

Euglossa amazonica (Hymenoptera: Apidae: Euglossina) outside of the Amazon Basin: A Short Review

André Nemésio*

Instituto de Biologia, Universidade Federal de Uberlândia. R. Ceará, S / N, Uberlândia, MG, Brazil

The knowledge on the geographic distributions of organisms is a key issue in biology, being useful, among others, for understanding biogeographic patterns and also for establishing conservation strategies. The so-called “range extensions” of many animal species are thus important for those dealing with ecology and conservation of each particular species and the ecosystems where these species live in [1-4]. As pointed out by Nemésio [5], these first records or range extensions can also indicate the dispersion or deliberate introduction of potentially invasive species, which theoretically may represent a threat to the new environment itself or to the native species living on this environment. As orchid bees (Apidae: Euglossina) are mostly forest-dependent insects [6,7] with a suggested role as bioindicators [8,9]. First records or range extensions have been recently reported for some rare species [10-15] and even for potentially invasive species [16-18].

A recent paper by Hinojosa-Díaz [19] continued this tradition and reported the alleged first record of *Euglossa amazonica* Dressler outside the Amazon Basin, based on two specimens captured in lowland areas in the western side of the Andes, one from Colombia and the other one from Panama. A thorough discussion on the biogeographic implications of these findings was then provided by Hinojosa-Díaz (2013).

At this point it should be stressed, however, that Hinojosa-Díaz's (2013) report is not the first and the only record of *Euglossa amazonica* outside the Amazon Basin. This species has been collected in central and eastern Brazil [20-24], far from the Amazon Basin. It could be argued that Silveira's master thesis [20] is an unpublished work of difficult access and its omission from Hinojosa-Díaz's work would be acceptable on this basis. On the other hand, the same cannot be said about Nemésio's studies [21-24], published in well-established journals. Although unpublished, the findings by Silveira were also summarized by Nemésio [23] and his record of *Euglossa amazonica* in central Brazil was accordingly plotted in the geographic distribution map provided by Nemésio in the aforementioned paper.

These omissions are not only improper – since they give the reader the false impression that an outstanding fact has been discovered, in this particular case, that a species once believed to only occur in a given biome was unexpectedly found outside of it, when this fact had already been observed for the same species, although in other areas – but they also make Hinojosa-Díaz's conclusions weaker and biased. The records of *Euglossa amazonica* in Colombia and Panama by Hinojosa-Díaz and in central and eastern Brazil by Silveira and Nemésio, together, suggest that it may be one of the few species in the genus with a wide distribution throughout the Neotropics, a feature emphasized by Hinojosa-Díaz but not realized by him for *Euglossa amazonica*. If Hinojosa-Díaz's and Nemésio's interpretations of this species are correct, it means that *Euglossa amazonica* occurs in the evergreen forests of Central America, in the tropical forests of lowland Colombia, in the Amazon Basin, in the Atlantic Forest of eastern Brazil and in gallery forests immersed in a savanna matrix in central Brazil, showing a plasticity rarely observed among members of *Euglossa*. The alternative hypothesis is that we are facing a complex of cryptic species, as it was recently realized for *Euglossa crassipunctata* Moure [25], formerly believed to occur from Central America to eastern Brazil, but now known to be a complex of

at least three species [26]. Given the credentials and expertise of Dr. I. A. Hinojosa-Díaz, all the above discussion could be part of his original work have critical literature for this enterprise had not been omitted. The present publication would, thus, not be necessary.

It is important to note that it is not the first time that critical literature in the core of the area dealt with by Dr. Hinojosa-Díaz is omitted from his works on orchid bees. In a recent paper [27], it was stated: “The length of the labiomaxillary complex in *E. decorata* reaches the tip of the metasoma, although some females, most notably the specimen here examined from Minas Gerais, Brazil have a noticeably shorten labiomaxillary complex. Given that we could find no further distinguishing evidence, it is assumed here that these females belong to *E. decorata* although we note that further review of new evidence could reveal largely cryptic species requiring recognition” [27, page 56]. Nevertheless, the specimen from Minas Gerais mentioned by the authors is a male and it was examined (upon request) and photographed by Dr. I. A. Hinojosa-Díaz himself! These photographs were published by Nemésio [13, page 118] and this particular specimen was discussed by Nemésio *et al.* [28] and Nemésio [13], two studies dealing with *Euglossa decorata* Smith [29] and not cited by Hinojosa-Díaz and Engel in a paper which main focus was the *Euglossa decorata* group, with the consequent incorrect conclusions outlined above.

References

1. Feio RN, Cassimiro J, Cruz CAG (2003) Geographic distribution. *Myersiella microps*. Herpetological Review 34(1): 259.
2. Vasconcelos MF (2005) A range extension for Dusky-tailed Flatbill *Ramphotrigon fuscicauda* in eastern Amazonia. Bulletin of the British Ornithologists' Club 125: 314-315.
3. Santos MPD, MF Vasconcelos (2007) Range extension for Kaempfer's Woodpecker *Celeus obrieni* in Brazil, with the first male specimen. Bulletin of the British Ornithologists' Club 127: 249-252.
4. Lopes LE, Malacco EF, Alteff, Vasconcelos MF, Hoffmann D, Silveira LF (2009) Range extensions and conservation of some threatened or little known Brazilian grassland birds. Bird Conservation International 20: 84-94.
5. Nemésio A (2011b) First record of *Exaeret lepeletieri* Oliveira & Nemésio (Hymenoptera: Apidae: Euglossina) in Venezuela and comments on the distribution of *Eufriesea laniventris* (Ducke) in the Amazon. Bioscience Journal 27: 505-509.
6. Dressler RL (1982a) Biology of the orchid bees (Euglossini). Annual Review of Ecology and Systematics 13: 373-394.

*Corresponding author: André Nemésio, Institute of Biology, Universidade Federal de Uberlândia .R. Ceara, S / N, Uberlândia, MG, Brazil, Tel: +38400-902; E-mail: andre.Nemésio@gmail.com

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7. Dressler RL (1982b) New species of *Euglossa* IV. The *cordata* and *purpurea* species groups. Rev Biol Trop 30: 141-150.
8. Tonhasca A, Blackmer JL, Albuquerque GS (2002) Abundance and diversity of euglossine bees in the fragmented landscape of the Brazilian Atlantic Forest. Biotropica 34: 416-422.
9. Nemésio A, Silveira FA (2006a) Edge effects on the orchid-bee fauna (Hymenoptera: Apidae) at a large remnant of Atlantic Forest in southeastern Brazil. Neotrop Entomol 35: 313-323.
10. Morato EF (2001) Ocorrência de *Aglae caerulea* Lepeletier & Serville (Hymenoptera, Apidae, Apini, Euglossina) no estado do Acre, Brasil. Rev Bras Zool 18: 1031-1034.
11. Nemésio A, Silveira FA (2004) Biogeographic notes on rare species of Euglossina (Hymenoptera: Apidae: Apini) occurring in the Brazilian Atlantic Rain Forest. Neotrop Entomol 33: 33: 117-120.
12. Nemésio A, Silveira FA (2006b) First record of *Eulaema helvola* (Hymenoptera: Apidae: Euglossina) for the state of Minas Gerais: biogeographic and taxonomic implications. Neotrop Entomol 35: 418-420.
13. Nemésio A (2009a) Orchid bees (Hymenoptera: Apidae) of the Brazilian Atlantic Forest. Zootaxa 2041: 1-242.
14. Nemésio A (2009b) Taxonomic notes on *Euglossa (Glossuropoda)* with a key to the known species (Hymenoptera: Apidae: Euglossini). Zootaxa 2142: 45-56.
15. Nemésio A (2011c) Rediscovered after forty-two years: the rare orchid bee *Eufriesea brasilianorum* (Hymenoptera: Apidae) of eastern Brazil. North-Western Journal of Zoology 7: 356-359.
16. Skov C, Wiley J (2005) Establishment of the Neotropical orchid bee *Euglossa viridissima* (Hymenoptera: Apidae) in Florida. Florida Entomologist 88: 225-227.
17. Pemberton RW, Wheeler GS (2006) Orchid bees don't need orchids - evidence from the naturalization of an orchid bee in Florida. Ecology 87(8): 1995-2001.
18. Hinojosa-Díaz IA, Ferial-Arroyo TP, Engel MS (2009) Potential distribution of orchid bees outside their native range: The cases of *Eulaema polychroma* (Mocsáry) and *Euglossa viridissima* Friese in the USA (Hymenoptera: Apidae). Diversity and Distributions 15: 421-428.
19. Hinojosa-Díaz IA (2013) Presence of *Euglossa (Euglossa) amazonica* outside of the Amazon Basin – biogeographic insights. Journal of Melittology 2: 1-6.
20. Silveira GC (2010) Diversidade e sazonalidade de abelhas Euglossini Latreille (Hymenoptera: Apidae) em duas áreas de mata estacional semidecidual no domínio do Cerrado no Triângulo Mineiro. M.Sc. Thesis. Universidade Federal de Uberlândia, Uberlândia.
21. Nemésio A (2010) The orchid-bee fauna (Hymenoptera: Apidae) of a forest remnant in northeastern Brazil, with new geographic records and an identification key to the known species of the Atlantic Forest of northeastern Brazil. Zootaxa 2656: 55-66.
22. Nemésio A (2011a) The orchid-bee fauna (Hymenoptera: Apidae) of a forest remnant in southern Bahia, Brazil, with new geographic records and an identification key to the known species of the area. Zootaxa 2821: 47-54.
23. Nemésio A (2012b) The western limits of the “Hileia Baiana” for orchid bees, including seven new records for the state of Minas Gerais, eastern Brazil (Hymenoptera: Apidae: Euglossina). Spixiana 35: 109-116.
24. Nemésio A (2012a) Species of *Euglossa* Latreille, 1802 (Hymenoptera: Apidae: Euglossina) belonging to the *purpurea* species group occurring in eastern Brazil, with description of *Euglossa monnei* sp. n. Zootaxa 3151: 35-52.
25. Moure JS (1968) Espécies novas de *Euglossa* da América Central. Boletim da Universidade Federal do Paraná, Zoologia 3: 13-64.
26. Nemésio A, Engel MS (2012) Three new cryptic species of *Euglossa* from Brazil (Hymenoptera, Apidae). ZooKeys 22: 47-68.
27. Hinojosa-Díaz IA, Engel MS (2011) Revision of the orchid bee subgenus *Euglossella* (Hymenoptera, Apidae), Part I, The *decorata* species group. ZooKeys 140: 27-69.
28. Nemésio A, Augusto SC, EAB Almeida (2007) *Euglossa decorata* Smith (Hymenoptera: Apidae) in central Brazil – biogeographic implications. Lundiana 8: 57-61.
29. Smith F (1874) A revision of the genera *Epicharis*, *Centris*, *Eulema* and *Euglossa*, belonging to the family Apidae, section Scopulipedes. Annual Magazine of Natural History 4: 440-446.