



## Article

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### ***Mirnapis ohloweni* Packer and Dumesh, new species with notes on *M. inca* Urban (Hymenoptera: Apidae: Eucerini)**

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#### **Abstract**

The bee genus *Mirnapis* is revised. *Mirnapis ohloweni* Packer and Dumesh new species, is described from East of Nazca, Peru and compared to both sexes of the type species, *M. inca* Urban, based upon material from northern Chile. Thus, the female of the genus is described for the first time. Both sexes of both species are illustrated and variation in some important characteristics noted. The new material permits a more detailed diagnosis of the genus. Michener's (2007) key to South American Eucerini is modified to facilitate the identification the genus and Vivallo's (2009) key to Chilean Eucerini is emended to permit identification of *M. inca*.

**Key words:** Chile, Peru, bees, taxonomy

#### **Introduction**

The genus *Mirnapis* was described by Urban (1997) based upon 6 males from Arequipa, Peru. Generic level status was considered warranted as a result of the following combination of characteristics: T6 with gradulus dentate laterally, mesotibia with specialized lanceolate hairs, pygidial plate narrowly rounded, S7 with lateral lobes sinuate, gonostylus not capitate and with fine setae, penis valves with apex rounded or weakly pointed and terga with long fine hairs (Urban, 1997). Urban (1997) compared the new genus with *Gaesischia*, *Santiago* and *Svastrides* because all four genera led to the same couplet in Michener *et al.*'s (1955) key to the genera of South American Eucerini. A full description of the genus has not been possible until now however, because the female was unknown.

The purpose of this paper is to describe the female of *Mirnapis inca* and a new species, *M. ohloweni* Packer and Dumesh. It also compares the new species with the type species of the genus, contrasts *Mirnapis* with related genera and emends identification keys to permit identification of *Mirnapis* among South American genera of Eucerini and Chilean eucerine species.

#### **Methods**

Terminology for bee morphology generally follows Michener (2007), with F, S and T referring to flagellomeres, sterna and terga, respectively. Dimensions of some features, including hair length, are given in terms of the diameter or the median ocellus—MOD. Puncture density is presented in terms of the relative dimensions of puncture diameter (d) and puncture interspaces (i). In the generic description, states for the main characteristics that differentiate the various genera of Neotropical Eucerini are provided for *Mirnapis*.

Male terminalia were dissected from relaxed specimens, cleared in 5% KOH and stored in glycerin.

Images were taken with a Visionary Digital BK Plus imaging system using a Canon EOS 40D digital SLR camera and processed with Adobe Photoshop.

Field methods employed by the senior author included standard netting and various trapping methods. *Mirnapis* females were most often caught in traps, mostly in blue, deep cup traps (Creative Converting, True Blue,

Cold Cups, Clintonville, WI) whereas a few individuals were caught in blue vane traps (Stephen & Rao, 2007), but never in yellow traps.

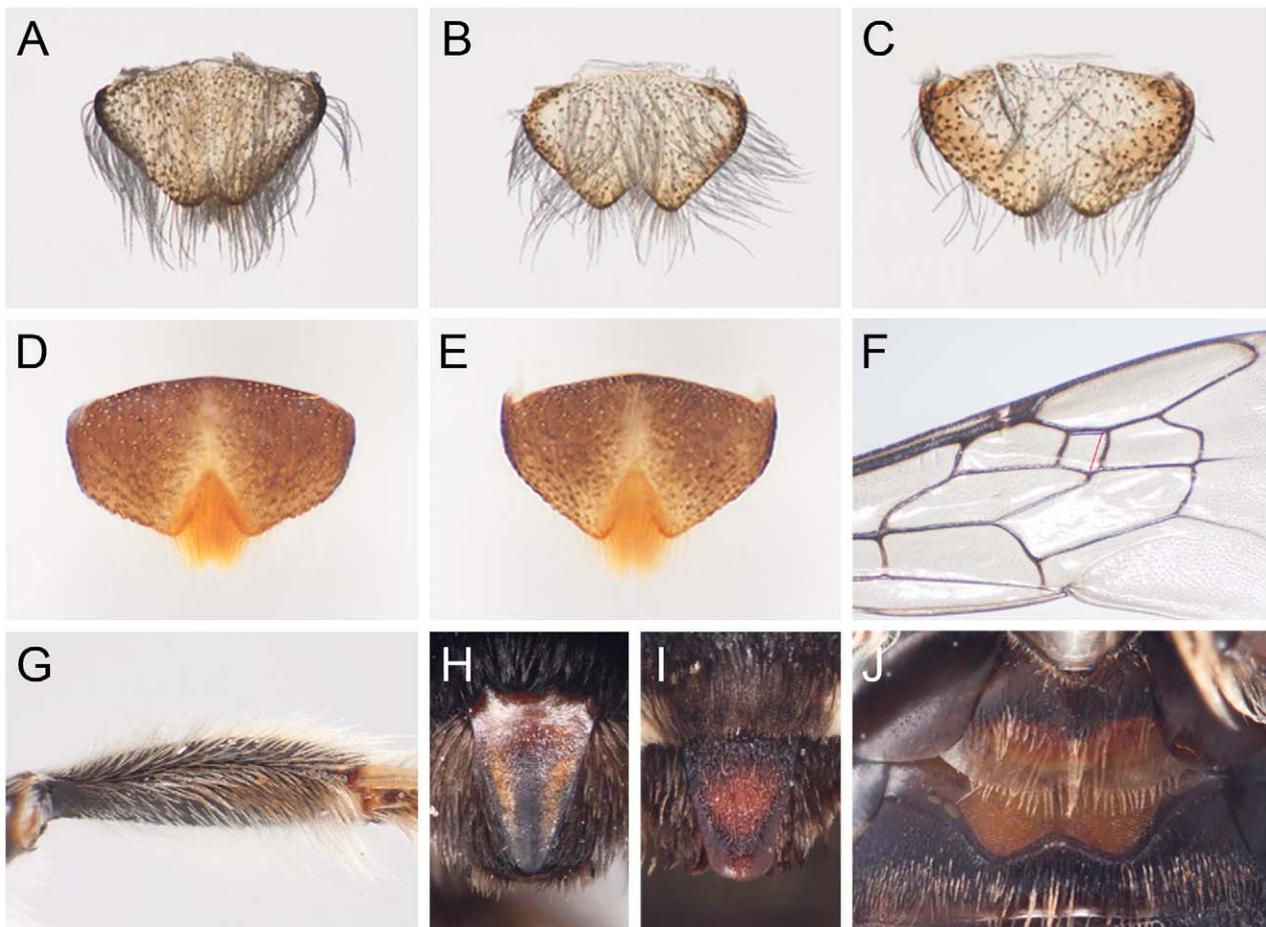
Museums where material is stored are as follows: AMNH—American Museum of Natural History, New York, United States; CTMI—Central Texas Melittological Institute, Texas, United States; MNHU—Museum für Naturkunde, Humboldt-Universität, Berlin, Germany; MSN—Museo Nacional de Historia Natural, Santiago, MUSM—Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru; PCYU—Packer Collection at York University, Toronto, Canada; PUCV—Pontificia Universidad de Valparaíso, Chile; RPSP—Coleção Camargo, Faculdade de Filosofia, Ciências e Letras, Universidade de São Paulo, Ribeirão Preto, Brazil and SEM—Snow Entomological Museum, Lawrence, United States.

## Taxonomy

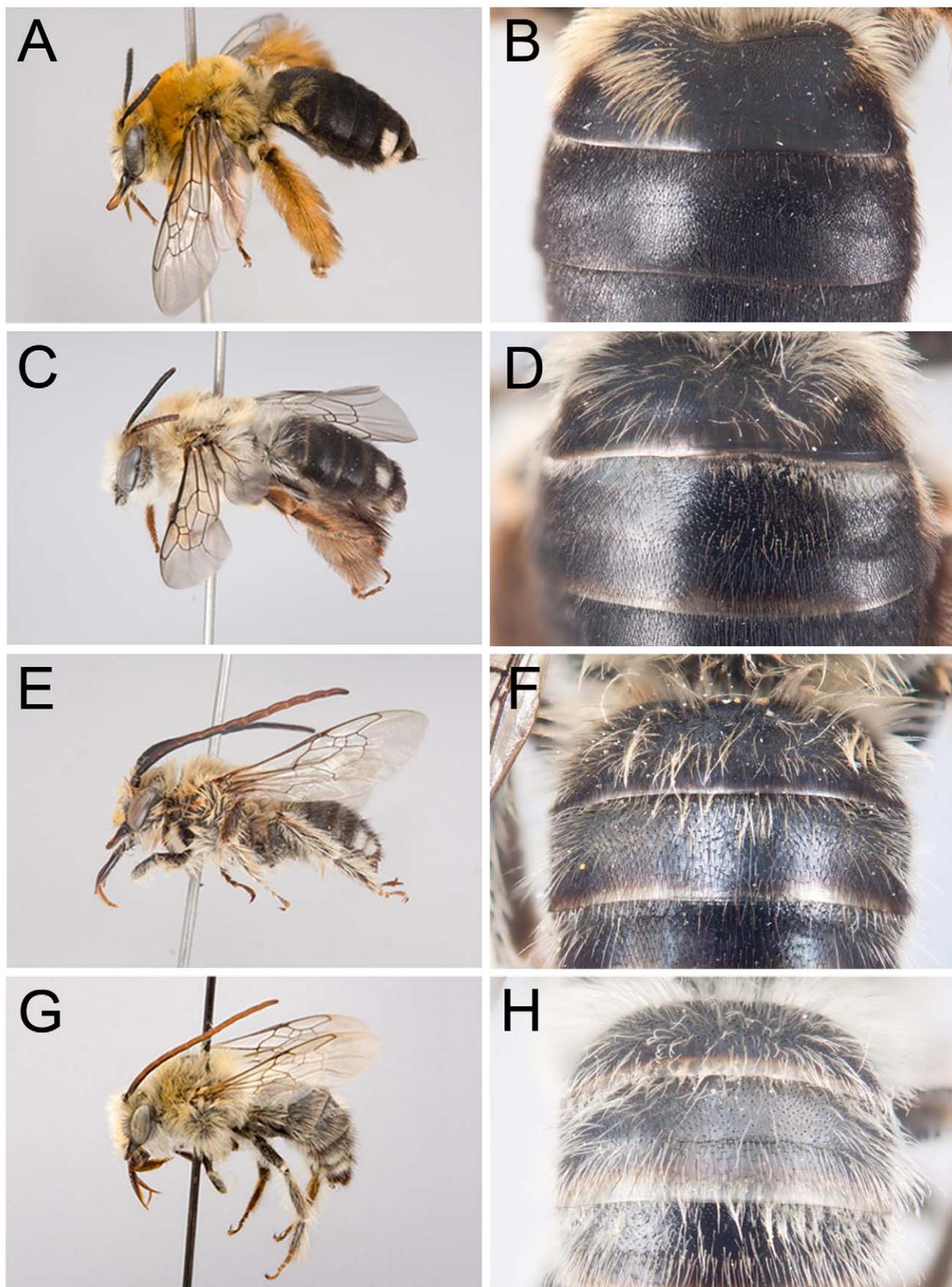
### *Mirnapis* Urban.

(Figs. 1–3, 4C)

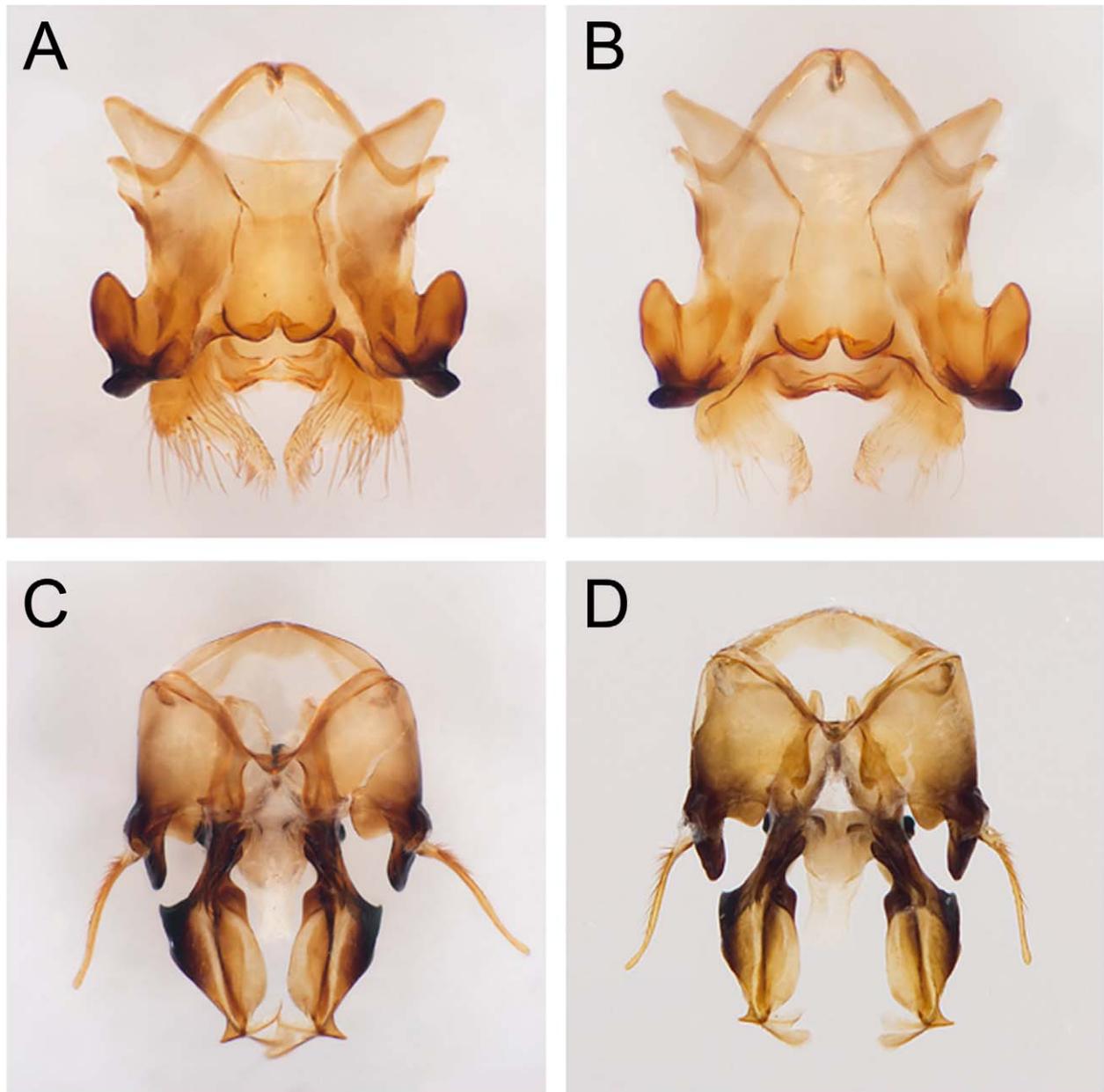
Type species *Mirnapis inca* Urban 1997, by original designation.



**FIGURE 1.** Important characters for generic level identification of *Mirnapis*. A–E, labra; A, male *M. ohloweni* (this is the longest and least strongly apically concave labrum of any male of the genus available to us); B and C, male *M. inca*, (the latter has the most obtuse lateral lobes of any individual of the species available to us); D, female *M. ohloweni*; E, female *M. inca*; F, part of forewing of *M. ohloweni* showing how length (blue) and width (red) of 2<sup>nd</sup> submarginal cell were measured; G, midtibia of male *M. inca* to show the lanceolate hairs; H, pygidial plate of female *M. inca*; I, pygidial plate of male *M. inca*; J, S2 of female *M. inca* to show the angle of the sternal gradulus.



**FIGURE 2.** A, B, E, F *Mirnapis ohloweni* Packer & Dumesh, new species. C, D, G, H. *M. inca*. A and C, female habitus lateral view; B and D, female T1–T3, dorsal view; E and G, male habitus, lateral view; F and H, male T1–T3, dorsal view.



**FIGURE 3.** Terminalia of male *Mirnapis*, ventral views. A and C, *M. ohloweni* (S7–S8 and genital capsule respectively); B and D, *M. inca* (S7–S8 and genital capsule respectively).

**Diagnosis:** For the male each of i) labrum strongly excised apically with the sides of the emargination at approximately a right angle to each other and ii) S7 with inner lobe weakly sclerotized, transversely scrolled and sparsely setose, are unique among Neotropical Eucerini. For the female, the labrum with deep apicomedian concavity extending for approximately 0.4X the maximum length of the labrum is diagnostic. This character has to be observed for the ventral (oral) surface of the labrum as the concavity is hidden by a dense tuft of hairs on the dorsal (aboral) surface.

**Description:** Labrum long, length more than 0.6X width in male (Figs. 1A–C), sometimes slightly less in female (Figs. 1D and E); apex with concavity deep and narrow in female, extending for ~0.4X greatest length; shallower and triangular, <0.2X greatest length, in male; lobes on either side approximately right angular, sides of emargination approximately right angular in male, acutely angulate in female. Galea 1.05–1.1X as long as compound eye. Mandible without inner basal tooth, subapical tooth obtuse or absent, apex triangularly excised in fresh specimens, condylar ridge of normal saliency. Maxillary palpomeres 5 (rarely 4); mouthparts lacking hooked hairs. Clypeal margin unmodified; clypeocular distance 0.75X minimum diameter of F1; paraocular carina absent

below thus not united with lateral clypeal carina; clypeus produced for slightly more than half width of compound eye (20:42). Malar space short, ~0.3X basal depth of mandible. Vertex elevated such that ocelli face somewhat anteriorly; distinct acute tubercle lateral to lateral ocellus. Inner margin of compound eyes subparallel. Female scape length ~3X maximum width; male F1 minimum length at most 1/6 as long as F2, maximum length 1/4–1/3 as long as F2; male antenna attaining T4, flagellum slightly flattened, depth 0.8X width. Scutellum approximately one third length of mesoscutum; anterior margin of tegula convex. Submarginal cells 3; submarginal cell 2 shorter than wide (Fig. 1F) or with length and width subequal; stigma much shorter on posterior margin than prestigma (Fig. 1F); jugal lobe more than half as long as vannal lobe; hindwing cu less than half as long as 2nd abscissa of M+Cu; wing hairs sparse. Forecoxal spine absent; male midtibia with lanceolate hairs apicoventrally (Fig. 1G), legs otherwise unmodified; keirotrichiate area on inner surface of hind tibia of female broad, extending almost to base; tibial and basitarsal scopal hairs long, plumose (Fig. 2A, 2B and 4C), apical bare area short, ~0.15X length of tibia; basitibial plate largely obscured by hairs, only posterior margin visible; dense dorsobasal hair patch on hind tibia shorter than basitibial plate; arolia present. Apical impressed areas of metasomal terga extensive, >0.5 tergal length on T2, these areas translucent only towards apex. Spatuloplumose hairs absent; metasomal terga lacking distinct basal hair bands (the female T2 may have a weak pale band basolaterally); patch of appressed, plumose, white hairs sublaterally on T4 and laterally on T5 of female, sublaterally on both T4 and T5 of male (Figs. 2A, C, E and G). Pygidial plate acute <45° in female (Fig. 1H), narrowly subtruncate in male with apical margin <MOD (Fig. 1I); gradulus of female on T2–T6 carinate laterad, untoothed; male gradulus on T2–T7 carinate laterally, T4–T5 with apex of gradular carina right angular, sometimes somewhat obtuse or acute, T6 with acute lateral tooth, T7 without tooth; female S2 gradulus concave medially, angle subtended by sides of concavity ~140° (Fig. 1J). Female with sternal hairs suberect, male with subapical fringe of long hairs on S2–S5. Male S6 with converging carinae, with shallow median depression margined with posteriorly oriented setae; S7 disc flat and apically weakly bilobed, inner lobes somewhat membranous, scrolled, sparsely setose; outer lobes strongly sclerotized, ventrally concave (Fig. 3A and C); S8 with apex of apical lobe broadly concave, apicodorsal swelling broad and deep (Figs. 3A and B); gonostylus 2/3 as long as maximum length of gonocoxite, spatha ~2X as wide as long (Figs. 3C and D).

### ***Mirnapis ohloweni* Packer and Dumesh, new species**

(Figs. 1A and D; 2A, B, E and F; 3A and C)

**Diagnosis:** This species is most easily distinguished from *M. inca* by the following: female with metatibial and metabasitarsal scopa orange (Fig. 2A); male with dark metasomal hairs extensive, extending for apical half of T2 medially (Figs. 2E and F); basal areas of T2–T4 with white, plumose, appressed hairs absent or reduced to fringe of short hairs on gradulus (Fig. 2F); T1–T5 with apical translucent areas short, approximately 0.5MOD (range 0.3 – 0.6MOD) (Fig. 2F).

**Description: Female: Dimensions:** Body length: 13.0–14.0 mm; forewing length: 8.5–8.7 mm; head width: 4.3–4.5 mm; intertegular span: 3.5–3.7 mm.

**Colouration:** Integument black except as follows: F3–F10 dark brown anteriorly; apex of metatibia and all tarsomeres 1–4 marked with dark red-brown, pretarsi entirely red-brown; tegula amber posteriorly, dark brown anteriorly; apical impressed areas of terga with extremely narrow, slightly translucent apical rim (<0.25MOD) (Fig. 2B); pre-gradular area of S2 orange, darkened apically; apex of apical impressed areas of sterna narrowly amber then orange-brown anteriorly.

**Pubescence:** Apical fringe of labrum pale, hairs plumose, <2MOD; median tuft orange-brown, ~1.5MOD. Clypeal hairs pale, weakly plumose or simple, ≤1MOD; rest of face, vertex, mesoscutum and scutellum with strongly plumose, yellowish-brown hairs (ferruginous in fresh specimen) ≤2.5MOD; pleura, side of propodeum and forefemur with paler, longer hairs, ≤4MOD. Metatibial and metabasitarsal scopa yellow-orange, hairs long (≤4MOD) with numerous long branches (~0.5MOD) (Fig. 2A). T1 hairs pale yellowish-orange, erect, long (<3.5MOD), shorter blackish hairs on sides and subapically (Fig. 2A and 2B). T2–T6 with black, subappressed, simple, short hairs (≤1MOD), with few longer (<2MOD). T5 with dense, suberect black hairs (<1.5MOD). T6 with shorter blackish hairs. T2 with minute and T4 with large sublateral patch of appressed plumose white hairs (those on T2 sometimes hidden beneath T1) (Fig. 2A); T5 with plumose, pale, long (2MOD) hairs laterally continuous with sublateral patch similar to that on T4 (Fig. 2A).

**Sculpture:** Clypeus weakly imbricate, punctures large,  $i \leq d$ , except small and crowded on brow of apical rim. Lower paraocular area weakly imbricate, shiny, punctures shallow, dense. Upper paraocular area and region between lateral ocellus and compound eye shiny, punctures minute and sparse. Vertex densely punctate, punctures small. Mesoscutum coarsely imbricate, dull; punctures shallow, sparse,  $i=1-2d$ . Scutellum less strongly imbricate, punctures dense, more distinct than those of mesoscutum,  $i \sim d$ . Metanotum dull, punctures shallow, crowded medially, sparse laterally. Metapostnotum punctate-areolate, with distinct medial line. Metasomal terga very weakly imbricate (T1, T4–T6) to shiny (T2–T3), punctures small, distinct, irregularly spaced,  $i=1-3d$ .

**Structure:** Labrum approximately twice as wide as long, deeply and triangularly excised apicomediaally, excision extending basad for almost 1/2 length of labrum, lobes on either side of excision approximately right angular (Fig. 1D). Postpalpal part of galea 1.05–1.1X as long as compound eye. Maxillary palpomeres 5. Mouthparts entirely devoid of hooked or otherwise modified hairs. Malar space subequal to minimum diameter of F1, approximately 1/3 as long as basal depth of mandible. Clypeus more than twice as wide as long, L:W 32:66; lateral clypeal carina strong; minimum clypeocular distance subequal to length of malar space. Inner margins of compound eyes subparallel. Small, sharp tubercle posterolaterad of lateral ocellus. Vertex somewhat raised, distance between posterior tangent of median ocellus and top of head in frontal view slightly less than MOD (13:15); region between lateral ocellus and compound eye weakly depressed. Scutellum  $< 1/3$  as long as mesoscutum, 35:105. Metanotum mostly declivitous. 2<sup>nd</sup> submarginal cell short, anterior margin less than width (Fig. 1F). Translucent apices of T2–T4 narrow, on T2  $\leq 0.6\text{MOD}$ .

**Male:** As in female except as follows:

**Dimensions:** Body length: 11.7–12.5mm; forewing length: 9.0–9.5mm; head width: 4.0–4.4mm; intertegular span: 3.0–3.5mm.

**Colouration:** Entire flagellum red-brown on anterior surface; labrum yellow, edged with dusky brown (Fig. 1A); clypeus yellow; apical impressed areas of terga with narrow, somewhat translucent apical rim ( $\sim 0.6\text{MOD}$ ) (Fig. 2F).

**Pubescence:** Labrum and clypeus with hairs dense, plumose, long  $\sim 2.5\text{MOD}$ ; rest of face, thorax and T1 with longer hairs,  $\leq 4.5\text{MOD}$ . T2 with pale, somewhat plumose, suberect, long ( $\leq 2.5\text{MOD}$ ) hairs laterally and basally, elsewhere hairs black, simple and shorter ( $< 2\text{MOD}$ ). T2 and T3 without sparse, strongly plumose, short hairs or with these restricted to gradular fringe laterally and absent medially; sparse, suberect pale, long hairs ( $\leq 2.5\text{MOD}$ ) laterally; suberect, simple, black hairs elsewhere, ( $< 2.5\text{MOD}$ ) (Fig. 2F). T4 and T5 with erect, pale, long ( $\leq 3\text{MOD}$ ) hairs anterolaterally with large patches of white, appressed, strongly plumose hairs sublaterally; elsewhere hairs simple, suberect  $< 2\text{MOD}$  (Fig. 2E). T6 apical fringe, dark brown medially,  $\leq 1\text{MOD}$  with small posterolateral patch of pale hairs, white laterally, pale brown sublaterally ( $\leq 3\text{MOD}$ ). T7 with black-brown hairs,  $\leq 1.5\text{MOD}$ . S2–S4 with subapical hair fringes of plumose, whitish hairs,  $\leq 3\text{MOD}$  laterally, sparser and shorter medially, more distinctly divided into lateral patches on S4. S5 with subapical fringe of brown, plumose hairs,  $\leq 2\text{MOD}$  laterally, 1MOD medially; slightly longer, black, simple hairs anterior to subapical fringe. S6 apicomedian depression margined with dark hairs ( $\sim 1\text{MOD}$ ).

**Sculpture:** Clypeus more sparsely punctate,  $i > d$ ; metasomal terga sparsely punctate, especially on apical 1/3,  $i=2-5d$ , apical translucent areas largely impunctate.

**Structure:** Labrum approximately 2/3 as long as wide, length (to apex of lobe): width 32:51; deeply and triangularly excised apicomediaally, excision extending basad for  $> 1/6$  length of labrum (6:32), emargination and lobes on either side approximately right angular (Fig. 1A). Malar space longer than clypeocular distance (7:5). F1 with minimum length subequal to minimum diameter; minimum length 1/6 length of F2, maximum length 1/4 that of F2. Tubercle laterad of lateral ocellus larger. Pygidial plate narrowed, apex  $< 0.7\text{MOD}$ . S6 with lamellate posteriorly convergent carinae, separated apically by  $< 1\text{MOD}$ . Genitalia as in figures 3A and 3C.

**Material examined:** Holotype female, 6 male paratypes: PERU, Ica Departamento, 51.1km E. Nazca, 14°48.623'S 074°39.958'W, 2775m, 3.v.2011, leg. Ohl, Krause and Breitkreuz (holotype and one paratype male MUSM; other paratypes MNHN and PCYU); Additional paratypes: one female, one male: Ica Departamento, 41km E Nazca, 14°50.254'S 074°43.322'W, 2310m, 2.v.2011, leg. Ohl, Krause and Breitkreuz (PCYU); one female: Ayacucho Departamento, 55km E. of Nazca, -14.791 -74.647, 2730m, 3.iv. 2010, L. Packer and J. Rivera, *Tarasa operculata* (Cav.) Krapov. Malvaceae) (PCYU).

**Etymology:** The species is named in honour of Michael Ohl and Robin Owen. The former caught both sexes of the new species and the latter caught the first specimen of *M. inca* in Chile and the efforts of both were necessary to permit the descriptions and redescriptions presented here.

**Variation:** The male and female from 41km East of Nazca have more densely punctate metasomal terga than all but one male of the other specimens examined.

**Comments:** *Tarasa* is not the pollen source collected by the females in the series noted above as the pollen in the scopae of the females is of a different colour – being orange rather than brown.

### ***Mirnapis inca* Urban**

(Figs. 1C, E, G–J; 2C, D, G and H, 3B and D; 4C)

**Diagnosis:** This species is most easily distinguished from *M. ohloweni* by the following characteristics: female with metatibial and metabasitarsal scopa dusky brown (Figs. 2C and 4B); male with fewer dark hairs on metasomal terga, on T2 reduced to at most a subapical transverse row (Fig. 2H); T2–T4 with basal bands of white, plumose, appressed hairs, most complete on T3 (though sometimes abraded or hidden by preceding tergum, visible only laterally in Fig. 2H); apical translucent areas on terga long, on T2 ~1MOD (range 1 – 1.3MOD) (Fig. 2H).

**Female:** as in *M. ohloweni* except as noted in diagnosis and as follows: F3–F10 orange-brown anteriorly; tarsomeres 1–4 entirely brown; 2<sup>nd</sup> submarginal cell with length and breadth subequal; apical impressed areas of terga with longer translucent apical rim (~1MOD) (Fig. 2D); T2 with more extensive patch of white hairs basally (Fig. 2D).

**Male:** as in male of *M. ohloweni* except as noted in diagnosis and as follows: F1 with minimum length slightly greater than minimum diameter; minimum length 1/4 length of F2, maximum length nearly 1/3 length of F2; T1–T2 with hairs long and almost entirely pale (Fig. 2H), T3–T5 with dark hairs only subapically, otherwise hairs pale; apical impressed areas of terga with longer translucent apical rim (1–1.3MOD) (Fig. 2H). Genitalia as in figures 3B and D.

**Material Studied:** Paratype male, PERU: Arequipa, 2200m, III.1954, A. Meza (SEM); CHILE Region XV, Candelabra cactus zone, 7.v.2001, R. E. Owen 1 male; Region XV, Hwy 11, 72.5km, Quebrada Cardones, -18.45698 -69.77264, 2378m, 19.iv.2012, L. Packer, 10 males, 1 female; same locality but 19.iv.–13.v.2012, one male, blue vane trap; same locality but 12–13.v.2012, 20 males. CHILE Region XV, Hwy 11, 74.5km, Quebrada Cardones, -18.44759 -69.76234, 2443m 17–19.iv.2012, L. Packer, blue cup trap, 1 female; CHILE Region XV, Hwy 11, Quebrada Cardones, -18.43780 -69.74481, 2618m 17.iv.–12.v.2012, L. Packer blue vane trap, 1 male; CHILE Region XV, Hwy 11, 69km, -18.46403 -69.80427, 2189m 17.iv.–12.v.2012, L. Packer, blue vane trap, one female. CHILE Region I, Mamiña vertedero, -20.06175 -69.22181, 2660m 16.–21.iv.2012, L. Packer, blue deep cup, one female. Same locality 21.iv.–10.v.2012, 2 females, deep blue cup. All specimens currently housed at PCYU, one male will be distributed to each of CTMI, RPSP, MNHN, AMNH and one female and multiple males to PUCV in due course.

**Comments:** Males were collected mostly flying rapidly over an unidentified Shrub<sup>1</sup> that was not flowering in April. Some were also flying over *T. operculata* from which the sole female netted was collected and another was seen but not caught. *Tarasa* is not considered to be the source of pollen collected by these bees for the same reasons given for *M. ohloweni* above.

The highly male biased sex ratio in samples netted versus the female biased one from traps is worthy of note. By net, the ratio of males to females caught was 30:1, in the deep cup and blue vane traps the total was 2 males to 5 females. The overall high male bias is not likely to be a result of protandry as the sample netted in May was 100% male and the species had been active for at least three weeks by that time. It is possible that the females are active at a restricted time of day. However, both females that were seen alive were observed in the afternoon and prolonged searches from 8:00 hrs to 14:00 hrs on May 13<sup>th</sup> 2012 (a day that started off unusually cloudy) resulted in only males being seen.

This bee was common in the Candelabra cactus zone (*Browningia candelaris* (Meyen) Britton & Rose) in April and May of 2012. The area had received an unusually large amount of rainfall earlier that year and vegetation was abundant. However, many plants were drying up and overall bee activity was considerably reduced by mid May although some *T. operculata* remained in strong bloom. It seems that *M. inca* flies later into the early winter in northern Chile than most other bees, only *Centris* spp. and *Anthophora arequipensis* Brèthes seemed more common this late in the year than in April.

## Identification

Michener's (2007) key to South American Eucerini is not straightforward to use for an accurate identification of *Mirnapis* males and the females were not known at that time.

Male identification is rendered difficult by variation in labral morphology which does not completely agree with Michener's couplet 18 (2007, p. 713) which states "(L)abrum nearly three fourths as long as broad, apex deeply emarginate, sides of emargination at about right angle to one another and lobe on each side of emargination narrowly rounded". In the specimens available to us the labrum is at most 2/3 as long as wide and the emargination averages 1/6<sup>th</sup> the length of the labrum (but is only 1/10<sup>th</sup> in one specimen). The sides of the emargination range from 85° to 110° from one another and the lobes on either side are from 85° to 110° with one male having unusually blunt lobes of 135°.

The best way to emend the key for identification of *Mirnapis* males (Michener 2007, p. 713) is as follows:

- 18. Labrum with apical emargination distinct, at least 1/7<sup>th</sup> as long as maximum length of labrum (only 1/10<sup>th</sup> as long in one specimen), angle of sides of lateral lobe and also of sides of emargination generally approximately right angular (Figs. 1A–C) (labrum clearly more than half as long as wide; T4 and T5 with large patches of white, plumose, appressed hairs towards sides; mid altitudes on the western slopes of the Andes in southern Peru and northern Chile) . . . . . *Mirnapis*
- Labrum with weak apical emargination, not clearly forming lateral lobes or forming very obtuse ones and sides of emargination forming strongly obtuse angle (Fig. 4A) . . . . . 19.

It is relatively straightforward to take the female of *Mirnapis* to couplet 34 which, as modified below permits its identification:

- 34. Anterior margin of tegula straight or gently concave . . . . . *Melissodes*
- Anterior margin of tegula convex. . . . . 34A
- 34A. T4 and T5 with lateral patches of white, appressed pubescence (Figs. 2B and D) and hairs of tibial scopa with numerous moderately long branches (Fig. 4B). . . . . *Mirnapis*
- Without above combination, either T4 and T5 lacking lateral patches of white, appressed pubescence and/or hairs of tibial scopa simple or with one or two long branches towards base (Fig. 4C) (some more plumose hairs may be present ventrally) . . . . . 35

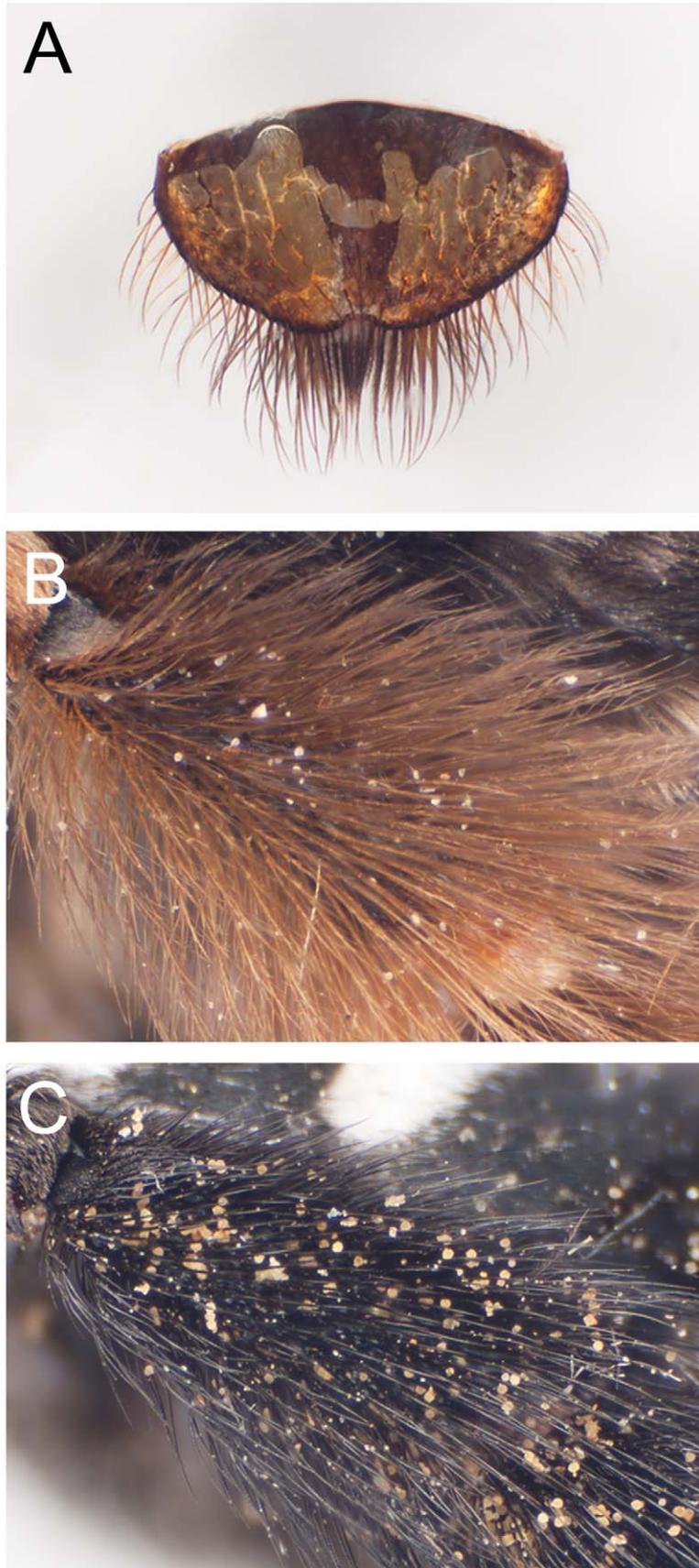
As modified, the key has the added advantage of omitting the forecoxal spine character. This spine is either absent or at least very small in some of the taxa in which it is meant to be present.

Vivallo's (2009) key to the Eucerini of Chile is somewhat easier to modify to permit identification of *Mirnapis inca*. The male runs to *Svastra flavitarsis* at couplet 5 from which it is readily differentiated based upon the absence of spatuloplumose hairs on the base of T2 and by the presence of lanceolate hairs anteroventrally on the mesotibia. Thus, couplet 5 can be modified as follows:

- 5. Prestigma clearly longer than stigma . . . . . 5A
- Prestigma almost as long as stigma....(genus *Melissoptila*) . . . . . 6
- 5A. Spatuloplumose hairs on base of T2 present; mesotibia lacking subappressed, lanceolate hairs anteroventrally. . . . . *Svastra flavitarsis*
- Spatuloplumose hairs on base of T2 absent (Fig. 2H); mesotibia with subappressed, lanceolate hairs anteroventrally (Fig. 1G) . . . . . *Mirnapis inca*

For females, couplet 30 requires emendation as follows:

- 30. Tibial scopa black or brown (Figs. 4B and C). . . . . 30A
- Tibial scopa yellow (as in Fig. 2A). . . . . 32
- 30A. Tibial scopa brown, hairs with numerous branches (Fig. 4B). . . . . *M. inca*
- Tibial scopa black, hairs simple or with one or two branches towards base (Fig. 4C) (some more plumose hairs may be present ventrally) (genus *Svastrides*). . . . . 31



**FIGURE 4.** Characters to aid in identification of *Mirnapis* based upon keys in the text. A. Labrum of male *Svastrides melanura* to show strongly obtuse emargination and apicolateral margin. B. tibial scopa of *M. inca* to show plumose hairs. C. tibial scopa of *S. melanura* to show mostly simple hairs.

## Discussion

The Eucerini is a complex tribe with many monotypic genera and subgenera. While the generic status and interrelationships among genera and subgenera remain to be assessed phylogenetically, it seems clear that *Mirnapis* is deserving of generic status based upon the combination of characters discussed above.

Urban (1997) compared *Mirnapis* to *Gaesischia*, *Santiago* and *Svastrides* whereas Michener (2007, p. 733) noted similarities to *Gaesischia*, *Santiago* and *Hamatothrix*. *Mirnapis* is differentiated from these genera by the characters given in the diagnosis. Additional differences from these genera, but not necessarily all other genera of the tribe, include: hairs of tibial scopa with numerous moderately long branches (Fig. 4B) (branches short, reduced to one or two, absent or scopa strongly modified forming short apical corbicula—in *Hamatothrix*). The narrow apex to the pygidial plate (Fig. 11) and genitalic characters serve to separate the males of *Mirnapis* from those of these other genera: the rather membranous, transversely scrolled but clearly not folded, inner lobe to S7 (Figs. 3A and B) contrasts with the sclerotized and/or strongly folded (and usually apically expanded or strap-like) lobe of the other genera. The broadly concave apical margin to S8 (Figs. 3A and B) is also not found in the other genera which have an entire or more narrowly emarginate apex or a median convexity (enlarged into a process in some *Gaesischia*) (Michener *et al.*, 1955; Urban, 1967, 1968, 1972, 1975, 1989a, 1989b).

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1. This plant has since been identified as *Trixis cacalioides* (Kunth) Don. (Asteraceae). We are grateful to Jorge Macaya, Sebastien Tellier and Horacio Larrain for assistance in obtaining this determination.