

The genus *Keroplatus* Bosc, 1792 — an interesting addition to the Norwegian fauna (Diptera: Keroplatidae)

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The genus *Keroplatus* is reported new to Norway, based on 5 finds from southern Norway in the period 1982—1991. The specimens belong to the species *K. testaceus* Dalman, 1818 and *K. dispar* Dufour, 1839. Notes on taxonomy, biology and distribution are given. *Keroplatus* species seem to be closely associated with virgin forests. As these forests are vanishing in Norway, both species should be regarded as vulnerable.

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INTRODUCTION

Keroplatus species are noteworthy fungus-gnats in several ways. They are unusually large, with long and strongly compressed antennae. At first sight, they may look like crane flies or wasps. Their larvae spin webs, in which they trap fungal spores and carnivorous preys. Luminous larvae and pupae have been documented in several species (first time by Wahlberg 1849). Despite their conspicuous appearance, no *Keroplatus* species have so far been published from Norway (Krivosheina and Mamaev 1988, Krogerus 1960, Siebke 1877, SootRyen 1942, Lundström 1914). During an extensive study of an old spruce forest in Akershus, SE Norway, during 1991, one single female was collected in a window trap. In addition, four specimens are kept in the collection of Zoological museum Bergen — all collected in southern Norway. The collections in the zoological museums of Oslo, Trondheim and Tromsø do not comprise any additional specimens.

SYSTEMATICS

Keroplatidae is treated as an independent family under the superfamily Sciaroidea (Andersson 1991) of the superfamily Myce-

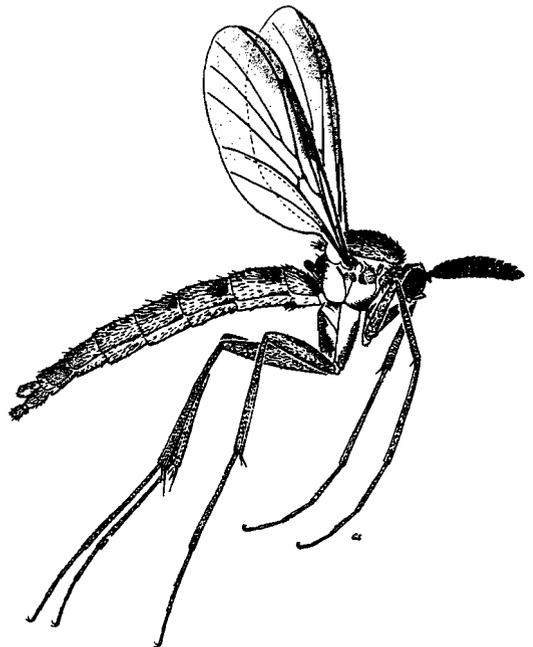


Fig. 1. *Keroplatus testaceus*, male. Drawn after a specimen stored in alcohol.

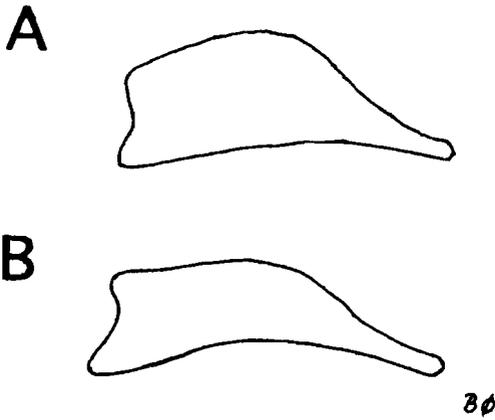


Fig. 2. Female cerci in (A) *Keroplatus testaceus* and (B) *Keroplatus dispar*.

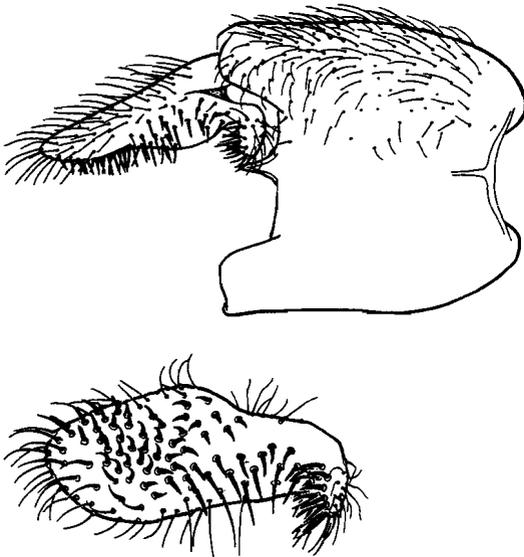


Fig. 3. Male genitalia of *Keroplatus testaceus*. A. Right gonostylus, internal view. B. Gonocoxite, ventral view (right gonostylus removed).

tophilidea (Matile 1990), but is frequently considered a subfamily, Keroplatinae, in the family Mycetophilidae (e.g. Hutson, Ackland and Kidd 1980, Wood and Borkent 1989). Present descriptions of Keroplatidae include 80 genera and 800 species from all zoogeographical regions (Matile 1990).

Keroplatidae is divided into three subfamilies, of which two are represented in Europe, Macrocerinae and Keroplatinae. The latter includes the genus *Keroplatus*. In this revision of the *Keroplatus*, Matile (1986) gives an overview of the long and confusing history with respect to the systematic naming of these species. Four species have been recorded from Europe, *tipuloides* Bosc, 1792, *testaceus* Dalman, 1818, *dispar* Dufour, 1839, and *reamurii* Dufour, 1839.

IDENTIFICATION

Among the fungus gnats, the family Keroplatidae can be characterized by wing venation (see Fig. 1): Posterior fork and stem of median fork are connected by a cross-vein well beyond the basal portion of the wing; radius 4 is absent or less than half the length of radius 5; subcosta long; media and radius are fused for a short distance (Hutson et al. 1980, Vockeroth 1981).

The genus *Keroplatus* is easily recognized by the huge, flattened antennae and the reduced palps (Fig. 1). In his world revision of Keroplatidae, Matile keys out ten species of *Keroplatus* in the Holarctic region (Matile 1990), and this key was used in the identification of the present material.

Two closely related species were recognized, *K. testaceus* and *K. dispar*. They do not differ notably in body size nor in wing length; but, intraspecific variation was observed (Table 1). The two species may be identified by characters in the wing venation. In *K. testaceus*, subcosta ends near apex of the radius-media fusion, while it ends distinctly

Table 1. Some measurements of the Norwegian specimens of *Keroplatus*.

Species	Sex	N	Body Length	Wing Length
<i>Keroplatus testaceus</i>	female	2	9.0–13.7 mm	6.8–9.4 mm
<i>Keroplatus testaceus</i>	male	1	11.0 mm	6.6 mm
<i>Keroplatus dispar</i>	female	2	11.9–14.5 mm	8.2–9.5 mm

beyond this point in *K. dispar*. However, according to Matile (1990) genitalia should be studied to accomplish a certain identification. In females of *K. dispar*, the cerci are widest at its base, while in *K. testaceus*, they are wider near its middle (Fig. 2). In males, the ventral lobe of the gonostylus is more pronounced in *K. testaceus* than in *K. dispar* (Fig. 3).

A third species, *K. tipuloides* (Syn: *K. seioides* Wahlberg, 1839), is likely to occur in Norway, but is still not recorded. Its wings are more clouded with a distinct clear spot at apex.

NORWEGIAN RECORDS

Keroplatus testaceus Dalman, 1818

Syn: *Keroplatus winnertzi* Landrock, 1925.
TEY: Porsgrunn, Brevik, Dammane, EIS 11, 11—20 July 1988, 1 female, leg. G. Søli (Malaise trap); Gravastranda, EIS 18, 19 Sept. 1988, 1 male, leg. G. Søli (Malaise trap); HOY: Samnanger, Ådland, EIS 31, 17 July—13 Aug. 1982, 1 female, leg. A. J. Nilssen/L. Greve (Malaise trap).

Keroplatus dispar Dufour, 1839

AK: Rælingen, Tappenberg, EIS 29, July 1991, 1 female, leg. B. Økland/S. Hågvar (window trap). HOY: Samnanger, Ådland, EIS 31, 17 July—13 Aug. 1982, 1 female, leg. A. J. Nilssen/L. Greve (Malaise trap).

BIOLOGY

All known larvae of Keroplatidae, except in the genus *Planarivora*, spin webs for capturing small animals or spores. Generally, these webs are constructed under dead, decomposing wood, and most often under resipunate or bracket Polypores (Matile 1990). Probably, both the larvae and the adults of most Keroplatidae are nocturnal. They are fragile, slow flying, short lived, and have little capacity for chance dispersal (Matile 1990). Larvae in three *Platyura* species (Keroplatidae) have been observed killing their prey in their web with small drops containing oxalic acid (Mansbridge 1933). The larvae of another fascinating Keroplatidae species, *Arachnocampa luminosa* (Skuse, 1890), construct webs on the walls in caves in New Zealand. The larvae are luminous, and the light from colonies of the larvae is supposed to attract preys into their webs (Oldroyd 1966).

Within the genus *Keroplatus*, the biology

is best studied in *K. tipuloides*. The larvae of this species produce irregular mucilaginous webs under bracket-fungi, and feed primarily on fungus spores (Santini 1982). The species is reported to live solely under the carpophores of *Fomes fomentarius* (Fr.) Kickx (Polyporaceae) (Santini 1982, Ståhls and Kaila 1990). Both larvae and pupae are reported to be luminous (Wahlberg 1849, Santini 1982). There are few documentations on biology from the three other European *Keroplatus* species. Luminous larva is documented from *K. reamurii*, spinning larvae are studied in *K. testaceus*, and *K. dispar* is found under a polypore under a fallen tree-branch (Matile 1986).

The specimen of *K. dispar* from Akershus was trapped under a sporulating carpophore of *Fomitopsis pinicola* (Fr.) Karst. in an old spruce forest with a high density of dead wood and polypores. The two specimens of *K. testaceus* from Telemark were both collected in a rather undisturbed mixed forest dominated by deciduous trees.

DISTRIBUTION AND CONSERVATION EVALUATION

In Fennoscandia both *K. tipuloides* and *K. testaceus* have been recorded from Sweden and Finland (Hackman 1980, Matile 1986), while *K. dispar* from Sweden only (Krivoshina and Mamaev, 1988, Matile 1986).

K. tipuloides is regarded as an endangered species in Finland (Väisänen 1982, Anonymous 1985) and as a vulnerable species in Sweden (Anderson et al. 1987). In Finland, no records of this species were made between 1960 and 1989 despite comprehensive collection of more than 100 000 fungus gnats by Hackman and Tuomikoski in the 1960s (Väisänen 1982). *K. tipuloides* was rediscovered 1989 (Ståhls and Kaila 1990). The decline of this species in Finland, is explained by the disappearance of old deciduous trees with polypores, as a consequence of silvicultural practices (Ståhls and Kaila 1990).

On the British Isles, the only *Keroplatus* species, *K. testaceus*, is listed as «rare» in the «British Red Data Book» (Shirt 1987).

The Norwegian fauna of fungus gnats is poorly documented. However, due to their striking appearance, one should expect specimens of *Keroplatus* to be represented in museum collections if they were common. Hence, the two species here recorded must be

considered rare in Norway. Both species show strong affinity to fungi in undisturbed forests. Since modern forestry has degraded most virgin forests in Norway, and very few remaining areas have been protected, the two species should at least be regarded as vulnerable. There are good reasons to pay attention to these species in order to achieve more information about their biology, distribution and relation to forest practices.

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SAMMENDRAG

Slekten *Keroplatus* Bosc — et interessant tillegg til den norske fauna (Diptera: Keroplatidae)

Slekten *Keroplatus* rapporteres for første gang fra Norge, basert på 5 funn i Sør-Norge i perioden 1982—91. Individene tilhører artene *K. testaceus* Dalman, 1818 og *K. dispar* Dufour, 1839. Artenes systematikk, biologi og utbredelse er kort kommentert. Begge artene er sannsynligvis avhengige av uberørt skog for å overleve. Dette er naturtyper som står i fare for å forsvinne, og av den grunn bør artene betraktes som «sårbare» i Norge.

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