



A new species of *Neobaryssinus* Monné & Martins, and two new species of *Baryssiniella* new genus (Coleoptera: Cerambycidae), reared from trees in the Brazil nut family (Lecythidaceae)

AMY BERKOV¹ & MIGUEL A. MONNÉ²

¹Department of Biology, City College of the City University of New York, Convent Avenue @ 138 St., New York, NY 10031, U. S. A., and Division of Invertebrate Zoology, American Museum of Natural History. E-mail: berkov@sci.cuny.cuny.edu

²Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista, 20940-040, Rio de Janeiro, RJ, Brazil. Fellow of the Conselho Nacional de Desenvolvimento Científico e Tecnológico. E-mail: monne@uol.com.br

Abstract

Neobaryssinus altissimus **new species** is described from central French Guiana; a key to the four species of the genus is given. *Baryssiniella* **new genus** is described, including two new species: *B. hieroglyphica* **new species** from southeastern Peru, and *B. tavakiliani* **new species** from central French Guiana. Comparisons among *Neobaryssinus*, *Baryssiniella*, and several other genera in the tribe Acanthocinini are presented. All three new species were reared from trees in the Brazil nut family (Lecythidaceae). Two of these species emerged preferentially from bait branches at canopy stratum.

Key words: Acanthocinini, canopy, *Couratari*, DNA, genitalia, host specificity, Lamiinae, *Lecythis*, sulfur compounds

Introduction

Acanthocinini is a large cosmopolitan tribe of (relatively) small brown beetles including 2,149 species (Roguet, 2004–2010). It is particularly well represented in the Neotropics, where it accounts for 10% of the described cerambycid species (Monné, M. A. pers. comm.). Several acanthocinine genera routinely use trees in the Brazil nut family (Lecythidaceae) as larval host plants, including *Neobaryssinus* Monné & Martins, 1976, *Neoetrypanus* Monné, 1977, *Palame* Bates, 1864 and *Xylergates* Bates, 1864 (Tavakilian *et al.* 1997; Berkov *et al.* 2000; Monné 2001). These genera have elytra with erect long hairs, and are most easily distinguished from each other (and from other similar genera) by the size and position of lateral tubercles on the pronotum, elytra with central basal cristae present or absent, and various sexual dimorphisms. In this paper we describe three new acanthocinines reared from Lecythidaceae: *Neobaryssinus altissimus* new species, and two species in a new genus, *Baryssiniella hieroglyphica* new species and *B. tavakiliani* new species.

Methods

Specimens were collected during cerambycid rearing experiments in central French Guiana (1995–96; 2007–8) and the Department of Madre de Dios, Peru (2003–5). In the course of these projects we cut bait branches from ten species in seven genera of Lecythidaceae (*Allantoma decandra*, *Bertholletia excelsa*, *Corythophora amapaensis*, *Couratari macrosperma*, *C. stellata*, *Eschweilera coriacea*, *E. tessmannii*, *Gustavia augusta*, *G. hexapetala*, and *Lecythis poiteaui*). We exposed the bait branches to beetles at both canopy and ground stratum, during both the dry and rainy seasons (see Berkov & Tavakilian 1999 for a complete description of the rearing protocol). For this study the reared specimens were compared to specimens of morphologically similar species at MNRJ and AMNH. Most photographs and genitalia measurements were taken with a Spot Insight camera and software (v. 3.5) and a Nikon SMZ 1500 stereo microscope; other measurements were

made on a Nikon SMZ 645 stereo microscope with an ocular micrometer. Prothoracic width includes the lateral tubercles, and elytral length was measured to the elytral apex.

Reference DNA sequences range from approximately 600 to 1049 base pairs of the mitochondrial gene cytochrome oxidase I (COI). We extracted, amplified, and purified DNA from adult cerambycid specimens using the beetle protocols described in Berkov *et al.* 2007 (except we used Promega *GoTaq* DNA Polymerase). Most primer sequences were published in Berkov (2002) or Berkov *et al.* (2007). Unpublished primers or primers designed for this study include, reading 5' to 3': L4Pan (GCA ACA ATA ATT ATT GCA GTC CC), L5OL (GTA CTT TCA ATA GGT GCA GTT TTC GC), L5BH (GTT TTA TCA ATA GGG GCT GTA TTC GC), H11 (CCA TGA AAT GTT GCT AGT CA), H1La15 (CCT GTA AAT AAT GGG TAT CAT TG), and H3La15 (GGG TAA TCT GAA TAT CGT CGA GGC AT). Cycle sequencing and sequencing of both strands were performed by Genewiz Inc. (South Plainfield, NJ), and sequences were aligned using Sequencher 4.2.2 (Gene Codes Corporation 2004). Resulting sequences were submitted to GenBank (<http://www.ncbi.nlm.nih.gov/Genbank/>).

Abbreviations cited in the text:

AMNH	American Museum of Natural History, New York, NY, USA.
IRD	Institut de Recherche pour le Développement, Paris, France.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
MNRJ	Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil.
UNMSM	Museo de Historia Natural Universidad Nacional Mayor de San Marcos, Lima, Peru.

Taxonomy

Baryssinus marianae Martins & Monné 1974 was described from a female specimen collected in French Guiana. Like other *Baryssinus*, it had lateral elytral carinae and central basal cristae (Monné 1990). When a male was examined, Monné & Martins (1976) transferred *B. marianae* as the type species into a new genus, *Neobaryssinus* (Figs 1, 7). It differed from males in other species of *Baryssinus* by the presence of dense erect pubescence on the venter, strongly clavate profemora, carinate protibiae, and expanded pro- and mesotarsi. Two additional species (*Neobaryssinus phalarus* Monné & Martins 1976 and *N. capixaba* Monné & Delfino 1980) were described from specimens collected in Espírito Santo, Brazil (Figs 3–4). Although the presence of small, dark glabrous spots on the scape and femora is one of the characters used in the key to distinguish *N. marianae* from the other two species (Monné & Delfino, 1980), the spots are lacking in the specimens we reared in French Guiana (Fig. 1). We consider this to be an example of intraspecific variation, because specimens reared in Peru have the glabrous spots, and COI divergences in specimens from these two widely separated localities are low (<4%, GenBank Accession numbers GU827556 and GU827557).

The three species proposed in this paper are allied with *Neobaryssinus* because the males have moderate to dense erect ventral pubescence, enlarged profemora, and dilated protarsi. Only one of the three new species, *Neobaryssinus altissimus*, is characterized by lateral elytral carinae and pronounced central basal cristae. We therefore propose a new genus, *Baryssiniella*, to accommodate the other two species.

Neobaryssinus Monné & Martins, 1976

Neobaryssinus Monné & Martins, 1976: 80

Type species: *Neobaryssinus marianae* (Martins & Monné, 1974)

Comments. *Neobaryssinus* is characterized by its elytra with erect setae, central basal cristae with bristles (Fig. 7), and two longitudinal carinae: the lateral carina starts behind the humeral angle and the inner carina is less obvious. Males are characterized by the dense ventral pubescence, enlarged profemora, and dilated pro- and mesotarsi.

Key to the species of *Neobaryssinus* Monné & Martins, 1976

- 1 Lateral pronotal tubercles acute (conical)..... 2
- Lateral pronotal tubercles obtuse (not conical)..... *N. altissimus*, new species (Fig. 2)
- 2 Pronotum with fine punctures; white medial elytral maculae oblique; scape and femora often with small, dark glabrous spots *N. marianae* (Fig. 1)
- Pronotum without fine punctures; white medial elytral maculae not oblique; scape and femora without small, dark glabrous spots 3
- 3 White medial elytral maculae extending to the elytral suture; dorsum of second tarsomere without pale pubescence *N. capixaba* (Fig. 4)
- White medial elytral maculae separated by the elytral suture and a fairly broad band of dark pubescence; dorsum of second tarsomere covered with pale pubescence..... *N. phalarus* (Fig. 3)

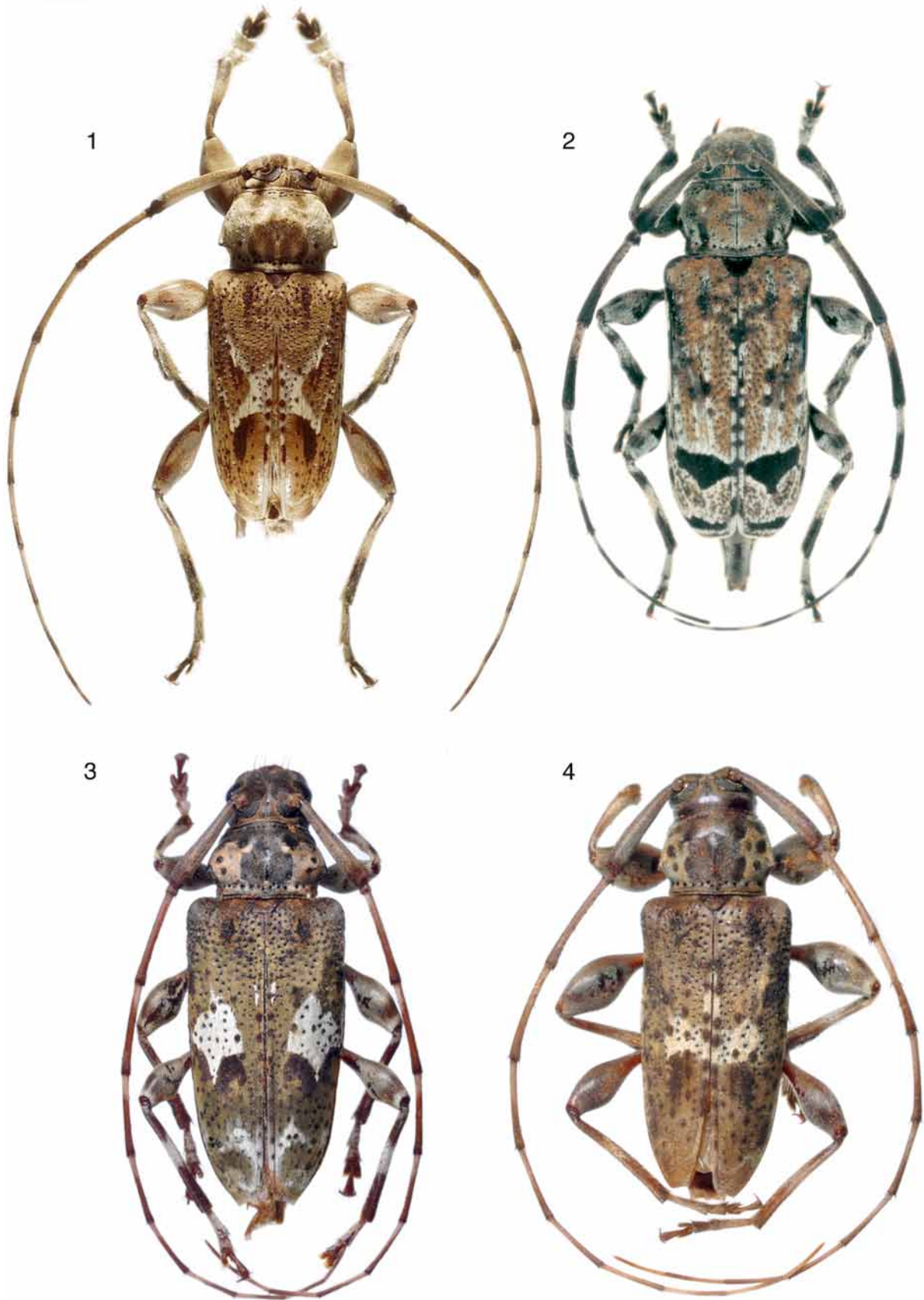
Neobaryssinus altissimus Berkov and Monné, new species

(Figs 2, 9, 12, 15–17)

This species was referred to as *Neoeutrypanus* sp. 915 in Berkov & Tavakilian 1999 and Berkov *et al.* 2000.

Type material. Holotype male: FRENCH GUIANA, Les Eaux Claires (7 km N Saül, 3° 37' N, 53° 12' W, elevation 200–400 m), 16.03.1996, A. Berkov leg. (MNHN, ex IRD), host plant *Lecythis poiteaui*. **Paratypes:** Same locality as the holotype: 19 males and 21 females, 3° 37' N, 53° 12' W, 29.III.–12.VII.1996, A. Berkov leg.; 3.IV.–25.VII.2008, A. Berkov & A. Baxt leg. 1 male, 4.IV.1996; 1 male, #831, 7.IV.1996; 1 male, #875, 12.IV.1996; 1 male, #922, 17.IV.1996; 1 male, #963, 21.IV.1996; 1 male, #1182, 10.V.1996; 1 male, #1397, 3.VI.1996; 1 male, #1410, 5.VI.1996; 1 male, #1654, 12.VII.1996; 2 males, #2877 and #2980, 3.IV.–14.V.2008; 1 male, #3154, 7.VI.–4.VII.2008; 1 male, #3198, 29.V.–25.VII.2008; 2 males, #3285 and 3392, 18–26.VI.2008; 1 male, #3320, 21.VI.2008; 1 male, #3465, 29.VI.–9.VII.2008; 1 male, #3599, 13–21.VII.2008; 1 male, #3633, 29.V.–25.VII.2008, 1 female, 29.III.1996; 1 female, 14.IV.1996; 1 female, #1053, 29.IV.1996; 1 female, #1230, 16.V.1996; 1 female, #1239, 17.V.1996; 1 female, #1258, 19.V.1996; 1 female, #1274, 20.V.1996; 1 female, #1517, 23.VI.1996; 1 female, #1568, 30.VI.1996; 1 female, #1696, 21.VII.1996; 1 female, #1804, 29.VIII.1996; 1 female, #1805, 29.VIII.1996; 2 females, #2934 and #2967, 4.IV.–14.V.2008; 1 female, #3095, 10.IV.–15.VI.2008; 2 females, #3318 and #3393, 19–27.VI.2008; 3 females, #3419, #3463 and #3534, 28.VI.–9.VII.2008; 1 female, #3625, 7–25.VII.2008 (MNHN, AMNH, and MNRJ). [Note: These specimens were reared from four individuals of *L. poiteaui* located between 180–860 m along the Sentier Botanique, bait branches were cut in Sept. 1995, Jan. 1996, Aug. 2007, and Jan. 2008 (LP-T, LP-U, LP-V, LP-W; vouchers M24175–M24178 at NYBG)]. French Guiana, Piste de Kaw, pk 43.5, 1 female, M. Thouvenot; pk 50, 1 female, F & J.-P. Serais (MNHN). Piste Maman Lézard, pk 7, 1 female, P. Gevril (MNHN). Crique Longi, 1 female, 11.05.1995, J.-F. Guégan (MNHN). (MNHN, AMNH, and MNRJ).

Description. Male (Figs 9, 15–16): Integument predominantly black; body pubescence short and appressed, cinereous, tan, medium brown testaceous, and black. Head mostly cinereous to tan, frons and vertex tan, darker on bases of antennal sockets, genae cinereous, scape with fine ashy-tan pubescence contrasting with piceous pubescence and integument at dorsal apex, all other antennomeres with ashy-tan pubescence at basal parts contrasting with piceous at apices. Pronotum variegated ashy, tan, and medium brown, with two pairs of piceous maculae towards base. Scutellum uniformly piceous. Elytra with appressed pubescence, mostly tan with ashy tufts, two piceous fasciae separated by ashy-tan fascia. Prosternum with dense ashy appressed pubescence, mesosternum with fairly dense, erect ashy pubescence, metasternum with sparser, erect ashy pubescence. Ventrites 1–4 with integument medially reddish-brown and laterally black, medially with erect ashy pubescence bounded by ashy appressed pubescence and lateral faciae alternating piceous and ashy, ventrite 5 uniformly piceous. Legs with integument reddish brown to black and patchy appressed pubescence from ashy to tan, all coxae with erect ashy pubescence, dorsum of first two tarsomeres covered with appressed ashy pubescence.



FIGURES 1–4. Species of *Neobaryssinus*, habitus: 1, *N. mariana* Martins & Monné, male, French Guiana; 2, *N. altissimus* Berkov & Monné **sp. nov.**, female; 3, *N. phalarus* Monné & Martins, female (MNRJ); 4, *N. capixaba* Monné & Delfino, male (MNRJ).

Form robust with parallel sides. Head slightly convex, antennae attaining elytral apex at approximately middle of antennomere 7, antennomeres 10 and 11 similar in length. Pronotum transverse, sides with obtuse post-medial tubercles, disk gibbose with coarse punctures along both anterior and basal impressions, and scattered punctures associated with long, fine setae on basal disk. Scutellum triangular, truncate at apex, raised above base of elytra. Elytra approximately twice as long as humeral width, with erect setae, pronounced humeral angles, central basal cristae with bristles, and two pairs of longitudinal carinae: lateral carina starting at humeral angle and extending to apical one-third of elytra, second medial carina oblique, starting below humeral angle, also extending to apical one-third of elytra, coarse punctures scattered mostly on basal half of elytra, apex truncate with outer angle rounded. Prosternal process narrow, less than one-fourth width of procoxa, apex expanded posteriorly, mesosternal process about width of mesocoxa, metasternum plane medially. Abdominal segment 5 with both apical sternite and tergite slightly emarginate (semicircular). Legs stout, profemora strongly clavate, pro- and mesotibiae with margins of ventral face carinate clothed with stiff bristles, first metatarsomere about as long as next two together. Genitalia: Median lobe 2.2 mm long, basal apophyses about one-third of whole median lobe in length, apex heavily sclerotized, truncate. Tegmen 2.3 mm long, extended base (fused part) slightly longer than paramere, ring elbowed, unfused portions of parameres 0.3 mm long, parallel with narrow medial gap, rounded apices with several setae, the longest about 0.3 mm.

Female (Figs 2, 12, 17): Similar to male but venter lacking erect ashy pubescence and mostly covered with appressed ashy pubescence, except for basal portions of abdominal segments 2–4 and apical portion of segment 5; antennae attaining elytral apex at approximately apex of antennomere 7; apical sternite and tergite elongated to form ovipositor extending well beyond elytral apex; and profemora less strongly clavate. Genitalia: spermatheca 0.8 mm long, narrows gradually into duct at 90°.

Dimensions, in mm.

	♂	♀
Total length	8.0–11.0	8.3–11.8
Prothorax length	1.7–2.4	1.6–2.3
Prothorax width	2.3–3.3	2.3–3.4
Elytra length	5.7–7.7	6.2–8.6
Humeral width	2.8–4.0	3.0–4.2

Comments. This species is distinguished from other species of *Neobaryssinus* by the lateral tubercles of the pronotum obtuse rather than acute and conical, and dark transverse fasciae near the apices of the elytra.

Host plant. *Lecythis poiteaui*, from bait branches cut during both dry and rainy seasons.

GenBank accession numbers. AF466979 (1 male, #1806, 30.VIII.1996), GU827558 (1 female, #3535, 29.VI.–9.VII.2008).

Etymology. From Latin *altus*, high, the specific epithet refers to the preference this beetle shows for canopy stratum branches; 97% of the specimens emerged from bait branches suspended in the canopy.

***Baryssiniella* Berkov and Monné, new genus**

Type species: *Baryssiniella hieroglyphica* Berkov and Monné, new species

Description. Superior lobes of eyes separated by width of one lobe; inferior lobe more than twice depth of gena. Antennae with 11 antennomeres, unarmed in both sexes. Prothorax wider than long, disk without tubercles or gibbose areas, lateral tubercles postmedial, obtuse and terminating in small points, coarse punctures restricted to basal impression. Scutellum triangular, truncate at apex, raised above base of elytra. Elytra with erect setae, lateral carinae lacking, slight central basal gibbosity with dark setae, coarse punctures in at least basal half, apices obliquely truncate with sutural angles rounded. Prosternal process approximately one-fourth width of procoxa or less, mesosternal process approximately same width as mesocoxa. Femora

clavate, first metatarsomere approximately $1.5 \times$ times as long as second and third together. Males: moderate to dense erect pubescence covering, at minimum, medial mesosternum, metasternum, first abdominal segment, and interior sides of coxae. Abdomen with apical sternite semicircular (to truncate) and apical tergite emarginate. Pro- and mesofemora at least somewhat enlarged, carina on mesotibiae. Females: erect ventral pubescence lacking, most of surface covered with appressed pubescence, apical sternite semicircular (truncate), may or may not extend beyond apex of elytra. Pro- and mesofemora not enlarged.

Comments. *Baryssiniella* is characterized by sexual dimorphism in ventral pubescence and anterior leg morphology, and setose elytra with, at most, a slight central basal gibbosity (Fig. 8). *Baryssiniella* lacks central basal cristae and the lateral carinae that characterize *Baryssinus*, *Neobaryssinus*, and *Neoeutrypanus*. *Palame*, *Neopalame* Martins & Monné, and *Xylergates* also lack central basal cristae and lateral elytral carinae. *Baryssiniella* lacks the gibbose pronotum and tuberculate elytra of *Xylergates* (Giorgi & Corbett 2005), and differs from *Palame* and *Neopalame* in having shallower genae (less than half the depth of the lower lobe of the eye) and more pronounced lateral pronotal tubercles. In addition, males of *Palame* and *Neopalame* often have a hook at the apex of antennomere 5 or 6 (Martins & Monné 1972), while males of *Baryssiniella* lack protuberances on any antennomere. We also compared *Baryssiniella* to *Onalcidion* Thomson. *Onalcidion* males lack erect ventral pubescence, and both sexes differ from *Baryssiniella* in that elytral length exceeds twice the width at the humeral angles, hind legs were comparatively pedunculate, and the first tarsomere on the hind legs was approximately twice as long as the next two tarsomeres combined.

Etymology. The generic name is feminine, and was selected because the two included species are similar to *Neobaryssinus* Monné & Martins, but much smaller; hence the diminutive suffix.

***Baryssiniella hieroglyphica* Berkov and Monné, new species**

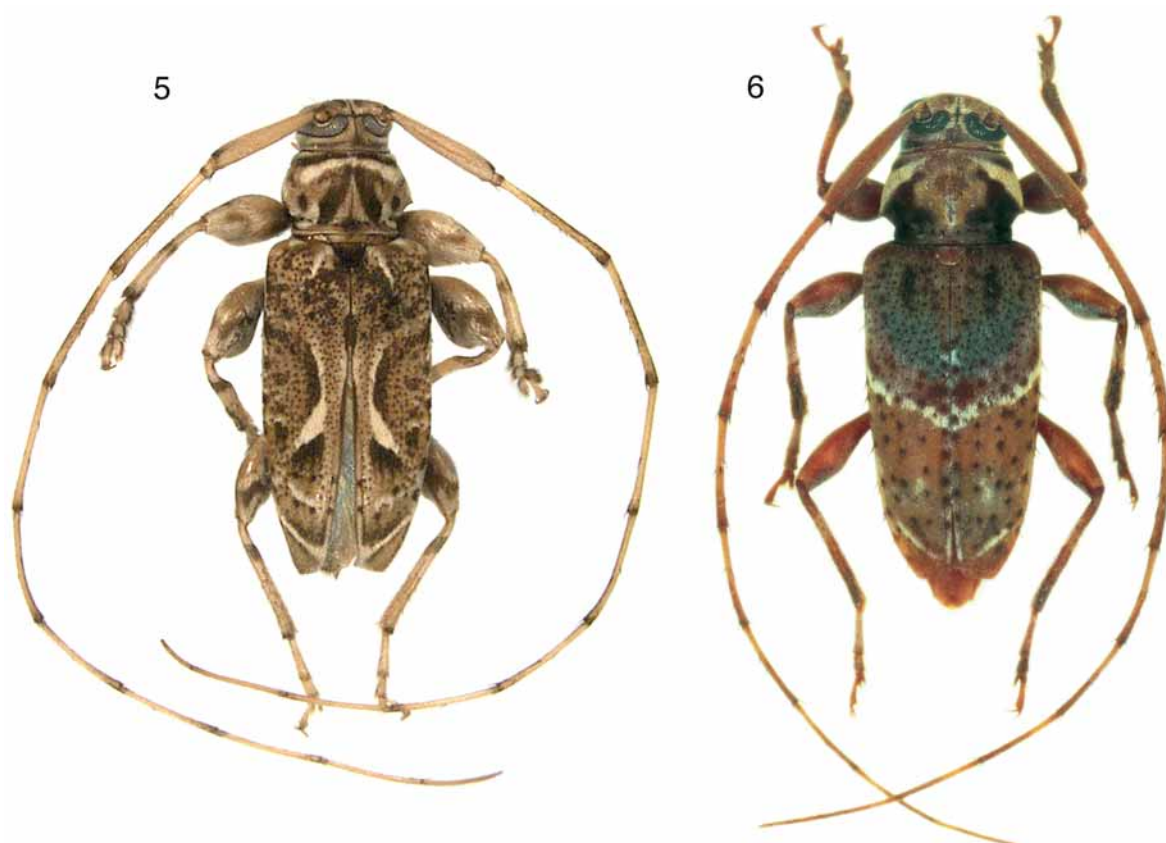
(Figs 5, 8, 10, 13, 18–20)

This species was referred to as *Neopalame* sp. 228 in Tavakilian *et al.* 1997.

Type material. Holotype male: PERU, Madre de Dios, Los Amigos Research Station (12° 33' S, 70° 06' W, elevation approx. 268 m), IV.2004–I.2005, A. Berkov & P. Centeno, leg. (UNMSM); host plant: *Eschweilera coriacea*. Note: This specimen was reared from a tree at 1000 m along the Plataforma trail; the bait branch was cut during the rainy season (EC-4, I.2004) and suspended in the canopy. **Paratypes:** Same locality as holotype: 7 males and 8 females, 12° 33' S, 70° 06' W / IV.2004–26.I.2005, host plant data same as holotype; 3 males and 6 females, 12° 34' S, 70° 06' W / IV.2004–26.I.2005, host plant *Bertholletia excelsa*. [Note: These specimens were reared from tagged tree 02 at 128 m along the Aerodromo trail, the bait branches were cut during the rainy season (BE-4, I.2004). One female was reared from a bait branch at ground stratum; others were from canopy stratum]; 1 female, 12° 32' S, 70° 05' W / 24.I.–10.VIII.2004, host plant *B. excelsa* [Note: This specimen was reared from a tree at 350 m along the Trompeteros trail, the bait branch was cut during the dry season and suspended in the canopy (BE-2; VIII.2003)]. Peru, Junin, Satipo, 3 males and 3 females, XI.1942, without collector (MNRJ). **Brazil**, Amazonas, Fonte Boa, 1 male, IX.1975, F. M. Oliveira (MNRJ). Rondônia, Ariquemes, 1 female, VIII.1980, B. Silva (MNRJ). Ouro Preto do Oeste, 1 male, III.1976, O. Roppa, J. Becker & B. Silva. (MNRJ). Mato Grosso, Sinop, 1 male, III.1976, O. Roppa & M. Alvarenga (MNRJ); same locality and collectors, 2 females, XI.1976 (MNRJ). **French Guiana**, Crique Plomb (Sinnamary), 1 male, 12.V.1993, G. Tavakilian (MNHN); same locality and collector, 1 female, 19.IV.1993 (MNHN). Crique Grand-Laussat, 1 female, 8.II.1984, A. Braunshausen (MNHN). (UNMSM, AMNH, MNHN, and MNRJ).

Description. Male (Figs 5, 8, 10, 18–19): integument light to medium reddish brown; body pubescence short and appressed, tan with ivory and medium brown markings. Head with frons, gena, and vertex ivory, pubescence densest bordering side of eye and posterior to the superior lobe, brown macula on antennal socket, scape ivory-tan with medium brown macula at dorsal apex, all other antennomeres ivory-tan at base, grading to medium brown at apex. Pronotum ivory-tan, with brown fascia near apex and subtler semicircular brown fascia terminating in conspicuous lateral spots, subtended by inverted v-shaped brown macula (sometimes

reduced to two maculae with tan at apex). Scutellum piceous. Elytra mostly tan with numerous scattered brown maculae, ivory maculae shadowed in brown forming a rough “x” across suture, and oblique ivory fasciae near apices. Prosternum with ivory appressed pubescence, meso- and metasternum with moderately dense, erect ivory pubescence, metasternum with lateral brown maculae. Abdomen with integument light reddish-brown, segment 1 with medial erect ivory pubescence and lateral appressed ivory pubescence with subtle brown macula, segments 2–5 with appressed ivory pubescence, segments 2–4 almost glabrous medially, with subtle brown lateral macula. Legs with integument light reddish-brown, coxae with dense, erect ivory pubescence, femora and tibiae with patchy appressed ivory and tan pubescence, dorsum of meso- and metatarsi predominantly ivory.



FIGURES 5–6. Species of *Baryssiniella*, habitus: 5, *B. hieroglyphica* Berkov & Monné **sp. nov.**, holotype, male; 6, *B. tavakiliani* Berkov & Monné **sp. nov.**, female.

Head slightly convex, antennae attaining elytral apex at approximately end of antennomere 5, antennomeres 10 and 11 similar in length. Pronotum transverse, sides with obtuse post-medial tubercles terminating in small spines, coarse punctures in basal impression. Scutellum triangular, truncate at apex, raised above base of elytra. Elytra approximately twice as long as humeral width, with erect setae, slight central basal gibbosity, coarse punctures extending from base to the apical one-quarter of elytra, apex obliquely truncate with sutural angle rounded. Prosternal process extremely narrow, less than one-sixth width of procoxa, apex expanded posteriorly, anterior margin of mesosternum sinuate, mesosternal process about width of mesocoxa. Abdomen with apical sternite semicircular and apical tergite emarginate (truncate). Pro- and mesofemora strongly clavate, mesofemora with coarse tooth near apex of internal side, pro- and mesotibiae with margins of ventral face carinate, mesotibial carinae more conspicuous with stiff bristles, first tarsomere of hind leg longer than next two tarsomeres together. Genitalia: Median lobe 2.2 mm long, basal apophyses about one-third of entire median lobe in length, apex of dorsal lobe sagitate, apex of ventral lobe lightly, medially sclerotized. Tegmen 2.3 mm long, extended base (fused part) about four times as long as paramere, ring elbowed, unfused portion of parameres 0.1 mm long, touching medially, widest near base, apices with several long setae, the longest about as long as paramere.

Female (Figs 13, 20): Similar to male except venter lacks erect ivory pubescence, mostly covered by sparse appressed ivory pubescence, except for brown lateral maculae on metasternum and abdominal segments 1–4, apex of ovipositor grading to brown with dark terminal setae. Antennae attaining elytral apex at approximately middle of antennomere 6, apical sternite and tergite elongated to form ovipositor extending well beyond elytral apex, pro- and mesofemora less strongly expanded, and mesofemora without coarse tooth. Genitalia: spermatheca 0.7 mm long, symmetrically indented forming duct at obtuse angle.

Dimensions, in mm.

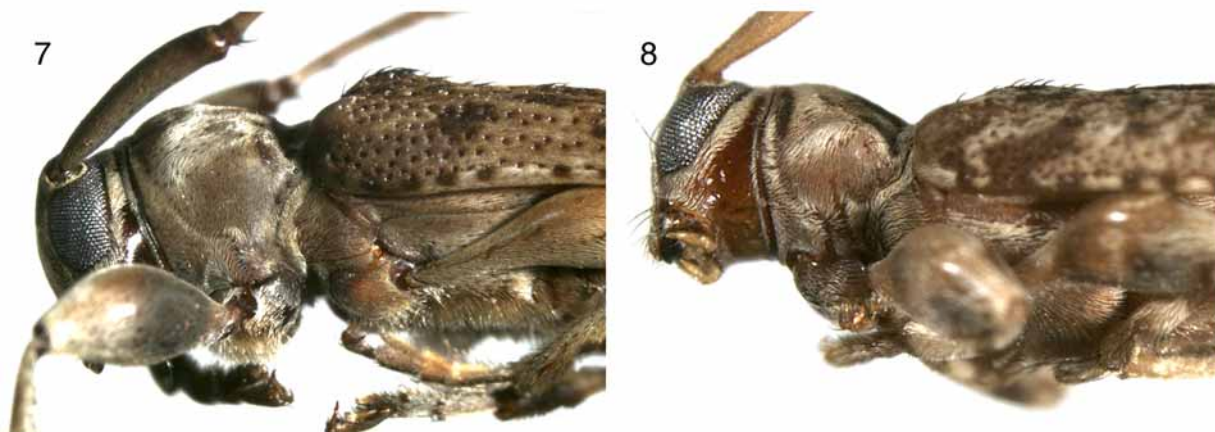
	♂	♀
Total length	5.1–6.4	5.9–6.9
Prothorax length	1.0–1.2	1.1–1.3
Prothorax width	1.5–1.8	1.7–2.0
Elytra length	3.8–4.6	4.3–5.1
Humeral width	1.9–2.2	2.1–2.5

Comments. This species is distinguished from *Baryssiniella tavakiliani* by the following characters: the integument predominantly light reddish-brown, the light color of the appressed pubescence, which ranges from ivory to medium brown, the brown macula in the form of an inverted “v” on the medial pronotum (sometimes reduced to two maculae), the ivory maculae, shadowed in brown, forming a rough “x” on the elytra, and males with a coarse tooth near the apex of the enlarged mesofemora.

Host plants. *Eschweilera coriacea* and *Bertholletia excelsa*, reared preferentially from bait branches cut during the rainy season and suspended at canopy stratum.

GenBank accession numbers. GU827559 (1 female, #A10-1, IV.2004–I.2005), GU827560 (1 male, #A10-3, IV.2004–I.2005).

Etymology. From Latin *hieroglyphicus*, sacred carving, the specific epithet refers to the elegant and complex pubescence pattern.



FIGURES 7–8. Lateral views of *Neobaryssinus* and *Baryssiniella*: 7, *N. marianae* Martins & Monné, male, with distinct central basal cristae; 8, *B. hieroglyphica* Berkov & Monné, male, with a slight central basal gibbosity.

***Baryssiniella tavakiliani* Berkov and Monné, new species**
(Figs 6, 11, 14)

This species was referred to as *Neobaryssinus* sp. 851 in Tavakilian *et al.* 1997, and *Neopalame* sp. 851 in Berkov & Tavakilian 1999, Berkov *et al.* 2000.

Type material. Holotype male: FRENCH GUIANA, Les Eaux Claires (7 km north of Saül, 3° 37' N, 53° 12' W, elevation 200–400 m) 27.III.1996, A. Berkov leg. (MNHN ex IRD); host plant: *Corythophora*

amapaensis. [Note: This specimen, #705, was reared from a tree at 920 m along the trail Sentier Botanique; the bait branch was cut during the dry season (IX. 2008, CA-Q, voucher M24147 at NYBG) and suspended in the canopy (MNHN)]. **Paratypes:** same locality, collector, and host plant species as holotype: 4 males and 3 females, 3° 37' N, 53° 12' W / 23.II–14.VII.1996, 2 males, 23.II.1996; 1 female, 01.V.1996; 1 female, 10.V.1996; 1 female, 22.V.1996; 1 male, 06.VII.1996; 1 male, 14.VII.1996. (AMNH, MNHN, MNRJ). French Guiana, Piste de Kaw, pk 43.5, 1 male, 27.V.1985, G. Tavakilian (MNHN); 1 male, 14.VIII.1992, J.-A. Cerda (MNHN). Crique Longi, 1 female, 28.VIII.1993, G. Poyet (MNHN). Crique Plomb, 1 male, 12.VIII.1993, G. Tavakilian (MNHN). (AMNH, MNHN, MNRJ).

Description. Male (Fig. 11): integument dark brown; body pubescence short and appressed, predominantly copper with white and piceous markings. Head with frons tan, gena white, and vertex copper grading into white bordering side of eye and posterior to the superior lobe, copper macula on antennal socket, scape and all other antennomeres with sparse copper pubescence, slightly darker annulate apices. Pronotum piceous with broad white fascia obliquely extending from anterior margin to lateral tubercles, and thin medial white line bisecting copper diamond-shaped macula. Scutellum copper. Base of elytra copper grading into gray and brown, medially bisected by oblique white fascia, post-medial pubescence sparse, copper with subtle white spots midway to apex and subtle oblique white fascia near apex. Ventral integument light reddish-brown. Prosternum anteriorly and laterally with pale appressed pubescence, prosternal process, mesosternum, metasternum, and abdominal segments 1–5 with medial, erect pale pubescence, laterally with denser pale appressed pubescence. Legs with integument pale reddish-brown to piceous, coxae with erect pale pubescence, femora and tibiae with sparse appressed pale and brown pubescence.

Head slightly convex, antennae attaining elytral apex at approximately middle of antennomere 6. Pronotum transverse, sides with obtuse tubercles terminating in small postmedial spines, coarse punctures in basal impression. Scutellum triangular, truncate at apex, raised above base of elytra. Elytra approximately twice as long as humeral width, with conspicuous erect setae, central basal gibbosity with denser erect setae, coarse punctures mostly on basal half of elytra, apex obliquely truncate with sutural angle rounded. Prosternal process narrow, approximately one-fourth width of procoxa, apex expanded posteriorly, mesosternal process about width of mesocoxa, metasternum plane medially. Abdomen with apical sternite shallowly semicircular and apical tergite emarginate (to truncate). Profemora moderately clavate, pro- and mesotibiae with margins of ventral face carinate and clothed with bristles, first tarsomere of hind leg longer than next two tarsomeres together. Genitalia are not described because a single male specimen was available to the authors.

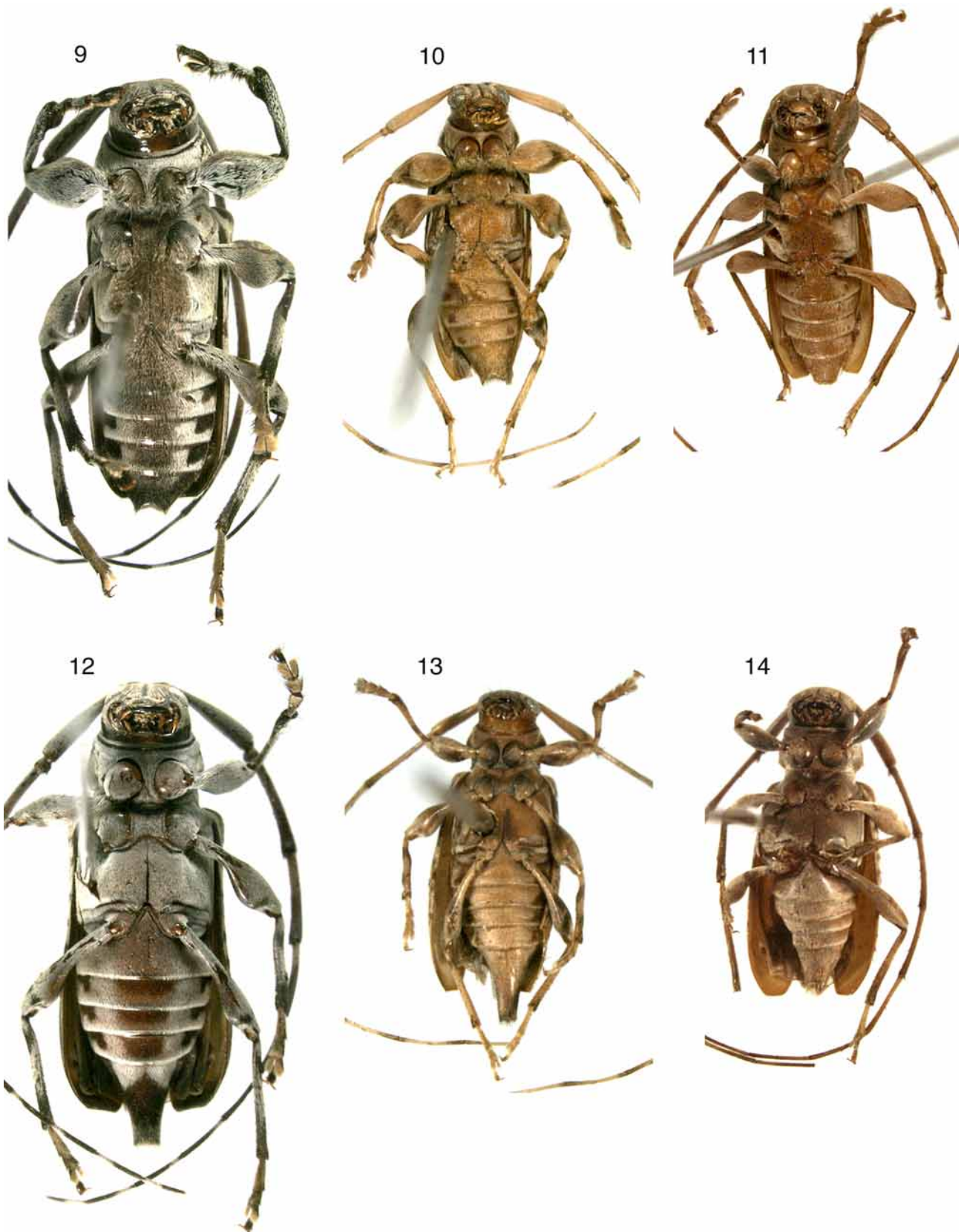
Female (Figs 6, 14): Similar to male except venter lacks erect pale pubescence, sparsely covered by appressed pale pubescence. Apical sternite and tergite slightly elongated and narrowed towards apex, ovipositor not extending beyond elytra, and profemora not strongly expanded. Genitalia are not described because a single female specimen was available to the authors.

Dimensions, in mm.

	♂	♀
Total length	6.2	6.1
Prothorax length	1.3	1.2
Prothorax width	1.8	1.7
Elytra length	4.4	4.3
Humeral width	2.1	2.2

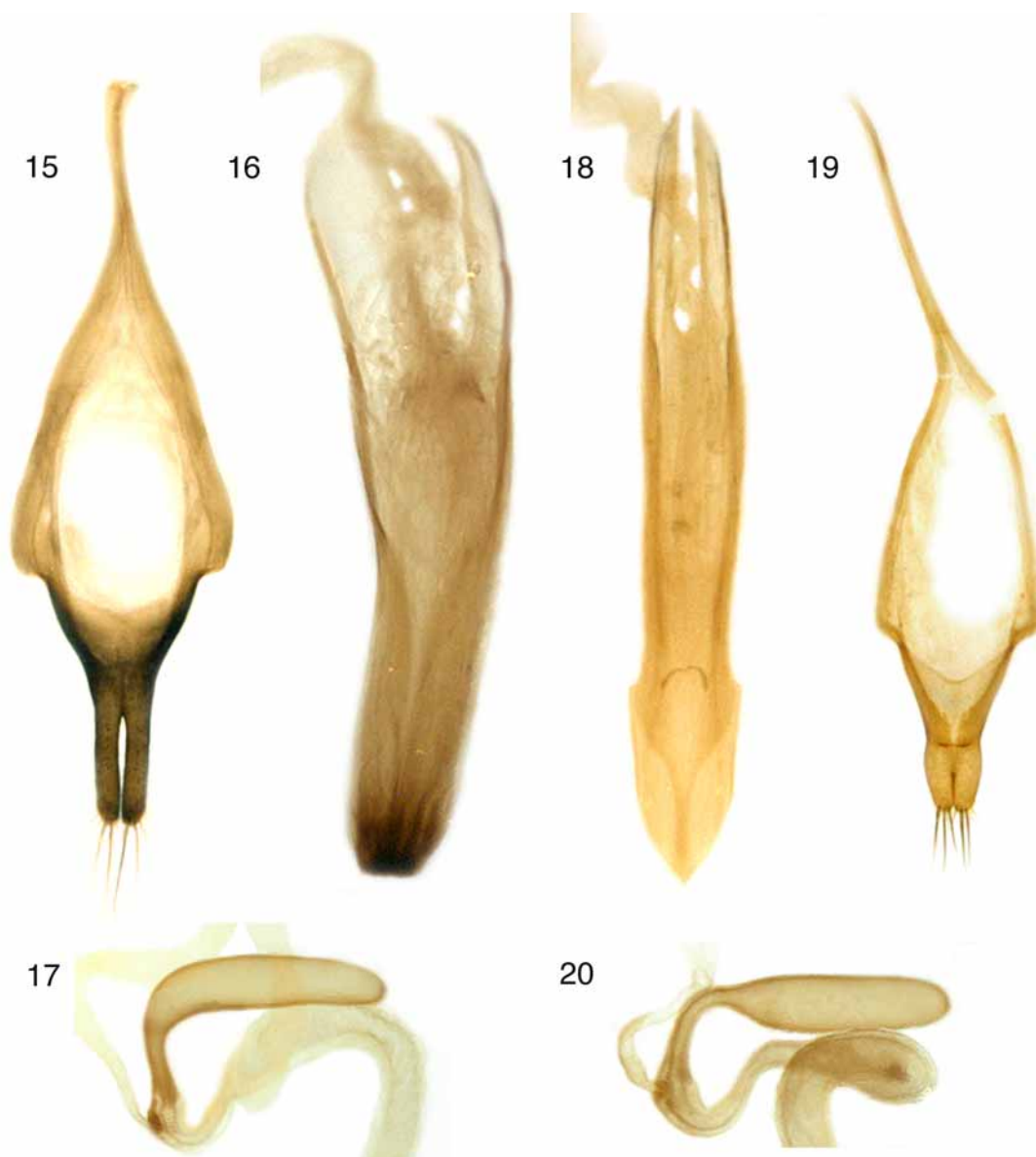
Comments. This species is distinguished from *Baryssiniella hieroglyphica* by the following characters: the dorsal integument predominantly dark brown, the prevalent copper appressed pubescence, the elytra medially bisected by oblique white fascia, the males with erect ventral pubescence on all abdominal segments, and the mesofemora not conspicuously enlarged and lacking a coarse tooth.

Etymology. The specific epithet honors Gérard Tavakilian, who described host plant associations for 334 Neotropical cerambycid species, discovered the guild of cerambycids associated with the Brazil nut family, and reared the first specimens of this species (Tavakilian *et al.* 1997).



FIGURES 9–14. Ventral views showing sexual dimorphism in ventral pubescence, profemora, and protarsi: 9, *N. altissimus*, male; 10, *B. hieroglyphica*, holotype, male; 11, *B. tavakiliani*, holotype, male; 12, *N. altissimus* female; 13, *B. hieroglyphica* female; 14, *B. tavakiliani* female.

Host plants. *Corythophora amapaensis*, reared from both ground and canopy stratum bait branches cut during the dry season; also reared from *Eschweilera parviflora* in a portion of the Sinnamary River Basin that was subsequently inundated after the completion of the Petit Saut Dam (Tavakilian *et al.* 1997).



FIGURES 15–20. Male and female genitalia: 15, *N. altissimus* tegmen; 16, *N. altissimus* median lobe; 17, *N. altissimus* spermatheca; 18, *B. hieroglyphica* tegmen; 19, *B. hieroglyphica* median lobe; 20, *B. hieroglyphica* spermatheca.

Discussion

Acanthocinines in the genera *Neoeutrypanus*, *Palame*, and *Xylergates* have been reared almost exclusively from trees belonging to a monophyletic lineage of Lecythidaceae including *Bertholletia*, *Corythophora*, *Eschweilera*, and *Lecythis* (the *Bertholletia* clade of the subfamily Lecythidoideae, in Mori *et al.* 2007). Thus far *Neobaryssinus marianae* is the only cerambycid species known to reproduce preferentially in the malodorous branches of *Couratari*. At least some species of *Couratari* produce sulfur compounds including dimethyl disulfide (Berkov *et al.* 2000), an insect neurotoxin that is lethal to generalist insects (Dugravot *et al.* 2003). *Neobaryssinus altissimus* was reared from *Lecythis poiteaui*, and while sulfur compounds are not dominant in its wood (Berkov *et al.* 2000), they are major aroma components of its bat-pollinated flowers

(Feinstein *et al.* 2008). Because *N. altissimus* emerged in abundance from canopy branches cut during the rainy season, while *L. poiteaui* was in bloom, (Berkov & Tavakilian 1999; Lee, Baxt & Berkov, unpubl. data), ovipositing females were exposed to the rank floral volatiles. Species of *Neobaryssinus* seem to tolerate exposure to sulfurous compounds that most other cerambycids avoid (cerambycids associated with *L. poiteaui* usually emerge preferentially from branches cut during the dry season, when flowers are not present). Host plants have not yet been identified for *N. phalarus* or *N. capixaba*, but it might be productive to sample *Couratari macrosperma* or *Lecythis pisonis*. Both of these tree species are common in Espírito Santo, Brazil (Mori & Prance 2006 onward), where *N. phalarus* and *N. capixaba* were collected.

Like most other Lecythidaceae specialists, *B. hieroglyphica* and *B. tavakiliani* emerged from host trees in the *Bertholletia* clade (Berkov & Tavakilian 1999, Berkov & Centeno unpubl. data). Although both species of *Baryssiniella* have been reared from several trees in more than one genus of Lecythidaceae, neither was reared in great abundance and the data do not suggest any particular evolutionary scenario. Thus far *B. hieroglyphica* and *N. altissimus* appear to be preferentially associated with branches cut during the rainy season, but suspended at canopy stratum—where the drier microclimate (Lee, Baxt & Berkov, unpubl. data) might help maintain a wood or bark moisture content suitable for larval development (Hanks *et al.* 1999).

The acanthocinine genera most consistently associated with the Brazil nut family share a suite of sexual dimorphisms including males with erect ventral pubescence, enlarged profemora, and dilated protarsi (Martins & Monné 1972, Monné & Martins 1976, Monné 1977, Giorgi & Corbett 2005). Although these might suggest a close relationship, it will be impossible to evaluate without phylogenetic analysis; a daunting notion in this large tribe of cryptic, poorly known beetles. There are still many undescribed species (Monné, M. A. pers. obs.), and while the monophyly of the cerambycid subfamily Lamiinae is well supported (Napp 1994), the monophyly of Acanthocinini and included genera are far from certain.

Phylogenetic analysis of Acanthocinini would require a large data set including character systems that are thus far poorly explored. Genitalic characters are considered too variable to provide much information about large subfamilies such as Cerambycinae and Lamiinae (Napp 1994, Hubweber & Schmitt 2010), but are sometimes included in species descriptions and taxonomic revisions (Micheli & Nearn 2005, Thongphak & Wang 2007, Lin *et al.* 2009). In cryptic Acanthocinini, this inherent variability might make genitalic characters useful in the circumscription of monophyletic genera. Of course DNA is also a rich source of characters. GenBank currently includes sequences for only 1% of the worldwide Acanthocinini, including COI “barcodes” that, for instance, facilitate the identification of larvae (Berkov *et al.* 2007), but lack adequate signal for phylogenetic reconstruction. Sequence data have been used in conjunction with genital morphology to distinguish externally similar sibling species of *Leiopus* (Acanthocinini) (Wallin *et al.* 2009). In our preliminary studies of molecules and genitalia in *Palame* (Berkov 2002; unpubl. data), it is encouraging that thus far they are in agreement—suggesting that it may ultimately be possible to tame even the most recalcitrant Cerambycidae.

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Literature citations

Bates, H.W. (1864) Contributions to an insect fauna of the Amazon Valley. Coleoptera: Longicornes. *Annals and*

- Magazine of Natural History*, 14, 11–24.
- Berkov, A. (2002) The impact of redefined species limits in *Palame* (Coleoptera, Cerambycidae, Lamiinae, Acanthocinini) on assessments of host, seasonal, and stratum specificity. *Biological Journal of the Linnean Society*, 76, 195–209.
- Berkov, A., Feinstein, J., Centeno, P., Small, J. & Nkamany, M. (2007) Yeasts isolated from Neotropical wood-boring beetles in SE Peru. *Biotropica*, 39, 530–538.
- Berkov, A., Meurer-Grimes, B. & Purzycki, K. (2000) Do Lecythidaceae specialists (Coleoptera: Cerambycidae) shun fetid tree species? *Biotropica*, 32, 440–551.
- Berkov, A. & Tavakilian, G. (1999) Host utilization of the Brazil nut family (Lecythidaceae) by sympatric wood-boring species of *Palame* (Coleoptera, Cerambycidae, Lamiinae, Acanthocinini). *Biological Journal of the Linnean Society*, 67, 181–198.
- Dugravot, S., Grolleau, F., Macherel, D., Rochetaing, A., Hue, B., Stankiewicz, M., Huignard, J. & Lapeid, B. (2003) Dimethyl disulfide exerts insecticidal neurotoxicity through mitochondrial dysfunction and activation of insect KATP channels. *Journal of Neurophysiology*, 90, 259–270.
- Feinstein, J., Purzycki, K.L., Mori, S., Hequet, V. & Berkov, A. (2008) Neotropical soldier flies (Stratiomyidae) reared from *Lecythis poiteaui* in French Guiana: Do bat-pollinated flowers attract saprophiles? *Journal of the Torrey Botanical Society*, 135, 200–207.
- Giorgi, J.A. & Corbett, D.C. (2005) Sinopse do gênero *Xylergates* (Cerambycidae, Lamiinae, Acanthocinini). *Iheringia, Série Zoologia, Porto Alegre*, 95, 5–8.
- Hanks, L.M., Paine, T.D., Millar, J.G., Campbell, C.D. & Schuch, U.K. (1999) Water relations of host trees and resistance to the phloem-boring beetle *Phoracantha semipunctata* F. (Coleoptera: Cerambycidae). *Oecologia*, 119, 400–407.
- Hubweber, L. & Schmitt, M. (2010) Differences in genitalia structure and function between subfamilies of longhorn beetles (Coleoptera: Cerambycidae). *Genetica*, 138, 37–43.
- Linn, M., Tavakilian, G., Montreuil, O. & Yang, X. (2009) Eight species of the genus *Glenea* Newman, 1842 from the Oriental Region, with description of three new species (Coleoptera: Cerambycidae: Lamiinae: Saperdini). *Zootaxa*, 2155, 1–22.
- Martins, U.R. & Monné, M.A. (1972) Caracterização de dois generos de Acanthocinini (Col., Cerambycidae). *Revista Brasileira de Entomologia*, 16, 61–66.
- Martins, U.R. & Monné, M.A. (1974) Contribuição ao conhecimento dos Acanthocinini II (Coleoptera, Cerambycidae, Lamiinae). *Studia Entomologica*, 17, 317–332.
- Micheli, C.J. & Nearn, E.H. (2005) Two new species of *Plectromerus* Haldeman (Coleoptera: Cerambycidae) from the West Indies. *Zootaxa*, 1028, 23–36.
- Monné, M.A. (1977) Contribuição ao conhecimento dos Acanthocinini VI (Coleoptera, Cerambycidae, Lamiinae). *Revista Brasileira de Biologia*, 37, 693–711.
- Monné, M.A. (1990) Sinopse dos gêneros de Acanthocinini neotropicais. I. Gêneros com setas e crista centro-basal nos élitros (Coleoptera, Cerambycidae, Lamiinae). *Revista Brasileira de Biologia*, 50, 249–278.
- Monné, M.A. (2001) Catalog of the Neotropical Cerambycidae with known host plant—Part III. Subfamily Laminae, tribes Acanthocinini to Apomecynini. *Publicações Avulsas do Museu Nacional*, 92, 1–94.
- Monné, M.A. & Delfino, S.M. (1980) Contribuição ao conhecimento dos Acanthocinini VII (Coleoptera, Cerambycidae, Lamiinae). *Revista Brasileira de Biologia*, 40, 317–322.
- Monné, M.A. & Martins, U.R. (1976) Contribuição ao conhecimento dos Acanthocinini (Coleoptera, Cerambycidae, Lamiinae). *Papéis Avulsos de Zoologia*, 30, 43–98.
- Mori, S.A. & Prance, G.T. (2006 onward) The Lecythidaceae Pages, The New York Botanical Garden, Bronx, New York. Available from <http://sweetgum.nybg.org/lp/index.html> (accessed 4 January 2010).
- Mori, S.A., Tsou, C.-H., Wu, C.-C., Cronholm, B. & Anderberg, A.A. (2007) Evolution of Lecythidaceae with an emphasis on the circumscription of Neotropical genera: Information from combined ndhF and trnL-F sequence data. *American Journal of Botany*, 94, 289–301.
- Napp, D.S. (1994) Phylogenetic relationships among the subfamilies of Cerambycidae (Coleoptera—Chrysomeloidea). *Revista Brasileira de Entomologia*, 38, 265–419.
- Roguet, J.-P. (2004–2010) Lamiarum du Monde, Paris, France. Available from <http://www.lamiinae.org/> (accessed 8 January 2010).
- Tavakilian, G., Berkov, A., Meurer-Grimes, B. & Mori, S. (1997) Neotropical tree species and their faunas of xylophagous longicorns (Coleoptera, Cerambycidae) in French Guiana. *The Botanical Review*, 63, 303–355.
- Thongphak, D. & Wang, Q. (2007) Taxonomic revision of the longicorn beetle genus *Uracanthus* Hope 1833 (Coleoptera: Cerambycidae: Cerambycinae: Uracanthini) from Australia. *Zootaxa*, 1569, 1–139.
- Wallin, H., Nylander, U. & Kvamme, T. (2009) Two sibling species of *Leiopus* Audinet-Serville, 1835 (Coleoptera: Cerambycidae) from Europe: *L. nebulosus* (Linnaeus, 1758) and *L. linnei* sp. nov. *Zootaxa*, 2010, 31–45.