

## Redescription of *Chaetochile* as Subgenus of *Megachile* (Hymenoptera, Megachilidae)

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### ABSTRACT

*Chaetochile* Mitchell (Megachilidae) is herein confirmed as a subgenus of *Megachile* and represented by one species *M. (Chaetochile) mitchelli* Raw. The subgenus is characterized by a clypeus and supraclypeal area which is flat in the female, a second mandibular tooth which truncate and closer to the first than to the third tooth; T6 with an anterior depression and the distal margin with a conspicuous expansion and one spine on each side in the male. This contribution includes a redescription of *M. Chaetochile* and its single species.

### INTRODUCTION

*Megachile* Latreille, commonly called leaf cutting bees, is represented by approximately 900 solitary species on all continents. They carry foreign materials from outside their nests to form cells. Nests may be in the soil, in holes, in wood and in diverse cavities.

In the New World, *Megachile* has been divided into 23 subgenera by Mitchell (1973) and later the same author (1980) divided *Megachile* into seven genera (*Cressoniella* Mitchell, *Chalicodoma* Lepeletier, *Chrysosarus* Mitchell, *Eumegachile* Friese, *Megachile* Latreille, *Megachiloides* Mitchell, *Pseudocentron* Mitchell), each one with several subgenera. Michener (2000) made modifications to the previous classification and recognized three subgenus groups.

*Chaetochile* was described by Mitchell (1980) based on *C. golbachi* Schwimmer (Schwimmer in Mitchell, 1980), as a subgenus of *Cressoniella*. Michener (2000) established the synonymy of *Chaetochile* and *Dasymegachile* Mitchell, a subgenus including at least 20 species from Argentina, Chile and Perú. Durante & Abrahamovich, (in press) considered that *Chaetochile* and *Dasymegachile* show enough differences to separate them into independent subgenera.

In the present contribution we study the monotypic subgenus *Chaetochile* with its single species *Megachile mitchelli* Raw, recorded for Argentina and Brasil. In this paper we redescribe the subgenus *Chaetochile* and the type species based on the holotype and paratypes, adding new characters for its recognition and updating its distribution.

## MATERIAL AND METHODS

The examined material is housed at Museo Argentino de Cs. Naturales “Bernardino Rivadavia”, Buenos Aires (MACN); Museo de La Plata, Argentina (MLP); National Museum of Natural History, USA (MNHN) and Snow Entomological Museum, University of Kansas, USA (SEMC). Morphological terminology follows Fischer (1956), Mitchell (1980) and Engel (2001). The following abbreviations are used in the descriptions: F, flagellomere; S, metasomal sternum; Sc, scape; Pe, pedicel; T, metasomal tergum. All measurements are indicated in millimeters and were taken with an ocular micrometer attached to a stereoscopic microscope.

## TAXONOMIC TREATMENT

Genus *MEGACHILE* Latreille

Subgenus *Chaetochile* Mitchell

(Figs. 1-13)

*Cressoniella* (*Chaetochile*) Mitchell, 1980: 63. Type species *Cressoniella* (*Chaetochile*) *golbachi* Schwimmer in Mitchell 1980, by original designation.

*Megachile* (*Dasymegachile*) Mitchell, 1943: 669. Type species *Megachile saulcyi* Guérin-Méneville; Michener, 2000: 555 (Syn. Nov.); Silveira *et al.*, 2002: 212.

*Redescription.*—*Female* - Large (10 to 14 mm long). Integument black, coriaceous and punctured; wings hyaline; tegula and veins brown to dark brown. Pubescence generally long and abundant, yellowish white and black; metasomal tergum with apical faciae. Clypeus and supraclypeal area flat, completely covered with special hairs; transverse portion of the epistomal sulcus straight. Sc subequal than F1+F2+F3. Mandibles tridentate, fourth mandibular tooth notched, incomplete cutting edge in the second interspace and complete in the third interspace. Scutellum rounded with slight median elevation. Metasoma cordate or ovate. T6 in dorsal view, rounded, in lateral view, straight; scopa black. S with black scopal hairs.

*Male* - Mandible tridentate, the second mandibular tooth truncate, sometimes notched, and closer to first than to third tooth; without mandibular process. F11 simple, narrow, with apical margin rounded. Scutellum rounded without median elevation. Procoxae without tubercles or spines, lacking ferruginous bristles; profemur crenate; probasitarsus unmodified, protarsus reddish brown, with black spot, basitarsal lobe absent. Mesotibial spur well developed. Carina of T6 emarginated, U-shaped, external margin denticulate and irregular; with anterior depression; distal margin of T6 with conspicuous expansion and one spine on each side. S5. Pregradular area with pubescence simple; gradulus medially conspicuous; postgradular area completely covered with simple and long hairs; apical rim slightly arcuate. S6. Pregradular subtriangular, apical margin with simple hairs; postgradular area with lateral patch of simple setae; apical rim with conspicuous lateral lobes. S8. Apical lobe with distal margin rounded, lateral margin bare. *Genitalia*. Gonobase with basal margin straight; gonoforceps slightly

subcylindrical, apex simple, with subterminal brush of setae.

*Distribution.*— This subgenus is distributed in Argentina, Brasil and Perú.

*Taxonomic discussion.*— *Megachile (Chaetochile)* significantly differs from all other *M. (Dasymegachile)* species and should be excluded from that subgenus. The main characters to separate them are: clypeus and supraclypeal area flat in the female, second mandibular tooth truncate and closer to first than to third tooth; T6 with anterior depression and distal margin with conspicuous expansion and one spine on each side in the male.

***Megachile (Chaetochile) mitchelli* Raw**

(Figs. 1-13)

*Cressoniella (Chaetochile) golbachi* Schwimmer in Mitchell, 1980: 87.

*Megachile (Dasymegachile) golbachi*, Michener, 2000: 555; Silveira *et al.*, 2002: 212.

(non *M. golbachi* Schletterer 1891)

*Megachile (Dasymegachile) mitchelli* Raw, 2004: 2 (replacement name for *Cressoniella (Chaetochile) golbachi* Schwimmer in Mitchell, 1980.

*Redescription.*— *Female.* Length 10.85-14.11 ( $X=12.75$ ) (Figs. 1-4). *Color.* Integument black; mandible reddish brown near the teeth. Wings hyaline; tegula and veins dark brown. Legs and tibial spurs brown; claws brown, basally ferruginous. *Pubescence.* Generally long and abundant, yellowish white and black. Clypeus, supraclypeal area, paraocular area, frons, vertex and gena with abundant brown or black pubescence; clypeus completely covered with special bent hairs (Figs. 1 and 3); supraclipeal area with abundant, erect and short spine-like hairs (Figs. 1 and 2). 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 black; legs with dark brown setae; inner face of tibiae ferruginous. T1-2 with abundant white yellowish pubescence and T3-6 completely black; T3-5 with complete white yellowish apical faciae; scopa black; E6 with black scopal hairs. *Sculpture.* Integument of the head generally coriaceous, strongly punctured; basal margin of clypeus and distal margin of supraclypeal area unpunctured. *Structure.* Head, maximum width 4.85, maximum length 4.34. Clypeus wider than long (2.00-1.30). Transverse portion of the epistomal sulcus straight, apical margin straight and dentate (Fig. 1); clypeus nearly flat and supraclypeal area flat; posterior margin of vertex slightly concave; gena subrectangular; maximum width of compound eye longer than maximum width of gena (1.30-1.10); eyes convergent below; paraocular carina present; orbitocipital distance 0.80; maximum width and maximum length of eye 1.30-3.20; interantennal distance subequal than antennocellar distance (to median ocellus) (0.90-0.80), subequal than antennocular distance (0.90-0.70), and longer than antennoclypeal distance (0.90-0.50). Sc, 1.13; Pe, 0.14; F1, 0.41; F2, 0.36; F3, 0.36; Sc subequal than F1+F2+F3 (1.13-1.13). Ocellus located above supraorbital tangent line; interocellar distance (between lateral ocelli) longer than ocellocular distance (to lateral ocellus) (0.72-0.63) and longer than ocelloccipital distance (to lateral ocellus) (0.72-0.54). Mandible tetridentate, with incomplete cutting edge in the second interspace and complete in the third interspace; fourth mandibular tooth notched (Fig. 4). Scutellum rounded with slight median elevation; metanotum vertical. Mediotarsus cordate. *Metasoma*, cordate, T6, in dorsal

view rounded, in lateral view, straight.

*Male* - Length. 10.31-12.21 ( $X = 11.35$ ). (Figs. 5-13). It differs from female by the following characters. *Color*. Tegula and veins brown; protarsus reedish brown, with black spot. Metasomal sternum brown. *Pubescence*. Clypeus, supraclypeal area, paraocular area, with long, abundant and white yellowish hairs; frons, vertex and genae with long, abundant and dark brown pubescence, vertex with intermixed sparse white hairs; lower margin of mandible with brown pubescence; episternum covered with white yellowish pubescence; procoxae hairy; posterior surface of profemur and protarsus with long, abundant, white yellowish pubescence; protibia and mesotibia with brown hairs; mesotarsus and metatarsus ferruginous. Metasoma with ventral, sparse, brown pubescence. T3-5 with incomplete apical faciae yellowish white. *Sculpture*. Integument coriaceous. Head with dense punctures; clypeus with dense punctation (Fig. 5). *Structure*. Head, maximum width 4.10, maximum length 3.20. Clypeus wider than long (1.44-0.90), upper clypeal area protuberant; gena narrower than compound eye (0.80:1.20); hypostomal area flat, without angles or projections; orbitoccipital distance 0.58; maximum width and maximum length of eye 1.20: 2.40; interantennal distance subequal to antennocellar distance (to median ocellus) (0.67:0.63), longer than antennocular distance (0.67:0.41) and longer than antennoclypeal distance (0.67:0.49); Sc, Pe and F1-F3= 0.72:0.14:0.22:0.22:0.27; Sc as long as F1+F2+F3 (0.72: 0.71); F11 simple, narrow, with apical margin rounded. Ocellus below supraorbital line; interocellar distance (between lateral ocelli) subequal to ocellocular distance (to lateral ocellus) (0.54:0.58) and subequal to ocelloccipital distance (to lateral ocellus) (0.54:0.58). Mandible tridentate, second mandibular tooth truncate, sometimes notched, and closer to first than to third tooth (Fig. 6); without mandibular process. Procoxae without tubercles or spines; profemur carinate; probasitarsus unmodified, basitarsal lobe absent. Mesotibial spur well developed. *Metasoma*, carina of T6 emarginated, U-shaped, external margin denticulate and irregular; with anterior depression; distal margin of T6 with a conspicuous expansion and one spine on each side (Fig. 10, 11). S5. (Fig. 7). Lateral portions of pregradular area as wide as long; apical pubescence long and marginal; median portion of pregradular area narrow. Gradulus medially conspicuous. Postgradular area completely covered with simple and long hairs. Apical rim slightly arcuate. S6. (Fig. 8). Pregradular area well separated, subtriangular, apical margin pilose, with simple hairs. Pubescence of postgradular area composed of lateral patch of simple setae, medially separate. Apical rim with conspicuous lateral lobes and acute medially. S7. Absent. S8. (Fig. 9). Apical lobe with distal margin rounded, lateral margin slightly straight and bare; surface subapically covered with fine hairs; basal margin acute. *Genitalia* (Fig. 12, 13). Gonobase wider than long, basal margin straight. Gonoforceps slightly subcylindrical, with basal projection, inner surface hairy, apex simple, lanceolate and asymmetric, with subterminal brush of setae, their length not exceeding penis valve length. Penis valve laterally flattened; penis valve bridge subrectangular, superior margin arcuate and inferior margin straight. Volsella well developed, acute.

*Remarks*.—The characteristic facial hair in the females of *M. mitchelli*, can be considered as special adaptations for the collection of pollen, just as it was considered for Muller (1986).

*Distribution*.— *M. (C.) mitchelli* is distributed in Argentina (Jujuy, Catamarca

and La Rioja province), Brasil and Perú.

*Type material examined.*— ARGENTINA. Holotype female labeled: “La Quiaca, 3400 m/Jujuy RA.”, 9-11, 1960/R. Golbach”; “*Cressoniella* (*Chaetochile*)/*golbachi*/ Eric Schwimmer/Holotype 1980”; “Type Nf/100887/U.S.N.M”. Paratype, female labeled: “Arg.: Catamarca/C.Minas Capillitas/17-XII-72 J. Neff”; “*Lathyrus/macropus*”; “76645”; “*Cressoniella* (*Chaetochile*)/*golbachi*/Eric Schwimmer/Paratype 1980”. Paratype, female labeled: “Arg.: Catamarca/C. Minas/Capillitas 21-XII-72 J. Neff”; “*Lathyrus/macropus*”; “*Cressoniella* (*Chaetochile*)/*golbachi*/Eric Schwimmer/Paratype 1980”.

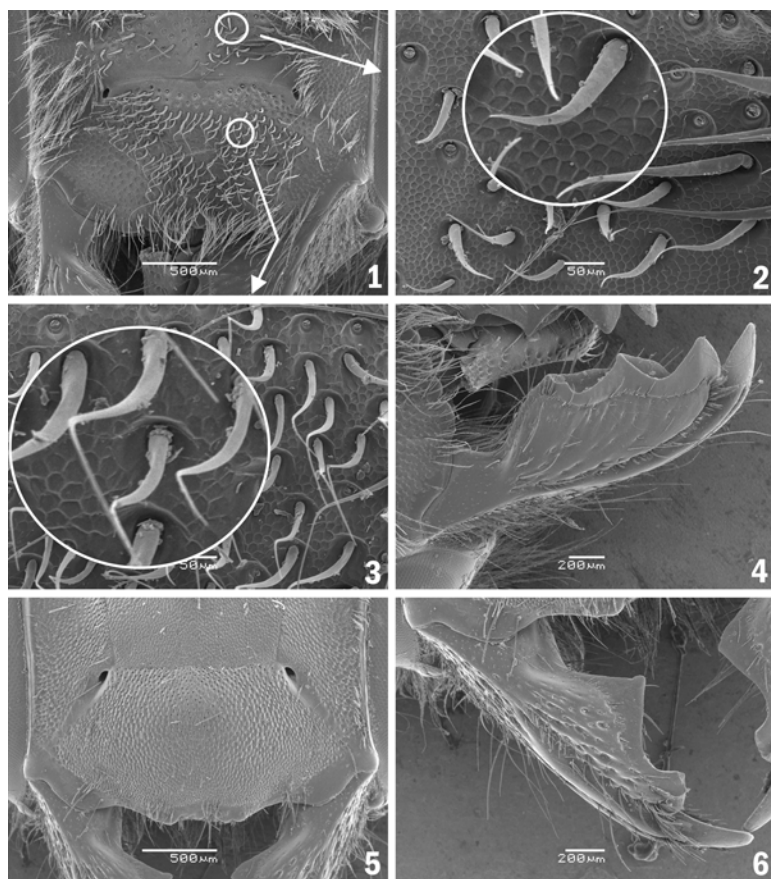
*Additional material examined.*— ARGENTINA: Jujuy, 1 male, El Aguilar, 4500m, 12-I-1972, Leg. D. J. Brothers, (SEMC); 4 males, Iturbe, 21-I-1959, Leg. Torres-Dadone, (MLP); 1 male, Santa Catalina, 24-I-1959, Leg. Torres-Dadone, (MLP); 1 male, Cerro Colorado (La Quiaca), 13-II-1958, Leg. Torres-Ferreya, (MLP); 1 female, La Quiaca, I-1943, Leg. B. Cipolletti (MLP); 1 female, Barrios-La Quiaca, 13-II-1958, Leg. Torres-Ferreya, (MLP); 1 female, La Quiaca, 3400 m, 1-II-1949, Leg. Martínez, (MLP); *La Rioja*, 1 female, La Rioja, (MACN); 1 female, Entre Punta de Vacas y Los Horcones, (MACN). PERÚ: 1 female, Luquina, Titicaca, 25-I-1939, Leg. Foerster, (MLP).

#### ACKNOWLEDGEMENTS

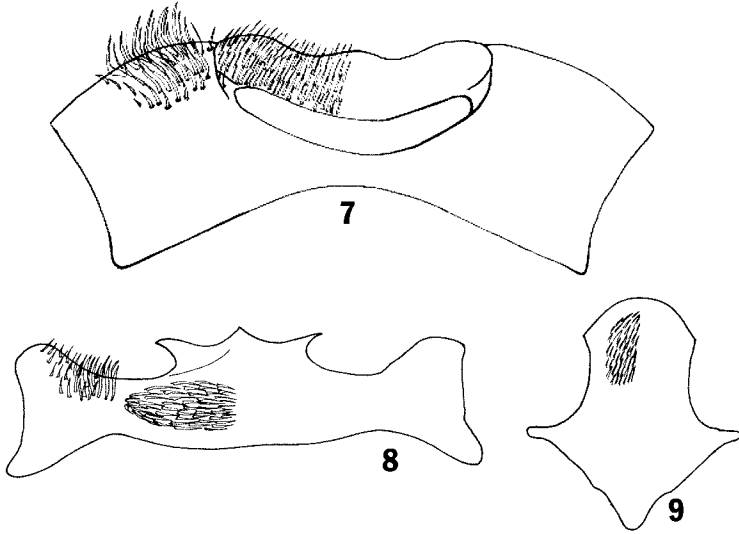
We thank Claire Villemant (Museum National D'Histoire Naturelle, Paris), Arturo Roig (Museo Argentino de Cs. Naturales “Bernardino Rivadavia”, Buenos Aires), R. Brooks and C. Michener (Snow Entomological Museum, University of Kansas) for the loan of specimens. We also thank A. Lanteri (Facultad de Ciencias Naturales y Museo, UNLP) for the critical reading of the manuscript.

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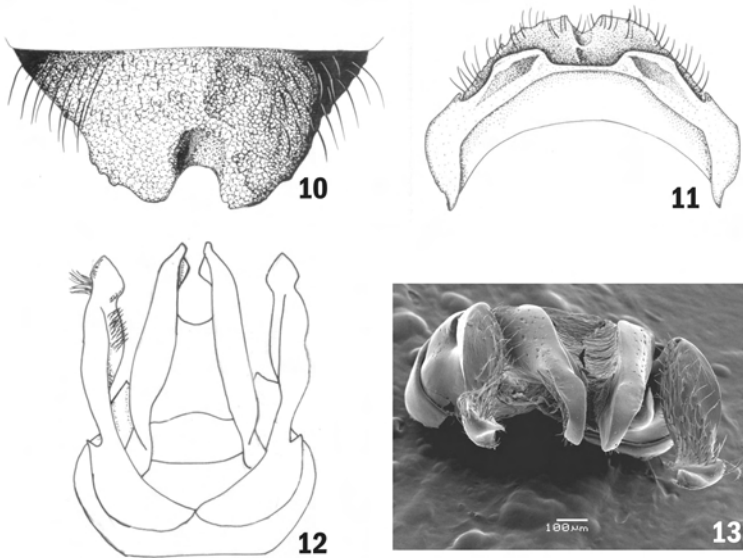
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Figs. 1-6. *Megachile (Chaetochile) mitchelli*, 1-4, Female. 1, Clypeus and supraclypeal area. 2, Detail of supraclypeal area; 3, Detail of clypeus; 4, Mandible. 5-6, Male. 5, Clypeus and supraclypeal area; 6, Mandible



Figs. 7-9. *Megachile (Chaetochile) mitchelli*, Male, Metasomal sternum; 7, metasomal sternum 5; 8, metasomal sternum 6; 9, metasomal sternum 8.



Figs. 10-13. *Megachile (Chaetochile) mitchelli*, Male. 10-11, dorsal and ventral view of carina of T6; 12-13, Genitalia, dorsal and apical view.