

SCIENTIFIC NOTE

Biogeographic Notes on Rare Species of Euglossina (Hymenoptera: Apidae: Apini) Occurring in the Brazilian Atlantic Rain Forest

ANDRÉ NEMÉSIO AND FERNANDO A. SILVEIRA

Lab. Sistemática e Ecologia de Abelhas, Depto. Zoologia, ICB – Universidade Federal de Minas Gerais, C. postal 486, Belo Horizonte, MG, 30123-970, e-mail: nemesio@ornitologia.com.br

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Notas Biogeográficas Sobre Espécies Raras de Euglossina (Hymenoptera: Apidae: Apini) que Ocorrem na Mata Atlântica Brasileira

RESUMO - Indivíduos de espécies de Euglossina, raras nas coleções entomológicas, têm sido coletados recentemente. O significado desses exemplares para o conhecimento da biogeografia e estado de conservação de espécies raras dessa subtribo é discutido. Em especial, são apresentados dois novos registros para Minas Gerais, que ampliam significativamente a distribuição geográfica conhecida das espécies que representam: um macho de *Eufriesea aeneiventris* (Mocsáry), cujo último registro datava de 1943, coletado em isca de salicilato de metila no Parque Estadual do Rio Doce e um macho de *Eulaema seabrai* Moure, coletado em flor na área urbana de Sabará. Este é, também, o primeiro registro desta espécie para o estado de Minas Gerais.

PALAVRAS-CHAVE: Insecta, abelha, conservação, *Eufriesea aeneiventris*, *Eulaema seabrai*

ABSTRACT - The significance of specimens of rare species of Euglossina collected recently is discussed in terms of elucidating their biogeography and conservation status. Particularly, two new records are presented for the state of Minas Gerais, which considerably increase the known geographic range of the species they represent. These are a male of *Eufriesea aeneiventris* (Mocsáry), last recorded in 1943, which was attracted to methyl salicylate at the Parque Estadual do Rio Doce, and a male of *Eulaema seabrai* collected on flowers in the urban area of Sabará. This is also the first record for this species in the state.

KEY WORDS: Insecta, conservation, *Eufriesea aeneiventris*, *Eulaema seabrai*, bee

Sampling of euglossine bees has changed spectacularly since the late 1960's, when aromatic compounds that attract their males were discovered, artificially synthesized and, after that, employed as lures in the field (e.g. Dodson *et al.* 1969). Males of some species, however, are not attracted to any known aromatic compound, e.g., *Euglossa* (*Euglossella*) *mandibularis* Friese, *Eulaema* (*Eulaema*) *seabrai* Moure. Moreover, other species, in spite of being attracted to chemical baits, have not been collected in the last few decades in the Brazilian Atlantic Forest. Most of them belong to the genus *Eufriesea* (see Peruquetti *et al.* 1999:108-109). For these reasons, the geographic distributions and biologies of those species are poorly known.

Here, recent records of some rare species and their implications on understanding their biogeographic patterns and conservation status are discussed. The first occurrence of *El. seabrai* for the state of Minas Gerais and the rediscovery of *Ef. aeneiventris*, after 56 years (91 years for the state), are also reported.

***Eufriesea aeneiventris* (Mocsáry, 1896).** This is a medium sized (ca. 16 mm), poorly known, metallic greenish-purple

bee, first collected in Espírito Santo state in 1896 (Moure 1976). The last two records of this species involves one specimen collected at Mar de Espanha, Minas Gerais state, in 1908 (Kimsey 1982 – as *aeniventris*, Peruquetti *et al.* 1999) and another one captured at Juquiá, São Paulo state, in 1943 (Moure 1976), both well before the discovery of the aromatic compounds used to attract male euglossine bees. The known geographic distribution of the species is restricted to the states of Minas Gerais, Espírito Santo, Rio de Janeiro, and São Paulo.

A male of *Ef. aeneiventris* was collected by one of us (AN) in 03 October 1999, during a survey of the euglossine fauna of the Parque Estadual do Rio Doce (PERD), in the municipality of Marliéria, Minas Gerais state, southeastern Brazil. This record for the species is the most distant from the Atlantic coast (Fig. 1). This specimen is deposited at the Entomological Collection of the Department of Zoology of the Universidade Federal de Minas Gerais. The PERD is the largest reserve of the Brazilian Atlantic Forest in the state of Minas Gerais, encompassing an area of 35,973 ha, of which,

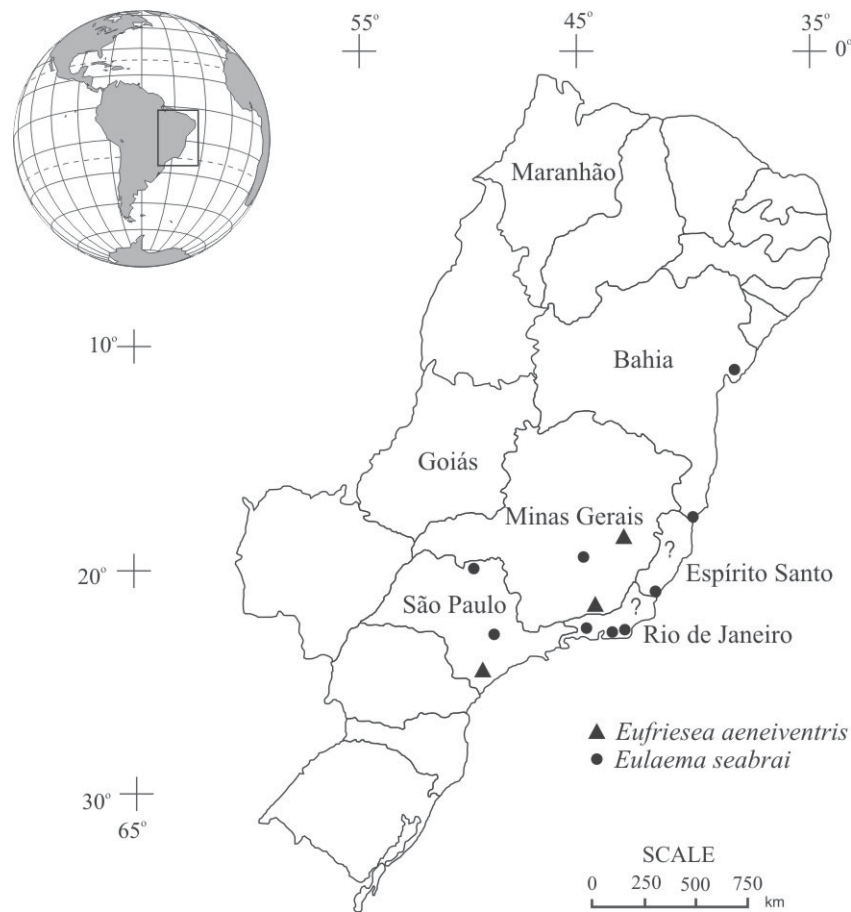


Figure 1. Geographic distributions of *Eufriesea aeneiventris* and *Eulaema seabrai*. *Ef. aeneiventris* also occurs in the states indicated by a question mark, but the exact locations where individuals were collected are not known.

3,000 ha are covered by pristine forest (Andrade *et al.* 1997). During the study, six sites were sampled at different distances from the edge of the forest. The male of *Ef. aeneiventris* was attracted to methyl salicylate, at approximately 1000 hours at the edge of the forest (19°39'04"S; 42°35'05"W; elevation: ca. 300 m). The fact that only a single specimen was collected during the 10 consecutive months of sampling suggests that this species is rare in that region.

***Eulaema seabrai* Moure, 1960.** This is a large (ca. 25 mm) and hairy bee (Moure 1960). It occurs only in the Brazilian Atlantic Rain Forest, from São Paulo state, northward to Bahia (Oliveira 2000).

In 10 March 2003, a male *El. seabrai* was collected on flowers of a cultivated specimen of *Gloxinia* sp. (Gesneriaceae), in the municipality of Sabará (19°53'51"S, 43°47'31"W; elevation: ca. 800 m), which is adjacent to the city of Belo Horizonte. This specimen is deposited at the Entomological Collection of the Department of Zoology of the Universidade Federal de Minas Gerais. This is the first record of the species in Minas Gerais state and suggests, as already pointed out by Oliveira (2000), that it occupies all the semideciduous Atlantic Forest that spreads over the interior of the states of Minas Gerais and São Paulo (Fig. 1).

Other authors (Dressler 1979, Kimsey & Dressler 1986) had

included *El. tenuifasciata* (Friese) (= *El. mimetica* Moure, according to Oliveira 2000), *El. luteola* Moure, and *El. bennetti* Moure as subspecies of *El. seabrai*. Thus considered, this species would be distributed from Central America to São Paulo and southern Goiás states, Brazil. This fact led Dressler (1979) to suggest that "this species may have reached southern coastal Brazil not through Bahia and Espírito Santo, but through Mato Grosso and Goiás". Oliveira (2000: 66), however, regarded the specimen captured in Goiás (a male collected in 1935 in Campinas, now part of the city of Goiânia) as a new species of *Eulaema*, not so closely related to *El. seabrai* and *El. tenuifasciata*, which probably are sister species.

The geographic distribution of *El. seabrai*, as now understood, and the phylogenetic hypothesis by Oliveira (2000) suggest that the ancestor of *El. seabrai* and *El. tenuifasciata* was once spread through the Amazonian Basin and the Atlantic Forest domain. Thus, contrary to what Dressler (1979) hypothesized, *El. seabrai* probably did not reach southern coastal Brazil but originated there.

Since the region of Belo Horizonte is just on the western limits of the Atlantic Forest and given that *El. seabrai* was collected inside the urban area of Sabará (in a home garden), it seems that this species is tolerant to open and/or disturbed habitats.

Bees of the genus *Eufriesea* are highly seasonal, occurring during only 2-3 months per year, generally in the wet season. They also seem to occur in small populations or, at least are poorly attracted to aromatic baits compared to species in the genera *Euglossa* and *Eulaema* (e.g. Bonilla-Gomez 1999, Peruquetti *et al.* 1999, Tonhasca Jr. *et al.* 2002). For this reason, their absence in recent surveys, as pointed out by Peruquetti *et al.* (1999), may be a mere consequence of the fact that there has been little systematic sampling of the euglossine fauna of the Atlantic Forest. All the recent information available on the euglossine bees in this biome comes from the surveys of nine sites in forest remnants spread over the 700,000 km² originally covered by the Atlantic Forest (Rebêlo & Garófalo 1991, 1997, for semideciduous Atlantic Forest in São Paulo state; Neves & Viana 1997, 1999, for mangrove and gallery forest areas in Bahia state; Bonilla-Gomez 1999, for the Atlantic Rain Forest in Espírito Santo state; Peruquetti *et al.* 1999, for semideciduous Atlantic Forest in Minas Gerais state; Bezerra & Martins 2001, for the Atlantic Rain Forest in Paraíba state; Tonhasca Jr. *et al.* 2002, for the Atlantic Rain Forest of Rio de Janeiro state) and all previous information came from casual collections. This is, clearly, a very poor sample of this large region. Until recently, *Eufriesea brasiliatorum* (Friese 1899) was not collected since the 1970's (Kimsey 1982); in Brazil, it was recorded only for the state of Espírito Santo (Moure 1967), which has been severely deforested in the last 40 years. For this reason, this species was included as extinct in a preliminary list of threatened species for this country (Fundação Biodiversitas, not published). However, four males of *Ef. brasiliatorum* were collected by Tonhasca Jr. *et al.* (2002) at the Desengano region, northern Rio de Janeiro state, between 1997 and 1999. This represents an expansion of the known geographic distribution of the species.

In general, sampling and field observations of species not attracted to the known aromatic lures, such as *El. seabrai*, are scarce or anecdotal and lead to the impression, potentially false, that they are rarer than the species commonly collected at the aromatic baits. This may be the case for *Euglossa (Euglossella) mandibularis* (Friese), which is not collected at baits but is quite abundant at flowers of *Solanum calycinum* (formerly *Cyphomandra calycina*, Solanaceae) in the region of Viçosa, Minas Gerais (Soares *et al.* 1989).

Aside from these sampling difficulties, two important Brazilian biomes, the savannic "cerrado" and the semiarid "caatinga," have not been surveyed for Euglossina, perhaps because these bees are generally regarded as dependent on forest environments (Dressler 1982). *Ef. mussitans*, for example, a rare species recently collected by Bonilla-Gomez (1999) at the Reserva Florestal de Linhares, state of Espírito Santo, was until recently known only from the Atlantic Forest (states of Espírito Santo and Rio de Janeiro) and the Amazonian Forest (states of Mato Grosso and Pará) (Kimsey 1982). *Ef. brasiliatorum* is recorded, by Kimsey (1982 – spelled as *brasiliatorum*) in San Antonio, Bolivia, in addition to the state of Espírito Santo. Those disjunct distributions, however, may only reflect (i) the fact that the intervening regions (including the 'cerrado' and the 'caatinga') are virtually unsampled or (ii) that each of those names is being

applied to at least two different species. Probably, more intensive collection at areas that are currently poorly sampled will eliminate or reduce such disjunctions. Thus, the first surveys of euglossine bees in Maranhão (Rebêlo & Silva 1999) revealed the occurrence of *Ef. mussitans* in the eastern part of that state. Moreover, sporadic collecting in central and northwestern Minas Gerais state (in the 'cerrado' domain), both at baits and on flowers, have shown that many of the species of euglossine collected in the semi deciduous Atlantic Forest remnants near Belo Horizonte also occur in these areas, including several *Euglossa* species (AN and FAS, pers. observations).

Given the known data, it seems that any conclusion regarding the geographic distribution, local abundance and/or conservation status of most euglossine bees occurring in Brazil will be premature and should be considered with caution.

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