

Research Article

**One new species and one new record of *Dryinus* Latreille, 1804
(Hymenoptera: Dryinidae) from Uruguay**

Una nueva especie y un nuevo registro de *Dryinus* Latreille, 1804 (Hymenoptera: Dryinidae) de Uruguay

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Abstract. *Dryinus* Latreille, the most diverse genus of Dryininae (Hymenoptera: Dryinidae), has a worldwide distribution with 268 extant species, of which 103 are reported from the Neotropics. Only eight species of Dryinidae have been recorded in Uruguay, none of them belong to genus *Dryinus*. In this study, we describe the first species of *Dryinus* in Uruguay, *Dryinus rogeriae nov. sp.* and expanded the geographical distribution of *D. bocainanus* (Olmi) based on specimens collected in eastern Uruguay. We illustrate the studied species and provide a distributional map.

Key words: Chrysidoidea; Dryininae; *Dryinus bocainanus*; *Dryinus rogeriae*; geographical distribution.

Resumen. *Dryinus* Latreille, el género más diverso de Dryininae (Hymenoptera: Dryinidae), tiene distribución mundial con 268 especies viventes, de las cuales 103 provienen del Neotrópico. En Uruguay, solo se han registrado ocho especies de Dryinidae, y ninguna de ellas pertenece al género *Dryinus*. En este estudio, describimos la primera especie de *Dryinus* en Uruguay, *Dryinus rogeriae sp. nov.* y ampliamos la distribución geográfica de *D. bocainanus* (Olmi) con base en especímenes recolectados en el este de Uruguay. Ilustramos las especies estudiadas y proporcionamos un mapa de distribución.

Palabras clave: Chrysidoidea; distribución geográfica; Dryininae; *Dryinus bocainanus*; *Dryinus rogeriae*.

Introduction

Dryinus Latreille, 1804, with a worldwide distribution, is the most diverse genus of Dryininae (Hymenoptera: Dryinidae) including 268 extant and 42 fossil species (Olmi *et al.* 2019b; Martynova *et al.* 2020). Species of the genus are known as parasitoids of planthopper species belonging to Acanaloniidae, Cixiidae, Dictyopharidae, Flatidae, Fulgoridae, Issidae, Lophopidae, Ricaniidae, and Tropiduchidae (Hemiptera: Auchenorrhyncha) (Guglielmino *et al.* 2013; Olmi & Virla 2014).

The neotropical fauna of Dryinidae was reviewed by Olmi & Virla (2014) and 111 species

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of *Dryinus* were listed. Since then, only two species of *Dryinus* were described from Brazil and French Guiana (Martins *et al.* 2015a, b; Olmi *et al.* 2019a). *Dryinus* is distributed into four species groups (Olmi & Virla 2014) and the number of extant species is underestimated.

In Uruguay, only eight species of Dryinidae have been recorded to date, none of them belong to genera *Dryinus*: *Aphelopus diffusus* Olmi, 1984 and *A. jamaicanus* Olmi, 1984 (Aphelopinae); *Anteon albifarse* Cameron, 1888 and *An. bousemani* Olmi, 1998; *Deinodryinus inermis* Olmi, 1984 and *D. reali* Olmi, 1993 (Anteoninae); *Gonatopus lauti* Virla, 1998 and *G. fritzi* (Olmi, 1992) (Gonatopodinae) (Olmi & Virla 2014).

In this study, we present the description of the first *Dryinus* in Uruguay, *Dryinus rogeriae nov. sp.* and provide novel information on the geographical distribution of *D. bocainanus* (Olmi) in eastern Uruguay.

Material and Methods

The specimens treated in this paper were collected as part of the project “Characterization of pollinating insects, parasitoids and predators in environments with different anthropogenic modifications in eastern Uruguay and their evaluation as bioindicators of environmental quality” founded by the Instituto Nacional de Investigación Agropecuaria of the República Oriental del Uruguay, between October 2013 and September 2016. Two Malaise traps (Townes 1972) with 70% ethanol were set up about 100 m apart and samples were collected every two weeks between December 2014 and December 2016. The traps were set up in a natural field area with low grazing intensity ($34^{\circ}05'1.07''S$, $53^{\circ}45'43.08''W$ - 57 m asl) and in an area with constant grazing by cattle and sheep ($34^{\circ}05'26.8''S$, $53^{\circ}52'14.4''W$ - 89 m asl), near the town of Castillos, Rocha Department, Uruguay.

Species identification was based on the identification key provided by Olmi & Virla (2014). The morphological terminology follows Olmi & Virla (2014), except for venation, which follows Brothers (2011), and integumental sculpture, which follows Harris (1979). The terminology of propodeum dorsal and posterior surface follows Olmi & Virla (2014). The studied specimens were compared with images of the holotypes of *D. bocainanus* (Olmi, 1987) and *D. tuparrensis* Olmi, 2004 deposited at Instituto Alexander von Humboldt (Bogotá, Colombia) [IAVH] and the Museum of Comparative Zoology (Harvard University, Cambridge, Massachusetts, USA) [MCZ].

The following abbreviations are used in the descriptions: POL, refers to the minimum distance between the inner edges of the lateral ocelli; OL, to the minimum distance between the inner edges of the lateral ocellus and the median ocellus; OOL, to the minimum distance from the outer edge of the lateral ocellus to the eye inner margin; OPL, to the minimum distance from the posterior edge of a lateral ocellus to the occipital carina; and TL, to the minimum distance from the posterior edge of eye to the occipital carina.

Color images were taken at the Laboratório de Biologia Comparada de Hymenoptera (LBCH) at the Universidade Federal do Paraná (UFPR), Curitiba, Paraná, Brazil, using a Leica M125 stereomicroscope coupled to a Leica DFC295 digital camera. The images acquired were stacked to obtain an extended depth of field using Zerene Stacker version 1.04. Scanning electron microscopy (SEM) images were obtained with the VEGA3 TESCAN system at the Centro de Microscopia Eletrônica da UFPR. The distribution map was produced on the website SimpleMappr (Shorthouse 2010). Figures were prepared using Adobe Photoshop (version 11.0).

The information on the labels of the examined specimens was transcribed as follows: backslash (\) indicates the different lines on the label, double quotation marks (" ") indicate different labels on the same specimen, and square brackets ([]) indicate the acronyms of the collection repository.

List of reposidores. LRRP - Coleção Entomológica do Laboratório de Sistemática e Bioecologia de Predadores e Parasitoides of the Instituto Biológico; Ribeirão Preto, São Paulo, Brazil (N.W. Perioto, curator); MZUSP - Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brazil (C.R.F. Brandão, curator).

Results

Dryinus rogeriae nov. sp. (Figs. 1, 5)

Diagnosis. *Dryinus rogeriae nov. sp.* is unique among the other neotropical species of *Dryinus* since it has the following combination of characters: body predominantly black, except the mandible, clypeus, part of face and legs, testaceous; scape, pedicel, and part of the 1st flagellomere yellow-testaceous; pronotum red-testaceous. Head rugose, frontal line, and occipital carina incomplete. POL about twice as long as OPL, OL about twice as long as POL. Pronotum with many irregular carinae around the disc; mesoscutum reticulate-rugose; notauli absent. Fore wing with two dark transverse bands. Enlarged claw with one row with eight setae modified in lamellae and one subapical tooth.

Description. Holotype female (Figs. 1A–1E); fully winged, body length 7.0 mm. **Color.** Head predominantly black, except anterior part of face, mandible and clypeus testaceous; ventral region of head partly testaceous; antenna (Figs. 1A–1C) brown; scape, pedicel, and proximal part of 1st flagellomere yellow testaceous; flagellomeres 5–8 testaceous. Pronotum (Fig. 1D) red-testaceous; tibiae and tarsi testaceous, femora predominantly red, with some regions black; fore wing (Fig. 1A) with two dark transverse bands; rest of mesosoma (Figs. 1A, 1C) black; metasomal tergum I and II testaceous, last tergum black and with creamy yellow transversal bands (Fig. 1A). **Pubescence.** Face and gena (Figs. 1C–1D) with dense and short setae, vertex with sparse setae; pronotum (Fig. 1D) with dense and short setae on the posterior surface; mesoscutum (Fig. 1D) with sparse and short setae; mesoscutellum and metanotum (Fig. 1D) with fine, short, and sparse setae; legs (Fig. 1A) with fine setae; propodeum (Fig. 1A) with short and dense setae. **Integumental sculpture.** Head (Figs. 1B–1C) rugose, frontal line incomplete; occipital carina present only on the vertex (Fig. 1C); gena partially with many irregular carinae, pronotum with many irregular carinae around the disc (Fig. 1D); mesoscutum reticulate-rugose, notauli absent; mesoscutellum reticulate-rugose and with a straight groove on the anterior surface, metanotum rugose; mesopleura and metapleura rugose; and propodeum reticulate-rugose (Figs. 1A, 1D); the posterior surface of propodeum with two incomplete longitudinal carinae. **Structure and proportions.** Antennomeres in the following proportions: 23:8:45:20:15:13:11:9:9:13; ocellar ratio: OL= 11, POL= 6, OOL= 20, OPL= 3 and TL= 0. Fore wing with 2r-rs little smaller than 3Rs&4Rs (34:35); protarsomeres in the following proportions: 30:7:12:26:45; enlarged claw with a row of eight lamellae (Fig. 1E) and apex with a broad tooth; 5th protarsomere with two rows of 46 lamellae and many long setae (Fig. 1E); dorsal surface of the propodeum shorter than the posterior one (50: 65); tibial spurs 1/1/2.

Male. Unknown.

Host. Unknown.

Remarks. In the key to the females of the Neotropical *Dryinus* proposed by Olmi & Virla (2014), *Dryinus rogeriae nov. sp.* belongs to group 2, termed “ruficauda”, since its members have an enlarged claw (Figs. 1E, 2C) much longer than the arolium, with one subapical tooth

and absent notauli (Fig. 1D). In the identification key for the species of group 2, *D. rogeriae nov. sp.* is close to *D. tuparrensis* (Figs. 2A–2D) and they share features as a rugose head (Figs. 1B, 2B), occipital carina (Fig. 1C) present only in the vertex, mesosoma (Figs. 1A, 2A) predominantly black, mesoscutum (Fig. 1D) reticulate-rugose, notauli absent; propodeum with two incomplete longitudinal carinae in the posterior surface and metasoma with creamy yellow transversal bands. *D. rogeriae nov. sp.* differs from *D. tuparrensis* by the predominantly black head (Figs. 1A–1C) (vs. red-testaceous in *D. tuparrensis* (Figs. 2A–2B)); antenna with apical part of flagellomere 3 and 4–5 darkened (Fig. 1A) (vs. testaceous (Fig. 2B)); pronotum red-testaceous (Figs. 1A, 1D) (vs. predominantly black (Fig. 2A)); fore wing with two dark and complete transverse bands (Fig. 2A) (vs. with two basal bands very small (Fig. 1A)); metasoma with two first terga testaceous and others black with transverse yellow band (vs. black with transverse yellow bands (Fig. 1A)); frontal line incomplete (vs. frontal line complete); both species have a rugose head (Figs. 1B–1C, 2B–2C), occipital carina (Figs. 1C, 2B) present only in the vertex, notauli absent (Figs. 1D, 2B) and propodeum with two incomplete longitudinal carinae in the posterior surface.

Etymology. The species name is a feminine noun in the genitive case. It is a privilege to name this new species after Dr. Rogéria Inês Rosa Lara, entomologist at the Instituto Biológico, Ribeirão Preto, São Paulo, Brazil, for her friendship and dedication in the study of the Neotropical Neuroptera.

Distribution. Uruguay (Department of Rocha) (Fig. 5).

Type material. Holotype female, labeled “Uruguay, Rocha, Castillos \ Cardoso, campo natural / 34°05'26.8"S, 53°52'14.4"W \ arm. Malaise \ 26 / II / 2015 \ E. Castiglioni e eq., cols.” [MZUSP].

The key to females of neotropical *Dryinus* from group 2 “ruficauda” proposed by Olmi & Virla (2014) was modified to accommodate the new species described herein:

21. Head with vertex excavated; OL about twice as long as or shorter as POL 21a
 - Head with vertex plane, not excavated; OL as long as or slightly longer than POL 22
- 21a. Head (Figs. 2A–2B) red-testaceous; antenna (Figs. 2A–2B) with 1st flagellomere brown-testaceous; OL about twice as long as POL; pronotum black, except lateral margins testaceous; fore wing with two dark transversal bands, the basal being incomplete
..... *D. tuparrensis* Olmi
- Head (Fig. 1B) predominantly black, except anterior part of face, mandible, and clypeus, testaceous; antenna (Figs. 1A–1C) with part of 1st flagellomere yellow-testaceous; OL about twice as shorter as POL; pronotum red-testaceous; fore wing with two complete dark transversal bands *D. rogeriae nov. sp.*

***Dryinus bocainanus* (Olmi, 1987)**
(Figs. 3–5)

Alphadryinus bocainanus Olmi, 1987: 433. Female holotype. Brazil: São Paulo, Serra da Bocaina, São José do Barreiro (MCZ, examined through photographs).

Material examined. Holotype female: “Brasil: Serra da\ Bocaina, S. J. Barri-\ eirós, S.P. I-13-17-69 Porter, Garcia” “Holotypus\ *Aphadryinus\ bocainanus* n. sp.\ 1985 M. OLMI DET.” “MCZ TYPE\ Holotype\ 35964” [MZC]; 1 female: “Uruguay, Rocha, Castillos \ Don Bosco bosque-campo \ 34°05'1.07"S, 53°45'43.08"W \ arm. Malaise \ 29 / XII / 2015 \ E. Castiglioni e eq., cols.” [LRRP].

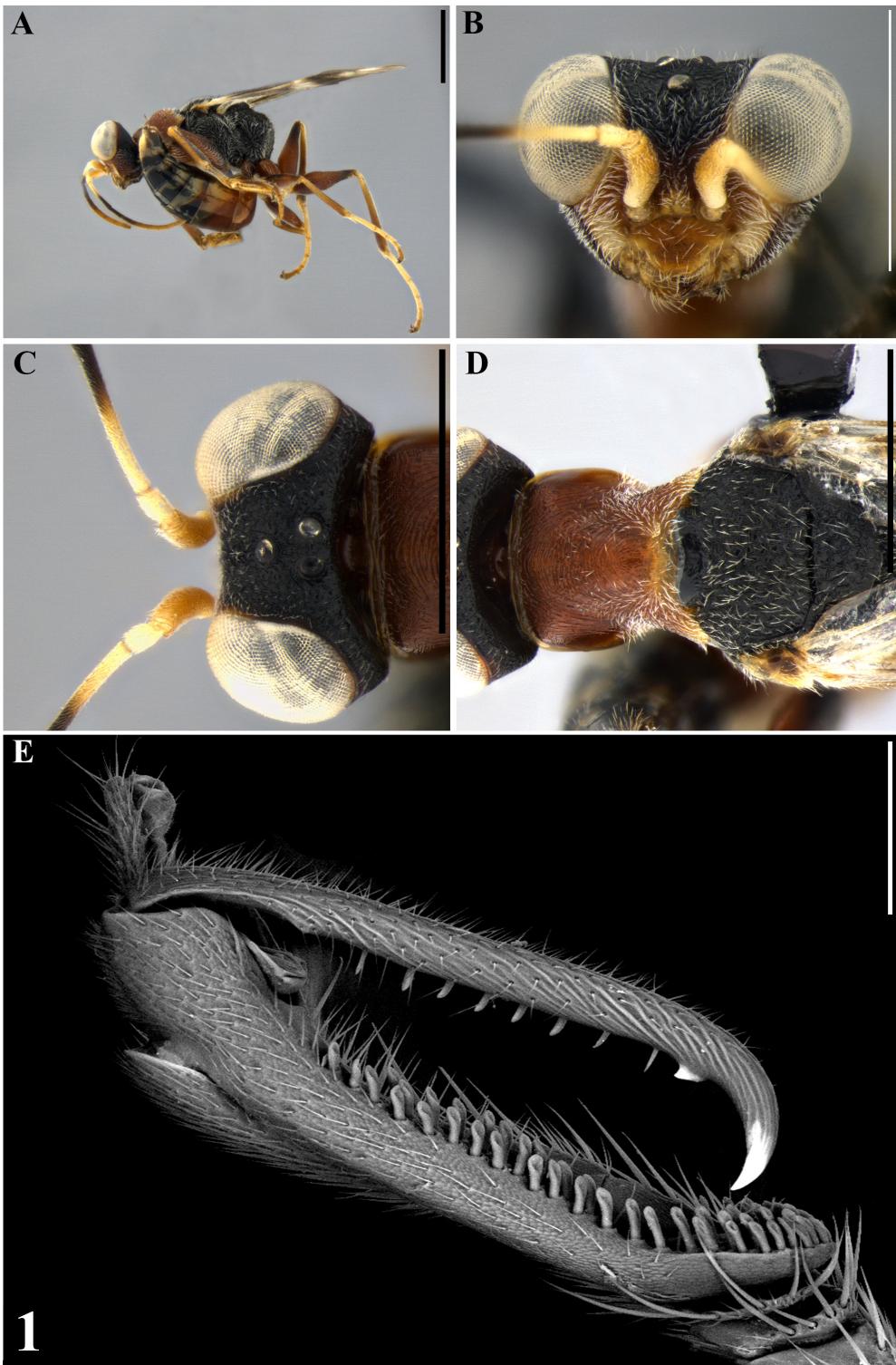


Figure 1. *Dryinus rogeriae* nov. sp., holotype. A. Habitus, lateral. B. Head, frontal. C. Head, dorsal. D. Part of mesosoma, dorsal. E. Chela. Scale bars: (A–D) 1.0 mm; (E) 0.2 mm. / *Dryinus rogeriae* sp. nov., holotipo. A. Habitus, lateral. B. Cabeza, frontal. C. Cabeza, dorsal. D. Parte del mesosoma, dorsal. E. Chela. Escalas: (A–D) 1,0 mm; (E) 0,2 mm.

Male. Unknown.

Host. Unknown.

Distribution. Brazil (São Paulo), Ecuador, Panama, Paraguay, and Uruguay (**new record**) (Fig. 5).

Comments. The studied specimen from Uruguay differs from the holotype in the following characters: head predominantly black (Figs. 4A–4C), except malar space and margin of eye testaceous; scape, pedicel and 1st flagellomere testaceous, other brown; mandible (Figs. 3A–3D) testaceous; pronotum (Figs. 4A, 4C–4D) testaceous, except black spot on anterior surface; mesosoma (Figs. 3A, 4A) testaceous, except lateral surface of mesoscutum (Fig. 3D), part of mesopleuron, and propodeum black (Fig. 4A); metasoma (Fig. 4A) testaceous, except distal part black. Body with fine and sparse pilosity. Head (Figs. 3B–3C) with frons finely rugose and vertex alveolate, frontal line (Figs. 2B–2C) incomplete. Occipital carina (Fig. 4C) present only behind ocelli, gena partially granulate; pronotum (Fig. 3C) alveolate; mesoscutum (Fig. 2D) granulate and alveolate; notauli incomplete in the different sculpture, reaching about 0.5–0.8X length of mesoscutum. Antennomeres in following proportions: 23:10:43:23:19:16:12:10:9:12. Ocellar ratio: OL= 10, POL= 18, OOL= 18, OPL= 0, and TL= 0. Fore leg with tarsomeres in following proportions: 30:5:8:35:58. Enlarged claw slightly shorter than protarsomere 5 (55:58). Chela (Fig. 2E) with enlarged claw with one row of about 15 setae modified in lamellae and apex with one broad lamella and 5th tarsomere with two rows of approximately 55 lamellae. Fore wing with 2r-rs shorter than 3Rs&4Rs (14:28). Propodeum with dorsal surface shorter than posterior surface (18:17).

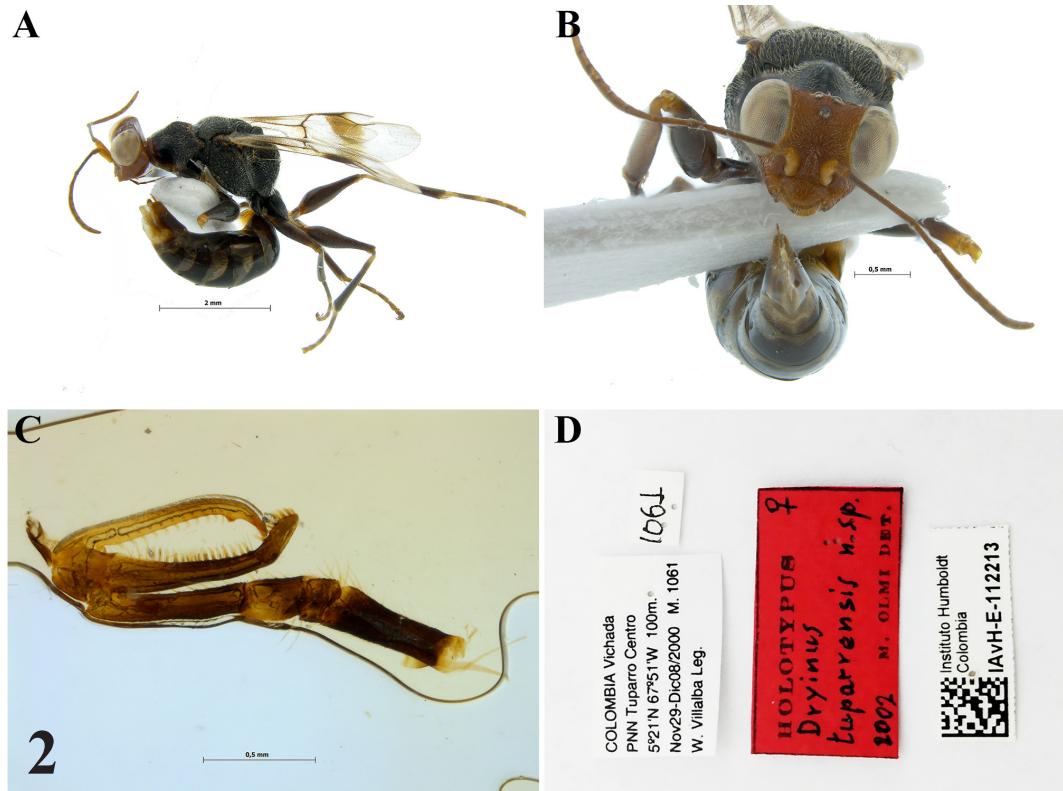


Figure 2. *Dryinus tuparrensis* Olmi, holotype. A. Habitus, lateral. B. Head, frontal. C. Chela. D. Holotype labels (IAvH-E-112213). / *Dryinus tuparrensis* Olmi, holotipo. A. Habitus, lateral. B. Cabeza, frontal. C. Chela. D. Etiquetas holotipo (IAvH-E-112213).



Figure 3. *Dryinus bocainanus* (Olmi), holotype. A. Habitus, lateral. B. Head, frontal. C. Mesosoma, lateral. D. Habitus, dorsal. E. Holotype labels (MCZ 35964). / *Dryinus bocainanus* (Olmi), holotipo. A. Habitus, lateral. B. Cabeza, frontal. C. Mesosoma, lateral. D. Habitus, dorsal. E. Etiquetas holotipo (MCZ 35964).

Discussion

No compilatory studies of the Uruguayan Dryinidae fauna exist to date, and the knowledge about the species that occur comes from sporadic studies like those of Olmi (1984, 1993, 1998), Olmi *et al.* (2000), and Olmi & Virla (2014).

For the first time, *Dryinus* has been recorded in Uruguay, a country in which only eight species in four genera of Dryinidae were recorded previously. Now, by this paper, ten species in five genera are reported. They certainly represent only a fraction of Uruguayan Dryinidae fauna. Like many other species of Dryinidae from the Neotropical region, nothing is known about the biology of *D. rogeriae nov. sp.*

With its vast geographical distribution throughout the Neotropics, *D. bocainanus* has been recorded in Panama, Ecuador, Brazil, and Paraguay (Olmi & Virla 2014). Here, for the first time, we document the presence of this species in Uruguay (Fig. 5).

These new records show the importance of carrying out faunistic research in areas where the entomofauna is little known. These studies provide basic information on local biodiversity, which is essential for the development of ecological and biogeographic research, conservationist policies, and biological control programs.

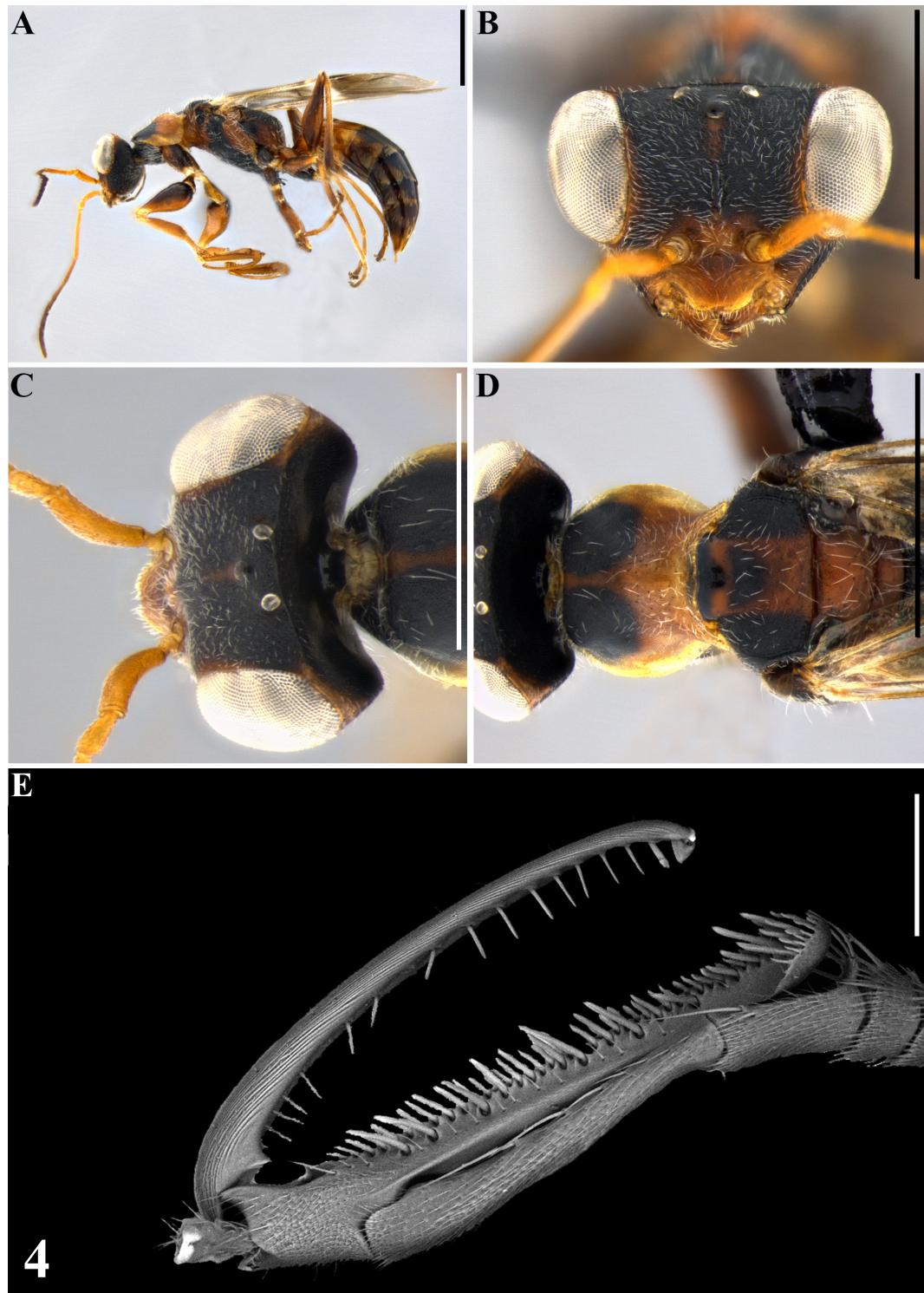


Figure 4. *Dryinus bocainanus* (Olmi) from Uruguay. A. Habitus, lateral. B. Head, frontal. C. Head, dorsal. D. Pronotum and part of mesosoma, dorsal. E. Chela. Scale bars: (A, E) 1.0 mm; (B-D) 0.5 mm.
/ *Dryinus bocainanus* (Olmi) de Uruguay. A. Habitus, lateral. B. Cabeza, frontal. C. Cabeza, dorsal. D. Pronoto y parte del mesosoma, dorsal. E. Chela. Escala: (A, E) 1,0 mm; (B-D) 0,5 mm.

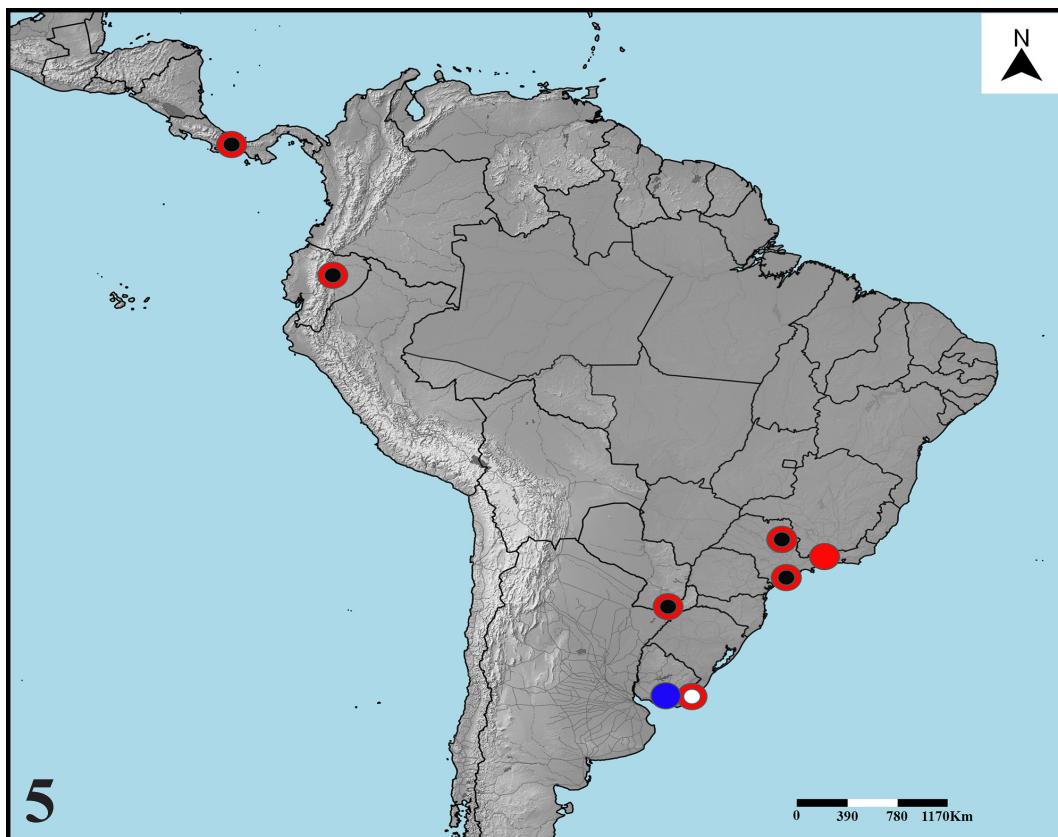


Figure 5. Geographic distribution of *Dryinus bocainanus* (Olmi) (red circle= type locality, red circle with black dot= known records, red circle with white dot= new record). *Dryinus rogeriae* nov. sp. (blue circle= type locality). / Distribución geográfica de *Dryinus bocainanus* (Olmi) (círculo rojo= localidad tipo, círculo rojo con punto negro= registros conocidos, círculo rojo con punto blanco = nuevo registro). *Dryinus rogeriae* sp. nov. (círculo azul= localidad tipo).

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