



Contributions to the knowledge of *Olixon* Cameron, 1887 (Hymenoptera, Rhopalosomatidae): a new species and new records of the genus for northeastern Brazil

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Abstract

The genus of solitary wasps *Olixon* Cameron, 1887 is currently represented by 29 species, distributed across the African, Australian and American continents where it is present from southeastern Canada to central-eastern Argentina for the latter. Its presence in India is also attested. Despite the many genus records published for the Neotropical region, northeastern Brazil is still one of the least represented regions for the genus. Here we describe and illustrate *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**, based on specimens of both sexes collected in a Restinga vegetation located in the coastline of the state of Sergipe, Brazil. In this work the description was carried out based on a male, with, additionally, the description and illustration of the genitalia. We provide an updated identification key for the seven New World species and present a distribution map for the three known species that occur in Brazil including new distribution records for *Olixon testaceum* Cameron, 1887 in northeastern Brazil.

Key words: Insecta, distribution, Maranhão, Piauí, Restinga, RPPN do Caju, Sergipe, taxonomy

Introduction

Rhopalosomatidae Ashmead, 1896 (Hymenoptera: Vespoidea) are solitary wasps, also known as cricket leeches, due to their larval habit as ectoparasitoid of crickets (Insecta, Orthoptera, Grylloidea) (Lohrmann *et al.* 2014; Lohrmann & Engel 2017; Miller *et al.* 2019; Armstrong *et al.* 2024). This family occurs mainly in tropical and subtropical regions (Townes 1977; Krogmann *et al.* 2009; Lohrmann 2012; Lohrmann *et al.* 2020), and is represented by four fossil and by 74 extant species, the latter assigned to four genera: *Rhopalosoma* Cresson, 1865, *Olixon* Cameron, 1887, *Paniscomima* Enderlein 1904 and *Liosphex* Townes, 1977 (Aguiar *et al.* 2013; Bulbol *et al.* 2023a, 2023b; Lohrmann *et al.* 2020).

Among the genera of Rhopalosomatidae, *Olixon* differs from the others in being brachypterous, in not having a notch on the inner margin of its eyes and in having its first abdominal segment wider than long (Bulbol *et al.* 2023b; Krogmann *et al.* 2009). The genus is currently represented by 29 species, distributed across the African, Australian and American continents where it is present from southeastern Canada to central-eastern Argentina for the latter, and its presence in India is also attested (Bulbol *et al.* 2023a; Krogmann *et al.* 2009; Lohrmann & Engel 2017; Lohrmann *et al.* 2012).

Lohrmann *et al.* (2012) carried out a taxonomic revision of the *Olixon* species from the New World for which more than 400 specimens were examined, recognizing five species: *O. atlanticum* Fernández & Sarmiento-M., 2002, *O. banksii* (Brues, 1922), *O. bicolor* Roig Alsina & Martínez, 2010, *O. melinsula*, Lohrmann *et al.*, 2012 and *O. testaceum* Cameron, 1887. With the exception of *O. atlanticum* and *O. melinsula*, the other species are known from both sexes. A decade after this revision, Bulbol *et al.* (2023a, b) resumed studies on the genus, extending the distribution of *O. testaceum* to three Brazilian states and describing the second species for the country, *O. pantanensis* Bulbol, Bartholomay & Somavilla, 2023, known only from the male, as well as describing and illustrating for the first time the male genitalia for both species. However, the real diversity of the genus could be much greater, as indicated by the results presented in Armstrong *et al.* (2024) which show that no less than six genetic lineages fall within the range of morphological variation observed in '*Olixon testaceum*'. Furthermore, Armstrong *et al.* (2024) assume more cryptic species within the other described morphospecies, e.g., *O. banksii* and *O. melinsula* (Armstrong *et al.* 2024). Despite the new records, northeastern Brazil is one of the least represented regions for the genus, with only one known record in the state of Maranhão (Bulbol *et al.* 2023a, b). Here we describe and illustrate both sexes of a new species, *Olixon caju* Celante, Martins & Bulbol, **sp. nov.** and provide new distribution records for *O. testaceum* in northeastern Brazil. In addition, we present an updated identification key for the New World species and a distribution map for the *Olixon* species that occur in Brazil.

Material and methods

The specimens of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.** were collected in the protected natural reserve "Reserva Particular do Patrimônio Natural" (RPPN) do Caju, which belongs to Embrapa Tabuleiros Costeiros and is located in the municipality of Itaporanga d'Ajuda (11°06'16.19"S, 37°11'05.89"W) in the state of Sergipe, Brazil. This reserve covers an area of 763.37 ha with various ecosystems, including Restinga, which is a diverse ecosystem comprising three vegetation types: secondary forests (Fig. 1A), shrub vegetation (Fig. 1B) and open areas (Fig. 1C). A full description of the collection area is provided in Brito *et al.* (2023). The region's climate is tropical, with a well-defined dry season from September to March and a rainy season from April to August, and average annual rainfall of over 1,250 mm (Nogueira Júnior *et al.* 2015). Collections were carried out between July 2017 and July 2018 (13 months) using pitfall traps that remained in the field for 48 hours.

The specimens collected were deposited in the Coleção de Entomologia do Museu de Fauna (MFCE) of the Centro de Conservação e Manejo de Fauna da Caatinga, Campus de Ciências Agrárias of the Universidade Federal do Vale do São Francisco (UNIVASF), Petrolina, Pernambuco State, Brazil and Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Amazonas State, Brazil (José Albertino Rafael). In addition to the specimens collected, other specimens of the genus were studied from the Coleção Zoológica do Maranhão (CZMA) of Universidade Estadual do Maranhão (UEMA), Caxias, Maranhão State, Brazil.

The sampled specimens were identified applying the keys provided in Lohrmann *et al.* (2012) and Bulbol *et al.* (2023a). Furthermore, we compared the specimens with the original descriptions of all known New World species of the genus, i.e., Cameron (1887), Brues (1922), Fernández & Sarmiento-M. (2002), Lohrmann *et al.* (2012) and Roig Alsina & Martínez (2010), and Bulbol *et al.* (2023a). The description of the new species is primarily based on the character sets applied by Krogmann *et al.* (2009) and Lohrmann *et al.* (2012). Subsequently, their terminology, measurements, and indices are followed, except for the genitalia of the male which was described following the terminology used by Somavilla *et al.* (2018) and Bulbol *et al.* (2023a).

To dissect the genitalia of the males, the specimens mounted on entomological pins were submerged in water at 60°C for 10 minutes. The last segments of the metasoma were then removed along with the genital capsule. These structures were placed in a 1.5ml Eppendorf tube containing a 10% KOH solution and heated in water at 60°C for 30 minutes. To neutralize the KOH, the structures were immersed in a solution of acetic acid (10%) for five minutes

and then washed with distilled water. To facilitate visualization of the characters, the parameres, cuspis, digitus and penis valve were disarticulated and mounted on slides with glycerin and covered with a coverslip. After obtaining the images, the structures were stored in a microtube filled with glycerine and pinned to the specimen.

The images of the new species were produced using a Nikon D5600 camera equipped with a Raynox m250 and Nikon CFI Plan 10x Achromat lens (MRL00102) or CarlZeiss lens (3.2/0.10 \ 160/-). For lighting, two Yongnuo YN560IV speedlites were used, triggered remotely by a Yongnuo YN560-TX II trigger connected to the camera. While the images of *O. testaceum* were taken using a LEICA DFC295 camera coupled to a stereomicroscope LEICA M125. After the photographs were taken at different focus distances, they were stacked using the licensed software Helicon Focus (8.2.0). After stacking, the images were edited and organized into plates using the licensed software Adobe Photoshop (24.7.2). The distribution map was drawn up in Qgis (3.16.3-Hannover).

Abbreviations: F1—first flagellomere; F2—second flagellomere; IOD—interocellar distance: distance between the two posterior ocelli; OOD—ocellocular distance: smallest distance between the posterior ocellus and the eye; PnI—pronotal index: ratio between the length and the width of the pronotum; PpI—propodeal index: ratio between the length and the width of the propodeum; T1—first metasomal tergum; T3—third metasomal tergum.

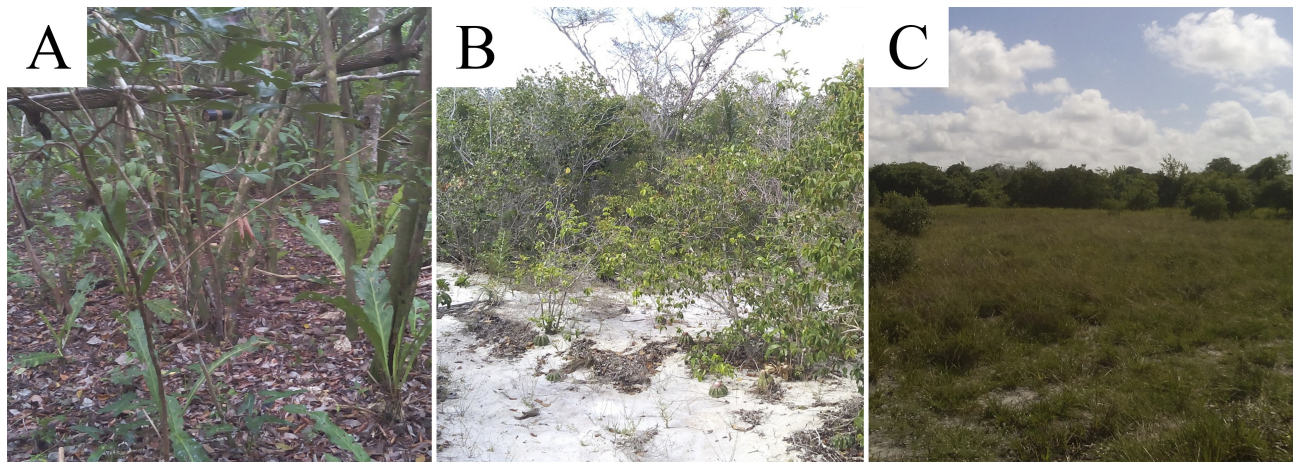


FIGURE 1. Sampled areas in the protected natural reserve "Reserva Particular do Patrimônio Natural do Caju" in Itaporanga d'Ajuda, Sergipe. **A.** Secondary forest. **B.** Shrub vegetation. **C.** Open area.

Results

Taxonomy

Order Hymenoptera Linnaeus, 1758

Superfamily Vespoidea Latreille, 1802

Family Rhopalosomatidae Ashmead, 1896

Genus *Olixon* Cameron, 1887

Olixon caju Celante, Martins & Bulbol, sp. nov.

<http://zoobank.org/urn:lsid:zoobank.org:act:62DEC50D-BD40-4359-88C2-C770F1CADD5>

(Figs 2–7)

Type material. HOLOTYPE ♂ with the following labels: “Brasil – SE, Itaporanga d'Ajuda \ Col. Brito, A. \ 21.IX.2017 \ 11.1213S, 37.1903W \ MFCE014404” “RPPN do caju, coletado em área de vegetação arbustiva, armadilha pitfall” (MFCE). ALLOTYPE 1♀, with following labels: “Brasil – SE, Itaporanga d'Ajuda \ Col. Brito, A. \ 21.IX.2017 \ 11.1185S, 37.1852W \ MFCE014403” “RPPN do caju, coletado em área de floresta secundária, armadilha pitfall” (♀) (MFCE). PARATYPES 2♂; with following labels: “Brasil – SE, Itaporanga d'Ajuda \ Col. Brito, A. \ 21.VI.2018

\ 11.1185S, 37.1852W \ MFCE014405” “RPPN do caju, coletado em área de floresta secundária, armadilha pitfall” (♂) (MFCE); “Brasil – SE, Itaporanga d’Ajuda \ Col. Brito, A. \ 29.I.2018 \ 11.1213S, 37.1903W \ MFCE014406” “RPPN do caju, coletado em área de vegetação arbustiva, armadilha pitfall” (♂) (INPA).



FIGURE 2. Male of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**, holotype (MFCE014404). **A.** Habitus, lateral view. **B.** Habitus, dorsal view. Scale bar: 0.50 mm.

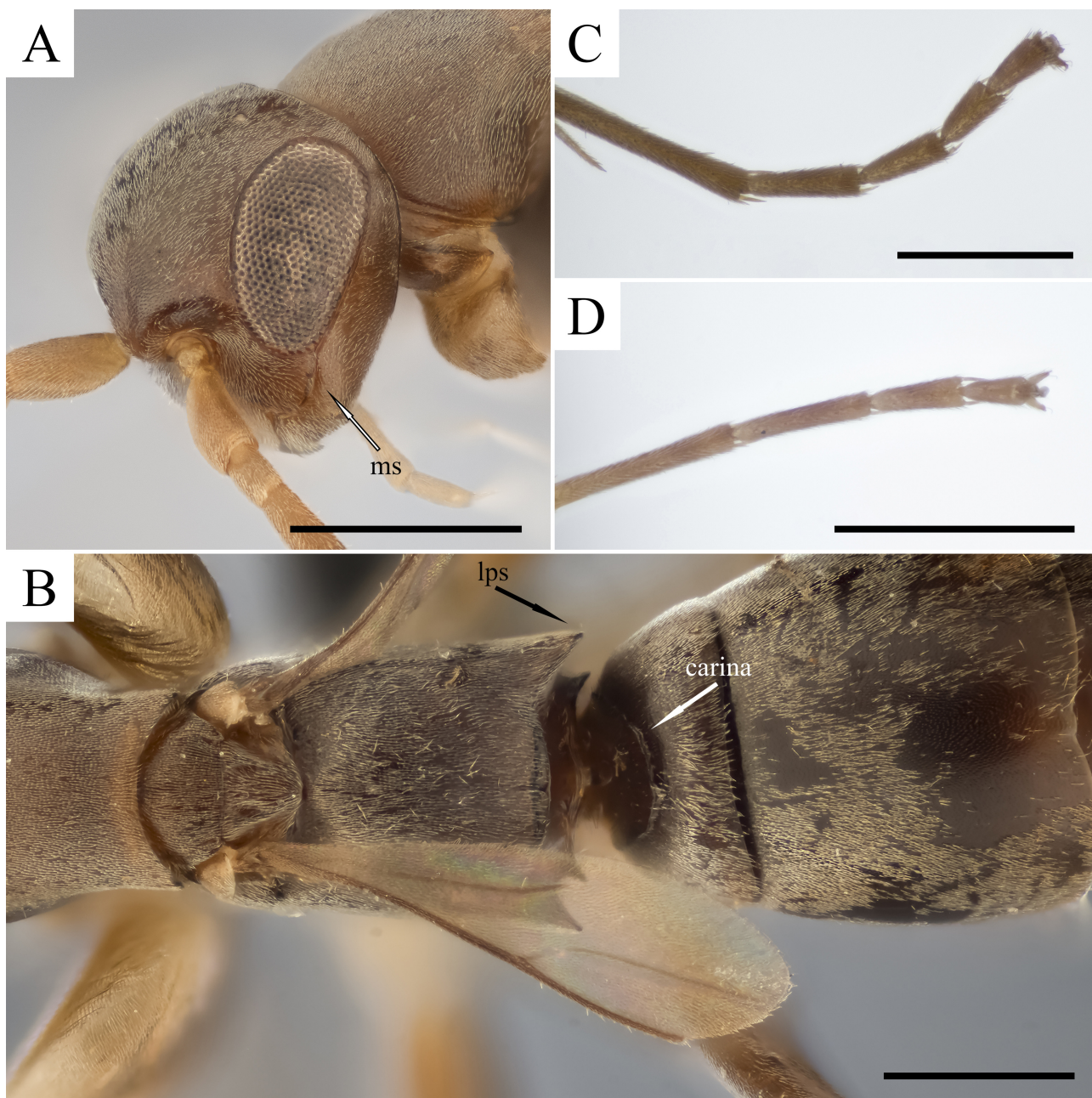


FIGURE 3. Male of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**, holotype (MFCE014404). **A.** Head, anterolateral view. **B.** Propodeum and T1, dorsal view. **C.** Mesotarsus. **D.** Metatarsus. Abbreviations: lps—posterolateral propodeal process; ms—malar sulcus. Scale bar: 0.50 mm.

Diagnose. The new species differs from other species of the genus due to the following combination of characters: ocelli present; malar sulcus between the eye and the base of the mandible (Figs 3A, 6A); brachypterous, but with membrane broadly expanded (Figs 2A, B, 3B, 5A, B, 6E); female penultimate mesotarsomeres with asymmetrical lobes (Fig. 6C); female penultimate metatarsomeres with the distal region wider than the proximal region and symmetrical lobes (Fig. 6D); T1 with a transverse carina and without median sulcus posterior to transverse carina (Figs 3B, 6B); male genitalia with two preapical processes.

Description. Male. Body length 4.50 mm [4.5–5.00 mm] **Colour.** Predominantly brown, except antennae, legs and part of metasoma pale brown. **Head.** Vertex with many evenly distributed short setae (Fig. 3A); frons surface without deep punctures; malar sulcus present and complete (Fig. 3A); posterior ocelli and anterior ocellus present, reduced; ocular sulcus without pubescence; OOD $1.33\times$ IOD [OOD $1.10-1.33\times$ IOD]; clypeus pubescence, dense and complete; eye $1.75\times$ [1.75–1.84 \times] as long as wide, temple length $0.12\times$ [0.12–0.14 \times] and malar space

0.43× [0.36–0.43×] as long as eye length; clypeus 2.55× [2.33–2.73×] as wide as high; flagellomeres, without conspicuous apical setae; F1 1.80× [1.80–2.22×] as long as wide, 1.64× [1.64–1.90×] as long as pedicel, and 0.55× [0.55–0.59×] as long as F2. **Mesosoma.** PnI 1.20 [1.20–1.33]; tegulae separated from each other by 2.63× [2.40–2.75×] the width of one tegula; PpI 1.06 [1.06–1.19]; propodeal spiracles situated closer to posterior than to anterior propodeal margin; each posterolateral propodeal process triangular and well developed (Fig. 3B); convex carina with a small longitudinal ridge in the central region between the two posterolateral propodeal process (Fig. 3B); metapleural sulcus incomplete. **Legs.** Profemur 1.95× [1.95–2.00×] as long as wide; metafemur 5.05× [4.50–5.05×] as long as wide; outer hind tibial spur present, inner hind tibial spur 0.55× [0.54–0.56×] as long as basitarsus; lobes of the penultimate mesotarsomere asymmetric (Fig. 3C); lobes of the penultimate metatarsomere symmetric (Fig. 3D); penultimate metatarsomere with the distal and proximal region of approximately the same width (Fig. 3D). **Wings.** Brachypterous, forewing with membrane expanded and tubular longitudinal vein along costal margin and two longitudinal veins, at rest reaching T1 (Fig. 3B); hindwing reduced to short stub. **Metasoma.** Dorsal surface of T1 with transverse carina, without median sulcus posterior to transverse carina (Fig. 3B). **Genitalia.** Paramere (Fig. 4A): base, 1.2× longer than wide; paramere spine elongated and acute apically, but curved dorsally; cuspis and digitus (Fig. 4B): linked by the membrane that unites them to the paramere, membrane 2.4× longer than wide covered with cylindrical bristles and elongated cuspis; digitus robust with rounded apex, both slightly curved dorsally, apexes punctuated with bristles and more sclerotized than the rest of the volsella; penis valve (Fig. 4C): laterally flattened, elongated and with a rounded apex, ventral margin with two preapical processes, the first in the form of a column with the apex wider than the base and the second with a triangular shape inclined anteriorly.

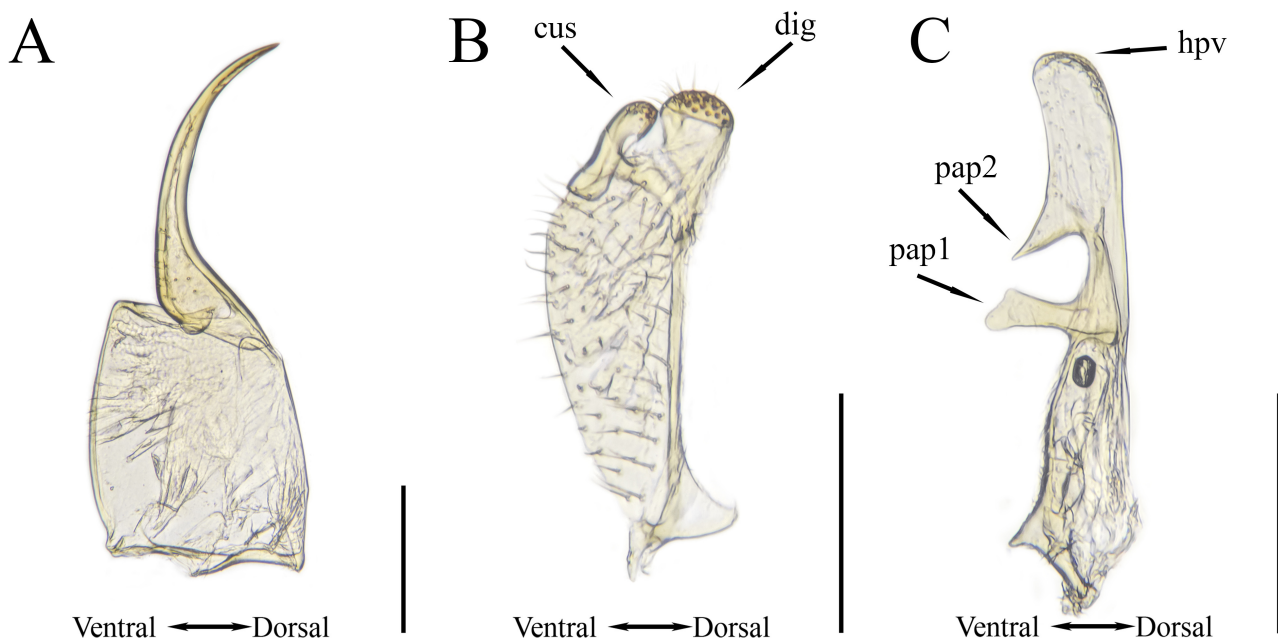


FIGURE 4. Male genitalia of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**, holotype (MFCE014404). **A.** Paramere, lateral view. **B.** Volsella. **C.** Penis valve. Abbreviations: cus—cuspis; dig—digitus; hpv—head of penis valve; pap1—first preapical process; pap2—second preapical process. Scale bar: 0.25 mm.

Female. Body length 5.75 mm. **Colour.** Predominantly brown, except antenna, legs and part of metasoma pale brown. **Head.** Vertex with many evenly distributed short setae (Fig. 6A); frons surface without deep punctures; malar sulcus present and complete (Fig. 6A); posterior ocelli and anterior ocellus present, reduced; ocular sulcus without pubescence; OOD 1.33× IOD; clypeus pubescence, dense and complete; eye 2.09× as long as wide, temple length 0.17× and malar space 0.48× as long as eye length; Clypeus 2.4× as wide as high; flagellomeres without conspicuous apical setae; F1 1.80× as long as wide, 1.5× as long as pedicel, and 0.53× as long as F2. **Mesosoma.** PnI 1.67; tegulae separated by 2.0× the width of one tegula; PpI 1.27; propodeal spiracles situated closer to posterior than to anterior propodeal margin; each posterolateral propodeal process long; convex carina with a small longitudinal ridge in the central region between the two posterolateral propodeal process (Fig. 6B); triangular and well-developed posterolateral propodeal process (Fig. 6B); metapleural sulcus incomplete. **Legs.** Profemur 1.67× as

long as wide; metafemur 3.42× as long as wide; outer hind tibial spur present, inner hind penultimate metatarsomere symmetric (Fig. 6D); penultimate metatarsomere with the distal region wider than the proximal region (Fig. 6D). **Wings.** Brachypterous, forewing with membrane expanded and tubular longitudinal vein along costal margin and two longitudinal veins, at rest reaching T1, but shorter than male forewing (Fig. 6E); hindwing reduced to short stub. **Metasoma.** Dorsal surface of T1 with transverse carina, without median sulcus posterior to transverse carina (Fig. 6B); stridulatory organ present on T3 (Fig. 5B).

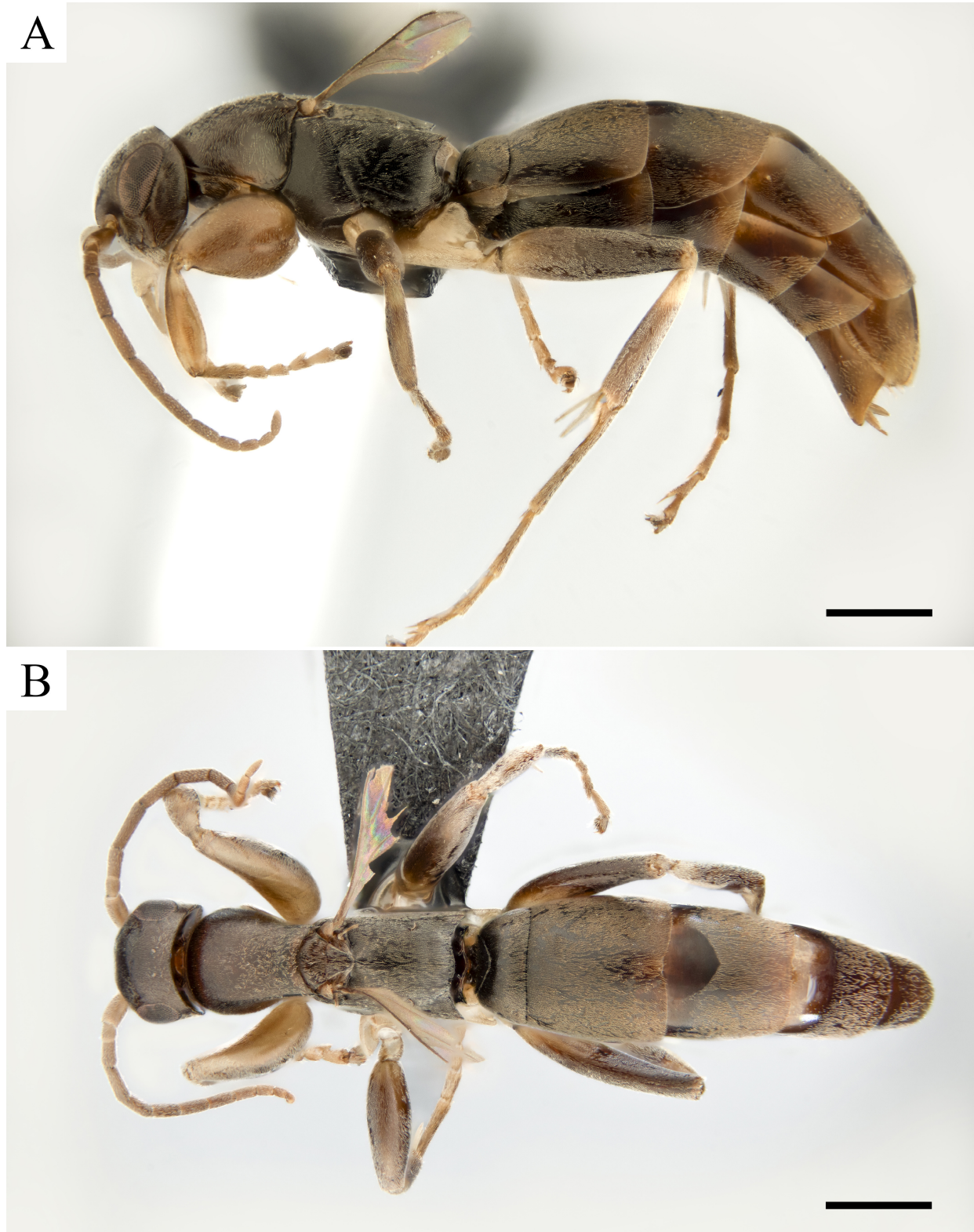


FIGURE 5. Female of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**, allotype (MFCE014403). **A.** Habitus, lateral view. **B.** Habitus, dorsal view. Scale bar: 0.50 mm.

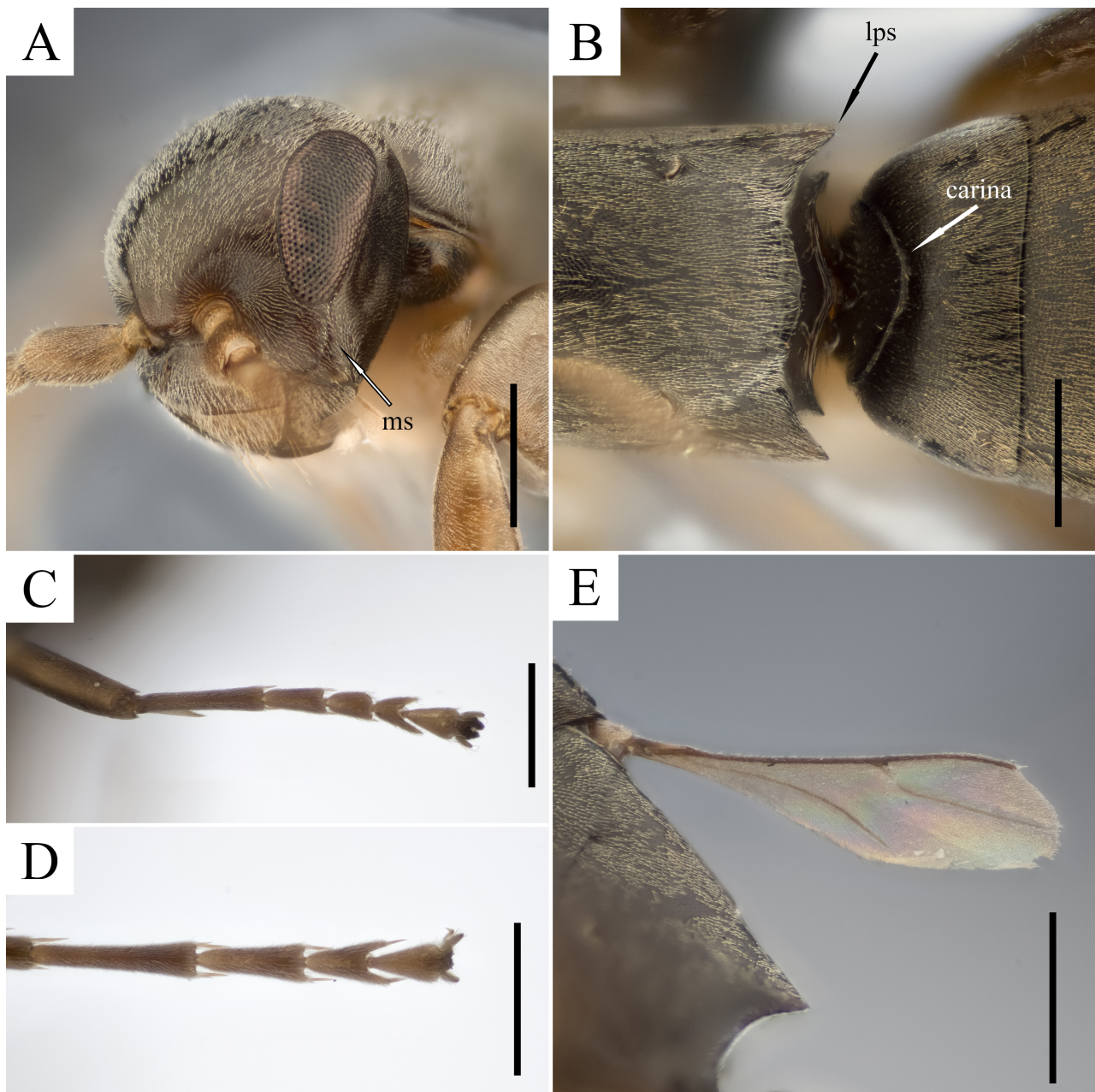


FIGURE 6. Female of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**, allotype (MFCE014403). **A.** Head, anterolateral view. **B.** Propodeum and T1, dorsal view. **C.** Mesotarsus. **D.** Metatarsus. **E.** Fore wing. Abbreviations: lps—posterolateral propodeal process; ms—malar sulcus. Scale bar: 0.50 mm.

Etymology. The name of the new species is a direct reference to cashew (Caju, in Portuguese), a name given to the peduncle (pseudofruit) attached to the “nut” (fruit) of the cashew tree (*Anacardium occidentale* L.), a plant typical of northeastern Brazil with high socioeconomic importance for the region. This fruit also gave its name to the natural reserve (RPPN do Caju) where the new species was found.

Distribution. Brazil, Sergipe state (Fig. 7).

Biological aspects. Based on what we know about the species’ biological aspects, it seems to prefer environments with a greater abundance of trees and shrubs, as well as denser leaf litter. These factors contribute to a lower average temperature and higher relative humidity in these places (Brito *et al.* 2023), where its hosts probably live.

Remarks. Holotype (MFCE14404): right antenna broken, flagellomeres 7 to 11 glued in a triangle next to the specimen. The paramere, volsella, penis valve, and the sterna 6, 7 and subgenital plate, removed during the dissection of the genitalia, are stored in a microtube filled with glycerine and pinned next to the specimen.

***Olixon testaceum* Cameron, 1887**

(Figs 7, 8)

Material examined. Brazil. Maranhão: 1♂, "CZMA// BR, Maranhão, Barreirinhas, \ PNLM, 02°39'80"S 42°49'88"W, \Altitude 16m; Arm. Malaise, \ 15-30.ix.2016; F. Limeira-de-Oliveira, A. A. T. Sousa & \D. M. Limeira, Cols." (CZMA); 1♀, "CZMA// BR, Maranhão, Barreirinhas, \ PNLM, 02°39'80"S 42°49'88"W, \Altitude 16m; Arm. Malaise, \ 15-30.ix.2016; F. Limeira-de-Oliveira, A. A. T. Sousa & D. M. \ Limeira Cols." (CZMA); 1♂, "CZMA// BR, Maranhão, Barreirinhas, \ PNLM, 02°39'80"S 42°49'88"W, \Altitude 16m; Arm. Malaise, \ 01-15.viii.2016; F. Limeira-de-Oliveira, L. L. M. Santos, A. A. T. \ Sousa & D. M. Limeira Cols." (CZMA). Piauí: 1♀, "CZMA// Brasil (Piauí), Caracol, \ Parq. Nac. Serra Confusões, \ Saco da Cachorra, 522m, \ 09°12'42.7"S/ 43°30'04.2"W" "CZMA// Malaise Suspensa, \01-10.x.2013, J. A. Rafael, \ F. Limeira-de-Oliveira & \T. T. Silva, cols" (CZMA).

Distribution in Brazil. Amazonas, Amapá, Espírito Santo, Goiás, Maranhão (**new record**), Mato Grosso, Pará, Piauí (**new record**), Rio de Janeiro, Rondônia, and Roraima (Fig. 7).

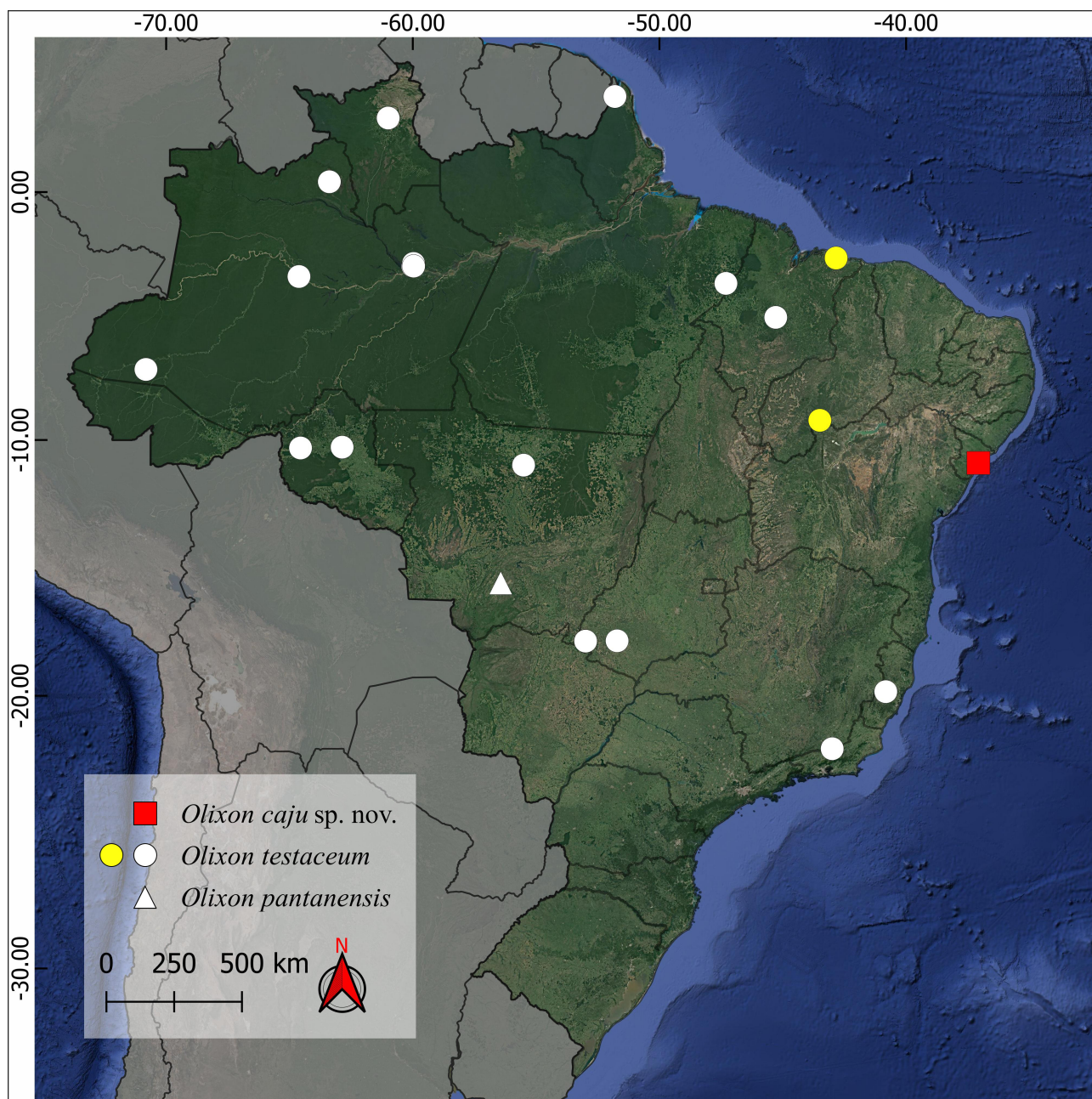


FIGURE 7. Distribution map of the three *Olixon* species found in Brazil. The white triangles and circles are the known records for the genus (Bulbol *et al.* 2023a). The yellow circles are new records. The red square is the type locality of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.**



FIGURE 8. Female of *Olixon testaceum* Cameron, 1887. **A.** Habitus, lateral view. **B.** Habitus, dorsal view. Scale bar: 0.50 mm.

Updated key for the New Word species of *Olixon*

(modified from Bulbol *et al.* (2023a))

1. Malar space with sulcus from eye to mandible 2
- Malar space without sulcus 6
2. T1 with median sulcus posterior to transverse carina (northern Argentina) *O. bicolor* Roig Alsina & Martínez, 2010
- T1 without median sulcus posterior to transverse carina 3
3. Temple length about width of scape (southeastern USA and Paraguay) *O. melinsula* Lohrmann *et al.*, 2012
- Temple length less than half width of scape. 4
4. Propodeum posteromedially without process between posterolateral processes; volsella with few bristles on the membrane that unites them.—Penis valve narrow, space between head of penis valve and preapical process smooth; color varies from bright stramineous to brown; head, meso- and metasoma (except for darker marking on metasomal segment II) of same color; (Arizona to northern Argentina) *O. testaceum* Cameron, 1887
- Propodeum with one or two posteromedian processes between posterolateral process; volsella with bristles all over the membrane that joins both and at the apex of each one 5
5. Posteromedian process without protuberance; penis valve, margin between the head of penis valve and the second pre-apical process slightly concave (northeastern Brazil) *O. caju* Celante, Martins & Bulbol, **sp. nov.**
- Posteromedian process bilobed; penis valve, margin between the head of penis valve and preapical process with a bulging dimple; (midwestern Brazil) *O. pantanensis* Bulbol, Bartholomay & Somavilla, 2023
6. Metasoma dark brown to black; transverse carina on T1 evenly arched (Colombia) *O. atlanticum* Fernández & Sarmiento-M., 2002
- Metasoma brownish; transverse carina on T1 forming a narrow posterad angle on midline (southeastern Canada, eastern USA, and northern Mexico) *O. banksii* (Brues, 1922)

Discussion

Olixon caju Celante, Martins & Bulbol, **sp. nov.** is more similar to *O. pantanensis*, but it differs by the ocelli (absent in *O. pantanensis*); by presence of the posteromedian propodeal process (two in *O. pantanensis*). Other considerable differences are observed in the male genitalia, the main one being the presence of two preapical processes (one in *O. pantanensis*). *Olixon caju* Celante, Martins & Bulbol, **sp. nov.** differs from *O. atlanticum* and *O. banksii* by presence of the malar groove (absent in *O. atlanticum* and *O. banksii*); from *O. bicolor* for not presenting a longitudinal furrow/carina in T1 (present in *O. bicolor*); from *O. melinsula* for having a relatively small temple length and ocelli (ocelli absent in *O. melinsula*); and from *O. testaceum* for presenting a posteromedian propodeal process (only a carina, without projections in *O. testaceum*). It also differs from *O. testaceum* in that it has reduced ocelli (absent in *O. testaceum*) and the penis valve has two preapical processes (only one in *O. testaceum*).

We recognized the males and the female as belonging to the same new species described in this study, considering that the three males and the female of *Olixon caju* Celante, Martins & Bulbol, **sp. nov.** were collected in the same locality and, due to the morphological similarities between both sexes such as: clypeus with dense and complete pubescence, groove in the malar space, presence of ocelli and a convex carina on the margin of the propodeum, projected posteriorly, and by a small longitudinal crest in the central region.

Of all known species of *Olixon*, around 70% are known for both sexes and, for the most part, around 80% have a female individual as holotype (Bulbol *et al.* 2023a; Krogmann *et al.* 2009; Lohrmann *et al.* 2012), either because only the female was known at the time of the description, or by choice on the part of the describer, especially for the dozen new Australian species described by Krogmann *et al.* (2009). In the New World, for the six species described before this paper, the holotype is of the only sex available at the time of description. *O. atlanticum*, *O. bicolor* and *O. pantanensis* have a male as holotype and *O. testaceum*, *O. banksii* and *O. melinsula* a female. For *O. caju* Celante, Martins & Bulbol, **sp. nov.** both sexes were available and the choice to use the male as holotype was based on the fact that they can have characters more informative than the females. Bulbol *et al.* (2023a) have shown that dissection of the genitalia of *O. testaceum* and *O. pantanensis* revealed considerable differences in the morphology of the volsella and penis valve, highlighting the importance of this structure for the identification and separation of *Olixon* species.

The penis valve of *O. caju* Celante, Martins & Bulbol, **sp. nov.** is noteworthy for having two preapical processes, unlike *O. testaceum* and *O. pantanensis*, whose have only one (Bulbol *et al.* 2023a). In Rhopalosomatidae, the studied species from the genus *Liosphex* also have two preapical processes on the penis valve, but in these species the first preapical process is inclined anteriorly, and the head of the penis valve is acute (Bulbol *et al.* 2021), while

in *O. caju* Celante, Martins & Bulbol, **sp. nov.** the first preapical process is erect and the head of the penis valve is rounded. Morphological studies also show that they differ from *Rhopalosoma* and *Paniscomima*, as these have three preapical processes on the penis valve (Townes 1977; Lohrmann *et al.* 2019).

Specimens of *Olixon* can be collected with different methods, e.g. Malaise trap, Moericke trap, pitfall trap, light traps, sweep net, etc. (Bulbol *et al.* 2023b; Lohrmann *et al.* 2012). Lohrmann *et al.* (2012) reported a possible relationship between the collection method and the species collected, analysing the two most abundant species and observing that for *O. banksii*, the pitfall traps are apparently the most efficient in relation to other methods, while for *O. testaceum*, the most efficient method is apparently the Malaise trap. This can be corroborated by the new records of *O. testaceum* presented in this study, since the four individuals collected were captured with Malaise trap. As in the study by Bulbol *et al.* (2023b), where collection data are presented for 20 specimens of *Olixon* recorded in Brazil, the only specimen of *O. pantanensis* was collected in a pitfall trap, while 11 of the 19 specimens of *O. testaceum* were also obtained from Malaise traps, suggesting that this sampling method may be efficient for capturing individuals of this genus. Several non-flying arthropods, especially arboreal ones, are seen walking on the Malaise trap's mooring lines and end up falling into the collecting vessel (G.L.C. pers. obs.), the brachypterous *Olixon* can reach the Malaise traps by the same route. As for the specimens of *O. caju* Celante, Martins & Bulbol, **sp. nov.**, only four specimens were found in the 624 pitfall traps distributed over 13 consecutive months, however, it was the only collecting method used. This low abundance may reflect the ineffectiveness of the pitfall trap for collect this species, or the low density of individuals in the Restinga ecosystem.

The description of *O. caju* Celante, Martins & Bulbol, **sp. nov.** and the new records of *O. testaceum* contribute to the knowledge of a group considered to be poorly sampled in Brazil and in the Neotropical region. More studies using different collecting methods are needed to better understand the biological and ecological aspects of the group, e.g. information on the host species and more precise data on the distribution pattern in the environment.

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