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THE FUNGUS GNATS (DIPT., MYCETOPHILOIDEA) AS POTENTIAL HOSTS OF PROCTOTRUPID WASPS (HYM., PROCTOTRUPOIDEA)

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The hosts of the parasitic wasps of the family *Proctotrupidae* s. str., so far known, belong predominantly to beetles and the families *Carabidae*, *Staphylinidae* and *Elateridae* in particular. This is demonstrated from the rearing records, recently reviewed by JANSSON (1960) and HEDQVIST (1963). Besides these records there are also scattered data recording other insects, and an uncorfirmed record of a millipede as potential hosts of *Proctotrupidae*. These include the superfamily *Mycetophiloidea* or fungus gnats, the well known inhabitants of various fungi. It is generally known that some species of *Proctotrupidae* are attracted by fungi as a habitat of their potential hosts. Among the latter, two major groups should be mentioned — beetles and flies. The first group is represented by several families (REHFOUS, 1955), the second one especially by the superfamily *Mycetophiloidea* (BUXTON, 1961). The larvae of these two insect orders develop within the fungus, yet their attitude to fungi as a habitat is not always the same. The fungicolous *Mycetophilidae* are fungivorous, while the larvae of certain beetles are predaceous (many *Staphylinidae*). Entering this habitat the parasite has thus the choice of at least two different insect orders. It is believed the parasite prefers such host (or group of hosts) it is parasitising in habitats other than in fungi.

As far as known, species of the following genera of *Proctotrupidae* are reported bred from various fungus gnats: *Proctotrupes* LATR., *Phaenoserphus* KIEFF., *Codrus* PANZ. and *Cryptoserphus* KIEFF. Unfortunately, some of these records are considered doubtful (erroneous records caused by mass-rearing methods). The aim of the present paper is to bring new and reliable evidence of fungus gnats as potential hosts of *Proctotrupidae*.

There are only a few records of fungus gnats to be the hosts of Proctotrupid wasps. MORLEY (1922) listed six species viz. *Proctotrupes gravidator* (L.) from *Bolitophila hybrida* (MEIG.)*, *Proctotrupes divagator* OL. from *Neoempheria lineola* (MEIG.), *Cryptoserphus aculeator* (HAL.) from *Sceptonia nigra* (MEIG.), *Phaenoserphus pallipes* (JUR.) from *Macrocera maculata* MEIG., *Codrus niger* PANZ. from *Brevicornu griseicolle* (STAEG.) and *Codrus ater* (NEES) from *Mycetophila fungorum* (DE GEER). VOLLENHOVEN (cf. KIEFFER, 1914) reports the very same hosts and parasites listed by MORLEY (op. cit.). BISCHOFF (1923) quotes several unnamed species of *Proctotrupes* s. l. bred from Mycetophilids. MADWAR (1937) cites MORLEY (1922). SZELÉNYI (1942) reports a reliable record of *Cryptoserphus cumaeus fungorum* SZEL. parasitising *Mycetophila fungorum* (DE GEER). FERRIÈRE (1955) reports *Phaenoserphus* and *Cryptoserphus* spp. bred from various fungi but gives

* New nomenclature used (teste P. Laštovka).

no hosts. JANSSON (1960) mentioned all the records cited above except that of SZELÉNYI (op. cit.).

In spite of several records the species of *Proctotrupes* LATR. are doubtfully parasites of fungus gnats. The reliable host records give beetles of the family *Carabidae*. *Proctotrupes gravidator* (L.) is recorded from *Amara apricaria* (PAYK.) (NIXON, 1938) and *Amara* sp. (WEIDEMANN, 1962). *Phaenoserphus* KIEFF. (in its new restricted sense) has the host spectrum restricted to *Carabidae* and *Staphylinidae*. *Phaenoserphus pallipes* (JUR.) was bred from *Staphylinus olens* MÜLL. in Europe (ELLIOTT & MORLEY, 1911) and from *Nebria lewisi* BATES in Japan (WATANABE, 1954). All reliable host records of *Codrus*-species include Staphylinids only. *Codrus niger* PANZ. is reported bred from *Staphylinus ater* GRAV. (WEIDEMANN, 1962), *Codrus ater* (NEES) from *Creophilus maxillosus* L. (FROHAWK, 1886) and *Staphylinus olens* MÜLL. (ELLIOTT & MORLEY, 1911).

REHFOUS (1955) lists from various fungi a high number of Staphylinids and Carabids, which in my opinion are the potential hosts of the above mentioned species of *Proctotrupes*, *Phaenoserphus* and *Codrus*. If this assumption proves incorrect the species of these genera must be considered highly polyphagous. So far the Proctotrupids are considered to be oligophagous (cf. WEIDEMANN, 1965). However, further observations and reliable rearing records are necessary to clear up this problem.

On the contrary, the genus *Cryptoserphus* KIEFF. includes some species which are, beyond doubt, parasites of fungus gnats. FERRIÈRE (1955) expressed the very same idea. Several new host records given below (rearings of isolated fungus gnats pupae) support the view that the *Cryptoserphus* species of the *aculeator* (HAL.) — group are strictly monophagous upon *Mycetophilidae*. Thus, the Mycetophilids are shown to be hosts of at least some Proctotrupids, a fact ignored in some recent papers (e.g. HEDQVIST, 1963).

Cryptoserphus aculeator (HAL.)

A widely distributed species ranging from England over Europe (?Siberia) to Japan and Kurile Islands (PSCHORN-WALCHER, 1964). Reported by MORLEY (1922) from *Sceptonia nigra* (MEIG.).

New records: 2♀♀ Dobřichovice (Bohemia centr.), 30. 9. 1960 from *Mycetophila ruficollis* MEIG. (Laštovka coll.); 1 ♂ Klánovice (Bohemia centr.), 25. 9. 1966 from *Exechia contaminata* WINN. in *Lactarius plumbeus* (BULL.) (Laštovka coll.)

Cryptoserphus cumaeus NIX.

Known from Europe and reported from northern Japan (Rishiri Is., Hokkaido) (PSCHORN-WALCHER, 1964). SZELÉNYI (1942) described a subspecies *fungorum* SZEL. from *Mycetophila fungorum* (DE GEER).

New records: 8 ♀♀, 2 ♂♂ Malšice (Bohemia merid.), July 10—14, 1960 from *Mycetophila fungorum* (DE GEER) (Laštovka coll.); 1 ♂ Vrané n. Vlt. (Bohemia centr.), November 1, 1959 from *Mycetophila fungorum* (DE GEER) (Laštovka coll.).

SUMMARY

The species of fungus gnats (*Mycetophiloidea*, *Dipt.*) are discussed as potential hosts of Proctotrupid wasps. In addition to several new host records a critical review of all known records is given.

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