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Studies of some fungus gnats (Diptera: Mycetophilidae) including nine additions to the British list

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ABSTRACT. A key is provided to the eight species of *Anatella* recorded in Britain, including three species newly recorded (*A.dampfi* Landrock; *A.gibba* Winnertz; *A.lenis* Dziedzicki). A further six species are newly recorded from Britain (*Exechia sororcula* Lackschewitz; *Exechiopsis dumitrescae* (Burghele-Balacesco); *Allodia* (*Brachycampta*) *angulata* Lundström; *Mycetophila autumnalis* Lundström; *M.lubomirskii* Dziedzicki; *M.lunata* Meigen); these and several other species are redescribed. The following nomenclatural changes are proposed. *Exechia bicincta* (Staeger) (= *spinosa* Bukowski, syn.n.); *Mycetophila confusa* Dziedzicki (= *affluctata* Edwards, syn.n.); *Mycetophila dziedzickii* nom.n. (= *obscura* Dziedzicki nec Walker). Female characters of seventeen of the twenty-two British species of *Exechia* and eight species of *Mycetophila* are discussed and illustrations provided.

Introduction

Since the revision of Edwards (1925b) and his supplementary notes (1941), knowledge of British Mycetophilidae has advanced slowly. Nineteen species have, however, been added to the British list but five have been deleted, bringing the total to 416. During examination of recent collections of British fungus gnats, several species were discovered new to the British list although known from other parts of Europe; nine of them are dealt with here, all belonging to the sub-family Mycetophilinae. Material of the genera concerned in the British Museum (Nat. Hist.) and Hope Department of Entomology, Oxford University Museum (referred to below by the abbreviations BMNH and HD respectively) has also been studied.

A revised key to *Anatella* was desirable but this can still only be applied to males as so few females have been associated. In *Exechia*, more work had been done previously on females but the characters employed required revision and this is attempted as far as practicable. Also in the Exechiini, where the generic revision of Tuomikoski (1966) is now generally followed, the generic position of *Allodiopsis ingeniosa* Kidd was found to require discussion.

The interpretation of some species groups in *Mycetophila* is in need of clarification but as such groups have not been clearly defined in the Palaearctic fauna, only those including species new to the British list or involving nomenclatural changes are discussed here. Again, it has been possible to elucidate female characters where these were unknown in several species.

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Anatella Winnertz

Anatella Winnertz, 1863, 854. Type-species *Anatella gibba* Winnertz, designated by Johannsen, 1909: 90.

Anatella species are small (1.5–3 mm in length), dark coloured and possess few useful characters other than in the male genitalia.

Anatella is the only Palaearctic genus of Exechiini to have the costa distinctly produced beyond the tip of vein R5 and it was considered monophyletic by Tuomikoski (1966), who studied fifteen species. The single dark basal bristle on the hind coxa characteristic of all other Exechiini may be absent but there are intermediate species with a weakly developed bristle. The base of the cubital fork is usually a little beyond that of the median fork (a little before in *A.gibba*) but its position is variable within species and cannot be used for reliable identification. The variation in the development of the mid tibial spurs mentioned by Tuomikoski and the distinctive mid femoral chaetotaxy of some species appear to be secondary sexual characters of the male.

Eight species have been recorded from Britain but three others can now be added. Only seven have been figured in British literature (*setigera* Edwards and *unguigera* Edwards in Edwards, 1921, claspers only; the others in more detail in Edwards, 1925b) while *A.turi* Dziedzicki was added by Edwards (1941) without a figure. Eight or nine other European species are recognized but several are of uncertain status. Some were figured by Dziedzicki (1923) and Landrock (1924, 1925) but the three described by Strobl have not been figured. Strobl's *rufithorax* was founded on thoracic coloration, i.e. distinct stripes on a paler ground and the type was a female although he recognized the male later. I have found that this pattern may occur in several species and the record by Matile (1967) of female *rufithorax* from the Pyrenees is therefore uncertain.

No external characters have been found in females to associate them with their respective males but there are probably good characters in the ovipositor. This was figured by Dziedzicki (1923) for *A.longisetosa* Dziedzicki and by Plassmann (1970b) for *A.lenis* Dziedzicki, of which he had reared both sexes from the bark encrusting fungus *Exidia glandulosa* Fries (Tremellinaceae). The rearing of *A.flavomaculata* Edwards from a small lignicolous Ascomycete, *Helotium aciculare* Persoon has enabled the female of this species to be recognized. Nothing else is known of the development of *Anatella*.

The present study of male *Anatella* has suggested further specific characters, employed in the following key, which it is hoped will be a useful aid to sorting species but examination of the genitalia is still essential for confirmation. Structural characters are given precedence where possible but in some instances it is necessary to place greater reliance on colour, the three types of thoracic coloration being perhaps most reliable. The first flagellar segment is elongate in all species, the next few being progressively shorter and relative measurements cited apply best to the fourth and immediately following segments.

Although only one or two specimens have been seen of the three additional species, they are easily distinguished by the highly specific genital characters. These are figured in detail for these species but an internal view of the clasper complex is figured for all British species except *lenis*. The nomenclature adopted has, however, required careful consideration of the literature in the cases of *gibba* and *dampfi*.

Key to British species (males only)

1 Mid femora with posteroventral fringe well developed, distinctly longer and stronger than anteroventral fringe, with some hairs at least nearly half median femoral depth. 2

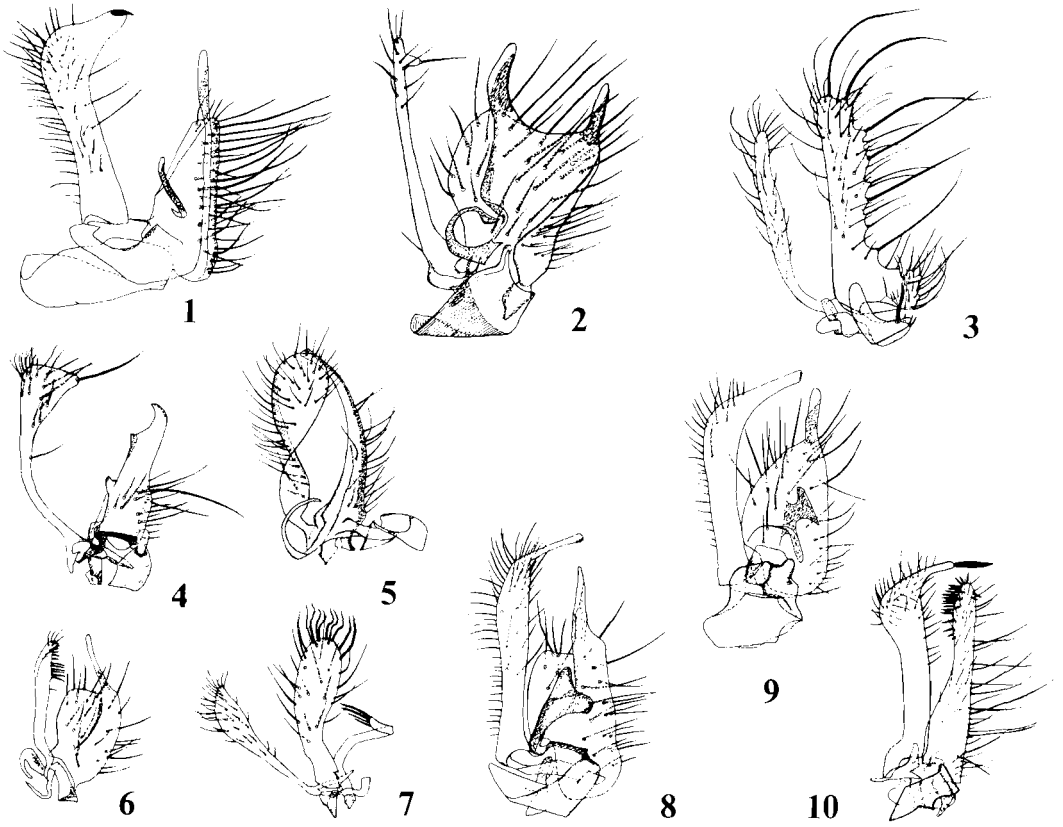
– Mid femora with weak fringes, posteroventral never better developed than anteroventral, although some hairs of latter may be half median femoral depth 4

2 Mid femoral fringe strong, longest towards base where it reaches median femoral depth. Outer (anterior) spur of mid tibia very short, not more than one quarter length of inner spur. Antennal flagellar segments more than twice as long as broad. No bristle at base of hind coxa.
(Thorax grey pruinose; tergites 1–2 sometimes slightly paler. First flagellar segment yellow basally. Wing length 2.3–2.5 mm.)
ciliata Winnertz

– Mid femoral fringe weaker, scarcely exceeding half depth of femur. Outer spur of mid tibia at least half length of inner spur. 3

3 Flagellar segments less than twice as long as broad. Mid femoral fringe longer on basal half. A well developed bristle at base of hind coxa.
(Body blackish grey. Flagellum entirely grey. Wing length 2.0–2.3 mm.)
longisetosa Dziedzicki

– Flagellar segments at least twice as long as broad. Mid femoral fringe longest apically but not quite half femoral depth. Hind coxal bristle small and weak.



FIGS. 1–10. *Anatella* males, internal view of left claspers: (1) *unguigera* Edwards; (2) *gibba* Winnertz; (3) *longisetosa* Dziedzicki; (4) *setigera* Edwards; (5) *turi* Dziedzicki; (6) *minuta* Staeger; (7) *flavomaculata* Edwards; (8) *dampfi* Landrock; (9) *simpatica* Dziedzicki; (10) *ciliata* Winnertz.

(Body grey pruinose. First flagellar segment yellow basally) . . . . . .*setigera* Edwards

4 Outer spur of mid tibia absent although inner spur of normal strength. Flagellar segments longer than broad but not twice breadth. No bristle at base of hind coxa. Mid femoral fringes very short.
(Thorax grey pruinose; tergites 1–3 yellow laterally. First one or two flagellar segments yellow. Wing length 1.9–2.2 mm.)
turi Dziedzicki

– Outer spur of mid tibia always present; although almost invariably shorter than inner spur, never less than half as long 5

5 Bristle at base of hind coxa absent. Outer mid tibial spur more than five-sixths length of inner spur. Wing veins yellow. Flagellar segments from the fourth onwards nearly quadrate (segment 3, 1.2 X breadth). Mid femoral fringes short, longest apically.
(Body dark grey, thorax blackish dorsally. Basal antennal segments and palpi darker than in *A.setigera*. Wing length 2.4–2.5 mm.)
unguigera Edwards

– Bristle at base of hind coxa usually well developed, always present. Outer mid tibial spur usually shorter (except in *dampfi*). Wing veins grey, fork veins as usual paler than the radial sector. 6

6 Flagellar segments 3–4 about 1.5 X long as broad. Outer mid tibial spur about 0.8 length of inner spur. Hind coxal bristle well developed. Anteroventral mid femoral fringe well developed but less than half femoral depth.
(Thorax grey pruinose. Base of first flagellar segment pale. Wing length 3.1 mm.)
gibba Winnertz

– Flagellar segments 3–4 quadrate or a little longer than broad 7

7 Thorax uniformly sooty black on dorsum. Sides of first three tergites usually broadly yellowish but this coloration sometimes obscured or reduced in extent. Antennae and palpi grey, base of first flagellar segment brownish 8

– Thorax obscurely grey brown, often more reddish brown laterally, never uniformly black but sometimes with pale ground bearing a dark central stripe and shorter more or less fused

lateral stripes, leaving pale shoulders. Mid femoral fringes short and weak, longer apically 9

8 Mid femora with anteroventral fringe well developed but short, longest apically. Outer mid tibial spur five-sixths length of inner spur. Bristle at base of hind coxa small and weak. Wing length 2.3 mm. . . . . *dampfi* Landrock

– Mid femora with anteroventral fringe weak and not close-set but on basal half may exceed half median femoral depth. Outer mid tibial spur about three-quarters length of inner spur. Bristle at base of hind coxa well developed. Wing length 1.9–2.0 mm. . . . . *flavomaculata* Edwards

9 Basal antennal segments (scape and pedicel) and palpi obscurely yellowish brown. Abdominal tergites 1–4 with yellow patches towards their lower posterior corners, sometimes faint. Outer mid tibial spur of variable length, from little more than half to three-quarters length of inner spur. Wing length 1.6–2.4 mm.

simpatica Dziedzicki

– Basal antennal segments and palpi yellow but antennal flagellum usually entirely grey. Outer mid tibial spur about two-thirds as long as inner. 10

10 Flagellar segments slightly longer than broad. Fork veins pale grey but more distinct than in *minuta*. Thorax dull orange brown with three darker stripes. Wing length 2.4 mm.

lenis Dziedzicki

– Flagellar segments quadrate or slightly broader than long. Fork veins very pale. Coloration variable, thorax often all dark grey brown but usually paler laterally and may have colour described for *lenis*. Sides of tergites 2–3 sometimes pale. Wing length 1.8–2.0 mm.

minuta Staeger

Anatella lenis Dziedzicki

Anatella lenis Dziedzicki, 1923; 5, Figs. 23–24.

The British example agrees well with Dziedzicki's (1923) figures and there is little doubt that it is correctly identified. *A.lenis* was recorded by Lackschewitz (1937) from the Baltic States and Plassmann (1970a, b, 1971, 1973), who reared it in Germany, described the larva and figured the ovipositor but in a contracted position.

Male. Head grey. Palpi and basal antennal segments yellow; flagellum dark grey. Flagellar segments slightly longer than broad. Thorax dull orange brown with three darker stripes, the median broadened anteriorly to the fore margin, the laterals ending where the median begins to broaden and rounded anteriorly. Pleura largely pale brownish yellow (the thoracic coloration may display the same range of variation found in *minuta* and *simpatica*). Halteres pale yellow. Abdomen grey with tergites 2–3 narrowly pale laterally. Hypopygium brownish yellow (Figs. 13 and 14).

Legs yellow. Fore metatarsus four-fifths length of its tibia. Mid femora with fringes very short, stronger and longer towards tip. Outer mid tibial spur two-thirds length of inner spur. Bristle at base of hind coxa strong.

Wings with fork veins pale grey but distinct. Costa extending about halfway from R5 to M1. Cubital fork beginning slightly beyond base of median fork. Wing length 2.4 mm.

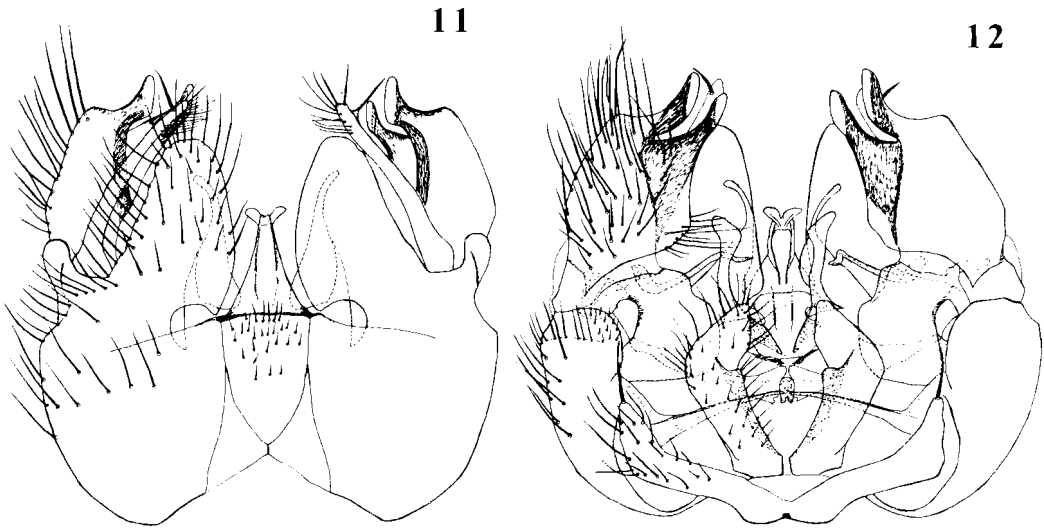
Material examined. HUNTS: Monk's Wood, 15.ix.1972, 1 ♂ ex suction trap (*Cole*).

Anatella gibba Winnertz

Anatella gibba Winnertz, 1863, 855; Dziedzicki, 1923: 3, Figs. 11 and 12 (based on Winnertz' type).

Landrock's (1927) character of the base of the cubital fork being a little before that of the median applies to the British specimen and may be constant. I did not use it in the key because I found that some other species may have it either immediately below or distinctly beyond the base of the median fork. Landrock did not reproduce a figure of the genitalia because he was then unaware of the work of Dziedzicki (1923) (published posthumously, the author having died in 1921), who figured dorsal and ventral views. The British example agrees with these figures in the slender lower claspers, hairy only at the tip and the nearly equally bilobed broad posterior margin of the upper claspers. It apparently differs in the relative dimensions of the median and lateral sternal processes but this may be due to the angle at which they were drawn (in Dziedzicki's figure the lateral processes are much shorter).

Male. Head dark grey. Antennae with basal segments dark yellowish brown, flagellum grey with base of first segment paler. Palpi grey brown. Flagellar segments 3–4 1.5 times as long as broad. Thoracic dorsum grey pruinose, slightly paler laterally. Pleura grey



FIGS. 11–12. *Anatella gibba* Winnertz, male genitalia: (11) ventral view; (12) dorsal view.

but propleura brownish yellow. Halteres brownish with paler stalk. Abdomen grey. Hypopygium brownish yellow (Figs. 11 and 12; claspers, Fig. 2).

Legs yellow. Fore metatarsus equal to tibia in length. Mid femoral fringes short, anterior fringe increasing in length apically where it approaches half median femoral width. Mid tibia with outer spur three-quarters length of inner. A well-developed bristle at base of hind coxa.

Wing veins yellowish grey, fork veins paler. Costa extending half distance from R5 to M1. Cubital fork begins slightly before base of median fork. Wing length 3.$\frac{1}{4}$mm (the largest specimen of *Anatella* examined but it may be abnormally large for the species).

Material examined. INVERNESS: Kinrara, 23.vi.1967, 1 ♂ (*D. M. Ackland*, BMNH).

Anatella dampfi Landrock

Anatella dampfi Landrock, 1924: 80, Figs. 8–10.

Landrock (1924) described *A.dampfi* from Estonia and figured the genitalia. If his dorsal and ventral views represent the species described here they must be inaccurate, agreeing in the lateral sternal processes being separate flanges articulating with the genital capsule but not very exactly in their shape. His lateral view of the claspers, however, is considered confirmatory as their shape is nearly identical; the thin membranous internal process is omitted but its shape and position are indicated in his dorsal view.

Landrock (1937) suggested that *A.novata* Dziedzicki (1923) might be the same as *dampfi* but *novata* is not used here because in his figures of *novata* the upper claspers resemble the lower claspers of *dampfi* from the views figured and I think this synonymy unlikely. According to Landrock's (1927) key, *A.dampfi* (like *A.unguigera* Edwards) has the outer mid tibial spur nearly as long as the inner as in the British specimen. The dark thoracic coloration is also found in *unguigera, flavomaculata* and *longisetosa* but the genitalic structure is nearer to *simpatica.*

Male. Head grey dusted. Antennae and palpi grey, but basal antennal segments and first flagellar segment brownish. Flagellar segments nearly quadrate, slightly longer than broad. Thoracic dorsum slightly shining sooty black; pleura and metanotum brownish grey. Halteres yellow. Abdomen dark grey with tergites 2–4 yellowish laterally. Hypopygium small, brownish yellow (Figs. 15 and 16; claspers, Fig. 8).

Legs yellow. Fore metatarsus equal to tibia. Mid femoral fringes short and weak.

Mid tibia with outer spur five-sixths length of inner spur. Hind tibia (as usual) with outer spur three-quarters length of inner. A small weak bristle near base of hind coxa.

Wings with grey veins, fork veins paler. Costa extending two-fifths of distance from R5 to M1. Base of cubital fork distinctly beyond base of median fork. Wing length 2–3 mm.

Material examined. MERIONETH: Cwm Bychan, 12.x.1975, 1 ♂ in hillside oakwood (*Ismay*); SELKIRK: Happertutie Burn, iv.1976, 1 ♂ (*B. Milligan*).

Anatella unguigera Edwards

Anatella unguigera Edwards, 1921: 122, Fig. 2 (examined).

Claspers, Fig. 1; 12 ♂ seen from Britain (Sussex to Sutherland) and Ireland (Down).

Anatella longisetosa Dziedzicki

Anatella longisetosa Dziedzicki, 1923: 6, Figs. 27–31.

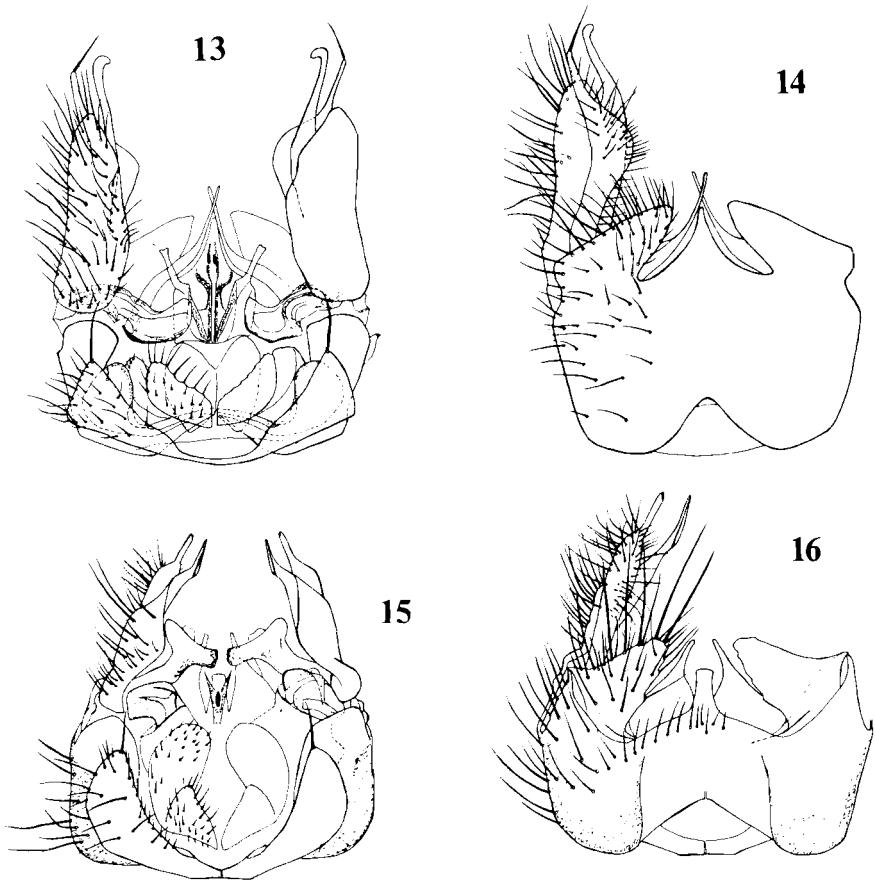
Anatella piligera Edwards, 1925b: 590, Figs. 48–50 (examined).

Claspers, Fig. 3; 16 ♂ seen from Britain (Bucks. to Inverness).

Anatella setigera Edwards

Anatella setigera Edwards, 1921: 122, Fig. 1.

Claspers, Fig. 4; 14 ♂ seen from Britain (Devon and Hunts. to Argyllshire) and Ireland (Sligo).



FIGS. 13–16. *Anatella* male genitalia: (13–14) *lenis* Dziedzicki, dorsal and ventral views; (15–16) *dampfi* Landrock, dorsal and ventral views.

Anatella turi Dziedzicki

Anatella turi Dziedzicki, 1923: 4, Figs. 17 and 18.

Claspers, Fig. 5; 10♂ seen of this previously little known but evidently widespread species. New records are: HUNTS: Monk's Wood, 28.vi.1971, 4♂, 25.viii.1972, 1♂ (*Cole*); CAMBS: Chippenham Fen, 24.ix.1941, ♂ (*Collin*, HD); CAERNARVON: Glan-y-Gors, 16.vii.1976, ♂; ROSS: Kinrive pinewood, 15.vi.1976, 2♂ (*Chandler*).

Anatella minuta (Staeger)

Mycetophila minuta Staeger, 1840: 253 (examined by Edwards, 1925a).
Anatella minuta (Staeger): Edwards, 1925a, 167.

Claspers, Fig. 6; 11♂ seen, mostly from southern England and Wales but one from Scotland (INVERNESS: Inverdruie).

Anatella flavomaculata Edwards

Anatella flavomaculata Edwards, 1925b: 590, Figs. 51–53 (examined).

Claspers, Fig. 7; ovipositor, Figs. 17 and 18; 24♂ and 1♀ seen from many parts of Britain. Two males and one female were reared by R. E. Evans from *Helotium aciculare* collected at Oversley Wood, WARWICKS. in ix.1972.

Anatella simpatica Dziedzicki

Anatella simpatica Dziedzicki, 1923: 6, Figs. 25 and 26.
Anatella incisurata Edwards, 1925b: 589, Figs. 43–45 (examined).

Claspers, Fig. 9; 24♂ seen from Britain (Sussex to Sutherland).

Anatella ciliata Winnertz

Anatella ciliata Winnertz, 1863: 856; Dziedzicki, 1923: Figs. 13 and 14 (based on Winnertz' type).

Claspers, Fig. 10; 31♂ from all parts of the British Isles.

Exechia Winnertz

Exechia Winnertz, 1863: 879. Type-species *Mycetophila fungorum* Degeer, designated by Johannsen, 1909: 106 (misident.) = *fusca* (Meigen).

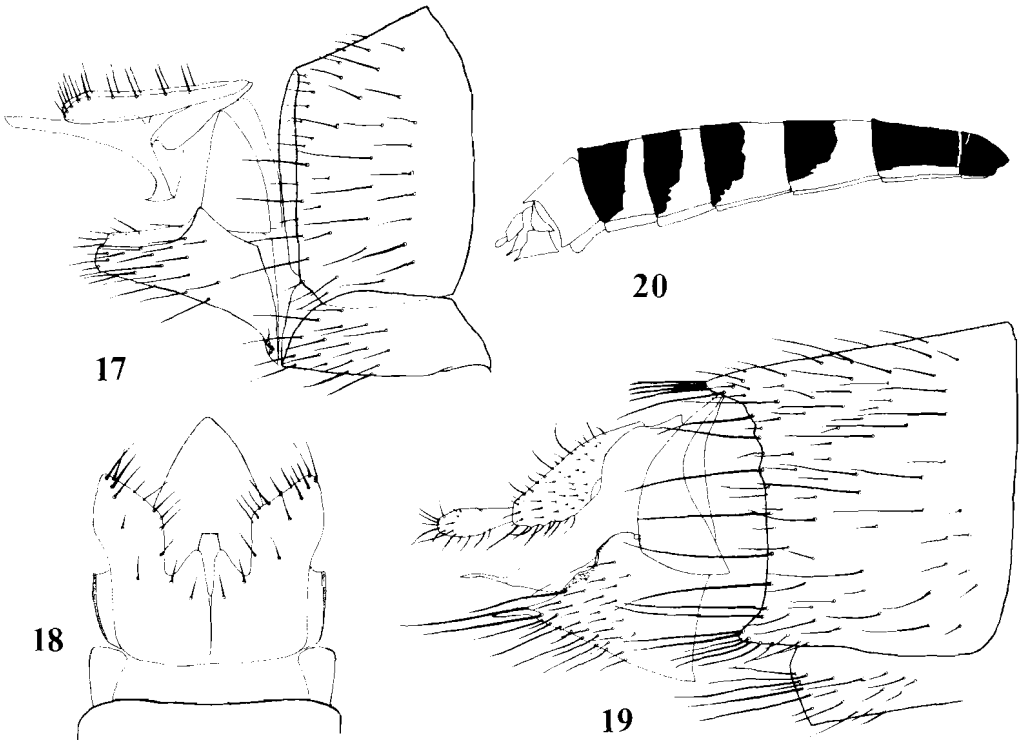
This name is restricted, following Tuomikoski (1966) to Group I of Edwards' (1925b) key, with twenty-one British species. Many are only reliably determined by reference to the male genitalia and females have been inadequately studied. The discovery of both sexes of an *Exechia* new to Britain led to a re-assessment of the characters used to distinguish species of the *bicincta* Staeger-*lundstroemi* Landrock Group, to which it belongs. Females of other species were studied and good characters in the ovipositor were found although differences are less pronounced between related species than in the male genitalia.

Many published figures of Mycetophilid ovipositors show the contracted position, often concealing important features, while inaccuracy and misidentification are sometimes involved. In *Exechia*, the shape of the pregenital tergite (VII), sometimes omitted from figures, is highly specific and often permits identification of dried material. As few ovipositors have been figured in sufficient detail for accurate recognition, those which have been identified in the material examined are discussed and figured.

Exechia sororcula Lackschewitz

Exechia sororcula Lackschewitz, 1937: 22, Figs. 6a–g.

This little known species was frequent in the Dolgellau area of north Wales in October 1975. Apart from Lackschewitz' unique Estonian type, no records have appeared although it was included in the keys of Landrock (1940) and Ostroverkhova & Stackelberg (1969). It runs in the key of Edwards (1925b) to *E. lundstroemi* Landrock, of which only one British male is certainly known (Edwards, *op. cit.*) although it is said to be not uncommon in some parts of Europe. The locality for *lundstroemi* was not recorded, only that it was in Mr Collin's collection; I have not, however, located the speci-



FIGS. 17–20. Female genitalia of *Anatella* and *Exechia*: *Anatella flavomaculata* Edwards, (17) lateral view; (18) dorsal view; *Exechia* sp. near *dizona* Edwards (?*cincta* Winnertz), (19) lateral view; (20) abdominal pattern.

men. Comparison of *sororcula* with *bicincta* Staeger is also necessary because this often runs to *lundstroemi* in keys.

The hypopygium of *sororcula* is distinctive; the external claspers are rounded and bear long dense apical bristling. There are yellow markings on the bases of the male tergites 2–5 compared with 2–4 in *bicincta* and only 3–4 in *lundstroemi*. The female *sororcula*, not previously recognized, has yellow markings on tergites 3–6 while *bicincta* has them on 2–5; the female characters of *lundstroemi* require clarification. The ovipositor is obviously different from *bicincta* as interpreted below. That of *lundstroemi* has only been figured by Ostroverkhova & Stackelberg (*op. cit.*) but the figure may represent *bicincta* which it resembles.

Male. Head dark, with yellow palpi and basal antennal segments; flagellum dark except basal half of first segment. Thorax largely dark with small yellow humeral patches and yellowish propleura. Two propleural bristles. Abdomen with tergites 1 and 6 entirely dark, 2–5 with yellow lateral spots in contact with fore margins, that on 2 elongate, those on 3–5 more rounded, all occupying at least half tergal length, narrowly but distinctly separated dorsally. Hypopygium brownish yellow (Figs. 21–23). Legs yellow with distinct dark patches beneath bases of mid and hind femora. Hind tibia with 3–5 d, 6–10 a, 4–6 short p near tip.

Female. Very similar to male except in abdominal pattern. Tergites 1–2 entirely dark; 3–6 have large yellow lateral spots at bases, those on 3–4 not in contact with fore margin on upper half, 5–6 only touching fore margins at lower corners, that on 6 distinctly smaller than those on 3–5. Tergite 7 and ovipositor (Fig. 24) brownish yellow.

Wing length 3.25 mm.

Material examined. MERIONETH: Brithdir-Isaf, 25.ix.1971, ♂, ♀ (*Hutson,*

Even where in the male there appear to be bands in lateral view, they are usually narrowly divided dorsally. There is also variation in the number of anterior (external) bristles on the hind tibia (normally 12–14 in a close set row, but ranging from 9 to 15).

The ovipositor of *E.bicincta* (Fig. 25) is easily recognized; the figures of Lundström (1911) and Dziedzicki (1915) fit the British specimens and the figure of *spinosa* Bukowski by Matile (1963) also agrees quite well. Indeed, the figures of male genitalia given by Bukowski (1949) and Matile (*op. cit.*) for *spinosa* also agree with *bicincta*. I believe that *spinosa* was based on specimens of *bicincta* with incomplete abdominal bands, leading it to be compared only with *lundstroemi*; Dr L. Matile tells me that he is now also of this opinion.

The figure of the ovipositor of *lundstroemi* (Ostroverkhova & Stackelberg, 1969) agrees with *bicincta* in the lack of a clearly differentiated apical cercal segment, present in all other *Exechia* I have examined. Although there are some small differences, it is possible that this too is based on *bicincta*.

The only published British records of *bicincta* I have found are by Edwards (1925b, 1933) and Kidd & Ackland (1970). Only males were present in the BMNH collection and a female labelled ?*bicincta* teste Edwards in HD was *E.dorsalis* (Staeger). My identification of the female is based on a series (3♂, 3♀) I reared from an unidentified small pale brown gill fungus (collected in a copse at Bromley, KENT, 19.v.1965, pupated 22.v., emerged 29.v.). I have in all examined 16♂ and 6♀, from southern England north to Suffolk and Hereford except for two females from north Wales which have the thorax mainly dark greyish instead of the usual coloration where it is broadly yellow laterally and brownish dorsally.

Exechia dizona Edwards

[*Exechia bicincta* (Staeger) Lundström, 1909: 46, Figs. 94 and 95. Misident.]

Exechia dizona Edwards, 1925a: 166 (nom.n. for *bicincta* Lundström nec Staeger).

This species, coupled with *bicincta* in Edwards' (1925b) key, has complete yellow basal bands on tergites 2–4 of the male occupying a little more than half the tergal length dorsally and extended to the apical margin laterally; there may be a constant difference in this pattern. Only two males of *dizona* have been recorded from Britain, one from the Clifton collection, locality unknown, in BMNH, the other (DORSET: Studland, 5.x.1910, J. W. Yerbury) I found unnamed in the Verrall-Collin collection, HD. Edwards (1925b) mentioned a female from Monk's Wood, HUNTS., but I found that it is one of the possible *repanda* discussed below. The true female of *E.dizona* has not yet been recognized but a French female, briefly described below, might be *dizona* or more likely belongs to the non-British *cincta* Winnertz of which the female has not been described. It runs to the *bicincta/dizona* couplet in Edwards' key and is distinct from *bicincta* in both abdominal pattern and ovipositor; it has a very characteristic pregenital tergite.

Female. Head grey dusted. Antennae with basal segments and base of first flagellar segment yellow, rest grey. Palpi yellow. Thorax mainly dusted dark grey, yellow on shoulders and narrowly on fore and lateral margins of mesoscutum. Abdomen with complete yellow bands basally on tergites 3–6; abdominal pattern and ovipositor, Figs. 19 and 20. Legs yellow with dark patches beneath bases of mid and hind femora. Two strong propleurals, with a short weak one behind. Hind tibia with 7–8 d, 8–10 a, 4–6 short p near tip.

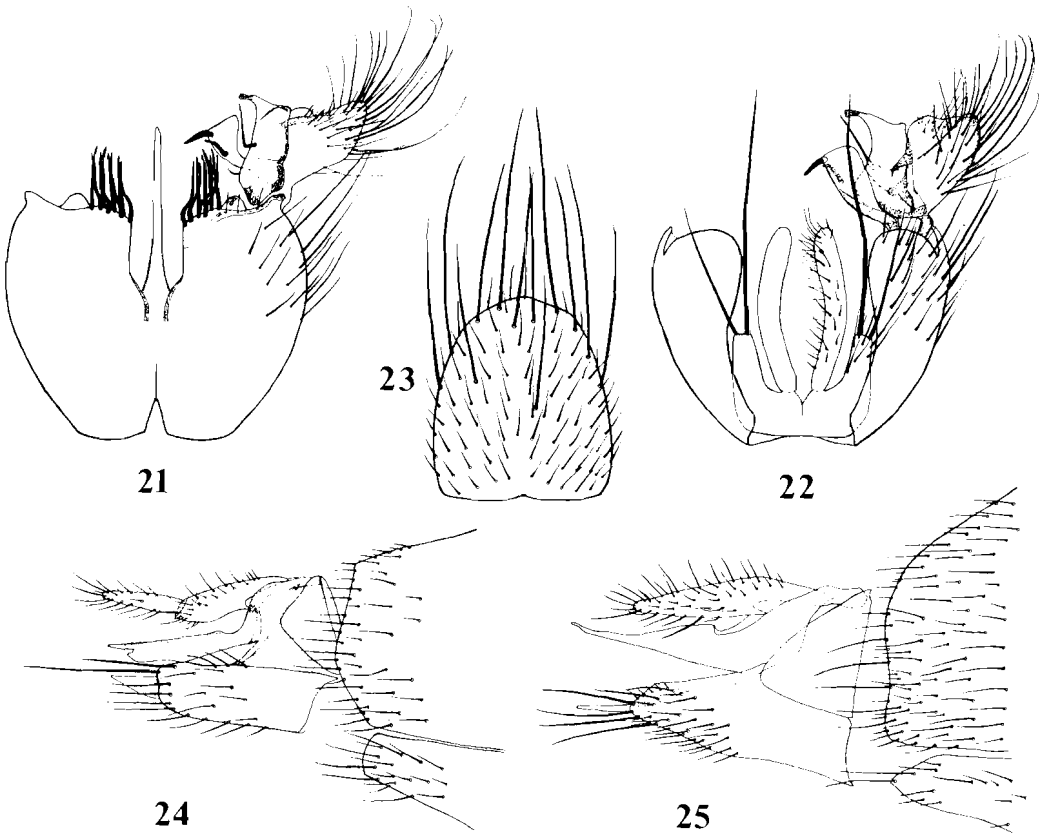
Material examined. FRANCE (Charentes-Maritimes): Saintes, 23.v.1971, ♀ swept on a wooded roadside verge (*Chandler*).

The females of other *Exechia* species

Females have been associated as far as possible with their males in the remaining British species of the genus. Some conclusions are tentative but it is hoped that this preliminary work will be a stimulus to further study based on reared series and pairs taken *in copula*.

Exechia seriata (Meigen)

Exechia seriata (Meigen); Edwards, 1924: 16.



FIGS. 21–25. Genitalia of *Exechia*: *sororcula* Lackschewitz, (21) male hypopygium, ventral view; (22) dorsal view; (23) eighth sternite; (24) ovipositor, lateral view; *bicincta* Staeger, (25) ovipositor, lateral view.

BMNH); Benglog, 9.x.1975, ♀; near Mallwyd, 12.x.1975, 3♂; Cwm Llinau, 12.x.1975, 3♂ (*Stubbs*); Coed Ganllwyd, 10.x.1975, ♀ (*Stubbs*), ♂ (*Hutson*, BMNH); Ceunant Llannyrch, 11.x.1975, ♂ (*Stubbs*), 12♂ (*Hutson*, BMNH); Coed Crafnant, 12.x.1975, ♂ (*Hutson*, BMNH); Coed y Brenin, 25.x.1975, 3♂ (*Chandler*); CAERNARVON: Coed Tremadog, 11.x.1975, ♂ (*Chandler*) (all localities were in more or less mixed deciduous woodland).

Exechia bicincta (Staeger)

Mycetophila bicincta Staeger, 1840: 263; (examined) Edwards, 1925a.

Mycetophila interrupta Zetterstedt, 1852: 4240; (examined) Edwards, 1925a.

Exechia interrupta (Zetterstedt); Winnertz, 1863: 895; Dziedzicki, 1915: Table XV, Figs. 236 and 237 ♂, Table XVI, Figs. 238 and 239 ♀ (based on Winnertz' material); Edwards, 1913: 371.

Exechia serpentina Lundström, 1911: 407, Taf. XIII, Figs. 9–12. ♂♀.

Exechia bicincta (Staeger); Edwards, 1925a: 168; Edwards, 1925b: 594.

Exechia spinosa Bukowski, 1949: 407, Fig. 5. ♂. **Syn.nov.**

Exechia spinosa Bukowski; Matile, 1963: 141, Figs. 1 and 2. ♂♀.

The record of *E.lundstroemi* which I published (1966) was based on a female of *bicincta*. Because of its incomplete abdominal bands, it ran to *lundstroemi* in Edwards' key but examination of other material of *bicincta* has shown that the female has narrowly separated lunules rather than bands.

Even where in the male there appear to be bands in lateral view, they are usually narrowly divided dorsally. There is also variation in the number of anterior (external) bristles on the hind tibia (normally 12–14 in a close set row, but ranging from 9 to 15).

The ovipositor of *E.bicincta* (Fig. 25) is easily recognized; the figures of Lundström (1911) and Dziedzicki (1915) fit the British specimens and the figure of *spinosa* Bukowski by Matile (1963) also agrees quite well. Indeed, the figures of male genitalia given by Bukowski (1949) and Matile (*op. cit.*) for *spinosa* also agree with *bicincta*. I believe that *spinosa* was based on specimens of *bicincta* with incomplete abdominal bands, leading it to be compared only with *lundstroemi*; Dr L. Matile tells me that he is now also of this opinion.

The figure of the ovipositor of *lundstroemi* (Ostroverkhova & Stackelberg, 1969) agrees with *bicincta* in the lack of a clearly differentiated apical cercal segment, present in all other *Exechia* I have examined. Although there are some small differences, it is possible that this too is based on *bicincta*.

The only published British records of *bicincta* I have found are by Edwards (1925b, 1933) and Kidd & Ackland (1970). Only males were present in the BMNH collection and a female labelled ?*bicincta* teste Edwards in HD was *E.dorsalis* (Staeger). My identification of the female is based on a series (3 ♂, 3 ♀) I reared from an unidentified small pale brown gill fungus (collected in a copse at Bromley, KENT, 19.v.1965, pupated 22.v., emerged 29.v.). I have in all examined 16 ♂ and 6 ♀, from southern England north to Suffolk and Hereford except for two females from north Wales which have the thorax mainly dark greyish instead of the usual coloration where it is broadly yellow laterally and brownish dorsally.

Exechia dizona Edwards

[*Exechia bicincta* (Staeger) Lundström, 1909: 46, Figs. 94 and 95. Misident.]

Exechia dizona Edwards, 1925a: 166 (nom.n. for *bicincta* Lundström nec Staeger).

This species, coupled with *bicincta* in Edwards' (1925b) key, has complete yellow basal bands on tergites 2–4 of the male occupying a little more than half the tergal length dorsally and extended to the apical margin laterally; there may be a constant difference in this pattern. Only two males of *dizona* have been recorded from Britain, one from the Clifton collection, locality unknown, in BMNH, the other (DORSET: Studland, 5.x.1910, J. W. Yerbury) I found unnamed in the Verrall-Collin collection, HD. Edwards (1925b) mentioned a female from Monk's Wood, HUNTS., but I found that it is one of the possible *repanda* discussed below. The true female of *E.dizona* has not yet been recognized but a French female, briefly described below, might be *dizona* or more likely belongs to the non-British *cincta* Winnertz of which the female has not been described. It runs to the *bicincta/dizona* couplet in Edwards' key and is distinct from *bicincta* in both abdominal pattern and ovipositor; it has a very characteristic pregenital tergite.

Female. Head grey dusted. Antennae with basal segments and base of first flagellar segment yellow, rest grey. Palpi yellow. Thorax mainly dusted dark grey, yellow on shoulders and narrowly on fore and lateral margins of mesoscutum. Abdomen with complete yellow bands basally on tergites 3–6; abdominal pattern and ovipositor, Figs. 19 and 20. Legs yellow with dark patches beneath bases of mid and hind femora. Two strong propleurals, with a short weak one behind. Hind tibia with 7 8 d, 8–10 a, 4–6 short p near tip.

Material examined. FRANCE (Charentes-Maritimes): Saintes, 23.v.1971, ♀ swept on a wooded roadside verge (*Chandler*).

The females of other *Exechia* species

Females have been associated as far as possible with their males in the remaining British species of the genus. Some conclusions are tentative but it is hoped that this preliminary work will be a stimulus to further study based on reared series and pairs taken *in copula*.

Exechia seriata (Meigen)

Exechia seriata (Meigen); Edwards, 1924: 16.

Exechia pallida (Stannius); Lundström, 1909: Figs. 126 and 127; Edwards, 1925b: 593 (apparently a lapsus).

The ovipositor, figured by Lundström (1909), is dorsoventrally flattened unlike other *Exechia* I have seen; combined with the other specific characters it is easily recognized.

Exechia dorsalis (Staeger)

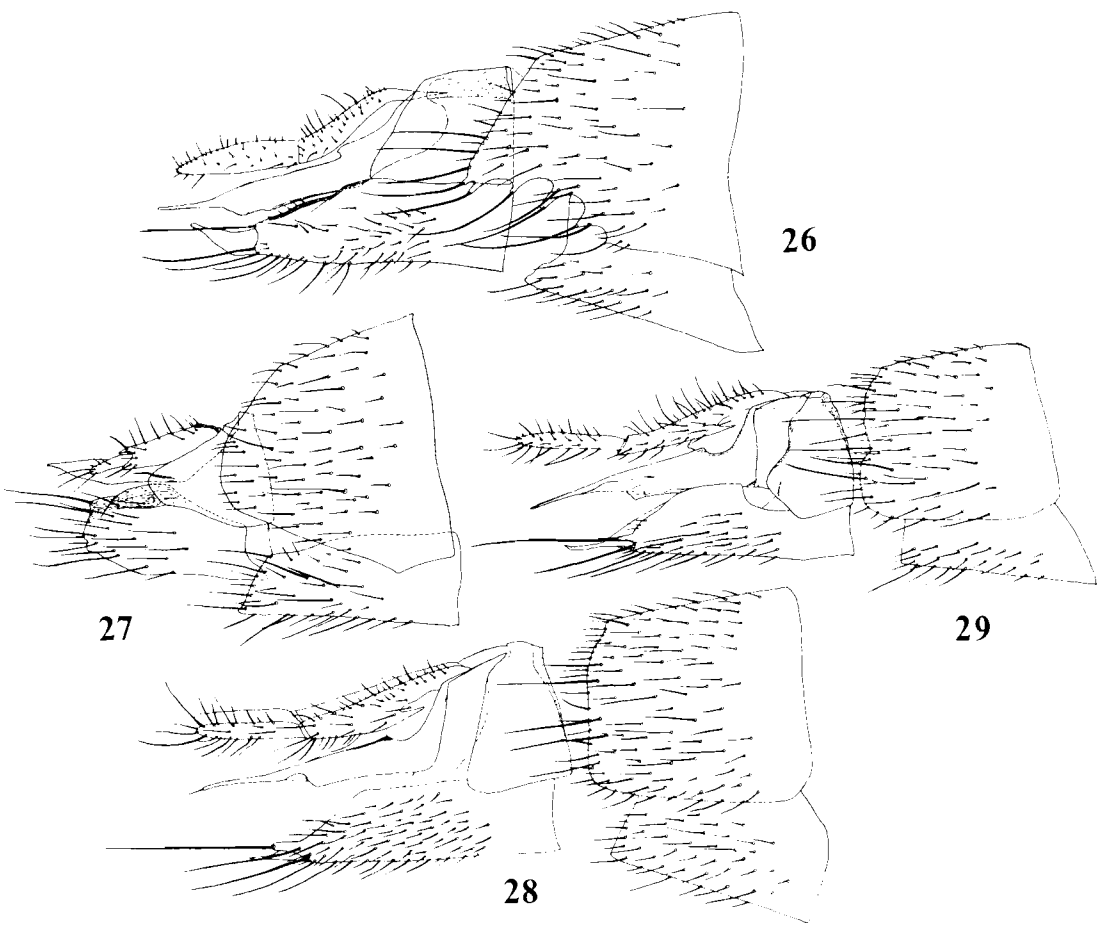
Exechia dorsalis (Staeger); Dziedzicki, 1915: Figs. 251 and 252.

Ovipositor, Fig. 26. The scalloped margin of the pregenital tergite is distinctive.

Exechia lucidula (Zetterstedt)

This is the only British *Exechia* with a strongly shining black thorax, also found in two other Palaearctic species, *nitidicollis* Lundström and *micans* Laštovka & Matile. The ovipositors of these last two were figured by Laštovka & Matile (1974); *E.lucidula* (Fig. 27) resembles them but is distinct, being closest to *micans* in the small apical cercal segment.

E.lucidula has not apparently been collected in Britain since 1941; it is known from HERTS., SUFFOLK (Edwards, 1913, 1925b), CHESHIRE (Kidd, 1959) and CAMBS. (Chippenham Fen, 1 ♂, 20.vii.1941, *Collin*, HD).



FIGS. 26–29. Ovipositors of *Exechia* species, in lateral view: (26) *dorsalis* Staeger; (27) *lucidula* Zetterstedt; (28) *fusca* Meigen; (29) *confinis* Winnertz.

Exechia spinuligera Lundström

Exechia spinuligera Lundström, 1912: 33, nom.n. for *spinigera* (Winnertz) Lundström, 1909: 45, Figs. 111 and 112.

[*Exechia spinigera* (Winnertz); Edwards, 1925; 594. Misident.]

Ovipositor, Fig. 30. Lundström's (1909) figures agree but related species (*frigida* Boheman in Britain and three other Palaearctic species) may be very similar. The dark mark beneath the base of the hind femora may be faint or absent in *spinuligera* (and occasionally *fusca* Meigen), which then run to the *parva* Group in Edwards' key but are more robust apart from the genital differences.

The *Exechia fusca* (Meigen) Group

The ovipositors of the two British species, *fusca* (Meigen) (Fig. 28) and *confinis* Winnertz (Fig. 29) have some small differences basally which appear to be constant. Previous figures of *fusca* (Lundström, 1909; Dziedzicki, 1915; both as *fungorum* Degeer), *confinis* (Plassmann, 1970b) and *peyerimhoffi* Burghele-Balacesco (1966) are inseparable.

Exechia nigra Edwards

Exechia nigra Edwards, 1925b: 595, Fig. 63a.

The shape of the pregenital tergite is distinctive but Plassmann (1970) figured the non-British *nigrofusca* Lundström, showing no obvious difference from *nigra* although they are not closely allied.

The *Exechia contaminata* Winnertz Group

E.contaminata (Fig. 31) was correctly figured by Lundström (1909, as *dorsalis*) and Dziedzicki (1915). Some examples which agree, however, run to *nigroscutellata* Landrock in keys because they lack a dark mark beneath the hind femora. The ovipositor of *nigroscutellata* (Ostroverkhova & Stackelberg, 1969) is apparently distinct but the female of *pseudocincta* Strobl has not been recognized.

Exechia festiva Winnertz

Exechia festiva Winnertz; Lundström, 1909: 43, Figs. 121 and 122.

Ovipositor, Fig. 32. Lundström's (1909) figure is probably correct but shows the contracted condition and omits the slight median apical projection of the pregenital tergite.

Exechia pseudofestiva Lackschewitz

The ovipositor figure (Fig. 33) is based on the female of the pair recorded by Edwards (1941); there is no indication that they were taken *in copula* but the structure is distinct from any other seen. Apart from the above and the recent Irish record (Chandler, 1976), I have seen 2♂: MERIONETH: Coed Crafnant, 12.x.1975, (*Chandler*); INVERNESS: Ben Macdhui, 15.viii.1968, pit-fall trap at 3870 ft (*R. C. Welch*).

Exechia separata Lundström

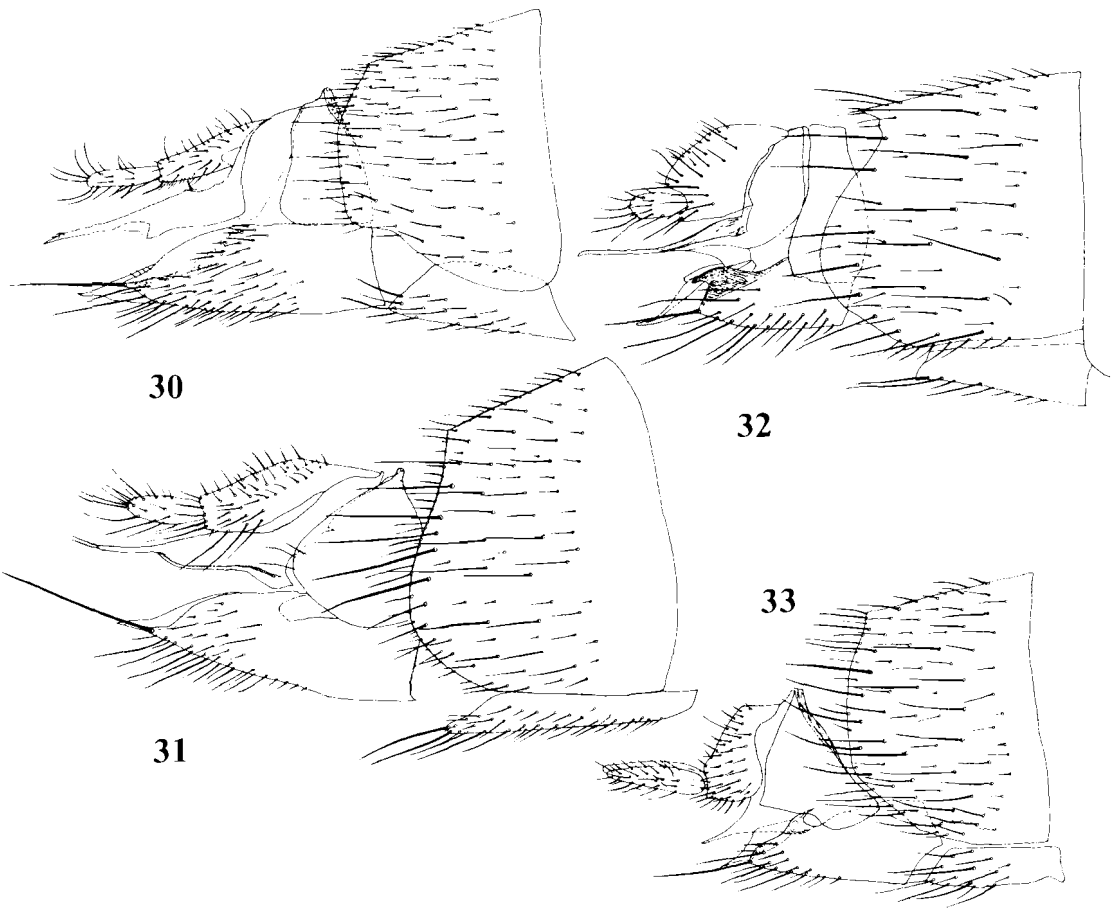
Exechia separata Lundström, 1912: 34, nom.n. for *concinna* (Winnertz) Lundström, 1909, 46, Figs. 132 and 133 (♀), 87–89 (♂).

[*Exechia lateralis* (Meigen); Dziedzicki, 1915, Figs. 255 and 256, ♀. Misident.]

Dziedzicki (1915) figured dorsal and ventral views, showing a broad emargination of the pregenital tergite but omitting the long fine marginal hairs. Lundström's (1909) figure agrees in the short cerci but shows only a shallow emargination. The female figured here (Figs. 34 and 35) has been reared from *Russula* species with males of *E.separata*.

Exechia parva Lundström

British specimens agreeing with Plassmann's (1970) figure of *parva* have two types of abdominal marking. The first group, considered to be typical *parva* (Fig. 36), have small yellow patches on tergites 3–6 not more than half tergal height in lateral view. The second group have a yellow band on the side margin of tergite 2, yellow patches extended dorsally as complete or narrowly



FIGS. 30–33. Ovipositors of *Exechia* species, in lateral view: (30) *spinuligera* Lundström; (31) *contaminata* Winnertz; (32) *festiva* Winnertz; (33) *pseudofestiva* Lackschewitz.

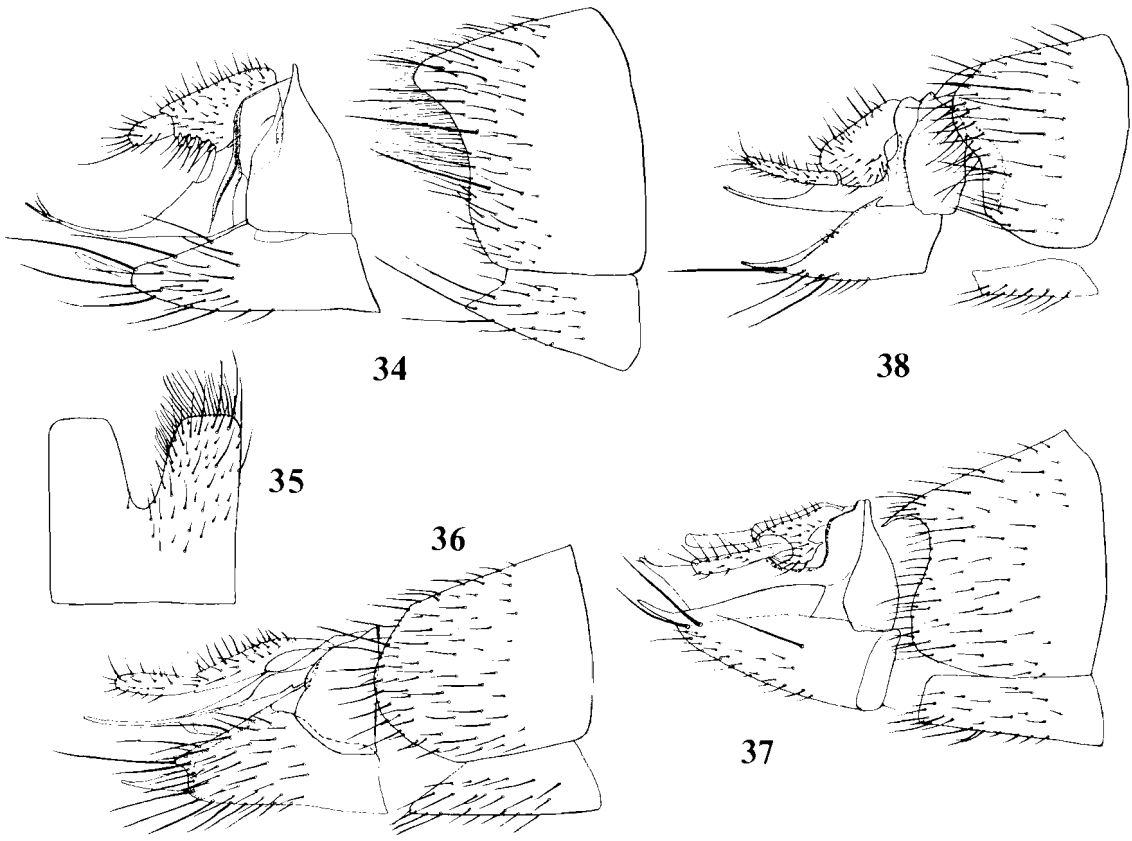
divided narrow basal bands on 3–4 (longest on 4, two-fifths tergal length), triangular patches on 5–6 and 7 yellow but vaguely darkened dorsally. These run in Edwards' key to *exigua* Lundström but Ostroverkhova & Stackelberg (1969) figured *exigua* with longer cerci and resembling the probable *nana* discussed below. Also some were found hibernating in umbelliferous stems at Clumber Park, NOTTS. with males of *repanda* Johannsen and they may belong to this species which has male genitalia close to *parva*.

Exechia nana (Staeger)

[*Exechia lateralis* (Meigen); Lundström, 1909: 42, Figs. 117 and 118, form A; Fig. 119, form B. Misident.]

Exechia nana (Staeger); Edwards, 1925a: 167.

Lundström figured two forms of the ovipositor, both with elongate cerci, one with a produced apical margin to the pregenital tergite, the other with a central emargination. The first (Fig. 37) was identified as *nana* by Edwards (4 ♀ in BMNH: Baldock, HERTS.; Shefford, BEDS.) but only one other has been seen (SURREY: Thursley Common, 16.iv.1967, *A. E. Stubbs*). They have large yellow lateral patches on tergites 3–4 (two-thirds tergal height) and smaller patches on 2, 5 and 6. A commoner British form (8 ♀; KENT, SURREY, MERIONETH and



FIGS. 34–38. Ovipositors of *Exechia* species: (34) *separata* Lundström, lateral view, (35) dorsal view of pregenital tergite; (36) *parva* Lundström; (37) ? *exigua* Lundström; (38) ? *nana* Staeger.

ARGYLLSHIRE) (Fig. 38) with only small yellow lateral spots on the tergites, could be Lundström's second form, which he suggested might be *parva*. Ostroverkhova & Stackelberg's (1969) figure of *exigua* was similar but I consider it more probable that it is the true *nana*, widespread in Britain, while the first form could feasibly be *exigua*, a local southern species recorded from Baldock and Shefford by Edwards (1925b).

Exechiopsis Tuomikoski

Exechiopsis Tuomikoski, 1966: 177. Type-species *Exechia subulata* Winnertz, by original designation.

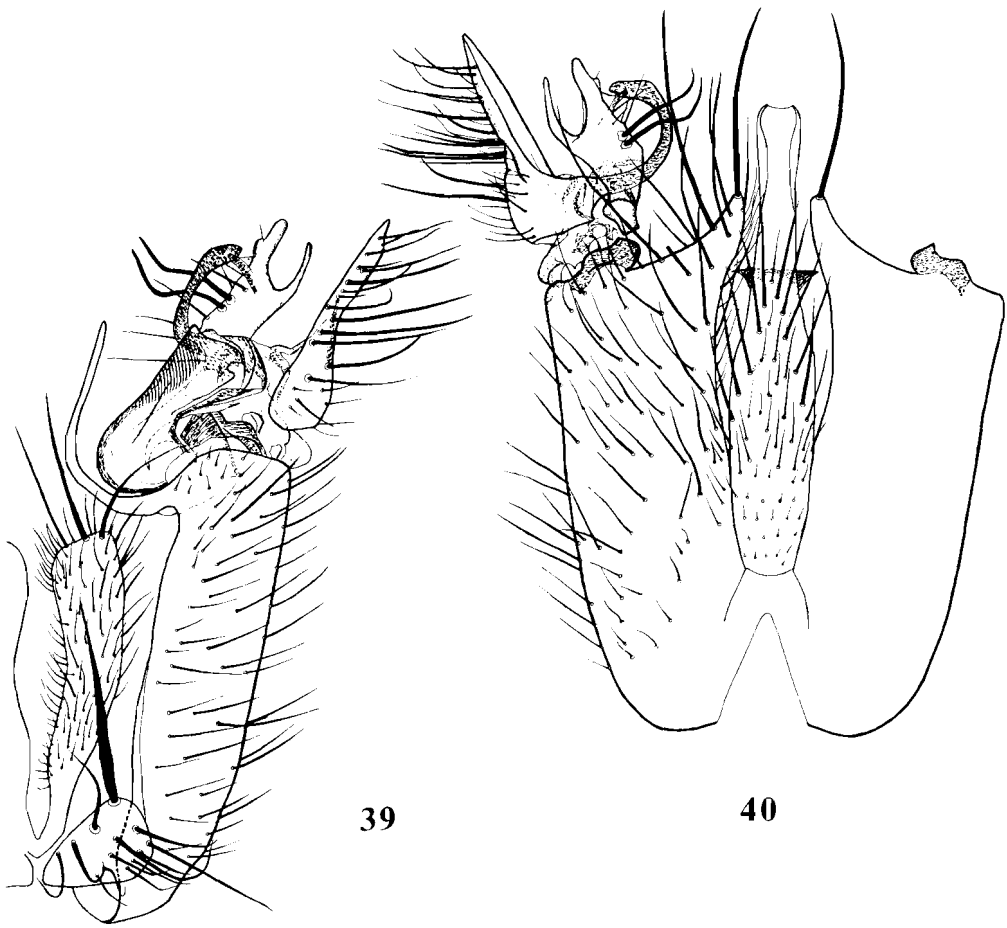
Most of Edwards' (1925b) Group II of *Exechia* are now placed here, comprising fifteen British species. A further species, only separable on genital characters from *intersecta* Meigen and *magnicauda* Lundström, may be added. My record (1966) of *magnicauda* from Kent was incorrect, being based on *intersecta*.

Exechiopsis (E.) dumitrescae (Burghele-Balacesco)

Exechia dumitrescui Burghele-Balacesco, 1972: 390, Plate 124: 3.

Exechiopsis (E.) dumitrescae (Burghele-Balacesco): Laštovka & Matile, 1974, 113, Fig. 38.

Described from three males collected in a Rumanian cave, one male has since been found in Mongolia (Laštovka & Matile, 1974). I have examined one male which agrees with the published figures and its collector tells



FIGS. 39–40. *Exechiopsis dumitrescae* Burghele-Balacesco, male hypopygium: (39) dorsal view; (40) ventral view.

me that he has four further males from the same locality (28.vi.1971, 18.vii.1971, 26.ix.1972, 29.ix.1972).

Male. Head brownish. Antennae with basal joints and basal half of first flagellar segment yellow, the rest darkened. Thorax mainly dull yellow with three discrete light brown stripes dorsally, a long median reaching the fore margin but tapered posteriorly to only faintly reach the scutellum and short laterals leaving broadly yellow humeral areas and sides; dark median stripe on scutellum and metanotum; some darker shades on lower parts of pleura. Discal bristles well developed on mesoscutum; one long propleural ~~(the type had~~ a second short hair-like propleural~~)~~. Tergites largely yellow posteriorly, the yellow extending laterally to bases of tergites 1–3, more restricted on 4–5; 6 only narrowly yellow on hind margin. Hypopygium brownish yellow (Figs. 39 and 40). Wings clear. Sc ends in R. R5 strongly downcurved near tip. Petiole of m-fork about half length of r-m. Legs yellow; fore metatarsus about one sixth longer than its tibia. Hind tibia has 11–12 a, 9 d, 10–11 short p near tip. Wing length 4 mm.

Material examined. HUNTS: Monk's Wood, 10.vii.1972, ♂ ex suction trap (*Cole*).

Allodia Winnertz
sub-genus *Brachycampta* Winnertz

Brachycampta Winnertz, 1863: 833; Tuomikoski, 1966: 184. Type-species *Myceto-*

phila alternans (Zetterstedt) Winnertz (= *Allodia grata* (Meigen) Edwards, 1925b: 607), designated by Coquillett, 1910.

Tuomikoski's (1966) concept of this subgenus includes the *grata* (Meigen) and *silvatica* (Landrock) Groups of Edwards' (1925b) key. It is characterized by well-developed discal bristles on the mesoscutum, yellow abdominal markings more extended towards bases of tergites and a longer cubital fork, the base of which is level with the base of r-m in *czernyi* (Landrock) and *alternans* (Zetterstedt). The fork is longer and distinctly before r-m in the other species. Reliable separation of species cannot be achieved from external characters but the male genitalia are highly specific in contrast to the close similarity between species of *Allodia* sensu stricto.

Recent material has been seen of the eight British species and a ninth can now be added. The only common species is *grata* (Meigen), which has been reared from various large or medium sized terrestrial Agarics and Boleti (summarized by Plassmann, 1971). It is closest to *alternans* which probably has similar habits as Kidd (1964) reared it from a *Boletus* species. Buxton (1960) recorded rearing *silvatica* and *triangularis* (Strobl) from the cup fungus *Peziza repanda* Persoon; examination of Buxton's material (in BMNH) has shown that most '*silvatica*' were *barbata* (Lundström) (1 ♂ *silvatica*, 11 ♂ *barbata*, 4 ♂ *triangularis*, 16 ♀ or lacking abdomen). No other Mycetophilidae have been reared from Pezizales and this may suggest the usual food-plants of the *silvatica* Group.

A. (B.) alternans is less common than *grata*, which is the only species known from Ireland, but occurs throughout Britain. Of the other members, *silvatica* and *pistillata* (Lundström) are local in southern England and Wales; *barbata* and *neglecta* (Edwards) are scarce but found in the south and in northern Scotland. *A. (B.) czernyi* was known from only one Scottish male but I obtained 1 ♂ at Tummel Forest, PERTHSHIRE, 5.vii.1975; this example has the abdomen darker than usual with the yellow markings reduced to small basal spots on tergites 2–4, occupying less than half the tergal length. *A. (B.) triangularis* too was known only from northern Scotland but I can record 1 ♂ from Windsor Forest, BERKS., 22.vi.1971 and 1 ♂ from Glen Nant, ARGYLLSHIRE, 9.vii.1974.

Allodia (Brachycampta) angulata (Lundström)

Brachycampta angulata Lundström, 1913: 308, Taf. XV, Figs. 5 and 6.

Allodia angulata (Lundström); Landrock, 1927: 119, Taf. IX, Fig. 21.

One British male accords with Lundström's figures of *angulata*, described from one male collected in Swedish Lapland, 8.vii.1911 and not recorded since. Lundström did not mention discal bristles and Landrock (1927) concluded that it lacked them. They are, however, present in the British specimen and it is evident that *angulata* should be placed in *Brachycampta*.

Male. Head dark brown; palpi and base of antennae, including basal half of first flagellar segment, yellow; rest of flagellum brownish. Mesoscutum mainly brown but humeral area and continuous side margins yellow (only a small humeral spot in Type). Scutellum brown, metanotum yellowish; pleura brownish yellow, propleura paler yellow. Well developed black discal bristles on mesoscutum. Two strong propleural (proepisternal) bristles, four strong bristles on side of pronotum. One pair of strong scutellars. Halteres yellow. Abdomen dark brown with sides of tergites 1–4 broadly yellow, on 3–4 extended dorsally on fore margins; 5 with triangular yellow markings on fore margin nearly reaching hind margin; 6 entirely black (the Type only had triangular spots on 2–4 but colour variation according to latitude and climate is common in the Exechiini). Hypopygium large, yellow (Figs. 41–43). Legs yellow; hind tibia with 11 a, 5 d, no p bristles.

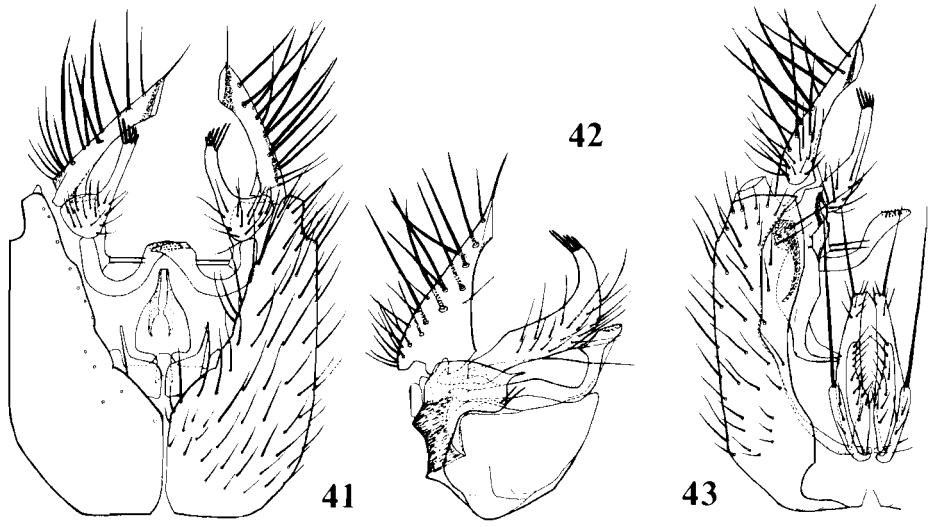
Wings clear. Vein Sc short, ending in R; R5 slightly downcurved apically. Petiole of m-fork nearly equal to r-m. Base of cu-fork twice length of M1 + 2 before base of m-fork. Vein An short and weak but nearly reaching base of cu-fork. Wing length 2.5 mm.

Material examined. SURREY: Chobham Common, sallow carr in a valley on heathland, 5.viii.1967, ♂ (*Chandler*).

Allodiopsis (Gymnogonia) ingeniosa Kidd

Allodiopsis (sub-genus *Gymnogonia*) *ingeniosa* Kidd, 1969: 201, Figs. 1–3.

This was described from a single male collected at Wytham Wood, Berks; two



FIGS. 41–43. *Allodia angulata* Lundström, male hypopygium: (41) ventral view; (42) internal view of right clasper complex; (43) dorsal view.

further examples have been seen. Kidd did not mention that the anal vein (An) is shorter and weaker than is normal in '*Rymosia*' sensu lato of which *Allodiopsis* is a segregate proposed by Tuomikoski (1966), who divided it into four possibly paraphyletic sub-genera. The sub-genus *Gymnogonia* was considered close to *Allodia* but nearest to *Allodia* sensu stricto with which it agreed in the lack of discal bristles. Kidd noted that *A.ingeniosa* did not entirely conform to *Gymnogonia* because it possesses discal bristles on the posterior part of the mesoscutum.

In *ingeniosa* the anal vein only extends to two-thirds of the length of the stem of the cubital fork whereas in typical *Allodiopsis* it is prolonged past the base of that fork. It therefore runs in Edwards' (1925b) key to *Allodia*; *A. (B.) czernyi* has some similarities in the genitalia but has An very short, ending at one third of the Cu stem. The *silvatica* Group, however, have An reaching the base of the cubital fork because this is nearer the base of the wing. *A.ingeniosa* also agrees with *Allodia* in the small body size compared with typical robust *Allodiopsis.* It does, however, possess the posterior hind tibial bristles and the setulae on the tips of the fork veins characteristic of *Allodiopsis* and not present in *Allodia.* Although it agrees with *Brachycampta* in the thoracic bristling it differs in the posteriorly set abdominal markings. The generic position of *ingeniosa* appears inconclusive and it may be regarded as a link between *Allodiopsis* and *Allodia.*

Some infraspecific variation should be noted. The Monk's Wood male has vein M1 abbreviated on both wings, the apical quarter being absent as are the setulae of this vein although present on the complete M2. The Alyth specimen has normal venation but its abdominal coloration is darker, the pale markings being reduced to apical patches on tergites 2–4.

Material examined. HUNTS: Monk's Wood, 29.ix.1972, ♂ ex suction trap (*Cole*); PERTHSHIRE: Den of Alyth, 31.vii.1975, ♂ swept in mixed woods (*Chandler*).

Mycetophila Meigen

Mycetophila Meigen, 1803: 263. Type-species *Tipula agarici* Villers, designated by Johannsen, 1909.

This is the largest genus of Mycetophilidae with many species groups meriting closer study. Edwards (1925b, 1941) recognized 49 British species. Kidd & Ackland (1970) added *bohemica* (Laštovka), one of the *vittipes* Zetterstedt Group of which Laštovka (1963) revised the European species. Laštovka & Kidd (1975) recognized four British members of the *ruficollis* Meigen

Group (=*lineola* Meigen of Edwards). Here three further *Mycetophila* species are recorded, bringing the British list to 56. Two nomenclatural changes have also been found necessary.

Laffoon (1957) revised the Nearctic species, drawing attention to several external characters which help to associate the sexes where reliance had been placed almost entirely on the male genitalia. Twenty British species are Holarctic and are fully described by him, while many others are discussed in connection with related American species. Although Laffoon figured the ovipositor of only a few species, Laštovka & Kidd (*op. cit.*) used its structure in the *ruficollis* Group and there are good specific characters in the species covered here. Although several distinct species groups are discussed below, they all belong to Laffoon's Group F (both v and a–d bristles on mid tibia, no a–d on hind tibia and at least apical third of second row of anterior setulae on hind tibia dark brown) which is the largest, including about 20 British species.

The *Mycetophila pictula* Meigen Group

This Group is characterized by a distinct pre-apical wing spot just touching the tip of vein R1, the male genital structure and in the female thickened fore tarsi and single-segmented cerci. All other known British *Mycetophila* females have two-segmented cerci although some other Nearctic species have a single segment. Thickened female fore tarsi are more frequent, also found in the following: *pumila* Winnertz, *unicolor* Stannius, *rudis* Winnertz, *strigata* Staeger, *sigillata* Dziedzicki, *cingulum* Meigen, *occultans* Lundström and (only slightly) *edwardsi* Lundström. One British species, *bialorussica* Dziedzicki, has thickened tarsi in both sexes and agrees with the *pictula* Group in the position of the pre-apical wing spot but has two-segmented female cerci. It is more nearly related to *strigatoides* Landrock (=*venusta* Laffoon), a Holarctic species not recorded in Britain.

Edwards (1925b) recorded two species of this Group from Britain, i.e. *pictula* (as *bimaculata* Fabricius) and *forcipata* Lundström, later (1926) adding *tridentata* Lundström. Two further species which run to *M.bimaculata* in Edwards' key are here added, both on males only, their females being unknown. *M.autumnalis* Lundström appears to belong to the *pictula* Group and probably has the usual female characters but *lubomirskii* Dziedzicki has rather different male genitalia and is probably not nearly related. It is likely to have a female with simple tarsi and two-segmented cerci.

Mycetophila lubomirskii Dziedzicki

Mycetophila lubomirskii Dziedzicki, 1884: 7, Table VIII, Figs. 19–22.

A male collected in Norfolk had distinct genitalia agreeing with Dziedzicki's (1884) figures of *lubomirskii*, described from 3 ♂ collected in June in Bjelo-Russia. It is apparently scarce as the only more recent record was by Lundström (1912) who found 1 ♂ in Finland.

The basistyle (ventral stylomere) has a dorsolateral lobe bearing a single long curved terminal spine as in the *lunata* Group, but lacks lateral spines on this lobe. It is nearest to the Nearctic *clavata* van Duzee but in Laffoon's (1957) key it runs most readily to *napaea* (Laffoon) as it has longish posterior hairs on the hind coxae (separating it from the *pictula* Group) and largely dark brown ventral setulae on the hind tibiae (excluding it from the *lunata/pectita* Group). Both *clavata* and *napaea* belong to the Group which includes the British species *M.luctuosa* Meigen which, however, lacks the dorsolateral lobe of the basistyle of *lubomirskii* and *clavata*.

In Landrock's (1927) key the British specimen runs to *nigrofusca* Dziedzicki because it has only two (instead of three) ventral bristles on the mid tibia and an entirely dark abdomen but these characters may be variable, *nigrofusca* again being distinct on hypopygial structure. *M.lubomirskii* differs from *pictula* in the pre-apical wing band being distinct only to the middle of cell R5, although it is continued faintly beyond. The terminology used here in descriptions of *Mycetophila* species is based on that of Laffoon (*op. cit.*).

Male. Head dark, palpi and basal antennal joints yellow; antennal flagellum dark but basal 3–4 segments yellowish beneath. Mesoscutum with three nearly fused dully shining black stripes; yellow humeral areas, narrow front margin and prescutellar spot extended as a central band on scutellum to base of metanotum. Scutellum and metanotum (mediotergite) otherwise dark brown; pleura dark brown except yellow proepisternum. Halteres yellow. Abdomen dark brown with small brownish yellow hypopygium (Figs. 47–49). Legs yellow except for narrowly darkened tip to hind femora.

Wings with median spot covering bases of cells R1, R5 and M1; preapical band just touching tip of vein R1, filling end of cell R1, then contracted basad, distinct to middle of cell R5, faintly extended across m-fork, barely exceeding M2. Vein R with about 13 setulae below; M before r-m bare. Petiole of m-fork slightly shorter than r-m. Wing about 3.2 mm.

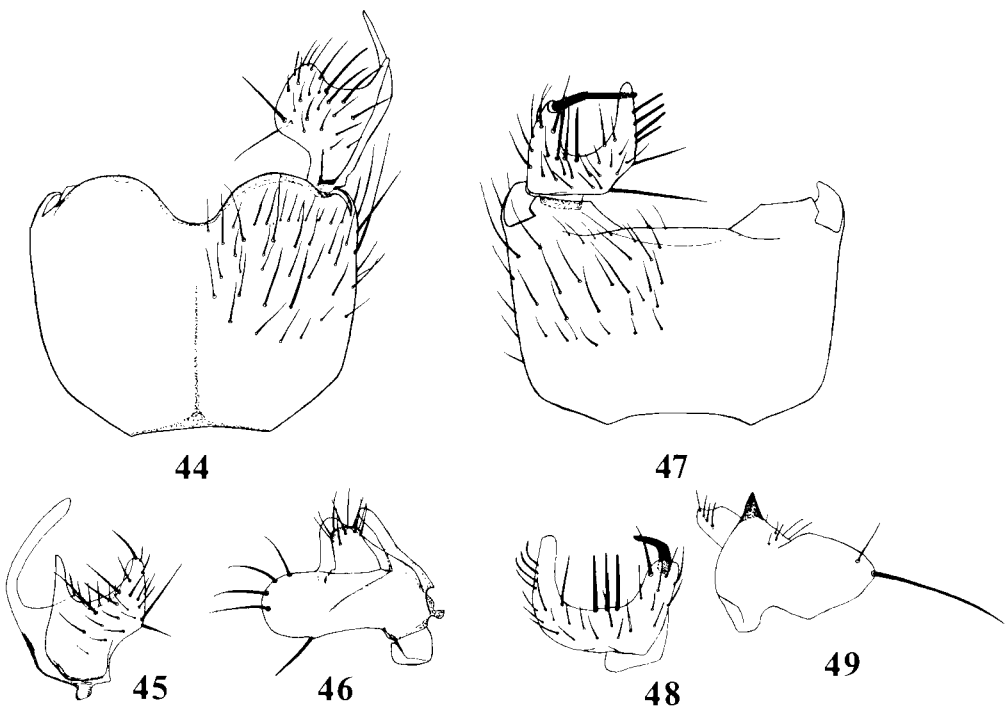
Mid tibia with 5 d, 1 a–d, 3 a, 4 weak p, 2 strong v. Hind tibia with 4 strong d, interspersed with about 5 short weak bristles; 0 a–d, 6–7 a, 3–4 short weak yellow p near tip. Tibial setulae all brown. Hind coxae with distinct posterior setae from basal third, longer apically, more than half length of external preapical bristle.

Material examined. NORFOLK: Felbrigg Great Woods, 24.x.1975, ♂ (*Ismay*).

Mycetophila autumnalis Lundström

Mycetophila autumnalis Lundström, 1909: 60, Figs. 140–142.

The recognition of *lubomirskii* led to the discovery of this species also introduced as British on a single male, apparently the first since the unique Finnish Type. Landrock (1927) briefly described *autumnalis* but omitted it from his key, in which the British example runs to *lubomirskii* or *bimaculata* dependent on whether the thorax is considered shining. The British male conforms to



FIGS. 44–49. Male hypopygia of *Mycetophila* species: *autumnalis* Lundström, (44) ventral view; (45) external view of ventral stylomere; (46) external view of dorsal stylomere; *lubomirskii* Dziedzicki; (47) ventral view; (48) external view of ventral stylomere; (49) external view of dorsal stylomere.

Lundström's genitalia figures and to his description except in having the thoracic stripes fused; the type had three closely approximated stripes on a reddish yellow ground. This character, however, varies in other species (see below) and Edwards (1928) recorded *pictula* with well separated thoracic stripes from Corsica.

The three-lobed basistyle distinguishes *autumnalis* from allied European species but similar structure is found in the Nearctic *alata* Guthrie. The proportions are different and *alata* also has a few setulae on the portion of vein M before r-m.

Male. Head dark. Antennae brownish yellow on basal joints and base of first flagellar segment, rest of flagellum dark. Thorax slightly shining, most of disc covered by three fused pruinose blackish stripes; broad brownish yellow humeral area connected with like coloured side margins. Scutellum dark except at basal corners. Metanotum and pleura nearly entirely blackish. Abdomen dark brown; hypopygium small, brownish yellow (Figs. 44–46). Legs yellow but slightly darkened at tip of hind femora.

Wings with brown central spot covering Rs and bases of cells R5 and M1; pre-apical band just touching tip of vein R1, filling end of cell R1, sharply contracted basally to a narrow band in cell R5, then at middle of cell deflected distally as a fainter shade broadening across fork veins to faintly reach wing margin in cell Cu1. Vein R with 13–15 setulae below; M before r-m with only 0–1 below at junction with r-m. Petiole of m-fork nearly equal to r-m. Wing length 3.5 mm.

Mid tibia with 5–6 d (stronger apically), 1 a–d, 3 a, 3 p, 3 v (basal short). Hind tibia with 4 strong d, interspersed with 6–8 short weak bristles; 0 a–d, 8 a, 2–3 very weak yellow p near tip. All tibial setulae brown. Hind coxae practically bare posteriorly.

Material examined. WEST SUSSEX: Durford Heath, 26.vii.1974, ♂ (*Chandler*).

Mycetophila pictula Meigen

Sciara bimaculata Fabricius, 1805: 59 (preocc. Meigen, 1804: 92).
Mycetophila pictula Meigen, 1830: 299.
Mycetophila bimaculata (Fabricius); Edwards, 1925b: 639.
Fungivora bimaculata (Fabricius); Laffoon, 1957: 277.
Mycetophila pictula Meigen; Laffoon, 1965: 213.

Ovipositor, Fig. 50. Examination of females of this Group has confirmed their close relationship. The male of *pictula* has a simple triangular ventral lobe to its basistyle (figured by Laffoon, 1957) and a weak dorsal lobe similar to *tridentata* but lacking the tridentate margin. Edwards (1925b), who reared it from *Poria vaporaria* Cooke, said 'fairly common', but it is unaccountably scarce in recent material. I have seen 18 ♂ and 21 ♀ mostly from southern England, extending north to Inverness, but only 1 ♂ and 3 ♀ collected since 1950.

Mycetophila forcipata Lundström

Mycetophila forcipata Lundström, 1913: 318, Table XVI, Figs. 28 and 29.
Mycetophila luteicauda Edwards, 1913: 379, Figs. 77 and 78.
Mycetophila forcipata Lundström; Edwards, 1925b: 639.

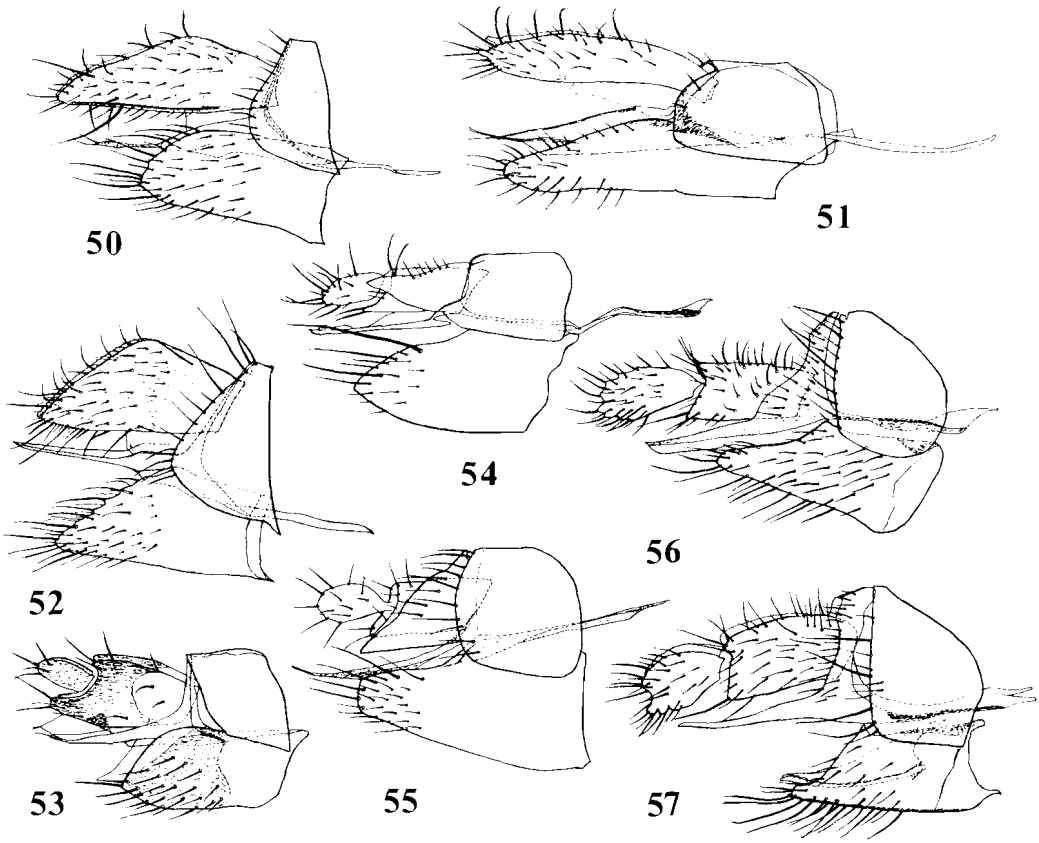
Ovipositor, Fig. 51. Elongate cerci are found in both sexes. This is a frequent species which develops in *Piptoporus betulinus* Fries; 20 ♂ and 15 ♀ have been seen from many parts of Britain and from Ireland.

Mycetophila tridentata Lundström

Mycetophila tridentata Lundström, 1911, 415, Table XIV, Figs. 11 and 12.
Mycetophila tridentata Lundström; Edwards, 1926: 23; Edwards, 1941: 80.

This has a largely dull yellowish brown more humped thorax with three abbreviated brown stripes. The previously unknown female is very similar to the male, differing only in the somewhat thickened joints 2–3 of the fore tarsi (less than in *pictula* and *forcipata*). Male genitalia, Figs. 58–60; ovipositor, Fig. 52.

Although only the three specimens recorded by Edwards (1926, 1941) are in BMNH, I have found *tridentata* widespread



FIGS. 50–57. Ovipositors of *Mycetophila* species in lateral view: (50) *pictula* Meigen; (51) *forcipata* Lundström; (52) *tridentata* Lundström; (53) *bialorussica* Dziedzicki; (54) *lunata* Meigen; (55) *dziedzickii* nom.n.; (56) *unipunctata* Zetterstedt; (57) *confusa* Dziedzicki.

in the south and have reared it from *Ganoderma applanatum* Karst., collected 14.ix.1964, ♂♀ emerged 18.ix.1964, Farningham Wood, KENT. In all 14♂ and 3♀ have been examined. New records are as follows: MIDDLESEX: Perivale Woods, 2.vi.1974, ♂; BERKS: Windsor Forest, 7.vi.1973, ♀, 20.vi.1974, ♂, 3.viii.1974, ♂, 2.xi.1975, ♂; WILTS: Savernake Forest, 28.vi.1971, 3♂; SUFFOLK: Brandeston, 10.ix.1972, ♂; BRECON: Llanddew, 26.vi.1976, ♂ (all *Chandler*); HANTS: Mark Ash, 2.vi.1975, ♀ (*Stubbs*); CAMBS: Chippenham Fen, 1.x.1946, ♂ (*Collin*, HD).

Mycetophila bialorussica Dziedzicki

Mycetophila bialorussica Dziedzicki, 1884, 14, Table VII, Figs. 1–4.

The mesoscutum is black but for the yellow humeral areas as in *pictula* and *forcipata*, but is more strongly shining. Ovipositor, Fig. 53. It may have a northern/western distribution but only 4 have been seen. New records are: CORNWALL: Lelant, 28.viii.1912 (*Yerbury*, BMNH); ROSS: Dingwall, 11.viii.1909, ♂ (*King*, BMNH); PERTHSHIRE: Foss Bridge, 22.vi.1974, ♀ (*Chandler*).

Mycetophila confusa Dziedzicki

Mycetophila confusa Dziedzicki, 1884, 9, Table VI, Figs. 19–21 (captioned incorrectly as *M.stolida* Walker, corrected by Dziedzicki, 1886).

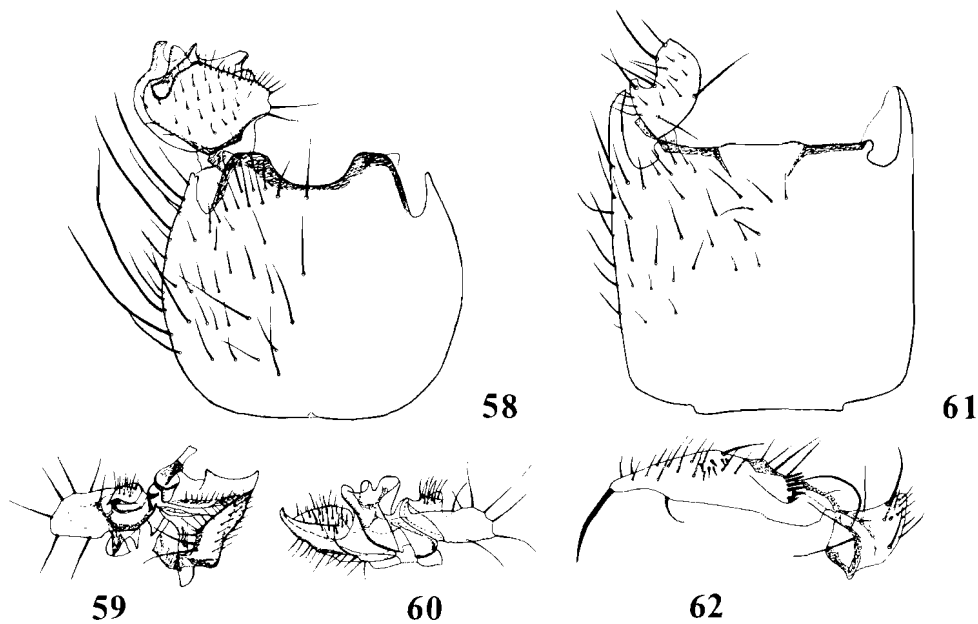
Mycetophila affluctata Edwards, 1941: 79, Figs. 9a–b, **Syn.nov.**

Laffoon (1957) drew attention to the close resemblance between genitalia figures of *confusa,* briefly described by Dziedzicki from a single Bjelo-Russian male (compared with *stolida* Walker) and *affluctata,* which Edwards described from a British male and female (compared with *unipunctata* Meigen). Examination of this and other British material has convinced me that these names apply to the same species.

M.confusa is close to the Nearctic *limata* Laffoon and to the common Holarctic *unipunctata* Meigen. Laffoon stated, following published figures, that *confusa* and *affluctata* differed from *limata* in having two short stout setae on the posterior border of the dististyle directly behind its point of attachment. While only two are apparent from the angle figured, however, there is really a lobe bearing a row of about six close-set spines best seen from a posterior view; Fig. 62 shows this aspect.

Edwards (*op. cit.*) thought *affluctata* was close to the Canarian *fluctata* Becker (hence his choice of name) but he had not seen *fluctata,* which has not been figured. I have examined Becker's type, which is a male (not a female as stated by Becker, 1908) and found it to be conspecific with the British and European species *pumila* Winnertz (this synonymy to be established in an account of the Canarian Mycetophilidae under preparation).

The additional material of *confusa* differs from Edwards' type of *affluctata* in that the mesoscutal stripes are not completely fused. Also *unipunctata* sometimes has these stripes blacker and more approximated than usual so this character used by Edwards does not hold good. Laffoon's character for *limata* (first row of posterior setulae ventral to dorsal bristles of hind tibia darker brown than succeeding rows; all setulae pale in *unipunctata*) also applies to *confusa* but is not a very clear distinction. The male genitalia are distinct (figured by Edwards, 1941), i.e. the three strong spines on the basistyle of *unipunctata* are represented by fine bristles in *confusa* and *limata.* The females are less easily recognized but their ovipositors are distinct (Figs. 56 and 57). There may be a constant difference in the antennae (segments a little more than twice as long as broad in *unipunctata,* somewhat less in *confusa*).



FIGS. 58–62. Male hypopygia of *Mycetophila* species: *tridentata* Lundström, (58) ventral view; (59) internal view of right stylomeres; (60) postero-external view of right stylomeres; *confusa* Dziedzicki, (61) ventral view; (62) postero-internal view of right stylomeres.

Material examined. Holotype ♂ of *Mycetophila affluctata* Edwards, SUFFOLK: Eriswell, 24.x.1934 (*Collin*, BMNH). SUFFOLK: Brandeston, 3.x.1972, ♂ (*Chandler*); CAMBS.: Chippenham Fen, 16.viii.1940, ♀ 21.ix.1941, 4♂, 2♀; 24.ix.1941, 2♂, 3♀; 13.x,1943, ♂ (*Collin*, HD).

The *Mycetophila lunata* Meigen Group

This corresponds to the Nearctic *pectita* Johannsen Group, said by Laffoon (1957) to include three Nearctic species (*pectita* Johannsen, *subita* (Laffoon) and *contigua* Walker) and the European *obscura* Dziedzicki (a homonym renamed below); he did not mention *lunata* Meigen although its close relationship can be seen from Dziedzicki's figures. Edwards (1913) said that *obscura* might be a dark form of *lunata* because of similarity in hypopygial structure, while Laffoon refers to *pectita* and *obscura* as an allopatric species pair. *M.lunata*, however, rather than *obscura* is nearer to *pectita* to which it runs in Laffoon's key. I have not considered *lunata* and *pectita* conspecific, although this is possible, because of small differences in the shape of the dorsal processes of the dististyle.

Laffoon stated that he had examined European material of *obscura* but did not mention that it differs from the three Nearctic species in possessing a row of setulae below vein M before r-m, also completely absent in *lunata*. Because of this character, *obscura* runs in Laffoon's key to *strigata* Staeger, which is not closely allied. Otherwise, *obscura* closely resembles *contigua*, differing again most obviously in the shape of the dorsal processes of the dististyle.

Mycetophila lunata Meigen

Mycetophila lunata Meigen, 1804: 90; Winnertz, 1863: 931; Dziedzicki, 1915, Plate XVIII, Figs. 283–286 (based on Winnertz' collection).

It is necessary to discuss the interpretation of this name. Many nineteenth century authors cited *lunata* but most probably refer to *lunata* of Fabricius (1805), i.e. species of the *signata* Meigen Group such as *alea* Laffoon (=*guttata* Dziedzicki of Edwards) and *signatoides* Dziedzicki, common species with more or less separated black stripes on a strongly shining yellow mesoscutum. They develop in terrestrial gill fungi and the rearing records of *lunata* from Agarics no doubt refer to them or other related species. Walker (1836, 1856) recorded *lunata* from the British Isles but at least Haliday's Irish material was *alea* (Chandler, 1976). Lundström (1906) and possibly some earlier Scandinavian authors used the name *lunata* for *finlandica* Edwards.

The present usage of *lunata* follows Winnertz (1863) according to Dziedzicki's figures, an interpretation followed by most later authors. Meigen (1804) said it was common on ivy blossom and developed in bark encrusting fungi, which would fit the species dealt with here. Edwards (1924) did not mention *lunata* in his review of Meigen's types but Séguy (1940) described a female specimen said to be the type of *lunata* and there is nothing in his description to conflict with this identification. It is not possible to say how many records can be accepted but the true *lunata* sensu Dziedzicki is probably widespread but local in western and central Europe.

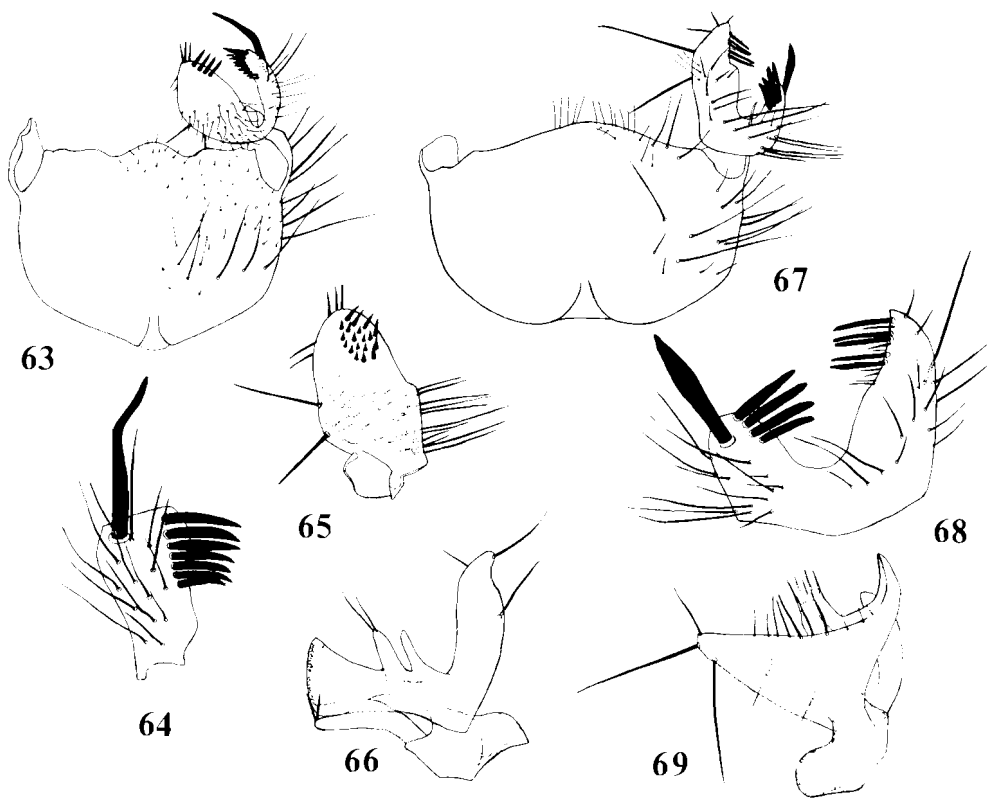
I became aware of *lunata* as a British species when Mr R. E. Evans sent to me reared material which ran in Edwards' (1925b) key to *finlandica* because of their separate thoracic stripes and *lunata* is coupled with *finlandica* in Landrock's (1927) key, but the genital structure is quite different. I later found, however, that *lunata* was mixed with *obscura* in collections and some, especially that from Norfolk, had fused stripes with only the shoulders yellow and the thorax more shining; these run to *obscura* in Edwards' key. The genitalia of both have a spinose dorsolateral lobe to the basistyle, also found in the Nearctic species of the group. *M.lunata* has the apical spine of this lobe markedly curved and 7–8 lateral spines as in *pectita*; *obscura* has the apical spine nearly straight and only 4–5 lateral spines. The ventral lobe is also distinctly longer in *obscura* while the lobes are about equal in *lunata*. There is a greater difference in the structure of the delicate dististyles.

Male and female. Head dark. Palpi and

basal antennal joints, including whole of first flagellar segment yellow, rest of flagellum dark. Mesoscutum with three dully shining black stripes, narrowly separated or completely fused; median stripe reaches fore margin but broad humeral area and adjoining side margins of mesoscutum yellow. A yellow prescutellar spot (larger when the stripes are separate) extended as a median band onto scutellum. Rest of scutellum, metanotum and most of pleura dark; pronotum and proepisternum yellow. Abdomen dark with narrow yellow hind margins to segments; hypopygium (Figs. 63–66) and ovipositor (Fig. 54) brownish yellow. Legs pale yellow with tips of mid and hind femora narrowly dark brown.

Wings with large dark brown median spot in bases of cells R1, R5 and M1; a narrow preapical band filling the end of cell R1 but not nearly reaching back to vein R1, arching basad in cell R5, then extending faintly across median fork, ending just beyond vein M2. Both wing markings much stronger than in *obscura*. Vein R with 9–11 setulae below; vein M before r-m bare. Petiole of m-fork short, less than half length of r-m.

Mid tibia with 6 d, 1 a–d, 3 a, 2–3 strong p (2 short weak yellowish bristles above them), 3 v. Hind tibia with 4 strong d (interspersed with about 6–8 short weak bristles), 0 a–d, 7 a, 4–8 short yellow p near tip. Mid tibia with anterior setulae brown, posterior yellowish. Hind tibia with first 1–2 rows mainly brown, rest of anterior rows only brown on apical quarter to third, ventral brown only near tip and posterior all yellow. Hind coxae with several long posterior hairs near tip, nearly as long as external preapical, only shorter hairs basally. Female fore tarsi



FIGS. 63–69. Male hypopygia of *Mycetophila* species: *lunata* Meigen, (63) ventral view; (64) external view of dorsal lobe of left ventral stylomere; (65) internal view of ventral lobe of left ventral stylomere; (66) internal view of left dorsal stylomere; *dziedzickii* nom.n., (67) ventral view; (68) external view of left ventral stylomere; (69) external view of left dorsal stylomere.

simple (slightly thickened on segments 2–3 in *pectita*).

Wing length, ♂ 3.5–4.0 mm; ♀ 4.1–4.3 mm.

Material examined. NORFOLK: Wheatfen Broad, 31.x.1975, ♂ (*Irwin*), 30.iv.1976, ♂ (*Ismay*); SUFFOLK: Boyton, 27.viii.1907, ♂ (*Collin*, HD); CAMBS.: Chippenham Fen, 11.viii.1940, ♂, 24.viii.1940, ♂, 21.ix.1941, ♂, 24.ix.1941, ♂ (*Collin*, HD); HUNTS.: Monk's Wood, 29.ix.1972, ♂ (*Cole*); NOTTS.: Strelley, 21.ix.1922, ♂ (*Edwards*, BMNH); WARWICKS.: Dumble Wood, reared ii.1975 ex *Coniophora puteana* Karst., 1♂, 3♀ (*Evans*).

Mycetophila dziedzickii nom.n.

Mycetophila obscura Dziedzicki, 1884: 8, Table VIII, Figs. 30–33, nec Walker, 1848: 101.

This new name is proposed because of the homonymy stated above, which was first mentioned by Laffoon (1957: 282). *M.obscura* Walker is a *Phronia* species which cannot be identified because of the poor condition of the Type (in BMNH).

Since Dziedzicki figured the hypopygium when describing *obscura* from a single Polish male, most published records are probably correct although some evidently apply to *lunata*. It is widespread in Europe but has not been reared. Edwards (1913, 1925b) quoted several British localities; his Baldock and Shefford specimens can be confirmed but the Strelley example was *lunata* (see above).

The ovipositors of *lunata* and *dziedzickii* (not previously figured) agree with the Nearctic species of the group in the possession of produced terminal lobes to tergite IX, covering part of the basal joint of the cerci, differing in this respect from other *Mycetophila* species. The shape of this lobe and of the cerci are closely similar (according to Laffoon's figures) in *lunata* and *pectita* and there is a similar resemblance between *dziedzickii* and *contigua*, no obvious differences being apparent in either case. This tends to confirm the view that two very closely related allopatric species pairs are involved.

Male and female. Head dark with palpi and base of antennae (including less than basal half of first flagellar segment) yellow. Mesoscutum with three fused shining brown stripes, leaving a large yellow humeral area not connected with small yellow postalar and prescutellar spots, the latter joining median yellow scutellar band. Metanotum and most of pleura dark brown but pronotum, propisternum and upper part of katepisternum yellow. Abdomen dark brown with narrow yellow hind margins to segments; hypopygium (Figs. 67–69) and ovipositor (Fig. 55) brownish yellow. Legs yellow; tips of mid and hind femora narrowly brown.

Wings with small brown median spot concentrated in base of cell R5 but extending over Rs and into upper part of cell M1; preapical band fainter, filling tip of cell R1 and nearly reaching back to vein R1 (approaching *pictula* Group in this respect), arched basad in cell R5 but becoming very faint beyond middle of cell, disappearing just beyond vein M2. Vein R with 9–12 setulae below; M before r-m with about 7 setulae on apical half below. Petiole of m-fork short, half or slightly less length of r-m.

Mid tibia with 5–6 d, 1 a–d, 3 a, 2–3 v (basal when present weaker), 3–4 p (1–2 upper very short and weak); anterior setulae brown, posterior yellow. Hind tibia with 4–5 long interspersed with 3–5 short d, 0 a–d, 8 strong a (sometimes one short additional basal to them), 2–3 very short p near tip; first anterior row of setulae brown, rest only brown on apical third to half, posterior setulae all yellow. Hind coxae with many pale posterior hairs becoming longer on apical half. Female fore tarsi simple.

Wing length, ♂ 3.0–3.5 mm; ♀ 3.7–4.0 mm.

Material examined. HANTS.: Leckford, ♂♀ *in copula* at ivy flowers, 5.x.1975 (*Chandler*); I. of WIGHT: Freshwater, ♂♀ at windows, 5.ix.1948 (*K. G. Blair*); HERTS.: Baldock, v.1916, ♂ (*Edwards*, BMNH); BEDS.: Shefford, viii.1913, 1♂, 2♀ (*Edwards*, BMNH); SUFFOLK: Newmarket, Sussex Lodge, 12.ix.1888, ♀ (*Verrall*, HD), 17.ix.1922, ♂ (*Collin*, HD); Tuddenham, 16.ix.1891, ♂ (*Verrall*, HD); Hollesley, 17.ix.1909, ♂ (*Yerbury*, HD); INVERNESS: Aviemore, 20.vi.1903, ♂ (*King*, BMNH).

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References

Becker, T. (1908) Dipteren der Kanarischen Inseln. *Berlin Mitt. Zool. Mus.* **1908**, 1–80.

Bukowski, W. (1949) New species of fungus gnats (Diptera, Fungivoridae) from the Crimea (in Russian). *Ent. Obozr.* **30**, 405–409.

Burghele-Balacesco, A. (1966) Les Mycetophilidae (Diptères) cavernicoles de la collection Biospeologica (IVe–VIIIe séries des "Grottes visitées." *Int. J. Speleol.* **2**, 319–334.

Burghele-Balacesco, A. (1972) Contribution a l'étude des Mycetophilidae des grottes de Roumanie avec la description de deux espèces nouvelles. *Int. J. Speleol.* **3**, 387–395.

Buxton, P.A. (1960) British Diptera associated with fungi. III. Flies of all families reared from about 150 species of fungi. *Entomologist's mon. Mag.* **96**, 61–94.

Chandler, P.J. (1966) *Leptomorphus walkeri* Curt. and other Mycetophilidae (Diptera) in Kent. *Entomologist's Rec. J. Var.* **78**, 80–81.

Chandler, P.J. (1976) A preliminary list of the fungus-gnats (Diptera, Mycetophilidae) of Ireland. *Proc. R. Irish Acad.* **76**, (B), 87–108.

Dziedzicki, H. (1884) Przyczynek do fauny owadów dwuskrzydłych. Gatunki rodzajów: *Mycothera, Mycetophila, Staegeria. Pamietnika Fizyjograficznego*, 4, 298–324. German translation without Plates: Beitrag zur Fauna der zweiflügeligen Insecten (Arten der Gattungen *Mycothera, Mycetophila* und *Staegeria*) (1886) *Wien ent. Zeit.* **5**, 153–156, 189–190, 229–231, 251–253, 265–266, 326–327, 346–347; **6**, 37–43).

Dziedzicki, H. (1915) Atlas des organes génitaux des types de Winnertz et des genres de sa collection de Mycétophiles. *Pub. Soc. Sci. Varsovie*, **3**, 1–16, pl. 1–21.

Dziedzicki, H. (1923) Revue des espèces européennes du genre *Anatella* Winnertz avec la description des deux genres nouveaux, *Heteropygium* et *Allophallus. Discipl. biol. Arch. Soc. Sci. Varsoviensis*, **1**, (1922), 1–8, 2 pl.

Edwards, F.W. (1913) Notes on British Mycetophilidae. *Trans. ent. Soc. Lond.* **1913**, 334–382.

Edwards, F.W. (1921) Diptera Nematocera from Arran and Loch Etive. *Scot. Nat.* **1921**, 59–61, 89–92, 121–125.

Edwards, F.W. (1924) Notes on Meigen's fungus gnat types. *Encycl. Ent.* (B2) *Dipt.* **1**, 13–17.

Edwards, F.W. (1925a) Notes on the types of Mycetophilidae (Diptera) described by Staeger and Zetterstedt. *Ent. Tidskr.* **45**, 160–168.

Edwards, F.W. (1925b) British fungus gnats (Diptera, Mycetophilidae) with a revised generic classification of the family. *Trans. ent. Soc. Lond.* **1924**, 505–662.

Edwards, F.W. (1926) The Wood collection of British Diptera and Lepidoptera. *Entomologist's mon. Mag.* ~~21–32, 67–82.~~

Edwards, F.W. (1928) The nematocerous Diptera of Corsica. *Encycl. Ent.* (B2) *Dipt.* **4**, 157–189.

Edwards, F.W. (1933) *Exechia bicincta* Staeger (Mycetophilidae), a *Trichocera* (Trichoceridae) and *Tipula vittata* Meigen (Tipulidae) with abnormal characters (Dipt.). *J. ent. Soc. S. Engl.* **1**, 55–56.

Edwards, F.W. (1941) Notes on British fungus gnats (Dipt., Mycetophilidae). *Entomologist's mon. Mag.* **77**, 21–32, 67–82.

Fabricius, J.C. (1805) Systema antliatorum secundum ordines, genera, species, adjectis synonymis, locis, observationibus, descriptionibus. Brunsvigae, Reichard.

Johannsen, O.A. (1909) Diptera. Family Mycetophilidae. Fasc. 93, 141 pp. in Wytsman, P. (Ed.) *Genera Insectorum*, Brussels.

Johannsen, O.A. (1912) The fungus gnats of North America. Part IV. *Maine Agr. Expt Sta. Bul.* (ser. 2). **200**, 57–146.

Kidd, L.N. (1959) The Diptera of Lancashire & Cheshire. Part 1. Nematocera, 15–107. Lancashire & Cheshire Fauna Committee.

Kidd, L.N. (1964) The Diptera of Lancashire and Cheshire. Part 1 (Supplement). *Lancashire & Cheshire Fauna Committee*, **34**, 1–6.

Kidd, L.N. (1969) A new species of *Allodiopsis* Tuomikoski (Diptera, Mycetophilidae) taken in Britain. *Entomologist*, **102**, 201–202.

Kidd, L.N. & Ackland, D.M. (1970) *Mycetophila bohemica* Laštovka and *Dynatosoma nigromaculatum* Lundst. new to Britain and notes on other little known fungus-gnats (Dipt., Mycetophilidae). *Entomologist*, **103**, 10–17.

Lackschewitz, P. (1937) Die Fungivoriden des Ostbaltischen Gebietes. *Arb. Naturforsch. Ver. Riga*, **21**, 1–47.

Laffoon, J. L. (1957) A revision of the Nearctic species of *Fungivora* (Diptera, Mycetophilidae). *Iowa State Coll. J. Sci.* **31**, 141–340.

Laffoon, J.L. (1965) Family Mycetophilidae, pp. 196–229, in Stone, A. *et al.* (Ed.) A catalog of the Diptera of America north of Mexico. *Agric.*

Res. Serv. U.S. Dept. Agric., Agric. Handbook no. 276.

Landrock, K. (1924) Neue Mycetophiliden aus den Hochmooren von Estland. *Zool. Anz.* **58**, 77–81.

Landrock, K. (1925) Holländische Mycetophiliden. *Natuurhist. Maandblad.* **14**, 33–37.

Landrock, K. (1927) Fungivoridae (Mycetophilidae) in Lindner, E. (Ed.), *Die Fliegen der Paläarktischen Region*, **8**, 1–195, 13 pl. Stuttgart.

Landrock, K. (1937) Zur Synonymie der Fungivoriden (Diptera). *Ann. Mus. Zool. polon.* **13**, 29–32.

Landrock, K. (1940) Pilzmücken oder Fungivoridae in Dahl, F. (Ed.), *Die Tierwelts Deutschlands*, **38**, 1–166. Jena.

Laštovka, P. (1963) Beitrag zur Kenntnis der europaïschen *Fungivora*-Arten aus der Grüppe *vittipes* (Zetterstedt) (Diptera, Fungivoridae). *Acta Soc. ent. Cech.* **60**, 312–327.

Laštovka, P. & Kidd, L.N. (1975) Review of the British and notes on other species of the *Mycetophila ruficollis*-group with the description of a new species (Dipt., Mycetophilidae). *Entomologist's mon. Mag.* **110**, 203–214.

Laštovka, P. & Matile, L. (1974) Mycetophilidae (Diptera) de Mongolie. *Acta Zool. Acad. Sci. Hung.* **20**, 93–135.

Lundström, C. (1909) Beiträge zur Kenntnis der Dipteren Finlands. IV. Supplement. *Acta Soc. Fauna Fl. Fennica*, **32**, 1–67.

Lundström, C. (1911) Neue oder wenig bekannte europaïsche Mycetophiliden. *Ann. hist. nat. Mus. Nat. Hung.* **9**, 390–419.

Lundström, C. (1912) Beiträge zur Kenntnis der Dipteren Finlands. VIII., supplement 2. *Acta Soc. Fauna Fl. Fennica*, **36**, 1–70.

Lundström, C. (1913) Neue oder wenig bekannte europaïschen Mycetophiliden. III. *Ann. hist. nat. Mus. Hat. Hung.* **11**, 305–322.

Matile, L. (1963) Un nouveau Mycétophilide pour la faune de France (Diptera, Nematocera). *Rev. franç. Ent.* **30**, 141–143.

Matile, L. (1967) Notes sur les Mycetophilidae de la région pyrénéenne et description de quatre espèces nouvelles (Dipt., Nematocera). *Bull. Soc. ent. France*, **72**, 121–126, 208–217.

Meigen, J.G. (1804) Klassifikation und Beschreibung der bekannten europaïschen zweiflügeligen Insekten (Diptera L.). Erster Band. Abt. I, 1–152. Braunschweig.

Ostroverkhova, G.P. & Stackelberg, A.A. (1969) 24. Mycetophilidae (Fungivoridae) in Bey-Bienko, (Ed.). Keys for the determination of Insects of European U.S.S.R. (in Russian), **5**, 265–320.

Plassmann, E. (1970a) Die Fungivoriden-Sammlung des Senckenberg-Museums Frankfurt a. M. *Senckenbergiana biol.* **51**, 387–391.

Plassmann, E. (1970b) Zur Taxonomie der Fungivoridae (Diptera). *Senckenbergiana biol.* **51**, 393–400.

Plassmann, E. (1971) Über die Fungivoriden-Fauna (Diptera) des Naturparkes Hoher Vogelsberg. *Oberhessische Naturwiss. Zeitschr.* **38**, 53–87.

Plassmann, E. (1973) Pilzmücken in der Lichtfalle (Diptera, Mycetophilidae). *Mitt. deutsch. Ent. Gesell.* **32**, 14–17.

Séguy, E. (1940) Diptères Nématocères. *Faune de France*, **36**, 1–368. Paris.

Strobl, G. (1895) Die Dipteren von Steiermark. III. Theil. Diptera Nematocera. *Mitt. Ver. Steiermark*, **31**, 121–246.

Tuomikoski, R. (1966) Generic taxonomy of the Exechiini (Dipt., Mycetophilidae). *Ann. ent. fenn.* **32**, 159–194.

Walker, F. (1836) Notes on Diptera. XIII. *Ent. Mag.* **3**, 113–117.

Walker, F. (1848) Lists of the specimens of dipterous insects in the collection of the British Museum. I, 1–229. London.

Walker, F. (1856) Insecta Britannica Diptera, **3**, 1–352. London.

Winnertz, J. (1863) Beitrag zu einer Monographie der Pilzmücken. *Verh. Zool.-bot. Ges. Wien*, **13**, 637–964.

Zetterstedt, J. W. (1852) Diptera Scandinaviae, disposita et descripta. **11**, 4091–4546. Lund.

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