellowish, reddish to greenish) scales, with recurvate, decumbent, yellowish setae. Eyes (Fig. 15B) 1.7-times longer than wide, projected, 0.4-times width and 0.7-times length of head in lateral view, separated from anterior margin of prothorax by 0.5-times greatest diameter of eye; line of anterior margin of eyes impressed; shortest distance between eyes (in dorsal view) 0.4-times greatest width of pronotum; median furrow (Fig. 15B) apically bifurcated, narrow and shallow, extending from anterior margin of eyes beyond their posterior margin, though not reaching anterior margin of pronotum. Rostrum (Fig. 15B) nearly as long as wide, with lateral margins slightly constricted at basal third; epistome apically with 3–5 setae situated on each side, extending posteriorly as a longitudinal, narrow keel to midpoint of rostrum, nasal plate well defined, concave. Rostrum in lateral view slightly longer than wide; antennal
insertion near apical third of rostrum; scrobe curved downwards by 50°, directed ventrally at end, extending to anterior third of eye, separated from it by 3-times width of rostrum. Mandibles with 3 lateral setae, pharyngeal process slightly longer than mandible. Maxillae with cardo 3.4-times longer than its greatest width; stipes with 4 lateral setae; galeo-lacinial complex mesally extending to apex of maxillary palpomere I, apex slightly acute, with 3-4 apical mid-sized setae, with a tuft of tongue-like apically rounded mid-sized setae, with 4 lacinial teeth and a small tuft of long fine setae at base of lacinia; maxillary palpomere I as long as III, each 1.5-times longer than II; I with 1 apicolateral seta; II with 1 mesolateral and 1 antepical dorsal seta. Labium with prementum subquadrate, slightly longer than wide, lateral margins rounded, apical margin slightly projected in mid region; in lateral profile with ventral surface slightly depressed at base, thereafter roundly projected and upwardly curved towards apex, not strongly sculptured. Antennae reddish brown; antennal scape extending to posterior margin of eye; funicular antennomere I 1.5-times longer than II; antennal club 0.5-times length of funicle, 2.7-times longer than wide. Pronotum (Fig. 15A) subquadrate, slightly wider than long, greatest width at midpoint; dorsal surface shallowly puncturate, each puncture with a curved, brownish seta; posterior margin bisinuate, 1.2-times wider than anterior margin; prothorax in lateral view with dorsal outline 1.6-times length of ventral outline; scutellum subcircular, with scales. Mesosternum (Fig. 15D) 0.6-times length of prosternum. Metasternum with lateral portions posteriorly slightly produced (in lateral profile gradually ascending towards posterior fourth, thereafter descending roundly, posterior face covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.9-times length of prosternum. Metendosternite with furcal arms 1.3-times longer than stalk, positioned at nearly 120° in relation to horizontal axis; ventral margin of stalk 1.9-times its dorsal width. Legs with profemora 1.2-times length of pronotum; claws subparallel, with inner margins divergent. Elytra in dorsal view (Fig. 15A) 1.9-times their greatest width which is 1.5-times wider than pronotum; anterior margins sinuate; humeral region 1.6-times wider than posterior margin of pronotum; lateral margins parallel; apex narrowly rounded; in lateral view (Fig. 15C) with dorsal outline subplane; posterior declivity distinct, rounded; striae IX and X fused along their second third; intervals completely covered with brown and white to grey scales, sometimes forming irregular spotted patterns (each spot consisting of ±15 brown scales); interval X slightly produced along second fifth; with recurvate, decumbent setae. Wings 1.9-times length of elytra, 3.7-times longer than wide; costal margin nearly straight; apex slightly wider than base; 3A not intersecting with 2A. Venter (Fig. 15D) densely covered with scales; VII with median posterior pit interrupting posterior margin, anterior margin 2.4-times wider than its length; ♂: IV 1.2-times longer than V and VI jointly, as long as VII, VII with posterior margin rounded; ♀: IV 2-times longer than V and VI jointly, 1.7-times longer than VII, VII with posterior margin mesally narrowed.

Terminalia. Male with tergum VII subpentagonal, nearly as long as wide; anterior margin subtriangular, mesally narrowly rounded, posterior margin mesally emarginate, laterally rounded. Tergum VIII transverse, slightly wider than its mesal length; anterior
margin rounded; posterior margin straight in mid region, laterally widely rounded. Sternum VIII with 3–4 apical setae; spiculum relictum forming a forked process with base slightly longer than wide, arms 1.5-times length of base. Spiculum gastrale with apodeme 1.5-times longer than aedeagus, each furcal arm suboval. Tegmen with tegminal apodeme nearly 0.7-times length of aedeagus, tegminal plate slightly projected posteriorly. Aedeagus in dorsal view (Fig. 15E) 4-times longer than its greatest width, lateral margins apically slightly divergent; apex narrowly rounded. Endophallus with a pair of opposed lightly sclerotized areas positioned near apex, and a pair of J-shaped sclerites apicad of midpoint. Aedeagus in lateral view (Fig. 15F) 7-times longer than its greatest width. Aedeagal apodemes slightly longer than aedeagus.

**Female.** With tergum VII slightly wider than long, posterior margin acutely rounded. Tergum VIII subtriangular, 1.2-times wider than long. Sternum VIII with lamina triangular, occupying posterior one fifth. Coxites+styli slightly shorter than lamina of sternum VIII, stylus 3-times longer than its greatest width, with 3–5 long apical setae. Genital chamber 0.7-times length of sternum VIII. Spermatheca (Fig. 15G) 1.4-times longer than wide, J-shaped; margin between cornu and ramus emarginate; ramus slightly widened distally, apically truncate; surface of cornu and ramus lightly striate.

**Variation**

The examined specimens vary considerably in their color patterns yet are never uniformly colored.

**Etymology**

Named after Quisqueya, the original name of Hispaniola in the Taíno language.

**Natural history**

*Apodrosus quisqueyanus* occurs in dry, shrubby lower-elevation forests (5–450 m) in the southwestern Dominican Republic (Fig. 18B). Adult specimens have been taken primarily on legume species.

**Apodrosus adustus** Girón & Franz sp.n. (Fig. 16)

**Diagnosis**

*Apodrosus adustus* is characterized by the combination of having a mesally constricted rostrum, an apically bifurcated median furrow on the head, uniformly colored legs, a slightly produced interval X along the second fifth of the elytra, and a uniform coverage of brown, iridescent (reddish) scales, except on the ventral surface where the scales are whitish. This species may be distinguished from *A. empherefasciatus* by its uniformly brown dorsal coloration, the lack of a constriction between the cornu and corpus of the spermatheca, and a less developed ramus of the spermatheca.
Specimens examined

Holotype ♀ “GRAND BAHAMA ISLAND, Freeport, 20-27 June 1987, W. E. Steiner, M. J. & R. Molineaux” (NMNH, dissected); paratypes, same label information as holotype (NMNH: 1 dissected ♂, 1 dissected ♀).

Description

Body length 4–4.5 mm; in dorsal view (Fig. 16A) 2.1-times longer than greatest width which is at midpoint of elytra, shape subrectangular; dorsal outline in lateral view sub-plane. Integument surface smooth; vestiture uniformly composed of brown, iridescent (reddish) scales, and white scales on ventral surface, with recurvate, decumbent, brown setae. Eyes (Fig. 16B) 1.8-times longer than wide, projected, 0.3-times width and
0.6-times length of head in lateral view, separated from anterior margin of prothorax by 0.6-times greatest diameter of eye; line of anterior margin of eyes impressed; shortest distance between eyes (in dorsal view) 0.4-times greatest width of pronotum; median furrow (Fig. 16B) apically bifurcated, narrow, shallow, extending from anterior margin of eyes though not reaching their posterior margin. Rostrum (Fig. 16B) 1.2-times wider than long, with lateral margins slightly constricted at basal third; epistome apically with 3–4 setae situated on each side, extending posteriorly as a longitudinal, narrow keel to midpoint of rostrum, nasal plate defined, concave. Rostrum in lateral view slightly wider than long; antennal insertion near apical third of rostrum; scrobe curved downwards by 45°, directed ventrally at end, extending to midpoint of eye, separated from it by 2-times width of scrobe. Mandibles with 2–3 lateral setae. Antennae yellowish brown; antennal scape almost reaching posterior margin of eye; funicular antennomere I 1.8-times longer than II; antennal club 0.5-times length of funicle, 2.6-times longer than wide. Pronotum (Fig. 16A) subquadrate, 1.2-times wider than long, with greatest width at anterior third; dorsal surface shallowly puncturate, each puncture with a curved, brown seta; posterior margin slightly bisinuate, 1.2-times wider than anterior margin; prothorax in lateral view (Fig. 16C) with dorsal outline 1.5-times length of ventral outline; scutellum subcircular, with scales. Mesosternum (Fig. 16D) 0.6-times length of prosternum. Metasternum with lateral portions posteriorly produced (in lateral profile gradually ascending towards posterior third, thereafter descending roundly, posterior face covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of pronotum. Legs with profemora 1.2-times length of pronotum; claws subparallel. Elytra in dorsal view (Fig. 16A) 1.8-times their greatest width which is 1.6-times wider than pronotum; anterior margins straight; humeral region 1.5-times wider than posterior margin of pronotum; apex rounded; in lateral view (Fig. 16C) with dorsal outline subplane; posterior declivity rounded; striae IX and X fused along their second third; intervals completely covered with brown scales; interval X slightly produced along second fifth; with recurvate, decumbent setae. Venter (Fig. 16D) densely covered with whitish scales; VII with median posterior pit interrupting posterior margin, anterior margin 2.4-times wider than its length; ♂: IV 1.2-times longer than V and VI jointly, as long as VII, with VII posterior margin rounded; ♀: IV 2-times longer than V and VI jointly, 1.7-times longer than VII, VII with posterior margin mesally narrowed.

**Terminalia.** Male with tergum VII subpentagonal, nearly as long as wide; anterior margin subtriangular, mesally narrowly rounded, posterior margin mesally emarginate, laterally rounded. Tergum VIII transverse, 2.2-times wider than its mesal length; anterior margin roundly emarginate; posterior margin widely rounded. Sternum VIII with 2–3 apical setae. Spiculum gastrale with apodeme 1.3-times longer than aedeagus, each furcal arm suboval. Tegmen with tegminal apodeme nearly 0.6-times length of aedeagus, tegminal plate mesally slightly projected posteriorly. Aedeagus in dorsal view (Fig. 16E) 3.6-times longer than its greatest width, lateral margins parallel; apex widely rounded. Endophallus with a pair of opposed lightly sclerotized areas positioned near
apex, and a median reticulate area. Aedeagus in lateral view (Fig. 16F) 7.4-times longer than its greatest width. Aedeagal apodemes 0.5-times as long as aedeagus.

**Female.** With tergum VII as long as wide, suboval, posterior margin acutely rounded. Tergum VIII subtriangular, as wide as long. Sternum VIII with lamina triangular, occupying posterior one fifth. Coxites+styli as long as lamina of sternum VIII, stylus 3.6-times longer than its greatest width, with 1 long and 3 shorter apical setae. Genital chamber 0.6-times length of sternum VIII. Spermatheca (Fig. 16G) 1.2-times longer than wide, J-shaped; cornu roundly curved towards ramus; margin between cornu and ramus nearly straight; ramus apically truncate; surface not particularly sculptured.

**Variation**

The examined specimens vary slightly in size. All examined specimens are apparently teneral.

**Etymology**

Named in reference to the uniform brown dorsal scale coloration, with the Latin term *adustus* meaning “brown, tanned, swarthy” (Brown 1956).

**Natural history**

*Apodrosus adustus* is apparently restricted to Grand Bahama Island (Fig. 18A). The host plant associations remain unknown.

**Apodrosus empherefasciatus** Girón & Franz sp.n. (Fig. 17)

**Diagnosis**

*Apodrosus empherefasciatus* is characterized by the combination of a mesally constricted rostrum, an apically bifurcated median furrow on the head, uniformly colored legs, a slightly produced interval X at the basal third of the elytra, and a predominantly white coloration with light brown, iridescent (yellowish to reddish) scales forming an apparent striped pattern along the elytra and with recurvate, decumbent setae. This species may be differentiated from *A. quisqueyanus* by its more or less uniform (as opposed to irregularly patterned) coloration, and by the acutely angled cornu and ramus of the spermatheca. Furthermore, it differs in scale coloration from the darker *A. adustus* and in having a characteristic constriction between the cornu and corpus of the spermatheca.

**Specimens examined**

coppice edge, sweeping. 87-152J” (CMNC: 1 ♀); “BAHAMAS: Andros, Morgans Bluff, 25 July 2006, R. Turnbow” (CWOB: 1 ♂); “Bahamas, Andros I. San Andros, Robinson’s Place, J. Browne 10 VI 1987, wet pineland, -blk. lt. 87-41J” (CMNC: 1 ♂); “Bahamas, Andros I. CDC Farm, Shotgun Coppice, 19 VII 1987, J. Browne, high interior coppice, blk. lt. 87-107J” (CMNC: 2 ♂); “Bahamas, Andros I. Menne-nite’s Farm, 30 VII 1987, J. Browne, crop, blk. lt. 87-107J” (CMNC: 1 ♂, 2 ♀); “Bahamas, Andros I. Menne-nite’s Farm, 31 VII 1987, J. Browne, crop, blk. lt. 87-143J” (CMNC: 1 dissected ♂); “Bahamas, Andros I., Behring Pt., Behring Pt. Beach, 12 VIII 1987, J. Browne, random srch. of beach drift. 87-198J” (CMNC: 2 ♀); “Bahamas,

Description

Body length 3–5 mm; in dorsal view (Fig. 17A) 2.5-times longer than greatest width which is at second third of elytra; dorsal outline in lateral view subplane. Integument surface smooth; vestiture uniformly composed of white and brown, iridescent (yellowish to reddish) scales, with recurvate, decumbent setae. Eyes (Fig. 17B) 1.5-times longer than wide, projected, 0.4-times width and 0.6-times length of head in lateral view, separated from anterior margin of prothorax by 0.4-times greatest diameter of eye; line of anterior margin of eyes impressed; shortest distance between eyes (in dorsal view) 0.4-times greatest width of pronotum; median furrow (Fig. 17B) apically shortly
bifurcated, shallow, extending between anterior and posterior margins of eyes. Rostrum (Fig. 17B) slightly longer than wide, mesally slightly constricted; epistome apically with 3–5 setae situated on each side, posteriorly extending as a longitudinal, narrow keel almost to base of rostrum; nasal plate evident, concave. Rostrum in lateral view slightly longer than wide; antennal insertion approximately at apical fourth of rostrum; scrobe curved downwards by 45°, directed ventrally at end, extending to anterior third of eye, separated from it by 2-times width of scrobe. Mandibles with 2 lateral setae, pharyngeal process nearly as long as mandible. Maxillae with cardo 3.6-times longer than its greatest width; stipes with 3–4 lateral setae; galeo-lacinial complex mesally extending to midpoint of maxillary palpomere III, apex with 2–3 long setae, with 4 tongue-like apically narrowed setae and a tuft of shorter and apically rounded setae, with 4 lacinial teeth and a tuft of long fine setae at base of lacinia; maxillary palpomere I longer than III, III slightly longer than II; I and II with a mesolateral seta. Labium with prementum suboval, slightly longer than wide, apical margin slightly mesally projected; in lateral profile with ventral surface slightly depressed at base, thereafter abruptly roundly produced, continuing straight to apex, sculptured. Antennae reddish brown; antennal scape extending to posterior margin of eye; funiculiferous antennomere I 1.5-times longer than II; antennal club 0.5-times length of funicle, 2.3-times longer than wide. Pronotum (Fig. 17A) subquadrate, slightly wider than long, greatest width at mid length; dorsal surface shallowly puncturate, each puncture with a curved, spatulate, brownish seta; posterior margin nearly straight, 1.2-times wider than anterior margin; prothorax in lateral view with dorsal outline 1.7-times length of ventral outline; scutellum subcircular, with scarce scales. Mesosternum (Fig. 17D) 0.5-times length of prosternum. Metasternum with lateral portions posteriorly produced (in lateral profile gradually ascending towards posterior fifth, thereafter descending roundly, posterior face covered with scales); distance between posterior margin of mesocoxae and anterior margin of metacoxae 0.7-times length of prosternum. Metendosternite with furcal arms as long as stalk, positioned nearly at 120° in relation to horizontal axis; ventral margin of stalk 3.3-times its dorsal width. Legs with profemora 1.1-times longer than pronotum; claws subparallel. Elytra in dorsal view (Fig. 17A) 1.6-times their greatest width which is 1.5-times wider than pronotum; anterior margins sinuate; humeral region 1.5-times wider than posterior margin of pronotum; lateral margins parallel; apex roundly truncate; in lateral view (Fig. 17C) with dorsal outline subplane; posterior declivity distinct, rounded; striae IX and X fused along their second third; intervals completely covered with oval scales, forming a pattern of dark and light intervals, appearing striped; interval X slightly produced along basal third and along apex of elytra; with recurvate, spatulate setae. Wings 1.7-times length of elytra, 3.1-times longer than wide; costal margin emarginate along basal third; apex rounded; medial margin slightly rounded; cubital margin slightly emarginate; 3A intersecting with 2A. Venter (Fig. 17D) densely covered with scales; anterior margin of VII 2.4-times wider than its length; ♀: IV 1.8-times longer than V and VI jointly, 1.4-times longer than VII, VII with posterior margin rounded; ♂: IV 1.7-times longer than V and VI jointly, 2-times longer than VII, VII with posterior margin slightly narrowed mesally.
Terminalia. Male with tergum VII 1.4-times wider than its mesal length, distal third with multifi d setae; anterior margin nearly triangular, mesally narrowly truncate, posterior margin mesally slightly emarginate, laterally rounded. Tergum VIII 1.6-times wider than its mesal length, anterior margin slightly emarginate, apical margin nearly straight in mid region, laterally widely rounded. Sternum VIII without spiculum relictum. Spiculum gastrale with apodeme 1.3-times longer than aedeagus, each furcal arm lightly sclerotized, suboval. Tegmen with tegminal apodeme nearly 0.6-times length of aedeagus; tegminal plate mesally slightly projected posteriorly. Aedeagus in dorsal view (Fig. 17E) 3.3-times longer than its greatest width, parallel sided; apex truncate, laterally rounded. Endophallus with a pair of subtriangular sclerites positioned near apical fourth, and a pair of hook-like sclerites near midpoint. Aedeagus in lateral view (Fig. 17F) 9-times longer than its greatest width; apex slightly curved upwards. Aedeagal apodemes nearly as long as aedeagus.

Female. With tergum VII 1.2-times longer than wide; posterior margin acutely rounded, with anteapical multifi d setae and apical unifi d setae. Tergum VIII suboval, 1.3-times longer than wide. Sternum VIII with lamina sagittate, occupying posterior one fifth. Coxites+styli nearly as long as lamina of sternum VIII, stylus 2.8-times longer than its greatest width, with 4–5 long apical setae. Genital chamber 0.7-times length of sternum VIII. Spermatheca (Fig. 17G) 1.2-times longer than wide, J-shaped; cornu slightly rounded, roundly acutely curved towards ramus, margin between cornu and ramus emarginate; distance between cornu and base of corpus shorter than width of cornu; ramus apically truncate.

Variation
The examined specimens vary primarily in their patterns of coloration which range from uniformly white to appearing striped, turning light brown when abraded.

Etymology
Noun in apposition. Named after the Greek term empheres meaning “resembling” and the Latin term fascia meaning “band, stripe” (Brown 1956), in reference to the apparent striped scale coloration pattern on the elytra.

Natural history
Apodrosus empherefasciatus is apparently restricted to shrubby, coastal habitats on Andros Island, Bahamas (Fig. 18A). The host plant associations remain unknown.

Phylogenetic analysis
A matrix of 25 parsimony-informative characters was constructed for 20 terminal taxa, including seven outgroup species and 13 ingroup species (Table 1). Implementation of a comprehensive search strategy (parsimony ratchet as implemented in TNT,
Fig. 18. Occurrences of *Apodrosus* species in (A) the Bahamas (Grand Bahama and Andros Island) and (B) Hispaniola, Mona Island, and the Turks and Caicos Islands.
see above) yielded a single most parsimonious cladogram (Fig. 20) with a length of 61 steps, a consistency index (CI) of 42, and a retention index (RI) of 74 (cf., Farris 1989). The character states and inferred optimizations are presented simultaneously in this section, and the consistency and retention indices for individual characters (CI and RI, respectively) are provided in cases of homoplasy. Characters 19–25 were coded as missing for *A. artus* because of a lack of female specimens. Due to limited outgroup representation, the subsequent discussion of synapomorphies is restricted to the ingroup taxa.
1. Head, presence of a median furrow: (0) present; (1) absent. Synapomorphy for the *P. conicus*-A. adustus clade, with a subsequent reversal in the *A. bicaudatus-Apodrosus* clade (CI=50; RI=66).

2. Head, shape of the median furrow: (0) linear; (1) apically bifurcated. Coded as inapplicable for taxa which lack a median furrow (see character 1). Synapomorphy for the *A. stenoculus*-A. empherefasciatus clade.

3. Eyes, degree of projection: (0) flattened; (1) produced. Synapomorphy for the *P. mutabilis*-A. empherefasciatus clade with a subsequent reversal in the *A. argentatus*-A. mammuthus clade (CI=50; RI=75).

4. Rostrum, mesal constriction: (0) absent; (1) present. Synapomorphy for *A. bicau-
datus*-A. empherefasciatus clade, with a subsequent reversal in the *A. argentatus-A. empherefasciatus* clade and apparent regain in the *A. quisqueyanus*-A. empherefasciatus clade (CI=33; RI=77).

5. Epistome, presence of a basal carinate-striped projection: (0) absent; (1) present. Synapomorphy for the *P. peninsularis*-A. empherefasciatus clade, with a subsequent reversal in the *A. artus-A. wolcotti* clade (CI=50; RI=88).

6. Nasal plate, degree of development: (0) indistinct; (1) visible. Synapomorphy for the *P. scansorius*-A. empherefasciatus clade, with two independent reversals in the *A. epipolevatus*-A. wolcotti clade and in *A. argentatus* (CI=33; RI=33).

7. Antennae, length of scape: (0) Not or merely reaching posterior margin of eyes; (1) surpassing posterior margin of eyes. Synapomorphy for the *P. scansorius*-A. empherefasciatus clade, with a subsequent reversal in the *A. argentatus*-A. empherefasciatus clade (CI=50; RI=85).

8. Metasternum, degree of projection: (0) slightly projected; (1) strongly projected. Convergently present in the *P. mutabilis*-C. nigrocinctus clade and in the *A. ander-
soni*-A. wolcotti clade (CI=50; RI=80).

9. Legs, scale coverage of anterior surface of posterior femur: (0) not uniformly colored; (1) uniformly colored throughout. Coded as inapplicable in *P. mutabilis* in which the femora are not covered with scales. Convergently present in *P. conicus*, *P. peninsularis*, and in the *A. eximus-A. empherefasciatus* clade, with a subsequent reversal in *A. quisqueyanus* (CI=25; RI=62).

10. Legs, presence of premucro on the tibial apex: (0) present; (1) absent. Synapomorphy for the *P. conicus*-A. empherefasciatus clade, with a subsequent reversal in *Apodrosus* (CI=50; RI=75).

11. Elytra, separation of striae IX and X: (0) completely separated along their entire length; (1) fused along their second third. Convergently present in *A. bicaudatus*, *A. andersoni*, *A. wolcotti* and in the *A. viridium-A. empherefasciatus* clade (CI=25; RI=57).

12. Elytra, projection of surface of interval X basad of midpoint: (0) flat; (1) slightly produced; (2) strongly produced. Coded as additive, thus presuming a phylogenetic transition sequence. State (1) is convergently present in the *A. earini-
usparsus*-A. wolcotti clade, the *A. argentatus*-A. mammuthus clade, and in the *A. quisqueyanus*-A. empherefasciatus clade; whereas state (2) is present as a secondary transformation in the *A. epipolevatus*-A. wolcotti clade (CI=50; RI=75).
13. Abdomen, presence of a median posterior fovea on sternum VII: (0) absent; (1) present. Synapomorphy for Apodrosus, with an apparent reversal in A. epipolevatus (CI=50; RI=85).

14. Abdomen, posterior margin of male abdominal sternum VII: (0) mesally emarginate to straight; (1) rounded. Synapomorphy for the P. peninsularis-A. empherefasciatus clade.

15. Male terminalia, configuration of sternum VIII: (0) configured as two hemisternites; (1) configured as a complete plate. Coded as inapplicable in C. nigrocinctus and P. mutabilis which present a third, intermediate state in which two hemisternites are joined by a narrow sclerotized bridge. Slow optimization preferred. Synapomorphy for P. peninsularis-A. empherefasciatus clade.

16. Male terminalia, arms of spiculum gastrale: (0) continuous with apodeme; (1) separated from apodeme yet connected to it via a membrane. Synapomorphy for the A. bicaudatus-A. empherefasciatus clade.

17. Male terminalia, tegminal plate: (0) incomplete; (1) complete. Convergently present in P. conicus, C. nigrocinctus and in Apodrosus (CI=33; RI=50).

18. Male terminalia, shape of apex of aedeagus in dorsal view: (0) mesally projected, not uniformly roundly continuous; (1) simple, uniformly roundly continuous. Convergently present in A. andersoni, A. eximius, and in the A. stenocus-A. empherefasciatus clade (CI=33; RI=60).

19. Abdomen, presence of two mesolateral, longitudinally aligned, transversally strigulate stripes on female tergum VII: (0) absent; (1) present. Synapomorphy for the P. conicus-A. empherefasciatus clade, with a subsequent reversal in the A. bicaudatus-A. empherefasciatus clade (CI=50; RI=66).

20. Female terminalia, presence of longitudinal sclerites along genital chamber: (0) absent; (1) present. Synapomorphy for the P. conicus-A. empherefasciatus clade, with a subsequent reversal in Apodrosus (CI=50; RI=80).

21. Female terminalia, shape of spermatheca: (0) C-shaped; (1) J- or Y-shaped. Synapomorphy for Apodrosus.

22. Female terminalia, presence of a projection on the cornu of the spermatheca: (0) absent; (1) present. Synapomorphy for the P. scansorius-A. empherefasciatus clade, with two independent reversals in C. nigrocinctus and in Apodrosus, as well as an apparent subsequent regain in A. wolcotti (CI=25; RI=40).

23. Female terminalia, angle formed between cornu and corpus of spermatheca: (0) acute, 40-60°; (1) more or less obtuse, 80-110°. Synapomorphy for the A. bicaudatus-A. empherefasciatus clade, with two subsequent reversals in A. viridium and in the A. adustus-A. empherefasciatus clade (CI=33; RI=75).

24. Female terminalia, projection of ramus of spermatheca: (0) not or only slightly projected; (1) strongly projected. Convergently present in P. scansorius and in the P. peninsularis-A. empherefasciatus clade, with a subsequent reversal in A. wolcotti (CI=33; RI=50).

25. Female terminalia, development of collum of spermatheca: (0) reduced or very short; (1) well developed. Fast optimization preferred. Synapomorphy for the
P. peninsularis-A. empherefasciatus clade, with three independent reversals in the A. artus-A. wolcotti clade, in A. viridium, and in A. quisqueyanus (CI=25; RI=50).

Systematics and phylogeny of Apodrosus

According to the most parsimonious cladogram (Fig. 20), the monophyly of Apodrosus is well supported by the combination of two unreversed synapomorphies, viz. the presence of a median fovea on the apex of sternum VII (character 13) and a J- or Y-shaped spermatheca (character 21). In addition, four homoplasious features bear out the monophyly of the genus as presently redefined; including the presence of premucro (character 10), a complete tegminal plate in males (character 17), the absence of longitudinal sclerites in the genital chamber of females (character 20), and an apical projection on the spermathecal cornu (character 23). Apodrosus is furthermore distinguished from similar appearing Caribbean anypotactine and polydrusine weevils by several diagnostic features such as the presence of a median furrow on the head; a large, triangular and glabrous epistome (cf., Marshall 1922); and phanerognathous mouthparts.

Table 1. Character matrix for the cladistic analysis of the species of Apodrosus with select outgroup taxa, arranged in phylogenetic sequence. Character 12 was coded as additive; “–” represents inapplicable character states and “?” represents missing information (see also text).

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However, these character states are also convergently present in numerous other groups of entimine weevils that are not closely related (e.g., some Naupactini), and are therefore not included in this analysis. The present redefinition of *Apodrosus* is more restrictive and precise in comparison to Marshall’s (1922) original concept of the genus, and at the same time includes 11 species in addition to the previously known *A. argentatus* and *A. wolcotti*.

Among the selected outgroup taxa *A. bicaudatus* (Anypotactini) was inferred to represent the closest relative of *Apodrosus*, even though the latter is traditionally placed in the vicinity of *Polydrusus* in the Polydrusini, grounded in the shared presence of connate claws (e.g., Marshall 1922; Blackwelder 1947; O’Brien & Wibmer 1982; Alonso-Zarazaga & Lyal 1999). The validity of this placement is called into question here since the two studied North and Central American species of *Polydrusus* appear more phylogenetically removed from *Apodrosus* than *Anypotactus* (Fig. 20). However, at present we cannot conclusively resolve this issue, in part because *Polydrusus* is an exceedingly diverse and nonmonophyletic genus (N.N. Yunakov, pers. commun.) with some 188 species distributed primarily in the Palearctic region and with 24 New World species (Champion 1911; Sleeper 1957; O’Brien & Wibmer 1982). Due to a lack of adequate phylogenetic analyses of anypotactine-polydrusine relationships, we provisionally maintain the tribal placement of *Apodrosus* in the Polydrusini sensu Alonso-Zarazaga & Lyal (1999).

Within *Apodrosus* two main clades are inferred, i.e., the Hispaniolan/Puerto Rican *A. artus-A. wolcotti* clade and the more speciose and widespread western Caribbean *A. eximius-A. empherefasciatus* clade. The available character support for each clade is relatively weak, and is constituted by homoplasious states such as the presence of a carinate stripe projecting from the base of the epistome (character 5), the development of the spermathecal collum (character 25), and the the uniform versus heterogeneous scale coloration on the hind femora (character 9), respectively. Slightly higher support is evident for less inclusive species groups, including *A. epipolevatus* and *A. wolcotti* (character 12: elytral interval X strongly produced near midpoint) and the *A. stenoculus-A. empherefasciatus* clade (character 2: median furrow of head apically bifurcated).

Most species of *Apodrosus* are readily identified by externally visible characters such as the overall size, shape, and scale coloration patterns, with the principal exception of the *A. argentatus-A. mammuthus* complex where dissections of the terminalia are essential to species identification. It is likely that further sampling of *Apodrosus* specimens, particularly in more remote habitats of Hispaniola, will produce additional new species.

Lastly, the available information on host plant association is limited and too imprecise to facilitate strong inferences. However, it appears that over time *Apodrosus* populations are more responsive to certain ecological conditions of their habitat than to the composition and chemistry of specific host plants. This is a common condition in many entimine lineages (Oberprieler et al. 2007). As the following section aims to show, much of the diversification within *Apodrosus* may instead be related to historical biogeographic factors.
Areas of endemism

A total of 13 areas of endemism were identified, including 12 areas that reflect the species occurrences of *Apodrosus* in the Caribbean and one area representing the closest Central American relative *Anypotactus* Schoenherr (Figs 18, 19 and 21). With the exception of Hispaniola, the thus delimited areas correspond to individual islands or closely associated island groups, and therefore have a distinct historical biogeographic identity. Within Hispaniola, five regions of endemism were recognized; viz., the southwestern peninsula; the southern, northern, and eastern lowland/coastal regions, respectively; and the Central Cordillera. Of these, the southern and northern lowland regions could plausibly be merged into a single, semi-coherent area (excluding the Central Cordillera), given that two species – *A. argentatus* and *A. viridium* – are distributed in both of them. Nevertheless, they are upheld here as separate areas in order to maximize the inferential resolution of taxon–area relationships.

![Fig. 20. Phylogeny of the species of Apodrosus and select outgroup taxa according to the single most parsimonious cladogram (L=61; CI=42; CI=74). Character 15 is mapped under DELTRAN optimization, whereas character 25 is mapped under ACCTRAN optimization (cf., Agnarsson & Miller 2008); all other characters have unambiguous optimizations. Black rectangles represent single, non-homoplasious character state transformations and white rectangles represent multiple, homoplasious character state transformations. The small numbers above and below each rectangle correspond to character numbers and states, respectively. The larger numbers displayed at the left end of each branch represent Bremer support values.](image-url)
Historical biogeographic reconstructions

All species and areas were included in the DIVA 1.1. analysis (Ronquist 1997). The maximum value for the number of ancestral areas was set to two (“maxareas=2”), based on the observation that all species except *A. argentatus* occur in only one or two of the identified areas of endemism, suggesting that more widespread ancestral distributions may have been rare. Given this constraint, the step matrix optimization procedure requires 17 area ‘shifts’ to accommodate all ancestral and extant species occurrences, with each shift resulting either from vicariance or colonization. A full rendition of the DIVA-inferred ancestral distributions is provided in Fig. 21, whereas Fig. 22 shows a more distilled version of the analysis. In the latter figure, the terminal species were replaced with their respective areas, and an intuitive ‘ancestral area optimization’ procedure was used to resolve any ambiguities that remained in the original reconstruction (similar to the upward/downward pass deployed for optimizing phylogenetic characters; cf., Fitch 1971). This approach yields a more specific hypothesis of the sequence of splitting events.

The COMPONENT 1.5 analysis (Page 1990) was carried out with only 11 areas (Fig. 23), assuming that the presence of *A. argentatus* on several smaller Caribbean islands reflects relatively recent events of colonization in spite of their different geological origins (Carew & Mylroie 1997; Gill et al. 1997; González et al. 1997; Renken et al. 2002). Under this restriction, assumption 0 (widespread taxa indicate sister areas)
produces two very similar area cladograms, both of which place a clade containing Mona Island and the Turks & Caicos Islands as sister area to a larger Hispaniola/Puerto Rico/Bahamas region, on the grounds of the *A. argentatus-A. mammuthus* relationship. This hypothesis is rejected, however, since it presents a poor fit with the timeline of Caribbean island origins and particularly with the Quartenary development of the Bahamian islands (Carew & Mylroie 1997). Indeed, all component analyses for *Apodrosus* are likely biased by the condition of having different time scales operating in the two main clades within the genus (see discussion below). Under assumption 1 (widespread taxa indicate paraphyletic areas), more than 1280 area cladograms are generated, thus producing an inconclusive result. However, under assumption 2 (widespread taxa are free to ‘float’ in all areas except for one), only six area cladograms are obtained. All of these show an early-splitting relationship of Central America // (Eastern Hispaniola // remaining areas), as well as sister relationships among (1) Mona Island and the Turks and Caicos Islands (jointly inhabited by *A. mammuthus*) and (2) Andros Island (*A. empherefasciatus*) and Grand Bahama (*A. adustus*). Four of the six area cladograms furthermore display a sister relationship of Puerto Rico with southwestern Hispaniola. Yet only two of these also show the three-area relationship of Central Cordillera Hispaniola // (southwestern Hispaniola // Puerto Rico) which was recovered in the DIVA analysis (Figs 21 and 22). The preferred cladogram among the latter two is shown in Fig. 23; the alternative cladogram differs from it only by virtue

Fig. 22. Distilled version of the DIVA analysis (see Fig. 21; taxa replaced with their respective areas), with unambiguously optimized ancestral areas and inferred events of vicariance (//) and colonization (=>). Area labels as in Fig. 21. See text for further detail.
of a sequential placement of northern and southern Hispaniola along the internal branch as opposed to showing a sister relationship among these two areas.

Discussion

The historical biogeographic results are discussed here in reference to Iturralde-Vinent’s (2006) “GAARlandia hypothesis” which posits (inter alia) the temporary existence of a continuous Greater Antilles-Aves Ridge landspan some 35–32 million years ago (see also Iturralde-Vinent & MacPhee 1999). We point out, however, that the plausibility of this scenario is not uncontested (cf., Hedges 2001; MacPhee & Iturralde-Vinent 2005); and, furthermore, that the following discussion presumes that the age of origin of *Apodrosus* predates the existence of GAARlandia. This assumption seems warranted in particular with regards to the *A. artus-A. wolcotti* clade where post-GAARlandia vicariance among larger islands may have played an important role in speciation. On the other hand, several members of the larger *A. eximius-A. emphere-fasciatus* clade may have a more recent origin since they occur on smaller islands with a Miocene or younger origin.

According to the DIVA reconstruction (Figs 21 and 22), the earliest split in the cladogram occurred between the Central American *Anypotactus* and Caribbean *Apodrosus*. The timing of this split may date back to the (early) Eocene (approximately 50 million years ago), when a connection existed between the Central American Chortis Block and the Nicaraguan Rise to western Jamaica (Iturralde 2006). The tectonic movement of western Jamaica to the Caribbean and concomitant rise of sea levels suggest that *Apodrosus* came into origin as the result of a genuine vicariance event. This hypothesis presupposes that *Apodrosus* is either extinct on Jamaica (and possibly also eastern Cuba) or not yet recorded there. Subsequent colonization of southwestern Hispaniola may have been facilitated through dispersal to the Jamaican Blue Mountains Block and then via GAARlandia across a hypothesized land connection to Hispaniola as well as Central and Eastern Cuba and Puerto Rico during the Oligocene/Eocene transition (approximately 33 million years ago). Such a scenario would entail
a widespread ancestral occurrence of *Apodrosus* in southwestern Hispaniola and Puerto Rico, thereby establishing the necessary preconditions for vicariance among these two islands during the Late Oligocene to Middle Miocene (approximately 28–12 million years ago) through the establishment of the Mona Passage.

The area relationships within the genus suggest that the earliest members of *Apodrosus* inhabited higher-elevation habitats along the ridge that connected Hispaniola and Puerto Rico (see Iturralde 2006: 806). This life history is retained in members of the *A. artus-A. wolcottii* clade which occur (e.g.) at Cerro Punta (1338 m), the highest peak of Puerto Rico, and apparently never under 1000 m in Hispaniola. The origin of *A. artus* may therefore have resulted from an early colonization of the Central Hispaniolan mountain range. On the other hand, the split among the southwestern Hispaniolan *A. earinusparsus* and its Puerto Rican *A. epipolevatus-A. wolcottii* sister clade is most plausibly explained through vicariance (see above).

Members of the *A. argentatus-A. empherefasciatus* clade, in turn, tend to occur in more arid, lower-elevation, and coastal habitats, including those of much smaller and younger islands than Hispaniola and Puerto Rico. Their geographic origin is also optimized as southwestern Hispaniola, however, their subsequent radiation may have unfolded on a shorter and more recent time scale than that of the opposing *A. artus-A. wolcottii* clade. This phenomenon could explain why some results of the component analyses under assumptions 0 and 2 are not plausible; e.g., the splitting off of the Mona Island and Turks and Caicos Islands clade prior to the aforementioned vicariance event (Fig. 23). These inconsistencies may be further resolved through future use of molecular dating techniques (Arbogast et al. 2002).

Within the lower-elevation clade of *Apodrosus* several independent colonizations of new areas of endemism are inferred (Fig. 22); including (in apparent temporal sequence) *A. eximius* which represents an early colonization event of (relatively humid) lower-elevation habitats in eastern Hispaniola; *A. mammuthus* to Mona Island and the Turks & Caicos Islands; *A. viridium* to southern and northern Hispaniola; *A. stenoculus* to southern Hispaniola; *A. quisqueyanus* to the Central Cordillera; and *A. empherefasciatus* and *A. adustus* to Andros Island and Grand Bahama, respectively, and also possibly in a two-step sequence. The two southern Hispaniolan species must have independently crossed the Cul-de-sac Lake Enriquillo Valley (corresponding to the Muertos Trough), a very dry desert habitat that divides many components of the island’s fauna (e.g., Rosen 1985; Liebherr 1992; Franz 2010). Similarly, the occurrence of *A. quisqueyanus* in the Central Cordillera represents an additional independent colonization of this area presently shared with *A. artus*. The high overall and often sympatric diversity of *Apodrosus* in southwestern Hispaniola is consistent with the hypothesis of a prolonged evolutionary trajectory and possibly narrow ecological specialization on the peninsula which was separated from the central and northern parts during the Late Oligocene to Late Miocene before reconnecting with these parts (Iturralde 2006). A similar pattern is observed in the sympatric entimine genus *Apotomoderes* Dejean (Franz 2010).

The closely related *A. argentatus* and *A. mammuthus* have arguably the most intriguing distributions among the species of *Apodrosus*. In particular, it remains unclear
whether ancestral populations of the currently widespread *A. argentatus* were present on Puerto Rico and/or the more eastern Vieques Island and St. Croix prior to the establishment of the Mona Passage. If so, then these distributions may be explained without invoking frequent over-water dispersal. An early presence of this lineage in southwestern Puerto Rico would also render more plausible the presence of *A. mammuthus* on Mona Island and on the Turks and Caicos Islands, which may thus have resulted from two successive westward colonizations promoted (e.g.) by the prevalent east-to-west winds in the Mona Passage (Smith et al. 1988). The alternative scenario – *viz.* an evolutionary origin (and subsequent extinction) in southwestern Hispaniola with two independent colonizations of small and fairly distant eastern- and northern-situated islands – is not very plausible. We hope that future phylogeographic studies of the *A. argentatus*-*A. mammuthus* complex will shed further light on the origins of these unusual distribution patterns.

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