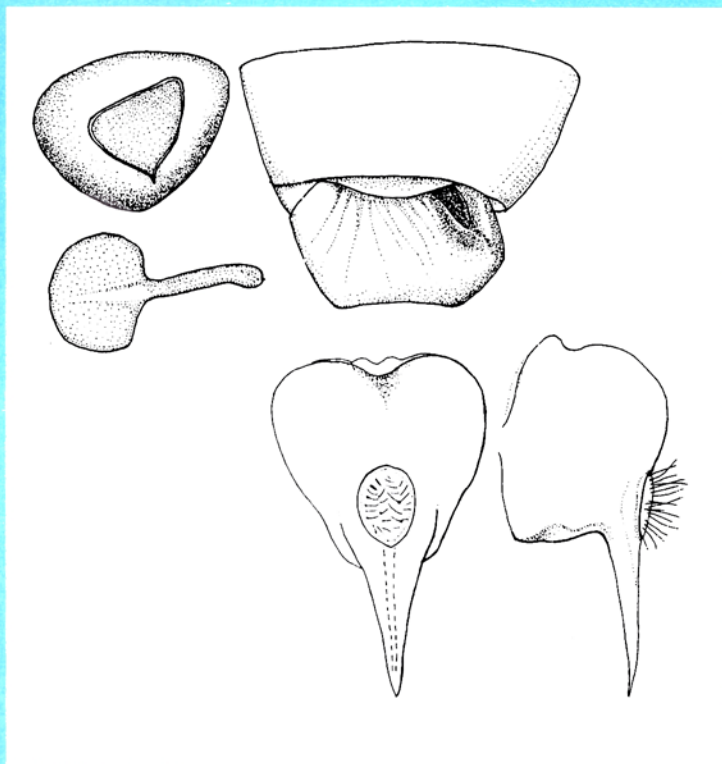


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Dipterists Digest is the journal of the **Dipterists Forum**. It is intended for amateur, semi-professional and professional field dipterists with interests in British and NW European flies. All notes and papers submitted to **Dipterists Digest** are refereed. The scope of **Dipterists Digest** is:

- the behaviour, ecology and natural history of flies;
- new and improved techniques (e.g. collecting, rearing etc.);
- the conservation of flies;
- provisional and interim reports from the Diptera Recording Schemes, including maps;
- records and assessments of rare or scarce species including those new to regions, countries etc.;
- local faunal accounts and field meeting results, especially if accompanied with good ecological or natural history interpretation;
- descriptions of species new to science;
- notes on identification including deletions or amendments to standard key works and checklists.

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Style and format should follow articles published in the most recent issue. A short Summary (in the form of an Abstract) will be included at the beginning of each article in future issues and should be supplied with the article. References to journals should give the title of the journal in full. Scientific names should be underlined or, preferably, italicised. **If an article is to be supplied on disc, scientific names should always be italicised.** Authors of scientific names should be given in full (with parentheses if applicable) and nomenclature should follow the most recent check list, unless reflecting subsequent changes. Tables should be on separate sheets. Figures should be drawn in clear black ink, about 1.5 times their printed size and lettered clearly. Descriptions of new species should include a statement of the museum or institution in which type material is being deposited.

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The British species of *Anapausis* Enderlein (Diptera, Scatopsidae)

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Anapausis Enderlein, 1912 is the only genus of the subfamily Psectrosciariinae known from the British Isles and was diagnosed in the Handbook by Freeman (1985), who figured the distinctive wing venation of the genus. Three species were included in Freeman's key. One of these species, *A. soluta* (Loew, 1846), was thought to be easily recognised in the male because of the presence of a pair of elongate blunt processes to tergite 8, which are downwardly directed at the tip of the abdomen *in situ*.

During examination of scatopsid material in my collection, in parallel with study of the collection of the National Museums of Scotland, it was found that males with this character varied in the form of sternite 6, which is emarginate medially while each lateral part has a bilobed inner margin. Three forms were identified and examination of further material from other Museum collections confirmed that they represented distinct taxa. The examination of pairs taken in *copula* of each has permitted the recognition of females, although differences in female genital structure are, as usual in this genus, significantly less than in the male.

Male specimens were also found with shorter processes on tergite 8 and a broadly emarginate sternite 6, without bilobed lateral margins. These were identified as *A. rectinervis* Duda, which was consequently incorporated in the new check list (Chandler 1998); females corresponding to the genitalia figures of *rectinervis* by Cook (1965) were collected with males at two sites. A Scottish female differing in genital structure must represent a seventh British species and may be conspecific with a new species described here from European males.

It was already known that males of several species shared the presence of the paired processes on tergite 8. Cook (1965), who redefined *Anapausis* and revised the Holarctic species, recognised nine species from Europe and three from North America. Apart from *soluta* and *rectinervis*, an American species *A. cismarina* McAtee possessed these processes, again differing in the form of sternite 6. More recently, Haenni and Brunhes (1981) described *A. aratrix* from the Massif Central in France; this had the tergal processes developed as in *soluta* but sternite 6 without the bilobed lateral portions. The latter character has therefore till now been thought to apply to only one species, *soluta* (Loew).

Further European species of *Anapausis* have been described by Haenni (1980, both sexes of two species from the French Pyrenees; 1984, both sexes of three species and males only of two others from Switzerland), Fritz (1983, female only of one species *A. baueri* from Germany; recorded from Switzerland by Haenni 1986; both authors suggested that it might be parthenogenetic because the spermatheca was slender and pear-shaped, compared to the spherical structure of other species) and Martinovský (1996, male only of one species from the Czech Republic), bringing the total to 19. None of these additional species had processes on the male tergite 8.

Haenni (1984) suggested that there were more than 20 European species, with the greatest number inhabiting montane regions: central Europe, Alps and Pyrenees. He recorded four non-British species as visiting flowers, sometimes in large numbers, in Switzerland but added that the larval biology was unknown apart from the rearing from cow dung reported by Skidmore (1978) under the name *soluta*; this was corrected in Skidmore (1991) to *nigripes* (Zetterstedt), so the larval biology of the "*soluta* group" discussed here has not been recorded.

Nomenclatural History of *Anapausis soluta* (Loew)

Although, as indicated above, all male *Anapausis* with a pair of processes on tergite 8 and bilobed lateral portions of sternite 6, have been considered conspecific there has not always been agreement as to their nomenclature. This has been due to differing interpretation of the name *Scatopse soluta* Loew, of which some clarification was offered by Collin (1954) and Cook (1965).

Loew (1846) described *Scatopse soluta* from two specimens collected by Zeller in March and April in Sicily. Then (1847) he stated that he had three examples, having also found it in the vicinity of Posen and he also suggested that *Aspistes inermis* Ruthé was closely related. When Enderlein (1912) described *Anapausis soluta* and *inermis* were the only recognised species and all specimens would have been referred to these names before the description of further species by Verrall (1912), Edwards (1925) and Duda (1928).

According to Collin (1954), when Loew's collection came to Berlin it contained only one specimen labelled by Loew as *soluta*, which had been collected at Annaberg in Silesia three months after appearance of his 1847 publication. Collin considered that Loew's earlier specimens must have been lost and that a lectotype for *soluta* could not therefore be selected.

It was evident to Collin that Loew had latterly based his interpretation of *soluta* on this Annaberg specimen, which is the species now known as *nigripes* (Zetterstedt) (= *palustris* (Edwards)). This was apparent because when Schiner (1864) synonymised *soluta* with *inermis* Ruthé, Loew (1870) rejected this on the basis of differences which applied to *nigripes*. Loew had also returned a specimen of "*soluta*" to Verrall in 1878 under the name "*inermis* var. *obscura*", leading Verrall to introduce the name *inermis* to the British list (included in both his 1888 and 1901 lists). The specimen concerned (from Penzance, Cornwall) is in UMO and is labelled "*inermis* var. *obscura* Loew det. 19/9/78". It belongs to the species described here as *A. floricola* sp. n., which has the apical part of the abdomen reddish, although to a lesser extent than *A. inermis* and this is probably why Loew determined it as *inermis*.

The name *obscura* was unpublished, but *inermis* is a good species, which has not been found in Britain. Subsequent to Loew's determination, Verrall and Collin placed specimens of the three British species till now confused with *soluta* under *inermis*. Edwards (1925) introduced *soluta* as the name for "*inermis*" of the British list, having compared it with continental specimens of *inermis* in Collin's collection, because the British specimens agreed better with Loew's description of *soluta*. *A. inermis* was still queried as British in the 1945 check list, but was finally deleted by Hutson (1970), who stated that a specimen from Banffshire labelled as *inermis* in BMNH was also *soluta*. Like Verrall's Penzance specimen, this too is *A. floricola*.

Duda (1928), however, accepted the Annaberg specimen as a type of *soluta* and used this name for *A. nigripes*. Because of this transfer of the name *soluta*, Duda proposed a new name *tenuicauda* for *soluta* sensu Edwards and also proposed a varietal name *dalmatina* for specimens from Yugoslavia, which were stated to differ from the typical form in having broader processes on tergite 8.

Collin (1954), for the reasons cited above, restored Edwards' usage of *soluta* and this was accepted by Cook (1965), who noted that *nigripes* (as *palustris*) had not been recorded from southern Europe and was unlikely to occur in Sicily, while "*soluta*" was recorded widely from southern Europe (by Duda under *tenuicauda*). Since these authors *tenuicauda* and *dalmatina* have been treated as synonyms of *soluta*, as they were by Krivosheina and Haenni (1986).

As *soluta* is the type-species of *Anapausis* by original designation of Enderlein, it was important to establish its identity. A specimen considered to be one of the two original syntypes of *soluta* has, thanks to Marion Kotrba, been found in Berlin. It is a female labelled "Sicil." and had been determined as *soluta* by Enderlein, who had also labelled it as found with the types of *Scatopse fuscinervis* Loew. It had also been labelled *tenuicauda* by Duda, but was not listed by

him (1928) under that name and it is unclear why he did not recognise it as a type; it is here designated lectotype of *soluta* Loew. Although he stated that *tenuicauda* was a new name for *soluta* of Edwards, Duda had not examined any of Edwards' specimens. His description was drawn up only from the material he listed, which comprised 19 males and 8 females from seven localities and an unspecified number from Enderlein's collection, which are all syntypes. It is preferable that the lectotype be selected from among these specimens, rather than from Edwards' material, which is nevertheless eligible as syntypes according to the terms of the ICZN Code.

Syntypes of both *tenuicauda* and its variety *dalmatina* have been examined and lectotypes have been designated. The lectotype of *tenuicauda* is conspecific with that of *soluta*, so the synonymy is confirmed. *A. soluta* and *A. dalmatina* represent two of the British species, while the third is described as *floricola* sp. n.. Examination of specimens available to Edwards (1925) has shown that they comprised both *soluta* and *dalmatina* but not *floricola*. The only specimen dissected by Edwards, which was figured by him, had been collected by Verrall at Butley, Suffolk and was *dalmatina*. The Verrall bequest material examined by Edwards included both species; however, specimens collected by Edwards himself were *soluta*.

The figures of both sexes of *soluta* by Freeman (1985) also represent *A. dalmatina* but the figures by Cook (1965) of both sexes were of *A. soluta*. Cook examined only five males and two females assigned to *soluta*. He did not state the source of this material, which has not been located; the two males collected by Guy Shewell may have been in Ottawa, although this is not cited among the institutions consulted. A British male was listed as from "Warrington, Lancs, 16-7-70, Verrall" but this is an error for Warrengore, Lewes in Sussex according to specimens in the Verrall-Collin collection at Oxford, collected on 16.vii.1870, which are *soluta*.

Collin's (1954) comments about Loew's inability to recognise his own species have proved inappropriate in the light of subsequent findings, but it must be acknowledged that Collin made genitalia preparations of two males and four females, which included both sexes of *dalmatina* and *soluta* and the female of *floricola*, so he may have recognised that more than one species was involved subsequent to publication of his paper.

Material examined

In addition to the type material, specimens from the author's collection (PJC) and from the following institutions have been examined:

The Natural History Museum, London	BMNH
National Museums of Scotland, Edinburgh	NMS
National Museum of Wales, Cardiff	NWC
National Museum of Ireland, Dublin	NMID
University Museum of Natural History, Oxford	OXUM
Museum and Art Gallery, Doncaster	DMAG

The species hitherto confused under *soluta* (Loew)

Species of *Anapausis* are principally recognised by the structure of the genitalia and other postabdominal structures of both sexes, which are figured here for *rectinervis* and the three species previously identified as *soluta*. The general habitus and structure is very uniform throughout the genus and these species cannot be reliably separated on characters other than the structure of the postabdomen. The new species *A. floricola* is described more fully and brief descriptions given of the other species to emphasise points of difference.

A new key to British species of the genus is provided, of necessity relying heavily on genital characters for the newly recognised species. The genitalia of both sexes of the other two British species *nigripes* (Zetterstedt) and *talpae* (Verrall) were figured adequately by Freeman (1983), but full data of material examined is also cited for these species.

***Anapausis floricola* sp. n.**

Male. Head shining black, bearing dense yellow hairs. Antennae, palpi and proboscis dull dark brown. Antennae a little longer than height of head with eight flagellomeres, of which 1-2 are quadrate, 3-7 progressively broader than long and 8 is elongate, about as long as 5-7 together and rounded apically. Palpi longer than broad, a little shorter than labella of proboscis.

Thorax shining black, with small yellow spot adjacent to each basal corner of scutellum; scutum, scutellum and pronotum bearing irregularly distributed short yellow setae, the scutum also with a group of longer darker supra-alar setae; scutellum with a continuous row of longer yellow setae on its apical margin.

Wings clear hyaline with costa and radial veins thicker and yellowish, posterior veins colourless. All veins bear short macrotrichia, longer macrotrichia thinly scattered on posterior part of membrane, mainly behind M_2 , sometimes a few between the tips of M_1 and M_2 . Costa reaches two thirds of wing length, second costal section (between R_1 and R_{4+5}) about half length of first; R_1 and R_{4+5} broadly upcurved to costa, with R_s just before middle of R_1 ; M_1 free basally; M_2 , CuA_1 and CuA_2 diverging to wing margin. Halteres yellow, brownish dorsally on knob.

Legs shining black, with tibiae yellowish on basal two fifths. Femora enlarged, femur 2 less so; femur 1 deep on basal two thirds and contracted apically; femur 3 thickened on apical two thirds. Tibiae broadened apically, tarsi simple in structure. Legs bear short pale setae over most surfaces; there are longer more or less curved fine setae in a dorsal row on tibiae and tarsi; tarsi bear short thickened darker setae ventrally, especially developed on hind first tarsomere.

Abdomen cylindrical but dorsally flattened and broadened apically; shining black, paler on side of tergite 1 and on sternite 1; tergite 8 and ventral part of posterior lobes of sternite 6 are brownish red. Abdomen covered with short pale hairs, which are longer and denser on tergites 6-8. Postabdomen (Fig. 1): tergite 8 with a pair of long apically tapered blunt processes; sternite 6 deeply emarginate, reduced medially to broad semicircular strip linking deeply bilobed lateral portions; posterior lobe on each side with a hooked apical process.

Wing length 2.3-2.6mm.

Female. Very similar to male. Antennae relatively shorter, not longer than height of head. Tibiae usually as male, Gala Water (Scotland) female has basal part more obscured. Abdomen apically (tergite 6 onwards) obscurely reddish brown. Postabdomen (Fig. 5): tergite 8 with bluntly rounded lateral lobe extended more distally than in other species; tergite 9 is broad and not deeply set in apical margin of tergite 8, which is only shallowly emarginate; sternite 9 rounded apically; furca with single elongate anterior process. Wing length 2.4-2.75mm.

Holotype male, *Norfolk*, Old Buckenham Fen, 11.vii.1993 (PJC, deposited in NMS).

Paratypes (40 males, 38 females): ENGLAND: *Sussex*, Beacon Hill, chalk grassland, 29.vii.1974 male (PJC). *Surrey*, Bookham, 11.viii.1946 male; 11.viii.1957 3 males, 1 female at *Pastinaca* flowers (L. Parmenter, BMNH). *Hampshire*, Leckford, Water Garden, 14.viii.1987 male (PJC); Leckford, Reserve D, bank of River Test, 25.vii.1998 5 males (PJC); Shawford, 25.vii.1959 male and pair in copula under *Clematis vitalba* bark, 3 males swarming on dead tree (C.R. Vardy, BMNH). *Dorset*, Flett, 26.vii.1906 female; Worth, 25.viii.1906 male (J.E. Collin, OXUM). *Cornwall*, Penzance, 15.vii.1871 male (G.H. Verrall, OXUM, det. *inermis* var. *obscura* by H. Loew). *Wiltshire*, Savernake Forest, 24.vii.1973 male (PJC). *Gloucestershire*, Lydney, St Briavels, 30.vii.1947 3 males, 11 females (E.G. Bucknill, OXUM); Bristol, 15-22.viii.1948 male (E.C.M. d'Assis-Fonseca, BMNH); River Severn, south of Gloucester, vii.1953 3 males (B.R.

Laurence, BMNH). *Herefordshire*, Uphampton, 29.vii.1973 female (PJC). *Berkshire*, Woolhampton, by River Kennet, 11.viii.1973 male, 2 females (PJC). *Oxfordshire*, North Leigh, Holly Court Farm, 4.viii.1970 5 females at *Cirsium eriophorum* flowers (PJC); Oxford, 21.viii.1946 male (A.H. Hamm, OXUM). *Buckinghamshire*, The Coombe, 14.vii.1997 male (PJC). *Hertfordshire*, Berkhamsted, 27.vii.1958 2 males (J.M. Holborn, BMNH). *Cambridgeshire*, Woodditton Wood, 6.viii.1944 female (J.E. Collin, OXUM); Kennett, 28.vii.1956 2 females (J.E. Collin, OXUM); Chippenham Fen, 18.vii.1965 male (L. Parmenter, BMNH). *Suffolk*, Barton Mills, 14.viii.1922 female, 15.viii.1955 female (J.E. Collin, OXUM). *Norfolk*, Fowlmere, 8.viii.1956 6 females (J.E. Collin, OXUM); same data as holotype, male (PJC); Thompson Common, 11.vii.1993 male (PJC). *Northamptonshire*, Kettering, springs in meadow, 26.vi.1984 male (PJC).

SCOTLAND: *Dumfries-shire*, Gala Water, 14.vii.1988 4 males, 3 females (PJC, deposited in NMS). *Perthshire*, Culdochart, 10.vii.1986 male at *Heracleum* flowers (PJC, deposited in NMS). *Banffshire*, Glen of Drumloch, 10.vii.1936 female (R.L. Coe, BMNH). *Caithness*, Sackville House, 3.viii.1972 female (PJC, deposited in NMS).

Biology. The flight period covered by the above records is late June to August. It has been found in woodland, marshes and grassland, including chalk and limestone. Like *dalmatina* and *soluta* this species has been found swarming on dead trees and telegraph poles. The record of swarming in a house at Bristol (Grensted 1956) evidently referred to this species. It was also found together with *A. dalmatina* in a study at St Briavels and with *A. soluta* on telegraph poles by the River Severn south of Gloucester. At Shawford, Hampshire, it was swarming on a dead tree and was also found under loose bark of *Clematis vitalba*, including a pair in copula.

Flower visiting records include *Pastinaca* at Bookham, Surrey; *Heracleum* at Culdochart, Perthshire; *Cirsium eriophorum* in limestone grassland at North Leigh, Oxfordshire. On the bank of the River Test at Leckford, Hampshire males assembled around and landed on me immediately following application of a mosquito repellent based on diethyltoluamide (20 per cent).

Distribution. *A. floricola* is widespread in England and Scotland so it is surprising that most specimens examined are from more recent collections, with only the examples from Cornwall, Dorset, Banffshire and one from Barton Mills from before 1944. On the other hand, most specimens of *soluta* (80 per cent. of those examined) were collected earlier, from which it is concluded that this has declined in abundance while *floricola* has increased.

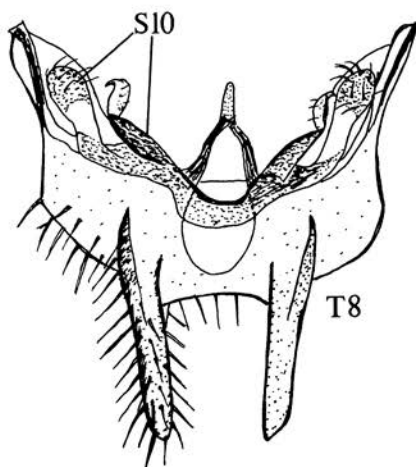
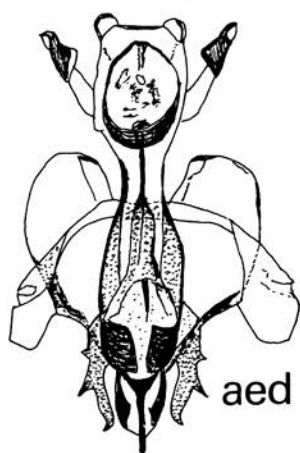
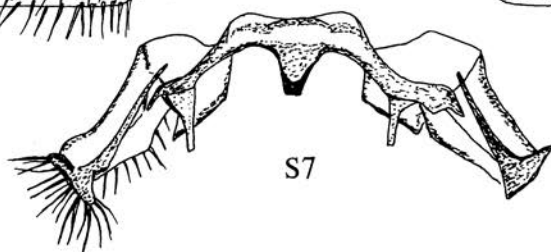
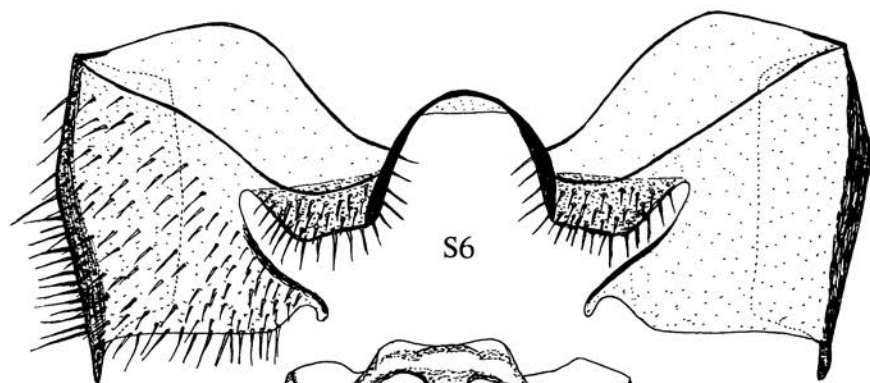
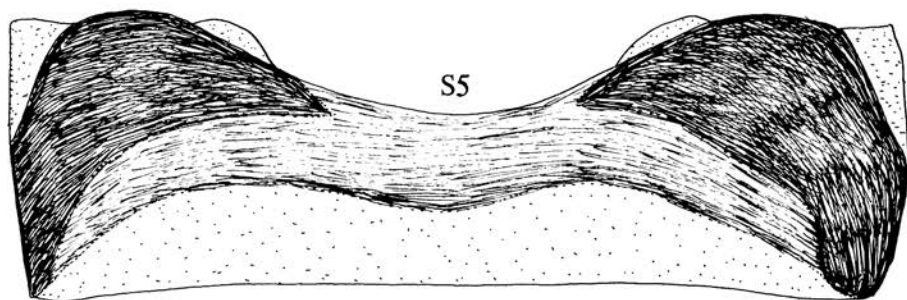
Anapausis soluta (Loew, 1846)

Scatopse soluta Loew, 1846

Anapausis tenuicauda Duda, 1928, synonymy confirmed

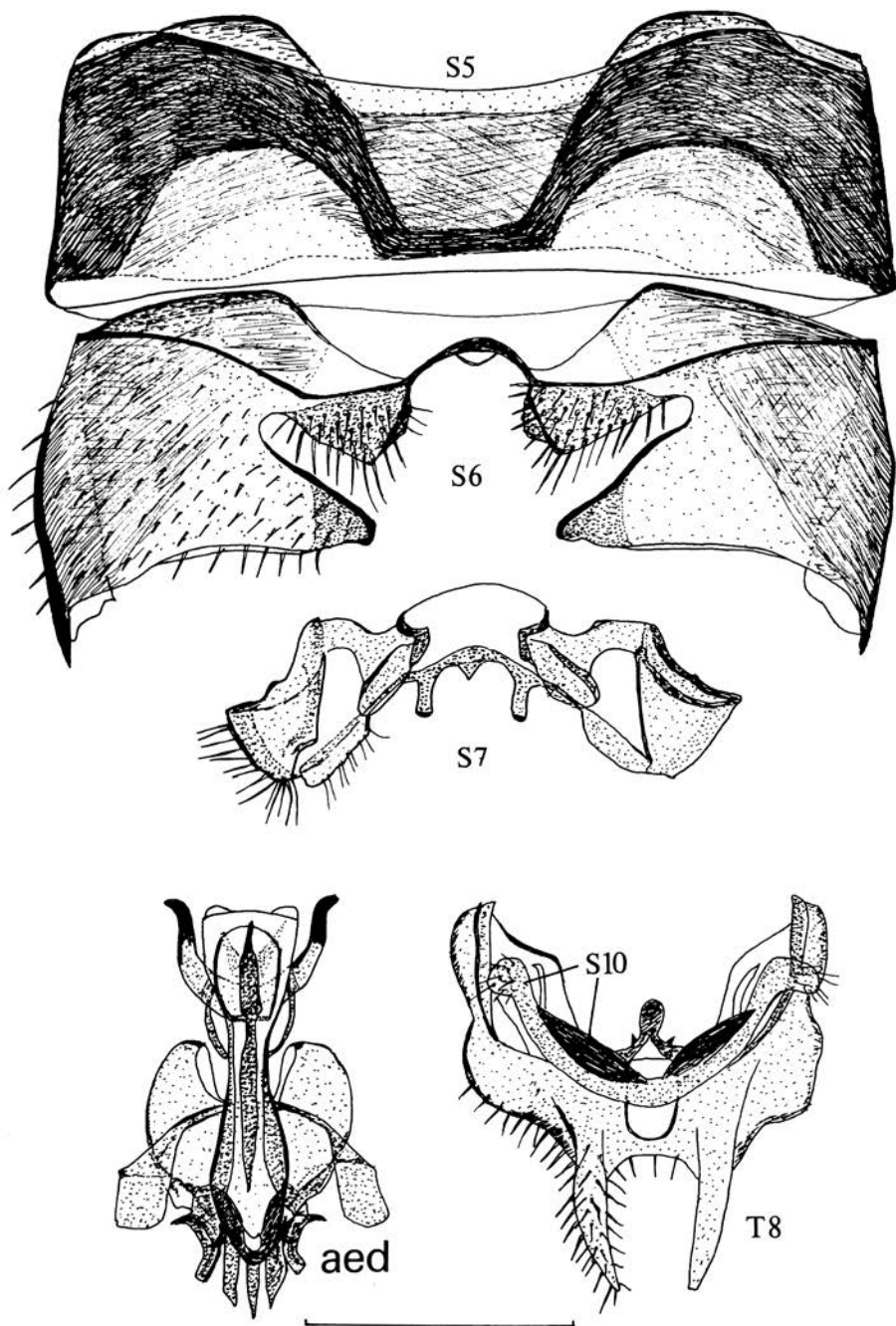
Male. Very similar to *A. floricola* and *A. dalmatina*. Mainly shining black with pale hairs and setae. Scutum with small yellow prescutellar patch on each side. Wing venation and distribution of macrotrichia as other species, few to none apically between M_1 and M_2 . Halteres yellowish, brown dorsally on knob. Legs shining black, tibiae only obscurely brownish on basal third; hairs and setae as other species, with the thickened setae under hind first tarsomere well developed.

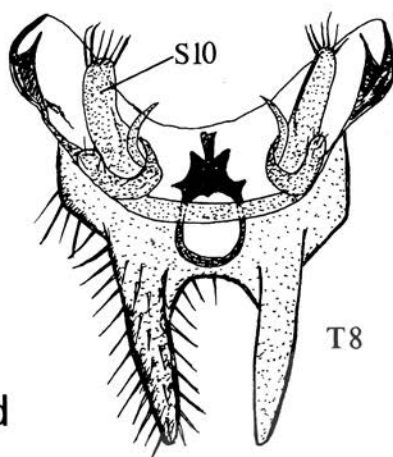
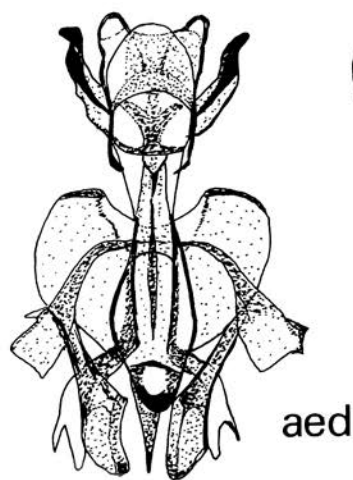
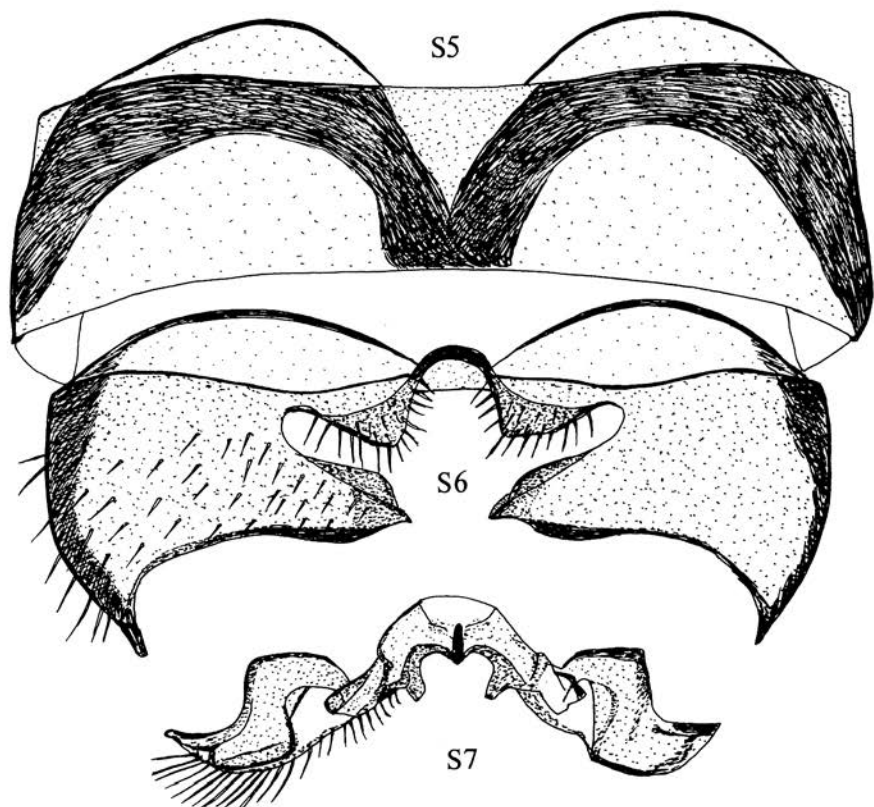
Figs 1-4. Male postabdomen of *Anapausis* species, ventral view of sternites 5-7 and 10, tergite 8 and aedeagus, with parts beyond sternite 6 separated. 1, *A. floricola* sp. n.; 2, *A. soluta* Duda; 3, *A. dalmatina* Duda; 4, *A. rectinervis* Duda. S = sternite, T = tergite, aed = aedeagus and accessory structures. Scale lines 0.25mm.



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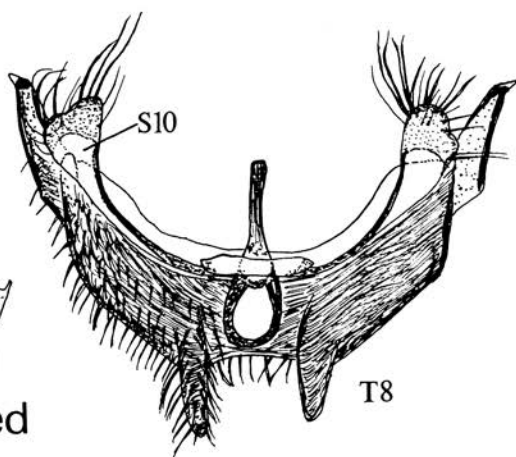
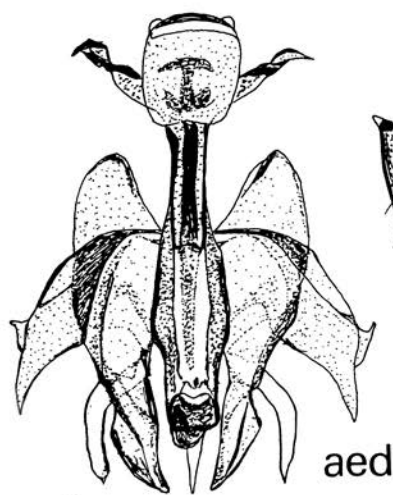
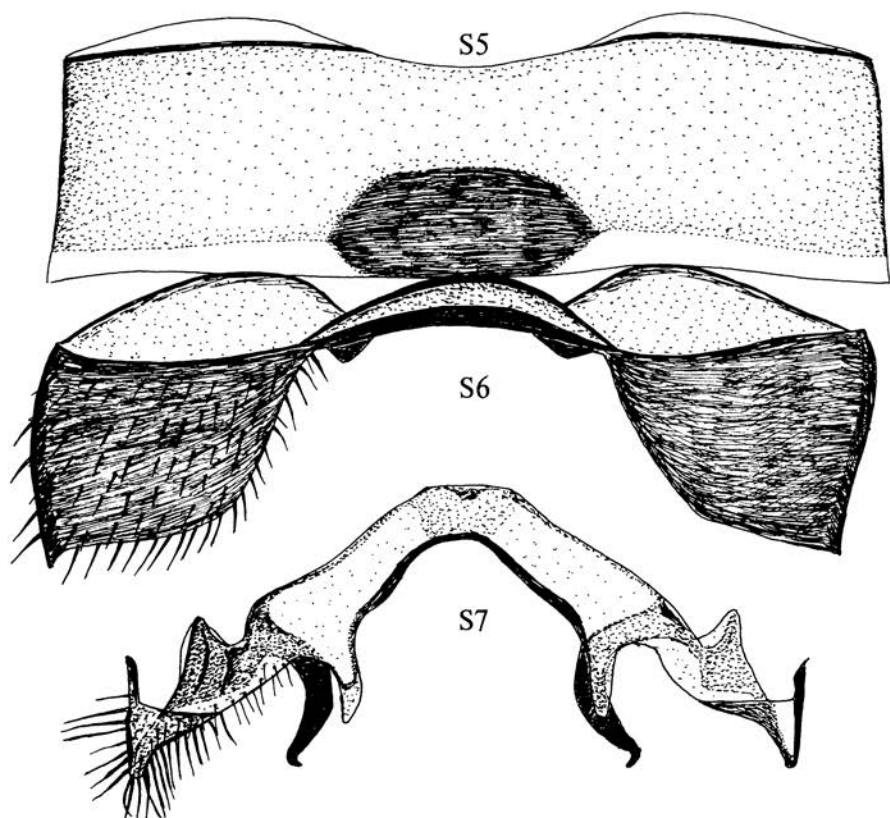






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4



Abdomen black with side margin of tergite 1 and sternite 1 dull yellowish, tergite 8 dark brown.

Postabdomen (Fig. 2): tergite 8 with a pair of relatively short but slender processes, tapered apically and downwardly directed *in situ*; sternite 6 deeply and broadly emarginate medially as in *floricola*, with broad semicircular median strip linking deeply bilobed lateral portions, the posterior lobe bluntly rounded apically with only a small indentation on posterior margin in contrast to the hooked apical process of *floricola*.

Wing length 2.2-2.6mm.

Female. Very similar to male and to females of other species, differing from male as *floricola* in relatively shorter antennae. Coloration as male, abdomen with tergite 6 onwards more or less dark brown. Postabdomen (Fig. 6): tergite 9 distinctly broader than long, with basal margin more evenly rounded than in *dalmatina*, but deeply set in the apical margin of tergite 8, of which the lateral margin is more produced apically than in *floricola* but not produced laterally; sternite 9 rounded apically; furca with two short diverging anterior processes. Wing length 2.1-2.4mm.

Type material examined. *Scatopse soluta* Loew. Lectotype here designated: female, labelled "Sicil.", "13.3" (one syntype was collected on 13 March), "coll. H. Loew", "spec. eadem", "fand ich bei *S. fuscinervis* Loew Typen" (in Enderlein's hand), "*Anapausis soluta* (Loew, 1846) Dr Enderlein det. 1919" and "*tenuicauda* female d. Duda" (Museum für Naturkunde, Berlin).

Anapausis tenuicauda Duda. Lectotype here designated: male, labelled "S. Tirol, Bozen [= Bolzano, Italy], 24.7.1913 Zerny" and "*tenuicauda* nom. n. det Duda", bearing a red "Type" label (Naturhistorisches Museum Wien). An Austrian female syntype is an unidentified species, a Spanish male is *A. pollicata* sp. n. and some other syntypes are *dalmatina* Duda (see below).

Other material examined (69 males, 25 females). *Kent*, Darenth, 18.vi.1868 male (G.H. Verrall, OXUM). *Sussex*, near Warrengore, Lewes, 16.vii.1870 2 males (G.H. Verrall, OXUM); Ringmer, Lewes, 18.vii.1870 male (G.H. Verrall, BMNH); near Plashett, Lewes, 18.vii.1870 female (G.H. Verrall, OXUM); Brighton district, vii.1928 male (C.G. Nurse, NWC). *Surrey*, Woldingham, 13.vii.1964 2 males (L. Parmenter, BMNH). *Isle of Wight*, Brighstone Grange Chine, 31.vii.1950 2 males (O.W. Richards, BMNH); Rowridge Valley, chalk scrub, 2.vii.1980 male, 2 females (PJC; 1 male, 1 female deposited in NMS). *Somerset*, Edington, 5.vii.1947 male, female (E.C.M. d'Assis-Fonseca). *Gloucestershire*, Cirencester, 14.viii.1955 male (L.W. Grensted, OXUM); south of Gloucester, River Severn, vii.1957 male (B.R. Laurence, BMNH). *Berkshire*, Hen Wood, 21.vi.1926 2 males (O.W. Richards, BMNH); Cumnor Hill, v.1948 2 males (G.D. Hale-Carpenter, OXUM). *Oxfordshire*, Bayswater, 15.vii.1916 male (A.H. Hamm, det. *tenuicauda* by F.W. Edwards in 1931, OXUM); Brasenose, 21.vii.1917 pair *in copula* (A.H. Hamm, OXUM); Oxford, Museum, 25.v.1920 female, 20.vii.1921 female (A.H. Hamm, OXUM), 25.v.1926 male (O.W. Richards, BMNH); Bagley Wood, 10.vi.1925 3 males, 1.viii.1925 4 males, 16.vi.1926 9 males and pair *in copula* (O.W. Richards, BMNH); Washford, 22.vi.1926 male (O.W. Richards, BMNH); Wychwood Forest, 16.vii.1948 male and pair *in copula* (L.W. Grensted, OXUM). *Buckinghamshire*, between Tring and Wendover, 27.vi.1926 4 males (O.W. Richards, BMNH). *Hertfordshire*, Letchworth, vii.1917 2 pairs *in copula*, vii.1918 2 males (F.W. Edwards, BMNH); Baldock, vi.1918 2 females (F.W. Edwards, BMNH); Commonwood, 3.vii.1927 female (O.W. Richards, BMNH); Rothamsted, "oats", vii.1964 2 females (? collector, BMNH). *Essex*, Mersea, ix-x.1907 male (? collector, BMNH, slide); Walton-on-Naze, 16.vii.1912 4 males (J.E. Collin, OXUM); Frinton, vii.1919 5 males (C.G. Nurse, NWC). *Cambridgeshire*, Upware, 19.vii.1875 male (G.H. Verrall, OXUM); Cambridge, 12.vii.1878 2 males (G.H. Verrall, OXUM); Kirtling, 4.vii.1897 2 males, 2 females, 8.vii.1897 female, 11.viii.1965 female, 1.vii.1966 female (J.E. Collin, OXUM); Wicken Fen, 8.vii.1989

male (PJC). *Suffolk*, Timworth, 9.vii.1913 male (C.G. Nurse, NWC); Barton Mills, 29.vii.1937 female (J.E. Collin, OXUM). *Norfolk*, Fowlmere, 8.viii.1956 female (J.E. Collin, OXUM). *South Yorkshire*, Thorne Moors, 22.vii.1979 male (P. Skidmore, DMAG). *West Yorkshire*, Ingleton, 1.vii.1936 3 males, 1 female (O.W. Richards, BMNH). ? *county*, female (presented by F.W. Hope 1849-57, labelled *Scatopse minuta*, OXUM).

Biology. Records in Britain are from May to early August. It has been found in dry woodland and scrub as well as fens and marshes. *A. soluta* was found swarming and *in copula* on the outer wall of a house at Cumnor Hill, Berkshire. It was also found with *A. floricola*, swarming on telegraph poles near the River Severn, south of Gloucester. At Letchworth, Hertfordshire it was found in large numbers sitting face downwards on wooden posts in the hot midday sun, including pairs *in copula* with the female carrying the male motionless on his back.

Distribution. This species has only been found in England within the British Isles, most records being from southern counties, north to Cambridgeshire and Suffolk with one record from Yorkshire. It was evidently locally frequent in the early part of this century but there are very few post 1960 records.

Anapausis dalmatina Duda, 1928

Male. Mainly shining black with pale hairs and setae. Yellow prescutellar patches on scutum as in *floricola*. Wings clear hyaline, with costa and radial veins slightly brownish. Distribution of macrotrichia on wing membrane as in *floricola*, several between the tips of M_1 and M_2 usually present. Legs shining black, tibiae not paler basally. Development of setae on legs as in *floricola*. Abdomen shining black with tergite 8 obscurely dark brown (not reddish).

Postabdomen (Fig. 3): tergite 8 with the pair of processes broad basally, gently tapered apically; sternite 6 emarginate in middle but median semicircular strip linking lateral portions is smaller than in *floricola* or *soluta*, so that posterior lobes (which are bluntly rounded and produced to a small point apically) are less widely separated; basal margins of lateral portions are more evenly rounded than in other species.

Wing length 2.5-3.0mm (2.6mm in lectotype).

Female. Very similar to male. Differing as female of other species in relatively shorter antennae, not longer than height of head. Tibiae may be obscurely paler on basal third. Abdomen shining black with apical segments obscurely brownish. Postabdomen (Fig. 7): tergite 8 with lateral lobe more basal than in *floricola*; tergite 9 longer and more deeply set in the concave apical margin of tergite 8 than in *floricola* and *soluta*; furca with single long slender anterior process. Wing length 2.4-2.8mm.

Type material examined. Lectotype here designated: male, labelled "Dalmatia, Ombla-Tal 30.3.26 Zerny" and "*tenuicauda* var. *dalmatina* det. Duda" and bearing a red "Type" label (Naturhistorisches Museum Wien). This specimen was cited as 30.6.26 in error by Duda (1928). Duda mentioned only one other specimen, a male from "Mokosica 26.3.26".

Syntypes of *tenuicauda* Duda: 3 males, labelled "3.10.26, Krain Fiume Belvedere, Dr Enderlein G" [locality = Rijeka, now in Croatia]; female, labelled "Südspanien [= southern Spain] Prof. G. Strobl" (mounted with male *pollicata* sp. n.) (Museum für Naturkunde, Berlin).

Other material examined (74 males, 46 females). ENGLAND: *Kent*, Bromley, 21.v.1964 2 males (PJC); Pett's Wood, 7.viii.1984 female (P. Freeman, BMNH, slide). *Sussex*, Rogate Park,

20.vi.1894 female (G.H. Verrall, BMNH). *Surrey*, Ashtead Wood 21.v.1972 male (PJC); Bookham, 13.vii.1957 7 males (W. Spreadbury, BMNH, 1 on slide). *Hampshire*, New Forest, Aldridge Hills, 18.viii.1956 female (J.E. Collin, OXUM); Totton, trapped in sunhouse 1951-1955 female (C.R. Vardy, BMNH); Alice Holt Forest, 25.v.1991 female (PJC). *South Devon*, Buckfastleigh, 14.v.1966 2 males, 2 females (R.T. Thompson, BMNH); Exeter, 7.vi.1883 male, female (G.H. Verrall, BMNH). *Cornwall*, Church Cove, cliff grassland, 9.vii.1983 male (PJC). *Somerset*, Failand, 1.vii.1962 male (E.C.M. d'Assis-Fonseca, BMNH). *Gloucestershire*, Lydney, St Briavels, 30.vii.1947 2 males, 3 females (E.G. Bucknill, OXUM); Bristol, 22-30.v.1981 male (E.C.M. d'Assis-Fonseca, BMNH). *Wiltshire*, Coombe Bissett, 28.v.1975 female (C.H. Andrewes, BMNH). *Middlesex*, London NW2, viii.1963 female (Mrs E. Weston, BMNH). *Essex*, Benfleet, woodland edge, 10.vi.1972 male (PJC). *Berkshire*, Bagley Wood, 28.vi.1927 male (O.W. Richards, BMNH); Wytham Wood, 15.viii.1944 4 males and pair in copula (J.S. Berry, OXUM); Windsor, 3.vi.1961 male (L. Parmenter, BMNH); Windsor Great Park, Old Windsor Wood, 10.ix.1967 male (PJC). *Oxfordshire*, Oxford, Museum, 16.vii.1920 female; Aston Rowant, 31.vii.1931 female (J.E. Collin, OXUM); Henley-on-Thames, 18.v.1943 2 males, 4 females (Mrs O. Blows, BMNH); Wychwood Forest, 23-24.v.1970 male (E.C.M. d'Assis-Fonseca, BMNH); Cothill, 16.vii.1972 female (PJC). *Buckinghamshire*, Burnham, Cocksherd Wood, 12.viii.1970 male, female (PJC). *Hertfordshire*, Letchworth, v.1917 female (F.W. Edwards, BMNH). *Cambridgeshire*, "F.V. Kirtling", 6.vi.1921 male (J.E. Collin, OXUM); Chippenham Fen, 9.vi.1930 male (genitalia preparation by J.E. Collin, OXUM). *Suffolk*, Butley Decoy, 11.vii.1908 male (G.H. Verrall, genitalia preparation by F.W. Edwards, BMNH). *Norfolk*, Upton, 8.vi.1930 male (J.E. Collin, OXUM); Fowlmere, 8.viii.1956 3 females (J.E. Collin, OXUM). *North Yorkshire*, Gunnerside, 27.vi.1981 2 males (PJC). *Durham*, Scargill, 23.vi.1981 female (PJC). *Westmorland*, Windermere, 11.vii.1876 female (G.H. Verrall, BMNH), vi.1929 male, female (F.W. Edwards, BMNH). ? county, female (presented by F.W. Hope 1849-1857, originally det. *Scatopse bifilata* and then as *soluta* by L.W. Grensted, OXUM).

WALES: *Gwent*, Magor Marsh, 27.v.1960 male (PJC). *Glamorgan*, Barry, 1.vi.1950 3 males (H. Audcent, NWC); Gower, Oxwich, 4-9.vii.1954 2 males (E.C.M. d'Assis-Fonseca, BMNH). *Carmarthen*, Dinefwr Deer Park, 31.v-5.vi.1996 2 males, 1 female (B. Levey and P.M. Pavett, NWC). *Cardigan*, Towyn Warren, 6.x.1973 male (PJC). *Denbighshire*, Llangollen, 18.vii.1888 female (G.H. Verrall, BMNH).

SCOTLAND: *Kirkcudbright*, Castramon Wood, 20.vii.1979 female (PJC). *Clyde Isles*, Arran, 12.vi.1882 male (G.H. Verrall, BMNH). *Renfrewshire*, Kilbarchan, Old Manse, 25.vi.1946 male (F.J. Ramsay, NMS). *Dunbartonshire*, Bonhill, 2.vi.1906 female, 16.vi.1906 male, 20.vi.1906 2 males, 29.vi.1906 male, 30.vi.1906 female, 25.vii.1906 female, 5.vi.1907 male, female, 8.vi.1907 male, 13.vi.1907 female (J.R. Malloch, NMS). *Fife*, Kinghorn, received 1896 male; Aberdour, received 1904 male (NMS). *Perthshire*, Loch Tummel, "F. woods", 14.vii.1932 female (J.E. Collin, OXUM); Dunalastair, 3.vii.1971 female (PJC). *Inverness-shire*, Glenelg, 28.vi.1934 4 males (O.W. Richards, BMNH). *Aberdeenshire*, Braemar, Linn of Quoich, 15.vii.1970 female (P. Skidmore, DMAG). *Morayshire*, Grantown, pine (*Pinus sylvestris*) forest, 19.vi.1982 female (PJC). *Wester Ross*, Gairloch, 12.vi.1884 2 females (G.H. Verrall, OXUM and BMNH). *Sutherland*, Lochinver, 27.vi.1911 female (J.W. Yerbury, BMNH).

IRELAND: "Ireland" 3 males (A.H. Haliday, NMID, 1 labelled *soluta* by Haliday). *Dublin*, Howth, 12.vi.1953 male (R.L. Coe, BMNH). *Wicklow*, Deputy's Pass, 19.vii.1929 8 males (A.W. Stelfox, NMID); Derrybawn, 24.vi.1975 male (PJC). *Wexford*, Oaklands, 10.vi.1986 female (J.P. O'Connor, NMID).

FRANCE: male collected with paratype male of *A. pollicata* sp. n. (data as cited below).

Biology. British records are from May to August and October. Records are from woodland, marshes and grassland. It was found visiting umbels at Bromley, Kent. This species has also been found swarming in various situations. The specimens found on wooden fence posts at Letchworth by Edwards (1925) were *dalmatina* and the observations reported by Scott (1943 as *tenuicauda*), of flies assembling on a drain-pipe under the roof guttering of a house at Henley-on-Thames, also applied to *dalmatina*. The specimen from London was labelled as appearing persistently in cracks behind a kitchen sink. It also occurred on a pole at Buckfastleigh, Devon and together with *A. floricola* in a study at St Briavels. At Wytham Wood it was found under bark of a standing tree. At Deputy's Pass, Wicklow it was assembling on a dead holly (*Ilex aquifolium*).

Distribution. *A. dalmatina* is distributed throughout Britain as far north as Sutherland and is the only species of the *soluta* Group so far recorded in Wales and Ireland. The Irish material cited as *soluta* by D'Arcy-Burt and Chandler (1987) has been re-examined and found to belong to this species. Also seen from Croatia, Spain and France so a wide distribution in Europe is likely.

Anapausis rectinervis Duda, 1928

Male. Again very similar to above species. Shining black except for yellow prescutellar spots, but pleural membranes, especially adjacent to scutum, are also clear yellow. Halteres yellow (some Staffordshire examples) to brown. Legs black, with tibiae sometimes a little paler on basal third; chaetotaxy similar to above species including strong ventral setae on tarsi. Abdomen black except sternite 1 partly yellowish and tergites 7-8 dark reddish brown.

Postabdomen (Fig. 4): tergite 8 with short paired processes, which are broad and downwardly directed in lateral view; sternite 6 with broad deep emargination, the lateral parts not bilobed.

Wing length 2.4-2.7mm.

Female. Similar to male, differing in proportions of antenna as in other species. Shining black with dull yellow prescutellar spots and pleural membrane more dull yellowish. Halteres brown. Abdomen black except dark brown postabdomen (Fig. 8): tergite 8 comprises narrow medial part with straight edged posterior margin and a broad internally pointed lateral lobe on each side of tergite 9, which is longer than broad with a straight anterior margin. Wing length 2.1 mm.

Material examined. *Berkshire*, Dinton Pastures Country Park, Mortimer's Meadows, fen/carr at south end, 27.v.1993 male (PJC). *Cambridgeshire*, Woodwalton Fen, 24.v.1980 male, female (PJC). *Staffordshire*, Bickford Meadows, 30.v.1984 4 males, 1 female (N.P. Wyatt, BMNH).

Biology. Nothing is recorded concerning the biology of this species.

Distribution. In the British Isles, it appears to be restricted to wetland sites in England. It is widespread in central and northern Europe (Haenni 1993, Martinovský 1996). Haenni and Greve (1995), who recorded it from window traps at three sites in Norway, commented that while it was often restricted to peat bogs and marshes in central Europe, it was more widespread in the north.

Anapausis pollicata sp. n.

Male. Very similar to other species described above in external characters. Mostly shining black with a small indistinct yellow prescutellar spot, not apparent in Spanish specimen. Halteres

brown, slightly yellowish on stem. Legs dark brown, tibiae only slightly paler on basal third. Wing clear with costa and radial veins light brown; macrotrichia more widely distributed on wing than in other species and more numerous between M_1 and M_2 . Abdomen mainly shining black; parts of postabdomen a little paler and concave part of apical margin of each lateral lobe of sternite 6 yellow.

Postabdomen (Fig. 11): tergite 8 with a pair of tapered slender blunt processes, about as long as space between them, a little longer in Spanish specimen; sternite 6 deeply emarginate, medially reduced to a thick strip, which is almost semicircular but slightly asymmetrical, being a little more thickened on the right hand side; the lateral parts are not bilobed but with a posteriorly directed bluntly rounded process set near the angular internal margin and a weakly sclerotised area lateral to this process.

Wing length 2.3-2.4mm.

Holotype male, AUSTRIA, labelled "Austria inferior. Bezirk Neukirchen Gahns (Schneeberggelnet), 1300m, 7.viii.1984, C. Holzschuh leg.", "in Borkenkäfer pheromon Fallen" [= bark beetle pheromone traps] (Muséum d'Histoire Naturelle, Neuchâtel) [a female of sp. indet. 1 (see below) was collected with it].

Paratypes (2 males): FRANCE: Hérault, St Gely du Fesc, "jardin boisé, sur fl. d'arb. d'orn." [wooded garden, on a flowering bush], 120m, 21.v.1985 (collected with a male of *dalmatina*) (J-P. Haenni, Muséum d'Histoire Naturelle, Neuchâtel). SPAIN: labelled "Südspanien [= southern Spain] Prof. G. Strobl" (mounted with a female of *dalmatina*, see above; both were syntypes of *tenuicauda* Duda) (Museum für Naturkunde, Berlin).

Anapausis sp. indet. 1

A single Scottish female has been examined of this species and its identity is yet to be established. However, an Austrian female was collected with *A. pollicata* described above and it is quite possible that they are conspecific although this cannot be confirmed and some other European species are known only in the male. A brief description is given; the Scottish specimen is damaged with the hind legs missing and only the left wing present.

Female. Shining black with the usual yellow prescutellar patches on scutum. Structure of legs as above species. Tibiae obscurely yellowish on basal quarter. Wing clear but costa and radial veins more brownish than other species; macrotrichia more widely distributed on membrane, with many present between M_1 and M_2 and some anterior to M_1 (as in *pollicata* male). Abdomen entirely shining black including genitalia. Postabdomen (Fig. 9): tergite 9 about as broad as long, inset in apical margin of tergite 8, which has apically produced and pointed lateral margins; sternite 9 pointed apically; furca with a pair of diverging anterior processes. Wing length 2.8 mm.

Material examined. SCOTLAND: Perthshire, Craigmore Wood, 19.vi.1992 female (PJC). AUSTRIA: female labelled "Austria inferior. Bezirk Neukirchen Gahns (Schneeberggelnet), 1300m, 7.viii.1984, C. Holzschuh leg.", "in Borkenkäfer pheromon Fallen" [= bark beetle pheromone traps] (Muséum d'Histoire Naturelle, Neuchâtel) [the holotype of *pollicata* was collected with it].

Anapausis sp. indet. 2

As mentioned above, the syntype female of *tenuicauda* Duda from Salzburg, Austria is not conspecific with the lectotype and cannot presently be determined. This is also briefly described and the genitalia figured. The absence of tergite 9 is in common with most *Anapausis* females other than those dealt with above, suggesting that this belongs to a different group of the genus.

Female. Shining black with small obscurely yellow prescutellar spots. Leg structure similar to other species but only fore tibiae with a row of dorsal setae, which are shorter and less curved than in other species and strong thickened setae are not developed below tarsi. Wing as in other species; costa and radial veins pale yellowish; weak macrotrichia are distributed as in *soluta*, with a few present between tips of M_1 and M_2 . Abdomen entirely black including postabdomen (Fig. 10); tergite 8 has a broad triangular apical part and tergite 9 is absent; sternite 8 truncate and sternite 9 rounded apically.

Material examined. AUSTRIA: "Salisburgia" (= Salzburg), Blühnbachtal, 22.vii.1916 female (Zerny, Naturhistorisches Museum Wien, Austria; labelled "*tenuicauda* det. Duda" and "Type"). The syntype material of *tenuicauda* listed by Duda included 5 males, 1 female from Salzburg.

Notes on other British species of *Anapausis* Enderlein

Anapausis nigripes (Zetterstedt, 1860)

Andersson (1978) found that *Aspistes nigripes* Zetterstedt was an earlier name for *Psectrosciara palustris* Edwards, based on the figures by Cook (1965). Cook examined two specimens from Chippenham Fen in BMNH, which included a syntype of *palustris*. Haenni (1984) re-examined this material, which had been slide-mounted by Cook, and designated the male as lectotype.

Material examined (23 males, 19 females). ENGLAND: *Surrey*, near Godalming, Charterhouse alder holt, 8.vi.1968 male (A.E. Stubbs, BMNH). *Hampshire*, Leckford Estate, carr woodland, 14.vi.1987 male, 2 females (PJC, 1 deposited in NMS). *Oxfordshire*, Weston Green Fen, 1.vi.1991 male (PJC). *Cambridgeshire*, Chippenham Fen, 5.vi.1906 2 males (lectotype on slide and paralectotype of *palustris* Edwards), 29.v.1930 2 females (J.E. Collin, BMNH), 5.vi.1906 3 males, 3.viii.1910 female, 29.v.1930 3 males, 4 females, 5.vi.1930 male, 3 females, 6.vi.1930 2 males, 9.vi.1930 2 males, 1 female, 20.vi.1942 female, 2.vi.1949 male, 24.v.1952 male (J.E. Collin, OXUM), 25.v.1980 2 males (PJC, 1 deposited in NMS). *Suffolk*, Barton Mills, 26.v.1911 female (J.E. Collin, OXUM); Lakenheath Warren, 13.vi.1965 female (L. Parmenter, BMNH, slide). *Norfolk*, Upton, 8.vi.1930 2 females (J.E. Collin, OXUM); Ringland, 29.v.1976 male (K.G.V. Smith, BMNH, slide).

WALES: *Glamorgan*, Gower, Oxwich, 30.v.1972 male (E.C.M. d'Assis-Fonseca, BMNH).

AUSTRIA: "Styria inf.", Tüffer, 20.v.1917 male (Zerny, Naturhistorisches Museum Wien, Austria; labelled *soluta* det. Duda).

Biology. Like *A. rectinervis*, *nigripes* is a wetland species, but has been recorded from carr woodland as well as more open marsh and fen habitats. The rearing from cow dung cited by Skidmore (1991) is the only record of larval development for the genus.

Distribution. This species is apparently confined, in the British Isles, to the south of England and south Wales. Outside Britain, *A. nigripes* has been recorded only from Germany, Austria, Poland and Sweden (Krivosheina and Haenni 1986) and the Czech Republic (Martinovský 1996).

Anapausis talpae (Verrall, 1912)

Type material. ENGLAND: *Surrey*, Reigate, 5.vii.1872 7 males (G.H. Verrall, OXUM), male (G.H. Verrall, BMNH). *Cambridgeshire*, Snailwell, 18.vi.1908 8 males, 22.vi.1908 4 males, 2 females (J.E. Collin, OXUM). Pont (1995) was unable to trace syntypes from Barton Mills but later specimens from this site are in OXUM (see below).

Other material examined (14 males, 7 females). ENGLAND: *Berkshire*, Temple, 12.viii.1933 female, 16.vi.1934 female (E.B. Basden, NMS); by River Kennet west of Newbury, 15.vi.1969 male (PJC). *Cambridgeshire*, Chippenham Fen, 25.vi.1937 male, 29.vi.1939 female, 17.vii.1944 male (J.E. Collin, OXUM); Woodwalton Fen, vi.1939 male, 7.vi.1940 female (F.W. Edwards, BMNH). *Suffolk*, West Stow, 16.vi.1914 5 males (C.G. Nurse, NWC); Ixworth, 27.v.1914 male (C.G. Nurse, NWC); Barton Mills, 8.vi.1911 female (G.H. Verrall, BMNH, slide), 24.vi.1930 2 males, 2 females, 6.ix.1937 male (J.E. Collin, OXUM).

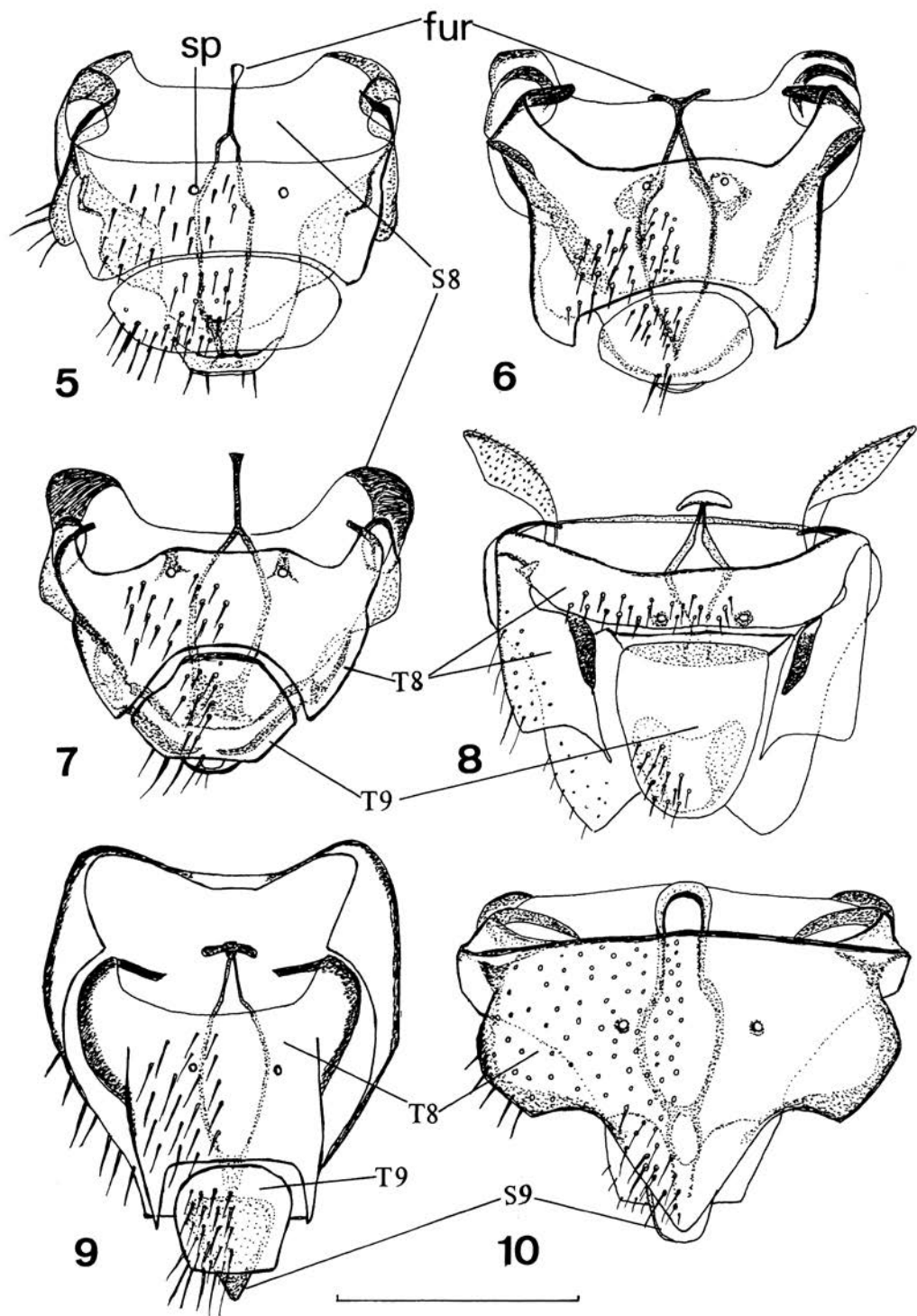
Biology. Verrall (1912) recorded that J.E. Collin had found this species swarming on a small willow (*Salix* species) trunk at Snailwell, Cambridgeshire in vi.1908 and "under similar circumstances" at Barton Mills, Suffolk in vi.1911, in addition to his original specimens from Reigate. The specimens from Basden's collection were taken as adults, dead and alive respectively, in a decoy nest during his studies of nest fauna.

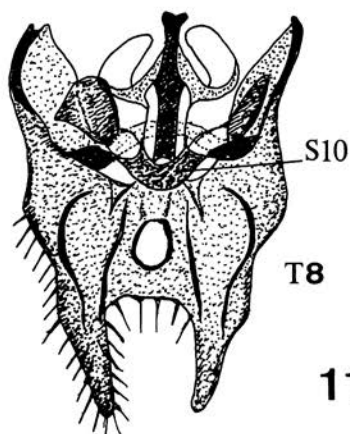
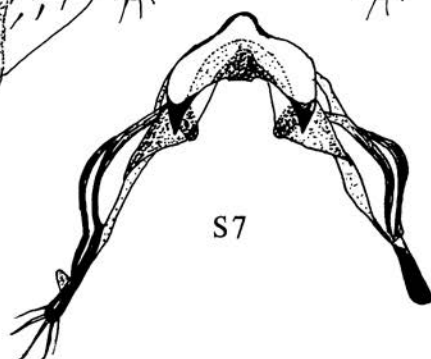
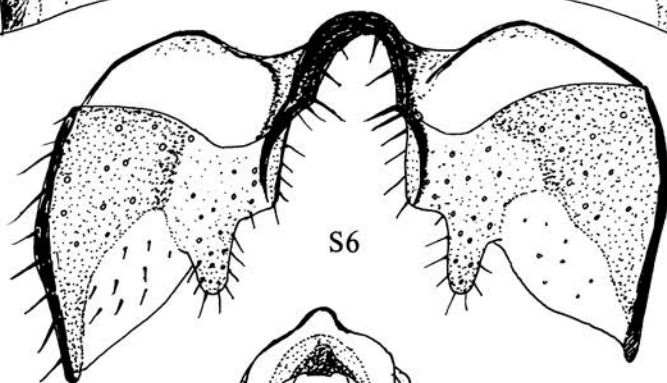
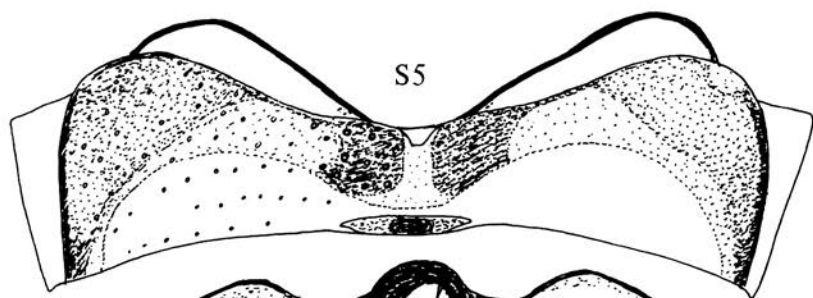
Distribution. In Britain, *A. talpae* has only been found in the south-east and East Anglia in England; it is widespread in western and central Europe (Haenni 1993, Martinovsky 1996).

Key to British species of *Anapausis* Enderlein (also including *A. pollicata* sp. n.)

- | | | |
|---|--|-------------------------------|
| 1 | Vein M_1 bent anteriorly at wing margin; macrotrichia on wing membrane anterior to M_1 . Male tergite 8 with two parallel strap-like curved arms, subapically joined by median bridge. Female sternite 7 with broad lateral lobes widely separated medially. | |
| | | <i>talpae</i> (Verrall) |
| - | Vein M_1 not bent anteriorly at wing margin; macrotrichia mainly confined to membrane behind M_1 . Male tergite 8 without apically fused lateral arms. Female sternite 7 not divided into two lobes. | 2 |
| 2 | First tarsomeres without comb-like rows of stout setae. Male tergite 8 rounded apically with small median indentation, lacking paired processes. Female tergite 8 with small projection medially; tergite 9 absent. | <i>nigripes</i> (Zetterstedt) |
| - | First tarsomeres with comb-like rows of spiniform setae. Male tergite 8 with a pair of posteroventrally directed tapered blunt processes. Female tergite 8 without medial projection; tergite 9 well developed. | 3 |
| 3 | Males. | 4 |
| - | Females. | 7 |

Figs 5-10. Female postabdomen of *Anapausis* species, dorsal view. 5, *A. floricola* sp. n.; 6, *A. soluta* Duda; 7, *A. dalmatina* Duda; 8, *A. rectinervis* Duda; 9, *A. sp.* indet 1; 10, *A. sp.* indet 2. S = sternite, T = tergite, fur = furca, sp = spiracle. Scale line for Figs 5-9 = 0.25mm, for Fig. 10 = 0.2mm.





11

4. Sternite 6 broadly emarginate medially, lateral parts simple and not bilobed. Tergite 8 with pair of processes short, not longer than gap between them (Fig. 4). *rectinervis* Duda
 - Sternite 6 deeply emarginate medially, lateral part not simple but variously lobed. 5
5. Sternite 6 with lateral part not bilobed medially, but with apical margin angled internally and bearing a posteriorly directed thumb-like process near this angle. Tergite 8 with pair of processes about as long or a little longer than gap between them (Fig. 11). *pollicata* sp. n.
 - Sternite 6 with lateral part deeply bilobed medially. Tergite 8 with pair of processes longer than gap between them. 6
6. Sternite 6 with narrow emargination, each lateral part with anterior margin evenly curved and posterior lobe pointed apically (Fig. 3). Sternite 5 with large rounded anterior lobes, broader than the gap between them. *dalmatina* Duda
 - Sternite 6 with wider emargination, each lateral part with anterior margin concave on inner part and posterior lobe not pointed apically. Sternite 5 with rounded anterior lobes small and widely separated. 7
7. Sternite 6 with posterior lobes only slightly indented subapically; tergite 8 dark brown, with processes shorter and more slender (Fig. 2). *soluta* Duda
 - Sternite 6 with posterior lobes strongly indented subapically to give a hooked appearance; tergite 8 usually more reddish with processes longer and thicker (Fig. 1). *floricola* sp. n.
8. Tergite 9 distinctly longer than broad, with straight basal margin and deeply inset in tergite 8 which is short medially. Sternite 8 emarginate apically. *rectinervis* Duda
 - Tergite 9 not longer than broad, with curved basal margin. Tergite 8 broader medially with curved apical margin. 9
9. Sternite 9 produced apically to a point, protruding beyond tergite 9. Furca with a pair of diverging (ventrally directed) anterior processes (Fig. 9). *sp. indet.* 1
 - Sternite 9 rounded apically. 10
10. Tergite 9 more angular and deeply inset in concave apical margin of tergite 8. Furca with single slender anterior process (Fig. 7). *dalmatina* Duda
 - Tergite 9 broadly ovate, more shallowly inset in tergite 8 (Figs 5-6). 11
11. Tergite 8 without a rounded lobe laterally. Furca with a pair of short diverging (sometimes anteroventrally directed) anterior processes (Fig. 6). *soluta* Duda
 - Tergite 8 with bluntly rounded lateral lobe (extended more distally than in *dalmatina*). Furca with single elongate anterior process (Fig. 5). *floricola* sp. n.

Fig. 11. Male postabdomen of *Anapausis pollicata* sp. n., ventral view of sternites 5-7 and 10, tergite 8 and aedeagus, with parts beyond sternite 6 separated. S = sternite, T = tergite, aed = aedeagus and accessory structures. Scale line 0.25mm.

Acknowledgements

I am indebted to the authorities of the museums cited above for the opportunity to examine their collections, to Ruth Contreras-Lichtenberg and Marion Kotrba for enabling me to examine some of Duda's syntypes and to Adrian Pont for conveying those from Berlin. Jean-Paul Haenni kindly enabled me to include the description of *A. pollicata*; he also advised on various aspects of this study and I am grateful to him for useful discussion.

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A new prey record for *Meliscaeva auricollis* (Meigen) (Diptera, Syrphidae) - On 2.xi.1998, a shoot of the evergreen shrub *Pittosporum tobira* was sent to the RHS Garden, Wisley from a private garden in East Budleigh, South Devon. It had been damaged by a sap feeding insect known as the pittosporum sucker, *Trioza vitreoradiata* (Maskell) (Hemiptera, Triozidae), which causes a puckered distortion of the foliage. This pest originates from New Zealand and was first discovered in Britain in July 1993 in Cornwall (Malumphy and Cheek 1994. Pittosporum Psyllid *Trioza vitreoradiata*. *Central Science Laboratory Plant Pest Notice* No. **18**, 1-4). It is now widely distributed in Cornwall, Devon and the Isles of Scilly.

The shoot sent to the Entomology Department at Wisley bore a single syrphid larva, which was feeding on the few sucker nymphs remaining on the damaged leaves. The larva pupated on 11.xi.1998 and it was kept in a warm room. A female *Meliscaeva auricollis* (Meigen) emerged on 26.xi.1998. Previous host records for this species are of aphids on shrubs such as *Berberis* and *Sarothamnus* (J. Dixon 1960. *Transactions of the Entomological Society of London* **112**, 345-379) or aphids on stems and flowers of umbellifers (G.E. Rotheray. 1993. Colour guide to hoverfly larvae (Diptera, Syrphidae). *Dipterists Digest* **9**, 156 pp). Rotheray also stated that it is known to prey on the alder sucker, *Psylla alni* (Linnaeus) (Hemiptera, Psyllidae) on common alder *Alnus glutinosa* - **A.J. HALSTEAD**, Royal Horticultural Society's Garden, Wisley, Woking, Surrey GU23 6QB

Sexual dimorphism of last instar *Dilophus febrilis* (Linnaeus) larvae (Diptera, Bibionidae)

JOHN SKARTVEIT

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Introduction

When doing field investigations in insect biology it is frequently of interest to be able to determine the sex of specimens collected. In most insects this is rather easy for imagines. In Diptera: Nematocera, Tabanomorphia and Asilomorphia sex identification is usually straightforward even in pupae, as the appearance of head and abdomen is generally strongly sexually dimorphic. However, sex determination of larvae is more problematic. In some Chironomidae a sexual dimorphism has been found in the shape of the mouthparts, the sexes being identifiable by a principal components analysis of mouthpart measurements (Atchley 1971, Atchley and Martin 1971). In other groups, the sexes can be identified by examination of the genital imaginal discs found on the venter of the two last abdominal segments. Abul-Nasr (1950) described the preimaginal development of the male and female genitalia in *Chironomus dorsalis*: authors, misident. (Chironomidae), *Sylvicola fenestralis* (Scopoli) (Anisopodidae) and *Mycetophila cingulum* Meigen (Mycetophilidae). Wülker & Götz (1968) and Wülker *et al.* (1979) described the development of genital imaginal discs in *Chironomus* species. Sexual dimorphism in larvae has not previously been investigated in the Bibionidae. Bibionid larvae can be found in dense aggregations in the litter layer of various terrestrial biotopes. Since each aggregation may include several hundred larvae, obtaining large samples of these insects for study is frequently rather straightforward.

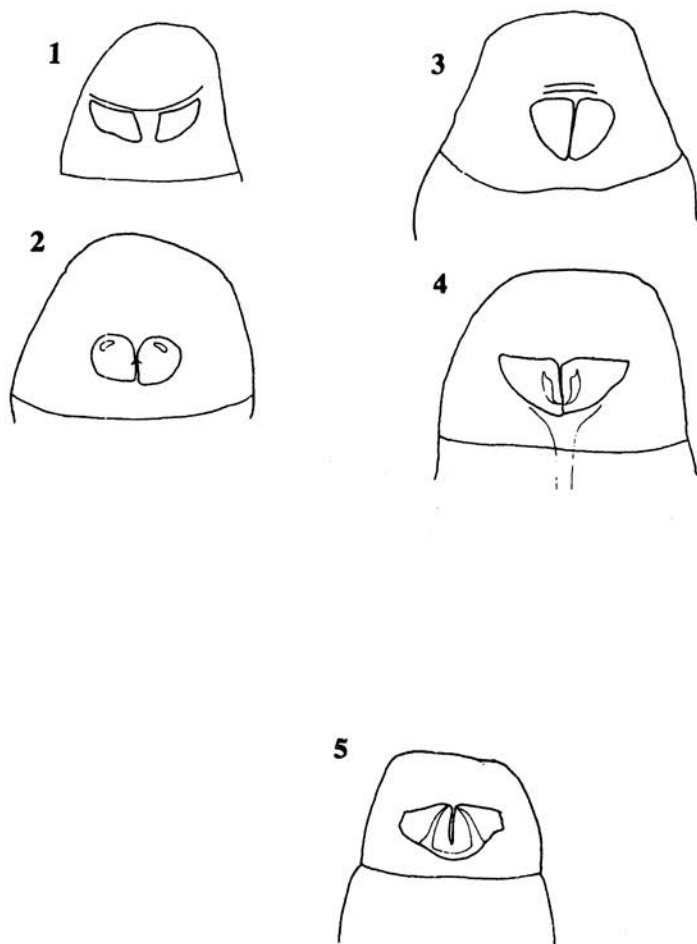
Material and methods

Dilophus febrilis (Linnaeus) was used for this study of bibionid development because the larvae have a rather transparent cuticle compared to most other bibionid larvae, which simplifies examination; it is also very abundant and larvae are thus easily collected.

Larvae were collected in the field at Sevheim, Finnøy community, South-West Norway (59° 10' N, 5° 45' E). Samples of *Dilophus febrilis* were collected in a cultivated meadow on 17.iv. (510 larvae) and 28.iv. (237 larvae) 1995. Additional samples were collected on 6.iv. and 4.v.1996. All larvae found in each aggregation were collected (destructive sampling). The samples included two aggregations on each date. The larvae were identified according to Brindle (1962) and this identification was confirmed by rearing similar larvae from the same site. Larvae of *Dilophus femoratus* Meigen were also found at the site but these were clearly morphologically different. Only these two *Dilophus* species occur in the lowlands of Norway (Skartveit 1996).

The larvae were collected into a mixture of three parts 75 % ethanol to one part glacial acetic acid, as this makes tissues softer, less contracted and more translucent than ethanol only and transferred to 75 % ethanol after a few days in the fixation medium.

They were examined under a stereo microscope. Although the imaginal discs were usually visible through the cuticle, the cuticle of the venter of the two last abdominal segments was torn away using two pairs of forceps in order to examine the discs.

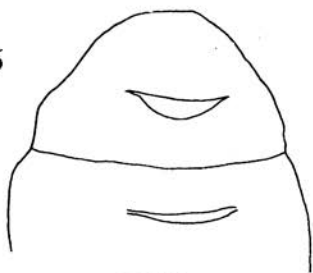


Figs 1-5. Male larvae, venter of ninth abdominal (last) segment: 1, in an early phase of disc development; 2-5, progressively later in development; 5, close to pupation.

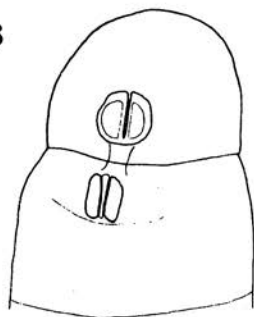
Figs 6-9. Female larvae, venter of eighth and ninth abdominal segment: 6, in an early phase of development, genital imaginal discs starting to differentiate; 7-9, progressively (?) later in development. Some of the differences may be due to variation between individuals and not progression of development.

Fig. 10. Fresh male pupa, venter of last abdominal segment. Fig. 11. Pharate male imago within pupal skin, illustrating probable homology of the anterior part of the cushion-shaped swelling to the gonocoxites and posterior part to the gonostyli. Fig. 12. Female pupa, venter of last abdominal segment.

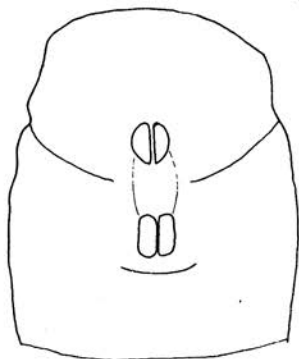
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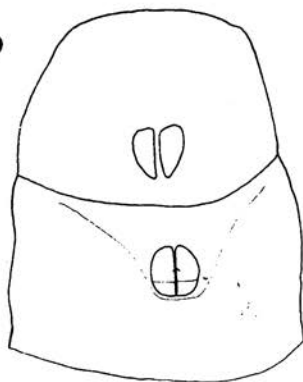
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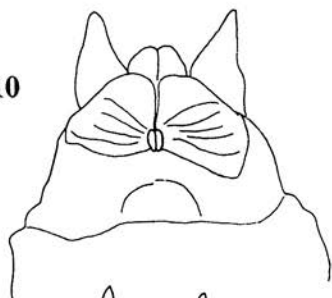
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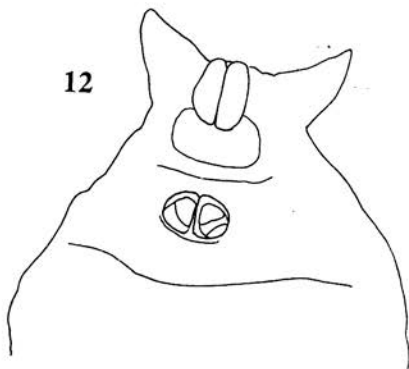
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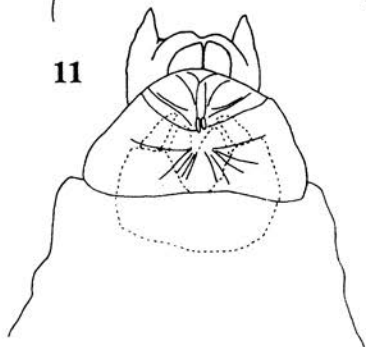
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The head capsule width and total length of the larvae were measured using graded oculars. Drawings were made using a microscope with camera lucida. If a larva was found to be too opaque for microscopical examination, the ventral half of the two last segments was cut off and examined separately. Which were male and female was determined by comparing the structures with the venter of the last segments of pupae, which are strongly sexually dimorphic. A group of larvae collected on 4.v.1996 was kept in the laboratory in moist peat with some decaying leaf litter and samples of larvae/pupae taken out and fixed every 2-3 days until the pharate imago stage was reached, in order to study the last phases of the development of the imaginal discs.

Results

Morphological dimorphism (Figs 1-12)

Male larvae (Fig. 1-6) have just one pair of genital imaginal discs, on the venter of the middle of the ninth abdominal segment. Female larvae (Figs 6-9) have two pairs of genital discs, one situated approximately in the middle of the venter of the eighth abdominal segment and one in the anterior part of the ninth segment. These eventually become connected (Figs 7, 9).

In both sexes, the imaginal discs originate as narrow transverse bands of denser tissue (white in preserved larvae, contrasting against the hyaline muscle cells, Fig. 6). In this early stage the discs look rather similar in the two sexes but females can be recognised as they have two pairs of discs. When further differentiated the discs in males take on a triangular shape (Fig. 3), while those in the females look like a pair of longitudinally arranged bars (Fig. 7). In the early phases the discs are superficial, while later on they extend into the body. The genital imaginal discs of fully mature male larvae are nearly triangular and joined in the anterior fourth (Fig. 5). In females the two pairs of imaginal discs eventually become connected by strands of tissue. There seems to be some individual variation in the shape of the discs (Figs 8, 9).

In the male pupa, most of the ventral side of the ninth abdominal segment is covered by a cushion-shaped swelling (Fig. 10). The posterior part of this swelling is similar in shape to and probably homologous to the imaginal discs. This part develops into the gonostyli of the adult while the anterior part develops into the gonocoxites (Fig. 11). In the female pupa a pair of small but prominent tubercles are present near the anterior end of the ninth abdominal segment (Fig. 12). These are similar in shape to and probably homologous to the imaginal discs of the corresponding segment of the larvae. No such structures are apparent on the eighth abdominal segment in the pupa.

In the larvae collected on 6.iv.1996, the genital imaginal discs were still not visibly developed, so that these larvae could not be sexed.

Table 1. Means, standard errors and sample sizes for last instar *Dilophus febrilis* male and female larvae collected on various dates. All measurements in mm. Dates from 17.iv.1995 from one subsample (out of two) only.

Date	Males, mean HCW	Males, SE/N	Females, mean HCW	Females, SE/N
17.iv.1995	0.925	0.010/97	1.002	0.003/55
28.iv.1995	0.932	0.003/57	0.972	0.004/32
4.v.1996	0.859	0.004/43	0.924	0.004/39

Size dimorphism (Figs 13-14)

A pronounced sexual dimorphism in head capsule width was found (Table 1, differences between means $Z = 7.3-11.4$, $p < 0.0001$, see also Fig. 13), with females being larger than males. Mean total length was 10.4 mm for males and 11.1 mm for females collected on 17.iv.1995, while the corresponding values for the 28.iv.1995 sample was 9.1 and 9.9 mm, respectively (Fig. 14).

Discussion

Day *et al.* (1994) found a sexual dimorphism in weight, but not in head capsule width, of fourth instar *Chironomus riparius* Meigen larvae (Chironomidae). Although weight was not measured in the present study, the females, being larger, were probably also significantly heavier than the males. If the cubes of total lengths are compared, the estimated mean volume of male larvae is 66-72 % of that of female larvae. The decrease between 17. and 28.iv. could possibly be caused by the larvae collected on the latter date being ready for pupation. Before pupation, a general contraction of the larval body takes place. Additionally, larvae collected just before pupation are very susceptible to shrinking when they are transferred to the fixation medium, so that the decrease could be accounted for by increased shrinking. Since apparent total length of the larvae may change considerably in a short time for various reasons, the difference in total length is of little value in distinguishing the sexes.

One problem in interpreting the total length dimorphism is that larvae from any one sample, although probably of the same chronological age, are in somewhat different stages of development. Male larvae had differentiated genital discs at a smaller size than females. The different degrees of the sexual size dimorphism in the samples of *D. febrilis* may represent variation between larval clutches in this respect. The sampling procedure involved collecting all larvae in one particular aggregation, which probably in most cases corresponds to one clutch of larvae. It is not known how far back into the larval instars the sexual size dimorphism is traceable. The earlier development of the genital imaginal discs in males does not result in a protandrous eclosing pattern. Unlike some other bibionids, males and females of *D. febrilis* eclose synchronously (Skartveit unpublished data).

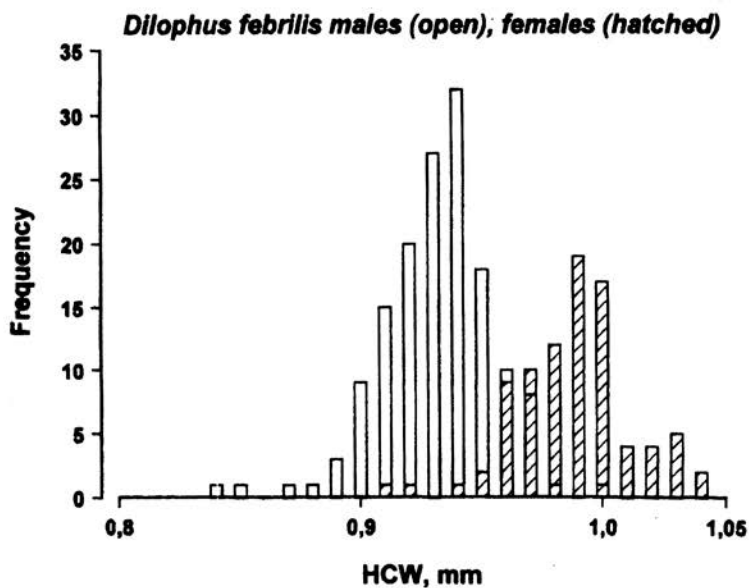
It is also interesting to note that the variation in size between the two years is of a similar magnitude to the sexual dimorphism. The spring of 1996 was preceded by an unusually cold winter, which may be the reason for the reduced size of the larvae in this sample compared to 1995.

Obtaining a method for sexing mature larvae of bibionids stretches the period in which identification of sex without sophisticated histological techniques is possible, and could prove useful for studies of sex ratios and sex-specific growth rates.

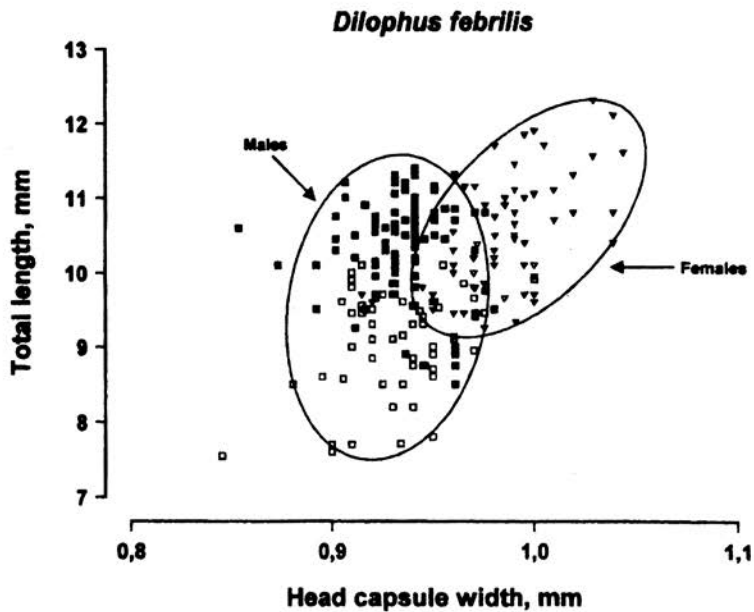
Although this investigation was done on preserved larvae, I have also attempted to study live larvae. I have found that the genital discs are relatively easily seen in species with rather transparent cuticles if the larvae are viewed in transmitted light when immersed in water. Immersion in water for moderate time periods seems not to damage the larvae. However, the opaque cuticle of many species (for instance *Bibio johannis* (Linnaeus)) precludes sexing living larvae. I have also examined imaginal discs in several species of *Bibio* and found these to be rather similar to *Dilophus febrilis* in appearance and development.

Fig. 13. Distribution of head capsule widths for male (open bars) and female (hatched bars) larvae with differentiated imaginal discs from the 1995 samples.

Fig. 14. Head capsule widths and total lengths for male and female larvae. Filled symbols: 17.iv.1995, open symbols: 28.iv.1995. Ellipses fitted by hand.



13



14

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A record of an entomoparasitic nematode in *Syrphus vitripennis* (Diptera, Syrphidae) -

On a recent examination of syrphid samples sweep-netted from field margin Hogweed (*Heracleum sphondylium*) on Rothamsted Farm, Hertfordshire (TL 116142) on 26.vi.1997, I noticed a very small female *Syrphus vitripennis* Meigen, which at first glance appeared gravid due to a greatly distended abdomen. On dissection under the microscope, I noticed that she was in fact infested with a single entomoparasitic nematode. The large size of this nematode (105mm) immediately suggested that it was the juvenile stage of a mermithid nematode (Mermithidae). This family of nematodes is notoriously difficult to identify to species, particularly as only the larval stage is often encountered and involves either DNA analysis or electron microscopy. The adults of these parasites are free-living in soil and larvae enter their insect hosts either via the tracheal system or through the mouthparts when feeding at a flower. The postparasitic stage emerges from the host by rupturing the cuticle and then enters the soil, where it eventually moults to the adult stage. The small size of the hoverfly (8mm) suggests that these parasites do have a significant impact on the growth of the host insect in addition to killing the host on emergence. The discovery of bacteria, fungi and yeast in *Episyrphus balteatus* De Geer by Khalil *et al.* (1997. *Dipterists' Digest (Second Series)* **3**(2), 56-58) prompted this additional note, as there are apparently very few records of this type of parasitism in syrphids, or indeed any Diptera. It would be very important to consider more fully the potential implications of the effect of these pathogens on insect faunas. Firstly, from the standpoint that syrphids migrate and therefore transmit entomoparasites over large distances and second to investigate the potential non-target effects of releasing nematodes for use as biological control agents of insect pests - **JAMIE P. SUTHERLAND**, 16 Delavor Road, Heswall, Wirral, L60 4RN

Dipterists Day Exhibits 1998

- compiled by Editor from exhibitors' notes

This year there were fewer exhibits in common with the BENHS Exhibition (only four exhibits from the sixteen BENHS exhibitors re-appeared), probably due to the relocation in Cardiff, but this was compensated for by some new exhibitors. Space for exhibits at Cardiff was rather restricted and this should be considered in future locations for the meeting, especially as it is hoped to encourage more Forum members to exhibit. As last year, a prize was again on offer and it was awarded to Malcolm Smart for his exhibit relating to the summer field meeting, illustrated by photographs of some of the sites visited.

BALL, S. — A distribution map of *Norellia spinipes* (Meigen) (Scathophagidae), showing the progressive spread of this species, prepared following a recent trawl for records.

BLOXHAM, M. — A light-hearted look at a survey of canals in Birmingham and the Black Country, showing a variety of flies associated with these once heavily polluted waters and demonstrating that they are now havens of biodiversity compared to natural waterways such as many local rural streams, seriously affected by agricultural chemicals. Included in this were *Psacadina verbekei* Rozkošný (Sciomyzidae), *Neoascia obliqua* Coe (Syrphidae), taken on butterbur (*Petasites hybridus*) at the canal fringe in Wolverhampton and *Coenosia stigmatica* Wood (Muscidae), sunning itself on concrete canal pilings at the same site.

CLEMENTS, D. — (1) Exuviae of *Asilus crabroniformis* Linnaeus (Asilidae) found at Brockwells Meadows SSSI near Newport, Gwent (SO 4689) in 1997 and at Thursley Common, Surrey (SU 9139): these were found typically about 2cm below the surface amongst loose soil and litter (autecological studies of this species are being funded by CCW).

(2) Examples of some British and European *Herina* and *Melieria* species (Ulidiidae), including *H. approximata* Villeneuve from Coto Nacional, Cazorla, Spain in 1976, collected by the late Joan Morgan.

(3) Three local hoverflies found quite frequently on "rhos pastures" in South Wales: *Cheilosia chrysocoma* (Meigen), near Cosheston, Pembrokeshire (SM 9902), 14.v.1998; *C. albipila* Meigen, near Tonyrefail, Glamorgan (SS 9987), 27.iii.1997; *Arctophila superbians* (Müller), near Pontllanfraith, Glamorgan (ST 1695), 23.ix.1998. These rough, species-rich circum-neutral marshy grasslands are characteristic of the Carboniferous strata at the edge of the South Wales coalfields and support numerous uncommon and characteristic plants and insects.

(4) *Didea fasciata* Macquart (Syrphidae), open marshland at Pontllanfraith (data as for *Arctophila* above), formerly thought to be an ancient woodland indicator species but recently occurring widely in non-wooded habitats.

COLE, J.H. — (1) Flies from Osier Lake, Godmanchester, Cambridgeshire in 1998; this is a secluded old gravel pit reserve owned by Redland Aggregates Ltd, which was largely under water until mid June, following the Easter floods: *Neoempheria striata* (Meigen) (Mycetophilidae), 23.vii, second British record; *Clastobasis alternans* Winnertz (Mycetophilidae), numerous in *Salix* carr in late viii, fourth British record; *Dolichopus cilifemoratus* Macquart (Dolichopodidae); *Pherbellia styliifera* Rozkošný (Sciomyzidae), first British record; *Pteromicra pectorosa* (Hendel) (Sciomyzidae); *Themira biloba* Andersson (Sepsidae).

(2) Dorchester Field Meeting, vi-vii.1998 with a map showing the sites at which the species exhibited had been found:

The Spittles: *Arctoconopa melampodia* (Loew) (Limoniidae), *Gonomyia abbreviata* Loew (Limoniidae), *Monocentrotia favonii* Chandler (Keroplatidae), *Chirosia griseifrons* (Séguy) (Anthomyiidae).

Eype's Mouth: *Lipara rufitarsis* Loew and *Platycephala umbraculata* (Fabricius) (Chloropidae), *Lispe nana* Macquart (Muscidae).

Cesil Beach: *Sarcophaga compactilobata* (Wyatt) (Sarcophagidae).

The Verne, Portland: *Empis volucris* Wiedemann in Meigen (Empididae).

Morden Bog: *Leiophora innoxia* (Meigen) (Tachinidae).

Middlebeare Heath: *Thyridanthrax fenestratus* (Fallén) (Bombyliidae).

Studland Heath: *Rhamphomyia physoprocta* Frey (Empididae), *Paragus tibialis* (Fallén) and *Eumerus sabulonum* (Fallén) (Syrphidae), *Hecamede albicans* (Meigen) (Ephydriidae).

Troublefield Heath: *Tipula helvola* Loew (Tipulidae), *Loewia submetallica* (Macquart) (Tachinidae).

Parley Common: *Sphaerophoria virgata* Goeldlin de Tiefenau (Syrphidae).

Hod Hill: *Machimus rusticus* (Meigen) (Asilidae), *Urophora solstitialis* (Linnaeus) (Tephritidae).

Ringmoor: *Phaonia bitincta* (Rondani) (Muscidae).

CROSSLEY, R. — Some noteworthy Yorkshire Empidoidea collected in recent years: *Oedalea ringdahli* Chvála (Hybotidae), Forge Valley Woods NNR, 10.vii.1995, first record for England; *Empis nigratarsis* Meigen (Empididae), Skipwith Common, carr woodland, v.1998, new to Yorkshire; *Hilara gallica* (Meigen) (Empididae), from a small relict grass-heath site in the parish of Barmby Moor, about a mile from Allerthorpe Common (where the only previously known British specimen was a male found by W.J. Fordham in 1926), 1 male collected in 1997 and both sexes at several locations within the overall site in 1998; *Dolichopus migrans* Zetterstedt (Dolichopodidae), both sexes found in 1998 at same site as *H. gallica*, a breckland species previously known outside breckland only at Risby Common, North Lincolnshire; *D. signifer* Haliday (Dolichopodidae), 2 males found in 1998 on wet sand near the beach at Barmston, south of Bridlington, second Yorkshire record, the first having been by J. Coldwell from a disused mining waste site near Barnsley in 1992; *Sciapus contristans* (Wiedemann) (Dolichopodidae), 2 males at same site as *D. migrans*, also previously reported from a site near Barnsley in 1991 by J. Coldwell.

DRAKE, M. — Distribution maps for the four scarcer species of *Lonchoptera* Meigen (Lonchopteridae): *L. mejerei* Collin, *L. nigrociliata* Duda, *L. nitidifrons* Strobl and *L. scutellata* Stein. It was suggested that with increasing knowledge of their distribution, Notable status currently accorded them may not be justified in all cases.

ILIFF, D. — Ten photographs of hoverflies (Syrphidae). Four British species: *Eriozonea erratica* (Linnaeus) and *Heringia pubescens* (Delucchi and Pschorn-Walcher), Mallard's Pike, Forest of Dean; *Tropidia scita* (Harris), a hovering male at Strumpshaw Fen, Norfolk; *Lejops vittatus* (Meigen), Horsey Mere, Norfolk. Six species from eastern USA: *Eristalis dimidiatus* Wiedemann*, *E. transversus* Wiedemann; *Toxomerus geminatus* (Say) and *T. marginatus* (Say)*, small but brightly marked species, both common but with different flight periods, found in similar habitats on visits in vii and ix respectively; two species with distinctive coloured patterns on the eyes, *Orthonevra nitida* (Wiedemann) and *Spilomyia longicornis* Loew*. These were photographed in 1998 except for those marked *, which were in ix.1991.

KRAMER, J. — Craneflies recorded in 1998 in Leicestershire and on the Dorchester and Hereford Field Meetings: (a) Leicestershire - effort was concentrated on sites fed by a spring or flush, of which the three best sites (producing more than 40 species) were undisturbed woodland (Swithland Wood, SK 5311-5312) or small spinneys (Scam Hazel Wood, SK 3318 and Noseley Copse, SP 732997); these sites were best indicated by the Notable species *Limonia trivittata*

(Schummel) (exhibited from all three sites, vi and vii) and *Rhipidia uniseriata* Schiner (Swithland Wood, 17.vi and Noseley Copse 8.vii); *Epiphyragma ocellare* (Linnaeus) was found on the springfed marsh at Swithland Wood, 20.v; *Limonia masoni* (Edwards) was found at Scam Hazel Wood, 27.v (all above Limoniidae). Grassland sites were less productive, considered to be due to less vegetable detritus being available for larval development, the best rough pasture site with 37 species (Empingham Marshy Meadow, SK 957092), contained a stream, a tall hedge and standing/Fallén black poplars (*Populus nigra*) and the flush was fed from Lincolnshire limestone strata; *Thaumastoptera calceata* Mik and *Gnophomyia viridipennis* (Gimmerthal) (Limoniidae) were present on 3.vi. The following were exhibited from acid soil of the Charnwood area: *Prionocera turcica* (Fabricius) (Tipulidae) from Bradgate Pool (SK 52941154), 22.vii and *Dicranota bimaculata* (Schummel) (Pediidae) from Ulverscroft Priory (SK 501125).

(b) Dorset: *Tipula marginella* Theowald (Tipulidae) from Creech Heath (SY 923837), 3.vii and *Erioptera limbata* Loew (Limoniidae) from an old green lane at North Poorton (SY 552985), 30.vi; also exhibited were *Nephrotoma cornicina* (Linnaeus) (Tipulidae), *Dicranota claripennis* (Verrall) (Pediidae) and *Helius longirostris* (Meigen) (Limoniidae), all from Aunt Mary's Bottom (SY 548024), 28.vi.

(c) Hereford: *Pedicia occulta* (Meigen) (Pediidae) from Haugh Woods (SO 590354), 10.x; *Tipula holoptera* Edwards (Tipulidae) at Humber Carr (SO 527535), 12.x.

PALMER, C. — Examples of twelve species of Asilidae from France and Spain: *Leptogaster pumila* (Macquart), Causse Comtal, Salles-la-Source, Aveyron, France, 6.viii.1998; *Scytomedes haemorrhoidalis* (Fabricius), Sierra del Chaparral, Otivar, Granada, Spain, 15.iv.1997; *Habropogon appendiculatus* Schiner, Messanges, Landes, France, 4.viii.1994; *Stenopogon elongatus* (Meigen), Pals, Girona, Spain, 22.viii.1996; *Pogonosoma maroccanum* (Fabricius), la Mole, Cogolin, Var, France, 17.viii.1995; *Choerades fuliginosus* (Panzer), Bois d'Ustaritz, Pyrénées-Atlantiques, France, 5.viii.1994; *Andrenosoma atra* (Linnaeus), Messanges, Landes, France, 16.viii.1994; *Neomochtherus flavicornis* (Ruthé), Bois de Plagnolle, Nauviale, Aveyron, France, 9.viii.1998; *Paritamus geniculatus* (Meigen), Bois de Plagnolle, Nauviale, Aveyron, France, 10.viii.1998; *Machimus fimbriatus* (Meigen), Pals, Girona, Spain, 28.viii.1996; *M. setosulus* (Zeller), La Mole, Cogolin, Var, France, 16.viii.1995.

ROBERTSON, D. — (1) Some flies from a sycamore tree (*Acer pseudoplatanus*), with heart rot and small sap runs in Leith, Midlothian, NT 2875: *Rhipidia ctenophora* Loew (Limoniidae), male and female on exposed sapwood, 15. and 17.vi.1998, new to Scotland; *R. maculata* (Meigen) (Limoniidae), male on exposed sapwood, 17.x.1998; *Telmatoscopus rothschildii* Eaton (Psychodidae), pupa in sap run, 7.viii.1997, adult male emerged 19.viii.1997, new to Scotland; *Drapetis arcuata* Loew (Hybotidae), larvae in sappy decay in hollow of tree 29.iv.1998, male and 2 females emerged 21.vi.1998, new to Scotland; *Systemus pallipes* (von Roser) (Dolichopodidae), larva in sap run 3.ix.1997, male emerged 10.vi.1998, male also found on exposed sapwood 2.viii.1998; *S. mallochi* MacGowan (Dolichopodidae), female on exposed sapwood 3.viii.1997; *Periscelis annulata* (Fallén) (Periscelididae), female at sap run 3.viii.1997, larva in sap run 24.viii.1997, female emerged 15.vi.1998; *Lasiambia brevivucca* (Duda) (Chloropidae), male and female on exposed sapwood 18.vii and 3.viii.1998, new to Scotland; *Phaonia cincta* (Zetterstedt) (Muscidae), male on exposed sapwood 5.viii.1998; *Helina pertusa* (Meigen) (Muscidae), male and female on exposed sapwood 7.ix and 1.x.1998.

(2) Flies from an ash tree (*Fraxinus excelsior*) with exposed sapwood and bracket fungus, Leith Links, Midlothian, NT 2775: *Systemus bipartitus* (Loew) (Dolichopodidae), female on exposed sapwood, 1.viii.1997, male in same situation 11.vii.1998; *Sapromyza apicalis* Loew (Lauxaniidae), female near bracket of *Grifola gigantea*, 18.ix.1997, new to Scotland.

SMART, M.J. — Dorchester Field Meeting. Photographs of some habitats visited during the Dipterists Forum field week in Dorset 1998, with specimens of typical or interesting Diptera found there:

(a) dry heath/wet heath boundary at Parley Common, 2.vii: *Pelecocera tricineta* Meigen (Syrphidae), which seemed to favour yellow flowers in dry heathland close to wetter heath zones, where it was typically found with *Sphaerophoria* and *Platycheirus* species, e.g. *P. clypeatus* (Meigen).

(b) dry heath/woodland boundary at Merritown Heath, 2.vii: *Eutolmus rufibarbis* (Meigen) (Asilidae), several seen but all in other dipterists' nets; *Dioctria baumhaueri* Meigen (Asilidae); *Xanthandrus comtus* (Harris) (Syrphidae).

(c) wooded hedgerow adjacent to heathland at Holt Heath, 3.vii: from grass/flowers in foreground *Leptogaster cylindrica* (De Geer) (Asilidae), *Xanthogramma pedissequum* (Harris) (Syrphidae) and *Sicus ferrugineus* (Linnaeus) (Conopidae); from hogweed (*Heracleum sphondylium*) *Callicera aurata* (Rossi).

(d) dry heath with boggy zones at Godlingstone Heath, photographed 30.vi but specimens exhibited were collected on 19.viii: swept from around the pool *Chrysops sepulchralis* (Fabricius) (Tabanidae), both sexes; on nearby sandy path *Bombylius minor* Linnaeus (Bombyliidae).

From the nearby (dry heath) Stoborough Heath, 30.vi: *Dysmachus trigonus* (Meigen) (Asilidae); *Hybomitra distinguenda* (Verrall) (Tabanidae).

(e) lightly grazed or ungrazed chalk grassland, the photograph being of "artificial" chalk grassland at Warmwell Heath, 29.vi, where an old landfill site has been surfaced with chalk soil and has developed a chalk grassland flora (including Pyramidal Orchid, *Anacamptis pyramidalis*); the specimens exhibited were from true chalk grassland at Hod Hill, 1.vii and Badbury Rings, 3.vii: *Machimus rusticus* (Meigen), *M. atricapillus* (Fallén) and *Leptarthrus brevisrostris* (Meigen) (all Asilidae); *Ogcodes pallipes* Latreille (Acroceridae); *Pachygaster atra* (Panzer) (Stratiomyidae); *Thecophora atra* (Fabricius) and *Physocephala rufipes* (Fabricius) (Conopidae).

(f) dry heath/sedge saltmarsh boundary at Arne, 30.vi: on boardwalk *Thyridanthrax fenestratus* (Fallén) (Bombyliidae); on umbel flowers *Nemotelus notatus* Zetterstedt (Stratiomyidae), *Eristalinus sepulchralis* (Linnaeus) and *Ripponensia splendens* (Meigen) (Syrphidae), *Conops flavipes* Linnaeus (Conopidae).

(g) dry heath/saltmarsh boundary at Studland Heath, 2.vii: *Atylotus latistriatus* Brauer and *Tabanus bromius* Linnaeus (Tabanidae); *Thyridanthrax fenestratus* (Fallén) (Bombyliidae); *Machimus cingulatus* (Fabricius) (Asilidae); *Eristalinus aeneus* (Scopoli), *Anasimyia lineata* (Fabricius), *Paragus tibialis* (Fallén), *Platycheirus angustatus* (Zetterstedt) (Syrphidae).

(h) conifer plantation at Hurn Forest, viewed in very dull weather at the end of Dipterists Week and revisited on 4.viii when *Asilus crabroniformis* Linnaeus (Asilidae) was seen; at least three specimens were sitting on a horse-riding path at the centre of the view shown.

SUMNER, D. — Examples of Diptera collected on a visit to Hungary in 1998 with L. Gorman. Syrphidae: *Microdon analis* (Macquart), *M. mutabilis* (Linnaeus), *Temnostoma vespiforme* (Linnaeus) investigating large beeches (*Fagus sylvatica*) in shade, *Chalcosyrphus curvipes* (Loew) on stumps in open sunny sites, *Sphiximorpha subsessilis* (Illiger) and *Ceriana conopsoidea* (Linnaeus) on sap runs, *Lejops vittatus* (Meigen) on most large water bodies, *Caliprobola speciosa* (Rossi) and *Myolepta potens* (Harris) in numbers in an area of partially felled woodland with many rotting stumps and sap runs. Bombyliidae (determined by C. Palmer): *Bombylius medius* Linnaeus, *B. ater* Scopoli, *B. fimbriatus* Meigen, *B. fulvescens* Wiedemann, *Exoprosopa cleomene* Egger and *Hemipenthes morio* (Linnaeus). Coenomyiidae (determined by M. Smart): *Coenomyia ferruginea* (Scopoli).

***Lyciella stylata* Papp, 1978 (Diptera, Lauxaniidae) new to Fennoscandia; *Lyciella pallidiventr* (Fallén, 1820) and *Sapromyza basalis* Zetterstedt, 1847 (Diptera, Lauxaniidae) new to Norway**

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The family Lauxaniidae (Diptera) has not been surveyed in Norway since the time of Siebke (1877), who listed 22 species from Norway. There are more than fifty species recorded from Fennoscandia and Denmark (Papp 1984).

Papp (1978) described two species of *Lyciella*, which were very similar to *Lyciella pallidiventr* (Fallén, 1820) viz. *L. stylata* and *L. subpallidiventr*. These three species can only be separated on the male genitalia. Godfrey (1994) found both *Lyciella stylata* and *L. subpallidiventr* in material from the British Isles, some of which had earlier been determined as *L. pallidiventr*. *L. stylata* turned out to be the most common of the three species.

On examination of material from Norway which keys out as *L. pallidiventr* (Fallén, 1820) in older keys like Collin (1948), several males agreed with Papp's description of *L. stylata*. None, however, agreed with Papp's description of *L. subpallidiventr*. The material, which is fixed in alcohol and kept in Zoological Museum, University of Bergen, is listed below (MT = Malaise trap; LT = Light trap; WT = Window trap):

***Lyciella pallidiventr* (Fallén, 1820)** (12 males from five localities)

Material: *Østfold province* Råde: Tasken EIS 19 MT 6-24.vi.1995 1 male. *Akershus province* (= AK) Nesodden: Fagerstrand EIS 28 LT 5-6.viii.1991 1 male, 26-27.viii.1991 1 male, 19-20.viii.1992 1 male (2 females), 1-2.ix.1994 1 male. *Outer Rogaland province* (= RY) Hå: Ognå EIS 3 2 MT 21.viii.-28.ix.1996 1 male. *Outer Hordaland province* (= HOY) Bergen: Vollane EIS 39 WT 9-13.vi.1978 2 males, MT 1-14.vii. 3 males (1 female). *Inner Hordaland province* (= HOL) Kvam: Gravdal, near Lake Svevatn Square 47 11.ix.-29.x.1997 1 male (1 female).

***Lyciella stylata* Papp, 1978** (17 males from seven localities)

Material: AK Nesodden: Fagerstrand EIS 28 LT 3-4.vii.1991 1 male, 15-16.viii.1991 4 males (1 female), 19-20.viii.1992 1 male, 1-2.ix.1994 1 male (2 females), 21-22.ix.1994 1 male, 6-7.x.1996 1 male; Vestby: Soner LT 7-13.viii.1988 1 male. *Inner Telemark province* (= TEL) Kviteseid: Kviteseid LT 28-30.vi.1988 1 male. *Outer West-Agder province* Mandal: near road to Valand EIS 2 MT 6-22.vii.1982 1 male. RY Hå: Ognå EIS 3 2 MT 21.viii.-21.ix.1996 1 male. HOY Bergen: Vollane EIS 39 MT 1-14.vii.1994 1 male, 19.vi.-1.vii.1996 2 males. *Inner Møre and Romsdal province* Norddal: Fjæra MT 18.vii.-11.ix.1993 1 male (1 female).

In addition some females were collected alone at the following localities and these females may represent either *L. pallidiventr*, *L. stylata* or *L. subpallidiventr*: HOY Bergen: Straume EIS 30 MT 31.viii.1979 1 female; Stord: Iglatjødn Nature Reserve EIS 23 MT 29.viii.-10.x.1989 1 female; Os: Gæssand, Raudli EIS 31 MT 26.vii - 9.viii.1990 1 female. *Inner Sogn and Fjordane province* Balestrand: Målsnes EIS 50 2MT 1-29.viii.1998 6 females.

L. stylata Papp has, according to Godfrey (1994), not been earlier recorded from Fennoscandia or Denmark and is here recorded as new for this area. *L. pallidiventr* (Fallén, 1820) is recorded as new to Norway. *L. pallidiventr* was described from Sweden and has also been recorded from Finland (Papp 1984).

These *Lyciella* species have a grey thorax and are generally more brownish than most of the other species belonging to this genus. Both Papp (1978) and Godfrey (1994) figured the male genitalia of both species, together with figures of *L. subpallidiventr*.

L. pallidiventr and *L. stylata* have been collected together at three localities. The locality at Fagerstrand is an edge habitat, between old coniferous forest, temperate deciduous forest, open grassland and a garden. The site is a shaded area (Kobro 1991). The Ognå Malaise traps were situated on grassland at the edge of planted Scots pine (*Pinus silvestris*) forest. The traps at Vollane were in a garden with original forest of mostly deciduous trees and herbage together with some single Scots pines. All the localities for *L. pallidiventr* represent coastal areas or fjord areas, while for *L. stylata* the Kviteseid locality is inland. For *L. stylata* the locality Fjåra is the northernmost in Europe.

***Sapromyza basalis* Zetterstedt, 1847**

One female was collected in one of two Malaise traps located at Målsnes in Balestrand community in Sogn and Fjordane province in Western Norway between 1-29 September 1998. The locality is a mingled forest of Scots pine and deciduous trees, mostly birch (*Betula pubescens*), rowan (*Sorbus aucuparia*) and some willows (*Salix* species). *S. basalis* was described from Scandinavia and Denmark and is also known from Finland (Papp 1984). It is a fairly small *Sapromyza* species, easily recognised by the dark antennal scape and pedicel. The palpus is also distally black.

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A new species of *Eudorylas* from Scotland (Diptera, Pipunculidae)

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Introduction

In 1991 Iain MacGowan gave me some pipunculids preserved in alcohol, which were collected in a Malaise trap in Aberdeenshire in 1990. Detailed examination of the male genitalia indicated that they were undescribed.

Definition of terms used

In this paper I follow Albrecht (1990) with regard to morphological terms and position, except for the use of the term phallic guide instead of aedeagus. The terms dorsal and ventral with regard to the genitalia refer to the morphological position, regardless as to whether the hypopygium has twisted 180° or is folded under the abdomen. Skevington and Marshall (1998: 11), in a revision of New World *Pipunculus*, state that in order to avoid confusion, they refer to dorsal and ventral parts of the genitalia as if they were not twisted. In my opinion this is likely to lead to more confusion; for example, if the morphological dorsal surface of the epandrium, which is in a ventral position due to the folding over of the distal segments of the abdomen, were to be called 'ventral', confusion might arise as to whether to refer to the morphological distal margin of the epandrium as distal or proximal. In the female genitalia the ventral surface of the female piercer is in a dorsal position when the ovipositor is in a retracted position. This has caused some previous workers to describe the piercer as upturned, when it is in fact downturned.

In this paper the dorsal medial projections on the phallic guide in the male are on the side nearest to the epandrium and surstyli; they are therefore dorsal as defined above. They are present in a group of about six British species and should not be confused with an apparently similar projection on the phallic guides of some other British species (for example *E. montium* (Becker) and *fuscipes* (Zetterstedt) where this projection is ventral, i.e. between the phallic guide and the ejaculatory ductuli, as in Fig. 25)).

The detailed structure of the phallic guide and ejaculatory ductules show specific differences in *Eudorylas*, even when the shape and location of the membranous area on the syntergosternum 8 is almost identical; the latter character is in my experience often variable.

Eudorylas caledonicus sp. n. (Figs 1-15)

Male. Head: first flagellomere of antennae yellowish brown, appearing whitish pruinose from some angles; acuminate. Eyes touching for a distance equal to twice length of ocellar tubercle. Lower part of frons above lunule blackish but silver dusted when viewed from above. Face silvery white pubescent when viewed from in front.

Thorax: postpronotal lobe yellow, scutum brownish dusted. Halteres yellowish brown, knob darker.

Wing: third costal section slightly longer than fourth (Fig. 15). Crossvein r-m at slightly beyond basal fourth (0.29) of discal cell. Wing length 4.7 mm.

Legs: trochanters and bases of femora clear yellow, especially hind femora; apices of femora also narrowly yellow. Hind femora shining on posterior surface. Tibiae and mid tarsi with a yellowish posteroventral apical seta, mid femora with a posteroventral row of tiny black spinules. Anterior pulvilli shorter than claws.

Abdomen: terga brownish dusted, greyish laterally, not shining. 6th sternite rather long (Fig. 12). Hypopygium orange-yellow.

Genitalia: syntergosternum 8 (Fig. 1) with a roughly triangular membranous area, which is more or less centrally placed. Epandrium on the left side with a projecting lobe (Fig. 3). Phallic guide (Figs 7, 8) fairly long, with two projecting truncate dorsal lobes which are setulose basally. Bases of phallic guide asymmetrical, right (morphological) side projecting in a point (Fig. 7). Ejaculatory ductules (Fig. 9) fairly long, not coiled but folded backwards towards base. Ejaculatory apodeme as in Fig. 4.

Female. Similar to the male except as follows: first flagellomere longer than in male, posteroventral apical setae on fore and mid tibiae longer, and pulvilli longer. Ovipositor base (Fig. 13) with a distinct furrow basally, the two sides of the base symmetrical. Piercer rather shorter than base, wide basally in dorsal view, almost straight in lateral view.

Type material: **Holotype** male, Aberdeenshire, Glen Tanar, July and August, 1990, Malaise trap No 4892, I. MacGowan. (deposited in University Museum of Natural History, Oxford). One wing gummed onto card, the genitalia dissected and mounted in Canada balsam on a plastic slip, mounted on the same pin.

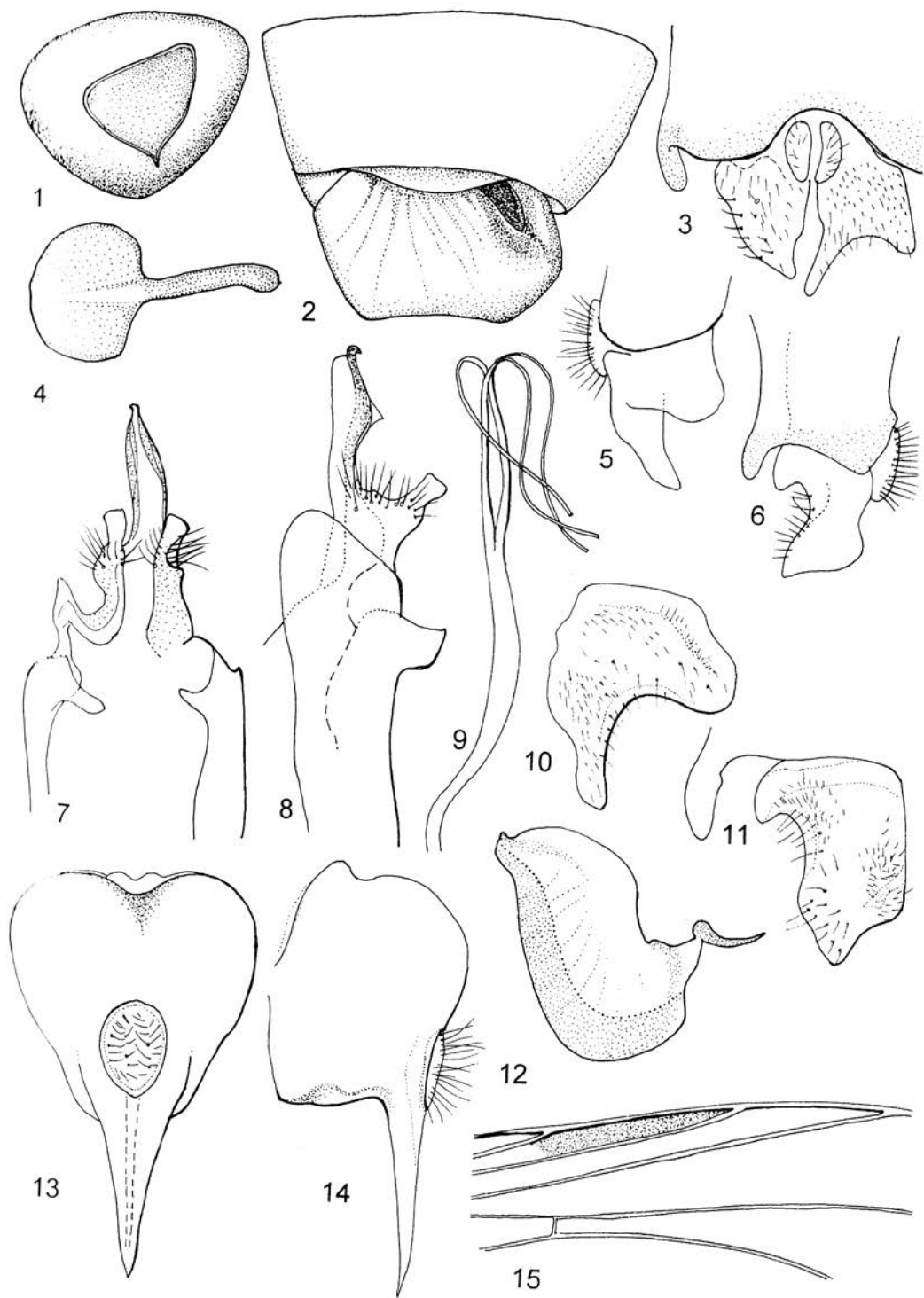
Paratypes: 4 males, 1 female, same locality and data (2 males and 1 female with genitalia dissected). The material was originally preserved in alcohol. It has been dried and pinned; consequently some discoloration and shrinking has occurred.

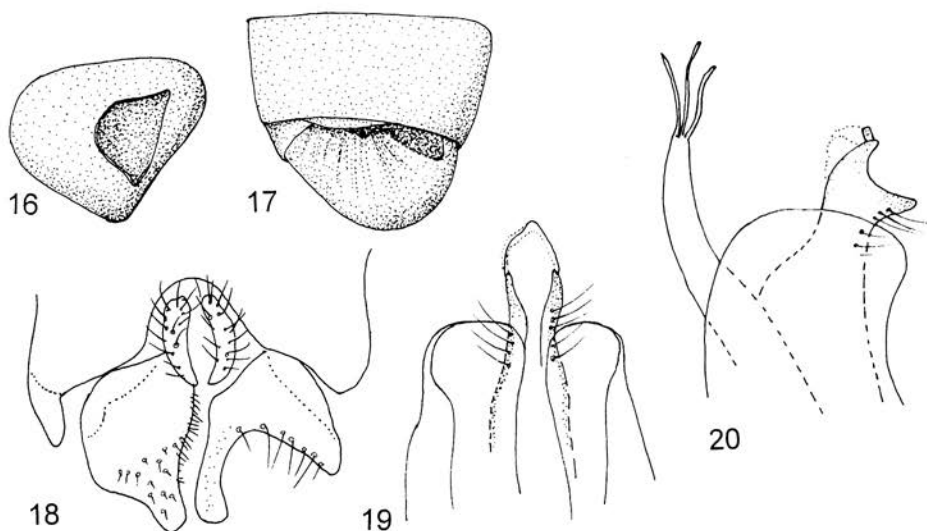
Mr MacGowan has given me the following information on the site: "Glen Tanar is the most easterly [of the Scottish trapping sites] and therefore the driest / sunniest / most continental native pinewood remnant and turned out to have some characteristic species which I did not obtain by trapping elsewhere, such as the rare *Thereva inornata* Verrall (Therevidae). The trap was set in an area of "old growth" pine with occasional juniper bushes; birch was scarce in the immediate area. The ground flora was dominated by dense, long *Calluna* to a height of about 0.5m. The aspect was slightly northerly"

Relationship

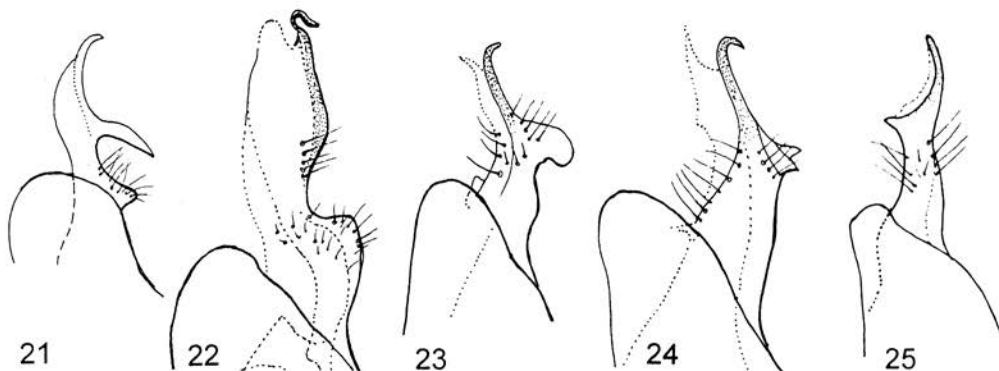
E. caledonicus appears to be related to *obliquus* Coe and *jenkinsoni* Coe (as far as the British species are concerned), in having a projecting lobe on the left side of the epandrium (Figs 3, 18). The ejaculatory ductuli are however much longer than in these species. The males of *obliquus* and *jenkinsoni* have extremely similar genitalia, but the female ovipositor appears to show reliable differences (De Meyer 1993: 48). Both species have the base of the ovipositor distinctly asymmetrical (enlarged on the right side) and thus differ from *caledonicus*. *E. jenkinsoni* has a more widely excavated dorsal groove than *obliquus*.

Figs 1-15. *Eudorylas caledonicus* sp. n. 1, male syntergosternum 8, caudal view; 2, ditto dorsal view; 3, epandrium and surstyli, dorsal view; 4, ejaculatory apodeme; 5, right surstylus, lateral view; 6, left surstylus, lateral view; 7, phallic guide, dorsal view; 8, ditto, lateral view; 9, ejaculatory ductuli; 10, left surstylus, plan view; 11, right surstylus, plan view; 12, 6th sternite; 13, female ovipositor, caudal view; 14, ditto, lateral view; 15, portion of male wing.





Figs 16-20. *Eudorylas obliquus* Coe. 16, male syntergosternum 8, caudal view; 17, ditto, dorsal view; 18, epandrium and surstylus; 19, phallic guide, dorsal view; 20, phallic guide and ejaculatory ductuli, lateral view.



Figs 21-25. Phallic guides, lateral view (dorsal surface on right). 21, *Eudorylas fascipes* Collin; 22, *E. subfascipes* Collin; 23, *E. subterminalis* Collin; 24, *E. terminalis* (Thomson); 25, *E. montium* (Becker).

E. caledonicus males differ from *obliquus* as follows: sytergosternum 8 (Fig. 1) with the membranous area more centrally placed, therefore the left margin is narrower than in *obliquus* (Fig. 16) and the right side of the tergum in caudal view is not so obliquely cut off; in dorsal view sytergosternum 8 is square ended (Fig. 2) (*obliquus* is more rounded, Fig. 17). The ejaculatory ductuli are much longer and are bent once but not coiled, as in Fig. 9 (*obliquus* shown in Fig. 20). The phallic guide is longer, see Figs 7, 8 (*obliquus* Figs 19, 20).

Other British *Eudorylas* species which possess a dorsal medial projection on the phallic guide are *fascipes* (Zetterstedt) (Fig. 21), *subfascipes* Collin (Fig. 22), *subterminalis* Collin (Fig. 23) and *terminalis* (Thomson) (Fig. 24). The last two species have longer ductuli than *obliquus* but not so long as *caledonicus*. British species with longer ductuli are *zermattensis* (Becker), *arcanus* Coe, *obscurus* Coe, and *longifrons* Coe, but none of these have an epandrial lobe or a dorsal projection on the phallic guide. *E. subfascipes* Collin (Fig. 22) has a much longer phallic guide and coiled ductuli, *fascipes* (Zetterstedt) (Fig. 21) has a narrow pointed dorsal projection on the phallic guide.

Of the non-British species of *Eudorylas* which might be related to *caledonicus*, *E. mediterraneus* De Meyer and Ackland (De Meyer 1997: 431) has short ductuli similar to *obliquus* but is without a projecting lobe on the left side of the epandrium. *E. slovacus* Kozánek (Kozánek 1993: 45) has shorter ejaculatory ductuli, a very distinctive falcate dorsal medial process on the phallic guide, and a small projecting lobe on the left side of the epandrium.

There have been many other Palaearctic species of *Eudorylas* described in recent years, but it will not be possible either to identify some of them correctly, or work out their phylogenetic relationships until the types have been re-examined and the internal genital structures ascertained. Many recently described new species are based on females only.

Acknowledgements

I thank Prof. S.J. Simpson, Professor of Entomology and Dr G.C. McGavin, Associate Curator, for the use of facilities at the Hope Entomological Collections, University Museum of Natural History, Oxford. I also thank Mr I. MacGowan, Scottish Natural Heritage, for sending me some of the material collected on his Scottish survey. Dr M. De Meyer and Dr J.W. Ismay very kindly read the manuscript and made valuable suggestions, which I have incorporated.

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Two rare flies in Cambridgeshire, *Ochthera manicata* (Fabricius) and *Thrypticus cuneatus* (Becker) (Diptera, Ephydriidae and Dolichopodidae)

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The genus *Ochthera* includes the largest British ephydriids and is immediately recognisable by the greatly enlarged front femora. Irwin (1985) gave data on the distribution of the three British species. *O. mantis* (De Geer) is widespread and usually found on acid mires, *O. schembrii* Rondani is known from only one Cornish site and *O. manicata* (Fabricius) was then known only from the Norfolk and Suffolk Broads. The small species of the dolichopodid genus *Thrypticus* are recognisable in the field by their brilliant almost pea-green colour. There are only two previous British records for *Thrypticus cuneatus* (Becker), from Aviemore in 1913 and Quy Fen near Cambridge in 1986 (Assis-Fonseca 1978; Perry 1988).

I collected a male and female of both *O. manicata* and *T. cuneatus* on 23 August 1997 at brick pits on the southern outskirts of Peterborough, Cambridgeshire (TL 165947). The Oxford Clay at the site has been dug for bricks for over 50 years, resulting in a remarkable complex of ridges and furrows, with many hundreds of pools in the furrows between the steep-sided ridges, which are about 7-10m high. Most of the pools where the flies were collected are about 40 years old and dominated by dense *Scirpus tabernaemontani* and smaller amounts of *Typha angustifolia* and *Eleocharis palustris*. Stoneworts (*Chara*) dominated the submerged flora and *Potamogeton natans* was locally frequent at the margins. The area of these brick pits where I collected was designated in 1995 as Orton Pit SSSI, principally for Great Crested Newts, *Triturus cristatus* (Laurenti), dragonflies and rare species of stonewort (*Chara*).

Ochthera manicata was found at two pools. One fly was swept from the shoreline over almost bare clay with a sparse covering of moss and stranded stonewort, the other from a small patch of bare clay at the base of tall *Scirpus*. The habitat where the specimens were found was typical of many of the older ponds. As the emergent plants were dense around most of the pools, it was difficult to sweep low over most of the margins and no more *O. manicata* could be found, although many other ponds were searched.

Outside the Norfolk and Suffolk Broads, *Ochthera manicata* has been collected recently from a pingo pool at Thompson Common, Norfolk (TL 9396; 1 male, 6.vii.1993, Andrew Godfrey) and Wicken Fen, Cambridgeshire (TL 5570; 1 male, 1 female, 4.ix.1998, Drake), where it was found at the bare peat of several damp depressions made by vehicles along paths and in mown compartments. These records confirm that *O. manicata* would appear to be restricted to sites of known high value for invertebrates. Its occurrence at Orton Pit is therefore significant as it suggests that the brick pits have acted as a refuge for fenland species that may have been more widespread across the Fens before they were drained and converted to almost unbroken arable cultivation. Dogsthorpe Star Pit SSSI on the eastern outskirts of Peterborough is a similar refuge for water beetles, some of which are regarded as fenland relicts and was notified primarily for this outstanding assemblage.

The substrates where *O. manicata* has been found are mainly fen peat, including all records given by Irwin (1985) and that from Wicken Fen, but sand and alluvium at Thompson Common and impervious clay at Orton Pit. One factor common to all these areas is the low

nutrient status of the water. The pools at the brick pits are almost entirely rain-fed although, being below ground level, there is a slow infiltration of water from outside the site.

As Orton Pit is one of the largest pond complexes in England, containing about 400 separate ponds, it is not surprising that it has a rich ephydrid fauna. Another uncommon ephydrid found here was *Parydra pusilla* (Meigen). The remaining species caught are widespread: *Axysta cesta* (Haliday), *Coenia palustris* (Fallén), *C. curvicauda* (Meigen), *Hyadina rufipes* (Meigen), *Hydrellia griseola* (Fallén), *H. maura* Meigen, *H. maculiventris* Becker, *H. mutata* (Zetterstedt), *Ilythea spilota* (Curtis), *N. cinerea* (Fallén), *Notiphila riparia* Meigen, *N. maculata* Stenhammar, *Notiphila* sp (thought to be an undescribed but common species related to *cinerea* Fallén), *Paracoenia fumosa* (Stenhammar), *Parydra coarctata* (Fallén), *P. fossarum* (Haliday), *P. quadripunctata* (Meigen), *Psilopa nigrutella* Stenhammar, *Scatella stagnalis* (Fallén), *S. tenuicosta* Collin, *Scatophila caviceps* (Stenhammar), *Setacera aurata* (Stenhammar). Nomenclature follows Chandler (1998).

Thrypticus cuneatus is the most distinctive of the British species in the genus as the male has wings shaped like those of *Sciapus platypterus* (Fabricius) and both sexes have characteristic genitalia (Negrobov and Stackelberg 1971-1972). It is therefore unlikely to have been overlooked or misidentified and is probably genuinely rare. Other wetlands in Cambridgeshire, for instance Chippenham Fen and Wicken Fen, have been worked moderately well for dolichopodids yet this species has not been recorded from these important sites. Falk and Crossley (in preparation: 1994 draft) give *T. cuneatus* the Red Data Book status of Indeterminate (that is, there are insufficient data to be certain which RDB category is most appropriate), although Shirt (1987) and Falk (1991) regarded it as Endangered (RDB1).

Perry (1988) recorded his specimens of *T. cuneatus* at a pond margin in habitat, at Quy Fen, similar to that at Orton Pit and he suggests (*pers. comm.*) that its larvae may feed within *Eleocharis*. The vegetation from which the specimens were swept at Orton Pit was not recorded. Few other dolichopodids were recorded at Orton Pit, as would be expected at such a late date as 23.viii, but they did include the nationally scarce *Thrypticus divisus* (Strobl) and numerous *Campsicnemus pcticornis* (Zetterstedt).

Acknowledgements

I would like to thank Roger Tallwin of Peterborough Southern Township Ltd for permission to record at Orton Pit and Adrian Colston (National Trust) to record at Wicken Fen. Andrew Godfrey allowed me to quote his record, Ivan Perry provided useful discussion and Tom Langton checked the manuscript.

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Does *Scenopinus fenestralis* (Linnaeus) (Diptera, Scenopinidae)

breed in beehives ? - While I was working at the Central Science Laboratory National Bee Unit (SP 1652, V.C. 38) in 1995, beehive components such as hive boxes, old combs and brood frames, mainly from experimental sites, were occasionally brought into the building and stacked temporarily in a lobby adjacent to my office. On two occasions the arrival of these paraphernalia coincided with the appearance of numbers of *Scenopinus fenestralis* (Linnaeus) inside my office window. On the first occasion, on 20 June 1995, at least six were seen at one time. About three weeks later, on 5 July, and following the appearance of a new stack of beehive components in the lobby, several more specimens (number unrecorded) appeared on the office window. The concrete and brick construction of the small office and laboratory building did not appear to offer breeding habitat for the fly, which has a predaceous larva well known to feed on other insect larvae in nests of birds and mammals, as well as in dry domestic and warehouse situations. Taking this together with the coincidence in timing described above and given the known habitats and habits of the fly's larva, it is suggested that this represents circumstantial evidence that *S. fenestralis* may breed within beehives, living as a predator on the beetle and moth larvae known to occur in honey bee colonies - **JOHN R. DOBSON**, 46 Elmwood Avenue, Kenton, Harrow, Middx. HA3 8AH

***Trupanea stellata* and some other Tephritidae (Diptera) in Highland**

Scotland - A single female *Trupanea stellata* (Fuessly, 1775) was swept from ragwort (*Senecio jacobaea*) at Coul Links (NH 812946), a coastal dune system north of Dornoch, Sutherland, on 13.ix.1995. As in Britain *T. stellata* usually attacks *Senecio* spp. (I.M. White, 1988. Handbooks for the Identification of British Insects 10, part 5a, pp. 53 and 63) ragwort flowers and seed heads were collected in 1996, but no *T. stellata* were reared. K.P. Bland (1996. *Dipterists Digest (Second Series)* **3**(1), 31) identified a breeding population of *T. stellata* in the flowerheads of *Tripleurospermum maritimum* (Sea Mayweed; given incorrectly as Scentless Mayweed, *pers. comm.* from Keith Bland) at St Abbs, Berwickshire. In discussing its distribution he quoted old records suggesting a west coast presence north to Lewis. A further record from the east coast of Scotland was from the Gullane Bents dunes, East Lothian, NT 4784, 13.vii.1995, P.J. Chandler. The present record is the furthest north on the east coast of Scotland.

Extensions of the known geographical range (in comparison with L. Clemons, 1996. A Provisional Atlas of the Tephritidae (Diptera) of Britain and Ireland. *British Tephritidae Newsletter* No. 6) of nine other tephritid species can also be recorded.

Campiglossa argyrocephala (Loew, 1844): a predominantly Grampian species known also from the Black Isle, Ross-shire and now extended northwards by about 65km to North Dalchork Forest, Sutherland (NC 545215), 2.vi.1985. RDB3.

Campiglossa plantaginis (Haliday, 1833): an essentially coastal species now extended eastward by about 30km from the Beaulieu area, Ross-shire to Nairn Bar, Nairnshire (NH 9260), 3.vii.1991 and northward to Udale Bay, Black Isle (NH 7165), 19.vii.1992 (specimen collected by P. Kirby).

Dioxyna bidentis (Robineau-Desvoidy, 1830): previously recorded from Grampian though very little known in Scotland, a short series was taken at Coul Links (NH 812946) on the east coast on 18.ix.1995 and a single specimen near Ardoch, Loch Broom (NH 169894), on 7.viii.1986, on the west coast, together extending its range about 90km northwards. Notable B.

Dithryca guttularis (Meigen, 1826): a single pre-1970 record exists for Highland Region to which can now be added one for Easter Croachail (NH 3835) on 15.vi.1984 (collected by W. Ely) and Glen Strathfarrar (NH 3439) on 22.vii.1992 (collected by P. Kirby).

Tephritis bardanae (Schränk, 1803): there are very few Scottish records and only one for the Highlands (Weem Castle woods, Perthshire, NN 8499, mixed deciduous woods on a south facing slope, 20.vi.1992, P.J. Chandler) but a single new record from a specimen collected by N. Martin, in Inverness Museum and Art Gallery, extends the known distribution to Hilton of Cadboll, Black Isle (NH 874766), 4.vi.1993.

Tephritis cometa (Loew, 1840): not known in northern England and in Scotland recorded only at Dam Wood, the Black Isle, Ross-shire. A single female was beaten from *Pinus sylvestris* at Migdale Wood, near Bonar Bridge, Sutherland (NH 645907) on 20.v.1996.

Tephritis comura (Loew, 1844): this is the species most frequently encountered in south-east Sutherland and is now recorded from Spinningdale Bog (NH 665907), 8.v.1993, 10.v.1993, 25.v.1994, 30.v.1997 and 20.ix.1998; Migdale Wood (NH 645907), 29.iv.1998, 12.v.1993, 16.v.1997, 24.v.1995, 28.v.1994, 3.vi.1998, 12.vi.1995 and 26.vi.1995; Dornoch dunes (NH 806885), 7.vi.1996; Coul Links (NH 812946), 30.ix.1996 and North Dalchork (NC 545215), 7.vi.1984, all north of the Dornoch Firth. Notable B.

Tephritis leontodontis (De Geer, 1776): generally distributed in Scotland north of the Clyde-Forth valley system, this species was found at several sites in the Strathaird Peninsula of Skye (NG 5621 to NG 5515) during 4.vi-23.vii.1998. Notable B.

Xyphosia miliaria (Schränk, 1781): a nationally widespread and common species which can now be recorded from the Strathaird Peninsula of Skye (NG 5620) on 22.vii.1998 as well as Spinningdale Bog, 24.vi.1983 and 28.vii.1996, and Migdale Wood in south-east Sutherland, 23.vi.1984, 26.vi.1995, 30.vi.1994 and 20.vii.1982.

In addition *Chaetostomella cylindrica* (Robineau-Desvoidy, 1830), *Rhagoletis alternata* (Fallén, 1814), *Tephritis neesii* (Meigen, 1830) (collected by W. Ely), *Tephritis ruralis* (Loew, 1844) (Notable A), *Tephritis vespertina* (Loew, 1844), *Trypeta artemisiae* (Fabricius, 1794) (Notable B; a little known species with only 3 post-1970 localities recorded in Scotland: to these Migdale Wood and Spinningdale Bog can now be added) and *Trypeta immaculata* Macquart, 1835 (Notable A) have all been noted within, or close to, their already documented ranges.

All dates of captures fall within the aggregated monthly limits presented by L. Clemons (*op. cit.*), with the exception of one specimen of *T. leontodontis* collected on 6.x.1996 at Welltown of Easter Leys, Inverness-shire (NH 697412). We thank W. Ely, Dr P. Kirby, P.J. Chandler and Inverness Museum Records Centre for their kind permission to quote records. We are very grateful to Laurence Clemons for his comments on the manuscript - **P.F. ENTWISTLE**, Rhivra, Spinningdale, by Ardgay, Sutherland, IV24 3AD and **S.A. MORAN**, Museum and Art Gallery, Castle Wynd, Inverness, IV2 3ED

***Phaonia longicornis* Stein, 1916 (Diptera, Muscidae)
new to Britain**

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A single rather damaged female of a puzzling muscid fly was collected by PS from Knock alderwood (Mull) on 29 June 1991. The precise site from which the specimen was swept was a sward of rich herbage on a sandbank and an adjoining deep backwater channel on the east bank of the mouth of the River Ba just below the road-bridge. Alders and willows form the dominant canopy here over a rich ground-flora of marsh-plants. Despite its poor condition, the fly appeared to PS to agree with *Phaonia longicornis* Stein, as described by Ringdahl (1954) and Hennig (1955-64), a rare species previously known only from Scandinavia.

The specimen was forwarded to ACP who was able to confirm that it was indeed that species. The specimen has been placed in the collection of the Natural History Museum, London (BMNH). The full data was SCOTLAND, *Mid Ebudes*: Mull, River Ba, Knock, NM 544392, site 22a, 29.vi.1991 (P. Skidmore), 1 female.

Phaonia longicornis is a rather slender, slightly shining black species with sparse greyish pruinosity on thorax and abdomen, the former with the usual longitudinal median and lateral dorsal stripes ill-defined and most clearly seen in posterodorsal view. The median stripes are poorly separated. Legs entirely black or with knees extremely narrowly yellowish and calypters deep yellow. As the specific name implies, the first flagellomere appears rather longer than normal in lateral view, descending almost to the mouth-edge. The head of the male, with its relatively broad frons and large antennae, resembles that of *Phaonia magnicornis* (Zetterstedt), whilst the female is very reminiscent of *Lophosceles frenatus* (Holmgren) in body shape and colour.

The species can be easily distinguished from other British (and European) species of *Phaonia* Robineau-Desvoidy by the following diagnosis: male frons broad, at narrowest point equal to twice width of antennal flagellomere and with two pairs of reclinate orbital setae. Dusting on all of head brown from most angles. Antennal first flagellomere long and robust. Arista short-pubescent, the longest hairs hardly as long as basal diameter of arista. Presutural acrostichal setae absent. Three pairs of postsutural dorsocentrals. Notopleuron bare apart from the two setae. Prealar seta strong, longer than second notopleural seta. Meron bare. Calypters and wing-base deep yellow. Legs entirely black, or knees very narrowly yellowish. Fore tibia with a submedian posterior seta. Mid tibia without an anterodorsal seta. Hind tibia with the single near-posterodorsal bristle ("calcar") in apical third, but without a posteroventral apical seta. Full descriptions can be found in Ringdahl (1954: 39-40) and Hennig (1963: 838-839), but the genitalia of this species appear not to have been figured.

In the Handbook for British Muscidae (Assis-Fonseca 1968: 13), *Phaonia longicornis* will key through the subfamily Phaoniinae to couplet 17 (20). It differs from *Dialytina atriceps* (Loew) (now placed in *Phaonia*) and from species of *Lophosceles* Ringdahl by the strong prealar seta. In addition, the presence of three pairs of postsutural dorsocentral setae, yellow halteres, mid tibia with two posterior setae and the strikingly yellow calypters and wing-base will separate it from these taxa.

P. longicornis can be incorporated into Assis-Fonseca's (1968) keys to *Phaonia* species as follows:

Males

- 32 (33) All femora black.
 32a (32b) Tibiae black. Frons broad, at narrowest point equal to twice width of antennal flagellomere and with two pairs of reclinate orbital setae. Arista pubescent. Fore tibia without a submedian posterior seta. Body length 5.5 mm. *longicornis* Stein
 32b (32a) Tibiae yellow. Frons very narrow, at narrowest point equal to diameter of anterior ocellus and without orbital setae. Arista plumose. Fore tibia with a submedian posterior seta. Body length 5.5- 7mm. *palpata* (Stein)

Females

- 34 (31) Scutellum entirely black in ground-colour.
 34a (34b) Legs wholly black. Arista short-pubescent, the longest hairs hardly as long as basal width of arista. Head dusting (on fronto-orbital plates, parafacials, genae, occiput) brown to dark brown. *longicornis* Stein
 34b (34a) Legs with tibiae, and usually also mid and hind femora, yellow. Arista plumose, the combined plumosity equal to at least width of antennal flagellomere. Head dusting grey to light grey. (other species)

The species was originally described by Stein (1916: 27) from one male collected by Ringdahl at Höganäs in Skåne province, south Sweden. Ringdahl subsequently found females at Pälssjö, also in Skåne (Ringdahl 1917: 308); in the forest zone at Åre and Enafors in Jämtland province, central Sweden (Ringdahl 1951: 170) and at Bolmen in Småland province, southern Sweden (Ringdahl 1954: 39-40). These were the only records known to Hennig (1963: 838-839). Since then it has been recorded by Michelsen (1977: 128) from the Danish island of Bornholm (1 female) and by Rognes (1982: 41) from a number of localities in the Vest-Agder province of south-west Norway, including 1 female reared from a puparium. These records were summarised in Pont (1986: 125). Months of occurrence are April to July inclusive. Nothing is known of the biology of this species, but *Phaonia* larvae are obligate predators, developing in the soil, in dead or sickly trees, sap-runs, rot or water-holes, in injured herbaceous plants, in moss, decaying vegetation or humus (Skidmore 1985).

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***Graphogaster brunnescens* Villeneuve, 1907 (Diptera, Tachinidae) at Hartslock nature reserve in Oxfordshire**

Hartslock nature reserve is in south Oxfordshire, near Goring-on-Thames (V.C. 23, SU 616796). The reserve is owned and managed by BBONT, the Wildlife Trust for Berkshire, Buckinghamshire and Oxfordshire, and is part of a larger Site of Special Scientific Interest. The habitat is mainly unimproved chalk grassland, but this is surrounded by a combination of ancient hedges and mixed yew (*Taxus baccata*) woodland. It has a south-west facing aspect overlooking the Thames and although only 4.4 hectares in area, the reserve has produced records of a large number of nationally scarce invertebrates.

On 21.ix.1998 the authors were operating two mercury vapour lights at the reserve. As so often in 1998, the night was quite poor for moths, but a variety of other invertebrates were also recorded, of which the highlight turned out to be *Graphogaster brunnescens* (Villeneuve). The specimen came to an MV light being operated over a sheet; it was taken and initially determined by CMR. This fly is classified as RDB3 (Rare) by D. Shirt (1987. *British Red Data Books 2: Insects*. NCC, Peterborough). The key by R. Belshaw (1993. *Tachinid Flies - Diptera: Tachinidae. Handbooks for the Identification of British Insects* Vol. 10, Part 4a(i)) suggests a disjunct distribution, with records from northern Scotland and, in southern England, Wiltshire, Gloucestershire and Kent. Belshaw gave the flight period as late June to late August, so the current record extends both the distribution and the flight period (Belshaw, quoting Herting, stated that in Europe the flight period extends to the beginning of September). Belshaw listed four micro-moths as recorded hosts for *G. brunnescens*; none of these have been recorded at Hartslock, but the reserve's micro-moth list is not comprehensive. In any case, since the hosts come from three different families it seems likely that *G. brunnescens* is able to develop in a variety of smaller Lepidoptera.

The authors are grateful to Peter Chandler for confirming their determination - **CHRIS M. RAPER**, 22 Beech Road, Purley-on-Thames, Reading, Berkshire, RG8 8DS (email: chris.raper@parnassus.demon.co.uk) and **MARTIN C. HARVEY**, 10 Kiln Ride, Upper Basildon, Berkshire, RG8 8TA (email: martin@kitenet.freesserve.co.uk)

***Lonchaea affinis* Malloch (Diptera, Lonchaeidae) new to Britain and its separation from *Lonchaea laxa* Collin**

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During recent work on the ecology and status of Lonchaeidae in Britain we examined several specimens of *Lonchaea laxa* Collin, both from our own fieldwork and also specimens from the British Museum and the Verrall-Collin collection at the University Museum, Oxford. These fell into two geographical groups, one from southern England and Wales and one centred on the Scottish Highlands.

When Collin (1953) introduced the species *L. laxa* he provided a rather brief description which mainly concentrated on differences between it and *L. obscuritarsis* Collin, 1953. Crucially, he did not illustrate the male genitalia and only stated that they were different to *L. obscuritarsis* in having a "bluntly rounded end to the inner laminate process". Not unusually for Collin he did not designate a holotype, but listed a type series consisting of one male and six females from Scotland (Sutherland, Perthshire and Inverness-shire) and two specimens from England, a male from Barton Mills and a female from Newmarket, both in Suffolk. Full details of this syntype material were given by Pont (1995).

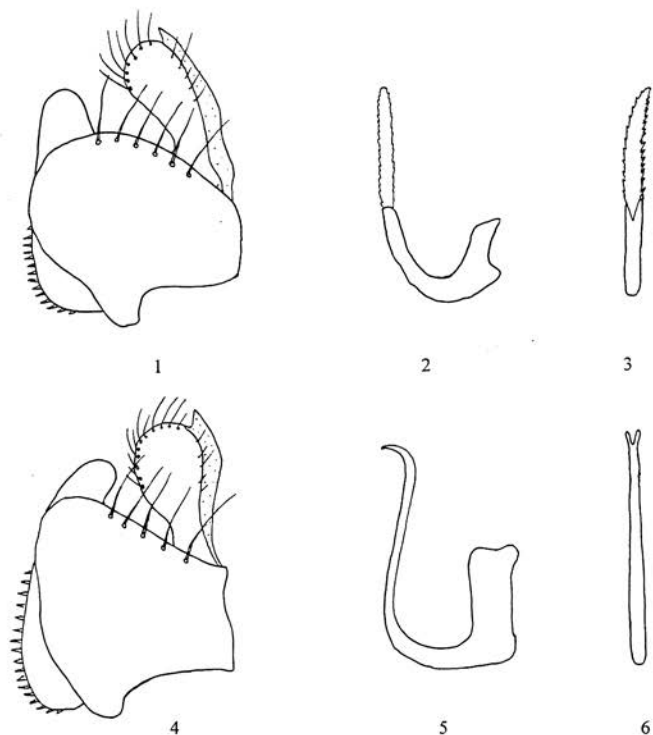
We obtained the Barton Mills syntype specimen from the Verrall-Collin collection and dissected the male genitalia. The only published illustration of the male genitalia of *L. laxa* is that of Hackman (1956), who identified a species common in Finland as *laxa*. Although the epandrium was very similar, the aedeagus did not correspond to that of the Collin syntype. Hackman's illustration showed the aedeagus to be an obviously jointed structure, whilst the aedeagus of the Barton Mills syntype of *laxa* was a one piece rather simple tube with a curved tip (Fig.5). There were obviously two species confused under one name.

McAlpine (1958) revised the lonchaeid types of Zetterstedt. He introduced to Europe *L. affinis* Malloch, previously only known from North America (described by Malloch 1920), when he came across a male and female. The *L. affinis* male came from Lycksele in Sweden and the female from Finland. McAlpine also stated that he had seen other European specimens from Abisko in Sweden. McAlpine considered that *L. affinis* was "identical with or very closely related to *L. laxa*". His detailed illustrations showed that the male of *L. affinis* had a jointed aedeagus with the apical part having serrated margins (Fig. 2), closely resembling the illustration of *L. laxa* in Hackman (1956). It seemed likely that *L. laxa* sensu Hackman (1956) was *L. affinis* Malloch. To confirm this we examined a male *L. laxa* from the Hackman collection (Utsjoki: collected by R. Frey) and on dissection this specimen has proved to have identical genitalia to *L. affinis*. It therefore seems probable that most of the northern European material previously attributed to *L. laxa* is actually *L. affinis*.

These findings led us to re-examine material from southern Britain and from the boreal woodlands of the Scottish Highlands. Although Collin (1953) had taken six females in Scotland and we had collected another five there was only one Scottish male available, a syntype of *laxa* from Aviemore. On dissection of the genitalia this proved to be a specimen of *L. affinis*. This raises the probability that all the other "*laxa*" females from the Scottish Highlands are in fact *L. affinis*. Further comparative work on the morphologically similar females will need to be

undertaken to establish if this is so. In order to fix usage of the name *laxa*, the Barton Mills specimen is here designated as lectotype of *laxa* Collin.

At present the true *L. laxa* of Collin is only known from southern England and Wales. Apart from the lectotype, we have seen only one other male from Oxwich in the Gower peninsula, Glamorgan, Wales taken by E.C.M. d'Assis-Fonseca. We have reared a female from under the bark of fallen beech (*Fagus sylvatica*) at Burnham Beeches NNR in Buckinghamshire.



Figs 1-3. *Lonchaea affinis* Malloch (after McAlpine 1958). 1, lateral view of male epandrium and associated structures; 2, lateral view of aedeagus; 3, ventral view of aedeagus.

Figs 4-6. *Lonchaea laxa* Collin (drawn from lectotype). 4, lateral view of male epandrium and associated structures; 5, lateral view of aedeagus; 6, ventral view of aedeagus.

On gross adult characters both *L. laxa* and *L. affinis* are almost identical. Both belong to a group with bare eyes, a single row of bristles on the mouth edge, dark squamal hairs, partly yellow tarsi, bare scutellar dorsum and several stigmatal hairs. The chief differences between *L. affinis* and *L. laxa* are in the structure of the male genitalia. In both species the epandrium is rather similar in shape (Figs 1 and 4) but the aedeagus is clearly different in the two species. In *L. affinis* the aedeagus is in two segments, the apical segment being serrated along its lateral edges (Figs 2 and 3). In *L. laxa* the aedeagus is in one section, long and slender and somewhat sinuous with a bifurcated tip (Figs 5 and 6).

Finding a specimen of *L. affinis* within the type series of *L. laxa* highlights some of the problems with lonchaeid taxonomy. The adults are in general rather similar in appearance with relatively few reliable characters on which to make species determinations. In many cases, species identity can only be confirmed with certainty when the male genitalia are dissected and examined.

In Britain *L. affinis* would seem to be confined to the Scottish Highlands, where females have been taken at several localities, the earliest records being from Rannoch and Aviemore in June and July 1898. Details of the material examined are given below. Despite searching over several years we have not, however, been able to find this species as a larva or puparium or to find another adult male, so full details of its ecology are still unclear. However, Hackman (1956) recorded rearing from larvae in coleopterous galleries in the bark of Norway spruce *Picea abies* (as *excelsa*), suggesting that *affinis* may be associated with pine (*Pinus*) in Scotland.

Scottish material examined of *Lonchaea affinis* Malloch: 1 male, Inverness-shire, Aviemore, 8.vi.1913, J.E. Collin, University Museum of Natural History, Oxford.

Probable females of *Lonchaea affinis* Malloch (in National Museums of Scotland, Edinburgh unless otherwise stated): 1 female, Inverness-shire, Aviemore, 20.vi.1903, J.J.F.X. King, Hunterian Museum; 1 female, Inverness-shire, Dores, 28.v.1991, I. MacGowan; 1 female, Inverness-shire, Nethy Bridge, 25.vi.1997, E.G. Hancock; 2 females, Ross-shire, Beinn Eighe, Malaise trap, vi.1992, P.W. Brown.

Acknowledgements

We thank the authorities of the Oxford University Museum, the Hunterian Museum in Glasgow and the Zoological Museum, Helsinki for loaning material.

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Three species of leaf-mining Agromyzidae (Diptera) on globeflower, *Trollius europaeus*, new to Britain

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In the British Isles, *Trollius europaeus* (Ranunculaceae) grows locally in damp places in grassland and woods in Wales, Scotland, northern England and north-west Ireland, often in upland localities (Stace 1991). *T. europaeus* has also been planted extensively in gardens, both in its native form and as garden cultivars and hybrids with Asiatic species (McIntosh 1989). In mainland Europe, three species of agromyzids are recorded mining the leaves of *T. europaeus*, while a further species feeds in the seed heads (Spencer 1976, 1990). The three leaf-miners, namely *Phytomyza trollii*, *P. trolliivora* and *P. trolliophila*, have now been added to the British list.

Phytomyza trollii Hering, 1930

A single male of this species was taken (by DH) in a yellow water trap at Malham Tarn (SD 8967), North Yorkshire (V.C. 64), in mid-September 1980. The trap was situated on a lawn above wetlands, where *Trollius* was growing. In subsequent years, searches were made for the leaf-mines but none was ever found, nor any further specimens captured. Confirmation of identity was from the genitalia.

Phytomyza trolliivora Hering, 1935

A single male of this species was also taken (by DH), in a white water trap (DCCT 85) at Bishops Middleham quarry, County Durham (NZ 3332) during September 1981 as part of a conservation survey instigated by the Sunderland Museum. Whilst no further details are available as to local botany etc., it is more than probable that *Trollius* occurs there. Identity was confirmed from the male genitalia, although these were somewhat smaller than expected for the species.

On 28 July 1991 ten agromyzid leaf-mines were collected (by HCJG) from young *T. europaeus* growing in the Inverewe Gardens (NC 8682), near Gairloch in the Highland region of Scotland (V.C. 105). All but one of the mines were empty, the larvae having left through the lower surface, presumably to pupate in the soil. The single remaining larva was parasitised by an ectoparasitoid wasp. The parasitoid was successfully reared and proved to be a male of the common and polyphagous species *Diglyphus isaea* (Walker, 1838) (Hymenoptera: Eulophidae). The mines were true blotches (i.e. not coalesced linear mines), that tended to fill a lobe of the palmate leaf. Near the beginning of the mine, the frass was concentrated in roughly concentric rings to form a dark spot and elsewhere the frass was arranged in loose series of lines and arcs. Mines often appeared rusty and mottled. Comparison of these mines with the illustrations of the leaf-mines of *P. trolliivora* in Hering (1957) and with the key to the *Trollius* leaf-miners in Spencer (1976), confirm that they were made by *P. trolliivora*.

Phytomyza trolliophila Hering, 1949

A few blotch-like leaf-mines in the lobes of the leaves of *T. europaeus* were found (by KPB) at Glen Fender Meadows (NN 9067), Perthshire (V.C. 89) on 21.x.1996. The mines appeared to form "false blotches" due to the coalescence of linear feeding and, as all contained puparia, they were presumed to belong to *P. trolliophila*. Unfortunately only parasites were reared, namely two *Cremnoides atricapillus* (Gravenhorst, 1815) (Hymenoptera: Ichneumonidae) (emerged 25.v.1997) and two male miscogasterines (Hymenoptera: Pteromalidae) (emerged 19 and 30.vi.1997). These specimens key to *Sphaeripalpus* (= *Gitognathus*) *fuscipes* Walker in Graham (1969) and Bouček and Rasplus (1961), a species that has been reared from agromyzids. However, further study is needed to confirm the identification of these parasitoids. On 13.ix.1997 a further collection of leaf-mines in *Trollius* was made in Glen Fender Meadows (NN 8967). Many of the mines still had actively feeding larvae. By 20.ix.1997 all larvae had ceased feeding and pupated. Some 50 larvae had pupated in their leaf mines, while five larvae had left their mines to pupate. Parasitoid chalcid wasps began to emerge on 29.iv.1998. Some 20 chalcids and nine days later the first agromyzid emerged. In all, 17 *Phytomyza trolliophila* (identity confirmed from male genitalia and grey jowls) emerged from the larvae that had pupated in the mines and two *Phytomyza trolliivora* (yellow jowls) emerged from the five puparia that pupated externally. Inspection of the preserved leaf-mines confirmed that this dichotomy should have been predicted. The numerous parasites that emerged consisted of 26 *Chrysocharis pubicornis* Zetterstedt, 1838 (Hymenoptera: Eulophidae) (9 males, 17 females), a very common and polyphagous parasitoid of agromyzids, especially *Phytomyza* species that pupate in the mine, usually attacking the pupae and less frequently the larvae (Hansson 1985), and one *Dacnusa* species (Hymenoptera, Braconidae). The braconid keys in Griffiths (1966) to the vicinity of a group of species that attack *Phytomyza* species on Ranunculaceae (and is nearest to *D. aquilegiae* Marshall). However, comparing the specimen with Griffiths' descriptions and with material in the Natural History Museum, it differs from all described species, particularly in being small and dark and in the lack of pubescence on the mesonotum. More specimens are needed but it could very well be an undescribed species.

Leaf-mines in *Trollius* in Britain can be separated using the following key:

1. Mine a primary blotch. 2
- Mine linear, but possibly forming a secondary blotch. 3

2. Early mine persisting as a black spot formed from roughly concentric rings of dark frass; later frass in rough arcs or lines; pupation externally. *Phytomyza trolliivora*
- No such dark spot; dark granular frass in irregular patches; larva with head capsule; pupation externally. Sawfly, *Pseudodineura enslini* (Hering, 1923)

3. Simple white linear mine widening rapidly; frass deposited in scattered black spots; pupation externally. *Phytomyza trollii*
- Linear mine closely winding; the adjoining sections usually forming a secondary pseudo-blotch; frass variably coloured and in diffuse patches; pupation internally. *Phytomyza trolliophila*

The male genitalia of all three *Phytomyza* species are illustrated in Spencer (1976, 1990).

Acknowledgements

We are grateful to Dr Martin Schwarz of Lintz, Austria, for identifying the two female *Cremnoides atricapillus*.

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***Zodion notatum* (Meigen) (Conopidae) new to Shropshire and Gloucestershire**

- A few individuals of a *Zodion* species were observed in Walcot Park (SO 345838), Shropshire, 29.vii.1996 and one retained for identification proved to be the rarer of the two British species, *Z. notatum* (Meigen). The flies were hovering around flowerheads along a sheltered pathway amongst scrub and scrub woodland on the lower slopes of an area of relict ancient pasture-woodland. Other Conopidae were also present: *Conops flavipes* Linnaeus, *C. quadrifasciatus* De Geer and *Sicus ferrugineus* (Linnaeus).

A single specimen was also swept from a steep bank of ungrazed limestone grassland in Snobs Farm Nature Reserve (SO 890085), near Slad, east Gloucestershire, 25.v.1998. This site lies within a sheltered Cotswold valley and the specimen was taken on the south-facing slopes.

I wish to thank Dave Clements for confirming the identity of the Shropshire *Zodion* -
KEITH ALEXANDER, National Trust, 33 Sheep Street, Cirencester, Gloucestershire GL7 1RQ

Corrections - In the paper by Graham Rotheray and David Robertson "Breeding habits and early stages of seven saproxylic acalypterates (Diptera)" in the previous issue of *Dipterists Digest* 1998 **5**, 96-107, the heading on page 103 was unfortunately omitted and should read "***Stegana coleoprata* (Scopoli) (Drosophilidae)**". The caption for Fig. 27 on the preceding page should be ***Stegana nigrithorax*** (not nigrothorax).

The second author of the paper by Lita Greve *et al.* on p. 95 of the same issue should be Reidun Pommersche (not Pommereche).

Observations on the Distribution, Phenology and Ecology of *Rhamphomyia physoprocta* Frey (Diptera, Empididae)

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Rhamphomyia physoprocta Frey is a rare species in Britain, having been taken in Hampshire, Dorset, Buckinghamshire, Norfolk and Yorkshire (Crossley 1993, McLean 1986, Plant 1994). It was recommended to be accorded RDB1 status (endangered) by Falk (1991) although Falk and Crossley (in preparation: draft issued in 1994) have proposed that this should be revised to a proposed RDB3 (rare) status. The species has also been recorded from Holland (Beuk 1995) and is considered rare in central Europe, where it has been taken near Pisek, Bohemia, from European Russia and from near Lednice (Bartak *pers. comm.*). In 1993, I recorded *R. physoprocta* from two localities in Dorset and speculated that it is well established in the county (Plant 1994). It is now known from nine 1km grid squares in Dorset (Fig. 1) and its British stronghold is probably Poole Basin and the Avon Valley in Dorset and the New Forest in Hampshire. In this area at least, *R. physoprocta* invariably occurs on damp peat soils, usually in association with ancient oak (*Quercus*) woodland. I have found it occasionally flying over open heath, but never more than 50m from adjoining woodland.

Crossley (1993) reported *R. physoprocta* from a site adjoining the old course of the River Derwent at Wheldrake Ings, Yorkshire and from bushes along the side of a large dyke nearby. Roy Crossley (*pers. comm.*) has also identified a single female in material caught 1-8.vii.1996 in a Malaise trap operated by Dr J.W. Ismay at Burnham Beeches, Buckinghamshire. The trap was sited near Fallén beech (*Fagus*) and pine (*Pinus*) at the Moat (SU 946856), which is the site of an ancient homestead. This site formerly experienced some winter flooding, but in recent years has been much drier, although the surrounding woodland contains many seasonally wet areas with *Molinia* (Helen Read *pers. comm.* to John Ismay).

In central Europe Bartak (*pers. comm.*) found it amongst *Phragmites* surrounded by old deciduous woodland. In Dorset *R. physoprocta* can be abundant in certain woodlands. During June and July 1996, males were commonly encountered in open areas throughout Daymans Wood (SZ 1497) on the flood plain of the River Avon. In contrast, at Gold Point Wood (SY 9789), *R. physoprocta* was locally abundant in damper areas during 1997 and 1998 but was seldom encountered in dryer more heathy areas of the wood.

Gold Point Wood is a relict ancient woodland surrounded by heathland and estuary on the RSPB reserve at Arne. Part of the wood is relatively open, containing mature and massive oaks growing on peaty soil 50-70m apart. In May 1998 I collected samples of approximately 3kg of the top 10cm of woodland soil from 14 localities with different shading, ground flora or water content. Six *R. physoprocta* adults subsequently emerged from two samples. Five insects were from a site which had held standing water during the winter and had almost no ground vegetation with a bare carpet of rotting leaves when the sample was taken. The other insect emerged from a sample taken from a damp area with sparse vegetation of grasses and honeysuckle (*Lonicera*).

A Malaise trap positioned equidistant between the trees and 0.5-3.0m above ground in Gold Point Wood during 1997 caught 64 adult *R. physoprocta*. Peak emergence was during the last two weeks of June and the first two weeks of July (Fig. 2). It is interesting that the ratio of females to males in the Malaise trap was 11.8:1 whereas the ratio was 1.0:1 in the small sample

(n = 6) reared from soil. Males usually predominate over females caught by sweeping vegetation up to a height of about 4m. However, at 11.00 a.m. on 6 June 1998 both sexes were swept from ground vegetation in the wood. Many of these insects were teneral and clearly had recently emerged. The morning was overcast and cool, becoming hot and sunny by early afternoon when females could not be found and males were at rest on lower branches of trees or swarming. These observations suggest differences in behaviour or activity between the sexes; possibly the females spend more time at rest than males, or crawl rather than fly towards the canopy on emergence. Both sexes reared from soil samples emerged during the morning and were positively phototactic, preferring to rest on the side of the rearing cages facing a sunlit window.

Males form "swarms" or at least aggregations of up to about 10 individuals in sunlit clearings, open glades, woodland margins or even shafts of sunlight penetrating shading vegetation. Aggregations form 1-4m above the substrate and rapidly disperse when approached by an observer. The swarming flight is very distinctive and once recognised by the observer can be used reliably to identify the species from a distance of up to 10m. Swarming involves very rapid and emphatic zigzags, short spirals and parallel flying between two or more individuals within a quite limited volume of space. Occasionally, an individual will suddenly change direction and fly rapidly to a new location several metres away before resuming the "dance". The reflective milk-white wings of swarming males are conspicuous in direct sunlight and presumably have a signalling function. I have noted co-swarming with Chironomidae, *Empis praevia* Collin and *E. aestiva* Loew (Diptera, Empididae) on several occasions.

The function of these male swarms is not entirely clear. The small size and extremely rapid movements of swarming individuals make observation difficult. However, females were not seen to enter a swarm and males were never seen to leave one in pursuit of nearby females. Males were never seen to be carrying prey but on one occasion a male was seen to pursue and catch a chironomid midge. As yet there is no confirmation of the likely epigamic function for these male aggregations.

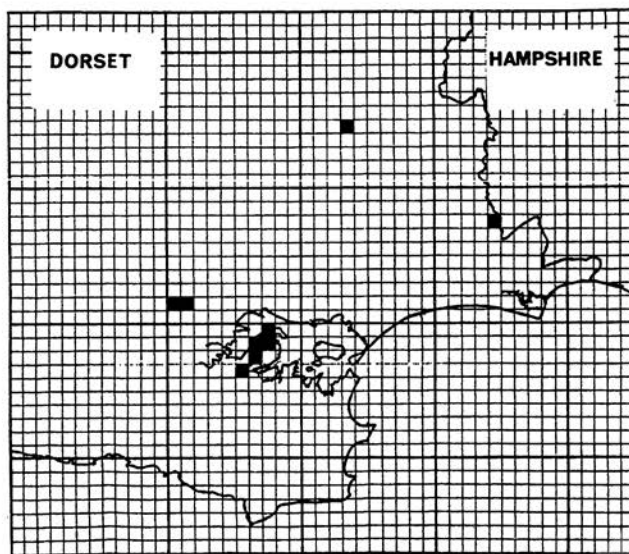


Fig. 1. Distribution of *Rhamphomyia physoprocta* in south east Dorset.

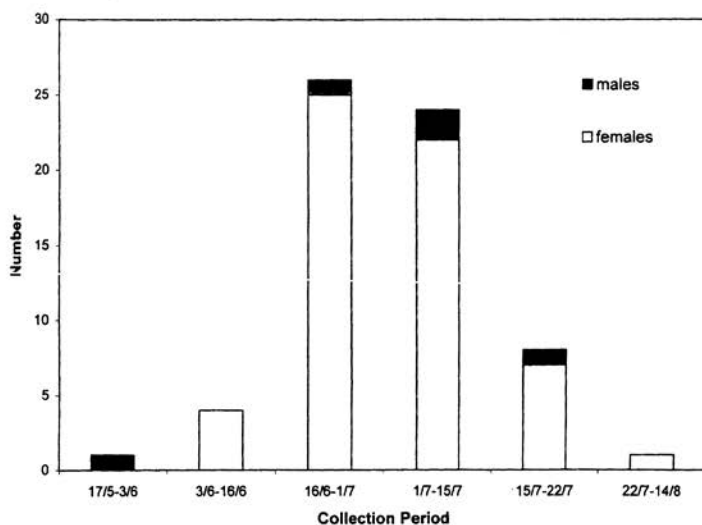


Fig. 2. Numbers of *Rhamphomyia physoprocta* caught in a Malaise trap at Gold Point, Arne during 1997.

Important habitat requirements for *R. physoprocta* include provision of suitable well lit areas for male swarming and adjacent damp soils for immature stages. It is interesting that known sites include damp hollows in woodland, a *Phragmites* stand and an old river course, suggesting that ephemeral waterlogging of soils may be important. However, it is not clear why the species can be abundant in some such sites but absent from other apparently suitable locations.

Acknowledgements

I am grateful to all the landowners who allowed access to their land. In particular, I would like to thank the Royal Society for the Protection of Birds for access to their reserve at Arne. Roy Crossley and Miroslav Bartak kindly made available their own records of *R. physoprocta*. John Ismay and Helen Read commented on the habitat association at Burnham Beeches.

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***Chaoborus flavicans* (Meigen) (Diptera, Chaoboridae), a Phantom Midge new to Ireland**

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The Chaoboridae are a poorly known group in Ireland. To date, only three species have been recorded compared with six in Britain (Ashe *et al.* 1998, Chandler 1998). These are *Chaoborus crystallinus* (De Geer), *Mochlonyx fuliginosus* (Felt) and *M. velutinus* (Ruthé). Nomenclature follows Chandler (1998). The presence of these species is based on a few scattered records in the literature (Haliday 1833; Hogan and Haliday 1855; Grimshaw 1912; Edwards 1929, 1930; Freeman 1950) and it has not yet been possible to verify all the identifications. The most commonly mentioned species is *M. velutinus* (under the synonym *M. culiciformis* (De Geer)).

Over a period of years, the authors have collected a small number of chaoborid adults and immature stages in various parts of Ireland. As a result a species new to Ireland, *C. flavicans* (Meigen), was found to occur in several localities. The specimens were identified using Saether (1997). In addition, P. J. Chandler (*pers. comm.*) has very kindly made available his unpublished Irish data on the same species.

The records are as follows:

Cork: Garrylucas Marsh, Old Head of Kinsale (W 6143), 29.iv.1984, pupa (PA). *Kerry*: O'Sullivan's Cascade beside the Lower Lake (Lough Leane), Killarney (V 9188), 27.viii.1987, three males (JPOC). *Kildare*: Newbridge Fen (N 7616), 27.v.1984, male (PJC). *Mayo*: Townaghmore, Lough Conn (G 2206), 29.vi.1996, pupa (PA). *Offaly*: Charleville Woods, by lake (N 3122), 27.v.1984, male, 15.vi.1985, female (PJC). *Waterford*: Belle Lake (S 6605), 5.vii.1990, male (JPOC). *Westmeath*: Lough Ballynafid (N 4060), 16.vi.1985, two males, one female (PJC). *Wexford*: pond near Killowen (S 7121), 19.vi.1990, two males (JPOC and M.A. O'Connor).

Larvae of *C. flavicans* are most commonly found in lakes but they frequently occur also in ponds. The species has a great ecological plasticity and is able to withstand very adverse conditions. Larvae have been shown to be able to survive without oxygen for 18 days and without food for a maximum of 44 days (Saether 1997). It is likely therefore that *C. flavicans* is widely distributed in Ireland.

Voucher specimens have been presented to the National Museum of Ireland.

Acknowledgements

The authors are very grateful to M.A. O'Connor for her help with field work and to P. J. Chandler for his kindness in providing records.

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Corrections and changes to the Diptera Checklist (1) - Editor

It is intended to publish here any corrections to the text of the recently published Diptera checklist (publication date was 13 November 1998; the final "cut-off" date for included information was 17 June 1998) and to draw attention to any subsequent changes. All readers are therefore asked to inform me of any errors or changes and I would like to thank all those who have already brought these to my attention. Corrections in Cecidomyiidae were supplied by Margaret Redfern, and Raymond J. Gagné who has compared the list with his world catalogue of the family in preparation.

As indicated in the Review of the German checklist (p. 62 below), a comparison has been made with the British list to assess the differences. This led to detection of some errors in the British list, which are included among those indicated below. There are also about 20 differences in specific nomenclature, authorship or publication dates, of which the validity has not yet been resolved and most of these have been referred to specialists.

On page ix of the Introduction to the British Checklist it was mentioned that a new edition of the ICZN Code would be coming into force at the beginning of 1999. However, the publication of the 4th edition of the Code was delayed and it is now expected to come into force on 1 January 2000.

In the notes below where names of genera and species are given as in the checklist, authorship is not stated here. Corrections are in page order; changes are listed under families; names new to the British list are given in bold type.

The notes below result in loss of five names due to synonymy (indicated by *) and addition of 16 species, a net gain of 11 resulting in a new total of 6679 species.

Corrections

- p. 24 Line 7 from bottom, delete b in Robbins (1995b); only one reference in that year is cited.
- p. 27 Delete *Anthodiplosis* from synonymy under AMETRODIPLOSIS.
APHIDOLETES *urticae* should be amended to *urticae*.
Delete *acarisuga** under ARTHROCNODAX (this species was also listed, correctly, under FELTIELLA).
The authorship of *Camptodiplosis auriculariae* should be amended to Buxton & Barnes.
- p. 28 The authorship of *Contarinia artemisiae* should be Rübsaamen, not Kieffer.
- p. 29 The date for *Dichodiplosis langeni* should be 1910.
The species name *affinis* was omitted before Barnes, 1928 in LESTODIPLOSIS.
- p. 30 The date for *Monobremia subterranea* should be 1913; it was a nomen nudum in 1898.
- p. 31 Under *Lasioptera arundinis* the host should be *Phragmites australis* (not *communis*).
Under *L. rubi* the synonym and homonym *rubi* Heeger in Loew, 1850 cited as a nomen nudum, was validated in 1851; this does not affect the citation for *rubi* (Schrank, 1803).
- p. 33 The original genus for *Dasineura graminis* was *Dasyneura* (not *Perrisia*) so the parentheses should be deleted.
- p. 36 The authorship for *Rabdophaga nielsenii* should be Kieffer in Kieffer & Nielsen.
Rabdophaga rosaria should be replaced by its senior synonym *strobilina* (Bremi, 1847 - *Cecidomyia*).
- p. 46 The last sentence of the introduction to Trichoceridae should be deleted, as the two species mentioned are not listed, but dealt with in Note 1.
- pp. 62-67 The last two names on each of these pages is listed as being on the following page in the Index. METRIOCNEMUS appears elsewhere on both pages 63 and 64.
- p. 64 The date for *Orthocladius maius* should be 1942, not 1992.
- p. 79 LEPTOGASTERINAE should be LEPTOGASTRINAE and the generic name LEPTOGASTER should appear before Meigen, 1803 in the following line.
The author of NEOMOCHTHERUS should be Osten Sacken without a hyphen.
- p. 82 The date for *Platypalpus aristatus* should be 1926, not 1961.
- p. 102 Under DISNEY 1981a and 1981b, the volume number should be 116: not 110.
Under DISNEY 1982i, the volume number should be 33: not 37.
- pp. 104, 106 and 108 References to Note 26 under CHEILOSLIA, LAPPOSYPHUS and SPHAEROPHORIA should be to Note 27; p. 105. Add Note 26 under CRIORHINA.
- p. 120 The second sentence in the introduction to Lonchaeidae is inaccurate, as *Silvestrodasiops* was not recognised in the checklist, but listed as a synonym of DASIOPS.
- p. 136 *Melanagromyza tripolii* author should be Hering, 1957, as description of the larva by Hering preceded (in April) that of the adult by Spencer, 1957 (in December).
Ophiomyia aquilegiana author's name is correctly spelt Lundqvist (not Lundquist).
- p. 137 *Liriomyza huidobrensis* author should be in parentheses: (Blanchard, 1926 - *Agromyza*).
- p. 138 *Liriomyza trifolii* authorship should be (Burgess in Comstock, 1880 - *Oscinis*).
Phytomyza autumnalis author should be Hering, 1957; although based on the larva only, (the adult being described by Griffiths, 1959) the name is valid from the earlier date according to ICZN Code Article 17 (2) as stated in the introduction to Cecidomyiidae.
- p. 147 Under RHOPALOPTERUM, *atricilla* should be on a separate line to *anthracinum*.
- p. 157 The citation of MÁCA 1980 should be 77: 328-346. That given is for his 1977 paper.
- p. 166 Tribe Hydrophorini should be Hydrophoriini.
- p. 168 The authorship of *Pegomya rubivora* should be "in Slingerland" (not Slingusland).
- p. 170 *Fannia atripes* authorship should be Stein, 1916 without parentheses, not 1895.
- p. 215 Page xii listed under melanosoma should be under MELANOSTOMA.

INDEX There was a problem with the programme used to produce this, which deleted generic names spelt the same as species names. The 44 such names identified (e.g. *ATHERIX*) were entered by hand; unfortunately some were missed and 11 have been noticed (*BREMIA*, *CULICOIDES*, *DIPLOSIS*, *ECCOPTOMERA*, *FLABELLIFERA*, *HELIOPHILUS*, *MACROPTERA*, *NODICORNIS*, *OPACIFRONS*, *PLATYCEPHALA*, *POECILOPTERA*); in these cases the genus is omitted and page numbers for the genus appear under the species name.

Changes

Limoniidae. *Idiocera connexa* of the British list is a misidentification and should be replaced by *I. sziladyi* (Lackschewitz, 1940 - *Gonomyia*) as suggested in the Palaearctic Catalogue (this has been confirmed from genitalia figures supplied by Jaroslav Starý to Alan Stubbs, *pers. comm.*).

Mycetophilidae. The changes in *ALLODIA* and *EXECHIA* attributed to Kallweit (in press) were published by U. KALLWEIT (1998. *Studia dipterologica* **5**, 153-157).

Sciaridae. Some changes attributed to MENZEL & MOHRIG 1998 were not as indicated made in the monograph cited, which is not yet published, but did appear in a separate paper by these authors in *Studia dipterologica* **5**, 351-378 (published 29 December 1998). This included all the changes in generic status or synonymy, the description of the new genus *PSEUDOLYCORIELLA*, subgenus *DIVERSICRATYNA* and species *Bradysia arcana*, *Scatopsiara neglecta* and *Sciara ulrichi*. Other changes, i.e. new specific synonymies and corrections of misidentifications, attributed to MENZEL & MOHRIG 1998, have not yet been published by these authors.

New changes affecting the British list in this paper were description of a new subgenus **ALLOZYGONEURA** Menzel & Mohrig, 1998 to include *Zygoneura calthae* and synonymy of *Scatopsiara pusilliformis** with *S. pusilla* (these two being listed separately in the checklist).

Cecidomyiidae. *Dasineura galiicaulis* Stelter on *Galium verum* was added by J. ROBBINS (1998. *Cecidology* **13**, 31). As Robbins stated, this name was given in Buhr (1964. *Bestimmungstabellen der gallen (Zoo- und Phytocecidien) an Pflanzen Mittel- und Nordeuropas*. Band 1. Fischer, Jena) and attributed to Stelter. However, as no description of the insect was published and, as indicated in the introduction to this family, names based only on galls and published after 1931 are not valid, this name must be treated as a nomen nudum (as it was by SKUHRAVÁ 1986) and should not be included on the British list.

The monograph of Lestremiinae by M. JASCHHOF, cited as Jaschhof (in press) was published: 1998. *Studia dipterologica Supplement* **4**, 1-552.

Tetraneuromyia ramosa was transferred to **PARATETRANEUROMYIA** Spungis, 1987 by V. SPUNGIS (1987. *Latvijas Entomologs* **30**, 15-42).

Contarinia floricola (Oettingen, 1927 - *Phytophaga*) is an earlier name for *C. poae* according to Raymond Gagné (*pers. comm.*)

Trichoceridae. STARÝ (1998. *Studia dipterologica* **5**, 175-186) has redefined subgenera in **TRICHOCERA**, such that most British species now belong to subgenus **METATRICHOCERA** Dahl, 1966. Only *hiemalis* and *major* remain in **TRICHOCERA** sensu stricto.

Scatopsidae. *Neorhegmoclemina catharinae*, cited as added by Peacey (in press), was added by M. PEACEY and J.W. ISMAY (1998. *Entomologist's monthly Magazine* **134**, 351-352).

CHANDLER (1998. *Dipterists Digest (Second Series)* 5, 83-88) added the genus **PHARSOREICHERTELLA** Cook, 1956 and its species *P. simplicinervis* (Duda, 1928 - *Scatopse*). In the present issue changes are made to ANAPAUSIS, including confirmation of *rectinervis* and addition of *dalmatina* Duda, 1928 and *floricola* Chandler, 1999.

Dolichopodidae. SYSTENUS has been revised following examination of type specimens by C. KASSEBEER (1998. *Dipteron* 1, 10-20), resulting in changes to the British list. *S. tener* is restored to specific rank. *S. pallidus** is, as suggested in Note 8, synonymised with *S. pallipes* and the synonymy of *alpinus* with *scholtzii* is confirmed.

Campsicnemus umbripennis Loew, 1856 subspecies *hispanicus* Strobl, 1899 has been found in Dorset by Ivan Perry (*pers. comm.*) (determined by Peter Dyte) (cited in *Bulletin of the Dipterists Forum* No. 47, p. 24); it will be added formally in the next issue of *Dipterists Digest*.

Syrphidae. The *Platycheirus* species mentioned in Note 27 was described as *P. splendidus* Rotheray, 1998 (*Entomologist's Gazette* 49, 271-276).

Pipunculidae. *Eudorylas caledonicus* Ackland, 1999 is described in the present issue.

In the German checklist the name *opacus* Fallén, 1816 is used for *Microcephalops vestitus*. Apparently this synonymy is correct at the specific level, but its acceptance results in other problems because *opacus* is the type-species of EUDORYLAS and would involve transfer of this name to *Microcephalops* and application of a new name to the present concept of *Eudorylas* (Marc de Meyer *pers. comm.*). An application to ICZN is proposed (De Meyer and Skevington in preparation) in order to maintain current usage so replacement of *vestitus* is not accepted here pending this application.

Lonchaeidae. *Lonchaea affinis* Malloch, 1920 is added in the present issue.

Pallopteridae. The species mentioned in Note 3 has been described as *Palloptera anderssoni* Rotheray & MacGowan (1999. *British Journal of Entomology and Natural History* 11, 175-179).

Tephritidae. The record of *Bactrocera cucurbitae* (Imported species) was reported by A.A. ALLEN (1999. *Entomologist's Record and Journal of Variation* 111, 36).

Sciomyzidae. *Pherbellia stylifera* Rozkošný, 1982 is added in the present issue (p. 29).

Agromyzidae. Details of *Phytomyza diversicornis* and *P. rostrata* were given by K.P. BLAND (1999. *Entomologist's Gazette* 50, 51-52) and of *Aulagromyza lucens* by J.C. DEEMING (1999. *British Journal of Entomology and Natural History* 11, 172-174). The three *Phytomyza* species associated with *Trollius*, included in the checklist, are confirmed in the present issue.

In the German checklist, M. VON TSCHIRNHAUS (1999. Agromyzidae, pp. 118-130), *Cerodontha* (subgenus *Dizygomyza*) *gallica** is newly synonymised with *C. (D.) morosa*.

Braulidae. *Braula schmitzi* has been confirmed and fully characterised by J.R. DOBSON (1999. *British Journal of Entomology and Natural History* 11, 139-148).

Chloropidae. In the German checklist (H. WENDT. 1999. Chloropidae, pp. 140-143) *Elachiptera unisetia* is newly synonymised with *austriaca* Duda, 1932; this synonymy was based on examination of types of both species so is accepted here.

J.W. ISMAY (1999. *Entomologist's monthly Magazine* **135**, 1-37) has added the genus CHLOROPSINA Becker, 1911 including two new species *varleyi* Ismay, 1999 and *pulicaria* Ismay, 1999; he also formally added *Chlorops scutellaris*.

Chyromyidae. *Gymnochiromyia mihalyii* Soós, 1979 was added by M.J. EBEJER (1998. *Studia dipterologica* **5**, 19-29).

Ephydriidae. Late changes were made to the checklist to recognise that all species of HYDRELLIA included by Collin (1966) were British, as shown by specimens in his collection. The 1976 list had included some changes from this paper but not those indicated on p. 159; two species cited from British localities (*concolor* and *fusca*) and two others without locality details (*albifrons* and *fascitibia*) were thus added, but one other (*nigricans*) was not included because Collin queried his identification; this was thus assumed to require confirmation, but as later authors have evidently accepted Collin's interpretation of the name, it is considered here that *H. nigricans* (Stenhammar, 1844 - *Notiphila*) should be added to the list.

PHILYGRIA has been revised by V. HOLLMANN-SCHIRRMACHER (1998. *Studia dipterologica Supplement* **5**, 1-144), resulting in the following changes to the British list:

NOSTIMA was synonymised with *Philygria* and *picta* transferred; although *semialata* was not mentioned, it is included in *Philygria* in the German checklist contributed by the same author.

P. femorata (Stenhammar, 1844 - *Notiphila*) = *posticata*: auctt., misident and replaces it on the British list.

*P. maculipennis** was synonymised with *P. interstincta*, of which it was considered a darker form.

P. morans (Cresson, 1930 - *Hydrina*) was added to the British list, based on specimens in the Cambridge University Museum.

Anthomyiidae. As subgenera in PEGOMYA were recognised in the latest *Anthomyiidae Newsletter* No 6 (February 1999), it is considered useful to indicate which species belong to the two subgenera (information from Michael Ackland):

Subgenus PEGOMYA sensu stricto (20 species): *betae*, *bicolor*, *conformis*, *cunicularis*, *depressiventris*, *dulcamarae*, *exilis*, *flavifrons*, *haemorrhoum*, *holostaeae*, *hyoscyami*, *interruptella*, *laticornis*, *nigrisquama*, *rugulosa*, *seitenstettensis*, *setaria*, *solenis*, *steini*, *versicolor* (this group have short ovipositors and larvae with three or more teeth on the mouth hooks; all are leaf miners).

Subgenus PHORAEA Robineau-Desvoidy, 1830 (26 species): *argyrocephala*, *caesia*, *calypttrata*, *circumpolaris*, *deprimata*, *fulgens*, *furva*, *geniculata*, *incisiva*, *maculata*, *meridiana*, *notabilis*, *pallidoscutellata*, *provecta*, *pulchripes*, *rubivora*, *rufina*, *sociella*, *tabida*, *testacea*, *transgressa*, *transversa*, *ulmaria*, *vittigera*, *winthemi*, *zonata* (these have longer ovipositors and larvae with fewer teeth on their mouth hooks; most species are fungus feeders, although some develop in higher plants, where they are stem feeders, e.g. *rubivora* in *Rubus* and *Filipendula*).

Muscidae. The identification of *Musca chloris* Haliday with *Neomyia cornicina* (Note 5) has been confirmed from a specimen in Berlin labelled as *chloris*, which had been given by Haliday to Loew. The determination of *Atherigona varia* by Grainger (1998) has also been confirmed, so this species will be restored to the British list. (Adrian Pont pers. comms).

Phaonia longicornis Stein, 1916 is added in the present issue.

Tachinidae. Details of *Catharosia pygmaea* were published by S. FALK (1998. *British Journal of Entomology and Natural History* **11**, 1-5).

REVIEW

Checkliste der Dipteren Deutschlands. 1999. H. Schumann, R. Bährmann and A. Stark (Eds). *Studia dipterologica Supplement 2*, 1-354.

The German checklist, including nearly 9200 species, was published on 10 February 1999. This is the last known to be expected of the series of European checklists which have been prepared in recent years. It has, like all these lists, depended on the co-operation of a large number of specialists and in this case 50 German and 12 foreign specialists have authored family chapters.

The checklist is well presented, to the usual high standard typical of the *Studia dipterologica Supplement* series, of which it is the fifth to be published, although originally projected as the second, hence the numbering. There is a brief introduction followed by an explanation of the classification adopted in which all families of Diptera recognised are listed, with those represented in Germany in bold type. Like the British checklist, the higher groupings recognised largely follow those in the Nearctic Manual, with a few differences in the Asilomorpha and Aschiza and subdivision of some schizophoran superfamilies. The family chapters are, however, arranged in alphabetical order within three groupings accorded suborder status: Nematocera, Brachycera Orthorrhapha and Brachycera Cyclorrhapha.

More splitting of families has been accepted than in the British checklist and there is separate treatment of Otitidae (as well as Ulidiidae), Neottiophilidae, Thyreophoridae, Helcomyzidae, Heterocheilidae, Trixoscelidae, Gasterophilidae and Hypodermatidae, while on the other hand Mycetobiidae and Stenomomicridae are treated as subfamilies of Anisopodidae and Periscelidae respectively. Ten families (with 17 German species) not known from the British Isles are represented in Germany: Blephariceridae, Pleciidae, Hesperinidae, Canthyloscelidae, Coenomyiidae, Hilarimorphidae, Pyrgotidae, Cremifaniidae, Cryptochetidae and Egniniidae.

The family parts begin with a statement of the number of species known in Germany and the world. Genera and species are listed in two columns with valid names in bold type and synonymy clearly indicated. It was a convention of the list to restrict synonymy to that essential to clarifying the identity of species included, but because each family was the responsibility of its author, there was considerable variation in its application, e.g. in Sciaridae there is no synonymy, in Dolichopodidae a moderate amount and in Agromyzidae this is apparently comprehensive. Most families have literature references; in some cases there are some footnotes to the text, but in only a few (notably Dolichopodidae and Agromyzidae) more extensive explanatory notes.

There is a comprehensive index which, like the British list, includes all species names but has the advantage over it of giving the author's name and date, followed by an abbreviation of the family name, so that the same name appearing in different genera can be effectively traced.

It was not anticipated by the editors that taxonomic changes should be included, but this has perhaps inevitably occurred to a small extent and there are a few new combinations and new synonymies in some families. The author of the Scathophagidae part has reversed changes in generic nomenclature accepted since 1965, apparently assuming priority of Becker 1894 over Becker in Strobl 1894; the validity of this is being investigated.

Most British species are included in this list and a comparison has been made to assess what differences can be detected. There are the expected divergences between authors on composition of families, subfamilies, tribes or genera and there are differences in gender for 19 genera, the British list differing, in all these cases, for the reasons given in the Introduction to that list. The relatively small number of differences in nomenclature, authorship and dates are being assessed and those already found to be correct are dealt with in the pages above - **EDITOR**

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