

Journal of Melittology

Bee Biology, Ecology, Evolution, & Systematics

The latest buzz in bee biology

No. 9, pp. 1–8

3 May 2013

Revision of the bee genus *Chlerogella* (Hymenoptera: Halictidae), Part III: New records and a new species from Peru

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Abstract. A distinctive new species of the bee genus *Chlerogella* Michener (Halictinae: Augochlorini) is described and figured from central Peru (Santuario Nacional Pampa Hermosa). *Chlerogella mabelae* Engel, new species, is quite distinctive from other species of the genus and can be recognized by its sculpturing, coloration, and male terminalia. In addition, new Peruvian records for *C. azurea* (Enderlein) and *C. rostrata* Engel are appended.

INTRODUCTION

The bee genus *Chlerogella* Michener comprises a diversity of distinctive bees distributed through much of the New World tropics (Engel, 2003a, 2003b, 2009, 2010). Species of the genus range from Costa Rica to Bolivia and are largely found in the mountainous regions of these countries, particularly along the Andean range. When first described, the genus was monotypic (Michener, 1954), although two other species were subsequently ascribed to the group by Moure & Hurd (1987). The genus was recently revised and 34 species recognized (Engel, 2009, 2010), and although the diversity has clearly increased, the number of available specimens remains meager. Effectively nothing is known of the biology of species of *Chlerogella*, with most of the recent specimens caught either in malaise traps, flight intercept traps, and a single specimen from a light trap.

Herein is presented the description of a distinctive new species of *Chlerogella* (Fig. 1) recently recognized from material collected in a lower montane-premontane *Podocarpus* Persoon (Pinales: Podocarpaceae) forest in central Peru. In addition, new

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Table 1. Peruvian species of *Chlerogella* with the total known number of specimens, elevational range, and collecting localities in Peru (based on Engel, 2010). A total of only 24 specimens have been collected at an average elevation of 1140 m a.s.l. All of the localities are on the eastern foothills of the Andes (Fig. 12).

Species	Sex	Elevation (m)	Peruvian Localities
<i>C. arhyncha</i> Engel	1♀3♂♂	1300–1500	Junín (W San Ramon)
<i>C. azurea</i> (Enderlein)	7♀♀3♂♂	620–1422	Cusco (Cosñipata-area ¹ , NE Paucartambo, Santa Rosa), Huanúco (Cueva de las lechuzas, Tingo Maria ²), San Martín (NE Tarapoto)
<i>C. buyssoni</i> (Vachal)	1♀	1500	Cusco (Callanga ³)
<i>C. mabelae</i> Engel, n. sp.	1♂	1940	Junín (Pampa Hermosa)
<i>C. nasus</i> (Enderlein)	2♀♀	1000–1120	Cusco (Cosñipata-area ¹ , NE Paucartambo)
<i>C. rostrata</i> Engel	5♀♀	1300–1627	Junín (W San Ramon), Pasco (Villa Rica)
<i>C. vachali</i> Engel	1♀	480	Madre de Dios (S Atalaya)

¹ Otto Garlepp (1864–1959), who collected the type specimen, used a larger area around the Cosñipata River as one of his collecting stations east of Cusco. The exact locality and altitude is therefore only an approximation (Rasmussen *et al.*, 2009).

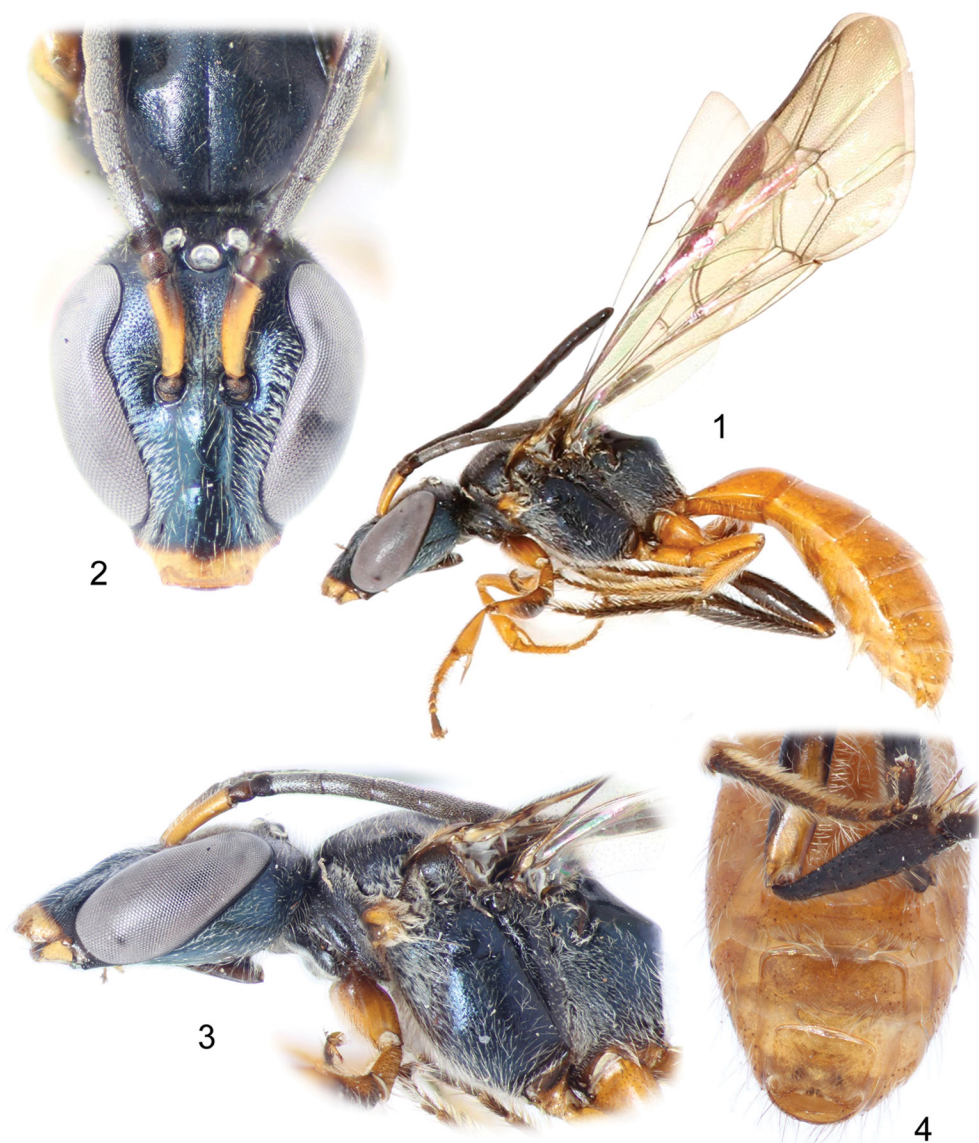
² Should be interpreted as in the vicinity of the city of Tingo Maria.

³ Callanga was an Inca economic outpost in the tropical Andean foot-hills where coca and other crops were grown centuries ago (Gade, 1999). The collector of this specimen is not indicated, but Vachal described species from specimens purchased from all of the major dealers of exotic insects (Rasmussen, 2012). The only commercial collectors known to have been active in Callanga around the turn of the last century are the Garlepp brothers (Gade, 1999), Gustav (1862–1907) and Otto, who likely collected the type specimen. The exact locality and elevation is only an approximation but is with certainty around the Rio Callanga, a tributary from Rio Piñi Piñi and Rio Alto Madre de Dios. Moure *et al.* (2007) suggested that Callanga is in Lima, west of the Andes, which is an error.

specimen records for two further species are provided as a supplement to the earlier revisions of the genus. The discovery of the new species brings the Peruvian diversity of *Chlerogella* up to seven species (Table 1). Most specimens were collected from very humid tropical premontane forests on the eastern foothills of the Andes, an area characterized by high precipitation and cloud persistence (Holdridge, 1967). This area also is formed by a transition zone between the higher montane forests and the Amazonian lowland forests, allowing for the existence of organisms from both forest types including a set of unique taxa such as the present genus. It is also noteworthy that all of the collecting sites, without exception, have been from areas with well-conserved and dense forest cover, at least at the time of capture. This apparent habitat preference contrasts with that of other species of Andean halictids, such as *Neocorynura* Schrottky, *Caenohalictus* Cameron, &c., that are rather common in disturbed areas.

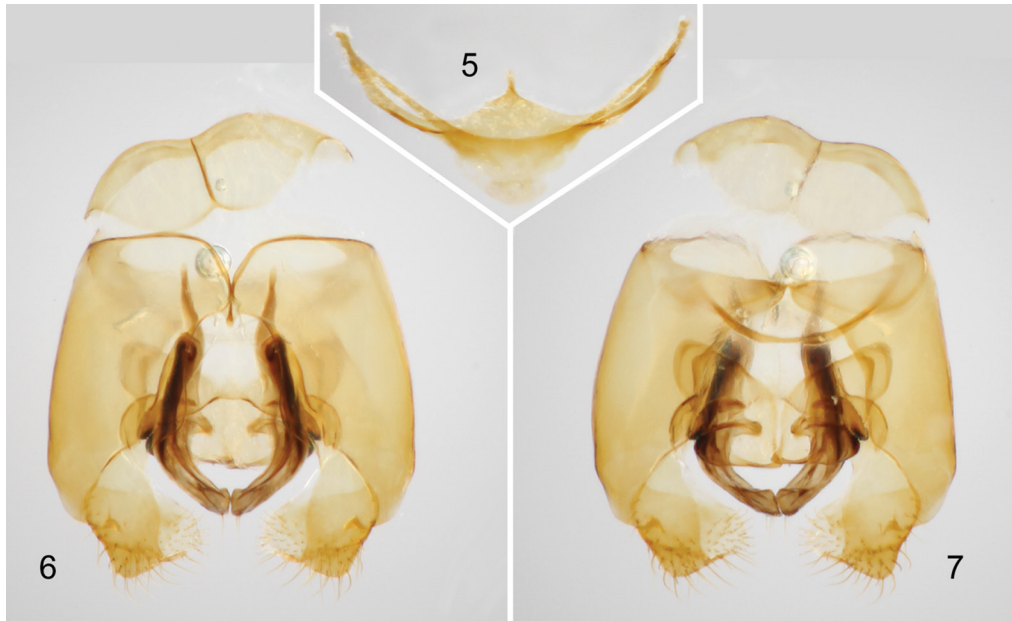
MATERIAL AND METHODS

The material discussed herein is deposited in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru (MUSM) and was compared with



Figures 1–4. Holotype male of *Chlerogella mabelae*, new species. 1. Lateral habitus. 2. Facial aspect. 3. Lateral aspect of head and mesosoma. 4. Apical metasomal sterna (IV, V, and VI).

other species of *Chlerogella* housed in the Division of Entomology, University of Kansas Natural History Museum, Lawrence, USA (SEMC). Morphological terminology follows that of Engel (2001, 2009) and Michener (2007), while the format for the description follows that of Engel (2009, 2010). Measurements were prepared with an ocular micrometer on an Olympus SZX-12 stereomicroscope and photographs taken using a Canon 7D digital camera attached to an Infinity K-2 long-distance microscope lens.



Figures 5–7. Male terminalia of *Chlerogella mabelae*, new species. 5. Fused and hidden metasomal sterna VII and VIII. 6. Genital capsule, dorsal view. 7. Genital capsule, ventral view.

SYSTEMATICS

Genus *Chlerogella* Michener

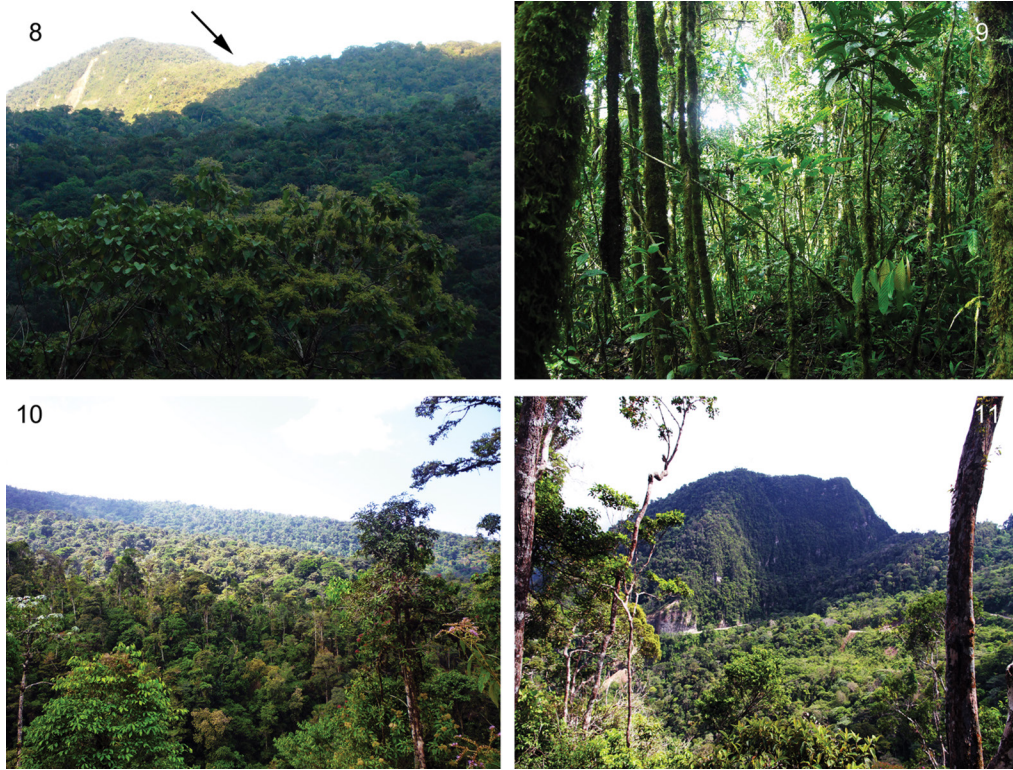
Chlerogella mabelae Engel, new species

ZooBank urn:lsid:zoobank.org:act:A2AA9926-99E1-48EC-A440-B11B62E0E8FD

(Figs. 1–7)

DIAGNOSIS: The new species is most similar to *C. arhyncha* Engel, also from Peru, but can be distinguished by the deep metallic blue coloration of the head and mesosoma, the largely honey-yellow scape, the largely yellow to orange legs, the yellowish orange metasoma, the slightly longer malar space (0.27 versus 0.2 times the basal mandibular width in *C. arhyncha*), the longer second flagellomere (nearly three times length of first flagellomere versus two times in *C. arhyncha*), and the shape of the male terminalia (Figs. 5–7).

DESCRIPTION: ♂: Total body length 7.50 mm; forewing length 5.67 mm. Head length 1.82 mm, width 1.51 mm. Clypeus beginning well above lower tangent of compound eyes (Fig. 2). Malar space 4% compound eye length (malar length 0.05 mm; compound eye length 1.25 mm) (Figs. 1–3), malar space 0.27 times basal mandibular width. Upper interorbital distance 0.78 mm; lower interorbital distance 0.52 mm. First flagellomere about as long as pedicel, about as long as wide; second flagellomere almost three times length of first flagellomere (2.85 times); ventral surfaces of second through eleventh flagellomeres densely covered in placoid sensilla, placoid fields not disrupted. Upper portion of pronotum not depressed, not elongate, medially less than 0.25 times ocellar diameter in length; ventral portion of preëpisternal sulcus similar to upper portion of preëpisternal sulcus; intertegular distance 1.12 mm; mesoscutellum



Figures 8–11. View of collecting localities in Peru for *Chlerogella mabelae*, new species, *C. rostrata* Engel, and *C. azurea* (Enderlein). **8.** The type locality of *C. mabelae* indicated with an arrow, Junín, Pampa Hermosa. **9.** Understory of same forest (photographs by Luis Figueroa). **10.** Collecting site of *C. rostrata*, Pasco, Villa Rica (photograph by Luis Figueroa). **11.** View away from collecting site of *C. azurea*, San Martín, NE Tarapoto (“Biodiversidad”) (photograph by Claus Rasmussen).

convex, not bigibbous. Basal vein distad cu-a by four times vein width; 1rs-m distad 1m-cu by five times vein width; 2rs-m distad 2m-cu by ten times vein width, 2rs-m relatively straight; first submarginal cell longer than combined lengths of second and third submarginal cells; second submarginal cell slightly narrowed anteriorly, anterior border of second submarginal cell along Rs shorter than that of third submarginal cell; posterior border of third submarginal cell about 1.25 times length of anterior border. Distal hamuli arranged 2-1-2. Femora not swollen; inner metatibial spur serrate. Apical margin of metasomal sterna III–V entire (Fig. 4); apical margin of sternum VI emarginate; terminalia as depicted in figures 5–7.

Clypeus and supraclypeal area weakly imbricate with weak punctures separated by 1–4 times a puncture width; face with small, contiguous punctures; punctures of face blending to faintly imbricate integument in ocellular area and vertex, with small punctures separated by 1–4 times a puncture width; gena faintly imbricate with small punctures separated by 1–2 times a puncture width; postgena imbricate and impunctate. Pronotum imbricate with sparse minute punctures; mesoscutum imbricate with small punctures separated by 1–2 times a puncture width, anteromedially punctures becoming faint to absent; mesoscutellum imbricate with small punctures separated

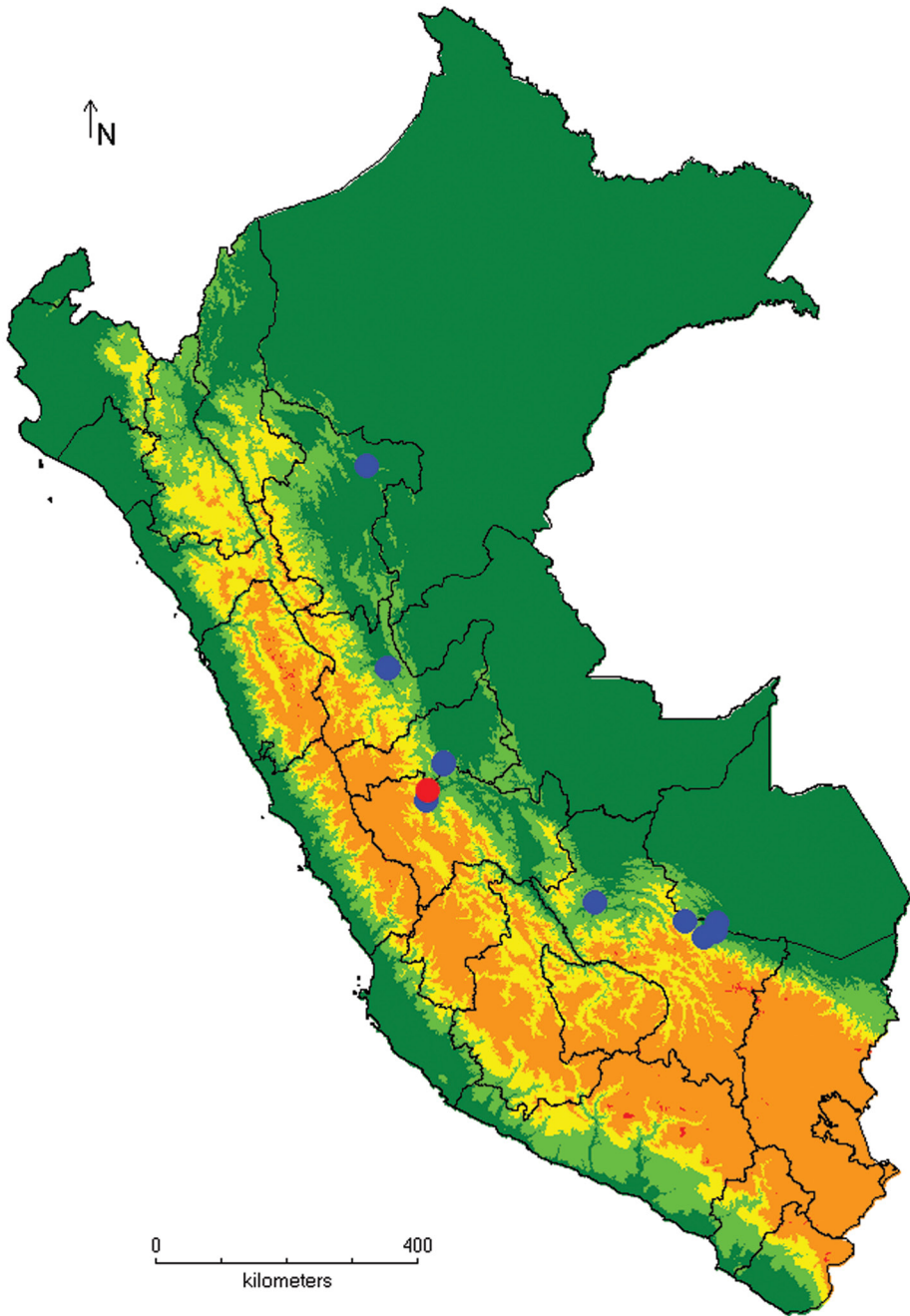


Figure 12. Collection localities of individuals of species of *Chlerogella* in Peru. Blue dots indicate records for previously-described species, while the single red dot denotes the type locality for *Chlerogella mabelae*, new species.

by 0.5–1.5 times a puncture width; metanotum faintly imbricate with small punctures separated by a puncture width or less. Preëpisternum weakly imbricate with small punctures separated by 1–2 times a puncture width; hypopimeral area smooth with

minute punctures separated by 2–4 times a puncture width; mesepisternum imbricate with small punctures separated by 2–4 times a puncture width, punctures weak; metepisternum faintly imbricate. Propodeum strongly imbricate. Metasoma weakly and finely imbricate.

Mandible and labrum honey yellow, with reddish apex on mandible; apex of clypeus honey yellow, remainder of clypeus and head deep metallic blue (Figs. 2, 3). Scape largely honey yellow except upper half dark brown (Fig. 1); pedicel and flagellum dark brown. Mesosoma deep metallic blue except pronotal lobe honey yellow (Figs. 1, 3); tegula translucent light brown. Wing membranes weakly infumate; veins dark brown. Legs largely yellowish orange except outer basal area of procoxa brown, ventral area on profemur brown, apicalmost protarsomere brown, mesocoxa brown, medial patch of brown on posterior surface of mesofemur, outer surface of mesotibia largely brown, mesotarsus brown, most of metafemur dark brown, entirety of metatibia and metatarsus dark brown. Metasoma yellowish orange (Fig. 1).

Pubescence generally golden; typical gender pilosity; ventral surface of trochanters with elongate setae; metafemoral setae ventrally diffuse; setae of inner surface of metabasitarsus darkly fuscous. Apical margins of metasomal sterna III–V with apicolateral diffuse patches of elongate setae, such patches particularly ill-defined on sternum III.

♀: Unknown.

HOLOTYPE: ♂, Peru: JU [Department of Junín], Chanchamayo, SN Pampa Hermosa, 10°59'51.8"S/75°25'35.9"W, 1940 m, *Podocarpus* forest, 23–31.v.201 [sic: 23–31 May 2011], light trap, M. Alvarado leg. (MUSM). Type locality depicted in figures 8–9, 12.

ETYMOLOGY: The specific epithet is a matronym honoring Mabel Alvarado, collector of the holotype and outstanding graduate student of the senior author.

COMMENTS: The species was collected at a light trap operated between 1800–2400h. The species will run to couplet 20 in the key to South American species of *Chlerogella* (Engel, 2010). The following modified couplets will permit its recognition:

20. Malar space 0.9–1.75 times basal mandibular width 21
 —. Malar space linear, almost absent, less than 0.5 times basal mandibular width ..
 20a
- 20a. Second flagellomere nearly three (2.85) times as long as first flagellomere; head and mesosoma deep metallic blue; mesoscutellum distinctly convex; metasoma entirely yellowish orange; malar space 0.27 times basal mandibular width (Peru) *C. mabelae* Engel, n. sp.
 —. Second flagellomere twice as long as first flagellomere; head and mesosoma dark metallic greenish blue; mesoscutellum weakly convex; metasoma dark reddish brown with strong metallic blue highlights; malar space less than 0.25 times basal mandibular width (Peru) *C. arhyncha* Engel

Chlerogella azurea (Enderlein)

NEW RECORDS: PERU: 1♀, [PE-12-01], San Martín Prov. [Department of San Martín], 35 km N Tarapoto, Bosque Prote[c]ción Cord. Escalera, malaise in humid montane forest, 6–16.iii.2005 [6–16 March 2005], ME Irwin, JD Vasquez, 900 m, 6°27.46'S 76°17.24'W (MUSM) [locality depicted in figure 11]; 1♀, CU [Department of Cusco], La Convención, Echarate, CC Santa Rosa, 73°05'23" [W]/12°34'13.18" [S], 1422 m, 14.x.2009 [14 October 2009], C. Carranza y C. Rossi (MUSM).

Chlerogella rostrata Engel

NEW RECORDS: Peru: 1♀, PA [Department of Pasco], Villa Rica, Zona de Protección del Bosque San Matias San Carlos, 75°12'18"W, 10°36'27"S, 1627 m, 03–05.v.2012 [3–5 May 2012], FIT, L. Figueroa & V. Borda (MUSM) [locality depicted in figure 10]; 1♀, PA [Department of Pasco], Villa Rica, ZA del Bosque de Protección San Matias San Carlos, 75°12'18"W, 10°38'36"S, 1593 m, 3–5.v.2012 [3–5 May 2012], malaise trap, V. Borda & L. Figueroa (SEMC).

ACKNOWLEDGEMENTS

We are thankful to Gerardo Lamas for the loan of material, to Mabel Alvarado and Matthew L. Gimmel for assistance with photomicrography, to Luis Figueroa for field photographs, and to two anonymous reviewers for their comments on the manuscript. This is a contribution of the Division of Entomology, University of Kansas Natural History Museum.

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Journal of Melittology

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The *Journal of Melittology* was established at the University of Kansas through the efforts of Michael S. Engel, Victor H. Gonzalez, Ismael A. Hinojosa-Díaz, and Charles D. Michener in 2013 and each article is published as its own number, with issues appearing online as soon as they are ready. Papers are composed using Microsoft Word® and Adobe InDesign® in Lawrence, Kansas, USA.

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ISSN 2325-4467