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Species of *Megachile* (*Chrysosarus*) with a partial cutting edge in the female mandible in Argentina, Chile and Uruguay (Hymenoptera, Megachilidae)

Arturo ROIG-ALSINA[1] & Juan Pablo TORRETTA[2,3]

[1] Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina. División Entomología. [2] Universidad de Buenos Aires, Facultad de Agronomía, Cátedra de Botánica General, Buenos Aires, Argentina. [3] Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina

Abstract: The subgenus *Megachile* (*Chrysosarus*) is known for the lack of cutting edges in the female mandible. Nevertheless, a small cutting edge on the lower margin of the third tooth is present in a few species, all described from Brazil. This contribution calls attention to the presence of this condition in several species occuring in Argentina, Chile, and Uruguay. Four new species are described: *M. basimacula*, *M. platensis*, *M. sancticlaudii*, and *M. simpliciclypeata*. The identity of two species described over a century ago is clarified: *M. interjecta* Vachal, and *M. cubiceps* Friese. *Megachile uncinata* González, Griswold & Engel is a junior synonym of *M. cubiceps* Friese. Species of *M.* (*Chrysosarus*) with a small cutting edge in the female mandible form an heterogeneous assemblage, and seem to be related to species that completely lack cutting edges, and not to each other. A probable exception is the group formed by the four species *M. basimacula*, *M. cubiceps*, *M. euzona*, and *M. tetrazona*, which share a number of common features, and are included as the *M. euzona* species group. Descriptions, illustrations, and distributional data are presented for all treated species.

Key words: Wild bees, leaf-cutter bees, taxonomy, new species.

Resumen: Especies de *Megachile* (*Chrysosarus*) con un borde cortante parcial en la mandíbula de la hembra en Argentina, Chile y Uruguay (Hymenoptera, Megachilidae). El subgénero *Megachile* (*Chrysosarus*) es conocido por la falta de bordes cortantes en la mandíbula de la hembra. Sin embargo, un pequeño borde cortante en el margen inferior del tercer diente está presente en unas pocas especies, todas descritas de Brasil. En esta contribución se destaca la presencia de esta condición en varias especies presentes en Argentina, Chile y Uruguay. Se describen cuatro nuevas especies: *M. basimacula*, *M. platensis*, *M. sancticlaudii* y *M. simpliciclypeata*. Se clarifica la identidad de dos especies descritas hace más de un siglo: *M. interjecta* Vachal y *M. cubiceps* Friese. *Megachile uncinata* González, Griswold & Engel es un sinónimo posterior de *M. cubiceps* Friese. Las especies de *M.* (*Chrysosarus*) con un pequeño borde cortante en la mandíbula de la hembra forman un grupo heterogéneo y no parecen estar todas relacionadas entre sí, sino con especies que no tienen bordes cortantes. Probablemente constituyen una excepción las cuatro especies *M. basimacula*, *M. cubiceps*, *M. euzona* y *M. tetrazona*, que comparten varias caracterísiticas en común y son incluidas como el grupo de especies *M. euzona*. Se presentan descripciones, ilustraciones y datos de distribución para todas las especies tratadas.

Palabras clave: Abejas silvestres, abejas cortadoras de hojas, taxonomía, nuevas especies.

INTRODUCTION

The subgenus *Chrysosarus* Mitchell is one of the major subgenera of *Megachile* Latreille in the Neotropics, currently including 60 nominal species (Moure *et al*., 2007; Raw, 2007; Ascher & Pickering, 2020). The subgenus includes nearly all of the Neotropical species which completely lack cutting edges in the female mandible. As presently understood, the subgenus also includes a few species which have a small cutting edge on the lower margin of the third tooth, partially filling the second interspace, between the second and third teeth. Raw (2006) proposed the new subgenus *Austrosarus* for three such species from Brazil. Besides the presence of the small cutting edge in the female mandible, these three species bear no other characteristics that allow to separate them from *Chrysosarus*, and consequently *Austrosarus* has been placed in the synonymy (Gonzalez, 2013; Melo & Parizotto, 2015; Gonzalez *et al*., 2019; Roig-Alsina & Torretta,

2021). Later, Melo & Parizotto (2015) described two further species of *Chrysosarus* with a small cutting edge in the female mandible.

According to current understanding of *Megachile* phylogeny (Trunz *et al*., 2016; Gonzalez *et al*., 2019) the lack of cutting edges in *Chrysosarus* is a derived condition for the subgenus, since all immediate outgroup subgenera in the cladograms have cutting edges. The presence of a small cutting edge is then a plesiomorphy within the subgenus, and cannot be taken as evidence of relationship for the species bearing it. The possibility that the cutting edge has arisen de novo in some species needs to be clarified in a comprehensive phylogenetic analysis of the subgenus, beyond the scope of the present contribution.

The present contribution deals with several species of *Chrysosarus* from Argentina, Chile and Uruguay which have a small cutting edge in the female mandible. The species with this condition form an heterogeneous assemblage, with the exception of four species which share a number of common features. The other species seem to be related to species that completely lack cutting edges, and not to each other.

The aim of this study is to contribute to the knowledge of the morphological diversity within the *Chrysosarus* lineage, to describe four new species, to clarify the identity of two species described over a century ago, and to provide illustrations and distributional data for all treated species.

MATERIAL AND METHODS

Morphological terminology follows Michener (2007) for general terms, Michener & Fraser (1978) for mandibular structures, and Mitchell (1980) for terminology of the hidden sterna of the male. The maximum diameter of the median ocellus (MOD) is used as a reference to express the length of the pubescence and other structures, and the diameter of punctures (PD) to indicate the size of the intervals between the punctures. The metasomal terga (T) and sterna (S) are identified with Arabic numerals. The sex of the specimens is indicated by F, female, and M, male. Distribution maps were constructed using SimpleMappr (Shorthouse, 2010).

The material studied belongs to the following institutions: Facultad de Agronomía, Universidad de Buenos Aires (FAUBA), Instituto Argentino de Investigación de Zonas Áridas, Mendoza (IADIZA), Museo Argentino de Ciencias Naturales, Buenos Aires (MACN), Museo de La Plata, La Plata (MLP), Muséum National d'Histoire Naturelle, Paris (MNHN), Natural History Museum, London (NHMUK); Snow Entomological Collection, Lawrence, Kansas (SEMC); Zoologisches Museum der Humboldt Universität, Berlin (ZMB).

SYSTEMATICS

Genus *Megachile* Latreille
Subgenus *Chrysosarus* Mitchell

Remarks. Currently, five species with a small partial edge in the second interspace of the female mandible have been included in the subgenus *Chrysosarus*, all described from Brazil: *Megachile canastra* Melo & Parizotto, *M. candanga* Raw, *M. diamontana* Melo & Parizotto, *M. diasi* Raw, and *M. frankieana* Raw (Melo & Parizotto, 2015; Raw, 2006). A further species, the Chilean *Megachile euzona* Pérez, has been reported as having a small edge (Gonzalez *et al*., 2019), although barely visible in frontal view.

The subgenus *Chrysosarus* in Argentina, Chile, and Uruguay includes several species with a partial cutting edge on the third tooth of the female mandible, although with different degrees of development of the edge. The species are listed below taking into account features both of the females and the males. *Megachile interjecta* Vachal, and *M. platensis* n. sp. occur in Argentina and Uruguay; *M. euzona* Pérez, and *M. tetrazona* Friese occur in Argentina and Chile; and *M. basimacula* n. sp., *M. cubiceps* Friese, *M. sancticlaudii* n. sp., and *M. simpliciclypeata* n. sp. only occur in Argentina.

Megachile interjecta stands apart because of the mandibular structure of the female. Both the second and the third interspaces have a partial cutting edge (Fig. 1A). We know of no other *Chrysosarus* with this type of mandible. The hidden sterna and the basitarsus of the male relate this species to *M. platensis* n. sp.

Megachile sancticlaudii n. sp. has a clearly visible cutting edge (Fig. 1C). The female is readily recognized by the complete sternal apical bands of plumose hairs below the scopa on S2-S5. The male has an angle on the lower margin of the mandible, and the preapical carina of T6 bears strong spiniform teeth on each side of the median emargination.

The two species *M. platensis* n. sp. and *M. simpliciclypeata* n. sp. present a rudiment of cutting edge (Fig. 1B), difficult to see when the man-

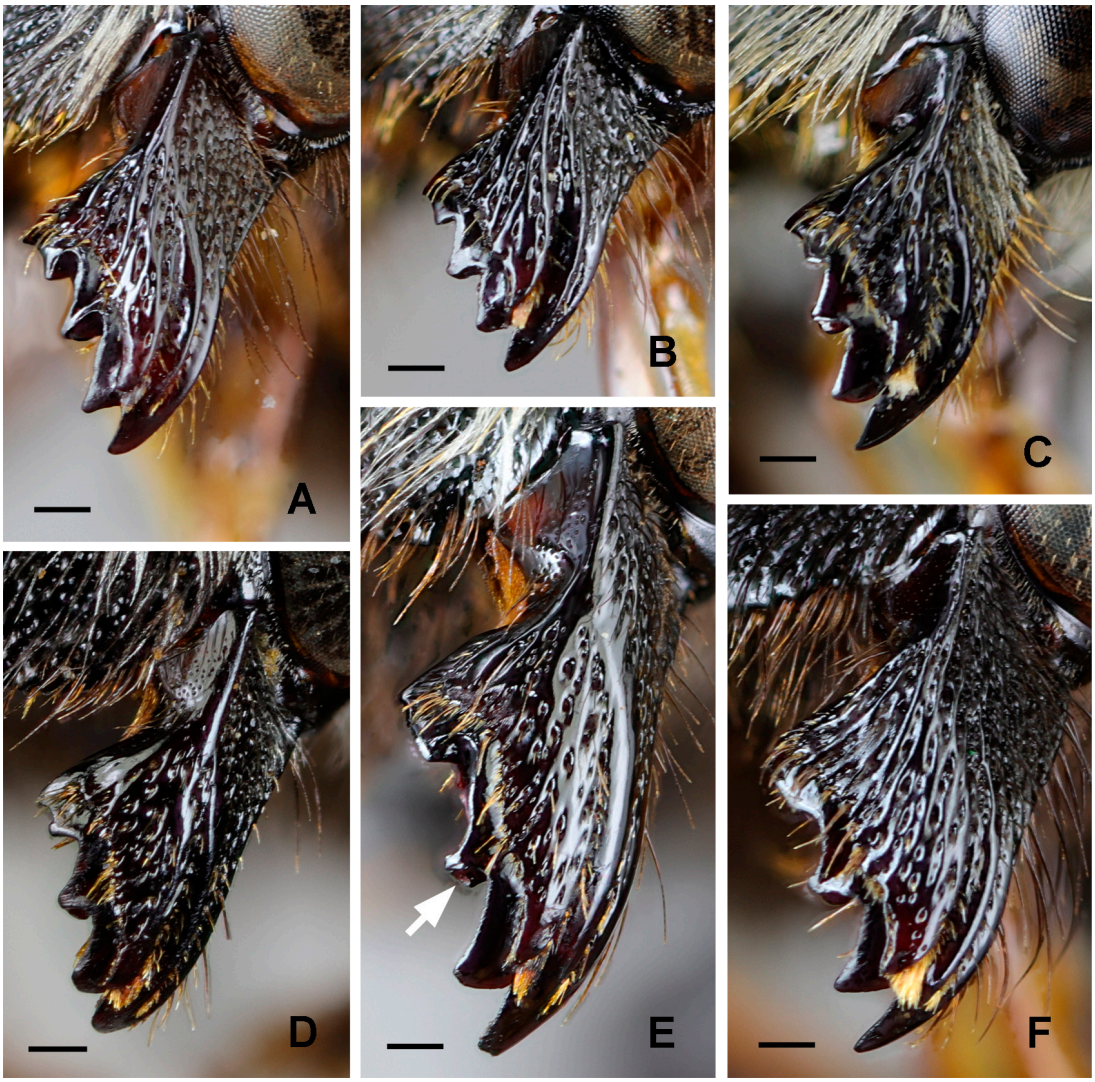

Fig. 1. *Megachile* (*Chrysosarus*) species, left mandible of females. A. *M. interjecta* Vachal. B. *M. platensis* n. sp. C. *M. sancticlaudii* n. sp. D. *M. basimacula* n. sp. E. *M. cubiceps* Friese (arrow indicates cutting edge on lower margin of third tooth, partially filling second interspace). F. *M. tetrazona* Friese. Scale lines = 0.2 mm.

dibles present some wear. They are included to illustrate the extent of variation of the structure within *Chrysosarus*. As in *Megachile interjecta*, females have lateral apical bands of plumose hairs under the scopa.

Megachile euzona species group. This group is very distinctive and different from all other species groups in *Chrysosarus*. Its species are distinguished at first sight by their sturdy body form. The group may deserve subgeneric recognition and further phylogenetic studies may resurrect the name *Stelodides* Moure for the group.

The cutting edge in the second interspace varies in these species from rudimentary in *M. euzona*, moderate in *M. basimacula* (Fig. 1D) and *M. tetrazona* (Fig. 1F) to well developed in *M. cubiceps* (Fig. 1E). The four species included in the group are quite dissimilar in aspect, and each of them is singled out by peculiar features, such as the enormous head and mandibles of the female *M. cubiceps*, the color pattern of *M. euzona*, the shape of the clypeus of *M. basimacula*, or the unique forebasitarsus of the male *M. tetrazona*.

The females of the four species have an ovoid metasoma, which gives them an aspect of robustness. The second and the third metasomal

terga in these species are of similar width. Other species currently in *Chrysosarus* have a cordate metasoma, with the second metasomal tergum wider than the third. Two characteristics tabulated by Gonzalez *et al*. (2019) for *M. euzona* are also present in the other three species. One of them refers to the outer premarginal impressed line of the female mandible, which bears stiff setae on all its length, while in other *Chrysosarus* such setae are usually restricted to the portion that borders the fourth tooth. The second one refers to the hypostomal carina, which curves towards the cranial acetabulum. Furthermore, the strip that borders the mandibular socket posteriorly is strongly thickened in the four species. Apical bands of plumose hairs under the scopa are absent in these species.

The males of *M. cubiceps*, *M. basimacula*, and *M. euzona* share a strikingly similar anterior basitarsus, which is flattened, broadest subbasally, with a sinuous outer margin bearing a fringe of short hairs, and with a basal black spot on the undersurface (Fig. 10A-C); other tarsomeres lack black spots on the undersurface. The foretarsus of other *Chrysosarus* bears as a rule a black spot on the undersurface of the second tarsomere, although in some species black spots may also occur on the third and fourth tarsomeres. The sharply carinate outer margin of the foretibia of the males is another feature that separates the four species from other *Chrysosarus*. The hidden sixth sternum of the males is also characteristic. Except in *M. euzona*, the apical lobes of the postgradular area of S6 are strikingly large and broadly rounded, and the pregradular lateral hairs form a dense tuft of plumose hairs.

Megachile (Chrysosarus) interjecta Vachal

(Figs. 1A, 2A-F, 5A, 6A, 7A, 11D)

Megachile interjecta Vachal, 1909: 6, 16. Holotype male, Buenos Aires [Argentina], 7-II-99. (MNHN, EY35451, examined through photographs).

Diagnosis. Females are readily distinguished by their mandibles, which have the second interspace with a small cutting edge and the third interspace narrow, oblique, and partially closed by a rudimentary cutting edge arising from the lower margin of the fourth tooth (Fig. 1A). The males are distinguished by the color pattern of the pilosity of the face: the upper half to upper one-fourth of the clypeus bears black hairs, in contrast with the white hairs of the rest of the face (Fig. 2C); they are also distinguished by the preapical carina of T6, abruptly produced on the middle one-third of the tergum and distinctly emarginate, thus forming two broad teeth (Fig. 2B, 11D). The outer fringe of the foretarsus is much reduced: on the basitarsus it is restricted to the apical third, and the hairs are approximately as long as the width of the tarsomeres (Fig. 5A).

Female. Body length: 8.8-10.5 mm. Forewing length: 6.7-7.7 mm. *Color*. Black, except under side of flagellum, tibial spurs, and claws reddish brown. Wings weakly infuscate, darker along costal margin of marginal cell, and on apex of forewing; veins and pterostigma dark brown. *Pubescence*. Head: white around antennal sockets, on paraocular areas, posterior margin of vertex and genae; some specimens with few white hairs on sides of clypeus; other hairs black; some specimens with white hairs reduced on head to upper paraocular areas and above antennal sockets. Mesosoma: white on pronotal collar, pronotal lobes, dense tuft behind pronotal lobe, anteriorly on tegula, on scutum, scutellum and metanotum; other hairs of mesosoma including legs, black; some specimens with white hairs extended to entire propodeum and middle and hind legs. Hairs on disc of scutum of various lengths, 0.2-1.2x MOD, longer on mesopleuron (1.5-1.7x MOD). Metasoma: T1 on disc and marginal area with white, long hairs (0.9-1.5x MOD), not forming definite apical band; T2-T5 with distinct apical bands (on T2-T3 weaker medially), white to yellowish on T2-T3, yellow on T4-T5; discs of T2-T5 with yellowish erect hairs (on T3 0.3-0.5x MOD); T6 with yellowish appressed pubescence and stiff erect hairs yellowish basally and black apically. Scopa yellow from S2 to apex of S6; S3-S5 with lateral apical yellowish fasciae under scopa. *Sculpture.* Clypeus and supraclypeal area with dense and irregular punctures separated by shiny interspaces (0.1-0.3x PD), some specimens with narrow, median impunctate longitudinal stripe on supraclypeal area. Punctures on scutum nearly coalescent, small, half the size of those of clypeus; punctures of mesopleuron below hypoepimeral area similar to those of scutum, but becoming larger ventrally and separated by tessellate interspaces 0.2-0.5 PD. Discs of metasomal terga with small punctures separated by 0.3-0.5 PD. *Structure*. Inner margin of eyes converging below, upper interocular distance 1.08x lower interocular distance. Distance from lateral ocellus to posterior margin of head 1.8x MOD. Maximum width of gena in lateral view 0.7x maximum width of eye. Clypeus 2.2x as wide as long, more convex on upper third; apex den-

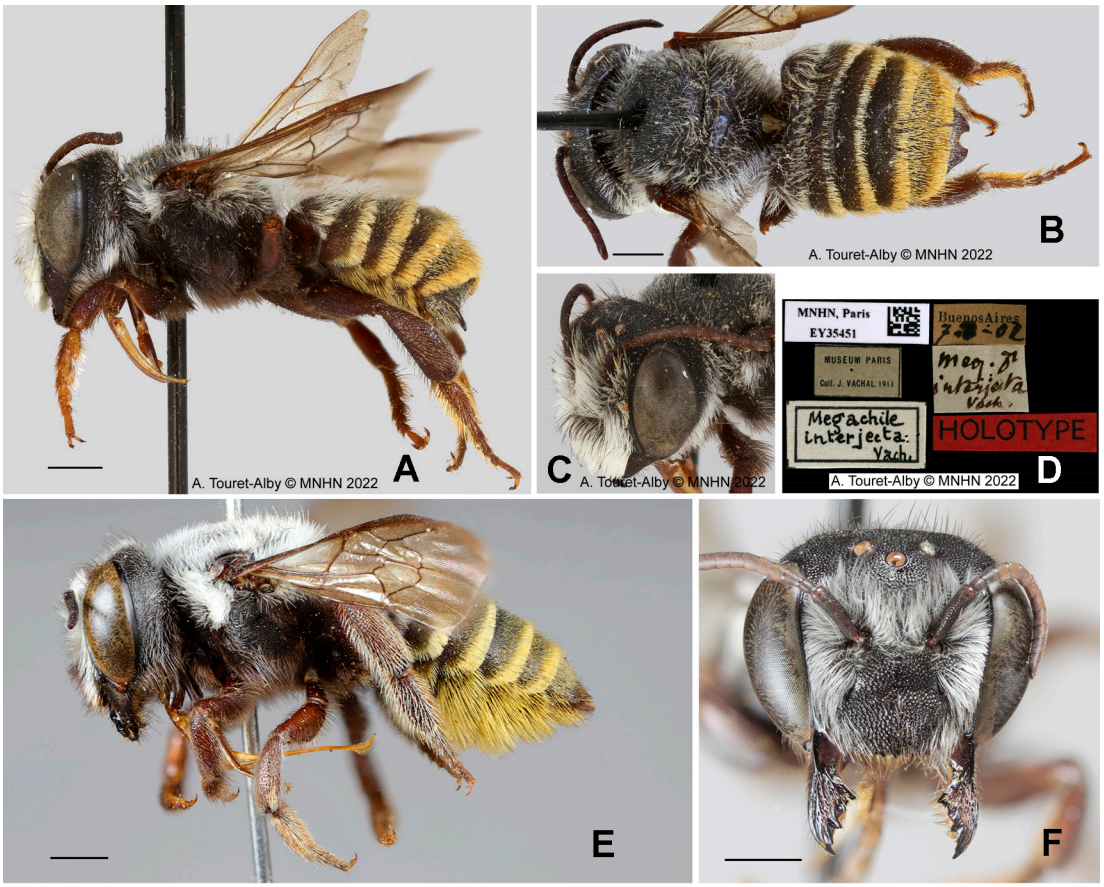

Fig. 2. *Megachile interjecta* Vachal. A-D, male holotype (MNHN, Paris, images published with permission). A. Lateral view. B. Dorsal view. C. Anterolateral view of head. D. Labels. E-F. Female. E. Lateral view. F. Face. Scale lines = 1 mm.

ticulate, with median denticle larger than lateral ones. Mandible with four teeth; first to third teeth of similar size; fourth tooth broad, distinctly incised; second interspace with small cutting edge; third interspace narrow, oblique, partially closed by rudimentary cutting edge arising from lower margin of fourth tooth (independent of premarginal carina); upper acetabular groove with apical tuft; outer premarginal impressed line with few scattered setae bordering fourth tooth. Hypostomal carina ending close to posteromesal angle of mandibular socket. Proportions of scape, pedicel and first three flagellomeres 3.4:0.9:1:0.7:1; first flagellomere 1.25x as long as its apical width. Hind basitarsus 2.8x as long as its maximum width in lateral view.

Male. Body length 7.8-9.5 mm; length of forewing 5.7-6.7 mm. *Color*. Black, except foreleg with underside of femur, underside of tibia, tibial spur and tarsus yellowish brown; underside of second tarsomere with ovoid black spot. Claws of mid and hind legs yellowish brown. Wings as in female. *Pubescence*. Hairs of head mostly white, except black on upper half to upper one-fourth of clypeus, on vertex and around outer orbits. Venter and sides of mesosoma with black hairs, and dorsum with white hairs, except disc of scutum and scutellum with intermixed black and white hairs. Coxae, femora, and fore and middle tibiae with black hairs, hind tibiae and tarsi with white hairs. Outer fringe of foretarsus of short hairs (1.0-1.4x MOD), on basitarsus restricted to apical third. T1 with white hairs on disc and apically, not forming distinct apical band; T2-T5 with distinct yellow apical bands; discs of T2-T5 with erect, simple, yellowish hairs, disc of T5 also with appressed, plumose, yellow hairs; T6 with erect, simple, pale-yellowish, slender hairs, inconspicuous in caudal view. S2-S3 with apical fringes; hairs on S2 rather sparse, longer

laterally, on S3 of even length, very dense medially. *Sculpture*. Punctation similar to that of female. T6 densely covered with small, coalescent punctures. *Structure*. Lower margin of mandible without any angle or projection. Proportions of scape, pedicel and first three flagellomeres 3.6:0.9:1:1.2:1.3; first flagellomere as long as 1.2x its apical width; last flagellomere unmodified. Hypostomal area unmodified. Anterior surface of forecoxa with long, finely branched hairs, and patch of short red bristles partially hidden by plumose hairs; coxal spine short, as long as 1x MOD. Outer margin of foretibia rounded. Forebasitarsus flattened, short, 1.4x as long as its apical width; inner margin with digitiform prolongation. Preapical carina of T6 strongly produced on middle one-third of tergum and medially emarginate. S5, S6, and S8, as in Figure 6A.

Comments. Vachal (1909) mentions in the description of the species the date of collection of the holotype as 7-II-99, but the year (most probably 1899) is not written on the label pinned with the specimen (Fig. 2D).

Distribution. Argentina, provinces of Buenos Aires, La Rioja, Mendoza, Salta, San Luis, and Santa Fe. Uruguay, department of Montevideo (Fig. 7A).

Material studied. ARGENTINA. Buenos Aires: 1 M, San Isidro, 11-II-1927, J. Brèthes (MACN); 1 M, Patagones, XI-1937, M.J. Viana (MACN); 1 F, San Miguel, F.C.P., 2-IV-1938, Novoa S.J. (MACN); 1 F, Escobar, Maq. Savio, 6-I-1998, A. Roig A. (MACN); 1 F, Tres Arroyos, Claromecó, Vivero, 27-II-2006, ex *Adesmia bicolor* [Fabaceae], A. Roig A. (MACN); 2 F, Tornquist, Villa Ventana, 4-5-I-2008, A. Roig A. (MACN); 1 F, Punta Chica, 20-27-III-1950, ex *Jussiaea repens* [= *Ludwigia pleploides*, Onagraceae], M. Senkute (SEMC); 1 M, San Isidro, 20-III-1950, M. Senkeute [sic] (SEMC); 1 F, Delta del Río Paraná, 26-III-1950, M. Senkeute (SEMC); 2 F, Punta Lara, 16-IV-1950, M. Senkute (SEMC); 1 F, Hurlingham, IV-1950, M. Senkute (SEMC); 1 M, San Isidro, XII-1950, E. Plaumann (SEMC); 1 F, Delta de Río Paraná, 6-II-1951, E. Plaumann (SEMC); 2 F, San Fernando, 17-III-1951, J. Foerster (SEMC); 1 F, Punta Lara, 24-III-1951, J. Foerster (SEMC); 2 F, Bolívar, 28-III-1951, J. Foerster (SEMC); 1 F, Fco. Madero, XI-1951, J. Foerster (SEMC); 1 F, González Catán, II-1952, J. Foerster (SEMC); 1 F, Boulogne, 6-IV-1953, M. Senkute (SEMC); 1 F, Hurlingham, III-1954, F.H. Walz (SEMC); 1 F, Luján, III-1954, F.H. Walz (SEMC); 2 M, Villa Elisa, II-1955, J. Foerster (SEMC); 1 F, San Isidro, IV-1960, M. Senkute (SEMC). Ciudad Autónoma de Buenos Aires: 1 F, 25-III-1904, J. Brèthes (MACN); 1 F, 1 M, 4-IV-1904, J. Brèthes (MACN); 3 F, 1 M, 25-III-1909, J. Brèthes (MACN); 1F, 1M, "*nidifie dans le panier d' Oiketicus platensis* Berg", XII-1917, J. Brèthes (MACN); 1 M, 16-II-1920, J. Brèthes (MACN); 1 M, 10-II-1921, J. Brèthes (MACN); 1 F, 3-III-1921, J. Brèthes (MACN); 1 F, 1 M, 2-III-1922, 12286, J. Brèthes (MACN); 1 F, 6642, J. Brèthes (MACN); 1 F, V-1951, J. Foerster (SEMC). La Rioja: 1 M, Anillaco, S 28° 43' 45.36'' W 66° 56' 5.09'',1-6-XI-2011, ex *Prosopis* [Fabaceae], A. Roig A., R. Gonzalez-Vaquero & L. Compagnucci (MACN); 1 F, Estación Amado, 21-IX-1922 (MACN). Mendoza: 1 M, Potrerillos, II-1973, A. Roig A. (MACN). Salta: 1 F, 5 km NE of Cafayate, 14-XI-1993, A. Roig A. (MACN). San Luis: 1 M, La Angelina, without date, E. Almandoz (MACN). Santa Fe: 1 F, Esperanza (Potrero), 8-III-2005, M. Dalmazzo (MACN). URUGUAY. Montevideo: 1 F, Montevideo, 25-II-1909, J. Brèthes (MACN).

Megachile (Chrysosarus) sancticlaudii n. sp.

(Figs. 1C, 3A-D, 5C, 6B, 7B, 11C)

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Diagnosis. Females are easily distinguished by the presence of complete apical fasciae below the scopa on S2-S5. Males can be distinguished by the lower margin of the mandible with an acute angle near the apical third, and the carina of T6 with a shallow median emargination and laterally with 3-4 irregular spiniform teeth (Fig. 11C).

Female. Body length: 9-12 mm (holotype 11.8 mm). Forewing length: 6.8-8.2 mm (holotype 7.7 mm). *Color*. Integument black, except claws reddish brown. Wings infuscated, darker along costal margin of marginal cell and apex of forewing; pterostigma and veins light brown. *Pubescence*. White hairs on paraocular area, on apical corners of clypeus, around antennal socket, on lower part of frons, and on gena and underside of head; hairs black on disc of clypeus, supraclypeal area, upper part of frons, and vertex; some specimens with intermixed white and black hairs on disc of clypeus, supraclypeal area and lower part of frons, and some specimens with black hairs restricted to upper part of frons and vertex; apical margin of clypeus with tufts of golden hairs. Mesosoma mostly with white hairs, except upper part of mesopleuron with black hairs, and

Fig. 3. *Megachile sancticlaudii* n. sp. A-B. Female holotype. A. Lateral view. B. Face. C-D. Male. C. Lateral view. D. Face. Scale lines = 1 mm.

discs of scutum and scutellum either with black hairs or with intermixed black and white hairs. Hairs on disc of scutum erect, of various lengths, 0.4-1.4x MOD, longer on mesopleuron (1.1-1.6x MOD). Foreleg with white hairs on coxa, trochanter and femur, on remainder of leg mostly orange and white, and orange on under surface of tarsus; mid- and hind- legs with white hairs, except on tarsi intermixed with brown hairs. T1 with long, white hairs on disc, and apically with weakly defined apical band of hairs 0.6-0.9x MOD; T2-T5 with short, yellowish hairs on discs (on T3 0.3-0.4x MOD), and complete apical bands of orange-yellow, plumose hairs, although in some specimens band on T2 medially interrupted; T6 with yellowish, decumbent hairs and scattered, semierect, longer brown hairs. Scopa orange-yellow on S2-S6. S2-S5 with complete apical fasciae of yellowish white hairs, in some specimens fascia medially interrupted on S2. *Sculpture*. Clypeus with dense punctures, separated by feebly tessellate to polished interspaces 0.1-0.2x PD (although sparser along midline); supraclypeal area with smaller punctures separated by feebly tessellate interspaces 0.3-0.5x PD. Scutum, scutellum and mesopleuron with dense, uniform punctures separated by tesselate interspaces 0.1-0.3x PD. *Structure*. Inner margin of eyes converging below, upper interocular distance 1.08x lower interocular distance. Distance from lateral ocellus to posterior margin of head 2x MOD. Maximum width of gena in lateral view 0.75x maximum width of eye. Clypeus 2.5x as wide as long; apex denticulate. Mandible with four teeth; first and second teeth of similar size; third tooth bearing a small but distinct cutting edge; fourth tooth broad, incised; second and third interspaces in form of asymmetric V; upper acetabular groove with apical tuft; outer premarginal impressed line with stiff setae close to fourth tooth. Hypostomal carina ending close to posteromesal angle of mandibular socket. Proportions of scape, pedicel and first three flagellomeres 3.6:0.8:1:0.75:0.85; first flagellomere 1.15x as long as its apical width. Hind basitarsus 3.3x as long as its maximum width in lateral view.

Male. Body length: 7.5-10.5 mm. Forewing length: 6.2-7.5 mm. *Color*. Black, except on foreleg undersurface of femur and tibia brown, tibial spur and claws brown, and tarsus yellowish (in

some specimens distitarsus and proximal part of basitarsus brown, contrasting with yellowish second to fourth tarsomeres); second tarsomere of foretarsus with a black, ellipsoid macula on undersurface. Wings as in female. *Pubescence*. Yellow on face, black on vertex and white on gena and underside of head. Hairs black intermixed with some white hairs on scutum and scutellum; hairs brown on lateral side of pronotum, on upper part of mesopleuron and on lateral and posterior sides of propodeum; other hairs of mesosoma white. Legs with white hairs intermixed with sparse black hairs. Outer fringe of foretarsus white, with hairs 1.2-1.6x apical width of basitarsus. Metasoma with yellow hairs, those of discs longer on T1 and T5 than on T2-T4; T6 with abundant decumbent hairs and sparse erect ones. Apical bands of golden-yellow hairs forming lateral patch on T1, complete on T2-T5, although narrowed on T2-T3 and in some specimens briefly interrupted medially. Sterna with yellow hairs on discs and complete, dense apical fringes of plumose hairs on S2-S4; hairs of fringes long laterally (1-1.5x MOD) and shorter medially (0.2-0.5x MOD). *Sculpture*. Similar to that of female. T6 entirely covered with minute, nearly coalescent punctures, usually hidden by the pubescence. *Structure*. Lower margin of mandible on apical third with distinct angle bearing sharp point. Apical margin of clypeus with irregular denticles. Proportions of scape, pedicel and first three flagellomeres 3:0.8:1:1.2:1.3; first flagellomere 1.3x as long as its apical width; last flagellomere weakly broadened. Hypostomal area unmodified. Anterior surface of forecoxa with long, finely branched hairs hiding patch of pale-reddish, stiff bristles; forecoxal spine present, strong, 1.0x MOD. Outer margin of foretibia not carinate. Forebasitarsus rather cylindrical, 3.5x as long as its apical width. Preapical carina of T6 medially with small emargination and laterally with 3-4 irregular spiniform teeth. S5, S6, and S8, as in Figure 6B.

Comments. All specimens from the type locality have been reared from trap-nests.

Etymology. The species name is taken from the San Claudio Farm, type locality, at department of Carlos Casares in the province of Buenos Aires.

Distribution. Argentina, provinces of Buenos Aires, Formosa, and Misiones (Fig. 7B).

Material studied. **Holotype**: MACN-En 39922, female, Argentina, Buenos Aires, Carlos Casares, Ea. San Claudio, date of emergence 30-IV-2015, J.P. Torretta (MACN). **Following paratypes:** ARGENTINA. Buenos Aires: 1 M, Moreno, La Reja, Parque Muñiz, 3-XII-2003, *ex duraznillo* [= *Cestrum* sp.; Solanaceae], L. Compagnucci (MACN); 1 F, Rojas, Ea. Las Polvaredas, 21-I-2011, V. Le Féon, C Bertrand & G. Molina (MACN); 10 F, Pdo. Tigre, Delta, 1a sección Río Carapachay, 12-III-2015, A. Roig A. (MACN); 40 M, 40 F, Carlos Casares, Ea. San Claudio, from trap-nests with different dates of emergence: from 28-XII-2014 to 18-XI-2015 and from 28-XII-2015 - 28-XI-2016, J.P. Torretta (FAUBA and MACN). Ciudad Autónoma de Buenos Aires: 1 M, 1 F, Palermo, "*habitant du ceibo*", J. Brèthes (MACN); 1 F, 25-III-1904, J. Brèthes (MACN); 1 F, 27-III-1904, J. Brèthes (MACN); 2 M, 4-IV-1904, J. Brèthes (MACN). Formosa: 1 F, Formosa, Reserva Laguna Oca, 26-IX/-4-X-2008, G. Galvani (MACN); 1 M, Formosa, Reserva Laguna Oca, 26-IX/-4-X-2008, in yellow pan-trap, G. Galvani (MACN). Misiones: Iguazú, P.N. Iguazú, 25° 40' S, 54° 27' W, 5-IX-2008, A. Taylor & N. Veiga (MACN).

Megachile (*Chrysosarus*) *platensis* n. sp.

(Figs. 1B, 4A-D, 5B, 6C, 7C, 11A-B)

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Diagnosis. Females are recognized, among those species with lateral apical fasciae under the scopa and an incised upper tooth in the mandible, by the entirely black pilosity of the clypeus and supraclypeal area (Figs. 4A-B), the absence of scuto-scutellar band, and the long hairs on T1, not forming a definite apical band (Fig. 4A). Males are distinguished by the lower margin of the mandible without any angle or projection, but with a basal tuft of hairs, by the short anterior basitarsus, the tuberculate first metasomal sternum, and the lack of appressed pubescence on T6.

Female. Body length: 7.5-10.8 mm (holotype, 10.6 mm). Forewing length: 5.5-7.5 mm (holotype, 6.6 mm). *Color*. Black, except reddish brown claws. Wings weakly infuscate; veins and pterostigma dark brown. *Pubescence*. Head: black on clypeus, supraclypeal area, and vertex; white along inner margin of eyes; on other areas of head white with intermixed black hairs. Mesosoma: white behind pronotal lobe, sides of metanotum, and above propodeal spiracle; some specimens with white hairs on anterior and lateral margins of scutum; other areas of mesosoma with variable amounts of intermixed white and

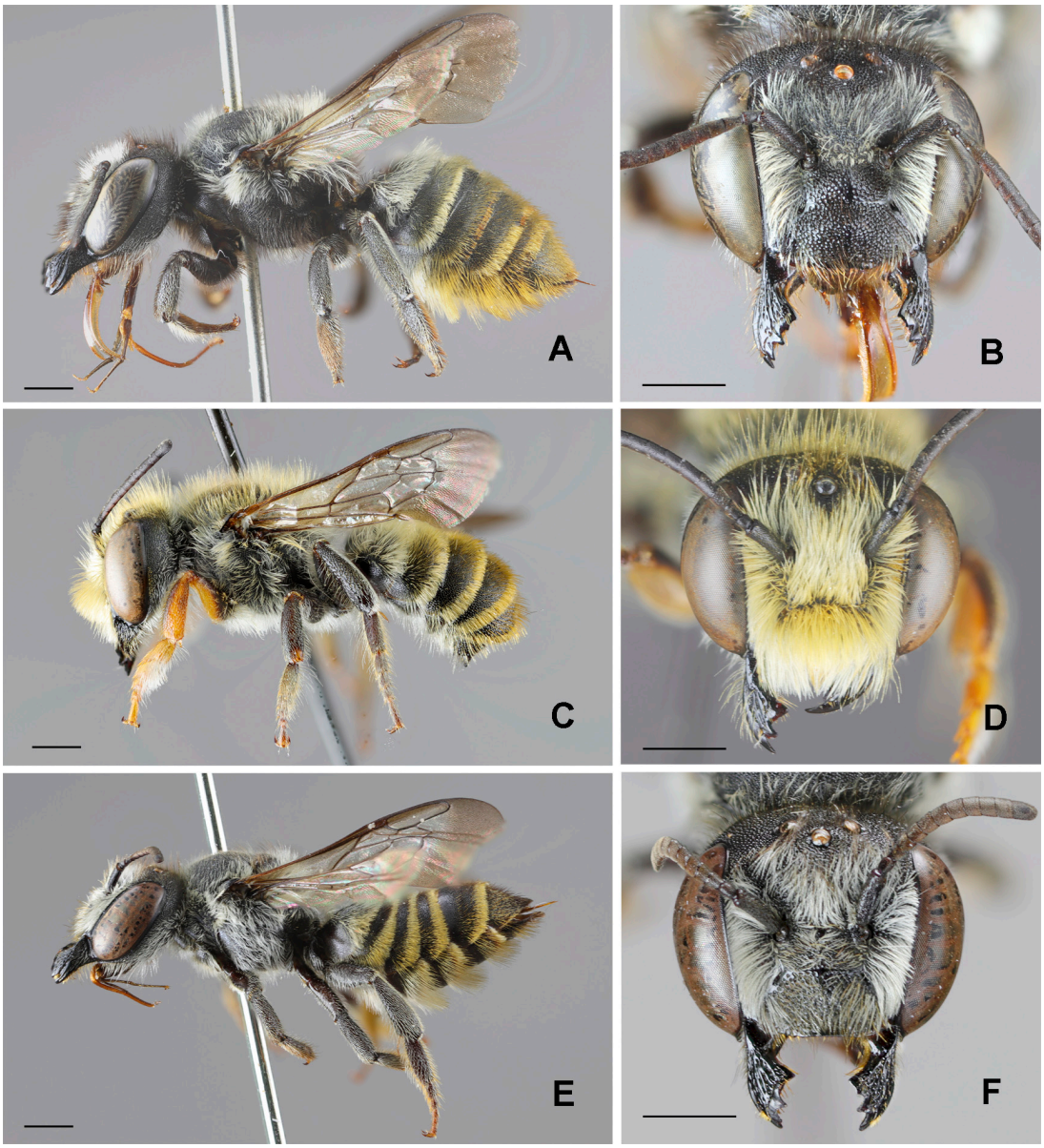

Fig. 4. A-D. *Megachile platensis* n. sp. A-B. Female holotype. A. Lateral view. B. Face. C-D. Male. C. Lateral view. D. Face. E-F. *Megachile simpliciclypeata* n. sp., female holotype. E. Lateral view. F. Face. Scale lines = 1 mm.

black hairs: mostly white on scutellum, metanotum, and posterior surface of propodeum, and mostly black on sides and venter of mesosoma; without scuto-scutellar band. Pubescence of legs mostly white. Scutum with erect short hairs (0.3-0.5x MOD), and interspersed longer ones (0.7-1.3x MOD). Scutellum and metanotum with very long hairs, up to 3.2x MOD. Mesopleuron densely covered with hairs 1.5-2.0x MOD. T1 with long white hairs, on marginal area 1.0-1.2x MOD, not forming definite apical band. T2-T5 with distinct apical bands, yellowish on T2-T3, yellow on T4-T5; discs of T2-T5 with yellow erect hairs (on T3 0.7-1.2x MOD); T6 with yellow appressed pubescence and stiff erect yellow hairs. Scopa yellow from S2 to apex of S6; S2-S5 with short lateral apical whitish fasciae under scopa; on S3 fasciae occupying lateral 0.2-0.3 of apical margin of sternum; in some specimens, fasciae on S2 much reduced. *Sculpture.* Clypeus with dense, regular

Fig. 5. *Megachile* (*Chrysosarus*) species, anterior tarsus of male. A. *M. interjecta* Vachal, dorsal (above) and ventral (below) views. B. *M. platensis* n. sp., dorsal (above) and ventral (below) views. C. *M. sancticlaudii* n. sp., dorsal (left) and ventral (right) views. Scale lines = 0.5 mm.

punctures separated by shiny interspaces (0.2-0.3x PD), punctures medially not reaching margin, leaving apical polished band; supraclypeal area with similar punctures and narrow, median tessellate longitudinal stripe without punctures. Punctures on scutum small, nearly coalescent; punctures of mesopleuron small and dense, similar to those of scutum. Discs of metasomal terga with small punctures separated by 0.3-0.5 PD. *Structure*. Inner margin of eyes converging below, upper interocular distance 1.15x lower interocular distance. Distance from lateral ocellus to posterior margin of head 1.6x MOD. Maximum width of gena in lateral view 0.53x maximum width of eye. Clypeus 2.2x as wide as long; apex denticulate (in some specimens denticles weaker medially). Mandible with four teeth; first to third teeth of similar size; third tooth with rudiment of cutting edge; fourth tooth broad, distinctly incised; upper acetabular groove with apical tuft; outer premarginal impressed line with few scattered setae bordering fourth tooth. Hypostomal carina ending close to posteromesal angle of mandibular socket. Proportions of scape, pedicel and first three flagellomeres 3.3:0.9:1:0.8:0.9; first flagellomere 1.28x as long as its apical width. Hind basitarsus 2.6x as long as its maximum width in lateral view.

Male. Body length 8.0-10.2 mm; length of forewing 5.2-7.2 mm. *Color*. Black, except foreleg with underside of femur, most of tibia, tibial spur and tarsus yellowish brown; underside of second tarsomere with ovoid black spot. Claws of mid and hind legs yellowish brown. Wings as in female. *Pubescence*. Hairs of head yellowish to yellow on face and vertex, white on genae and underside of head. Lower margin of mandible with basal tuft of hairs. Dorsum of mesosoma with yellowish to yellow hairs; venter and sides of mesosoma with white hairs. Legs with whitish hairs; fringes of fore and middle basitarsi white. Outer fringe of foretarsus of short hairs, on basitarsus 1.0-1.4x MOD, longer basally, on second tarsomere 0.7-0.9x MOD. T1 with yellowish hairs on disc and apically, not forming distinct apical band; T2-T5 with distinct yellow apical bands and their discs with erect, simple, yellow hairs; disc of T5 also with appressed, plumose, yellow hairs, at least basally; T6 with erect, simple, yellowish, slender hairs, and without appressed pubescence on the

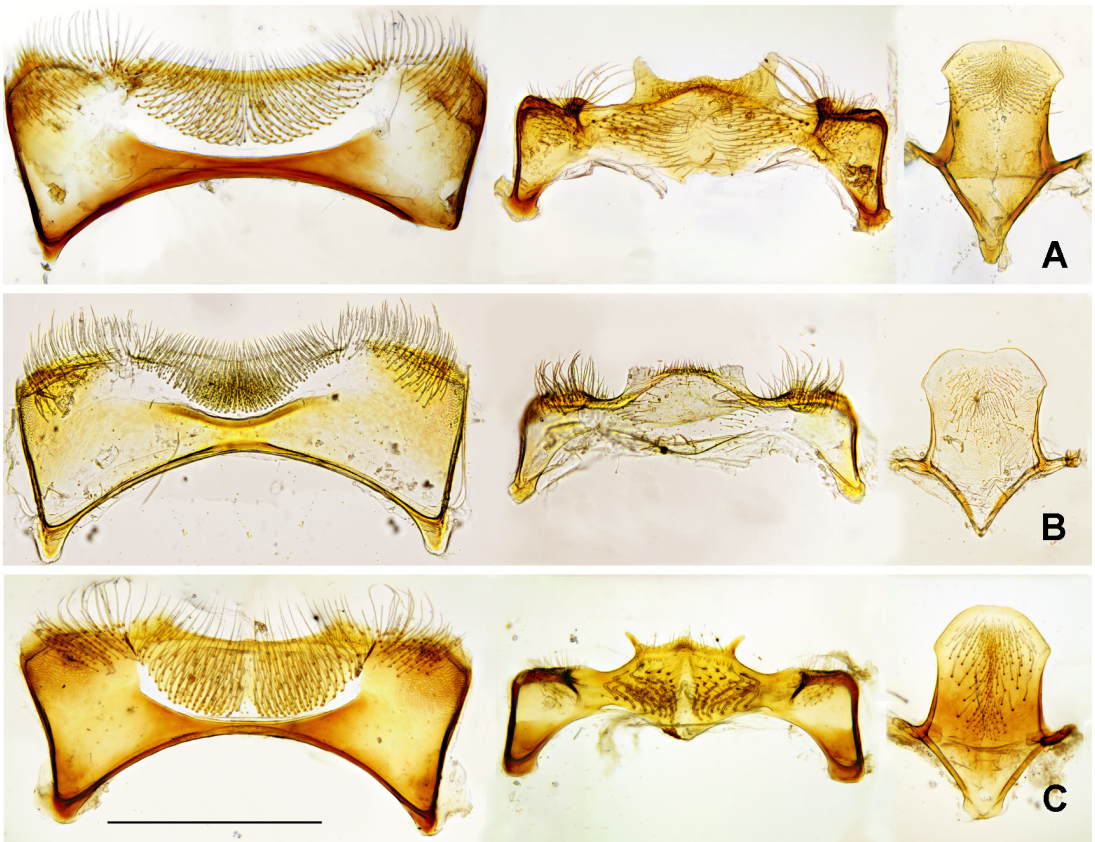

Fig. 6. Metasomal sterna of *Megachile* (*Chrysosarus*) males: S5 (left), S6 (center), and S8 (right). A. *M. interjecta* Vachal. B. *M. sancticlaudii* n. sp. C. *M. platensis* n. sp. Scale line = 1 mm.

disc, but small patch of appressed pubescence may be present laterally close to the gradulus. S2-S4 with apical fringes; hairs on S2 longer laterally, 1.2-1.4x MOD. *Sculpture*. Punctation similar to that of female. T6 with small, coalescent punctures forming rugulose sculpture. *Structure*. Lower margin of mandible without any angle or projection. Proportions of scape, pedicel and first three flagellomeres 3.5:0.75:1:1.15:1.25; first flagellomere as long as 1.15x its apical width; last flagellomere broadened. Hypostomal area unmodified. Anterior surface of forecoxa with few, short hairs, and patch of red bristles close to coxal spine reduced to 4-5 minute bristles to absent; coxal spine short, as long as 1x MOD. Outer margin of foretibia rounded. Forebasitarsus flattened, short, 1.2x as long as its apical width; inner margin with digitiform prolongation. Preapical carina of T6 with small median emargination, and lateral to it irregularly rounded, crenulate, to distinctly crestate. S1 bearing a median tubercle pointing caudally. S5, S6, and S8, as in Figure 6C.

Comments. The preapical carina of T6 of the male varies from nearly even at both sides of the small median emargination (Fig. 11A) to crenulate, and to distinctly dentate (Fig. 11B). The male specimen studied from Entre Ríos has more extensive yellow appressed pubescence on T5 than specimens studied from elsewhere.

Etymology. The species name refers to the presence of the species on both margins of the Río de la Plata.

Distribution. Argentina, provinces of Buenos Aires, Corrientes, and Entre Ríos. Uruguay, department of Cerro Largo (Fig. 7C).

Material studied. **Holotype:** MACN-En 39923, female, Argentina, Capital Federal, Reserva Ecológica Costanera Sur [-34.6092, -58.3511], 24-III-2004, A. Roig A. & L. Compagnucci (MACN). **Following paratypes:** Argentina. Buenos Aires: 1 F, Hurlingham, INTA Castelar, Jardín Botánico, 6-XI-2003, A. Roig Alsina & L. Compagnucci, (MACN); 1 F, Pdo. Tandil, Tandil, Las Dinas, S 37° 22’ 02’’ W 59° 07’ 54’’, 24-25-

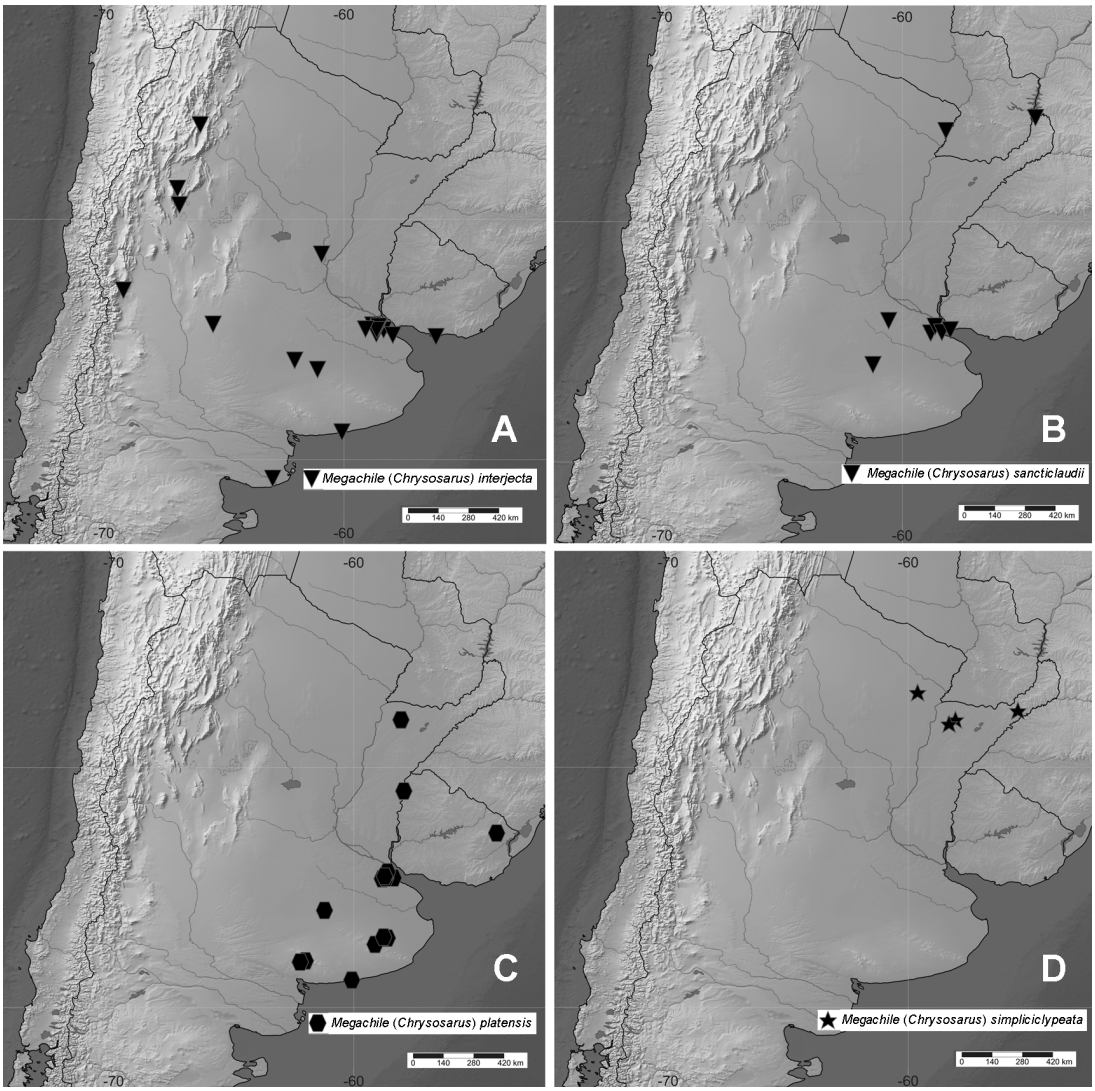

Fig. 7. Distribution maps of *Megachile* (*Chrysosarus*) species. A. *M. interjecta* Vachal. B. *M. sancticlaudii* n. sp. C. *M. platensis* n. sp. D. *M. simpliciclypeata* n. sp.

II-2011, *en vuelo frente a barranca*, C. Roig (MACN); 2 F, Pdo. Tandil, Tandil, Las Dinas, S 37° 22' 02'' W 59° 07' 54'', 24-II-2011, Clara Roig (MACN); 1 F, Tandil, Tandil, Las Dinas, 9-10-III-2011, C. Roig & A. Roig A. (MACN); 1 F, Pdo. Tres Arroyos, Claromecó, Vivero, 27-II-2006, ex *Salpichroa* [Solanaceae], A. Roig A. (MACN); 3 F, Tres Arroyos, Claromecó, 27-II-2006, A. Roig Alsina (MACN); 1 F, Tornquist, pie Cerro Ventana, 18-I-1994, A. Roig Alsina, (MACN); 1 F, Tornquist, Villa Ventana, 4/5-I-2008, A. Roig Alsina (MACN); 1 F, Malvinas Argentinas, Km 26 F.C.G.B., XII-1989, O. Di Iorio (MACN); 1 F, Tigre, 12 km NO Tigre, 17-XI-2005, Compagnucci & Roig Alsina (MACN); 2 F, Moreno, La Reja, Reserva F.J. Muñiz, 3-XII-2003, L. Compagnucci (MACN); 1 F, Moreno, La Reja, Reserva F.J. Muñiz, 2-XI-2003, L. Compagnucci (MACN); 1 M, Moreno, La Reja, Parque Muñiz, 22-XI-2002, Roig Alsina & Compagnucci (MACN); 1 M, 3 F, Moreno, La Reja, Parque Muñiz, 15-XII-2016, A. Roig A. (MACN); 1 F, Moreno, La Reja, Reserva F.J. Muñiz, 1-XII-2017, R. Ferrer (MACN); 1 M, Azul, Sierras R.P. 80, -37.06, -58.76, XI-2013, A. Sanguinetti, (MACN); 20 M, 20 F, Carlos Casares, Ea. San Claudio, from trap-nests with different dates of emergence: from 30-XII-2014 to 18-XI-2015 and from 8-I-2016 to 23-XI-

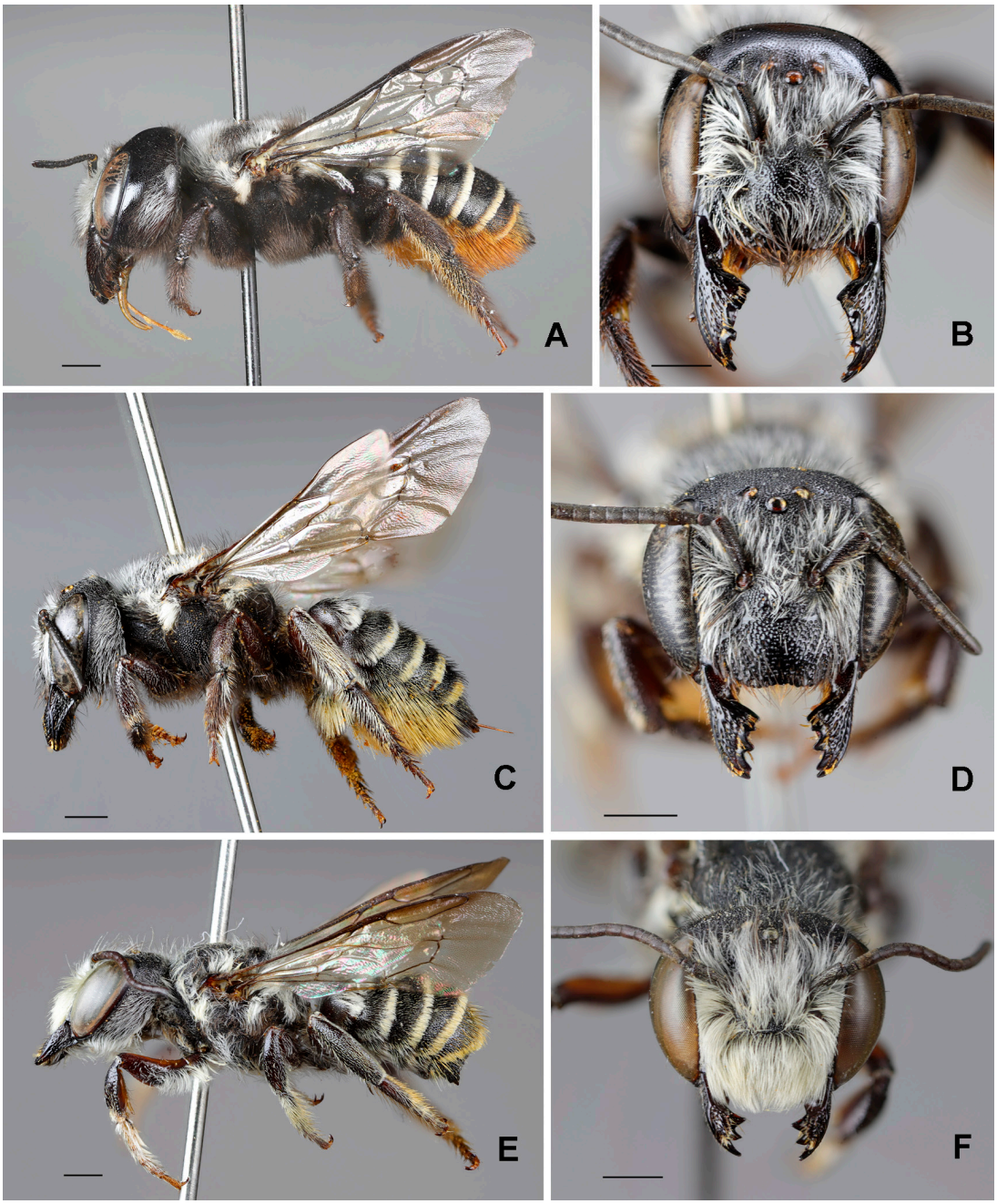

Fig. 8. A-B. *Megachile cubiceps* Friese, female. A. Lateral view. B. Face. C-F. *M. basimacula* n. sp. C. Female holotype, lateral view. D. Female holotype, face. E. Male, lateral view. F. Male, face. Scale lines = 1 mm.

2016 (FAUBA and MACN);1 M, 1 F, Tornquist, 18 December 2022 (date of emergence from trap-nest), J. Haedo & H. Marrero (FAUBA). Corrientes: 1 F, Santa Teresa, P. N. Mburucuyá (28°01.233 S, 58°02.367 W), 5-X-2009, N. Veiga (MACN); 1 F, Santa Teresa, P. N. Mburucuyá, 17-X-2008, A. Taylor & N. Veiga (MACN); 1 F, P. N. Mburucuyá, Potrero 5, 17-X-2008, A. Taylor & N. Veiga (MACN). Entre Ríos: 1F, 1 M, Federación, I-1997, G. Zubarán (MACN). Uruguay. Cerro Largo: 1 F, Cuchilla de Melo, 13-XI-1916 (MACN).

Megachile* (*Chrysosarus*) *simpliciclypeata n. sp.

(Figs. 4E-F, 7D)

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Diagnosis. Females are characterized by the edentate, arched apex of the clypeus (Fig. 4F), without the usual denticles present in most other species of *Chrysosarus*. Also characteristic is the roundish shape of the head, with an arched vertex and the anterior ocellus slightly above the upper ocular tangent (Fig. 4F).

Female. Body length: 8.0-9.5 mm (holotype, 9.2 mm). Forewing length: 5.8-6.3 mm (holotype, 6.0 mm). *Color*. Black, except under side of flagellum, tibial spurs, and claws reddish brown. Wings weakly infuscate; veins and pterostigma dark brown. *Pubescence*. Head: white, except brown long hairs on vertex. Mesosoma: white, except intermixed long brown hairs on posterior half of scutum and on scutellum; legs with white hairs. Hairs on disc of scutum of various lengths, 0.2-0.8x MOD, brown hairs on posterior part longer, up to 2x MOD; hairs on mesopleuron 0.9-1.2x MOD. T1 on disc and marginal area with whitish, long hairs (0.8-1.2x MOD), not forming definite apical band; T2-T5 with distinct apical bands, yellowish on T2-T3, yellow on T4-T5; discs of T2-T5 with short, brown to black erect hairs (on T3 0.3-0.6x MOD); T6 with yellowish appressed pubescence and stiff, black erect hairs. Scopa yellowish from S2 to apex of S6; S2-S5 with lateral apical whitish fasciae under scopa; on S3 fasciae occupying lateral 0.5 of apical margin of sternum. *Sculpture.* Clypeus with deep, regular punctures separated by shiny interspaces (0.2-0.4x PD), punctures medially not reaching margin, leaving apical polished band; supraclypeal area with dense punctures half the size of those of clypeus. Punctures on scutum nearly coalescent, smaller than those of supraclypeal area; punctures of mesopleuron similar in size to those of clypeus, separated by shiny interspaces 0.2-0.5 PD. Discs of metasomal terga with small punctures separated by 0.2-1.0 PD. *Structure*. Inner margin of eyes converging below, upper interocular distance 1.18x lower interocular distance. Distance from lateral ocellus to posterior margin of head 1.9x MOD. Maximum width of gena in lateral view 0.57x maximum width of eye. Clypeus 2.15x as wide as long; apex with edentate median polished band. Mandible with four teeth; first to third teeth of similar size; third tooth with rudiment of cutting edge; fourth tooth broad, distinctly incised; upper acetabular groove with apical tuft; outer premarginal impressed line with few scattered setae bordering fourth tooth. Hypostomal carina ending close to posteromesal angle of mandibular socket. Proportions of scape, pedicel and first three flagellomeres 3.8:1:1:0.8:1; first flagellomere as long as its apical width. Hind basitarsus 2.9x as long as its maximum width in lateral view.

Male. Unknown.

Etymology. The species name refers to the simple apical margin of the clypeus of the female.

Distribution. Argentina, provinces of Chaco, Corrientes, and Misiones (Fig. 7D).

Material studied. **Holotype**: MACN-En 39924, female, Argentina, Misiones, INTA Cerro Azul, 17-X-2010, Roig Alsina *et al*. (MACN). **Following paratypes:** Argentina. Chaco: 1 F, Colonia Popular, 12-XI-2017, A. Schaller (MACN); 1 F, Capitán Solari, P.N. Chaco, S 26° 53.493' W 59° 36.561', 21-II-2008, A. Taylor & N. Veiga (MACN). Corrientes: 2 F, PN Mburucuyá, S 28° 01' W 58° 02', 3-X-2008 and 17-X-2008, A. Taylor & N. Veiga (MACN); 3 F, PN Mburucuyá, Santa Teresa, S 28° 01.183' W 58° 02.150', 5-X-2009, MT, N. Veiga (MACN); 3 F, PN Mburucuyá, Tung, 15-III-2010, 9-IV-2010, and 10-X-2010, Malaise trap, N. Veiga (MACN). Misiones: 3 F, INTA Cerro Azul, 17-X-2010, A. Roig A. *et al*. (MACN).

Megachile* (*Chrysosarus*) *basimacula n. sp.

(Figs. 1D, 8C-F, 10A, 11F, 12A, 13A)

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Diagnosis. The female is distinguished by the presence of a small cutting edge in the second interspace of the mandible (Fig. 1D), and by its clypeus, gibbous basally and flattened on the apical third, with a broad apical polished band (Fig. 8D). The male is morphologically similar to the male of *M. cubiceps*, but lacks the hypostomal tooth, the anterior basitarsus is more slender, and has extended white pubescence.

Female. Body length: 9.0-11.5 mm (holotype, 10.7 mm). Forewing length: 6.8-8.7 mm (holotype, 8.4 mm). *Color*. Black, except anterior tibial spur and claws reddish brown. Wings weakly infuscate, darker along costal margin of marginal cell; veins and pterostigma dark brown. *Pubescence*. White around antennal sockets, on paraocular areas, posterior margin of vertex and genae; some specimens with white hairs on sides of clypeus; other hairs of head black. Mesosoma

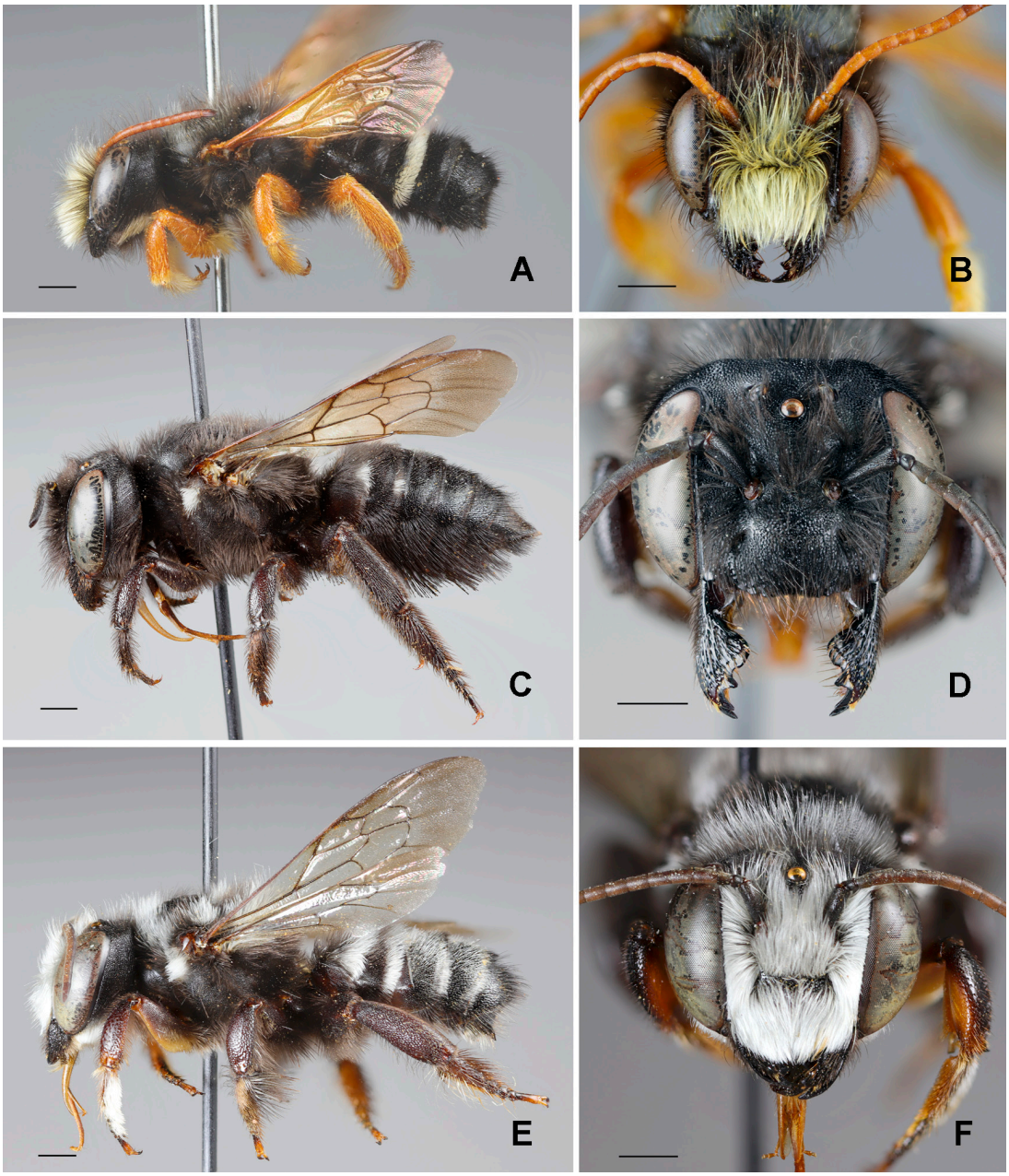

Fig. 9. A-B. *Megachile euzona* Pérez, male. A. lateral view. B. face. C-F. *M. tetrazona* Friese. C. Female, lateral view. D. Female, face. E. Male, lateral view. F. Fale, face. Scale lines = 1 mm.

with white hairs on pronotal collar, pronotal lobes, dense tuft behind pronotal lobe, anteriorly on tegula, dense tuft on propodeum above spiraculum, on scutum, scutellum, metanotum, and posterior surface of propodeum; on discs of scutum and scutellum with intermixed white and black hairs; other hairs of mesosoma black; outer surface of tibiae and of hind basitarsus mostly with white hairs. Hairs on disc of scutum of various lengths, 0.3-1.3x MOD, longer on mesopleuron (up to 1.6x MOD). T1-T5 with distinct white apical bands; disc of T1 with white hairs; discs of T2-T5 with black hairs (on T3 0.3-0.8x MOD); T6 with pale appressed pubescence and stiff erect black hairs. Scopa pale yellowish on S2-S5, black on S6; sterna without apical fasciae under

Fig. 10. *Megachile* (*Chrysosarus*) species, anterior tarsus of male, dorsal (above) and ventral (below) views. A. *M. basimacula* n. sp. B. *M. cubiceps* Friese. C. *M. euzona* Pérez. D. *M. tetrazona* Friese. Scale lines = 0.5 mm.

scopa. *Sculpture*. Clypeus and supraclypeal area with deep punctures separated by polished interspaces; punctures medially separated by 0.5-1.0 PD, closer laterally; with polished, impunctate apical rim. Punctures on scutum of different sizes, sparser on disc, separated by feebly tessellate interspaces 0.2 1.0 PD; punctures of mesopleuron below hypoepimeral area similar to those of scutum, sparser ventrally, separated by tessellate interspaces 0.2-0.5 PD. Discs of metasomal terga with small punctures separated by 0.5-1.5 PD. *Structure*. Inner margin of eyes slightly diverging below, upper interocular distance 0.96x lower interocular distance. Distance from lateral ocellus to posterior margin of head 1.7x MOD. Maximum width of gena in lateral view 0.9x maximum width of eye. Clypeus 2.2x as wide as long, more convex on upper third and flattened apically; apical margin denticulate. Mandible with four teeth; first to third teeth of similar size; fourth tooth broad, distinctly incised; second interspace with small cutting edge; third interspace U-shaped; upper acetabular groove with apical tuft; outer premarginal impressed line with stiff setae on all its length. Hypostomal carina curving towards cranial acetabulum and forming thickened strip bordering mandibular socket. Proportions of scape, pedicel and first three flagellomeres 3.6:0.9:1:0.8:1; first flagellomere 1.05x as long as its apical width. Hind basitarsus 3.3x as long as its maximum width in lateral view.

Male. Body length 9.2-10.5 mm; length of forewing 6.5-8.2 mm. *Color*. Black, except foreleg with underside of femur, underside of tibia, apex of tibia, tibial spur and tarsus yellowish brown; distitarsi and claws of mid and hind legs reddish brown. Under surface of forebasitarsus with basal ovoid black spot. Wings as in female. *Pubescence*. White on head, mesosoma, and legs, except vertex of head and discs of scutum and scutellum with intermixed black and white hairs. Outer fringe of foretarsus of short hairs (0.8-1.2x MOD), shorter than maximum width of basitarsus.T1 with white hairs on disc and apically, not

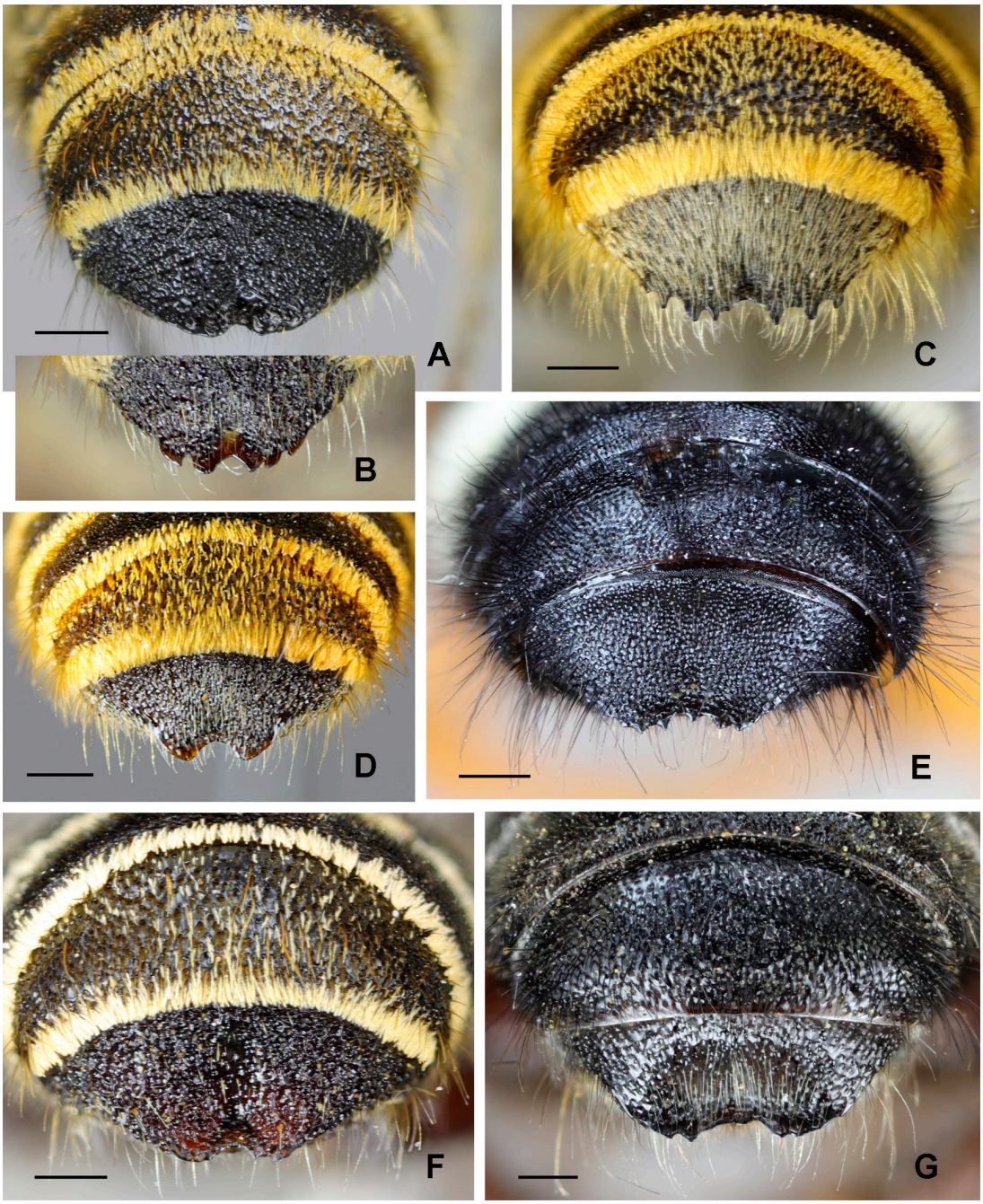

Fig. 11. *Megachile* (*Chrysosarus*) species, fifth and sixth metasomal terga, caudal view. A-B. *M. platensis* new species, showing variation in the shape of the premarginal carina of T6. A. Specimen from Buenos Aires. B. Specimen from Entre Ríos. C. *M. sancticlaudii* n. sp. D. *M. interjecta* Vachal. E. *M. euzona* Pérez. F. *M. basimacula* n. sp. G. *M. tetrazona* Friese.

forming distinct apical band; T2-T5 with distinct apical bands, white on T2-T3, yellowish on T4-T5; disc of T2 with white hairs; discs of T3-T4 with intermixed white and black hairs and T4 also with some stiff, long yellow hairs preapically; T5 with stiff, long yellow hairs (0.8-2.0x MOD); T6 without appressed pubescence, with sparse, inconspicuous erect hairs; metasomal sterna with

white hairs. S2-S3 with apical fringes of plumose hairs, longer and denser laterally (laterally on S2 1.2-1.5x MOD). *Sculpture*. Punctation similar to that of female. T6 rugose due to coalescent irregular punctures. *Structure*. Lower margin of mandible more or less straight, without any angle or projection. Proportions of scape, pedicel and first three flagellomeres 3.4:1:1:1.4:1.6; first flagellomere as long as 0.9x its apical width; last flagellomere slightly broadened. Hypostomal area unmodified. Anterior surface of forecoxa with sparse, minute hairs, and patch of 16-20 red bristles in front of coxal spine (length of spine 1x MOD). Outer margin of foretibia sharply carinate. Forebasitarsus flattened, widest subbasally, with sinuous outer margin, 2.7x as long as its apical width. Preapical carina of T6 medially emarginate and irregularly crenulate laterally; in some specimens median emargination obscured by median crenulations. S5, S6, and S8, as in Figure 12A.

Etymology. The species name refers to the basal black spot on the undersurface of the male basitarsus.

Distribution. Argentina, provinces of Catamarca, Córdoba, La Rioja, and San Luis (Fig. 13A).

Material studied. **Holotype:** MACN-En 39925, female, Argentina, Catamarca, San Fernando, 16-XI-1993, A. Roig A. (MACN). **Following paratypes:** Argentina. Catamarca: 1 F, Catamarca Capital, Choya, 12-IV-1936 (MACN); 1 M, Concepción, 1-II-1928, M. Gómez (MACN). Córdoba: 1 F, Córdoba, E. Giacomelli, no date (MACN). La Rioja: 5 F, 2 M (MACN). San Luis: 1 F, 1 M, Potrero de Los Funes, I-1926, M. Gómez (MACN).

Megachile* (*Chrysosarus*) *cubiceps Friese

(Figs. 1E, 8A-B, 10B, 12B, 13B)

Megachile cubiceps Friese, 1906: 97-98. Holotype female, Salta, N.-Argentina, Steinbach leg. (ZMB, examined through photographs).

Megachile (*Zonomegachile*) *uncinata* González, Griswold & Engel 2018: 60-63, figs. 21, 33 A-E, 34 A-I. Holotype male, 15 km S Colpes, Catamarca, Argentina, 27-X-1972, G.E. Bohart, *Zuccagnia punctata*. (USDA-ARS Bee Biology and Systematic Laboratory, Logan, Utah, not examined). **New synonym**.

Diagnosis. This species is one of the largest *Megachile* in Argentina, with females reaching up to 17 mm long. Females are easily distinguished by their enormous head (Figs. 8A-B), with swollen genae and vertex (distance between lateral ocellus and occipital margin 4.5-6.0x MOD), and by the bright orange scopa with capitate hairs (Fig. 8A). Males can be recognized by the presence of a hypostomal tooth, strongly curved and posteriorly directed. Both sexes have the mesosoma with black hairs on the sides and venter, and complete white apical bands on T1-T5.

Female. Body length: 10.5-17.0 mm. Forewing length: 7.5-10.7 mm. *Color*. Integument black, except distitarsi and claws reddish brown, anterior tibial spur yellow, and mid- and hind tibial spurs brown. Wing infuscated, darker along costal margin of marginal cell; pterostigma brown; veins brown, clearer to apex of forewing. *Pubescence*. Head with intermixed white and black hairs on most of face, but paraocular areas with white hairs; upper three fourths of gena with white hairs, lower fourth and hypostomal area with black hairs; vertex with sparse black hairs. Scutum and scutellum with white hairs on margins, encircling central area with sparse, longer, intermixed black and white hairs; pronotal lobe and anteriorly on tegula with white tuft; metanotum with white hairs; propodeum with white hairs bordering metapostnotum and above spiraculum; other hairs of mesosoma black. Legs with black hairs, except hind tibia with yellow hairs in part, and tarsi with intermixed yellow and black hairs (hind tarsus with some hairs capitate). Disc of scutum with black hairs 0.5-1.3x MOD, and shorter white hairs 0.3-0.7x MOD; hairs longer on scutellum (0.7-2x MOD), mesopleuron (1.2-2.5x MOD) and metanotum (1.5-3x MOD). Metasoma. Anterior surface of T1 with sparse, white hairs, disc of T1 with erect, white hairs (1.1-2x MOD), discs of T2-T6 with black hairs, on T2-T4 short (0.2-0.4x MOD) and longer on T5-T6 (0.5-1.1x MOD). T4-T5 with some orange hairs laterally anterior to apical bands. T6 with decumbent, plumose whitish hairs and stiff, erect hairs black medially and orange laterally. Apical bands complete on T1-T5, white on T1-T2, with yellowish tint on T3-T4 and yellowish on T5. S1 and basal half of S2 with black hairs. Scopa from apex of S2 to S5 with long, capitate, orange hairs; S6 with shorter orange and black hairs. *Sculpture*. Clypeus and supraclyeal area with dense and irregular punctures separated by shiny interspaces (0.1- 0.5x PD); in some specimens upper half of supraclypeal area tessellate. Apex of clypeus with transverse, impunctate band. Vertex and gena with smaller punctures, separated by shiny interspaces (1.0-1.5x PD). Acetabular interspace of mandible shiny.

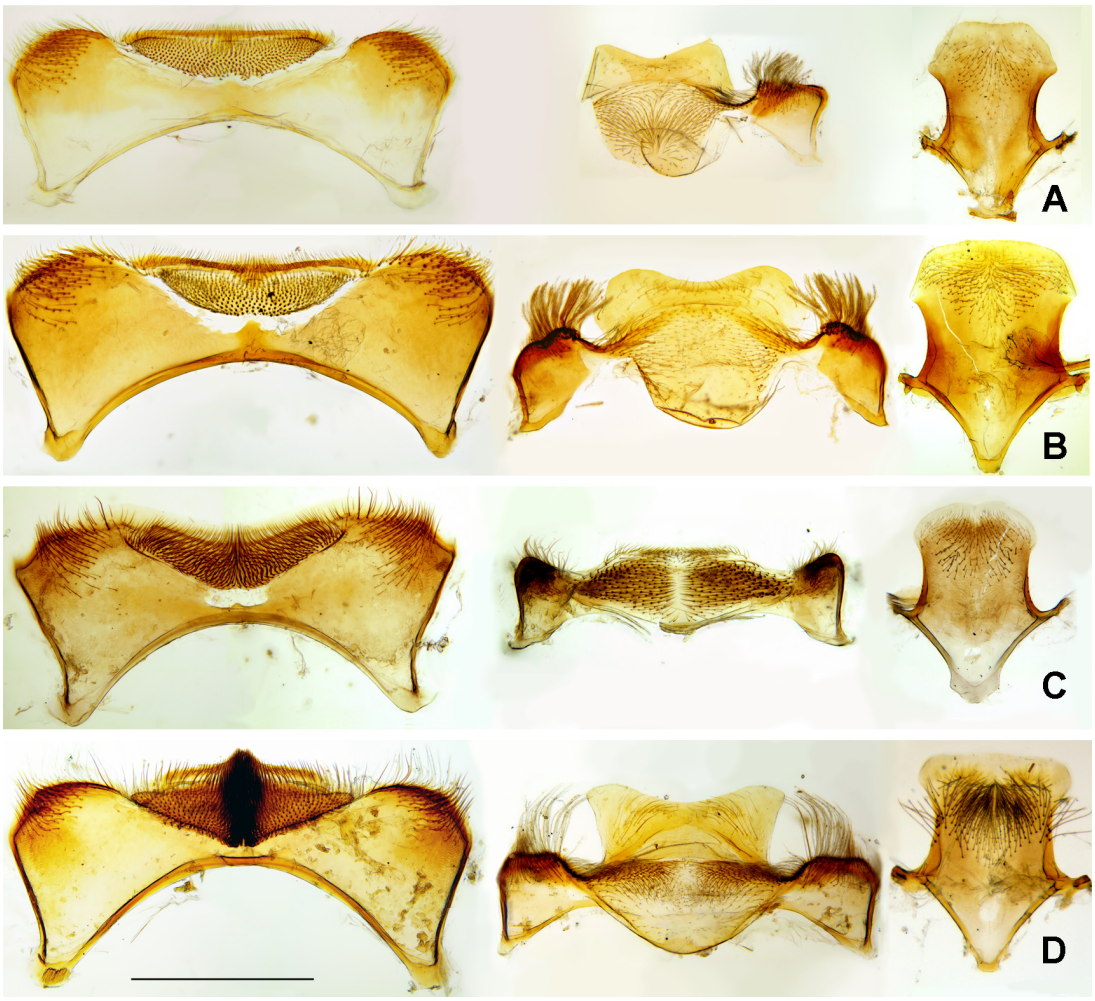

Fig. 12. Metasomal sterna of *Megachile* (*Chrysosarus*) males: S5 (left), S6 (center), and S8 (right). A. *M. basimacula* n. sp. B. *M. cubiceps* Friese. C. *M. euzona* Pérez. D. *M. tetrazona* Friese. Scale line = 1 mm.

Punctures on most of scutum dense, but on center of disc sparse, separated by feebly tessellate to shiny interspaces (0.5-1.5x PD). Punctures on mesopleuron dense, nearly coalescent. Disc of terga with shallow punctures separated by feebly tessellate to shiny interspaces (0.5-2x PD), coarser and denser on T5-T6; on T6 obscured by tomentose pubescence. *Structure*. Inner margin of eyes slightly diverging below, upper interocular distance 0.9x lower interocular distance. Distance from lateral ocellus to posterior margin of head 4.5-6.0x MOD. Maximum width of gena in lateral view 1.4-2.2x maximum width of eye. Clypeus 3.5-4.0x as wide as long, more convex on upper third and flattened apically; apical margin denticulate, but in many specimens median portion of margin irregular. Mandible with four teeth; first tooth larger than second; fourth tooth broad, truncate, not incised; second interspace asymmetrically V-shaped, with small cutting edge; third interspace oblique; upper acetabular groove with apical tuft; outer premarginal impressed line with stiff setae on all its length. Hypostomal carina curving towards cranial acetabulum and forming thickened strip bordering mandibular socket. Proportions of scape, pedicel and first three flagellomeres 3.5:0.7:1:0.9:1; first flagellomere 1.15x as long as its apical width. Hind basitarsus 3.0x as long as its maximum width in lateral view.

Male. The male of this species was described and illustrated in detail by Gonzalez *et al*. (2018). For ease of comparison, images of S5, S6, and S8 are also included in the present contribution (Fig. 12B).

Comments. The presence of a hypostomal tooth in the male misled Gonzalez *et al*. (2018) to include this species in the subgenus *Zonomegachile*, although they cautioned that the species might belong to a different subgenus, given that the genital capsule and the hidden sterna differed from those of the other species included in *Zonomegachile*. The hypostomal tooth is curved and directed backwards in *M. cubiceps*, while in species of *Zonomegachile* the tooth is straight and directed forwards.

Distribution. Argentina, provinces of Catamarca, Chaco, Córdoba, La Pampa, La Rioja, Mendoza, Salta, San Luis, Santiago del Estero, and Tucumán (Fig. 13B).

Material studied. Argentina. Chaco: 1 M, Roque Sáenz Peña, 1932, Ohnmeiser (MACN). Córdoba: 1 F, Chancaní, V-1987, "*polinizador de* Prosopis" [Fabaceae], J. Genise (MACN); 2 F, 2 M, Chancaní, X-1991, J. Genise, J. Farina & P. Hazeldine (MACN). La Pampa: 1 F, Toay, Ea. Anquilòo, 10 December 2010, ex *Carduus acanthoides* [Asteraceae], H.J. Marrero (FAUBA); 2 M, Toay, Ea. Anquilòo, 10 December 2010, ex *Clematis montevidensis* [Ranunculaceae], J.P. Torretta (FAUBA); 3 M, Toay, Ea. Anquilòo, 11 December 2010, ex *Gaillardia megapotamica* [Asteraceae], J.P. Torretta (FAUBA); 4 M, 1 F, Toay, Ea. Anquilòo, 10 December 2010, ex *Hyalis argentea* [Asteraceae], J.P. Torretta (FAUBA). La Rioja: 1 M, La Rioja (MACN). Mendoza: 2 F, Lavalle, Reserva Telteca, S 32° 25' 35.3'' W 67° 55' 50.3'', ex *Prosopis flexuosa* [Fabaceae], G. Debandi (IADIZA). Salta: 1 M, Cafayate, 14-XI-1993, A. Roig A. (MACN); 6 M, Cafayate, Los Médanos, 3-XI-2004, ex *Propsopis* [Fabaceae], L. Compagnucci & C. Grismado (MACN). San Luis: 6 M, San Jerónimo, XI-1972, G.J. Williner (MACN). Santiago del Estero: 1 F, without further data (MACN). Tucumán: 5 F, 6 M, Amaicha del Valle, 2-XI-2004, ex *Propsopis* [Fabaceae], L. Compagnucci & C. Grismado (MACN).

Megachile* (*Chrysosarus*) *euzona Pérez

(Figs. 9A-B, 10C, 11E, 12C, 13C)

Megachile euzona Pérez, 1899: 105 (Holotype male, Chile, Valparaíso, MNHN Paris, not examined).

Megachile philippii Friese, 1905: 139-140 (Male and female syntypes, Chile, Santiago, Philippi, ZMB, not examined). Synonymy of Moure, 1953.

Megachile (*Stelodides*) *euzona*: Moure, 1953: 123-124.

Diagnosis. This species is readily distinguished by its color pattern: the integument of the body is black with orange antennae and legs, and the pubescence of the metasoma, including the female scopa, is black, except for a distinctive broad white band on T3 (Fig. 9A). This is a well-known and unmistakable species. The following notes complement the detailed original description of Pérez (1899) and the description of Moure (1953), when he proposed the subgeneric name *Stelodides*. Gonzalez *et al*. (2019) included *M. euzona* in their phylogenetic study of Megachilini, and tabulated a large number of characters for this species.

Female. Body length 10.0-12.0 mm; length of forewing 7.2-8.4 mm. *Structure*. Inner margin of eyes nearly parallel, upper interocular distance 0.93-0.95x lower interocular distance. Distance from lateral ocellus to posterior margin of head 2x MOD. Maximum width of gena in lateral view 1x maximum width of eye. Clypeus 2.4x as wide as long, more convex on upper third, apically with transverse polished band; apical margin crenulate. Mandible with four teeth; first and second teeth of similar size; third tooth with small edge on lower margin; fourth tooth broad, incised; second interspace U-shaped; third interspace asymmetrically V-shaped; upper acetabular groove with apical tuft; outer premarginal impressed line with stiff setae on all its length. Hypostomal carina curving towards cranial acetabulum and forming thickened strip bordering mandibular socket. Hind basitarsus 2.8-3.0x as long as its maximum width in lateral view. Sterna without apical fasciae under scopa.

Male. Body length 9.0-11.5 mm. Forewing length 7.0-8.2 mm. *Structure*. Proportions of scape, pedicel and first three flagellomeres 3.0:0.7:1.0:1.3:1.6. Outer margin of foretibia sharply carinate. S5, S6, and S8, as in Figure 12C.

Comments. The preapical carina of the male T6 is variable. Some specimens have a median emargination, and crenulations or teeth lateral to it. In other specimens the carina is dentate to crenulate without any median notch.

Distribution. Argentina, provinces of Chubut and Neuquén. Chile, from Coquimbo to Temuco (Fig. 13C, locations for Chile were obtained from GBIF.org, 2023).

Material studied. Argentina. Chubut: 1 M, P.N. Los Alerces, Futalaufquen, 13-15-XII-1997, C. & M. Vardy (NHMUK); 1 M, INTA Trevelin (sitio 4; S 43° 06.025' W 71° 33.155'), 3-XI-2007, R. González-Vaquero (MACN). Neuquén: 1 M, Lago Currué Chico, 17-XII-2010, L. Compagnucci & R.

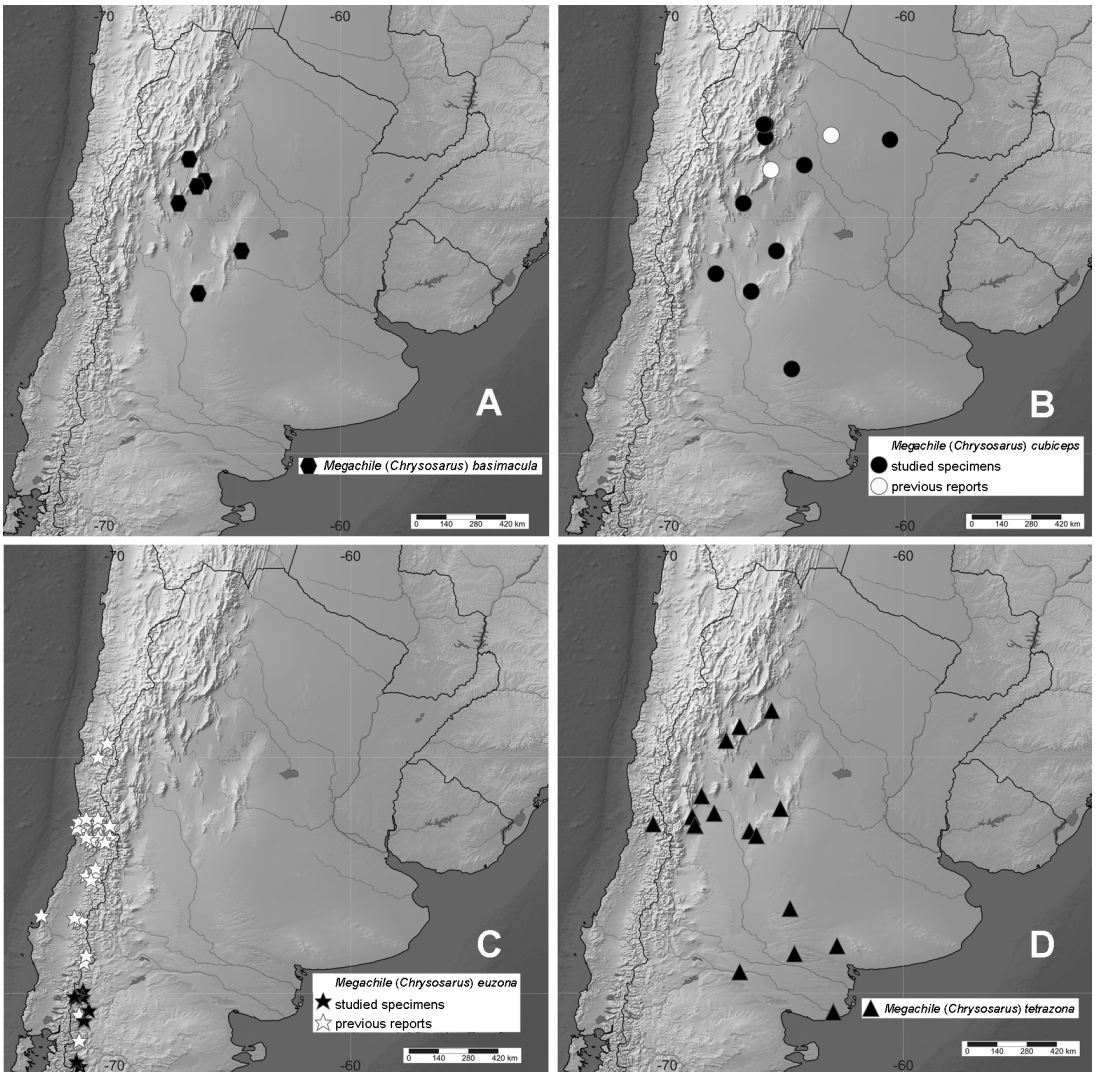

Fig. 13. Distribution maps of *Megachile* (*Chrysosarus*) species. A. *M. basimacula* n. sp. B. *M. cubiceps* Friese. C. *M. euzona* Pérez. D. *M. tetrazona* Friese. Previous reports for *M. cubiceps* are from Gonzalez *et al.* (2018), and those for *M. euzona* from GBIF.org (2023).

González-Vaquero (MACN); 1 F, San Martín de los Andes, I-1959, Z. Jara (MLP); 1 F, San Martín de los Andes, 7-III-1955, ex flowers of "*menta*" [Lamiaceae], A. Ogloblin (MLP); 1 F, San Martín de los Andes, 8-III-1955, ex Labiatae *cultivada* [= Lamiaceae], A. Ogloblin (MLP); 1 M, 1 F, Pucará, 1-XII-1957, S. Schajovskoi (MLP); 1 M, Lago Nahuel Huapi, 3-XII-1964, A.J. Giai (SEMC); 1 M, Confluencia, 20-XII-1964, S. Schajovskoi (MLP), 1 M, Lácar, Lago Queñi, 11 December 1999, ex *Buddleja globosa* [Buddlejaceae], N. Montaldo *et al.* (FAUBA); 1 M, Lácar, Lago Queñi, 11 December 1999, ex *Lathyrus multiceps* [Fabaceae], N. Montaldo *et al*. (FAUBA).

Megachile* (*Chrysosarus*) *tetrazona Friese

(Figs. 1F, 9C-F, 10D, 11G, 12D, 13D)

Megachile tetrazona Friese, 1908: 64, 67 (Holotype male, Argentina, Burmeister, ZMB, examined).

Megachile albopunctata Jörgensen, 1909: 225 (Lectotype female, Argentina, Mendoza, 12- XII-1907, P. Jörgensen, MLP, examined). Lectotype designation and synonymy of Durante *et al*. 2020.

Diagnosis. The female is recognized by its black pilosity, except for small white tufts behind the pronotal lobe and on the sides of T1 and T2 (Fig. 9C). Its metasoma is ovoid, T3 in dorsal view be-

ing as wide as T2. It is also distinguished by its mandible with a small cutting edge on the third tooth and a broad, truncate upper tooth (Fig. 1F). The male is readily recognized by the anterior basitarsus, which is widest basally, at the level of the distal end of the strigillar concavity, and then tapers apically, having the under surface flattened, glabrous, and polished (Fig. 10D); the basitarsus is yellowish brown basally and black apically. The anterior tibial spur has a black apex in both sexes; it is truncate in the male. Both sexes of this species have been redescribed in detail by Durante *et al*. (2020). The following notes complement that redescription.

Female. Body length 11.5-14.6 mm; length of forewing 7.9-9.5 mm. *Structure*. Inner margin of eyes nearly parallel, upper interocular distance 0.97-1.00x lower interocular distance. Distance from lateral ocellus to posterior margin of head 1.9-2.2x MOD. Maximum width of gena in lateral view 0.72-0.75x maximum width of eye. Clypeus 2.7x as wide as long, more convex on upper third, apically with transverse polished band; apical margin weakly crenulate. Mandible with four teeth; first and second teeth of similar size; fourth tooth broad, truncate; second interspace with small cutting edge; second and third interspaces U-shaped; upper acetabular groove with apical tuft; outer premarginal impressed line with stiff setae on all its length. Hypostomal carina curving towards cranial acetabulum and forming thickened strip bordering mandibular socket. Hind basitarsus 2.8-3.0x as long as its maximum width in lateral view. Sterna without apical fasciae under scopa.

Male. Body length 11.6-12.6 mm. Forewing length 6.9-8.8 mm. *Structure*. Proportions of scape, pedicel and first three flagellomeres 2.9:0.8:1.0:1.5:1.7. Outer margin of foretibia sharply carinate. S5, S6, and S8, as in Figure 12D.

Distribution. Argentina, provinces of Buenos Aires, Catamarca, Córdoba, La Pampa, La Rioja, Mendoza, Río Negro, San Juan, and San Luis. Chile, Los Andes (Fig. 13D).

Material studied. All specimens cited by Durante *et al*. (2020: 28) were examined; their data are not repeated here, but are included in the distribution map.

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