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Eufriesea zhangii sp. n. (Hymenoptera: Apidae: Euglossina), a new orchid bee from Brazil revealed by molecular and morphological characters

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Abstract

Eufriesea zhangii Nemésio & Santos Júnior sp. n. is described from the ‘Parque Nacional de Ubajara’, state of Ceará, northeastern Brazil. This orchid-bee species is superficially similar to the blackish species belonging to the *Eufriesea mussitans* (Fabricius, 1787) species-group. Molecular and morphological (both external and genital) characters were used to demonstrate that *Eufriesea zhangii* sp. n. is distinct from morphologically similar *Eufriesea nordestina* (Moure, 1999) and *Eufriesea auriceps* (Friese, 1899). Molecular data vaguely suggested that its closest relative is *Eufriesea nigrohirta* (Friese, 1899). This new species, as well as the recently described *Eulaema quadragintanovem* Nemésio & Ferrari, 2012, seems to be geographically restricted to ‘brejos de altitude’—Atlantic Forest physiognomies at the top of mountains in northeastern Brazil—in the state of Ceará. Due to their conspicuous isolation, these areas appear to be a rich source of unknown species that may rapidly vanish due to environmental disturbances.

Key words: Atlantic Forest, ‘Brejo de altitude’, conservation, new species, orchid bee, taxonomy

Introduction

The genus *Eufriesea* Cockerell, 1908 (Hymenoptera: Apidae: Apini: Euglossina) is the second most diverse genus of orchid bees and comprises about 65 species (Nemésio & Rasmussen 2011). Euglossina is an exclusively Neotropical group of insects widely known for their vivid metallic colors and the association between the males and orchids (see Dressler 1982). Despite being species-rich, *Eufriesea* is one of the least known groups of orchid bees, mainly due to the fact that its species are univoltine, highly seasonal, with adults usually only active for two or three months yearly, during the rainy season (see Kimsey 1982). As a consequence, relevant biological data (such as nesting behavior and plants visited) are missing for most species (Kimsey 1982; Ramírez *et al.* 2002); for example, precise geographic distributions of most species are unknown and, for many species, only one of the genders is known. This makes it difficult to study morphological variations in larger series in order to define species limits. Recently, some of these “unknown genders” have been described (*e.g.* Moure 1999; Nemésio 2005, 2011a; Ferrari & Nemésio 2011), and data on geographic distribution of some of the rarest species have become available (*e.g.* Nemésio & Silveira 2004; Nemésio 2011e).

Kimsey (1982) made the first attempt to understand the relationships within *Eufriesea* and to split the genus into subgroups. Nevertheless, the resulting subgroups were not grounded on formal phylogenetic hypotheses, and subsequent phylogenetic studies based on morphological (Faria Jr. 2009) and molecular (Ramírez *et al.* 2010) characters revealed that most of Kimsey’s (1982) subgroups seemed to be paraphyletic. Faria Jr. (2009) used 128 morphological characters of a small subset of 33 species of *Eufriesea* belonging to all 12 groups proposed by Kimsey (1982) in three analyses (equal weights parsimony, implicit weights parsimony, and Bayesian analysis) and found that only four species-groups resulted as monophyletic in all analyses. One of these groups is the *Eufriesea mussitans* (Fabricius, 1787) species group, delimited by Kimsey (1982) as comprising three species: *E. mussitans*, *E. tucumana* (Schrottky, 1902), and *E. violascens* (Mocsáry, 1898).