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1 Introduction

Sciarids, or black fungus gnats, are small flies, mostly 1-6 mm in size and of uniform appearance. The antennae have 16 segments: two basal segments and 14 flagellomeres. The compound eyes usually form a dorsal bridge in front of the ocelli (absent only in some genera such as *Phyxia* with more or less reduced wings). Also the wing venation is quite characteristic for all species: with a short C ending between R_5 and M_1 , two forks of M and CuA, and only one crossvein r-m. These defining characteristics easily distinguish the Sciaridae from the Mycetophilidae s. l. From the "Lestremiinae" (Cecidomyiidae) they differ by the spurs at the apex of the tibiae, and the mostly uniform flagellar segments of the antennae.

The Sciaridae are generally accepted to form a monophyletic group within the complex of the Mycetophiloidea (= Sciaridoidea sensu WOOD & BORKENT 1989). Several larval and imaginal characters are discussed as synapomorphies of the Sciaridae (e. g. WOOD & BORKENT 1989, BLASCHKE-BERTHOLD 1994). The Cecidomyiidae (WOOD & BORKENT 1989, OOSTERBROEK & COURTNEY 1995) and a taxon (Diadocidiidae + [Ditomyiinae + Mycetophilinae]) (BLASCHKE-BERTHOLD 1994) were considered to be the sister group of the Sciaridae, but we are still far from a definitely accepted phylogenetic hypothesis.

This problem of conflicting interpretations will only be solved when extensive revisionary studies of the world genera have been made and a better knowledge of the Sciaridae of the zoogeographic regions of the southern hemisphere has been acquired.

Inventory studies of the species of a given area are the basis of every zoogeographic analysis. So far, the Australasian-Oceanian sciarid fauna has been studied very little. The 'Catalog of the Diptera of the Australasian and Oceanian Regions' only listed the published names for Australia and New Zealand without any generic revision (STEFFAN 1989). Earlier taxonomists had placed nearly all species in the genus *Sciara*, and so many assignments are now incorrect (SKUSE 1890 for Australia; TONNOIR & EDWARDS 1927 for New Zealand) and there is no information about the generic structure within the regional fauna as a whole.

So far only 19 species of Sciaridae are known from the main islands of New Zealand (TONNOIR & EDWARDS 1927), excluding the genus *Ohakunea* EDWARDS with the species *Ohakunea bicolor* EDWARDS. This species differs markedly from the accepted definition of the Sciaridae, in wing venation, structure of male genitalia and in an incomplete eye bridge. The genus is doubtfully referring to the Sciaridae. The four species described from Campbell Island (HARRISON 1955, STEFFAN 1964) are also omitted from the list of species from the main islands.

The 19 previously described species were referred to the genera *Sciara* MEIGEN (17), *Scythropochroa* ENDERLEIN (1) and *Neophyxia* TONNOIR (1). We have studied these types, most of the paratypes, and additional material from New Zealand identified by EDWARDS, in the London Natural History Museum (MENZEL & MOHRIG 1999). In addition, we studied a large collection made by the junior author on the North Island in the summer of 1992/93.

2 Material and methods

Generally adult sciarids can be collected carefully by net from herbs and bushes, but also from the surface of soil and rotten wood. For this study most of the specimens were collected by sweeping, but a small percentage was trapped using simple water traps (yellow dishes filled with water containing some drops of dish soap). These can be exposed for periods up to two days, or for longer if 1 % of formaldehyde is added.

Good results are obtained with Moericke and Malaise traps. Sciarids also can be captured in Barber traps, a common method for collecting terrestrial arthropods, especially brachypterous forms and small species with limited flying activity. All specimens were preserved in 70 % alcohol with the addition of 1% formaldehyde.

Species determination is possible only with specimens mounted on slides for microscope examination. The best preparation method is simple: preserved specimens are transferred to 96 % alcohol for about 10 minutes, then to creosote for at least the same length of time. They can be stored in creosote for several days. Creosote is a suitable intermediate stage between alcohol and the xylol-based Canada Balsam and increases the transparency of the specimens dramatically.

After that, the specimen is transferred to a slide with the help of pins. The male hypopygium is removed, placed separately in a small drop of Canada Balsam with the ventral side facing up, and covered with a small coverslip under a stereomicroscope. The body is placed in a sufficiently large drop of Canada Balsam, without removing any other structure, and is covered with a coverslip. Other microscopic mountants or bleaching agents have been found to be less suitable.

Females are usually difficult to identify and they have been excluded except for a few characteristic species where males and females can be associated together with certainty. Drawings were made by means of a simple Abbe microscopic drawing mirror (Carl Zeiss, Jena). All figures are given to the same scale: Gonostyles and claws 400×; base of hypopygium, 4th flagellomere, apex of fore tibia and palpi 200×; basal parts of antennae and wings 80×.

The material studied is, unless otherwise stated, deposited in the MOHRIG collection, Greifswald. The abbreviation BMNH is used for the Natural History Museum, London, UK.

3 Localities

The present study is based on a large material collected by the junior author during a fieldtrip through the North Island from November 27th, 1992, to January 19th, 1993. The material comes from 17 different localities, listed as follows, together with some notes on date, type of habitat, height above sea level (only mentioned when over 500 metres) and collecting method.

- 1: 06./07. 12. 92; Otorohanga, pasture 1 km west of the town; layer of high grasses, herbs and ferns at roadside; yellow dishes.
- 2: 14. 12. 92 and 13. 01. 93; Waitomo Caves, 12 km southwest of Otorohanga; *Podocarpus* wood with tree ferns; sweepnet.
- 3: 16. 12. 92; Tongariro National Park, 2 km east of Whakapapa village; *Nothofagus* wood with very dense layer of shrubs and herbs; altitude 1200 m; sweepnet.
- 4: 18. 12. 92; Tongariro National Park, near Historic Waihohonu Hut; dense *Nothofagus* wood, altitude 1200 m; sweepnet.
- 5: 21. 12. 92; Hauhungaroa Range, 5 km southwest of Tihoi; *Podocarpus* wood with ground ferns; sweepnet.
- 6: 23. 12. 92; Urewera National Park, Huiarau Range 30 km southeast of Murupara; *Podocarpus-Nothofagus* wood, altitude 600-1000 m; sweepnet.
- 7: 26. 12. 92; White Pine Bush 3 km southwest of Whakatane / Bay of Plenty; *Podocarpus* wood; sweepnet.
- 8: 26. 12. 92; Kaimai Range, Whakamarama 10 km southwest of Tauranga; dense *Podocarpus* secondary wood with tree ferns; sweepnet.