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A synopsis of American *Caraphia* Gahan, 1906 (Coleoptera: Cerambycidae: Lepturinae) with description of two new species

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A synopsis of American *Caraphia* Gahan, 1906 (Coleoptera: Cerambycidae: Lepturinae) with description of two new species

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Abstract. The males of *Caraphia squamosa* (Chemsak and Linsley, 1984) and *C. seriata* (Chemsak and Linsley, 1984), and the female of *C. lingafelteri* Ohbayashi and Yamasako, 2016 (Coleoptera: Cerambycidae: Lepturinae) are described for the first time. Two new *Caraphia* species are described: *C. warneri* Wappes and Santos-Silva, from Guatemala; and *C. woodruffi* Wappes and Santos-Silva, from Guatemala and Honduras. A key to American species of *Caraphia* and a map showing their known distribution is provided. New country records for *C. seriata* and *C. lingafelteri* are also provided. Lastly, the *C. seriata* record for Honduras was based on specimens of a new species (*Caraphia lingafelteri*), hence the Honduras record should be deleted.

Key words. Mexico, Central America, taxonomy.

Introduction

Before the revision by Ohbayashi et al. (2016), the genus *Caraphia* Gahan, 1906 was limited to Asia. The authors synonymized the American genus *Noctileptura* Chemsak and Linsley, 1984 with *Caraphia* and described a new tribe, Caraphiini, for the genus. This dramatically altered the known distribution of *Caraphia* to include Mexico and Central America. Although this makes for an unusually disjunct distribution, the synonymy is well supported by the information provided. Sixteen *Caraphia* species and one subspecies were recognized in the Ohbayashi et al. revision, with three belonging to the American fauna: *C. squamosa* (Chemsak and Linsley, 1984); *C. seriata* (Chemsak and Linsley, 1984); and *C. lingafelteri* Ohbayashi and Yamasako, 2016. In addition two new species are described herein, resulting in five of the 18 species assigned to the genus now being found in America (see Fig. 33 for distribution of American *Caraphia*). *Caraphia squamosa* was originally described in *Noctileptura* Chemsak and Linsley (1984) based on a single female from Mexico (Chiapas). Ohbayashi et al. (2016) examined another female from Mexico (Chiapas). Here, the previously unknown male is described and illustrated. *Caraphia seriata* was also originally described in *Noctileptura*, based on two females from Guatemala; Turnbow et al. (2003) reported the species from Honduras, but their specimens in reality belong to the subsequently described *C. lingafelteri*; Ohbayashi et al. (2016) examined the holotype but lacked other specimens. Herein the species is recorded from Mexico (Chiapas), and the previously unknown male is described and illustrated. *Caraphia lingafelteri* was described based on a single male from Nicaragua. Here we record *C. lingafelteri* from Honduras and describe and illustrate the female. Additionally, two new species are described, one from Guatemala and the other from Guatemala and Honduras. A key to American species of *Caraphia* is provided, adapted from Ohbayashi et al. (2016). American species of *Caraphia* are rarely encountered and nothing is known of their natural history or habits other than the adults are nocturnal and typically collected at lights in mid to high altitudes (800–2000 m).

Materials and Methods

Photographs were taken in the MZSP with a Canon EOS Rebel T3i DSLR camera equipped with Canon MP-E 65mm f/2.8 1–5× macro lens controlled by Zerene Stacker AutoMontage software. Measurements were taken in mm using a measuring ocular Hensoldt/Wetzlar - Mess 10 in the Leica MZ6 stereomicroscope, also used in the study of the specimens. The morphological terminology used in this paper follows that used by Lawrence et al. (2011). Acronyms used in the text are as follows:

ACMT American Coleoptera Museum (James Wappes), San Antonio, TX, USA
DJHC Dan Heffern Collection, Houston, TX, USA
EAPZ Escuela Agricola Panamericana Zamorano, Honduras
FSCA Florida State Collection of Arthropods, Gainesville, FL, USA
JMMC Jean-Michel Maes Collection, León, Nicaragua
MZSP Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil
RDCC Ronald D. Cave Collection, Port St. Lucie, FL, USA
RFMC Roy F. Morris Collection, Lakeland, FL, USA
RHTC Robert H. Turnbow, Jr. Collection, Ft. Rucker, AL, USA

Taxonomy

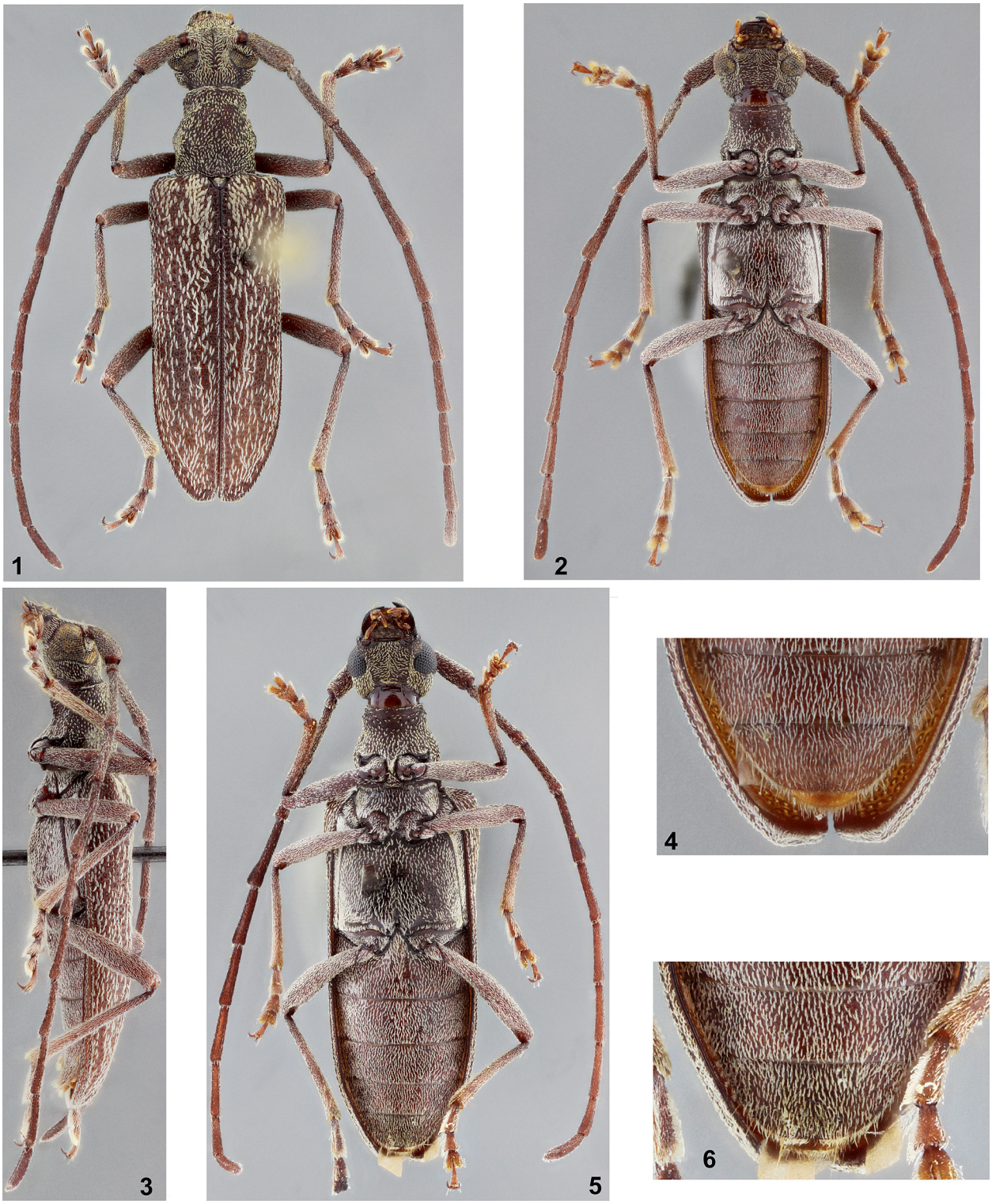
Caraphia squamosa (Chemsak and Linsley, 1984)

(Fig. 1–6, 22, 27–28)

Noctileptura squamosa Chemsak and Linsley, 1984: 282; Chemsak et al. 1992: 98 (checklist); McNamara 1993: 12 (cat.); Monné and Giesbert 1994: 167 (checklist); Monné 1995: 116 (cat.); Noguera and Chemsak 1996: 403 (cat.); Monné 2006: 131 (cat.); 2012: 122 (cat.).

Caraphia squamosa: Ohbayashi et al., 2016: 200, 213; Monné 2018: 5 (cat.).

Description of male. Integument mostly dark brown; palpi yellowish brown; narrow anterior area of clypeus and anterior half of labrum reddish brown; antennae gradually slightly lighter toward distal segments; tibiae gradually reddish-brown toward apex. **Head.** Frons moderately coarsely, densely punctate; with short, decumbent, moderately narrow yellowish-white scales not obscuring integument, slender and shorter close to superior area of eyes. Vertex with sculpturing as on frons, slightly coarser close to prothoracic margin; with moderately short, decumbent, abundant yellowish-white scales, larger and wider than on frons, and a few short, decumbent, narrow yellowish-white scales close to prothorax. Area behind upper eye lobes with sculpturing as on vertex; scales as on vertex toward dorsal surface of head, finer, sparser close to lower eye lobe. Area behind lower eye lobes with sculpturing as on vertex; scales shorter, slender, sparser than on vertex. Antennal tubercles with narrow, moderately abundant yellowish-white scales not obscuring integument. Median groove distinct from clypeus to level of posterior margin of eyes, deeper between antennal tubercles and upper eye lobes. Genae with moderately abundant, decumbent, thick (nearly scale) yellowish-white setae not obscuring integument, except glabrous distal area, interspersed with a few short, sub-erect brownish setae. Gulamentum smooth, glabrous posteriorly, moderately coarsely, abundantly punctate, with thick, moderately sparse, narrow yellowish-white scales in wide anterior area (with a few long, erect brownish setae in this area). Postclypeus with sculpturing as on frons; scales as on frons posteriorly, gradually becoming thick, sparser setae toward anterior margin; with moderately long, sparse, sub-erect yellowish-brown setae laterally and anteriorly (yellower anteriorly). Labrum coplanar with clypeus posteriorly, inclined anteriorly; finely, sparsely punctate posteriorly, smooth anteriorly; with long, erect, sparse yellowish setae laterally, small, sparse, decumbent yellowish setae centrally in posterior area, glabrous in anterior area. Distance between upper eye lobes 0.56 times length of scape; in frontal view, distance between lower eye lobes 0.79 times length of scape. Antennae 1.85 times elytral length, reaching elytral apex at midlength of antennomere IX; scape moderately coarsely, abundantly punctate, with thick, decumbent yellowish-white setae not obscuring integument; antennomeres III–V with yellowish-white pubescence not obscuring integument, interspersed with thick, decumbent setae of same color, sparser toward V; remaining antennomeres



Figures 1–6. *Caraphia squamosa*. **1–4)** Male: **1)** Dorsal habitus. **2)** Ventral habitus. **3)** Lateral habitus. **4)** Abdominal ventrites IV–V. **5–6)** Female: **5)** Ventral habitus. **6)** Abdominal ventrites IV–V.

with yellowish-white pubescence not obscuring integument (whiter depending on light intensity); outer side of antennomeres carinate (III slightly distinct only in distal area, IV only in distal half). Antennal formula (ratio) based on length of antennomere III: scape = 0.84; pedicel = 0.15; IV = 0.94; V = 1.14; VI = 0.92; VII = 0.92; VIII = 0.83; IX = 0.83; X = 0.78; XI = 0.91.

Thorax. Prothorax slightly longer than wide (about 1.1 times); nearly parallel-sided in posterior quarter, swollen from this point to about midlength, distinctly convergent toward anterior quarter, and then slightly swollen in anterior quarter. Pronotum coarsely, abundantly punctate; with short, decumbent, moderately wide yellowish-white scales interspersed with short, narrow, decumbent scales of same color (wide scales slightly more abundant laterally). Sides of prothorax with sculpturing and scales as on sides of pronotum. Prosternum moderately coarsely and sparsely punctate (punctures sparser anteriorly); with moderately short and sparse yellowish-white scales in posterior half (whiter depending on light intensity), gradually smaller, sparser on sides of anterior half; with short, decumbent, thick yellowish-white (whiter depending on light intensity) setae in wide central area of anterior half, forming two transverse rows, one close to anterior margin, another on posterior margin of anterior sulcus; postcoxal processes glabrous. Prosternal process with short, decumbent, thick yellowish-white setae (whiter depending on light intensity), not obscuring integument. Mesoventrite with decumbent, narrow yellowish-white setae (whiter depending on light intensity), abundant laterally, sparser scale-shaped centrally. Mesanepisternum and mesepimeron with moderately abundant, narrow, decumbent yellowish-white scales (whiter depending on light intensity). Metanepisternum and sides of metaventrite with abundant, decumbent, narrow yellowish-white scales (whiter depending on light intensity) nearly obscuring integument; remaining surface of metaventrite with moderately short, decumbent, narrow yellowish-white scales (whiter depending on light intensity), distinctly not obscuring integument. Scutellum with very short, decumbent yellowish-white scales on centrobasal area, obscuring integument, glabrous on remaining surface. **Elytra.** Coarsely, deeply, moderately abundantly punctate in basal half, gradually finer, sparser toward apex (punctures nearly 8-shaped in anterior half); with moderately abundant, decumbent, wide yellowish-white scales in anterior third (Fig. 27), not organized in rows, gradually whiter, slender, sparser toward distal area (Fig. 28); with longitudinal row of narrow, short whitish scales along suture and epipleuron; with minute yellowish-white seta inside most punctures. **Legs.** Femora and tibiae with abundant, decumbent, thick yellowish-white setae not obscuring integument (some of setae on tibiae slightly scale-shaped); tibiae interspersed with fine yellowish setae ventrally in distal third of ventral surface and along apex.

Abdomen. Ventrites finely, moderately abundantly punctate; I–IV with narrow, decumbent, abundant yellowish-white scales (whiter depending on light intensity), wider in center of ventrite I, gradually more seta-shaped toward IV; V with short, decumbent, moderately abundant yellowish-white setae (whiter depending on light intensity) not obscuring integument; sides of ventrites with long, erect sparse yellowish-white setae; ventrite V (Fig. 6) as long as IV, with apex truncate, slightly emarginate centrally.

Variation. Scales on frons very short, yellowish, nearly absent centrally; scales and thick setae on postclypeus distinctly sparse; scales on pronotum yellower; scales in central area of pronotum very small and sparse; all elytral scales yellowish-white.

Dimensions (mm), male/female. Total length 10.30–11.85/12.90; prothoracic length 1.75–1.95/2.05; anterior prothoracic width 1.20–1.35/1.35; posterior prothoracic width 1.55–1.85/1.95; maximum prothoracic width 1.70–1.90/2.00; humeral width 2.60–3.25/3.60; elytral length 6.90–8.00/8.60.

Material examined. MEXICO, *Chiapas*: Sumidero Canyon (4000′), 2 males, 1 female, 25.VI.1987, E. Giesbert col. (1 male, 1 female FSCA, 1 male MZSP); 2 males, 14–26.VI.1987, J.E. Wappes col. (ACMT).

Remarks. Females differ by slightly shorter antennae, 1.7 times elytral length, reaching elytral apex at apex of antennomere IX, and abdominal ventrite V slightly longer than IV.

The number of known specimens remains small (holotype female, 2 females, and 4 males). They were collected in Sumidero Canyon, except the holotype which was collected nearby. The paucity of specimens may indicate that the species has a very restricted habitat, or it may simply reflect collecting bias.

***Caraphia seriata* (Chemsak and Linsley, 1984)**
(Fig. 7–9, 23, 29)

Noctileptura seriata Chemsak and Linsley, 1984: 283; Chemsak et al. 1992: 98 (checklist); Turnbow et al. 2003: 19 (distr.); Monné 2006: 131 (cat.); Hovore 2006: 375 (distr.); Lingafelter et al. 2014: 318 (holotype).
Caraphia seriata: Ohbayashi et al. 2016: 200, 212; Monné 2018: 5 (cat.).

Description of male. Head, prothorax, ventral surface of meso- and metathorax dark brown; mouthparts reddish-brown, more yellowish on apex of last palpomere; narrow anterior area of clypeus and most of labrum reddish-brown; scape, pedicel, antennomeres III–IV dark reddish-brown; antennomeres V–X brown except yellowish- brown distal area (yellowish-brown area gradually narrower toward X); antennomere XI brown; elytra dark brown centrally in basal 2/3 (gradually lighter toward apex), dark reddish-brown on remaining surface (gradually lighter toward apex); profemora reddish-brown in basal quarter and narrow distal area, dark brown on remaining surface; meso- and metafemora reddish-brown in basal third and narrow distal area (latter wider than on profemora), dark brown on remaining surface; tibiae brown basally, reddish-brown on remaining surface; tarsi mostly reddish-brown, slightly darkened on base of each segment; abdominal ventrites I–II dark reddish-brown; abdominal ventrites III–V dark reddish-brown basally, gradually lighter toward apex.

Head. Frons densely, finely punctate (punctures shallow); with moderately sparse, thick (slightly scale-shaped), short, nearly decumbent yellowish-brown setae (more golden depending on light intensity). Vertex finely, shallowly, abundantly punctate (punctures slightly coarser and deeper close to prothoracic margin); with short, moderately abundant, arched yellowish-brown (more golden depending on light intensity) scales, except glabrous central area between antennal tubercles and posterior margin of upper eye lobes, gradually slender and shorter toward prothoracic margin. Area behind upper eye lobes with sculpturing as on vertex; with narrow, moderately abundant, arched yellowish-brown (more golden depending on light intensity) scales, interspersed with short, thick setae of same color, sparser, slenderer close to lower eye lobe. Area behind lower eye lobes moderately coarsely, confluently punctate in wide area close to eye, smooth close to prothorax; with sparse, thick, decumbent yellowish-brown setae (more golden depending on light intensity) in punctate area, glabrous in smooth area; with a few long, erect brownish setae near eye. Antennal tubercles with sculpturing and scales as on frons except glabrous and smooth narrow distal area (scales gradually slightly wider toward posterior area). Median groove distinct from clypeus to level of posterior margin of eyes, deeper between antennal tubercles and upper eye lobes. Genae finely, moderately abundantly punctate; with short, slightly arched, narrow, moderately sparse yellowish-brown scales. Gulamentum smooth, glabrous posteriorly, moderately coarsely, shallowly, abundantly punctate, with narrow, sparse yellowish-white setae in large anterior area (more yellowish-brown, scale-shaped laterally), smaller, more abundant close to anterior margin; with a few long, erect yellowish-brown setae laterally. Postclypeus with sculpturing as on frons; with minute, sparse yellowish-brown scales (more golden depending on light intensity); with a few long erect brownish setae on sides of anterior area. Labrum coplanar with clypeus in posterior half, inclined in anterior half; finely punctate posteriorly close to inclined area, smooth on remaining surface; nearly glabrous in posterior half, with long yellowish setae in anterior area, especially laterally. Distance between upper eye lobes 0.57 times length of scape; in frontal view, distance between lower eye lobes 0.85 times length of scape. Antennae 2.0 times elytral length, reaching elytral apex at middle of antennomere IX; scape moderately coarsely, abundantly punctate, with narrow, short, slightly arched yellowish-brown scales, interspersed with minute scales of same color; antennomeres III–IV with minute, decumbent, narrow yellowish-brown scales; remaining antennomeres with slightly conspicuous yellowish-white pubescence interspersed with minute, thick yellowish setae, more distinct in light area; outer side of antennomeres III–IV not carinate; outer side of antennomere V carinate in distal half; outer side of remaining antennomeres entirely carinate. Antennal formula (ratio) based on length of antennomere III: scape = 0.76; pedicel = 0.19; IV = 0.87; V = 1.04; VI = 0.89; VII = 0.80; VIII = 0.74; IX = 0.72; X = 0.69; XI = 0.87.

Thorax. Prothorax 1.25 times longer than wide; sides slightly convergent in posterior quarter, slightly swollen from this point to about midlength, distinctly convergent toward anterior quarter, then slightly swollen in anterior quarter. Pronotum coarsely, moderately abundantly punctate; with short, slightly arched, narrow yellowish scales, gradually more whitish toward posterior margin; with fringe of short

Figures 7–9. *Caraphia seriata*, male. **7)** Dorsal habitus. **8)** Ventral habitus. **9)** Lateral habitus.

yellowish setae at anterior margin; with minute yellowish setae inside of most punctures. Sides of prothorax with sculpturing as on pronotum; with scales sparser, slenderer than on pronotum, interspersed with short yellowish setae. Prosternum coarsely, moderately abundantly punctate except nearly smooth narrow anterior area; with sparse, narrow yellowish-white scales posteriorly, gradually narrowed, becoming thick whitish setae toward anterior area; nearly smooth anterior area glabrous, except row with short, decumbent whitish setae close to anterior margin; postcoxal processes glabrous. Prosternal process nearly glabrous. Ventral side of mesothorax with short, sparse, thick yellowish setae. Ventral surface of metathorax with short, narrow, slightly arched, moderately abundant yellowish scales. Scutellum with very short, decumbent, thick yellowish-white setae in centrobasal area, glabrous on remaining surface. **Elytra.** Coarsely, deeply, moderately abundantly punctate (punctures partially aligned in rows, nearly 8-shaped, especially in anterior half); with narrow, moderately long, arched yellowish-brown setae aligned in rows (Fig.7, 29); with longitudinal row of short, narrow yellowish-white scales along suture and epipleuron; with minute yellowish-white seta in each puncture. **Legs.** Femora and tibiae with moderately abundant, decumbent, thick yellowish-white setae not obscuring integument (part of setae scale-shaped), more abundant on tibiae; tibiae interspersed with fine yellowish setae ventrally in distal third and along apex.

Abdomen. Ventrites I–II moderately coarsely and abundantly punctate; ventrites III–V finely and abundantly punctate; I–III with narrow, moderately sparse, slightly arched yellowish-brown scales (part of them lost in specimen examined); IV with narrow, moderately sparse, slightly arched yellowish-brown scales in basal third, gradually narrower toward distal area; V with thick, decumbent yellowish setae interspersed with some scale-shaped setae basally; V about as long as IV; apex of ventrite V truncate, very slightly emarginate centrally.

Variation (observed in females). Body nearly entirely dark brown; antennae entirely dark brown; elytra entirely dark brown; femora entirely reddish-brown (light or dark); abdominal ventrites entirely dark brown; setae behind lower eye lobes partially narrow, scale-shaped; scales on postclypeus short and moderately abundant; all scales on pronotum yellowish; ventral surface of mesothorax with scales as on ventral surface of metathorax.

Dimensions (mm), male/females. Total length 7.30/8.00–10.60; prothoracic length 1.50/1.55–2.05; anterior prothoracic width 0.80/0.80–1.05; posterior prothoracic width 1.20/1.20–1.70; prothoracic width between apices of swollen area of basal region 1.15/1.10–1.40; humeral width 2.00/2.10–2.80; elytral length 4.65/5.00–6.35.

Material examined. MEXICO (**new country record**), *Chiapas*: Parque Laguna Belgica, 1 female, 27.V.1987, D.A. Rider, E.C. & T.J. Riley col. (ACMT). GUATEMALA, *Izabal*: 25 km SE Morales (800 m), 2 females, 23-27.V.1995, E. Giesbert & J. Monzón col. (1 female FSCA, 1 female MZSP); (2800'), 1 female, 21-24.V.1996, E. Giesbert & J. Monzón col. (FSCA); (900 m), 1 male, 1 female, 31.V-2.VI.1997, E. Giesbert & J. Monzón col. (FSCA).

Remarks. Females differ by slightly shorter antennae, 1.8 times elytral length, reaching elytral apex in basal third of antennomere X. *Caraphia seriata* notably differs from other American *Caraphia* species by its distinctly elongate prothorax.

Caraphia lingafelteri Ohbayashi and Yamasako, 2016

(Fig. 10–12, 24, 30)

Caraphia lingafelteri Ohbayashi and Yamasako, 2016: 210, 213; Monné 2018: 5 (cat.).
Noctileptura squamosa: Maes et al. 2010: 12 (distr.), misidentified.

Description of female. Integument mostly dark brown; mouthparts reddish-brown, with some areas yellowish-brown; distal area of clypeus and labrum yellowish-brown; posterior area of gulamentum reddish-brown.

Head. Frons densely, moderately finely, shallowly punctate; with short abundant, narrow yellowish-brown scales. Vertex finely punctate between antennal tubercles and upper eye lobes, slightly, gradually coarser toward prothoracic margin; with moderately short (longer than on frons), abundant, narrow yellowish-brown scales except glabrous, longitudinal central area. Area behind upper eye lobes with sculpturing and scales as on vertex; with a few long, erect brownish setae close to eye. Area behind lower eye lobes coarsely, densely punctate in wide area close to eye, finer, distinctly sparser in narrow area close to prothorax; with moderately short yellowish-brown scales in coarse punctate area, glabrous on remaining surface. Antennal tubercles with sculpturing and scales as on frons except glabrous and smooth narrow distal area. Median groove distinct from clypeus to level of posterior margin of eyes, deeper between antennal tubercles and upper eye lobes. Genae finely, moderately abundantly punctate; with short, narrow, moderately abundant yellowish-brown scales, distinctly more slender than in area behind eyes. Gulamentum smooth, glabrous posteriorly, moderately coarsely, shallowly, abundantly punctate, with narrow, short, sparse scales in wide anterior area (scales yellowish-brown anteriorly, gradually whitish posteriorly). Postclypeus with sculpturing as on frons; scales as on frons posteriorly, gradually sparser and narrower toward anterior margin; with a few long, erect yellowish-brown setae laterally near anterior margin. Labrum coplanar with clypeus in posterior half, inclined in anterior half; finely punctate posteriorly close to inclined area, smooth on remaining surface; with minute, moderately sparse yellowish setae, interspersed with long, erect yellowish-brown setae. Distance between upper eye lobes 0.78 times length of scape; in frontal view, distance between lower eye lobes 1.06 times length of scape. Antennae 1.45 times elytral length, reaching elytral apex at basal third of antennomere XI; scape moderately coarsely, abundantly punctate, with narrow, short, decumbent, abundant yellowish scales; antennomeres III–V with short, decumbent, abundant, thick yellowish setae (more abundant, scale-shaped on III–IV); remaining antennomeres with whitish pubescence; outer side of antennomeres III–IV not carinate; outer side of antennomere V–VI carinate at distal third; outer side of remaining antennomeres entirely carinate. Antennal formula (ratio) based on length of antennomere III: scape = 0.84; pedicel = 0.24; IV = 0.89; V = 1.08; VI = 0.89; VII = 0.89; VIII = 0.81; IX = 0.81; X = 0.76; XI = 0.89.

Thorax. Prothorax about as long as wide; sides slightly divergent from posterolateral angles to about midlength, then convergent toward distinct anterior constriction. Pronotum coarsely, abundantly punctate; with moderately short, abundant, slightly arched yellowish-brown scales (some of them lighter). Sides of prothorax with sculpturing and scales as on pronotum. Prosternum moderately coarsely and

Figures 10–12. *Caraphia lingafelteri*, female. **10)** Dorsal habitus. **11)** Ventral habitus. **12)** Lateral habitus.

abundantly punctate; with short, arched, moderately sparse yellowish scales (more abundant and whiter in posterior half, especially close to procoxal cavities), except nearly glabrous area near anterior margin; with very short yellowish scales close to anterior margin; postcoxal processes nearly glabrous. Prosternal process with short, narrow, decumbent, moderately sparse whitish scales. Ventral surface of mesothorax with short, decumbent, narrow, abundant yellowish-white scales (whiter depending on light intensity), slightly sparser on mesepimeron. Ventral surface of metathorax with short, decumbent, narrow, abundant yellowish-white scales (whiter depending on light intensity), distinctly denser on metanepisternum and sides of metaventrite, absent along central discrimen. Scutellum with very short, decumbent, narrow yellowish scales, except glabrous area close to margin. **Elytra.** Coarsely, deeply, moderately abundantly punctate in basal half (punctures not aligned in rows, nearly 8-shaped), gradually finer, sparser toward apex; with narrow, long, arched yellowish-brown setae not aligned in rows (Fig. 10, 30); with longitudinal row of short, narrow yellowish scales along sutural and epipleural margins; with minute yellowish seta in nearly all punctures. **Legs.** Femora and tibiae with short, abundant, decumbent yellowish scales (whiter depending on light intensity); tibiae interspersed with fine yellowish setae ventrally in distal half.

Abdomen. Ventrites finely, moderately abundantly punctate; with short, decumbent, abundant yellowish scales (whiter depending on light intensity), interspersed with long, erect yellowish setae laterally; apex of ventrite V truncate.

Variation (observed in males and females). Body mostly reddish-brown, including legs and antennae; abdominal ventrites partially dark reddish-brown; antennae, legs, most of elytra, and parts of ventral surface reddish-brown; scales on vertex and behind eyes distinctly short and sparse; scales on scape very short and sparser; prothorax slightly longer than wide; scales on ventral surface of thorax distinctly short and sparse.

Dimensions (mm), males/females. Total length 9.35–11.60/11.65–15.50; prothoracic length 1.60–2.00/2.00–2.60; anterior prothoracic width 1.05–1.40/1.30–1.80; posterior prothoracic width 1.40–1.90/1.90–2.50; prothoracic width about central area 1.50–2.05/1.95–2.65; humeral width 2.45–3.30/3.35–4.20; elytral length 5.85–7.50/7.75–10.20.

Material examined. HONDURAS (**new country record**), *Francisco Morazán*: Cerro Uyuca Est. Biol. 1 male, 2 females, 16-27.IX.2015, E. van den Berghe col. (EAPZ); 1 male, 12.V.2016, E. van den Berghe col. (DJHC); Cerro Uyuca, 1 male, 6.VI.1993, R. Turnbow col. (RHTC); (1200 m), 1 female, 1.V.1999, R. D. Cave col. (RDCC); Cerro Uyuca Est. Biol. nr. Zamarano, 1 female, 27.IV.2017, E. van den Berghe col. (ACMT); (14°02′N / 87°04′W; 1650 m), 2 males, 5.IV.2016, E. van den Berghe col. (ACMT); 1 male, 5.IV.2016, E. van den Berghe col. (DJHC); (MV/UV, EL 5,300'), 2 males, 5-6.VI.2017, Wappes & Morris col. (1 ACMT, 1 RFMC); *Yoro*: Parque Nacional Pico Pijol, 1 female, 3.VI.2003, R. Turnbow col. (RHTC). NICARAGUA, *Matagalpa*: Selva Negra (1300 m), 1 male, V.2012, J.M. Maes col. (JMMC). EL SALVADOR (**new country record**), *Santa Ana*: Parque Nacional Montecristo (1810 m, 14°23′56″ N / 89°21′40″ W) 1 female, 21.V.1999, R. D. Cave col. (RDCC).

Remarks. Males differ by longer antennae, 1.7 times elytral length, reaching elytral apex in basal distal third of antennomere X. According to Ohbayashi and Yamasako (2016) the elytral apex is not truncate but is roundly narrowed to sutural angle. However, based on the larger number of specimens available for study, it can also be obliquely truncate.

***Caraphia warneri* Wappes and Santos-Silva, new species**
(Fig. 13–15, 25, 31)

Description of female holotype. Head dorsally, and prothorax, dark brown; head ventrally dark reddish-brown; mouthparts reddish-brown; anteclypeus and anterior half of labrum yellowish-brown; posterior half of labrum reddish-brown; scape, pedicel, and antennomeres III–IV dark brown (more dark reddish-brown depending on light intensity), with distal area reddish-brown; remaining antennomeres reddish-brown; ventral surface of meso- and metathorax dark brown (slightly dark reddish-brown in some areas depending on light intensity); scutellum and longitudinal band along elytral suture dark brown; remaining elytral surface reddish-brown except dark brown punctures; femora dark brown (darker reddish-brown in some areas depending on light intensity); tibiae dark brown basally, reddish-brown on remaining surface; tarsi brown (slightly reddish-brown depending on light intensity); abdominal ventrites dark reddish-brown, darker brown centrally in some areas, especially basal half of V.

Head. Frons densely, moderately finely punctate; with short, abundant, moderately narrow yellowish-white scales nearly obscuring integument (scales slightly yellower or whiter in some areas), except shorter, narrower, sparser scales in central area near antennal tubercles. Vertex moderately finely, densely, shallowly punctate (punctures slightly coarser than on frons and partially confluent); with scales longer than on frons, with similar color, nearly obscuring integument (apparently, part of them lost in area between upper eye lobes), except smaller, sparser scales close to prothoracic margin. Area behind upper eye lobes with sculpturing and scales as on vertex, gradually shorter and sparser toward lower eye lobe. Area behind lower eye lobes moderately coarsely, shallowly, abundantly punctate; with short, narrow, moderately abundant yellowish-white scales (yellower depending on light intensity), partially obscuring integument, except nearly glabrous area close to prothorax. Antennal tubercles with sculpturing and scales as on frons, except smooth and glabrous narrow distal area. Median groove distinct from clypeus to level of posterior margin of eyes, deeper between antennal tubercles and upper eye lobes. Genae finely, moderately abundantly, shallowly punctate; with short, decumbent, narrow, moderately abundant yellowish-white scales. Gulamentum smooth, glabrous posteriorly, moderately coarsely, shallowly, confluently punctate, with narrow, short, bristly yellowish scales, slightly whiter, sparser toward posterior region of punctate area. Postclypeus with sculpturing and scales as on frons posteriorly, with scales gradually slender toward anterior margin; with a few long, erect yellowish setae laterally close to anterior margin. Labrum coplanar with anteclypeus in posterior third, inclined in anterior 2/3; finely, moderately sparsely punctate posteriorly close to boundary of inclined area, smooth on remaining surface; with both, short and long, sparse yellowish setae in punctate area, glabrous on remaining surface. Distance between upper eye lobes 0.83 times length of scape; in frontal view, distance between lower eye lobes 1.05 times length of scape. Antennae 1.2 times elytral length, reaching about posterior ninth of elytra; scape moderately finely, abundantly punctate, with narrow, small, decumbent, moderately abundant whitish scales; antennomeres with short, decumbent whitish scales, gradually

Figures 13–15. *Caraphia warneri*, holotype female. **13)** Dorsal habitus. **14)** Ventral habitus. **15)** Lateral habitus.

shorter, sparser toward distal segments; outer side of antennomeres III–IV not carinate; outer side of antennomeres V–IX carinate posteriorly (carina slightly increasing in length toward X); outer side of antennomeres X–XI entirely carinate. Antennal formula (ratio) based on length of antennomere III: scape = 0.96; pedicel = 0.23; IV = 0.93; V = 1.16; VI = 0.96; VII = 0.94; VIII = 0.87; IX = 0.83; X = 0.82; XI = 0.98.

Thorax. Prothorax about as long as wide; sides subparallel in posterior third, with large, rounded tubercle about midlength, with distinct constriction between lateral tubercles and anterior quarter, rounded in anterior quarter before narrow constriction near anterior margin. Pronotum coarsely, shallowly, confluently punctate; anterolateral tubercles distinctly elevated; with moderately short, very slightly arched yellowish-white scales, slightly whiter toward posterior margin, moderately yellowish-brown, more abundant laterally in anterior half; with small, decumbent whitish scales close to anterior and posterior margins. Sides of prothorax with sculpturing and scales as on pronotum, interspersed with shorter and narrower whitish scales toward prosternum. Prosternum shallowly, moderately rugose-punctate in posterior 2/3, shallowly, moderately sparsely punctate in anterior third; with moderately short, very slightly arched yellowish-white scales (more yellowish-brown depending on light intensity) in posterior third, distinctly finer, sparser in anterior third; postcoxal processes glabrous except narrow band with small, decumbent, narrow scales close to procoxal cavities. Prosternal process with short yellowish-white scales (more yellowish-brown depending on light intensity), bristly posteriorly. Ventral surface of mesothorax with short, decumbent, moderately narrow yellowish-white scales (more yellowish-brown depending on light intensity), distinctly denser on mesanepisternum and mesepimeron. Metanepisternum, sides and anterior area of metaventrite with short, decumbent, moderately narrow yellowish-white scales (more yellowish-brown depending on light intensity); remaining surface of metaventrite with narrower, sparser whitish scales (slightly yellowish depending on light intensity). Scutellum with very short, decumbent yellowish-white scales except glabrous area close to margins. **Elytra.** Coarsely, deeply, moderately abundantly punctate in basal half (punctures not aligned in rows, nearly quadrate), gradually finer toward apex; apex obliquely truncate; with moderately narrow, elongate, abundant, decumbent yellowish-white scales (Fig. 13, 31) (whiter depending on light intensity); with longitudinal row of short, narrow whitish scales along sutural and epipleural margins; with minute yellowish seta in nearly all punctures.

Legs. Femora and tibiae with short, abundant, decumbent yellowish-white scales (whiter depending on light intensity); tibiae interspersed with fine yellowish setae ventrally in distal half; ventral surface of protibiae transversely striate.

Abdomen. Ventrites finely, abundantly punctate; with short, decumbent, abundant, narrow yellowish scales (whiter depending on light intensity), slender on V, interspersed with fine, erect yellowish setae on sides and in posterior area of V; apex of ventrite V truncate, very slightly emarginate centrally.

Dimensions (mm). Total length 14.55; prothoracic length 2.20; anterior prothoracic width 1.40; posterior prothoracic width 2.05; maximum prothoracic width 2.20; humeral width 3.55; elytral length 9.95.

Type material. Holotype female from GUATEMALA, *Zacapa*: Sierra de las Minas (Cerro del Mono; cloud forest; 8 road km N San Lorenzo marble mill; 2150 m; MV & UV lights), 7.VI.1993, W.B. Warner col. (FSCA).

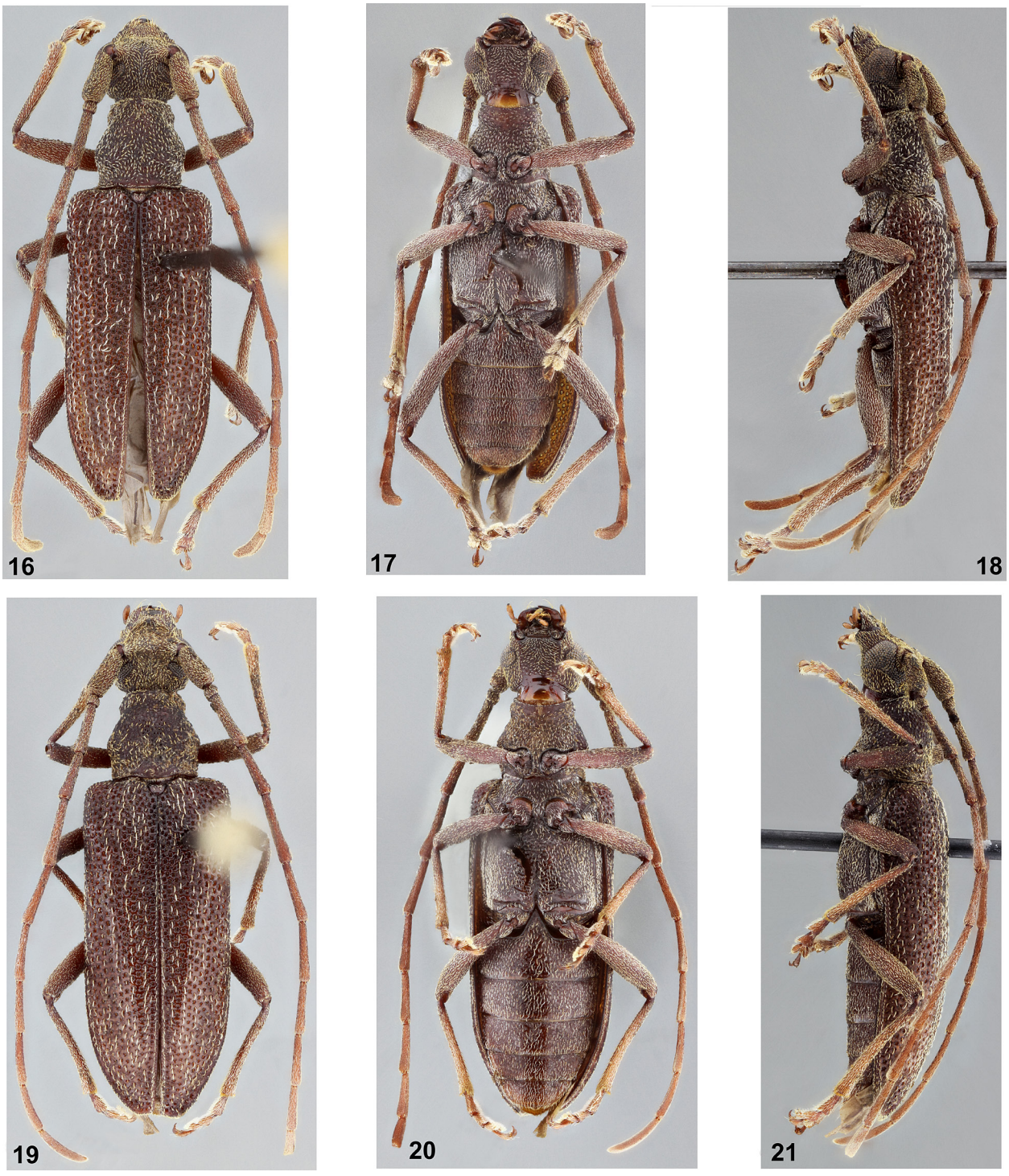
Etymology. Named for Bill Warner, collector of the holotype and a noted student of the Scarabaeidae.

Remarks. *Caraphia warneri* sp. nov. is similar to *C. lingafelteri* but differs as follows: body more slender (4.1 times longer than wide); elytral apex obliquely truncate, with outer side distinctly angular (Fig. 13); elytral scales longer, wider, straight and not arched (Fig. 13, 31); antennae terminating well short of elytral apex. In females of *C. lingafelteri* the body is wider (from 3.5 to 3.7 times longer than wide), the elytral apex is rounded or slightly obliquely truncate but with outer side not angular (Fig. 10), the elytral scales are shorter, narrower and distinctly arched (Figs 10, 30), and antennae clearly surpass elytral apex.

***Caraphia woodruffi* Wappes and Santos-Silva, new species**
(Fig. 16–21, 26, 32)

Description of male holotype. (Fig. 16–18). Integument mostly dark brown; palpi dark reddish-brown; posterior area of gulamentum reddish-brown; antennae gradually reddish-brown toward distal segments; tibiae gradually dark reddish-brown toward apex.

Head. Frons moderately coarsely, densely punctate; with very short, narrow, decumbent, moderately abundant yellowish-brown scales not obscuring integument. Vertex with sculpturing and scales as on frons (scales sparser). Area behind upper eye lobes with sculpturing and scales as on vertex. Area behind lower eye lobes with sculpturing and scales as on vertex in wide area close to eye, finely, sparsely punctate, glabrous close to prothorax; with one long, erect yellowish seta close to upper eye lobe. Antennal tubercles with sculpturing and scales as on frons except smooth, glabrous, narrow distal area. Median groove distinct from clypeus to level of posterior margin of eyes, deeper between antennal tubercles and upper eye lobes. Genae finely, moderately sparsely punctate; with very short, moderately sparse yellowish-brown scales. Gulamentum smooth, glabrous posteriorly, moderately coarsely, shallowly, confluently punctate, with thick, short, decumbent, sparse white setae in wide anterior area. Postclypeus with sculpturing as on frons; scales as on frons posteriorly, gradually shorter, sparser toward anterior area; with a few long, erect yellowish-brown setae on sides of anterior area. Labrum coplanar with clypeus posteriorly, inclined anteriorly; finely, moderately sparsely punctate posteriorly close to inclined area; with long, erect yellowish-brown setae laterally. Distance between upper eye lobes 0.65 times length of scape; in frontal view, distance between lower eye lobes 0.90 times length of scape. Antennae 1.9 times elytral length, reaching elytral apex near midlength of antennomere IX; scape moderately coarsely, densely punctate, with short, decumbent, moderately abundant, narrow yellowish-brown scales; antennomeres III–V with very short, decumbent yellowish scales interspersed with shorter whitish scales, and a few long, erect yellowish setae at apex; remaining antennomeres with yellowish-white pubescence not obscuring integument; antennomeres VI–X with a few long, erect yellowish setae at apex; outer side of antennomeres III–IV not carinate; outer side of antennomeres V–VIII carinate in distal third; outer side of antennomere IX carinate in posterior half; outer side of antennomeres X–XI entirely carinate. Antennal formula (ratio) based on length of antennomere III: scape = 0.86; pedicel = 0.17; IV = 0.93; V = 1.14; VI = 1.03; VII = 1.03; VIII = 0.95; IX = 0.95; X = 0.91; XI = 1.00.



Figures 16–21. *Caraphia woodruffi*. **16–18)** Holotype male: **16)** Dorsal habitus. **17**) Ventral habitus. **18)** Lateral habitus. **19–21)** Paratype female: **19)** Dorsal habitus. **20)** Ventral habitus. **21)** Lateral habitus.

Thorax. Prothorax about as long as wide; subparallel-sided in posterior fifth, distinctly swollen from this point to about anterior third (anterior part of swollen area distinctly convergent forward, with moderate constriction between swollen area and anterior quarter, slightly tumid in anterior quarter, followed by narrow constriction near anterior margin. Pronotum coarsely, abundantly punctate; with

narrow, short, sparse, arched yellowish and whitish scales; with transverse band of very short scales close to anterior and posterior margins (yellowish close to anterior margin, whitish close to posterior margin). Sides of prothorax with sculpturing as on pronotum; with short, narrow, sparse, arched whitish scales, gradually shorter toward prosternum. Prosternum coarsely, moderately abundantly punctate in posterior 2/3, sparser in anterior third; with short, narrow, moderately sparse, slightly arched whitish scales in posterior third, distinctly shorter, sparser in anterior third; postcoxal processes glabrous except very short, sparse whitish scales close to procoxal cavity. Prosternal process with scales as in posterior area of prosternum. Ventral surface of meso- and metathorax with short, narrow, slightly arched whitish scales, more abundant than on prosternum, especially laterally. Scutellum with very short, thick whitish setae centrally, glabrous on remaining surface. **Elytra.** Coarsely, deeply, abundantly punctate in basal half, gradually finer, sparser toward apex (punctures nearly 8-shaped in anterior half); with moderately long, narrow, arched whitish scales partially aligned in rows (Fig. 16, 19, 31, 32); with longitudinal row of narrow, short whitish scales along suture and epipleuron; with minute yellowish scale inside most punctures. **Legs.** Femora and tibiae with moderately abundant, narrow, short, decumbent whitish scales, interspersed with minute yellowish-white scales; tibiae interspersed with fine yellowish setae ventrally in distal third of ventral surface and along apex.

Abdomen. Ventrites finely, moderately abundantly punctate; with narrow, short, slightly arched scales not obscuring integument (gradually more seta-shaped toward V); apex of ventrite V truncate, slightly, widely emarginate centrally.

Female. (Fig. 19–21). Antennae slightly shorter, 1.75 times elytral length, reaching elytral apex at distal end of antennomere IX.

Variation. (Male and female). Gulamentum entirely dark brown; elytra dark reddish-brown with dark brown band along suture; femora dark reddish-brown; tibiae entirely dark brown or entirely dark reddish-brown; abdominal ventrites dark reddish-brown; distal area of clypeus and posterior area of labrum reddish-to yellowish-brown; labrum entirely yellowish-brown; scales on frons moderately sparse; scales in area behind lower eye lobes sparser than on vertex; setae on gulamentum more yellowish; prothorax slightly longer than wide; scales on sides of prothorax yellowish; scales on elytra more yellowish depending on light intensity.

Dimensions (mm), holotype male/ paratype males/paratype female. Total length 10.40/9.10–11.65/10.35; prothoracic length 2.00/1.70–2.15/1.80; anterior prothoracic width 1.30/1.10–1.45/1.20; posterior prothoracic width 1.80/1.55–2.10/1.70; maximum prothoracic width 2.00/1.65–2.30/1.90; humeral width 3.20/2.50–3.50/2.90; elytral length 6.80/5.90–7.50/6.85.

Type material. Holotype male from GUATEMALA, *Izabal*: E. of Morales (Sierra del Merendon; Finca Firmeza; 1 km W Honduras; 1250 m; at light; cloud forest), 27–28.V.2003, R. Woodruff & J. Monzon col. (FSCA). Paratypes – GUATEMALA, *Izabal*: Morales (600 m), 1 male, VI.2000, J. Monzon col. (DJHC); 25 km SE Morales (2800'), 1 male, 21-24.V.1996, E. Giesbert & J. Monzon col. (FSCA); (900 m), 1 male, 31.V-2.VI.1997, E. Giesbert & J. Monzon col. (FSCA); E. of Morales (Sierra del Merendon; Finca Firmeza; 1 km W Honduras; 1250 m; blacklight/mercury vapor; cloud forest), 1 male, 27-28.V.2003, R. Woodruff & J. Monzon col. (ACMT); 1 female, 13-14.VIII.2005, R. Woodruff & J. Monzon col. (FSCA); Sierra del Caral (Cerro Negro Norte, 1180 m, 15°21′52″ N / 88°41′28″ W), 1 male, 18.VII.2001, R. D. Cave col. (RDCC). HONDURAS, *Copan*: 6 km NW San Agustin, 2 males, 19.V.2002, R. Turnbow col. (1 male RHTC, 1 male MZSP); *Yoro*: Sinai (5.3 km NW San Francisco Campo, 1410 m, 15°25′46″ N / 87°21′43″ W), 1 male, 4.VI.2002, R. D. Cave col. (RDCC).

Etymology. Named for Bob Woodruff, one of the collectors of the holotype and long-time Coleoptera curator at the Division of Plant Industry, Florida State Collection of Arthropods (now retired).

Remarks. *Caraphia woodruffi* sp. nov. is similar to *C. lingafelteri* but differs by the elytral scales distinctly sparser and partially aligned in rows (Fig. 16, 19, 32), while in the latter they are more abundant and distinctly not aligned (Fig. 10, 30). The new species also differs from *C. seriata*, which has elytral scales aligned in rows and a noticeably shorter prothorax.

Figures 22–26. Head and pronotum. **22)** *Caraphia squamosa*, male. **23)** *Caraphia seriata*, male. **24)** *Caraphia lingafelteri*, female. **25)** *Caraphia warneri*, holotype female. **26)** *Caraphia woodruffi*, holotype male.

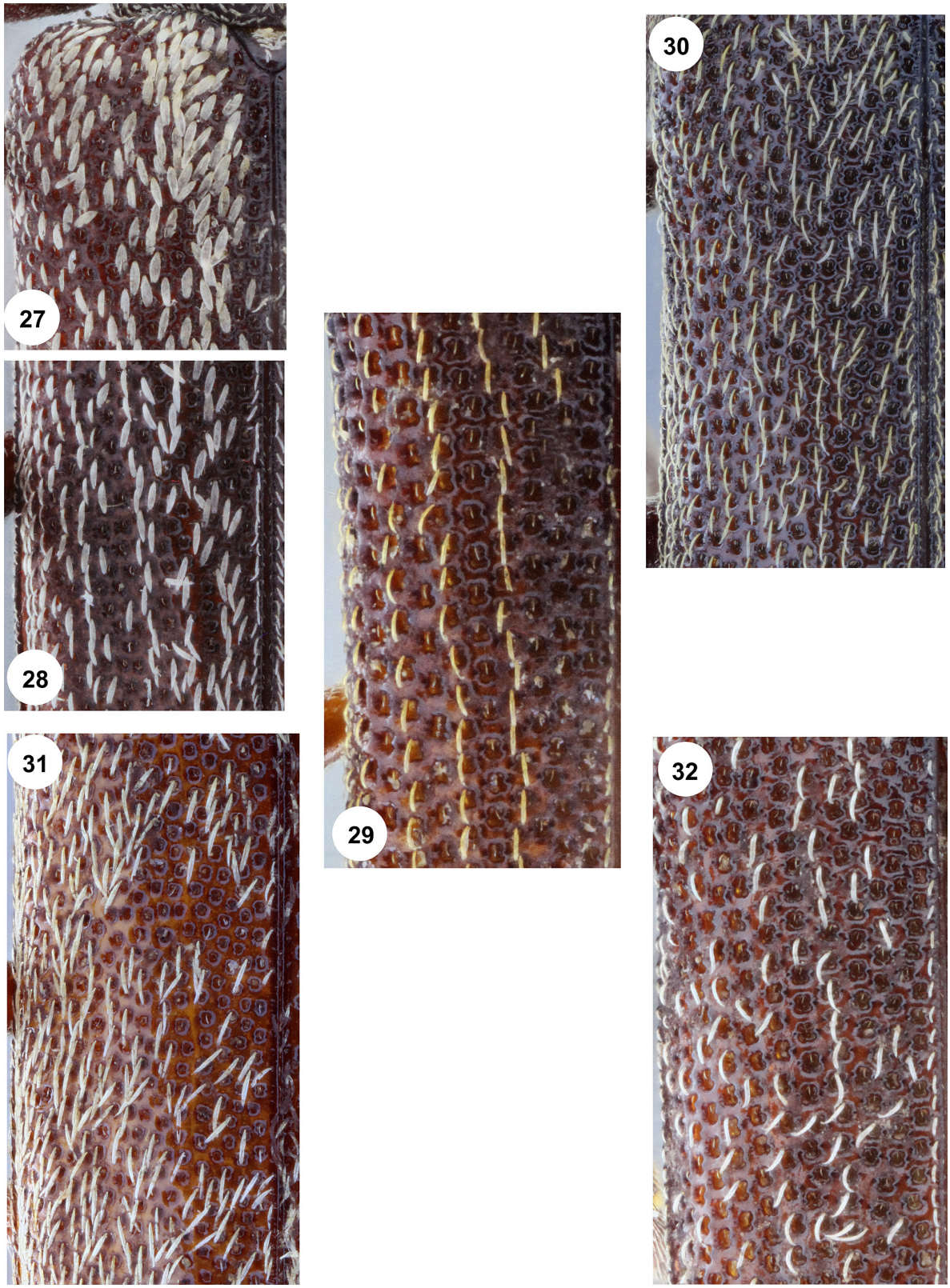
Key to American species of *Caraphia* (adapted from Ohbayashi et al. 2016)

1. Elytra with rows of scales nearly alternately associated with rows of foveae **2**
— Elytra with rows of scales along every row of foveae **3**

2(1). Prothorax distinctly longer than wide . . . . . ***C. seriata* (Chemsak and Linsley, 1984)**
— Prothorax about as long as wide . . . . . ***C. woodruffi* sp. nov.**

3(1). Most scales of elytra approximately 4 times as long as wide (Fig. 27–28); with basal scales widest . . . . . ***C. squamosa* (Chemsak and Linsley, 1984)**
— Most scales of elytra at least 6 times as long as wide and similar throughout (Fig. 10, 13, 30, 31) **4**

4(3). Elytral scales arched; antennae in female clearly surpassing elytral apices . . . . . ***C. lingafelteri* Ohbayashi and Yamasako, 2016**
— Elytral scales not arched; antennae in female not reaching elytral apex ***C. warneri* sp. nov.**



Figures 27–32. Scales of elytra. **27–28)** *Caraphia squamosa*, male. **27)** Anterior area of the elytra. **28)** Posterior half of elytra. **29)** *Caraphia seriata*, male. **30)** *Caraphia lingafelteri*, female. **31)** *Caraphia warneri*, holotype female. **32)** *Caraphia woodruffi*, holotype male.

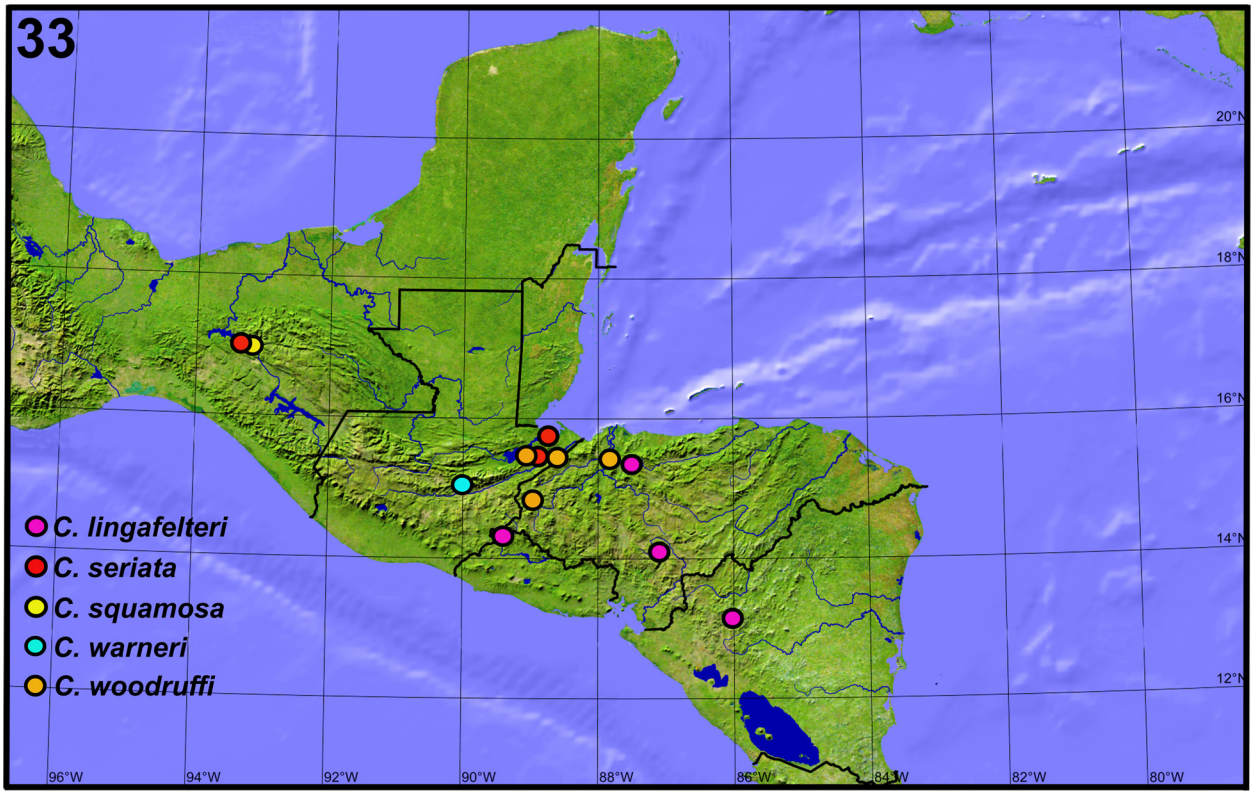


Figure 33. Known distribution of American *Caraphia* species.

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