

STUDIES ON NEOTROPICAL CADDISFLIES, LX: THREE NEW SPECIES OF THE CHILEAN GENUS *MICROTHREMM*A, WITH A REVIEW OF THE GENUS (TRICHOPTERA: HELICOPHIDAE)¹

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ABSTRACT: The genus *Microthremma* is confined to Argentina and Chile, and has contained five species. Two new species, *M. angulatum* and *M. patagonicum*, both placed in the *crassifimbriatum* complex, and a third new species, *M. lobatum*, placed in the *griseum* complex, are described and figured. Also *M. crassifimbriatum* is redescribed and figured. A key to males, diagnostic characters, and distributional records is given for all eight species.

In the New World, the family Helicophidae is limited to the Chilean subregion of the Neotropical Realm. Presently five genera, *Alloecentrellodes*, *Austrocentrus*, *Eosericostoma*, *Microthremma*, and *Pseudosericostoma*, are placed in this region's fauna (Flint et al., 1999). Australia and New Zealand contain two and one genera respectively (Neboiss, 1986), with no representatives yet known from the Afrotropical Realm.

Examples of *Microthremma* have been taken on various occasions, but generally in small numbers and none have yet been associated with their immature stages. The most frequently encountered species has been identified as *M. crassifimbriatum* Schmid, with the other species being known from the type material only and perhaps 1 or 2 subsequent collections. *Microthremma crassifimbriatum* had seemed a rather variable species, but no study had been made of these "variations." The arrival of a specimen from Dr. Holzenthal with the note that it seemed somewhat different from the figure of the type prompted a study of all our material. It quickly became apparent that three species are mixed together under that name, two of which were undescribed. An additional undescribed species of *Microthremma*, herein described, had been segregated and was awaiting description.

Some specimens have been borrowed from the University of Minnesota, St. Paul, MN (UMSP) and the Zoologisk Museum, University of Copenhagen, Denmark (UZMC); all the rest of the material is from the National Museum of Natural History, Washington, DC (NMNH).

crassifimbriatum complex

I consider this complex to consist of two old species *M. crassifimbriatum* Schmid (1955) and *M. villosum* Schmid (1957) and two new species herein

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described, *M. angulatum* and *M. patagonicum*. It is defined in the male genitalia by the tenth tergum being divided into a pair of long, slender rods. The inferior appendages are mostly fused mesoventrally, and bear a pair of apico mesal, pointed processes. The inferior appendages also appear to be more elongate with a lobate posterolateral margin.

I have not described females as two or three species have commonly been taken in the same general locality, or even in the same collection. Some of these females still carry an almost spherical, rather complexly ornamented egg ball attached to the tip of their abdomens.

Microthremma crassifimbriatum Schmid

Figures 1-3

Microthremma crassifimbriata Schmid 1955:149, pl.6, figs. 12, 13 (male, wings); Flint, 1974:91 (distribution in part, Ñuble only).

This, the type species of the genus has not been frequently encountered, and never in numbers. Males are recognized by the combination of the following genitalic characters: the posterior margin of the ninth segment is vertical and almost straight, the lobe between the bases of the tenth tergites is membranous, the posterolateral lobe of the inferior appendages is produced into an apicoventral point, the posteromesal processes are angled dorsad and in ventral aspect the posterior margin of the appendages is straight with a posterolateral process, and the phallus is only slightly curved.

Adult male: Length forewing, 4-5 mm. Color brown, head and thorax mesally with band of stramineous hair; legs stramineous; forewing uniformly brown except posterior margin on basal half bearing stramineous hair. Seventh abdominal sternum bearing large, posteromesal, nail-like lobe. Genitalia: Ninth segment in lateral aspect with large, rounded anterior lobe, posterior margin vertical; anterior margin deeply incised in dorsal or ventral aspects. Cercus small, ovoid. Tenth tergum divided into pair of long, slender, slightly curved processes tapering to apical point; basally with membranous lobe between processes in dorsal aspect. Inferior appendage with small, thumb-like, dorsobasal process; posterior margin with lateral lobe ending in a small, posteroventrally directed process; posteromesally with a pair of strongly sclerotized, pointed processes directed posterodorsally; in ventral aspect with appendages mostly fused mesally, posterior margin transverse with small posterolateral process and mesally with pair of elongate, pointed processes; internally with slender, band-like sclerite from base of apical processes to base of phallus. Phallus long, tubular, slightly arched, apex membranous with internal, C-shaped darkened area.

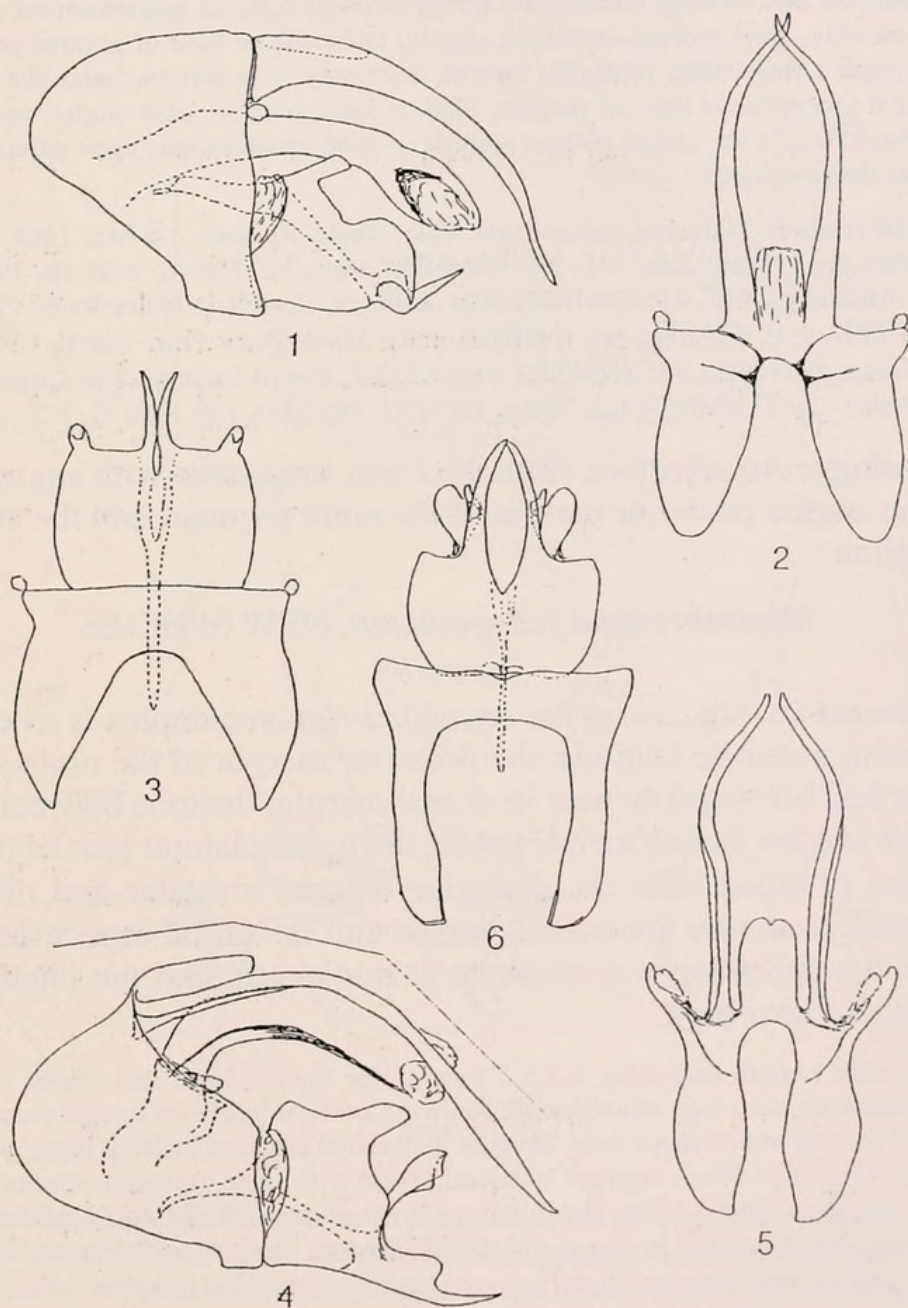
Material studied: Chile, Pcia. Ñuble, Recinto, 30 Nov 1951, L.E. Peña, ♂ holotype (NMNH). Pcia. Malleco, Cordillera Nahuelbuta, Cabreria, 1100m, 9-15 Jan. 1977, L.E. Peña G., 1♂ (NMNH); Vegas Blancas, 27km W Angol, 700m, 17 Jan 1987, C.M. & O.S. Flint, Jr., 1♂ (NMNH). Pcia. Maule [now Pcia. Cauquenes], Tregualemu, 600m, 27 Jan 1979, L.E. Peña G., 1♂ (NMNH).

Microthremma angulatum, NEW SPECIES

Figures 4-6

Microthremma crassifimbriata Schmid: Flint, 1974:91 (distribution, Curicó only).

This is a distinctive species readily recognized by the combination of the following characteristics: the posterior margin of the ninth segment is strongly angled at midheight, the lobe between the bases of the tenth tergites is sclerotized, the posterolateral lobe of the inferior appendages is produced into a small, upright process narrow basally, the posteromesal processes are only slightly curved and bear at midlength a distinct dorsolateral hump and in ventral aspect the posterior margin of the appendages is straight without any lateral process, and the phallus is angulate basally and arises from a cuplike sclerite.



Figures 1-6. Male genitalia: *Microthremma crassifimbriatum* Schmid. 1, genitalia, lateral; 2, ninth and tenth terga and cerci, dorsal; 3, ninth sternum, inferior appendages and cerci, ventral. *M. angulatum* n. sp. 4, genitalia, lateral; 5, ninth and tenth terga and cerci, dorsal; 6, ninth sternum and inferior appendages, ventral.

Adult male: Length forewing, 5-6 mm. Color brown, head and thorax mesally with band of stramineous hair; legs stramineous; forewing uniformly brown except posterior margin on basal half bearing stramineous hair. Seventh abdominal sternum bearing large, posteromesal, nail-like lobe. Genitalia: Ninth segment in lateral aspect with large, rounded anterior lobe, posterior margin angulate at midheight, ventral portion displaced posteriad; anterior margin deeply incised in dorsal and ventral aspects. Cercus small, elongate, decumbent. Tenth tergum divided into pair of long, slender, slightly curved processes tapering to apical point; basally with elongate sclerotized lobe with bilobed tip between processes in dorsal aspect. Inferior appendage with small, thumb-like, apicodorsal process (greatly reduced or lacking in Curicó material); posterior margin with erect, narrow lobe; posteromesally with a pair of strongly sclerotized, pointed processes directed posteriad and bearing dorsolateral hump at midlength; in ventral aspect with appendages fused mesally, erect process extending slightly laterad from base of pointed processes from which midlength hump barely protrudes laterad; internally with narrow, band-like sclerite from base of apical processes to base of phallus. Phallus long, tubular, base angled ventrad and enclosed in cup-like sclerite, apical portion slightly arched, membranous apex expanded laterally with internal darkened area ventrad.

Material studied: Holotype, male: Chile, Pcia. Ñuble, Recinto, 4-6 Mar 1968, Flint & Peña (NMNH). Paratypes: Same data, 1♂, 3♀ (NMNH); same, but 800 m, 2-23 Jan 1979, D. & M. Davis & B. Akerbergs, 6♂, 7♀ (NMNH). Pcia. Malleco, Cordillera Nahuelbuta, Cabreria, 1100 m, 9-15 Jan 1977, L.E. Peña G., 1♂ (NMNH). Pcia. Maule [now Pcia. Talca], Constitución, 16 Dec 1976, Gurney & Barria, 1♂ (NMNH). Pcia. Curicó, Estero La Jaula, Los Queñes, 14-18 Jan 1965, L.E. Peña G., 1♂ (NMNH); Las Tablas, E Curicó, Feb 1985, L.E. Peña G., 5♂, 1♀ (NMNH).

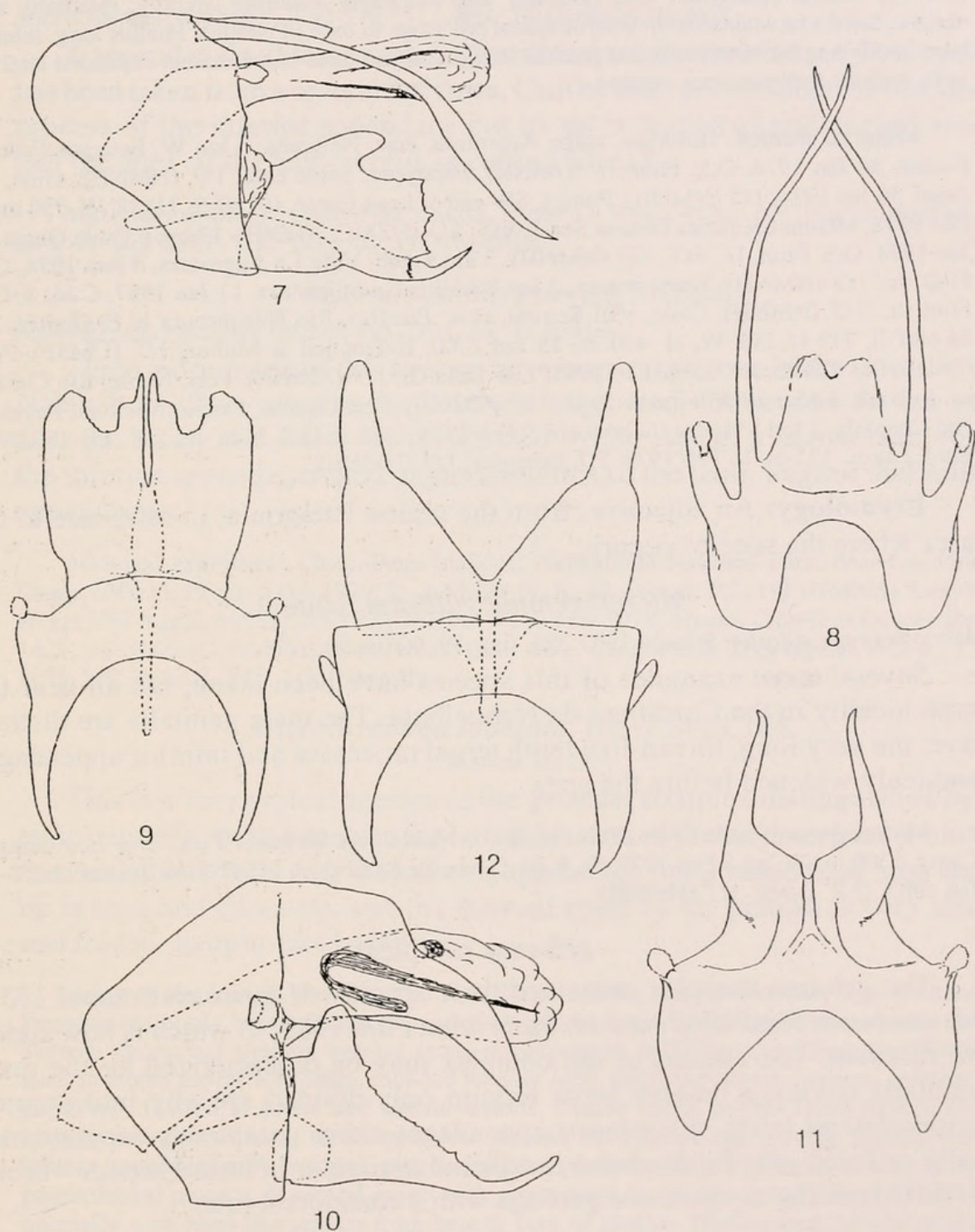
Etymology: An adjective, from the Latin, *angulatus*-with angles, in reference to the angled posterior margin of the ninth segment and the angled base of the phallus.

Microthremma patagonicum, NEW SPECIES

Figures 7-9

The second new species in the *crassifimbriatum* complex is recognized by the following genitalic features: the posterior margin of the ninth segment is almost vertical but angulate near its dorsal margin, the lobe between the bases of the tenth tergites is semimembranous, the posterolateral lobe of the inferior appendages is broad with the posterior margin irregular and oblique, the posteromesal processes are curved dorsad and in ventral aspect the posterior margin of the appendages is excavate at midlength, and the phallus is only slightly angled near base.

Adult male: Length forewing, 4.5-5.5 mm. Color brown, head and thorax mesally with band of stramineous hair; legs stramineous; forewing uniformly brown except posterior margin on basal half bearing stramineous hair. Seventh abdominal sternum bearing large, posteromesal, nail-like lobe. Genitalia: Ninth segment in lateral aspect with large, rounded anterior lobe, posterior margin angulate anteriorly just above cercus, ventral portion slightly displaced posteriad; anterior margin deeply incised in dorsal and ventral aspects. Cercus small, clavate. Tenth tergum divided into pair of long, slender, slightly curved processes tapering to apical point; basally with elongate lightly sclerotized lobe with bilobed tip between processes in dorsal aspect. Inferior appendage with small, thumb-like, dorsal process; posterior produced into enlarged lobe with margin irregular, oblique; posteromesally with a pair of strongly sclerotized, pointed processes curved posterodorsally and bearing small small lateral hump at midlength; in ventral aspect with



Figures 7-12. Male genitalia: *Microthremma patagonicum* n. sp. 7, genitalia, lateral; 8, ninth and tenth terga and cerci, dorsal; 9, ninth sternum, inferior appendages and cerci, ventral. *M. lobatum* n. sp. 10, genitalia, lateral; 11, ninth and tenth terga and cerci, dorsal; 12, ninth sternum, inferior appendages, and cerci, ventral.

appendages fused mesally, pointed processes with midlength hump barely protruding laterad, posterior margin emarginate with posterior lobe extending posteriad laterally; internally with narrow, band-like sclerite from base of apical processes to base of phallus. Phallus long, tubular, base barely angled ventrad, apical portion straight, apical third membranous expanded laterally with Internal darkened area ventrad.

Material studied: Holotype, male: Argentina, Pcia. Neuquén, 3 km W, Estación Forestal Pucará, 30 Jan 1974, O.S. Flint, Jr. (NMNH). Paratypes: Same data, 1 ♀ (NMNH); same, but canal, 30 Jan 1974, 1 ♂ (NMNH). Pucará, SW end of Lago Lacar, 40° 09' S, 71° 38' W, 750 m, 26 Dec 1978, Mision Cientifica Danesa Sta. 9, 9 ♂, 2 ♀ (UZMC, NMNH). 13 km E Quila Quina, 27 Jan 1974, O.S. Flint, Jr., 7 ♂, 4 ♀ (NMNH). 3 km South, Villa La Angostura, 4 Feb 1974, O.S. Flint, Jr., 1 ♂ (NMNH). Small stream, 2 km SE Villa La Angostura, 11 Jan 1987, C.M. & O.S. Flint, Jr., 1 ♂ (NMNH). Chile, VIII Region, Pcia. Bio-Bio, Río Huequecura in El Guachi, 37° 38.680' S, 71° 41.730' W, el. 450 m, 15 Jan 2000, Holzenthal & Muñoz, 1 ♂ (UMSP). Pcia. Curicó, Las Tablas, E Curicó, Feb 1985, L.E. Peña G., 1 ♂ (NMNH). Pcia. Ñuble, Río Chillán, nr. Recinto, 6 Mar 1968, Flint & Peña, 1 ♂ (NMNH). Pcia. Osorno, Parque Nacional Puyehue, Río Chanlefu, 1 km S Aguas Calientes, 8-9 Feb 1978, C.M. & O.S. Flint, Jr., 2 ♂, 1 ♀ (NMNH). Entre Lagos, 135 m, 15 Feb 1978, P.J. Spangler, 1 ♂ (NMNH).

Etymology: An adjective, from the region Patagonia, in reference to the area where the species occurs.

Microthremma villosum Schmid

Microthremma villosum Schmid 1957:395, figs. 59, 60 (male).

Several more examples of this species have been taken, but all near the type locality in the Cordillera de Nahuelbuta. The male genitalia are distinctive: the very long, thread-like tenth tergal processes and inferior appendages suddenly widened before the apex.

Material examined: Chile, Pcia. Malleco, Nahuelbuta National Park, near Los Gringos Camp, 1300 m, 29 Jan-5 Feb 1979, D. & M. Davis, B. Akerbergs, 1 ♂ (NMNH); same, but 6-11 Jan 1982, D.R. Davis, 1 ♂ (NMNH).

griseum complex

The *griseum* complex contained three species, *M. griseum* Schmid 1957, *M. caudatum* Flint 1969, and *M. bipartitum* Flint 1983, to which is now added *M. lobatum*. The species of the complex may be characterized by the male genitalia having a broader tenth tergum only divided apically into pointed posterolateral lobes, the inferior appendages either completely separate mesally or fused only for the basal fourth and triangular in lateral aspect – broad basally tapering to apex, and perhaps with a basodorsal lobe.

Microthremma bipartitum Flint

Microthremma bipartitum Flint 1983:90, figs. 317-319 (male).

This species is still known only from the unique male type taken on the island of Chiloé. It is easily recognized in the male by the inferior appendage being divided into long, terete basodorsal and apical lobes and the phallus having a long, terete, dorsomesal process.

Microthremma caudatum Flint

Microthremma caudatum Flint 1969:511, figs. 38-40 (male, wings).

A second male of this species, described from the Province of Concepción, has been taken from a second Province, Cautín. The species lacks the basodorsal process of the inferior appendage but its tip is narrowed and curved mesad, and the apex of the tenth tergite is curved laterad.

Material examined: Chile, Pcia. Cautín, Fundo La Selva, 48 km NW Nueva Imperial, 700 m, 9-11 Dec 1981, L.E. Peña G., 1♂ (NMNH).

Microthremma griseum Schmid

Microthremma griseum Schmid 1957:394, fig. 61 (male).

Three more series of this species have been taken, two in the Cordillera de Nahuelbuta, from whence the holotype originated, the second further north near the coast. The males are recognized by the lack of a basodorsal lobe on the inferior appendages, and unmodified tips of the tenth tergites and inferior appendages.

Material examined: Chile, Pcia. Malleco, Nahuelbuta National Park, near Los Gringos Camp, 1300 m, 29 Jan-5 Feb 1979, D. & M. Davis, B. Akerbergs, 7♂, 1♀ (NMNH). Los Alpes, 10 km NW Angol, 650 m, 37°E35' S, 73°E 00' W, 17 Mar 1979, Mision Cientifica Danesa Sta. 60, 14♂, 1♀ (UZMC, NMNH). Pcia. Maule [now Pcia. Cauquenes], Tregualemu, 600 m, 27 Jan 1979, L.E. Peña G., 2♂, 1♀ (NMNH).

Microthremma lobatum, NEW SPECIES

Figures 10-12

This is a very typical species of the *griseum* complex distinguished by the male genitalia. In this species the lateral process of the tenth tergum is broader than usual and decurved, the inferior appendage has a basodorsal lobe and its tip is long and attenuate, and the internal spine of the phallus is very slender and folded, hairpin-like basally.

Adult male: Length forewing, 5.5 mm. Color brown, mostly denuded; legs stramineous; forewing uniformly brown except triangular, stramineous spot at midlength of posterior margin. Seventh abdominal sternum bearing large, posteromesal, nail-like lobe. Genitalia: Ninth segment in lateral aspect with large, rounded anterior lobe, posterior margin vertical; anterior margin deeply incised in dorsal and ventral aspects. Cercus small, ovoid. Tenth tergum divided apically into pair of long, tapering, lateral process, tip pointed and curving slightly ventrad. Inferior appendage with rounded, basodorsal lobe; posterior margin oblique, ending in slender posterolateral process; in ventral aspect with appendages fused basomesally for fifth of length; internally with band-like sclerite from base to base of phallus. Phallus long, tubular, angled at midlength, apex membranous expanded laterally with pair of internal spine-like sclerites, each bent hairpin-like forming a ventral piece and a long dorsal portion 3 times as long as ventral, a small, rounded apicodorsal sclerite internally.

Material studied: Holotype, male: Chile, Pcia. Valdivia, Las Trancas, W La Union, 5-10 Feb 1988, L.E. Peña G. (NMNH). Paratype: Same data, but 23-29 Jan 1995, 1♂ (NMNH).

Etymology: An adjective, from the Latin lobus – a rounded projection, in reference to the basodorsal lobe of the inferior appendage.

Key to males of *Microthremma*

1. Tenth tergite slender, distinctly longer than inferior appendage 2
Tenth tergite broad basally, tapering to apical point, shorter than inferior appendage 5
2. Inferior appendage narrow basally, with a large, rounded, dorsal lobe
subapically *M. villosum*
Inferior appendage broad basally, with posterolateral margin bearing various
lobes and appendages 3
3. Inferior appendage bearing a narrow process in middle of posterolateral margin;
posterior margin of ninth segment angulate at midheight *M. angulatum*
Inferior appendage with a broad lobe from posterolateral margin; ninth segment
with posterior margin either straight or but very slightly angulate 4
4. Inferior appendage with broad lobe, truncate or slightly angulate apically,
from posterolateral margin *M. patagonicum*
Inferior appendage with broad, posterolateral lobe tapering to a sharp,
decurved point *M. crassifimbriatum*
5. Inferior appendage with a long, slender, basodorsal process; phallus with
dorsomesal process *M. bipartitum*
Inferior appendage without such a lobe; phallus with no dorsomesal process 6
6. Tenth tergite with tip angled sharply laterad; inferior appendage with tip
angled mesad *M. caudatum*
Both tenth tergite and inferior appendage with tips directed posteriad 7
7. Inferior appendage with a rounded, basodorsal lobe *M. lobatum*
Inferior appendage without such a lobe *M. griseum*

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