

Amiseginae and Cleptinae from northeastern Brazil, with the description of four new species (Hymenoptera, Chrysididae)

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Abstract

The diversity of two subfamilies of cuckoo wasps in northeastern Brazil is reviewed. Four new species are described and illustrated: *Amisega boyi* Lucena, **sp. nov.**, *A. sertaneja* Lucena, **sp. nov.**, and *Duckeia dudui* Lucena, **sp. nov.** (Amiseginae), and *Cleptidea nordestina* Lucena, **sp. nov.** (Cleptinae). These new species of *Amisega* and *Duckeia* represent the first records of both genera in the core zone of the Caatinga dry region, and they seem to be endemic to this portion of the region. The other two *Amisega* species previously recorded in northeastern Brazil are restricted to ecotone habitats between Caatinga and Atlantic forest. *Cleptidea nordestina* Lucena, **sp. nov.** (Cleptinae) is the most septentrional record for the *fasciata* species group in South America. With the present contribution, the total recorded diversity of Amiseginae and Cleptinae in northeastern Brazil is represented by the following species: *A. boyi* Lucena, **sp. nov.**, *A. flavipes* Kimsey, 1987, *A. sertaneja* Lucena, **sp. nov.**, *A. similis* Kimsey, 1987, and *D. dudui* Lucena, **sp. nov.** (Amiseginae), and *C. nordestina* Lucena, **sp. nov.** (Cleptinae).

Keywords

Chrysidoida, deciduous forest, diversity, rain forest, semiarid, taxonomy

Introduction

Cuckoo wasps are a species-rich cosmopolitan group of aculeate hymenopterans, currently with more than 2,500 valid species distributed into 94 extant genera and four subfamilies (e.g., taxonomic data modified from Kimsey and Bohart 1991; Aguiar et al. 2013). The great morphological disparity and highly specialized biology exhibited by its representatives are the outcomes of more than 130 Mya of evolution (Lucena and Almeida *in press*). While the Chrysidinae are widespread, being relatively common in almost all kinds of habitats, the other three subfamilies are less frequently collected and seem to have had a diversification-history largely associated with tropical savannah and humid forested environments (Krombein 1983, 1986; Lucena and Almeida *in press*). In Brazil, the pioneering investigation of Adolf Ducke provided a preliminary account of the chrysidid fauna in the country, which was particularly important for the northern (Pará state) (e.g., Ducke 1904, 1907a, 1911a) and northeastern regions of Brazil. Ducke's contributions to the description of the chrysidid fauna in the northeast largely resulted from his expeditions to Ceará state in the early 1900s (e.g., Ducke 1907b, 1908, 1910, 1911b).

Northeastern Brazil corresponds to an area roughly equivalent to Colombia and Ecuador together, totaling 1,552,157 Km² and extending from 07°12' to 48°20'S, and the easternmost point in South America, nearly 34°47' to 48°45'W (IBGE 2019). The largest Brazilian biomes are represented in this region (Fig. 1): Amazon and Atlantic rain forests, Caatinga, and Cerrado. The majority of northeastern Brazil, over 50% of its area, is occupied by a large central longitudinal strip characterized by a tropical semiarid climate: the semiarid region (Pereira-Júnior 2007). The xerophytic deciduous Caatinga vegetation is the predominant phytophysiognomy, and it occupies much of its dry core zone, which is also considered as part of the neotropical seasonally dry forests (Fig. 1A–D) (Pennington et al. 2000; Cardoso da Silva et al. 2017). The Atlantic rainforest covers a narrow eastern stripe near the coast. In the western border, there are transition zones with areas of the Amazon rainforest and Cerrado, the Brazilian savannah. In the highlands of southern Bahia state, there is also a quite distinct highland rupestrian grassland vegetation, the “campos rupestres”, probably older in origin, which was recently recognized as a distinct biogeographical province, namely “Chapada Diamantina” (Colli-Silva et al. 2019). Within the dry Caatinga core region, the hilltop, plateaus and hillside forests (e.g., Serra do Ibiapaba and Chapada do Araripe) harbor distinct biota which contrast with that typically found in the xerophilous caatinga. There are substantial evidences showing that these more humid enclaves (Fig. 1E–H) share elements of biota with the Amazon and Atlantic rainforests, and Cerrado, as exemplified by some taxa of bees (Camargo and Moure 1991), scorpions (Lourenço 2010), lizards (Rodrigues et al. 2002, 2013), and plants (Ribeiro-Silva et al. 2012).

The driest biome, Caatinga, has traditionally been considered to harbor the poorest biodiversity in comparison with more humid neighboring biomes, which also reflected in a relative overlook of its biology. Despite that, this biome has received growing attention from researchers (e.g., Bravo and Calor 2014). Caatinga is now characterized

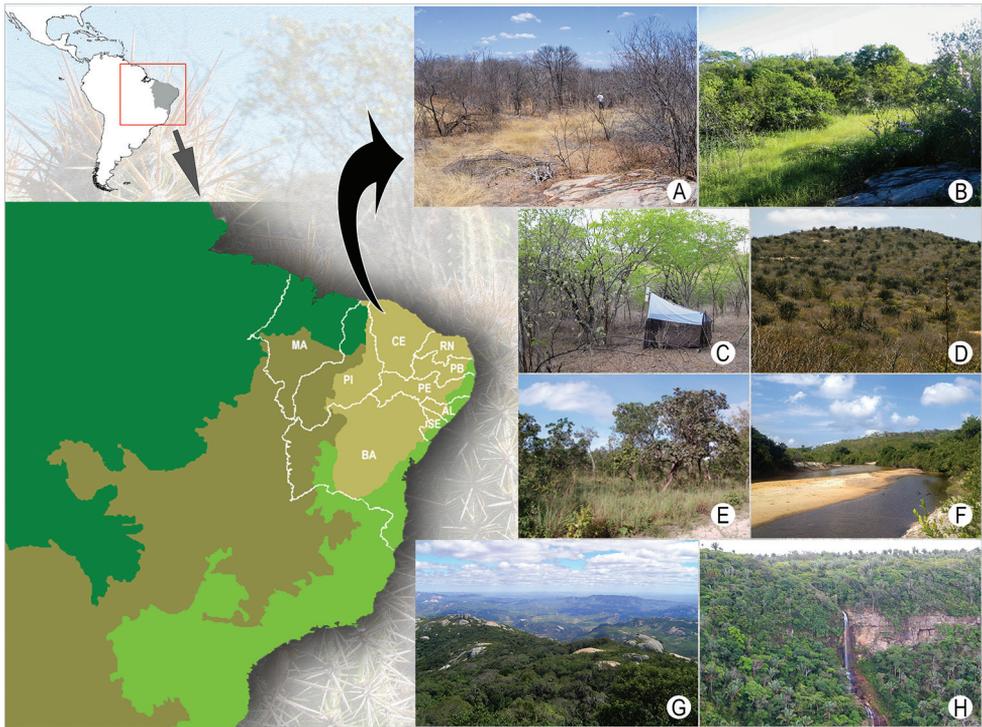


Figure 1. Easternmost biogeographic regions of South America (modified from Morrone 2014)—brown: Chacoan domain (light brown: Caatinga province); light green: Parana/Atlantic forest; dark green: northern Amazonia. Abbreviations for the northeastern Brazilian states are as the follow: Bahia (BA), Sergipe (SE), Alagoas (AL), Pernambuco (PE), Paraíba (PB), Rio Grande do Norte (RN), Ceará (CE), Piauí (PI), and Maranhão (MA). Limits of the Caatinga province in the Chacoan Dominion (dark brown band) indicated by the longitudinal light brown strip. The photographs (right) depict the diversity of habitats in northeastern and Caatinga **A, B** xerophilous deciduous caatinga vegetation during dry (**A**) and rainy (**B**) seasons, ESEC-Seridó, Serra Negra do Norte-RN **C** malaise trap set in a caatinga fragment in Santa Teresinha-PB **D** caatinga vegetation with abundant arboreal cacti, Picuí-PB **E** cerrado vegetation enclave in Caatinga region, Chapada do Araripe, CE **F** amazon rainforest near northwest border of the semiarid region, São Benedito do Rio Preto, MA **G, H** evergreen humid montane enclaves in Caatinga region, Parque Estadual Pico do Jabre, Maturéia, PB (1,197 m), and Parque Nacional de Ubajara, Ubajara, CE (847 m) (**H**).

as quite heterogeneous region, resulting from the interplay between presenting high spatial and historical complexity (Fig. 1A–H) (Cardoso da Silva et al. 2017; Queiroz et al. 2017). It has been suggested that its flora displays higher diversity per area than the Amazon rainforest (Fernandes et al. 2020).

Caatinga is mostly characterized by high temperatures throughout the year, with a marked seasonal climate marked by a strong hydric deficit (Fig. 1A, B). The amount of rainfall varies between 240–1500 mm per year (generally below 800 mm per year in the semiarid region), and it is irregularly distributed, usually concentrated in three consecutive months during austral summer (Prado 2003). The adverse weather conditions imposed by the hydric deficit imply that biota in the Caatinga has significant

tolerance to dehydration. At least part of the fauna may be unique, potentially with a high number of undiscovered endemic taxa remaining to be found.

Herein, we expand the knowledge of Chrysididae fauna in northeastern Brazil by describing and illustrating four new species in the Amiseginae and Cleptinae. We comment on the new species' habitats and discuss some geographic records of previously known taxa from the northeastern region. Additionally, we discuss and update the list of taxa with occurrence in the core region of Caatinga.

Material and methods

Geographic delimitation

For the analyses of geographic occurrence of species into the semiarid limits, we used delimitation presented by Pereira-Júnior (2007), established considering the isohyet of 800 mm or lower per year, the Thornwaite aridity index equal to 0.50, and hydric deficit with drought risk of 60%. The shapefiles of Morrone's (2014) biogeographic dominions (Löwenberg-Neto 2014) were used as reference for the limits of other major natural areas in South America. The main biogeographic areas shown in the Figure 1 correspond to combinations of units of the complex biogeographical regionalization proposed for the Neotropical region by Morrone (2014): the **Amazon rainforest** herein corresponds to Boreal Brazilian Dominion + South Brazilian Dominion + South-eastern Amazonian subregion; the **Atlantic rainforest** corresponds to Parana Dominion; the **Cerrado** and **Caatinga** correspond to provinces in the Chacoan Dominion. We used QGIS Development Team (2020) for combining shapefiles and generating new maps for species distribution. Distribution maps were based on locality records taken from specimen labels and complemented by information in the literature.

Material studied

Most specimens were collected using malaise traps standing in the field for at least two consecutive months (Patu and Mossoró-RN), a whole year (Jequié-BA), and four consecutive years (Santa Teresinha-PB) (detailed descriptions of localities and sampling methods were provided in Lucena et al. 2012; Zanella and Lucena 2014; Fernandes et al. 2014, 2019, 2020; Guedes et al. 2019). We also examined specimens housed in the following institutions: **BME**: Bohart Museum of Entomology, University of California, Davis, California, USA (Lynn S. Kimsey; Steven Heydon); **DZUP**: Coleção Entomológica "Pe. Jesus Santiago Moure", Universidade Federal do Paraná, Curitiba, Brazil (Gabriel A. R. Melo); **INPA**: Coleção Entomológica do Instituto Nacional de Pesquisa da Amazônia, Manaus, Brazil (Márcio L. Oliveira; Thiago Muniz); **MPEG**: Museu Paraense Emílio Goeldi, Universidade Federal do Pará, Belém, Brazil (Orlando Silveira); **MZSP**: Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (Carlos R. F. Brandão; Kelli S. Ramos); **RPSF**: Coleção Entomológica "Prof. J.M.F. Camargo", FFCLRP, Universidade de São Paulo, Ribeirão Preto, Brazil (Eduardo A. B. Almeida);

UFPB: Universidade Federal da Paraíba, João Pessoa, Brazil (Celso F. Martins); **UNI-LA:** Universidade Federal da Integração Latino-Americana, Foz do Iguaçu, Brazil (Fernando C. V. Zanella); **UFES:** Coleção Entomológica da Universidade Federal do Espírito Santo, Vitória, Brazil (Marcelo T. Tavares; Ricieri C. Dall'Orto); **UFMG:** Centro de Coleções Taxonômicas da Universidade Federal de Minas Gerais, Belo Horizonte, Brazil (Fernando A. Silveira; Alessandro Lima); and **USNM:** The National Museum of Natural History, Smithsonian Institution, Washington, USA (Seán G. Brady). Part of the type specimens of taxa described by Kimsey (1987) were originally housed at The American Entomological Institute (**AEI**), Gainesville, Florida, but the AEI collection was recently relocated to Logan, Utah, and became part of the Utah State University, Logan, USA (**USU**) (James Pitts). Finally, some taxonomic decisions were possible by comparisons of specimens with high-resolution images of the holotypes housed in the Canadian National Collection, Ottawa, Canada (**CNC**) (Sophie Cardinal).

Photographs

Specimens were photographed at Laboratório de Biologia Comparada e Abelhas, Departamento de Biologia, FFCLRP/USP, using a Leica DFC425 camera attached to a Leica M205C stereomicroscope, equipped with a Leica FlexiDome lighting diffuser, and light system model Leica LED5000 HDI. Images were improved using Leica application suite software-LAS to combine multiple photos, then enhanced with Adobe Photoshop.

Terminology

The general morphological terminology follows primarily Huber and Sharkey (1993), with few modifications intended to incorporate the terms specifically used for Chrysididae, such as: malar space, malar sulcus, propodeal angle, and scapal basin (Kimsey and Bohart 1991: 41–42). The abbreviations **F**, **S**, and **T** are employed for **flagellomere**, **metasomal sternum**, and **metasomal tergum**, respectively. **MOD** refers to the **median ocellus diameter**. **LID** refers to the **least interocular distance**. **PD** refers to **puncture diameter**. **OL** refers to the minimum distance between the inner margin of the **lateral ocellus** and median ocellus. **OOL** refers to the **minimum distance from the outer margin of lateral ocellus to compound eye**. **POL** refers to the minimum distance between inner margins of **lateral ocelli**. Malar space and subantennal distance refer to the minimum distance between the inferior ocular margin and mandible, and between the inferior margin of torulus and dorsal margin of clypeus. Sculpturing terminology follows Harris (1979).

Taxonomy

Subfamily Amiseginae

The Amiseginae are specialized parasitoids of walking stick eggs (e.g., Costa Lima 1936; Krombein 1957, 1960, 1983; Kimsey and Bohart 1991; Baker 2016). Due to

their relatively small size and cryptic habits, these wasps are uncommon in collections. They are most frequently collected in forested habitats using Malaise traps and yellow pan-traps. Generic revisions with notes on biology, geographic ranges, list of valid species, and illustrated keys were provided by Krombein (1957, 1960, 1983) and Kimsey and Bohart (1991). There are nineteen species and four genera recorded in Brazil (Lucena and Zanella 2016). Still, we can assume that this number is underestimated for the country, especially considering there are vast geographic areas without any significant sampling. In northeastern Brazil, we found two genera and five species. Three of these species are herein described as new and represent the first records of species of this subfamily for the Caatinga region.

***Amisega* Cameron, 1888**

Amisega Cameron, 1888: 457. Type species: *Amisega cuprifrons* Cameron, 1888: 457 (by monotypy).

This genus is one of the largest in the Amiseginae. Currently, *Amisega* includes 24 valid species (Kimsey 1987, 1990, 1993), ranging from southeast Canada, midwestern and southeastern United States, as far west as Arizona, through Mexico, Central America, Chile, and in most South America (e.g., Kimsey and Bohart 1991). Although *Amisega* is one of the most abundant amisegines in collections, its biology is poorly known. Milliron (1950) reported *Amisega kahlii* (Ashmead, 1902) (= *Mesitiopteros*) in North America rearing from eggs of *Diapheromera femorata* (Say, 1824) (Diapheromeridae), and Kimsey (1990) described the flightless *Amisega chilensis* Kimsey, 1990 reared from eggs of *Heteronemia mexicana* Gray, 1835 (= *Bacunculus phyllopus*) (Heteronemiidae). Kimsey (1987) revised the genus, described twelve new species, and presented the most complete discussion for species distinctions to date, later complemented by Kimsey (1990, 1993), and Kimsey and Bohart (1991). In Brazil, eight valid species were previously known to occur from the Atlantic rainforest along east coast, as far north as Pernambuco state, through the Cerrado in the central-west and Amazon rainforest on north. The genus is represented in northeastern Brazil by two previously known species, and two new ones are herein described.

***Amisega boyi* Lucena, sp. nov.**

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Fig. 2

Diagnosis. Vertex and anterolateral border of pronotum with rugose-striate marks; anterior declivity of pronotum without medial pit; dorsum of propodeum polished; scapal basin punctate-rugulose, vaguely cross-ridged; metasoma with distinct purple highlights; legs brown, lighter on pro- and mesotibiae, and tarsomeres; malar space 1.5× MOD. *Amisega boyi* Lucena, sp. nov. most resembles *A. flavipes* Kimsey, 1987

and *A. similis* Kimsey, 1987. This new species can be distinguished from both species based on the following combination of characters: rugose marks on vertex and pronotum (lacking rugose marks on vertex in *A. similis*, and only striatiform punctures on anterior border of pronotum in *A. flavipes*); scapal basin punctate-rugulose, vaguely cross-ridged medially (entirely cross-ridged in *A. flavipes* and *A. similis*); dorsum of propodeum polished and impunctate (dorsum of propodeum smooth and scarcely punctated in *A. flavipes* and *A. similis*); sparse punctation on disc of T2, with more than 1PD apart and medial impunctate polished strip clearly defined (disc of T2 densely punctated in *A. similis*, and medial impunctate polished strip not defined in *A. flavipes*); and purple highlights on metasoma (blue highlights in *A. similis*). The light brown antenna, mandible, and clypeus, and the anterior declivity of pronotum lacking medial pit also help to distinguish this new species from *A. flavipes* (dark brown antenna, mandible, and clypeus, and with well-marked medial pit on anterior border of pronotum); and the greenish blue body coloration contrasts with the light blue pattern of *A. similis*.

Description. Holotype, male. Body length: 2.8 mm (Fig. 2A).

Head: 0.95× wider than high; toruli barely separated, inner margins slightly produced, forming a short lamellar projection; scape long, cylindrical, slightly wider basally, 3.8× longer than its maximum width; F1 length 2.2× breadth, 1.25× longer than F2, F2 1.15× longer than F3; F4 0.9× F3, F5–F10 slightly shorter than F4, F11 acute; lower margin of clypeus evenly round; subantennal distance 0.2× MOD; malar space 1.5× MOD; POL 1.6× OL, 4.3× OOL; inner ocular margin convergent submedially, LID 0.95× scape length; eye height 1.75× breadth.

Mesosoma: anterior declivity of pronotum lacking medial pit, lobe slightly separated from tegula; scutum notaulus barely distinguishable, impressed only basally (Fig. 2D, E); parapsidal line deeply impressed; M with first abscissa gently curved submedially, diverging before 1cu-a; Rs very short, spectral trace gently curved towards costal wing margin; dorsum of propodeum posteriorly limited by discrete transverse groove.

Metasoma: lateral margins of T1–T3 sharp, but not carinate; first metasomal segment with ventral keel; posterior margin of S1 concave, posterior margins of S2–S4 nearly straight.

Coloration: head greenish blue, with greenish highlights on frons, scapal basin, and gena; bluish purple tint on vertex (Fig. 2B); antenna, clypeus, and mandible brown, labrum and mouthparts light brown; mesosoma mainly greenish blue; lateral pronotum, mesopleuron, and metapleuron-propodeum mostly dark brown, extending from half portion to venter, with greenish blue tints on anterior corners; tegula light brown; wing membrane light fuscous, veins brown; legs dark brown, lighter on pro- and mesotibiae and tarsomeres; metasoma mostly brown, with distinct purple highlights on dorsum (e.g., Fig. 2F), venter entirely brown.

Sculpturing: head regularly punctate, punctures becoming clumped among ocelli and near face; vertex with rugose marks marginally (Fig. 2B); scapal basin somewhat rugulose, vaguely cross-ridged medially, with discrete medial groove extending from dorsal border of torulus to midface (Fig. 2C); gena punctate; malar area and clypeus impunctate; scape punctulate dorsally, with broad basal impunctate area; dorsum of

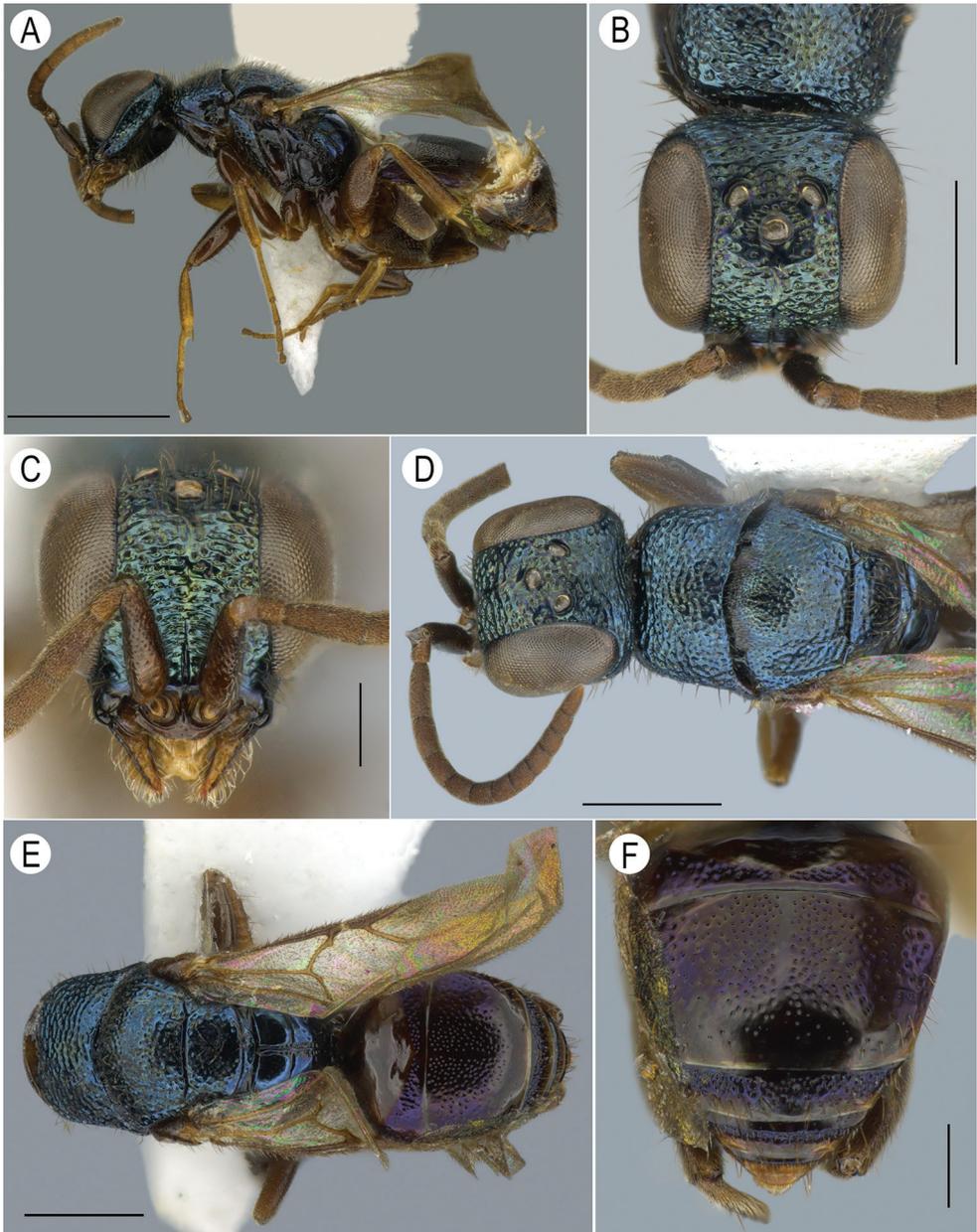


Figure 2. *Amisega boyi* Lucena, sp. nov., holotype, male (A–D) A lateral habitus B head and pronotum, dorsal view C head, frontal view D head and mesosoma, dorsal view. Paratype, male (E, F): E dorsal habitus F metasoma, dorsal view. Scale bars: 1 mm (A), 0.5 mm (B, D, E), 0.2 mm (C, F).

mesosoma without distinct striae, except anterolateral margin of pronotum with rugose-striate marks (Fig. 2B, D); scutum and scutellum punctate, sparser posteriorly on scutellum (e.g., Fig. 2E); mesopleuron contiguously punctate anteriorly, with broad

impunctate stripe along posterior margin; metanotum scarcely punctate; propodeum polished on dorsum (e.g., Fig. 2E), posterior declivity with some sparse punctures; anterior border of T1 and most of laterotergite impunctate, marginal punctate stripe running from dorsum to dorsoposterior corner of laterotergite; punctuation on disc of T2 more than 1PD apart (e.g., Fig. 2F); T2–T4 contiguously punctate, becoming clumped on laterotergites, posterior borders of terga with impunctate stripes, S2–S4 densely punctate.

Vestiture: short erect light brown setation on vertex, gena, and frons, with relatively longer and denser setation on occiput; mandible, clypeus and labrum with distinct long gold setation; antenna with short, decumbent, pale setation; eye with sparse microtrichia; dorsum of mesosoma with dense, relatively long, light brown setation; lateral pronotum, posterior border of mesopleuron, dorsum of propodeum, and metapleuron-propodeum, glabrous; wing membrane entirely setose; outer surface of metatibia, and pro- and metafemora, with long dark setae; venter of tarsomeres with abundant irregularly-sized spines; T1–T2 mostly glabrous, except for sparse short setae placed marginally; T3–T5 with marginal stripe of dense long dark setae; S2–S5 abundantly setose.

Female. Unknown.

Material examined. Holotype: BRAZIL • ♂; Rio Grande do Norte, Mossoró, “Faz. Sta. Júlia” [Fazenda Santa Júlia], Malaise 1, caatinga; 05°01'10"S, 37°22'56"W; 14.iv.2008; Fernandes, DRR & cols; RPSP.

• 3♂ paratypes: same data as holotype (1♂ INPA; 2♂ UNILA).

Distribution. BRAZIL, RN: Mossoró.

Comments. The holotype is missing F6–F11 of the left antenna. The metasoma is damaged, with distal segments partly detached and upside down. Two paratypes lack heads, and another paratype has a detached metasoma. This species is only known from Mossoró, Rio Grande do Norte state (sympatric with *A. sertaneja* Lucena, sp. nov., see below), within the semiarid region. All specimens were collected in a Caatinga native vegetation fragment adjacent to a melon crop *Cucumis melo* L. (Cucurbitaceae) (Fernandes et al. 2014).

Etymology. The new species is named after Daniell Fernandes (*Boy*), collector of many specimens used in this study.

Host. Unknown.

Amisega flavipes Kimsey, 1987

Fig. 3

Amisega flavipes Kimsey, 1987: 67. Holotype ♀ (USU: not examined). BRAZIL: Bahia, Encruzilhada.

Material examined. BRAZIL • 1♂ paratype; Bahia, Encruzilhada; xi.1975; M Alvarenga; BME • 1♂; Bahia, Jequié; i.2016; Antunes RCL; RPSP.

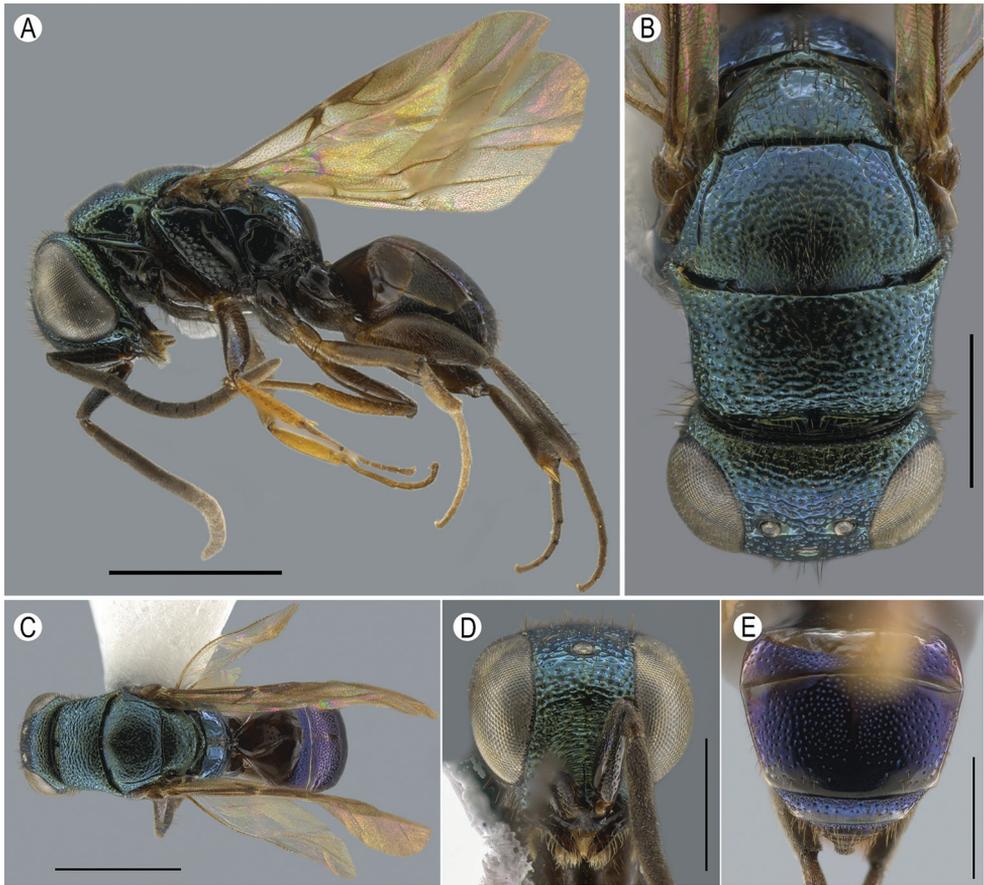


Figure 3. *Amisega flavipes* Kimsey, male (Brazil: Bahia, Jequié) **A** lateral habitus **B** head and mesosoma, antero-dorsal view **C** dorsal habitus **D** head, frontal view **E** metasoma, dorsal view. Scale bars: 1 mm (**A, C**); 0.5 mm (**B, D, E**).

Distribution. BRAZIL, BA: Encruzilhada, Jequié.

Comments. This species can be readily distinguished from other species of the northeastern Brazil by the following combination of characters: scapal basin cross-ridged; dark brown antenna, clypeus, mandible, and metaleg; and lack of distinct striation on vertex and dorsum of mesosoma (Fig. 3C–E). In the original description, Kimsey (1987: 67) cited F1 length $4\times$ breadth, with the male interpreted as identical. The analyzed specimen from Jequié-BA has comparatively shorter F1 (length $2.3\times$ breadth), and a distinct medial pit on anterior declivity of pronotum (not cited in the original description). All other diagnostic characters described for *A. flavipes* are identical with this specimen. This species has been recorded in a transition area between Caatinga and Atlantic rainforest. The Encruzilhada county is in the “Sul-Baiano” highlands, on altitudes above 600 m, with milder climate than usual in the Caatinga (Radambrasil 1983). The new record herein presented

for Jequié is only 207 km north of the previous record, and in spite of having a lower altitude and warmer and drier climate than the type locality, still in the transition zone between the Atlantic rainforest and Caatinga. The taxonomic conclusions about this species are based on the original description and by examination of a male paratype from Bahia: Encruzilhada (BME), and a male recently collected in Bahia: Jequié (RPSP).

Host. Unknown.

***Amisega sertaneja* Lucena, sp. nov.**

<http://zoobank.org/D5531506-E382-4EA2-B2D1-81F9DBA19D3C>

Figs 4, 5

Diagnosis. Dorsum of head and mesosoma densely striate, with sparse punctures inserted among striae; propodeum with rugose marks, becoming irregularly striate posteriorly, posterior declivity with some sparse punctures; lateral pronotal pit sulci-form; scapal basin transversely cross-ridged; metasoma brown, without blue nor purple highlights; legs light brown; malar space $1.7\times$ MOD. This new species can be readily distinguished from other species occurring in northeastern Brazil, *Amisega boyi* Lucena, sp. nov., *Amisega flavipes* Kimsey, and *A. similis* Kimsey, based on densely striate vertex and mesosoma; rugose marks on propodeum; and lack of blue or purple highlights on the metasoma in both genders. Furthermore, *A. sertaneja* sp. nov. has the lateral pronotal pit shallow and sulci-form (pit well-marked in *A. flavipes*), and concolorous light brown legs in both sexes (bicolored in *A. similis*, and dark brown in males of *A. flavipes*). The extensive transverse striation on dorsum of head and mesosoma also resembles *A. striata* Kimsey (Costa Rica). However, *A. sertaneja* sp. nov. is readily distinguished from *A. striata* by its relatively shorter body (3.1 mm *vs.* 4 mm), lack of reddish highlights on the legs, brassy tints dorsally on the body, and the entirely dark brown scape (paler ventrally in *A. striata*).

Description. Holotype, male. Body length: 3.1 mm (Fig. 4A).

Head: $1.2\times$ higher than broad; toruli barely separated, inner margins slightly produced, forming a short lamellar projection (Fig. 4E); scape long, cylindrical, slightly wider basally, $3.6\times$ longer than its maximum width; F1 length $3.1\times$ breadth, $1.3\times$ longer than F2, F2 $1.3\times$ longer than F3; F4 slightly shorter than F3, F5–F10 subequal, progressively shorter; lower margin of clypeus evenly round; subantennal distance $0.4\times$ MOD; malar space $1.7\times$ MOD; OL $1.2\times$ POL, $7\times$ OOL; inner ocular margin convergent submedially, LID $1.1\times$ scape length; eye height $1.4\times$ breadth.

Mesosoma: anterior declivity of pronotum with shallow medial pit, lateral pit near pronotal lobe sulci-form, lobe slightly separated from tegula (Fig. 4C); scutum notaulus barely distinguishable, impressed only basally; parapsidal line deeply impressed; M with first abscissa gently curved submedially, diverging at 1cu-a (e.g., Fig. 5F); Rs very short, spectral trace gently curved towards costal wing margin; dorsal surface of propodeum posteriorly limited by discrete transverse groove (Fig. 4I).

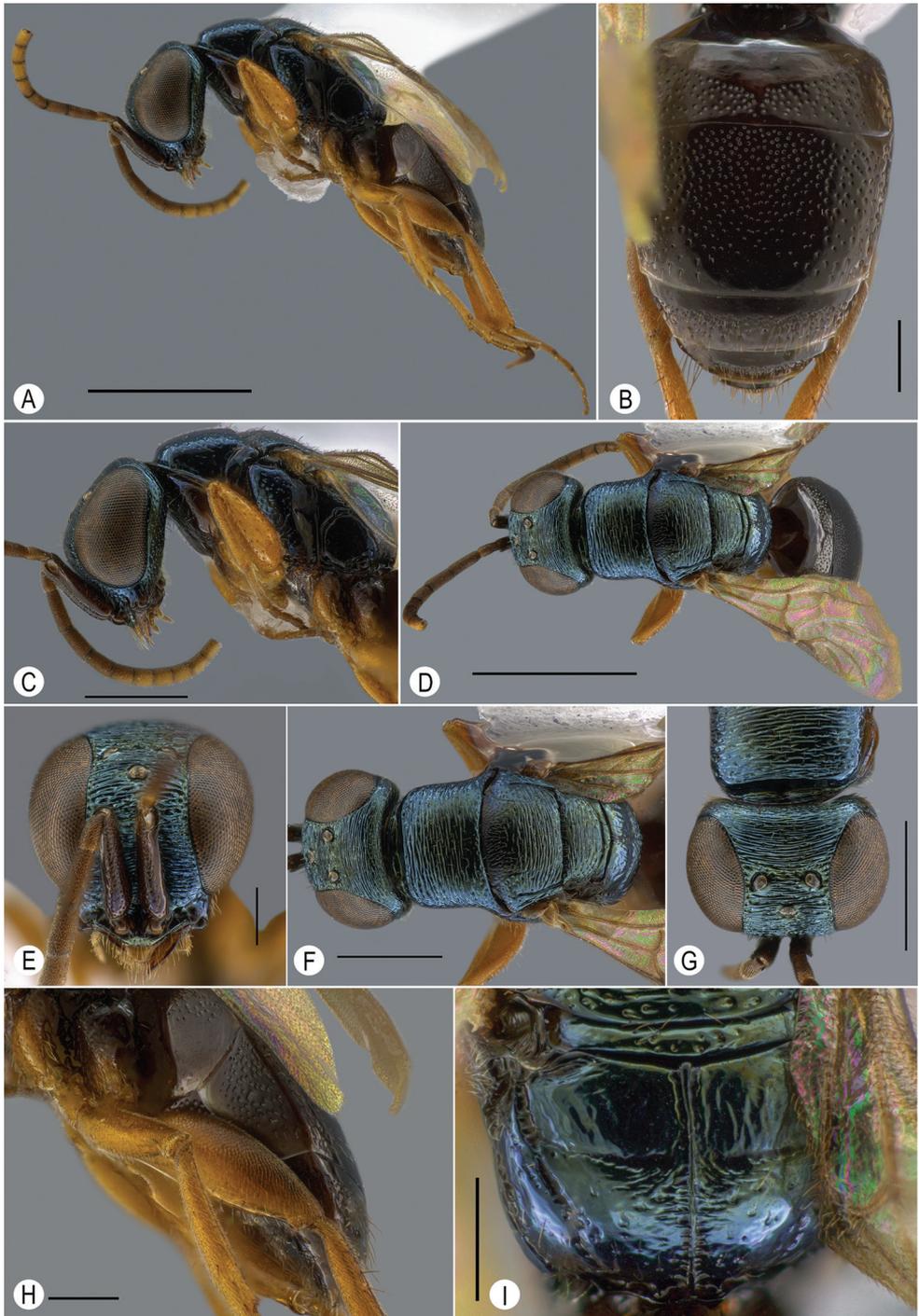


Figure 4. *Amisega sertaneja* Lucena, sp. nov., holotype, male **A** lateral habitus **B** metasoma, dorsal view **C** head and mesosoma, lateral view **D** dorsal habitus **E** head, frontal view **F** head and mesosoma, dorsal view **G** head, dorsal view **H** metasoma, lateral view **I** propodeum, dorsal view. Scale bars: 1 mm (**A**, **D**), 0.5 mm (**F**, **G**), 0.2 mm (**B**, **C**, **E**, **H**, **I**).

Metasoma: lateral margins of T1–T3 sharp, but not carinate (Fig. 4H); first metasomal segment with discrete ventral keel; posterior margin of S1 concave, posterior margins of S2–S4 nearly straight.

Coloration: head dark blue, with greenish highlights on frons, scapal basin, and gena; eye, antenna, and mouthparts light brown; distal flagellomeres light brown; mesosoma mainly dark blue, with greenish highlights dorsally; mesopleuron with ventral light brown tint, posterior margin with dark brown stripe; metapleuron-propodeum dark brown with marginal bluish highlights; tegula light brown; wing membrane light fuscous, veins brown; legs brown, darker on metacoxa; metasoma entirely brown (Fig. 4B).

Sculpturing: frons and vertex heavily striate (Fig. 4G), with sparse punctures inserted among striae; scapal basin densely cross-ridged; gena punctate; clypeus with small punctures on disc, impunctate marginally; scape densely punctulate dorsally, sparser ventrally, with medial polished stripe; dorsum of pronotum, scutum and scutellum densely striate (Fig. 4D, F), with sparse punctures inserted among striae; lateral pronotum with sparse punctures; disc of propleuron impunctate, marginal border with sparse punctures; mesopleuron contiguously punctate, with broad impunctate stripe along posterior margin; disc of metanotum punctate; outer surface of profemur with sparse punctures; dorsum of propodeum with lateral rugose marks (Fig. 4I), becoming irregularly striate marginally, posterior declivity with some sparse punctures; anterior border of T1 and most of laterotergite impunctate and polished, with marginal punctate stripe running from dorsum until dorsoposterior corner of laterotergite; T2–T4, including laterotergites, densely punctate, except by posterior impunctate stripes; S2–S4 densely punctate.

Vestiture: short sparse pale setation on vertex, gena, and frons, with relatively longer and denser setation on lateral border of face and occiput; mandible, clypeus and labrum with distinct long gold setation; antenna with very short, decumbent, pale setation; eye with sparse microtrichia; dorsum of mesosoma with short sparse light brown setation; lateral pronotum, posterior border of mesopleuron, dorsum of propodeum, and metapleuron-propodeum, glabrous; wing membrane entirely setose; outer surface of metatibia, and pro- and metafemora, with long dark setae; venter of tarsomeres with abundant irregularly-sized spines; T1–T2 mostly glabrous, except for sparse short setae placed marginally; T3–T5 with marginal stripe of long dense dark setae; S2–S5 abundantly setose.

Female (Fig. 5). Same as male, except: scape 4.4× longer than its maximum width; F1 length 3.3× breadth, 1.7× longer than F2; LID 0.85× as long as scape; transverse groove on dorsal surface of propodeum barely marked; metasoma dark brown becoming lighter ventrally; T2 with broad impunctate marginal area (Fig. 5C); and denser punctation among striae on dorsum of mesosoma (Fig. 5D, E).

Material examined. Holotype: BRAZIL • ♂; Rio Grande do Norte, Mossoró, “Faz. Sta. Júlia” [Fazenda Santa Júlia], Malaise 1, caatinga; 05°1'10"S, 37°22'56"W; 14.iv.2008; Fernandes, DRR & cols; RPSP • 9 paratypes same data as holotype (2♂1♀ RPSP; 1♂1♀ UNILA; 2♂ DZUP; 1♂1♀ MZSP) • 3 paratypes, same data as holotype, but collected in 06.iii.2007 (1♀ RPSP; 1♀1♂ BME) • 3♂1♀ paratypes; Paraíba, Santa Teresinha, Fazenda Tamanduá, Ciliar A1; 05.iv.2010; Messias KDVS leg.;

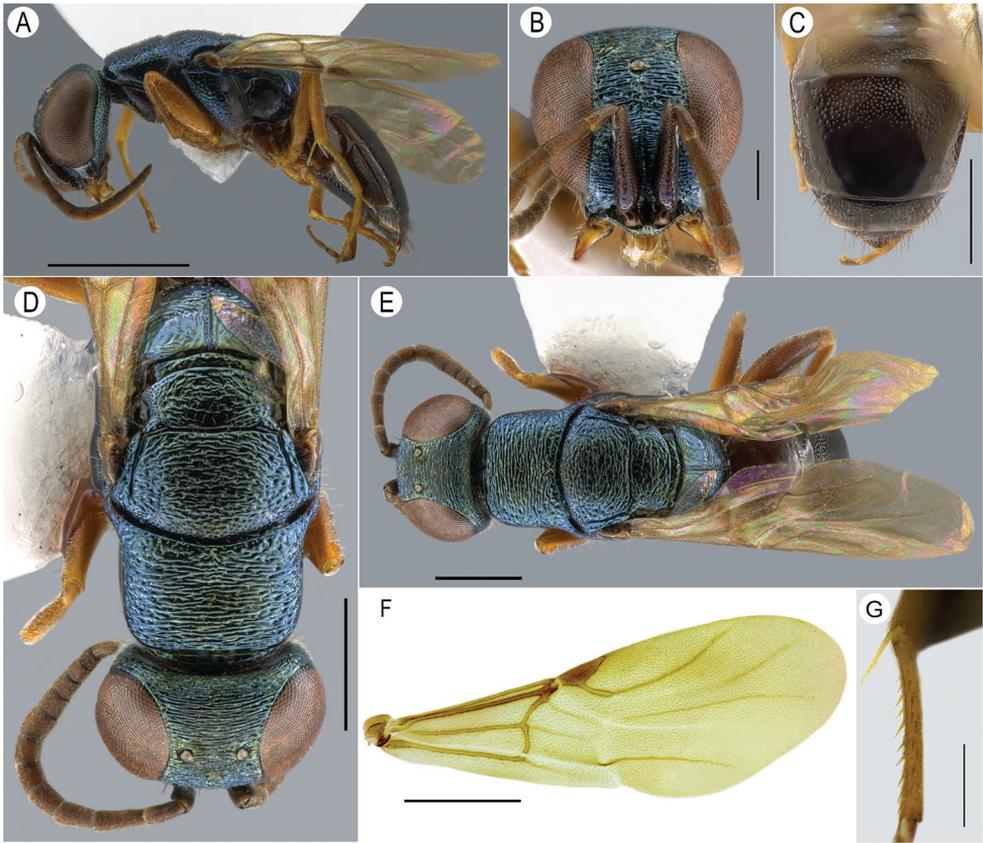


Figure 5. *Amisega sertaneja* Lucena, sp. nov., paratype, female **A** lateral habitus **B** head, frontal view **C** metasoma, dorsal view **D** head and mesosoma, dorsal view **E** dorsal habitus **F** forewing **G** inner margin of metabasitarsus. Scale bars: 1 mm (**A**), 0.5 mm (**C**, **E**, **F**), 0.2 mm (**B**, **G**).

UNILA • 13 paratypes, same data as preceding, except: Reserva B3; 01.iii.2010; 1♂ UFMG; Reserva B1; 01.ii.2010; 1♂ UFMG; Reserva 2; 08.iii.2010; 1♂ MPEG 1♂ UFES 1♂ UFPB; Reserva 3; 07.vi.2010; 1♂ INPA; Reserva A3; 21.iii.2010; 2♀ INPA 2♀ UFPB; Reserva B3; 18.i.2010; 1♀ UFES; Reserva B2; 17.v.2010; 1♀ MPEG; Ciliar; 12.vii.2010; Silva JKS leg.; 1♀ DZUP.

Distribution. BRAZIL, PB: Santa Teresinha; RN: Mossoró.

Comments. The holotype is missing F10–F11. This species is only known from localities in the core zone of the Caatinga dry region. It is sympatric with *A. boyi* Lucena, sp. nov. in Mossoró-RN, which suggests both species are endemic to Caatinga. All specimens of both new species were collected between January to May, which is the period of most intense rainfall in the region.

Variation. Body size: 2.8–3.0 mm; F1 length 2.6–3.3× breadth.

Etymology. The name is a Brazilian gentile adjective for person living in the semi-arid region.

Host. Unknown.

***Amisega similis* Kimsey, 1987**

Amisega similis Kimsey 1987: 70. Holotype ♂ (CNC: examined by photos). BRAZIL: Rio de Janeiro, Guanabara, Represa Rio Grande (presently Rio de Janeiro county).

Material examined. BRAZIL • 1♂ paratype; Pernambuco, Caruaru; iv.1972; M Alvarenga; USNM.

Distribution. BRAZIL, BA: Encruzilhada; MG: Pedra Azul; PE: Caruaru; RJ: Rio de Janeiro and Mangaratiba.

Comments. This species can be distinguished from other species of the northeastern Brazil by its bicolored legs, blue highlights on dorsum of metasoma, and lack of striation on vertex and dorsum of mesosoma. Kimsey (1987) cited AEI as the repository of the holotype, which is actually housed at CNC. The previous record for Pernambuco is now clarified as it came from Caruaru county (originally misspelled as “Carvary” by Kimsey 1987). *Amisega similis* is sympatric with *A. flavipes* in the “Sul-baian” highlands in southern Bahia, and probably also in northern Minas Gerais state, although *A. similis* clearly also reaches areas in the Atlantic rainforest in Rio de Janeiro state. Therefore, it is possible that neither species occur in the limits of the Caatinga.

Host. Unknown.

Key to species of *Amisega* Cameron from northeastern Brazil

- 1 Vertex and dorsum of mesosoma densely striate (e.g., Fig. 4D, F, G); metasomal terga brownish, without metallic blue or purple highlights (Figs 4B, 5C) ***Amisega sertaneja* Lucena, sp. nov.**
- Vertex and dorsum of mesosoma lacking striae or with only stratiform punctures or rugose marks on vertex and anterolaterally on pronotum (e.g., Fig. 2D); metasomal terga with distinct metallic blue or purple highlights (e.g., Figs 2F, 3E) **2**
- 2 Pronotum without any striae or rugose marks; metasomal terga with metallic blue highlights; malar space 1.3× MOD long; male F1 length 3.5× breadth ***Amisega similis* Kimsey**
- Pronotum with discrete anterolateral stratiform punctation or rugose marks; metasomal terga with metallic purple highlights; malar space 1.5× MOD long; male F1 length shorter than 3× breadth **3**
- 3 Anterior declivity of pronotum lacking distinct medial pit; scapal basin punctate-rugulose, vaguely cross-ridged medially (Fig. 2C); antenna, mandible, and clypeus light brown (Fig. 2C); legs light brown; vertex roughly sculptured, with punctures inserted among discrete striae, punctures 1 PD apart or more (Fig. 2B); T2 with medial impunctate polished strip clearly defined (Fig. 2F) ***Amisega boyi* Lucena, sp. nov.**
- Anterior declivity of pronotum with deep medial pit (Fig. 3B); scapal basin entirely cross-ridged (Fig. 3D); antenna, mandible, and clypeus dark brown (Fig. 3D); legs dark brown; vertex lacking striae, punctures touching to 2 PD apart; T2 with medial impunctate polished strip not defined (Fig. 3E) ***Amisega flavipes* Kimsey**

***Duckeia* Costa Lima, 1936**

Duckeia Costa Lima 1936: 174. Type species: *Duckeia cyanea* Costa Lima 1936: 174 (monotypy).

Duckeia is a rarely collected taxon. Currently, the genus comprises three species, two of them were recorded in Rio de Janeiro state, southeastern Brazil, in an area of Atlantic rainforest, and one species is known from Costa Rica (Costa Lima 1936; Kimsey 1993; Lucena and Zanela 2016). According to Costa Lima (1936), the type series of *Duckeia cyanea* Costa Lima, 1936 was reared from eggs of *Prisopus ohrtmanni* (Lichtenstein, 1802) (Phasmatidae), in Rio de Janeiro, Brazil. Kimsey (1987) described *D. vagabunda* based on specimens reared from quarantine material carried by airplane from an unknown locality of Mexico that arrived in Memphis, Tennessee, 27 March, 1962 (Kimsey 1987: 75). According to Kimsey (1987), the host phasmatid egg was probably *Prisopus berosus* Westwood, 1859 (label record). Some years later, Kimsey (1993) recorded *D. vagabunda* for Costa Rica. For the first time, this genus is reported for the Caatinga in northeastern Brazil, and a new species is described.

***Duckeia dudui* Lucena, sp. nov.**

<http://zoobank.org/04628463-EF89-472B-9756-81DF513D2A6F>

Fig. 6

Diagnosis. Body short, stocky build, not compressed laterally; posterior margin of eye lacking carina; upper gena slightly produced; malar space about half eye height; antennae brown, lighter on distal flagellomeres; legs light brown, becoming yellow in tarsomeres; metasoma with dense appressed punctation on marginal borders; dorsum of metasoma with distinct blue highlights. *Duckeia dudui* sp. nov. closely resembles *D. gracile* Kimsey, 1987. The new species differs from *D. gracile* by the following combination of characters: elongated head, 1.3× higher than broad (0.9× higher than broad in *D. gracile*); long malar space, about half of eye height (one third eye height in *D. gracile*); light brown legs (darker in *D. gracile*); short, sparse pale setation on dorsum of meso- and metasoma (relatively longer and denser setation on dorsum of meso- and metasoma in *D. gracile*); marginal borders of T1–T2 with contiguous punctures (punctation on marginal borders of T1–T2 more than 0.5–1.0 PD in *D. gracile*); dorsum of metasoma with distinct bluish highlights marginally on terga (only T2 with faint bluish tint in *D. gracile*). Furthermore, *D. dudui* sp. nov. has a stocky built and relatively short body, contrasting with the laterally compressed and relatively elongated body of *D. gracile*.

Description. Holotype, female. Body length: 3.4 mm (Fig. 6A).

Head: pyriform, 1.3× higher than broad (Fig. 6B); inner margins of toruli produced, touching medially, forming a short lamellar projection; scape long, cylindrical, slightly wider basally, 4.7× longer than its maximum width; F1 length 2.7× breadth,

2.2× longer than F2, F2 1.6× longer than F3; F4 as long as F2; F3 as long as F5, F5–F10 sub-equal in size, F11 acute apically, slightly longer than F10, F4–F10 slightly flattened ventrally; lower margin of clypeus nearly straight; subantennal distance about 0.5× MOD; malar space 0.4× eye height; OL 1.7× POL, 4× OOL; inner ocular margin distinctly convergent above, LID 0.9× shorter than F1; eye height 1.3× breadth; posterior border of eye slightly elevated, lacking carina or crest; upper gena slightly produced; occiput with pair of shallow foveae (e.g., Fig. 6D).

Mesosoma: pronotum with discrete medial longitudinal sulcus, posterior margin not elevated upon scutum, lateral and posterior pronotal pits well-marked, lobe separated from tegula by about 0.7× tegular diameter (Fig. 6E); scutum with notaulus deeply impressed, strongly convergent posteriorly (Fig. 6C); parapsidal line stronger posteriorly, faintly marked anteriorly; M with first abscissa slightly curved submedially, diverging at 1cu-a (e.g., Fig. 6J); stigma somewhat round, longer than first abscissa of M; Rs short, fading gradually, spectral trace curved towards costal wing margin; outer posterior margin of procoxa carinate; lateral margin of propodeum carinate.

Metasoma: lateral margins of T1–T2 carinate (Fig. 6I), T3 with faintly produced anterolateral carina; S1 with ventral keel; posterior margin concave, posterior margins of S2–S4 slightly convex.

Coloration: head dark brown green, with green highlights on frons, vertex and gena, darker basally at malar area; mouthparts light brown; antenna brown, lighter on pedicel and distal flagellomeres; mesosoma dark green brownish, with bluish purple tints dorsally on propodeum; mesopleuron with ventral and posterior light brown stripe; tegula light brown; wing membrane slightly pale to subhyaline, veins brown; legs light brown, becoming yellowish on tibiae and tarsomeres; metasoma dark brown, metallic blue highlights on dorsum, becoming greenish marginally on T3–T4; disc of T1 and T2 brownish; sterna mostly dark brown, except for marginal bluish highlights on S2.

Sculpturing: head contiguously punctate (Fig. 6B, F); clypeus impunctate; scapal basin densely cross-ridged; scape punctulate dorsally, venter slightly excavated and polished; pronotum, scutum, and scutellum densely punctate (Fig. 6C), punctures comparatively deeper and larger on metanotum; anterior border of pronotum with distinct medial pit, lateral margins with shallower pits, latero-posterior border with hyaline impunctate stripe; propleuron widely impunctate on disc, lateral margins densely punctate; mesopleuron contiguously punctate, with narrow impunctate stripe along posterior margin; outer surface of coxae and femora with shallow and sparse punctation; propodeum densely punctate, except by lateral polished areas beside to the metapostnotal median carina; metasoma densely punctate (Fig. 6G–I), with narrow posterior impunctate stripes on T1–T3; medial line of S2–S3 finely punctulate.

Vestiture: sparse long golden pale setation on vertex, gena and clypeus, frons and face with relatively shorter and sparser setation; flagellomeres with decumbent dense pale setation, sparser and longer on scape and pedicel; eye with sparse microtrichia on upper border; mesosoma setose, except glabrous disc of metapleuron-propodeum; mesosomal dorsum with sparse, pale setation, longer on metanotum; mesopleuron with long dense

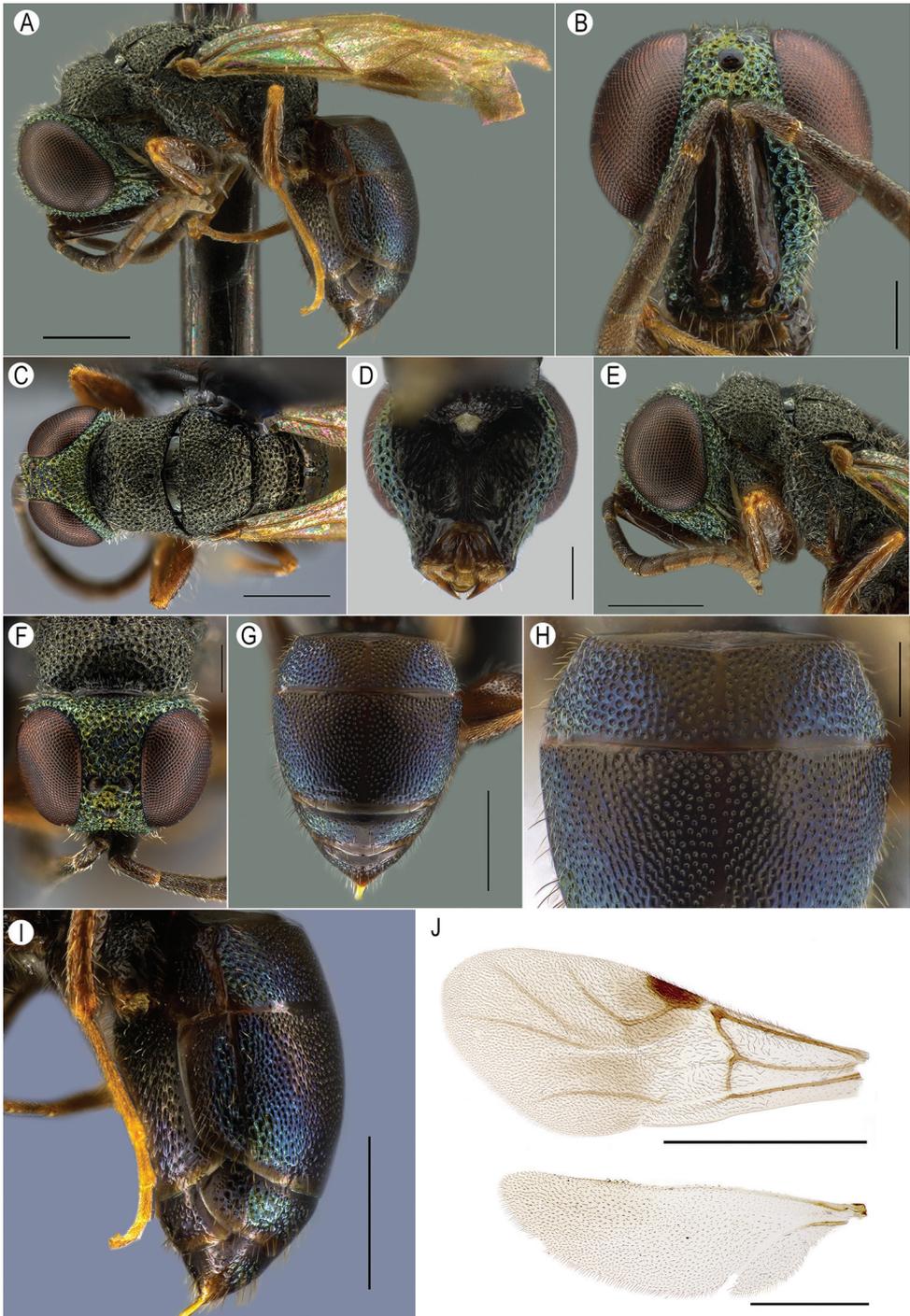


Figure 6. *Duckeia dudui* Lucena, sp. nov., holotype, female **A** lateral habitus **B** head, frontal view **C** head and mesosoma, dorsal view **D** occiput (female paratype) **E** head and mesosoma, lateral view **F** head, dorsal view **G** metasoma, dorsal view **H** amplified view of T1–T2, dorsal view **I** metasoma, lateral view **J** wings (female paratype). Scale bars: 0.5 mm (**A**, **C**, **E**, **G**, **I**), 0.2 mm (**B**, **D**, **F**, **H**, **J**).

pale setation, becoming longer ventrally; wing membrane entirely setose (e.g., Fig. 6J); legs with pale setation, comparatively longer on pro- and metafemora, and meso- and metatibiae; tarsomeres with short, condensed, spine-like, yellow setation; disc of T1 and T2 glabrous, sparse setation marginally, and on laterotergites; T3 and T4 comparatively with longer setation, denser posteriorly, and on laterotergites; S2–S4 entirely setose.

Male. Unknown.

Material examined. Holotype: BRAZIL • ♀; Rio Grande do Norte, Patu, “caatinga-arm. Malaise” [Malaise trap in caatinga]; 06°06'S, 37°37'W; ix.2008; DRR Fernandes & colls; RPSP • 4 paratypes, same data as holotype (1 ♀ MZSP, 1 ♀ DZUP 1 specimen RPSP, 1 specimen UNILA—the latter two could not have their gender determined as detailed in the Comments below).

Distribution. BRAZIL, RN: Patu.

Comments. The holotype is missing part of left metaleg. Two paratypes are poorly conserved, lacking antennae, legs and metasoma, thus, preventing gender determination. This species is only known from Patu county. Specimens were collected in the base of “Serra do Lima” (inselberg), 248 m above sea level (Fernandes et al. 2020), in the core zone of the Caatinga dry region. Interestingly, the specimens were collected in November, which is characterized as part of the dry season in the region.

Etymology. The species is named after Sebastião Antônio de Araújo, *Dudu* (*in memoriam*), grandfather of the first author.

Host. Unknown.

Subfamily Cleptinae

Cleptinae are rarely collected and there are only few specimens housed in Brazilian collections. These wasps are parasitoids of prepupal larvae of Tenthredinoidea sawflies (e.g., Kimsey and Bohart 1991). This subfamily currently includes three extant genera: *Cleptes* Latreille, *Cleptidea* Mocsáry, and *Lustrina* Kurian (Kimsey and Bohart 1991; Móczár 1996b; Rosa et al. 2020). Among these, only *Cleptidea* is recorded in Brazil (Lucena and Zanela 2016).

Cleptidea Mocsáry, 1904

Cleptidea Mocsáry 1904: 567. Type species: *Cleptes aurora* Smith 1874: 452 (by original designation).

This genus is neotropical, occurring mostly in forested warm habitats from southwestern Mexico, through Central America, into South America as far south as northern Argentina (Kimsey 1981, 1986; Kimsey and Bohart 1991). Kimsey (1981, 1986) revised the genus, described eight new species, and provided identification keys and illustrations. Three other species were later described by Móczár (1996a,b) along with an updated key for all species in the genus. Móczár (1996b) also designated a lectotype for *Cleptidea fasciata* (Dalman, 1823) (a dorsal habitus image of the lectotype specimen is available in Rosa and Vårdal 2015) and synonymized *Cleptidea propodealis* Kimsey,

1986 under *C. fasciata*. Currently, the genus includes nineteen valid species, divided into six species groups (*sensu* Kimsey 1986). Seven species and five species groups are known to occur in Brazil (Lucena and Zanela 2016). The genus was first recorded in northeastern Brazil in a preliminary local survey (Lucena et al. 2012). The morphological distinction between that specimen and members of the *fasciata* species group is now evident, and this new species is described.

***Cleptidea nordestina* Lucena, sp. nov.**

<http://zoobank.org/1C3F8F4B-F198-4616-B750-401AE446B901>

Fig. 7

Diagnosis. Head bicolored, mostly dark green extending from vertex until upper half of face, mid face to malar area orange; clypeus raised and square-shaped, with lower margin straight; scutum, scutellum and metanotum testaceous; propodeum entirely black, except for the whitish tip of lateral angle. *Cleptidea nordestina* sp. nov. most resembles *C. fasciata* (Dalman). The new species can be readily distinguished from *C. fasciata* by the following combination of unique characteristics: bicolored head, hyaline marks at body (especially trochanters, pronotum, and propodeal angles), clypeus produced, orange metanotum, and entirely black propodeum.

Description. Holotype, female. Body length: 6.7 mm (Fig. 7A).

Head: 1.2× wider than high; toruli 0.9× MOD separated; scape more or less cylindrical, broader apically, 3.4× longer than its maximum width; F1 length 3.1× breadth, 3.1× longer than F2; F2–F10 sub-equal in size, slightly flattened ventrally, F8–F11 excavated ventrally, F11 acute apically, slightly longer than F10; clypeus protruded medially, squared lobe, with lower margin slightly convex; malar space about 0.6× MOD; ocelli set in compact triangle on vertex, with transverse sulcus linking laterals; posterodorsal border of eye surpassing lateral ocellus dorsal limit; inner ocular margin sub-parallel, slightly convergent above; LID 1.1× eye height; eye height 1.5× breadth; OOL 2.3× OL, 2.6× POL; frons with short longitudinal sulcus below median ocellus briefly interrupted.

Mesosoma: pronotum crossed antero- and submedially by transverse crenulate grooves, longitudinal sulcus culminating in a deep fovea posteriorly (Fig. 7H); posterior margin of pronotum slightly elevated, posterolateral lobe touching tegula; scutum with notaulus deeply impressed, parapsidal line discrete, faintly marked; disc of metanotum slightly convex, marginal areas depressed, posterior margin with pair of small medial pits (Fig. 7G); M with first abscissa more or less straight, diverging at 1cu-a; costal cell wider distally, about 2.2× the maximum width of C; dorsum of metacoxa with distinct longitudinal carina; lateral angle of propodeum short, thumb-like.

Metasoma: posterior margin of S1 distinctly concave medially; posterior margin of S2–S4 slightly convex.

Coloration: head basally orange, extending from malar area to mid face, paler basolaterally, metallic dark green hue extending from upper half of face to vertex and gena (Fig. 7B); scape, pedicel and F1–F2 orange; F3–F11 brownish orange, paler ventrally; pronotum predominantly orange, paler on lobe; disc of scutum testaceous, be-

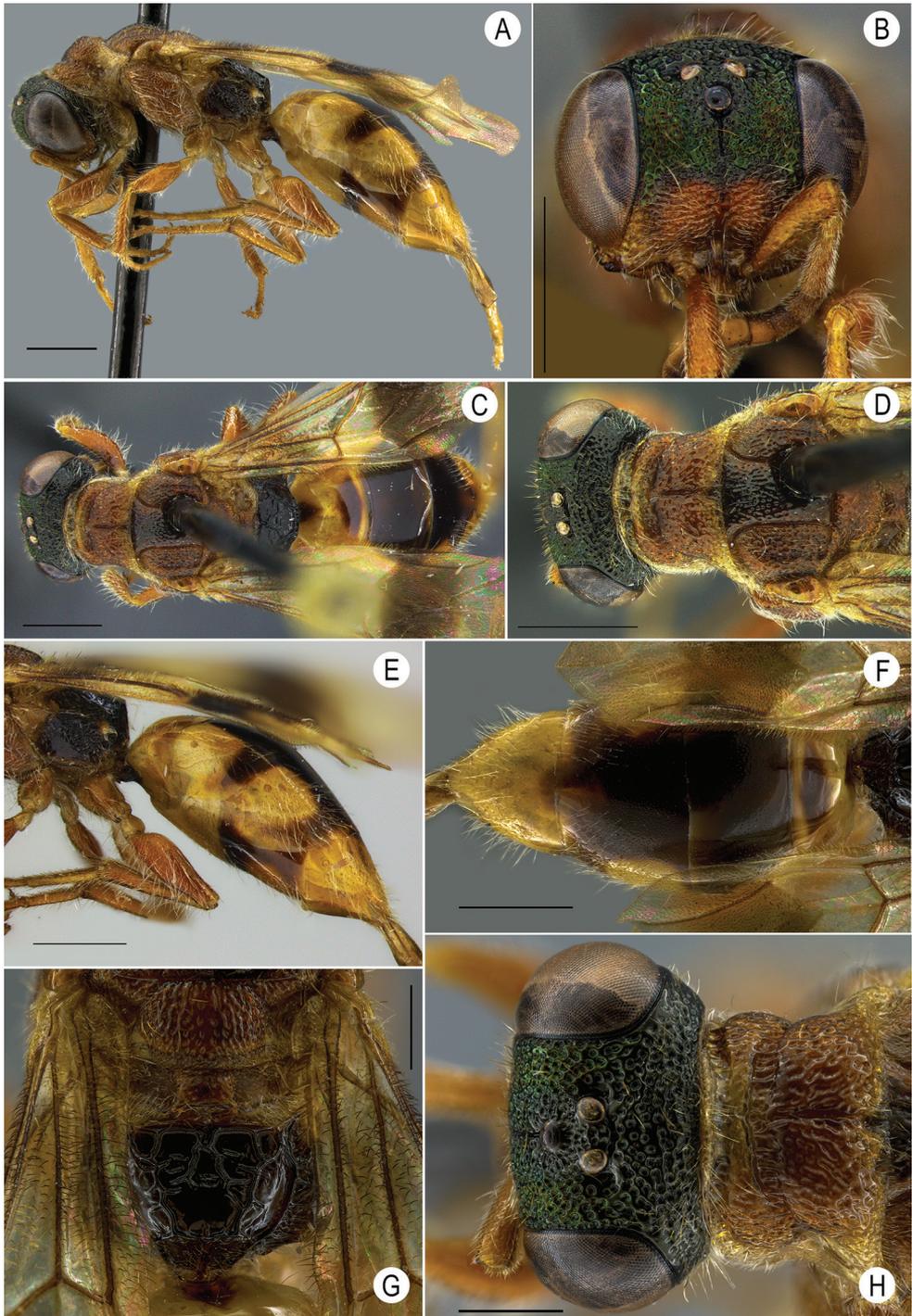


Figure 7. *Cleptidea nordestina* Lucena, sp. nov., holotype, female **A** lateral habitus **B** head, frontal view **C** dorsal habitus **D** head and mesosoma, dorsal view **E** metasoma, lateral view **F** metasoma, dorsal view **G** propodeum, dorsal view **H** head and pronotum, dorsal view. Scale bars: 1 mm (**A–F**), 0.5 mm (**G, H**).

coming gradually orange laterally (Fig. 7C, D); scutellum and metanotum orange; legs yellowish orange, paler on trochanters and ventrally on coxae; tegula orange; wing membrane dusky-hyaline, with broad brownish band submedially, veins brown; metapleuron-propodeum black, tip of lateral angle of propodeum white; metasoma mostly yellowish orange, T1–T3 with broad dark brown bands (Fig. 7E, F); T4 predominantly yellowish; sterna most yellowish orange, anterior S1 and posteromarginal borders of S2–S3 brown; S4 orange.

Sculpturing: head heavily sculptured, densely punctate, rugulose-lacunose, particularly on vertex and frons, becoming sparser on gena, and impunctate basally near torulus and clypeus; pronotum, scutum and scutellum mostly rugulose-lacunose, lobe of pronotum impunctate; mesopleuron faintly costate above, punctate to rugulose-lacunose below; metanotum punctate on disk; femora and tibiae sparsely punctate; dorsum of propodeum heavily carinate forming areolate enclosures, posterior declivity longitudinally crossed by three main carinae, somewhat rugulose in-between; T1 nearly impunctate and polished posteromedially, with sparse tiny lateral punctures; T2 sparsely punctate on disk, marginal areas impunctate; T3–T4 densely punctate on disc, with broad impunctate stripes marginally; S1 and S4 nearly impunctate, with sparse marginal punctures; S2–S3 finely punctate on disk becoming sparser marginally.

Vestiture: head with sparse, long, pale setae on vertex; frons, face, gena and scape with relatively shorter and denser setation; flagellomeres with decumbent dense pale setation; eye with tiny, sparse, sub-erect microtrichia; dorsum of mesosoma with long, sparse, pale setation, longer on venter of mesopleuron; marginal depression of metanotum with patch of pale setae posteriorly; wing membrane entirely setose, with some distinctive, long, erect dark setae inserted proximally; legs with abundant long pale setation, comparatively longer on metaleg; inner surface of tarsi with short, thick setation and short spines irregularly distributed; disc of T1 and T2 glabrous, sparse setation only marginally, T3 and T4 with long dense setae posteriorly, S1 and S4 glabrous, S2 and S3 with long sparse setation; gonapophysis with some erect setae apically.

Male. Unknown.

Host. Unknown.

Material examined. Holotype: BRAZIL • ♀; Bahia, Jequié, *campus* II UESB, Malaise III; 11.v.2007; Silva-Jr. JC & cols; RPSP.

Distribution. BRAZIL, BA: Jequié.

Comments. The holotype is missing distal flagellomeres of the left antenna. The new species is only known from Jequié, located in a transition zone between Atlantic rainforest and Caatinga (Fig. 8C). Three unidentified male specimens from Maranhão state (06.vii.1987, Möericke, UFES; but no collector nor locality data) are also new records of the genus *Cleptidea* for northeastern Brazil. These male specimens are poorly preserved (lacking appendices, altered coloration, and their metasomas are collapsed); thus, we could not assign them to *C. nordestina* sp. nov. confidently or to interpret them as representing yet another new species.

Etymology. The name refers to the region where the new species was collected, and it is a Brazilian gentile adjective for a person native from the northeastern region.

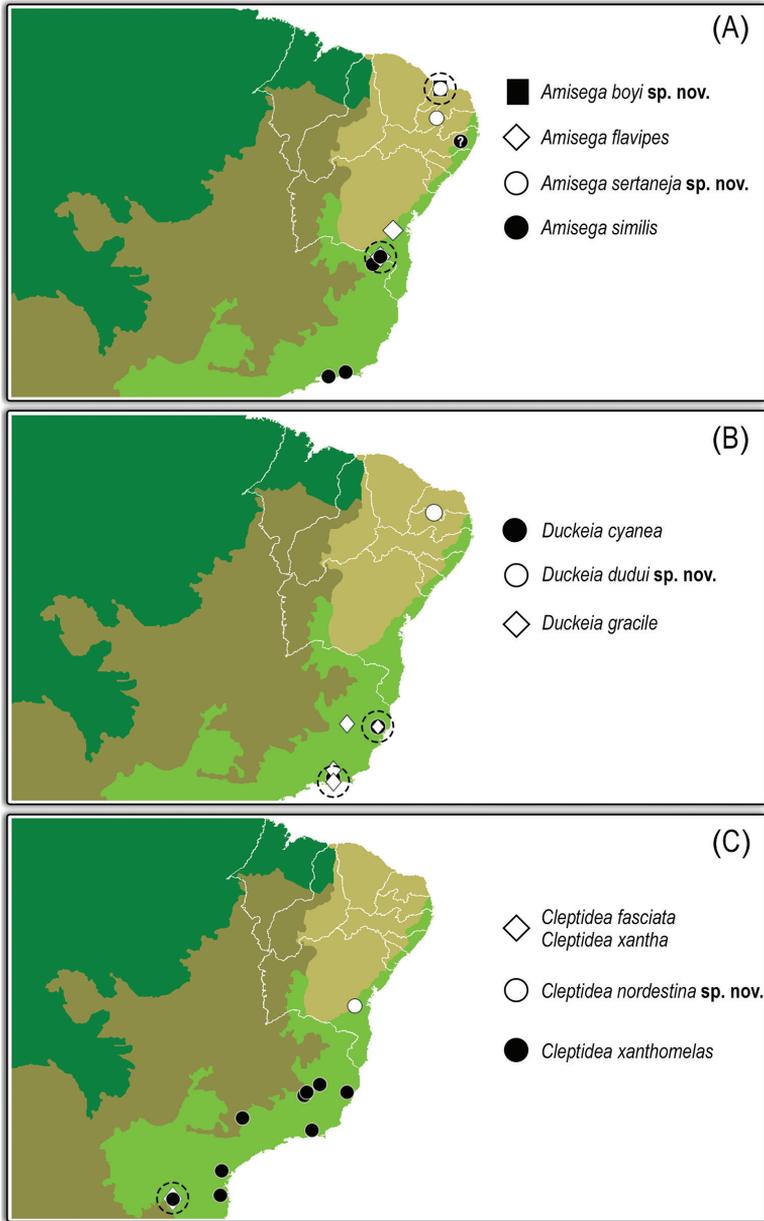


Figure 8. Biogeographic regions of easternmost South America, shown in Fig. 1, and geographical records of species in the genera *Amisegea* and *Duceia* (Chrysididae: Amiseginae), and *Cleptidea* (Chrysididae: Cleptinae). Political division of northeastern Brazilian states is indicated by white lines **A** distribution records of *Amisegea* species (one paratype of *Amisegea similis* Kimsey is signed with a question mark—see Discussion) **B** distribution records of *Duceia* species **C** distribution records of *Cleptidea* species. Some localities harbor more than one species, which are indicated by dashed circles. *Cleptidea fasciata* and *C. xantha* Kimsey, 1986 are only known from the same type locality and both are represented by the same symbol in **C** (see Discussion).

Discussion

Since Kimsey (1987, 1990, 1993), further contributions to the taxonomy of *Amisega* were not published, and consequently, the identities of several taxa remain challenging as new samplings become accessible. Previously to this study, three out of eight valid species known to Brazil had been described by Ducke (1902, 1903) from Amazon rainforest in northern Brazil: *A. aeneiceps* Ducke, 1903, *A. azureascens* Ducke, 1903, and *A. mocsaryi* Ducke, 1902. In contrast, *A. semiflava* Kimsey, 1987 is known from localities in the Cerrado of central Brazil, and *A. flavipes* Kimsey, *A. rufilateralis* Kimsey, 1987, *A. similis* Kimsey, and *A. tenebrae* Kimsey, 1987, are known from localities along the eastern coast of South America in the Atlantic rainforest (Kimsey 1987; DAA Lucena *unpubl. data*). The geographical records cited by Kimsey (1987) for *A. similis* are the most disparate among these species, ranging from the southernmost limit of the Atlantic rainforest in Rio de Janeiro state (its type locality) to the northern boundary in the transition zone between the Atlantic rainforest and Caatinga in Caruaru-PE (Fig. 8A). The examination of high-resolution pictures of the holotype of *A. similis* deposited at CNC made it clear that this species is distinct from every new species described in this work. It is possible that the paratypes of *A. similis* from Caruaru-PE represent yet another undescribed species, which should be temporarily interpreted with caution (we have represented with a question mark in the distribution map: Fig. 8A). Future examinations of the complete type series of *A. similis* will prove essential to clear any doubts regarding the taxonomic identity of each specimen.

The present records of *Duckeia* species in quite distant sites in Central America and eastern Brazil without references to intermediate areas suggest a rudimentary knowledge of its diversity. We examined the type material of *D. cyanea* and *D. vagabunda* (USNM), and additional material of *D. cyanea* and *D. gracile* from localities with Atlantic rainforest collected in Espírito Santo state (Laranja da Terra), Minas Gerais state (Marliéria), and Rio de Janeiro state (Nova Iguaçu) (MZSP, UFES) (Fig. 8B). *Duckeia dudui* sp. nov. represents the first record of this genus in a habitat characterized by a seasonally dry forest.

Kimsey (1986) placed four species in the *fasciata* species group in *Cleptidea*, three of them recorded only in Santa Catarina state, southern Brazil (Fig. 8C). The type series of *Cleptidea fasciata* was collected in an unknown locality in Brazil. Móczár (1996b) synonymized *C. propodealis* under *C. fasciata*. The former has only been known from Santa Catarina as well. Previously, Kimsey (1981) had cited *C. fasciata* for Guatemala, Panamá, Peru, and Argentina (Tucumán), but the distribution was later revised and restricted to Brazil and Argentina (Kimsey 1986: 324; Kimsey and Bohart 1991). We had examined specimens housed in the most important Brazilian entomological collections. Still, we only found new records for *C. xanthomelas* (Mocsáry, 1889), which seems to be the most common and abundant species in south-eastern Brazil, occurring mostly in localities of Atlantic forest of the following Brazilian states: Espírito Santo (Santa Teresa), Minas Gerais (Marliéria, Santa Bárbara, and São Gonçalo do Rio Abaixo), Paraná (Campina Grande do Sul), Santa Catarina (Blumenau), and São Paulo (Luis Antônio) (Fig. 8C). In this regard, the new species herein proposed and three

unidentified male specimens from Maranhão represent now the most septentrional records for the *fasciata* species group in South America.

Conclusions

The diversity of Amiseginae and Cleptinae is probably the most underestimated in comparison with other groups of cuckoo wasps in South America. Their relatively small size and peculiar parasitoid lifestyles contribute to these wasps being rarely collected and frequently misidentified as other hymenopterans. The new species herein described in Amiseginae and Cleptinae enhance our understanding of chrysidid diversity in a poorly known Brazilian region. These new findings also reinforce the importance of long-term collecting studies and strategic samplings, which provide precious audited data potentially useful for selecting priority areas for conservation.

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