

SPIXIANA	8	3	281–284	München, 30. Dezember 1985	ISSN 0341-8391
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Mycetophilids on islands in the Southern Ocean, with the description of a new species from the Falkland Islands

(Diptera: Mycetophilidae)

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Abstract

Mycomya malvinensis spec. nov. (Diptera: Mycetophilidae) from the Falkland Islands is described. All other members of the mycetophilid complex are widely distributed in South America, but with a decrease in the number of species in Tierra del Fuego. The offshore islands north of New Zealand show similarities with the South American situation. There are no native mycetophilids recorded from more remote islands which are under the influence of the Antarctic Convergence.

Introduction

This paper presents results of the examination of material collected by M. Vogel on the Falkland Islands in March 1982. The research was carried out in the course of the project „Zur Ökologie antarktischer Landinsekten“ on South Georgia and the Falkland Islands.

Material and methods

The gnat material was obtained by pitfall traps (plastic bakers with a diameter of 7 cm and a volume of about 200 ml, containing a mixture of formaldehyde, water and a detergent) set out in different localities in the outlying areas of Port Stanley. The type of vegetation can be classified as an oceanic heath formation (MOORE 1968):

Port Stanley 1: pitfall traps, 17. 3. 1982–20. 3. 1982 in a grassland at the boundary of the “Live Firing Area” of the Royal Marines. The vegetation consists of different species of grass, which were heavily grazed by sheep. Port Stanley 2: pitfall traps, 17. 3. 1982–20. 3. 1982 inside the “Live Firing Area”. The vegetation consists mainly of different species of grass (i. e. *Poa annua*, *Festuca contracta*, *Agrostis magellanica*). Other plants identified were *Juncus scheuchzerioides*, *Rostkovia magellanica* and *Acaena magellanica*. Port Stanley 3: pitfall traps, 17. 3. 1982–20. 3. 1982 at the foot of rocks inside the “Live Firing Area”. The vegetation a dwarf shrub association with dominant plant species being *Empetrum rubrum* and *Blechnum magellanicum*. A total of 4 species from 100 specimens was collected (see table 1).

Results

Mycomya malvinensis spec. nov.

Mycomya malvinensis spec. nov. is closely related to *Mycomya fusca* (Meigen, 1818) and *M. maura* (Walker, 1856), concerning shape and coloration. The form of the male genitalia is similar to *M. maura*. However the new species is well founded because of differences in the structure of the male genital forceps at the hypopygium.

Diagnosis:

Male: Medium-sized brown coloured midge of the genus *Mycomya* Rondani, 1856. Length 4 mm. Head brown, clypeus and palpi yellow. Antennae, inclusively the basal segments, brown. Mesonotum, scutellum, postnotum and pleura brown. Scutellum with four long bristles. Coxae brown; middle coxae without processus. Femura, tibia and tarsae yellow. Tibial spurs brown. Fore tibia longer than fore metatarsus. Halteres greyish white. Wings hyaline, without any pattern. Subcosta broken, leading to R 1. Cu – fork basis beyond crossvein R-M. Stalk of the M – fork longer than the under tine. Abdomen uniformly brown. Hypopygium (fig. 1) yellow.

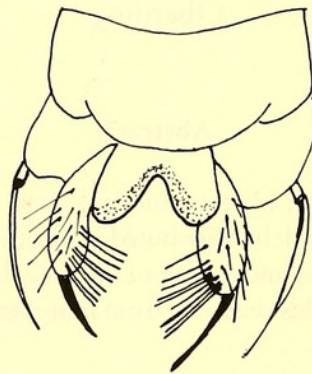


Figure 1: Male hypopygium of *Mycomya malvinensis* spec. nov. from below.

Female: Length 3 mm. In coloration and wing venation totally equal to the male. Ovipositor yellow. Locus typicus: Port Stanley, Falkland Islands.

Deposition: Typus 1♂ in Zoological State Collection, Munich, preserved in 70% ethanol. 46♂♂, 12♀♀ (holotypus and paratypes) in Zoological State Collection, Munich, 3♂♂, 3♀♀ (paratypes) in Collection University of Marburg.

Discussion

Distribution of mycetophilids on islands in the Southern Ocean

The larvae of mycetophilids play an important role in the decomposition of dead animal and plant material in terrestrial ecosystems. However, on islands with cold temperate and subantarctic climates, the conditions for survival become more critical. Two points are important:

1. The possibility to colonize these islands and to recolonize them again after extinction.
2. The Antarctic Convergence seems to be an absolute boundary for a further distribution.

In the southern hemisphere the occurrence of mycetophilids is only recorded from South Georgia, an island south of the Antarctic Convergence (COLLESS 1970). However, an intensive study of the invertebrate fauna at different sites on the island furnished only a single specimen in the old whaling station Grytviken (see VOGEL and NICOLAI 1983) refer to likelihood of this specimen being introduced. The total number of arthropods collected on the island was more than 150 000 (compare VOGEL, REMMERT &

LEWIS-SMITH 1984, VOGEL in press). It therefore appears that the species could not establish a stable population on the island and is restricted to favourable places and probably only inside the shelter of human settlements. The main primary macro-decomposers on this island are perimylopids (Coleoptera, Perimylopidae). There are no records of native mycetophilids from islands that lie in the sphere of influence of the Antarctic Convergence or that are farther away from the next continent (i. e. Marion Island, Prince Edward Island, Iles Crozet, Iles Kerguelen, Heard Island, Macquarie Island). Mycetophilids are found on islands in cold temperate climates with a transition to subantarctic climate, located in a very close position to the next centre of dispersal. Such are Campbell Island, the Auckland Islands and the Falkland Islands. HARRISON (1955) described four species of mycetophilids from Campbell Island and the Auckland Islands. Three of them, *Anomalomya guttata* (Hutton), *Exechia hiemalis* (Marshall), *Mycetophila marginepunctata* Tonnoir, are widely distributed in New Zealand. One species (*Zygomyia submarginata*) is described as new (HARRISON 1955). The same situation exists on the Falkland Islands. The genus *Tetragoneura* Winnertz is found in South America with c. 54 species. Four species (*T. ardeiceps*, *T. pollux*, *T. sinuta*, *T. tibialis*; all described by FREEMAN) occur in Tierra del Fuego. The genus *Brevicornu* Marshall occurs with about 10 species in South America and with one species (*B. simile* Freeman) in Tierra del Fuego. The cosmopolitan genus *Mycetophila* Meigen even exists with about 216 species in South America. Seven of them (*M. bifida*, *M. conjuncta*, *M. fuscens*, *M. nervitacta*, *M. picea*, *M. subcapitata*, *M. triangulifera*; all described by FREEMAN) occur in Tierra del Fuego. Also the cosmopolitan genus *Mycomya* Rondani is found in South America with about 85 species. Four of them (*M. basinerva*, *M. coxalis*, *M. inermis*, *M. pectinata*; all described by FREEMAN) are recorded from Tierra del Fuego (all data after PAPAVERO 1978 and DURET 1979, 1980a, 1980b, 1981, 1982). Therefore there is the possibility of colonization of the Falkland Islands from the South American continent c. 500 km to the west. However, there is no detailed information available on the ecology of the species and their distribution in the more southerly parts of Tierra del Fuego. Thus the Antarctic Convergence seems to be a sharp boundary even in terrestrial biotopes. However it is remarkable, that mycetophilids (together with sciarids) are the most important soil insects in the high Arctic, and cold arctic oceanic islands such as Jan Mayen (REMMERT 1980). At present it is not clear why there are such differences between the insect fauna of arctic and antarctic terrestrial biotopes.

Acknowledgements

Grateful acknowledgement is made to Volker Nicolai for his help during the field work and to Bettina Hitzfeld, R. I. Lewis-Smith, W. Block for correcting the manuscript. The research was supported by the Deutsche Forschungsgemeinschaft.

Table 1: Numbers and species of mycetophilids collected in outlying areas of Port Stanley, Falkland Islands in March 1982.

Species	Stanley 1		Stanley 2		Stanley 3	
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
<i>Tetragoneura penai</i> Duret	2	1				
<i>Mycetophila</i> spec.				3		
<i>Mycomya malvinensis</i> spec. nov.	42	14	5	3	3	
<i>Brevicornu</i> (<i>B.</i>) <i>argentinense</i> Lane	7	13	6			

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Vogel, Michael and Plassmann, E. 1985. "Mycetophilids on islands in the Southern Ocean, with description of a new species from the Falkland Islands (Diptera, Mycetophilidae)." *Spixiana* 8, 281–284.

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