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Article

Geographic range extension to Minas Gerais, Brazil, for Social wasps (Hymenoptera: Vespidae: Polistinae)

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Abstract

In this study, *Mischocyttarus iheringi*, *Polybia liliacea* and *Polybia lugubris* were recorded for the first time in Minas Gerais state, with a brief diagnosis of species.

Additional key words: Distribution; urban fragment; Atlantic forest; Southeastern Brazil

Introducción

Social wasps of the subfamily Polistinae have remarkable importance in the ecosystems as predators of herbivore insects, pollinators and indicators of conservation (Prezoto *et al.* 2008, Elisei *et al.* 2010, Souza *et al.* 2010; Clemente *et al.* 2012, Barbosa *et al.* 2014). These wasps build nests with great structural variety (Jeanne 1975, Wenzel 1998) with one or multiple combs and covered, or not, by a protective envelope; these features has taxonomic importance in species identification (Wenzel 1998, Carpenter and Andena 2013).

Researches about the social wasps fauna have increased, although the Brazilian biomes are few investigated, in addition, currently the number of conservation areas have decreased and local and global extinctions rate increased, fact that reinforce the need of studies about the biodiversity in Brazil (Souza and Zanuncio 2012, Barbosa *et al.* 2016a, Maciel *et al.* 2016).

In this context, urban fragments, that according Maciel and Barbosa (2015) are modification of the original vegetation (e.g. town squares, parks, urban forests, wastelands, botanic gardens), have received attention from the scientific community to animal conservation, because are considered potential "refuges areas" and resource survival to the biodiversity (Frankie *et al.* 2009; Ernstson *et al.* 2010). Therefore, this study aims to reporting the extention of geographic range of three species of social wasps to Minas Gerais state, Brazil.

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Materials and Methods

The wasps were sampled with the use of entomological nets and bait traps in area of Semideciduous Seasonal Mountain Forest (IBGE 2012) at Jardim Botânico da Universidade Federal de Juiz de Fora (21°43'28" S – 43°16'47"W/ 800 m above the sea level), in Juiz de Fora, southeastern Minas Gerais State, Brazil, between 2011-2014, a. state. According Köppen-Geiger classification, this site has warm subtropical climate, with a dry cold season and a wet warm one (Cwa) (Sá-Júnior *et al.* 2012). The area, with its 84 hectares of extension, situated in the urban perimeter, was recently classified by Santiago *et al.* (2014) as a complex of richness, diversity and floristic heterogeneity of the arboreal vegetation, with endangered species and predominance of pioneer plants, and a considerable presence of exotic species (Figures 1-3).

For identification of the captured exemplars was used the dichotomous keys proposed by Richard (1978) and Silveira (2008) and consulted the previous studies on diversity carried out in Minas Gerais in order to validate the new distribution records (Barbosa *et al.* 2016a, Maciel *et al.* 2016).

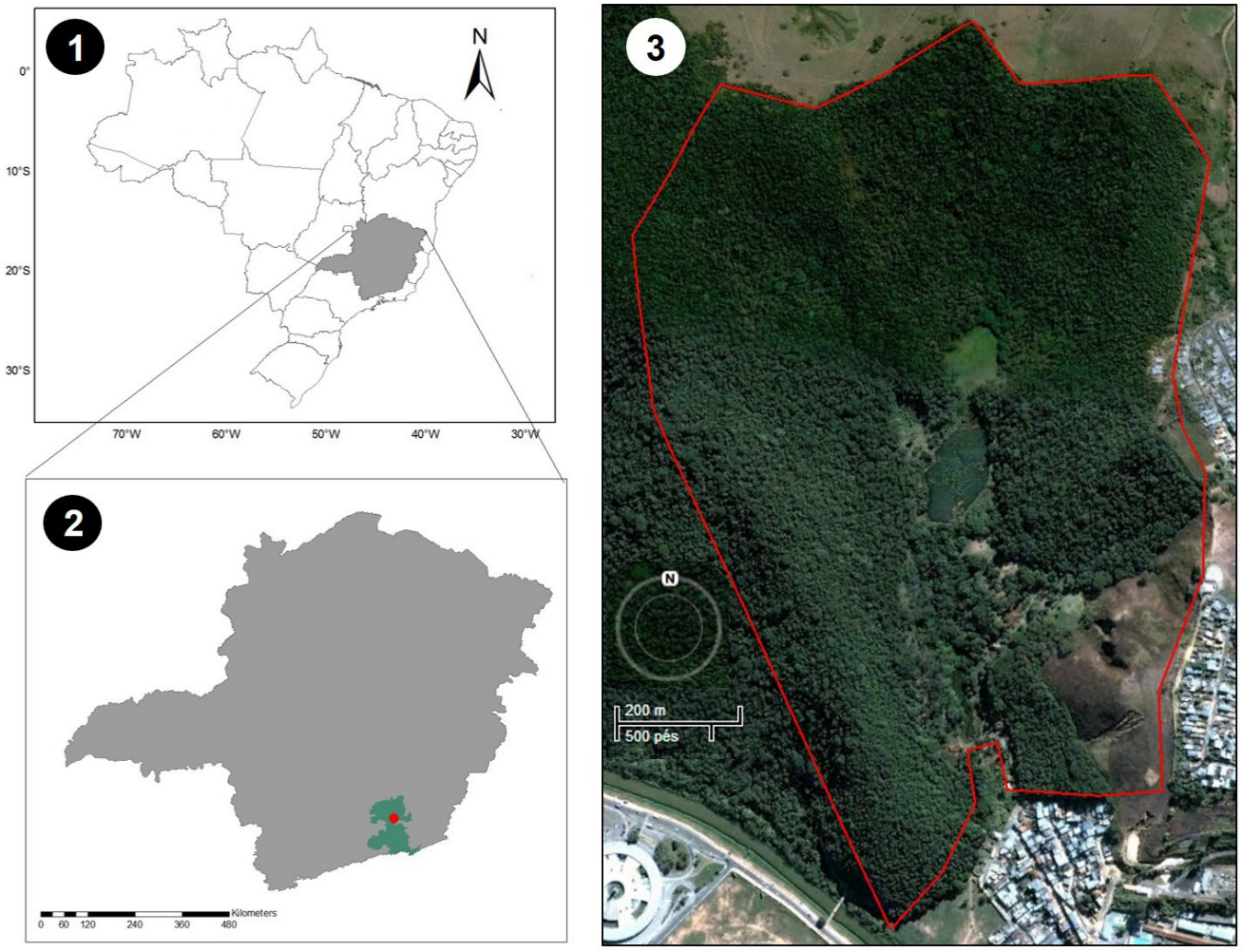


Figure 1-3. Localization of occurrence: 1 - Brazil; 2 – Minas Gerais states; 3 – Jardim Botânico da Universidade Federal de Juiz de Fora.

Results and Discussion

Mischocyttarus iheringi Zikán, 1935 (Figures 4 – 7)

Diagnosis: female, body length 13,5-16 mm; forewing length 10,5-11,5 mm, with wings hyaline, venation light yellow-brown. Individuals are characterized by the presence of a clypeus in a round or slightly downward-pointed shape, wide gena, mandibles yellow or with yellow marks, dark brown gaster, pronotum without fovea and with a moderately elevated anterior margin preceded by a groove, and a slightly widened and long first abdominal tergite (Richards 1978). Males were not observed. Colonies can be found mainly on rocks, trees, orchids and bromeliads and are inconspicuous (Richards 1978, Wenzel 1998, Barbosa *et al*. 2016b).
New record: Brazil (Minas Gerais).
Other records: Brazil (Rio de Janeiro) (Figure 16).

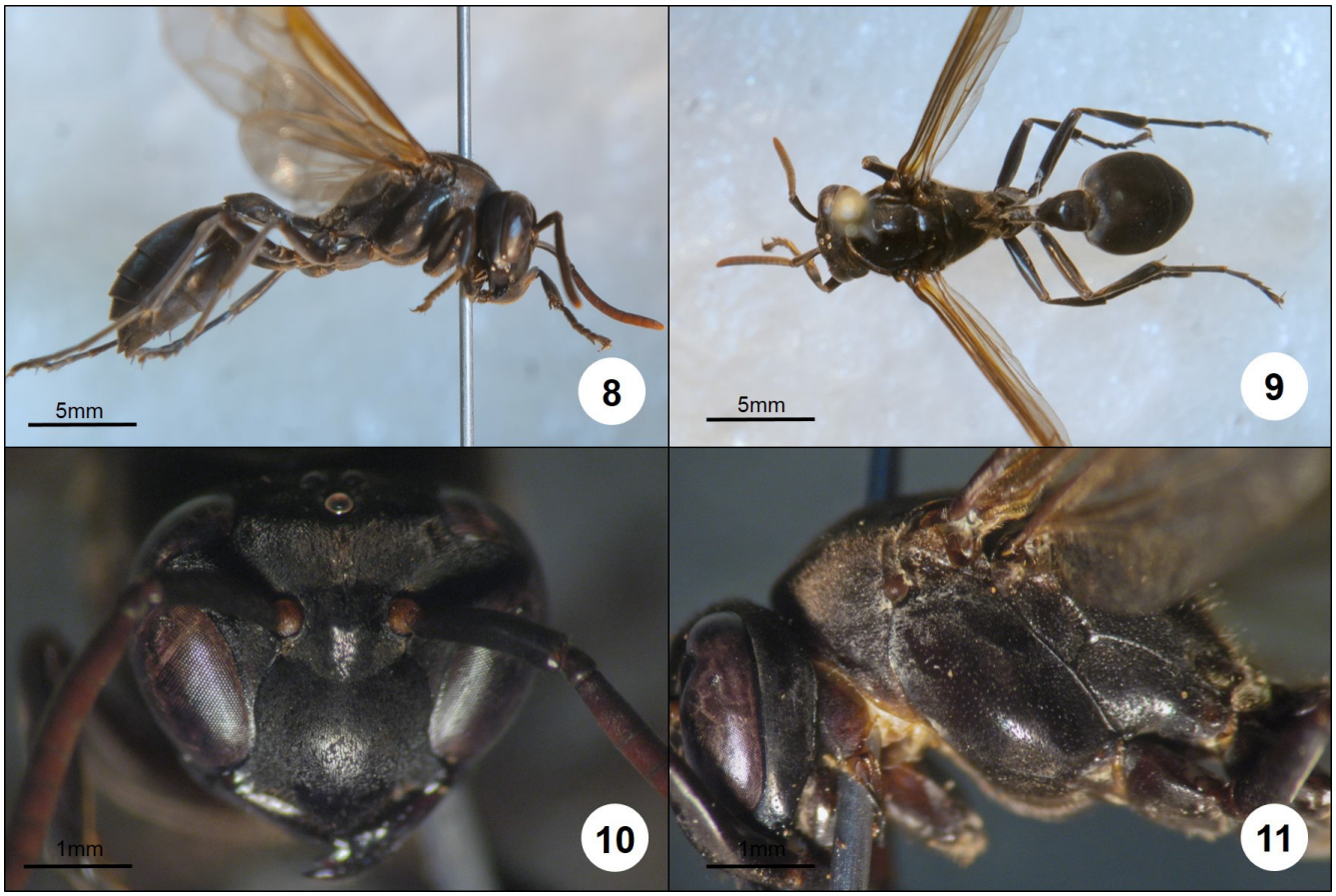
Polybia lugubris Ducke, 1905 (Figures 8 – 11)

Diagnosis: female**,** body length 15-17 mm and forewing length 13-15 mm. Individuals are characterized by the presence of a clearly narrow clypeus that reaches up to its eyes, being yellow in color. The gena is narrow, having neither margins nor spots, or sometimes only slightly visible spots. The abdominal sternum is flattened. The face has silver setae (Richards 1978). Males are unknown.
New record: Brazil (Minas Gerais).
Other records: Brazil (Espírito Santo, Rio de Janeiro, Paraná, Santa Catarina, São Paulo and Rio Grande do Sul) (Figure 16).

Polybia liliacea Fabricius, 1804 (Figures 12 – 15)

Diagnosis: female, body length 15-17 mm; forewing length 13-15 mm. Individuals are characterized by metasomal tergum I, sideways, going up abruptly after receiving the propodeum muscle; propodeum angles

Figures 4-7. *Mischocyttarus iheringi*, 4. lateral view; 5. dorsal view; 6. head in frontal view; 7. part of head and mesosoma, in lateral view.



Figures 8-11. *Polybia lugubris,* 8. lateral view; 9. dorsal view; 10. head in frontal view; 11. part of head and mesosoma, in lateral view.

without streaking; yellow apical bands always present in all metasomal tergum. Petiole with the back without growing abruptly. Males are unknown.

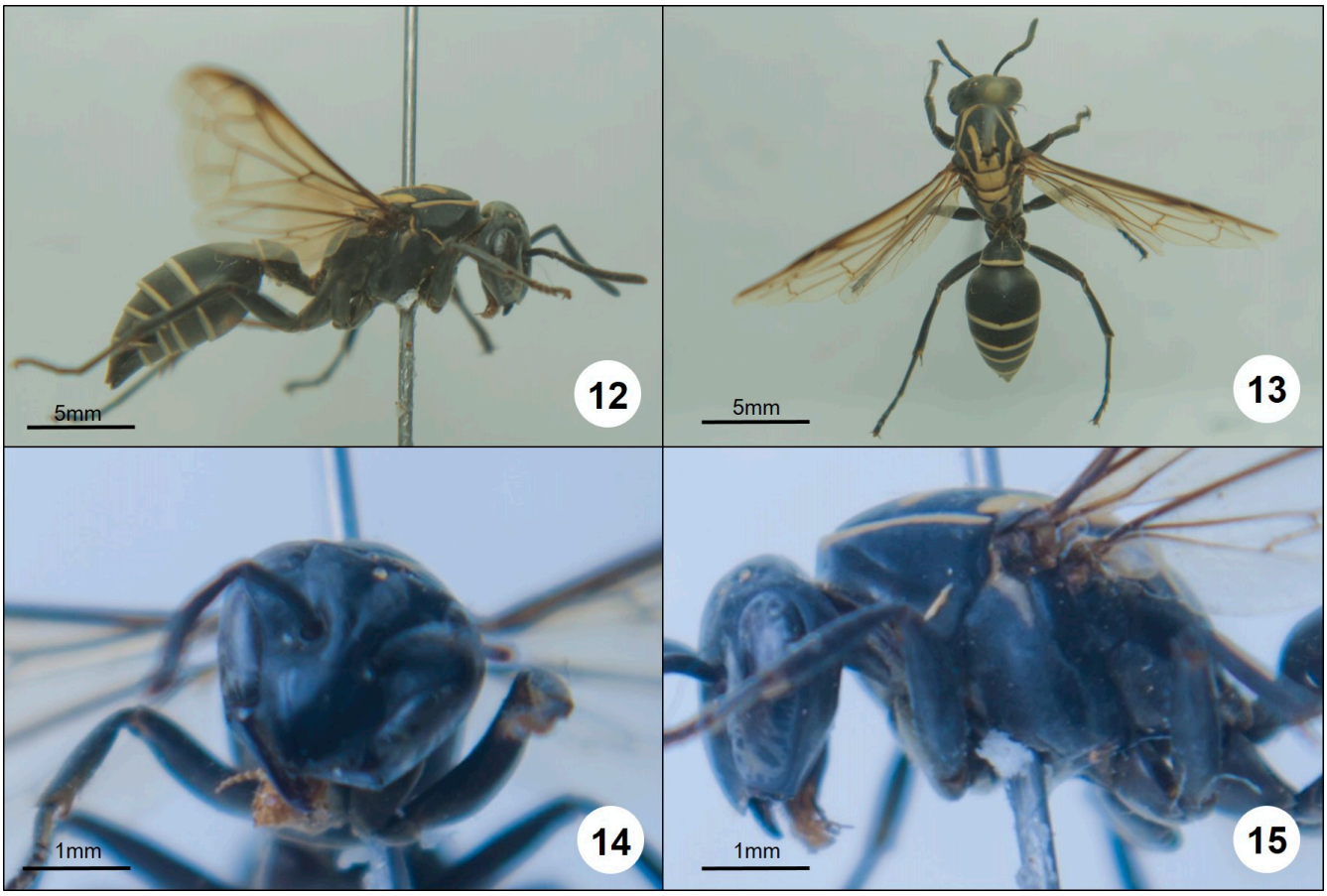
New record: Brazil (Minas Gerais)

Other records: Bolivia, Colombia, Ecuador, French Guiana, Guyana, Surinam, Panama, Peru, Venezuela, Brazil (Acre, Amapá, Amazonas, Goiás, Maranhão, Mato Grosso, Pará, Rondônia and São Paulo) (Figure 16).

Mischocyttarus Saussurre (1853) (Polistinae: Mischocyttarini) is distributed in Central and South America with at least one species in the Nearctic region. It is the largest genus among social wasps with 245 species included in nine subgenera (Richards 1978, Silveira 2008, Carpenter and Andena 2013). Richard (1978) has examined *M. iheringi* specimens collected in the Parque Nacional do Itatiaia in 1949, state of Rio de Janeiro, but this species was never recollected. The present report concerns its recent collection from state of Minas Gerais. This is a very cryptic scarce species (Barbosa *et al.* 2016b), with limited distribution to the Atlantic Forest of southeastern Brazil, in the mountainous region, with more than 800 m altitude.

The *Polybia* Lepeletier, 1836 is the largest genus in the Epiponini tribe, with 59 species described in 11 subgenera, and is distributed from México to Argentina. In Brazil there are 45 species, four of which being endemic. Its colonies present many superimposed combs covered by a protective envelope (Richards 1978, Carpenter and Day 1988, Carpenter *et al.* 2000); the genus is also known for associating with other animals (Menezes *et al.* 2014, Virginio *et al.* 2015).

The current occurrence of *P. lugubris* limited in the states southern and southeastern Brazil and, Richard (1978) reports its in the states of Espírito Santo, Rio de Janeiro, Paraná, Santa Catarina, São Paulo and Rio Grande do Sul in which the latter state Kohler and Lemes (2014) also reports its occurrence. The distribution of the species, until the moment, is restricted to the Atlantic Forest of southern and southeastern Brazil, a region with lower temperatures than other regions of the country.



Figures 12-15. *Polybia liliacea*, 12. lateral view; 13. dorsal view; 14. head in frontal view; 15. part of head and mesosoma, in lateral view.

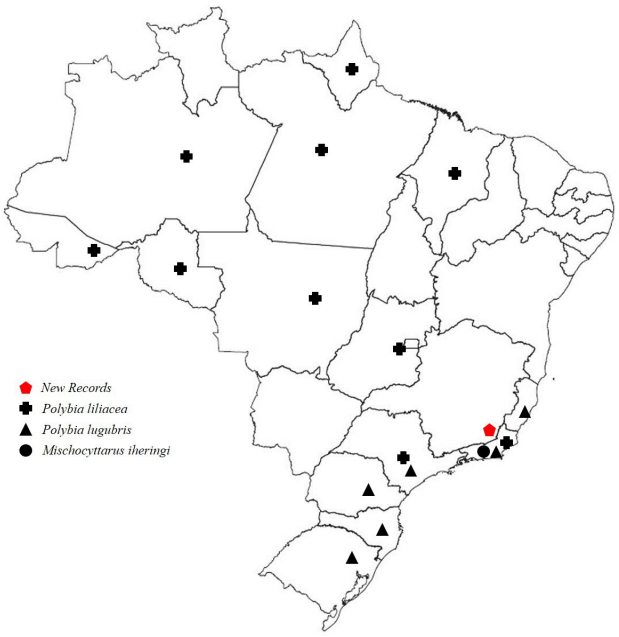


Figure 16. Map with the distribution of *Mischocyttarus iheringi*, *Polybia liliacea* and *Polybia lugubris* in Brazil. Red simbols indicate the new records of geographic extention.

Polybia liliacea occurs in the northern states and the Midwest of the continent and in southeastern Brazil (Richard, 1978, Diniz and Kitayama, 1998, Silveira 2002, Silva and Silveira 2009, Silveira *et al.* 2012, Somavilla 2012, Somavilla *et al.* 2014a, Somavilla *et al.* 2014b, Somavilla *et al.* 2015). Its presence is associated with Amazon, Cerrado and Atlantic Forest biomes.

These new records and rediscovery, with detailed data improve the knowledge on the social wasps in Brazil, and demonstrates the importance of urban fragments as refuges for biodiversity conservation. The new data includes three new Minas Gerais records, and all previous data were limited to the original descriptions of Richard (1978).

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