Recent study of the British Agromyzidae (SPENCER, in press) has led to the clarification of a number of European species, which are discussed in this paper. The previous paper in this series was published by SPENCER (1969b). Four species, previously incorrectly identified, are described below as new; three new synonyms are established; two species, previously synonymised, are now resurrected; and the male genitalia of 17 further species are illustrated. In addition, revised keys are provided for the genera Phytopia LIOY and Amauromyza HENDEL.

I particularly wish to thank the following persons for the loan of type material: Dr. W. HACKMAN, University Museum, Helsinki; Dr. H. J. HANNMANN, Zoologisches Museum der Humboldt-Universität, Berlin; Dr. A. KALITENBAU, Naturhistorisches Museum, Vienna; Dr. habil. GÜNTER MÖRGE, custodian of the STRÖLM collections and of the Natural History Museum Admont, Austria; Dr. L. TESLA, Muséum National d'Histoire Naturelle, Paris; Dr. TH. VAN LEETWEN, Zoologisch Museum, Amsterdam. I also wish to thank my wife for preparation of the illustrations.

**Genus Agromyza FALLÉN**

*Agromyza bicophaga* HERING


HENDEL (1931-6: 141) synonymised this species with *A. orobi* HENDEL. HERING never accepted this synonymy and in two letters (in SPENCER 1968: 30 and 34) discusses larval differences which fully confirm the distinctness of the two species.

*A. bicophaga* in fact most closely resembles *A. johannae* DE MEIJER and the two cannot be entirely satisfactorily separated on external characters, although the male genitalia are quite distinct, as seen in Figs. 1 and 2.

The posterior spiracles of the larva of *bicophaga* each have three bulbs. However, a female reared from *Vicia sepium* L. at the Botanical Gardens, Berlin, 19 March 1952 (E. M. HERING) is mounted with a puparium in which the posterior spiracles each have an ellipse of some 20 minute bulbs. If this really is the puparium from which the fly emerged, then this must represent a further species in this complex.

**Genus Phytopia LIOY**

While clarifying the four species of this genus known in Great Britain, it became necessary to investigate the species described by HENDEL (1931-6: 22; and in BARNES 1933: 509) and KANGAS (1935, 1949). Of the 13 species previously considered as belonging to Phytopia, it was found that *alunulata* HENDEL correctly belongs in Agromyza and is a senior synonym of *A. distorta* GRIFFITHS, 1955; that *laticeps* HENDEL is synonymous with *lunulata* HENDEL; that *barnesi* HENDEL and almost certainly *tremulae* KANGAS are synonymous with *cambii* HENDEL and that *latigenis* HENDEL is synonymous with *carbonaria* ZETTERSTEDT. The two latter species were recently synonymised by SPENCER (1971).
A revised key to the 8 European species now known in the genus is given below.

Known hosts for European Phytobia species are Betula spp. (betulae Kangas); Salix spp. and Populus tremula L. (cambii H.d.); Sorbus aucuparia L. (aucupariae Kangas); and Prunus cerasifera Ehrh. (cerasiferae Kangas). The characteristic feeding tracks in the cambium of young trees have also been recorded in Acer, Alnus and Pyrus.
Beiträge zur Entomologie, Band 21, Nr. 3/6; 1971

Key to European Phytopia species

1 Only 1+1 dc; host: Sorbus aucuparia ................................. aucupariae KANGAS
   - 3+1 dc (rarely 2+1) ........................................... 2
2 Costa ending at vein r_{4+5} ...................................... lumulata HENDEL
   - Costa extending to vein m_{1,2} ............................... 3
3 Last section of vein m_{3,4} approximately 1^{1/2} times length of penultimate ............. 4
   - The two sections of m_{3,4} equal or the last slightly shorter ............................ 6
4 Mesonotum mat-greyish ............................................ 5
   - Mesonotum more black; smaller species, wing length 3—3.5 mm .................. 5
5 Aedeagus as in Fig. 5 .............................................. mallochi HENDEL
   - Aedeagus as in Fig. 6; host Prunus cerasiferae ........................ cerasiferae (KANGAS)
6 Mesonotum distinctly black, somewhat shining; lunule silvery-reddish ........................ carbonaria (ZETTERSTEDT)
   - Mesonotum mat-grey ................................. 7
7 Aedeagus as in Fig. 7 .............................................. cambii HENDEL
   - Aedeagus as in Fig. 3 .............................................. betulae (KANGAS)

Phytopia betulae (KANGAS), comb. nov.

Dendromyza (Dizygomyza) betulae KANGAS, 1935: 11. Type series from Finland in Institute of Agricultural and Forest Zoology of the University of Helsinki.

Germany: Silesia, Nimptisch, 2 5°, 14. v. 28 (E. M. HERING).

KANGAS reared this species from Betula sp. and (1949) showed its close similarity with cambii HENDEL feeding on Salix spp. Illustrations of the male genitalia (1949: 112) give insufficient detail to see the exact form of the aedeagus but it is apparent that it closely resembles that of cambii.

The aedeagus of one of the males from Silesia is shown in Fig. 3. The distiphallus is both larger and more complex than in cambii but is clearly of the same form and there seems little doubt that this represents betulae.

Phytopia lumulata (HENDEL), comb. nov.

Dizygomyza (Dizygomyza) lumulata HEND. 1930: 124. Holotype ♀ from Austria in Naturhistorisches Museum, Vienna.


Examination of the male genitalia of these two species confirms that they are identical and laticeps is synonymised with lumulata herewith.

Essential characters of the species are the black mesonotum and costa ending at vein r_{4+5}; wing length is 3.3 mm. The aedeagus of the holotype of lumulata is shown in Fig. 4. This suggests a sister-group relationship with P. carbonaria (cf. SPENCER 1971: Fig. 18).

Phytopia mallochi (HENDEL), comb. nov.

Dizygomyza mallochi HEND. 1924b: 147. Holotype ♀ from Switzerland in Naturhistorisches Museum, Vienna.


The two distinctive characters of this species are the black, rather than grey mesonotum and the long last section of vein m_{3,4}, which is 1^{1/2} times the length of the
penultimate. In both these characters mallochi agrees with cerasiferae Kangas and with the limited material available the two species can only be distinguished by the male genitalia. The aedeagus of mallochi is shown in Fig. 5, that of cerasiferae in Fig. 6.

P. mallochi also closely resembles P. septentrionalis SPENCER described from Canada. The genitalia are extremely similar, although the aedeagus of mallochi is substantially larger (SPENCER 1969a: Figs. 189, 190). There seems little doubt that the two are sister-species, with only slight differentiation between the Palaearctic and Nearctic species.

HENDEL (1931-6: 30) refers to two specimens of this species, from Vienna and from Switzerland and the one from Vienna is labelled as „Typus“. This, however, is not correct, as the description in 1924 was based on the single specimen from Switzerland and this specimen must be treated as the holotype. I have examined both specimens and can confirm that they are indeed identical.

**Genus Amauromyza HENDEL**

When studying the Agromyzidae of Canada, it was found that Cephalomyza luteiceps HENDEL was clearly congeneric with certain species of Amauromyza, and Cephalomyza was formally synonymised with Amauromyza (SPENCER 1969a: 157). It was further suggested that Trilobomyza also should logically be synonymised with Amauromyza.

The examination of further species in this complex when preparing the Handbook for the Identification of British Agromyzidae (SPENCER, in press) has shown that there are four distinct groups in Europe, for which sub-generic status has been proposed (SPENCER 1971). Campanulomyza NOWAKOWSKI, with type species gyrans FALLÉN, is now included within Amauromyza, and Campanulomyza has been reduced to sub-generic rank (SPENCER 1971).

The genus therefore now has the following structure:

**Amauromyza HENDEL, 1931**

Type of genus lamii KALTENBACH

sub-genus Amauromyza HENDEL. Type of sub-genus lamii KALTENBACH

sub-genus Campanulomyza NOWAKOWSKI. Type of sub-genus gyrans FALLÉN

sub-genus Trilobomyza HENDEL. Type of sub-genus flavifrons MEIGEN

sub-genus Cephalomyza HENDEL. Type of sub-genus luteiceps HENDEL

KALTENBACH’s description of lamii is confusing and in view of its brevity and inaccessibility, it is repeated here:

„Fliege: glänzend schwarz; Flügelwurzel, Schwinger und der Hinterrand des letzten Hinterleibringes gelb, Knie bräunlichgelb.“

This description is given in the section dealing with insects on Ballota but it is stated that the species also occurs on Lamium.

It now seems clear that KALTENBACH must have reared and confused the two species, lamii, which is „glänzend schwarz“, and labiatarum HENDEL, to which the rest of the description applies.

Specimens bred by HERING in Germany from leaf-mines on Leonurus cardiaca L. represent a distinct species and this is described below as leonuri spec. nov. NOWAKOWSKI (1962: Fig. 10) illustrated the male genitalia of lamii and it can be seen that this species is closely related both to leonuri and also to carlinae HERING, which is discussed below.

1 As this paper goes to press, I have noticed that NOWAKOWSKI (1964: 212) suggested that Campanulomyza and Trilobomyza, and also Melanophytobia HERING and Irenomyia NOWAKOWSKI, (not, however, Cephalomyza) might be included in an enlarged, natural genus Amauromyza. Preliminary study indicates that NOWAKOWSKI’s suggestion regarding Melanophytobia and Irenomyia was correct and I hope that he will clarify this proposal in due course.

DOI: 10.21248/contrib.entomol.21.3-6.249-265
A further new species from Hungary is described and two further species are discussed.

Hering considered that *gyrans* (FALLÉN) represents two species, which it is at the moment only possible to separate on the basis of differences in the larval leaf-mines. Species 1 feeds exclusively on *Campanula trachelium*, a number of larvae feed together and form a large greenish blotch. Species 2 feeds on other *Campanula* species and also on *Phyteuma*, with only a single larva forming a small white blotch mine. The differences between the two were discussed by Hering (in SPENCER 1968: 29). Although the differences in leaf-mines are indeed striking, there is no apparent difference either in the external morphology of the adults or in the male genitalia. I have also not been able to confirm the differences in the number of bulbs on the larval hind-spiracles mentioned by Hering. Study of further material will therefore be necessary before being able to decide whether or not two distinct species are involved.

**Key to European Amauromyza species**

1. Aedeagus enclosed in strong spinular membrane (Figs. 11—13); 3+1 dc; jowls deep, 1/4 to 1/4 height of eye; epistoma frequently present (sub-genus *Cephalomyza*) .............................................................. 2
   - Aedeagus without strong spinular membrane; 3+0 or more rarely 3+1 dc; jowls narrower; epistoma never present .............................................................. 8
2. Frons and antennae yellow .............................................................. 3
   - Frons and antennae black .............................................................. 4
3. Femora with knees narrowly yellow ............................................... karli (HENDEL)
   - Femora yellow in distal third ........................................................ luteiceps (HENDEL)
4. Costa ending at vein r4,5 .............................................................. madrilena SPENCER
   - Costa extending to vein m4,5 ........................................................ 5
5. Halteres whitish-yellow .............................................................. monfalconensis (STROBL)
   - Halteres black .............................................................. 6
6. Wings distinctly infuscated ........................................................... strobli HENDEL
   - Wings clear .............................................................. 7
7. Small species, wing 1.9 mm; last section of vein m4,4 21/2 times length of penultimate .............................................................. mihalyi SPENCER
   - Larger species, wing 2.2—3 mm; last section of m3,4 11/2 times length of penultimate .............................................................. chenopodiivora SPENCER
8. Frons and antennae black .............................................................. 9
   - Frons yellowish or pale brown (sub-genus *Trilobomyza*) .......... 13
9. Frons not projecting above eye ........................................................ 10
   - Frons distinctly projecting above eye ................................................ 12
10. Halteres white (sub-genus *Campanulomyza*) ................. gyrans (FALLÉN)
    - Halteres black (sub-genus Amauromyza) ......................... 11
11. Aedeagus as in Figs. 9, 10 ........................................................ leonuri SPENCER
    - Aedeagus as in Fig. 8 ........................................................ cordinae HERING
    - Aedeagus as in NOWAKOWSKI, 1962: Fig. 10 ................... lamii (KALTENBACH)
12. 3+0 dc; small species, wing length 1.6—2.2 mm ................ morionella (ZETTERSTEDT)
    - 3+1 dc; larger species, wing length 2—2.5 mm .................. balcanica HENDEL
13. Third antennal segment black ........................................................ 14
    - Third antennal segment yellow .................................................... verbasica (BOUCHÉ)
14. Frons bright yellow .............................................................. flavifrons MEIGEN
    - Frons pale to dark-brown .......................................................... labiatarum (HENDEL)

DOI: 10.21248/contrib.entomol.21.3-6.249-265
Amauromyza (Amauromyza) carlinae HERING


The aedeagus of this species, originally bred by Bühr from leaf-mines on Carlina vulgaris L. in N. France, is shown in Fig. 8. The male genitalia clearly indicate the close relationship of this species to leonuri spec. nov. described below (Figs. 9, 10).

Amauromyza (Amauromyza) leonuri spec. nov.

Head: frons 1½ times width of eye, projecting only slightly above eye in profile; orbits not conspicuously differentiated, with two equal ors and two (on one side three) similar ori; orbital setulae upright or slightly reclinate; jowls slightly extended at rear, about one-fifth vertical height of eye, cheeks forming only narrow ring below eye; third antennal segment slightly longer than broad, rounded at end, arista distinctly pubescent, long, only slightly shorter than vertical height of eye, in ratio 15:18.

Mesonotum: three strongly developed dc, fourth presutural weak or scarcely differentiated; acr irregularly in four or five rows, some extending beyond level of first dc.

Wings: length from 1.9 mm in male to 2.2 mm in female, last section of vein m3,4 just over twice length of penultimate, first cross-vein at midpoint of discal cell.

Colour: uniformly dark; frons mat black, somewhat brownish in centre below ocellar triangle; orbits only weakly shining; mesonotum distinctly shining black, pleura, legs, abdomen entirely black; squamae dark grey, margin and fringe black; halteres brownish-black.

Male genitalia: aedeagus ending in two short, broad tubular processes (Figs. 9, 10); ninth sterna uniformly rounded.

Pupa: dark, reddish-brown, posterior spiracles each with three bulbs, two circular, one more elongate.

Host-plant/Biology: Leonurus cardiaca L., larva forming initial linear mine, after first instar producing an irregular, greenish blotch, which may entirely envelope the early linear section; frass deposited in irregular black strips or lumps; pupation externally.

Holotype S, Germany, Berlin, Botanical Gardens, emerged 6 July 1957 ex leaf-mines on Leonurus cardiaca var. crispa hort. Leg. 18 June 1957; paratypes: one female, same data as holotype; two females, Crossen/Oder, 27—29 July 1940 ex same host (all E. M. HERING), in author’s collection.

Remarks: This species was misidentified by Prof. HERING as lamii (KALTENBACH). A. leonuri is a uniformly dark species closely resembling both lamii and carlinae and the three can only be reliably separated by their male genitalia.

Amauromyza (Cephalomyza) abnormalis (MALLOCH)

Hendel identified European specimens bred from stems of Chenopodium album L. as the Nearctic species, abnormalis (MALLOCH). Although the adults of the Nearctic and Palearctic populations cannot be distinguished on external characters, the differences in the male genitalia are substantial and justify treating the two as representing distinct species.

The European species was recently described as chenopodivora spec. nov., with illustrations of the aedeagus (SPENCER 1971: Figs. 28, 29). The aedeagus of abnormalis from Canada was illustrated by SPENCER (1969a: Fig. 273).

Amauromyza (Cephalomyza) mihalyii spec. nov.

Head: frons broad, twice width of eye, distinctly projecting above eye in profile; 2 ors, 3 (on one side 4) ori; orbital setulae short, sparse, irregular; cheeks forming broad ring below eye, jowls broad, at deepest point one-third vertical height of eye; third antennal segment small, round, arista appearing virtually bare.

DOI: 10.21248/contrib.entomol.21.3-6.249-265
Fig. 5. Aedeagus of: Fig. 5. Phytobia mallochi (Hendel). — Fig. 6. Phytobia cerasicerae (Kanga). — Fig. 7. Phytobia cambii (Hendel). — Fig. 8. Amauromyza (Cephalomyza) carlinae Heriné — Figs. 9—10. Amauromyza (Cephalomyza) leonuri spec. nov., side view and distiphallus, ventral view. — Fig. 11. Amauromyza (Cephalomyza) mühalyii

DOI: 10.21248/contrib.entomol.21.3-6.249-265
Mesonotum: 3 + 1 strong dc, acr in 4 rows.  
Wing: length in male 1.9 mm, second costal section nearly 4 times length of fourth; discal cell small, last section of m3,4 2 1/2 times length of penultimate.  
Colour: entirely dark species; frons dark brown behind, black in front; antennae, pleura and legs entirely black; mesonotum conspicuously mat, greyish-black; squamae, fringe and halteres black; wings clear.  
Male genitalia: aedeagus with paired distiphallus surrounded by spinulose membrane, as in Fig. 11.  
Holotype ♀, Hungary, Harmashatahegy, nr. Budapest, 27. v. 64 (K.A.S.), in author's collection.  
Remarks: This species is immediately distinguishable from chenopodivora by the smaller discal cell and longer last section of vein m3,4. With the limited material available, it is only possible to distinguish it from morionella and lamii by the entirely different male genitalia.  

*Amauromyza* (Cephalomyza) *strobi* (Hendel), comb. nov.  

*Agromyza obscurepennis* Strobli, 1906: 381.  

Nowakowski (1962: 93), apparently without having examined Strobli's specimens, synonymised *strobi* with *abnormalis* Malloch. I have now seen the five specimens in the type series - two males and three females — and can confirm that *strobi* is a distinct species. It is readily distinguishable from *chenopodivora* by the broader and more projecting frons, deeper jowls and darkened wings. The male genitalia are typical of the sub-genus *Cephalomyza* and the aedeagus is shown in Figs. 12, 13. One of the two males is herewith designated and has been labelled as lectotype.  

**Genus Cerodontha Rondani**  

*Cerodontha* (*Digymomyza*) *morosa* (Meigen)  

*Cerodontha (Digymomyza) morosa* Nowakowski, 1967: 644.  

This species has in the past been misidentified by Hendel, Hering and all subsequent workers, until Nowakowski examined the holotype and established its correct identity from its distinctive genitalia. The aedeagus of the holotype is shown in Fig. 14.  
The name *morosa* has been widely applied to the common miner on Carex with the notopleura partially yellow. Hendel noted a form in which the notopleura are even more conspicuously yellow and named it *morosa* var. *suturalis*, adding the comment „vielleicht eigene Art“. From the differences in genitalia it can now be seen that *suturalis* is indeed a good species and most specimens identified as *morosa* during the past 50 years in fact represent this species.  
In the true *morosa* the notopleura are not significantly paler but all knees are conspicuously bright yellow (as in *suturalis*). Nowakowski (1967: 644) states that the species is common but it apparently does not occur in England.  
Specimens in the United States and Canada identified as *morosa* do not represent the European species and in future the available name *magnicornis* (Loew) should be used. This species is very close to *suturalis* but in view of a slight but consistent difference in the form of the aedeagus, it seems desirable to treat the Holarctic and Palaearctic populations as distinct, particularly since the larvae are not known in North America.  

**Genus Liriomyza Mik**  

One new species is described below and three further species are briefly discussed and illustrations are given of their male genitalia.
Figs. 12–18. Aedeagus of: Figs. 12–13. *Amauromyza (Cephalomyza) strobli* (Hendel), side view and distiphallus, ventral view. — Fig. 14. *Gerodonta (Dizygomyza) morosa* (Meigen). — Fig. 15. *Liriomyza flavopicta* Hendel. — Figs. 16–18. *Liriomyza hierantorea* spec. nov. wing; aedeagus, side view and distiphallus, ventral view

*Liriomyza flavopicta* Hendel

I have examined the two specimens in the University Museum, Helsinki (labelled by HENDEL as *picta* but described as *flavopicta*) and one has been labelled and is here-with designated as lectotype. The distinctive aedeagus is shown in Fig. 15.

HERING (1957: 25 and in SPENCER 1968: 246) recorded this species as a stem-miner on *Achillea millefolium* L. A species caught on this plant on Hampstead Heath, London was believed to represent *flavopicta*, until the examination of the genitalia has shown that it is a distinct species, which has now been described as *hampsteadensis* spec. nov. (SPENCER 1971).

*Liriomyza hieracivora* spec. nov.

Head: frons only slightly projecting above eye in profile; 2 equal, reclinate ors, 2 incurved ori, the lower distinctly weaker, cheeks forming conspicuous ring below eye; jowls broad, extended at rear, almost one-third height of eye; third antennal segment round, with short, normal pubescence. Mesonotum: 3 + 1 dc, second well before level of supra-alar; in holotype and topotypical paratype small additional dc beyond fourth; acr irregularly in 4 rows, not extending beyond level of second dc. Wing (Fig. 16): length in male 1.6 — 1.8 mm; second cross-vein conspicuously oblique, last section of vein m3+4 almost 3 times length of penultimate. Colour: frons, orbits, entire hind-margin of head, all antennal segments bright yellow; mesonotum distinctly mat, blackish-grey, though with some shine; hind-corner with large yellow patches; mesopleura with only small black bar at front lower corner; area above mid-coxa broadly yellow, dividing black of sterno- and hypopleura; legs: coxae entirely yellow, femora largely so but at least fore-femora with faint, irregular brownish striations; tibiae and tarsi yellowish-brown; tergites essentially black but sides and hind-margins conspicuously yellow.

Male genitalia: aedeagus as in Figs. 17, 18.

Holotype ♂. E. Germany, Thuringia, Vogtland-Jocketal, emerged spring 1961 from blotch-mine on *Hieracium lachenalii* Gmel. (Buhr, No. 1656); Paratypes: 1 ♂, same data as holotype; 1 ♀, Güntersberg/Oder, emerged spring 1925 ex *H. vulgatum* (Fr.) Almq. (HERING, No. 2608). Holotype and paratypes in author's collection.

Remarks: The male genitalia immediately confirm that this species is distinct from *Liriomyza hieracii* (KALTENBACH); the tubular base of the distiphallus is shorter and broader and the distiphallus itself is distinctly larger. The aedeagus of *L. hieracii* was illustrated by SPENCER (1971: Fig. 44).

The two species can also be distinguished as follows:

<table>
<thead>
<tr>
<th></th>
<th><em>L. hieracivora</em></th>
<th><em>L. hieracii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hind-margin of eye</td>
<td>entirely yellow</td>
<td>black beyond base of ste</td>
</tr>
<tr>
<td>Mesonotum</td>
<td>distinctly greyish-black</td>
<td>less grey, more shining</td>
</tr>
<tr>
<td>Mesopleura</td>
<td>only small bar at lower front corner black</td>
<td>entire lower margin black</td>
</tr>
<tr>
<td>Second cross-vein</td>
<td>conspicuously oblique</td>
<td>at rightangles to m3+4</td>
</tr>
</tbody>
</table>

*L. hieracivora* closely resembles *L. sonchi* but is readily distinguishable by the more oblique second cross-vein.

Although the only known hosts of this new species are *Hieracium lachenalii* and *H. vulgatum*, it remains to be established whether it in fact also feeds on other *Hieracium* species. *L. hieracii* (KALTENBACH) has been recorded from *H. murorum* L., *H. laevigatum* WILD., *H. lachenalii* Gmel. and *H. vulgatum* (Fr.) Almq.

*Liriomyza larissa* HÉRING


This species resembles *L. aquiseti* de MEIJER (SPENCER 1971: Fig. 40) and the male genitalia indicate a close relationship. The aedeagus in side view is shown in Fig. 19.

DOI: 10.21248/contrib.entomol.21.3-6.249-265
Figs. 19 — 24. Aedeagus of: Fig. 19. *Liriomyza larissa* Hering. — Fig. 20. *Liriomyza obliqua* Hendel. — Fig. 21. *Liriomyza oldenbergi* Hering. — Fig. 22. *Liriomyza scorzonerae* Rydén. — Fig. 23. *Para-phytomyza flavoscutellata* (Hendel). — Fig. 24. *Phytomyza campanulivora* spec. nov.

*Liriomyza obliqua* Hendel


I have examined the three specimens referred to by Hendel in his description of this species and designate as lectotype the male from Mt. Meszes. This specimen is in perfect condition; the aedeagus is shown in Fig. 20.

*L. obliqua* closely resembles but is somewhat larger than *L. flavopicta* Hendel. The male genitalia of the species in this group are of the same general form but are distinctively different in detail.

DOI: 10.21248/contrib.entomol.21.3-6.249-265
NOWAKOWSKI (1962: 93) synonymised *L. subobliqua* HENDEL with *obliqua*. In view of the differences cited by HENDEL and in the absence of a male of *subobliqua*, I feel this synonymy requires confirmation.

*Liriomyza oldenbergi* HERING


I have confirmed from examination of the genitalia of a male paratype that this species is distinct from *L. lutea* (MEIGEN). The aedeagus is shown in Fig. 21.

HERING in SPENCER (1968: 369) includes this species in couplet 17a of his revision of HENDEL's key to European *Liriomyza* species, differentiating it from *melanorhabda* HENDEL by the dark area of the mesonotum being mat. However, I obtained a number of specimens of *melanorhabda* (= *lutea* MEIGEN) from the type locality, Lautaret in Savoy, 7. vii. 60, and in fact on external characters there is no apparent difference between *oldenbergi* and this dark form of *lutea*.

*L. oldenbergi* was consistently caught on *Armeria vulgaris* L. and it seems possible that it feeds in the seeds of this plant, in view of its obviously close relationship to *lutea*, a seed-feeder on Umbelliferae.

*Liriomyza scorzonerae* RYDÉN


This species very closely resembles *L. tragopogonis* DE MEIJER (= *pusio* MEIGEN sensu HENDEL, cf. SPENCER 1971). However, the leaf-mine is entirely distinct, the larva forming a blotch-mine at the margin of the leaf.

The aedeagus of a specimen bred from *Scorzonera* at Stolp, Pomerania, 15. vii. 25 (O. KARL) is shown in Fig. 22.

Genus *Paraphytomyza* ENDERLEIN

*Paraphytomyza flavoscutellata* (HENDEL), comb. nov.


There has been doubt about the status of this species which is only known from the holotype. Following examination of the genitalia, I can confirm that this represents a distinct species, certainly congeneric with the type of the genus, *luteoscutellata* DE MEIJER (as *xylostei* ROBINEAU-DESOYD). The aedeagus is shown in Fig. 23.

Genus *Phytomyza* FALLÉN

One new species is described below and two new synonymies are established. In addition the *Phytomyza* species feeding on *Artemisia* are clarified and the male genitalia of two further species are illustrated.

1. *A new Phytomyza on Campanula*

When checking *Phytomyza campanulae* HENDEL during the preparation of the Identification Handbook of British species, I noticed that a specimen bred from *Campanula scheuzeri* VILL. near Garmisch in the Bavarian Alps in September 1955 differed in a number of characters from typical *campanulae*. Examination of the male genitalia immediately confirmed that this represented a different species, which is in fact undescribed.
Phytomyza campanulivora spec. nov.

Head: frons yellowish-orange; upper ors substantially weaker than lower; all antennal segments black, third small, round; face black. Mesonotum: all dc strong, fourth slightly beyond level of pre-sutural; acr irregularly in 4 rows in front, only a single hair beyond second dc; colour: entirely mat, greyish-black, no yellow patches at hind-corners. Pleura: uniformly greyish-black, only upper margin of mesopleura narrowly yellowish. Legs: black, only knees on fore-femora yellowish. Wing: length 1.8 mm, second costal section 3 times length of fourth. Male genitalia: aedeagus as in Fig. 24. Biology: host Campanula scheuchzeri subspecies kerner (Witasek) Hayek, larva forming whitish linear mine, which can entirely fill small leaves, thus producing a secondary blotch; frass in irregular black strips or pellets; puparium black, smooth, without inter-segmental depressions; posterior spiracles each with 20 bulbs.

Holotype 3, Germany: Alps above Garmisch, emerged Nov. 1955 from leaf-mine leg. 3. lx. 55, in author’s collection.

Remarks: This species can be included in Hendel’s key as amended by Herlinc in Spencer 1968: 383) in an extension to couplet 91, as follows:

For couplet 91, second alternative, read:

1. — 5 — 6 post suturala ia-Härchen; Gesicht und Lunula dunkel, braun oder schwarz. 2. Flügelrandabschnitt 2½ — 3 mal so lang wie der 4. Größe 1.8 bis 2.2 mm .................................................... 91a

Add new couplet:

91a Kleine Art, Flügelänge im Männchen 1.8 mm; Gesicht schwarz. Larva an Campanula ..........................................................

— Größere Art, Flügelänge 2.1 — 2.3 mm; Gesicht dunkelbraun. Larva an Solidago .......................................................... virgaureae Herlinc

P. campanulivora is readily distinguishable from campanulae Henel by the smaller size (wing 2.3 — 2.7 in campanulæ, darker legs (all knees yellow) and shorter second costal section (ratio to fourth, 3½ — 4 in campanulæ). The puparium of campanulæ is distinguishable by having deeply incised segmental boundaries.

2. Clarification of some leaf-miners on Umbelliferae

In Europe 54 Phytomyza species have been described as leaf-miners on Umbelliferae. Prior to my present study 6 of these had been synonymised by earlier workers. I have now discovered 9 further synonyms; two of these are established below and 7 were established by Spencer (1971) among species occurring in Britain.

Phytomyza aurei Herlinc


Herlinc (1931a) felt justified in differentiating P. aurei ex Chaerophyllum aureum from P. aromatici ex C. aromaticum on the apparent difference in leaf-mines on the two hosts.

 Examination of the holotype of P. aromatici from the Botanical Gardens, Berlin has shown that this represents Phytomyza chaerophylli Kaltenbach, which occurs commonly also on C. bulbosum L., C. temulum L. and Anthriscus sylvestris (L.) Hoffm. Henel (1931 — 6: 371) correctly synonymised P. aromatici with P. chaerophylli. The aedeagus was illustrated by Spencer (1971: Fig. 85).

The female holotype of P. aurei is a large specimen, with wing length of 2.8 mm. A male ex C. aureum from Thuringia is substantially smaller, with wing length of 2 mm, but this is nevertheless accepted as P. aurei. The distinctive aedeagus is shown in Fig. 25. This same species, with identical genitalia, has also been seen ex

DOI: 10.21248/contrib.entomol.21.3-6.249-265
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C. aromaticum from Kunnersdorf, nr. Görlitz and ex Conium maculatum from Berka a. d. Wipper (both leg. Hering).

The species with black frons ex Conium described by Hering as coniophila (Herling 1931b: 534) proved to represent chaerophylli Kaltenbach (Spencer 1971).

The mine of P. aurei, both from the type locality in Bavaria and from the Görlitz area in Saxony, is essentially linear and cannot be differentiated from that of P. chaerophylli. The blotch mine illustrated by Hering (1931a: Fig. 3) is secondary and is from C. aureum at the Botanical Gardens, Berlin. This probably represents C. chaerophylli.

Phytomyza ferulae Hering


Examination of a male paratype of umbelliferarum has confirmed that this represents the widespread Mediterranean species, ferulae Hering, and this synonymy is formally established herewith.

In addition to the numerous localities for this species which have already been cited, I found many mines with larvae on Daucus sp. on Menorca, 29. ii. 68, which produced adults 2 weeks later.

Phytomyza thysselini Hering

Phytomyza carvifoliae Hendl, 1924b: 144, syn. nov. Holotype from Germany, Lausitz in Naturhistorisches Museum, Vienna.

I have examined males of thysselini bred from Peucedanum palustre (L.) Möench and of carvifoliae from Selinum carvifolia L. The aedeagus is distinctive and identical (Fig. 26) and I therefore synonymise carvifoliae with thysselini herewith.

The unusually long pubescence on the third antennal segment is characteristic of this species.

3. The Phytomyza species on Artemisia in Europe and Japan

Hendl identified as albiceps Meigen the common leaf-miner on Artemisia vulgaris L. Examination of the type of albiceps in Vienna has shown that Hendl’s identification was not correct. P. albiceps probably represents a senior synonym of rydeniana Hering but more material is required before this synonymy can be formally established. No name is available for the Artemisia miner and this was therefore described as new by Spencer (1971). It occurs throughout the palaeaeptic Region and has been described and illustrated in Japan by Sasakawa, as albiceps (1961: 438).

Kuroda (1954) described P. artemisiae from Japan, later (1960) describing the larva (as albiceps Meigen) and noting that the posterior spiracles have 3 bulbs, whereas the common palaeaeptic Artemisia miner has 16–26 bulbs. P. artemisiae Kuroda is a valid name (P. artemisiae Kaltenbach is a nomen nudum, cf. Hendl, 1931—6: 338) and the male genitalia of this species are entirely distinctive. In January, 1960 I found larvae feeding near freezing point on Artemisia kisakaeana Miq. in the Botanical Gardens, Tokyo and, from 4 puparia obtained, flies emerged at the end of March and on 3, 10 and 17 April. I had believed that this species also represented artemisiae Kuroda but the male genitalia show that this is a further, undescribed species. The larvae have numerous minute bulbs on the posterior spiracles, as in the common European species.

DOI: 10.21248/contrib.entomol.21.3-6.249-265

Figs. 25 — 28. Aedeagus of: Fig. 25. *Phytomyza aurei* Hering. — Fig. 26. *Phytomyza thysselini* Hering. — Fig. 27. *Phytomyza lappicora* Hendel. — Fig. 28. *Phytomyza montana* Grosche

DOI: 10.21248/contrib.entomol.21.3-6.249-265
4. Clarification of Phytomyza albiceps MEIGEN

Phytomyza albiceps MEIGEN, 1830: 194. Lectotype ♀ in Naturhistorisches Museum, Vienna.

I have examined the two type specimens of albiceps, a female in Vienna from the von Winthem collection and a male in Paris bearing MEIGEN’s label „Phytomyza albiceps“*. MEIGEN’s description emphasizes the pale coloration of the sides of the thorax — „Seitenstreifen des Rückenschildes und Knie weisslich“; and later „Mittel-leib schwärzlich grau, mit mehr oder weniger breiter weisslicher Seitenstreifen vor der Flügelwurzel“*. He also states „Von Hrn. von Winthem“. The male in Paris has the sides of the thorax black and thus only the female in Vienna can correctly be designated as lectotype.

The lectotype is a large specimen, with wing length of 2.8 mm; the second costal section is unusually long, 5 times length of the fourth. The upper or (detectable from basal pits) is clearly weaker than the lower. The notopleura are entirely whitish-yellow, the mesopleura only narrowly yellow, with the bristle at the margin of the pale and dark ground.

HENDEL finally (1931—6:337) associated this species with the common leaf-miner on Artemisia vulgaris. He gives the wing length as 2 mm and states that the mesopleura are yellow in the upper half. These two critical characters apply exactly to the species on Artemisia but do not apply to the lectotype of albiceps. I have carefully studied all species with the sides of the thorax yellow and the only known species which could represent albiceps is rydeniana HERING. Three females I have examined have the following measurements:

<table>
<thead>
<tr>
<th>wing length</th>
<th>costal ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8 mm</td>
<td>5 : 1.3</td>
</tr>
<tr>
<td>2.8 mm</td>
<td>5.4 : 1.4</td>
</tr>
<tr>
<td>3.1 mm</td>
<td>5.5 : 1.5</td>
</tr>
</tbody>
</table>

Although these three specimens agree more or less exactly in colour and in wing length with albiceps, in no case does the costal ratio approach 5. In view of this disparity I hesitate formally to synonymise rydeniana with albiceps. However, when further material can be examined, I fully expect to find a specimen corresponding more exactly with albiceps, which would justify this synonymy being formally established.

5. The male genitalia of two further species

Phytomyza lappivora HENDEL


The aedeagus of this species, which is only known from the holotype, is entirely distinctive and is shown in Fig. 27.

Phytomyza montana GROSCHKE


This species was described from Bavaria but GROSCHKE commented that it was common around Stuttgart. The distinctive aedeagus of a specimen from Stuttgart (leg. GROSCHKE) is shown in Fig. 28.

Summary

Recent study of the British Agromyzidae (SPENCER, in press) has led to the clarification of a number of European species, which are discussed in this paper. The previous paper in this series was published by SPENCER (1969b).
Zusammenfassung


Réséume

Nouveau investigation des brétonnes Agromyzidae (SPENCER, en préparation) donne et précise le nombre de certaines espèces européennes qui sont données dans ce tableau. Les espèces anciennes non spécifiées sont reconnues comme nouveaux, trois nouveaux synonymes sont établis; deux nouveaux synonymes sont donnés de nouveau, et les mâles génitaux de 17 autres espèces sont illustrés. De plus, des tableaux d'identification sont fournis pour les genres Phytobia Lyoy et Amauromyza HENDEL.