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Description of the female *Euglossa perpulchra* Moure & Schlindwein, 2002 and an identification key to the females of the *Euglossa decorata* Smith, 1874 species group

(Hymenoptera, Apidae, Euglossina)

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A detailed description of the female *Euglossa perpulchra* Moure & Schlindwein, 2002 is here presented. The specimen mentioned at the description was collected during a survey on flowers of *Tecoma stans* L. (Bignoniacea) in the municipality of Camaragibe, state of Pernambuco, Brazil. This female is here compared to females of all species belonging to the *Euglossa decorata* Smith, 1874 species group, and an identification key for all females is provided.

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Introduction

Euglossa Latreille, 1802 is the most speciose genus of orchid bees (Hymenoptera: Apidae: Euglossina) with around 130 species (Nemésio & Rasmussen 2011). Its taxonomy, however, is strongly focused on males, since taxonomists have failed to find reliable distinguishable characters in female bees of most species (discussed by Bembé 2007, Nemésio 2009). As a consequence, most female *Euglossa* are kept unidentified in collections, making it difficult or even impossible to gather basic information on natural history of these bees. Thus, describing females and pointing out characters useful to identify and distinguish them from their closest allies are among the most relevant features in orchid-bee alpha taxonomy in forthcoming years (Ferrari & Nemésio 2011).

Species of *Euglossa (Euglossella)* Moure, 1967 belonging to the *E. decorata* Smith, 1874 species group were recently reviewed and diagnosed by Hinojosa-Díaz & Engel (2011), who also characterized the whole group and distinguished it from other *Euglossa* groups. Although females of all species were illustrated, taxonomic discussion was entirely based on male characters. The female *Euglossa (Euglossella) perpulchra* Moure & Schlindwein, 2002, unknown when the species was described, was illustrated by Hinojosa-Díaz & Engel (2011); however, their

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description was extremely succinct: "The female exhibits basically the same features as the male (i. e., coloration, punctation, and vestiture), besides having antennae light-brown with a small yellowish spot on the upper anterior surface of the scape, and the regular features observed in other females of the species group" (Hinojosa-Díaz & Engel 2011: 67).

The main goal of this study is to provide a detailed description of the female of *Euglossa perpulchra*, a species described from the state of Pernambuco, northeastern Brazil (Moure & Schlindwein 2002, Milet-Pinheiro & Schlindwein 2005), but also recorded in the neighbour states of Paraíba (Martins & Souza 2005, Souza et al. 2005) and Alagoas (Darrault et al. 2006, Moura & Schlindwein 2009). Moreover, an identification key to all females of the *E. decorata* species group is provided – an updated key to males was recently provided by Hinojosa-Díaz & Engel (2011).

Material and methods

Taxonomy follows Nemésio & Rasmussen (2011) and Hinojosa-Díaz & Engel (2011). General morphological terminology for bees follows Roig-Alsina & Michener (1993) and Michener (2007). Specific morphological terminology for orchid bees follows Nemésio (2009: 10, 12). The female *Euglossa perpulchra* described in this study is deposited at "Invertebrate Collection of the Taxonomic Collections of the Universidade Federal de Minas Gerais" (UFMG), Belo Horizonte, Brazil.

Taxonomy

Euglossa (Euglossella) perpulchra Moure & Schlindwein, 2002

Euglossa (Euglossella) perpulchra Moure & Schlindwein, 2002: 586.

Holotype male: Brazil, Pernambuco, Igarassu. (Holotype deposited at Moure Collection at the Universidade Federal do Paraná, Curitiba, Brazil).

Female

Diagnosis. Female *Euglossa perpulchra* superficially resembles all brownish *Euglossa* belonging to the *E. decorata* species group, but it can be readily distinguished by the bluish hues on metasoma (greenish hues in the other species of the *E. decorata* group) and T1–T6 banded dark brown basally and whitish distally (*E. cosmodora* Hinojosa-Díaz & Engel, 2011 presents banded terga only on T1–T2, which are dark brown basally and yellowish distally).

Description (Fig. 1)

Measurements (mm). Body length 11.1; head length 3.3; maximum head width 4.6; malar area (length × width) 0.2 × 0.7; clypeocellar distance 1.25; interocellar distance 0.32; ocellorbitaldistance 0.75; scape length 1.0; F1 length 0.46; intertegular distance 3.7; approximate forewing length 8.3; metasoma length 4.7; maximum metasoma width 4.6.

Structure. Clypeus flat with high longitudinal carina; paraocular area with rounded yellow spot; inner orbits converging toward mandible; scape subcylindrical; F1 conical; anterolateral angle of pronotum spiniform; scutellar tuft elongate, about twice as long as wide; mid and outer hind tibial spurs serrate; inner hind tibial spur pectinate; corbiculae deeply concave.

Colour. Predominantly olive green, except yellow on labrum and mandible; light ferruginous on antennae, tegulae and wing veins; ferruginous on front leg, on meso- and metatarsi (except on basitarsi); dark ferruginous with green hues on meso- and metatibiae and femurs; dark ferruginous with purple hues on meso- and metabasitarsi and on terga; cupper hues on mesepisternum.

Pubescence. Predominantly dark yellow, except whitish on inner surface of front trochanters and femurs, on ventral surface of metasoma, on mid and hind coxae and trochanters, on marginal depression of T1–T5; dark ferruginous on front tibiae and tarsi, on inner surface of mesotibiae, on mesotarsi, on anterior and posterior margin of metatibiae, on metatarsi; black setae on lateral margin of T2–T5, on T6; on mandible, labrum and clypeus, simple, short and very sparse; on front, branched, moderately short and dense; on vertex, branched, dense and very long behind ocelli; short behind compound eyes; on gena, branched, dense and short, but progressively longer toward hipostomal carina; on mesoscutum and scutellum, branched, long and moderately dense; on lateral surface of mesepisternum, branched, very long and moderately sparse, with a tuft of long and very dense pubescence near the anterolateral angle of pronotum; on metepisternum and lateral surface of propodeum, plumose, long and dense; on ventral surface of mesosoma, branched, long and moderately sparse; on front trochanters and femurs, branched, long and moderately dense on posterior margin; on front tibiae, short and very sparse on inner surface; branched and simple, moderately short and moderately dense on outer surface, with some thick setae on distal margin; on front basitarsi, simple, thick, long and sparse on outer surface and posterior margin; on posterior margin also with plumose,

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short and dense pubescence; on mesotrochanters and femurs, branched, moderately short (slightly longer on femurs) and sparse; on mesotibiae, simple, moderately long and moderately dense on inner surface and posterior margin; simple, very short and moderately sparse with some very thick setae on outer surface; on mesobasitarsi, simple, tick, long and very dense on inner surface; shorter and sparser on outer surface; on hind coxae, trochanters and femurs, branched, moderately short and sparse; on metatibiae, simple, extremely short and dense on inner surface; simple, thick, long and very sparse on anterior and posterior margins (slightly longer on anterior margin); on metabasitarsi, simple, thick, short and very dense on inner surface; longer on posterior margin; short and very sparse on outer surface;on T1, branched, long and sparse on disc; slightly longer on lateral margin; on T2–T5, simple, moderately short and sparse on disc, with some simple, thick setae on lateral margin; on T6, simple, long and very sparse; on S1–S5, branched, long and moderately dense, except for almost glabrous mid longitudinal area.

Punctation. Integument between punctures predominately shiny, except microreticulate on supraclypeal area and lateral surface of propodeum; on clypeus, very coarse, carenate (virtually without space between punctures) and deep; on paraocular area, very coarse, dense and deep; finer and denser at antennal socket level; on front, coarse, carenate and moderately deep; on gena, moderately coarse, dense and moderately deep; with some very coarse and very deep punctures behind the entire outer margin of compound eyes; on mesoscutum, coarse, moderately sparse and moderately deep on disc; slightly coarser and denser anteriorly; on scutellum, coarse, dense and deep; coarser and denser posteriorly; on lateral surface of mesepisternum, coarse, sparse and deep; slightly denser toward the mesepisternum tuft; on metepisternum, very fine, very sparse and shallow; on ventral surface of mesosoma, moderately coarse (intermixed with very coarse punctures), moderately dense and moderately deep; on T1, virtually without punctures on disc; coarse, sparse and shallow anteriorly; denser on lateral margin; on T2–T3, moderately fine, moderately dense and very shallow on disc; denser and deeper on lateral margin; on T4–T5, moderately coarse, dense moderately shallow on disc; slightly denser and deeper on lateral margin; on T6 and S1, very inconspicuous; on S2–S4, fine, sparse and very shallow; on S5–S6, moderately fine, moderately dense and shallow.

Identification key for females of the *Euglossa (Euglossella) decorata* Smith, 1874 species group

(Step 3 modified from Hinojosa-Díaz & Engel 2011).

1. Scutellar tuft with predominantly dark brown or blackish setae. ..... 2.
– Scutellar tuft with only pale fulvous setae. ... 3.
2. Scutellar tuft strongly ellipsoid, much longer than wide, with only blackish setae; mesosoma dark olive green with mixed pale and dark brown setae. .... *Euglossa singularis* Mocsáry in Friese, 1899
– Scutellar tuft rounded, about as long as wide, with predominantly dark brown setae; mesosoma light olive green with only pale brown setae. ..... *Euglossa apiformis* Schrottky, 1911
3. Metasoma with at least some terga exhibiting a clear banded pattern, with dark and light contrasting areas on individual terga (Fig. 1D). .. 4.
– Metasoma either uniformly coloured or coloured in a gradient, if bands present, then colours involved are never contrasting. ..... 5.
4. Frons with dark brown setae; T1–T2 banded (dark brown basally and yellow distally); T3–T6 not banded, entirely clothed in yellowish setae. ..... *Euglossa cosmodora* Hinojosa-Díaz & Engel, 2007
– Frons with pale fulvous setae; T1–T6 banded (dark brown basally and whitish distally) (Fig. 1D). ..... *Euglossa perpulchra* Moure & Schlindwein, 2002
5. Mandible entirely yellow; total length 10.5 to 11.5 mm. ..... *Euglossa decorata* Smith, 1874
– Mandible predominantly dark fulvous, with a yellow spot on its basal third; total length >12.0 mm. ..... *Euglossa aurantia* Hinojosa-Díaz & Engel, 2011

Comments

Only one female *Euglossa perpulchra* was collected in the municipality of Camaragibe "Conjunto Residencial Canaã", Bairro Aldeia (lat. −7°58'26.49", long. −34°59'30.51", alt. 115 m a.s.l.), state of Pernambuco, northeastern Brazil. This specimen was collected on June 8th, 2002 by one of us (CS) on flowers of *Tecoma stans* L. (Bignoniaceae). Female *Euglossa perpulchra* resembles its male in general appearance and it

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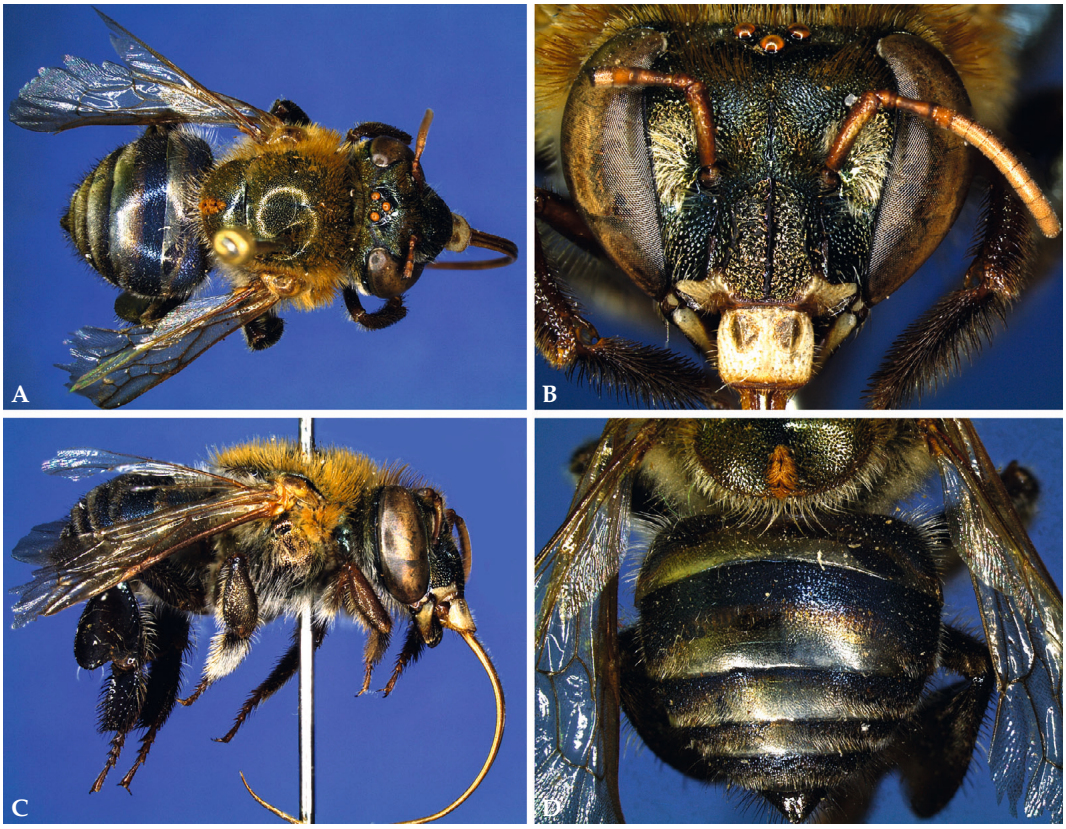

Fig. 1. Female *Euglossa perpulchra* Moure & Schlindwein, 2002. **A.** dorsal view; **B.** frontal view; **C.** lateral view; **D.** detail of metasoma, in posterior view.

is the only brownish *Euglossa* recorded in eastern Brazil to date, occurring exclusively in the Atlantic Forest of northeastern Brazil, known as "Centro de Endemismo Pernambuco".

The lack of some important and easily recognizable male characters of taxonomic relevance, such as paraocular ivory markings, mesotibial tufts, metatibial glandular scars, sternal tufts, and variable number of teeth in mandibles, makes females belonging to *Euglossa*, in fact, more difficult to distinguish from each other than males. Nevertheless, subtle but consistent differences distinguish (some) species even through females.

Finally, we correct a comment on *E. decorata* made by Hinojosa-Díaz & Engel (2011: 56), who stated that "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". Although not explicit, the aforementioned specimen is a male (not a female, as stated), which was sent by one of us (AN) as a loan to I. Hinojosa-Díaz and M. S. Engel (illustrated by Nemésio 2009: 118), with photographs taken by Hinojosa-Díaz and Engel themselves – who, curiously, did not cite Nemésio's (2009) study. As far as we know, until now, only males of *E. decorata* have been collected from Minas Gerais.

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