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Three species of Bibionidae (Diptera) new to the fauna of Switzerland

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Bibio siebkei MIK, *Bibio fulvicollis* GIMMERTHAL and *Dilophus borealis* SKARTVEIT are recorded for the first time from Switzerland. Some further records of *Dilophus borealis* from central and southern Europe are presented, the species being recorded for the first time from Spain and France. For each species, a short diagnosis and a figure of the male hypopygium are given.

Keywords: Bibionidae, Switzerland, faunistics, boreoalpine species

INTRODUCTION

Bibionid flies are common members of boreal habitats and can occasionally be very abundant. Some of the bibionids of Switzerland and neighbouring areas have been treated by HAENNI (1982) and GREVE & HAENNI (1994). DUDA (1930) included some material from the Eastern Alps and summarized the previous records in his monographic treatment of the Palaearctic Bibionidae. Recent contributions including faunistical records from central European mountainous areas are by PECINA (1962-66) from the former Czechoslovakia, MIKOŁAJCZYK (1976) from Poland and FRANZ (1989) from Austria. The fauna of the mountainous areas in central Europe is generally quite similar to that of the Scandinavian mountains, and it is thus not surprising to find that three more species described from Northern Europe belong to the Swiss fauna.

MATERIAL AND METHODS

The records are based on material deposited partly in Swiss collections, namely the Muséum d'Histoire Naturelle, Neuchâtel (MHNN), the Musée Zoologique, Lausanne (MZL) and the Zoologisches Museum der Universität, Zürich (ZMUZ), and partly in the collections of the Museum of Zoology, Helsinki, Finland (MZH).

Most of the material is pinned but some specimens are stored in alcohol. Most bibionids can be identified without any dissection, but the genitalia of some of the *Dilophus* specimens have been macerated in 8 % KOH for microscopic study.

RESULTS AND DISCUSSION

Bibio siebkei MIK, 1887 (Fig. 1)

Diagnosis: A medium-sized *Bibio* species, wing-length 6–7 mm. Antennal flagellum seven-segmented, wings milky-white or with a slight yellowish tinge, posterior veins concolourous with membrane. Crossvein r-m subequal to basal section

of Radial sector. Male with black setae on mesonotum, white pilosity on the sides of the abdomen, femorae black, tibiae yellowish, hind tibia black-tipped, moderately club-shaped. Male hypopygium (Fig. 1): epandrium with blunt lobes. Female body black, coxae black, legs reddish. Most easily distinguished from *Bibio fulvipes* (ZETTERSTEDT) male by the black thoracic pilosity and black-tipped hind tibiae, in the female by the black thorax and coxae; from *Bibio nigriventris* HALIDAY in both sexes by the seven-segmented flagellum; from *Bibio varipes* MEIGEN and *B. lanigerus* MEIGEN by the rather light-coloured wings.

Swiss records: **GR**: Piz Umbrail, 31.VIII.1979, M. DETHIER leg., 2 ♂♂, 4 ♀♀ (MHNN).

Distribution and ecology: In central Europe, *B. siebkei* has formerly been recorded from Austria by DUDA (1930) and FRANZ (1989), and in northern Europe from Norway (SIEBKE, 1863, as *Hirtea femoralis* SIEBKE), Sweden (POPPIUS *et al.*, 1916), Finland (LUNDSTRÖM, 1916) and Russia (KRIVOSHEINA, 1986). DUDA (1930) described *Bibio strobli* from Austria and stated that it was possibly conspecific with *B. siebkei*. However, one of us (J.S.) has examined the holotype (a female) of *Bibio strobli* from the Institut Royal des Sciences naturelles de Belgique, Brussels, and found it not to be conspecific with *Bibio siebkei*. At present, we are not sure about the status of *B. strobli*. *Bibio siebkei* is found mainly on dry lichen heaths and can be found at higher altitudes than any other bibionid in Norway. The larva has not been described.

Bibio fulvicollis GIMMERTHAL, 1842 (Fig. 2)

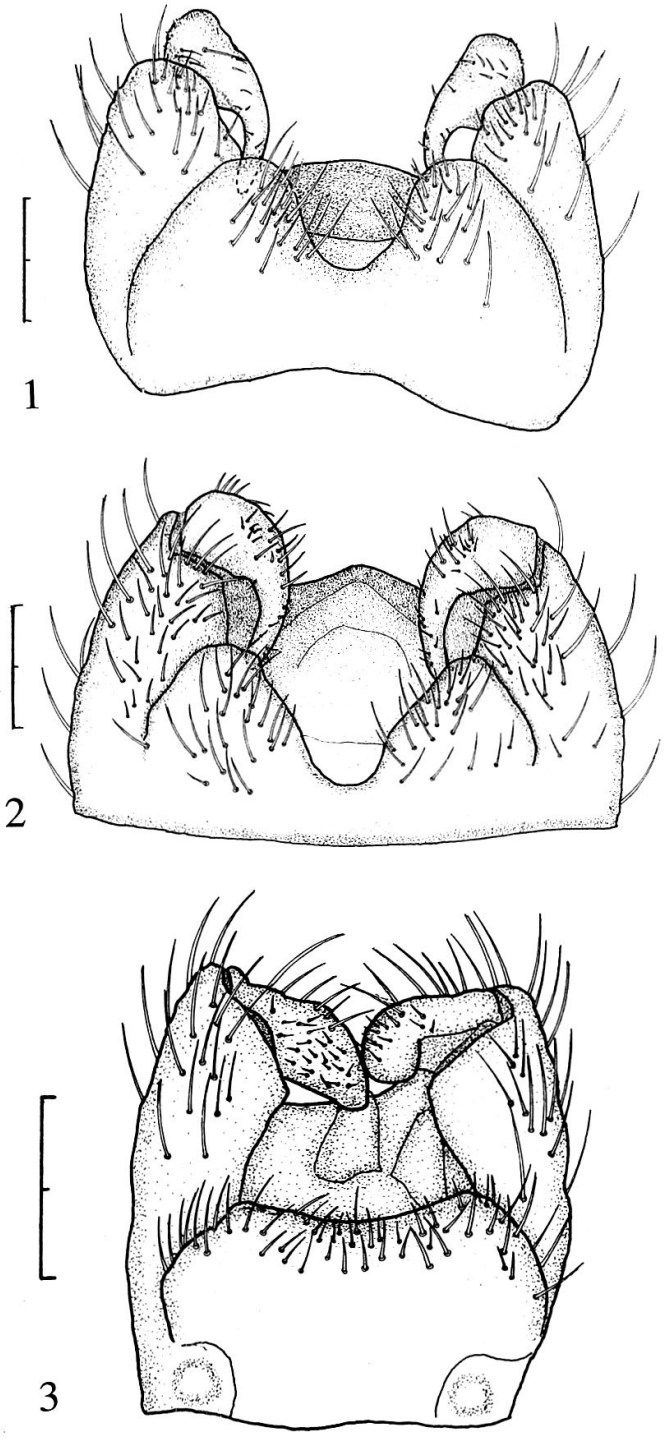
Diagnosis: A medium sized *Bibio* species, wing-length 5–6 mm. Antennal flagellum six-segmented. Wings clear, posterior veins colourless, crossvein r-m equal to basal section of Radial sector in length. Male all black including legs, hind tibia somewhat club-shaped, hind tarsus not swollen. Male hypopygium (Fig. 2): epandrium with rounded lobes, indentation in epandrium broadly V-shaped. Ventral indentation between gonocoxites shallow and broad. Female: mesonotum red with three black vittae. Legs reddish, rather stout. Hind tarsus black.

Most easily distinguished from *Bibio nigriventris* HALIDAY by the six-segmented flagellum, the entirely black legs in the male and the red ground colour of the thorax in the female; from *Bibio clavipes* MEIGEN by the much stouter legs, the six-segmented flagellum, the slender hind tarsus of the male and the black tarsi of the female.

Swiss records: **GR**: Unter-Engadin, Zernez, 1400 m a.s.l., 16.–18.VI.1953, H. LINDBERG leg., 4 ♂♂, 1 ♀ (MZH); Münstertal, Santa Maria, 1400 m a.s.l., 19.–22.VI.1953, H. LINDBERG leg., 1 ♂ (MZH).

B. fulvicollis has not before been published from central Europe but from Norway (SIEBKE, 1877, as *Hirtea festinans* ZETTERTSTEDT), Sweden (WAHLGREN, 1919, as *B. festinans* (ZETT.)), Finland (LUNDSTRÖM, 1910, as *B. festinans*), Estonia/Latvia (GIMMERTHAL, 1842), Kazakhstan and Russia (KRIVOSHEINA, 1986). The relationship between this species and *Bibio fulviventris* MEIGEN is uncertain and the two could possibly be conspecific. However, DUDA (1930) was not able to locate the type of *B. fulviventris* and it seems likely that it is lost. MEIGEN's description is too brief for a safe identification of the species.

Scandinavian records suggest that the species has declined strongly in Scandinavia, for instance no specimen seems to have been collected since 1944 in Norway. One of us (J.P.H.) has collected bibionids on LINDBERG's localities in Switzer-



Figs 1–3: Male hypopygium (dorsal view) of *Bibio siebkei* MIK (1), *Bibio fulvicollis* GIMMERTHAL (2), *Dilophus borealis* SKARTVEIT (3). Scale = 0.2 mm.

land in June without encountering this species. This may be an indication that this species has declined also in central Europe. Few of the specimen labels carry any information on the locality on which the specimens were collected but its distribution suggests this might be a forest species. The larva has not been described.

Dilophus borealis SKARTVEIT, 1993 (Fig. 3)

Diagnosis: A rather small *Dilophus* species, wing-length 3.5–4 mm, similar in habitus to *Dilophus femoratus* MEIGEN and *D. neglectus* HAENNI. Fore tibia rather slender with four mesal spines in one group, distal spines rather slender and well separated. Antennal flagellum slender, eight- to nine-segmented. Male black with dark brownish legs, female black with reddish-brown legs and entirely dark abdomen, including last sternite. Male hypopygium (Fig. 3): ventral indentation between gonocoxites W-shaped, gonostyli straight and blunt-ended (SKARTVEIT, 1993), very similar to that of *Dilophus neglectus* HAENNI. *D. borealis* can be differentiated from the latter in the male by the more slender antennae and legs and slight differences in the shape of the gonostyli, in the female by the more slender antennae and the entirely dark abdominal sternites.

Swiss records: **GR**: Swiss National Park, Il Fuorn, 1790 m a.s.l., 18.VIII.1982, J.-P. HAENNI leg., 15 ♂♂, 3 ♀♀ (MHNN). **VS**: Riffelberg, 2550 m a.s.l., 14.IX.1982, C. BESUCHET leg., 8 ♂♂ (MHNN); Bürchen, 1600 m a.s.l., 7.–13.VIII.1993, G. BÄCHLI leg., 2 ♂♂; same locality, 17.–19.VIII. 1993, G. BÄCHLI leg., 1 ♂ (ZMUZ).

Other records from Central and Southern Europe: **FRANCE**: Hautes-Alpes, 1 km SE Col de Larche, 1950 m a.s.l., 20.IX.1983, C. DUFOUR, J.-P. HAENNI, P. OOSTERBROEK & H. REVIER leg., 6 ♂♂ (MHNN). **SPAIN**: Granada, Sierra Nevada, [no other data] 21.–24.VII.1926, H. LINDBERG leg., 1 ♀ (MZH); Sierra Nevada, upper Lanjarón Valley, 9.IX.1950, F. SCHMID leg., 15 ♂♂, 1 ♀ (MZL); Sierra Nevada, 4 km N Picacho de Veleta, Barranco de San Juan, 2500 m a.s.l., 27.IX.1989, J.-P. HAENNI & C. DUFOUR leg., 4 ♂♂ (MHNN); Sierra Nevada, 2 km SE Cerro de Mulhacén, Chorreras Negras (Rio Culo de Perro) 2850 m a.s.l., 27.IX.1989, J.-P. HAENNI & C. DUFOUR leg., 6 ♂♂ (MHNN).

This species seems to have rather similar ecological requirements all over its known distribution. In the Alps as well as in the Sierra Nevada and Scandinavia, it was caught in open biotopes, including alpine meadows and pastures within the upper subalpine and lower alpine regions. Its flight period extends from late summer into autumn. *D. borealis* appears to have a widely disjunct distribution. Although it extends as far south as southern Spain, it is apparently absent from the Pyrenees (HAENNI, 1994). The larva of has not been described.

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RÉSUMÉ

Bibio siebkei MIK, *B. fulvicollis* GIMMERTHAL et *Dilophus borealis* SKARTVEIT sont signalées de Suisse pour la première fois. D'autres captures de cette dernière espèce en Europe centrale et méridionale sont mentionnées. *D. borealis* est également nouvelle pour la France et l'Espagne. Une courte diagnose et une figure de l'hypopygium mâle sont données pour les 3 espèces.

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