

THE ORIENTAL GENUS *MASTIGOMYIA* BECKER (DIPTERA: DOLICHOPODIDAE)

Daniel J. Bickel

Entomology Section, Australian Museum, 6 College Street, Sydney, NSW 2000 Australia.
(email: danb@amsg.austmus.gov.au)

ABSTRACT. - The genus *Mastigomyia* Becker is redefined, and is a member of subfamily Sympycninae (Diptera: Dolichopodidae). The genus is based on male secondary sexual characters of the antenna: an elongate first flagellomere, which bears a highly reduced and bristle-like arista. *Mastigomyia* is known only from the Oriental region, and comprises four species, *M. gratiosa* Becker, from Taiwan, Laos and Japan (Ryukyus), *M. anomalicerus* (Hollis), n. comb., from Nepal, and two new species, *M. trangensis* from Thailand, and *M. amami* from the Ryukyus.

KEY WORDS. - Oriental fauna, *Mastigomyia*, Diptera, Dolichopodidae.

INTRODUCTION

Becker (1924) proposed the dolichopodid genus *Mastigomyia* for a single species based on a male specimen from Taiwan. The description lacked accompanying figures and the genus has remained unrecognised. Becker originally placed the genus in the subfamily Rhapsiinae on account of its elongate antennal first flagellomere, and it was listed as such in the Catalog of the Diptera of the Oriental Region (Dyde, 1975). However, Ulrich (1981), based on personal communication from Dr. O. P. Negrobov, correctly referred *Mastigomyia* to the subfamily Sympycninae.

Recently I was able to examine the type species, *Mastigomyia gratiosa*, and noted its similarity to specimens I had seen in collections from the Oriental region, and to a *Chrysotimus* species described by Hollis (1964) from Nepal. This paper redefines and enlarges the genus *Mastigomyia*, and discusses its position in the Sympycninae.

MATERIALS AND METHODS

Institutional abbreviations for material cited are listed in the Acknowledgments. Drawings of genitalia were made with a camera lucida attached to a compound microscope. The left lateral view of the hypopygium or male genital capsule is illustrated. In describing the hypopygium, 'dorsal' and 'ventral' refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. Morphological terminology follows McAlpine (1981). Common features are listed in the introductory descriptions and are not repeated in species descriptions unless needing clarification. Measurements are in millimetres and were made on representative dry specimens. Body length is measured from the antennal base to the tip of the seventh abdominal segment. Wing length is the perpendicular distance to the apex to the humeral crossvein; wing width is measured from the junction of R_1 with the costa to the opposite side of the wing, perpendicular to wing's long axis. The CuAx ratio is the length of the m-cu crossvein/ distal section CuA. The position of features on elongate structures such as leg segments is given as a fraction of the total length, starting from the base. The relative lengths of the podomeres are representative ratios and not measurements. The ratios for each leg are given in the following formula and punctuation: trochanter + femur; tibia; tarsomere 1/ 2/ 3/ 4/ 5. The following abbreviations and terms are used: MSSC - male secondary sexual character(s), the non-genitalic characters found only on the male body; I, II, III: pro-, meso-, metathoracic legs; C, coxa; T, tibia; F, femur; ac, acrostichal setae; ad, anterodorsal; av, anteroventral; dc, dorsocentral setae; dv, dorsoventral; hm, postpronotal setae; npl, notopleural setae; pa, postalar setae; pd, posterodorsal; pm, presutural supra-alar setae; pv, posteroventral; sa, postsutural supra-alar setae; sr, presutural intra-alar setae; t, tarsus; t_{1-5} , tarsomeres 1 to 5.

SYSTEMATICS

Genus *Mastigomyia* Becker

Mastigomyia Becker 1924: 121.

Type species. - *Mastigomyia gratiosa* Becker 1924, by monotypy.

Diagnosis. - Length about 2 mm.

Head: strong vertical and strong diverging ocellar setae present; postverticals represented by 3-4 short setae, continuation of postorbitals; face (Fig. 1B); narrowed below antennae and covered with silvery pruinosity; eyes slightly emarginated laterad of antennae, with enlarged anterior and ventral facets; male first flagellomere greatly elongated and strap-like (MSSC), and covered with fine elongate microtrichia; male arista dorsal but reduced to a short thornlike projection (e.g., Figs 1E, 1F) or absent (Fig. 1G)(MSSC); female first flagellomere short and subtriangular, and with arista dorsal and unmodified, about head height in length.

Thorax: posterior mesonotum very slightly depressed but not flattened; postscutellum present as median longitudinal mound; major setae often yellowish; ac present as single irregular row of 7-8 short setae, or absent; 6 strong dc present; 1 pa, 2 sa, 2 sr, 2 npl, 1 hm, 1 pm present; median scutellar setae strong, with lateral scutellars reduced to tiny hairs; proepisternum with pale seta above base of coxa I.

Legs: legs mostly yellow, with yellow-brown vestiture; CII and CIII each with strong lateral seta; TI bare of major setae, and lacking any ad setal serration; FII with anterior subapical seta and stronger posterior subapical seta, each subtended by an av and pv seta respectively; TII with offset ad-pd setal pair at 1/4, and ad seta at 3/5; FIII with anterior preapical seta subtended by av seta, but posterior subapical seta absent with only subapical pv seta present; TIII with some short dorsal setae; III_{t2} distinctly longer than both III_{t1} and III_{t3}.

Wing: (Fig. 1D); hyaline; R₄₊₅ and M slightly diverging towards apex; CuAx ratio near 0.4.

Abdomen: mostly dark brown with brownish vestiture; tergum 1 with two pairs of very strong black marginal setae; hypopygium (Fig. 1A) dark brown with yellow cercus; hypandrium short and broad; aedeagus elongated and apically expanded; epandrial setae not evident; epandrial lobe with strong apical and subapical setae; surstyli lobate with setae as figured; cercus digitiform and setose.

Remarks. - *Mastigomyia* comprises four species, all from the Oriental Region. The male characters of an elongate and tapering first flagellomere, with a shortened and thickened dorsobasal arista, are considered autapomorphic characters that define the genus. Becker (1924) in his original description of the genus, thought the first flagellomere was an elongate apical arista. In addition, the genus has a single row of acrostichal setae, and lacks any ad setal serration on tibia I (an ad setal serration is common on tibia I of most *Sympycnus* s.s.). The rather simple encapsulated male genitalia (Fig. 1A) is characteristic of the *Sympycninae*.

The major head and body setae of most *Mastigomyia* species are yellow. In this respect, *Mastigomyia* may appear superficially similar to the cosmopolitan genus *Chrysotimus* Loew (indeed, *M. anomalicerus* was originally described in that genus). However, *Chrysotimus* has a wider and shorter thorax (distinct from the longer, more gracile thorax of true *sympycnines*) and its mesonotum is distinctly flattened on the posterior slope. As well, most *Chrysotimus* have biseriate ac as part of its groundplan, not one row as in *Mastigomyia*.

The genus *Mastigomyia* is defined solely by male secondary sexual characters (MSSC), and isolated females probably are not identifiable even to genus. Females (based on the only known associated female, *M. anomalicerus*) have a typical *sympycnine* habitus, with a dorsal arista on a short subtriangular first flagellomere, and would probably be sorted in collections to small undifferentiated *Sympycnus* Loew. Other *sympycnine* genera, such as *Teuchophorus* Loew, are also based on MSSC and their females are not readily separated from *Sympycnus* s.s. Therefore, should *Mastigomyia* even be recognized as a distinct genus? It might be regarded as a species group within some larger yet-to-be defined genus, but since the Oriental *sympycnine* fauna is so poorly known, it is best to retain *Mastigomyia*, at least to define what is a recognizable and monophyletic group. Indeed, I have seen males of undescribed species from Thailand (BPBM) which also have yellow head and thoracic setae but have an unmodified *sympycnine* antenna, characteristic of what might be regarded as an unmodified ancestral group.

Species included in *Mastigomyia*:

amami new species. Japan (Ryukyu Islands).

anomalicerus Hollis, 1964: 110. (*Chrysotimus*). New combination. Nepal.

gratiosa Becker, 1924: 122. Taiwan, Laos, Japan (Ryukyu Islands).

trangensis new species. Thailand.

Key to Male *Mastigomyia*

Mastigomyia can be distinguished from all other male Oriental Sympycninae by the elongate first flagellomere, in which the arista is short and thick, or totally absent. A single row of ac is usually present, and TI lacks any distinct ad setal serration.

1. Major setae of head and thorax dark brown; arista totally absent (Fig. 1G); ac totally absent; leg vestiture and major setae dark brown; halter yellow with brown club (Japan: Ryukyus).....
 *M. amami*
- Major setae of head and thorax yellowish; arista present as rather thickened projection; single row of ac present; leg vestiture and major setae yellow 2

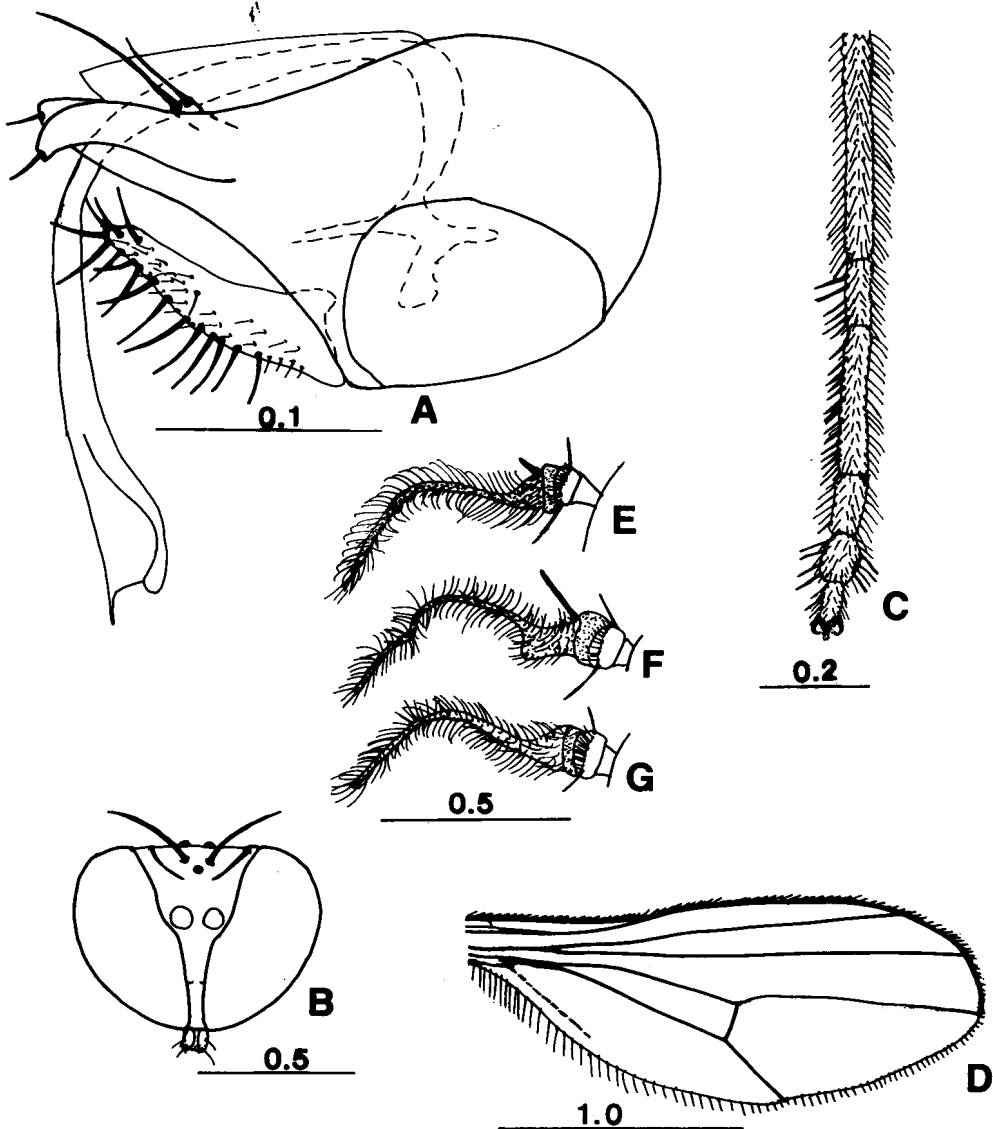


Fig. 1. *Mastigomyia gratiosa*: a. hypopygium, left lateral; b. male head, anterior; c. male tarsus III, ventral; d. male wing, dorsal; e. male antenna, left lateral; *Mastigomyia trangensis*: f. male antenna, left lateral; *Mastigomyia amami*: g. male antenna, left lateral.

2. First flagellomere with distinctive subrectangular basal projection; arista long and spine-like (Fig. 1F); TI with 7-8 yellow ventral seta along distal two thirds (Thailand) *M. trangensis*
- First flagellomere without subrectangular projection, but gradually tapering (Fig. 1E); arista various; TI bare 3.
3. Tergum 1 with two pairs of very strong black marginal setae; III_{t2,3} with anterior row of short dark setae and posterior row of pale setae; III_{t4} slightly flattened and ventrally bare, with some pale anterior hairs (Fig. 1C) (Laos, Taiwan & Japan: Ryukyus) *M. gratiosa*
- Marginal setae of tergum 1 unmodified; III_t not flattened and with unmodified vestiture (Nepal) *M. anomalicerus*

***Mastigomyia gratiosa* Becker**

Mastigomyia gratiosa Becker, 1924: 122.

Type material. - Becker described *Mastigomyia gratiosa* based on a single male from Daitotei, Taiwan, coll. H. Sauter, Apr.1914 (DEI, examined). The type has its head glued to the minuten block.

Additional material. - JAPAN: male, Ryukyu Islands, Iriomote Island, Nakara Gawa, 0-200m, 12 Mar.1964, C. Yoshimoto & J. Harrell (BPBM); LAOS: male, Vientiane Prov., Ban Van Eue, 30 Jun.1967, native collector (BPBM).

Redescription. - Male: length: 2.1; wing: 1.8 x 0.7.

Head: vertex and frons shining metallic blue; major setae yellowish; strong verticals and strong diverging ocellars present; postverticals represented by 3-4 short setae, continuation of postorbitals; face (Fig. 1B) narrowed below antennae and covered with dense silvery pruinosity; eyes with slight emargination laterad of antennae and with anterior and ventral facets enlarged; clypeus silvery; palp yellow with dark apical seta; proboscis yellow; scape and pedicel yellowish, first flagellomere (Fig. 1E) brown; first flagellomere greatly elongated, strap-like, and covered with fine elongate microtrichia; arista dorsal but greatly reduced to a short thornlike projection; ventral postcranium with some yellow ventral setae.

Thorax: dorsum dull metallic green, and pleura mostly dark brown except metepimeron yellow; posterior mesonotum very slightly depressed but not distinctly flattened; postscutellum present as median longitudinal mound; major setae yellowish; ac present as single irregular row of 7-8 short setae; 6 strong dc present; 1 pa, 2 sa, 2 sr, 2 npl, 1 hm, 1 pm present; median scutellars strong, with laterals present as tiny hairs.

Legs: all coxae and remainder of legs yellow; CI and CII with some yellowish anterior hairs; CII and CIII each with strong brownish lateral seta; I: 3.0; 2.5; 1.5/ 0.6/ 0.5/ 0.3/ 0.3; FI with row of 3-4 short pale pv setae in distal quarter; TI bare of major setae, and lacking any setal serration; II: 3.2; 3.4; 1.3/ 0.7/ 0.5/ 0.2/ 0.2; FII with anterior subapical seta and stronger posterior subapical seta, each subtended by an av and pv seta respectively; TII with offset ad-pd setal pair at 1/4, and ad seta at 3/5; III: 4.0; 4.2; 0.5/ 1.2/ 0.3/ 0.4/ 0.3; FIII with anterior preapical seta subtended by av seta, but posterior subapical seta absent with only pv seta present; TIII with some short dorsal setae; III_{t2} distinctly longer than either III_{t1} or III_{t3}; III_{t2,3} with anterior row of short setae and posterior row of pale setae (MSSC); III_{t4} slightly flattened and ventrally bare, with some pale anterior hairs (Fig. 1C) (MSSC).

Wing: (Fig. 1D); hyaline; R₄₊₅ and M slightly diverging towards apex; CuAx ratio: 0.4; lower calypter yellow with fan of yellow setae; halter yellow.

Abdomen: mostly dark brown with brownish vestiture; tergum 1 with two pairs of strong black marginal setae; hypopygium (Fig. 1A) dark brown with yellow cercus; hypandrium short and broad; aedeagus elongated and apically expanded; epandrial setae not evident; epandrial lobe with strong apical and subapical setae; surstyli lobate with setae as figured; cercus digitiform and setose.

Female: unknown.

Remarks. - *Mastigomyia gratiosa* is known from Taiwan, Laos, and the Ryukyu Islands, and therefore appears to be widespread through southeastern Asia. These male characters (MSSC) are diagnostic: short spine-like arista, slightly flattened IIIIt, with some outstanding anterior and posterior vestiture on tarsus III. Also of note, the male abdominal tergum 1 has two pairs of very strong, almost spine-like black marginal setae, which are much stronger than normal marginal setae.

Mastigomyia trangensis new species

Type material. - Holotype, male, THAILAND: Trang Prov. Khaophappa Khaochang, 200m, 11-15 Jan. 1954, malaise trap, G. A. Samuelson (BPBM).

Description. - Male: length: 1.8; wing: 1.6 x 0.6; similar to *M. gratiosa* except as noted:

Head: major setae also yellowish; scape and pedicel yellowish, first flagellomere (Fig. 1F) brownish; first flagellomere also elongated and strap-like, but with distinctive subrectangular basal projection (MSSC); arista dorsal, modified into stout spine which is longer than base of first flagellomere.

Legs: all coxae and remainder of legs yellow; relative podomere ratios similar; TI bare of major setae, but with 7-8 yellow ventral seta along distal two thirds (MSSC?); IIIIt covered with short, almost erect yellow hairs, but otherwise unmodified.

Wing: CuAx ratio: 0.4; lower calypter dark brown with fan of brownish setae; halter yellow.

Abdomen: mostly dark brown with metallic green reflections, and with brownish vestiture; tergum 1 with two pairs of brown marginal setae, which are not particularly strong; hypopygium not figured, but similar to that of *M. gratiosa*.

Female: unknown.

Remarks. - *Mastigomyia trangensis* is known from Trang Province, Thailand. It is readily distinguished from other *Mastigomyia* species by the angular base of its first flagellomere and the relatively long nail-like arista.

***Mastigomyia amami* new species**

Type material. - Holotype, male, JAPAN: Ryukyu Islands, Amami Group, Tokunoshima, Mikyo, 26 Jul. 1963, malaise trap, C. Yoshimoto (BPBM).

Description. - Male: length: 1.6; wing: 1.5 x 0.6; similar to *M. gratiosa* except as noted:

Head: vertex and frons covered with brownish pruinosity; major setae dark brown; antenna (Fig. 1G) brown; first flagellomere greatly elongated and strap-like, and covered with fine elongate microtrichia; arista totally absent.

Thorax: dorsum dull brown with metallic green reflections and with some brown pruinosity; pleura mostly brown except metepimeron yellow; setae dark brown; ac totally absent.

Legs: all coxae and remainder of legs yellow; relative podomere ratios similar; vestiture and major setae dark brown; CI and CII with some dark brown distolateral setae; CII and CIII each with strong dark brown lateral seta; FI with 2 short pv setae near apex; TI bare of major setae; TIII with some short dorsal setae, and with ad seta at 1/4; IIII unmodified.

Wing: distinctly narrowed at base, and anal angle reduced; CuAx ratio: 0.5; lower calypter yellow with fan of yellow setae; halter yellow with brown club.

Abdomen: mostly brown with dark brown vestiture; tergum 1 with two pairs of brown lateral setae, not unusually strong; hypopygium (not figured) dark brown with yellow cercus.

Female: unknown.

Remarks. - *Mastigomyia amami* is known from the Amami Group in the Ryukyu Islands. It is distinguished by the total absence of ac and absence of an arista. As well, the major head, thorax and leg setae are dark brown, in contrast to the yellowish setae of its congeners.

***Mastigomyia anomalicerus* (Hollis), new combination**

Chrysotimus anomalicerus Hollis, 1964: 110.

Type material. - Hollis described *Chrysotimus anomalicerus* based on a male-female pair from Nepal: Taplejung Dist., near Sangu (BMNH, examined).

Description. - See Hollis (1964) for complete description and figures.

Remarks. - This species was originally described as *Chrysotimus*, possibly because of its yellow head and thoracic setae, although Hollis noted the uniserial ac as being unusual for that genus. However, the description and figure of the male antenna indicate it is clearly a member of *Mastigomyia* as here defined.

Mastigomyia anomalicerus is the only species in the genus with an associated female. The female antenna is characteristically "sympycnine", with a short subtriangular first flagellomere and long thin dorsal arista.

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