

A gynandromorph of *Megachile (Austromegachile) montezuma* Cresson (Hymenoptera: Apoidea, Megachilidae)

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Abstract

González VH. 2004. A gynandromorph of *Megachile (Austromegachile) montezuma* Cresson (Hymenoptera: Apoidea, Megachilidae). Entomotropica 19(3): 155-156.

A mixed gynandromorph of *Megachile (Austromegachile) montezuma* is described from a single specimen from Brazil. The gynandromorph has a head that resembles a male but with mixed male and female features, whereas the mesosoma and metasoma are mostly male and female in characters, respectively. The possibility of as yet unknown developmental mechanism that promotes gynandromorphism in *Megachile* over other bees is also discussed, given its higher frequency of occurrence in the genus than in other bees, and its highly ecological and morphological diversity.

Additional key words: bees, Megachilini.

Resumen

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Se describe un ginandromorfo mixto de *Megachile (Austromegachile) montezuma* de un espécimen del Brasil. El ginandromorfo tiene una cabeza que se parece a la del macho, pero con caracteres de la hembra y macho mezclados, mientras que el mesosoma y metasoma son principalmente macho y hembra en caracteres, respectivamente. La posibilidad de un mecanismo de desarrollo, todavía desconocido, que promueva el ginandromorfismo en *Megachile* sobre otras abejas también es discutida, dada su alta frecuencia de ocurrencia en el género, más que en otras abejas, y su alta diversidad ecológica y morfológica.

Palabras claves adicionales: abejas, Megachilini.

Gynandromorphs and intersexes are sexually abnormal individuals that differ in the expression of male and female characters, and they are rare in nature. Gynandromorphs exhibit a body with a combination of tagmata or parts of them, either male or female, whereas intersexes are individuals primarily of one sex with a blend of sexual characters of the opposite sex, thus resulting in such symmetrical and normal looking individuals that they have been described as new species or even genera (Mitchell 1929). Recently, Wcislo et al. (2004) reviewed the occurrence of gynandromorphy in bees and listed nineteen species in the genus *Megachile*. This note describes a gynandromorph of *Megachile (Austromegachile) montezuma* Cresson, and is a complement to that list. The morphological terminology follows Michener (2000). The abbreviation OD is used for ocellar diameter and was based on the median ocellus.

Description. The specimen is in poor condition, lacking the right fore and middle legs and with setae in many

areas matted. Body length 10.4 mm; coloration, including legs, black to dark brown. *Head.* General appearance male-like (width: 3.8 mm, about 1.3 times as wide as long), with dense (integument not visible), long (>>OD), cream colored setae on face, and integument contiguously punctate throughout. Clypeus (about twice wider than long, with apical margin with a small and shallow median emargination) and supraclypeal area not conspicuously elevated nor flattened medially as in male; intercellar distance (about twice as long as OD, 0.8 times ocellular distance) and ocelloccipital distance (slightly greater than OD) similar to the female condition; antenna mixed: scape short, about 2.6 times as long as broad, 10 flagellomeres as in female but somewhat elongate, about 1.8 times as long as broad, thus resembling the male condition; mandibles male-like, lacking cutting edges but 4-toothed (three in normal males), right mandible with a broader and deeper third interspace, and a larger fourth tooth than left mandible



Figure 1. Gynandromorph head of *Megachile* (*Austromegachile*) *montezuma*.

(Figure 1); gena as in female, narrower than compound eye in lateral view, wider below. *Mesosoma*. All legs male-like, except for the expanded front tibia, narrower than in the typical male. *Metasoma*. Metasomal terga and sterna female, sternal scopal setae not as stiff and straight as in typical females. Although the metasoma was not dissected, it has a sting, as evidenced by the stylus+lancet projecting from the apex of the metasoma.

Material examined: one gynandromorph, BRAZIL, [São Paulo]; São Carlos, Oct 1 1945, D. Dias, deposited in the Division of Entomology, Natural History Museum, University of Kansas.

The gynandromorph described above has a head that resembles a male but with mixed male and female features, whereas the mesosoma and metasoma are mostly male and female in characters, respectively. Therefore, out of the four classes of gynandromorphs (lateral, anterior-posterior, transverse and mixed) recognized by Dalla Torre and Friese (1899), this specimen could be regarded as a mixed gynandromorph. Mixed gynandromorphs are those individuals whose male and female traits are not distributed in an obvious pattern among tagmata, and are the most common type described in bees (Wcislo et al. 2004).

Nearly half of the species of gynandromorphs known in bees are megachilids, most of them in the genus *Megachile* (Wcislo et al. 2004). These authors explained such large

numbers of *Megachile* as the result of T. B. Mitchell's interest in this phenomenon, because he described most of the gynandromorphs in that genus. It is remarkable, however, that *Megachile* is both ecologically and morphologically extremely diverse, with sometimes aberrant and bizarre structures not found in other families of bees, but occurring across the megachilids. Although there is no known developmental mechanism that would promote gynandromorphism in species of *Megachile* over other bees, this possibility is suggested given that gynandromorphs in social, abundant and frequently collected bee taxa such as stingless bees (Apidae: Meliponini) and Halictidae are poorly represented in the literature and in collections, yet gynandromorphs are known to exist. Furthermore, intersexes are also more common in *Megachile* than in other bees.

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