

A New Species of *Megaselia* (Diptera: Phoridae) Reared from the Fungus *Termitomyces* (Agaricales: Amanitaceae) in Taiwan

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(Accepted April 10, 1996)

R. Henry L. Disney and Wen-Neng Chou (1996) A new species of *Megaselia* (Diptera: Phoridae) reared from the fungus *Termitomyces* (Agaricales: Amanitaceae) in Taiwan. *Zoological Studies* 35(3): 215-219. *Megaselia termimycana* Disney, n. sp. is described from a series reared *Termitomyces albuminosus* (Berk.) Heim in Taiwan. It most closely resembles the Japanese species *M. gotoi* Disney. This is the 1st record of a named phorid reared from this fungus.

Key words: Fungus, Isoptera, Termitidae, Macrotermitinae.

The majority of the records of named species of scuttle flies (Diptera: Phoridae) reared from named species of fungi are from Europe. These, along with all other records are reviewed by Disney (1994), with some additions by Yakovlev (1994). Records for Asia are limited to recorded pests of cultivated Agaricaceae (Sandhu and Bhattal 1986, Disney 1993) and Pleurotaceae (Johal and Disney 1994, Mohan et al. 1995) and a few records from other fungi in Japan (Sasaki 1935, Disney 1989c).

While there are records of phorid larvae and numerous records of adult termitophilous Phoridae from the underground fungus gardens of the subfamily Macrotermitinae (Isoptera: Termitidae) (Disney 1994, Disney and Kistner 1995), there are only a few records, all from Nigeria, of species reared from the sporophores of *Termitomyces* spp. (Agaricales: Amanitaceae) (Disney 1989b 1994). In view of this, when engaged in collecting termitophilous phorids from the fungus gardens of *Odontotermes formosanus* (Shiraki) in Taiwan, we took the opportunity to examine the sporophores of *Termitomyces albuminosus* (Berk.) Heim, grow-

ing above these underground fungus gardens. These mushrooms were found to be infested with phorid larvae. A series reared to the adult stage showed these to be a previously undescribed species of the giant genus *Megaselia* Rondani. It is described below.

Megaselia termimycana Disney, n. sp.

Holotype: Male. Taiwan, Taipei, Botanic Garden, reared from larvae collected 1 June, pupated 2 June and emerged 19 June 1995. (Leg. RHL and AB Disney, W-N Chou). Deposited in National Museum of Natural Science, Taichung, Taiwan.

Paratypes: 10 males, 35 females, same data as holotype. Some deposited in Taiwan Forestry Research Institute, Taipei and some in Cambridge University Museum of Zoology, England; 5 males, same data, except caught in water traps set on site 4-6 June 1995.

Description

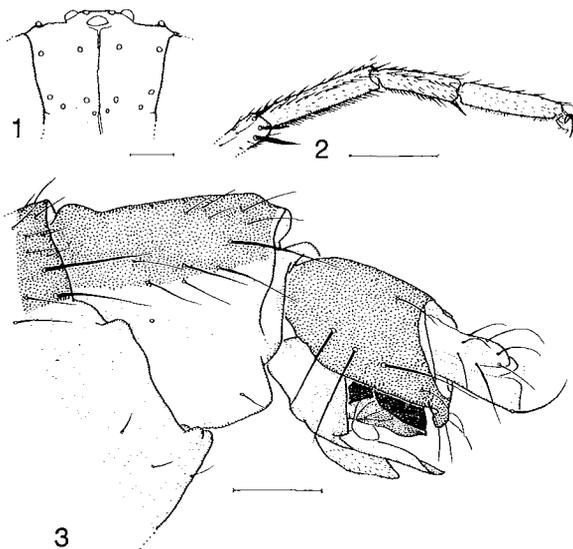
Male: Frons brown, with dense microtrichia (i.e., dull) and 54-70 hairs. Bristles disposed as in Fig. 1, the lower supra-antennals being less robust and only about 2/3 as long as upper pair. Third antennal segment subglobose, pale yellow with a

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dusky tinge and a pre-apical grayish brown arista. First segment of latter, which is about twice as long as its greatest breadth, subequal in length to swollen basal section of 3rd segment, the 2nd segment being a little longer than 1st. The hairs of thin section of third segment slightly longer than greatest breadth of 2nd segment. Palps pale yellow with a slight dusky tinge. With 4-5 bristles, the longest, most apical ones being at most as long as the lower supra-antennal bristles. The pale yellowish orange labrum with greatest breadth less than $2/3$ diameter of 3rd antennal segment. Labella tinged brown above, with a few scattered short colorless spines ventro-apically and short pale teeth on inner faces adjacent to glossa. Thorax largely pale yellow, but scutum very lightly tinged grayish brown and scutellum mainly pale brown on top. A brown patch on pteropleuron. Each side of scutum with a humeral bristle, 3 notopleurals, an intra-alar, a strong post-alar and a posteriorly situated dorsocentral bristle. Scutellum with an anterior pair of hairs, at most as strong as those at rear of scutum between the dorsocentral bristles, and a posterior pair of bristles. Mesopleuron bare. Legs pale yellow, very lightly tinged gray. All 5 fore-tarsal segments slender, and with a postero-dorsal hair palisade. Ratios of their lengths approximately $4 : 1.5 : 1.4 : 1.1 : 1$. Antero-ventral row of hairs extending from beginning of outer third of mid femur with the first 6-9 hairs differentiated

as sharp spines and postero-ventral row of outer half with 2-5 longer spine-like hairs. Mid tibia with dorsal longitudinal hair palisade extending about $3/4$ of length. Tarsal segments 3-5 as in Fig. 2. Hairs below basal half of hind femur fine but distinctly longer than those of antero-ventral row in distal half. Hind tibia with a row of about 12 differentiated postero-dorsal hairs and an irregular row of twice as many differentiated hairs immediately behind. Apical combs of posterior face with all spines simple. Wing 1.52-1.76 mm long. Costal index 0.45-0.49. Costal ratios $3.1-4.2 : 1.9-2.5 : 1$, section 1 always being longer than sections 2 + 3. Costal cilia 0.07-0.08 mm long. Veins brown, apart from paler Sc and vein 7, which are paler gray. No hair at base of vein 3. Sc runs almost to R1, but fades towards apex. Vein 4 originates beyond fork of vein 3. Axillary ridge with 2 bristles, which are stronger than costal cilia. Membrane lightly, but distinctly, tinged gray. Halter largely pale grayish brown. Abdomen with tergites 1-6 brown with short hairs at rear and in middle, but strong bristle-like hairs at sides of 2-6 (Fig. 3). Venter dusky orange yellow with only a few short hairs below at rear of segments 4-6 or 5-6. Hypopygium as in Fig. 3, the epandrium being brown. The hypandrium brown, except for the longer, hairless, left lobe, which is progressively paler distally. Shorter right lobe with crowded short hairs below. Anal tube with pale yellow ground color largely obscured by pale grayish-brown tinge. With 4 rectal papillae.

Female: Frons antennae, and palps similar to male's. Proboscis similar to male but with enlarged labrum, whose greatest breadth is clearly greater than diameter of 3rd antennal segment, and with more conspicuous teeth on inner face of labella. Thorax similar to male's. Legs similar to male's, except mid femur without the rows of short spines on outer third and mid-tarsal segment 5 shorter than 4. Mid metatarsus as in Fig. 6. Hairs below basal half of hind femur stronger than in male. Wing 1.80-1.94 mm long. Costal index 0.48-0.51. Costal ratios $4.0-5.1 : 2.3-3.0 : 1$. Otherwise it and halter as in male. Abdomen with tergites 1-7 brown. Hairs short, but longer at sides of 3-6 and distinctly longer on sides of 2. Tergites 5-7 as in Fig. 4. Venter pale grayish brown with hairs at rear margins of segments 4-6, but more developed on flanks than below on segment 4. Sternite 7 similar to tergite 7, but without the forwardly directed tapered stem. Cerci a little longer than breadth, but with conspicuous setae. With 4 rectal papillae, and Dufour's crop mechanism as in Fig. 5.



Figs. 1-3. *Megaselia termimycana* male. 1. Frons, with bristles indicated by their basal sockets only. 2. Anterior face of mid-tarsal segments 3-5. 3. Left face of abdominal segment 6 and hypopygium. (Scale bars = 0.1 mm).

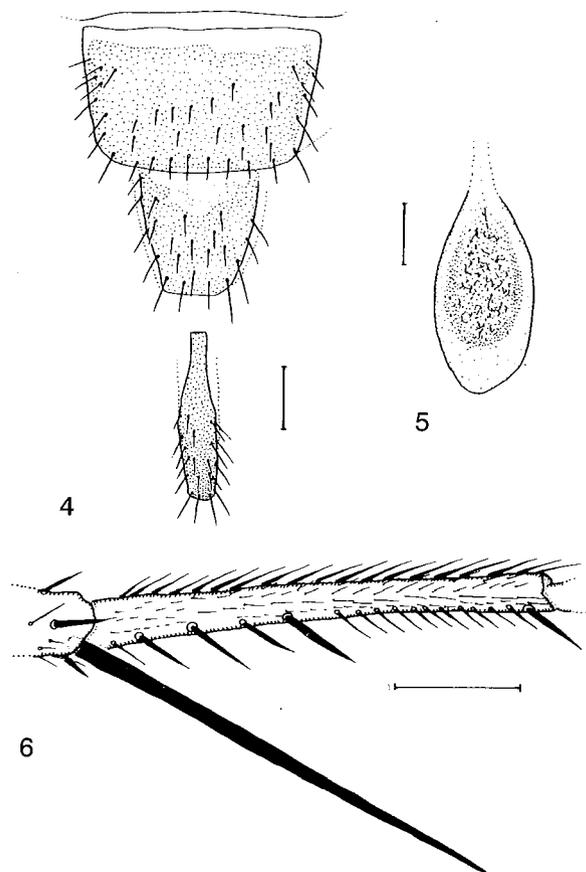
Larva (last instar): A little over 3 mm long when mature, and a pale dirty yellow color. The normal processes of the abdominal segments (see Fig. 3.1 in Disney 1994) are present, but they are greatly reduced and so are easily overlooked at low magnifications. The integument is unusually smooth and bare, apart from transverse shagreened welts at anterior and posterior margins of segments below. Cephalopharyngeal skeleton and mandibles as in Figs. 7-8.

Puparium: Orange brown, otherwise with processes and integument as larva. At eclosion the 2 eclosion plates and anterior cap are detached separately. Eclosion plate with respiratory horn as in Fig. 9.

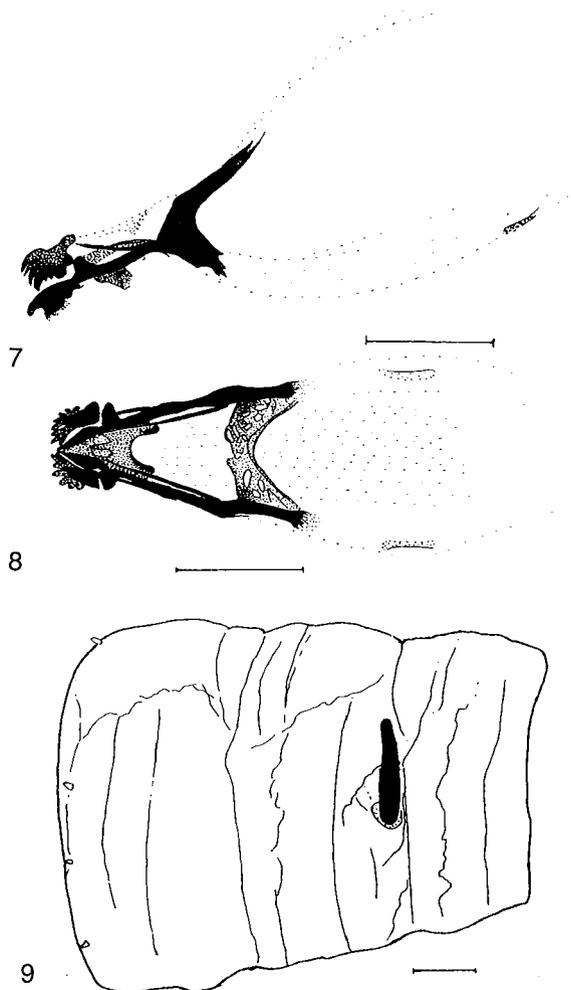
Etymology: The name is a contraction of the generic name of the fungus host with the addition of -ana, derived from the Latin suffix -an (= belonging to).

Remarks: The genus *Megaselia* Rondani is the largest in the family Phoridae and its bound-

aries are still the subject of dispute. However, *M. termimycana* readily runs to this genus in the most recent key to world genera (Disney 1994). In the relevant section of the keys to species of the Oriental and Australasian regions (Borgmeier 1967), the males run to couplet 37 on page 88. They are intermediate between *M. subsetella* Borgmeier, which has yellow halter knobs and whose 5th mid-tarsal segment is twice as long as the 4th, and *M. polychaeta* Borgmeier, which lacks the lengthened 5th mid-tarsal segment and has costal section 1 shorter than sections 2 + 3. Most females run to couplet 68 on page 90 of Borgmeier's key, to *M. antialis* Borgmeier. However, the latter species, of which only the male sex is known, has costal section 1 shorter than sections



Figs. 4-6. *Megaselia termimycana* female. 4. Abdominal tergites 5-7. 5. Dufour's crop mechanism from above. 6. Posterior face of mid-metatarsus. (Scale bars = 0.1 mm).



Figs. 7-9. *Megaselia termimycana* last instar larva and puparium. 7. Left face of larval cephalopharyngeal skeleton. 8. The same from above. 9. Left eclosion plate of puparium, with anterior end to right. (Scale bars = 0.1 mm).

2 + 3. Furthermore, its hypopygium lacks the strong bristles on the epandrium that characterize *M. termimycana* males. Females with the costal index 0.5 or more will run to couplet 79 on page 90 of Borgmeier's keys, to *M. luteicornis* Borgmeier, of which only the female sex is known. However, the latter species has longer bristles on the palps, about half as many differentiated postero-dorsal hairs on the hind tibia, and more highly modified ovipositor segments with reduced cerci. Specimens of 3 other species, described since Borgmeier's keys, will also run to these couplets. *M. robinsoni* Disney (1981) has the apex of the hind femur darkened and bifid spines in the apical comb of the posterior face of the hind tibia. *M. humida* Disney (1991) has bifid spines in the pre-apical comb of the hind tibia and the female abdominal tergites 2 and 3 are largely yellow. *M. kovaci* Disney (1991) females have abdominal tergites 2-6 largely yellow with a pair of brown blotches on each, and the apex of the hind femur is brown.

Megaselia termimycana shows more affinity with certain Palaearctic species. In the key to males of the British species (Disney 1989a) it runs to couplet 12, on the basis of the elongated last tarsal segment of the middle leg. The strong bristles on the epandrium will distinguish it from *M. scutellaris* (Wood) and *M. lutea* (Meigen). Males of the Japanese species *M. gotoi* Disney (1989c) will run to the same couplet. It has strong bristles on the epandrium, as in *M. termimycana*. However, *M. gotoi* has an exceptionally strong pair of bristles on the abdominal venter at the rear margins of both segments 5 and 6 (Fig. 2 in Disney 1989c). There are only fine hairs in this position in *M. termimycana*. The females of these 2 species are very similar. In *M. termimycana* there are at least 9 postero-ventral short spines between the row of strong spines in the basal half and the apical spur of the mid metatarsus. In *M. gotoi* females there are fewer than 9 short spines in this position.

The larvae of *M. gotoi* also breed in the Amanitaceae, having been reared from *Amanita farinosa* Schw. (Disney 1989c).

Acknowledgements: We are grateful to Dr Jung-Tai Chao (Division of Forest Protection, Taiwan Forestry Research Institute) who introduced us

and encouraged our collaboration. Audrey Disney helped in the field. Dr Gui-Xiang Li (Guangdong Entomological Institute, Guangzhou) kindly identified the termites.

RHLD is currently funded by a grant from the Leverhulme Trust, to Dr W. A. Foster (Dept. of Zoology, Cambridge University) for a Research Associate to carry out taxonomic studies of termitophilous Phoridae, and the Isaac Newton Trust (Trinity College, Cambridge).

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臺灣產雞肉絲菇(傘菌目：鵝膏科)內孵化之 *Megaselia* 屬
(雙翅目：蚤蠅科)新種

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本文描述一種由臺灣野生雞肉絲菇內所孵化出來的世界新種，*Megaselia termitomycana* Disney。此新種與日本發現的 *M. gotoi* Disney 非常相似。這是蚤蠅孵化自此種真菌的第一次記錄。

關鍵詞：真菌，等翅目，白蟻科，蚤蠅科。

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