

Revision of the *Melaloncha* (*M.*) *furcata*-group of bee-killing flies (Diptera: Phoridae)

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The *Melaloncha furcata*-group of bee-killing flies is revised, and two subdivisions recognized: the *M. furcata*-subgroup and the *M. obscurella*-subgroup. The *M. furcata*-subgroup consists of *M. furcata*, a species described from males only and thus not currently recognizable, and thirteen new species: *M. calceola*, *M. curvata*, *M. diffidentia*, *M. elongata*, *M. gibberosa*, *M. gongyla*, *M. hirtipecta*, *M. inversa*, *M. kungae*, *M. lingula*, *M. ovata*, *M. pilula*, and *M. varicosa*. The *M. obscurella*-subgroup consists of *M. obscurella* Borgmeier, and six new species: *M. mapiriensis*, *M. atlantica*, *M. dactyla*, *M. catervula*, *M. clandestina*, and *M. chamaea*. Possible hosts are known for some species, mostly stingless bees of the genus *Plebeia*.

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Introduction

The bee-killing flies, genus *Melaloncha*, are a fascinating group of Neotropical phorids. Larvae of all species are internal parasitoids of bees, with most attacking stingless bees (Meliponini; Brown 2004a). The taxonomy of this group has been greatly neglected, probably in part because the flies were difficult to collect, and thus rare in collections (Brown 2001). The thirty-two species described by earlier authors (i. e. Borgmeier 1934, 1959, 1971) is a small fraction of the entire fauna, which I estimate at 200 or more species.

The relationships of *Melaloncha* species are not well-resolved. A first, preliminary phylogeny (Brown 2004a) of *Melaloncha* and its hypothesized relatives was moderately well-supported, but the internal groupings were poorly-defined. The genus was organized into subgenus *Udamochiras* and *Melaloncha* s. s., and the species of *Udamochiras* were revised.

Within *Melaloncha* s. s., one distinctive subdivision was termed the *M. furcata*-group. Species of this group share the presence of wing vein R_{2+3} (Fig. 1), primitively present in most phorids, but absent in most *Melaloncha*. The postulated reappearance of this wing vein is considered a

synapomorphy within *Melaloncha*, and serves to unite the species of the *M. furcata*-group.

In this paper I revise the species of *M. furcata*-group, describing 19 new to science, and hypothesizing their phylogenetic relationships.

Methods and Material

This revision is based mainly on female specimens. Although we have possible males of some species, this sex in *Melaloncha* shows too few differences to be useful in characterizing species.

All specimens are barcoded, with their data stored at the LACM. Barcode data for holotypes is presented in square brackets for easy identification of holotypes.

Descriptions of species are relatively short, especially in species of the *M. obscurella*-sub-

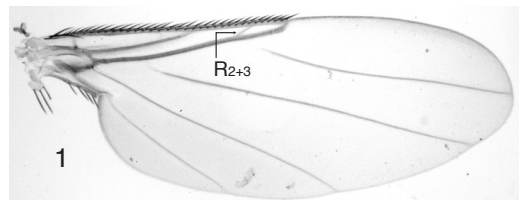


Fig. 1. Wing, *M. kungae* sp. n.

group. This brevity is because of the uniformity of the structure and color of most species within the group. The useful characters are nearly all found in the ovipositor, which we have illustrated extensively. Additionally, color images of all species are available on the author's web site, currently at *www.phorid.net*. Other, more general information about this genus is found at the same web site.

Material is deposited in the following collections (for more details on collections, see Arnett et al. 1993):

- AMNH - American Museum of Natural History, New York, USA.
- CBFC - Colección Boliviana de Fauna, La Paz, Bolivia.
- EMUS - Utah State University, Logan, USA.
- INBC - Instituto Nacional de Biodiversidad, Heredia, Costa Rica.
- INPA - Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil.
- KSEM - University of Kansas, Lawrence, USA.
- LACM - Natural History Museum of Los Angeles County, USA.
- MACN - Museo Argentina de Ciencias Naturales, Buenos Aires, Argentina
- MCZC - Museum of Comparative Zoology, Cambridge, USA.
- MUCR - University of Costa Rica, San Pedro, Costa Rica.
- MUSM - Museo de Historia Natural, Lima, Peru.
- MZSP - Universidade de São Paulo, Brazil.
- QCAZ - Quito Catholic Zoology Museum, Ecuador.
- USNM - United States National Museum, Washington, USA.

Phylogenetic Relationships

The relationships among taxa (Fig. 2) are partially hypothesized using the following character states (primitive state = 0, derived states = 1, 2):

- 1 - wing vein R_{2+3} absent (0), present (1).
Although the presence of wing vein R_{2+3} is primitive within the family Phoridae, it has been lost in most *Melaloncha* and the sister-group taxon *Melittophora* Brues. Its re-appearance in the *M. furcata*-group is therefore considered a derived character.
- 2 - frons relatively broad (0), greatly narrowed (0.30 head width or less) (1).
- 3 - frons relatively smooth, at most with shallow punctures (0), deeply punctate (1)
- 4 - ovipositor with fine longitudinal striations (Fig. 34, 35) that are not visible with light microscopy (0), with deep longitudinal striations

(Fig. 36) easily visible with light microscopy (1).

- 5 - palpal setae of normal size (0), short (1).
- 6 - apical section of dorsum of ovipositor slightly elongate (0), greatly elongate (1).

It is possible that the elongate flattened lobe in the *M. inversa*-subseries is homologous to this character, and that character 6 should apply to those species as well.

- 7 - ovipositor ending in regular point (0), ovipositor apically extended in laterally flattened, round lobe (1).
- 8 - frons yellow to orange (0), dark brown to black (1).
- 9 - ovipositor without posterior lobe at apex (0), lobe present (Fig. 37) (1).
- 10 - intersegment 7-8 without dorsal sclerotized hooks (0), scattered hooks present (Fig. 32) (1), hooks organized into 4 rows (Figs 33, 38) (2).
- 11 - inner tarsal claw of foreleg similar to outer claw (0), inner claw with enlarged inner tooth, making claws asymmetrical (Fig. 39) (1).

This character is found in all *M. obscurella*-subgroup taxa except *M. catervula* sp. n..

- 12 - ovipositor relatively broad (0), ovipositor elongate, narrow (1).
- 13 - posterior lobe of ovipositor broad (0), pointed (1).

Outgroup comparison with *M. catervula* indicates that a broad posterior lobe is primitive within the group.

Analysis of these characters using Hennig-86 (Farris, 1989) with all an all-zero outgroup, characters unordered and unweighted gives one tree (length 15, ci = 93, ri = 98), which is identical with that shown in Fig. 2, except the node marked "molecular characters" is collapsed. This node defines the *M. furcata*-subgroup, and is not yet demonstrated to be monophyletic, although there is support from molecular data. Based on combined analysis of sequence data from mitochondrial 12S rRNA, 16S rRNA, NADH 1 and nuclear 28S rRNA genes, *M. kungae* sp. n. and *M. gibberosa* sp. n. group together, exclusive of *M. chamaea* sp. n., in a larger matrix of *Melaloncha* species (B. Brown & P. Smith, in preparation).

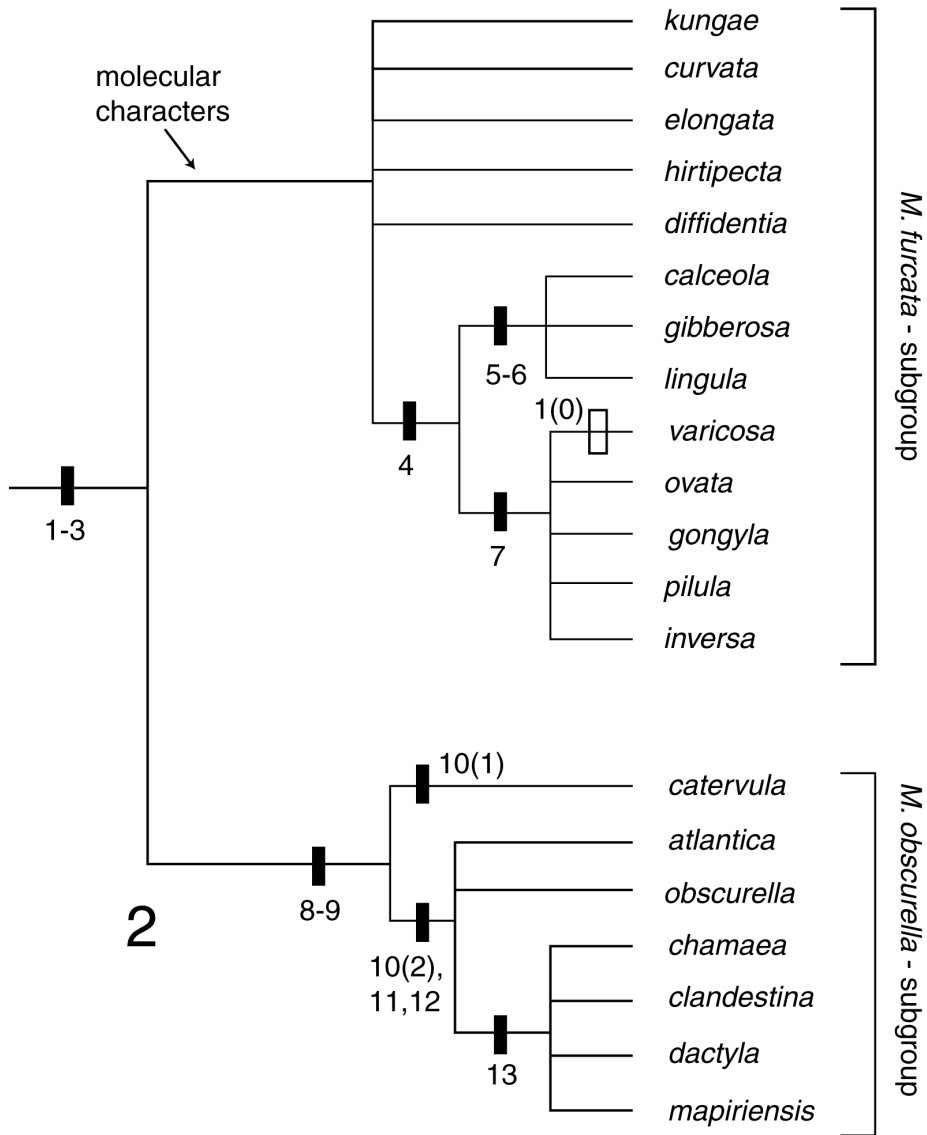


Fig. 2. Cladogram of *M. furcata*-group species. Numbers refer to character states in text.

Systematics

***Melaloncha furcata*-group**

Diagnosis. – Frons narrow, 0.30 head width or less, punctate. Mid- and hind tibiae without anterodorsal row of setae. Claws of foreleg thickened, of roughly equal length, with inner tooth arising from base. Mid- and hind tarsal claws not bifurcate. Wing vein R_{2+3} present, except in *M.*

varicosa sp. n., in which it apparently has been lost again. Abdominal tergites without large setae. Ovipositor lacking ventral, cercus-like process of the type found in *M. cingulata*-group (Brown 2004b). Apex of intersegment 7-8 a simple, elongate sclerite; lacking three-pronged dorsal process.

Behavior. – All species we have observed attacked bees while the fly was in flight; they attacked hosts

that were resting on surfaces or that were also in flight. This behavior is the same as that found in subgenus *Udamochiras*, but differs from all other species of *M.* (*Melaloncha*), which attack after landing.

Melaloncha furcata-subgroup

Diagnosis. – Frons yellow to orange. Intersegment 7-8 without small hooks.

Included species. – This group contains *M. furcata* Borgmeier, known only from males, the new species *M. kungae*, *M. curvata*, *M. elongata*, *M. hirtipecta*, *M. diffidentia*, and the species of the *M. gibberosa*-series (listed below).

Melaloncha furcata Borgmeier

Melaloncha furcata Borgmeier, 1934, p. 188, plate 3 fig. 17 (♂).

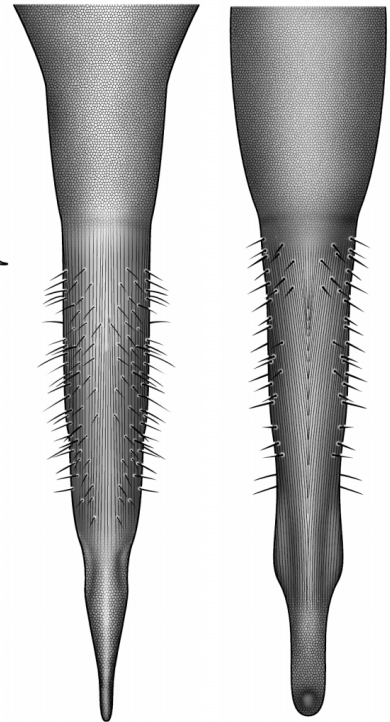
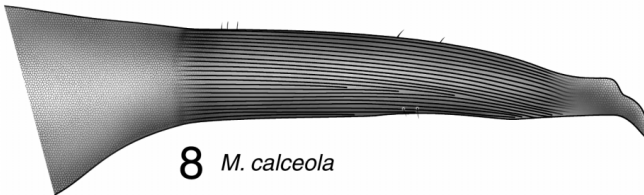
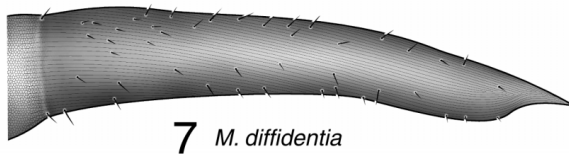
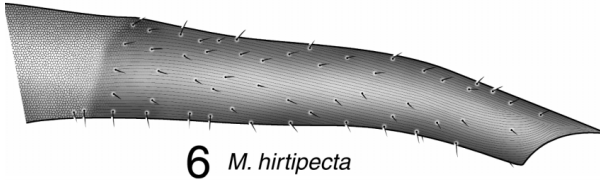
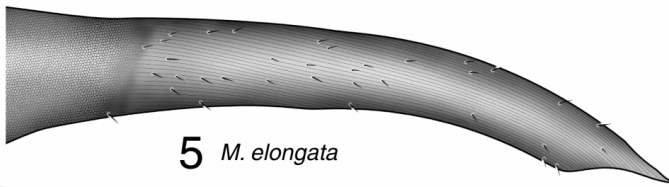
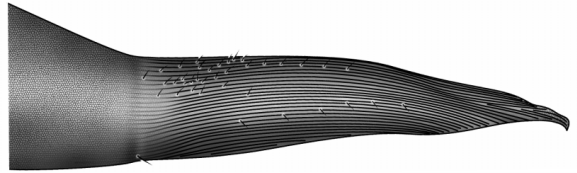
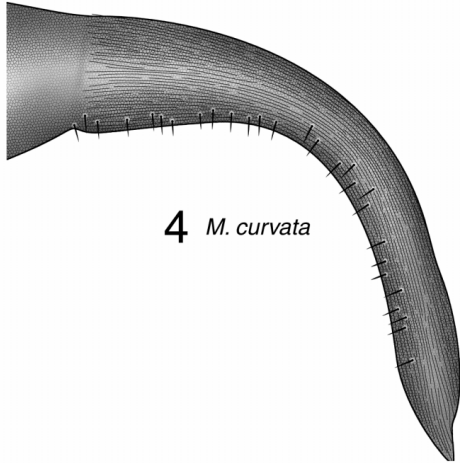
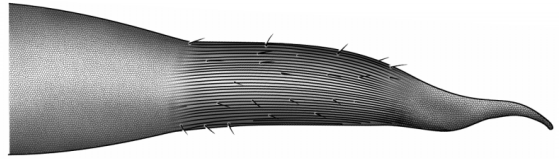
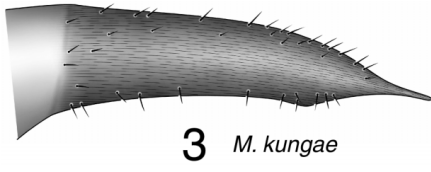
Type material. - Holotype ♂, BRAZIL: Espirito Santo: Santa Teresa, vi.1928, O. Conde [LACM ENT 122540] (MZSP; examined).

Recognition. – Unfortunately, this was one of the species that Borgmeier described from males only, a situation he later lamented (Borgmeier 1971: 125). Subsequently, he ascribed females and further males from a different site (Brazil: Santa Catarina: Nova Teutônia) to this species, although they were much smaller in size.

To understand the potential value of body size in assessing the likelihood of relationship, I measured hind tibial lengths for specimens of three species for which I have likely males and females (Table 1). Hind tibial lengths were used, rather than body length, because body length measurements are highly variable based on drying and preservation methods. In each species, the males and females had hind tibial lengths that were extremely similar. The holotype male of *M. furcata* would therefore belong to a species that has females larger than those of *M. diffidentia*, whose females were considered by Borgmeier (1959) to belong to *M. furcata*. True *M. furcata* females would probably be closer in size to the much larger *M. gibberosa*. Until further collecting can be

Table 1. Measurements of some *M. furcata*-subgroup species.

barcode	species	locality	sex	hindtibial length (mm)
122540	urcata (HT)	Santa Teresa, ES	m	1.20
127715	kungae	Amacayacu, Col.	m	0.80
127693	kungae	Amacayacu, Col.	m	0.80
069395	kungae	Yasuni, Ecu.	m	0.80
152416	kungae	Amacayacu, Col.	m	0.80
152419	kungae	Amacayacu, Col.	m	0.90
127657	kungae	Amacayacu, Col.	f	0.75
127807	kungae	Amacayacu, Col.	f	0.75
127744	kungae	Amacayacu, Col.	f	0.75
152921	kungae	Amacayacu, Col.	f	0.80
112030	kungae	Yasuni, Ecu.	f	0.85
035081	kungae	Rondonia, Brz	f	0.85
120344	diffidentia	Nova Teutonia, Brz	m	0.95
055429	diffidentia	Nova Teutonia, Brz	f	1.00
122179	diffidentia	Nova Teutonia, Brz	f	1.00
122422	diffidentia	Nova Teutonia, Brz	f	0.95
091932	diffidentia	Nova Teutonia, Brz	f	0.95
055832	diffidentia	Los Cedros, Mex.	f	0.90
075492	gibberosa	Tambopata, Peru	m	1.15
075458	gibberosa	Tambopata, Peru	m	1.10
075460	gibberosa	Tambopata, Peru	m	1.20
075701	gibberosa	Tambopata, Peru	m	1.30
074735	gibberosa	Tambopata, Peru	f	1.30
075506	gibberosa	Tambopata, Peru	f	1.30
074447	gibberosa	Tambopata, Peru	f	1.30
074789	gibberosa	Tambopata, Peru	f	1.30



Figs 3-12. Ovipositors, *M. furcata*-subgroup species. 3-10, left lateral. 11-12, dorsal.

done at or near the type locality in Espirito Santo, the name *M. furcata* should be used only for the holotype male.

Melaloncha kungae sp. n.

(Figs 1, 3, 34)

Etymology. – Named for Giar-Ann Kung, who has provided vital assistance to me in collecting and studying *Melaloncha*.

Type material. – Holotype ♀: ECUADOR: Napo: Yasuni National Park, PUCE Station, 0.63°S, 76.6°W, 3-20.xi.1998, T. Pape, B. Viklund, Malaise trap [LACM ENT 112149] (LACM). Paratypes: BOLIVIA: La Paz: San Juanito, near Teoponte, 15.49°S, 67.80°W, 1♀, 8.iv.2001, B. Brown, G. Kung, honey-sprayed leaves (LACM). BRAZIL: Amazonas: Manaus, Reserva Ducke, 3.13°S, 60.02°W, 1♀, 6-17.vii.1992, 2♀, 8-15.vii.1992, J. Vidal, 1A-10m (INPA, LACM), 60 km N Manaus, Reserva Campina, 2.67°S, 60.02°W, 1♀, 8-19.vi.1992, J. Vidal (INPA); Rondonia: 62 km SE Ariquemes, Rancho Grande, 10.53°S, 62.80°W, 1♀, 14-25.xi.1993, B. Harris, Malaise trap (LACM). COLOMBIA: Amazonas: PNN Amacayacu, 3.82°S, 70.26°W, 4♀, 9.iii.2000, 1♀, 10.iii.2000, 11♀, 11.iii.2000, 24♀, 12.iii.2000, B. Brown, G. Kung, attacking *Plebeia* bees, or attracted to bee aggregations, 93♀, 8-12.iii.2000, B. Brown et al., Malaise trap (EMUS, KSEM, LACM, MCZC, MZSP, NHRS, UNCB, USNM), 2♀, 8-12.iii.2000, M. Sharkey, total sweep sample (LACM), 2♀, 12-19.iii.2000, A. Feliz, Malaise trap #2, CAP-87 (LACM), 7 km W Leticia, 4.13°S, 69.90°W, 1♀, 26.viii.1997, B. Brown, G. Kung, attacking stingless bee aggregation (LACM), 22 km NW Leticia, 4.04°S, 69.99°W, 4♀, 27-28.viii.1997, 1♀, 1-4.ix.1997, 4♀, 4-7.ix.1997, M. Sharkey, Malaise trap, 1♀, 6-7.ix.1997, B. Brown, G. Kung, Malaise trap (LACM); Caquetá: PNN Chiribiquete, Cuñare-Amu, 0.21°N, 72.41°W, 3♂, 3♀, 14-17.ii.2001, M. Ospina, E. Gonzalez, Malaise trap CAP-1388, 300 m (LACM, UNCB), Rio Cuñare, 0.53°N, 72.63°W, 2♀, 15-19.xi.2000, E. Gonzalez, M. Ospina, Malaise trap, CAP-957 (LACM, UNCB); Vichada: PNN El Tuparro, 5.35°N, 67.86°W, 1♀, 16.vi.200, G. Kung, bee screen (LACM). ECUADOR: 1 male, 20♀, same data as holotype (LACM, QCAZ), 1♀, 19-30.x.1998, W. J. Hanson (EMUS). PERU: Madre de Dios: Cocha Cashu, 11.92°S, 77.30°W, 1♀, 31.viii-1.ix.1986, D. C. Darling, Malaise trap, 380 m (LACM), Pakitza, 11.94°S, 71.28°W, 2♀, 13-18.ii.1992, B. Brown, D. Feener, D. Quintero, Malaise trap (LACM, MUSM), Tambopata Research Center, 13.14°S, 69.61°W, 1♀, 22.vii.2001, B. Brown, G. Kung, honey-sprayed leaves (LACM); San Martin: 19 km NE Tarapoto, Biodiversidad, 2♀, ii.2003, C. Rasmussen, 950 m (LACM).

Recognition. – This species is distinguished from similar species (*M. elongata* and *M. diffidentia*) by the relatively short ovipositor and small body size.

Description. – Female: Body length 1.8-2.0 mm. Frons orange, punctate. Mean frontal width 0.27

head width. Ocellar triangle black; in some specimens dark color extends to eye margin. Ocular and genal setae flattened, yellow. Palpal setae yellow, except those at apex black. Scutum dark brown. Pleuron dark brown, with some lighter areas; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres slender. Apex of hind femur dark brown. Hind tibia 0.75-0.85 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray, except segment 6 yellow. Ovipositor basally yellow, apically dark brown to black; black portion of ovipositor 0.55-0.60 mm long. Ovipositor curved ventrally at apical one-third; dorsal apex of ovipositor forming short point. Surface of ovipositor with fine striations (not visible with light microscopy) and sparse, short setae.

Geographical distribution. – Widespread in the Amazon basin.

Host. – We collected this species attacking *Plebeia minima* Gribido, and *Plebeia* sp. at Amacayacu, and attacking *Tetragona* aff. *truncata* Moure at Tuparro, Colombia.

Melaloncha curvata sp. n.

(Figs 4, 35)

Etymology. – Named for the shape of the ovipositor, which is strongly curved compared to that of other *M. furcata*-group species.

Type material. – Holotype ♀: ARGENTINA: Misiones: Reserva Vida Silvestre Uruguay-í, 25.97°S, 54.11°W, 11.xii.2003, B. Brown, G. Kung, bee screen, 400 m [LACM ENT 077740] (MACN). Paratypes: ARGENTINA: Misiones: Reserva Vida Silvestre Uruguay-í, 25.97°S, 54.11°W, 4♀, 9.xii.2004, 15♂, 19♀, 10.xii.2003, G. Kung, bees on organic waste, at barbeque pit (EMUS, LACM, MACN, MCZC, USNM), 6♀, 11.xii.2003, B. Brown, G. Kung, bee screen, 400 m (LACM, MACN), 1♀, 15.xii.2003, G. Kung, attacking host bee *Tetragonisca angustula* (LACM), 10♀, 26.xii.2003, L. Gonzalez, honey spray (LACM, MACN).

Recognition. – This species can easily be separated from all other *M. furcata*-group species by the strongly curved ovipositor (Fig. 4).

Description. – Female: Body length 2.0-2.2 mm. Frons orange, punctate. Mean frontal width 0.22 head width, but wider ventrally. Ocellar triangle black. Ocular setae flattened, light brown. Genal and palpal setae yellowish-brown, except one

small and one larger apical setae on palpus black. Scutum dark brown. Pleuron dark brown, except anterior portion of anepisternum and ventral margin of meron yellowish brown; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown, except apical foretarsomere and hind tibia and tarsomeres, which are dark brown. Foretarsomeres slender. Apex of hind femur dark brown. Hind tibia 0.88-0.98 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray, except yellow near posterior apex. Ovipositor basally yellow, apically black; black portion approximately 1.4 mm long. Ovipositor strongly curved ventrally; dorsal apex of ovipositor forming narrow point. Surface of ovipositor with fine, longitudinal striation and sparse, short setae (especially ventrally).

Host. – These flies were attracted to an aggregation of *Trigona spinipes* (Fabricius) on flowers of a *Syagrus* sp. palm at Iguazu; we also collected them attacking *Tetragonisca angustula* Latreille at Uruguay.

Melaloncha elongata sp. n.

(Figs 5, 40)

Etymology. – Named for the shape of the ovipositor, which is elongate compared to that of some other similar species.

Type material. Holotype ♀: COSTA RICA: San José: Zona Protectora El Rodeo, 9.91°N, 84.28°W, 8.viii.2001, B. Brown, G. Kung, honey-sprayed leaves [LACM ENT 076143] (LACM). Paratypes: BOLIVIA: La Paz: 40 km NE Caranavi, Cumbre Alto Beni, 15.83°S, 67.56°W, 1♀, 14.iv.2001, B. Brown, G. Kung, 1♀, 16.iv.2003, 1♀, 18.iv.2003, B. Brown, S. Marcotte, E. Zumbado, honey-sprayed leaves, 1600 m (LACM), 4♀, 14.iv.2004, 2♀, 16.iv.2004, 3♀, 17.iv.2004, 1♀, 19.iv.2004, 1♀, 21.iv.2004, E. Zumbado, honey spray, 1600 m (CBFC, LACM), Coroico, Hotel Don Quixote, 16.19°S, 67.72°W, 1♀, 5.iv.2004, B. Brown, E. Zumbado, honey-sprayed *Phoenix* palm flowers, 1750 m (LACM). COSTA RICA: Guanacaste, 3 km SE Rio Naranjo, 1♀, 1-10.vii.1992, F. D. Parker (EMUS); San José: 1♀, same data as holotype (LACM). PANAMA: Canal Zone, Barro Colorado Island, 9.17°N, 79.83°W, 1♀, 12-19.vi.1996, J. Pickering, Malaise trap #6177 (LACM).

Recognition. – This species is distinguished from *M. kungae* and *M. diffidentia* by the relatively elongate ovipositor. It is similar to *M. hirtipecta*, but has fewer, sparser setae on the forecoxa (Fig. 40).

Description. – Female: Body length 2.0-2.5 mm.

Frons orange, punctate. Mean frontal width 0.22 head width. Ocellar triangle black; in some specimens dark color extends to eye margin. Ocular setae flattened, brown. Genal and palpal setae black. Scutum dark brown. Pleuron dark brown, except proepisternum and anterior portion of anepisternum yellowish-brown; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres slender. Apex of hind femur dark brown. Hind tibia 0.9-1.2 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen yellow, with darker median stripe. Ovipositor basally dark brown, apically black; black portion of ovipositor 1.1 mm long. Ovipositor curved ventrally along entire length, but more strongly at apical one-third; dorsal apex of ovipositor forming narrow point. Surface of ovipositor with fine, longitudinal striation and sparse, short setae.

Variation. – The specimens from Bolivia have an unusually narrow frons (0.18 head width) and have the ocular and genal setae yellow.

Host. – The specimens from Zona Protectora El Rodeo were collected at honey-sprayed undergrowth leaves the same day that *Scaptotrigona mexicana subobscuripennis* Schwarz bees arrived, after several days of collecting without either this fly or this bee being present. At Cumbre Alto Beni, Bolivia, the flies were attracted to an aggregation of bees, the commonest of which were *Paratamona epiphytophila* Pedro & Camargo and *Plebeia* sp.

Geographical distribution. - Costa Rica to Bolivia.

Melaloncha hirtipecta sp. n.

(Figs 6, 41)

Etymology. – From Latin words for hairy chest, referring to the dense setae of the forecoxae.

Type material. Holotype ♀: BOLIVIA: La Paz: Coroico, Hotel Don Quixote, 16.19°S, 67.72°W, 5.iv.2001, B. Brown, on *Phoenix* palm flowers, 1750 m [LACM ENT 128378] (CBFC). Paratypes: BOLIVIA: La Paz: Coroico, Hotel Don Quixote, 16.19°S, 67.72°W, 1♀ (abdomen only; rest of body used for molecular analysis), 5.iv.2004, 1♀, 6.iv.2004, B. Brown, E. Zumbado, honey sprayed *Phoenix* palm flowers, 1750 m (LACM).

Recognition. – This species can be distinguished from the similar *M. elongata* by the dense, long, black setae found anteriorly on the forecoxa; it is also slightly larger in size.

Description. – Female: Body length 3.2 mm (both specimens). Frons orange, punctate. Mean frontal width 0.16 head width. Ocellar triangle black. Ocular setae flattened, brown. Genal and palpal setae black. Scutum dark brown, except anterolateral corners yellowish-brown. Pleuron dark brown, except anterior one-third yellowish-brown; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown except hind tibia and apex of hind femur dark brown. Anterior face of forecoxa with long, dense, thick setae. Foretarsomeres slender. Hind tibia 1.4 mm long (both specimens). Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen yellow, except gray anterolaterally. Ovipositor basally yellow, apically dark brown to black; black portion of ovipositor 1.1 mm long (both specimens). Ovipositor slightly curved ventrally at apical one-third; dorsal apex of ovipositor forming short, blunt point. Surface of ovipositor with fine reticulation and sparse, short setae.

Host. – The holotype was collected on flowers of a *Phoenix* palm, where there was a small aggregation of *Trigona branneri* Cockerell (det. D. Roubik) and *Apis mellifera* L. Presumably they were attracted to *T. branneri*, as other nearby aggregations of *A. mellifera* did not attract flies.

Geographical distribution. – Bolivia.

Melaloncha diffidentia sp. n.

(Fig. 7)

Melaloncha furcata Borgmeier, 1934, p. 188, plate 3 fig. 17; 1959, p. 184-185, figs. 82-83 (♀, in part).

Etymology. – Latin for lack of confidence, a reference to the uncertain status of this species.

Type material. – Holotype ♀: BRAZIL: Santa Catarina: Nova Teutônia, 27.18°S, 52.38°W, iv.1949, F. Plaumann, “am Fenster [on window]” [LACM ENT 122422] (MZSP). Paratypes: ARGENTINA: Misiones, Parque Nacional Iguazu, 25.68°S, 54.44°W, 1♀ (abdomen only; rest of body used for molecular analysis), 4.xii.2003, B. Brown, G. Kung, 400 m, *Syagrus* palm flowers (LACM). BRAZIL: 3♀, same data as holotype (MCZC, MZSP). MEXICO: Tamaulipas: Gómez Farias, Est. Los Cedros, 23.05°N, 99.15°W, 1♀, iv.2002, A. Cordoba-Torres, Malaise trap, 340 m (LACM).

Recognition. – Previously, Borgmeier considered specimens from Nova Teutônia, Brazil, to belong to *M. furcata* (see discussion under that species). Females (and potential males) of *M. diffidentia* are smaller than *M. furcata*; their ovipositor is similar

to that of *M. elongata* and *M. kungae*, but shorter and longer than those species, respectively (see Table 1). The wide geographic disjunction between specimens of this species, and its intermediate size between *M. kungae* and *M. elongata* make its status as a single, separate species questionable.

Description. – Female: Body length 2.2-2.4 mm. Frons orange, punctate. Mean frontal width 0.21 head width. Ocellar triangle black; in some specimens dark color extends to eye margin. Ocular and genal setae flattened, yellow. Palpal setae yellow, except those at apex black. Scutum dark brown. Pleuron dark brown, with proepisternum and anterior portion of anepisternum yellowish-brown; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres slender. Apex of hind femur dark brown. Hind tibia 0.9-1.0 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray, except segment 6 yellow. Ovipositor basally yellow, apically dark brown to black; black portion of ovipositor 0.80-0.85 mm long. Ovipositor slightly curved ventrally at apical one-third; dorsal apex of ovipositor forming short point. Surface of ovipositor with fine reticulation and sparse, short setae.

Geographical distribution. – Mexico and Brazil.

M. gibberosa-series

Diagnosis. – Ovipositor deeply striate.

Included species. – The species are organized into two groups: the *M. gibberosa*-subseries and the *M. inversa*-subseries (both defined below).

M. gibberosa-subseries

Diagnosis. – Palpal setae short. Apical section of ovipositor greatly extended.

Included species. – *M. calceolus*, *M. gibberosa*, *M. lingula*.

Melaloncha calceola sp. n.

(Fig. 8)

Etymology. – Latin diminutive for half-boot, referring to the shape of the apex of the ovipositor.

Type material. – Holotype ♀: BRAZIL: Amazonas: Manaus, Reserva Ducke, 3.13°S, 60.02°W, 4-13.xi.1992, J. Vidal [LACM ENT 029260] (INPA).

Recognition. – The ovipositor of this species is distinctive, with its boot-shaped apex.

Description. – Female: Body length 3.0 mm. Frons orange, punctate, 0.25 head width. Ocellar triangle black. Ocular setae flattened, brown. Genal and palpal setae black; palpal setae short, reduced. Scutum dark brown. Pleuron dark brown with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown except apical foretarsomere and hind femur dark brown. Foretibia enlarged, broad; foretarsomeres broad, slightly flattened. Hind tibia 1.7 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray. Ovipositor basally dark brown, apically black; black portion of ovipositor 1.5 mm long. Ovipositor relatively straight; apex of ovipositor laterally flattened, ventrally curved, forming boot-shaped outline in lateral view. Surface of ovipositor with deep longitudinal striation on black portion and sparse, extremely short setae.

Geographical distribution. – Amazonian Brazil.

***Melaloncha gibberosa* sp. n.**

(Figs 9, 11, 36)

Etymology. – Latin for humped or crooked, referring to the long, thin, curved projection of the apex of the ovipositor.

Type material. – Holotype ♀: PERU: Madre de Dios: Tambopata Research Center, 13.14°S, 69.61°W, 24.vii.2001, B. Brown, G. Kung, honey-sprayed leaves [LACM ENT 074447] (MUSM). Paratypes: PERU: Madre de Dios: Tambopata Research Center, 13.14°S, 69.61°W, 5♀, 20-23.vii.2001, 1♀, 23-25.vii.2001, B. Brown, G. Kung, Malaise trap #5 (LACM), 1♀, 20.vii.2001, 3♀, 21.vii.2001, 1♀, 24.vii.2001, B. Brown, G. Kung, honey-sprayed leaves (LACM, MUSM).

Recognition. – This species is distinguished by the elongate, narrow, dorsal process of the ovipositor.

Description. – Female: Body length 2.5-2.9 mm. Frons orange, punctate. Mean frontal width 0.24 head width. Ocellar triangle black. Ocular, genal, and palpal setae black; palpal setae short, reduced. Scutum and pleuron blackish-brown; pleuron with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres broad, slightly flattened. Apex, dorsum and venter of anterior face of hind femur dark brown. Hind tibia 1.3 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray. Ovipositor basally and apically black;

striate portion of ovipositor 1.0-1.2 mm long. Ovipositor relatively straight; dorsal apex of ovipositor elongate, forming long, curved, digitiform process. Surface of ovipositor with deep longitudinal striation on apical two-thirds and sparse, short setae.

Host. – One specimen was collected as it attacked a worker of *Tetragona* aff. *truncata* Moure.

Geographical distribution. – Peru.

***Melaloncha lingula* sp. n.**

(Figs 10, 12)

Etymology. – Latin diminutive for tongue, referring to the flat process of the apex of the ovipositor.

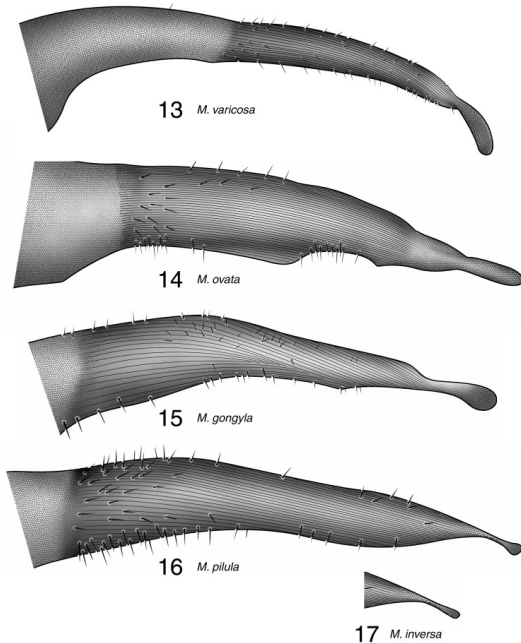
Type material. – Holotype ♀: BOLIVIA: La Paz: 10 km S Mapiiri, 15.35°S, 68.23°W, 11.iv.2001, B. Brown, G. Kung, honey-sprayed leaves [LACM ENT 128308] (CBFC).

Recognition. – This species is distinguished by the elongate, but broad and dorsally concave apical process of the ovipositor.

Description. – Female: Body length 2.9 mm. Frons orange, punctate, 0.26 head width. Ocellar triangle black. Ocular, genal, and palpal setae black; palpal setae short, reduced. Scutum and pleuron blackish-brown; pleuron with faint silver pollinosity. Forecoxa whitish-yellow, rest of leg yellowish-brown, except base of tibia brown; foretibia enlarged, thick; foretarsomeres broad, slightly flattened. Mid coxa yellowish-brown; mid femur dark brown; mid tibia and tarsomeres lighter brown. Hind coxae dark brown; hind femur dark brown; hind tibia and tarsomeres lighter brown. Hind tibia 1.4 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray. Ovipositor basally and apically black; striate portion of ovipositor 1.2 mm long. Ovipositor relatively straight; dorsal apex of ovipositor dorsolaterally flattened, concave, broad, ventrally curved. Surface of ovipositor with deep, longitudinal striations on apical two-thirds and sparse, short setae.

Host. – The flies were attracted to an aggregation of *Trigona branneri*.

Geographical distribution. – Bolivia. We returned to the collecting site in 2004, but the forest where we found this species was completely destroyed for cattle pasture.



Figs 13-17. Ovipositors, *M. inversa*-subseries, left lateral.

M. inversa-subseries

Diagnosis. – Apex of ovipositor with laterally flattened lobe.

Included species. – *M. varicosa*, *M. ovata*, *M. gongyla*, *M. pilula*, *M. inversa*.

Melaloncha varicosa sp. n.

(Fig. 13)

Etymology. – From Latin *varus* for bent, referring to the curved apical lobe of the ovipositor.

Type material. – Holotype ♀: BOLIVIA: La Paz: Alto Rio Beni, south of Rio Inicua, 15-18.i.1976, L. E. Peña, 1100 m [LACM ENT 147966] (AMNH).

Recognition. – The lack of wing vein R_{2+3} , plus the remarkably long ovipositor, with an elongate, curved apical process, are characters distinctive of this species.

Description. – Female: Body length 2.5 mm. Frons orange, punctate, 0.27 head width. Ocellar triangle black. Ocular, genal, and palpal setae black. Scutum dark brown. Pleuron dark brown; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown, except foretarsomeres 4 and 5

and apex of hind femur dark brown. Foretarsomeres broad, slightly flattened. Hind tibia 1.3 mm long. Wing vein R_{2+3} absent. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray. Ovipositor basally brown, apically dark brown to black; black portion of ovipositor 1.3 mm long. Ovipositor curved ventrally, abruptly so at apex; dorsal apex of ovipositor laterally flattened, forming elongate, rounded lobe. Surface of ovipositor with deep longitudinal striations on apical one-half and sparse, short setae.

Geographical distribution. – Bolivia.

Melaloncha ovata sp. n.

(Fig. 14)

Etymology. – Latin *ovatus* for oval, referring to the shape of the process of the ovipositor.

Type material. – Holotype ♀: COSTA RICA: Cartago: near Tuis, 16-22.vii.1993, W. J. Hanson, 3000' [LACM ENT 114182] (LACM).

Recognition. – This species is distinguished by the flattened apical lobe of the ovipositor, which is elongate-oval in shape. The somewhat similar *M. varicosa* sp. n. has a much narrower, more elongate, apically curved ovipositor (Fig. 13).

Description. – Female: (note some colors, particularly those of the frons and the mid and hind coxae, are unusually dark, probably because the specimen was air-dried). Body length 2.5 mm. Frons dark brown (in fresh specimens the frons would be orange), punctate, 0.23 head width. Ocellar triangle black. Ocular and genal setae slender, black. Palpal setae black. Scutum dark brown. Pleuron blackish-brown, with faint silver pollinosity. Forecoxa yellow, mid and hind coxae brown; rest of legs darker yellowish-brown. Foretarsomeres broad, flat, dark brown. Apex of hind femur same color as rest of femur, without dark brown apex. Hind tibia 1.2 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity. Venter of abdomen gray. Ovipositor basally yellow, apically dark brown to black; black portion of ovipositor 1.2 mm long. Ovipositor relatively straight; with ventral concavity at apical one-third; dorsal apex of ovipositor laterally flattened, forming an elongate, oval lobe. Surface of ovipositor with fine, longitudinal striation and sparse, short setae.

Geographical distribution. – Costa Rica.

***Melaloncha gongyla* sp. n.**

(Fig. 15)

Etymology. – From Greek *gongylos* for ball, referring to the round lobe of the apex of the ovipositor.

Type material. – Holotype ♀: BRAZIL: Amazonas: Manaus, Reserva Ducke, 3.13°S, 60.02°W, 8-15.iv.1992, J. Vidal, 1B-20 m [LACM ENT 029862] (INPA). Paratype: BRAZIL: Amazonas: Manaus, Reserva Ducke, 3.13°S, 60.02°W, 1♀, 8-15.iv.1992, J. Vidal, Arm. Oleo, 1A-1 m (LACM).

Recognition. – This species can be recognized by the large, round, laterally flattened apical process of the ovipositor.

Description. – Female: Body length 2.9-3.1 mm. Frons orange, punctate. Mean frontal width 0.27 head width. Ocellar triangle dark brown. Ocular setae flattened, yellow. Genal and palpal setae black. Scutum yellowish-brown, with small area of darker brown posteriorly. Pleuron yellowish-brown, with some dark brown areas around meron; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres slender. Apex of hind femur dark brown. Hind tibia 1.1 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity; tergite 6 yellow laterally. Venter of abdomen whitish-yellow and with longitudinal midventral orange stripe. Ovipositor basally yellow, apically dark brown to black; black portion of ovipositor 1.0 mm long. Ovipositor curved ventrally at midpoint; dorsal apex of ovipositor laterally flattened, forming round lobe. Surface of ovipositor with deep longitudinal striations and sparse, short setae.

Geographical distribution. – Amazonian Brazil.

***Melaloncha pilula* sp. n.**

(Fig. 16)

Etymology. – Latin, diminutive of *pila* for ball, referring to the shape of the apical process of the ovipositor.

Type material. – Holotype ♀: COSTA RICA: Puntarenas: San Vito, Las Cruces, 8.80°N, 82.97°W, vi-vii.1988, P. Hanson, Malaise trap, 1200 m [LACM ENT 048780] (LACM). Paratypes: COSTA RICA: Puntarenas: Las Alturas, 8.95°N, 82.83°W, 1♀, i-iii.1995, P. Hanson, Malaise trap (INBC), 10 km W Piedras Blancas, 8.75°N, 83.30°W, 1♀, iii-v.1989, P. Hanson, Malaise trap (LACM), 24 km W Piedras Blancas, 1♀, iii-iv.1989, P. Hanson, I. Gauld, Malaise trap (LACM).

Recognition. – This species is recognized by the small, round apical lobe of the ovipositor. It is sim-

ilar to *M. inversa* sp. n. (below), and might be conspecific with it, as the differences between them are relatively minor (the shape of the apex of the ovipositor and tergite color). At this time, however, I lack sufficient material to evaluate possible variation within species, and choose to recognize relatively narrowly-defined phorid species concepts.

Description. – Female: Body length 2.8-3.1 mm. Frons orange, punctate. Mean frontal width 0.23 head width. Ocellar triangle black; in some specimens dark color extends to eye margin. Ocular setae flattened, yellow. Genal and palpal setae black. Scutum anteriorly yellowish-brown, posteriorly dark brown. Pleuron yellowish-brown, with some dark brown areas on anepimeron, meron and katatergite; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres slender. Apex of hind femur dark brown. Hind tibia 1.2-1.3 mm long. Halter yellow. Abdominal tergites black, with dorsolateral areas of silver pollinosity; laterally with orange only along ventral margin of tergite. Venter of abdomen yellow to white and with longitudinal midventral orange stripe. Ovipositor basally yellow, apically dark brown to black; black portion of ovipositor 1.1-1.2 mm long. Ovipositor curved ventrally at mid-length; dorsal apex of ovipositor laterally flattened, forming an small, round lobe. Surface of ovipositor with fine longitudinal striation and sparse, short setae.

Geographical distribution. – Costa Rica.

***Melaloncha inversa* sp. n.**

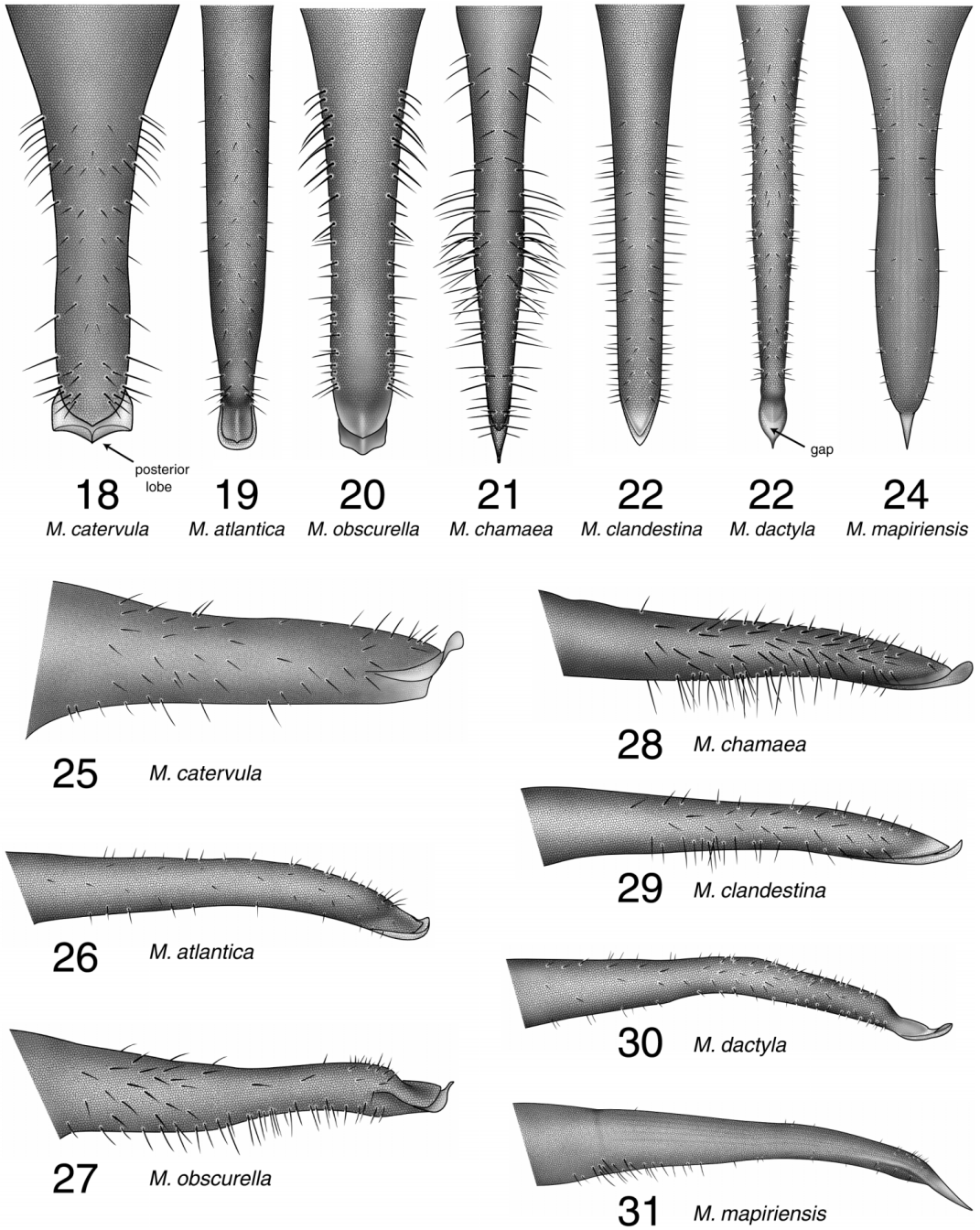
(Fig. 17)

Etymology. – Latin, for turned upside down, referring to the behavior of the female in flight.

Type material. – Holotype ♀: ARGENTINA: Misiones: Parque Nacional Iguazu, 25.68°S, 54.44°W, 4.xii.2003, B. Brown, G. Kung, 400 m, *Syagrus* palm flowers [LACM ENT 188529] (MACN). Paratypes: ARGENTINA: Misiones: Parque Nacional Iguazu, 25.68°S, 54.44°W, 1♀, 4.xii.2003, 2♀, 6.xii.2003, B. Brown, G. Kung, 400 m, *Syagrus* palm flowers (LACM, MACN).

Recognition. – This species is extremely similar to *M. pilula*, but the shape of the apex of the ovipositor is slightly less rounded, and there is much more extensive orange color laterally on the tergites.

Description. – Female: Body length 2.6-3.2 mm. Frons orange, punctate. Mean frontal width 0.30



Figs 18-31. Ovipositors, *M. obscurella*-subgroup. 18-24, dorsal. 25-31, left lateral.

head width. Ocular and genal setae flattened, yellowish-brown, except for one large black genal seta. Palpal setae black. Scutum yellowish-brown, dark brown along posterior margin; one specimen with dorsomedial brown stripe. Pleuron yellowish-brown, with small dark markings; with faint silver pollinosity. Coxae yellow; rest of legs yellowish-brown. Foretarsomeres slender. Apex of hind femur with dark brown spot. Hind tibia 1.2 mm long. Halter yellow. Abdominal tergites dark brown to black with orange anteriorly (including lateral area of tergites, in which anterior one-half is orange) and dorsolateral areas of silver pollinosity; tergite 6 mostly orange, with dorsomedial dark area posteriorly. Venter of abdomen yellow, orange posteriorly and with longitudinal midventral orange stripe. Ovipositor basally orange, apically dark brown to black; black portion of ovipositor 1.1-1.2 mm long. Ovipositor slightly curved ventrally; dorsal apex laterally flattened, forming elongate lobe. Surface of ovipositor with deep longitudinal striations and sparse, short setae.

Host. – We collected specimens as they attacked *Trigona spinipes* at flowers of a *Syagrus* palm on the back lawn of the Sheraton Hotel in Iguazu National Park. The flies attacked hosts while both were in flight, the fly maintaining a position in front of and slightly below the bee, hovering facing it with its abdomen hanging down. It darted at the bee, curving its abdomen dorsally, apparently attempting to make contact with the bee's body. Occasionally, the fly would land, upside down, holding onto the flying bee's dangling legs, apparently resting.

Geographical distribution. – Northern Argentina.

***Melaloncha obscurella*-subgroup**

Diagnosis. – Frons dark-colored, dark brown to black. Thorax dark brown to blackish-brown; pleuron of some species with small lighter brown areas. Coxae light yellowish-brown, contrasting strongly with dark pleuron. Inner tarsal claw of foreleg with enlarged inner tooth (except *M. catervula*); outer claw with small tooth only. Abdominal tergites black with silver pollinosity. Apex of ovipositor with dorsally-curved posterior lobe (except in *M. mapiriensis*). Base of female intersegment 7-8 with four double rows (in one species just a group) of thick, minute, hooks.

***Melaloncha catervula* sp. n.**

(Figs 18, 25, 32)

Etymology. – Latin diminutive form of *caterva*, meaning crowd, referring to the small group of spinuli on intersegment 7-8.

Type material. – Holotype female: BRAZIL: Roraima: Serra Grande, 21-30.x.1992, D. Davis [LACM ENT 114027] (MZSP).

Recognition. – This species can be recognized by relatively broad, three-pointed postapical lobe of the ovipositor and the small group of hooks on intersegment 7-8.

Description. – Female: Body length 2.2 mm. Frons blackish-brown, fading to light brown at extreme ventral apex; densely punctate; mean frontal width 0.27 head width. Claws of foretarsomeres subequal. Ovipositor relatively straight, less elongate and slender than other species. Apex of ovipositor broadly pointed, straight; posterior lobes forming tridentate apex. Venter of ovipositor with sparse, short setae. Spinuli of intersegment 7-8 form small group only 3-4 long; anteriorly with scattered, less sclerotized spinuli; posteriorly with slightly sclerotized spinuli gradually merging into setae posteriorly.

Geographical distribution. – Amazonian Brazil.

***M. obscurella*-series**

Diagnosis. – Tarsal claws asymmetrical, inner claw with enlarged, pointed inner tooth (Fig. 39). Ovipositor narrow, elongate. Base of intersegment 7-8 with spinuli organized into 4 long, parallel rows.

Included species. – *M. atlantica*, *M. obscurella*, *M. chamaea*, *M. clandestina*, *M. dactyla*, *M. mapiriensis*.

***Melaloncha atlantica* sp. n.**

(Figs 19, 26)

Etymology. – Named for the Atlantic slope of Costa Rica, where this species has been collected.

Type material. – Holotype ♀: COSTA RICA: Heredia: Chilamate, 10.45°N, 84.08°W, iv-vi.1990, P. Hanson, Malaise trap, 75 m [LACM ENT 048770] (LACM). Paratype: COSTA RICA: Heredia: La Selva Biological Station, 10.43°N, 84.02°W, 1♀, 1.iii.1994, ALAS, Malaise trap M/01/360 (INBC).

Recognition. – This species can be distinguished

by the ovipositor, which is nearly bare ventrally and is broadly rounded in dorsal view.

Description. – Female: Body length 2.6–2.7 mm. Frons dark brown fading to light brown ventrally, but setal bases (Brown, 2004a) blackish throughout; sparsely punctate; mean frontal width 0.28 head width. Ovipositor curved smoothly, ventrally in apical one-third. Apex of ovipositor rounded, dorsally curved; posterior lobes rounded. Venter of ovipositor with sparse, relatively short setae.

Variation. – The paratype has only one remaining wing, which is aberrant in lacking vein R_{2+3} .

Geographical distribution. – Costa Rica.

Melaloncha obscurella Borgmeier

(Figs 20, 27, 33, 37–39)

Melaloncha obscurella Borgmeier, 1934: 189, pl. 3 fig. 18 (♂).

Type material. – Holotype ♀: COSTA RICA: Higuaito, San Mateo, P. Schild [LACM ENT 055432] (USNM; examined).

Other material examined. – COSTA RICA: Heredia: La Selva Biological Station, 10.43°N, 84.02°W, 3♀, 2.iii.1993, ALAS, Malaise trap M/05/020, M/08/023, 3♀, 16.iii.1993, ALAS, Malaise trap M/16/047, 2♀, 1.iv.1993, ALAS, Malaise trap M/05/052, M/14/061, 1♀, 15.v.1993, ALAS, Malaise trap M/06/037, 1♀, 1.vii.1993, ALAS, Malaise trap M/06/151, 1♀, 15.vii.1993, ALAS, Malaise trap M/1/152 (INBC, LACM). San José: Zona Protectora El Rodeo, 9.91°N, 84.28°W, 1♀, 1.viii.2001, 1♀, 2.viii.2001, 2♀, 5.viii.2001, attacking *Plebeia* bees, 6♀, 1.viii.2001, 13♀, 2.viii.2001, 2♀, 3.viii.2001, 3♀, 4.viii.2001, 1♀, 5.viii.2001, 9♀, 8.viii.2001, B. Brown, G. Kung, honey-sprayed leaves, 2♀, 1–5.viii.2001, 6♀, 5–8.viii.2001, B. Brown, G. Kung, V. Berezovskiy, Malaise trap (EMUS, INBC, LACM, MCZC, MUCR, NHRS, USNM), University for Peace, 9.92°N, 84.28°W, 1♀, 2.viii.2001, G. Kung, honey-sprayed leaves (LACM).

Recognition. – Although this species is described from a single male holotype and its name is in question, we have collected numerous similar specimens of both sexes from Zona Protectora El Rodeo, near the type locality, that I consider conspecific with the holotype. The female can be distinguished by the relatively broad posterior lobes, and the dense ventral setation of the ovipositor.

Description. – Female: Body length 1.9–2.3 mm. Frons blackish-brown; densely punctate; mean frontal width 0.29 head width. Ovipositor slightly sinuous in lateral view. Apex of ovipositor, broad-

ly rounded, dorsally curved; posterior lobes broad. Venter of ovipositor with dense, relatively long setae.

Host. – Females were observed attacking *P. jati-formis* Cockerell and *P. frontalis* Friese at Zona Protectora El Rodeo.

Geographical distribution. – Costa Rica.

Melaloncha chamaea sp. n.

(Figs 21, 28)

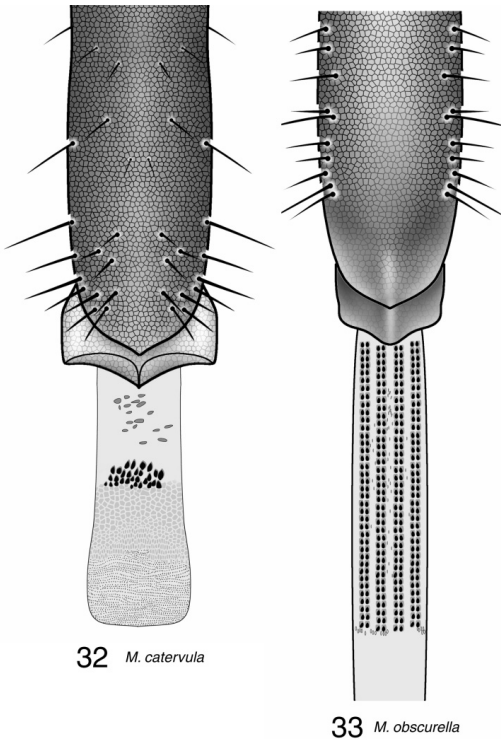
Etymology. – From Greek *chamai* for low, on the ground, referring to the hunting behavior of this species (see Host Relationships, below).

Type material. – Holotype ♀: PERU: Madre de Dios: Tambopata Research Center, 13.14°S, 69.61°W, 19.vii.2001, B. Brown, G. Kung, honey-sprayed leaves, 300 m [LACM ENT 075517] (LACM). Paratypes: BOLIVIA: La Paz: Alto Rio Beni, south of Rio Inicua, 1♀, 16.i.1976, L. E. Peña, 1100 m (AMNH), Arroyo Tuhiri, near Mapiri, 15.28°S, 68.25°W, 1female, 10.iv.2004, B. Brown, honey spray, 500 m (LACM), 40 km N Caranavi, Cumbre Alto Beni, 15.83°S, 67.56°W, 16.iv.2003, B. Brown, S. Marcotte, E. Zumbado, honey-sprayed undergrowth, 1600 m (CBFC), 1♀, 14.iv.2004, E. Zumbado, honey spray, 1600 m (LACM). BRAZIL: Rondonia: Rio Guapore, opp. mouth of Rio Baures, 2♀, 26.ix.1964, Bouseman & Lussenhop (AMNH). PERU: Madre de Dios: Tambopata Research Center, 13.14°S, 69.61°W, 2♀, 17.vii.2001, 1♀, 19.vii.2001, 1♀, 20.vii.2001, 10♀, 21.vii.2001, 7♀, 22.vii.2001, 6♀, 23.vii.2001, 4♀, 24.vii.2001, B. Brown, G. Kung, honey-sprayed leaves, 5♀, 20–23.vii.2001, B. Brown, G. Kung, Malaise trap #5, 300 m (LACM, MUSM). Also, many presumed males (not considered paratypes) of this species were collected at the type locality.

Recognition. – This species can be recognized by the laterally flattened, narrow apex of posterior lobe of the ovipositor.

Description. – Female: Body length 1.8–2.2 mm. Frons blackish-brown; densely punctate; mean frontal width 0.28 head width. Ovipositor slightly sinuous in lateral view. Apex of ovipositor pointed, dorsally curved; posterior lobes forming a narrow point that is laterally flattened and deep in lateral view. Venter of ovipositor with dense, long setae, especially at mid-length.

Host. – Specimens were observed attacking *Plebeia* sp. and *Tetragona goettei* (Friese) in Peru. In Bolivia, they were attracted to an aggregation of bees, the commonest of which were *Partamona epiphytophila* Pedro & Camargo and a different *Plebeia* sp.



Figs 32-33. Apex of ovipositor and base of intersegment 7-8.

- Frons orange; base of intersegment 7-8 without spinuli..... *M. furcata*-subgroup
- 4. Frons narrow, orange; female with ovipositor elongate, tubular, with laterally flattened, elongate lobe at apex (Fig. 13).....
..... *M. varicosa* sp. n. (*M. furcata*-subgroup)
- Frons various; ovipositor, if elongate and tubular, without apical, laterally flattened lobe 5
- 5. Ovipositor with ventral, cercus-like lobes.....
..... *M. cingulata*-group
[see Brown 2004b for key to species]
- Ovipositor various, but lacking cercus-like lobes..... other *Melaloncha*

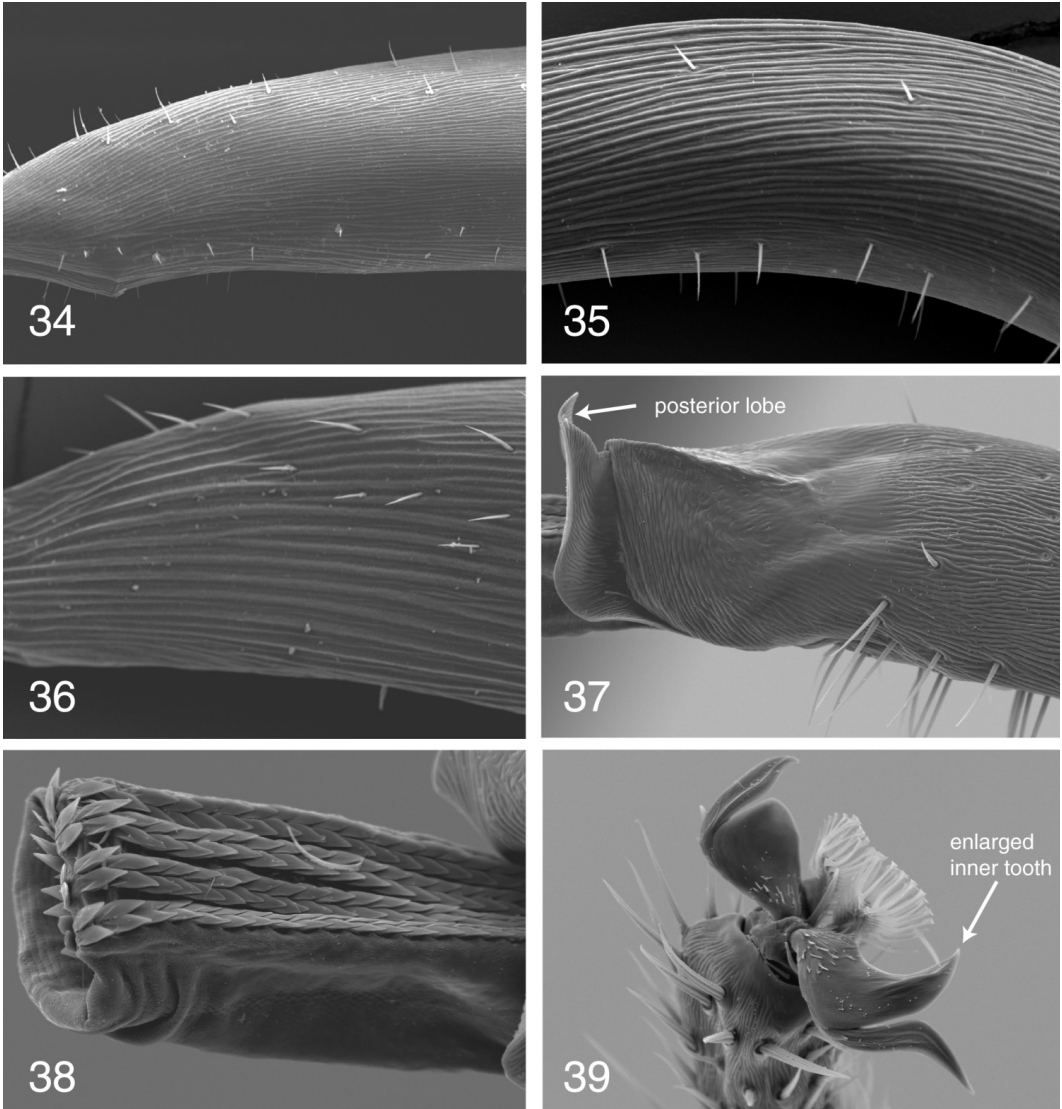
Key to females of the *M. furcata*-subgroup

1. Apex of ovipositor with a rounded, laterally flattened lobe (Figs 13-17)..... 2
- Apex of ovipositor not laterally flattened..... 6
2. Wing vein R₂₊₃ absent; ovipositor, especially basal portion, extremely long, with elongate-oval, downturned lobe (Fig. 13).....*M. varicosa* sp. n.
- Wing vein R₂₊₃ present; ovipositor various but if apex oval (Fig. 14), basal portion of ovipositor short and apex not downturned 3
3. Pleuron and scutum dark brown; rounded lobe at apex of ovipositor elongate, oval (Fig. 14).....
..... *M. ovata* sp. n.

- Pleuron and scutum mostly yellowish in color; rounded lobe at apex of ovipositor almost circular (Figs 15-16) or greatly narrowed (Fig. 17) 4
- 4. Rounded lobe and stalk robust (Fig. 15)
..... *M. gongyla* sp. n.
- Rounded lobe and stalk of apex of ovipositor slender (Figs 16-17).....5
- 5. Apex of rounded lobe with rounded swelling (Fig. 16); abdominal tergites laterally nearly entirely black *M. pilula* sp. n.
- Apex of rounded lobe nearly parallel-sided (Fig. 17); abdominal tergites laterally orange on anterior half and black posteriorly
..... *M. inversa* sp. n.
- 6. Ovipositor strongly curved ventrally, such that posterior portion of ovipositor almost perpendicular to base (Fig. 4)..... *M. curvata* sp. n.
- Ovipositor much less curved (Figs 3, 5-10).....7
- 7. Ovipositor with prominent, deeply impressed, longitudinal striations; palpal setae short 8
- Ovipositor with at most subtle longitudinal striations; palpal setae long..... 10
- 8. Dorsal apex of ovipositor slightly broadened (Fig. 12)*M. lingua* sp. n.
- Dorsal apex of ovipositor narrow (Fig. 11) 9
- 9. Apex of ovipositor with dorsal, digitiform process (Fig. 9)..... *M. gibberosa* sp. n.
- Apex of ovipositor appearing blunter in lateral view (Fig. 8)*M. calceola* sp. n.
- 10. Forecoxae with dense, thick setae anteriorly (Fig. 41)*M. hirtipecta* sp. n.
- Forecoxae with normal setae (Fig. 40) 11
- 11. Ovipositor relatively short (black portion 0.55-1.0 mm) and straight, downturned only at apical one-third 12
- Ovipositor longer (black portion 1.05-1.10 mm), ventrally curved throughout length (Fig. 5) *M. elongata* sp. n.
- 12. Smaller species, hind tibia 0.75-0.85 mm, black portion of ovipositor 0.55-0.60 mm (Fig. 3); frons broader, approximately 0.27 head width; ovipositor with reticulate sculpturing, without striations *M. kungae* sp. n.
- Larger species, hind tibia 0.95-1.00 mm, black portion of ovipositor 0.80-0.85 mm (Fig. 7); frons narrower, approximately 0.21 head width; striations on ovipositor distinct
..... *M. diffidentia* sp. n.

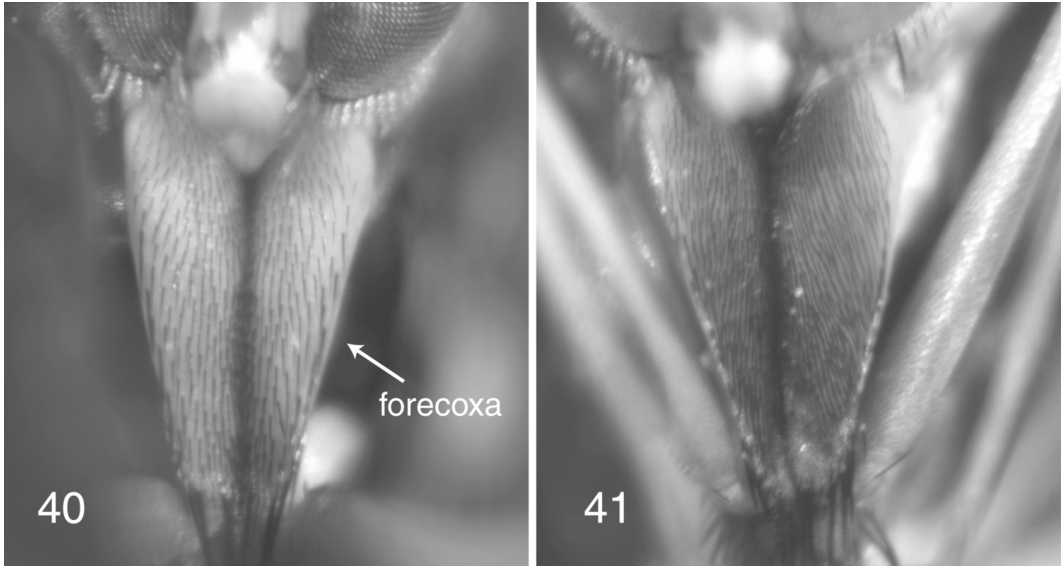
Key to females of the *M. obscurella*-subgroup

1. Apex of ovipositor ventrally directed, sharply pointed; posterior lobes absent (Figs 24, 31).....
..... *M. mapiriensis* sp. n.
- Apex of ovipositor or posterior lobes curved dorsally; ovipositor of various shape (Figs 25-30); posterior lobes present..... 2
2. Sclerotized hooks arranged in small group, shorter than wide (Fig. 32); posterior lobe tridentate in dorsal view (Fig. 18).....
..... *M. catervula* sp. n.
- Sclerotized hooks arranged in four rows, group longer than wide (Fig. 33); posterior lobe not tridentate, of different form 3



Figs 34-39. Scanning electron micrographs of *M. furcata*-group species. 34-37, ovipositor, right lateral. 34, *M. kun-gae* sp. n.. 35, *M. curvata* sp. n.. 36, *M. gibberosa* sp. n.. 37, *M. obscurella* Borgmeier. 38, base of intersegment 7-8, dorsal, *M. obscurella*. 39. Foretarsal claws, *M. obscurella*.

- | | |
|---|--|
| <p>3. Apex of posterior lobes of ovipositor broadly rounded, truncate (Figs 19-20)..... 4</p> <p>– Apex of posterior lobes of ovipositor narrowed, pointed (Figs 21-24)..... 5</p> <p>4. Venter of ovipositor relatively straight until ventrally curved near apex; ventral setae of ovipositor short, sparse (Fig. 26).....</p> <p>– Venter of ovipositor sinuous and with long,</p> | <p>dense setae (Fig. 27)..... <i>M. obscurella</i> Borgmeier</p> <p>5. In lateral view, apex of ovipositor enlarged, laterally flattened, deep; venter of ovipositor with long, dense setae (Fig. 28)..... <i>M. chamaea</i> sp. n.</p> <p>– In lateral view apex of ovipositor not enlarged in this manner; venter of ovipositor with fewer, shorter setae (Figs 29-30)</p> <p>6. Ovipositor with posterior lobe extended, with gap between posterior lobe and end of ovipos-</p> |
|---|--|



Figs 40-41. Forecoxae, anterior. 40, *M. elongata* sp. n.. 41, *M. hirtipecta* sp.

- itor (Fig. 23); venter of ovipositor with short, sparse setae (Fig. 30) *M. dactyla* sp. n.
 – Posterior lobe ending directly posterior to rest of ovipositor (Fig. 22); venter of ovipositor with longer setae (Fig. 29) *M. clandestina* sp. n.

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