

First description of male of *Megachile (Pseudocentron) gomphrenoides* Vachal and redescription of female (Hymenoptera, Megachilidae)

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ABSTRACT

Megachile is one of the largest genus of the family Megachilidae widely distributed in temperate and tropical areas of the world. *Megachile (Pseudocentron) gomphrenoides* was described by Vachal (1908) based on three female collected in Buenos Aires. Recently in a work about nest building of bees, we obtained females and males of this species in trap-nest. In this paper, the original description of the female is enlarged and the first description of the male is provided. Additionally, floral host and new record geographical are presented.

INTRODUCTION

Megachile Latreille is a large and diverse genus of Megachilidae, is represented by

approximately 900 solitary species on all continents. Members of this genus are bees easily recognized (Raw 2007), but the great sexual dimorphism exhibited in most species makes it difficult to recognize the male and the female of each. These bees nesting in the soil, in holes, in wood and in diverse existing cavities. Most species cut leaves, although others used petals, mud and resins.

In the New World, *Megachile* has been divided into 23 subgenera by Mitchell (1934-1937) and later the same author (1980) divided *Megachile* into seven genera, one of them, *Pseudocentron* was described by this author (1934) and listed 41 species primarily neotropical (Mitchell, 1943). Michener (2000, 2007) proposed a different arrangement for the subgenera and recognized a single genus *Megachile* and grouped the subgenera into three informal groups and assigned *Pseudocentron* to "group 1" and propose near probably 80 species.

Megachile (Pseudocentron) gomphrenoides was described by Vachal (1908) based on three female collected in Buenos Aires. Since then, only two collection record of this species has been available (Schrottky, 1920; Moure 1947). Vachal's original description was based on pilosity of

mesosoma and color of tibial spurs III.

Recently in a work about nest building of bees, we obtained females and males of *M. (P.) gomphrenoides* in trap-nest (Torretta *et al.* in prep.).

The propose of this paper is to enlarged the original description of the female adding morphological characters and provide the first description of the male of *Megachile (Pseudocentron) gomphrenoides*. Additionally, floral host and new record geographical are presented.

MATERIAL AND METHODS

The examined material is housed at Facultad de Agronomía, Universidad de Buenos Aires (FAUBA), National Museum of Natural History, USA (MNHN) and Museo de La Plata (MLP). Morphological terminology follows Fischer (1956), Mitchell (1980) and Engel (2001). The following abbreviations are used in the descriptions: F, flagellomere; Pe, pedicel; S, metasomal stem; Sc, scape; T, metasomal tergum. F, S and T are identified by an Arabic number (F1, F2...). All measurements are indicated in millimeters and were taken with an ocular micrometer attached to a stereoscopic microscope.

Megachile (Pseudocentron) gomphrenoides Vachal (Figs. 1-15)

Megachile gomphrenoides Vachal, 1908: 236; Schrottky, 1920: 209.

Megachile (Pseudocentron) gomphrenoides, Moure, 1947: 232. Michener, 2000: 563; 2007: 581. Moure, J. S. *et. al.*, 2007: 917. Catalog.

Pseudocentron (Pseudocentron) gomphrenoides, Mitchell, 1980: 46

Redescription.— *Female.* (Figs. 1, 3, 5). Length 12.9 (10.45-12.90).

Color.— Integument black. Wings hyaline; tegula and veins dark brown. Legs black; tibia 1 spurs ferruginous and tibia 2 and 3 spurs black; claws brown, basally ferruginous.

Pubescence.— Generally long and abundant, yellowish white and black.

Clypeus, supraclypeal area and vertex with abundant black pubescence; paraocular area, frons, and gena completely covered with yellowish white pubescence (Figs. 1 and 3). Mesoscutum, scutellum, tegula, pronotal lobe, upper portion of episternum, metanotum and propodeal triangle with white yellowish hairs; with intermixed sparse black hairs on dorsum; venter of mesosoma and legs with black setae; tomentum of tibiae 3 white; inner face of tarsus dark brown. T1 with abundant yellowish white pubescence and T2-6 completely black; T2-5 with complete white yellowish apical faciae; scopa ferruginous; S1 with sparse black scopal hairs.

Sculpture.— Integument of the head generally coriaceous, strongly punctured; middle line of clypeus and distal margin of supraclypeal area unpunctured. Mandibles scarcely punctured and coriaceous; vertex small punctured. Scutum, scutellum and axilla with small punctures T2 to T6 with scattered punctures.

Structure.— Head, maximum width 4.25, maximum length 2.95. Apical margin of clypeus straight and indentate (Fig. 1) nearly flat in profile; supraclypeal area flat; posterior margin of vertex concave; gena subrectangular; maximum width of compound eye subequal than maximum width of gena (0.78-0.72); eyes slightly convergent below; paraocular carina present; interantennal distance subequal than antennocellar distance (to median ocellus) (0.60-0.60), shorter than antennocular distance (0.60-1.10), and longer than

antennoclypeal distance (0.60-0.50). Sc, 0.8; Pe, 0.14; F1, 0.28; F2, 0.20; Sc longer than F1+F2 (0.80-0.42). Ocellus located above supraorbital tangent line; interocellar distance (between lateral ocelli) subequal than ocellocular distance (to lateral ocellus) (0.60-0.60) and longer than ocelloccipital distance (to lateral ocellus) (0.60-0.52). Mandible tetradentate, with incomplete cutting edge in the second interspace and complete in the third interspace; fourth mandibular tooth incised (Fig. 3). Scutellum rounded without median elevation; metanotum vertical. Mediotarsus I and II cordate; III subcilindric. Metasoma, cordate, T6, in dorsal view truncate, in lateral view, straight.

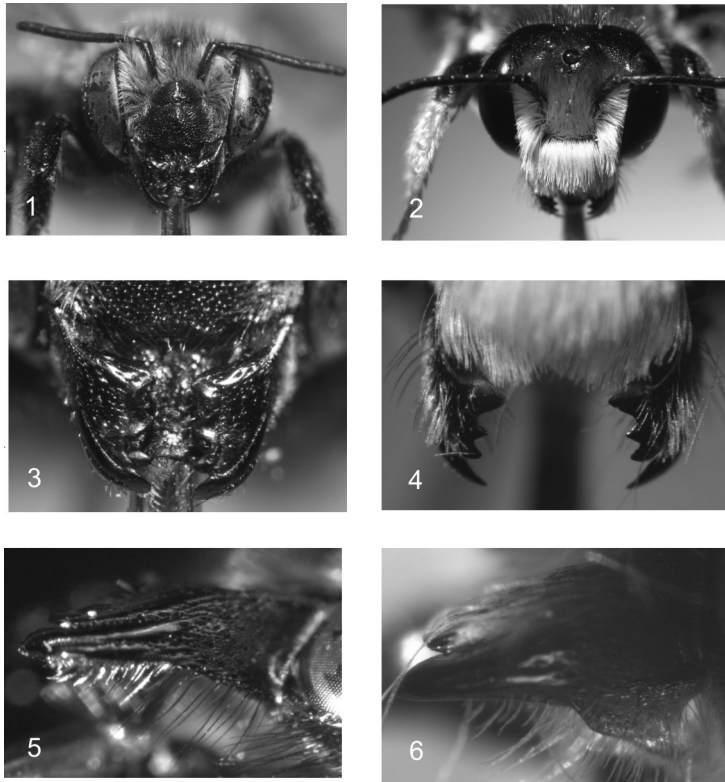
Description.— *Male.* (Figs. 2, 4, 6-14). Length. 9.15-11.00. It differs from female by the following characters.

Color.— Antenna, legs, tegula and veins black; internal surface of femur and tibia I, and tarsus yellow, with black spot, tibia I spurs yellow (extreme brown); claws brown, basally yellow. Metasomal sternum black.

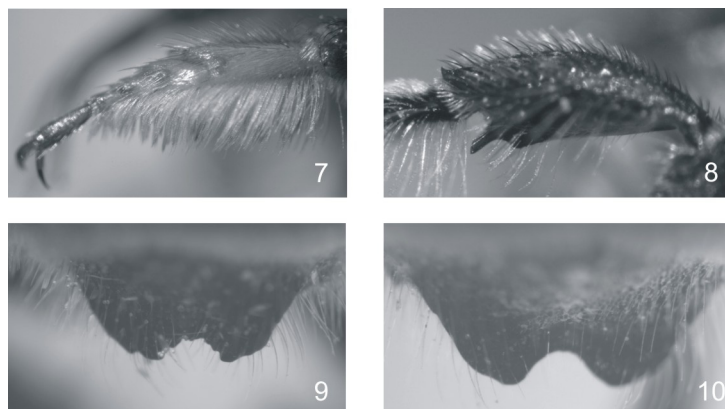
Pubescence.— Clypeus, supraclypeal area, paraocular area, with long, abundant and yellow hairs; vertex with long, abundant and dark brown pubescence, genae and lower margin of mandible with white yellowish hairs; mesosoma covered with white yellowish pubescence; scutum, scutellum and axilla intermixed with sparse brown hairs; procoxae glabre; posterior surface of profemur and protarsus with long, abundant, yellow pubescence; protibia and mesotibia with brown hairs; mesotarsus and metatarsus yellowish. Metasoma with sparse, white yellowish pubescence; T5 covered with abundant, long and ferruginous hairs; T6 and S1-3 with scarcely white yellowish pubescence. T1-5 with complete apical faciae yellow.

Sculpture.— Integument coriaceous. Head with dense punctures; clypeus with dense punctation.

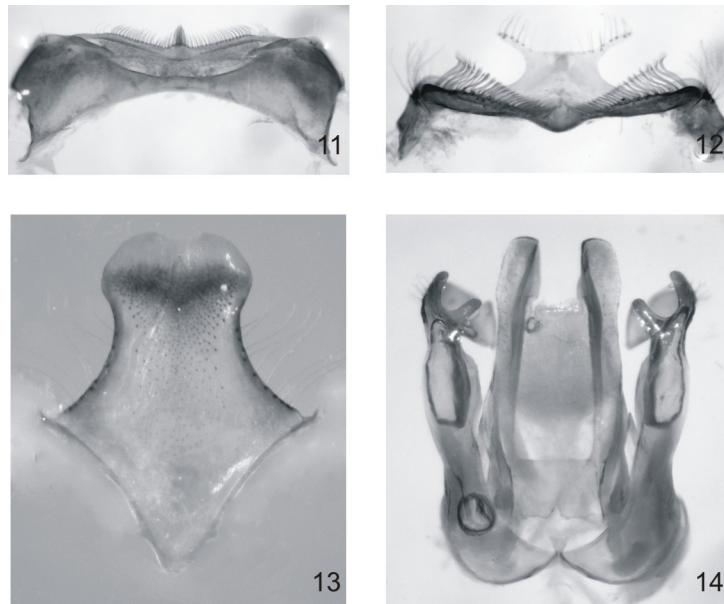
Structure.— (Fig. 2). Head, maximum width 3.90, maximum length 3.20. gena narrower than compound eye (0.72:1.10); hypostomal area flat, without angles or projections; interantennal distance longer than antennocellar distance (to median ocellus) (0.70:0.64), and antennoclypeal distance (0.70:0.49); shorter than antennocular distance (0.70:1.02) Sc, Pe and F1-F2= 0.72:0.18:0.28:0.28;; Sc as long as F1+F2 (0.72: 0.74); F11 simple,



Figs. 1-6. *Megachile (Pseudocentron) gomphrenoides*. 1-2. Head. 1. Female. 2. Male. 3-4. Mandibles, frontal view. 3. Female. 4. Male. 5-6. Mandible, lateral view. 5. Female. 6. Male.



Figs. 7-10. *Megachile (Pseudocentron) gomphrenoides*. Male. 7. Protarsi, external view. 8. Mesotibia. 9-10. Carina of T6.



Figs. 11-14. *Megachile (Pseudocentron) gomphrenoides*. Male. 11-13. Metasomal sternum. 11. S5. 12. S6. 13. S8. 14. Genitalia, dorsal view.

narrow, with apical margin rounded, maximum length 0.44 maximum width 0.24. Ocellus below supraorbital line; interocellar distance (between lateral ocelli) shorter than ocellocular distance (to lateral ocellus) (0.56:0.70) and subequal to ocelloccipital distance (to lateral ocellus) (0.56:0.60). Mandible tetridentate (Fig. 4); with triangular mandibular process (Fig. 6). Procoxae with small spines; profemur carinate; probasitarsus slightly modified, basitarsal lobe absent (Fig. 7). Mesotibial with two spurlike projection apical and subapical well developed (Fig. 8). *Metasoma*. Carina of T6 emarginated, U-shaped, external margin generally smooth; with anterior depression; distal margin of T6 with a conspicuous expansion and one spine on each side (Fig. 9, 10). S5. (Fig. 11). Lateral portions of pregradular area as wide as long; apical pubescence scarcely long and marginal; median portion of pregradular area narrow. Gradulus medially inconspicuous. Postgradular area completely covered with simple and long hairs. Apical rim slightly arcuate with patch of ferruginous setae. S6. (Fig. 12). Pregradular area well separated, subtriangular, apical margin

pilose, with sparse simple hairs. Pubescence of postgradular area composed of lateral patch of special setae, medially separate. Apical rim conspicuous with two lateral lobes and rounded medially. S7. Absent. S8. (Fig. 13). Apical lobe with distal margin bilobate, lateral margin concave and pilose; surface subapically covered with fine hairs; basal margin acute. *Genitalia* (Fig. 14). Gonobase wider than long, basal margin concave. Gonoforceps slightly subcylindrical, medially swollen, apex bilobate and asymmetric, ventral lobe well developed and laminar, dorsal lobe digitiform, their length not exceeding penis valve length. Penis valve laterally flattened; penis valve bridge subrectangular, superior margin straight and inferior margin arcuate. Volsella well developed, rounded.

Remarks.— *M. (P.) gomphrenoides* is easily separated from other species by the shape of the apical margin of clypeus and the colour of metatibial spurs in female and the male by the shape of mandibular process, pretarsus and mesotibial spurlike projection; also can be differentiated from S5, S6, S8 and genitalia.

Distribution—  species was originally

mentioned from Argentina: Buenos Aires, Mendoza, Salta and Santa Fe province. Based on material collected we add here La Pampa province (Fig. 15).

Type material examined.— **ARGENTINA.** Holotype female labeled: “Buenos Aires, 9-XII-1901”; “Holotype”; “*Megachile gomphrenoides* Vachal” (MNHN).

Other material examined.— **ARGENTINA.**
Buenos Aires. Buenos Aires, 1 ~~FF~~ II-1901 (MNHN); Carlos Casares, 5 ~~FF~~ I-2008, J.P. Torretta col. (FAUBA); 2 ~~FF~~ XII-2008, J.P. Torretta col. (FAUBA); 12 ~~FF~~ I-2009, J.P. Torretta col. (FAUBA); 4 ~~FF~~ III-2009, J.P. Torretta col. (FAUBA); 1 ~~F~~ and 1 ~~M~~, V-2009 J.P. Torretta col. (MLP); 7 ~~FF~~ and 2 ~~MM~~, V-2009 J.P. Torretta col. (FAUBA); Lincoln, , 1 ~~F~~ XII-2007, J.P. Torretta col. (FAUBA); 2 ~~FF~~ I-2008, J.P. Torretta col. (FAUBA); 1 ~~F~~ III-08, J.P. Torretta col. (FAUBA); Pila, 2 ~~FF~~ XII-2008, H.J. Marrero col. (FAUBA); Rivadavia; 2 ~~FF~~ XII-2006, J.P. Torretta & G. Cilla col. (FAUBA); San Antonio de Areco, ~~FF~~ XII-2008, J.P. Torretta col. (FAUBA); Tigre, 1 ~~F~~, II-1944, Duret col. (MLP); Trenque Lauquen, 2 ~~FF~~, XI-2009, J.P. Torretta col. (FAUBA); **La Pampa**, Toay, 2 ~~FF~~, XI-2008, J.P. Torretta col. (FAUBA); 6 ~~MM~~, I-2009, H.J. Marrero col. (FAUBA); 1 ~~N~~, II-2009, H.J. Marrero col. (FAUBA); 5 ~~FF~~, III-2009, H.J. Marrero col. (FAUBA); **Mendoza**, No loc., 1 ~~F~~, 1930, Rolle col. (MNHN).

Floral host: *Ammi visnaga*, *Hydrocotyle bonariensis* (Apiaceae); *Baccharis pingraea*, *Carduus acanthoides*, *Cirsium vulgare*, *Gaillardia megapotamica*, *Helianthus annuus*, *Senecio pampeanus*, (Asteraceae); *Diplotaxis tenuifolia*, *Hirschfeldia incana*, *Raphanus sativus* (Brassicaceae); *Adesmia bicolor* (Fabaceae) and *Portulaca oleracea* (Portulacaceae)

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LITERATURE CITED

- Engel, M. 2001. A monograph of the Baltic amber bees and evolution of the Apoidea (Hymenoptera). *Bulletin of American Museum of Natural History* 259: 192 pp.
- Fischer, R. L. 1956. The muscular mechanism of the male metasoma and genitalia of *Megachile fortis* Cresson (Hymenoptera, Megachilidae). *The Canadian Entomologist* 88 (12): 657-673.
- Michener, C. 2000. *The Bees of the world*. Johns Hopkins University Press, Baltimore, Maryland. 872 pp.
- Michener, C. D. 2007. *The Bees of the World*, second edition. Johns Hopkins University Press, Baltimore, 992pp.
- Mitchell, T.B. 1934. A revision of the genus *Megachile* in the Nearctic Region, Part. I. *Transactions of the American Entomological Society* 59: 295-361.
- Mitchell, T.B. 1935. A revision of the bees of the genus *Megachile* of the Nearctic region, Part II–III. *Transactions of the American Entomological Society* 61: 1–205.
- Mitchell, T.B. 1936. A revision of the bees of the genus *Megachile* of the Nearctic region, Part IV. *Transactions of the American Entomological Society* 62: 117–166.
- Mitchell, T.B. 1937. A revision of the bees of the genus *Megachile* of the Nearctic region, Part V. *Transactions of the American Entomological Society* 62: 323–382.
- Mitchell, T. B. 1943. On the classification of neotropical *Megachile* (Hymenoptera: Megachilidae). *Annals of the Entomological Society of America* 36: 656–671.
- Mitchell, T. 1980. *A generic revision of the Megachilinae bees of the Western Hemisphere*. *Contr. Dep. Ent. North. Carolina State Univ.* 95 pp.

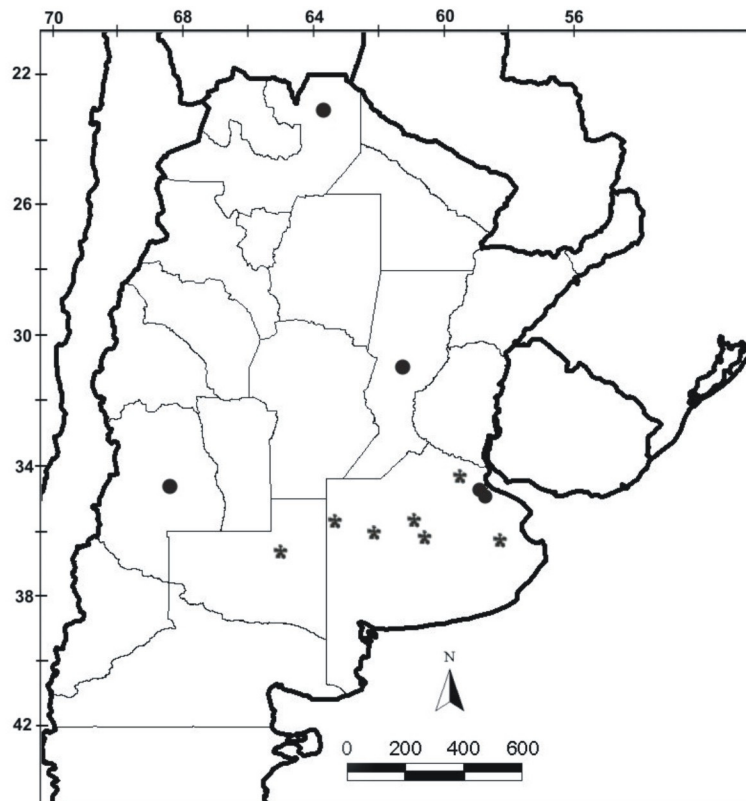
Moure, J. S. 1947. Notas sobre algunas abejas de la provincia de Salta (Hymen. Apoidea). *Revista de la Sociedad Entomológica Argentina* 13: 218-253.

Moure, J. S., Melo, G. A. R., & DalMolin, A. 2007. Megachilini. Pp. 917–1001. *In*: Moure, J. S., Melo, D., & Melo, G. A. R (eds). *Catalogue of Bees (Hymenoptera, Apoidea) in the Neotropical Region. Sociedade Brasileira de Entomologia*. Curitiba, Brasil. xiv, 1058p.

Raw, A. 2007. An annotated catalogue of the leafcutter and mason bees (genus *Megachile*) of the Neotropics. *Zootaxa* 1601: 1–127.

Schrottky, C. 1920. Himenópteros nuevos o poco conocidos sudamericanos. *Revista do Museu Paulista* 12: 3-51.

Vachal, J. 1908. Espèces nouvelles ou Litigieuses d'Apidae du haut bassin du Parana. *Revue d'Entomologie* 26: 221-244.



Figs. 15. *Megachile (Pseudocentron) gomphrenoides*. Geographic distribution. Black circles: previous records; asterisks: new record.