


## Scientific Note

# First record of *Heimbra bicolor* Subba Rao, 1978 (Hymenoptera, Eurytomidae) in São Paulo state, Brazil

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**Abstract.** *Heimbra bicolor* Subba Rao, 1978 (Hymenoptera, Eurytomidae) was previously known in Mexico, Argentina, Paraguay, and Brazil, with records in Federal District and Rio Grande do Norte, Minas Gerais, and Santa Catarina states. Here, we newly report this species from the state of São Paulo based on three females collected at Estação Ecológica de Jataí, in the municipality of Luiz Antônio, São Paulo state, Brazil. Additionally, we provide a map with the geographical distribution of the species based on the new record and literature. This record increases the number of species of *Heimbra* known in São Paulo state to two species.

**Keywords:** distributional range expansion, Chalcidoidea, Estação Ecológica de Jataí, parasitic wasp.

Heimbrinae (Hymenoptera, Chalcidoidea, Eurytomidae) as presently understood comprises two genera: *Symbra* Stage & Snelling, 1986 with two species, and *Heimbra* Cameron, 1909, with six species (Stage & Snelling 1986; Noyes 2019).

Most species of *Heimbra* have a neotropical distribution, except for *H. opaca*, which extends further north reaching central and west regions of the USA (Stage & Snelling 1986; Fernandes et al. 2012; Noyes 2019; Periato & Lara 2020).

*Heimbra* is poorly represented in entomological collections (Fernandes et al. 2012), and includes *H. acuticollis* Cameron, 1909, *H. opaca* (Ashmead, 1894), *H. bicolor* Subba Rao, 1978, *H. nigra* Subba Rao, 1978, *H. pallida* Stage & Snelling, 1986 and *H. parallela* Stage & Snelling, 1986 (Stage & Snelling 1986).

Until now, three species of *Heimbra* were known in Brazil, including *H. bicolor* for the Federal District and Rio Grande do Norte, Minas Gerais and Santa Catarina states; *H. opaca* for the Federal District and Goiás state, and *H. parallela* for Goiás, Minas Gerais, São Paulo and Paraná states (Stage & Snelling 1986; Fernandes et al. 2012; Noyes 2019; Periato & Lara 2020). Such records allow us to associate *H. bicolor* with Caatinga, Atlantic Rainforest and Brazilian savannah biomes; *H. parallela* with Atlantic Rainforest and Brazilian savannah biomes, and *H. opaca* with Brazilian savannah biome.

Stage & Snelling (1986) stated that species of *Heimbra* seem to have a preference for xeric environments, which is not confirmed for *H. bicolor* and *H. parallela*, which also occur in wetter environments such as the Atlantic Rainforest (Stage & Snelling 1986; Fernandes et al. 2012). The new distribution record of *H. bicolor* in a riparian forest such as the one presented here is important for a better understanding of the real distribution of this parasitic wasp.

The specimens reported here were collected with Malaise traps in a riparian forest adjacent to the Mogi-Guaçu River at Estação Ecológica de Jataí (EEJ).

The EEJ has about 9,000 ha, is located in the municipality of Luiz Antônio, São Paulo state, Brazil, and it includes habitats like the dry mesophytic semideciduous forest and the Brazilian savannah (Kronka et al. 2005), remnants of *Eucalyptus* sp. and *Pinus* sp. cultivars, and aquatic habitats located near Mogi-Guaçu River. The climate is Köpen AW type (tropical with wet summers and dry winters) and the total annual rainfall of 1,433 mm is concentrated between November and April (Cavalheiro et al. 1990). The sampling protocol used at EEJ is

detailed in Versuti et al. (2014).

The studied material was composed of three specimens of *H. bicolor* deposited at Coleção Entomológica do Laboratório de Sistemática e Bioecologia de Predadores e Parasitoides of the Instituto Biológico (LRRP), in Ribeirão Preto, São Paulo state, Brazil (N.W. Periato, curator).

The studied specimens were identified through the identification key provided by Stage & Snelling (1986). The consistency of anatomical data with the Hymenoptera Anatomy Ontology project (Yoder et al. 2010; Selmann et al. 2012) was determined using the proofing tool available through the Hymenoptera Glossary (HAO 2019). The details on body sculpture follows Harris (1979).

The images were taken using a digital camera Leica MC170 HD attached to a stereomicroscope Leica M205C APO and specimens illuminated with high diffuse dome illumination Leica LED5000 HDI. The images were combined by using the software Helicon Focus (version 5.3) and the figures were prepared using the software Adobe Photoshop (version 11.0).

The provided map with the geographical distribution of *H. bicolor* was generated with the Google MyMaps tool available at <https://www.google.com.br/maps> and is based on the literature data and the new record.

The information on the labels of the specimens examined was transcribed in the section of examined material as follows: the symbol backslash ( \ ) indicates the different lines on the label and two quotation marks ( " " ) indicate different labels on the same specimen.

### *Heimbra bicolor* Subba Rao, 1978

Figs. 1-2

**New record.** Luiz Antônio, São Paulo state, Brazil (Fig. 2).

**Examined material.** "Brasil / SP / Luiz Antônio \ Estação Ecológica de Jataí \ 21°37'23.7"S / 47°48'27.8 W \ mata ciliar - arm. Malaise \ 4 / I / 2007 \ N.W. Periato e eq., cols.", "*Heimbra bicolor* \ Subba Rao, 1978 \ N.W. Periato, det., 2021", "LRRP # 22572" 1 female; same data except 19 / XII / 2007 and 26 / XI / 2008, 2 females (LRRP # 22579 and # 22607, respectively).

**Identification.** According to Stage & Snelling (1986), *H. bicolor* (Fig. 1) can be distinguished from all other known species of the genus by presenting the following set of combined characters: body generally black except by the pronotum with conspicuous bright orange-red

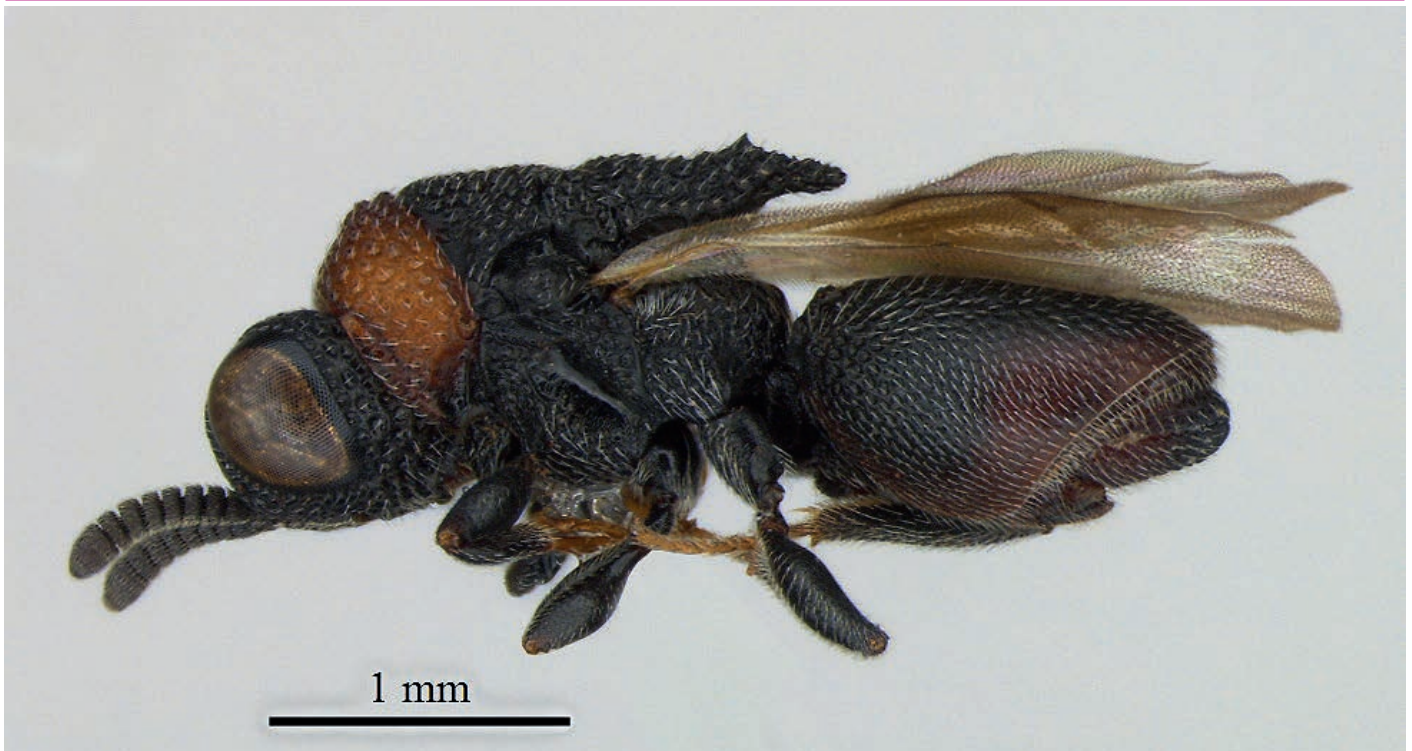


Figure 1. *Heimbra bicolor* Subba Rao, 1978 (Hymenoptera, Eurytomidae), habitus.

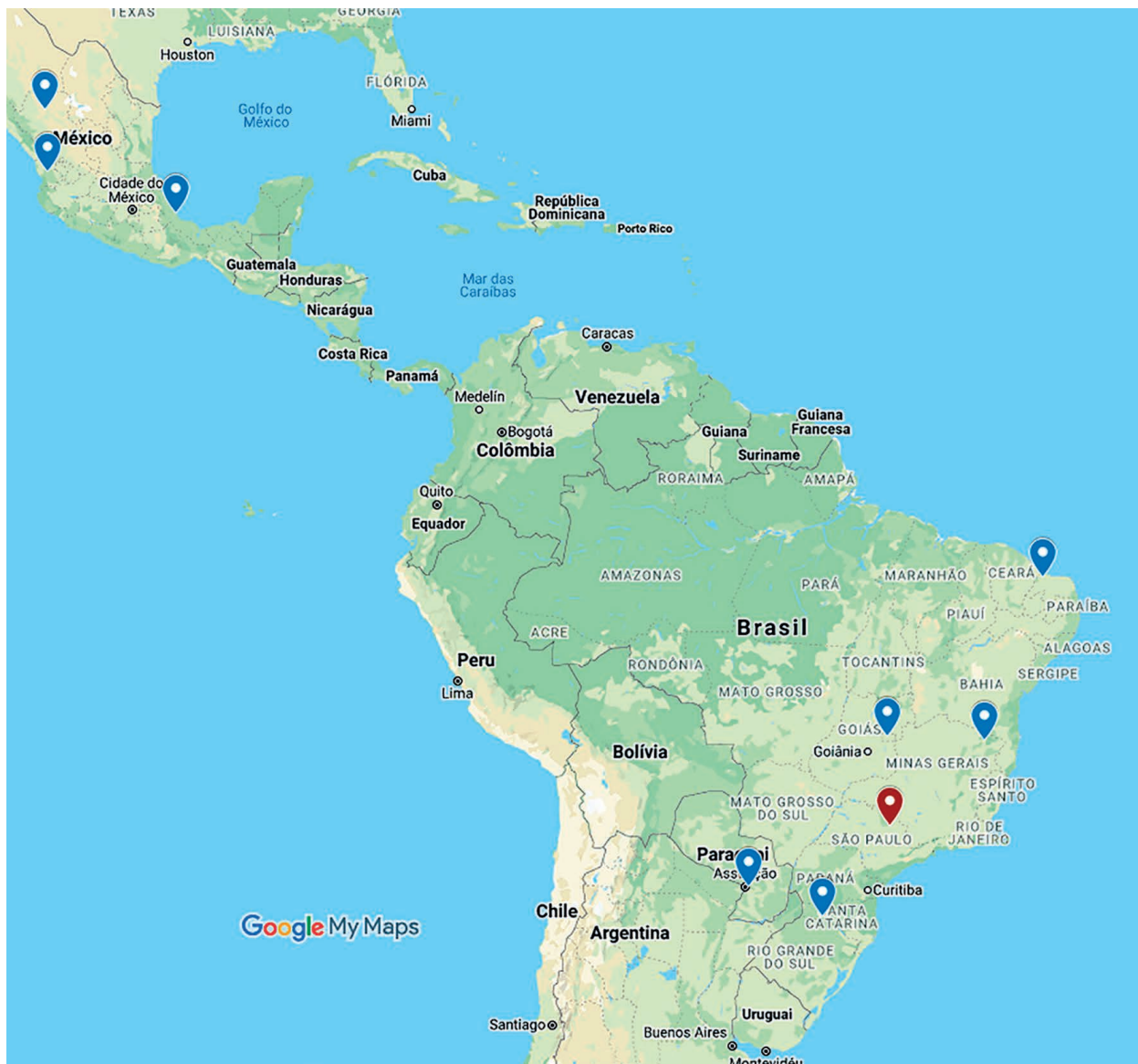


Figure 2. Geographic distribution of *Heimbra bicolor* Subba Rao, 1978 (Hymenoptera, Eurytomidae) (blue dots= known records, red dot= new record).

coloration; punctures on head and mesosoma with inner surface smooth; mesopleuron contiguously punctate, appearing dull along posterior margin and, tergum 6+7 of females with a transverse groove.

**Discussion.** The previous records of *H. bicolor* presented in Figure 2 were obtained from Stage & Snelling (1986) and Fernandes et al. (2012). The new record shows that *H. bicolor* has a broad distribution in Brazil and indicates that this species is capable of developing in both tropical/humid and xeric/dry biomes, as the Atlantic Rainforest, Brazilian savannah, and Caatinga. Only three specimens of *H. bicolor* were sampled, only in the rainy season, despite the great sampling effort employed in the collections carried out at the EEJ (4380 trap-days with Malaise trap, 1690 trap-days with Moericke trap and, 624 trap-days with light trap). The reasons that lead to this small catch rate are unknown and factors such as their development in small populations and/or the low efficiency of the traps used should be taken into account. Such facts may explain the small number of specimens of *Heimbra* deposited in entomological collections and reinforce the idea that long-term fauna sampling is a good collection methodology for some rare groups of Hymenoptera.

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## Authors' Contributions

N.W.P. and R.I.R.L. planned the sample design, performed the collections, and contributed with the writing, preparation of distribution maps, edition and revision of the final manuscript. N.W.P. identified the Eurytomidae.

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