

AUSTIN C. APGAR, *former Head of Biological Department.*

PROF. JOHN B. SMITH, *State Entomologist.*

WILLIAM H. WERNER, *State Taxidermist*

THREE HEAD OF DEPARTMENTS OF THE MUSEUM.

ANNUAL REPORT

OF THE

NEW JERSEY STATE  
MUSEUM

Including a Report of the Insects  
of New Jersey

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1909

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time the author had practically no material from the middle Atlantic States.

Family PULICIDÆ.

**PULEX** Linn.

*P. irritans* Linn. The human flea. Not a native of New Jersey, but is almost cosmopolitan, and specimens are occasionally found, brought from more southern States.

**CTENOCEPHALUS** Kol.

*C. canis* Curt. (*Pulex serraticeps*) The common cat and dog flea.

**CERATOPHYLLUS** Curtis.

*C. wickhami* Baker. (*Pulex howardi*) One of the squirrel fleas.

**CTENOPHTHALMUS** Kol.

*C. pseudarytes* Baker. A parasite on field mice.

## Order DIPTERA.

This order contains the flies, always recognizable by having two wings only, the secondaries being reduced to little knobs or halteres. The head is separated from the thorax by a distinct, very narrow neck, and the antennæ are either quite long or very short, often aristate. The mouth parts are formed for scraping or sucking, or both, and never for chewing, in the adult stage. The larvæ vary greatly, but are usually either very slender and elongate, or maggot-like in form. The metamorphosis is complete, and the change from larva to adult is more radical than in any other order.

Since the publication of the previous list our knowledge of the "Diptera" has increased vastly, and collectors are more numerous than ever before. Mr. Charles W. Johnson, now Curator of the Boston Society of Natural History, has again prepared the list as a whole, and has added perhaps the greatest number of species to it. But in the "Cecidomyiidæ" Mr. William Beutenmuller has done this work, and while the list in that family is still far from complete, it is a much better picture of our fauna than was the previous one. In the "Culicidæ" the list is probably almost complete. In no other family have collections been so thorough and systematic, and it is believed that few species will be added in future. Mr. John A. Grossbeck, one of the assistants in the mosquito investigation, has written this part of the list. In the "Tabanidæ" Mr. V. A. E. Daecke has supplied the mss., and here again his persistent and careful work, supplemented by that of Mr. Henry S. Harbeck, has left little to be done. In addition to these gentlemen, Messrs. G. M. Greene and Chas. T. Greene, of Philadelphia, have added many records, and nearly all the contributors to the previous edition have helped along the work on this.

Mr. Johnson estimated that the 1,200 species listed in the last edition were about two-thirds of the actual number to be found in the State. As before, all records not otherwise specifically credited belong to Mr. Johnson.

### Family TIPULIDÆ.

These are the "Crane-flies," which resemble exaggerated mosquitoes in appearance, and derive the common name from their long, ungainly, slender legs. The head is often prolonged into a sort of blunt snout, at the end of which are the prominent palpi, which are sometimes as long as the antennæ.

The species are most common in low meadows or at the edges of woodland, and their flight is as uncertain and awkward as their appearance. It is difficult to preserve these insects, because the legs break off at the least provocation, even when they are alive.

## SAYOMYIA Coq.

- S. albipes** Johann. Larvæ have been taken in the Great Piece Meadows, at Paterson IV, VII, IX, Arlington V, Newark VIII, Trenton, Delair VII, and the winter is apparently passed in that stage. Breeds in the more permanent woodland pools, but is also found in more open water.
- S. punctipennis** Say. Chester VIII, 1, Delair IX, 17, Riverton V, 19.

## CORETHRA Meig.

- C. cinctipes** Coq. Lake Hopatcong VII, 22, Great Piece Meadow IV, 10, Paterson V, 6, New Brunswick V, 3, Lahaway III, 28-IV, 26—all larvæ. This is a common spring species breeding in large woodland pools, the July specimen being a straggler. The larva is predaceous, and when food is scarce becomes cannibalistic.
- C. lintneri** Felt. Larvæ taken at Millburn in May were not recognized as distinct from the preceding until the adults emerged a few days later.

## CORETHRELLA Coq.

- C. brakeleyi** Coq. This is a very rare species which breeds in cold spring pools and sphagnum swamps. Larvæ have been taken by Mr. Brakeley at Lahaway in almost every month of the year, and beside that it has been taken only at Delair, by Mr. Seal, and at Trenton by Mr. Grossbeck.

## Family MYCETOPHILIDÆ.

These are fungus-gnats, also resembling mosquitoes or midges, but the antennæ are not verticillate or furnished with whorls of hair. In the male the abdomen ends in a forceps-like process, and in the female in a pointed ovipositor. There are other structural differences to characterize the family, but these are not easily seen except by the student. The larvæ are feeders in fungus and in decaying vegetation generally, and might be considered at worst harmless were it not that they attack cultivated mushrooms. The larvæ are white, slender, have a black head, and often live in large colonies. Some of them have the curious habit of forming great rope-like masses when ready to enter the pupal stage, sometimes travelling considerable distances to find a suitable place.

Where they occur in mushroom beds, fumigating frequently with tobacco or pyrethrum to kill the adults inside, and keeping all windows closely screened to prevent the entrance of specimens from outside, is the only practical measure known to me.

## PLESIASTINA Winn. (SYMMERUS Wik.)

- P. annulata** Meig. Riverton IV, 19.

**ASYNDULUM Latr.**

- A. montanum* Roeder. Dunnfield, Del. Water Gap VII, 11, 15.

**CEROPLATUS Bosc.**

- C. clausus* Coq. New Brunswick (Sm).

**PLATYURA Meig.**

- P. diluta* Loew. Dunnfield, Del. Water Gap VII, 11, 15.  
*P. mendosa* Loew. Clementon V, 30.  
*P. tæniata* Winn. Dunnfield, Del. Water Gap VII 12.  
*P. elegans* Coq. Orange Mts., Shark River VII, 12.  
*P. inops* Coq. Dunnfield, Del. Water Gap VII, 8, 12.  
*P. melasoma* Loew. Delaware Water Gap VII, 12.  
*P. subterminalis* Say. Riverton VIII, 11 (Jn); Lucaston IX, 2 (Dke);  
 Trenton VIII, 23 (Hk).  
*P. fascipennis* Say. DaCosta VIII, 9 (Dke).

**SCIOPHILA Meigen.**

- S. littoralis* Say. Del. Water Gap VII, 8, 13, Dover VI, 17, Merchantville VI, 28, Westville VII, 21, Clementon VI, 3 (Jn); New Brunswick VII, 20 (Sm).

**NEOEMPHERIA O. S.**

- N. balioptera* Loew. Princeton VII, 21, Westville VIII, 23.  
*N. nepticula* Loew. Merchantville VI, 28.  
*N. didyma* Loew. Woodbury VI, 7 (Jn); Lucaston IX, 12 (Dke).

**POLYLEPTA Winn.**

- P. tibialis* Coq. Dunnfield, Del. Water Gap VII, 8, Westville VI, 6.

**ACNEMIA Winn.**

- A. flaveola* Coq. Dunnfield, Del. Water Gap VII, 11.

**SYNTEMNA Winn.**

- S. polyzona* Loew. Clementon VI, 3.

**BOLETINA Stæger.**

- B. tricincta* Loew. Dunnfield, Del. Water Gap VII, 15, Dover VII, 17, Clementon VI, 3.  
*B. grønlandica* Stæg. Forest Hill III, IV (Wdt); Merchantville III, 13 (Vk).

**LEPTOMORPHUS** Curt.

- L. parvulus* Coq. Dunnfield, Del. Water Gap VII, 12.  
*L. walkeri* Curtis. Trenton VIII, 23 (Hk).

**EPICYPTA** Winn.

- E. punctum* Stann. Dunnfield, Del. Water Gap. VII, 15.  
*E. pulicaria* Coq. Riverton IV, 19.

**DOCOSIA** Winn.

- D. dichroa* Loew. Malaga VI, 1, Iona V, 10 (Dke).

**NEOGLAPHYROPTERA** O. S.

- N. bivittata* Say. Ft. Lee V (Lv); Princeton VII, 21, Jamesburg VII, 4, Atco VII, 12 (Jn).  
*N. opima* Loew. Dover VI, 17, Merchantville VI, 28.  
*N. sublunata* Loew. Merchantville VI, 28.  
*N. ventralis* Say. (Leja) Dunnfield, Del. Water Gap VII, 8, 15.

**TRICHONTA** Winn.

- T. perspicua* V. d. W. Riverton IV, 16.

**EXECHIA** Winn.

- E. analis* Coq. Dunnfield, Del. Water Gap VII, 8.

**MYCETOPHILA** Meigen.

- M. punctata* Meig. Riverton III, 20-IV, 8 (Jn); Merchantville IX, 16 (Dke).  
*M. sigmoides* Loew. Del. Water Gap VII, 8, Riverton III, 6.  
*M. contigua* Walk. Riverton III, 6, IX, 9.  
*M. obscura* Walk. Trenton IV, 19 (Hk); Riverton III, 6, Clementon VI, 16.  
*M. vitrea* Coq. Dunnfield, Del. Water Gap VII, 12.  
*M. discoidea* Say. New Brunswick VI, 11 (Coll).

**DYNATOSOMA** Winn.

- D. scalaris* Loew. (Mycetophila) Del. Water Gap VII, 8, Riverton III, 6, Clementon V, 10.

**MACROCERA** Meig.

- M. clara* Loew. Dunnfield VII, 8, Clementon VIII, 9 (Jn).  
*M. formosa* Loew. Del. Water Gap VII, 12, Merchantville V, 28, Clementon VIII, 9.

- M. nebulosa* Coq. Clementon VI, 3, VIII, 9.  
*M. hirsuta* Loew. Dunnfield, Del. Water Gap VII, 11.  
*M. inconcinna* Loew. Orange Mts. VIII (Wdt).

**EUGNORISTE** Coquillett.

- E. occidentalis* Coq. Trenton VIII, 3 (Hk).

**SCIARA** Meigen.

- S. fulvicauda* Felt. Types, Atlantic Co., from decayed blackberry roots (Sm).  
*S. paucisetata* Felt. New Brunswick, types from decaying potatoes IX (Sm).  
*S. multisetata* Felt. New Brunswick, types bred from mushrooms V, and this is the common species in mushroom cellars with us (Sm).  
*S. polita* Say. Clementon V, 30.  
*S. inconstans* Fitch. Newark, New Brunswick VIII, 7 (Coll); Riverton II, 26, Clementon VI, 3.  
*S. abbreviata* Walk. Anglesea VII, 12 (Sm).  
*S. fuliginosa* Fitch. Palisades (Lv); N. Woodbury VI, 17, Iona VI, 2 (Dke).  
*S. femorata* Say. Fort Lee IV, V (Lv).

**HESPERODES** Coquillett.

- H. johnsoni* Coq. Delaware Water Gap VII, 12.

## Family CECIDOMYIIDÆ.

Small, slender, mosquito-like flies with broad wings, long slender antennæ with cylindrical or bead-like joints, the males often with whorls of long hair on the segments, whence they are known as verticillate. On the whole the insects are fragile in appearance, slow in flight, and they are popularly known as "gall-gnats" or "gall-midges," because the larvæ of many species produce abnormal growths or galls on a great variety of vegetation. These larvæ are small, elongate-oval legless grubs, bluntly pointed at both ends, often with a chitinous process, known as a breast-bone, on the under side, near the anterior end.

Some of the species belonging here are among the most destructive of those in the order, and the injury caused by them is of the most diverse character. In some cases there is a true, gall-like swelling of the tissue; in others it is a characteristic crippling or folding of a leaf or of a growing tip, or even a mere swelling of the tissue. Some species produce no visible swellings or distortions at all, and some feed in or on seeds, causing rather a shrivelling than a swelling. Much attention has recently been paid to these insects by Mr. William Beutenmüller, of the American Museum of Natural History, who has been good enough to pre-



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pare the systematic part of this list, and by Dr. E. P. Felt, State Entomologist of New York, and a great many new species have been described, some of which will undoubtedly be found in New Jersey. Mr. Beutenmuller has in general included only actual records, mostly of his own collecting, and the notes on food plants, etc., are his, unless otherwise credited. In some cases galls have been described, of which the makers are yet unknown, and these are separately listed. Dr. Felt has kindly supplied additional notes from his breedings and studies, but I have not been able to incorporate all his systematic suggestions.

As the species differ so widely in habit, so the methods of dealing with them are diverse. Insecticides are available in the smallest number of cases, and usually it is some change in cultural method that must be relied upon to prevent injury.

### LASIOPTERA Meigen.

- L. *carbonifera* Felt. Makes galls on leaves of goldenrod; common and g. d. (Bt). The gall was first described by Osten Sacken, and the name is so credited in the last edition.
- L. *cornicola* Beut. Ft. Lee district. Galls on trunks and branches of dogwood, "*Cornus stolonifera*" IX-VI (Bt); Staten Island (Ds).
- L. *cylindrigallæ* Felt. Ft. Lee district IV, V (Bt); Staten Island, gall elongate on stems of goldenrod IV (Ft).
- L. *farinosa* O. S. Throughout the State, locally common, galls on leaves of blackberry, "*Rubus villosus*" VIII-X (Bt). See in this connection "*L. nodulosa*" Beut.
- L. *humulicaulis* Felt. New Jersey district (Bt); gall on stem of hop (Ft).
- L. *linderæ* Beut. Ft. Lee district and elsewhere, sometimes common; galls on branches of spice bush, "*Lindera benzoin*" X-VI (Bt); Staten Island, from irregular sub-cortical gall.
- L. *lycopi* Felt. Plainfield; gall on bugleweed "*Lycopus virginicus*" IX-V (Bt).
- L. *nodulosa* Beut. Ft. Lee district; galls on branches of blackberry, "*Rubus villosus*" X-VI (Bt). This is the species referred to in the last edition as "*farinosa*." I have found it, locally, from New Brunswick southward; sometimes also on dewberry, but never causing actual injury in cultivated fields.
- L. *sambuci* Felt. Ft. Lee district; galls on stems of elder, "*Sambucus canadensis*" IX-VI (Bt); Staten Island (Ds).
- L. *solidaginis* O. S. New Jersey district; larva probably inquiline in galls on *Solidago* (Bt).
- L. *tumifica* Beut. Ft. Lee district; gall on stalk of golden-rod, "*Solidago rugosa*" IX-VI (Bt); Staten Island, from eccentric sub-globular stem gall (Ft).
- L. *vernoniæ* Beut. Ft. Lee district and elsewhere; galls on leaves of ironweed, "*Vernonia noveboracensis*" IX (Bt); Staten Island IX (Ds).

- L. *viburnicola* Beut. Ft. Lee district; galls on branches of arrowwood, "Viburnum dentatum" X-VI (Bt); Staten Island (Ft).
- L. *vitinea* Felt. Staten Island VI, 15; obpyriform, slightly curved gall on leaf petiole of grape (Ft).
- L. *vitis* O. S. Throughout the State, local on grape, V, VI (Sm); makes swellings on stems and leaf galls of wild grapes (Bt).

#### CHORISTONEURA Rübs.

- C. *hibisci* Felt. Staten Island IV; gall on stem of marshmallow, "Hibiscus moschatus" (Ft).
- C. *eupatorii* Felt. Staten Island V; oval gall on stem of "Eupatorium" (Ft).

#### RHABDOPHAGA Westw.

- R. *batatas* Walsh. Montclair, Ft. Lee district; galls on twigs of "Salix discolor" and allied species of willow (Bt); Staten Island (Ds).
- R. *ramuscula* Felt. Staten Island, from willow twigs showing little or no swelling (Ft).
- R. *brassicoides* Walsh. Greenwood Lake, Montclair, Ft. Lee district VII-IX, galls on branches of willow (Bt).
- R. *rigidæ* O. S. Montclair, Ft. Lee district, galls on low willows (Bt); Staten Island (Ds).
- R. *salicifolia* Felt. New Jersey district (Bt); bred from a pouch gall on "Spiræa salicifolia" VI (Ft).
- R. *strobiloides* O. S. Del. Water Gap VI (Jn); Greenwood Lake, Montclair, Orange Mts., Englewood, Ft. Lee and g. d., galls on tip of branches of low willows VIII-V (Bt).

#### DASYNEURA Rond.

- D. *gleditschiæ* O. S. Sometimes common locally on leaves of honey locust, "Gleditschia triacanthos" VI (Bt); New Brunswick (Sm).
- D. *grossulariæ* Fitch. New Jersey district; larva in gooseberries (Bt).
- D. *hirtipes* O. S. Ft. Lee district, Carlstadt; gall on fragrant golden-rod, "Solidago graminifolia" VI, VII (Bt).
- D. *leguminicola* Lint. The clover-seed midge; more or less common throughout the State; but scarcely injurious because not much clover-seed is raised, and the value of the crop for hay is not affected. If clover-seed is wanted it is necessary to cut an early crop of flowers for hay and make seed from the later flowers.
- D. *coryli* Felt. Reared from corrugated leaves of "Corylus" at West Nyack, N. Y. (Ft).
- D. *rhois* Coq. New Jersey district; gall on roots of poison ivy (Bt).
- D. *pseudacaciæ* Fitch. Ft. Lee district (Bt); New Brunswick, common on leaves of locust, "Robinia pseudacacia" (Sm).

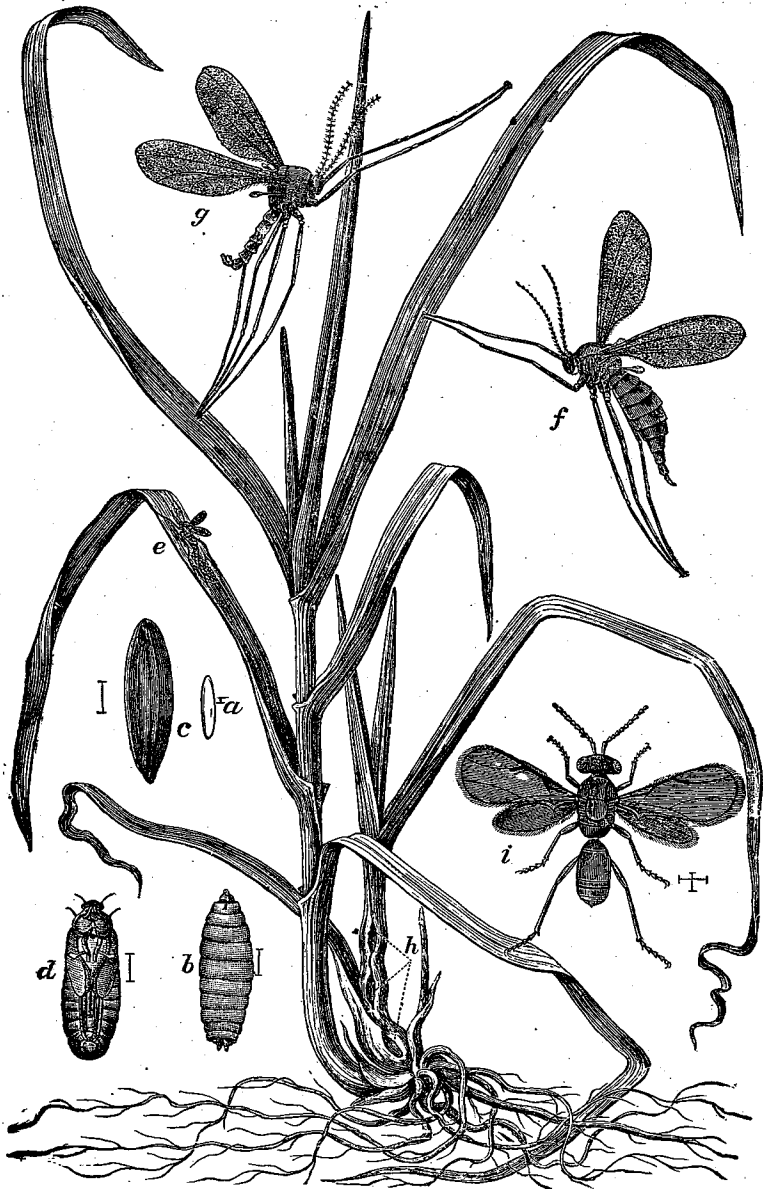


Fig. 297.—The Hessian fly, *Mayetiola destructor*: on the left a healthy stalk of wheat and on the right one infested at *h* by the "fly," showing galls; *a*, egg; *b*, larva; *c*, flaxseed; *d*, pupa; all very much enlarged; *e*, fly ovipositing on leaf, natural size; *f*, female; *g*, male fly, much enlarged; *i*, the parasite, *Merisus destructor*; also much enlarged.

- D. serrulatæ** O. S. Montclair, Ft. Lee district, Lakehurst, common locally, gall on bud of alder, "Alnus serrulatus" IX-VI (Bt); Staten Island (Ds).
- D. solidaginis** Loew. Common throughout the State; gall on goldenrod (Bt); Clementon VIII (Jn).

## ARNOLDIA Kieffer.

- A. fraxinifolia** Felt. Newfoundland VII, 25, gall on young ash leaflets (Ft).
- A. vitis** Felt. New Jersey district (Bt); from galls of "Lasioptera vitis" (Ft).

## ASPHONDYLIA Loew.

- A. azaleæ** Felt. New Jersey district (Bt); galls on buds of azalea (Ft).
- A. conspicua** O. S. New Jersey district; gall on stem of cone-flower, "Rudbeckia triloba" VIII, IX (Bt).
- A. globulus** O. S. New Jersey district; gall on stem of sun-flower, "Helianthus gigantea" VIII, IX (Bt).
- A. patens** Beut. New Jersey district; gall on aster VIII, IX (Bt).
- A. solidaginis** Beut. Montclair, Ft. Lee district, gall on leaf of goldenrod (Bt).

## RHOPALOMYIA Rübs.

- R. fusiformis** Felt. Ft. Lee district; galls on leaves and flowers of fragrant goldenrod, "Solidago graminifolia" VIII, IX (Bt).
- R. capitata** Felt. Common at West Nyack, N. Y., just north of the New Jersey line (Ft).
- R. inquisitor** Felt. Common at West Nyack, N. Y. (Ft).
- R. major** Felt. Staten Island V, 31 (Ft).
- R. anthophila** O. S. Staten Island (Ft).

## MAYETIOLA Kieffer.

- M. destructor** Say. The "Hessian fly." Sometimes very destructive north of the red shale line. The method usually adopted to avoid injury is to plant as late as is safe. In the southern counties it may be delayed until after mid-September and injury is rare; in the northern counties planting soon after September 1st is usual and this is dangerous. The flies usually emerge after the early September rains and are in the fields for two weeks thereafter. Sometimes a scant early seeding is made as a trap, and this is plowed under about September 10 and the real crop put in.

## CONTARINIA Rond.

- C. pyrivora** Riley. The "pear midge." Infests pear, preferring the Lawrence, causes an irregular lumpy growth, the larvæ eating out the core in June. This species has been gradually worked out and now maintains itself only in a few places near New Brunswick and Newark.
- C. tritici** Kirby. Locally and seasonally abundant north of the red shale in wheat kernels. Not really injurious since 1889.

## CECIDOMYIA Meigen.

- C. annulipes* Walsh. New Jersey district, inquilinous in galls of "Rhabdophaga strobiloides" (Bt).
- C. anthophila* O. S. New Jersey district; gall on golden-rod (Bt).
- C. atricornis* Walsh. New Jersey district; inquilinous in gall of "Rhabdophaga strobiloides" (Bt).
- C. bulla* Wash. New Jersey district; gall on leaves of wild sunflowers "Helianthus decapetatus" and "divaricata" VIII, IX (Bt).
- C. caryæ* O. S. Ft. Lee district; galls on leaves of hickory (Bt).
- C. cerasifolia* Felt. Newfoundland IX, 4; galls on leaves of choke cherry (Ft).
- C. clavula* Beut. Orange Mts., Montclair, Ft. Lee district, common on the terminal twigs of dogwood, "Cornus florida" VIII, IX (Bt); Staten Island (Ds).
- C. helianthi* Brodie. Staten Island VIII, IX (Ds).
- C. lysimachiæ* Beut. Carlstadt, Ft. Lee district and elsewhere; galls in buds of loosestrife, "Lysimachia" VI (Bt); Jamesburg and throughout south Jersey about and on cranberry bogs; this seems to be the species which I believed identical with that infesting cranberry (Sm).
- C. meibomiæ* Beut. Staten Island (Ds); galls on tick-trefoil, "Meibomia" sp., VIII, IX (Bt).
- C. meibomiifoliæ* Beut. Carlstadt; galls locally common VIII, on buds of "Meibomia canadensis" (Bt).
- C. myrica* Beut. Carlstadt; galls locally common on "Myrica cerifera" (Bt).
- C. nyssæcola* Beut. Ft. Lee district and elsewhere, sometimes very common, galls on the edges of leaves of sour-gum, "Nyssa sylvatica" VI (Bt).
- C. orbitalis* Walsh. New Jersey district; inquilinous in galls of "Rhabdophaga batatas," "strobiloides" and "brassicoides" (Bt).
- C. pilulæ* Walsh. Common throughout the State; galls on leaves of red, scarlet, black, scrub, black-jack and pin oak, "Quercus rubra," "coc-cinea," "velutina," "nana," "marylandica" and "palustris" VII-X (Bt).
- C. pudibunda* O. S. Ft. Lee district; galls on leaves of hornbeam, "Carpinus caroliniana" VI, VII (Bt).
- C. resinicola* O. S. Lakehurst and the pine barrens generally VIII, IX (Bt).
- C. rudbeckiæ* Beut. New Jersey district; galls on flower heads of cone-flower, "Rudbeckia hirta" VIII (Bt).
- C. seminivora* Beut. Plainfield (Mill); gall is a malformation of the seed capsule of apetalous or cleistogamous flowers of stemless or acaulescent violets, "Viola cucullata," "palmata," "affinis," "septentrionalis" VI-X (Bt).

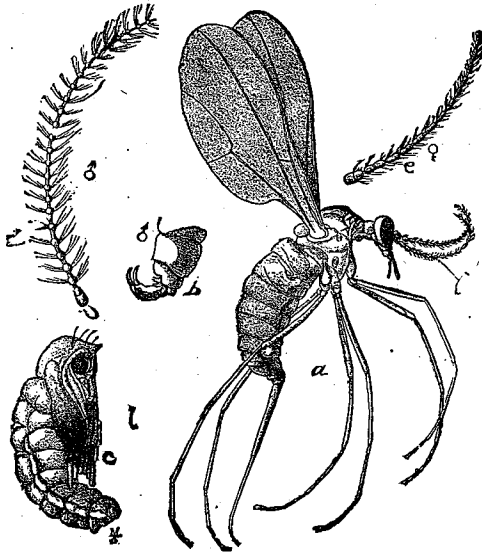


Fig. 298.

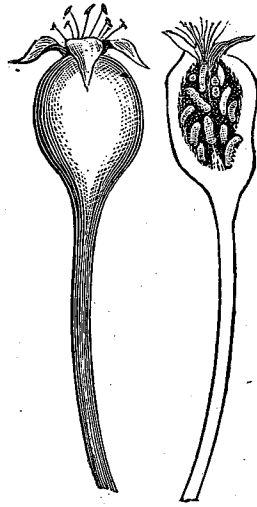


Fig. 299.

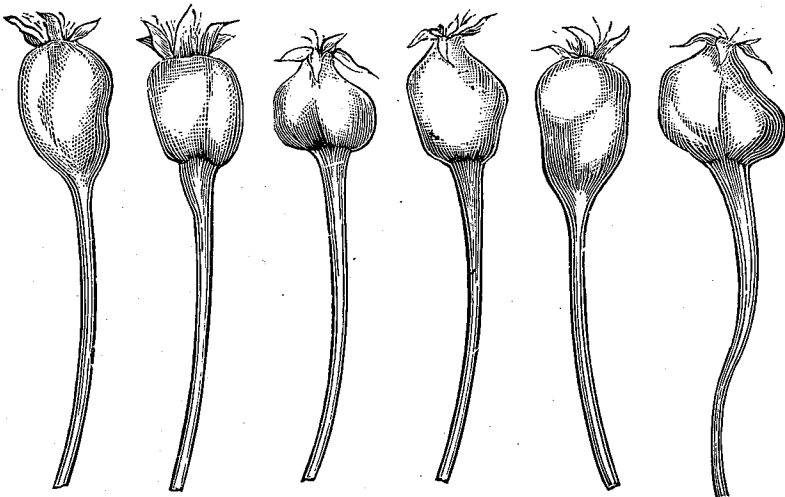


Fig. 300.

Fig. 298.—Pear midge, *Contarinia pyrivora*: a, female adult; c, pupa, both enlarged; all other references to structural details.

Fig. 299.—A sound pear and one infested by the larvæ of the pear midge.

Fig. 300.—A series of pears infested by the midge, showing distortions caused by larvæ.

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- C. *thurstoni* Brodie. New Jersey district; galls on sunflower, "*Helianthus divaricata*," VIII, IX (Bt).
- C. *verbenæ* Beut. Ft. Lee district, locally common; galls on leaves of nettle-leaved Vervain, "*Verbena urticifolia*" VI, VII (Bt).
- C. *ulmi* Beut. Carlstadt, Ft. Lee district, sometimes common; galls on leaves of elm, "*Ulmus americana*," VI, VII (Bt).
- C. *oxycoccana* Johns. (*vaccinii* Sm., not O. S.) Infests the terminal growth of the cranberry, throughout South Jersey; locally known as the "tip-worm" and sometimes injurious (Sm). Dr. Felt says it is a "*Dasyneura*."

CECIDOMYIÆ KNOWN BY THEIR GALLS AND LARVÆ ONLY.

- C.? *angelicæ* Beut. Middlesex Co. (Mill); gall on stalk of "*Angelica villosa*" IX, X (Bt).
- C.? *boehmeriæ* Beut. New Jersey district; gall on stalk of false nettle, "*Bœhmeria cylindrica*" IX (Bt).
- C. *brachypteroides* O. S. Lakehurst and in the pine barrens generally; galls on the leaves of scrub pine, "*Pinus inops*" (Bt).
- C. *caryæcola* O. S. Riverton IX (Jn); common everywhere, galls on leaves of hickory VIII-X (Bt).
- C.? *collinsoniæ* Beut. New Jersey district; galls on leaves of horse balm, "*Collinsonia canadensis*" VIII, IX (Bt).
- C. *coryloides* Walsh. New Jersey; galls on stems of wild grapes, "*Vitis riparia*" and "*cordifolia*" (Bt).
- C. *citrinæ* O. S. Ft. Lee district; galls on the tips of twigs of basswood, "*Tilia americana*," VIII, IX (Bt).
- C. *cynipsea* O. S. New Jersey district; galls on leaves of hickory VIII-X (Bt).
- C. *deserta* Patt. New Jersey district; galls on hackberry, "*Celtis occidentalis*" (Bt).
- C.? *eupatorifloræ* Beut. Ft. Lee district; galls in flower heads of "*Eupatorium ageratoides*" IX (Bt); Staten Island IX (Ds).
- C. *erubescens* O. S. Ft. Lee district; galls on leaves of red oak, "*Quercus rubra*," V, VI (Bt).
- C. *holotricha* O. S. Throughout the State on leaves of hickory (Bt); Staten Island (Ds); Riverton IX (Jn).
- C. *impatiens* O. S. New Jersey; galls on "*Impatiens pallida*" VIII, IX (Bt).
- C. *inopis* O. S. Staten Island (Ds); Riverton VII, IX (Jn); throughout the pine barrens generally; galls on the leaves of scrub pine, "*Pinus inops*."
- C. *liriodendri* O. S. Common throughout the State; galls on the leaves of tulip tree "*Liriodendron tulipifera*."
- C. *majalis* O. S. New Jersey; galls on leaves of pine oak, "*Quercus palustris*" (Bt).

- C. niveipila* O. S. Ft. Lee, galls on young leaves of red oak, "Quercus rubra," V, VI (Bt); Staten Island (Ds); Riverton (Jn).
- C. nuicola* O. S. New Jersey; in the husks of hickory nuts (Bt).
- C. pellex* O. S. Ft. Lee district; galls on leaves of ash, "Fraxinus," V, VI (Bt).
- C. ocellaris* O. S. Throughout the State; galls on leaves of red maple, "Acer rubrum," V, VI (Bt); Staten Island VI (Ds).
- C. persicoides* O. S. Ft. Lee district; galls on the under side of hickory leaves VIII, IX (Bt); Chimney Rock, Bound Brook, New Brunswick (Sm).
- C. poculum* O. S. Common throughout the State; galls on leaves of white oak, "Quercus alba," VIII-X (Bt); the "oak-spangle" of Fitch and a very characteristic structure.
- C. pomum* Walsh & Riley. Throughout the State in early summer on various species of grape, wild and cultivated; a very fleshy and often reddish discolored gall on vines, leaf-stalks and even tendrils; sometimes single, sometimes with a number of cells. Often attracts attention, but is rarely injurious and disappears before mid-summer.
- C.?* *pustuloides* Beut. Ft. Lee, Lakehurst; galls on red, scarlet, black, scrub and black-jack oak, "Quercus rubra," "coccinea," "velutina," "nana" and "marylandica," IX (Bt).
- C.?* *racemicola* O. S. Plainfield (Mill); galls among the racemes of golden rods, "Solidago canadensis," "puberula" and "serotina" IX (Bt); Staten Island (Ds).
- C. salicifoliæ* O. S. New Jersey; gall on "Spiræa salicifolia" (Bt).
- C. sanguinolenta* O. S. Ft. Lee district and elsewhere, common; galls on the leaves of hickory VI, VII (Bt); Staten Island (Ds).
- C. serotinæ* O. S. Greenwood Lake, Montclair, Ft. Lee district; gall on twig of wild cherry, "Prunus serotina," V, VI (Bt); Staten Island (Ds).
- C.?* *triadeni* Beut. Middlesex Co. (Mill); gall on stalk of marsh St. John's-wort, "Triadenum virginicum," IX (Bt).
- C. tubicola* O. S. Common almost everywhere in the State; galls on the leaves of hickory VIII, IX (Bt); Riverton IX (Jn); Jamesburg, Lahaway (Sm).
- C. tulipifera* O. S. Short Hills; galls on the ribs of leaves of tulip tree, "Liriodendron tulipifera," VIII, IX (Bt).
- C. umbellicola* O. S. South Orange, from galls among the umbels of elder, "Sambucus racemosa" (O. S.); Ft. Lee district, on common elder, "S. canadensis," VI (Bt); Staten Island (Ds).
- C. verrucicola* O. S. Little Falls, Staten Island (Ds); Ft. Lee district; galls on leaves of basswood, "Tilia americana," VII-IX (Bt); New Brunswick and frequently elsewhere in the State (Sm).
- C.?* *vaccinii* O. S. Dover, Morris Plains, Clementon (Jn); galls on the underside of leaves of huckleberry, "Vaccinium stramineum," IX, X (Bt).



*C. viticola* O. S. Ft. Lee district; galls on leaves of wild grape (Bt); Staten Island (Ds); Vincenttown (U S Ag).

### Family BIBIONIDÆ.

Loose-jointed, ungainly flies of moderate size, with long, stout legs, body often clothed with long hair, antennæ many jointed but short and stout, mouth parts a little produced. There is often considerable difference between the sexes, and in some cases the females have a ridiculously small head. From the very early appearance of some species they are called "March flies," and sometimes they occur in orchards in numbers so great as to attract attention.

The larvæ are cylindrical, footless grubs, and "feed on excremental or vegetable substances, especially on the roots of grass." They have not been, thus far, injurious in New Jersey.

#### PLECIA Wied.

*P. heteroptera* Say. Caldwell (Cr); Jamesburg (Sm); Lucaston IX, 4, Manumuskin X, 21 (Dke).

#### BIBIO Geoff.

*B. albipennis* Say. Caldwell (Cr); Newark (Sm); Westville V, 19, Clementon V, 30 (Jn); Manumuskin V, 21 (Dke).

*B. pallipes* Say. Husted V, 21 (Coll); Jamesburg VII, 4, Riverton V, 1.

*B. femorata* Wied. Caldwell (Cr); Newark V (Sm); Riverton V, 1 (Jn); National Park V, 6 (Dke).

*B. xanthopus* Wied. Caldwell (Cr), Riverton IV, 30.

*B. longipes* Loew. Palisades (Lv); Delair, Riverton; Wenonah, Lucaston, common X, XI (Dke).

*B. slossonæ* Ckil. (*gracilis* Walk. not Unger.) Clementon X, 11 (Hk).

#### DILOPHUS Meig.

*D. breviceps* Loew. Toms River V, 30 (Dke); Westville V, 19, Clementon V, 9, VI, 16.

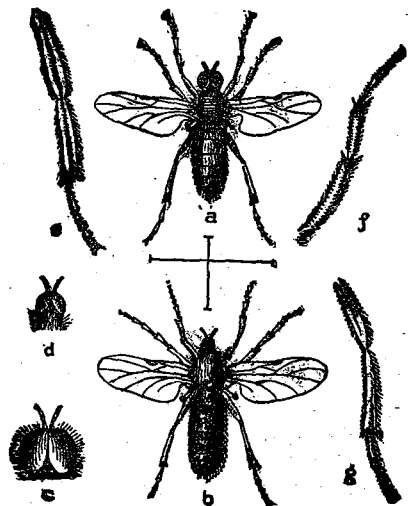


Fig. 301.—*Bibio albipennis*: a, male; c, its head; b, female; d, her head; all enlarged. Other references to structural details.

*D. dimidiatus* Loew. Avalon VI, 8 (Jn); Anglesea V (div); Cape May IX, 21 (Dke).

*D. thoracicus* Say. Forest Hill IX (Wdt); Blackwood VI, 8 (Jn).

#### SCATOPSE Geoffroy.

*S. notata* Linn. Clementon V, 9 (Jn); Glassboro V, 19 (Hk).

*S. pygmæa* Loew. Riverton VII, 31, IX, 9.

*S. atrata* Say. Riverton IV, 23.

#### EUPITENUS Macq.

*E. ater* Macq. Riverton IV, 9 (CG).

### Family SIMULIDÆ.

Rather undersized chunky flies, known as "black flies," dark in color, the thorax well developed and somewhat produced forward so as to partially conceal the small head from above. Though the head is small in proportion to the insect, the mouth parts are exceedingly well developed and furnished with a formidable array of lancets for puncturing and blood-sucking. The wings are short and broad, the venation obscure except along the front margin.

These flies are horrible pests locally, not so much in our State as in some others west and north, the "buffalo gnat" of the Mississippi Valley region and "black fly" of the north woods being excellent examples.

In New Jersey some species are pests in the Orange Mountains and northward, getting into the ears of horses, or even occasionally of man.

The larvæ are aquatic and live in running water.

#### SIMULIUM Latr.

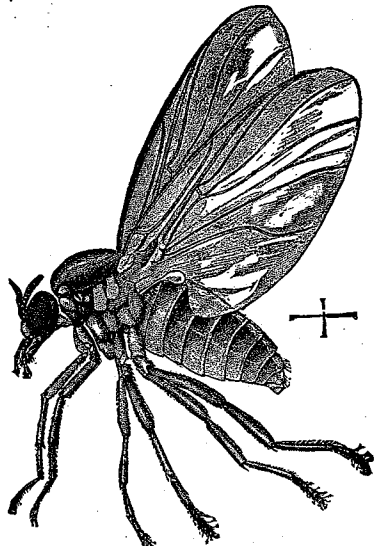
*S. venustum* Say. "Black fly"; Del. Water Gap VII, 11, Clementon V, 30 (Jn); Orange Mts., Caldwell VII (Cr); Lucaston IX, 3 (Dke).

*S. invenustum* Walk. Passaic (U S Ag); Orange Mts. (Sm), Clementon IV, 15 (Jn); Manumuskin IV, 28, Iona IV, 20 (Dke).

*S. vittatum* Zett. Orange Mts. (Sm).

*S. meridionale* Riley. Passaic (U S Ag); Riverton VII, 6, X, 20.

*S. bracteatum* Coq. Clementon V, 30.



Buffalo-gnat.

Fig. 302.