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First record of *Prionopelta punctulata* Mayr, 1866 (Hymenoptera: Formicidae) from Brazilian Pantanal

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Abstract

We present the first record of the ant *Prionopelta punctulata* Mayr, 1866 (Formicidae: Amblyoponinae) for the Pantanal of Mato Grosso do Sul in the Aquidauana region, located in an area with a predominance of riparian forest and patches of wooded savanna. The registration of the species expands the distribution and contributes to the knowledge of the diversity of ants in the Pantanal.

Keywords: ant, distribution, cryptobiotic, wetland

Introduction

The Pantanal possesses 150,000 km² distributed in Brazilian territory, through the states of Mato Grosso (35%) and Mato Grosso do Sul (65%) (Lopes *et al.* 2017) [21]. This biome is the largest tropical wetland, being considered a priority area for biodiversity conservation (Junk *et al.* 2006, Alho & Silva 2012) [18,1]. Despite the importance of the biome, few studies focusing on the diversity and distribution patterns of insect species and other arthropods have been carried out in the Brazilian Pantanal. Recently, some advances related to the description of insects, mainly Hymenoptera, have been reported (Battirola *et al.* 2005, 2007, Aranda 2013, 2017, 2019a, b, 2021, Aranda *et al.* 2016, Aranda & Aoki 2018, Aranda & Ie 2019) [11, 12, 3, 6, 2, 5, 4, 9, 7, 8].

Ants possess a high number of described species (~ 13,910), distributed in 17 subfamilies and 338 genera, being recognized 13 subfamilies, 142 genera, and approximately 3,000 species in the neotropical region (Baccaro *et al.* 2015, Bolton 2021) [10,14]. Even with extensive taxonomic and ecological studies, there are gaps in knowledge about ants from subsampled areas, among them Pantanal. The insufficient number of ant inventories puts at risk the conservation of ants biodiversity (Divieso *et al.* 2020) [15]. Besides, most studies with ants are related to the analysis of epigaeic, arboreal, and canopy ants, while the subterranean species, due to the limitations of collection methods, are under-sampled. (Berghoff *et al.* 2003, Jacquemin *et al.* 2012) [13, 17]. So far, the study of Lange *et al*. (2008) [20] was the only one to verify the variation in the composition of the fauna of underground ants in “capões” (vegetation islands in the middle of flooded fields) in the Pantanal of Mato Grosso do Sul.

Amblyoponinae (Hymenoptera: Formicidae) possesses a global distribution with 13 genera, being two of which found in Brazil (Baccaro *et al.* 2015) [10]. The genera *Prionopelta* possesses a pantropical distribution with around 25 described species, with eight species occurring in the Neotropical region: *P. amabilis* Borgmeier, 1949, *P. antillana* Forel, 1909, *P. dubia* Ladino & Feitosa, 2020 [19], *P. menininha* Ladino & Feitosa, 2020, *P. minuta* Ladino & Feitosa, 2020 [19], *P. modesta* Forel, 1909, *P. punctulata* Mayr, 1866 e *P. tapatia* Ladino & Feitosa, 2020 [19] (Ladino & Feitosa 2020, Bolton 2021) [19,14].

Considering that few studies are focusing on the pattern of distribution of insect species in the Pantanal, the objective of the study is to report and to expand the distribution of *Prionopelta punctulata* Mayr, 1866 to the Pantanal of Mato Grosso do Sul, contributing to the knowledge of the diversity of ants in the Pantanal.

Material and Methods

The collection of *P. punctulata* Mayr, 1866 was carried out in the Pantanal of Aquidauana, Mato Grosso do Sul (collection authorization No. 61938-3 ICMBio - MMA). The region is characterized by typical Brazilian savanna vegetation (Cerrado), ranging from wooded Cerrado to open fields and the presence of riparian forest along the rivers (Fig. 1). The specimen collection was performed on December 12th (2020) using a Winkler extractor. In the field, the top layer of litter was removed and excluded for soil collection, and approximately 1 kg of soil was collected from various locations in an area of approximately 5 m^2, being stored in cloth bags and taken to the camp. Samples were collected at five points in the riparian region and five in a higher area with a predominance of Cerrado, with an average distance of 20 m each point within the same type of vegetation. The soil samples remained in the Winkler Extractor for a period of 24 h. Following the screening of soil, the captured specimens were kept in 70% ethanol.

Results

A single *P. punctulata* Mayr, 1866 worker was collected at a single point in the riparian region of the Aquidauana River (Fig. 2), which expands the distribution of the species to the

Pantanal region. The species is characterized by the following morphological characters: eleven antennomeres, lateral part of the frons sculpted superficially, clipeus medially projected and margins of the subpeciolar process apically converging (Ladino & Feitosa 2020) [19]. The individual of *P. punctulata* was identified through specific literature and confirmed by Natalia Ladino (Ladino and Feitosa 2020) [19] and deposited in the Zoological Reference Collection of the Federal University of Mato Grosso do Sul (ZUFMS-HYM03835).

Prionopelta punctulata Mayr, 1866 is mainly known from litter samples collected in tropical forests; reported at elevations of 170-876m (Ladino & Feitosa 2020)[19]. While Neotropical *Prionopelta* species range from the central portion of USA state of Florida, the Caribbean Islands and Mexico to northwestern Argentina, *P. punctulata* Mayr, 1866 is distributed from northern Brazil to northwestern Argentina (Ladino & Feitosa 2020) [19].

In the state of Mato Grosso do Sul, a single register of *P. punctulata* Mayr, 1866 in the region of the Serra da Bodoquena National Park was noticed. The region is characterized by presenting areas that vary from 350 to 800 m, more commonly between 400 and 600 meters in altitude, native vegetation of sub-mountainous deciduous and semideciduous seasonal forest in most of its extension, being the last remnant of this type of forest vegetation in the Brazilian central-west region (Pott & Pott 2003, Facincani *et al.* 2006) [21, 16].

Despite the proximity of Serra da Bodoquena and Pantanal, around 100 km to the southern portion of the Bodoquena National Park, there are marked differences in relief and vegetation features between the areas. While the Serra da Bodoquena is located on the high altitude plateau, the Pantanal is a plain with about 120 m of altitude with periodic flooding regimes and vegetation mosaics, with greater influence from the Cerrado climate.

Fig 1: Characterization of riparian vegetation along the Aquidauana River in the Brazilian Pantanal where soil collections were carried out and the specimen of *Prionopelta punctulata* Mayr, 1866, was sampled

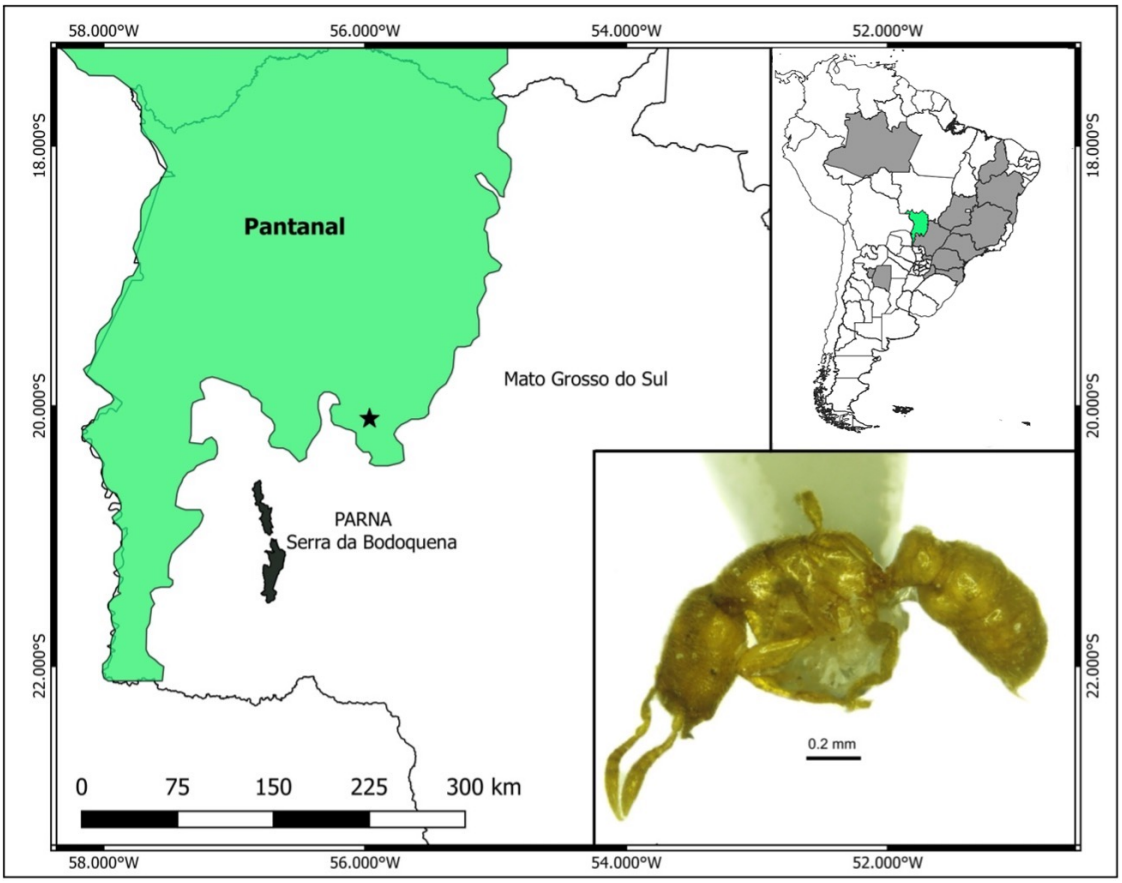

Fig 2: Geographic distribution of *Prionopelta punctulata* Mayr, 1866 in South America with previous registration in the National Park (PARNA) Serra da Bodoquena and the expansion of distribution in the Pantanal of Mato Grosso do Sul (★new record).

Conclusion

To summarize, a new record of *Prionopelta punctulata* Mayr, 1866 expands its distribution to the Pantanal of Mato Grosso do Sul, contributing to the knowledge of the species. In addition, advances in studies on the distribution pattern of ant species help to understand the environmental dynamics,

allowing studies with ants to monitor and characterize the environment based on the presence or absence of bioindicator species.

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