

Current Knowledge of the Social Wasps (Hymenoptera: Vespidae) in the State of Piauí, Brazil

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Abstract. New records of social wasps in the State of Piauí are presented, contributing to an increased knowledge of this group in this poorly studied region. This study documents new occurrence records for 12 social wasp species and extends their distribution.

Keywords: Caatinga; Distribution; Inventory; Northeast Region; Polistinae.

Atualização do Conhecimento Sobre Vespas Sociais (Hymenoptera: Vespidae) no Estado do Piauí, Brasil

Resumo. São apresentados novos registros da fauna de vespas sociais em localidades do Piauí, contribuindo para o aumento do conhecimento desse grupo de organismos na região. Este estudo registra a ocorrência de 12 novos registros de vespas sociais, ampliando suas distribuições.

Palavras-chave: Caatinga; Distribuição; Inventário; Região Nordeste; Polistinae.

Many areas of Brazil lack the most basic biodiversity studies, particularly in the case of invertebrates. In order to develop any effective conservation proposals, it is first of all necessary to acquire knowledge of the species that occur in a particular area (MELO *et al.* 2005). This taxonomic baseline is obtained by conducting biodiversity inventories.

In Brazil the wasp family Vespidae is represented by the subfamily Polistinae, which has 21 described genera and more than 300 species (CARPENTER & MARQUES 2001; SILVEIRA 2010). According to CARPENTER (1993) this subfamily has three tribes in Brazil: Mischocyttarini (made up of the genus *Mischocyttarus*), Polistini (consisting of the genus *Polistes*) and Epiponini (with 19 genera) (CARPENTER 2004). Wasps are ideal models for studying the evolution of social behavior, as different species of this family exhibit varying degrees of sociality, from solitary to eusocial species. This diversity in sociality means that wasps can be studied to develop an understanding of key issues about the evolution of social behavior (Itô 1993).

The State of Piauí is one of the least studied Brazilian States. Among the areas defined by the Ministry of the Environment, the municipalities of Canto do Buriti and São João do Piauí were examples of those with insufficient knowledge. Canto do Buriti and Serra das Confusões/ Parque Nacional da Serra da Capivara complex were considered priority areas for research (MMA 2002). There is a clear need to conduct more comprehensive inventories that can contribute to increasing knowledge of this group of insects and support future studies of behavior and biology. The aim of this study was to provide new information on the occurrence of social wasps in parts of the State of Piauí.

Data were collected from two municipalities in Piauí: Dom Expedito Lopes and Canto do Buriti (Figure 1).

The municipality of Dom Expedito Lopes is located 288 km from Teresina, in the southeastern corner of Piauí and Canto do Buriti is located in the southwest, 405 km from the capital (IBGE 2014a, b). Wasp inventories were conducted as part of the activities of the Grupo de Estudo do Ecótono Caatinga-Cerrado (GEECACE) and the research project "Entomofauna of Priority Areas for Conservation of the State of Piauí," funded by Fundação de Amparo à Pesquisa do Estado do Piauí (FAPEPI N. 20203.0822/2009). In Dom Expedito Lopes, the inventories took place in a property of the Água Mineral Manaira company (6°56'32"S, 41°41'46"W) and in Canto do Buriti the inventory took place in properties located 8 km from the town center (08°09'63"S, 042°55'50"W). All data were collected in the dry season. Surveys were conducted in October 2009 in Dom Expedito Lopes (14th, 15th, 16th and 17th) and in October 2010 (10th, 11th and 12th) in Canto do Buriti. Each area was inspected from 6:00 A.M. to 6:00 P.M. by two collectors. Collectors captured insects in flight or on the vegetation, using entomological nets and vials containing ethyl acetate. In Canto do Buriti two collectors searched for nests during two days using the Active Search Method along trails in the vegetation. Nests were collected using protective beekeeper clothing.

The collected insects were mounted, labeled and deposited in the Invertebrate Collection of the Museu Paraense Emílio Goeldi (MPEG).

One hundred and eighty seven individuals of social wasps belonging to 12 species in six genera were collected: *Agelaia*, *Brachygastra*, *Polistes*, *Polybia*, *Protonectarina* and *Protopolybia* (Table 1).

Of these, *Polistes canadensis canadensis* (Linnaeus),

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Figure 1. Landscape of the study area in the state of Piauí: Canto do Buriti – Piauí (Picture: A. A. Rocha).

Table 1. Diversity of Social Wasps (Hymenoptera, Vespidae) at two sites in the State of Piauí, Brazil.

| Tribe | Specie | Locality | |
|-----------|--|----------|------|
| | | DEL* | CB** |
| Polistini | <i>Polistes canadensis canadensis</i> (Linnaeus) | F | - |
| | <i>Polistes</i> (group) <i>canadensis</i> sp. | F | - |
| Epiponini | <i>Agelaia pallipes</i> (Olivier) | F | F |
| | <i>Brachygastra lecheguana</i> (Latreille) | F | N |
| | <i>Polybia ignobilis</i> (Haliday) | F | F |
| | <i>Polybia</i> (group) <i>occidentalis</i> sp. 1 | F | F, N |
| | <i>Polybia</i> (group) <i>occidentalis</i> sp. 2 | F | - |
| | <i>Polybia paulista</i> (Ihering) | F | - |
| | <i>Polybia ruficeps xanthops</i> Richards | F | - |
| | <i>Polybia sericea</i> (Olivier) | F | F, N |
| | <i>Protonectarina sylveirae</i> (Saussure) | - | F |
| | <i>Protopolybia exigua</i> (Saussure) | F | F, N |

* Dom Expedito Lopes - PI ** Canto do Buriti - PI (F): Collected in flight or on vegetation, (N): Collected in the nest.

Brachygastra lecheguana (Latreille), *Polybia ignobilis* (Haliday), *Polybia paulista* (Ihering) and *Polybia sericea* (Olivier) are widely distributed across Brazil and throughout the northeast region (RICHARDS 1978; ANDENA & CARPENTER 2014). *Agelaia pallipes* (Olivier), *Protonectarina sylveirae* (Saussure) and *Protopolybia exigua* (Saussure) are widely distributed across Brazil, but have only been recorded from two northeast States: Bahia and Ceará (RICHARDS 1978; ANDENA & CARPENTER 2014). *Polybia ruficeps xanthops* Richards has been recorded in the States of Mato Grosso, Minas Gerais, Ceará, Bahia and Rio Grande do Norte (RICHARDS 1978; ANDENA & CARPENTER 2014). This species has also recently been recorded from the State of São Paulo (GOMES & NOLL 2009; TANAKA-JUNIOR & NOLL 2011).

RICHARDS (1978) recorded the occurrence of *Polybia depressa* (Ducke) and *Synoeca virginea* (Fabricius) in Piauí. More recently ANDENA & CARPENTER (2014) added another two species to those recorded from Piauí: *Apoica pallens* (Fabricius) and

Brachygastra scutellaris (Fabricius). According to these authors social wasps represent 3% of the fauna in northeastern Brazil.

Considering the insects collected, both in flight and on the vegetation in Dom Expedito Lopes, a total of 102 individuals were recorded, distributed among 11 species and five genera. In Canto do Buriti, 85 individuals were recorded, distributed among six species and four genera.

During the study period a total of twenty one social wasp nests were located in Canto do Buriti, 14 of which were active. These active nests belonged to four species of which three (*B. lecheguana*, *Polybia* (group) *occidentalis* sp. 1 and *P. sericea*) have phragmocytarus nests i.e. the nest is fully secured to the substrate without the presence of stems. *P. exigua* has stelocytarus calyptodomous nests which are stalked with numerous combs (RICHARDS & RICHARDS 1951) (Figure 2).



Figure 2. Nests of social wasps collected in Canto do Buriti – Piauí: A) *Protopolybia exigua* (Saussure) on a leaf of *Ziziphus joazeiro* Mart. (Rhamnaceae); B) *Protopolybia exigua* (Saussure) on a leaf of *Musa* sp. (Musaceae); C) *Polybia* (group) *occidentalis* sp. 1 on a fence post; D) *Polybia* (group) *occidentalis* sp. 1 in *Cereus jamacaru* DC (Cactaceae); E) *Brachygastra lecheguana* (Latreille). (Picture: A. A. Rocha).

This study presents new occurrences of 12 social wasp species in Piauí. Our findings extend the species distributions and increase the number of species recorded in Piauí to 16. This increase may be an indication that the richness is probably higher in the regions studied and that Piauí may well contain a number of additional (as yet unrecorded) social wasp species. More comprehensive studies are needed in order to increase the knowledge of wasp species in Piauí, contributing to increased knowledge of the diversity in northeastern Brazil.

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