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NEW AND LITTLE-KNOWN AGROMYZIDAE FROM MICHIGAN
(DIPTERA: ACALYPTRATAE)

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The latest major work on North American Agromyzidae, *The Agromyzidae of Canada and Alaska* (Spencer, 1969), lists 290 regional species. Of that number, half (147) are new species and 23 are previously described species newly recorded for the continent. It is thus evident that the North American Agromyzid fauna is still poorly known. Among material recently determined for the collection of Michigan State University, East Lansing, were the 5 additional new species herein described. A male allotype for *Melanagromyza inornata* Spencer (1969), described from the female only, is also described, and more detailed figures of the male postabdomen of *Melanagromyza lauta* Spencer (1969) are presented. Unfortunately all of the material is from random collecting and no host plants for the species are known. Types are retained in the collections of the United States National Museum of Natural History (USNM) and paratypes are returned to the Michigan State University collections (MSC).

AGROMYZINAE

Agromyza haplacme, n. sp.

Male. Length of wing 2.5 mm.

Head: Front slightly projecting above eye in profile, 1.3 times width of eye; 2 strong, reclinate *ors*; 3 weak, inclinate *ori*; orbital setulae strong, reclinate, in single irregular row from level of antenna to upper *ors*; cheek deeply extended in rear, 1/3 height of eye; 3rd antennal segment circular, finely pubescent; arista swollen in basal 1/7, slender apical part with dense, fine pubescence spreading to width somewhat greater than largest diameter of basal part.

Mesoscutum: 2 strong *dc*, preceded by 3 much smaller ones; *acr* setulae rather long, in 6 or 8 irregular rows.

Wing: Costa extending strongly to 3rd vein, weakly to 4th vein; last section of 5th vein 0.63 as long as penultimate; *ta* at middle of discal cell.

Legs: Middle tibia with 2 short posterior bristles.

Color: Generally black; antenna brown; knees, both ends of tibiae, and all of tarsi yellowish; mesoscutum lightly tomentose; squamae and their fringes whitish; halter white.

Postabdomen: See Fig. 1; distiphallus with simple slender projection 2/3 as long as basiphallus; epandrium with small group of spicules on mesal side of lower margin.

Holotype: male, Bath, Clinton County, Michigan, 22 October 1956 (R. Scheibner), no. 71542 in USNM.

The species runs in Spencer's key (1969) to couplet 15, but differs decidedly in the postabdomen from 2 of the 3 species brought out at that point: *A. pseudoreptans* Nowakowski and *A. ambrosivora* Spencer. It is very similar to the 3rd species, *A. reptans* Fallen, as keyed by Spencer and as described by Nowakowski (1964), by its narrower front, deeper cheek, and several details of the postabdomen, notably the simple apical distiphallic process, which in *A. reptans* is divided more than halfway to its base.

The species name is a compound noun in apposition, composed of the Greek elements *haplo*-'simple' + *acme* 'tip.'

Melanagromyza inornata Spencer (1969:68)

Melanagromyza inornata was described from 2 female specimens taken at Beech Grove, Quebec. Its distinctive characters of large size, broadly projecting orbits with

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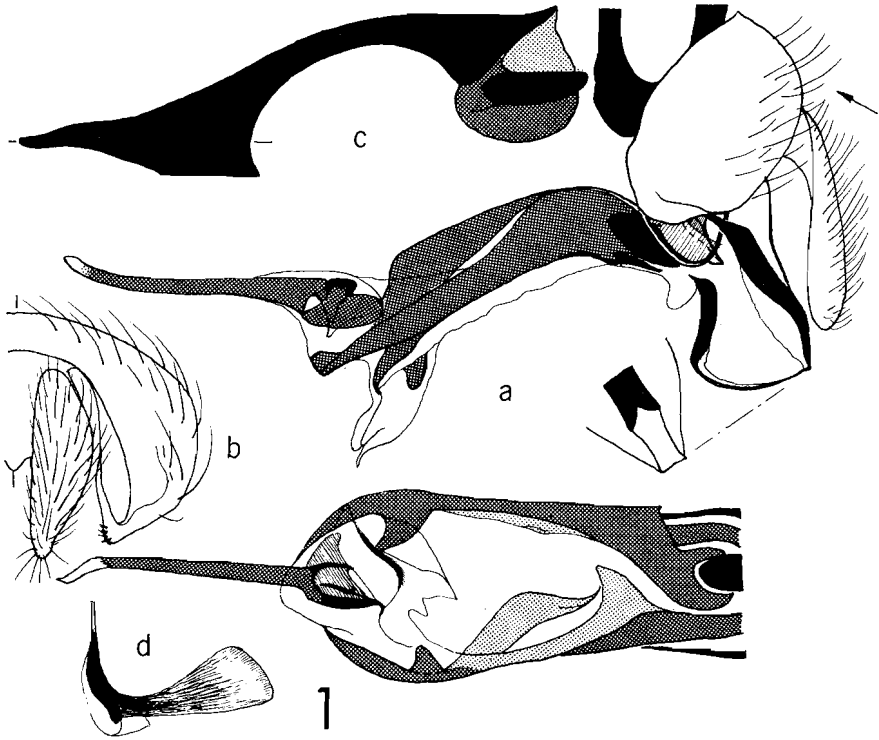


Fig. 1. *Agromyza haplacme*, n. sp., male postabdomen. a, lateral view, with anterior view of epiphallus and ventral view of aedeagus; b, posterior view of epandrium and cercus in direction of arrow in a; c, hypandrium; d, sperm pump.

proclinate setulae, and white squamae are found in a male taken in Clare County, Michigan, 4 May 1950 (R. R. Dreisbach), retained in USNM. The postabdomen of this latter specimen, which has been labeled as allotype, is shown in figure 2. *M. inornata* was stated by Spencer to be comparable only to *M. miranda* Spencer. The only part of the postabdomen of *M. miranda* that was figured is a lateral view of the distiphallus. That part in the allotype of *M. inornata* is very different. Only eventual securing of males associated with females agreeing in all details with the type of *M. inornata* will firmly establish the identity of the male of this species. The designation of the present specimen as allotype, a non-codical entity, is purely for convenience.

Melanagromyza lauta Spencer (1969:70)

A male specimen of *Melanagromyza lauta*, described from Simcoe, Ontario, was collected in Cheboygan County, Michigan, 21 June 1948 (Bernard Skud), retained in USNM. I have found that some of the additional postabdominal characters, especially those of the epandrium, shown in figure 3, to be of considerable value in distinguishing species of *Melanagromyza*.

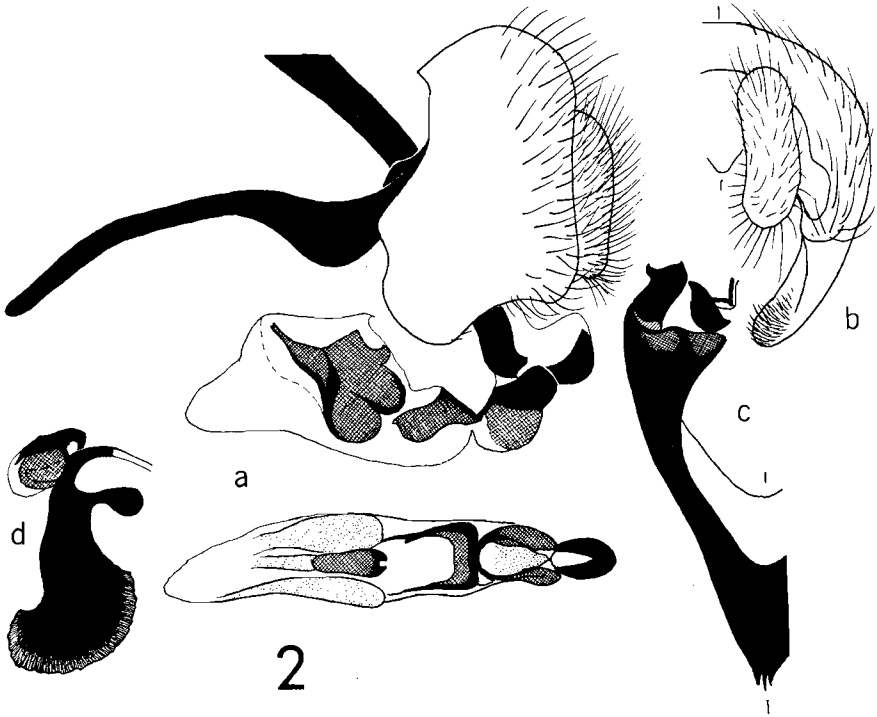


Fig. 2. *Melanagromyza inornata* Spencer, male postabdomen. a, lateral view, with ventral view of aedeagus; b, posterior view of epandrium and cercus; c, hypandrium; d, sperm pump.

PHYTOMYZINAE

Calycomyza michiganensis, n. sp.

Male. Length of wing 2mm.

Head: Orbit not projecting above eye, with 2 nearly equal *ors*, 2 weaker *ori*, and a row of setulae, reclinate and strong above, small below, and lowermost few proclinate; 3rd antennal segment as in fig. 4b, round, but flattened at base of arista.

Mesoscutum: 2 strong *dc*, anterior one more than half as long as posterior one; 6 rows of short *acr* setulae.

Wing: as in fig. 4a, last section of 5th vein 2.75 times as long as penultimate.

Legs: Middle tibia with 1 moderately strong posterior bristle.

Color: Upper orbit black from vertex to area between *ors*, becoming narrowly pale tan about *ori*; face piceous above, yellow in lower 2/5; mesoscutum shining black, notopleural area and mesal and posterior sides of humerus yellow; legs black, only fore knees very narrowly reddish yellow; squamae whitish, rim tan, fringe brown.

Postabdomen: As in fig. 4c-e; aedeagus differing only in detail from those of *C. cynoglossi* (Frick) and *C. novascotiensis* Spencer.

Holotype, male, Gull Lake Biological Station, Kalamazoo County, Michigan, 15 August 1964 (Robert W. Matthews), no. 71543 in USNM; paratype male, Ojibway Lake, Isle Royale, Keweenaw County, Michigan, 27 June 1964 (R. B. Willson), in MSU.

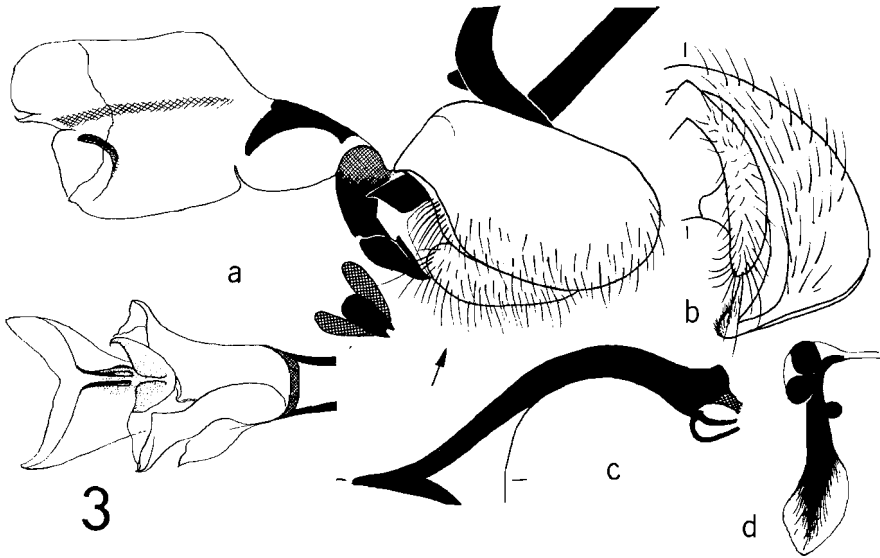


Fig. 3. *Melanagromyza lauta* Spencer, male postabdomen. a, lateral view, with ventral views of distiphallus and epiphallus; b, posterior view of epandrium and cercus in direction of arrow in a; c, hypandrium; d, sperm pump.

C. michiganensis will run in the key by Spencer (1969:145), if the squamal fringe is considered "at most ochrous brown," to *C. promissa* (Frick) and *C. menthae* Spencer, but if the squamal fringe is considered "dark, brown or black," it will run to *C. menthae* Spencer and *C. althaeae* Spencer at another place in the key. All of these species are differentiated otherwise than in color of the squamal fringe only by aedeagal characters.

C. michiganensis and several recently described species will fall into the concept of *C. jucunda* (Wulp) defined by Frick (1956:288), who had a pair of specimens from Dos Palos, Merced County, California, compared with the female type of *Agromyza jucunda* Wulp, from Wisconsin, by Dr. A. Diakonoff. The identity of the Wulp species will remain dubious until more critical examination of the type, including dissection of the postabdomen, can be made. *C. michiganensis* at least has the mesoscutum quite strongly shining, rather than with the weak shine (met flauwen glans) cited by Wulp for *A. jucunda*, and it is certainly a different species from the homoeotypes in the Frick collection.

The name *michiganensis* is an adjective referring to the State of Michigan.

Phytomyza cudu, n. sp.

Male. Length of wing 2.25 mm; 2nd costal section (fig. 5a), 3 times length of penultimate section; head black; frontal orbit projecting slightly above eye, shining; upper *ors* lacking, 3 incurved *ori*; arista densely short pubescent; thorax black except narrow yellowish dorsal and posterior margins of sternopleuron; mesoscutum lightly gray tomentose; 3+1 strong *dc*; *acr* setulae in about 4 irregular rows; squamae, squamal fringe, and halter cream-colored; legs black, narrowly but distinctly yellowish at knees.

Postabdomen as in figure 5; distiphallus with pair of sinuate processes resembling antelope horns.

Holotype, male, Hillsdale County, Michigan, 21 May 1960 (R. and K. Dreisbach), no. 71546 in USNM.

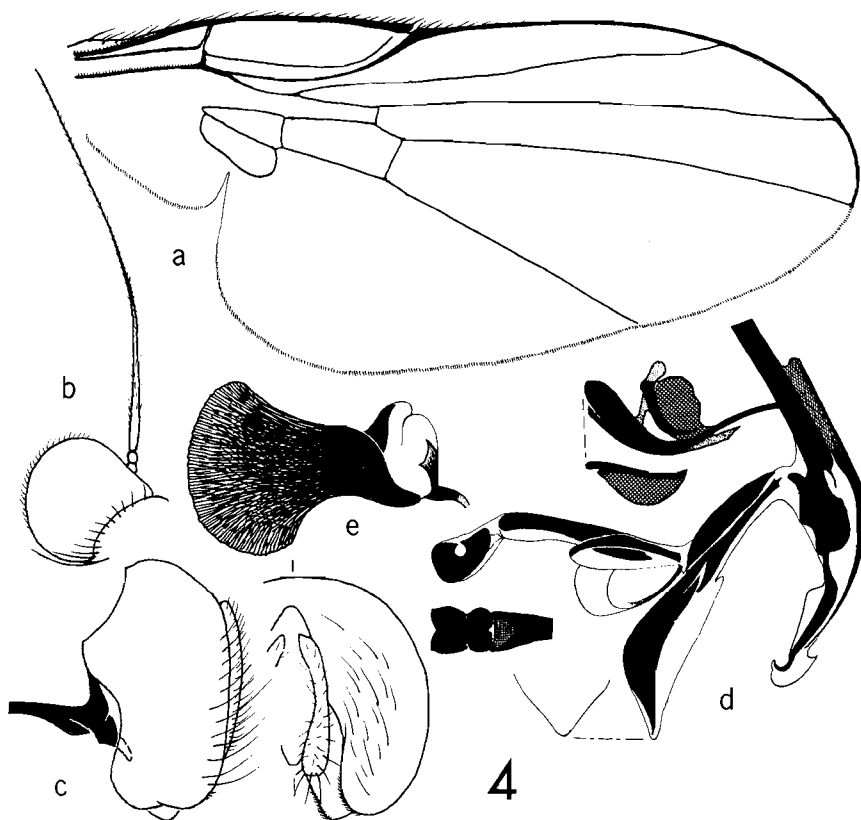


Fig. 4. *Calycomyza michiganensis*, n. sp., details of male. a, wing; b, antenna; c, epiandrium and cerci, lateral and posterior views; d, lateral view of aedeagus, with ventral views of gonites and distiphallus; e, sperm pump.

P. cudu runs in the key by Spencer to couplet 79, where the length of wing falls between the 2 ranges cited. Among the species brought out in this section of the key (*P. saskatoonensis* Spencer, *P. clematidophoeta* Spencer, *P. loewii* Hendel, *P. aquilegiovora* Spencer, and *P. thalictrivora* Spencer), it differs in length of 2nd costal section, pubescence of arista, numbers of *acr* setulae, and especially in conformation of postabdominal parts. In Frick's key (1959:421), *P. cudu* runs to *P. nigripennis* Fallén, a much larger species. Spencer treated *P. nigripennis* as doubtfully American.

The species name *cudu* is a noun in apposition, in token of the resemblance of the distiphallus in ventral view to the horns of the African antelope known as *kudu*. The genitive of *cudu* would be *cusus*, as in a few Latin nouns ending in -u in the nominative.

Phytomyza dreisbachi, n. sp.

Male. Length of wing 3.05 mm. Head (fig. 6b) with front broad, projecting well above eye; 2 nearly equal *ors*, 3 or 4 incurved *ori*, long, irregularly disposed orbital setulae; cheek half height of eye; 3rd antennal segment nearly 1/3 longer than deep, bare; broad



Fig. 5. *Phytomyza cudu*, n. sp., details of male, a, wing; b, lateral view, with displaced view (see broken lines) of aedeagus, anterior views of epiphallus and basiphallus, and ventral view of distiphallus; c, posterior view of epandrium and cercus; d, sperm pump.

epistoma present; *acr* setulae coarse, in 4 rows posteriorly, 2 rows anteriorly; wing (fig. 6a) with 2nd costal section 2.9 times as long as penultimate section.

Color of frons yellow, narrow orbits, bases of *ors* and *ori*, and ocellar triangle black; antenna black, yellowish only in apical part of dorsal side of 2nd segment; face brown; lower edge of cheek along bases of setae blackish; mesoscutum densely medium gray

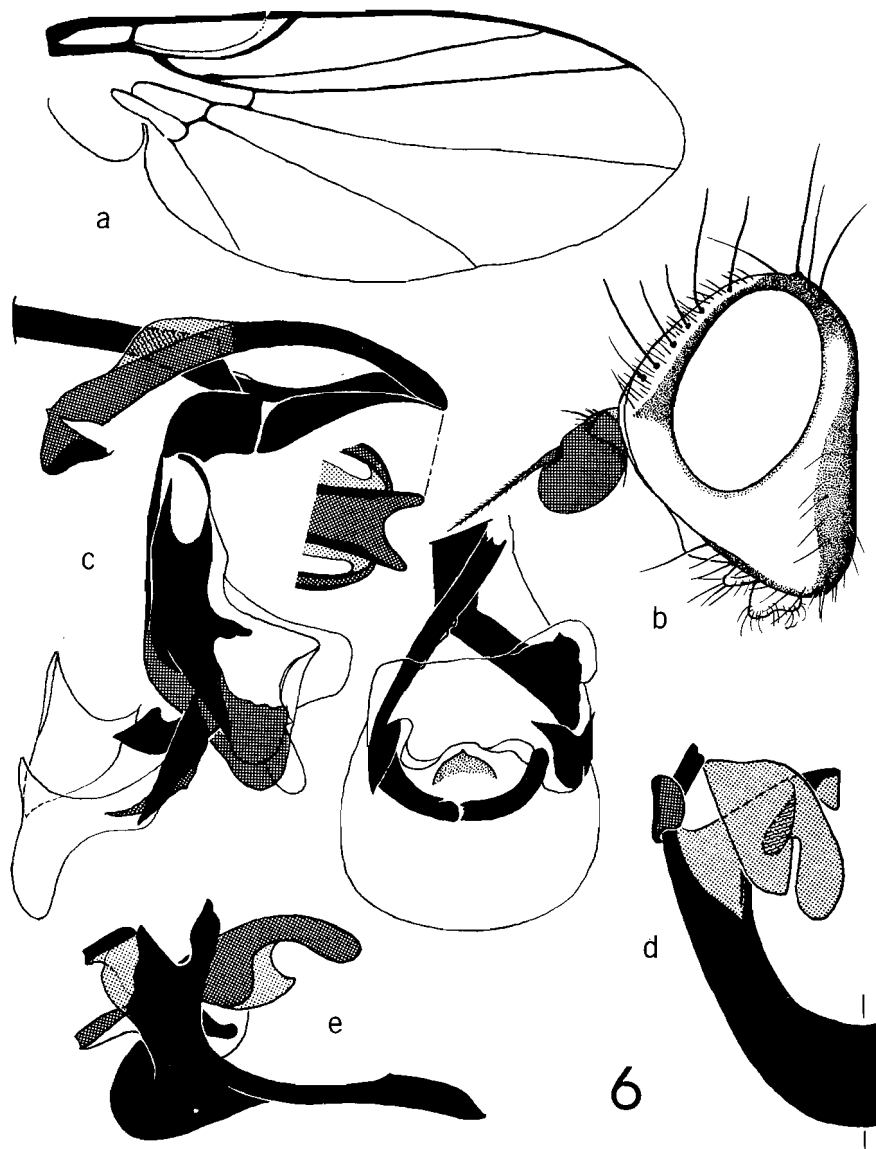


Fig. 6. *Phytomyza dreisbachi*, n. sp., details of male. a, wing; b, lateral view of head; c, lateral view of aedeagus and epiphallus, with anterior view of latter and ventral view of distal part of aedeagus; d, hypandrium, ventral view; e, same, lateral view.

tomentose with trace of darker dorsocentral stripes; pleura gray tomentose, upper margin of mesopleuron narrowly yellowish; legs black, apex of fore coxae yellowish, knees rather broadly yellow; wing distinctly brownish, especially anteriorly; squamae cream-colored, fringe yellowish to tan.

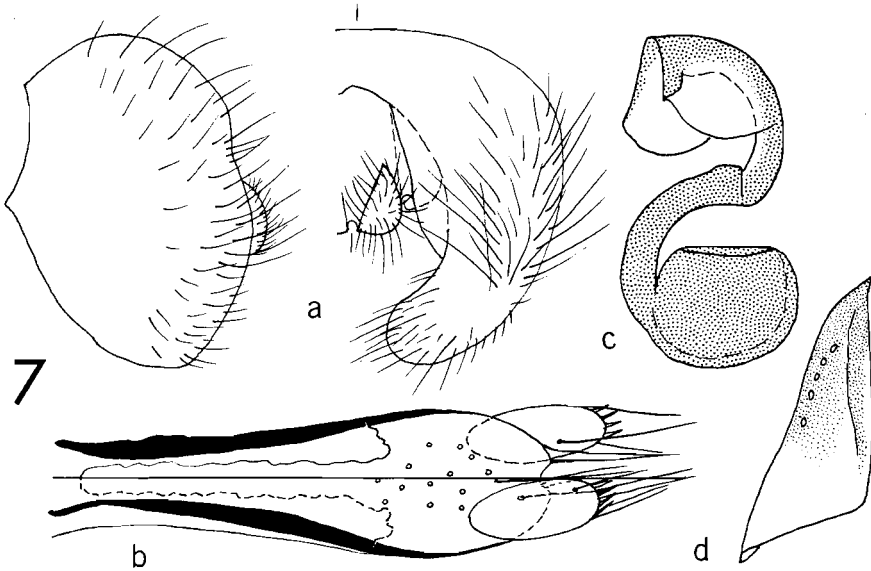


Fig. 7. *Phytomyza dreisbachi*, n. sp. a, (male) epandrium, lateral and posterior views; b, (female) ovipositor; c, (female) ventral sperm receptacle; d, (female) egg guide.

Postabdomen as in fig. 6c-e, 7a; aedeagus very similar to that of *P. aquilegiophaga* Spencer (1969:228, fig. 399-400), but differing in proportions and shape of parts.

Female. Similar to male; wing 3.05 - 3.22 mm long; ovipositor sheath 0.63 mm long to extreme base; ovipositor as in fig. 7b; egg guide (fig. 7d) acutely triangular; ventral sperm receptacle as in fig. 7c; spermathecae black, globular, smooth, without basal rim, diameter c 0.22 mm.

Holotype, male, and allotype, Kalkaska County, Michigan, 24 May 1954 (R. R. Dreisbach), no. 71544 in USNM; paratypes, 2 females, Potterville, Eaton County, Michigan, 10 May 1959 (E. A. Scheibner) and Allegan County, 18 May 1959 (R. and K. Dreisbach), in MSU.

Phytomyza dreisbachi runs in Spencer's key (1969:219) to couplet 29. Among the species brought out beyond that point, *P. dreisbachi* is most similar to *P. aquilegiophaga* Spencer, especially in conformation of the male postabdomen, but differs therefrom in having the 2nd antennal segment yellowish only dorso-apically, somewhat larger size, longer 2nd costal section of the wing (in *P. aquilegiophaga* 1.75 times as long as penultimate section, or in ratio of 35:20), and details of proportion and shape of parts of the postabdomen. In Frick's key (1959:421), *P. dreisbachi* runs to *P. aquilegiana* Frost, a smaller species with narrower cheeks and one that Spencer has shown to be quite different from species of close relationship to *P. aquilegiophaga*.

The species name *dreisbachi* is a genitive form of the family name of my long-time friend, the late Robert R. Dreisbach, to whom I am proud to dedicate this species which he collected.

Phytomyza regalensis, n. sp.

Male. Length of wing 1.85 - 2.1mm. Orbits with 2 equal *ors*, 1 large and sometimes 1 very small *ori*; cheeks a little more than 1/4 height of eye; 3rd antennal segment small, round, with very short pubescence; arista moderately swollen in basal 1/5; 3+1 strong *dc*;

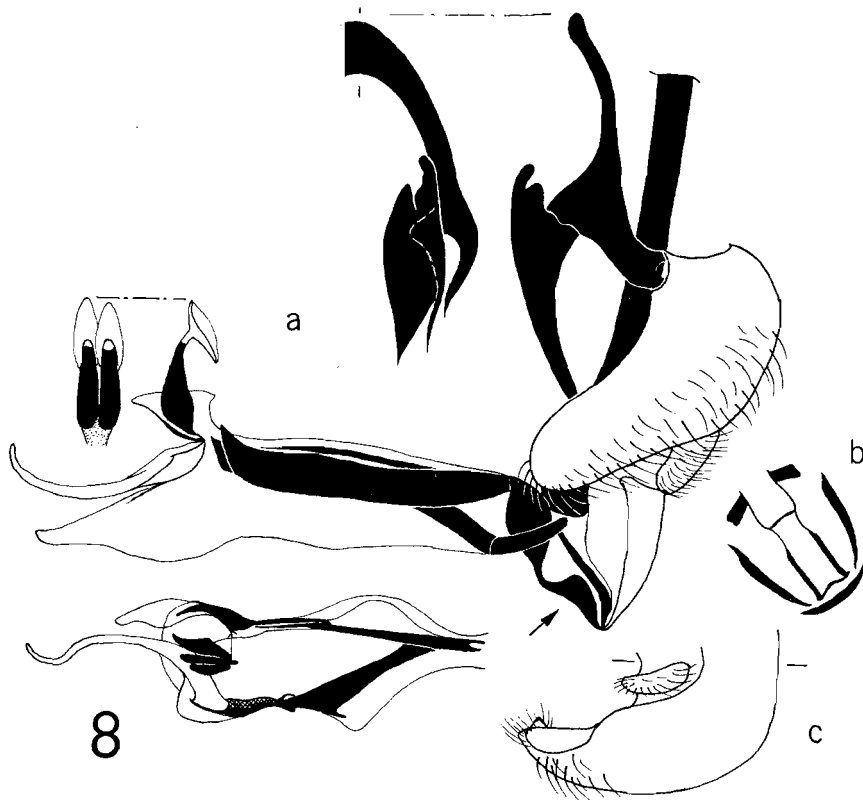


Fig. 8. *Phytomyza regalensis*, n. sp., male postabdomen. a, lateral view, with ventral views of hypandrium and distal part of aedeagus and anterior view of distiphallic processes; b, anterior view of epiphallus in direction of arrow in a; c, posterior view of epandrium and cercus.

acr setulae in 4 rows anteriorly, extending backwardly as far as middle postsutural *dc*; wing with 2nd costal section 2.5 times as long as 4th section.

Color of frons uniformly dull dark brown to blackish; antenna wholly black, in palest specimen with dorsal side of 2nd segment yellowish; mesoscutum black, with dense bluish-gray tomentum, but in one paratype with humerus (except summit) and notopleural area distinctly yellowish; legs wholly piceous to blackish in holotype, but in paratypes with knees, tibiae, and tarsi brown to yellowish; squamae tawny, fringe brown; halter with cream-colored knob.

Postabdomen as in fig. 8; aedeagus with pair of short distal processes, each bearing on deflected end an elliptical hyaline expansion; epandrium with exceptionally narrow ventral extension.

Holotype, male, Isle Royale, Keweenaw County, Michigan, 19 July 1957 (R. W. Hodges), no. 71545 in USNM; paratypes, 2 males, same data except 9 July 1957, 1 each in USNM and MSU.

Phytomyza regalensis, because of its variability in color, will run in the key by Spencer (1969:219) to either couplet 56 (*P. agromyzina* Meigen and *P. notopleuralis* Spencer) or couplet 72 (*P. caprifoliae* Spencer and *P. periclymeni* Meijere), from all of

which it differs in little more than postabdominal structures. In Frick's key (1959:421), it will run to *P. periclymeni* Meijere.

The name *regalensis* is an adjective formed from the Latinized name of Isle Royale: *Insula Regalis*.

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