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Notes on European Agromyzidae (Diptera) — 2

With 33 text figures

This paper continues the policy established in the first of the series (SPENCER, 1966b) of periodically discussing and clarifying miscellaneous species as new information accumulates. In addition seven new species are described. Three new species described below were discovered by Dr. habil. H. BUHR who died last year. Until shortly before his death BUHR provided detailed information on the many interesting and new species he had collected in recent years. With his tireless enthusiasm and unrivalled botanical knowledge BUHR developed into an outstanding collector of Agromyzidae. The immense effort required over many years to breed the elusive species mining the leaf-stalks of *Petasites albus* is illustrated by the collecting data given below for the species which I feel is fittingly dedicated to Dr. BUHR, described as *Phytomyza buhriella*. This was one of the last and proved to be the most difficult of all the many species he discovered.

During a short visit to Menorca and Mallorca at the end of February, 1968, I discovered two new *Phytomyza* species on *Clematis cirrhosa* which are described below. Leaf-mines of one of these, *Phytomyza cirrhosae*, have been known for some time (SPENCER, 1967).

For the past two years I have been studying the Canadian Agromyzidae (SPENCER, 1969) and in that paper many European species have been examined and are discussed, in many cases with illustrations of male genitalia. During the course of this work it was found that *Agromyza alnibetulae* HENDEL, which has been accepted as a leaf-miner on both *Alnus* and *Betula*, is in fact limited to *Betula*; the species on *Alnus* is described below as *A. alnivora*. It was further found that the species in Europe occurring commonly in stems of *Angelica* is not the Nearctic species, *Melanagromyza angelicae* (FROST) but an undescribed species.

I would like to thank Dr. A. KALTENBACH, Naturhistorisches Museum, Vienna and Drs. W. E. ELLIS, Zoological Museum, Amsterdam, for the loan of type specimens and Miss L. BOWDEN, Dept. of Botany, British Museum (Natural History) for the identification of plants from Menorca. I also wish to thank my wife who has prepared all drawings in this paper.

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Genus *Agromyza* FALLÉN

1. *Agromyza albitarsis* MEIGEN — a new synonymy

Agromyza albitarsis MEIGEN

Agromyza albitarsis MEIGEN, 1830: 171; HENDEL, 1931: 100. Lectotype ♀ in Naturhistorisches Museum, Vienna.

Agromyza lygophaga HERING, 1937: 462, **syn. nov.** Holotype ♂ in author's collection.

MEIGEN's description of *Agromyza albitarsis* is based on two specimens in the VON WINTHEM collection. There are two specimens bearing such labels in Vienna, both females. One appears to represent *A. spiraeae* KALTENBACH. The second, in addition to the VON WINTHEM label, has three labels reading „Arlberg“, „albitarsis M.“ and „coll. Hendel“, the first two in HENDEL's handwriting; it is a reared specimen, mounted with its puparium, which indicates that the food-plant was *Populus* (or possibly *Salix*). Although there could be grounds for doubting the authenticity of this specimen, the VON WINTHEM label is certainly present and it is therefore designated as lectotype. Acceptance of the other specimen as lectotype would involve name changes both of *A. spiraeae* and *A. albitarsis* sensu HENDEL and would be entirely undesirable.

In his description of *A. lygophaga* HERING cites only minor differences from *A. albitarsis*. Examination of the genitalia of the holotype of *lygophaga* bred from *Salix alba* and of a further male bred from *S. purpurea* has shown these specimens to be identical to *A. albitarsis*, which occurs commonly on *Populus*. *A. lygophaga* is therefore synonymised with *A. albitarsis* herewith.

A. albitarsis is a Holarctic species, which I have recently confirmed in British Columbia and Quebec. The male genitalia are illustrated by SPENCER (1969: Figs. 7, 8).

2. A clarification of *Agromyza alnibetulae* HENDEL

Agromyza alnibetulae HENDEL

Agromyza alnibetulae HENDEL, 1931: 101. Holotype ♀ in Naturhistorisches Museum, Vienna.

Examination of HENDEL's type series of *alnibetulae* has shown that the species feeding on *Alnus* and on *Betula* are distinct. In his description HENDEL compared *alnibetulae* with *albitarsis* MEIGEN, a species with a pale squamal fringe. As type of *alnibetulae*, however, he designated a female bred from *Betula verrucosa* EHRH. and this specimen has a distinctly dark squamal fringe and entirely different genitalia (Fig. 1) from specimens from *Alnus*. The species on *Alnus* is therefore described below, as *alnivora* spec. nov.

SASAKAWA (1961: 313) correctly noticed that the squamal fringe of specimens reared from *Betula tauschii* KOIDZ. in Japan was dark and described the new species, *Agromyza betulae*, differentiating it from *alnibetulae* HENDEL not only by the colour of the squamal fringe but also by the absence of the mid-tibial bristle, which it is suggested is present in *alnibetulae*. This, however, is not the case. In fact *A. betulae* appears to be identical to *A. alnibetulae* both in colora-

tion and in the absence of the mid-tibial bristle but the illustration of the aedeagus of *betulae* (SASAKAWA, 1961: Fig. 2) confirms that the two species are distinct.

Material examined:

AUSTRIA: Rauschen, 1 ♀, 16. iv. 1919, ex leaf-mine on *Betula verrucosa* (E. M. HERING), holotype.

GERMANY: Berlin-Dahlem, 2 ♂♂, 2 ♀♀, emerged spring 1947, ex leaf-mines on *Betula pendula* (E. M. Hering).

***Agromyza alnivora* spec. nov.**

Head: frons broad, $1\frac{1}{2}$ times width of eye, not significantly projecting above eye in profile, four orbital bristles approximately equal, orbital setulae in single row, reclinate; jowls deepest at rear, there $\frac{1}{4}$ vertical height of eye, in centre about one-eighth; third antennal segment small, round, arista distinctly pubescent.

Mesonotum: 3 + 1 strong *dc*, though pre-sutural one distinctly weaker than third; *acr* irregular, in 4 or 5 rows.

Legs: mid-tibia either with one lateral bristle (paratype) or without (holotype).

Wing: length in male 2.7 mm, in female up to 3.1 mm, costa extending to vein m_{1+2} , second costal section five times length of fourth, last section of m_4 two-thirds penultimate.

Colour: frons mat brownish-black, antennal segments essentially black, though first slightly paler; mesonotum distinctly grey; legs: femora black, tibiae and tarsi paler, yellowish-brown; squamae and fringe yellowish.

Male genitalia: aedeagus as in Figs. 2, 3, surstyli without bristles.

Leaf-mine: initially narrow, linear, considerably widening towards end (Fig. 4), frass at beginning in two lines at each side of the mine, in the wider part in single central line.

Holotype ♂, AUSTRIA, Walchsee, 10. viii. 1923, on *Alnus incana* (L.) MOENCH (HENDEL); paratypes: ENGLAND, Chippenham Fen, Cambs., 1 ♀, emerged 7. viii. 1954 ex mine on *Alnus* sp., leg. 8. vii. 1954 (K. A. S.); FINLAND, Tvärminne, 1 ♀, no date (R. FREY). — GERMANY, Berlin-Spandau, 1 ♂, 1 ♀, 2. iv. 1932, ex *Alnus incana*; Bredow bei Nauen, 1 ♀, 21. vii. 1924, ex *A. incana*. — RUMANIA, Sinaia, 27. vii. 1968, numerous empty leaf-mines on *A. incana* (K. A. S.). — Holotype in Naturhistorisches Museum, Vienna; paratypes in author's collection.

I have designated as holotype of *alnivora* the male associated with *Alnus* in HENDEL's type series of *al nibetulae*.

A. alnivora can be included in HENDEL's (1931) key to *Agromyza* species with the following extension to couplet 36:

36. 2. Abschnitt der *c* mindestens 5mal so lang wie der 4. 36a
 — 2. Abschnitt der *c* etwa 3 bis 4mal so lang wie der 4. *albitarsis* MEIGEN
 36a. Schüppchenwimper braun gerandet *al nibetulae* HENDEL
 — Schüppchenwimper weiß gerandet *alnivora* spec. nov.

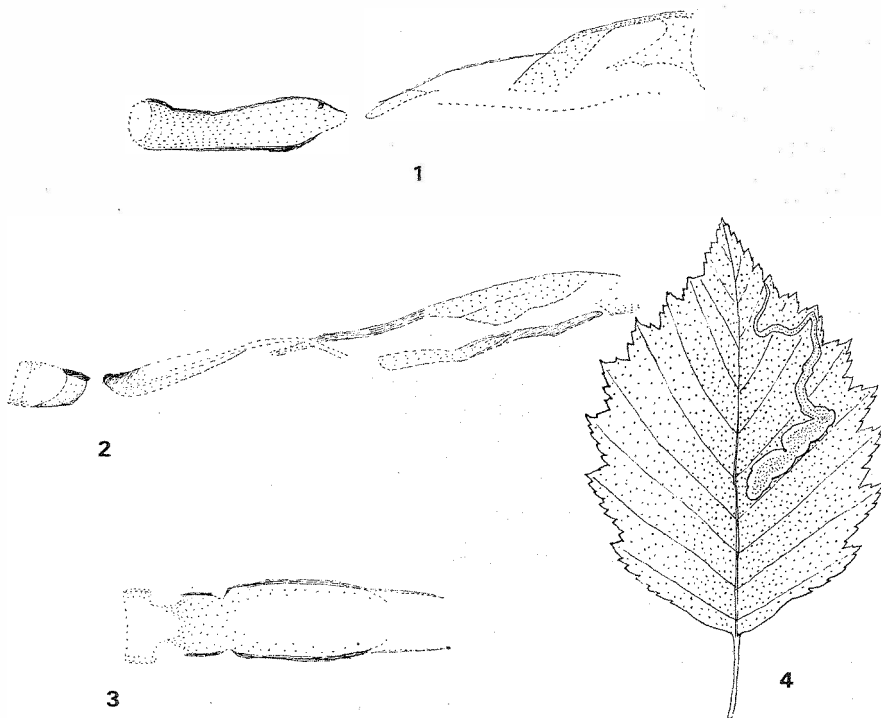


Fig. 1. *Agromyza alnibetulae* HENDEL: aedeagus. —

Figs. 2–4. *Agromyza alnivora* spec. nov.: 2, aedeagus, side view; 3, same, ventral view; 4, leaf-mine on *Alnus incana*

A. alnivora is readily distinguishable from *A. albitarsis* by the longer second costal section and broader frons; the genitalia of the two species are also entirely distinct.

The leaf-mine of *alnivora* is invariably shorter than in *alnibetulae*, in which it is conspicuously long, frequently winding over most of the leaf and often crossing its own track.

3. *Agromyza erythrocephala* HENDEL — a gall-causer on *Vicia*

Agromyza erythrocephala HENDEL

Agromyza erythrocephala HENDEL, 1920: 117; 1931-6: 115. Holotype ♂ from Silesia in Naturhistorisches Museum, Vienna.

This species has hitherto been known only from two specimens from Silesia, caught in 1918.

As early as 1954 BUHR discovered stem-galls on a number of *Vicia* species. HERING in SPENCER (1968: 50) considered the species to be a *Melanagromyza* sp. from examination of the larvae and described the larva as such (HERING, 1956: 261). Finally in 1966 BUHR succeeded in breeding out four specimens, a

male and three females and the species proved to be an *Agromyza*. The difficulties in breeding this species are clearly indicated by BUHR (private communication) who reported collecting 60 galls on *Vicia cracca* at Rammenau, Oberlausitz, 2. vii. 1966, from which only four puparia were obtained and from these no adults emerged.

I have examined the holotype of *A. erythrocephala* and can confirm that this is the species now discovered to be the gall-causer on *Vicia*. Host-plants so far established are *Vicia cracca* L., *dumetorum* L., *sepium* L., *silvatica* L. and *tenuifolia* ROTH (BUHR, 1965: 1382).

The head of *A. erythrocephala* is shown in Fig. 5. The male genitalia are shown in Figs. 6, 7; the distiphallus consists of 2 black tubules, with a small black, cylindrical process beyond; the ninth sternite has a short, pointed hypandrial apodeme; the surstyli bear some 30 or more short black bristles along the inner margin.

The larva forms a narrow, elongated stem-gall up to 2 cm in length, normally on the upper part of the stem. Pupation takes place internally. The puparium is dark-brown, having posterior spiracles each with up to 35 bulbs; the larva (Fig. 8a—e) was described in detail by HERING (1956: 261), as *Melanagromyza* sp.

HERING in SPENCER (1968: 334) considered that *A. erythrocephala* is related to *A. lathyri* HENDEL, both having the numerous bulbs on the larval posterior spiracles; the male genitalia confirm the close relationship of the two species.

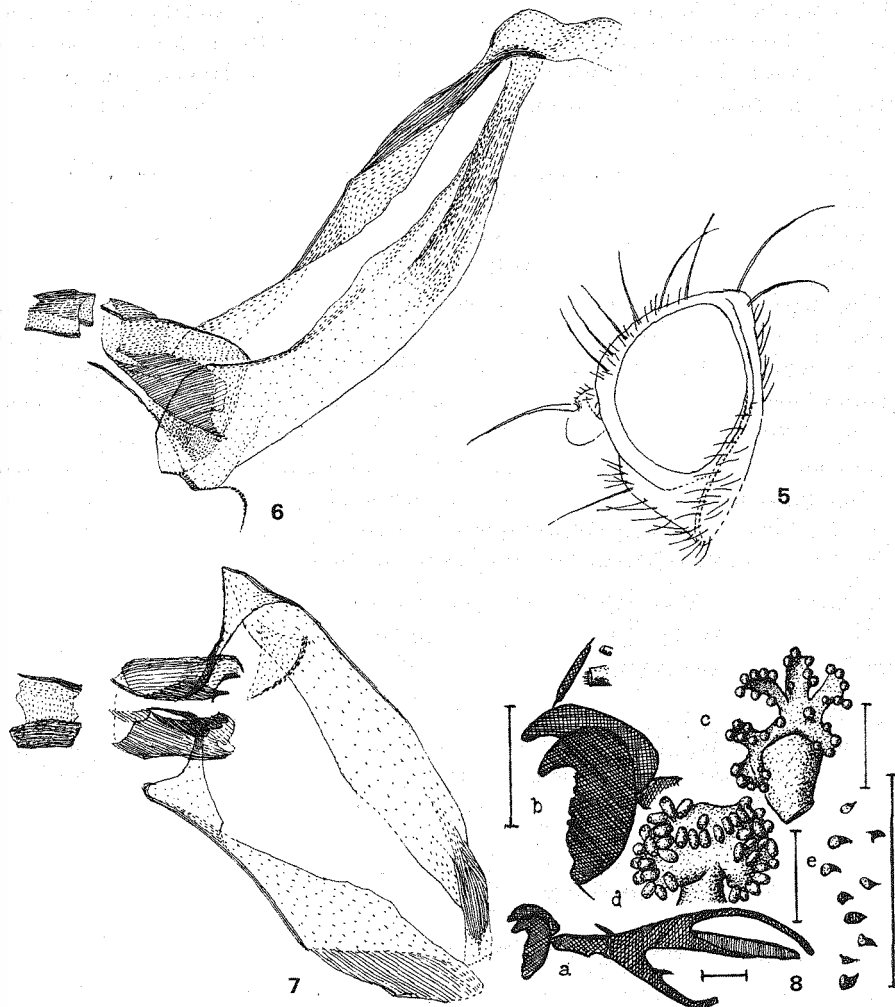
Material examined:

GERMANY: Silesia, „Löb. Br.“, 1 ♂, 1 ♀, 18. v. 1918 (male holotype); Thuringia, Mühlhausen, Stadtwald, 1 ♂, 2 ♀♀, emerged spring 1966, ex galls on *Vicia silvatica* leg. 29. vi. and 4. vii. 1965 (BUHR).

Genus *Melanagromyza* HENDEL

1. A clarification of the species in stems of *Angelica*

It has previously been considered that the European species found commonly in stems of *Angelica*, and more rarely in *Heracleum* and *Pastinaca*, represents *M. angelicae* (FROST) found in the stems of *Angelica* in the United States (SPENCER, 1957; 1966a). The adults of both populations appear to be identical on external characters, and in the male genitalia both have the same conspicuous gap between the basiphallus and distiphallus (Fig. 9). In the European population the posterior spiracles of the larva are adjoining (Fig. 11). I have recently seen a puparium obtained from New York, from stems of *Angelica atropurpurea*, leg. 26. ix. 1966 (A. S. MILLS) in which the posterior spiracular processes are separated by at least their own diameter, and the processes are distinctly smaller and the bulbs more irregular than in the European species. With this significant difference in the larvae it is clear that the Nearctic and Palaearctic populations must be treated as distinct species.



Figs. 5—8. *Agromyza erythrocephala* HENDEL: 5, head; 6, aedeagus, side view; 7, same, ventral view; 8, larva (drawn by HERING): a, cephalopharyngeal skeleton, side view; b, mouth-parts (higher magnification); c, anterior spiracles; d, posterior spiracles; e, lateral area of one of the anterior abdominal segments (scale line = 0.1 mm)

***Melanagromyza angeliciphaga* spec. nov.**

Head: Frons strongly projecting above eye, orbits pronounced, normally two *ors* and four *ori* but varying in total from five to seven; orbital setulae irregular, in several rows, those nearest eye margin partially reclinate, inner rows proclinate; lunule large, broad.

Mesonotum: 2 strong *dc*, *acr* numerous in 6—8 rows.

Wing: length from 2.6 to 3.5 mm, last section of vein m_{3+4} distinctly shorter than penultimate.

Colour: head entirely black, ocellar triangle only weakly shining; mesonotum predominantly black, with faint metallic reflections; abdomen shining, bluish-green; squamae whitish, margin pale-brown, fringe white to ochrous.

Male genitalia: aedeagus as in Figs. 9, 10, conspicuously wide gap between basiphallus and distiphallus.

Larva: described in detail by HERING (1957a:80), posterior spiracular processes adjoining, large, black, with an ellipse of 16—20 bulbs arranged regularly around the strong central horn (Fig. 11).

Host-plants/Biology: commonly *Angelica sylvestris* L., more rarely *Heracleum sphondylium* L. and *Pastinaca sativa* L.; internal stem-borer, many larvae frequently found together in stems of *Angelica*.

Holotype ♂, ENGLAND, Boxhill, Surrey, emerged 18. v. 1954 ex stem of *Angelica*, leg. 16. iv. 1954 (K. A. S.); paratypes: same locality, 5 ♂♂, 4 ♀♀; Bookham, 5. iv. 1957, 1 ♂, 1 ♀, ex *Angelica*; 1 ♂, 3 ♀♀, spring 1957, ex *Heracleum*; 1 ♂, 1 ♀, spring, 1957, ex *Pastinaca*; Headley, spring, 1957, 2 ♂♂, ex *Heracleum*; Scratch Wood, Middlesex, 1. vi. 1954, 1 ♂, 2 ♀♀, ex *Angelica*. — Holotype and paratypes in author's collection, further paratypes in British Museum (Natural History) and D. E. L., Eberswalde.

2. A new species in stems of *Chaerophyllum bulbosum* LINNAEUS

Melanagromyza chaerophylli spec. nov.

Head: frons broad, twice width of eye, not significantly projecting above eye in profile; two *ors*, three or four *ori*, orbital setulae irregularly in two rows, those nearest eye margin slightly reclinate, the inner row more proclinate; ocellar triangle broad; jowls deepest in centre below eye, about one-sixth eye height, cheeks forming narrow ring below eye.

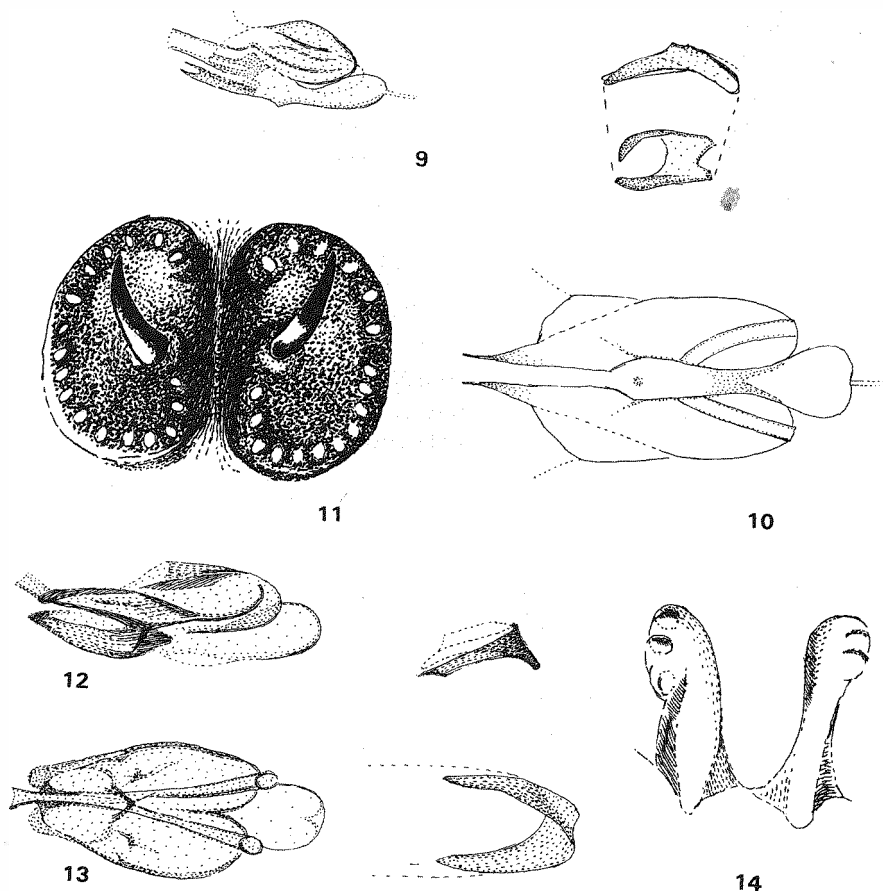
Mesonotum: 2 strong *dc*, *acr* in 6 to 8 rows.

Wing: length from 2.7 mm in male to 3.1 in female, costa extending strongly to vein m_{1+2} , last section of m_{3+4} two-thirds penultimate, first cross-vein at mid-point of discal cell.

Colour: head entirely black, orbits and ocellar triangle only weakly shining; mesonotum mat-black with faint coppery undertone, abdomen shining greenish; squamae pale-grey, margin dark-brown, fringe ochrous.

Male genitalia: aedeagus as in Figs. 12, 13.

Host-plant/Biology: *Chaerophyllum bulbosum* L. and possibly other *Chaerophyllum* spp., larva feeding as internal stem-borer. Puparium brownish-yellow, posterior spiracular processes separated by own diameter and arising from a distinct protuberance, each with an ellipse of about 15 bulbs arranged around a truncate central horn.



Figs. 9–11. *Melanagromyza angeliciphaga* spec. nov.: 9, aedeagus, side view; 10, same, ventral view; 11, posterior spiracles of puparium. —

Figs. 12–13. *Melanagromyza chaerophylli* spec. nov.: 12, aedeagus, side view; 13, same, ventral view. —

Fig. 14. *Hexomyza cecidogena* (HERING): posterior spiracles of puparium

Holotype ♂, GERMANY, Mühlhausen, Rieseninger, emerged 12–15. iv. 1967 ex stems of *Chaerophyllum bulbosum* leg. 28. vii. 1966 (H. BUHR); paratypes: 2 ♂♂, 4 ♀♀, same data. — Holotype and paratypes in author's collection.

A male and three females, all except one female in poor condition, from Jena, Wollnitz, leg. 18. ix. 1964 ex stems of *Chaerophyllum aureum* L. (H. BUHR), probably represent the same species. However, there are minor differences in the male genitalia and the posterior spiracles of the puparium are on a less pronounced protuberance. With only these two populations available for study, it is not possible at the moment to be certain whether these differences represent normal variation or whether there are sibling species on the two different hosts.

M. chaerophylli closely resembles *M. dettmeri* HERING and the adults cannot be satisfactorily distinguished. The arrangement of the larval spiracles, however, is entirely distinctive, with the two processes adjoining in *M. dettmeri* (or at most very narrowly separated, cf. HERING, 1957a: fig. 5).

Genus *Hexomyza* ENDERLEIN

Hexomyza cecidogena (HERING)

Melanagromyza cecidogena HERING, 1927; HENDEL, 1931—6: 162. Holotype ♂ from Germany in author's collection.

Hexomyza cecidogena, SPENCER, 1966a: 39.

This species was discussed and synonymised with *salicis* MALLOCH, a Nearctic species, by SPENCER, 1966a: 39.

I have recently described a new gall-causing species on *Salix* from Canada (SPENCER, 1969) and at this time re-examined available material of *salicis*, *cecidogena* and also *simplicoides* HENDEL. It is now apparent that differences in the male genitalia, of species which can certainly be accepted as distinct on the basis of external morphology or larval characters, may be extremely slight. It appears that the holotype of *salicis* was probably not a bred specimen and in any case the puparium has not been described or preserved. The male genitalia of *salicis* closely resemble those of *cecidogena* but show slight differences in detail. It is therefore felt desirable to revive the name *cecidogena* HERING for the Palearctic species. The exact status of *H. salicis* (MALLOCH) can only be further clarified when the larval or pupal characters can be studied.

The posterior spiracles of the puparium of the holotype of *H. cecidogena* are shown in Fig. 14.

Genus *Cerodontha* RONDANI

Cerodontha (Icteromyza) bohemanni (RYDÉN, 1951)

NOWAKOWSKI (1967: 654) has recently confirmed that *Icteromyza bohemanni* (RYDÉN) is distinct from the true *Icteromyza lineella* (ZETTERSTEDT), which was redescribed by HENDEL (1931, p. 55) as *hirticeps*.

I. bohemanni is very close to the Nearctic species, *longipennis* (LOEW) but is generally larger and the distal tubules of the aedeagus are conspicuously enlarged and strongly chitinated (Fig. 15, lectotype). The aedeagus of *I. longipennis* is illustrated by SPENCER (1969: Fig. 237).

Genus *Amauromyza* HENDEL

Amauromyza luteiceps (HENDEL, 1920), **comb. nov.**

Dizygomyza luteiceps HENDEL, 1920: 133.

Dizygomyza (Cephalomyza) luteiceps HENDEL, 1931: 34.

Dizygomyza hendeli DE MEIJERE, 1924: 138. Holotype ♂ in Zoological Museum, Amsterdam.

When recently studying the Holarctic species, *A. karli* HENDEL (SPENCER, 1969), specimens of *Cephalomyza luteiceps* HENDEL were also examined, and it became apparent that HENDEL's sub-genus *Cephalomyza* is synonymous with *Amauromyza* HENDEL. This synonymy has been formally established by SPENCER (1969).

The aedeagus of the holotype of *Dizygomyza hendeli* DE MEIJERE, which was correctly synonymised by HENDEL (1931: 34) with *luteiceps*, is shown in Figs. 16, 17.

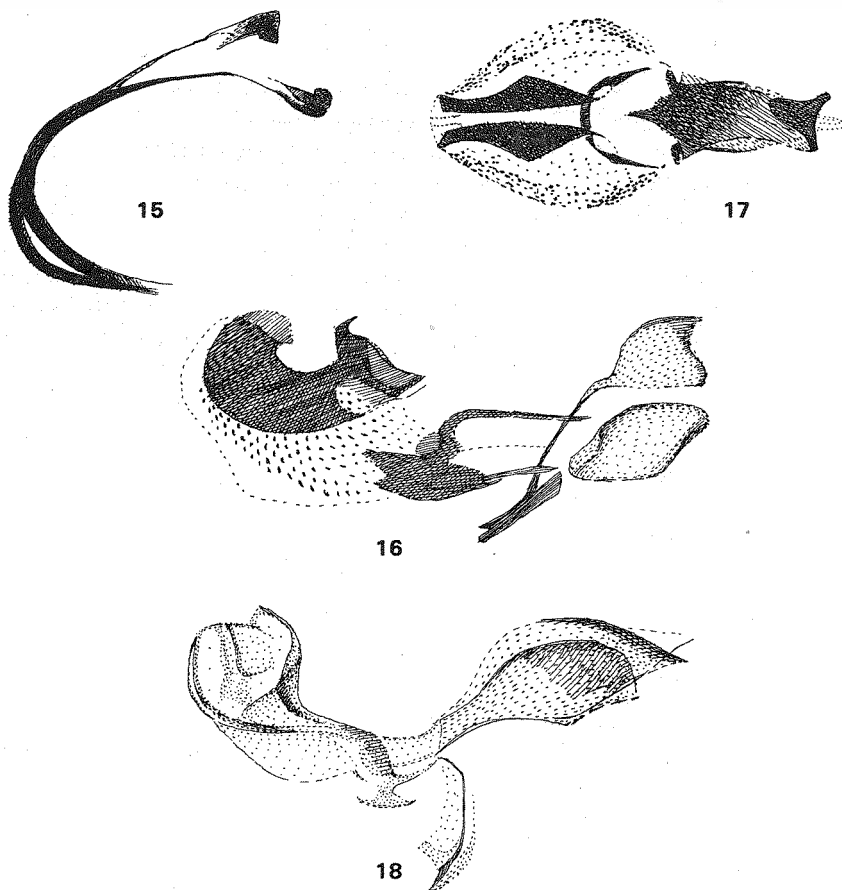


Fig. 15. *Cerodontha (Icteromyza) bohemani* (RYDÉN): distiphallus. —

Figs. 16—17. *Amauromyza luteiceps* (HENDEL): 16, aedeagus, side view; 17, same, ventral view. —

Fig. 18. *Praspedomyza morio* (BRISCHKE): aedeagus

Genus *Praspedomyza* HENDEL

Praspedomyza morio (BRISCHKE, 181: 26)

Study of specimens found in both Alberta and Quebec feeding on *Galium* spp. which externally appeared to be identical with the Palaearctic species, *morio* BRISCHKE, showed that a distinct species was involved, in which both the male genitalia and also arrangement of larval spiracles are conspicuously different. This new species, *galiivora*, described by SPENCER (1969: 199) is in fact Holarctic and is recorded both from Berlin and Corsica.

The aedeagus of *P. morio* (BRISCHKE) is shown in Fig. 18.

Genera *Paraphytomyza* ENDERLEIN and *Phytomyza* FALLÉN

1. A new leaf-miner on *Anemone silvestris* LINNAEUS

Phytomyza anemonanthae spec. nov.

Head: frons broad, almost twice width of eye, not projecting above eye in profile; two *ors*, the upper slightly weaker, two *ori*, the lower reduced to a weak hair; orbital setulae sparse; jowls one-fifth vertical eye height, cheeks linear; third antennal segment rounded, slightly longer than broad, arista finely pubescent.

Mesonotum: *acr* in four rows.

Wing: length from 1.9 mm in male to 2.2 in female; second costal section somewhat variable, from $2\frac{1}{3}$ to $3\frac{1}{3}$ times length of fourth.

Colour: frons entirely mat-black, orbits weakly shining, more so above; all antennal segments black; face black above but becoming distinctly yellowish towards margin of mouth; palps black; mesonotum black, dusted with grey, but with distinct sub-shine; all legs largely yellow, coxae becoming black towards base, tibiae and tarsi brownish-yellow, femora paler yellow; squamae whitish-yellow, fringe dark.

Male genitalia: aedeagus distinctive, as in Figs. 19, 20.

Leaf-mine: essentially linear, on *Anemone silvestris* L. (cf. HERING, 1957b: No. 358, p. 86); puparium brownish-black, posterior spiracles each with an ellipse of 6–8 bulbs.

Holotype ♂, GERMANY, Thüringen, Jena-Lobeda, 27. vi. 1964, ex *Anemone silvestris* leg. BUHR, No. 2053; paratype ♀, same locality, emerged 16. vi. 1967, ex leaf-mine on same, host, leg. 27. v. 1967 (BUHR, No. 3300). — Holotype and paratype in author's collection.

This is a striking species which is immediately recognisable by the combination of the black frons and antennae and yellow femora. HERING in SPENCER (1968: 95) had diagnosed the species as new and I have used the name with which he proposed describing it. In a letter dated 9 December 1967 BUHR commented that the species is generally common in May and June in the Jena district together with its food-plant.

P. anemonantheae can be included in HENDEL's (1931—6) key to palaearctic *Phytomyza* species and also in HERING's extended version of this key (SPENCER, 1968), as follows:

- 152 Schenkel ausgesprochen gelb; Stirn und alle Fühlerglieder schwarz *anemonantheae* spec. nov.
 — Schenkel mindestens teilweise schwarz 152a
 152a as in HENDEL (1931-6) and HERING in SPENCER (1968)

2. Two new species on *Clematis cirrhosa* LINNAEUS

Phytomyza cirrhosae spec. nov.

Head (Fig. 21): frons broad, twice width of eye, not projecting above eye in profile; two equal *ors*, two incurved *ori*; orbital setulae short, sparse; jowls distinctly extended at rear, in centre below eye about one-eighth vertical height of eye, cheeks forming only narrow ring below eye; third antennal segment essentially round, large.

Mesonotum: 3 + 1 *dc*, fourth distinctly in front of pre-sutural, *acr* irregularly in four rows, extending to midway between first and second *dc*.

Wing: length from 2.2 mm in male to 2.7 in female, second costal section short, normally just less than three times length of fourth.

Colour: frons reddish-yellow, upper orbits shining-black, both *vt* on black ground; face essentially yellow but sometimes faintly greyish; first and second antennal segments yellow, third black; palps yellowish; mesonotum and scutellum largely shining black, with at most faint greyish undertone; pleura grey-black, upper margin of mesopleura faintly yellowish; legs: coxae black, femora black with faintly yellow knees, tibiae and tarsi paler, yellowish-brown; squamae yellowish-grey, fringe black.

Male genitalia: aedeagus as in Figs. 22, 23, distiphallus bending back above basiphallus.

Host-plant/Biology: larva forming whitish blotch-mine on *Clematis cirrhosa* L., pupating externally; puparium dark-brown, posterior spiracles each with an irregular ellipse of about 16 bulbs.

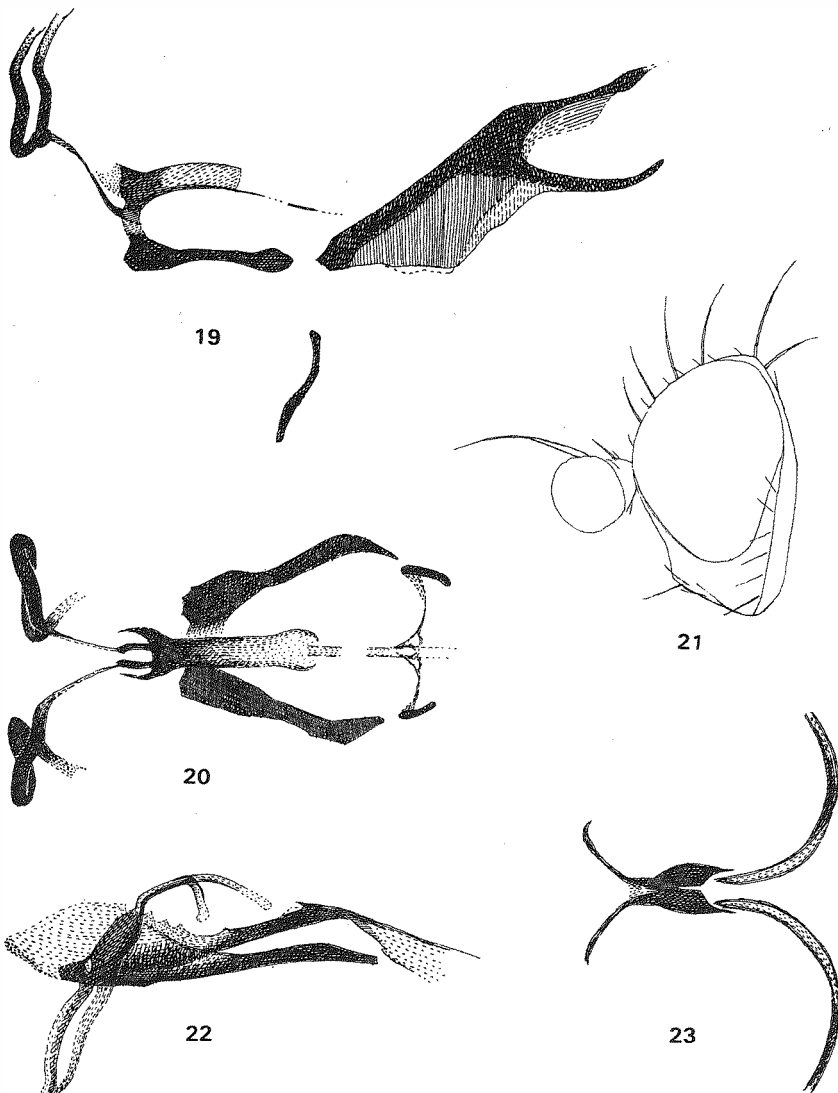
Holotype ♂, Spain, Menorca, S. Tomas, emerged 22. iii. 1968 ex leaf-mine on *Clematis cirrhosa* leg. 29. ii. 1968; paratypes: 1 ♂, emerged 25. iii. 1968, otherwise same data; Mallorca, nr. Palma airport, 1 ♀, 1. iii. 1968, caught on same host; 2 ♂♂, 3 ♀♀, emerged 23—28. iii. 1968, ex leaf-mines leg. 1. iii. 1968 (all K. A. S.). — Holotype and paratypes in author's collection, further paratypes in British Museum (Natural History) and D. E. I., Eberswalde.

P. cirrhosae can be included in HENDEL's (1931—6) key to palaearctic species in an extension to couplet 119, as amended by HERING (SPENCER, 1968: 404), as follows:

- 119 Das 3. Fühlerglied länger als breit *diversicornis* HENDEL
 — Das 3. Fühlerglied rund 119aa

- 119aa Mesonotum vorwiegend glänzend schwarz; Orbiten schwarz; die 1. und 2. Fühl-
 lerglieder gelb *cirrhosae* spec. nov.
 — Mesonotum matt, grau-schwarz 119a

Leaf-mines of this species were found by the author in the Atlas Mountains,
 south of Marrakech on 21.i.1966 and the mine was illustrated by SPENCER, 1967:



Figs. 19—20. *Phytomyza anemonantheae* spec. nov.: 19, aedeagus, side view; 20, same, ventral view. —

Figs. 21—23. *Phytomyza cirrhosae* spec. nov.: 21, head; 22, aedeagus, side view; 23, distiphallus, dorsal view.

Fig. 10. The species has also been recorded from Palestine by HERING, 1957b: No. 1511, p. 309.

***Phytomyza mallorcensis* spec. nov.**

Head (Fig. 24): orbits slightly but consistently projecting above eye in profile, more so anteriorly; two equal *ors*, directed upwards and slightly outwards, one strong, incurved *ori*; orbital setulae short, in single row; jowls somewhat extended at rear, in centre $\frac{1}{3}$ height of eye, cheeks broad, about $\frac{1}{2}$ width of jowls; third antennal segment large, distinctly longer than broad, arista distinctly widening towards base.

Mesonotum: 3 + 1 strong *dc*, 4th well before pre-sutural; *acr* in two rows, somewhat irregular, not extending beyond 2nd *dc*.

Wing: length from 2.8 mm in male to 3.5 in female; second costal section short, from $2\frac{1}{4}$ to $2\frac{1}{2}$ times length of fourth.

Colour: frons, orbits, jowls and face yellow; both *vt* on dark ground; second and third antennal segments black, first paler, yellowish; palps black; mesonotum and scutellum mat-grey; pleura blackish-grey, upper margin of mesopleura narrowly yellow; legs: fore-coxae distinctly yellowish, legs otherwise black, apart from all knees which are also yellow; squamae yellowish-grey, fringe black.

Male genitalia: aedeagus as in Figs. 25, 26.

Holotype ♂, Spain, Mallorca, nr. Palma airport, 1. iii. 1968, caught on *Clematis cirrhosa* L.; paratypes: 3 ♂♂, 5 ♀♀, same data; 1 ♀, emerged 8. iii. 1968 ex stem of same plant, leg. 1. iii. 1968; Menorca, S. Tomas, 1 ♀, 29. ii. 1968, caught on same plant (all K. A. S.). — Holotype and paratypes in author's collection, paratypes also presented to British Museum (Natural History) and D. E. I., Eberswalde.

P. mallorcensis can be included in a further extension to couplet 141 of HENDEL's (1931–6) key to palaearctic *Phytomyza* species, as amended by HERING (SPENCER, 1968: 408), as follows:

- 141 Arista auffallend lanzettlich verbreitert (HENDEL, 1931–6: Fig. 393, *crassiseta*; RYDÉN, 1937: Fig. 3, *ringdahli*) 141a
 — Arista entweder normal oder höchstens schwach verbreitert (HENDEL, 1931–6: Fig. 414, *globulariae*) 141b
 141a *Acr* schütter, nur 1–3 Paare vorhanden *crassiseta* ZETTERSTEDT
 — *Acr* zahlreicher, deutlich 2reihig, mit einigen überzähligen Härchen . *ringdahli* RYDÉN
 141b 2. Fühlerglied grau-schwarz ***mallorcensis* spec. nov.**
 — Die ersten zwei Fühlerglieder gelb 142

The one female reared from *Clematis cirrhosa* was obtained unexpectedly from a bag of stems and leaves from which I was breeding out *P. cirrhosae* described above. It therefore seems certain that this species feeds on this host as an internal stem-borer. The male genitalia indicate a close relationship with *P. eximia* SPENCER from South Africa (SPENCER, 1964: Figs. 39, 40); it now seems probable that this species is also an internal stem-feeder in one of the local *Clematis* species.

3. A clarification of three leaf-miners on *Lonicera*

There has in the past been considerable confusion regarding the identity of the various leaf-miners on *Lonicera* described by BRISCHKE (1881), ROBINEAU-DESVOIDY (1851) and KALTENBACH (1862). While clarifying the species treated by HENDEL as *Phytomyza xylostei* (ROBINEAU-DESVOIDY) which is not uncommon in Canada and for which the name *luteoscutellata* DE MEIJERE is now accepted, the true identity of *Phytomyza xylostei* ROBINEAU-DESVOIDY became apparent. These two species and also *Napomyza xylostei* (KALTENBACH), sensu HENDEL are briefly discussed below and the available names *Phytomyza aprilina* GOUREAU and *P. harlemensis* WEYENBERGH are revived.

Phytomyza aprilina GOUREAU

Phytomyza aprilina GOUREAU, 1851: 145. Types from France lost.

Phytomyza xylostei ROBINEAU-DESVOIDY, 1851: 398; GOUREAU, 1851: 145.

Agromyza loniceræ KALTENBACH, 1862: 93, **syn. nov.** Types from Germany lost.

Napomyza lonicerella HENDEL, 1931—6: 317, **syn. nov.**

It now seems clear that *Phytomyza xylostei* ROBINEAU-DESVOIDY represents the species subsequently named *lonicerella* by HENDEL, accepting its identity with *Agromyza loniceræ* KALTENBACH. A character with which this species can be immediately recognised is the pale greenish puparium remaining in the mine, which after emergence is white. GOUREAU (1851) who reared the 15 specimens on which ROBINEAU-DESVOIDY based his description refers to the colour of the puparium as „d'un vert tendre“; KALTENBACH (1862: 94) writes: „Die Puppe, welche an der untern Blattseite aus der durchbohrten Epidermis hervorragt, ist ein weisses Tönnchen“.

GOUREAU (1851) himself briefly described this species as *Phytomyza aprilina*, antedating ROBINEAU-DESVOIDY's description by one month. HENDEL was therefore formally not correct in using the name *xylostei* ROBINEAU-DESVOIDY and possible confusion with *xylostei* KALTENBACH can now be avoided by resurrecting the name *aprilina* GOUREAU.

This species has the second cross-vein but the male genitalia (Figs. 27, 28) indicate that it correctly belongs in *Phytomyza*. The synonymy is therefore as given above.

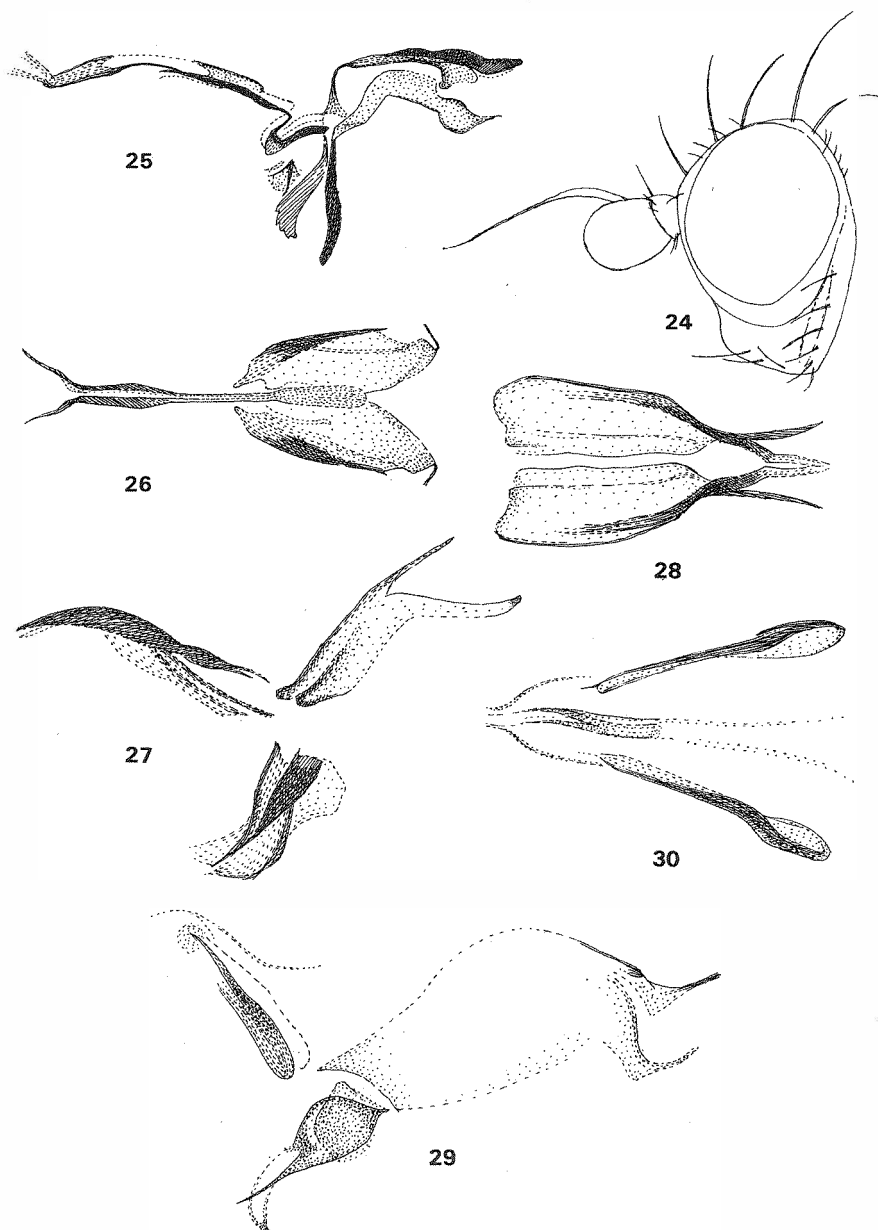
The male genitalia suggest that this species is closely related to *Phytomyza periclymeni* DE MEIJERE (cf. SPENCER, 1969: Fig. 486) and also to a new species from Canada feeding on *Lonicera involucrata* (RICHARDS.) BANKS (cf. SPENCER, 1969: Figs. 447—8).

Phytomyza harlemensis WEYENBERGH

Agromyza xylostei KALTENBACH, 1862. Types from Germany lost.

Napomyza xylostei, HENDEL, 1920: 151; 1931—6: 322.

Phytomyza harlemensis WEYENBERGH, 1870: 169. Lectotype ♂ in Zoological Museum, Amsterdam.



Figs. 24–26. *Phytomyza mallorcensis* spec. nov.: 24, head; 25, aedeagus, side view; 26, same, ventral view. —

Figs. 27–28. *Phytomyza aprilina* GOUVEAU: 27, aedeagus, side view; 28, same, ventral view. —

Figs. 29–30. *Phytomyza harlemensis* WEYENBERGH: 29, aedeagus, side view; 30, same, ventral view

The species described by KALTENBACH as *Agromyza xylostei* and later placed by HENDEL in *Napomyza* correctly belongs in the genus *Phytomyza*, despite the presence of the second cross-vein. In view of the secondary homonymy with *P. xylostei* ROBINEAU-DESVOIDY, the species must now be known by the next available name, *harlemensis* WEYENBERGH.

HENDEL tentatively accepted this synonymy. DE MEIJERE (1924: 143—4) was more positive in accepting *harlemensis* as synonymous with *xylostei* KALTENBACH. Some doubt may have existed in the past since the two illustrations of the leaf-mines given by WEYENBERGH (1870: Plate 7, Fig. 1) clearly represent two different species — *Paraphytomyza luteoscutellata* (DE MEIJERE) as well as the species under discussion here. However, I have now examined the available type specimen, designated herewith as lectotype, and the male genitalia immediately confirm its identity as the species treated by HENDEL as *Napomyza xylostei* (KALTENBACH).

The genitalia of this species are shown in Figs. 29, 30.

***Paraphytomyza luteoscutellata* (DE MEIJERE)**

Phytomyza lonicerae BRISCHKE, 1881: 257. Location of types not known, believed lost.

Phytomyza luteoscutellata DE MEIJERE, 1924: 143.

Phytomyza xylostei (ROBINEAU-DESVOIDY), sensu HENDEL, 1931—6: 299.

Phytomyza xylostei ROBINEAU-DESVOIDY was treated by HENDEL as the species subsequently described by BRISCHKE as *lonicerae*, in which the third antennal segment, scutellum and sides of the thorax are yellowish. This, however, is not in accord with the original description. DE MEIJERE (1924: 143) correctly doubted the validity of associating *lonicerae* BRISCHKE with *xylostei* ROBINEAU-DESVOIDY and proposed the new name *luteoscutellata* for *lonicerae* BRISCHKE, which was itself preoccupied by *lonicerae* ROBINEAU-DESVOIDY. The name *luteoscutellata* has been accepted for this Holarctic species by SPENCER (1969), with an illustration of the male genitalia in Fig. 369.

4. A new species in the leaf-stalks of *Petasites albus* (L.) GAERTNER

***Phytomyza buhriella* spec. nov.**

Head: Frons broad, twice width of eye, not projecting above eye in profile; two equal *ors*, two *ori*, the lower substantially weaker; orbital setulae well-developed, in single row; jowls extended at rear, in centre below eye about $\frac{1}{4}$ vertical height of eye, cheeks forming broad ring below eye; third antennal segment small, round, arista only finely pubescent, somewhat swollen at base.

Mesonotum: 3 + 1 strong *dc*, 4th well before pre-sutural; *acr* somewhat irregularly in two rows, more rarely appearing in three or four rows, normally ending shortly after 2nd *dc*, only isolated hairs beyond.

Wing: length in male 2.6 mm, in female 3—3.2 mm, second costal section from three to four times length of fourth.

Colour: frons and orbits yellow, both *vt* on grey ground which extends along hind-margin of eye; all antennal segments black, face greyish but margin of mouth yellow; palps black; mesonotum ash-grey, mat; pleura greyish-black, only upper margin of mesopleura narrowly yellow; legs: uniformly black but femora with knees conspicuously yellow; abdomen black, with hind-margin of tergites narrowly yellow; squamae yellowish-grey, fringe dark.

Male genitalia: aedeagus as in Fig. 31.

Host-plant/Biology: *Petasites albus* (L.) GAERTNER, mine initially in leaf-blade but quickly entering a vein and fully developing in the stalk of the leaf, more rarely entering the main stem; pupation in mine (HERING, 1957b, 2: 746).

Holotype ♂, GERMANY, Mühlhausen, emerged 8. ix. 1967 ex mine in *Petasites albus*, leg. 31. viii. 1967; paratypes: 1 ♂, 2 ♀♀, emerged 10–15. ix. 1967, otherwise same data (BUHR), in author's collection.

In HENDEL's (1931–6) key to palaearctic *Phytomyza* species, *P. buhriella* runs to couplet 129. It obviously closely resembles and could be identical with *P. nigroclypea* HENDEL; the male holotype is from Villach, Austria, a locality where *buhriella* might be expected. Unfortunately the type of *nigroclypea* appears to be mislaid and it therefore seems desirable to describe *buhriella* as new, until the identity of *nigroclypea* can be established from the examination of the male genitalia.

The acrostichals in *P. buhriella* are somewhat variable. In three of the four specimens examined they are clearly in two rows but in the fourth specimen, the largest female, they are irregularly in three or four rows. With this character *buhriella* would run to couplet 120 in HENDEL's key but it is clearly distinct from any of the species in the following group of couplets.

BUHR first discovered mines of this species in 1955 (HERING in SPENCER, 1968: 56). However, it was only in 1966 that three flies were obtained, all of which proved to be females. This was the meagre harvest from examination of 675 leaves!

Identification of the species without males was not possible and with undiminished enthusiasm in August, 1967 BUHR collected this species on an even larger scale. 844 leaves were examined from which 276 puparia were obtained, giving four flies, including two males. Details of this collecting are as follows:

	Leaves with mines	Empty mines	Puparia obtained		Larvae	Flies	Braconids	Chalcids
			mines upwards	mines downwards				
2. 8. 67	20	1	5	5	6	0	6	0
7. 8. 67	278	10	53	38	6	0	41	8
18. 8. 67	133	9	26	28	4	0	20	6
31. 8. 67	213	44	66	55	3	4	32	14

BUHR himself commented that no species had proved as difficult to breed as this one; examination of stems on this scale was virtually „hard labour“ (Sträflingsarbeit)!

Similar mines were found by BUHR on *Tussilago farfara* and GRIFFITHS has found such mines on this host in England. The Braconid parasites obtained by BUHR were identified by GRIFFITHS as *Dacnusa merope* (NIXON) which was described from England. It therefore seems certain that *P. buhriella* itself occurs in England.

5. *Phytomyza gymnostoma* LOEW — a new synonymy

Phytomyza gymnostoma LOEW

Phytomyza gymnostoma LOEW, 1858; HENDEL, 1931—6: 410. Holotype ♂ from „Posnania“ lost.

Phytomyza algeciracensis STROBL, 1906; HENDEL, 1931—6: 410. Syntypes in coll. STROBL, Admont.

Agromyza phytomyzina HERING, 1933, **syn. nov.** Holotype ♂ in Zoologisches Museum, Berlin.

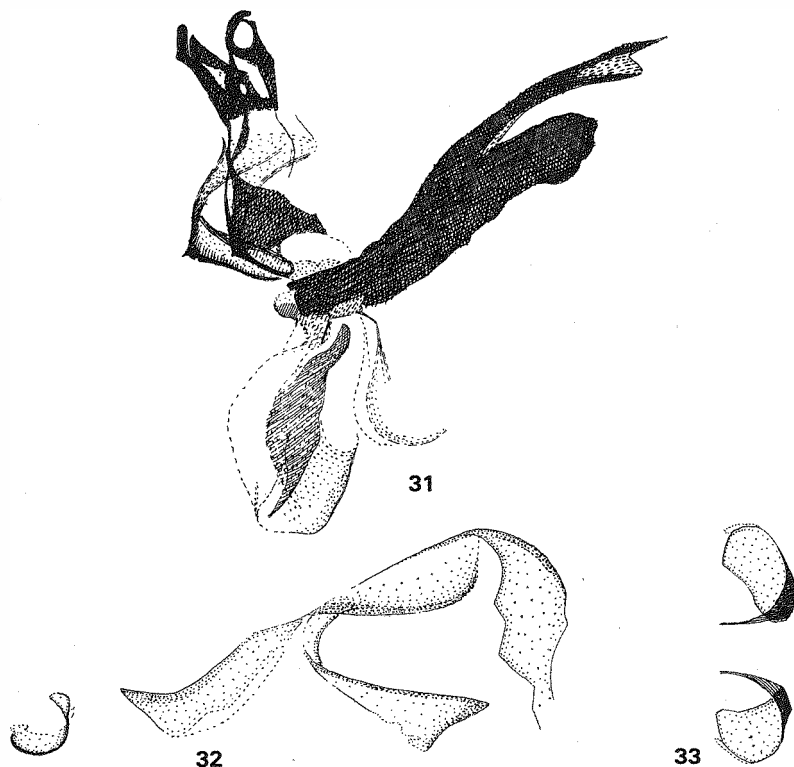


Fig. 31. *Phytomyza buhriella* spec. nov.: aedeagus. —

Figs. 32—33. *Phytomyza gymnostoma* LOEW: 32, aedeagus, side view; 33, distiphallus, ventral view

Careful examination of the type of *Agromyza phytomyzina* shows that the sub-costa does not directly join vein r_1 but continues as a fold to the costa. It is thus incorrectly placed in the genus *Agromyza* and in fact represents *Phytomyza gymnostoma* LOEW. This is confirmed by examination of the male genitalia.

I have also examined five syntypes of *Phytomyza algeciracensis* STROBL and confirm that HENDEL correctly synonymised this species with *gymnostoma*.

The aedeagus and distiphallus of *gymnostoma* are shown in Figs. 32, 33.

HENDEL (1931—6: 411) records *gymnostoma* as a leaf-miner on *Allium*. According to HERING (SPENCER 1968: 320) this information, based on one of his own early records, must be considered as doubtful.

Genus *Ptochomyza* HERING

Ptochomyza asparagivora SPENCER

Ptochomyza asparagivora SPENCER, 1964: 39. Holotype from Addis Ababa ex *Asparagus africanus* in author's collection.

In August, 1967 empty mines were found by my wife in the stout thorns of an unidentified plant at Mahon, Menorca. I returned to this locality at the end of February, 1968, found the plants without difficulty and after some searching obtained mines with fresh puparia which produced 3 ♂♂ and 3 ♀♀ between 29. ii. and 16. iii. 1968. The host-plant proved to be *Asparagus stipularis* FORSK. (= *horridus* L.).

This species is tentatively referred to *P. asparagivora*. The flies are slightly but consistently larger than in the type series and the puparia are also larger than in the series from Yugoslavia bred from *Asparagus acutifolius* by HERING in April, 1963. However, this could well be explained by the thorns on *A. stipularis* being substantially stouter than the thorn-like scales in which the species feeds on *A. acutifolius* and *A. africanus*. The distinctive arrangement of the two notopleural bristles, the form of the larval spiracles (as illustrated by DE MEIJERE, 1937: Fig. 94) and the male genitalia all appear identical in the populations from the three different hosts. The colour of the adults from *A. stipularis* is somewhat variable; the antennae may be entirely yellow and the dark area of the mesonotum divided into three bands as in the typical form or in some specimens both the third antennal segment and the entire mesonotum may be dark.

I have also seen specimens from Italy, Capo d'Orso, Penisola Sorrentina, 26. iv. 1968 ex mines on *A. acutifolius*, leg. 18. iv. 1968 (VIGLIANTI). This species thus appears to be widespread in the Mediterranean area.

Summary

Seven new species are described, four new synonymies are established, two discarded names are revived and six further species are discussed and clarified. Illustrations are given of the male genitalia of 15 species.

Zusammenfassung

Es werden sieben neue Arten beschrieben, vier neue Synonymien festgestellt, zwei aufgegebene Namen wiederaufgenommen und sechs weitere Arten besprochen und geklärt. Abbildungen der männlichen Genitalien von 15 Arten werden beigegeben.

Резюме

Описываются семь новых вида, устанавливаются 4 новых синонимов, две отвергнутые имена вновь устанавливаются и шесть другие виды обсуждаются и выясняются. Даются рисунки полового аппарата самцов 15-и видов.

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