

New Species and Records of Scuttle Flies (Diptera: Phoridae) Associated with Leaf-cutter Ants and Army Ants (Hymenoptera: Formicidae) in Argentina

by

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ABSTRACT

Lucianaphora folgaraitae Disney n. gen., n. sp., *Macrocerides attophilus* n. sp. are described, both being collected over leaf-cutter ants and *Cremersia crassicalis* n. sp. from females collected over army ants. Some species collected with army ants are given code letters until they are linked up with their unknown sex. Host records for previously known species were all from colonies of army ants, whose myrmecophiles are better documented than those recorded from the colonies of leaf-cutter ants.

Key Words: Phoridae, Argentina, Leaf-cutter ants, Army ants

INTRODUCTION

The numerous myrmecophile and parasitoid scuttle flies (Phoridae) associated with army ants (Ecitoninae) have been reviewed by Disney & Kistner (2003), recently augmented by Disney & Rettenmeyer (2007) and Disney & Berghoff (2007). The far fewer records of those associated with leaf-cutter ants (Myrmicinae) were last reviewed by Disney (1994), but since then knowledge of the parasitoid species has increased for phorids of the genera *Apocephalus*, *Neodohrniphora*, and *Myrmosicarius* (Braganca *et al.* 1998, 2002; Brown 1997, 2001, Disney 1996, Disney *et al.* 2006, Feener & Brown 1993; Feener & Moss 1990, Tonhasca 1996, Tonhasca *et al.* 2001).

During a study of the parasitoid genus *Myrmosicarius* Borgmeier (Diptera: Phoridae), whose preferred hosts are leaf-cutter ants (Disney *et al.* 2006), other myrmecophilous and parasitoid species of scuttle fly were also observed and collected from colonies of the same ants. In addition, some phorids

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associated with army ants were collected. The specimens were preserved in 70% alcohol and then mounted on slides in Berlese Fluid (Disney 2001). We report on these below, including the descriptions of three new species and a new genus. In addition four species are characterized but not named, because one was badly damaged and three require the hitherto unknown (or currently unrecognized) sex in order to be named.

REVIEW OF SPECIES

Holotypes and most paratypes of the new species have been deposited in the Museum Bernardino Rivadavia, Buenos Aires, Argentina (MBR). Otherwise duplicates have been deposited in the Museum of Zoology, University of Cambridge, Cambridge, England (MZUC) and in the collection of P.J.F. at the Universidad Nacional de Quilmes (P.J.F.). Ant specimens were also deposited in the Museum Bernardino Rivadavia as well as in P.J.F.'s collection.

Genus *Apocephalus* Coquillett

There are probably at least 300 species of this genus in the Neotropical Region, as indicated by recent revisions and additions by Brian Brown. Most species can only be named in the female sex in our present state of knowledge. The species noted below probably belongs in one of the groups covered by Brown (1997, 2000). Most larvae whose habits are known are parasitoids of ants.

Apocephalus sp. indet.

A single female, detailed below, was damaged when collected and has subsequently faded badly in the alcohol preservative (possibly because it was teneral). It is probably an undescribed species, but until fresh material is collected it is being put to one side.

Material examined: 1 female, ARGENTINA, Santiago del Estero, near Brea Pozo, March 2002, over *Atta vollenweideri*, L. Elizalde (MBR).

Genus *Cremersia* Schmitz

Borgmeier (1961) keyed the females of a dozen species and a further species was added by Disney & Rettenmeyer (2007). In his previous key Borgmeier

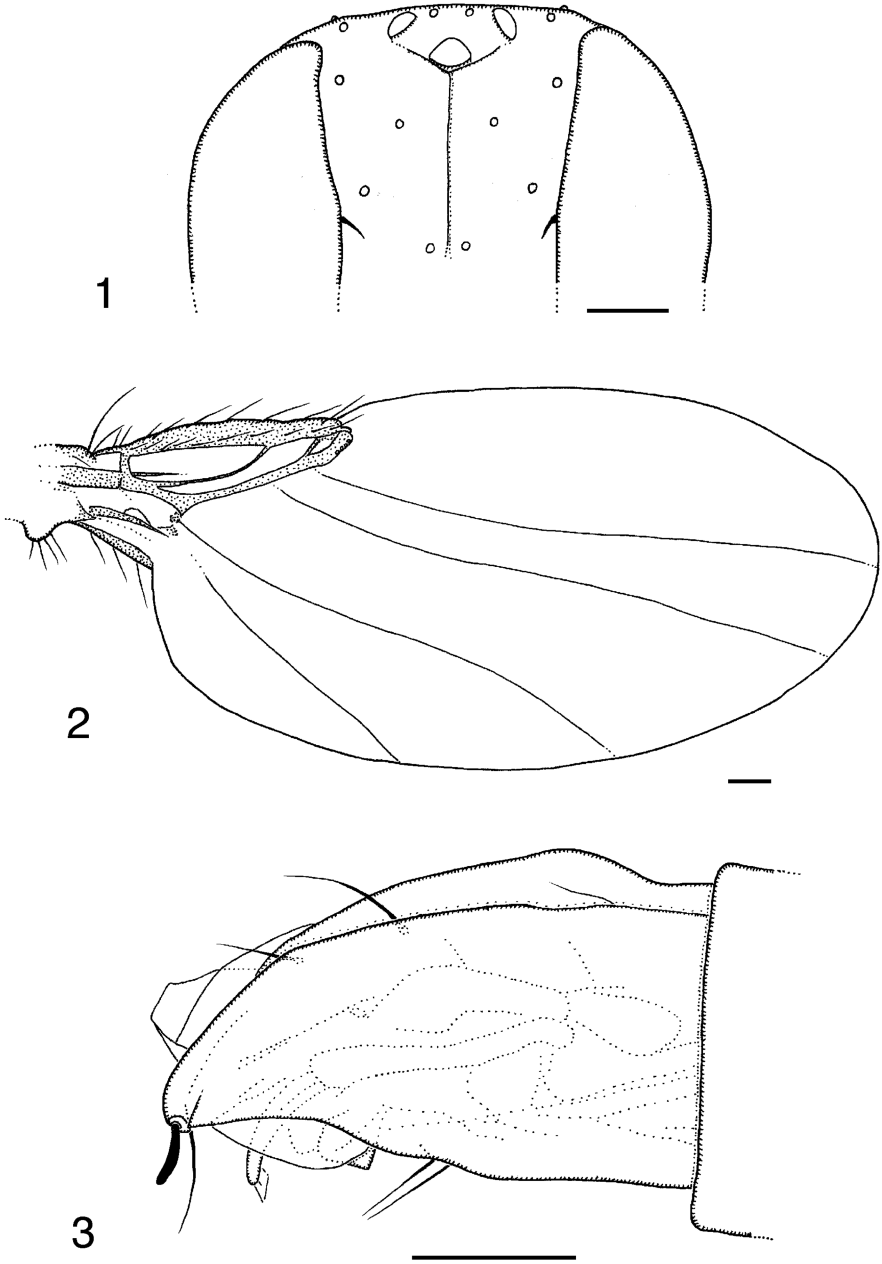
(1925) erroneously interpreted the complex ovipositor segments as the male hypopygium.

***Cremersia crassicostalis* Disney n. sp.**

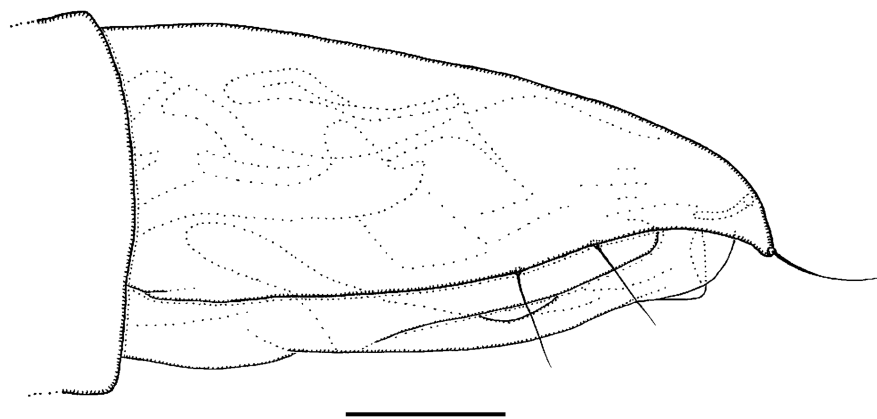
Figs. 1-5

In the keys of Borgmeier (1961) this species runs to *C. costalis* Borgmeier, which it closely resembles. The latter differs in having the hairs at the hind margin of abdominal tergite 7 longer than the tergite and likewise with those at the rear of sternite 7 (Fig. 33 in Borgmeier, 1925), in having the costa slightly concave anteriorly instead of convex (Estampa IX, Fig. 42 in Borgmeier 1925), and having 'der Rectalampulle' being subcircular (Estampa 27, Fig. 1 in Borgmeier 1928) rather than being elongated by being tapered anteriorly.

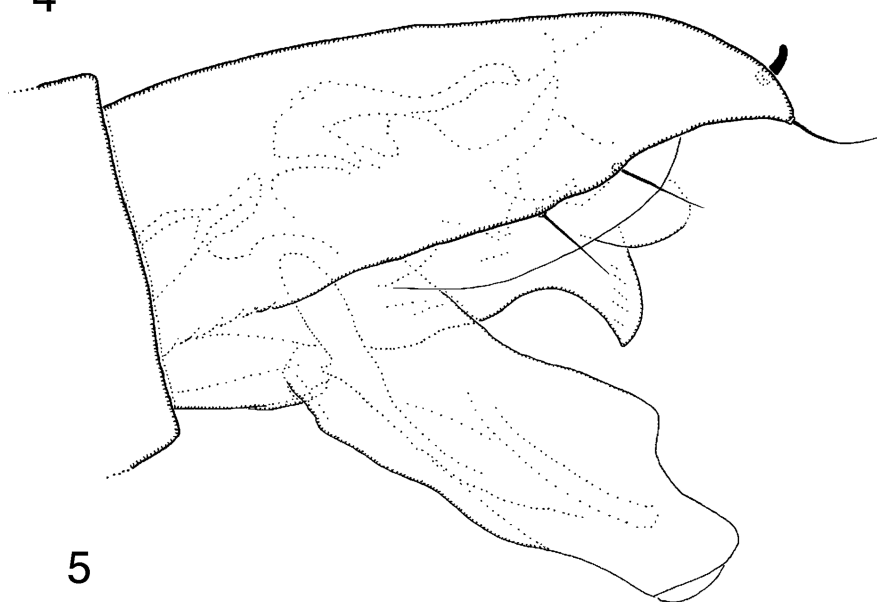
Female. Frons brown, with 26-36 hairs, dense but very fine microsetae and bristles on frons arranged as in Fig. 1. Cheek with one small hair and jowl with one strong bristle. Postpedicels about 1.5x as long as broad, straw yellow, without subcuticular pit sensilla (SPS) vesicles, and with short arista (only about as long as distance between anterior ocellus and base of antennae. Labrum and labella also straw yellow. Palps broadest just before middle with a shallow depression on upper surface at this point; the tip with 4 small bristles (all shorter than breadth of palp) and 2-4 similar bristles further back. Labrum about 0.6x as wide as postpedicel. Labella with only a few short spinules below. Thorax yellow to more light orange brown on top. Mesopleuron bare. Two notopleural bristles and no cleft in front of these. Scutellum with an anterior pair of hairs (about as long as hairs near notopleurals) and a posterior pair of bristles. Abdominal tergites brown, with longer hairs than rest at rear margins of 2-6. Ratios of lengths of tergites 1-6 about 0.5 : 1.7 : 1.6 : 1.2 : 1.1 : 1. Venter straw yellow, and with hairs below segments 3-5. Segment 6 with a small brown sternite bearing hairs, those at the rear margin being the longest. Segment 7 elongated and embracing the terminal segments that can be at least partly withdrawn as it is invaginated. Ovipositor sheath and withdrawn ovipositor (together comprising segments 8-10) as Figs. 3-5. Legs straw yellow apart from brown patch on mid coxa and a light brown tip to hind femur. Fore tarsus slender and with posterodorsal hair palisade on segments 1-4, and 5 is a little longer than 4 and slightly tapered. Dorsal hair



Figs. 1-3. *Cremersia crassicostalis* female. Fig. 1. Frons, with bristles represented by their basal sockets only; Fig. 2. Right wing; Fig. 3. Right face of ovipositor sheath with the ovipositor withdrawn (together comprising abdominal segments 8-10). (Scale bars=0.1 mm)



4



5

Figs. 4-5. *Cremersia crassicalis* female, left faces of ovipositor sheath with the ovipositor withdrawn. Fig. 4. With sheath closed; Fig. 5. With sternum of segment 8 deflected ventrally (as when an egg is being laid). (Scale bar=0.1 mm)

palisade of mid tibia extends about three quarters of length. Hairs below basal half of hind femur a little shorter than those of anteroventral row of outer half. Hind tibia with 16-18 differentiated posterodorsal hairs, with the last being more spine like. Spinules of apical combs simple. Wings 1.7-1.8 mm

long and as Fig. 2. Costal index 0.32-0.33. Costal ratios 6.1-7.1 : 2.2-2.8 : 1. Costal cilia (of section 3) 0.11-0.13 mm long. Hair at base of vein 3 absent. With 3-4 axillary bristles, all being shorter than costal cilia. Sc clearly not reaching R1. Thick veins pale yellowish grey, thin veins 4-6 light grey and 7 paler (especially in basal third). Membrane only very lightly tinged grey. Haltere knob brown.

Material examined: Holotype female, ARGENTINA, San Cristóbal, Santa Fe, 5 November 2005, over foragers of *Neivamyrmex pseudops*, L. Elizalde (ASC 128) (MBR).

Paratypes: 1 female as holotype (ASC 129); 2 females, as holotype except, 10 May 2006, (ASC 385 and 386) (MBR and MZUC)

Etymology: The name refers to the thickened costa.

Field observations: these phorids were attacking workers very fast in the side of body. Before an oviposition attempt, the fly hovered in the air following an ant for some seconds.

Genus *Ecitoptera* Borgmeier & Schmitz

The females of the twelve Neotropical species are keyed, along with the five known males, by Borgmeier (1960) and a female of a Nearctic species is covered by Disney & Kistner (1998).

Ecitoptera concomitans Borgmeier & Schmitz

This species has previously been reported from Argentina, Brazil, Costa Rica and Panama.

Material examined: 1 male, 1 female, ARGENTINA, Campo Bandera, Formosa, 22 December 2003, over a foraging trail of *Eciton dulcium*, L. Elizalde (TDCB6) (MBR, MZUC).

Previous host records: with the following army ants, *Eciton burchellii* (Disney & Rettenmeyer 2007), *E. dulcium*, *E. vagans*, *Nomamyrmex esenbeckii* & *N. hartigii* (Borgmeier 1960).

Ecitoptera subciliata Borgmeier

This species has previously been reported from Brazil, Costa Rica and Panama.

Material examined: female, ARGENTINA, San Cristóbal, Santa Fe, 13 May 2006, walking in a foraging trail of *Neivamyrmex pseudops*, L. Elizalde (ASC 398) (MBR).

Previous host records: with the following army ants, *Eciton dulcium*, *Nomamyrmex esenbeckii* & *N. hartigii* (Borgmeier 1960) and *Eciton burchellii* and *Labidus praedator* (Disney & Rettenmeyer 2007).

***Lucianaphora* Disney new genus**

Type species: *L. folgaritae* sp. n.

Diagnosis (only female known): Ocelli present; frons with median furrow, 4 supra-antennal bristles and three rows with 2 or 4-4-4 bristles above these; postpedicel longer than broad, with a short arista bearing short hairs; palps with short bristles confined to tip; each side of thoracic scutum with a humeral, two notopleural, an intra-alar, a post-alar and a pre-scutellar dorsocentral bristle; four bristles on scutellum; mesopleuron bare and with mid-mesopleural ridge; abdominal tergites 1-5 broad; tergite 6 (T6) reduced to vestiges at side; rest of abdominal terminalia modified into a long, sinuous, tubular ovipositor and its sheath; cerci absent; mid and hind tibia with a dorsal hair palisade; fifth tarsal segments of front and middle legs slightly tapered and clearly longer than fourth segments; costa at most one third of wing length, vein 3 unforked; with two bristles on axillary ridge and no hair at base of vein 3; haltere normal.

In the most recent key to world genera (Disney, 1994) this genus runs to couplet 172, lead 1, to *Pradea* Borgmeier. But this genus has globose postpedicels, only two bristles on the scutellum, T6 present and an entirely different form of the ovipositor and its sheath, which is broader, dorso-ventrally flattened and down curved.

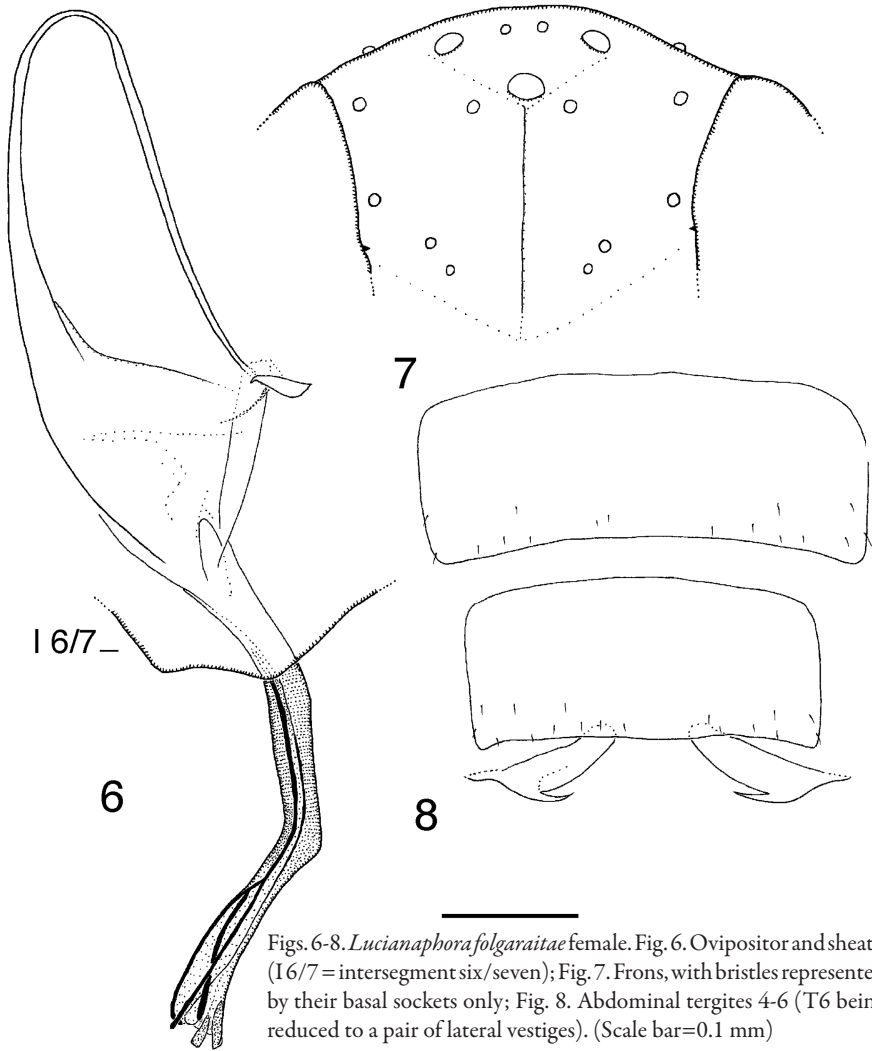
It remains a possibility that this genus represents the hitherto unknown females of a genus currently only known in the male sex.

Etymology: Named after Luciana Elizalde, who collected the type series.

***Lucianaphora folgaritae* Disney n. sp.**

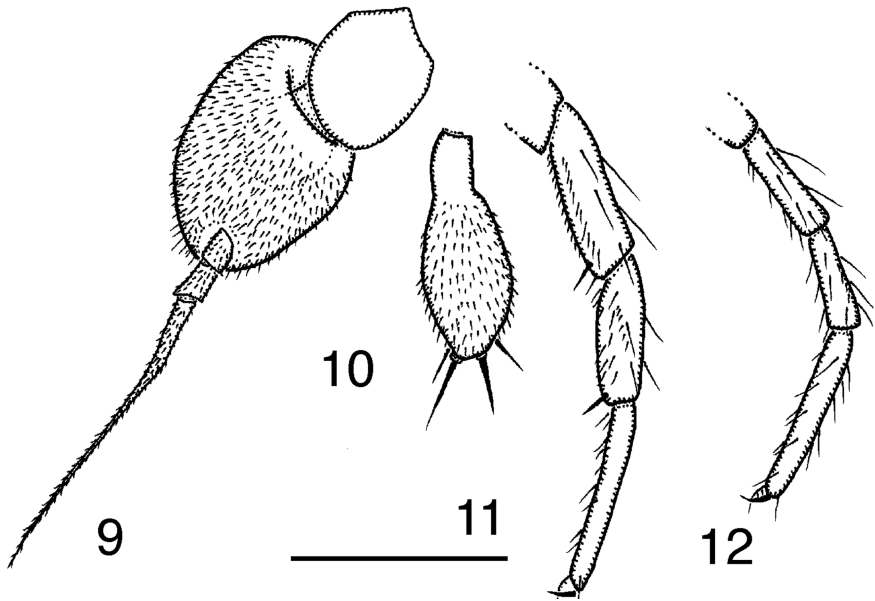
Figs. 6-12

Female: Frons brown, clearly broader than long, with 44-56 hairs and very dense microsetae. Supra-antennal bristles (SAs) robust but lower pair



Figs. 6-8. *Lucianaphora folgaritae* female. Fig. 6. Ovipositor and sheath (I6/7 = intersegment six/seven); Fig. 7. Frons, with bristles represented by their basal sockets only; Fig. 8. Abdominal tergites 4-6 (T6 being reduced to a pair of lateral vestiges). (Scale bar=0.1 mm)

shorter and a little less robust. Bristle arrangement as Fig. 7, but antials, when present, are weaker than anterolaterals and almost as close to the eye margin but about level with the upper SAs. Cheek without bristles and jowl with a single small bristle only. Postpedicels as Fig. 9, light brown, seemingly with 0-5 SPS vesicles that are variable in size. Palps dusky straw yellow and as Fig. 10, with 4-6 small bristles. Labrum paler than palps and about 0.6x as wide



Figs. 9-12. *Lucianaphora folgaraitae* female. Fig. 9. Right antenna; Fig. 10. Left palp; Fig. 11. Mid tarsus, anterior face of segments 3-5; Fig. 12. Front tarsus, posterior face of segments 3-5. (Scale bar=0.1 mm)

as postpedicel and about 1.2x as wide as a palp. Labella together about 1.1x as wide as a postpedicel, a little paler than labrum, and with only scattered hairs below. The glossa relatively large, being about 0.6x as long as labrum. Thorax brown, being paler on sides, and with chaetotaxy and mesopleuron as in generic diagnosis. Abdominal tergites 1-5 brown and with small sparse hairs. T6 reduced to a pair of lateral vestiges, T4-T6 as Fig. 8. Venter brownish grey, and with hairs below segments 3-6 minute (and easily overlooked at low magnifications). Segments 7-10 modified into a retractile ovipositor and its sheath (Fig. 6). Rectal papillae, furca and Dufour's crop mechanism evidently absent. Legs with coxae to tibiae brown, but the front legs more yellowish brown, and tarsi dusky straw yellow. Fore tarsus with posterodorsal hair palisade on segments 1-4 and 3-5 as Fig. 12. Dorsal hair palisade of mid tibia extends almost three quarters of length and segments 3-5 as Fig. 11. A few hairs below basal half of hind femur a little longer than those of anteroventral row of outer half. Hind tibia with 12-17 weakly differentiated posterodorsal hairs apart from the more spine-like last one. Spinules of api-

cal combs simple. Wings 1.1-1.2 mm long. Costal index 0.28-0.29. Costal ratios 4.6-6.3 : 1, vein 3 being unforked. Costal cilia (of section 3) 0.04-0.05 mm long. No hair at base of vein 3. With 2-3 axillary bristles, the outer being longer than costal cilia. Subcosta not reaching vein R1. Thick veins greyish brown, thin veins grey. Membrane tinged brownish grey, being darkest against front margin beyond costa. Haltere brown.

Material examined: Holotype female, ARGENTINA, Noetinger, Cordoba, 1 August 2005, over *Acromyrmex lundii* L. Elizalde (LU 1/4) (MBR).

Paratypes: 3 females as holotype, except one in PJF and one in MZUC.

Etymology: Named after Patricia Folgarait, who has contributed much to our knowledge of the phorid parasitoids of leaf-cutter ants.

Field observations: The flies were sitting on the side of the foraging trails. They approached the ants walking or with short flying bouts. To oviposit they walked towards the lower part of the head of an ant, and positioned the ovipositor pointing towards the maxillae, close to which they are presumed to inject the eggs.

Hosts: *Acromyrmex crassispinus*, *Ac. heyeri*, *Ac. lundii*.

Genus *Macrocerides* Borgmeier

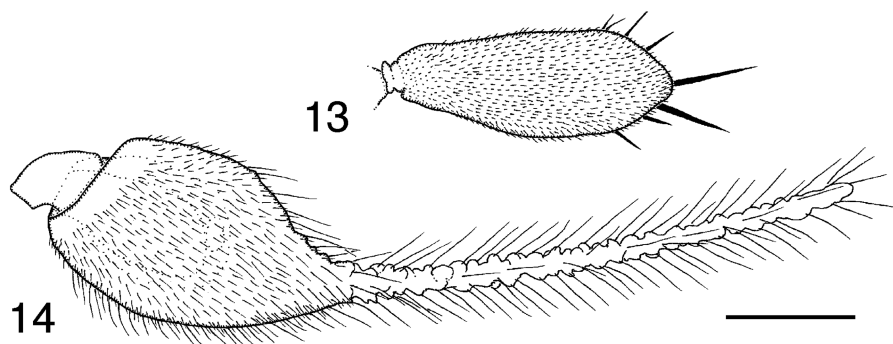
This genus may only be an assemblage of *Megaselia* species whose males have unusual antennae (see the comments under that genus below). The males of *Macrocerides* were keyed by Borgmeier (1969).

Macrocerides attophilus Disney n. sp.

Figs. 13-14

In the key of Borgmeier (1969) this species runs to couplet 2, lead 1, to *M. abaristalis* Borgmeier, which also has lost the arista but has the tip of the postpedicel extended to form a pseudo-arista. However it is immediately distinguished by its yellow, as opposed to brown, palps and legs; and the postpedicels are a lighter brown. Furthermore the new species has brown haltere knobs, as opposed to pale yellow. In addition the new species is smaller (wing length <2.1 mm, as opposed to >2.1 mm) and there are only 2-3 axillary bristles instead of more than 3.

Male. Frons brown, clearly much broader than long, with the median furrow vestigial but its line indicated by a brown band darker than the immediately



Figs. 13-14. *Macrocerides attophilus* male. Fig. 13. Right palp from above. Fig. 14. Left antenna. (Scale bar=0.1 mm)

adjacent regions. With 26-44 hairs and dense but greatly reduced and very fine microsetae. The four supra-antennals (SAs), antials and anterolateral bristles form a single row that is gently convex towards the front margin. SAs robust but the lower pair a little weaker. Pre-ocellars about as far apart as either is from a mediolateral bristle, which is level with or very slightly higher on frons. Cheek without bristles and jowl with two small ones. Postpedicels pale brown with a pale pseudo-arista, as Fig. 14, and without SPS vesicles. Palps straw yellow, with 7-10 bristles, 5-10 hairs and as Fig. 13. Proboscis small and pale, with the labrum only about 0.8x as wide as a palp and the labella with only small hairs below. Thorax brown, being paler on sides. Mesopleuron bare. Two notopleural bristles (but on one side of one specimen there is only one) and no cleft in front of these. Scutellum with two pairs of somewhat fine bristles with the anterior pair slightly longer than those behind. Abdominal tergites brown with the hairs largely confined to the hind margins and T6 longer than rest. Venter dusky straw yellow, with small hairs below segments 4 and 5 and only a few obscure ones on 6. Hypopygium brown, with a pale yellow anal tube, but small (the epandrium <0.2 mm long, the anal tube at most 0.12 mm long). The posterovental regions of the epandrium with 20-30 short hairs each side. The cerci subcircular (being only about 0.06 mm long) and each with 14-18 hairs. The lobes of the hypandrium are bare and dark brown. The left one is narrow, inclined towards the middle and deflected forwards. The right lobe is longer and wider and extends rearwards. With two rectal papillae. Legs largely straw yellow apart from a brown patch on

mid coxa and a variable light brown darkening of the outer half of hind femur and parts of hind tibia. Fore tarsus with posterodorsal hair palisade on segments 1-5 and 5 slightly longer than 4. Dorsal hair palisade of mid tibia extends about nine tenths of length. Hairs below basal half of hind femur shorter (and not differentiated from those of the adjacent anterior face) than those of anteroventral row of outer half. Hind tibia with about a dozen weakly differentiated posterodorsal hairs apart from a longer one near base and the most apical one that is robust. Spinules of apical combs simple. Wings 1.7-1.9 mm long. Costal index 0.58-0.64. Costal ratios 3.1-3.3 : 1.7-1.8 : 1. Costal cilia (of section 3) 0.04-0.06 mm long. No hair at base of vein 3. With 2-3 fine axillary bristles, which are longer than costal cilia. Vein Sc not reaching R1. Thick veins yellowish to brownish grey, thin veins more grey and 7 paler than rest. Membrane lightly tinged grey (just evident to naked eye when viewed against a white background). Haltere knobs brown.

Material examined: Holotype male, ARGENTINA, Reserva Natural Formosa, 4 October 2004, over *Atta saltensis*, L. Elizalde (4-LRFH3) (MBR). Paratype male, same data as holotype except (MZUC).

Etymology: The name refers to the association with *Atta*.

Genus *Megaselia* Rondani

This huge genus comprises at least half the species in the family. The boundaries of the genus are far from settled as there has been a tendency to transfer, or assign, species that are distinctive in one sex only to separate genera. The result is that these 'genera' can often only be recognised in one sex. What is required is clear characterisation of the species and the naming of new species on the basis of males or males plus females. Too many species with distinctive females have been named from this sex alone. Subsequently their unrecognised males have been found to have been previously assigned to *Megaselia* or when discovered they are not distinguishable from *Megaselia*. The female specimen described below has a distinctive, highly modified, ovipositor. Apart from this it is a typical member of the genus. If, however, its unknown male proves to be distinctive also then the generic assignment will need to be reconsidered.

In the most recent keys to world genera (Disney, 1994) the female treated below runs to couplet 242, lead 2 to the unresolved cluster *Diocophora*, *Mac-*

rocerides (part) and *Megaselia* (part). *Diocophora* has been recently reviewed (Disney & Berghoff, 2007) and can be discounted from further consideration. In the note appended to this cluster it is pointed out that the females of *Macrocerides* species whose males have a bristle on the mesopleuron have yet to be described. It is possible, therefore, that the species below is one of these. However, it is currently recognised that the genus *Macrocerides* may only represent an assemblage of *Megaselia* species whose males have aberrant antennae (Disney, 1994). It cannot be the female of the *Macrocerides attophilus* described above as the latter has a bare mesopleuron.

Megaselia sp. Arg. A

Fig. 15

In the absence of a male this species is not being named.

In the basic key to Neotropical species of *Megaselia* (Borgmeier, 1962) this species will run down on page 302 to couplet 30, lead 1, to *M. rudimentalis* Borgmeier. However, the latter does not have the terminal abdominal segments modified into an elongated ovipositor. Females with such an ovipositor (typical of species with parasitoid habits) were assigned by Borgmeier to the separate genus, *Plastophora* Brues, which has long since been synonymised with *Megaselia*. In his keys to '*Plastophora*' (Borgmeier, 1971) the female described below runs to couplet 11, lead 1, to *M. luteizona* (Borgmeier). It resembles this species but is smaller, has a brown (not yellow) haltere knob and costal section 2 is clearly shorter than section 1.

Female. Frons yellow (but with some brown patches on ocellar triangle), clearly broader than long, with 134-146 hairs and dense but fine microsetae. SAs robust but lower pair a little shorter. Upper SAs at about the same level on frons as antials, which are a little closer to anterolaterals, which are slightly higher on frons. Pre-ocellars about as far apart as either is from a mediolateral bristle, which is at about the same level on frons. Cheek with 2 bristles and jowl with 2 longer ones. Postpedicels subglobose, straw yellow, with a single SPS vesicle. Palps yellow, with a short basal segment, and the second with 6-7 bristles as many hairs. Labrum paler than palps and about 0.7-0.8x as wide as postpedicel. Labella slightly darker on top, the two together being 1.1-1.2x as wide as postpedicel, and with >40 short spinules below each. Thorax mainly straw yellow, being paler on sides. Mesopleuron with 7-8 hairs and a strong

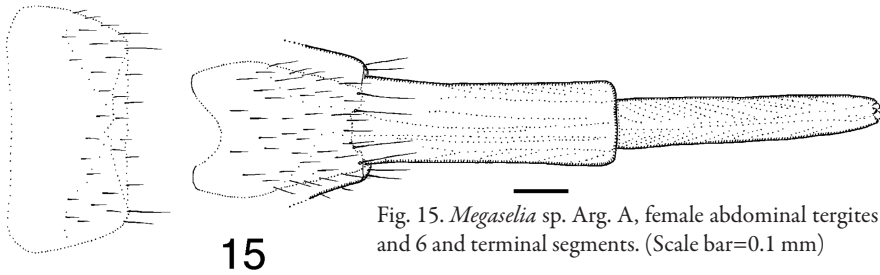


Fig. 15. *Megaselia* sp. Arg. A, female abdominal tergites 5 and 6 and terminal segments. (Scale bar=0.1 mm)

bristle at rear margin. Three notopleural bristles (the middle one being shorter than the other two) and no cleft in front of these. Scutellum with four bristles, the anterior pair being 0.6-0.7x as long as the posterior pair. Abdominal tergites mainly light brown in their posterior halves and straw yellow in their anterior halves. T5-T6 and ovipositor segments as Fig. 15. Some longer hairs at sides of T2. Venter yellowish grey, but darker on flanks extending from side margins of tergites, and with hairs below segments 3-6. The ovipositor sheath brown. Dufour's crop mechanism pale, about 0.25 mm long and with a very short pair of lobes behind. Legs straw yellow apart from brown patches on mid coxae and the tips of the hind femora. Fore tarsus with posterodorsal hair palisade on segments 1-5 and 4 and 5 about equal in length. Dorsal hair palisade of mid tibia extends about 0.8x the length. Hairs below basal half of hind femur a little longer than those of anteroventral row of outer half. Hind tibia with 9-10 differentiated posterodorsal hairs. Spinules of apical combs simple. Wings 1.6 mm long. Costal index 0.55-0.60. Costal ratios 3 : 2 : 1. Costal cilia (of section 3) 0.06 mm long. No hair at base of vein 3. With 5 axillary bristles, the outermost three at least being longer than costal cilia. Sc fading away before reaching R1. All veins yellowish grey. Membrane tinged grey (just evident to naked eye when viewed against a white background). Haltere knob brown.

Material examined: Female, ARGENTINA, Chaco National Park, 10 May 2004, *Labidus praedator*, L. Elizalde (TCH 28) (MBR).

Genus *Xanionotum* Brues

Fourteen species are known from the Nearctic and Neotropical Regions. The Nearctic species were keyed by Borgmeier (1963) and the females of the twelve species, from both regions, known in this sex are keyed by Borgmeier

(1968), who amends his key to the Nearctic females. However, these keys incorporate some confusions that are discussed by Disney & Rettenmeyer (2007), who describe a further species that was previously misidentified. Their discussion of the features of this genus inadvertently referred to the isolated bristles at the base of the femora, instead of the tibiae. This small bristle at the base of the mid tibia is critical in the recognition of males as belonging to this genus (Disney 1994). A Brazilian species known only in the male sex is described (as *Metopina photophila*, the female being a different species) by Borgmeier (1959).

Couplets 10 and 11 of Borgmeier's (1968) key to females are not very satisfactory because of variations in size. The numbers of long bristles on the dorsal face of segments 1-4 of the abdomen provide a better means of separation thus:

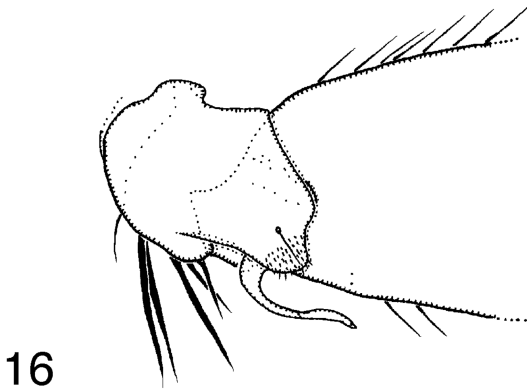
10. Bristle numbers on upper faces of segments 1-4 of abdomen I-0-2, II-6, III- 6-8, IV- 8.....*bruchii* (Borgmeier)
 — With more numerous long bristles on these segments..... 11
 11. Abdominal bristles I-8, II-10, III-12, IV-14 and relatively short (<0.25 mm).....*delicatum* (Borgmeier)
 — Abdominal bristles 6-2, II-8, III-10, IV-10 and relatively long (most being >0.25 mm).....*spinosius* (Borgmeier)

Xanionotum bruchi (Borgmeier)

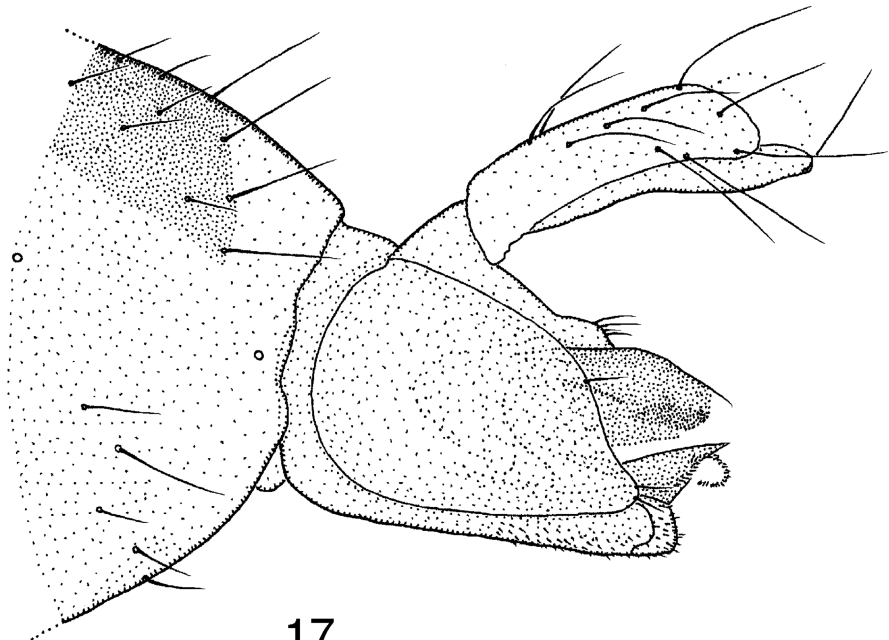
Figs. 16-17

This species has previously been reported from Argentina and Brazil. Details of the male as Figs. 16-17.

Material examined: 3 males, 3 females, ARGENTINA, San Cristóbal, Santa Fe, 5 November 2005, L. Elizalde (ASC 128); 1 male, 1 female, 9 May 2006, (ASC 368); 20 males, 10 May 2006, (ASC 369); 8 males, same date, (ASC 370); 1 male, 1 female, same date, (ASC 372); 2 males, 1 female, same date, (ASC 374); 6 males, 1 female, same date, (ASC 377); 3 males, 1 female, same date, (ASC 383); 3 males, 1 female, same date, (ASC 384); 2 males, 1 female, same date, (387); 8 females, 13 May 2006, (ASC 398). All specimens were collected over *Neivamyrmex pseudops*.



16



17

Figs. 16-17. *Xanionotum bruchi* male. Fig. 16. Left face of hypopygium. Fig. 17. Posterior face of hind trochanter and femur. (Scale bar=0.1 mm)

One male (ASC 387) and 4 females (1 on ASC 383 and 3 on ASC 398) had a mite (Mesostigmata) clinging to their abdominal venters with the heads facing forward.

Previous host records: with the following army ants, *Neivamyrmex legionis*, *N. pseudops*, *Nomamyrmex esenbeckii*.

Field observations: The females left the nest and walked along the foraging trail, meanwhile the ants were foraging. The males were flying above the nest entrance and along the foraging trail. They captured females and carried them in flight. Six males were around a female in a messy ball. Some of these phorids were active during the night, when the ants were foraging.

UNIDENTIFIED MALES

Disney & Rettenmeyer (2007) gave code letters to a number of males that cannot be assigned to their correct genus until associated with their flightless females. These belong to a complex of genera that were not separated in the keys to genera (Disney 1994), but embraces *Ecitomyia* Brues, *Ecitophora* Schmitz, *Ecitoptera* Borgmeier & Schmitz and *Ecituncula* Schmitz, but also needs to consider *Acontistoptera* Brues and probably other genera currently only known in the female sex. We briefly characterize two further such species whose males need to be linked to their females before they can be named.

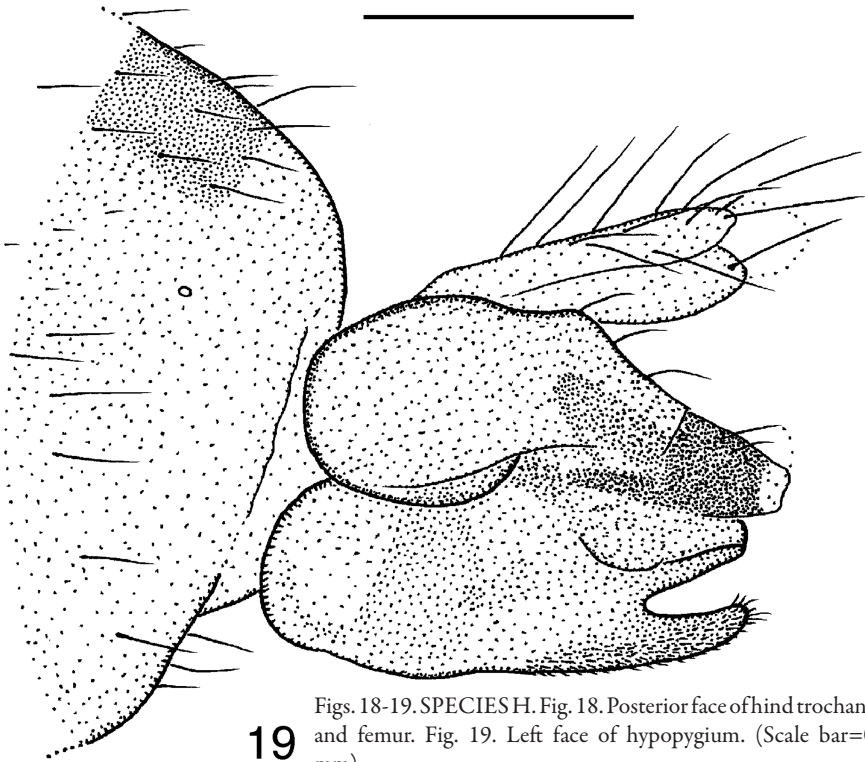
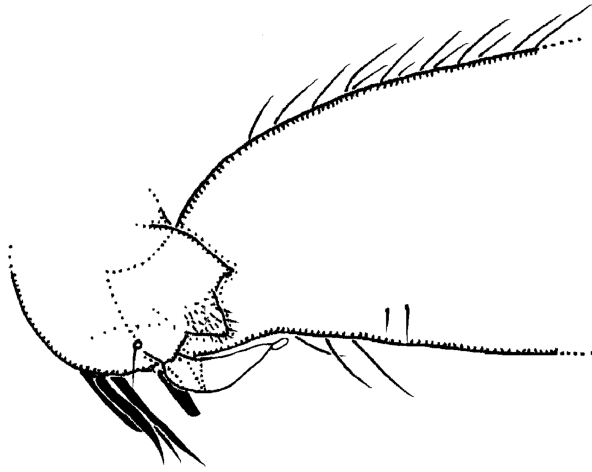
SPECIES H

Figs. 18-19

This resembles the known males of *Ecitoptera* apart from the reduced number of bristles on the frons.

Male. The brown frons clearly broader than long and with only a few hairs. A minute pair of supra-antennal bristles below a long pair of bristles, which are probably the antials. A similar pair of bristles (possibly the mediolaterals) are situated almost level with the lower (anterior) margin of the anterior ocellus but much nearer the eye margin. A similar bristle stands on the vertex each side and a pair of ocellar bristles are present. The light brown postpedicels are drawn out to an apical point bearing the arista. Without SPS vesicles. The slender palps are pale straw yellow, with their tips level with the tip of the proboscis, and bear 7-8 bristles and as many hairs. The similarly pale labrum only about 0.6x as wide as a postpedicel. The labella are paler and with only a few small spinules below. Thorax brown but paler on sides. Mesopleuron bare. Notopleuron with 3 bristles. Scutellum with an anterior pair of hairs (subequal to those on scutum) and a posterior pair of bristles. Abdominal

18



19

Figs. 18-19. SPECIES H. Fig. 18. Posterior face of hind trochanter and femur. Fig. 19. Left face of hypopygium. (Scale bar=0.1 mm)

tergites brown with small hairs. Venter pale brown with hairs restricted to segment 6. Hypopygium brown, with a pale brown anal tube, and as Fig. 19. Legs pale straw yellow apart from brown front basitarsus and patches on mid coxa and tip of hind femur. Front tarsus with posterodorsal hair palisades on segments 1-4 only. All tibiae lack dorsal hair palisades. Base of hind femur and trochanter as Fig. 18. Wings 1.25-1.35 mm long. Costal index 0.49-0.50. Costal ratios 0.60 : 1, vein 3 being unforked. Costal cilia 0.04-0.05 mm long. Sc pale and fading away before reaching vein 1. No hairs at base of vein 3 or on axillary ridge. Thick veins yellowish grey. Veins 4-6 grey but 7 very pale. Membrane very lightly tinged grey. Haltere brown.

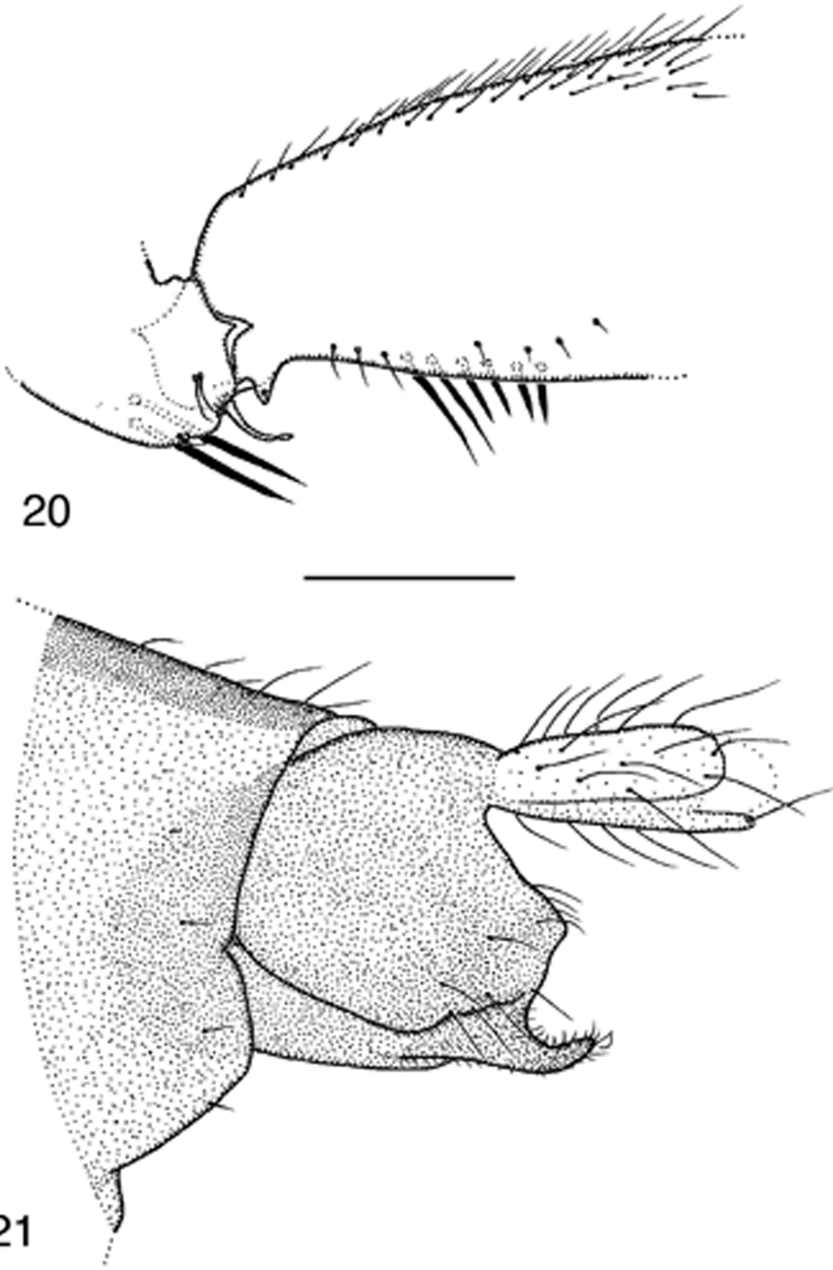
Material examined: 1 male, ARGENTINA, San Cristóbal, Santa Fe, 5 November 2005, over *Neivamyrmex pseudops*, L. Elizalde (ASC 128); 1 male, 10 May 2006 (ASC 128).

SPECIES I

Figs. 20-21

This is possibly one of the species of *Ecitoptera* currently only known in the female sex. In the keys to the known males (Borgmeier 1960) it fails to run down to either of the species recorded above or any other known male in this genus. It may, however, belong to a different genus.

Male. The brown frons clearly broader than long and with only a few hairs. A minute pair of supra-antennal bristles below a long pair of bristles, which are probably the antials. The anterolaterals are close to the mediolaterals (MLs) but a little further from the eye margin and a little lower on the frons. The MLs are a little shorter than the pre-ocellars, which are a little further apart than either is from an ML bristle. Six bristles on the vertex, including the ocellars. Postpedicels brown, subglobose but narrowed apically to the point of insertion of the arista, but at most as long as greatest breadth. Without SPS vesicles. Palps brown, with 5-7 bristles and twice as many hairs, and not quite extending as far as tip of proboscis. Labrum yellowish brown and only half the width of a postpedicel. Labella pale with only scattered hairs below. Thorax brown but paler on sides. Mesopleuron bare. Notopleuron with 3 bristles. Scutellum with an anterior pair of hairs (subequal to those on scutum) and a posterior pair of bristles. Abdominal tergites brown with small hairs, except for longer ones at rear margins. Venter brown with hairs



Figs. 20-21. SPECIES I. Fig. 20. Posterior face of hind trochanter and femur. Fig. 21. Left face of hypopygium. (Scale bar=0.1 mm)

restricted to segment 6. Hypopygium brown, with a pale yellow lightly tinged brown anal tube, and as Fig. 21. Legs mainly yellowish brown with darker tarsi, apart from brown patch on mid coxa and front basitarsus, but front legs otherwise the palest and hind legs the darkest. All five segments of front tarsus with a posterodorsal hair palisade. Base of hind femur and trochanter as Fig. 20. Wings 1.4-1.6 mm long. Costal index 0.5-0.6. Costal ratios 0.6-0.7 : 1, vein 3 being unforked. Costal cilia 0.04-0.05 mm long. Sc pale and fading away before reaching vein 1. No hairs at base of vein 3 or on axillary ridge. Thick veins yellowish brown. Veins 4-5 dark grey, 6 paler grey and 7 very pale. Membrane very lightly tinged grey. Haltere brown.

Material examined: 3 males, ARGENTINA, Chaco National Park, 10 May 2004, *Labidus praedator*, L. Elizalde (TCH 28). 6 males, Formosa, Estero Poi, Río Pilcomayo National Park, 26 May 2004, over *Labidus praedator*, L. Elizalde (LEP 28).

DISCUSSION

The new host records for the previously known species reflect the paucity of records for the associates of leaf-cutter ants compared with the numerous records for those recorded from the colonies of army ants, as the species concerned have all been previously recorded with a number of army ant hosts. For many of the records further observations are required to ascertain which are parasitoids of the associated ants, which are regular myrmecophiles and which are just casual associations of no significance.

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