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Research article

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Six new species of *Kelita* Sandhouse, 1943 (Hymenoptera: Apoidea: Apidae) from Northern Chile

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Abstract. Six new species of the cleptoparasitic nomadine genus *Kelita* Sandhouse, 1943 are described from Chile, north of the Tropic of Capricorn, an area where no species of the genus were previously known. All are from the nominate subgenus. The new species are: *Kelita cephalalgia* sp. nov., *K. tignamar* sp. nov., *K. cocai* sp. nov., *K. fontis* sp. nov., *K. keithsheldoni* sp. nov. and *K. chugchug* sp. nov. These are rare bees, known only from one to five specimens despite this area having been surveyed for bees intensively between 1998 and 2017. I diagnose, describe and illustrate each species and provide a key for their identification. A Chilean occurrence of *K. (Spinokelita) argentina* Rozen, 1997 is noted.

Keywords. Cuckoo bees, cleptoparasites, Northern Chile, Atacama Desert, identification key.

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Introduction

Kelita Sandhouse, 1943 is currently understood to comprise five species in two subgenera. Subgenus *Spinokelita* Rozen (1997) is currently monotypic. *Spinokelita* is differentiated from the nominate subgenus which has two submarginal cells, by having three. The nominate subgenus has four described species which are known from Central Chile north to the southern parts of the Atacama Desert with none known from north of the Tropic of Capricorn (Ehrenfeld & Rozen 1977; Ascher & Pickering 2020). As a result of extensive fieldwork by my students and I, six new species of the nominate subgenus have been found from far Northern Chile. The purpose of this paper is to describe them and to provide a fully illustrated key to permit their identification. Although the species are each known from at most a few specimens, they were all collected between 12 and 26 years ago in an area where our collecting has been extensive (Fig. 1A). For example there were over 30 000 trap days in 2013 alone. Figure 1B shows the distributions of the new species where each dot represents at most five individuals and supports the idea that they are truly rare. Thus, despite the availability of few specimens, these species are described now as no additional specimens are expected in the near future.

Northern Chile is here taken to be all areas north of 23.44° S, i.e., the part of Chile north of the Tropic of Capricorn. In reality, there are no records of the genus known to me over almost 1.5 degrees of latitude, between 23.3° S and 24.7° S, although our sampling over that range has been limited. The tropical part of Chile encompasses, from north to south: Arica and Parinacota (from 2007 until 2018 also known as Region XV), Tarapacá (Region I) and most of Antofagasta (Region II). Note that until 2007, Regions XV and I were united under Region I. While there are additional new species of *Kelita* from further south, there remains some complexity surrounding which of the more recently collected specimens may be conspecific with the two previously described distinctly reddish-marked species – *K. chilensis* (Fries, 1916) and *K. penai* Ehrenfeld & Rozen, 1977. The only other species with records further north than 31° S in Coquimbo (Region IV) are the two other previously described species: *K. toroi* Ehrenfeld & Rozen, 1977 and *K. tuberculata* Ehrenfeld & Rozen, 1977, both of which get into the southern end of the Atacama Region (Region III), but have not been found further north than 24.7° S. There are records of both from the same two coastal areas: in contrast, the new species described herein are all from higher altitudes (Fig. 1B).

Material and methods

Because many morphological features are shared among the species described here, a description for northern Chilean *Kelita* is given and only differences to that are outlined in the species accounts.

Descriptions follow the sequence colouration, pubescence, surface sculpture and structure. Terminology generally follows standard usage from my laboratory (e.g., Mir Sharifi *et al.* 2019; Packer & Graham 2020) with the exception that we revert to the term dorsal surface of the propodeum based upon the recent findings of Meira *et al.* (2024). Puncture spacing is generally described in terms of the ratio

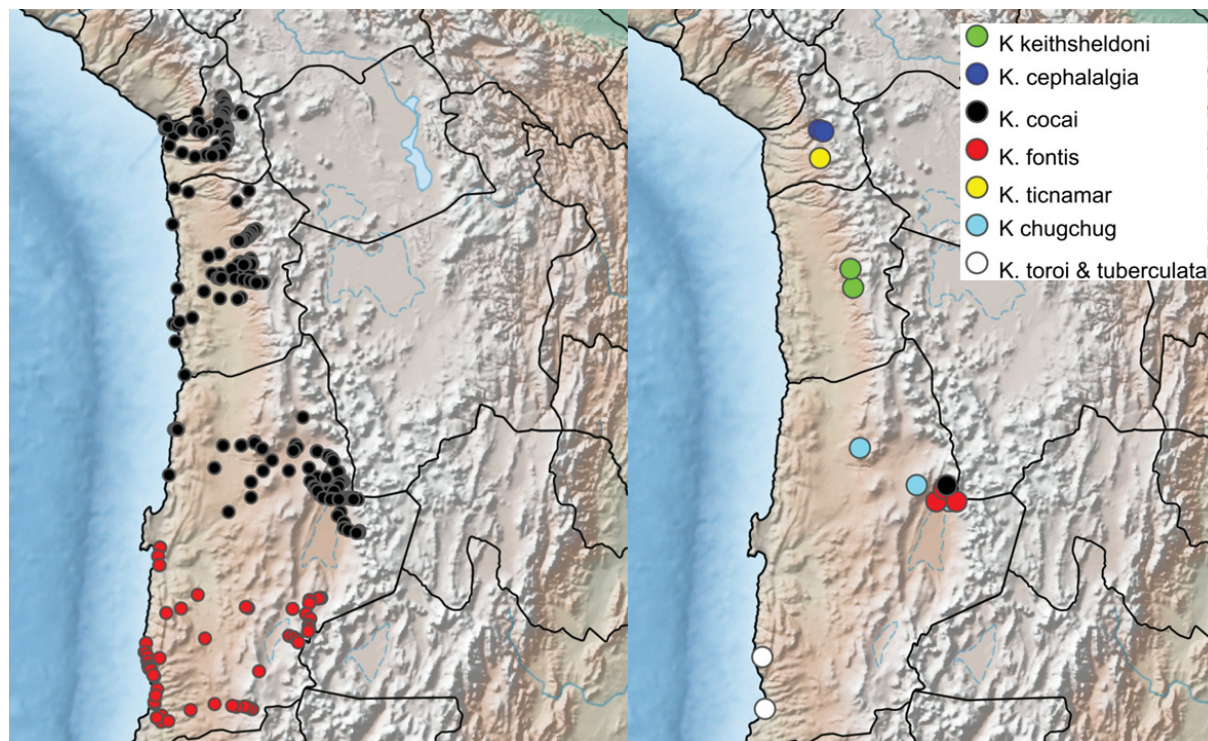


Fig. 1. Maps of northern Chile showing **A.** All collecting localities where my students and I worked north of 25.5° S. Black dots indicate localities north of the tropic of Capricorn; red dots localities between 25.5° S and the tropic of Capricorn. **B.** Provenances of the new species described.

of interspace distances and puncture diameters, thus, $i < d$ refers to punctures that are separated by a distance that is less than their diameters. When it is stated that $i = 0-2d$, this means that some punctures were directly adjacent or had coalesced while others were separated by distances up to twice a puncture diameter. Many of the species are available in small numbers, in two cases just the holotype. Such rare specimens did not have their pubescence disturbed to permit observation of underlying surface sculpture. Thus, such data are not always presented in the same detail for all taxa. Because of its utility in other cleptoparasitic apids, e.g., *Chiasmognathus* Engel, 2006 (Engel *et al.* 2019), *Epeolus* Latreille, 1802 (Onuferko 2019) and *Triepeolus* Robertson, 1901 (Onuferko & Rightmyer 2024), the pseudopygidial area was studied particularly carefully and because of its utility in *Kelita* taxonomy (Ehrenfeld & Rozen 1977), the structure of S5 was also investigated in detail.

Abbreviations

d	= puncture diameter
F	= flagellomere
i	= interspace between punctures
IOD	= interocular distance
ITW	= intertegular width
MLOD	= maximum lower interocular distance
MOD	= diameter of median ocellus
MUOD	= maximum upper interocular distance
OOC	= ocellocular distance
S	= metasomal sternum
T	= metasomal tergum

Body length was taken as the separate and combined lengths of head, mesosoma and metasoma only when necessary (i.e., the specimen was not relatively flat). Landmarks for measurements are explained in Figs 2–3. F1 is much longer dorsally than ventrally and in anterior view its apical margin is concave and the flagellomere is shortest below mid-depth rather than ventrally (Fig. 2C). Its length, and that of

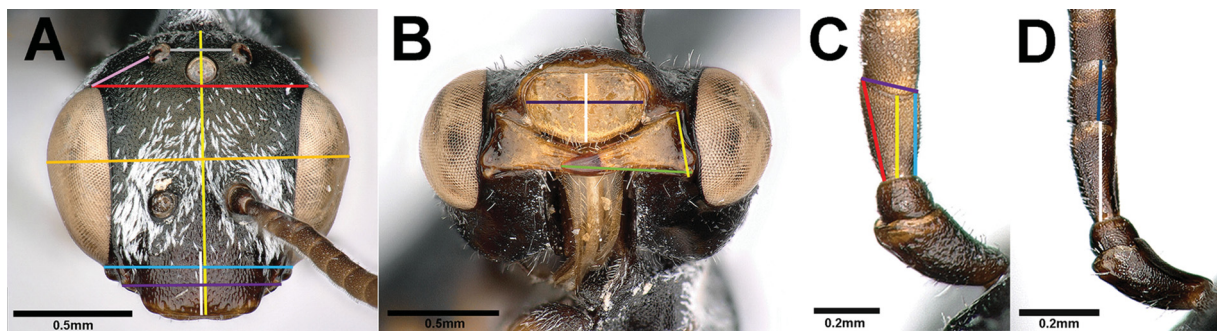


Fig. 2. Landmarks used for measurements taken on heads of *Kelita* specimens. **A.** *Kelita chugchug* sp. nov., holotype, ♀ (PCYU-KchchH), head, facial view: yellow = head length (note that the base of the labrum is detectable just below the lower extent of this line as is also the case for the white line), orange = head width, red = maximum upper ocular distance (MUOD), blue = maximum lower ocular distance (MLOD), white = clypeal length, purple = clypeal width, pink = OOD, grey = IOD. **B–D.** *Kelita fontis* sp. nov. holotype, ♀ (PCYU-KfH), showing additional head measurements. **B.** Head apical view: yellow = mandible width, green = mandible depth, purple = labrum width, white = labrum length. **C–D.** Basal part of antenna to show shape of F1 and measurements taken from F1 and F2. **C.** Anterior view: red = dorsal length of F1, blue = ventral length of F1, yellow = shortest length of F1, purple = depth of F1. **D.** Dorsal view: white = length of F1, dark blue = length of F2.

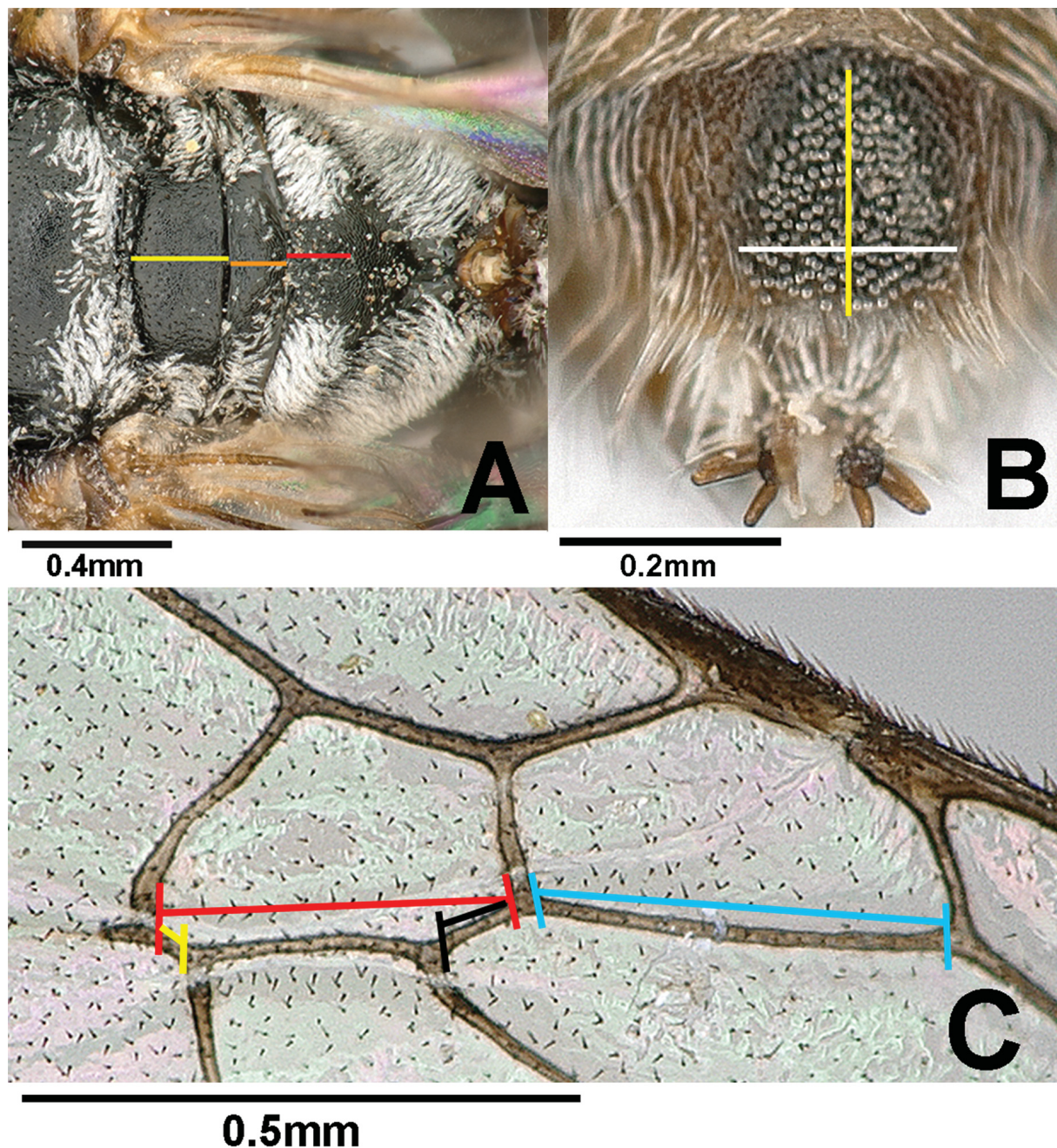


Fig. 3. Landmarks used for measurements of mesosoma and metasoma. **A.** *Kelita fontis* sp. nov., paratype, ♂ (PCYU-KfPm1), mesosomal dorsum: yellow = scutellum length, orange = metanotum length, red = length of dorsal surface of propodeum. **B.** *Kelita cocai* sp. nov., holotype, ♀ (PCYU-KcoH), T5 to show length (yellow), and width (white), of pseudopygidial area. **C.** *Kelita cephalalgia* sp. nov., paratype, ♀ (PCYU-KceP), part of forewing to show measurements of submarginal cells: blue = length of first submarginal cell, red = length of second submarginal cell, black = distance between first recurrent vein and base of first submarginal cell, yellow = distance between second recurrent vein and apex of second submarginal cell.

F2, was measured dorsally (Fig. 2D) and its depth from apicodorsal to apicoventral extremes and thus obliquely with respect to the longitudinal axis of the flagellum.

When morphological features were more readily observed in a specimen other than the holotype, that information was provided in square brackets. This arose when legs or the glue that affixed the bee to the pin precluded clear observation.

Surface sculpture: at low magnification the microsculpture of most of the head and much of the mesosoma of *Kelita* looks somewhat between imbricate and granulose (Fig. 2A). Ehrenfeld & Rozen (1977) termed this 'pebbled'. Relatively large punctures can be seen amongst this microsculpture. However, when observed at several hundred times magnification, the sculpture is clearly densely micropunctate and the larger punctures less distinct (Fig. 4A). Similarly, the sculpture of the metasomal terga appears silky and dull (Fig. 4B) (Ehrenfeld & Rozen 1977) but at considerable magnification, it appears transversely strigulate-imbricate (Fig. 4C–D). Nonetheless, in the descriptions, the surface sculpture is described as it appears at lower magnifications with diffused lighting provided by a Luminus PLY1223 energy-saving bulb. Statements concerning puncture density refer to the larger punctures detectable with diffused lighting at lower magnification, not the micropunctures.

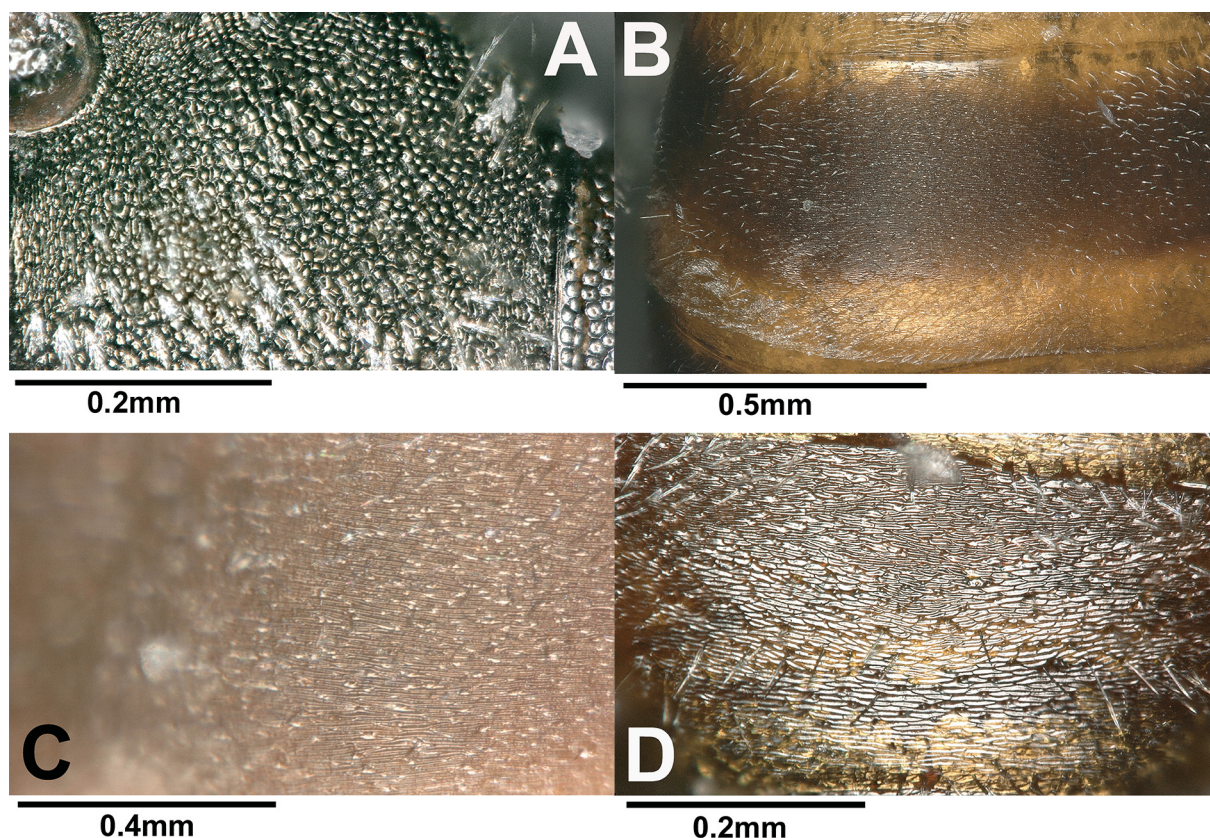


Fig. 4. Surface sculpture. **A–C.** *Kelita chugchug* sp. nov., holotype, ♀ (PCYU-KchchH). **A.** Frontal area sculpture at 1000× magnification (compare with Fig. 2A). Note the dense small punctures and the sparser large ones that are the ones detectable at lower magnification. **B.** Part of T2 at 400× magnification. **C.** Part of T2 at 1000× magnification. **D.** *Kelita cephalalgia* sp. nov., paratype (PCYU-KceP), part of T2 at 1000× magnification.

The complexity and taxonomic utility of the pseudopygidial area and S5 necessitate a description of their overall structure. The pseudopygidial area consists of a patch of modified hairs with spatulate ends that arise from an area of darkened cuticle. The length to width ratio of this area is important for species delimitation and it was measured from the outer extremities of the spatulate part of the outermost hairs (Fig. 3C). There is usually a small patch of unmodified hairs in the middle of the pseudopygidial area and while this varies in size and shape among previously described *Kelita* species, it is relatively similar among the species treated herein.

The fifth sternum bears a hairless, impunctate semicircular area either side of a median projection from the disc (Fig. 5). The entire junction of these areas with the disc and median projection is marked by long hairs. These hairs are often curved towards the middle of the semicircular area, although those that are most anterior or lateral may be relatively straight but still oriented towards the middle of the area. The anterior-most hairs are the shortest other than those close to the apex of the median projection which are even shorter, albeit with longer hairs subapically. The semicircular areas have relatively thin integument, are shallowly imbricate but devoid of punctures and their posterior margins are concave.

Images were taken with a Keyence 6000, the map was constructed using SimpleMappr (Shorthouse 2010). Locality data are provided in standardized format based upon information on the labels with coordinates given in decimal degrees. When not given directly on the labels, such as from specimens collected before GPS units became relatively affordable, these were extracted from data obtained from subsequent visits to the same localities.

Many specimens were caught in the deep cup version of a pan trap with propylene glycol as the collecting fluid (Packer & Darla-West 2020). These were often left in place for weeks to several months at a time.

Keys follow the recommendations of Packer (2024) to the extent possible for the limited material at hand.

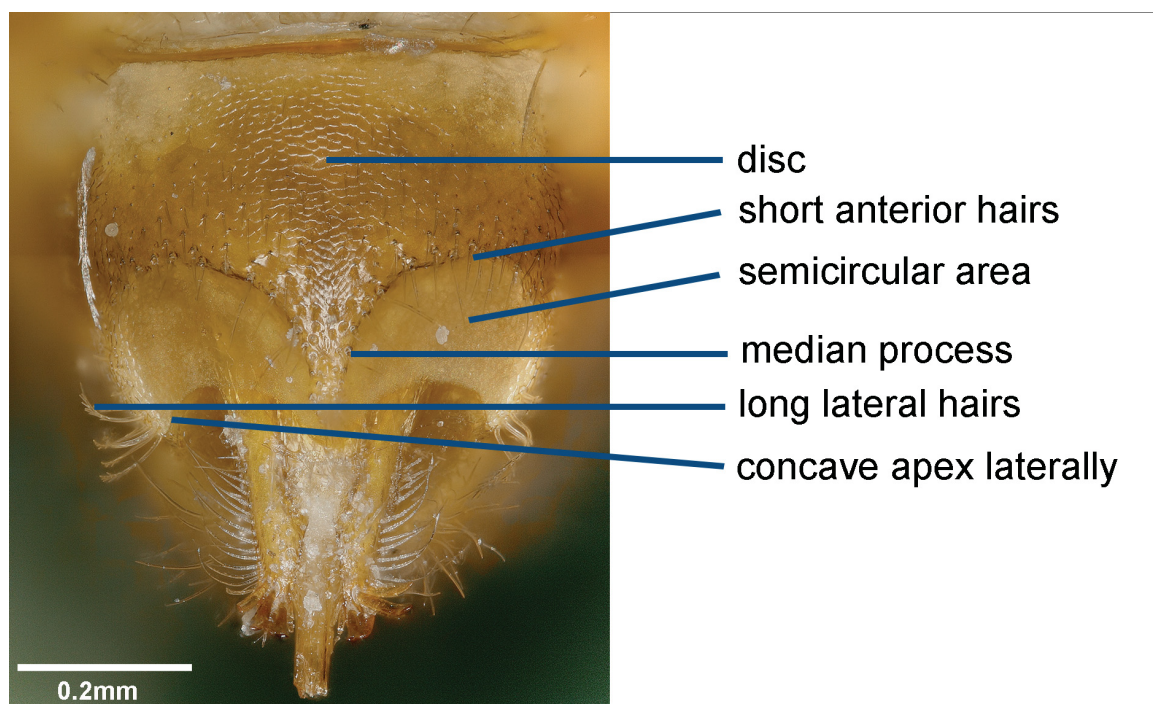


Fig. 5. S5 of *Kelita keithsheldoni* sp. nov., holotype, ♀ (PCYU).

Abbreviated names of institutions (curatorial staff involved in brackets)

AMNH = American Museum of Natural History, New York, NY, USA (J.G. Rozen Jr., J.M. Carpenter, C. Smith and E. Wyman).

MNHN = Museo Nacional de Historia Naturel, Santiago, Chile (Mario Elgueta, Francisco Urrea).

PCYU = Packer Collection at York University, Toronto, ON, Canada (Laurence Packer).

DNA barcode sequences were obtained using standard protocols (Hebert *et al.* 2003) that are available online at <https://ccdb.ca/resources/>. Sequences were uploaded to BOLD (Ratnasingham & Hebert 2007) and preliminary analyses were performed using BOLD and the BIN system (Ratnasingham & Hebert 2013). Some of these data were mentioned previously (Packer & Ruz 2017) but with only generic level identifications.

Results

In the following, I first diagnose the genus against all other bees. Thus, the reference group is all bees. Then the species of this area are keyed and a general description common to all species is provided before the individual species are diagnosed and described. Diagnoses provide the feature states that are diagnostic, either alone or in combination, followed by the alternate state(s) in brackets.

Descriptions of new species

Class Insecta Linnaeus, 1758

Order Hymenoptera Linnaeus, 1758

Superfamily Apoidea Latreille, 1802

Family Apidae Latreille, 1802

Subfamily Nomadinae Latreille, 1802

Tribe Brachynomadini Roig-Alsina & Michener, 1993

Genus *Kelita* Sandhouse, 1943

Diagnosis

Females can be differentiated from other bees by the combination of two submarginal cells along with details of the structure of the pseudopygidial area which is triangular to somewhat oval with hairs that are peg-like or apically broadly spatulate (Fig. 3C), although there are usually a few apically attenuated hairs centrally. While other cuckoo bees have modified pseudopygidial areas, spatulate hairs are found only in the Epeolini (Rightmyer 2004) but those from the relevant geographic area have three submarginal cells and thus easily distinguished from *Kelita*. Males are unique among all bees in the structure of the lower paraocular area (Fig. 6B): it forms a shallow concavity or flat area margined by the compound eye laterally, the malar area and mandible base below and a pronounced carina with its border with the clypeus medially (Fig. 6B). This area is devoid of pubescence and has weak to no surface sculpture. It stands out distinctly in specimens with dense facial hair (Fig. 6A). The raised lateral margin of the clypeus is paralleled by sharp process termed by Ehrenfeld & Rozen (1977) as the dorsobasal mandibular prominence (Fig. 6C). *Kelita* is also the only genus of cleptoparasitic bee in northern Chile with two submarginal cells (Fig. 3C) (the only species of the genus known with three submarginal cells – *K. (Spinokelita) argentina* Rozen, 1997 is not known from northern (or central) Chile (see introduction)). Thus, the reference group (Packer 2025) is Chilean cuckoo bees for females and all bees for males.

Description

It should be noted that this overall description of the genus applies only to those species from northern Chile, details may vary in extralimital taxa.

DIMENSIONS. Body length 3.7–4.8 mm; head width 1.25–1.6 mm; ITW 0.7–0.95 mm; wing length 2.8–3.2 mm.

COLOURATION. Body surface mostly blackish with paler orange-brown to yellowish sometimes as follows: labrum, mandibles at least around midlength, pronotal lobe, markings on legs. Metasomal terga dark brown to red-brown, differentiation of paler subapical bands from disc usually gradual, basal bands sometimes present, apical impressed areas translucent yellowish to colourless.

SURFACE SCULPTURE. Appearing somewhat granulate/imbricate dull on face and mesosoma except ventral surface of mesopleuron weakly microsculptured, shiny, punctures scattered; hypostomal area weakly imbricate, shiny, punctures scattered; metapleuron more coarsely imbricate and duller above than below; dorsal surface of propodeum somewhat rugulose especially anteriorly, lateral and posterior surfaces mostly imbricate somewhat dull; metasomal terga silky-dull except apical impressed areas more shiny; metasomal sterna imbricate, somewhat shiny, punctures usually scattered.

PUBESCENCE. White, mostly short and somewhat squamose; in more fresh specimens obscuring underlying integument on lower paraocular and genal areas, pronotal dorsal angle, extreme anterolateral portion and posterior margin of mesoscutum, laterally on scutellum and metanotum, lateral surface of mesopleuron usually except sparse on hypoepimeral area, lateral slopes and towards sides of dorsal surface of propodeum, T1 below junction of anterior declivous and posterior horizontal portions, apicolaterally on T1–T4 as follows: triangular on T1–T2, more parallel-sided and sparser on T3–T4, most extensive on T1 extending for at most $\frac{1}{3}$ width of tergum on each side; usually sparser on face of female and T1 declivous area below. Short (~ 0.5 MOD), short-branched erect hairs sparse on face and mesopleuron, most dense on vertexal area. Short simple hairs mostly laterally or posterolaterally oriented on horizontal portion of T1 and throughout T2–T4, slightly longer on lateral recurved portions of terga and T5 other than pseudopygidial area; similar hairs mostly posteromedially oriented on metasomal sterna.

STRUCTURE. Head varying from length and width subequal to $1.15 \times$ as wide as long; labrum $1.4\text{--}1.8 \times$ as wide as long, apex weakly concave lateral to median convexity or convex throughout; mandible approximately twice as long as basal depth; clypeus protuberant, more than twice as wide as medial length; eyes convergent below, MUOD:MLOD ~ 1.15 ; IOD approximately equal to OOC, F1 from 1.5 to $\sim 2 \times$ as long as F2 on dorsal side, mid flagellomeres slightly longer than wide in female, slightly shorter in male; propleuron lacking tubercle; metanotum more than half as long as scutellum, and slightly shorter than dorsal surface of propodeum; metatibial apex with short dorsal transverse lamella that is truncate to

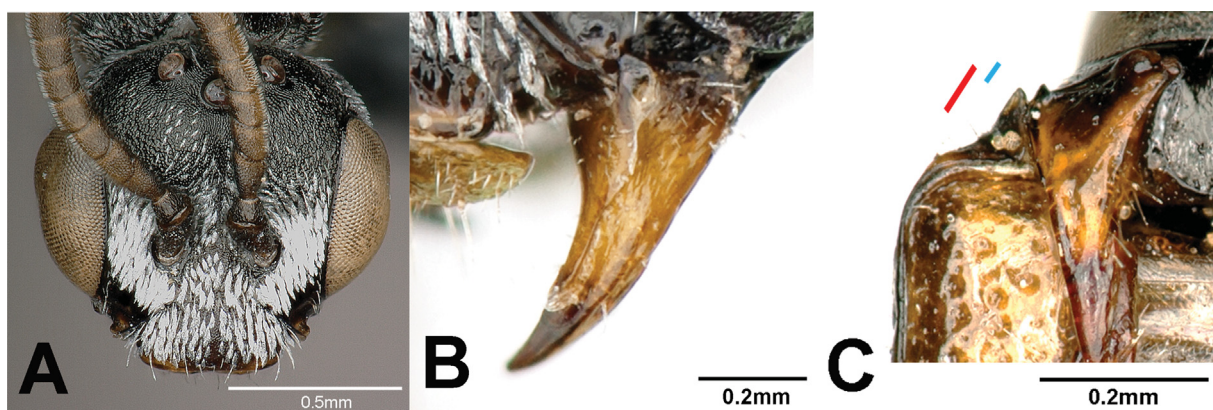


Fig. 6. Diagnostic features of *Kelita*. **A.** *Kelita chugchug* sp. nov., paratype, ♂ (PCYU-KchchPm1), face frontal view to show distinct nature of lower paraocular area against pubescent rest of lower face. **B.** *Kelita chugchug*, paratype, ♂ (PCYU-KchchPm2), lower paraocular area oblique view. **C.** *Kelita fontis* sp. nov., paratype, ♂ (PCYU-Kfpm1), head apicoventral to show parallel mandibular prominence; parallel to blue line, and lateral clypeal ridge; parallel to red line.

strongly bilobed; submarginal cell two varying from 0.88 to 1.5 × the length of second submarginal cell; distance between first recurrent vein and base of second submarginal cell on posterior margin between twice to 4.5 × as long as the distance between second recurrent vein and apex of second submarginal cell posteriorly; pseudopygidial area length slightly more to slightly less than width, hairs mostly spatulate with a few apically attenuated hairs in middle; pygidial plate margined by a ridge laterally, in female forming an acutely angled apically that is medially notched, in male rounded or somewhat truncate with median notch; female S5 with sides of apical process slightly to strongly convergent for posterior half.

Identification key to females of the species of *Kelita* from tropical Chile (<23.5°S)

1. Metasoma distinctly banded with bright yellow-orange to orange basal and subapical bands at least on T2–T3 (Fig. 7A–B) 2
 - Metasoma obscurely banded, basal band absent or slightly paler than tergal discs and subapical markings dark orange to orange brown (Fig. 7C is the most similar to the condition in the first lead) 3
2. Discs of terga orange-brown to red-brown (Fig. 7A); ventral surface of flagellum yellow-brown (Fig. 7E); head clearly broader than long (Fig. 7E)..... *K. keithsheldoni* sp. nov.
 - Discs of terga dark brown (Fig. 7B); ventral surface of flagellum red-brown (Fig. 7D); head almost as long as wide (Fig. 7D)..... *K. chugchug* sp. nov.
3. Glossa very long, extending to apex of procoxa (Fig. 8A)..... *K. tignamar* sp. nov.
 - Glossa not long, at most attaining base of procoxa (Fig. 8B)..... 4
4. S5 median projection apically almost parallel-sided (Fig. 8C); first submarginal cell distinctly longer than second (Fig. 8E)..... *K. cephalalgia* sp. nov.
 - S5 median projection more distinctly convergent to apex (Fig. 8D); first submarginal cell at most subequal in length to second (Fig. 8F)..... 5
5. First recurrent vein approximately twice as far from first submarginal crossvein as second recurrent vein is from second submarginal crossvein ~18:8 (as in Fig. 8E, inset); small bees, head width ~1.3 mm..... *K. cocai* sp. nov.
 - First recurrent vein more than three times further from first submarginal crossvein as second recurrent vein is from second submarginal crossvein ~18:5 (Fig. 8F); larger bees, head width ≥ 1.5 mm..... *K. fontis* sp. nov.

Identification key to males of the species of *Kelita* from tropical Chile (<23.5°S)

1. Pygidial plate notched apicomediaally (Fig. 9A) 2
 - Pygidial plate apically entire, rounded Fig. 9B)..... *K. keithsheldoni* sp. nov.
2. Head as long as wide or slightly longer (Fig. 9C) *K. chugchug* sp. nov.
 - Head wider than long (Fig. 9D)..... *K. fontis* sp. nov.

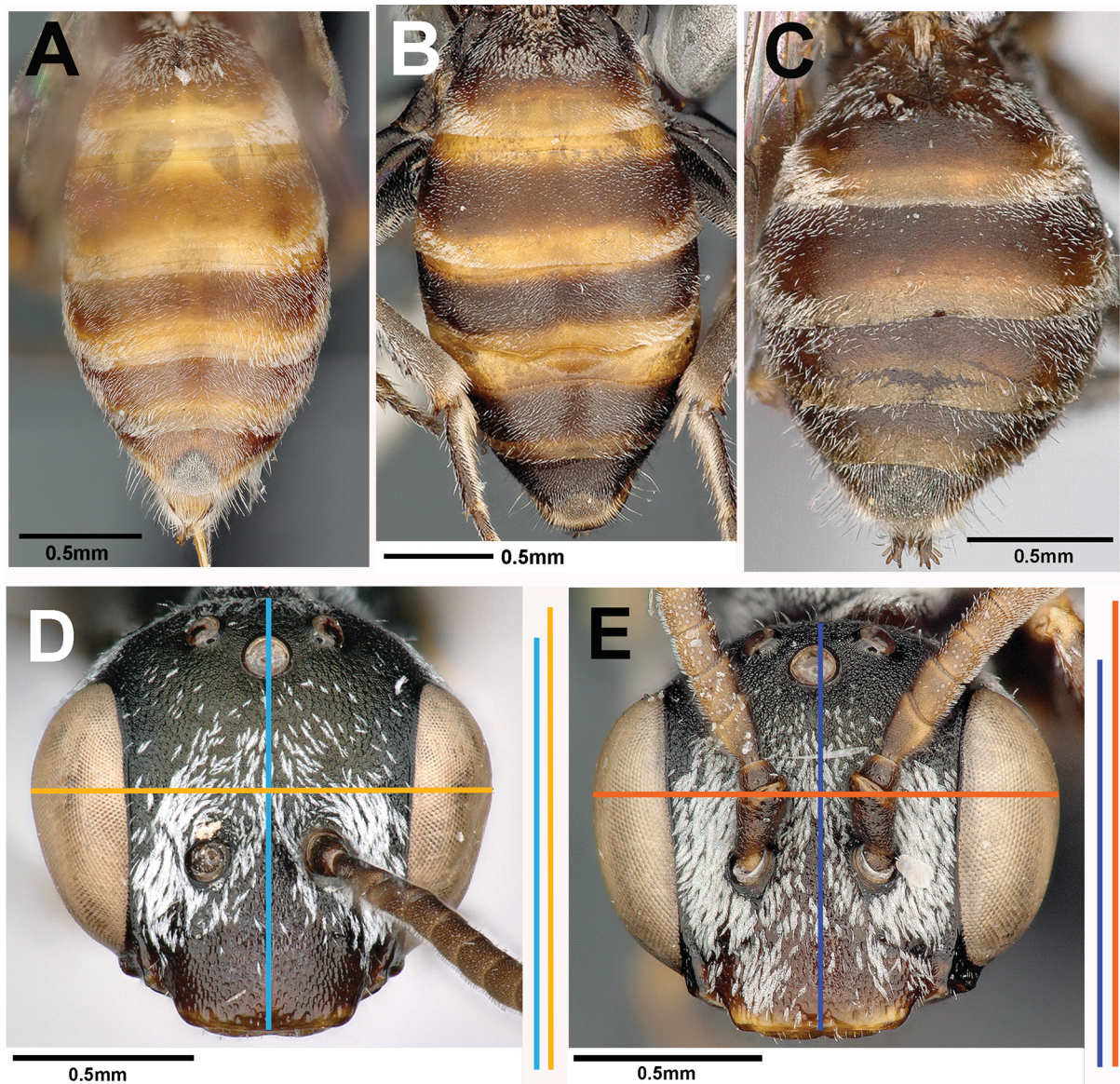


Fig. 7. A–C. Metasomal dorsum of *Kelita* species. A. *Kelita keithsheldoni* sp. nov., holotype, ♀ (PCYU-KksH). B. *Kelita chugchug* sp. nov., holotype, ♀ (PCYU-KchchH). C. *Kelita fontis* sp. nov., holotype, ♀ (PCYU-KfH). D–E. Head, frontal view. D. *Kelita chugchug* sp. nov., holotype, ♀ (PCYU-KchchH). E. *Kelita keithsheldoni* sp. nov., holotype, ♀ (PCYU-KksH).

***Kelita cephalalgia* sp. nov.**

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Figs 1B, 3C, 4D, 8B–C, E, 10

Diagnosis

Among other *Kelita* from northern Chile this species can be differentiated by the combination of: 1) pale markings on T2–T4 absent to weak basally (as in Fig. 7C) (basal bands present and distinct, Fig. 7A–B), 2) glossa not extending beyond midlength of propleuron (Fig. 8B) (versus attaining apex of procoxa, Fig. 8A) and 3) posterior margin of the first submarginal cell longer than the second (35:30) (Fig. 8E) (versus at most subequal to length of second, Fig. 8F). The only other species with such dark terga are *K. tignamar*, *K. cocai* and *K. fontis* (described below) the first differentiated by glossa length and the other two with the first submarginal cell shorter than or subequal in length to the second.

Etymology

The specific epithet refers to the intense headache caused by my driving from sea level to uphill from the type locality in a mere two hours the first time I visited northern Chile: '*cephalgia*' being Latin for 'headache'.

Material examined

Holotype

CHILE – **Arica and Parinacota** [Region XV] • ♀; S of Murmuntani; 18.370° S, 69.555° W; 3440 m a.s.l.; 20–29 Apr. 2013; S.K. Monckton leg.; cup trap; PCYU.

Paratype

CHILE – **Arica and Parinacota** [Region XV – Region I at time of capture] • 1 ♀; Tambo 4 km W of Zapahuira; [18.35° S, 69.62° W; 3240 m a.s.l.]; 4 Apr. 2000; L. Packer leg.; net.; MNHN.

Description

Female

DIMENSIONS. Body length 4.4 mm; head width 1.3 mm; ITW 0.8 mm; wing length 2.8 mm.

COLOURATION. Head and mesosoma black, metasoma and legs dark to red-brown except: following parts orange: mandible (base brown, apex reddish), labrum, all coxae apically, meso- and metatrochanters apically, all femora apically, all tibiae at base and apex, ventrally reflexed lateral parts of terga decreasing in extent from T1 to T5, T6; following orange-brown: clypeus apically (red-brown subapically); flagellum dark orange-brown ventrally, dark brown dorsally; metasomal terga brown increasingly paler towards straw-yellow apical impressed areas, intermediate red-brown to orange-brown portions most extensive on T1; metasomal sterna brown except basally yellow-brown on S4–S5 and apically on S1–S4.

SURFACE SCULPTURE. Labrum punctures mostly large and dense $i < d$; clypeus imbricate and dull except for shiny apical triangular area from apicolateral extreme to midlength medially, punctures elongate, dense $i < d$ except absent apically and along raised midline; supraclypeal area imbricate, dull, punctures somewhat obscure, $i = 1-3d$; frontal area granulose, punctures obscure, $i = 1-4d$, sparser above; mesoscutum punctures (only detectable on anterior one half) shallow, i mostly $\sim 2d$; scutellum dull, punctures smaller, deeper and less evenly spaced than on mesoscutum, $i = 1-4d$; dorsal surface of propodeum with longitudinal median carina; hypoepimeral area punctures large shallow $i = 1-3d$; T1–T2 punctures minute shallow and indistinct and apical impressed areas impunctate, T3–T4 punctures larger denser, $i = 1-4d$, sparser towards apex of disc and on apical impressed areas; metasomal sterna transversely imbricate/lineolate, shiny, punctures relatively large, scattered apicomediaally more distinct

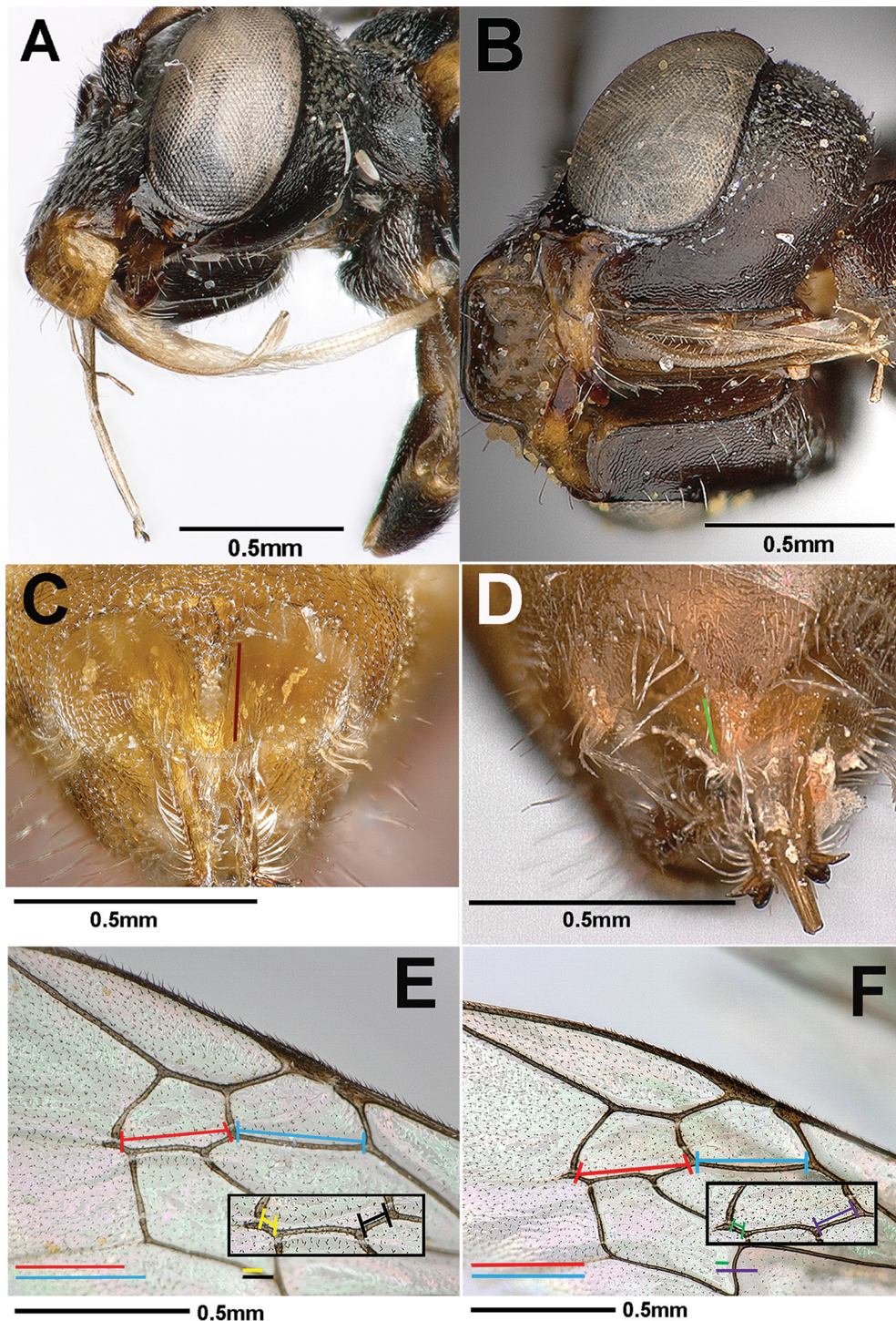


Fig. 8. A–B. Glossa. A. *Kelita tignamar* sp. nov., holotype, ♀ (PCYU-KtH). B. *Kelita cephalalgia* sp. nov., paratype, ♀ (PCYU-KceP). C–D. Pseudopygidial areas. C. *Kelita cephalalgia*, holotype, ♀ (PCYU-KceH). D. *Kelita fontis* sp. nov., holotype, ♀ (PCYU-KfH). E–F. Forewings to show relative lengths of submarginal cells (blue lines, first submarginal cell; red lines second submarginal cell) and insets, relative distance between first recurrent vein and first submarginal crossvein (yellow or green lines) and second recurrent vein and second submarginal crossvein (black or purple lines). E. *Kelita cephalalgia*, holotype, ♀ (PCYU-KceH). F. *Kelita fontis*, holotype, ♀ (PCYU-KfH).

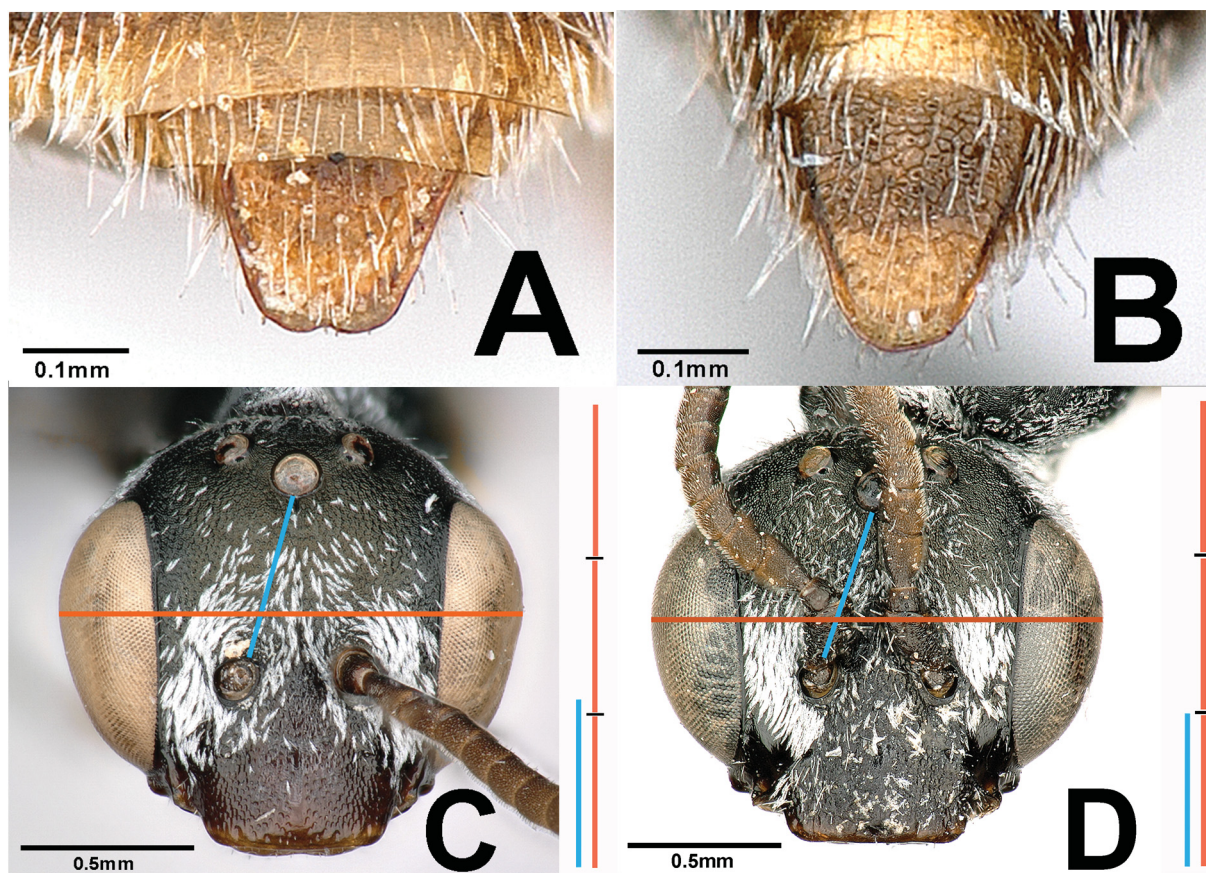


Fig. 9. A–B. Pygidial plate. A. *Kelita fontis* sp. nov., paratype, ♂ (PCYU-KfPm1). B. *Kelita keithsheldoni* sp. nov., paratype, ♂ (PCYU-KksPm1). C–D. Head, frontal views. C. *Kelita chugchug* sp. nov., paratype, ♂ (PCYU -KchchPm1). D. *Kelita fontis*, paratype, ♂ (PCYU-KfPm1).



Fig. 10. *Kelita cephalalgia* sp. nov., holotype, ♀ (PCYU-KceH). A. Lateral habitus. B. Face frontal view.

basally and towards sides, becoming more distinct on more apical terga, $i=1-4d$ on S4, S5 punctures $i=1-3d$.

PUBESCENCE. T1 apicolateral hair band extending for lateral $\frac{1}{4}$ of tergal apical width; T2–T4 laterally oriented setae silvery ~ 0.25 MOD.

STRUCTURE HEAD. Broader than long (66:59). Labrum $\sim 1.5 \times$ as wide as long (42:29), apical margin produced medially; mandible basal depth approximately half length of mandible (25:49); glossa short, not attaining midlength of propleuron; clypeus less than half as long as wide (30:67); frontal line distinctly carinate below, neither raised nor depressed above; MUOD:MLOD 46:41; [IOD=OOC, 23:23]; F1 longer than deep, depth subequal to length of F2 (22:12.5:12).

MESOSOMA. Scutellum relatively flat medially, ratio of scutellum:metanotum:dorsal surface of propodeum 23:13.5:15; metasternum posterior process somewhat acute, apex angulate; first submarginal cell longer than second (36:32); first recurrent vein further from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (10:4.5); metatibial apical lamella biconvex, posterior convexity a little longer than anterior one.

METASOMA. Pseudopygidial area subtriangular, as long as wide (20.5:20.5), all hairs spatulate except for a very few in the middle; pygidial plate shallowly notched apically, sides $\sim$ straight; S5 median projection long, sides strongly apically convergent for basal half, almost parallel for apical half.

Male

Unknown

Distribution

The far north of Chile at altitudes over 3000 m.

Ecology

Liphanthus aliavenus Sharifi, Graham & Packer, 2018 and one undescribed species of *Liphanthus* Reed, 1894 have been found close to one or other of the two localities known for this cuckoo bee.

Remarks

The paratype has a few differences from the holotype, most notably the sensilla placodea are much more obvious, being paler than the flagellum rather than as dark. Given the short distance between the localities for the two (8 km distant), it seems unlikely that they represent two separate species.

Kelita tignamar sp. nov.

urn:lsid:zoobank.org:act:70730B55-F9A8-40CB-B899-B6AF40730191

Figs 1B, 8A, 11

Diagnosis

The female of this species is similar to those of the other small dark species described here (Fig. 11A, C) (*K. cephalalgia* sp. nov., *K. fontis* sp. nov. and *K. cocai* sp. nov.) but is readily distinguished from all northern Chilean *Kelita* by the elongate glossa which extends beyond the posterior margin of the procoxa (Fig. 8A). In the other species, the apex of the glossa does not extend past the anterior margin of the procoxa (compare Fig. 8B).

Etymology

The specific epithet refers to the type locality and should be considered as a noun in apposition.

Material examined

Holotype

CHILE – Arica and Parinacota [Region XV] • ♀; SW of Tignamar; 18.699° S, 69.608° W; 3050 m a.s.l.; 1 Apr.–1 May 2013; J. Postlethwaite leg.; cup trap; BEE BOL CCDB-06382 E03; PCYU.

Description

Female

DIMENSIONS. Body length 3.97 mm; head width 1.25 mm; ITW 0.73 mm; wing length 2.9 mm.

COLOURATION. Head and mesosoma black, metasoma and legs dark to red-brown except as follows: labrum yellow-orange, mandible dark orange-brown except darker base and apex, clypeal apex orange-brown, flagellum dark orange-brown ventrally, dark brown dorsally, apex of each of F2–F9 yellow-brown apicoventrally; pronotal lobe yellowish; following parts yellow-orange: apex of all coxae, apex of all femora, base and apex of all tibiae, pygidial plate; metasomal terga brown increasingly paler towards straw-yellow apical impressed areas, yellowish portions relatively extensive on T1–T3 lateral reflexed portions extensively yellowish on T1–T2, mostly translucent on T3–T4; metasomal sterna orange-brown.

SURFACE SCULPTURE. Labrum punctures variable in size and spacing, few large punctures on disc medially, $i \leq d$; clypeus surface imbricate except apex and midline smooth, punctures longitudinally effaced, dense $i < d$ except absent apically; supraclypeal area imbricate and densely punctate ($i < d$) except extreme apex, apicomedia and adjacent to epistomal suture above devoid of sculpture; frontal area punctures shallow, $i = 1-4d$, becoming crowded and appearing rugulose below and on paraocular area towards inner margin of compound eye; mesoscutum punctures small, $i = 1-4d$; scutellum dull, punctures as for mesoscutum; hypopleural area punctures $i = 1-2d$; metasomal tergal punctures difficult to detect on most of T1–T2, minute on T3–T4 $i > 2d$ medially, less dense towards sides; metasomal sterna shallowly imbricate, shiny, punctures small and scattered medially more distinct basally and towards sides, becoming more distinct on more apical terga, $i = 2-4d$ laterally on S4, sparser medially, S5 punctures $i = 1-3d$.

PUBESCENCE. T1 apicolateral hair band $\sim \frac{1}{4}$ apical width of tergum; T2–T4 discal laterally oriented hairs comparatively dull, $\sim \frac{1}{3}$ MOD.

STRUCTURE HEAD. Broader than long (62:55). Labrum less than twice as wide as long (41:23), apical margin slightly produced medially, slightly concave either side; mandible basal depth less than half length (21:49); glossa long, attaining posterior margin of procoxa; clypeus less than half as long as wide (28:66); frontal line distinctly carinate below, somewhat swollen above; MUOD:MLOD 44:38; IOD and OOC subequal 24:23; F1 longer than depth less than length of F2 (19.5:11.5:12.5).

MESOSOMA. Scutellum relatively flat medially, ratio of scutellum:metanotum:dorsal surface of propodeum 22:14:15; metasternum posterior process acute, apex narrowly rounded; first submarginal cell slightly longer than second (36:34); first recurrent vein further from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (11:4.5); metatibial apical lamella bilobed, posterior convexity larger than anterior one.

METASOMA. Pseudopygidial area subtriangular, as wide as long (21:21), all hairs spatulate except for a very few in the middle; pygidial plate shallowly notched apically, sides straight; S5 median projection sides of apical portion convergent to apex; extreme apex of sternum produced medially, almost straight laterally.

Male

Unknown.

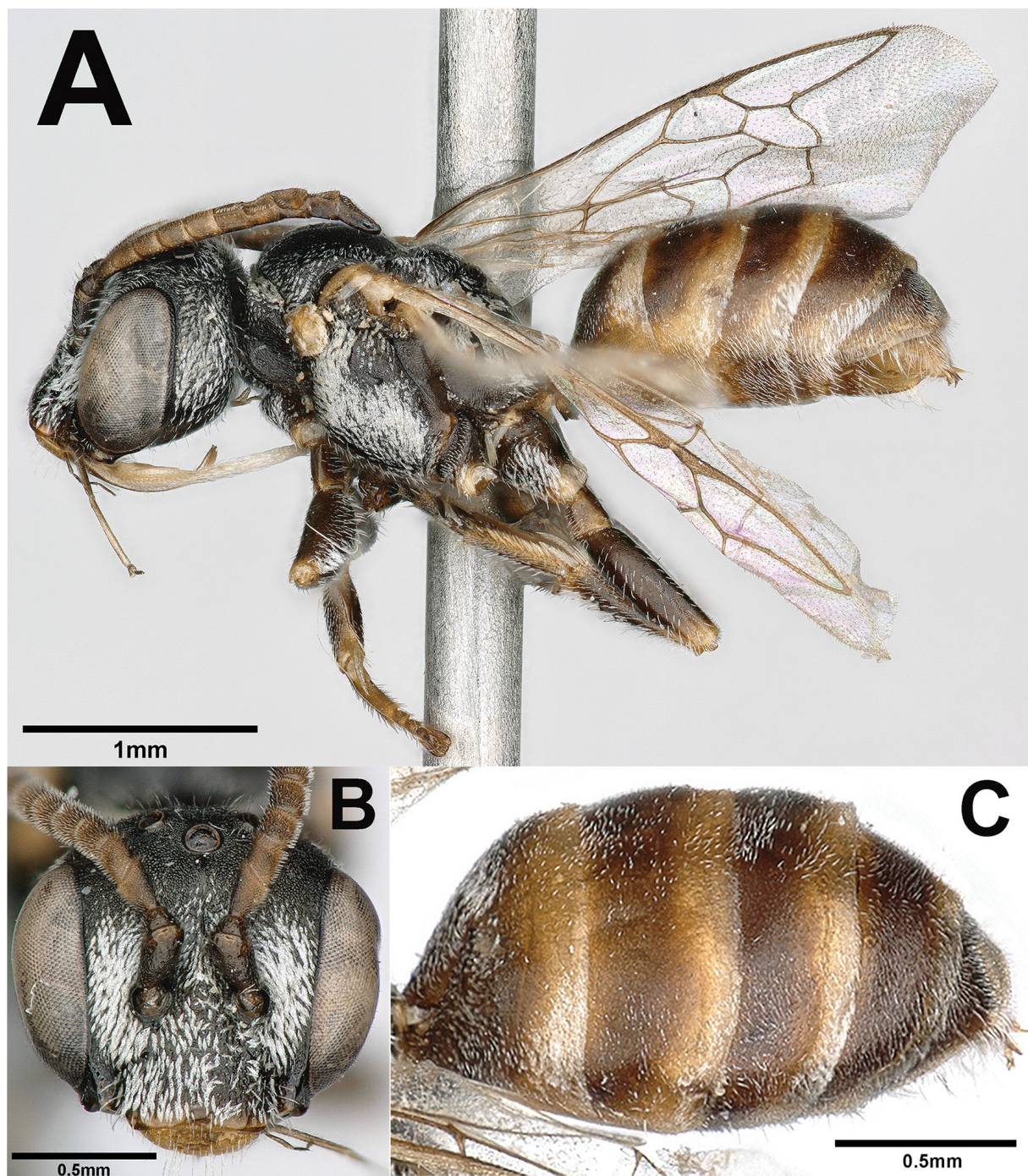


Fig. 11. *Kelita tignamar* sp. nov., holotype, ♀ (PCYU-KtH). **A.** Lateral habitus. **B.** Face frontal view. **C.** Metasoma oblique view.

Distribution

The far north of Chile.

Ecology

Two undescribed species of *Liphanthus* as well as *L. incasicus* Tapia & Ruz, 2003 have been found within 15 km of the type locality and one or more of these might be the host of this cuckoo bee.

Remarks

This species is known from a single specimen that shares the same BIN (AAN5841) as *K. keithsheldoni* sp. nov. described below. Nonetheless, it is morphologically distinct, especially with respect to the length of the glossa, and it has a 0.91 % average sequence divergence from the two *K. keithsheldoni* sequences.

Kelita cocai sp. nov.

urn:lsid:zoobank.org:act:89BC406F-EB53-4A90-BEE7-ABC9745BCB36

Figs 1B, 3B, 12

Diagnosis

From the other species of *Kelita* from northern Chile with indistinctly banded metasomal terga (Fig. 12A) (*K. cephalalgia* sp. nov., *K. fontis* sp. nov. and *K. tignamar* sp. nov. described above) it can be differentiated by the combination of the sides of the median projection of S5 convergent towards the apex (Fig. 12C) (compared to more parallel-side Fig. 8C) and the glossa short, not attaining the base of the procoxa (as in Fig. 8B) as opposed to attaining the posterior margin of the procoxa as in *K. tignamar* (Fig. 8A), the only other small dark species with the sides of the apical half of S5 median projection convergent apically.

Etymology

The species is named after Rolando Humire Coca whose help was invaluable to our collecting in the area around San Pedro de Atacama and he took the collector to the type locality of this species.

Material examined

Holotype

CHILE – **Antofagasta** [Region II] • ♀; E of Termas de Puritama, Hwy B-245 km 30; 22.717° S, 68.027° W; 3680 m a.s.l.; 3 Apr.–2 May 2013; S Monckton and R. Humire Coca leg.; cup trap; PCYU.

Description

Female

DIMENSIONS. Body length 3.7 mm, head width 1.31 mm, ITW 0.75 mm, wing length 2.95 mm.

COLOURATION. Head and mesosoma black, metasoma and legs dark to red-brown except: mandible dark orange-brown (except red-brown at base and red at apex), labrum yellow-brown; clypeus red-brown for entire apical margin and more extensively apicomediaally; following yellow to orange-brown: apex of all coxae, all trochanters, all femora apically, all tibiae at base and apex, metabasitarsus ventrally, reflexed lateral parts of T1–T3, T1 subapically, T2 basally; flagellum brown ventrally (except F1–F2 suffused with yellow-brown), dark brown dorsally; remaining metasomal terga brown, T2–T3 narrowly orange-brown subapically, apical impressed areas straw-yellow; metasomal sterna red-brown.

SURFACE SCULPTURE. Labrum punctures moderately large except around midline and margins; clypeus weakly imbricate dorsolaterally, shiny, imbrication absent for apical $\frac{2}{3}$ and midline, puncture spacing irregular $i=0-2d$, absent for most of midline, extreme apex and narrowly adjacent to epistomal

suture; supraclypeal area weakly imbricate, punctures shallow, dense ($i < d$); frontal area punctures $i = 1-3d$, sparser above; mesoscutum punctures $i = 1-2d$; scutellum as mesoscutum except more dull; dorsal surface of propodeum with few longitudinal striae and scattered punctures among rugulosity; metapleuron lacking sculpture below; metasomal terga punctures small indistinct; metasomal sterna shallowly imbricate, shiny, punctures small and scattered, S5 punctures small $i = 2-4d$.

PUBESCENCE. T1 apicolateral hair band $< \frac{1}{3}$ apical width of tergum; T2–T4 discal laterally oriented hairs somewhat silvery, $< \frac{1}{2}$ MOD.

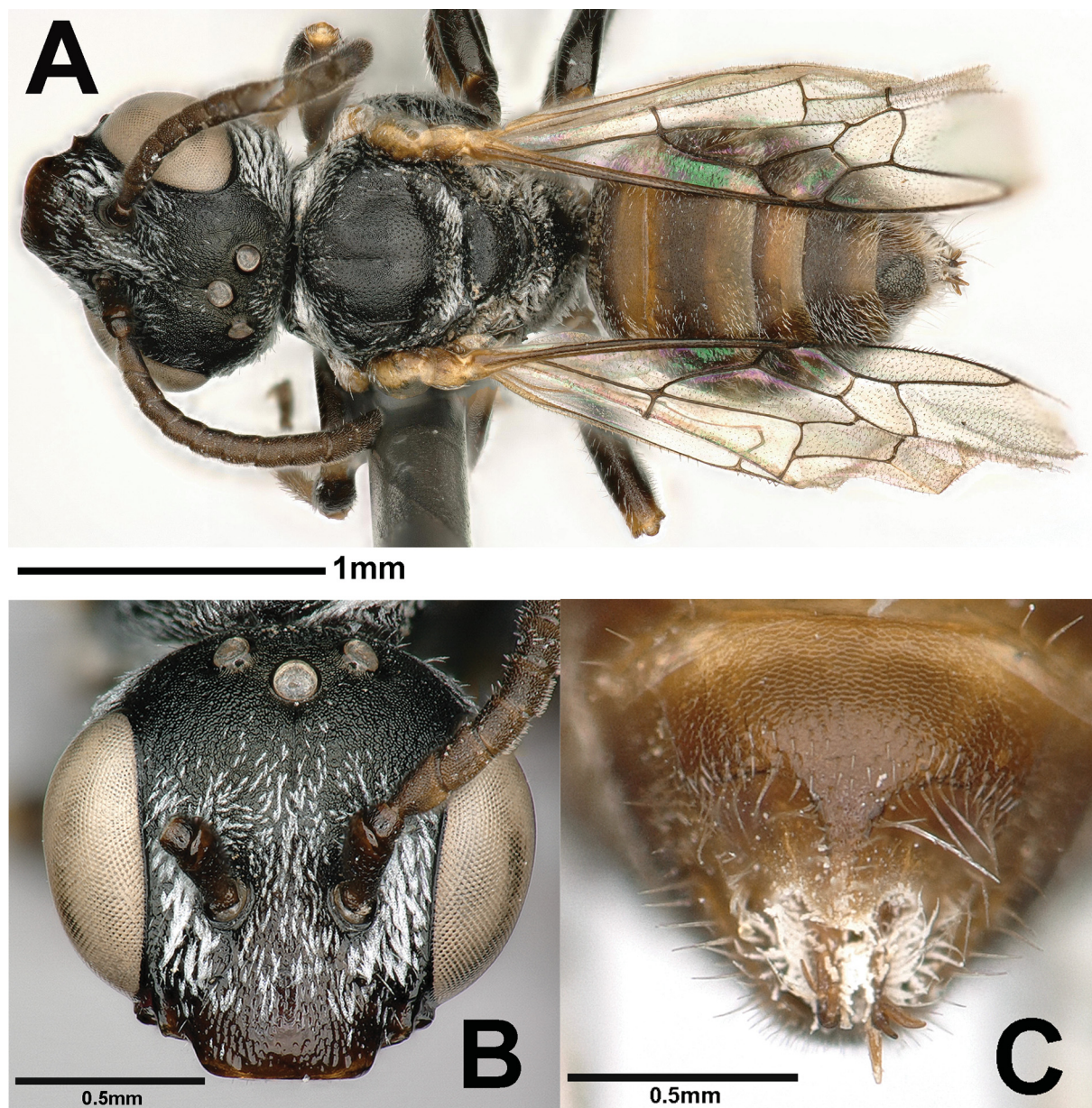


Fig. 12. *Kelita cocai* sp. nov., holotype, ♀ (PCYU-KcoH). A. Dorsal habitus. B. Face frontal view. C. S5.

STRUCTURE HEAD. Broader than long (67:61). Labrum broader than long (42:25), apical margin slightly convex for entire width; mandible basal depth less than half its length (24:52); glossa short, not attaining base of procoxa; clypeus protuberant, less than half as long as wide (30:66); frontal line carinate below, depressed at midlength, at same level above; MUOD:MLOD 46:40; IOD subequal to OOC 24:25; F1 longer than deep, depth subequal to length of F2 (20:12:11).

MESOSOMA. Scutellum slightly convex medially, ratio of scutellum:metanotum:dorsal surface of propodeum 21:12:15; metasternum posterior process acute, apex rounded; first submarginal cell little longer than second (36:34); first recurrent vein further from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (9:4); metatibial apical lamella biconvex, convexities of equal length, posterior convexity narrower than anterior one.

METASOMA. Pseudopygidial area subtriangular, narrower than long (18:21), all hairs spatulate except for a very few in the middle; (pygidial plate mostly hidden); S5 median projection sides strongly apically convergent, extreme apex of sternum biconcave.

Male

Unknown.

Distribution

Northern Chile above 3000 m altitude.

Ecology

Lipanthus quadrifasciatus Toro, 1989 is a potential host, having been found at the same locality as *Kelita cocai* although undescribed species of *Lipanthus* have also been found nearby.

Remarks

The sole specimen was caught in a pan trap left out for four weeks.

***Kelita fontis* sp. nov.**

urn:lsid:zoobank.org:act:D8B0967B-47A5-46C9-8ED1-5C46585313CE

Figs 1B, 2B–D, 3A, 6C, 7C, 8D–F, 9A, D, 13

Diagnosis

For females the combination of: 1) metasoma lacking distinct pale anterior bands on T2–T4 (versus basal bands present, compare Figs 7C or 13C with 7A–B or 14A), 2) first submarginal cell at most subequal to length of second (versus longer, compare Fig. 8E–F) and 3) glossa short, not extending beyond base of procoxa (as in Fig. 8B, compare with 8A) permits discrimination of this species from all other congeners in tropical Chile. Among the other species from this region, only *K. tignamar* sp. nov. has the first two features, but the two are readily differentiated by glossal length (compare Fig. 8B–A).

Males can be diagnosed based upon the combination of 1) pygidial plate apicomediaally notched (versus entire, compare Fig. 9A–B) and 2) head distinctly wider than long (versus width and length subequal, compare Fig. 9D–C). Of the two other species for which males are known, only *K. chugchug* sp. nov. males have a notched pygidial plate but their heads are almost as long as wide.

Etymology

The specific epithet refers to the type locality: Pozo Tres, which is a camping site and recreation area with a large swimming pool fed by naturally thermally warmed water. 'Pozo' is Spanish for well which translates to '*fontis*' in Latin.

Material examined

Holotype

CHILE – **Antofagasta** [Region II] • ♀; San Pedro de Atacama, Pozo 3; 22.915° S, 68.167° W; 2440 m a.s.l.; 23 Apr.–9 May 2012; L. Packer leg.; cup trap; PCYU.

Paratypes

CHILE – **Antofagasta** [Region II] • 1 ♀; same data as for holotype; Apr. 2004; L. Packer leg.; cup trap; MNHN • 1 ♂; El Loa Prov., 30 km E. of San Pedro de Atacama; 22.916° S, 67.907° W; 3830 m a.s.l.; 5 Dec. 2014; L. Packer and E.S. Wyman leg.; PCYU • 1 ♂; El Loa Prov., Guatín; 22.763° S, 68.072° W. 3210 m a.s.l., 6 Dec. 2014; L. Packer and E.S. Wyman leg.; CCDB-28231 A04; AMNH.

Description

Female

DIMENSIONS. Body length 5.1 mm; head width 1.58 mm; ITW 0.95 mm; wing length (to apex of marginal cell, wing apex abraded) 3.1 mm.

COLOURATION. Head and mesosoma black, legs dark brown, and metasoma red-brown except as follows: frontal area faintly greenish-bronze; labrum yellowish, mandible orange except red-brown at base, reddish at apex, clypeus red-brown becoming paler towards apex, flagellum dark yellow-brown ventrally, dark red-brown dorsally, apex of each of F2–F9 paler apically; following parts yellow-orange: pronotal lobe, apex of all coxae, apex and most of ventral surface of all trochanters, apex of all femora, base and apex of all tibiae; metasomal terga subapically dull orange most extensive on T1; T1 and T3–T4 apical impressed areas pale yellow, on T2 colourless; metasomal sterna yellow-orange, S3–S5 suffused with red-brown, S1 blackish basomedially.

SURFACE SCULPTURE. Labrum large punctures scattered, smaller around margins and mostly absent along midline; clypeus slightly imbricate except apex smooth, punctures longitudinally effaced, dense $i < d$ except apically irregularly spaced and round, midline and narrow band adjacent to epistomal suture above impunctate; supraclypeal area densely punctate ($i < d$); frontal area imbricate, shallowly and densely punctate $i < 0.5d$; lower paraocular area punctures becoming rugose towards compound eye; mesoscutum punctures $i = 1–3d$; scutellum imbrication weaker, punctures smaller; [dorsal surface of propodeum finely rugulose with longitudinal median carina]; hypoepimeral area punctures large, shallow; metasomal tergal punctures minute shallow and indistinct; metasomal sterna shiny, punctures small and scattered becoming more distinct on more apical terga, S5 punctures $i = 1–4d$.

PUBESCENCE. T1 apicolateral hair band $\sim \frac{1}{4}$ apical width of tergum, apicolateral bands on T3–T4 dense; T2–T4 discal laterally oriented hairs silvery, $< \frac{1}{3}$ MOD.

STRUCTURE HEAD. Broader than long (79:74). Labrum broader than long (52:31), apical margin slightly convex medially, slightly concave either side; mandible basal depth half length (30:60); glossa attaining anterior margin of procoxa; clypeus approximately half as long as wide (38:79); frontal line briefly carinate below; MUOD:MLOD 54:49; IOD and OOC subequal 30:28; F1 longer than depth which is as long as F2 (25:15:15).

MESOSOMA. Scutellum midline slightly depressed, [ratio of scutellum:metanotum:dorsal surface of propodeum 26:14:16]; metasternum posterior process acute, apex narrowly rounded; first submarginal cell shorter than second (40:45); first recurrent vein much further from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (18:4.5); metatibial apical lamella truncate.

METASOMA. Pseudopygidial area subtriangular, as wide as long (24:24), all hairs spatulate except for a very few in the middle; [pygidial plate shallowly notched apically, sides straight]; S5 median projection sides convergent to apex; extreme apex of sternum produced medially.

Male.

DIMENSIONS. Body length 4.7 mm; head width 1.44 mm; ITW 0.9 mm; wing length 3.2 mm.

COLOURATION. Head and mesosoma black, legs black-brown, and metasoma dark brown except as follows: following parts yellow-brown to orange-brown: labrum, mandible (base and apex red-brown), apices of all coxae and trochanters and femora, base and apex of all tibiae, all basitarsi ventrally, T1 broadly apically, T2 narrowly basally, T2–T5 narrow margin of apical impressed areas with discs, pygidial plate, S2–S6 (S1 dark brown); frontal area with slight bronze tinge; flagellum ventral surface dark orange-brown becoming slightly paler on more apical flagellomeres; clypeus extreme apex red-brown; T2–T6 apical impressed areas translucent pale yellowish.

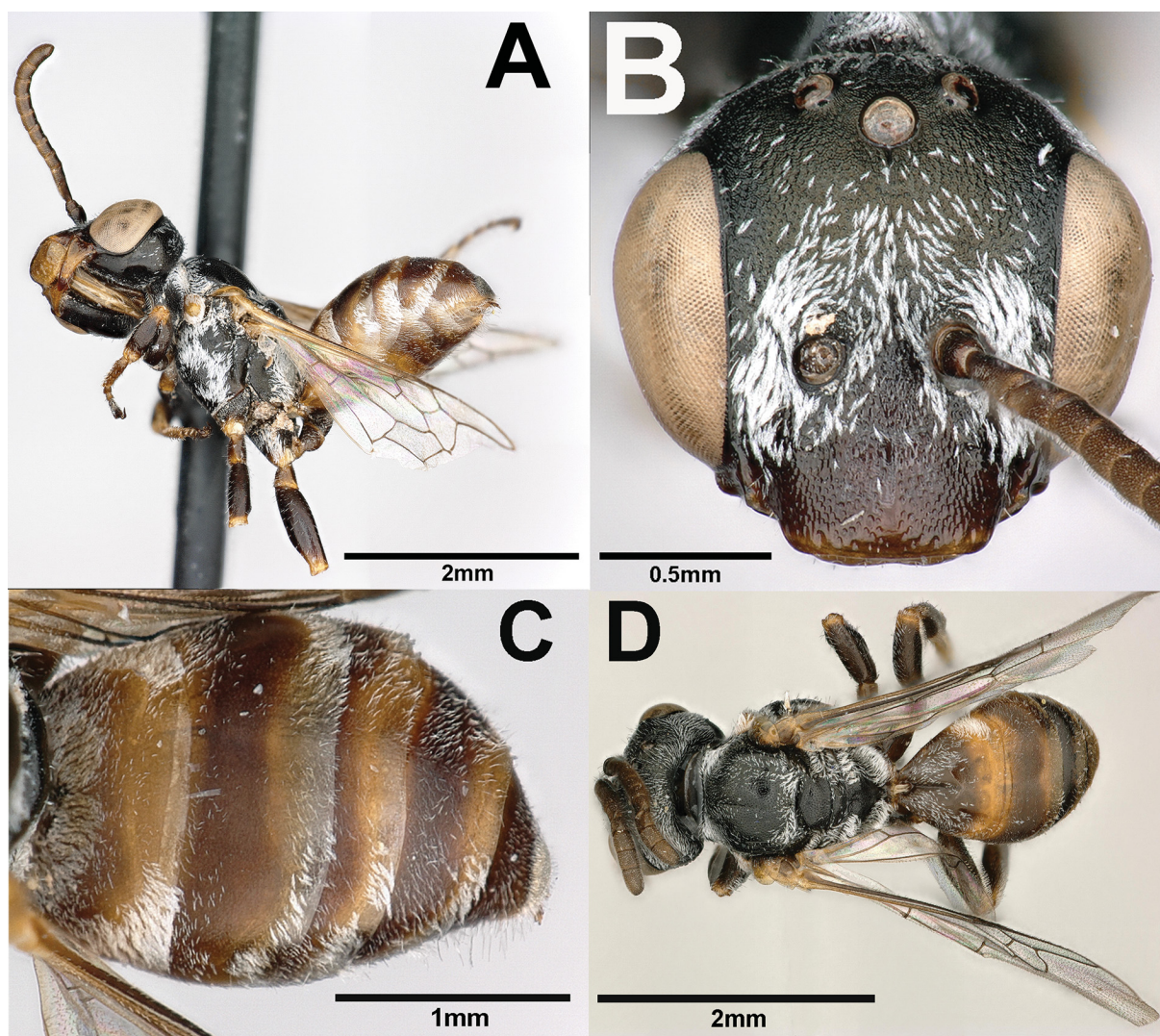


Fig. 13. *Kelita fontis* sp. nov. A–C. Holotype, ♀ (PCYU-KfH). A. Lateral habitus. B. Face. C. Metasomal dorsum. D. Paratype, ♂ (PCYU-KfPm1), dorsal habitus.

SURFACE SCULPTURE. Labrum punctures variable in size and spacing; clypeus broadly impunctate and without microsculpture apicomediaally, narrowly apically, otherwise weakly imbricate, shiny, punctures small $i=1-3d$; supraclypeal area weakly imbricate, punctures variable in size and spacing ($i=1-4d$); frontal area granulose, punctures small, $i=0.5-2d$; mesoscutum weakly imbricate, shiny, punctures small, $i=1-3d$; scutellum as for mesoscutum but imbrication stronger and punctures slightly larger; dorsal surface of propodeum with longitudinal median carina; metasomal tergal punctures minute shallow and indistinct; pygidial plate punctures variable in spacing $i=0-4d$; metasomal sternal punctures small and scattered becoming more distinct on more apical sterna.

PUBESCENCE. Metasomal tergal bands somewhat abraded in both specimens, but relatively broad on T1.

STRUCTURE HEAD. Broader than long (71.5:66). Labrum $\sim 1.5 \times$ as broad as long (48:33), apical margin slightly convex medially, $\sim$ straight on either side; mandible basal depth approximately half length (30:59); glossa attaining midlength of propleuron; clypeus less than half as long as broad (34:78); frontal line briefly carinate below, otherwise impressed; MUOD:MLOD 53:49; IOD and OOC subequal 26:28; F1 longer than depth, depth less than length of F2 (23:11:15).

MESOSOMA. Scutellum midline slightly depressed, [ratio of scutellum:metanotum:dorsal surface of propodeum 24:17:17]; metasternum apical process narrowly rounded; first submarginal cell shorter than second (50:38); first recurrent vein twice as far from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (12:6); metatibial apical lamella biconvex, anterior convexity narrower than posterior.

METASOMA. Pygidial plate broadly rounded apically, shallowly notched apicomediaally.

Distribution

Northern Chile above 3000 m altitude.

Ecology

Three species of *Lipanthus* including *L. toroi* Tapia & Ruz, 2003 and *L. quadrifasciatus* Toro, 1989, have been found at the same localities as one or more records of this species.

Remarks

The localities for the two females and the described male are less than 20 km apart and that for the second male and the other two localities less than 30 km in each case.

A DNA barcode is available for the second male specimen; it belongs to BIN ACL7606 which it shares with two specimens of *Kelita chugchug* sp. nov. described below with sequence divergences of 0.81 and 0.94%. Nonetheless, there are sufficient morphological differences between them to decide they belong to different species, the most obvious of which being the relatively wider head of both sexes and the less distinct metasomal banding in females of *K. fontis* sp. nov.

Kelita keithsheldoni sp. nov.

urn:lsid:zoobank.org:act:C8D92CE8-C3FF-49F8-BC88-BCECAC7A832B

Figs 1B, 5, 7A, E, 9B, 14–15

Diagnosis

For females the combination of 1) metasoma with both apical and basal pale orange bands (Fig. 7A, compare with 7C) and 2) ventral surface of the flagellum yellow-brown (compare Fig. 14C and 16A–B) is unique among northern Chilean *Kelita*. The four species described above lack the distinct basal pale

bands and the species described below, *K. chugchug* sp. nov., has a very dark flagellum. An additional difference between *K. keithsheldoni* sp. nov. and *K. chugchug* is the relatively broader head of the former (ranging from 64:70.5 to 57:65, i.e., with ratios of 1.1 to 1.14 (Fig. 7E)), whereas the head of the latter is almost as long as wide (W:L 66:64, ratio 1.03; Fig. 7D).

For males, the narrowly rounded apex to the pygidial plate is diagnostic (Fig. 9B) among the three northern Chilean *Kelita* species for which males are known. In *K. chugchug* sp. nov. and *K. fontis* sp. nov. the pygidial plate is broadly rounded apically with an apicomedial notch (Fig. 9A).

Etymology

This species is named in honour of Keith Sheldon, a man who appreciated, protected and loved all creatures at the behest of Candice Sheldon's generous donation to the Maria Stea fund for bee research at York University.

Material examined

Holotype

CHILE – **Tarapacá** [Region I] • ♀; Hwy 687, 46.8 km marker; 20.31° S, 69.05° W; 8–21 Apr. 2004; L. Packer leg.; cup trap; PCYU.

Paratypes

CHILE – **Tarapacá** [Region I] • 1 ♀; same data as for holotype; CCDB-03770 A07, UCEAS_2_11; PCYU • 1 ♀; same data as for holotype; MNHN • 1 ♂; Parca Turnoff; 20.063° S, 69.229° W; 2720 m a.s.l.; 27 Apr. 2015; L. Packer and R. Smith leg.; PCYU, 22013-B10.

Description

Female

DIMENSIONS. Body length 4.6 mm; head width 1.25 mm; ITW 0.73 mm; wing length 2.85 mm.

COLOURATION. Head and mesosoma black, legs dark red-brown, and metasomal terga orange-brown except: mandible orange (except base narrowly brown, apex dark red), labrum and pronotal lobe bright yellow; clypeus red-brown apex orange, supraclypeal area dark red-brown; scape and pedicel ventrally orange-brown, flagellum ventrally pale yellow-brown, dorsal surface red-brown except apices of flagellomeres dorsally orange-brown; following yellow-orange: apex of all coxae, all trochanters ventrally, all femora apically, all tibiae at base and apex (posterior surface of metatibia yellow-brown), protarsomeres 1–4 (propretarsus yellow-brown), metabasitarsus ventrally, apex of T1, base and apex of T2–T5, T6, reflexed lateral parts of T1–T5, metasomal sterna except S1 basomedially dark red-brown, S3–S4 suffused with orange-brown laterally, S5 orange-brown except at base and apex.

SURFACE SCULPTURE. Labrum punctures mostly moderate in size, $i=1-4d$ on disc; clypeus imbricate except apex and midline mostly smooth, punctures longitudinally effaced, dense $i<d$ except absent apically and midline for apical half; supraclypeal area imbricate and densely punctate ($i<d$); frontal area granulate, punctures $i=1-3d$ becoming almost crowded on lower paraocular area towards inner margin of compound eye; mesoscutum punctures small, $i=1-3d$; scutellum as mesoscutum but slightly shinier, punctures $i=1-2d$; hypoepimeral area punctures $i=1-3d$; metasomal tergal punctures minute shallow and indistinct; metasomal sterna imbricate, punctures small and scattered medially more distinct towards sides, becoming more distinct on more apical terga, $i=1-3d$ apicolaterally on S4, S5 punctures $i=1-6d$.

PUBESCENCE. T1 apicolateral hair band $< \frac{1}{4}$ apical width of tergum; T2–T4 discal laterally oriented hairs metallic pale cream, $\sim \frac{1}{3}$ MOD.

STRUCTURE HEAD. Broader than long (67:60). Labrum more than $1.5 \times$ as wide as long (41:26), apical margin slightly convex medially, concave either side; mandible basal depth more than half its length (27:51); glossa short, attaining midlength of propleuron; clypeus less than half as long as wide (30:68); frontal line carinate below, depressed at midlength, at same level above; compound eyes convergent below, MUOD:MLOD 46:40; IOD=OOC 25:25; F1 longer than deep, depth equal to length of F2 (21:12:12).

MESOSOMA. Scutellum relatively flat, ratio of scutellum:metanotum:dorsal surface of propodeum 25:13:15; metasternum posterior process right-angular, apex rounded; first submarginal cell little longer than second (32:31); first recurrent vein further from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (12:4); metatibial apical lamella biconvex, convexities of equal length, posterior convexity broader than anterior one.

METASOMA. Pseudopygidial area subtriangular, length and width subequal, all hairs spatulate except for small medial patch; pygidial plate apically notched, lateral margins very weakly sinuate, convex basally, concave apically; S5 median projection sides strongly apically convergent for basal half, weakly convergent for apical half.

Male

DIMENSIONS. Body length 3.7 mm; head width 1.02 mm; ITW 0.57 mm; wing length 2.45 mm.

COLOURATION. Head and mesosoma black, legs and metasomal terga dark red-brown except: following parts yellow-brown to orange-brown: mandible (except base narrowly brown, apex dark red), labrum,

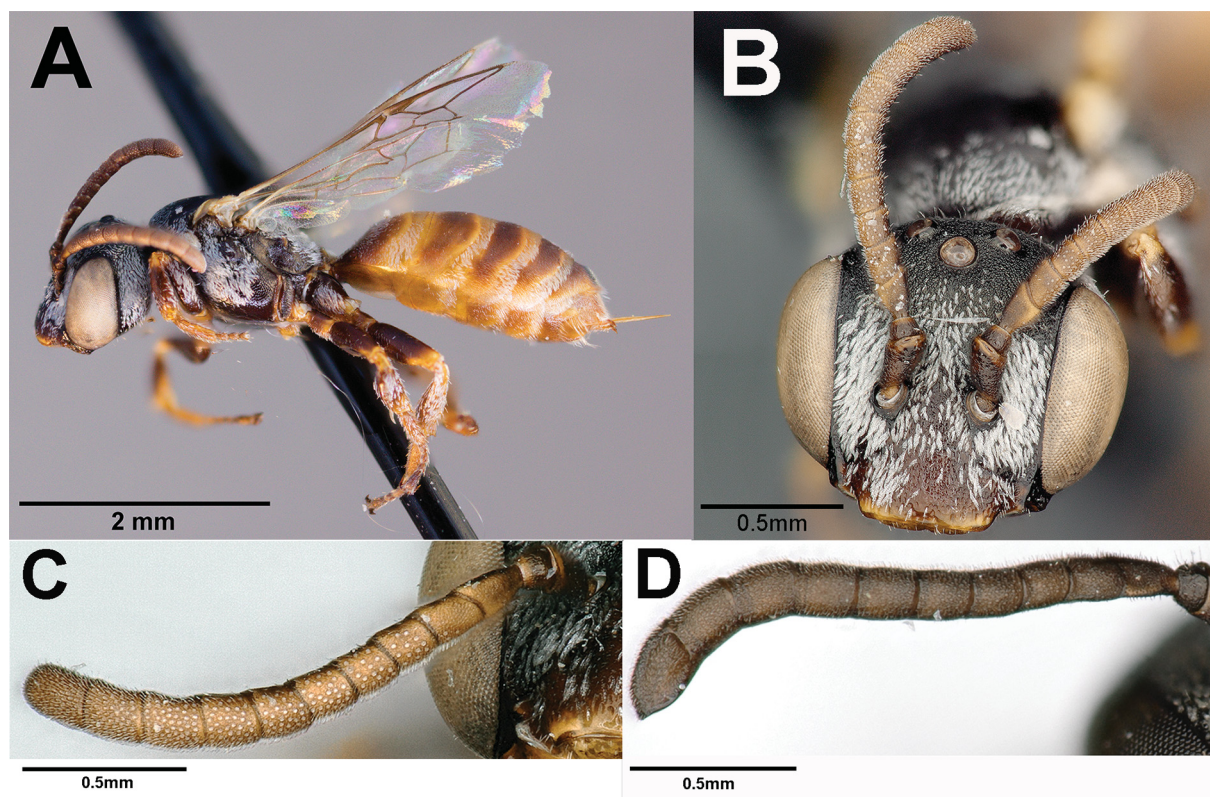


Fig. 14. *Kelita keithsheldoni* sp. nov., holotype, ♀ (PCYU-KsH). **A.** Lateral habitus. **B.** Face, frontal view. **C.** Antenna, anterior surface. **D.** Antenna, dorsal surface.

extreme apex of clypeus, apex of all coxae, apex of meso- and metatrochanter, apex of all femora, base and apex of all tibiae; flagellum ventrally dark orange-brown; pronotal lobe pale yellow; T1–T5 dark orange-brown subapically, gradually paler to pale yellow to transparent apex of apical impressed areas; metasomal sterna yellow-brown, fading to pale yellow apically except S1 basally dark brown.

SURFACE SCULPTURE. Labrum impunctate basomedially surrounded by few large punctures, lateral and apical punctures variable in size and spacing; clypeus imbricate except extreme apex, punctures largely obscured by pubescence; supraclypeal area surface imbricate, irregularly punctate $i=1-3d$; frontal area punctures $i=0.5-3d$; mesoscutum punctures small, $i=1-4d$; scutellum as mesoscutum but slightly shinier, punctures $i=1-3d$; dorsal surface of propodeum with strong longitudinal median carina; hypoepipimeral area imbricate, punctures $i=1-5d$; metasomal tergal punctures minute shallow and indistinct; metasomal sterna punctures small and obscure.

PUBESCENCE. Metasomal tergal apical bands narrow.

STRUCTURE HEAD. Broader than long (52:48). Labrum $1.5\times$ as wide as long (34:23), apical margin slightly convex medially, concave either side; mandible basal depth less than half its length (20:42); glossa short, attaining midlength of propleuron; clypeus half as long as wide (23:46); frontal line briefly carinate below, at same level above; MUOD:MLOD 73:66; IOD=OOC 20:20; F1 longer than deep, depth subequal to length of F2 (18:8:9).

MESOSOMA. Scutellum relatively flat, midline slightly impressed, ratio of scutellum:metanotum:dorsal surface of propodeum 19:10:11; metasternum posterior process sides convergent, acute apex rounded; first submarginal cell longer than second (24:18); second submarginal crossvein almost interstitial with second recurrent vein.

METASOMA. Pygidial plate apically rounded, apical $\frac{1}{3}$ slightly curved dorsally in profile.

Distribution

Northern Chile above 2000 m altitude.

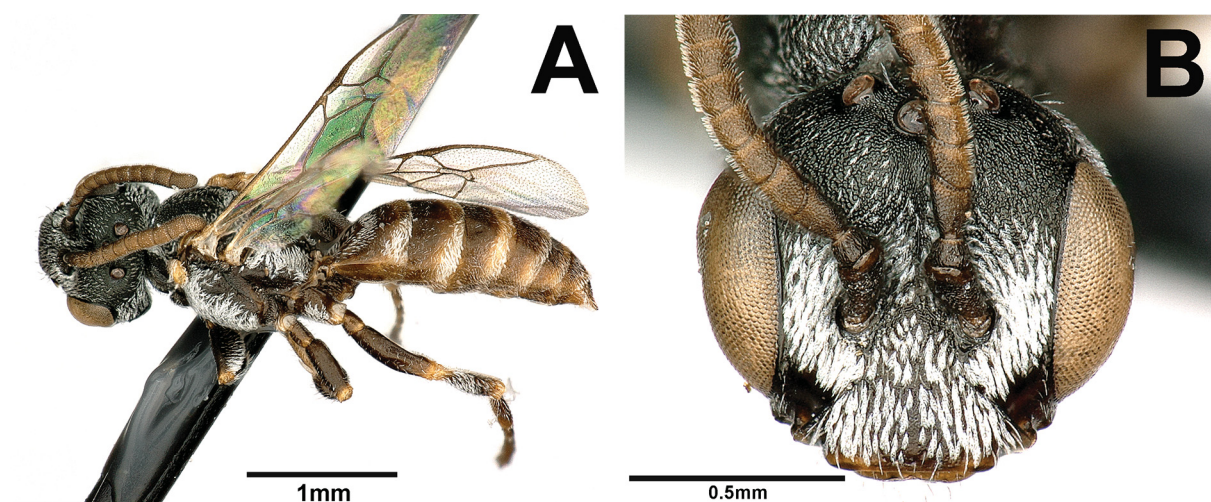


Fig. 15. *Kelita keithsheldoni* sp. nov., paratype, ♂ (PCYU-KsPm1). **A.** Lateral habitus. **B.** Face, frontal view.

Ecology

Three undescribed species of *Liphanthus* and an undescribed species of *Parasarus* Ruz, 1993 have been found at one of the localities for *Kelita keithsheldoni* sp. nov. but none at both of them.

Remarks

Two specimens have been barcoded and they belong to BIN AAN5841 which they share with *K. tignamar* sp. nov. described above, though the sequences of the species differ by an average of 0.91%. The two localities are separated by less than 35 km.

The female is the palest and most brightly marked species of the genus with extensive yellow-orange markings. None of the extralimital specimens available to me, i.e., from further south in Chile or from Argentina, have such bright markings. The male is darker but differs by less than 0.3% from one of the paratype females and 1.06% to the other barcoded female.

Kelita chugchug sp. nov.

urn:lsid:zoobank.org:act:35553F15-0B5B-45C8-A5F8-02C68F42F09B

Figs 1B, 2A, 4A–C, 6A–B, 7B, D, 9C, 16

Diagnosis

In females, the combination of 1) metasomal terga with distinct apical and basal pale bands (Figs 7A and 16A) and 2) antennal flagellum entirely dark (Fig. 14D) is unique. The only other species with distinct pale basal bands on the terga is *Kelita keithsheldoni* sp. nov. described above (Fig. 7B) which has the ventral surface of the flagellum yellow-brown (Fig. 14B–C).

In both sexes, the head is relatively longer than in any of the other northern Chilean *Kelita* species, for females compare Figs 16B and 14B, for males, compare Figs 16D and 15B.

Etymology

The specific epithet refers to the type locality which is close to the Chug-chug geoglyphs which date from 1000 BC to the 1550s AD. It is to be considered a noun in apposition.

Material examined

Holotype

CHILE – **Antofagasta** [Region II] • ♀; Chugchug; 22.246° S, 69.152° W; 2135 m a.s.l.; 2–27 Apr. 2013; L. Packer, S. Monckton and J. Postlethwaite leg.; cup trap; PCYU.

Paratypes

CHILE – **Antofagasta** [Region II] • 1 ♂; same data as for holotype; MNHN • 1 ♂; same data as for holotype; BEE BOL CCDB-06382 E05, UCEAS_2_7; PCYU • 1 ♂; Hwy 27-CH, km 19.9; 22.911° S, 68.001° W; 3045 m a.s.l.; 24 Jan.–6 Apr. 2013; J. Postlethwaite and S. Monckton leg.; blue cup trap; UCEAS_2_12; PCYU • 1 ♂; Barros Arana, Hwy 23-CH, km 57; 22.711° S, 68.423° W; 3385 m a.s.l.; 10 Feb.–6 Apr. 2013; S. Monckton and J. Postlethwaite; BEE BOL CCDB-06382 E04; MNHN.

Description

Female

DIMENSIONS. Body length 4.8 mm; head width 1.28 mm; ITW 0.8 mm; wing length 3.2 mm.

COLOURATION. Head and mesosoma black (frontal area faintly dark greenish-bronze), legs black-brown, metasomal terga dark red-brown: mandible orange (base broadly red-brown, apex dark red), labrum pale

orange-brown, pronotal lobe bright yellow; clypeus extreme apex red-brown, flagellum ventrally dark red-brown, dorsal surface blackish; all tarsi brown; following orange-brown: apex of all coxae, apical ring on pro- and meso-trochanters, metatrochanter ventrally, all femora apically, all tibiae at base and apex (posterior surface of metatibia yellow-brown), metasomal sterna (except base of S1 dark brown), remaining sterna paler apically; apex of T1, base and apex of T2–T3, base of T4 bright orange, T4 subapically narrowly orange-brown, T6 basally bright yellow-brown, pygidial plate orange brown.

SURFACE SCULPTURE. Labrum punctures variable in size and spacing, few large punctures on disc medially; clypeus imbricate except apex and midline smooth, punctures longitudinally effaced, dense $i < d$ except absent apically; supraclypeal area imbricate and densely punctate ($i < d$); frontal area punctures small, $i = 1-4d$; mesoscutum punctures small, $i = 1-4d$; scutellum imbricate-lineolate, dull, punctures less distinct; dorsal surface of propodeum with paired longitudinal median carina; metasomal tergal punctures minute shallow and indistinct; metasomal sternal punctures small and scattered medially more distinct

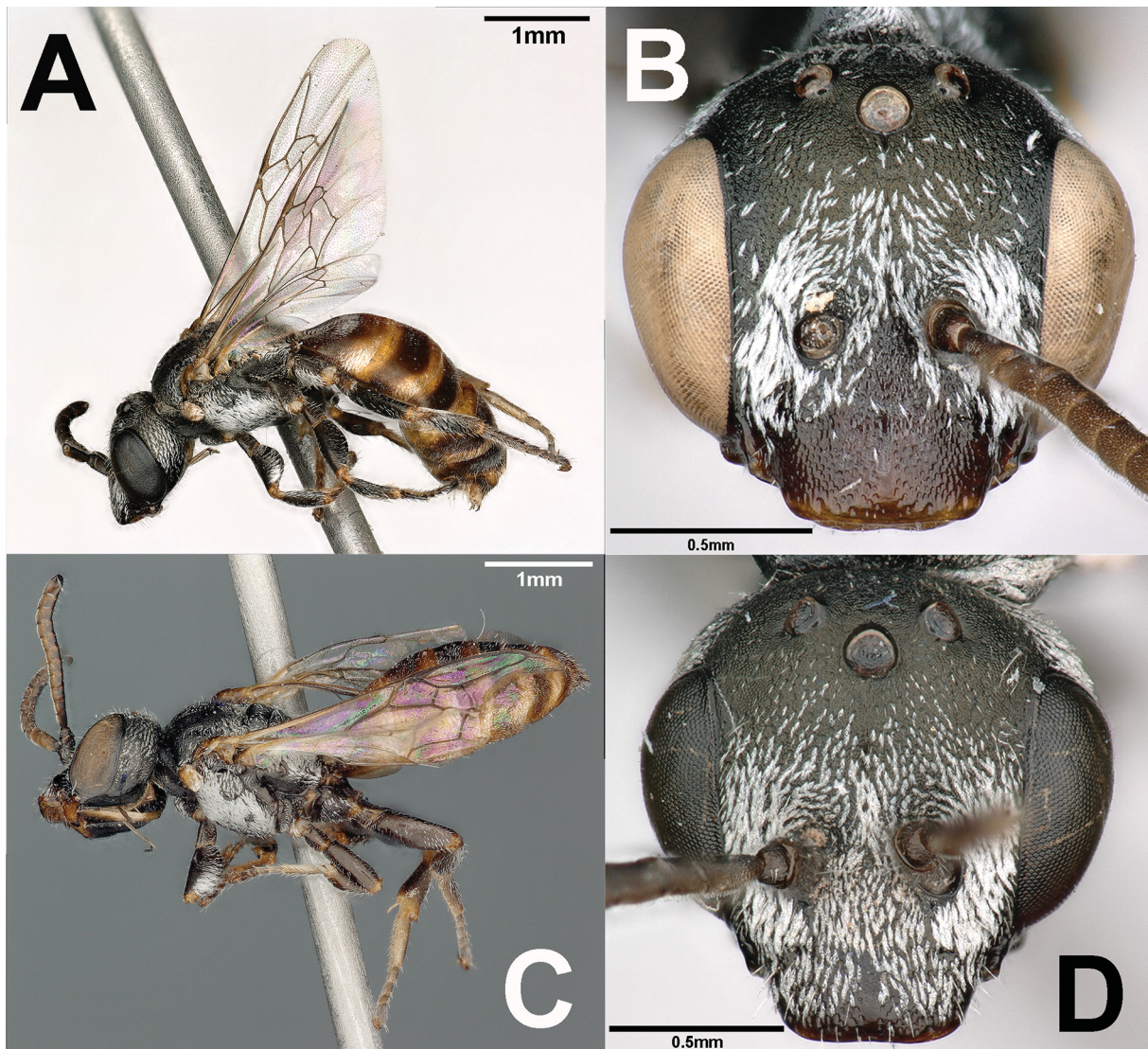


Fig. 16. *Kelita chugchug* sp. nov. **A–B.** Holotype, ♀ (PCYU-KchchH). **A.** Lateral habitus. **B.** Face, frontal view. **C–D.** Paratype, ♂ (PCYU-KchchPm1). **C.** Lateral habitus. **D.** Face, frontal view.

basally and towards sides, becoming more distinct on more apical terga, $i=1-4d$ on S4, S5 punctures $i=1-3d$.

PUBESCENCE. T1 apicolateral hair band $\sim\frac{1}{4}$ apical width of tergum; T2–T4 discal laterally oriented hairs slightly shiny, $\sim\frac{1}{4}$ MOD.

STRUCTURE HEAD. Almost as long as wide, L:W 64.5:65.5. Labrum $\sim 1.5\times$ as wide as long (44:30), apical margin slightly convex throughout; mandible basal depth $\sim$ half its length (26:51); glossa moderately short, attaining base of procoxa; clypeus less than half as long as wide (31:67); frontal line broadly raised below, depressed at midlength, at same level above; MUOD:MLOD 47:40; IOD>OOC 28:24; F1 longer than deep, depth equal to length of F2 (23:12:13).

MESOSOMA. Scutellum relatively flat transversely, strongly convex longitudinally, ratio of scutellum:metanotum:dorsal surface of propodeum 23:16:18; [metasternum obscured by pin]; first submarginal cell shorter than second (35:39); first recurrent vein $4\times$ further from first submarginal crossvein than second recurrent vein is from second submarginal crossvein (15:3.5); metatibial apical lamella biconvex, convexities of equal length, posterior convexity longer than anterior one.

METASOMA. Pseudopygidial area subtriangular, as wide as long (22:22), all hairs spatulate except for small elongate medial patch; pygidial plate apically notched, lateral margins weakly convex; S5 median projection sides strongly apically convergent for basal half, less strongly convergent for apical half.

Male

DIMENSIONS. Body length 5.2 mm; head width 1.35 mm; ITW 0.92 mm; wing length 3.1 mm.

COLOURATION. Head and mesosoma black, legs black-brown, and metasomal terga dark brown except: following parts yellow-brown to orange-brown: labrum, mandible (except base brown, apex dark red), labrum, extreme apex of clypeus, apex of all coxae, apex of metatrochanter, apex of all femora, base and apex of all tibiae, metabasitarsus ventrally; flagellum ventrally dark orange-brown; pronotal lobe orange; T1–T5 orange subapically, gradually paler to yellowish apex of apical impressed areas, orange extensive on T1 narrowing on successive terga, pygidial plate orange-brown; metasomal sterna bright orange-brown, except S1 mostly dark brown.

SURFACE SCULPTURE. Labrum punctures variable in size and spacing; clypeus imbricate except apex and midline smooth, punctures longitudinally effaced, dense $i<d$ except absent apically; supraclypeal area imbricate; frontal area punctures small, $i=0.5-6d$; mesoscutum punctures small, $i=1-4d$; scutellum weakly imbricate-lineolate, dull, punctures as distinct as on mesoscutum; dorsal surface of propodeum carinulate towards posterior and lateral margins with longitudinal median carina; hypoepimeral area punctures variable in spacing $i=1-4d$; metasomal terga punctures relatively distinct especially on T4–T6 $i=1-4d$; pygidial plate imbricate, punctures irregular in size and spacing $i=0.5-3d$; metasomal sterna punctures more distinct on more apical terga, most dense laterally on S5 $i=1-2d$, smaller basally and laterally on S6 which has scattered punctures on the apical half.

PUBESCENCE. Apical hair bands short, on T1–T2 $<0.2\times$ width of tergum, longest on T3–T4 $\sim$ one-third tergal width, medially ill-defined on T5, indistinct on T6.

STRUCTURE HEAD. Slightly longer than wide (L:W 67:68). Labrum more than $1.5\times$ as wide as long (48:29), apical margin slightly convex medially, concave towards sides; mandible basal depth half its length (28:57); glossa attaining base of procoxa; clypeus more than twice as long as wide (32:75); frontal line briefly carinate below, slightly impressed above; MUOD:MLOD 49:44; IOD>OOC 28:23; F1 longer than deep, depth greater than length of F2 (22:11:13).

MESOSOMA. Scutellum relatively flat, ratio of scutellum:metanotum:dorsal surface of propodeum 24:16:18; metasternum posterior process short, apex broadly rounded; first submarginal cell longer than second (40:35); first recurrent vein $\sim 2 \times$ as far from first submarginal crossvein than second recurrent vein is from second submarginal crossvein 10:4.5.

METASOMA. Pygidial plate apicomediaally notched, apical $\frac{1}{3}$ slightly curved dorsally in profile.

Distribution

Northern Chile above 2000 m altitude.

Ecology

Potential hosts are undescribed species of *Lipanthus*, *L. toroi* or an undescribed *Parasarus*.

Remarks

Two specimens have been barcoded, and their BIN is ACL7606 which is shared with *Kelita fontis* which differs by 0.94%.

The two most distant of the three localities are separated by approximately 140 km with the intermediate locality almost on a straight line directly connecting the other two.

First record of *Kelita* (*Spinokelita*) *argentina* in Chile

All the newly described species above are of the nominate subgenus. Hitherto, the other subgenus – the monotypic *Kelita* (*Spinokelita*) *argentina* has been known only from Argentina. I here report the species from Chile for the first time with the following label data.

CHILE – **Region XI [Aysén]** • ♂; S of Chile Chico; 46.663° S, 71.687° W; 611 m a.s.l.; 19 Dec. 2017; Droege and Packer leg.; pan trap; CCDB-30347 H10.

Discussion

Cleptoparasitic bees are known to be taxonomically tricky due to the often very minor and subtle differences that separate their species (e.g., Onuferko & Rightmyer 2024), yet their identification is important because of their rarity and potential role in assessing the state of ecosystems (Oertli *et al.* 2005; Sheffield *et al.* 2013). Here, I describe an additional six species of the cleptoparasitic bee genus *Kelita*, some of which are separable based on quite subtle characteristics and most of which are very rare and obtained using passive cup traps that preserve the collected insects in propylene glycol (see Packer & Darla-West 2020).

Previously described *Kelita* species are known to attack Protandrenini (*Kelita tuberculata* on *Parasarus atacamensis* Ruz 1993 in Ruz & Rozen, 1993) or Neopasiphaeinae (*Kelita toroi* on two species that were considered as *Leioproctus*, a genus which is being more finely divided now and the relevant species likely belonging to *Bicolletes* Friese, 1908) (Ehrenfeld & Rozen 1977; Rozen 1994). With all the females having been caught in traps, we can only guess at the possible hosts of the new species described here. Among bees of a similar size to those of these cleptoparasites, there are relatively few genera and *Lipanthus* and *Parasarus* species seem most likely potential hosts based upon size and co-occurrence. Eight species (of the former) *L. aliavenus*, *L. incasicus*, *L. quadrifasciatus*, *L. toroi* as well as four undescribed species and two undescribed species of the latter genus are considered potential hosts for the new *Kelita* species.

The localities where these bees were collected have yielded numerous additional new species, including other cleptoparasitic bees (Packer 2016; Packer & Graham 2020). Indeed, six cleptoparasitic nomadine species were described in those two papers each with only one to five specimens despite the extensive sampling undertaken in the area (Fig. 1A), four of them known only from singletons although Peruvian specimens of one (*Triepeolus cecilyae* Packer, 2016) have since been found (Onuferko & Rightmyer 2024). *Kelita* remains to be found in Peru.

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