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ON THE CLASSIFICATION OF THE BEE GENUS *MANUELIA* (HYMENOPTERA: APIDAE)

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Abstract – The classification of the monogeneric and relic xylocopine tribe Manueliini is briefly addressed. Two subgenera are recognized in *Manuelia* Vachal – *Manuelia* s.str., consisting of *Manuelia gayi* (Spinola), and *Uliamane* subgen. n., comprising *M. postica* (Spinola) as type species and *M. gayatina* (Spinola). Diagnoses for the subgenera are provided along with a key to these groups and detailed images for *M. postica*.

KEY WORDS: Apoidea, Anthophila, Xylocopinae, *Manuelia*, taxonomy, Chile, Argentina.

Izvleček – O RAZVRŠČANJU ČEBELJEGA RODU *MANUELIA* (HYMENOPTERA: APIDAE)

Razvrščanje enorodovnega in reliktnega plemena Manueliini poddružine Xylocopinae je predstavljeno na kratko. Prepoznana sta dva podrodova rodu *Manuelia* Vachal – *Manuelia* s.str., ki ga tvori vrsta *Manuelia gayi* (Spinola), in *Uliamane* subgen. n., ki vsebuje vrsti *M. postica* (Spinola) kot tipsko vrsto in *M. gayatina* (Spinola). Pripravljeni so opisi podrodov skupaj s ključem za ti skupini in podrobnimi slikami vrste *M. postica*.

KLJUČNE BESEDE: Apoidea, Anthophila, Xylocopinae, *Manuelia*, taksonomija, Čile, Argentina.

Introduction

Considerable interest has developed in the relationships among the various lineages of Xylocopinae, encompassing the large carpenter bees (Xylocopini), the small car-

penter bees (Ceratinini), the Old World allodapine bees (Allodapini), and the enigmatic, relic tribe Manueliini. A fifth tribe, the Boreallodapini, is known from mid-Eocene amber in Europe but was perhaps widespread (Engel, 2001). The boreallodapines were the closest relatives of the Allodapini (Engel, 2001). Phylogenetic considerations of the group have been presented by Daly et al. (1987), Sakagami and Michener (1987), Roig-Alsina and Michener (1993), Engel (2001), and Flores-Prado *et al*. (2010). In addition, Rozen (2010) recently documented numerous features from the mature larvae of the tribes of Xylocopinae, including remarks on one species of Manueliini [*i.e*., *Manuelia gayatina* (Spinola)].

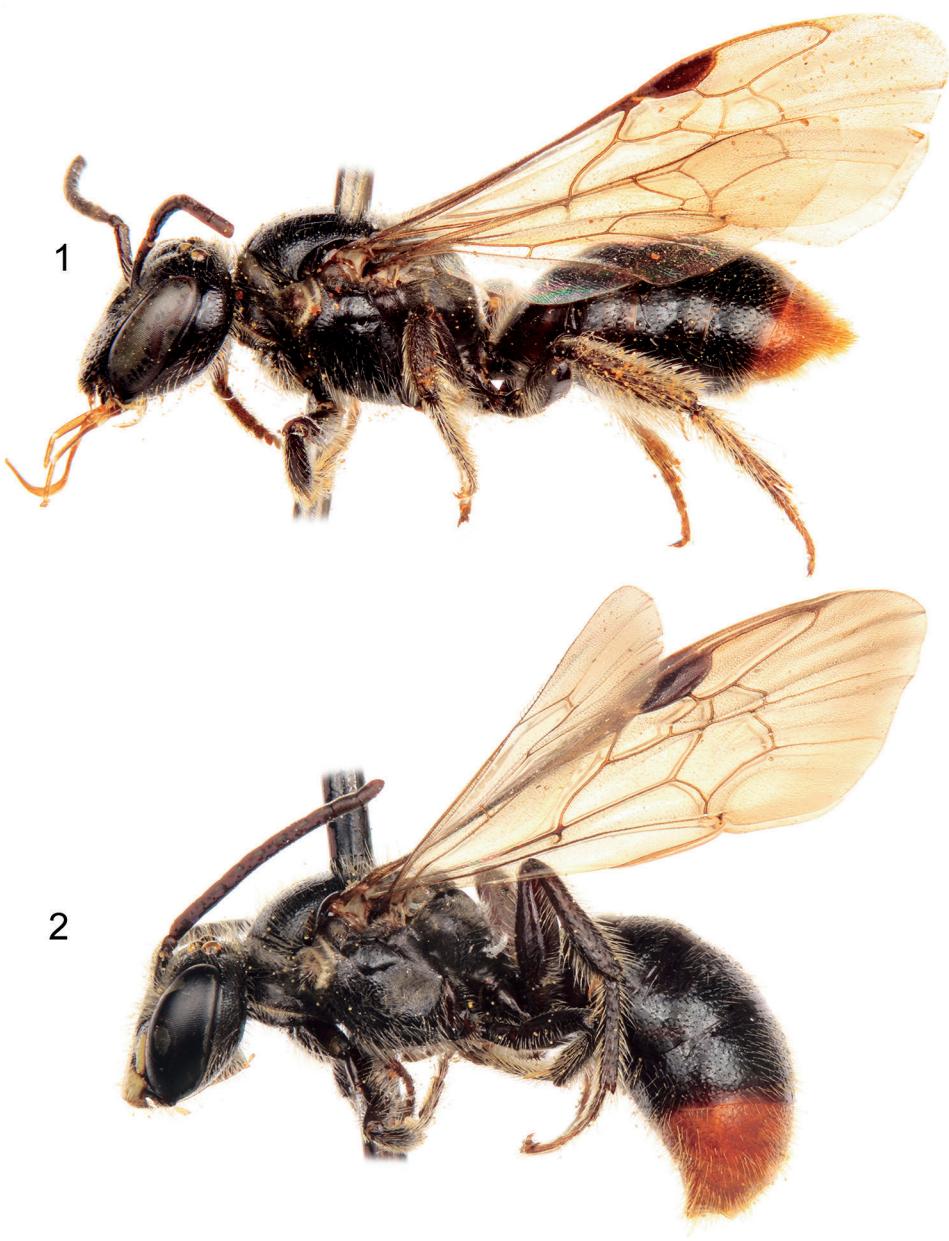
As noted, the Manueliini are perhaps the basalmost lineage of the Xylocopinae and are relic in southern South America, predominantly Chile but also in Argentina. The tribe consists of three species classified in a single genus, *Manuelia* Vachal, and superficially resemble small carpenter bees of the genus *Ceratina* Latreille. Recently the biology of one species, *M. postica* (Spinola), has been studied in great detail (Flores-Prado *et al*., 2008a, 2008b; Flores-Prado & Niemeyer, 2010), while Claude-Joseph (1926) provided a general account of the nesting biology of the other two species. While there are few species of *Manuelia* they are as different from each other as is usually classified in separate genera or subgenera elsewhere in the Apoidea and most certainly within the Xylocopinae. Herein a subgeneric classification of *Manuelia* is proposed to highlight these significant morphological differences. Morphological terminology follows that of Engel (2001) and Michener (2007). In addition, given that *Manuelia* has rarely been figured, I provide detailed images of pertinent structures for *M. postica* (Figs. 1–13).

Systematics

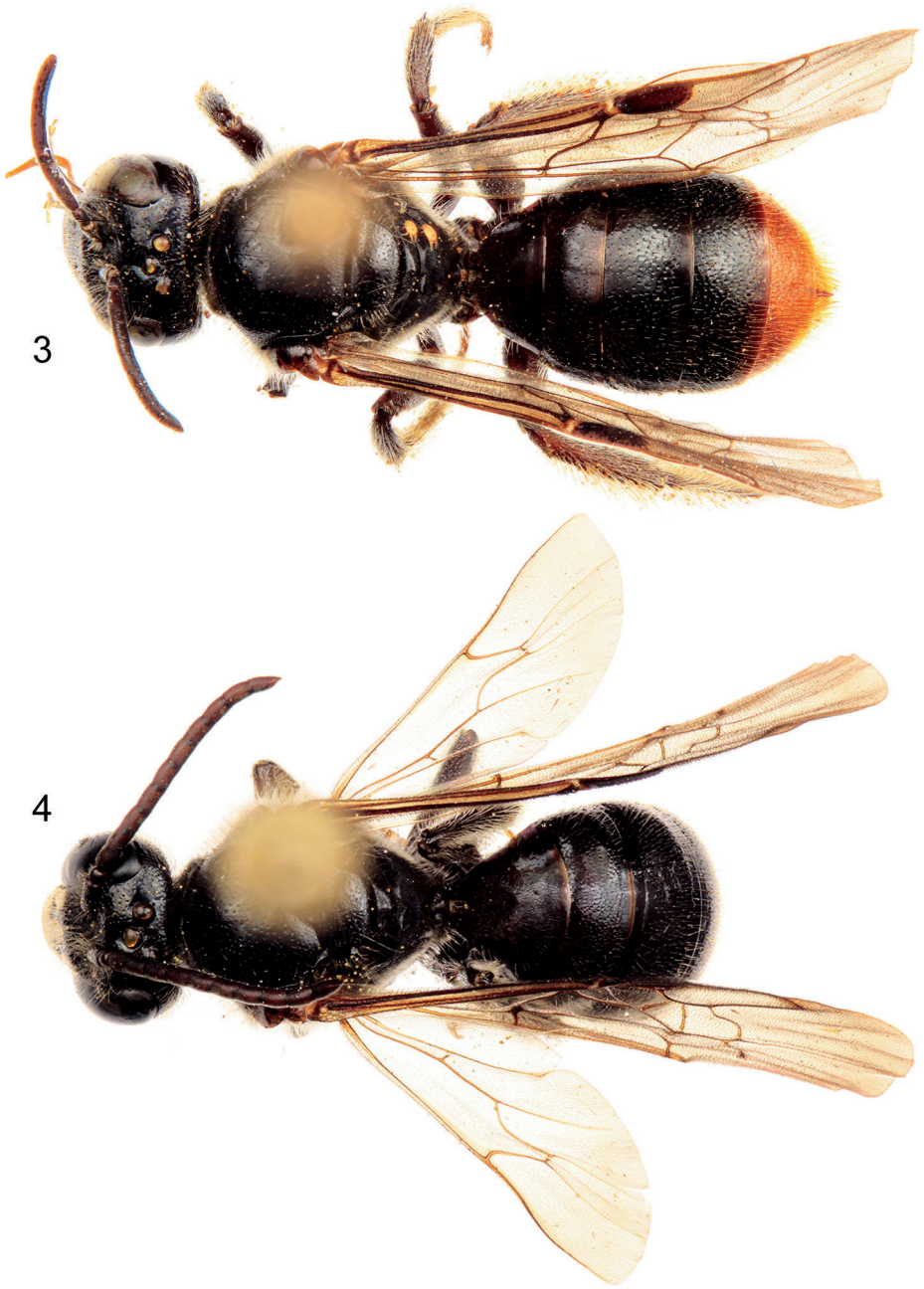
Tribe Manueliini Sakagami & Michener
Genus *Manuelia* Vachal

Diagnosis: Body small and slender (similar to *Ceratina*), 4.7–8.5 mm in length (Figs. 1–4); mandible tapering to apex, not abruptly narrowed; female labrum with elevated smooth triangular area; clypeus above anterior tentorial pits narrower than below (Figs. 5, 6), anterior tentorial pits situated above midheight of clypeus; apical metasomal terga strongly convex (not depressed as in Allodapini); first flagellomere shorter than combined lengths of second and third flagellomeres; wings distally pubescent (Figs. 1–4), not papillate; forewing with pterostigma large, with three submarginal cells (Fig. 1, 2); hind wing jugal lobe ca. 0.2x length of vannal lobe; female pygidial fimbria present; female pygidial plate present as strong spine (Fig. 3); male metasomal sternum VIII large, sclerotized (Fig. 10), strongly convex ventrally, with robust apical process (apical process absent in Ceratinini) (Fig. 10), lateral arms short, robust (Fig. 10); male gonostylus not fused with gonocoxa (fused in Ceratinini except *Euceratina* Hirashima) (Figs. 12, 13).

Comments: The genus and its species were reviewed in detail by Daly *et al*. (1987).



Figs. 1–2: Lateral habitus photomicrographs of *Manuelia postica* (Spinola) from Chile; 1) Female; 2) Male.

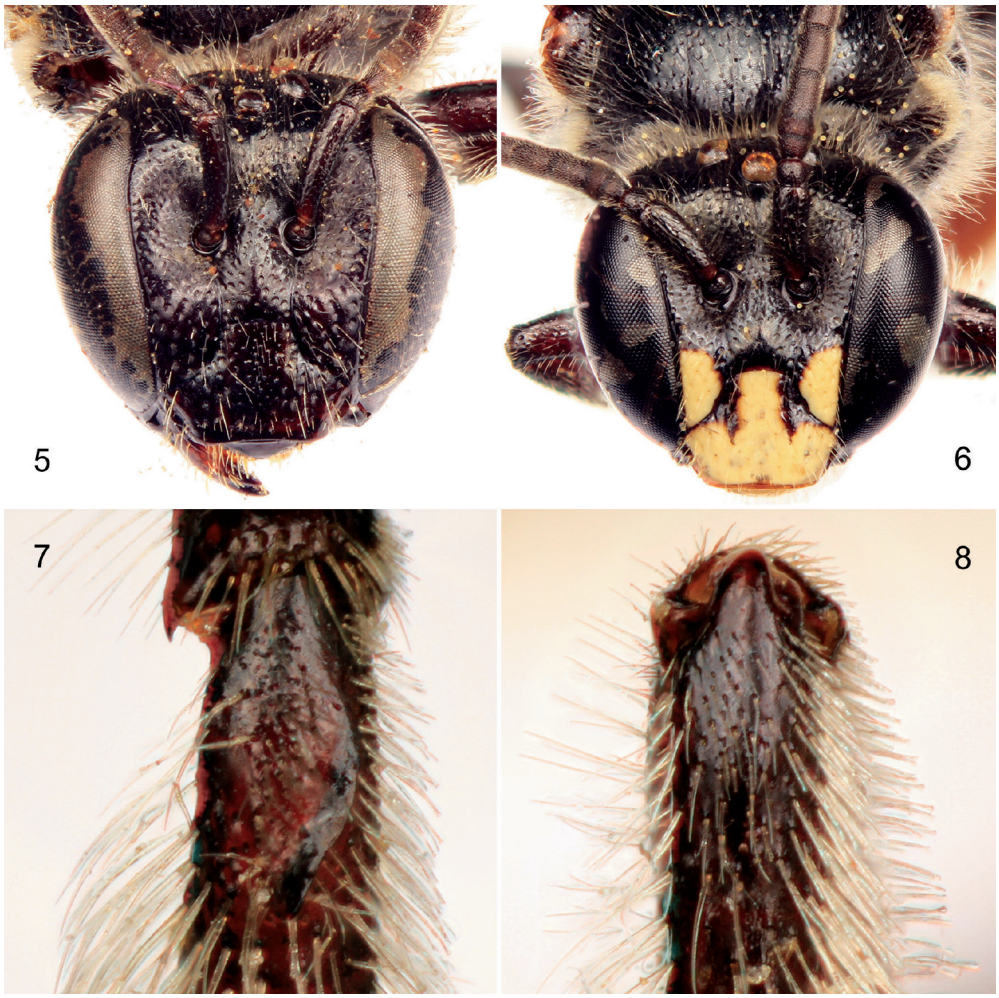


Figs. 3–4: Dorsal habitus photomicrographs of *Manuelia postica* (Spinola) from Chile; 3) Female; 4) Male.

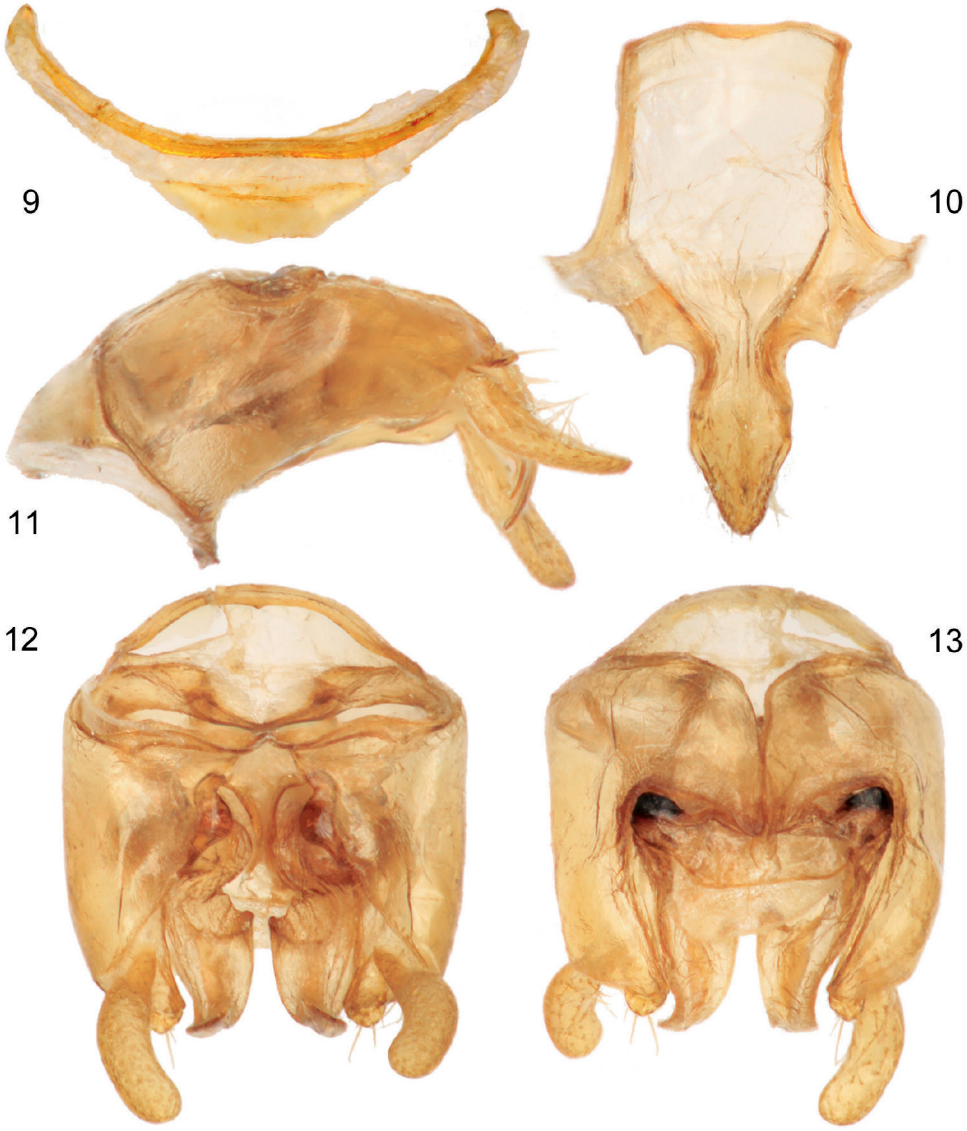
Key to Subgenera of *Manuelia*

1. Bees dark metallic blue; lateral margin of female labral disc straight; male mandible bidentate; male with posterior ocelli in front of vertex summit; male basimetatibial plate present ..... *Manuelia* s.str.

— Bees black, non-metallic, sometimes with apical metasomal segments reddish (Figs. 1–4); lateral margin of female labral disc concave; male mandible simple; male with posterior ocelli on vertex summit (Fig. 6); male basimetatibial plate absent (Fig. 8) .... *Uliamane*, subg. n.



Figs. 5–8: Photomicrographs of *Manuelia postica* (Spinola) from Chile; 5) Female face; 6) Male face; 7) Female basimetatibial plate; 8) Male outer base of metatibia (showing absence of plate).



Figs. 9–13: Photomicrographs of male terminalia of *Manuelia postica* (Spinola) from Chile; 9) Metasomal sternum VII; 10) Sternum VIII; 11) Genital capsule, lateral view; 12) Genital capsule, ventral view; 13) Genital capsule, dorsal view.

Subgenus *Manuelia* Vachal

Manuelia Vachal, 1905: 25. Type species: *Halictus gayi* Spinola, 1851, by designation of Daly *et al*. (1987: 104).

Diagnosis: Bees dark metallic blue; lateral margin of female labral disc straight; male mandible bidentate; male with posterior ocelli in front of vertex summit; male basimetatibial plate present; male penis valves robust; gonostylus short, shorter than penis valve apodemes.

Included species: *Manuelia gayi* (Spinola, 1851).

Uliamane subgen. n.

Type species: *Halictus posticus* Spinola, 1851.

Diagnosis: Bees black, non-metallic, sometimes with apical metasomal segments reddish (Figs. 1–4); lateral margin of female labral disc concave; male mandible simple; male with posterior ocelli on vertex summit (Fig. 6); male basimetatibial plate absent (Fig. 8); male penis valves relatively slender; gonostylus elongate, as long or longer than penis valve apodemes (Figs. 11–13).

Etymology: The new genus-group name is a euphonious combination of letters based on the generic name *Manuelia*, type genus of the tribe. The name is considered feminine.

Included species: *Manuelia postica* (Spinola, 1851) and *M. gayatina* (Spinola, 1851).

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References

Claude-Joseph, F., 1926: Recherches biologiques sur les Hyménoptères du Chili (mellifères). *Ann. Sci. Nat., Zool., ser. 10*, 9: 113–268.

Daly, H.V., Michener, C.D., Moure, J.S., Sakagami, S.F., 1987: The relictual bee genus *Manuelia* and its relation to other Xylocopinae (Hymenoptera: Apoidea). *Pan-Pac. Entomol*., 63(2): 102–124.

Engel, M.S., 2001: A monograph of the Baltic amber bees and evolution of the Apoidea (Hymenoptera). *Bull. Amer. Mus. Nat. Hist*., 259: 1–192.

Flores-Prado, L., Niemeyer, H.M., 2010: Kin recognition in the largely solitary bee, *Manuelia postica* (Apidae: Xylocopinae). *Ethology*, 116(5): 466–471.

Flores-Prado, L., Chiappa, E., Niemeyer, H.M., 2008a: Nesting biology, life cycle, and interactions between females of *Manuelia postica*, a solitary species of the Xylocopinae (Hymenoptera: Apidae). *New Zealand J. Zool.*, 35(1): 93–102.

Flores-Prado, L., Aguilera-Olivares, D., Niemeyer, H.M., 2008b: Nest-mate recognition in *Manuelia postica* (Apidae: Xylocopinae): An eusocial trait is present in a solitary bee. *Proc. R. Soc., Ser. B, Biol. Sci.*, 275(1632): 285–291.

Flores-Prado, L., Flores, S.V., McAllister, B.F., 2010: Phylogenetic relationships among tribes in Xylocopinae (Apidae) and implications on nest structure evolution. *Mol. Phylogenet. Evol.*, 57(1): 237–244.

Michener, C.D., 2007: The Bees of the World [2nd Edition]. xvi+[i]+953 pp., +20 pls. Johns Hopkins University Press, Baltimore.

Roig-Alsina, A., Michener, C.D., 1993: Studies of the phylogeny and classification of long-tongued bees (Hymenoptera: Apoidea). *Univ. Kansas Sci. Bull.*, 55(4): 124–162.

Rozen, J.G., Jr., 2010: Anatomy of the labiomaxillary region of mature larval xylocopine bees (Hymenoptera: Apidae: Xylocopinae). *J. Kansas Entomol. Soc.*, 83(4): 332–339.

Sakagami, S.F., Michener, C.D., 1987: Tribes of Xylocopinae and origin of the Apidae (Hymenoptera: Apoidea). *Ann. Entomol. Soc. Amer.*, 80(3): 439–450.

Spinola, M., 1851: Himenopteros. Pp. 153–569. *In*: Gay, C. (Ed.), Historia Física y Politica de Chile, Zoologia [Volúmen 6]. 596+[2] pp. Maulde et Renou, Paris.

Vachal, J., 1905: *Manuelia*, un nouveau genre d'Hyménoptères mellifères. *Bull. Soc. Entomol. Fr.*, 1905: 25–26.

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