

Mecistogaster linearis (Fabricius) (Odonata: Coenagrionidae): First Record from Mato Grosso do Sul State, Brazil

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Abstract. Commonly called “helicopter damselflies”, *Mecistogaster* species (Coenagrionidae) are recognized by their large body size in comparison with other Odonata species, ability to flap both anterior and posterior wings in opposite directions, and preference for dense forest. These species feed on spiders and require trunks or plants that can accumulate water, like bromeliads, for laying eggs. This relationship with phytotelm environments makes the *Mecistogaster* species sensitive to forest fragmentation and habitat changes. In Brazil, there are records of seven species, mainly in Amazon forest regions. *Mecistogaster linearis* (Fabricius) has a wide distribution reported in the Brazilian states of Acre, Amazonas, Roraima, Pará, Rondônia, Mato Grosso, Rio de Janeiro, and São Paulo. Herein, we report the first record of *M. linearis* in the state of Mato Grosso do Sul with specimens sampled from the municipality of Corumbá, in the Pantanal.

Keywords: Damselflies; Distribution; Pantanal; Phytotelmata; Zygoptera.

Mecistogaster linearis (Fabricius) (Odonata: Coenagrionidae): Primeiro Registro para o Estado de Mato Grosso do Sul, Brasil

Resumo. Conhecidas como “libélulas helicóptero”, as espécies do gênero *Mecistogaster* (Coenagrionidae) são caracterizadas pelo grande tamanho quanto comparado as outras espécies de Odonata, pela habilidade de bater as duas asas anteriores e posteriores em sentidos opostos e preferência por habitats de interiores de matas. Estas se alimentam de aranhas e dependem principalmente de troncos de árvores ou plantas, como bromélias, capazes de acumular água para a postura dos ovos. A relação com ambientes de fitotelmata faz com que as espécies deste gênero sejam sensíveis a fragmentação florestal e a alterações em seu habitat. No Brasil há registros de sete espécies, com ocorrências principalmente em regiões de floresta amazônica. *Mecistogaster linearis* (Fabricius) tem uma ampla distribuição, sendo reportada, até então no país, para os estados do Acre, Amazonas, Roraima, Pará, Rondônia, Mato Grosso, Rio de Janeiro e São Paulo. Nesta comunicação, reportamos o primeiro registro desta espécie para o estado de Mato Grosso do Sul, Brasil, coligida no município de Corumbá, região do Pantanal.

Palavras-Chave: Distribuição; Fitotelmata; Libélulas; Pantanal; Zygoptera.

Mecistogaster is a genus characterized by its large-sized compared with other Odonata species (60 - 155 mm; GARRISON *et al.* 2010) and is commonly known as “helicopter damselflies” (HEDSTRÖM & SAHLÉN 2001). The species of this genus lay eggs in plants and feed mainly on spiders. This relationship with *phytotelm* environments makes the *Mecistogaster* species sensitive to forest fragmentation and habitat changes (SRIVASTAVA *et al.* 2004; FINCKE 2008), while such food preferences may result from the species’ ability to flap the forewings in one direction and the latter in another, which allows these damselflies to make reverse maneuvers (GARRISON *et al.* 2010). *Mecistogaster* species have exclusive morphological characteristics (GARRISON *et al.* 2010), such as a cell line between the CuA (Cubital anterior) and the edge of the wing; also, in males, the paraproct is vestigial. The wings are hyaline, long, and narrow; the pseudostigma can vary in shape and color. Commonly, *Mecistogaster* are sexually dimorphic in their abdomen size and pseudostigma shape. Male sieges are long, linear, and curved medially, and are ventrally angulated in some species; in females, the ovipositor does not exceed the end of sieges (GARRISON *et al.* 2010). The genus consists of 10 species, which are distributed across the New World (NEISS 2012; GARRISON & VON-ELLENRIEDER 2016). According to GARRISON *et al.* (2010), there are few studies of the *Mecistogaster* species and

there is significant potential for the discovery of new species due their preference for dense forests, where they lay their eggs in trunks, as *Mecistogaster jocaste* (Hagen), *Mecistogaster linearis* (Fabricius) and *Mecistogaster ornata* (Rambur), on bamboo stalks, as *Mecistogaster asticta* (Selys) and *Mecistogaster jocaste* (Hagen), or in leaves and bracts of plants as bromeliads that accumulate water, as *Mecistogaster modesta* (Selys). In Brazil, seven species were registered: *Mecistogaster amalia* Burmeister, *M. asticta*, *Mecistogaster buckleyi* McLachlan, *M. linearis*, *Mecistogaster lucretia* (Drury), *M. ornata* and *Mecistogaster pronoti* Sjöstedt (DALZOCCHIO *et al.* 2011). Within the genus, *M. asticta* and *M. pronoti* are in the IUCN Red List of threatened species (IUCN 2016), being classified as Vulnerable and Critically Endangered statuses, respectively.

M. linearis is considered an effective predator of web-builder spiders (PRICE *et al.* 2011) and has been reported in countries like Argentina, Bolivia, Colombia, Costa Rica, Ecuador, French Guyana, Guyana, Panamá, Peru, Suriname and Venezuela (HEDSTRÖM & SAHLÉN 2001; LENCIONI 2005). In Brazil, it has been identified in the states of Acre, Amazonas, Roraima, Pará, Rondônia, Mato Grosso, Rio de Janeiro and São Paulo (the last of which was cited by HECKMAN (2008) but without coordinates

or references for the sampling site) (HEDSTRÖM & SAHLÉN 2001; LENCIONI 2005; HECKMAN 2008; GBIF 2016).

We collected two male adults and one female adult of *M. linearis* in Corumbá, Mato Grosso do Sul state, Brazil, from two areas during a field trip on August 03, 2014 (19°16'43.96"S and 57°34'21.11"W, 194 m of altitude and 19°10'53.18"S and 57°37'42.29"W, 324 m of altitude). These sites are located in a region called "Morraria do Urucum" which lies in the surrounding part of the Pantanal plain. This region is comprised of deciduous and semi-deciduous forests, with seasonal floods with in the plains. All the specimens were identified as *M. linearis* (Figure 1), according to the characteristics indicated by HEDSTRÖM & SAHLÉN (2001) and LENCIONI (2005), like the dark brown body color with light or whitish marks; veined dark wings with a brown pseudostigma, and a single line on the latter wings; males have long upper appendages, which are shaped like forceps, dark in color with lighter areas, and abdomens of females that measure approximately two-thirds the size of male abdomens. Also, specimen photos were sent and their identification confirmed by Dr. Jürg De Marmels (Central University of Venezuela, Caracas, Venezuela). The three specimens were deposited in the Zoological Reference Collection of the Federal University of Mato Grosso do Sul (ZUFMS) in Campo Grande, Mato Grosso do Sul (in deposit) and this note is considered the first record of the species for this state.

In order to create the *M. linearis* distribution map in Brazil (Table 1, Figure 2), we used the registers published by HECKMAN (1998, 2008), LENCIONI (2005), MACHADO *et al.* (1991), NEISS (2012),

RAIMUNDO *et al.* (2003), MONTEIRO-JÚNIOR *et al.* (2014, 2015), as well as records deposited in the Global Biodiversity Information Facility data platform (GBIF 2016). Considering the presence of records without georeferenced coordinates and more than one sample site in the same municipality, these points were located in the center of the city mentioned on the specimen collection card.

The region where the specimens were collected still has large areas of preserved vegetation; it is considered a priority area for conservation due to the composition and richness of species (CONSERVATION INTERNATIONAL 1999). However, the region has high geo-economic value in the Paraguay River Basin as a result of the large reserves of iron and manganese. Consequently, increasing exploitation of these resources have caused a change in these environments, due to forest fragmentation and anthropic activities (PORFIRIO & BORDIGNON 2015). Given this, it is worth reiterating that *M. linearis* is a species that is sensitive to environmental changes and depends on adequate forest conditions to complete their reproductive cycle. The conservation of some of these areas is essential to preserve the species.

Considering the distance to the nearest collection point (about 470 km from Poconé, Mato Grosso state), the limited sampling area in the state of Mato Grosso do Sul (VIANNA & DE MARCO 2012) could have impacted the collection of this species, until now; this reality suggests that identifying and recording new species may still be possible, especially with several current projects about Odonata in this state (KOROIVA *et al.* 2016).

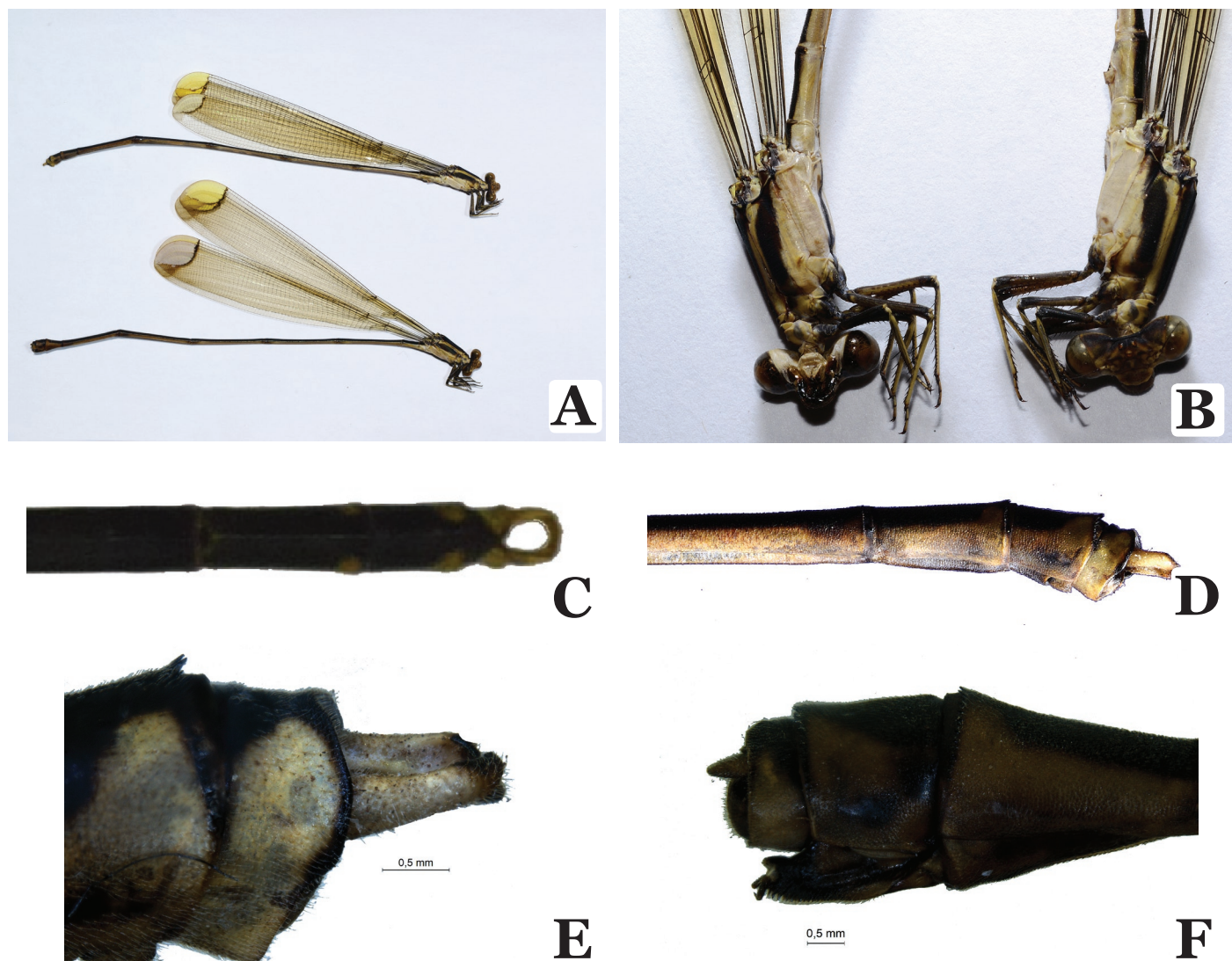


Figure 1. *Mecistogaster linearis* (Fabricius): (A) male (above) and female (below) specimens; (B) lateral overview of head and sinthorax of the male (right) and female (left) specimens; (C) male caudal appendages: dorsal view; (D) male caudal appendages: lateral view; (E) male lateral view; (F) female ovipositor: lateral view (author: RK).

Table 1. Geographic information for sampling sites and the reference for each register.

Sites	Latitude	Longitude	Reference
1 Barcelos, AM	0.873507	-63.4546	NEISS (2012)
2 Novo Airão, AM	-2.84567	-60.9158	NEISS (2012)
3 Presidente Figueiredo, AM	-2.06094	-59.8525	NEISS (2012)
4 Manaus, AM	-3.09512	-59.9877	NEISS (2012); MONTEIRO-JUNIOR <i>et al.</i> (2014); MONTEIRO-JUNIOR <i>et al.</i> (2015)
5 Poconé, MT	-16.0558	-56.6395	HECKMAN (1998)
6 Reserva Extrativista Alto Jurua, AC	-8.77974	-72.1202	RAIMUNDO <i>et al.</i> (2003)
7 Reserva Biológica Ilha de Maracá, RR	3.40354	-61.7008	MACHADO <i>et al.</i> (1991)
8 Rio Xingu Camp, Altamira, PA	-3.65	-52.37	GBIF (2016)
9 Ariquemes, RO	-9.90529	-63.0314	GBIF (2016)
10 Porto Velho, RO	-8.76146	-63.9013	GBIF (2016)
11 Rio de Janeiro, RJ	-22.907	-43.1817	GBIF (2016)
12 Jacaré, SP	-23.3036	-45.9757	LENCIONI (2005)

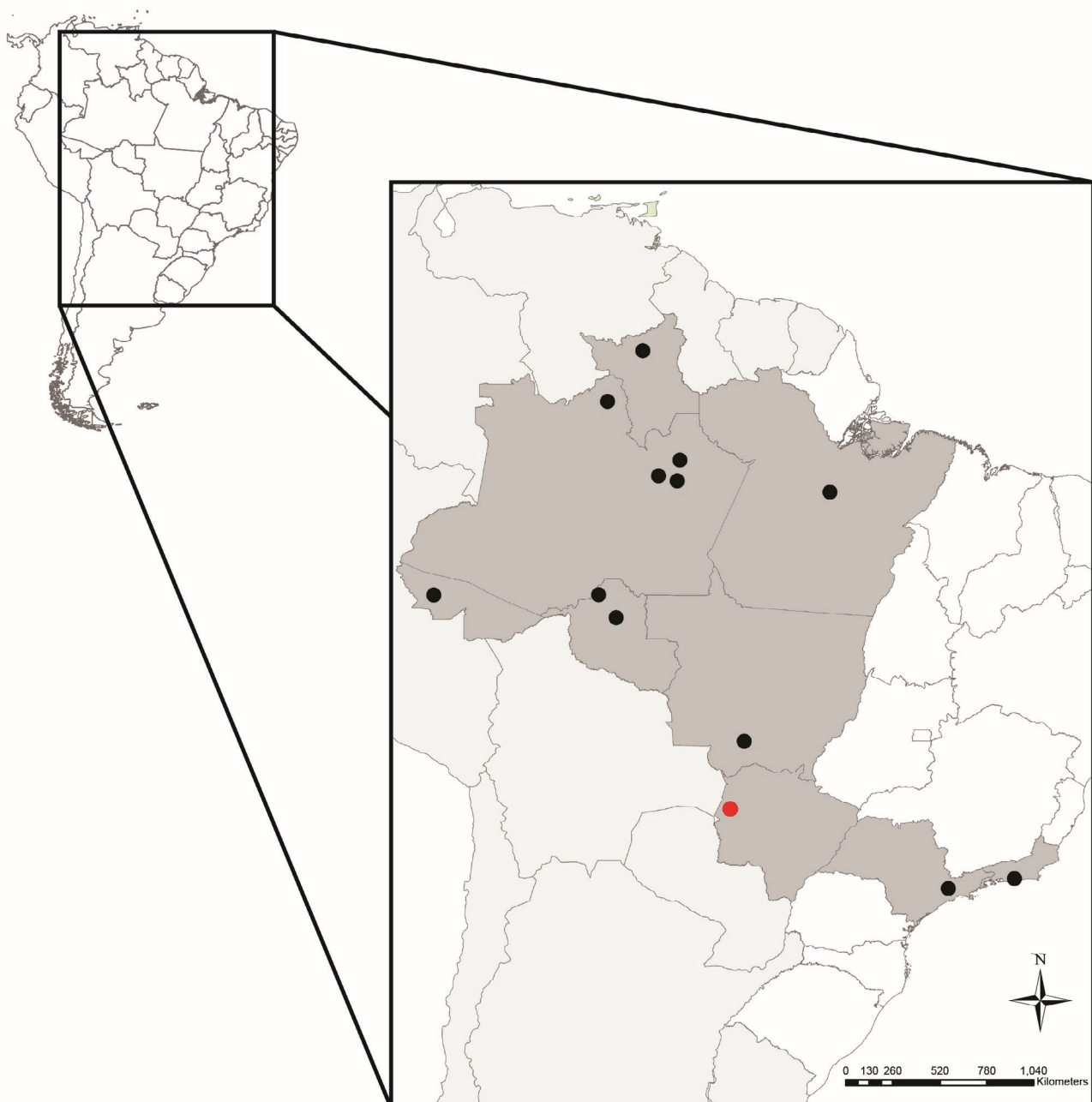


Figure 2. Map with the known distribution of *Mecistogaster linearis* (Fabricius) in Brazil, where black dots and dark-grey area represent previously known localities and Brazilian states with *M. linearis* registers (literature records), respectively, and the red point is the new record (author: RK).

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