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Description of seven new species of *Edessa* Fabricius, 1803 from Central America (Heteroptera, Pentatomidae, Edessinae)

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Abstract

Not much is known about the Central American stink bug fauna of the Edessinae subfamily. A recent survey of Costa Rican species from this subfamily listed 65 species, of which 47 were new additions. More recently, a description of a group of species of *Edessa* added more three species to the fauna of Costa Rica. This work is part of a series of articles aiming to review Edessinae from Central America. In this article seven new species are described from Panama and Costa Rica: *Edessa bituberculata* **sp. n.**, *E. bivenulata* **sp. n.**, *E. enargocelida* **sp. n.**, *E. fuscolimbata* **sp. n.**, *E. fuscopunctata* **sp. n.**, *E. helvoalata* **sp. n.** and *E. holochlorata* **sp. n.**

Key words: Costa Rica, Panama, stink bug, taxonomy

Introduction

Panama and Costa Rica are neighbor Central American countries with many attributes in common. They share a similar geological history, given that most of their territories are over the same tectonic microplate (Kellogg *et al.* 1995). They also have close values in many climatic features, such as mean temperature and precipitation (World Bank Group 2021). Unsurprisingly, the composition of their fauna and flora is remarkably similar as well (Barrantes 2009; Condit *et al.* 2010), and cladistic biogeographic analysis based on entomofauna have found biogeographic provinces common to both countries (Morrone 2006).

Panama has the higher percentage of forest cover in Central America (Grantham *et al.* 2020), and the laureate conservationist policies of Costa Rica have earned it the epithet of "Garden of the Americas" (Evans 1999); however, their ecological challenges are many and varied. Persistent threats to nature conservation have already taken root there and elsewhere in the form of intensive use of agricultural pesticides (Marquardt 2001; Echeverría-Sáenz *et al.* 2016), inadequate livestock practices (Quesada & Stoner 2004; Slusser *et al.* 2015) and climate change (Anderson-Teixeira *et al.* 2014; Quesada-Chacón *et al.* 2021).

Edessa Fabricius, 1803 is a very diverse genus of Neotropical stink bugs, which is undergoing detailed taxonomic scrutiny over the last two decades (Silva *et al.* 2006; Santos *et al.* 2015; Fernandes *et al.* 2018; Nunes *et al.* 2020). The genus *Edessa* is composed of several groups of species that have already been proposed and diagnosed: **dolichocera** (Fernandes & van Doesburg 2000a), **beckeri** (Fernandes & van Doesburg 2000b), **cervus** (Fernandes & van Doesburg 2000c), **collaris** (Fernandes *et al.* 2001), **rufomarginata** (Silva *et al.* 2006), **metallica** (Fernandes & Campos 2011), **caldaria** (Silva & Fernandes 2012), **pudibunda** (Santos *et al.* 2014), **viridula** (Nascimento *et al.* 2017), and **ovina** (Fernandes & Silva 2021). The subgenera *Ascra*, *Pygoda* and *Hypoxys* of *Edessa* were elevated to genus (Santos *et al.* 2015; Fernandes *et al.* 2018; Nunes *et al.* 2020). The subgenus *Aceratodes* of *Edessa* has already been partially revised, as group **rufomarginata** of species (Silva *et al.* 2006). The subgenus *Edessa* was reviewed

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by Silva (2017–unpublished data) and, based on a cladistic analysis, several groups of species were diagnosed. Also, some groups of species considered as new genus within Edessinae were described: *Anisoedessa* Nunes, Wallner & Fernandes, 2019; *Calcatedessa* Silva & Fernandes, 2021; *Doesburgedessa* Fernandes, 2010; *Graziaedessa* Eger, 2021; *Grammedessa* Correia & Fernandes, 2016; *Mediocampus* Thomas, 1994; *Odara* Campos & Fernandes, 2022; *Paraedessa* Silva & Fernandes, 2013 and *Plagaedessa* Almeida, Nunes & Fernandes, 2018.

Fernandes *et al.* (2015) made a list of Edessinae species recorded in the literature to Costa Rica (18 species). This list included three species of *Brachystethus*, two species of *Paraedessa*, one species of *Peromatus* and 12 species of *Edessa*. In addition, authors added to the list more 47 species from material deposited mainly in INBio collection: nine new species (described in Fernandes *et al.* 2015), one species of *Pantochlora*, one species of *Peromatus* and 36 species of *Edessa*. Campos *et al.* (2020) described the group of species **E. stalii** adding more three species to the list.

The present work is part of a series of articles aiming to review Edessinae from Central America, with an emphasis in Costa Rica (Fernandes *et al.* 2015; Campos *et al.* 2020). This work presents the description of seven new species with distribution in Panama and Costa Rica. We hope that the growing research and understanding of the insects of this region can contribute to the knowledge and protection of the amazing biodiversity that thrives there.

Material and methods

We examined 83 specimens from the following collections: DAR—David Rider Collection, Fargo, USA; DOE—Dodge Engelmann collection, University of Nebraska State Museum, Lincoln, USA; FMNH—Field Museum of Natural History (previously known as Chicago Natural History Museum, early acronym CNHM), Chicago, USA; INBio—Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica; JEE—Joseph E. Eger collection, Tampa, USA; MNHN—Muséum National d'Histoire Naturelle, Paris, France; TAMU—Texas A & M University, College Station, USA; TH—Donald Thomas collection, Weslaco, USA; USNM—National Museum of Natural History, Smithsonian Institution, Washington, USA.

The descriptions and terminology for general body parts followed Nunes *et al.* (2020), Dupuis (1970) for the genitalia, Zhou & Rédei (2020) for external female genitalia and Kment & Vilímová (2010) for the scent gland apparatus. The male's external genitalia removal and cleaning of the whole body followed Mendonça *et al.* (2021). Measurements (total length, length of head, width of head, length of antennomers, length of pronotum, width of pronotum, length of scutellum, width of scutellum, width of abdomen) were made using a gradicle scale attached to the scope's lens of Zeiss Discovery V8 stereomicroscope; minimum and maximum length are presented in millimeters. Images were taken using Leica DFC 450 camera connected to the Leica M205A stereomicroscope and stacked with Leica auto montage software (LAS software). Subsequent photo editing was done with GNU Image Manipulation Program (GIMP). Maps were made using QGIS (2022).

Results

Species description

***Edessa bituberculata* sp. n.**
(Figs. 1; 8 A, D; 10 A)

Etymology. The name refers to the tiny tubercles on pronotum.

Material examined. Holotype male. **COSTA RICA, Puntarenas:** 1♂, Fca. Cafrosa, Est. Las Mellizas, P. N. Amistad, 1300m, II–1991, G. Mora, L–S–316100, 596100 (Costa Rica, INBIO CRI000 612655) (INBio).

Paratypes. **COSTA RICA, Puntarenas:** 1♂, Finca Cafrosa, Embalce, 800m, N. O. de Tigra, 1280m, 17–24/IV/1996, E. Navarro, L_S_317800_596200 #7115, CRI002 439098 (INBio); 1♂, Estac. Biol. La Cruces, 17–20/IV/2003, Coll. E. G. Riley, ENTO–X0686477 (TAMU); 1♂, Fca. Cafrosa, Est. Las Mellizas, P. N. Amistad, 1300m, II–1991, G. Mora, L–S–316100, 596100 (Costa Rica, INBIO CRI000 612656; *Edessa* sp. det. J. E. Eger, 2000; sp

196, Fernandes, JAM) (INBio); 1♀, Fca. Cafrosa, Est. Las Mellizas, P. N. Amistad, 1300m, 20–VIII–4–IX–1989, M. Ramirez & G. Mora, 316100 596100 (Costa Rica, INBIO CRI001 015425; sp 196, Fernandes JAM) (INBio); 1♀, ACLAP, Mellizas, Sabalito, Coto Brus., Fca Willian Gamboa, 1300–1400m, 1–IV–2006, J. A. Azofeita, M. Moraga, B. Gambos. Tp. Luz, L_S_316200_596800 #85933 (Costa Rica, INBIOCRI INB0004007081; sp 196 Fernandes JAM) (INBio); **PANAMA, Chiriquí:** 1♂, Volcán de Chiriquí, 2-3000 ft, 1908, Champion, Museum Paris, Amérique Centrale, Coll. Du Bio. Central Amer., Godman (MNHN); 1♀, Dst. Renacimiento Sta. Clara, 20–22/V/1977, Engleman, at lights (DOE).

Measurements (n= 8)**:** antennomeres length: 1st: 0.50–0.54mm; 2nd: 1.23–1.33mm; 3rd: 1.46–1.71mm; 4th: 2.75–2.90mm; 5th: 3.10mm; head length: 0.99–1.28mm; head width: 2.41–2.43mm; pronotal length: 1.99–3.10mm; pronotal width: 6.59–7.20mm; scutellum length: 5.19–5.63mm; scutellum width: 3.97–4.01mm; abdominal width: 6.27–6.79mm; total length: 11.33–12.71mm.

Diagnosis: body dorsally green except variegated brown corium and yellow connexivum (Fig. 1 A). Antennae brown, last segment with basal and distal parts whitish (Fig. 8 A). Anterolateral margin of pronotum with narrow yellowish stripe (Fig. 8 A). Pronotum and scutellum with punctures dark brown, irregularly distributed (Fig. 8 A). Pronotum with small callosity adjacent to humeral angles bearing a tiny dark line (Fig. 8 A). Ventral surface: yellow with faded to dark brown stripes on thorax and abdomen (Fig. 8 D). Anterior bifurcation of metasternal process with arms short, thin, apices rounded (Fig. 8 D). Male genitalia: pygophore subtrapezoidal (Fig. 1 A, B). Posterolateral angles undeveloped (Fig. 1 A). Superior process of the genital cup with blade-like dorsal part fused to dorsal rim, ventral tongue-like part free (Fig. 1 C, D). Parameres with anterior lobe triangular, narrow, long, almost reaching dorsal rim; posterior lobe long and strongly curved (Fig. 1 C, D). Proctiger laterally broadly and shallowly excavated (Fig. 1 C, D); dorsal margin with conspicuously brown carina (Fig. 1 C, D); posterior face triangular (Fig. 1 C). Ventral rim with subrectangular median notch (Fig. 1 B). Female genitalia (Fig. 1 E): genital plates unpunctured. Valvifers VIII short with posterior margin acuminated.

Description: head: clypeus and jugae, slightly ridged. Bucculae subtriangular, harboring first labial segment. **Thorax:** dorsal surface: humeral angles straight, about as long as the width of an eye (Fig. 8 A). Scutellum with punctures larger and sparser on anterior half than on posterior half, unpunctured distally. Corium with parts of the veins, lateral margin and small spots yellow (Fig. 8 A). Membrane transparent, brown (Fig. 8 A). Ventral surface: prothorax and mesothorax with brown punctures (Fig. 8 D). Propleuron with diffuse brown arched stripe between anterolateral angle and procoxal cavity (Fig. 8 D). Mesopleuron with anterior transverse black stripe that curves and widens laterally (Fig. 8 D). Peritreme ruga-like, reaching 2/3 of the distance between ostiole of the scent gland and lateral margin of metapleuron (Fig. 8 D). Metasternal process with anterior arms slightly divergent (Fig. 8 D); anterior bifurcation receiving only fourth rostral segment and a small portion of third (Fig. 8 D). **Abdomen:** dorsal surface: posterolateral angle of connexival segments black (Fig. 8 A); last connexival segment with distal black spot comprising less than half segment (Fig. 8 A). **Male genitalia:** dorsal rim dark brown in a narrow area delimited by small tooth (Fig. 1 A). Posterolateral angles truncated, slightly developed (Fig. 1 A). Superior process of the genital cup black (Fig. 1 C, D). Expansions of ventral rim not inconspicuous (Fig. 1 B). **Female genitalia** (Fig. 1 E): valvifers VIII with inner margins strongly and abruptly divergent towards apex, exposing valvulae IX. Laterotergites VIII acute distally, outer lateral margin softly arched; free distal spinose part about 1/5 of its length. Valvifers IX smooth and trapezoidal. Laterotergites IX slightly surpassing sclerite uniting laterotergites VIII.

Differential diagnosis: *Edessa bituberculata* **sp. n.** is very similar to *E. bivenulata* **sp. n.** (Fig. 8 A, B). However, *E. bituberculata* **sp. n.** has a large basal yellow area on corium (Fig. 8 A) and mesothorax with dark punctures (Fig. 8 D) while *E. bivenulata* **sp. n.** do not show these characteristics (Fig. 8 B, E). Moreover, *E. bituberculata* **sp. n.** has the superior process of genital cup fused to dorsal rim (Fig. 1 C, D) (free in *E. bivenulata* **sp. n.**—Fig. 2 C, D), subrectangular notch on ventral rim (Fig. 1 B) (V-shaped notch in *E. bivenulata* **sp. n.**—Fig. 2 B), lateral excavation of proctiger larger than in *E. bivenulata* **sp. n.** (Figs. 1 C; 2 C), and posterior face of proctiger smaller than in *E. bivenulata* **sp. n.** (Figs. 1 C; 2 C). Females have valvifers VIII distal part of inner margins V-shaped while in *E. bivenulata* **sp. n.** they are U-shaped (Figs. 1 E; 2 E).

Distribution (Fig. 10 A)**:** COSTA RICA: Puntarenas; PANAMA: Chiriquí.

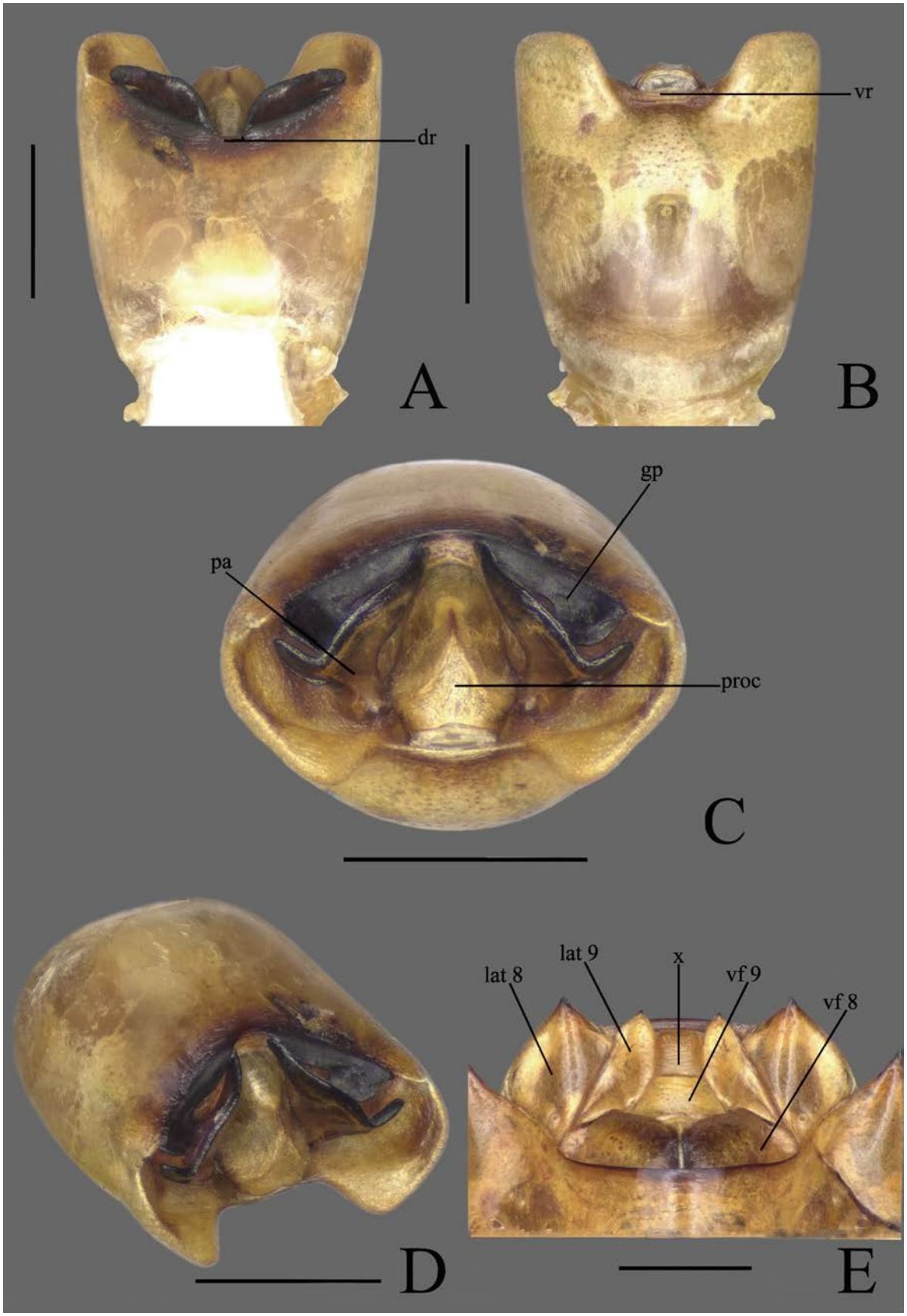

FIGURE 1. A–E. *Edessa bituberculata* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively; E, genital plates. dr—dorsal rim; vr—ventral rim; proc—proctiger; pa—parameres; gp—superior process of the genital cup; vf 8—valvifer VIII; vf 9—valvifers IX; lat 8—laterotergites VIII; lat 9—laterotergites IX; X—tenth segment. Scale 1 mm.

***Edessa bivenulata* sp. n.**
(Figs. 2; 8 B, E; 10 B)

Etymology. The name refers to the two small yellow veins in the corium.

Material examined. Holotype male. **PANAMA, Chiriquí:** 1 ♂, Hartmann's Finca, 4–7–VII–1997, Morris & Wappes (USNM).

Paratypes. **COSTA RICA, Puntarenas:** 1♂, Est. Pittier, PILA-ACLA, 1670 m, 5–18/I/1995, E. Navarro, L_N_330900_577400#4585, INBIO CRI002 197264 (UFPA); 1♂, Est. Altamira, Buenos Aires, 15/IX–14/X/1993, R. Delgado, L S 572100_331700 #2370, INBIO CRI001 621007 (INBio); **PANAMA, Chiriquí:** 1♂ 1♀, Hartmann's finca, St. Clara, 15–18/VI/1985, Riley & Rider, D. A. Rider Collection (DAR); 1♀, Hartmann's Finca, 4–7–VII–1997, Morris & Wappes (sp 188, Fernandes JAM) (JEE).

Measurements (n= 6)**:** antennomeres length: 1st: 0.56–0.61mm; 2nd: 1.25–1.47mm; 3rd: 1.68–1.79mm; 4th: 2.55–3.11mm; 5th: 2.72mm; head length: 1.21–1.54mm; head width: 2.53–2.78mm; pronotal length: 2.49–2.69mm; pronotal width: 7.51–8.22mm; scutellum length: 6.05–6.59mm; scutellum width: 4.37–4.93mm; abdominal width: 7.24–7.93mm; total length: 14.30–14.64mm.

Diagnosis: body dorsally green except brown corium (Fig. 8 B). Antennae brown, 4th and 5th antennomeres with basal halves whitish (Fig. 8 B). Anterolateral margin of pronotum with narrow yellowish stripe (Fig. 8 E). Pronotum and scutellum with punctures dark brown, irregularly distributed (Fig. 8 B). Pronotum with small callosity adjacent to humeral angles bearing a tiny dark line (Fig. 8 B). Corium with basal, black, lateral stripe (Fig. 8 B). Connexival segments with whitish medial spot. Ventral surface: yellow with brown narrow stripes on thorax and abdomen (Fig. 8 E). Anterior bifurcation of metasternal process with arms short, broad, apices rounded (Fig. 2 F). Male genitalia: pygophore subtrapezoidal (Fig. 2 A, B). Posterolateral angles slightly developed (Fig. 2 A). Superior process of the genital cup spearhead-shaped, bifid posteriorly (Fig. 2 C, D). Parameres with anterior lobe subrectangular and short (Fig. 2 C, D); posterior lobe short and curved (Fig. 2 C, D). Proctiger laterally shallowly excavated (Fig. 2 C, D); dorsal margin with broad, brown carina (Fig. 2 C); posterior face triangular (Fig. 2 C). Ventral rim with V-shaped median notch (Fig. 2 B). Female genitalia (Fig. 2 E): genital plates sparsely punctured. Valvifers VIII inner margins forming a deep U-shaped excavation.

Description: head: clypeus and jugae, slightly ridged. Bucculae subtriangular, harboring first labial segment. **Thorax:** dorsal surface: humeral angles concolorous with dorsum, straight, about as long as the width of an eye (Fig. 8 B). Scutellum with punctures sparser on anterior half than on posterior half (Fig. 8 B). Corium with margin and two curved spots and parts of few veins yellow (Fig. 8 B). Membrane transparent, brown (Fig. 8 B). Ventral surface: prothorax with irregularly distributed and light brown punctures (Fig. 8 E). Propleuron with dark brown arched stripe between anterolateral angle and procoxal cavity. Mesothorax unpunctured (Fig. 8 E). Mesopleuron with thin black stripe on margin adjacent to propleuron and small black line close to coxa (Fig. 8 E). Peritreme ruga-like, reaches 2/3 of the distance between ostiole of the scent gland and lateral margin of metapleuron. Metasternal process with anterior arms slightly divergent, anterior bifurcation receiving only fourth rostral segment (Fig. 2 F). **Abdomen:** dorsal surface: connexival segments with posterolateral angles black; last connexival segment with narrow distal black spot. **Male genitalia:** dorsal rim dark brown in an area delimited by indentation and coincident with parameres (Fig. 2 A). Posterolateral angles truncated (Fig. 2 A). Superior process of the genital cup dark brown (Fig. 2 C, D). Expansions of the ventral rim slightly swollen (Fig. 2 B). **Female genitalia** (Fig. 2 E)**:** valvifers VIII convex; lateral margin sinuous, excavation exposing valvulae IX. Laterotergites VIII distally sharp, outer lateral margin softly arched; free distal spinose part about 1/6 of its length. Valvifers IX smooth, subtrapezoidal. Laterotergites IX slightly surpassing sclerite uniting laterotergites VIII.

Differential diagnosis: *Edessa bivenulata* **sp. n.** is almost identical to *E. bituberculata* **sp. n.** (see differential diagnosis on *E. bituberculata* **sp. n.**). The species *E. bivenulata* **sp. n.** may be readily distinguished from *E. bituberculata* **sp. n.** by the presence of a black stripe on the basal outer lateral margin of the corium (Fig. 8 B) (not present in *E. bituberculata* **sp. n.**—Fig. 8 A).

Distribution (Fig. 10 B)**:** COSTA RICA: Puntarenas; PANAMA: Chiriquí.

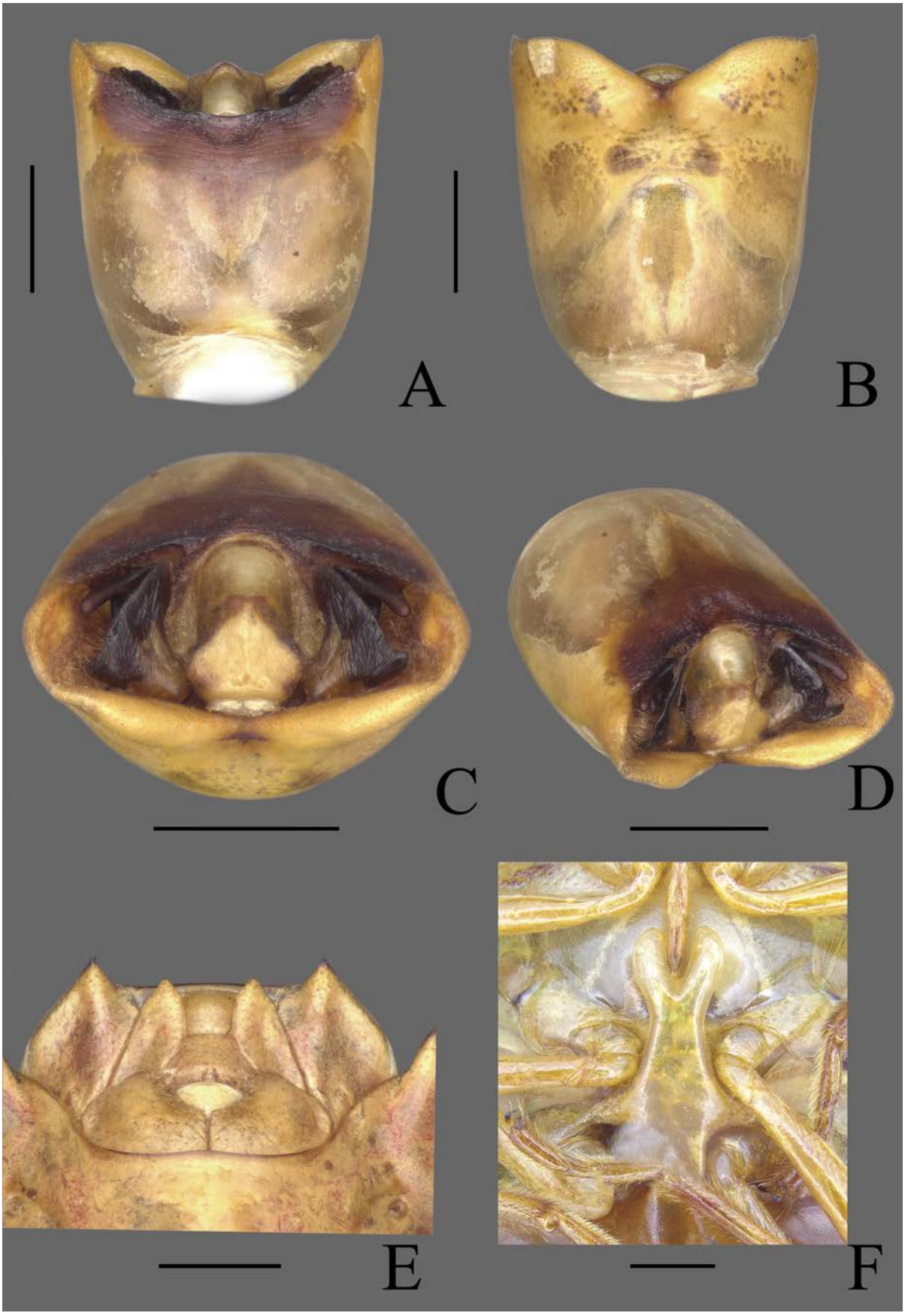

FIGURE 2. A–F. *Edessa bivenulata* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively; E, genital plates; F, metasternal process. Scale 1 mm.

***Edessa enargocelida* sp. n.**
(Figs. 3; 8 C, F; 10 B)

Etymology. The name refers to the greenish-yellow distal spot of the scutellum (Gr. *Enargo-* visible; Gr. *Kelidus-*stain, spot).

Material examined. Holotype male. **COSTA RICA, Cartago:** 1♂, Turrialba, 1–6/III/1965, S. S. & W. D. Duckworth (USNM).

Paratypes. **COSTA RICA, Guanacaste:** 1♂, Est. Cacao, 1000–1400m, Lado suroeste del Volcán, II curso Parataxon, VI–1990, L–N–323300 375700 (Costa Rica, INBIO CRI000 283893; *Edessa* sp. 8; sp. 174, Fernandes JAM) (INBio); 1♀, Est. Cacao, 1000–1400m, Lado SO Vol. Cacao, B. Guadamuz, X–XII–1989, L–N–323300 375700 (Costa Rica, INBIO CRI000 410622; *Edessa* sp. 8; sp. 174, Fernandes, JAM) (INBio); 1♀, Derrumbe, Estac. Mengo, 1400m, W side Volcán Cacao, 11–VII–1988, Janzen & Hallwachs (Costa Rica, INBIO CRI001 015439; *Edessa* sp. 8; sp. 174, Fernandes JAM) (INBio); **Alajuela:** 1♂, San Ramón de Dos Rios, 620m, XI–1994, L. Garcia, L_N_318100_381900 #6513 (Costa Rica, INBIO CRI002 331125; *Edessa* sp 8; sp 174, Fernandes JAM) (INBio); 1♂, Caño Negro, R. N. V. S., 20m, 3–30–VI–1996, K. Flores de Luz, L_N_319100_450200 #7634 (Costa Rica, INBIO CRI002 422175; *Edessa* sp. 8; sp. 174, Fernandes JAM) (INBio); **Limón:** 1♀, Sardinhas, R. N. F. S., Barra del Colorado, 15 m, 01–15–X–1994, F. V. Araya, L N 291900_565900 #3292 (Costa Rica, INBIO CRI002 120359; *Edessa* sp 8; sp 174 Fernandes JAM) (INBio); **Puntarenas:** 1♂, Est. Rio Bonito, 2.3 Km al O. del Cerro la Gamba, 110m, 17–22/IV/1996, E. Fletes, L_S_293900_547075#8309. INBIO CRI002 477501 (INBio); 1♂, Finca Las Cruces, 6 km, S. San Vito de Java, 4200 ft, 28/IX–2/X/1986, J. E. Eger, col., (JEE); 1♀, Monteverde, 12–21–IV–1984, S. McKamey coll. (sp 174, Fernandes, JAM) (JEE); 1♀, Rancho Quemado, Pen. Osa., F. Quesada, II–1991, L–S–292500 511000 (Costa Rica, INBIO CRI 000 640360; *Edessa* sp. 8; sp 174, Fernandes JAM) (INBio); **San José:** 1♀, Est. Bijagual, 600 m, N. de Bijagualito, 500 m, III/1995, J. C. Saborio, L_N_191800_476800#4371, INBIO CRI002 214817 (INBio); **PANAMA, Veraguas**: 1♂, 8 km W. Sante Fe, Cerro Tute el 3000 ft, 8º30'26"N 81º6'49"W, J. C. Schaffner, TAMU ENTO X0686536 (TAMU).

Measurements (n= 13)**:** antennomeres length: 1st: 0.40–0.50mm; 2nd: 1.14–1.71mm; 3rd: 1.05–2.12mm; 4th: 2.17–2.27mm; 5th: 2.28–2.33mm; head length: 1.03–1.24mm; head width: 2.27–2.43mm; pronotal length: 2.36–2.42mm; pronotal width: 5.82–6.34mm; scutellum length: 4.44–5.03mm; scutellum width: 3.58–3.91mm; abdominal width: 5.49–5.52mm; total length: 11.12–11.45mm.

Diagnosis: body dorsally green, except variegated brown and yellow corium (Fig. 8 C). Antennae brown (Fig. 8 C). Pronotum with punctures very sparse, minute and shallow (Fig. 8 C). Anterolateral margin of pronotum with narrow yellowish stripe (Fig. 8 C). Dark minute longitudinal callosity adjacent to humeral angles (Fig. 8 C). Scutellum anterior half with light-brown punctures (Fig. 8 C); distal half with light-brown to brown punctures (Fig. 8 C). Scutellum with transverse diffuse faint brown stripe delimiting a greenish-yellow distal spot (Fig. 8 C). Last connexival segment with more than distal half black (Fig. 8 C). Ventral surface: pale yellow to yellow with transversal, narrow brown stripes on thorax and abdomen (Fig. 8 F). Anterior bifurcation of the metasternal process with arms short, broad, apices acuminated (Fig. 8 F). Male genitalia: pygophore subrectangular (Fig. 3 A, B). Dorsal rim convex medially (Fig. 3 A). Posterolateral angle slightly developed (Fig. 3 A). Superior process of the genital cup small, reniform, and adjacent to dorsal rim (Fig. 3 C, D). Parameres with anterior lobe broad truncated and dorsally carinated, posterior lobe short and somewhat curved (Fig. 3 C, D). Proctiger barely laterally excavated (Fig. 3 C, D); posterior face truncated and peer-shaped (Fig. 3 C). Ventral rim with deep broad median notch, expansions slightly developed (Fig. 3 B). Female genitalia with few clusters of punctures (Fig. 3 E). Valvifers VIII with median narrow deep excavation (Fig. 3 E).

Description: head: clypeus and jugae plain or with few very subtle transversal ridges. Bucculae subtriangular, harboring first labial segment. **Thorax:** dorsal surface: humeral angles with short, narrow, dark spot at the apex (Fig. 8 C); short, less than the width of an eye (Fig. 8 C). Pronotum with concolorous to light-brown punctures (Fig. 8 C). Anterior margin of pronotum unpunctured (Fig. 8 C). Scutellum with punctures light brown or concolorous with adjacent areas, very sparse on anterior half, concentrated on middle region, after brown spot almost unpunctured (Fig. 8 C). Corium densely punctured (Fig. 8 C); claval vein, basal spot and some venal branches yellowish (Fig. 8 C). Membrane translucent, slightly dark (Fig. 8 C). Ventral surface: Prothorax–mesothorax irregularly punctured, punctures concolorous or brown (Fig. 8 F). Pleura, intersegmental region with subtle brown stripes, propleura with transversal brown stripe (Fig. 8 F). Peritreme ruga-like, reaching 3/4 of the distance between ostiole of the scent gland and lateral margin of metapleuron (Fig. 8 F). Metasternal process medially narrower; anterior arms slightly divergent,

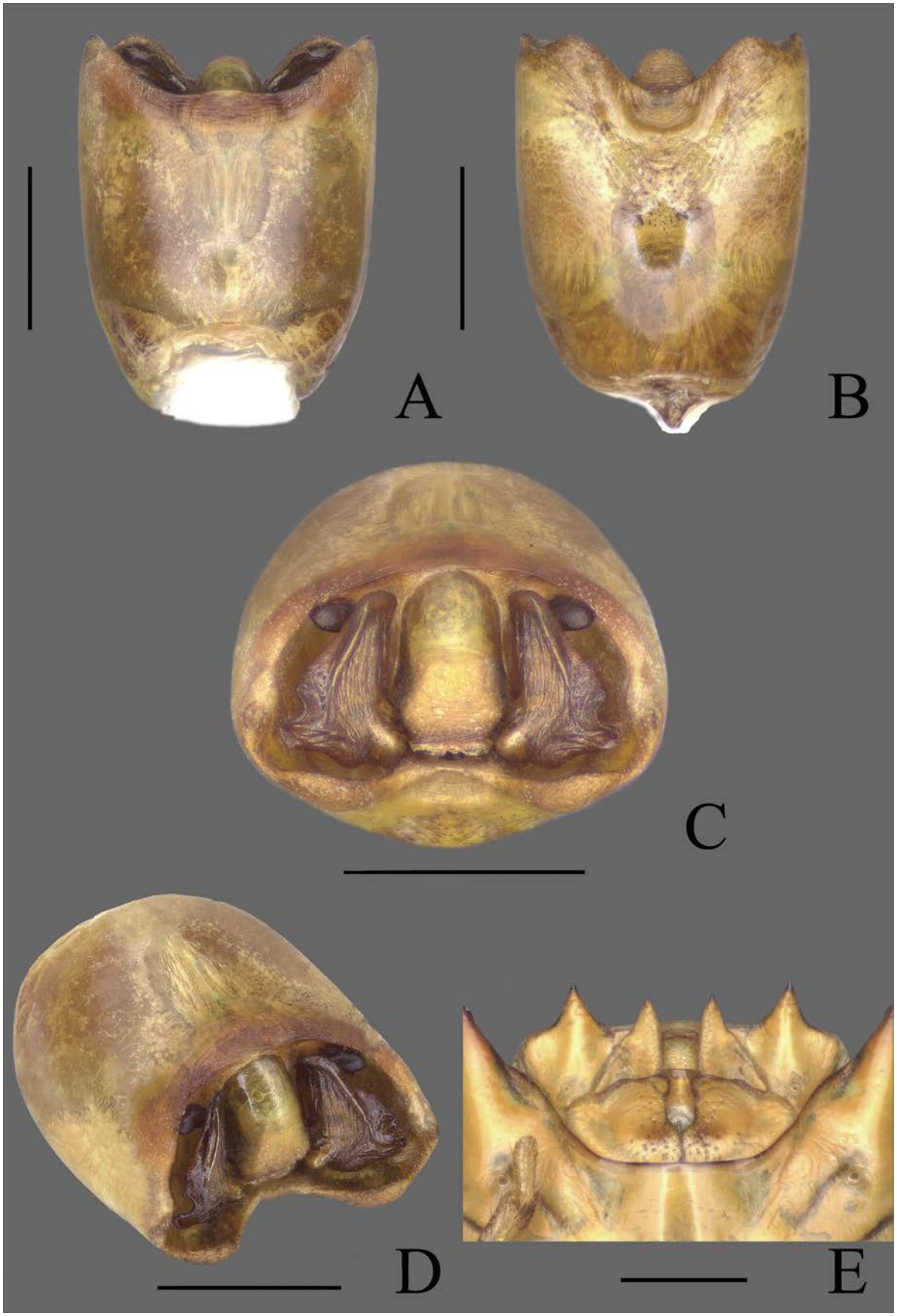

FIGURE 3. A–E.: *Edessa enargocelida* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively; E, genital plates. Scale 1 mm.

anterior bifurcation receiving only fourth rostral segment (Fig. 8 F). **Abdomen:** dorsal surface: posterolateral angles of connexival segments with apices black (Fig. 8 C). **Male genitalia:** dorsal rim light-brown (Fig. 3 A). Posterolateral angles mildly excavated (Fig. 3 A). Ventral rim with expansions rounded, slightly swollen, level with posterolateral angles (Fig. 3 B). **Female genitalia** (Fig. 3 E)**:** valvifers VIII almost flat covering most of valvifers IX, distal margin sinuous; median excavation fairly exposing valvulae IX. Laterotergites VIII with outer lateral margin strongly arched; free distal spinose part about 1/3 of its length. Valvifers IX smooth, subtrapezoidal. Laterotergites IX acute, subtriangular, projected, far surpassing sclerite uniting laterotergites VIII.

Differential diagnosis: the identification of *Edessa enargocelida* **sp. n.** can easily be done based on the combination of pronotum almost smooth except for a few shallow punctures (Fig. 8 C) (all other species presented here have the pronotum speckled with well-marked punctures—Figs. 8 A, B; 9 A, B, C), scutellum marked with a brown spot on its posterior portion, delimiting a greenish-yellow spot (Fig. 8 C) (brown spot shared only with *E. fuscopunctata*—Fig. 9 A), and a large black spot covering more than half of the last connexival segment (Fig. 8 C) (the other species with half or less of the segment covered by a black spot—Figs. 8 A, B; 9 A, B, C).

Distribution (Fig. 10 B)**:** COSTA RICA: Guanacaste, Alajuela, Limón, Puntarenas, San José, Cartago; PANAMA: Veraguas.

Edessa fuscolimbata **sp. n.**

(Figs. 4; 8 G, H; 10 A)

Etymology. The name refers to the black band on the anterolateral margin of the pronotum (L. *Fusco*- black; L. *limbus*- border).

Material examined. Holotype male. **COSTA RICA, Heredia:** 1♂, Estación Biológica La Selva, 50–150 m, 10º26'N,84º01W, 4–6/IV/2003, E. Riley, at lights, TAMU-ENTO X 0719945, TAMU Out. 2011 (TAMU).

Paratype. **COSTA RICA, Guanacaste:** 1♂, 18/V/1932, A. Alfaro, Washington 08/2014 (USNM).

Measurements (n= 2)**:** antennomeres length: 1st: 0.54–0.61mm; 2nd: 1.42–1.44mm; 3rd: 1.27–1.31mm; 4th: 1.98–2.06mm; 5th: 2.08mm; head length: 1.25–1.32mm; head width: 2.23–2.26mm; pronotal length: 2.19–2.26mm; pronotal width: 6.37–6.73mm; scutellum length: 4.77–5.16mm; scutellum width: 3.70–3.93mm; abdominal width: 6.00–6.18mm; total length: 11.11–11.71mm.

Diagnosis: body probably dorsally green except variegated brown corium (Fig. 8 G). Antennae black, basal portion of 3rd, 4th and 5th antennomeres whitish (Fig. 8 G). Anterolateral margin of pronotum black (Fig. 8 G). Pronotum, Scutellum and corium with black punctures (Fig. 8 G). Black minute longitudinal callosity adjacent to humeral angles (Fig. 8 G). Scutellum with black distal spot (Fig. 8 G). Corium with black longitudinal stripe on basal portion of lateral margin (Fig. 8 G); also with diffuse whitish basal and subdistal spots (Fig. 8 G). Last connexival segment with distal third black (Fig. 8 G). Ventral surface: pale yellow with transversal, narrow, incomplete and faded brown stripes on abdomen (Fig. 8 H); thorax uniformly and densely punctured, punctures dark (Fig. 8 H). Anterior bifurcation of the metasternal process with arms very short, narrow, apices rounded (Fig. 8 H). Male genitalia: pygophore trapezoidal (Fig. 4 A, B). Superior process of the genital cup pedunculated, small, subrectangular (Fig. 4 C, D). Parameres with anterior lobe elliptical (Fig. 4 C, D); posterior lobe long, narrow and laterally curved (Fig. 4 C, D). Proctiger laterally excavated (Fig. 4 C, D); posterior face subtriangular with dorsal part broad and slightly swollen (Fig. 4 C). Ventral rim with median notch broad and shallow (Fig. 4 B); expansions developed (Fig. 4 B).

Description: head: clypeus and jugae, slightly ridged. Bucculae subtriangular, almost completely harboring first labial segment. **Thorax:** dorsal surface: pronotum with punctures sparse, irregularly distributed (Fig. 8 G). Anterior margin of pronotum with subtle row of punctures (Fig. 8 G). Humeral angle with black spot at the apex (Fig. 8 G); short, about as long as the width of an eye (Fig. 8 G). Scutellum with punctures sparse on anterior half and dense on lateral margins and posterior half (Fig. 8 G). Clavus with yellowish line adjacent to corium (Fig. 8 G). Membrane translucent, slightly dark (Fig. 8 G). Ventral surface: prothorax–mesothorax without dark stripes (Fig. 8 H). Peritreme ruga-like, reaching 4/5 of the distance between ostiole of the scent gland and lateral margin of metapleuron (Fig. 8 H). Metasternal process delicate, anterior arms slightly divergent, anterior bifurcation receiving only part of fourth rostral segment (Fig. 8 H). **Abdomen:** dorsal surface: posterolateral angles of connexival segments with tiny distal black spot (Fig. 8 G). **Male genitalia:** dorsal rim brown and convex medially (Fig. 4 A). Posterolateral angles slightly developed, gently excavated on inner face (Fig. 4 A); apex coarse (Fig. 4 A). Ventral rim with expansions slightly tumid and laterally curved (Fig. 4 B). **Female genitalia:** unknown.

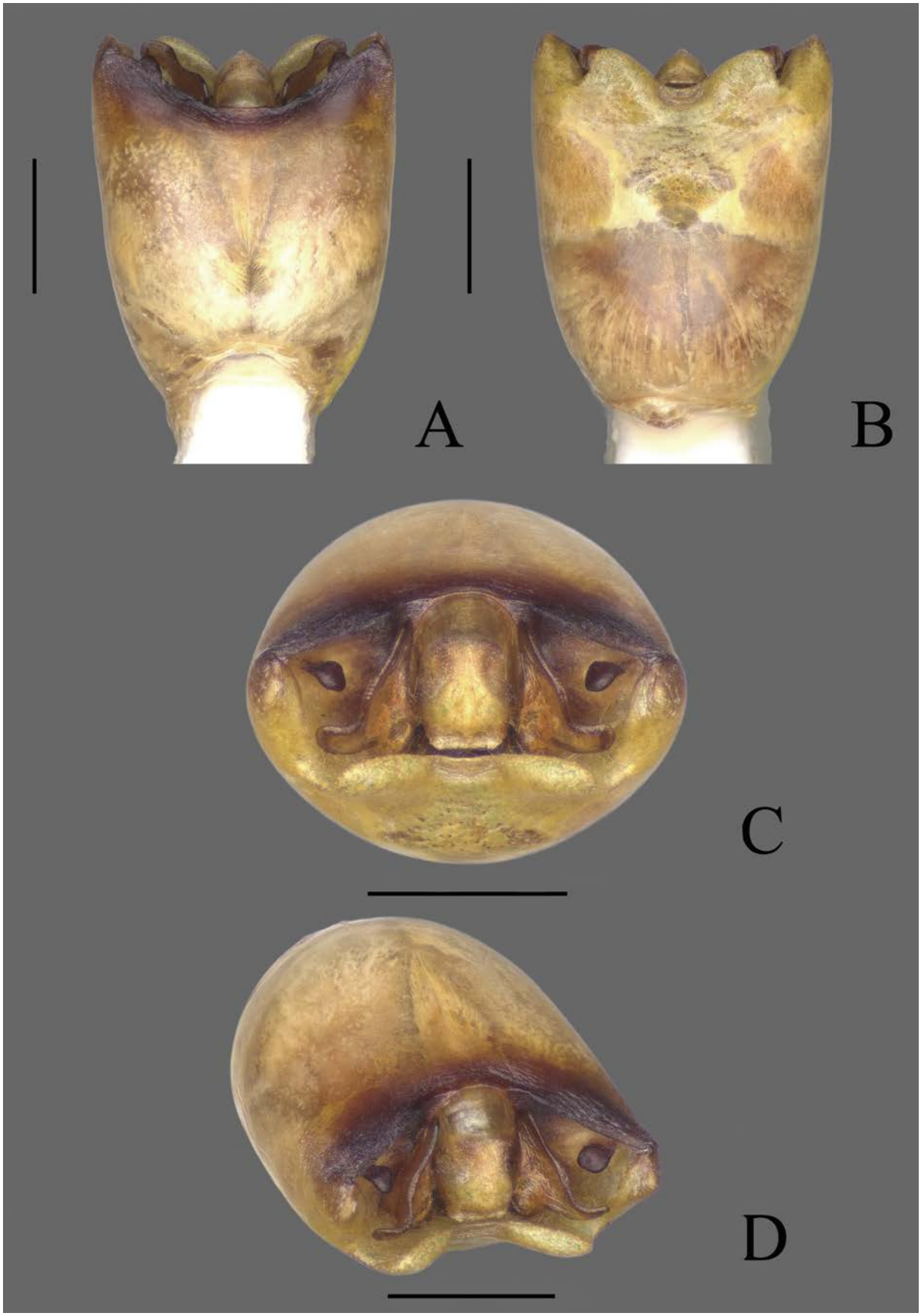

FIGURE 4. A–D. *Edessa fuscolimbata* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively. Scale 1 mm.

Differential diagnosis: *Edessa fuscolimbata* **sp. n.** has distinctive black antennae (Fig. 8 G), anterolateral margin of pronotum black (Fig. 8 G), and apex of scutellum black (Fig. 8 G), which are remarkable features among the species presented here. This species shares with *E. fuscopunctata* the black stripe on lateral margin of corium and black punctuation on dorsal surface (Figs. 8 G, 9 A). The black stripe on corium is characteristic of the genus *Hypoxys*, possibly both species are related to this genus, but are not part of it due to genital characteristics.

Distribution (Fig. 10 A)**:** COSTA RICA: Guanacaste, Heredia.

Observation: Both available specimens of *E. fuscolimbata* show strong evidence of generalized depigmentation, possibly caused by inadequate conservation, which makes specimens prone to partially or completely lose their original color, usually becoming brown. Because of this, color information is presented speculatively in the description. However, it is possible to state that their corium is naturally brown, since most of it seems unaffected.

***Edessa fuscopunctata* sp. n.**
(Figs. 5; 9 A, D; 10 A)

Etymology. The name refers to the black color of the pronotal punctuation (L. *Fusco-* black; *punctum-* hole).

Material examined. Holotype male. **COSTA RICA**. **Puntarenas:** 1♂, Corcovado National Park, Osa Peninsula, 5–11/VIII/1979, D. H. Janzen, INBIO CRI001 702800 (INBio).

Paratypes. **COSTA RICA**. **Puntarenas:** 1♂, Sirena, Corcovado Nat. Pk., Osa Peninsula, 13–22/III/1980, D. H. Janzen & W. Hallwachs, INBIO CRI001 715378 (INBio); 1♂, Corcovado Nat. Pk. Osa Penin, 15–22/III/1979, coll. D. H. Janzen, INBIO CRI001 702253 (INBio); 1♀, Est. Sirena, ACOSA. 1–100m, 5–24/IV/1995, B. Gamboa, L N 270500 507900#4738, INBIO CRI002 188039 (INBio).

Measurements (n= 4)**:** antennomeres length: 1st: 0.51–0.67mm; 2nd: 1.02–1.14mm; 3rd: 1.90–2.89mm; 4th: 3.48–3.57mm; 5th: 3.37mm; head length: 1.34–1.49mm; head width: 2.83–2.85mm; pronotal length: 2.79–2.99mm; pronotal width: 6.88–7.27mm; scutellum length: 5.55–5.96mm; scutellum width: 4.15–4.50mm; abdominal width: 6.87–7.23mm; total length: 12.99–13.68mm.

Diagnosis: body dorsally green except variegated brown corium (Fig. 9 A). Antennae brown, basal portion of 5th antennomeres whitish (Fig. 9 A). Anterolateral margin of pronotum with narrow yellowish stripe (Fig. 9 A). Pronotum with punctures black, coarse, covering most of pronotum except on cicatrices, anterior margin and anterolateral margins (Fig. 9 A). Black minute longitudinal callosity adjacent to humeral angles (Fig. 9 A). Scutellum with transverse diffuse brown stripe on midposterior region (Fig. 9 A). Corium with diffuse yellowish and reddish shade, black longitudinal stripe on basal portion of lateral margin (Fig. 9 A). Connexival segments with yellowish spots (Fig. 9 A). Last connexival segment mostly black (Fig. 9 A). Ventral surface: yellowish with thoracic dark lines restricted to propleura and abdominal dark lines narrow and incomplete (Fig. 9 D). Anterior bifurcation of the metasternal process with arms narrow, apices acuminated (Fig. 9 D). Male genitalia: pygophore subrectangular (Fig. 5 A, B). Dorsal rim freely projected over slightly developed posterolateral angles (Fig. 5 A). Superior process of the genital cup arrowhead-like, slightly bent, medially excavated (Fig. 5 C, D). Parameres with anterior lobe triangular and developed (Fig. 5 C, D); dorsal margin deeply excavated (Fig. 5 C, D); posterior lobe short, digitiform and straight (Fig. 5 C, D). Proctiger slightly excavated laterally (Fig. 5 C, D). Ventral rim with median notch subrectangular; expansions developed and triangular (Fig. 5 B). Female genitalia (Fig. 5 E): valvifers VIII punctured medially; medially largely excavated.

Description: head: clypeus and jugae, slightly ridged. Bucculae subtriangular, harboring first labial segment almost completely. **Thorax:** dorsal surface: anterior margin of pronotum with subtle intermittent row of punctures (Fig. 9 A). Humeral angle with small black stripe at the apex, short, about as long as the width of an eye (Fig. 9 A). Scutellum very acute, punctures coarse, grouped much tighter on brown stripe and adjacent areas; distal part unpunctured (Fig. 9 A). Membrane transparent, slightly dark (Fig. 9 A). Ventral surface: prothorax with black, dense, irregularly distributed punctures (Fig. 9 D). Mesothorax with few minute, shallow punctures (Fig. 9 D). Peritreme ruga-like, reaching 2/3 of the distance between ostiole of the scent gland and lateral margin of metapleuron (Fig. 9 D). Metasternal process with anterior arms slightly divergent, anterior bifurcation receiving only fourth rostral segment (Fig. 9 D). **Abdomen:** dorsal surface: posterolateral angles of connexival segments with distal black spot (Fig. 9 A). **Male genitalia:** dorsal rim light-brown, slightly sinuous, broadly excavated (Fig. 5 A). Posterolateral angles slightly developed, gently excavated on inner face (Fig. 5 A). Ventral rim with expansions short and slightly swollen (Fig. 5 B).

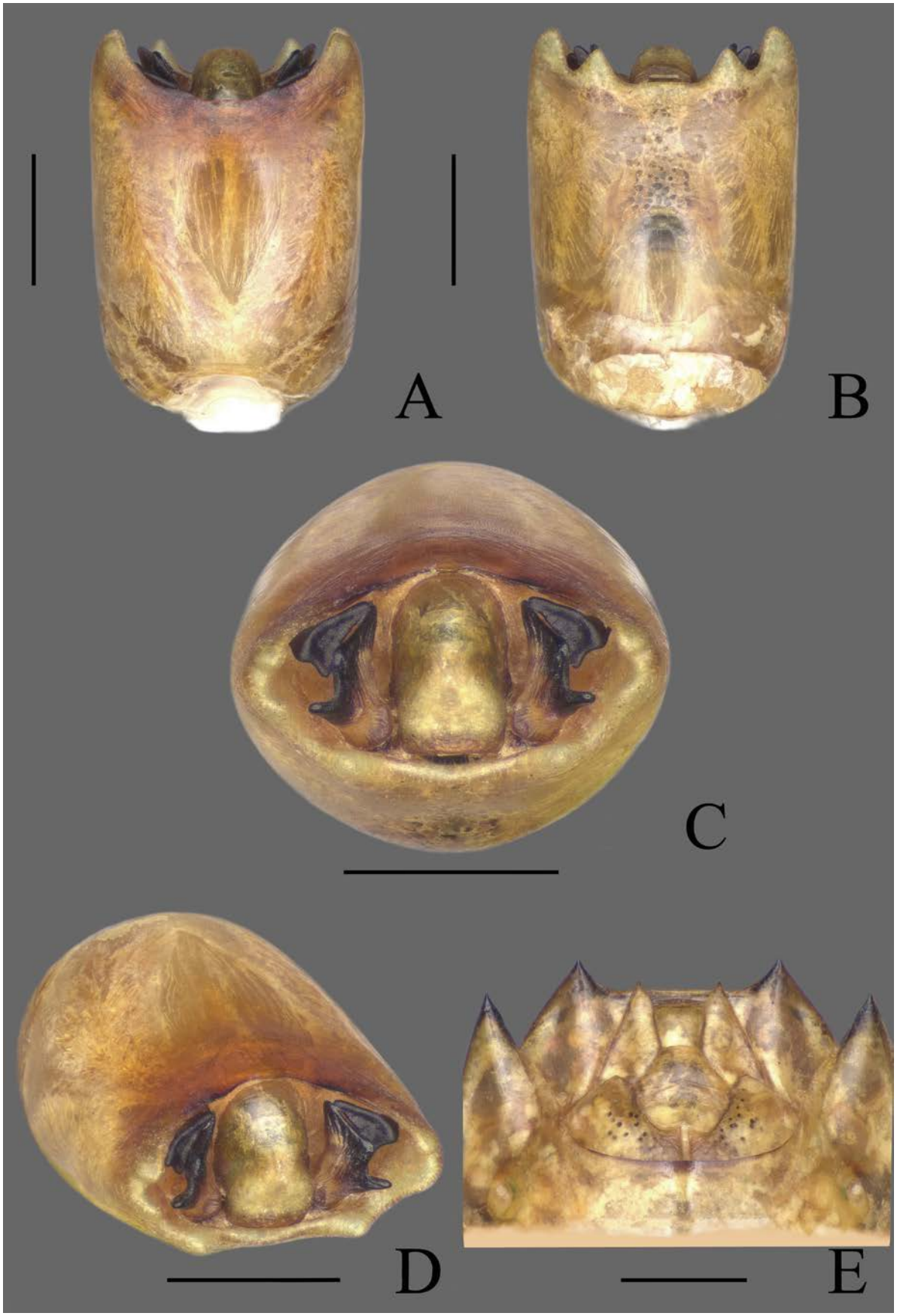

FIGURE 5. A–E. *Edessa fuscopunctata* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively; E, genital plates. Scale 1 mm.

Female genitalia (Fig. 5 E)**:** valvifers VIII slightly convex; distal margin slightly arched; median excavation widely exposing valvulae IX. Laterotergites VIII sharp distally, outer lateral margin almost straight; free distal spinose part about 1/5 of its length. Valvifers IX smooth, trapezoidal. Laterotergites IX acute distally, barely surpassing sclerite uniting laterotergites VIII.

Differential diagnosis: *Edessa fuscopunctata* **sp. n.** is more similar to *E. fuscolimbata* **sp. n.** (see differential diagnosis of *E. fuscolimbata* **sp. n.**). But *Edessa fuscopunctata* **sp. n.** can be separated from *E. fuscolimbata* **sp. n.** by the brown midposterior stripe on scutellum (Figs. 9 A; 8 G); humeral angles very short (Figs. 9 A; 8 G); pygophore with genital cup process arrowhead-like (Figs. 5 C, D; 4 C, D), and dorsal rim projected freely over humeral angles (Figs. 5 A; 4 A).

Distribution (Fig. 10 A)**:** COSTA RICA: Puntarenas.

***Edessa helvoalata* sp. n.**
(Figs. 6; 9 B, E; 10 C)

Etymology. The name refers to the yellowish diffuse color in parts of the corium (L. *Helvus*- pale-yellow).

Material examined. Holotype male. **PANAMA, Colón:** 1♂, Ft. Sherman area, 19–V–1999, Morris & Wappes (USNM).

Paratypes. **COSTA RICA, Guanacaste:** 1♀ 1♂, Est. Las Pailas, P. N. Rincón de la Vieja, 800m, 7–23–II–1994, K. E. Taylor, L N 306300_38600 #2567 (Costa Rica, INBIO CRI001 831667 831664; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, Est. Maritza, 600m, lado O vol. Orosi, II–IV–1992, Tp. Malaise, L–N 326900 373000 (Costa Rica, INBIO CRI000 377544; *Edessa* sp 32*;* sp 241 Fernandes JAM) (INBio); 1♀, Est. Maritza, 600m, lado W side Volcán Orosi, 1989, Malaise Tp., GNP Biod. Sur., 326900 373000 (Costa Rica, INBIO CRI000 037188; *Edessa* sp 32*;* sp 241 Fernandes JAM) (INBio); 1♀, Est. Maritza, 600m, lado O vol. Orosi, 26–II–10–III–1992, S. Rojas, L–N 326900 373000 (Costa Rica, INBIO CRI000 707027; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); **Alajuela:** 1♂, Caño Negro, R. N. V. S., 20m, 1–19–II–1994, K. F. Flores, L N 319100_450100 #2627 (Costa Rica, INBIO CRI001 941577; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); **Limón:** 1♂, Manzanillo, 0–100m, RNFS, Gandoca & Manzanillo, 9–IX–13–X–1992, K. Taylor, L–S 398100 6106600 (Costa Rica, INBIO CRI000 937577; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♂ 1♀, Amburi, A. C. Amistad, 70m, 1–19–II–1994, G. Gallardo, L S 385500_578000 #2687 (Costa Rica, INBIO CRI001 708474 708472; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♂, Est. Cuatro Esquinas, 0M, XI–1990, R. Delgado, L–N–280000 590500 (Costa Rica, INBIO CRI000 298689; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, Sardinas, Barra del Colorado, 15m, 27–III–3–IV–1995, F. Araya, L N 291900 565900 #4414 (Costa Rica, INBIO CRI002 192017; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, Sector Cerro Cocor., Fca de E. Rojas, 150m, 26–III–24–IV–1992, L–N 286000 567500 (Costa Rica, INBIO CRI000 794775; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); **Puntarenas:** 1♂ 1♀, Golfito Camino a las Torres, 400–500m, 23–IV–2004, W. Porras, B. Gamboa, D. Briceno, M. Morangas, Tp. Luz L_S 289300 555700 #76838 (IN0003837243 IN0003837242, INBIOCRI COSTA RICA; *Edessa* sp 7; sp 241, Fernandes JAM) (INBio); 1♂, P. N. Manuel Antonio, 80 m, Quepos, VI–1991, G. Varela, L–S–370900, 448800 (Costa Rica, INBIO CRI001 387732; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, P. N. Manuel Antonio, XI–1990, G. Varela & R. Zuniga, L–S–370900, 448800 (Costa Rica, INBIO CRI000 219009; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♂, Est. Quebrada Bonita, R. B. Carara, 80m, XI–1994, J. C. Saborio, L N 194500_469850 #3290 (Costa Rica, INBIO CRI002 054395; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, Est. Quebrada Bonita, Res. Biol. Carara, 50m, VI–1993, J. C. Saborio, L N 194500_469850 #3290 (Costa Rica, INBIO CRI001 185158; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♂, Est. Sirena, Corcovado, 0–100m, I–1990, G. Fonseca, 270500 508300 (Costa Rica, INBIO CRI000 185912; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, Rancho Quemado, 200m, Peninsula de Osa, IV–1992, D. Brenes, L–S 292500 511000 (Costa Rica, INBIO CRI000 494421; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♂, R. N. Cabo Blanco, Est. San Miguel, IX–1993, M. Ramírez, L S 173174_411412 #2343 (Costa Rica, INBIO CRI001 652073; *Edessa* sp 7*;* sp 241 Fernandes JAM) (INBio); 1♀, P. N. Corcovado, Sector La Leona, Cerro Puma, 100–300m, 27–VI–1–VII–2003, M. Morangas, Tp. Luz, L_S_267700_518900 #74481 (IN0003746819, INBIOCRI COSTA RICA; *Edessa* sp 32; sp 241, Fernandes JAM) (INBio); **Cartago:** 1♂, Turrialba, 13–17/III/65, S. S. & W. D. Duckworth, Washington 08/2014 (USNM); 1♀, Turrialba, 13–VII–1965, G. W. Frankie collector (*Edessa* no. 241, det. J. Fernandes; TAMU ENTO X0404606; TAMU OUT 2011) (TAMU);

PANAMA, Colón: 1♀, Canal Zone Base of Cerro Galera, 19/VI/1985, E. Riley & D. Rider, D. A. Rider collection (DAR); 1♀, Barro Colorado I., Canal Zone, Panama, 12/I/1959, H. S. Dybas leg., CNHM Zoo. Exped. (FMNH*)*; 2 ♀, Barro Colorado I., Canal Zone, Panama, 30/I/1959, H. S. Dybas leg., at lights, CNHM Zoo. Exped. (FMNH*)*; 1♀, Barro Colorado I., Canal Zone, Panama, 28/I/1959, H. S. Dybas leg., at lights, CNHM Zoo. Exped. (FMNH*)*; 1♀, Barro Colorado I., Canal Zone, Panama, 29/I/1959, H. S. Dybas leg., at lights, CNHM Zoo. Exped. (FMNH*)*; 1♀, Barro Colorado I., Canal Zone, Panama, 13/I/1959, H. S. Dybas leg., at lights, CNHM Zoo. Exped. (FMNH*)*; 1♀, Barro Colorado I., Canal Zone, Panama, 22/I/1959, H. S. Dybas leg., at lights, CNHM Zoo. Exped (FMNH*)*; 1♀, Ft. Sherman área, 8–V–1999, Morris & Wappes (sp 241, Fernandes, JAM) (JEE); **Panamá:** 1♂, B.C.I. (Barro Colorado Island), 10/I/1953, Ansley, #P13, Washington 08/2014 (USNM); 1♂, B.C.I. (Barro Colorado Island), HRA, 06/I/1953, sf nl., P2, Washington 08/2014 (USNM); 1♂, Barro Colorado Isl. Canal Zone, 14/III/1972, Col: D. Engleman, light trap (DOE); 1♂, Barro Colorado C. Z., 3/XII/ 1948, F. Schrader, 636 (USNM); 1♂, Barro Colorado, Panama Canal Zone, K. W. Cooper, Washington 08/2014 (USNM); 1♂ 1♀, Barro Colorado, Panama Canal Zone, K. W. Cooper, Washington 08/2014 (USNM); 1 ♀, C. Z. Cardenas Village, 22/V/1980, E. Riley & D. LeDoux (TH).

Measurements (n= 42)**:** antennomeres length: 1st: 0.50–0.55mm; 2nd: 1.07–1.20mm; 3rd: 1.61–2.12mm; 4th: 2.61–2.98mm; 5th: 3.61–3.70mm; head length: 1.49–1.54mm; head width: 2.60–2.70mm; pronotal length: 2.77–2.86mm; pronotal width: 7.22–7.91mm; scutellum length: 5.62–6.44mm; scutellum width: 4.47–4.83mm; abdominal width: 7.10–7.93mm; total length: 12.25–13.95mm.

Diagnosis: body dorsally green except brown corium (Fig. 9 B). Antennae uniformly brown (Fig. 9 B). Anterolateral margin of pronotum with narrow yellowish stripe (Fig. 9 B). Minute longitudinal callosity adjacent to humeral angles (Fig. 9 B). Humeral angles concolorous with dorsum, straight, short, about as long as the width of an eye (Fig. 9 B). Corium mostly brown with diffuse yellowish to greenish color especially on basal third (Fig. 9 B); veins yellowish, costal margin mostly green (Fig. 9 B). Last connexival segment with dark narrow stripe on posterior margin (Fig. 9 B). Ventral surface: green with median area yellow, without dark stripes, sometimes intersegmental areas of abdomen slightly darker (Fig. 9 E). Anterior bifurcation of the metasternal process with arms short, wide, apices acuminated (Fig. 6 F). Male genitalia: pygophore trapezoidal (Fig. 6 A, B). Superior process of the genital composed by two parts: dorsal part triangular, concave and fused with dorsal rim (Fig. 6 C, D), ventral part plain, rectangular and narrow placed ventrally to the dorsal part (barely visible on Fig. 6 D). Parameres very swollen, anterior lobe triangular and short (Fig. 6 C, D); posterior lobe small, narrow and rounded (Fig. 6 C, D); both lobes compressed and sulcate (Fig. 6 C, D). Proctiger laterally excavated (Fig. 6 C, D); posterior face rounded to subtriangular with median brown carina (Fig. 6 C). Ventral rim with median notch shallow and wide (Fig. 6 B). Female genitalia (Fig. 6 E): valvifers VIII punctured, broadly and shallowly excavated distally, margin of the excavation brown.

Description: head: clypeus and jugae slightly transversely ridged. Bucculae subtriangular, neighboring first labial segment. **Thorax:** dorsal surface: pronotum with punctures very sparse and light-brown (Fig. 9 B); anterior part of pronotum unpunctured, punctures disposed on posterior 3/4, mostly on medial region (Fig. 9 B). Scutellum with punctures light-brown, very sparse on anterior half, grouped much tighter on posterior 2/3, faded on posterior ¼ (Fig. 9 B). Corium with punctures brown (Fig. 9 B). Membrane translucent, slightly dark (Fig. 9 B). Ventral surface: prothorax–mesothorax irregularly punctured, punctures concolorous or light-brown, minute, sparse (Fig. 9 E). Peritreme ruga-like, reaching 3/4 of the distance between ostiole of the scent gland and lateral margin of metapleuron (Fig. 9 E). Metasternal process delicate, medially narrower; anterior arms slightly divergent, anterior bifurcation receiving only fourth rostral segment and a small portion of third (Fig. 6 F). **Abdomen:** dorsal surface: connexival segments with posterolateral angles concolorous (Fig. 9 B). **Male genitalia:** dorsal rim brown medially, setose (Fig. 6 A). Posterolateral angles small, truncated, inner face excavated (Fig. 6 A). Ventral rim with expansions inconspicuous (Fig. 6 B). **Female genitalia** (Fig. 6 C)**:** valvifers VIII convex reaching base of valvifers IX, excavation exposing part of valvulae IX. Laterotergites VIII outer lateral margin strongly arched, sinuous; free distal spinose part about 1/5 of its length. Valvifers IX smooth, trapezoidal, widely exposed. Laterotergites IX barely projected distally, reaching or slightly surpassing sclerite uniting laterotergites VIII.

Differential diagnosis: the facies of *E. helvoalata* **sp. n.** is similar to *E. bituberculata* **sp. n.**, *E. bivenulata* **sp. n.** and *E. enargocelida* **sp. n.**, but the green costal margin of *E. helvoalata* clearly separates them (Fig. 9 B) (brown margin in the other species—Fig.8 A, B, C). Furthermore, the ventral surface of *E. helvoalata* **sp. n.** does not present dark stripes (Fig. 9 E) (present in the other species—Fig. 8 D, E, F).

Distribution (Fig. 10 C)**:** COSTA RICA: Guanacaste, Alajuela, Puntarenas, Cartago; PANAMA: Colón, Panamá.

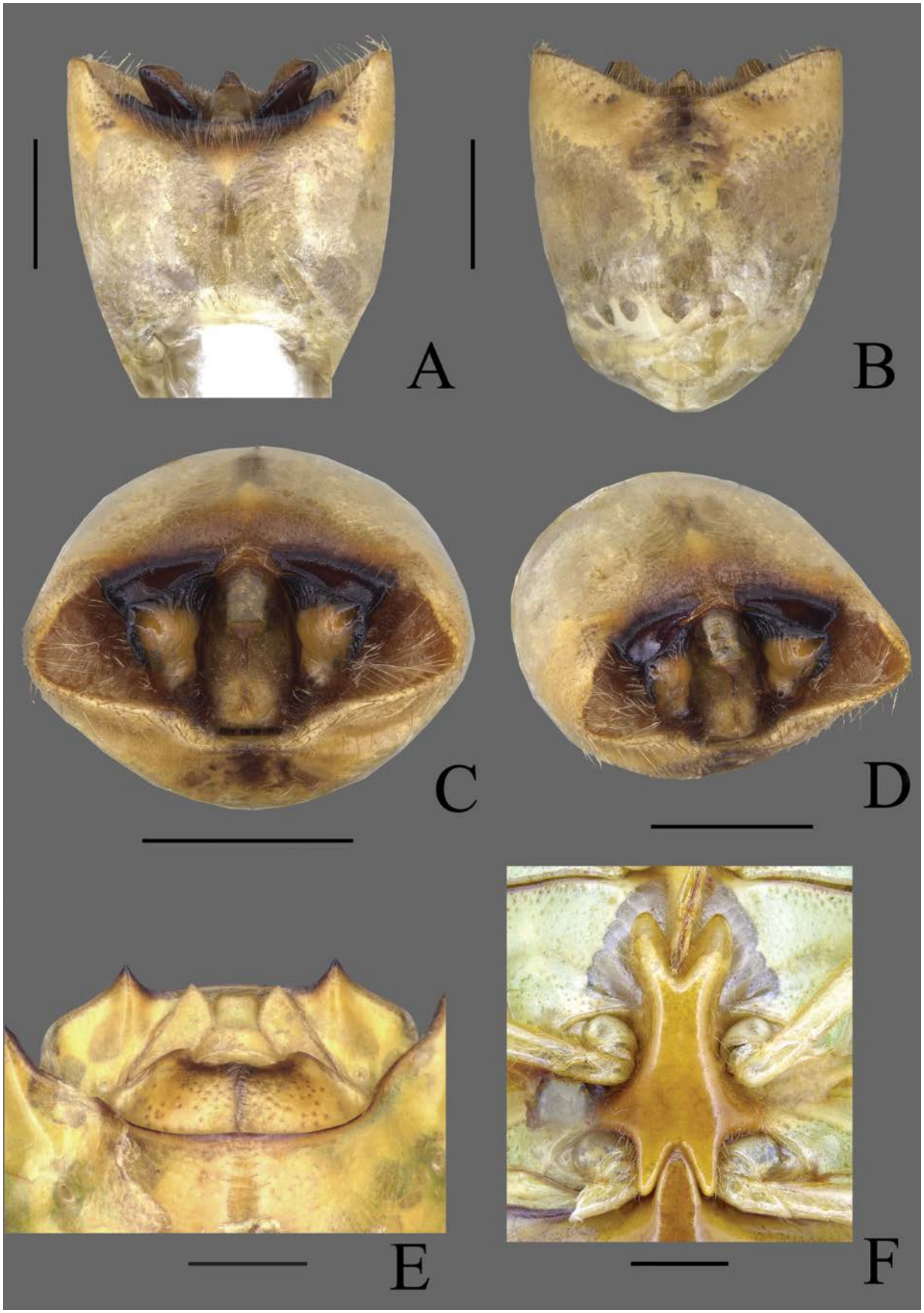

FIGURE 6. A–F. *Edessa helvoalata* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively; E, genital plates; F, metasternal process. Scale 1 mm.

***Edessa holochlorata* sp. n.**
(Figs. 7; 9 C, F; 10 B)

Etymology. The name refers to the uniform dorsal color of the body (Gr. *Holus*- whole; Gr. *Chlorus*- green).

Material examined. Holotype male. **COSTA RICA, Limón:** 1♂, Est. Hitoy-Cerere, 100m, Res. Biol. Hitoy-Cerere, XI/1992, G. Carballo, L-N 184200, 643300, CRI000 926730 (INBio).

Paratypes. **COSTA RICA, Limón:** 1♂, Amburi, 70m, XI/1995, G. Gallardo, L_S_385000_578100 #6826. CRI002 429864 (INBio); 1♀, Valle La Estrella, Banano Lodge, 80m, 19–20/V/2007, J. A. Azofeifa & J. Moutero, T. P., at lights, L N 200889 639300 #91343, INB0004080803 (INBio); **Puntarenas:** 1♀, R.V.S. Rio Piro, Golfito, Finca Catalino, 200m, 16/IX/2004, Y. Cardenas, M. Moraga, D. Briceño & B. Gamboa, at lights, L_S_264550_535590 #78215, INB0003880887 (INBio); 1♀, Sirena, Corcovado Nat. Pk., Osa Penin., 5–11/I/1981, D. H. Janzen & W. Hallwachs, CRI001 714731 (INBio); 1♀, Est. Sirena, 0–100m, P. N. Corcovado, IV–1992, G. Rodriguez (Costa Rica, INBIO CRI000, 545535; sp 195, Fernandes JAM) (JEE); **PANAMA, Bocas del Toro:** 1♀, Miramar, 9ºN;82º15'W, 2/I/1979, Henk Wolda (DOE); 1♂, Miramar, 9°N 82°15'W, 28–I–1979, Henk Wolda (DOE).

Measurements (n= 8)**:** antennomeres length: 1st: 0.82–0.88mm; 2nd: 1.47–1.57mm; 3rd: 1.52–2.02mm; 4th: 3.73–4.26mm; 5th: 3.84–4.35mm; head length: 1.40–1.79mm; head width: 2.27–3.10mm; pronotal length: 3.12–3.36mm; pronotal width: 7.20–10.16mm; scutellum length: 5.54–6.22mm; scutellum width: 4.23–4.69mm; abdominal width: 7.02–10.08mm; total length: 12.22–17.38mm.

Diagnosis: body dorsally green (Fig. 9 C). Antennae light-brown (Fig. 9 C). Anterolateral margin of pronotum yellow (Fig. 9 C). Black minute longitudinal callosity adjacent to humeral angles (Fig. 9 C). Humeral angles concolorous with dorsum, straight, short, less than the width of an eye (Fig. 9 C). Last connexival segment with only posterior margin black (Fig. 9 C). Ventral surface: green with median area yellow, without dark stripes, intersegmental areas of the abdomen slightly darker than the rest (Fig. 9 F). Anterior bifurcation of the metasternal process with arms very short, wide, swollen, apices rounded (Fig. 9 F). Male genitalia: pygophore trapezoidal (Fig. 7 A, B). Superior process of the genital cup subtriangular, surface rugose, slightly concave (Fig. 7 C, D). Parameres with anterior lobe long and subtriangular (Fig. 7 C, D); dorsal margin shallowly excavated (Fig. 7 C, D); posterior lobe short and triangular (Fig. 7 C, D). Proctiger laterally strongly excavated, separated by feeble low carina (Fig. 7 C); posterior face rounded to slightly elliptic (Fig. 7 C). Ventral rim with median notch shallow and wide (Fig. 7 B); expansions slightly developed (Fig. 7 B). Female genitalia (Fig. 7 E): valvifers VIII punctured with wide and deep V-shaped excavation; inner margin overlapping each other.

Description: head: clypeus and jugae, slightly ridged. Bucculae subtriangular, completely harboring first labial segment. **Thorax:** dorsal surface: pronotum with punctures concolorous, sparse, mostly present on posterior ¾ (Fig. 9 C). Anterior margin of pronotum with row of sparse punctures (Fig. 9 C). Scutellum with punctures concolorous, sparse on anterior half, grouped much tighter on posterior half (Fig. 9 C). Corium with concolorous punctures (Fig. 9 C); membrane transparent, unpigmented (Fig. 9 C). Ventral surface: prothorax–mesothorax irregularly punctured, punctures concolorous or dark (Fig. 9 F). Peritreme ruga-like, reaching 4/5 of the distance between ostiole of the scent gland and lateral margin of metapleuron (Fig. 9 F). Metasternal process with anterior arms slightly divergent, anterior bifurcation receiving only part of fourth rostral segment (Fig. 9 F). **Abdomen:** dorsal surface: posterolateral angles of connexival segments with apices black (Fig. 9 C). **Male genitalia:** dorsal rim with brown large spot that extends to dorsal surface (Fig. 7 A); shallowly concave (Fig. 7 A). Posterolateral angles well developed (Fig. 7 A); rounded, slightly swollen (Fig. 7 A). Ventral rim with expansions short, rounded, slightly swollen (Fig. 7 B). **Female genitalia** (Fig. 7 E)**:** valvifers VIII convex reaching base of valvifers IX, excavation exposing part of valvulae IX. Laterotergites VIII acute, outer lateral margin arched, sinuous, free distal spinose part about 1/4 of its length. Valvifers IX gently punctured, trapezoidal. Laterotergites IX acute clearly surpassing sclerite uniting laterotergites VIII.

Differential diagnosis: among the species in this article, *Edessa holochlorata* **sp. n.** stands out for having a completely green corium (Fig. 9 C), unlike the brown corium of all others (Figs. 8 A, B, C; 9 A, B). Furthermore, male and female genitalia also present distinctive characteristics like the shape of the parameres and overlapping valvifers VIII (Fig. 7 C, E).

Distribution (Fig. 10 B)**:** COSTA RICA: Limón, Puntarenas; PANAMA: Bocas del Toro.

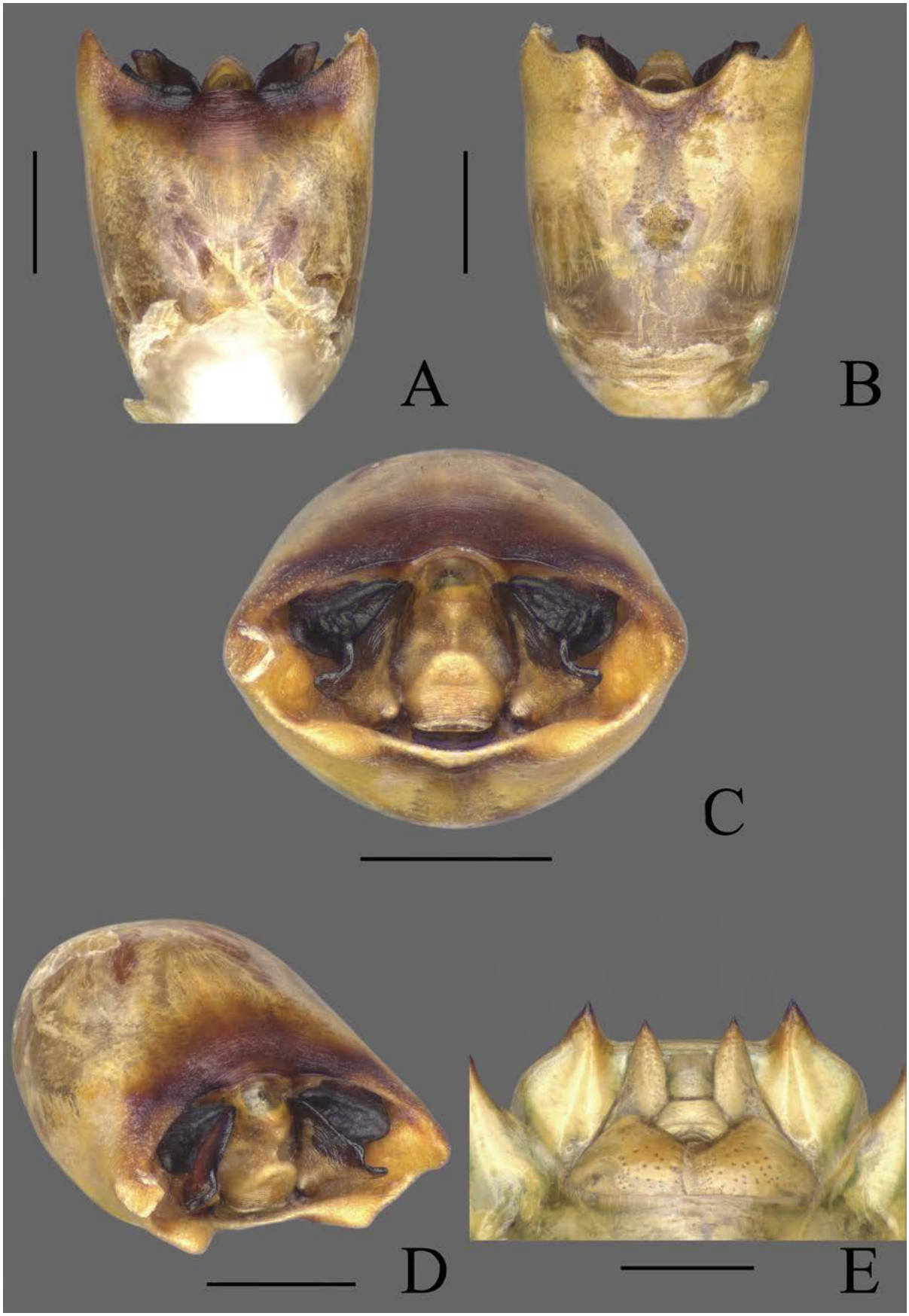

FIGURE 7. A–E. *Edessa holochlorata* **sp. n.**: A–D, pygophore in dorsal, ventral, posterior and posterolateral views, respectively; E, genital plates. Scale 1 mm.

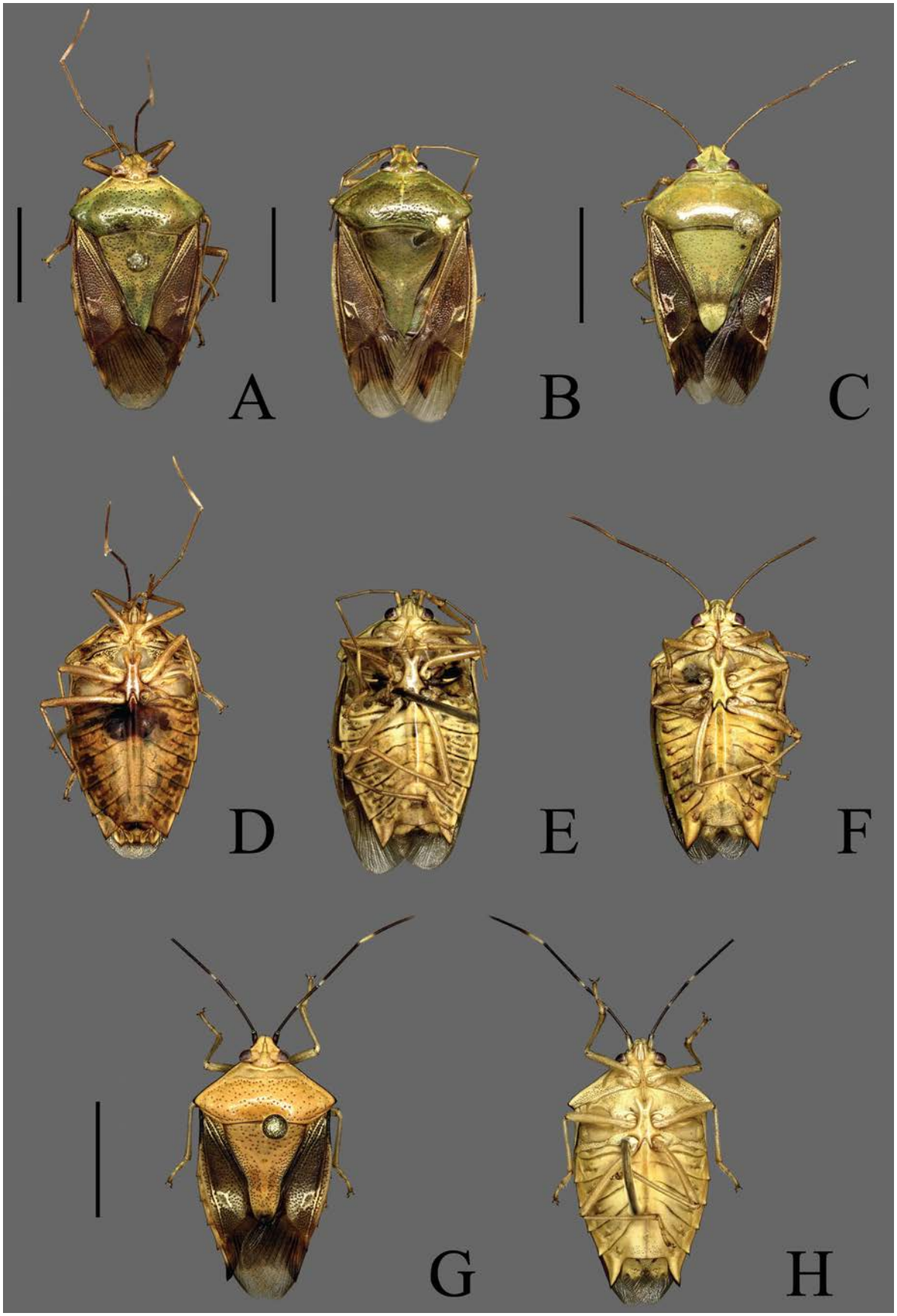

FIGURE 8. A–H. Dorsal and ventral surface: A–D, *Edessa bituberculata* **sp. n.**; B–E, *Edessa bivenulata* **sp. n.**; C–F, *Edessa enargocelida* **sp. n.**; G–H, *Edessa fuscolimbata* **sp. n.** Scale 5 mm.

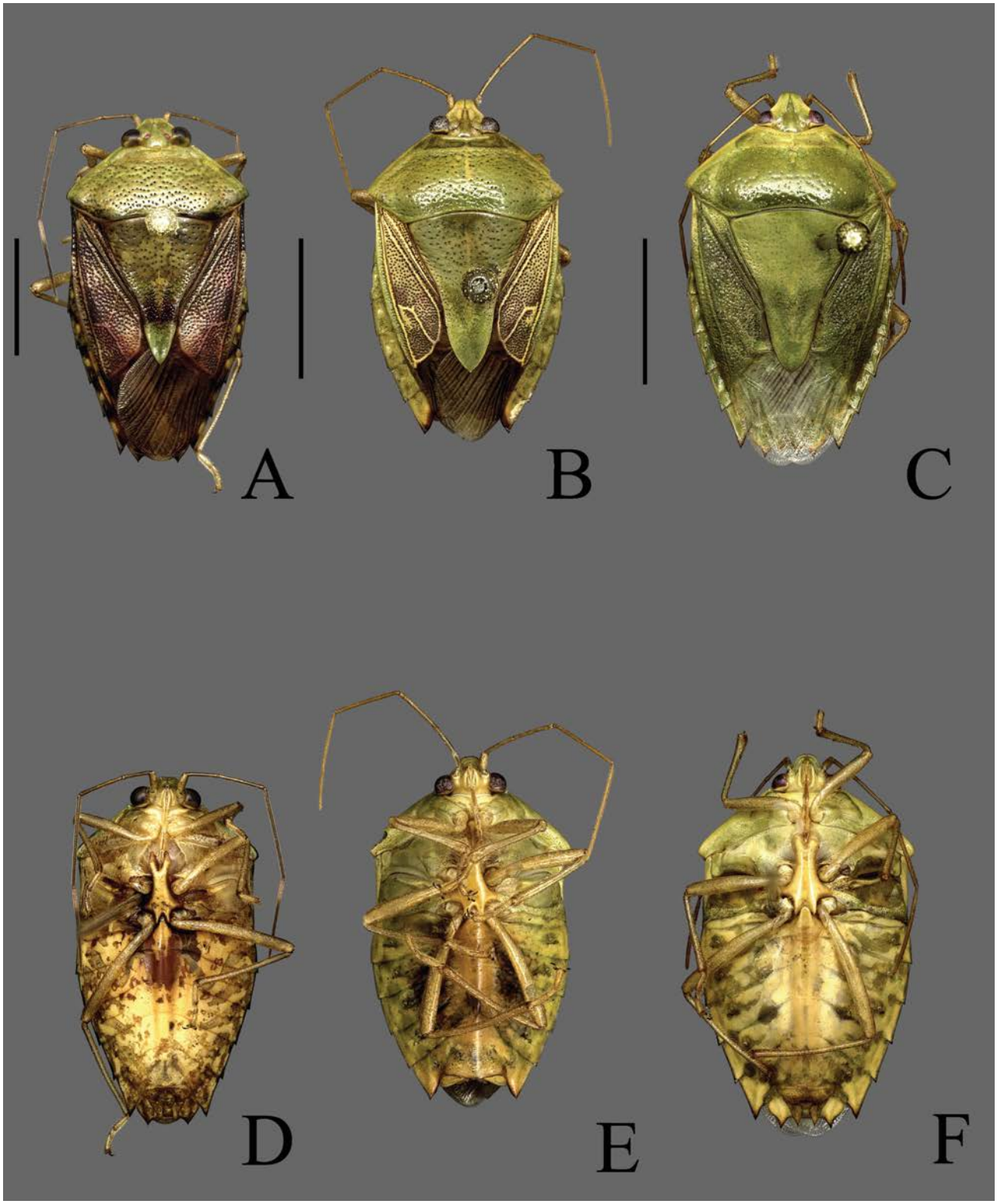

FIGURE 9. A–F. Dorsal and ventral surface: A–D, *Edessa fuscopunctata* **sp. n.**; B–E, *Edessa helvoalata* **sp. n.**; C–F, *Edessa holochlorata* **sp. n.** Scale 5 mm.

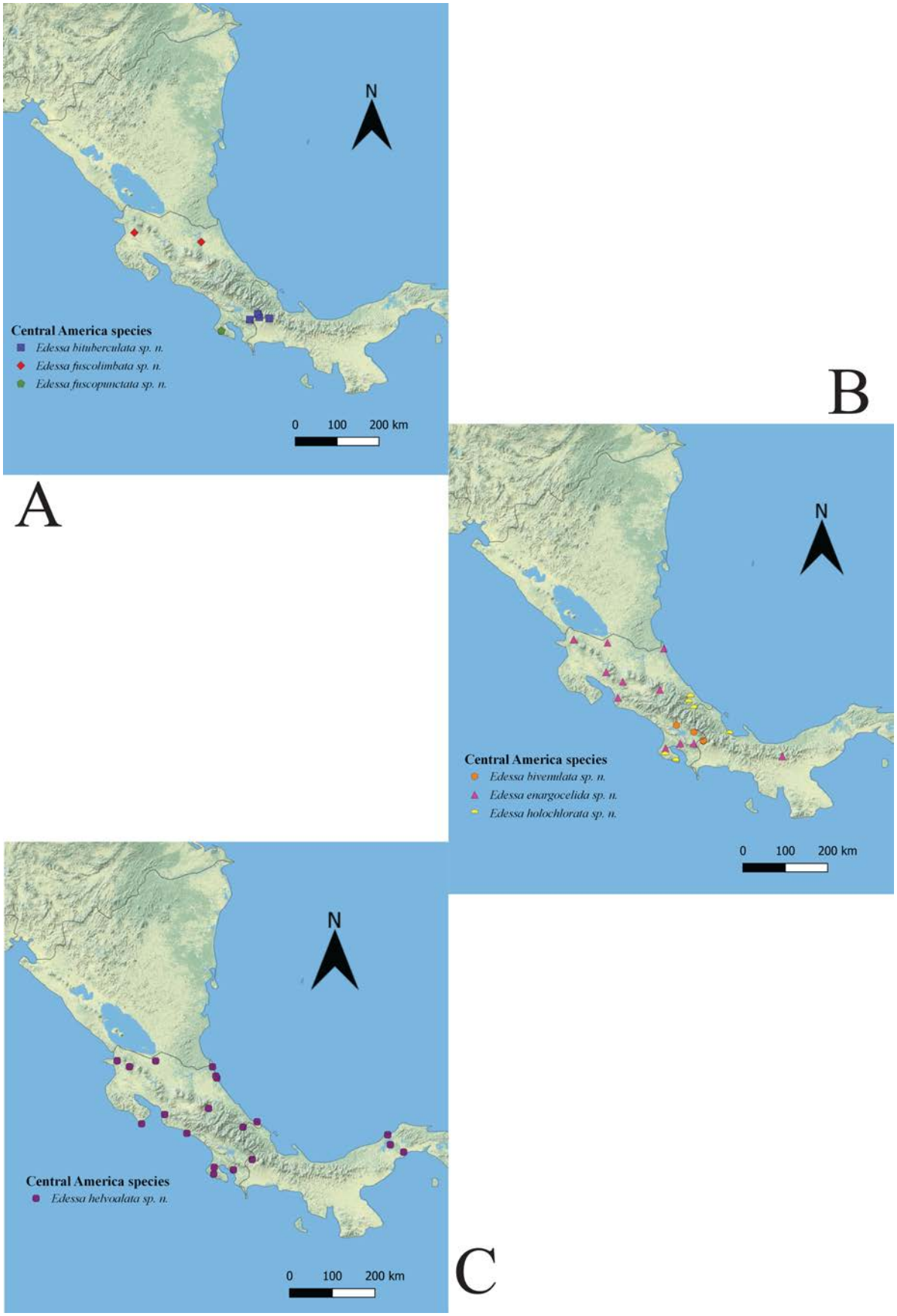

FIGURE 10. A–C. Distribution map of the species: A, *Edessa bituberculata* **sp. n.**, *Edessa fuscolimbata* **sp. n.**, *Edessa fuscopunctata* **sp. n.**; B, *Edessa bivenulata* **sp. n.**, *Edessa enargocelida* **sp. n.**, *Edessa holochlorata* **sp. n.**; C, *Edessa helvoalata* **sp. n.**

Conclusions

Based on the analysis of Panamanian and Costa Rican edessines made in the present work and over the last few years (Fernandes 2015; Campos 2020) we verify that both Panama and Costa Rica have a much more abundant *Edessa* fauna than previously thought. A period of 134 years separates the classic Biologia Centrali-Americana vol. 46 (Distant 1881) from the current series of articles (Fernandes *et al.* 2015), indicating that the attention given to edessines from this region is still incipient and many knowledge gaps await to be filled. Therefore, we strongly encourage further studies in this direction and suggest that other Central American countries may have an equally remarkable fauna of yet undescribed *Edessa* stinkbugs.

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