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Generic redefinition and a new species of *Nesolinoceras* Ashmead (Hymenoptera, Ichneumonidae, Cryptinae)

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ABSTRACT

The generic limits of *Nesolinoceras* Ashmead are redefined. The genus is characterized by the supraclypeal and supraantennal areas covered by distinct, uniformly spaced striae; antenna without white band; foretibia distinctly swollen, fusiform; forewing with extensive fuscous bands; areolet large, pentagonal, longer than wide, distinctly convergent; spiracle of first metasomal tergite placed at midlength; and ventral valve of ovipositor apically dilated and overlapping dorsal valve as a lobe. The type species, *N. ornatipennis* (Cresson) is redescribed, illustrated, and newly recorded from the Bahamas and the Cayman Islands. A new species, *N. laluzbrillante,* sp. nov., is described from the Dominican Republic. It is diagnosed mainly by having mesopleuron, propodeum, and metasoma extensively marked with blackish and whitish stripes and spots; clypeus in front view with base almost as wide as apex; central ocellus about as large as lateral ones; epicnemial carina short, reaching only 0.4 of length to subalar ridge; and areolet crossveins 2r-m and 3r-m distinctly convergent, but far from meeting on anterior apex of areolet. Previously thought to be restricted to Cuba, *Nesolinoceras* seems to be relatively widespread in the Caribbean Islands.

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INTRODUCTION

Nesolinoceras was described by Ashmead (1906) to include a single species from Cuba, *N. espini* Ashmead. The genus was characterized mainly by the "submedian cell in front wings a little shorter than the median, the areolet not large, irregularly pentagonal, the sides strongly convergent, wings hyaline with transverse brown fasciae." Townes (1946) recognized that *N. espini* was actually the male of *Cryptus ornatipennis* Cresson (1865), and therefore a synonym of the latter species, which was transferred to *Nesolinoceras*. Hence the genus currently includes a single valid species, *N. ornatipennis*. The generic definition was reviewed and updated by Townes (1970), who provided a short description for the genus.

Nesolinoceras ornatipennis was redescribed in more detail by Alayo and Tzankov (1974), who also provided additional distribution records and the first host record. In fact, *N. ornatipennis* seems to be a fairly common species in Cuba, being extensively reported in surveys from a variety of localities (e.g., Domínguez and Domínguez, 1990l Portuondo-Ferrer and Fernández-Triana, 2005; Fernández-Triana et al., 2005).

Nesolinoceras is classified in the subtribe Gabuniina (Townes, 1970), an apparently monophyletic (Aguiar, 2005; Laurenne et al., 2006), worldwide group of cryptine wasps currently with 34 genera and 312 described species (Yu et al., 2012). Gabuniines are parasitoids of xylophagous Coleoptera and Lepidoptera, and as noted by Townes and Townes (1962), females of the group possess a series of putative adaptations for that purpose: head subspherical, apical flagellomere apically flattened for vibrational sounding (see Broad and Quicke, 2000), body shape approximately cylindric, foretibiae dilated, having enlarged subgenual organs; metasomal tergites 7–8 enlarged, accommodating enlarged oviposition muscles; and ovipositor compressed, straight and stout, the lower valve with an apical lobe that partially encloses the upper valve.

This work aims to review the taxonomic limits of the genus and to describe a new species from the Dominican Republic.

MATERIAL AND METHODS

This work is based on 66 specimens of *Nesolinoceras*, belonging to the following institutions (curators in parenthesis): **AEIC,** American Entomological Institute, Gainesville, Florida (D. Wahl); **ANSP,** Academy of Natural Sciences of Drexel University, Philadelphia, Pennsylvania (J. Weintraub); **CNCI,** Canadian National Collection of Insects, Ottawa, Canada (A.Bennett); **FSCA,** Florida State Collection of Arthropods, Gainesville, Florida (K. Williams); **USNM,** National Museum of Natural History, Washington, D.C. (R. Kula).

Morphological terminology, biometric ratios, and other conventions follow Santos and Aguiar (2013), except that the "second trochanter" is referred herein as trochantellus, and the "posterior transverse carina of the mesothoracic venter" is called "postpectal carina." The first and subsequent tarsomeres are referred to as t1, t2, t3, etc.; the first and subsequent metasomal tergites are refererred to as T1, T2, T3, etc.; and the first and subsequent flagellomeres are referred to as f1, f2, f3, etc. The cell 1+2Rs is referred to as the "areolet," as it is standard in

Ichneumonidae literature, for simplicity. Abbreviations for biometric ratios used in descriptions are as follows: **APH,** forewing cell 1+2Rs (areolet) height/pterostigma maximum width; **AWH,** areolet maximum width/maximum height; **CWW,** clypeus maximum width/minimum width; **HW1C,** hind-wing vein Cua/cu-a length; **MLW,** mandible maximum length/maximum width; **MSM,** malar space maximum width/basal width of mandible; **MWW,** mandible minimum width/maximum width; CWH, clypeus maximum width/maximum height; **OST,** ovipositor sheath length/hind tibia length; **SWL,** propodeal spiracle maximum width/maximum length; **T1LW,** first metasomal tergite maximum length/maximum width (dorsal view); **T1WW,** first metasomal tergite maximum width/minimum width (dorsal view); **T2LW,** second metasomal tergite maximum length/maximum width (dorsal view); **T2WW,** second metasomal tergite maximum width/minimum width (dorsal view). When potentially ambiguous, color names are followed by their respective RGB formula, as determined from digital pictures of the studied specimens, according to procedures described by Aguiar (2005).

Figures 2–13 were generated using Helicon Focus 6.3.7 (http://www.heliconsoft.com/heliconsoft-products/helicon-focus/) to combine stacks of photos into extended-focus images. Stacks were prepared using a variety of methods: Figures 2–3 were done using the Microptics ML-100 digital imaging system, with a Canon EOS 60D camera attached to Infinity K2 and HDF lenses and a ML-1000 stroboscopic lighting system. Figures 4–5 used a Canon EOS Rebel T3 digital camera with a Canon EF-S 60mm f2.8 USM Macro lens and an extension tubes set. Figures 6–13 were done using EntoVision (GTVision, Hagerstown, Maryland), including a Leica Z16 zoom lens attached to a JVC KY-75U 3-CCD digital video camera that feeds image data to a desktop computer.

RESULTS

Nesolinoceras Ashmead, 1906

Nesolinoceras Ashmead, 1906: 294–295. Description. Type species: *N. espini* Ashmead, 1906, by monotypy and original designation.

Diagnosis: *Nesolinoceras* can be distinguished from other genera of Cryptini by the following combination of characters: apical area of clypeus with a small median tubercle (figs 3, 9); supraclypeal and supraantennal areas covered by distinct, uniformly spaced striae (figs 3,9); antenna without white band; foretibia distinctly swollen, fusiform (fig. 1); forewing hyaline with extensive fuscous bands; areolet large, pentagonal, longer than wide, distinctly convergent (figs 4, 10); T1 anteriorly without lateral tooth, its spiracle placed at midlength; ventral valve of ovipositor apically dilated and overlapping dorsal valve as a lobe (fig. 12).

Description: FEMALE: Forewing 7.2–10.8 mm long. Body stout, subcylindric, mostly shiny. *Head.* Mandible short, MLW 1.6–1.7, its apex much narrower than base, MWW 0.4–0.6; ventral tooth longer and more robust than dorsal one. Malar space moderately wide, MSM 0.6–0.7. Clypeus wide, CHW 1.9–2.1, apex about as wide as to much wider than base; CWW 1.2–2.0, basally weakly convex, apically almost concave; apical area slightly inflected, medially

straight, with small median tubercle. Supraclypeal and supraantennal areas covered by distinct, uniformly spaced striae (fig. 3). Antenna with 22–23 flagellomeres; flagellum with uniform width, not enlarged toward apex, without whitish band; apex of apical flagellomere blunt, flattened, with a cluster of modified sensillae. Occipital carina sharp, uniformly curved, apically fading out shortly before reaching hypostomal carina. Gena ventrally enlarged, much wider than on dorsal portion, giving head subspherical shape in front view (fig. 9).

Thorax. Dorsal margin of pronotum regular, not swollen; epomia indistinct. Mesoscutum moderately convex, subcircular, 1.0–1.1× as long as wide, shiny, distinctly sculptured (figs 5, 8); notaulus moderately short to moderately long, reaching 0.4–0.6 of mesoscutum length, moderately impressed, slightly to distinctly convergent, its surface smooth. Epicnemial carina reaching about 0.4–0.8 of distance to subalar ridge, somewhat sinuous. Sternaulus complete, uniformly shallow throughout its length, sinuous. Postpectal carina incomplete, its median portion short, straight. Posterior margin of metanotum without teethlike projections. Transverse furrow at base of propodeum narrow and moderately deep, medially smooth. Juxtacoxal carina absent or vestigial. Pleural carina absent. Fore tibia distinctly swollen, its broadest portion at midlength, giving tibia fusiform aspect. All fourth tarsomeres distinctly bilobed, lobes subequal in length and with a cluster of apical bristles.

Propodeum. In dorsal view, 1.0–1.1× as long as wide; in profile somewhat gently rounded. Anterior margin medially slightly concave. Spiracle elliptic, SWL 1.8–2.0. Longitudinal carinae absent. Anterior transverse carina complete, sharp, medially arched. Posterior transverse carina absent.

Wings. Hyaline, forewing with extensive fuscous bands (figs 4, 10). Forewing vein 1m-cu entirely fused with 1-Rs+M, limit between two veins indistinct; 1-Rs+M with bulla placed apically, almost reaching areolet; ramellus absent; crossvein 1cu-a arising far from 1M+Rs, basad by 0.2–0.4× its own length; vein 2Cua 1.1–1.2× as long as crossvein 2cu-a; bulla at crossvein 2m-cu moderately long, occupying about half of its length, placed more anteriorly than posteriorly; areolet large, APH 1.8–2.0, longer than wide, AWH 0.7–0.9, pentagonal; crossvein 3r-m mostly to entirely spectral; crossveins 2r-m and 3r-m distinctly convergent, both veins about the same length or 3r-m slightly longer; vein 4-Rs distinctly shorter than vein 4-M. Hind wing vein M+Cu only moderately curved apically, widest point of cell 1Cu (submediellan cell of Townes) only about twice as wide as basal width; vein Cua about as long as crossvein cu-a or slightly shorter, HW1C 0.9–1.0; veins 1-Rs and 2-Rs somewhat angled, cell R1 trapezoidal; vein Cub distinct, its apical 0.5 distinctly convex; vein 2-1A reaching at least 0.9 of distance to wing margin.

Metasoma. T1 short, about 0.3× as long as T2–8 combined, stout, T1LW 1.5, apex much wider than base, T1WW 1.9–2.2, distinctly depressed; without anterior lateral tooth; ventral surface of petiole and postpetiole forming uniform straight line, postpetiole and petiole not angled; spiracle of T1 near its midlength, placed on basal 0.4–0.5; median dorsal and dorsolateral carinae absent or vestigial; ventrolateral carina faint to distinct. T2 short, T2LW 0.8–0..8, trapezoidal, T2WW 1.3–1.6; thyridium small, placed rather anteriorly on T2, distinctly wider than long; T7–8 distinctly longer than T5–6. Ovipositor moderately long, OST 1.0–1.2, stout,

straight, distinctly compressed; apex of ovipositor somewhat blunt, without nodus or notch; dorsal valve without ridges; ventral valve apically dilated and overlapping dorsal valve as a lobe, with 7–8 weak to distinct teeth.

MALE: Generally similar to female. Morphological differences are usually more or less uniform within Cryptini and apply to the males of *Nesolinoceras*: General body size usually smaller than females. Antenna with 29–31 flagellomeres, each flagellomere usually shorter and wider than in females. Transverse furrow slightly longer than in female. Propodeum smaller, less strongly convex. First metasomal segment more slender, with T1LW around 3.2, and less widened apically, with T1WW around 1.4. T2–7 much more slender than in females.

COMMENTS: *Nesolinoceras* is similar to *Agonocryptus* Cushman, and particularly to *Cryptohelcostizus* Cushman. The three genera share features that are considered important in grouping gabuniine genera (Townes, 1970; Gupta and Gupta, 1983; Aguiar, 2005), such as the pleural carina absent; T1 without a basolateral tooth; and dorsolateral carina of T1 absent or vestigial. These three genera also have the body rather stout and subcylindric, with the gena strongly inflated giving the head a subspherical shape; these features are generally common in Gabuniina but contrast with other New World members of the subtribe, such as *Lagarosoma* Gupta, *Prosthoporus* Porter, *Trypha* Townes, and many species of *Digonocryptus* Viereck, which have a more slender body (particularly the metasomal T1) and somewhat triangular head in front view. However, *Nesolinoceras* can be readily differentiated from both *Agonocryptus* and *Cryptohelcostizus* by the distinctly banded pattern in the forewing; the very characteristic shape of the areolet (large, APH >1.7, longer than wide, with veins 2r-m and 3r-m strongly convergent); and the epomia indistinct. *Agonocryptus* also has the apical carina of the propodeum present (vs. absent in *Nesolinoceras*) and the antenna with a distinct white band (vs. absent); *Cryptohelcostizus* has the apical area of the clypeus without median tubercle (vs. present). The redescription of the genus presented above is largely congruent with the one provided by Townes (1970), though including a considerable number of characters not mentioned by that author. The new species *N. laluzbrillante* runs properly to the generic keys of Townes (1970) and Aguiar (2005).

DISTRIBUTION: Caribbean. While originally recorded exclusively from Cuba, herein the genus was also discovered in the Bahamas, Cayman Islands, and the Dominican Republic. *Nesolinoceras ornatipennis* has clearly dispersed between Cuba and the Bahamas, since the two landmasses were never connected (Pindell et al., 2006). It is likely that the dispersal happened from the former to the latter; the Bahamas were exposed above the sea level only during the Pleistocene, and most of its fauna is recently derived from the Greater Antilles and exhibits little endemism (Ricklefs and Bermingham, 2008). Such dispersal events are not surprising, since some species of Cryptinae seem to be strong fliers and have relatively large distributions (see revisions such as Townes and Townes, 1962; Aguiar and Ramos, 2011; Santos and Aguiar, 2013). It is possible that species of *Nesolinoceras* may be found in other Caribbean Islands. However, the genus was not discovered in Central or North America even after examination of extensive material from these areas, e.g., collections of AEIC, Instituto Nacional de Biodiversidad, Costa Rica (R. Zuñiga, personal commun.) and University of Costa Rica (P. Hanson, personal commun.).

FIGURE 1. *Nesolinoceras ornatipennis.* A female drilling a tree branch in Varahicacos Ecological Reserve, Cuba. Photo by Max Padt, used with permission; first published online (https://www.flickr.com/photos/maxman2402).

Nesolinoceras ornatipennis (Cresson, 1865)

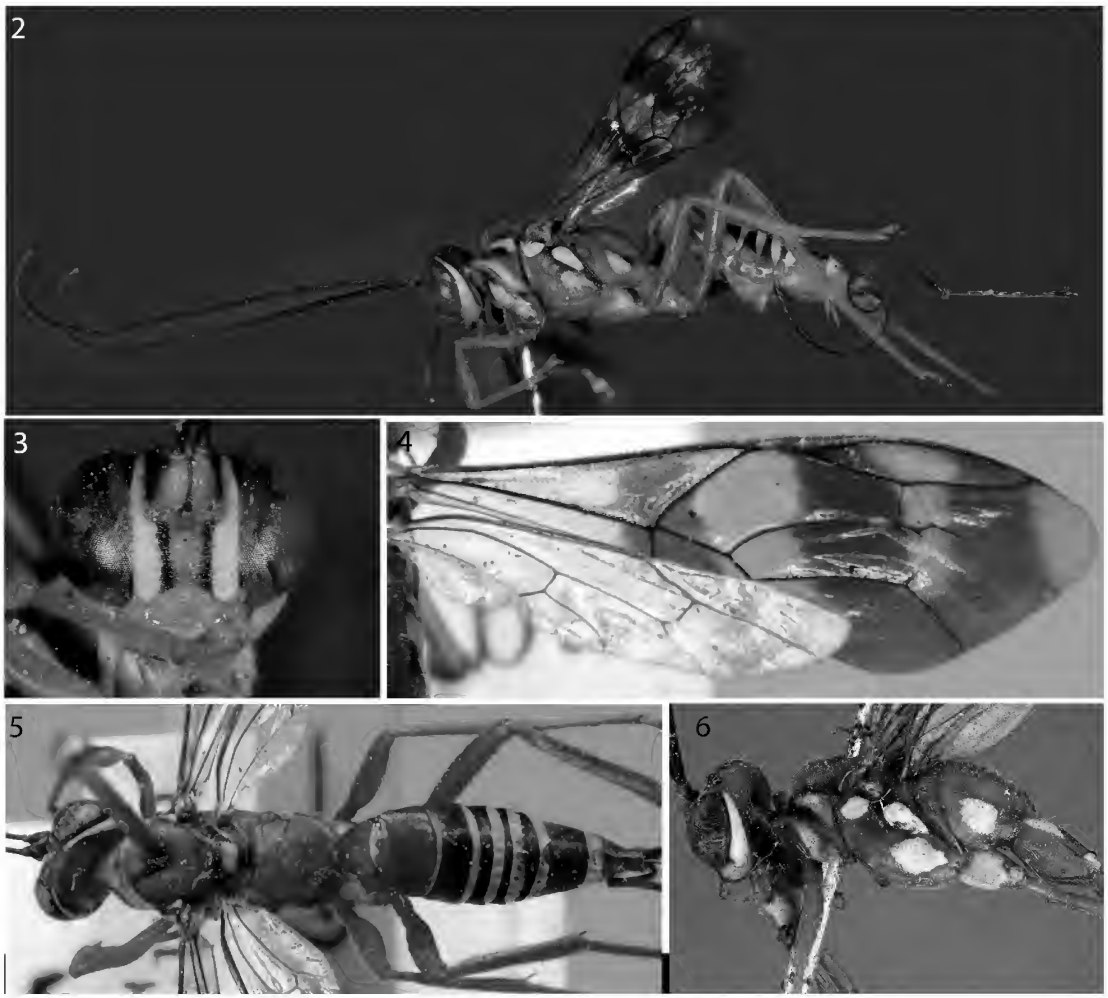
Figures 1–6, 14

Cryptus ornatipennis Cresson, 1865: 21–22. Description, figure. Holotype ♀ (ANSP, examined).
Nesolinoceras espini Ashmead, 1906: 294–295. Description. Holotype ♂ (USNM, examined).
Nesolinoceras ornatipennis: Townes, 1946: 42. Generic transfer.

Diagnosis: Mesopleuron mostly ferruginous, with three whitish marks and without blackish marks (fig. 2); propodeum entirely ferruginous (fig. 3); metasoma mostly ferruginous, each tergite with posterior whitish stripe, with sparse brownish marks (figs. 2, 5). Central ocellus larger than lateral ones. Areolet crossveins 2r-m and 3r-m distinctly convergent, almost meeting anteriorly (fig. 4).

Female holotype (figs. 2–5): Forewing 9.5 mm long. *Head.* Ventral tooth of mandible apically uniformly tapered, somewhat pointy; MLW 1.6; MWW 0.6. Malar space coriaceus; MSM 0.7. Clypeus wide, CWH 2.1, in front view somewhat semicircular, apex much wider than base, CWW 2.0, apically without distinct striae (fig. 3). Antenna with 23 flagellomeres. Central ocellus distinctly larger than lateral ones. Occipital carina fading out just before meeting hypostomal carina.

Thorax. Densely covered with short yellowish hairs, pilosity sparser on scutellum, postscutellum, mesopleuron, and anterior 0.6 of propodeum. Pronotum dorsally punctate, ventrally distinctly striate. Mesoscutum subcircular, 1.0× as long as wide, anteriorly covered with shallow, closely spaced punctures, posteriorly somewhat rugulose; notaulus reaching 0.6× length of mesoscutum, distinctly convergent, notauli almost meeting on posterior apex. Scutellum



FIGURES 2–6. *Nesolinoceras ornatipennis*. **2–5,** Female holotype. **2,** Lateral view. **3,** Head in frontal view. **4,** Wings. **5,** Dorsal view. **6,** Male holotype of *N. espini*.

anteriorly with shallow punctures; scutellar carina absent. Subalar ridge wide, somewhat ovoid, not keeled. Epicnemial carina almost reaching subalar ridge but much weaker, almost indistinct, on dorsal 0.3. Mesopleuron dorsally rugulose to striate, ventrally mostly smooth; sternaulus moderately impressed, surface over sternaulus distinctly wrinkled. Central portion of postpectal carina short but distinct, straight. Metapleuron rugulose.

Propodeum (fig. 5). In dorsal view, 1.1× as long as wide. SWL 1.9. Anterior area of the propodeum mostly smooth; posterior area anteriorly somewhat alveolate, posteriorly with transverse irregular wrinkles.

Wings (fig. 4). Forewing crossvein 1M+Rs weakly and uniformly arched; crossvein 1cu-a arising basad of vein 1M+Cu by 0.3 of its length; vein 2Cua 1.2× as long as crossvein 2cu-a; areolet large, APH 1.9, much longer than wide, AWH 0.7; 2r-m and 3r-m strongly convergent,

almost meeting on anterior apex of areolet; 3r-m entirely spectral; 2-M slightly longer than 3-M; 4-Rs gently curved until slightly curved anteriorly on apical 0.2; H1WC 0.9.

Metasoma. T1 short and triangular, T1LW 1.4; T1WW 2.2; polished; dorsolateral carina only faintly suggested on anterior apex of T1; ventrolateral carina distinct and complete; spiracle not prominent. T2 short, trapezoidal, T2LW 0.8, T2WW 1.5. T2–3 partially covered with shallow punctures, otherwise polished. T7–8 much longer than T5–6. Ovipositor long, OST 1.2 (fig. 2); ventral valve with eight teeth, the apical two very weak.

Color. Ferruginous with whitish and blackish marks. Head ferruginous (173,082,034); basal 0.25 of mandible, most of clypeus, and orbital band whitish (252,208,130); orbital band widest on lower gena and narrowest on supraantennal area, interrupted on malar space and at the level of ocelli; apical 0.3 of mandible, narrow longitudinal stripe on supraclypeal and supraantennal areas, blackish (fig. 3); pedicel and flagellum brownish. Thorax ferruginous; pronotal collar and most of dorsal margin, most of propleuron, subcircular spot on center of mesoscutum, median 0.5 of scutellum, basal stripe on tegula, subalar ridge, hypoepimeron, and large spots on ventral mesopleuron and metapleuron whitish. Legs ferruginous; fore- and mid coxae with large whitish marks on anterior face; hind coxa with small whitish mark on posterior face (fig. 2). Forewing with three extensive fuscous bands extending from midlength to apex, with central hyaline areas in between; basalmost band distinctly separated, apical ones connected on posterior end. (fig. 4); hind wing entirely hyaline. Metasoma mostly ferruginous; T1–7 and S2–6 with posterior whitish stripes, on T1–2 very narrow, T2–7 anteriorly sparsely marked with brownish. Ovipositor reddish ferruginous, its sheaths dark brown.

Variation: Forewing 7.8–10.8 mm long. Antenna with 22–23 flagellomeres. Whitish tones in the body varying from cream or pale yellow (252,208,130) to ivory (234,223,204). Specimens from the Bahamas differ from the observed specimens from Cuba (i.e., the holotype and the specimen in fig. 1) by lacking the posterior whitish stripes on the metasomal tergites; they also have a considerably shorter ovipositor (OST 1.00), and the clypeus with distinct transverse striae. Other measurement ranges include: MWW 0.5–0.6; CWH 2.0–2.1; CWW 1.8–2.0; mesoscutum 1.0–1.1 as long as wide; SWL 1.9–2.0; crossvein 1cu-a arising basad of vein 1M+Cu by 0.2–0.3 of its length; APH 1.9–2.0; H1WC 0.9–1.0; T1WW 1.9–2.2; T2LW 0.7–0.8.

Male (fig. 6): Very similar to the female, except for the following: forewing 5.0–8.0 mm; antenna with 28–31 flagellomeres; supraclypeal area mostly whitish, sometimes with only a faint ferruginous central mark; fore- and mid coxae more extensively white; metasomal tergites without distinct posterior whitish stripe. Male from the Cayman Islands with fuscous bands on forewing less extensive, apical bands not connected posteriorly.

Comments: The description of Alayo and Tzankov (1974) has a few inconsistencies as compared to the type specimen: ovipositor without a "very large tooth in its dorsal part"; abdomen mostly ferruginous, not "blackish" as stated in the first paragraph of the description, though some specimens may have sparse blackish marks in the metasoma (see fig. 1); further down in the description the authors describe the metasoma as being "dark red." Surface pos-

terior to anterior transverse carina of propodeum rugulose, not "transversely striate"; surface near apex of T1 without a "dorsal black spot."[2]

The considerable variation observed in the specimens from the Bahamas could be evidence that that population may be evolving in isolation as compared to the Cuban lineage. The two groups may be on the way to become distinct species or may be already be distinct entities. However, larger series of specimens and/or analyses of molecular data are needed for an in-depth investigation of the limits of *N. ornatipennis*.

Biology: *N. ornatipennis* is a common parasitoid of *Elaphidion cayamae* (Coleoptera, Cerambycidae), a citrus borer (Domínguez and Domínguez, 1990; Vázquez et al., 2008). According to Alayo and Tzankov (1974), it is also reported to attack larvae of *Lagocheirus procerus* Casey (= *Lagochirus* [sic] *obsoletus*; Coleoptera, Cerambycidae). Since most cryptines attack pupae or prepupae, it is unclear whether this record is accurate. The female drills into wood with the ovipositor to reach the xylophagous immature beetles inside (fig. 1). *N. ornatipennis* seems to be a very common species in Cuba, present in various habitats from degraded agricultural areas to undisturbed rainforests, usually in low vegetation, perching on leaves or branches (J. Fernández-Triana, personal commun.). Alayo and Tzankov (1974) also reported a male-to-female sex ratio of 1:1.15, and recorded the species through most of the year (months of March-April and June-December).

Distribution: Cuba (records from Alayo and Tzankov, 1974; Domínguez and Domínguez, 1990; Portuondo-Ferrer and Fernández-Triana, 2005; Fernández-Triana et al., 2005; Vázquez et al., 2008), Bahamas (new record), and Cayman Islands (new record) (fig. 14).

Material examined: 26 females, 34 males. **Holotype** ♀ (*N. ornatipennis*): CUBA, "Type No. 896," "*Echthrus ornatipennis* Cress." Pinned; complete. **Holotype** ♂ (*N. espini*): CUBA, "*Nesolinoceras* Ashm. n.g., ♂ Espini Ashm," "*Nesolinocera espini* Ashm.," "Type No. 9957, USNM." Pinned; apical segments of right antenna, right mid leg, right hind tarsus and left hind t2–5 missing; left forewing partially ripped anteriorly; abdomen detached from specimen and glued to paper card. **Other specimens**: BAHAMAS: 1♀ 1♂ "Man-o-War Cay, VIII.23.71 Bahama, H.and A. Howden." 1♂ "New Providence Is., Brit. W.I. // Martin Dickinson coll, III-61 // "*Nesolinoceras ornatipenis* Cr., Tow. 1966" (AEIC). 4♀ 1♂ "BAHAMAS: Eleuthera Rainbow Bay, 11-XI-19.XII.1986, D.B. and R.W. Wiley, malaise trap" (AEIC). 3♀ 3♂, same data (FSCA). 14♀ 24♂, same data except "I-VII.1987" (FSCA). 2♀ 2♂ "BAHAMAS: Great Inagua North Road, N21.10813, W73.60196, 14-VII-2007, Thomas Turnbow, Smith, Blacklight trap in Mangrove forest" (FSCA). CUBA: 1♀ "Juraguá, Ote., B-1948, P. Alayo col. // "*Nesolinoceras ornatipennis* Cr., Alayo '67" // "Generic drawing" (AEIC). CAYMAN ISLANDS: 1 ♂ "CAYMAN ISLANDS, Grand Cayman, George Town, 15-30.III.1965, J.R. McLintock" // *Nesolinoceras ornatipennis*, Aguiar and Santos det. 2008" (CNCI).

[2] Translated by the author. Original fragments, respectively, from Alayo and Tzankov, 1974: 11: "Ovipositor en su ápice con un diente muy alargado en su parte dorsal, otro corto en la parte ventral"; "abdomen negrusco"; "el resto de los segmentos de color rojo-oscuro"; "Primera carina transversal bien marcada…; la superficie después de ella estriada transversalmente"; "Pecíolo abdominal (…) ensanchándose hacia el ápice, y exhibiendo una mancha negra dorsal cercana a éste."

Nesolinoceras laluzbrillante, sp. nov.

Figures 7–14

DIAGNOSIS: Propodeum and mesopleuron with extensive blackish marks; mesopleuron with four whitish marks (fig. 7); propodeum with ovoid whitish marks (fig. 8); metasoma black with whitish stripes, without ferruginous except for base of T1. Central ocellus about as large as lateral ones (fig. 11). Areolet crossveins 2r-m and 3r-m distinctly convergent, but far from meeting on anterior apex of areolet (fig. 10).

FEMALE HOLOTYPE: Forewing 8.8 mm long. *Head.* Ventral tooth of mandible apically subquadratic; MLW 1.6; MWW 0.5. Malar space coriaceus; MSM 0.6. Clypeus wide, CWH 1.9, in front view almost rectangular, apex only slightly narrower than base, CWW 1.4, covered by distinct, uniformly spaced striae (fig. 9). Antenna with 22 flagellomeres. Central ocellus about as large as lateral ones (fig. 11). Occipital carina fading out well before meeting hypostomal carina, at a distance about as long as half of basal width of mandible.

Thorax. Densely covered with short yellowish hairs, pilosity sparser on postscutellum, mesopleuron and center of propodeum. Pronotum mostly punctate, distinctly and uniformly striate just posteriorly to pronotal collar. Mesoscutum subcircular, 1.1× as long as wide, mostly covered with shallow, closely spaced punctures, posterocentrally rugulose; notaulus reaching 0.4 of length of mesoscutum, slightly convergent. Scutellum covered with shallow punctures; scutellar carina absent. Subalar ridge moderately wide, somewhat ovoid, not keeled. Epicnemial carina short, reaching only 0.4 of length to subalar ridge. Mesopleuron mostly covered by shallow, moderately spaced punctures, striate just ventrad to hypoepimeron; sternaulus complete but very shallow, almost indistinct, surface over sternaulus smooth. Central portion of postpectal carina represented by vestigial, suturelike ridge. Metapleuron mostly punctate, centrally smooth.

Propodeum. In dorsal view, 1.0× as long as wide. SWL 1.8. Anterior area of the propodeum covered by shallow, closely spaced punctures; posterior area with transverse irregular wrinkles (fig. 8).

Wings (fig. 10). Forewing vein 1M+Rs mostly uniformly arched, posteriorly slightly sinuous; crossvein 1cu-a arising basad of 1M+Cu by 0.3 of its length; vein 2Cua 1.1× as long as crossvein 2cu-a; areolet large, APH 1.8, slightly longer than wide, AWH 0.9; crossveins 2r-m and 3r-m distinctly convergent, but far from meeting on anterior apex of areolet; 3r-m entirely spectral; vein 2-M slightly longer than 3-M; vein 4-Rs gently curved until abruptly curved anteriorly on apical 0.2; H1WC 1.0.

Metasoma. T1 short and triangular, T1LW: 1.5, T1WW: 2.0; anteriorly polished, sparsely but distinctly punctate on posterior 0.4; dorsolateral carina only faintly suggested on anterior apex; ventrolateral carina complete but weak, medially almost indistinct; spiracle slightly prominent. T2 short, trapezoidal, T2LW: 0.8, T2WW: 1.3; distinctly punctate, punctures gradually less conspicuous toward apical tergites, T7–8 alutaceous; T7–8 moderately longer than T5–6. Ovipositor moderately long, OST: 1.1; ventral valve with seven distinct teeth (fig. 12).

Color. Black, ferruginous, and whitish. Basal 0.3 of mandible, labrum, clypeus and orbital band, whitish (219,212,197), orbital band ventrally wide, dorsally narrower, briefly interrupted

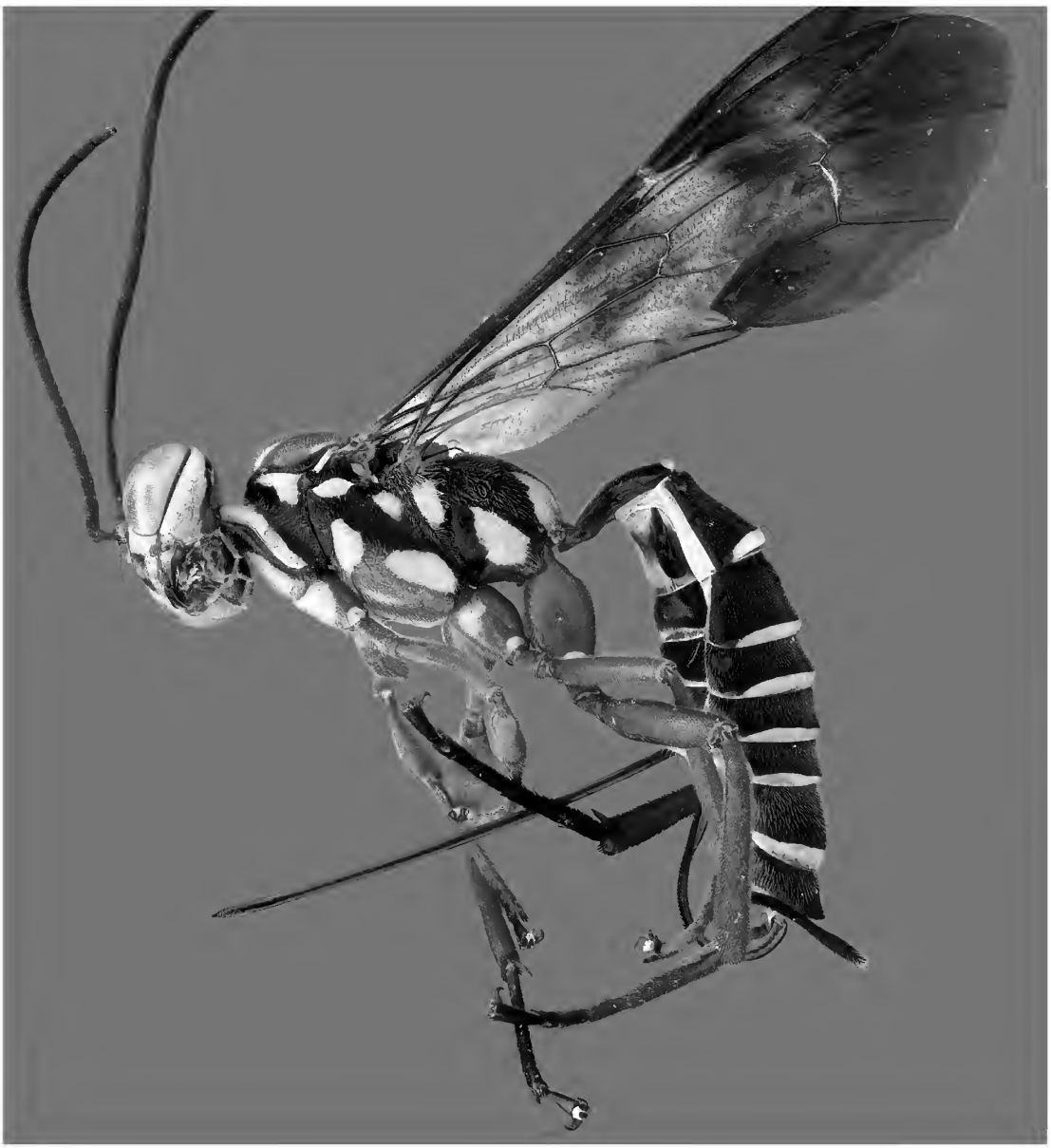
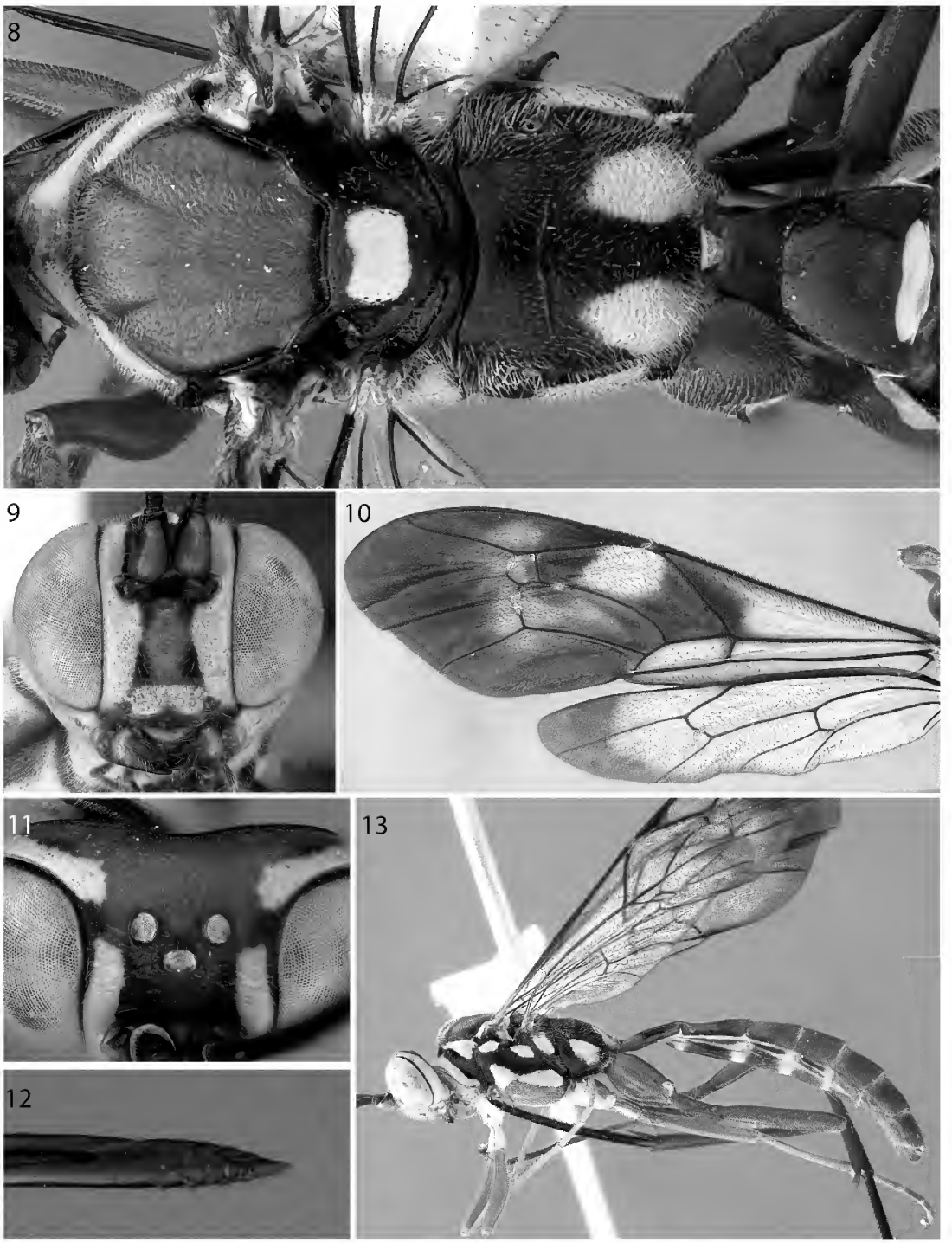


FIGURE 7. *Nesolinoceras laluzbrillante*, sp. nov., holotype habitus.

by black spot at level of lateral ocelli. Median 0.3 of mandible, apical spot on clypeus, supraclypeal and supraantennal areas centrally, scape ventral face, vertex, part of dorsal portion of temple and ventral 0.3 of occiput, ferruginous (168,120,083). Apical 0.3 of mandible, scape dorsal face, pedicel, flagellum, narrow longitudinal lines on supraclypeal and supraantennal area and dorsal 0.7 of occiput, black, the flagellum brownish toward apex. Palpi fuscous (081,076,073). Pronotum black, its dorsal margin and collar whitish; propleuron whitish; mesoscutum brownish (144,103,089), with narrow whitish dashes over anterior portion of notaulus



FIGURES 8–13. *Nesolinoceras laluzbrillante,* sp. nov., holotype. **8,** Dorsal view. **9,** Head in frontal view. **10,** Wings. **11,** Supraantennal area and vertex, dorsal view. **12,** Ovipositor, lateral view. **13,** Male paratype habitus.

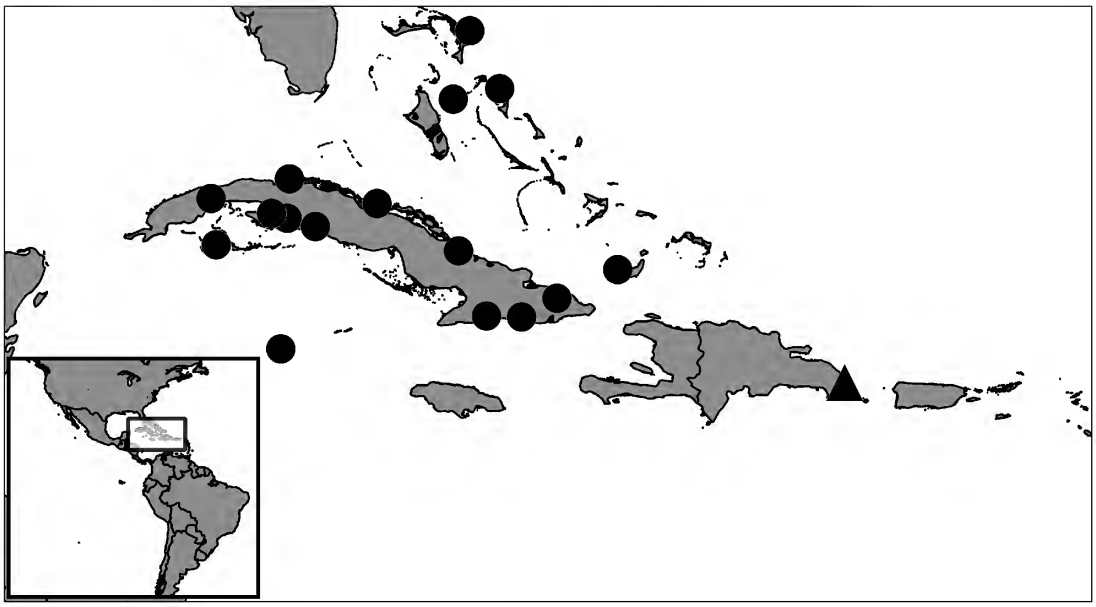


FIGURE 14. Diagram showing distributions for species of *Nesolinoceras*. Circles represent *N. ornatipennis*; the triangle represents *N. laluzbrillante,* sp. nov.

and at level of tegula. Scutellum centrally whitish, base and apex black; axillary through and postscutellum black. Mesopleuron dorsally black, ventrally ferruginous, with four distinct whitish marks and pale whitish dash over sternaulus; mesosternum ferruginous. Mesepimeron and carinal triangle black; dorsal division of metapleuron whitish; metapleuron ventrally ferruginous, dorsally black on anterior 0.3 and ferruginous on posterior 0.7 (fig. 7). Propodeum black, with sublateral ovoid marks posterior to anterior transverse carina (fig. 8). Legs mostly ferruginous, fore- and mid legs lighter (178,117,052) than hind leg (137,089,058); anterior and mid coxae with anterior whitish spots; mid tarsus fuscous; hind tarsus blackish. Forewing with three extensive fuscous bands extending from midlength to apex, with central hyaline areas in between; all bands connected on posterior end (Fig. 10); hind wing entirely hyaline. First metasomal tergite mostly ferruginous, dorsally blackish on posterior 0.5, laterally with brownish mark on anterior 0.5; T2–7 blackish with posterior whitish stripes; T8 blackish, laterally with narrow whitish stripe; S2 mostly whitish with anterior blackish spot; S3–6 blackish with posterior whitish stripes. Ovipositor dark ferruginous, its sheaths dark brown.

Variation: Paratype female with forewing 9.0 mm long; antenna with 23 flagellomeres; mesoscutum without yellow marks; areolet less distinctly convergent anteriorly; black marking on T1 slightly more extensive. Other measurement ranges include: MLW 1.7; MWW 0.6; CWH 2.1; CWW 1.2; MSM 0.7; APH 2.0.

Male (fig. 13): Similar to the female except: forewing 7.2–8.0 mm. long; supraclypeal area entirely whitish or at most with two small blackish marks; antenna with 29–31 flagellomeres; supraantennal area, vertex and occiput black, except for orbital band; mesoscutum sometimes with sparse blackish marks; ventral whitish marks on mesopleuron centrally con-

nected; forecoxa and trochanter entirely whitish; whitish marks on propodeum smaller, reaching about half the distance to anterior transverse carina; foretibia and tarsus yellow, lighter toward apex; mid tibia and tarsus yellow, darker toward apex; forewing with only one distinct apical fuscous mark, area around areolet sometimes with slight, sparse infuscation; T2–8 and S2–6 bright ferruginous, sternites slightly lighter than tergites, T2 sometimes with sparse blackish marks.

COMMENTS: *N. laluzbrillante* can be readily distinguished from *N. ornatipennis* by the very distinct color pattern, with extensive black marks on the mesosoma and metasoma, and by the distinct whitish marks on the propodeum (figs. 7–8). It can be further differentiated from the type species by several characters in general morphology (see Diagnosis for both species). Nonetheless, the two species are generally similar in morphology and biometric ratios, as well as in the distribution of most whitish marks.

BIOLOGY: Unknown.

ETYMOLOGY: The specific epithet comes from the Spanish *la luz brillante,* meaning "the bright light," in reference to the fact that the Dominican Republic is very bright and that the wings of the new species have a shiny, glossy appearance. The name was chosen by the sixth-grade students of the Washington Heights Expeditionary Learning School, in New York City. The epithet is construed as a noun phrase in apposition to the generic name.

DISTRIBUTION: Dominican Republic. Recorded from a single site on the extreme east of the country (fig. 14).

MATERIAL EXAMINED: Two females, 3 males. **Holotype:** ♀ "DOMINICAN REPUBLIC, La Altagracia, Punta Cana Ecological Foundation, recently cleared forest edge to the west of biodiversity center, 10.IX.2008, Malaise trap, Hymenoptera Unit" (USNM). Mounted in triangle point; complete. **Paratypes:** 1♀, 3♂, same data as holotype (USNM). All paratypes mounted in triangle point and in good condition except as follows. Female paratype head and prothorax removed for DNA extraction and glued back after internal tissue lysis; one male paratype with right hind t2–5 missing, another one with left mid t5 missing.

Species Inquirenda

COMMENTS: One male specimen recorded from the Dominican Republic does not match either of the species treated in this work. It is similar to males of *N. laluzbrillante* in having the head with the supraantennal area, vertex and occiput black; mesosoma laterally blackish with the same pattern of whitish marks; forewing with a single apical infuscate mark; and metasoma uniformly ferruginous with a dorsal blackish mark on T1. However, it differs from *N. laluzbrillante* by the mesoscutum black with a central whitish spot; mesosternum entirely whitish; propodeum dorsally smoother, less distinctly rugose, and entirely black; and areolet distinctly narrower and more distinctly convergent, most similar to males of *N. ornatipennis* (AWH 0.8). This specimen can also be distinguished from males of *N. ornatipennis* by all the color features shared with *N. laluzbrillante* (listed above), as well as the clypeus trapezoidal and central ocellus about as large as the lateral ones.

This specimen seems to belong to a distinct taxon, and therefore could be described as a new species. However, male specimens are generally more difficult to determine and interpret than the respective females, due to the character reduction and variations associated with their generally small size in relation to females. The fact that there is a single specimen available further complicates consistent comparisons. The specimen in question is therefore better interpreted, at least for now, as species inquirenda.

MATERIAL EXAMINED: One male. "DOMINICAN REPUBLIC: Pedernales Prov., 21 km N. Cabo Rojo, 19-20-VI-76, R.E. Woodruff" (FSCA).

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