

FLIES OF THE GENUS *AGROMYZA*, RELATED TO *AGROMYZA VIRENS*.

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The species dealt with in this paper belong to a group which is distinguished from all others in *Agromyza* by the black halteres.

When at work upon the species of *Agromyza* in the collection of the United States National Museum in 1913, I had considerable difficulty in finding characters by means of which the numerous closely allied species could be separated and had to use minute ones which had not previously been given in descriptions of species of the genus. Because of this departure from previous usage, and also because I realized that I was dealing with a large and complex group and not with merely a few widely distributed species, I refrained from associating but one of them with European forms. Just prior to the appearance of my paper¹ one by Prof. A. L. Melander appeared,² in which are given the names of several species of this group which belong to the European forms, but which are also said to occur in America. I have already given my reasons for refusing to adopt the course taken by Professor Melander³ and believe that, independent of the fact that identifications of European species described by the old authors in this group are only guesses up to the present, from the existence of such a large number of very closely allied species I am justified in my refusal to recognize American species as synonymous with those of Europe until we know to what European forms certain names really belong. I have accepted the European species *schineri* as occurring in eastern Canada and Massachusetts because the description agrees with that given by Giraud, but more especially because the larvæ of the European species and that of the specimens from Massachusetts both make galls on twigs of poplar. It is not my purpose to deal with questions arising from the publication

¹ Ann. Entom. Soc. Amer., vol. 6, No. 3, Sept., 1913.

² Journ. N. Y. Entom. Soc., vol. 21, No. 3, Sept., 1913.

³ Entom. News, vol. 25, 1914, p. 308.

of Professor Melander's synopsis of this genus, but I am not inclined to consider it as even possible for *simplex* Loew and *tibiae* Couden to be varieties of *maura* Meigen. The larvæ of the latter makes galls upon twigs of linden, while *simplex*¹ mines in stems of asparagus. The foregoing statements are not made with any intention of criticising Professor Melander's work, but merely to justify my own attitude with regard to the use of European species names until we are in possession of reliable information as to what species these names really apply to. As a further evidence that extreme care is required when identifying specimens belonging to this group, I present the facts contained in this paper. I was obliged, when working upon the paper previously referred to, to request Mr. C. W. Johnson to examine the type of *Agromyza virens* Loew in Museum of Comparative Zoology in Cambridge, Massachusetts, and report to me upon certain characters. Mr. Johnson kindly did so, and upon his information I based my identification of Loew's species. I had, however, a strong suspicion that I had more than one species before me, though the material was not sufficient to permit me at that time forming a definite opinion. Since coming to Illinois I have upon every occasion collected specimens of this group, until I have before me at the present time a series of three species which enable me to come to a conclusion with regard to their identity. A fourth species sent me by Prof. F. M. Webster is also included, which I have not succeeded in obtaining here. I give a synopsis of the four species below. This synopsis may be inserted in that which is given in my paper already referred to at the points in table where the name *virens* occurs.

The type-specimen of *gibsoni* and paratypes, with exception of 4 specimens in the collection of the Illinois State Laboratory of Natural History, have been returned to the Bureau of Entomology. The type-specimens of the other 2 new species are in the former collection, while paratypes will be deposited with the Bureau of Entomology.

Synopsis of Species.

a ¹ Last section of fifth vein at least as long as penultimate section.	<i>riparia</i> , new species.
Last section of fifth vein distinctly shorter than penultimate section.	a ² .
a ² Five pairs of orbital bristles present; frons not noticeably buccate.	
	<i>subvirens</i> , new species.
Four pairs of orbital bristles present.	a ³ .
a ³ Frons buccate; eyes of male distinctly hairy, of female pubescent above; last section of fourth vein 3-3½ times as long as penultimate.	<i>virens</i> .
Frons not buccate; eyes of male bare or slightly pubescent.	a ⁴ .
a ⁴ Outer cross vein slightly bent; last section of fourth vein 5 to 6 times as long as penultimate.	<i>gibsoni</i> .
Outer cross vein straight; last section of fourth vein 3-4 times as long as penultimate.	<i>cupatoriae</i> .

¹ J. E. Collin in his paper on British Muscidae Acalypttratae (Ent. Mon. Mag., vol. 22, 1911, p. 254) treats *simplex* and *maura* as distinct species.

Specific characters.—As indicated, all four species are similar in color. All are glossy black, the abdomen being more or less distinctly tinged with bronze, green, or, especially at apex, with a violaceous lustre. The wings are hyaline, but in *riparia*, and especially in the male of that species, they are often slightly suffused with brown. The squamae are white with pale fringes. Halteres black.

AGROMYZA RIPARIA, new species.

Female.—Head in profile as in fig. 1; frons barely over one-third the head width, and $1\frac{1}{2}$ times as long as broad; triangle glossy, long and slender, reaching three-fourths the distance to lunule; ocellar bristles parallel, directed forward; orbits of almost uniform width on their entire length, each equal to one-third the width of center stripe; 5 pairs of orbitals present, situated close to inner margin of orbits, becoming successively weaker anteriorly, the anterior 3 pairs incurved, orbital hairs numerous though weak; arista slender, almost bare, its length about $1\frac{1}{2}$ times that of width of frons anteriorly; eyes without distinct pile. In front of the anterior pair of dorso-centrals there are generally at least 1 pair, rarely 2, of setulae which are distinctly stronger than the weak discal setulae, but which can hardly be considered as dorso-centrals because of their close approximation to the anterior pair and their inconstancy, being sometimes absent on one side and present on the other in individual specimens; the discal setulae are numerous, 10–12 irregular rows between the dorso-centrals. Abdomen ovate; surface with numerous short hairs, those at apex and on lateral margins at base longer. Mid tibia with the pair of bristles present though weak. Wings as in fig. 2.

Length, 1.75–2 mm.

Type-locality.—Urbana, Illinois, July 4, 1914. A series of 15 specimens taken by the writer and Mr. C. A. Hart on vegetation in the dry portions of the old channel bed of Salt Fork. Six paratypes, Algonquin, Illinois, June, July, September, and October, W. A. Nason; and one, St. Joseph, Illinois, May 10, 1914, same collectors as type series.

The male agrees with the female except in having the abdomen more slender, the hypopygium small and knoblike, and the wings more distinctly infuscated.

Food plant.—Unknown.

Paratype.—Cat. No. 19390, U.S.N.M.

AGROMYZA SUBVIRENS, new species.

Female.—Differs from *riparia* in head characters as follows: Frons subquadrate, distinctly over one-third the head width; triangle short and broad, reaching three-fourths the length of frons; orbits over one-third as wide as central stripe; 5 pairs of bristles situated near

to inner margin of orbits, their length not so distinctly reduced anteriorly as in previous species; ocellar bristles short, parallel; orbital hairs numerous and short; pile on eyes barely distinguishable; arista bare, swollen at base, entire length about $1\frac{1}{2}$ times that of anterior width of frons; profile as in fig. 3. Mesonotum with two pairs of dorso-centrals; discal setulae very numerous, short, and irregular. Abdomen ovate, apex and lateral margins with rather long hairs, surface hairs short and not very numerous. Mid tibial bristles distinct. Wings as fig. 4.

Length, 2.5-3 mm.

Type-locality.—St. Joseph, Illinois, May 17, 1914, taken by the writer and Mr. C. A. Hart. Paratype, Algonquin, Illinois, May 17, 1894, W. A. Nason.

The male agrees with the female except that it is more slender and the wings are a trifle narrower.

Food plant.—Unknown.

Paratype.—Cat. No. 19391, U.S.N.M.

AGROMYZA VIRENS Loew.

Female.—Differs from *subvirens* only in the arrangement of the orbital bristles, which is shown in fig. 5, and in having the frons distinctly buccate.

Male.—Similar to female, but the pile is very conspicuous on a small area on upper surface of eyes near to margin. Venation as fig. 6.

AGROMYZA GIBSONI, new species.

Female.—Profile as fig. 7; frontal triangle rather broad, reaching well beyond half way to lunule; anterior pair of orbitals cruciate, second pair incurved but inclining slightly backward, upper 2 pairs very close together, the lower pair slightly incurved, the upper slightly inclined outwardly; orbital hairs numerous; eyes without distinguishable pilosity. Mesonotum as in *virens*. Venation as fig. 8.

Male.—Similar to female; hypopygium of normal size.

Length 2 mm.

Pupa.—Pale shining yellow. Segments, except the last 3 with their anterior halves covered with closely placed microscopic setulae; posterior spiracles short, disk-like, figs. 9 and 10.

Length, 3 mm.

Type-specimen.—Tempe, Arizona, reared from alfalfa, by E. H. Gibson, for whom the species is named. Webster's number 12239.

Type.—Cat. No. 19392, U.N.S.M.

I had difficulty in deciding whether this species was distinct from *phaseoli* Coquillett, described from specimens mining in stems of French beans in Australia, but an examination of one of the paratypes forwarded from the United States National Museum proves

that it is distinct, though closely related. *Phaseoli* has the head almost similar to that of *riparia*, the orbital hairs very weak, the vibrissæ comparatively stronger, the cheek narrower, the eye more elongate, and the venation different, the inner cross vein being but slightly beyond the middle of the discal cell and the last section of fourth vein 4 times as long as penultimate section. Length: 1 mm.

Pupa: Colored as that of *gibsoni*, but more glossy. Setulæ indistinguishable, posterior spiracles as fig. 11.

AGROMYZA EUPATORIAE, new species.

Closely resembles *gibsoni*, but separable by the following characters: The 4 pairs of orbitals are comparatively stronger and more equal in length; the eyes of the male are slightly pubescent above, the cheeks are linear in the male, slightly higher in the female, the last sections of the third and fourth veins are more regularly and decidedly divergent; the penultimate section of fourth vein in the male is slightly over one-fourth as long as ultimate; in female it is nearly one-fourth as long as ultimate and the outer cross vein is straight (in *gibsoni* it is very slightly but distinctly bent outward at middle). In other respects similar to *gibsoni*.

Type-specimen.—Rio Piedras, Porto Rico, July 16, 1914. Reared from *Eupatorium odoratum*, by Thos. H. Jones, P. R. S. G. A., Acc. No. 775-1914.

Type.—Cat. No. 19393, U.S.N.M.

The following species does not belong to the group dealt with in the previous paper, but for convenience is inserted with them, as are also the nomenclatorial notes at end of this paper.

AGROMYZA CONICEPS, new species.

Female.—Glossy black; halteres black; squamæ brownish; fringes dark brown; wings clear, veins black.

Head in profile as figure; frons one-third the head width, slightly narrowed anteriorly, its length about $1\frac{1}{2}$ times its width; orbits well defined, very narrow, at the broadest part not more than one-fifth as wide as center stripe; orbital bristles 4 in number, the lower 2 pairs slightly incurved; orbital hairs numerous; frontal triangle glossy and well defined, not extending to middle of frons; mouth margin produced as in figure. Mesonotum with 2 pairs of dorso-central bristles; discal setulæ numerous, about 12 irregular rows between the dorso-centrals, continued to the transverse level of posterior dorso-centrals; scutellar bristles subequal, the apical pair cruciate. Abdomen ovate; ovipositor normal. Legs normal in shape; mid tibiae without distinguishable bristles posteriorly. Costa to fourth vein; inner cross vein below



FIG. 12.—*AGROMYZA CONICEPS*. HEAD OF MALE IN PROFILE.

end of first vein and at three-sevenths from apex of discal cell; last section of fourth vein over 4 times as long as penultimate section; last section of fifth vein very slightly shorter than penultimate section; last sections of veins 3 and 4 distinctly divergent.

Length, 2 mm.

Type-specimen.—Salt Lake, Utah, August 4, 1914. Reared from larvæ mining in *Sonchus asper*, by P. H. Timberlake. Timberlake's No. 915a.

Type.—Cat. No. 19394, U.S.N.M.

This species belongs to the group which has the anterior angle of cheeks produced in both sexes and the vibrissae in the form of a fasciculus in the male. *Coniceps* is closely allied to *affinis* Malloch, from which it may be separated by the less strongly bristled frons, the narrow orbits, conspicuously produced mouth margin, and different venation.

Notes on names of *Agromyza* species can be found in a paper dealing with Formosan species of Agromyzidae,¹ and in one on North American species.

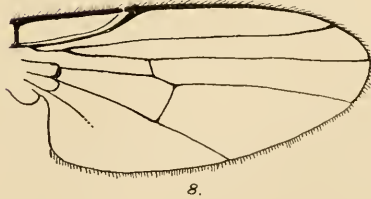
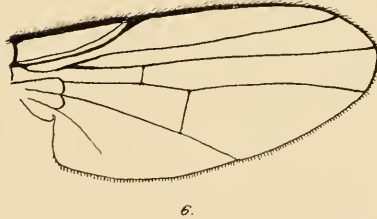
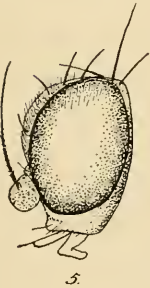
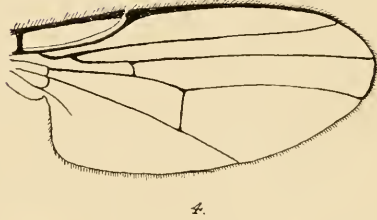
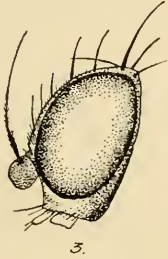
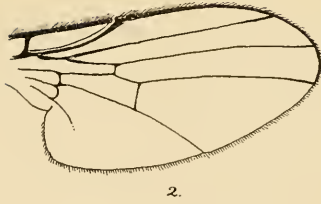
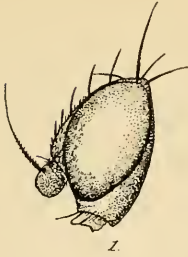
I inadvertently erred in leaving the name *atrata* in my table of species in *Agromyza*; this should read *nigrita* as in the text. Also I used the species name *niveipennis*, which is preempted by *niveipennis* Zetterstedt; I propose to change the name of my species to *vitri-nervis*, new name. I also overlooked Strobl and Czerny's name *infumata* in this genus and made a homonym in describing a North American species.² This species may be known by the new name *subinfumata*.

EXPLANATION OF PLATE 36.

- Fig. 1, *Agromyza riparia*, head in profile.
 2, *Agromyza riparia*, wing.
 3, *Agromyza subvirens*, head in profile.
 4, *Agromyza subvirens*, wing.
 5, *Agromyza virens*, head in profile.
 6, *Agromyza virens*, wing.
 7, *Agromyza gibsoni*, head in profile.
 8, *Agromyza gibsoni*, wing.
 9, *Agromyza gibsoni*, apex of pupa.
 10, *Agromyza gibsoni*, apex of posterior and spiracle of pupa.
 11, *Agromyza phascoli*, posterior and spiracle of pupa.

¹ Ann. Nat. Mus. Hung., vol. 12, 1914, pp. 306-336.

² Can. Ent., 1915, p. 15.



DETAILS OF AGROMYZA SPECIES, PUPÆ, AND IMAGINES.

FOR EXPLANATION OF PLATE SEE PAGE 108.

