

EXPLANATION OF THE LETTERS USED IN THE PLATES.

Cot.=cotyledon; H.=hypocotyl; R.=primary root; L¹=first leaf succeeding cotyledon; PL.=plumule; B.=bud; S.=scutellum; E.=epiblast.

EXPLANATION OF FIGURES.

Plate VII.

Fig. 19.	Seedling of <i>Platanus occidentalis</i> L.	.	.	Natural size.
" 20.	" <i>Liriodendron Tulipifera</i> L.	.	.	" "
" 21.	" <i>Sarracenia purpurea</i> L.	.	6 x	" "
" 22.	" <i>Dionæa muscipula</i> Ellis.	.	6 x	" "
" 23.	" <i>Catalpa bignonioides</i> Walt.	.	.	" "
" 24.	" <i>Ipomœa hederacea</i> Jacq.	.	$\frac{2}{3}$ of	" "
" 25.	" <i>Tilia Americana</i> L.	.	$\frac{2}{3}$ of	" "
" 26.	" <i>Aralia spinosa</i> L.	.	3 x	" "
" 27.	" <i>Claytonia megarrhiza</i> Parry.	.	.	" "

Plate VIII.

Fig. 28.	Seedling of <i>Aristolochia Serpentaria</i> L.	.	.	Natural size.
" 29.	" <i>Sanguinaria Canadensis</i> L.	.	.	" "
" 30.	" <i>Dentaria laciniata</i> Muehl.	.	.	" "
" 31.	" <i>Podophyllum peltatum</i> L.	.	.	" "
" 32.	" <i>Erigenia bulbosa</i> Nutt.	.	.	" "
" 33.	" <i>Claytonia Virginica</i> L.	.	.	" "
" 34 and 35.	<i>Ranunculus abortivus</i> L.	.	3 x	" "
" 36 and 37.	<i>Gillenia trifoliata</i> Moench.	.	.	" "

GALL MIDGES OF THE GOLDENROD.

By E. P. Felt, State Entomologist, Albany, N.Y.

Goldenrod or Solidago, a dominant characteristic American genus, represented by numerous species and varieties, supports an extensive fauna. This is particularly true of the Cecidomyiidae or gall midges dependent for sustenance upon members of this extensive genus. Every portion of the plant is subject to levy, including the blossom and leaf buds, the leaves, the young branches, the larger stems and even the subterranean rootstock, some species producing galls on several portions of the plant. This is particularly true of *Asphondylia monacha* which may breed in apparently unaffected florets, inhabits the small apical rosette galls on the branches of *Solidago graminifolia* and may also be found in peculiar oval cells formed between two adherent leaves on several species of Solidago. These latter galls are evidently caused by the parent depositing eggs between the loosely apposed leaves of unfolding apical buds. The activity of the larva causes the leaf tissues to fuse around the point of injury and, as a result, the affected leaves adhere even after the natural growth of the plant separates their bases and causes them to assume an approximately horizontal position. The

peculiar, long, fusiform galls of *Rhopalomyia fusiformis* and *Rhopalomyia pedicellata* may occur among the flower buds, arise from the leaves or even from portions of the stem, indicating that these two species in all probability have a somewhat extended breeding period. Goldenrod is a marked favorite with the genus *Rhopalomyia*, some 17 species existing at its expense and producing galls on all portions of the plant. Nine species of *Baldratia* may be reared from members of this genus all producing characteristic blister-like, apparently fungous affected, variously colored spots in the leaf tissues. The four species of *Lasioptera* reared from this genus live for the most part in goldenrod stems, while the peculiar *Camptoneuromyia adhesa* has been reared from the oval gall between adherent leaves noticed above, in connection with *Asphondylia monacha*. It is probable that further rearings would result in the discovery of additional species living upon goldenrod.

The following table of galls supplemented by extremely brief descriptions of the insects bred therefrom, will doubtless prove of service to any one interested in this subject. Members of the genus *Rhopalomyia* are usually rather large, reddish or reddish brown insects, easily recognized by the simple claws, the uni- or biarticulate palps and the stemmed antennal segments (in the male at least) bearing distinct whorls of hairs. The fraction following the number of antennal segments indicates the relative length of the stem of the fifth antennal segment, the length of the basal enlargement being the unit of length in every instance. Members of the genus *Lasioptera* and *Baldratia* are easily distinguished by the usually fuscous and white markings, and the dark scales along the anterior border of the wings, the first and second veins being very close to costa. The two genera are readily separated by the fact that *Lasioptera* has quadriarticulate palpi, while *Baldratia* has these organs uni- or biarticulate. Members of the latter genus breed almost exclusively in blister galls though a few may be found emerging from under the epidermis of nearly normal leaves. The genus *Camptoneuromyia* is allied to *Lasioptera* and easily distinguished therefrom by the strongly curved third vein which unites with costa near the distal third. The heavy bodied *Asphondylia* has long, cylindric antennal segments and a needle-like ovipositor.

Flower galls.

Gall greenish or reddish, subglobular, bud-like, 2 mm in diameter. Male, length 2.5 mm, yellowish red, 18-20 antennal segments, stem $\frac{1}{4}$.

Rhopalomyia racemicola O.S.



Gall green, cylindric, densely pubescent, 6 mm long. Male, length 2.5 mm, abdomen dark brown, 18-20 antennal segments, stem $\frac{1}{2}$. *Rhopalomyia anthophila* O. S.

Bred from an undescribed flower gall. Male, length 1.5 mm, abdomen light brown, 17 antennal segments, stem $\frac{1}{2}$. The female with 15 sessile antennal segments.

Rhopalomyia cruziana Felt.
Bred from apparently unaffected florets. Adult, length 4-5 mm, dark brown, the tarsi broadly white banded.

Asphondylia monacha O. S.
Bred presumably from apparently unaffected florets. Adult, length 4 mm, reddish brown, the tarsi fuscous yellowish.

Asphondylia johnsoni Felt.

Leaf galls.

Apical bud galls.

Gall green, composed of loose, convolute developing leaves. Female, length 1 mm, abdomen dark brown, mid and posterior tarsi yellowish, 17 antennal segments.

Baldratia convoluta Felt.

Gall a loose pod of adherent leaves. Female, length 1.25 mm, abdomen dark red, 15 antennal segments.

Dasyneura folliculi Felt.

Apical rosette galls.

On *Solidago canadensis*.

Female, length 6 mm, abdomen dark brown, 24-25 antennal segments. *Rhopalomyia carolina* Felt.

Male, length 4 mm, abdomen fuscous yellowish, 21 antennal segments, stem $\frac{3}{4}$. Female 5 mm long.

Rhopalomyia albipennis Felt.

Male, length 3 mm, abdomen fuscous yellowish, 16 antennal segments, stem $1\frac{1}{4}$.

Oligotrophus inquilinus Felt.

On *Solidago canadensis* and *S. serotina*.

Male, length 2.5 mm, abdomen fuscous yellowish, 20 antennal segments, stem $1\frac{1}{4}$. Female, length 3-4 mm, abdomen fuscous red, 21 antennal segments, subsessile.

Rhopalomyia capitata Felt.

Male, length 1.5 mm, abdomen fuscous yellowish, 20 antennal segments, stem $1\frac{1}{4}$. Female, length 2 mm, 19 antennal segments, stem $\frac{3}{4}$.

Rhopalomyia inquisitor Felt.

On *Solidago graminifolia*.

Gall green, closely resembling that of *Oedaspis polita*. Adult, length 4 mm, dark brown, the tarsi white banded.

Asphondylia monacha O. S.

Presumably bred from same gall. Female, length 1 mm, abdomen light yellowish, 16 antennal segments.

Lasioptera flavescens Felt.

A subapical or lateral oval gall. Male, length 2.5 mm, abdomen light yellowish, 17 antennal segments, stem $\frac{3}{4}$. Female, 15 antennal segments.

Rhopalomyia lanceolata Felt.

On *Solidago sempervirens*.

Asphondylia monacha O. S.

Galls attached to one, or at most, two leaves.

On *Solidago graminifolia*.

Gall greenish, red marked, ribbed, fusiform, sessile, length 6 mm. Male, length 2 mm, abdomen dark fuscous, 19 antennal segments, stem $\frac{2}{3}$. Female, length 3 mm, 18 antennal segments.

Rhopalomyia fusiformis Felt.

Gall green, red marked, fusiform, stemmed, length 13-14 mm. Male, length 2 mm, abdomen fuscous yellowish, 19 antennal segments, stem $\frac{1}{3}$. Female, length 3 mm, abdomen dark red, 18-19 antennal segments.

Rhopalomyia pedicellata Felt.

On *Solidago rugosa*.

Gall green, red marked, fusiform, length 1.6 mm. Female, length 2 mm, abdomen dull red, 17 antennal segments.

Rhopalomyia clarkei Felt.

On *Solidago canadensis* and *S. serotina*.

Oval galls between adherent leaves. Adult, length 1 mm, abdomen dark brown, 20-22 antennal segments.

Camptoneuromyia adhesa Felt.

Bred from similar galls. *Asphondylia monacha* O. S.

Bred from similar gall. Female, length 2 mm, abdomen silvery, 22 antennal segments.

Lasioptera argentsquamae Felt.

Blister-like galls occurring in leaf tissues.

Gall oval, black, on *Solidago graminifolia*. Male, length 1.5 mm, abdominal segments white margined posteriorly, tarsi banded, 16 antennal segments.

Baldratia carbonifera Felt.

Gall grayish brown, blue margined, on *Solidago squarrosa*. Male, length 1.5 mm, abdominal segments white spotted, 19 antennal segments.

Baldratia squarrosae Felt.

Gall rosy, on *Solidago rugosa*. Female, length 2 mm, abdominal segments white margined, posterior tars

narrowly annulate, 22 antennal segments.

Baldratia rosea Felt.

Gall oval, yellowish. Male, length 1.25 mm, abdomen light fuscous yellowish, 13 antennal segments.

Baldratia socialis Felt.

Female, length 1.5 mm, abdominal segments white margined, 16 antennal segments.

Baldratia fuscoannulata Felt.

Male, length 1.25 mm, abdomen reddish brown, 14-15 antennal segments.

Baldratia rubra Felt.

Gall lunate, yellowish. Female, length 2.5 mm, abdomen dark brown, 21 antennal segments.

Baldratia flavolunata Felt.

Probably from blister gall. Female, length 1.25 mm, abdomen deep carmine, 12 sessile antennal segments.

Dasyneura carbonaria Felt.

Elongate, brown leaf spot, possibly reared therefrom. Male, length 1 mm, pale yellowish, slender.

Lestodiplosis solidaginis Felt.

Male, length 1 mm, bright yellowish, slender.

Lestodiplosis triangularis Felt.

Stem galls.

On *Solidago graminifolia*.

Gall and adult described above.

Rhopalomyia fusiformis Felt.

Gall and adult described above.

Rhopalomyia pedicellata Felt.

Gall green, subglobular, near tip, 1.5 cm in diameter. Female, length 3 mm, abdomen dark brown, 19 antennal segments.

Rhopalomyia lobata Felt.

On *Solidago*, various species.

Gall a long, uniform swelling of the stem, near the tip of the stem. Male, length 2 mm, abdomen white spotted, 15-17 antennal segments. Female, 21-22 antennal segments.

Lasioptera cylindrigallae Felt.

Gall irregular, eccentric, usually near the base of stem. Adult similar to above.

Lasioptera tumifica Beutm.

Gall large, suboval, near the ground. Male, length 1.5 mm, abdomen reddish, 23 antennal segments, stem $\frac{2}{3}$. Female, length 4 mm.

Rhopalomyia hirtipes O. S.

Galls bulb-like, at base of stem. Male, length 2.5 mm, fuscous yellowish, 18 antennal segments, stem $\frac{3}{4}$. Female, length 3 mm, abdomen pale yellowish.

Rhopalomyia bulbula Felt.

Gall stout, cylindric, on rootstock. Male, length 2.5 mm, abdomen brick red, 19 antennal segments, stem $\frac{3}{4}$. Female, length 4 mm, abdomen dark brown, 18 antennal segments. *Rhopalomyia thompsoni* Felt.

NEW MEMBERS.

The following have been elected ordinary members of the Club at recent meetings of the Council:—

Mrs. Oakeley, Ottawa.

Miss L. E. Hunt, Ottawa.

Mr. J. E. Smyth, Ottawa.

Miss M. Haldane, Ottawa.

Miss A. E. Johnston, Ottawa.

Mr. A. S. Cram, Ottawa.

Mr. H. R. MacMillan, Ottawa.

MEETING OF BOTANICAL BRANCH.

Meeting held at the home of Mr. A. E. Attwood, January 4th, 1909. Present: Mr. A. E. Attwood, Prof. John Macoun, Rev. G. Eifrig, Messrs. R. B. White, G. H. Clark, W. C. Ewing, H. R. MacMillan, F. H. Reed, D. A. Campbell, T. E. Clarke, J. W. Gibson, Jas. M. Macoun, W. Bond, H. Groh, and L. H. Newman.

The subject forming the basis for the evening's discussion was as follows:—"The Meaning of some Common Plant Names." Mr. Attwood introduced the subject by explaining how he had come to question the significance of certain names by which some plants had come to be popularly known. The first case cited was that of the word "acorn." This was shown to have come from "oak-corn," or "oak-grain," corn coming from the Latin "cornu," a horn—something hard and horny. "Corn" is also the term by which the most important grain of any country is known. Some of the more striking illustrations of the unique and interesting derivations of certain names are found in the following:—

POMEGRANATE, from *L. pomum*, an apple; *granatus*, having many grains or seeds.

CATKIN, after the domestic cat; and *kin*, meaning little; thus, a little cat or pussy, hence, pussy willow.

CABBAGE, from the Latin *caput*, a head.

CAULIFLOWER, cabbage flower, or possibly a corruption of the French *choufleur*.

NINEBARK, meaning a shrub with many layers of bark, the word "nine" being commonly used to express an unlimited number, as "nine-days' wonder."



Felt, Ephraim Porter. 1919. "Gall Midges of the Goldenrod." *The Ottawa naturalist* 22(11), 244–249.

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