

**Article XVII.—NEW SPECIES OF GALL-PRODUCING
CECIDOMYIIDÆ.**

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PLATES XIII—XVII.

The following notes on some well known and new species of gall-producing Cecidomyiidæ are the results of a few observations made by me on this interesting group of Diptera. In my studies of this family of insects I have endeavored to acquire some knowledge of their galls, larvæ, and food-habits, and not simply to collect the mature insects in the field, because I believe that no attempt should be made to describe the adults only, especially from dried cabinet specimens or specimens collected at random in the field. The adults when dry almost always lose their colors and specimens taken in the field are invariably devoid of certain scales or markings by means of which they may be recognized, making descriptions of them very unsatisfactory. In this respect I agree absolutely with the late Baron R. Osten Sacken who says regarding the study of the Cecidomyiidæ:¹ "It is a peculiarity of the family Cecidomyiidæ that its natural history has always been studied in close connection with its classification. This is owing to the fact that *the gall*, the produce of the insect in its first stage of life, is generally a more striking object in nature than the insect itself. The latter small, tiny, difficult to preserve on account of their extreme delicacy, still more difficult to distinguish from their congeners on account of the uniformity of their appearance and coloring, would afford a very unsatisfactory object of study, unless in connection with the varied deformations which their larvæ produce on plants. The study of this family, different in this respect from most of the other families of insects, cannot be prosecuted apart from the observation of living nature, and for this very reason will always be a monopoly of the naturalist so situated as to afford such observations."

In a recent paper² Dr. E. P. Felt loses sight of this important matter and describes one hundred and seventy-nine new species of Cecidomyiidæ of which fifteen only were bred from their galls; the remaining species were taken at random in the field, on flowers, by sweeping or otherwise. He also named ninety-six of his new species after the plants upon which the adults were resting or after those plants in whose vicinity they were found.

¹ Monograph of North American Diptera, Vol. I, 1862, p. 173.

² New Species of Cecidomyiidæ, by Ephraim Porter Felt, Albany, New York, 1907, pp. 1-53.

Through the study of their life-history, more than likely it will be found that these species affect entirely different plants from those whose names they now bear. Dr. Felt's paper will undoubtedly cause great confusion. His system of nomenclature is obviously in this case misleading. The student of the subject will naturally conclude that the various species identified by botanical terms appertain to or feed upon the plants whose names have been given to them.

Asphondylia autumnalis sp. nov.

Male and female.—Head black, flattened, front very narrow, somewhat orange; eyes large, deep black. Antennæ long, joints longer than broad, brown. Thorax brown black above, with rather long hairs in the grooves and at the sides. Side of thorax partly dull orange. Abdomen dull orange, densely covered with sepia brown scales obscuring the ground color. Legs brown. Wings hyaline, rather densely covered with brown scales. Cilia sepia brown. Halteres scaled with sepia brown, knob orange. Expanse of male 5.5 mm.; of female 7 mm.

Gall (Plate XIII, Figs. 1, 2).—Globular or irregularly rounded with a number of aborted leaves at the apex, and elations of the stems of the plant at the sides. It is green outside and white inside. Interior rather soft, pithy and somewhat succulent, causing the gall to shrivel up and decay after the flies have emerged. Inside are a number of cells in which the larvæ live. These transform in the gall and the flies emerge during the latter part of August and early in September. The gall measures from 20 to 30 mm. in length and from 15 to 30 mm. in width. It occurs on *Helenium autumnale*.

Habitat.—Valley of the Black Mountains, North Carolina.

The adults were described from seven males and eight females.

Asphondylia patens sp. nov.

Female.—Head black, front orange, posterior edge and neck dull orange. Antennæ dark sepia brown, joints much longer than broad. Thorax dull brown on top, partly dull orange at the sides, and with rather long hairs in the grooves on top and at the sides. Thorax somewhat whitish at the sides if held in a certain light. Abdomen dull orange, densely covered with dark brown hairs and scales. Legs velvety black with a pure white mark on the junction of the femora and tibia; tarsi with a broad white band at the base covering the first three joints; claws white. Wings semiopaque, covered with numerous black scales; costa black with black hairs. Expanse 7 mm. Length 2.75 mm.

Gall (Plate XIII, Figs. 3, 4).—An accumulation of aborted leaves, forming a rosette-like body, measuring from 10 to 20 mm. in length. In the center it is bud-like, and inhabited by a single larva. The gall is formed on the tips of branches of a tall, pale, purple-flowered aster (*Aster patens*) and is caused by the arrest of growth of the terminal buds.

Habitat.—Valley of the Black Mountains, North Carolina.

The adults were described from three females.

The gall is quite common during the latter part of August. The larva pupates in the bud-like chamber and the adult emerges in September.

***Asphondylia conspicua* Osten Sacken.**

Asphondylia rudbeckiae conspicua OSTEN SACKEN, Tr. Am. Ent. Soc., Vol. III, 1870, p. 51; BERGENSTAMM & LÖW, Verh. Zool.-Bot. Gesell. Wien. Vol. XXVI, 1876, p. 69; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 293.

The gall of this species is found on *Rudbeckia triloba* and *Rudbeckia laciniata*. The adult and gall were described by Osten Sacken and the gall is figured here for the first time (Plate XVI, Fig. 6). I have taken it in the valley of the Black Mountains, North Carolina, in August, and have also received it from Miss Alberta Field from Ashtabula, Ohio. The adults emerge late in August and early in September.

***Asphondylia globulus* Osten Sacken.**

Asphondylia helianthi globulus OSTEN SACKEN, Tr. Am. Ent. Soc., Vol. II, 1869, p. 301; *ibid.*, Vol. III, 1870, p. 52; BERGENSTAMM & LÖW, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 89; MARTIN, Psyche, Vol. V, 1888, p. 102.

The gall (Plate XVII, Fig. 16) of this species is found on the giant sunflower (*Helianthus giganteus*) and sawtoothed sunflower (*Helianthus grosse-serratus*) in August and September. The pupa, gall and adult were briefly described by Osten Sacken and again in detail by Martin. The adults emerge in September and October.

***Cecidomyia ulmii* sp. nov.**

Male and female.—Head black. Antennæ rather long, joints about as long as wide, brown. Thorax black on top, red at sides and beneath. Abdomen bright red with a few black scales. Legs brown. Wings hyaline with minute black scales. Cilia brown. Expanse, 2.5 mm.

Gall (Plate XIII, Fig. 5).—This is made by folding and growing together of the small, immature terminal leaves or leaf-buds of the American elm (*Ulmus americana*), causing them to swell into galls.

Habitat.—Bronx, New York City, and vicinity.

Described from three males and fourteen females. The gall may be found during June and July. The imago emerges during the same months.

***Cecidomyia nyssæcola* sp. nov.**

Male and female.—Head jet black. Antennæ as long as the body, joints longer than broad and nearly all of equal size, ciliate, brown. Thorax deep black or deep red with two orange, parallel longitudinal lines along the middle; thorax orange at the sides and beneath. Abdomen orange, sparsely beset with brown scales. Legs dusky brown above, pale sordid white beneath. Wings hyaline with very minute dark scales and with a strong purplish reflection; a broad yellowish transverse band near the base, a large spot below the costa near the middle, another similar spot opposite on the inner margin, and another spot on the outer margin, all yellow. Cilia purplish brown. If held in a certain light the wings are pale yellow, except across the middle, where they are purplish. Expanse about 2.5 mm.

Gall (Plate XIII, Fig. 7). This is made by a narrow upward and inward fold of the margin of the leaf of sour gum (*Nyssa sylvatica*) and measures about .3 to 1 mm. in diameter and from about 2.5 to 3.5 mm. in length. Sometimes only a few of the folds occur on a leaf and again the entire margin on both sides of the leaf is covered with them, causing the leaf to become scalloped. The gall is pale yellowish or yellowish green and contrasts with the dark green leaf, making it a rather conspicuous object, readily detected. The galls are sometimes more or less contiguous when occurring in numbers on the same leaf. When dry the gall becomes brown.

Habitat.— Virginia, Kentucky, Illinois, New York, New Jersey, Pennsylvania, Valley of the Black Mountains, North Carolina, (alt. 3500 feet).

Described from one male and one female.

Very common everywhere in the vicinity of New York, from which locality my specimens were obtained. The gall may be found in June and the fly emerges in July.

***Cecidomyia unguicula* sp. nov.**

Male and female.— Head and antennæ black. Thorax dark brown black with scales of the same color. Thorax dull red at the sides and beneath. Abdomen dark red brown with dark brown scales in form of bands. Legs dark brown. Wings hyaline with dark brown scales, costa dark brown; at the base at the insertion of the wings, blood red. Halteres black. Expanse of male 3 mm.; of female 4 mm.

Gall (Plate XIII, Fig. 9).— Somewhat of the shape of a small carpet-tack with the broad part attached to the leaf. The base is rounded at the sides, from which it suddenly becomes narrow, terminating in a sharp point at the apex. Inside it is hollow and contains a single larva. Found in clusters on the under side of the leaf of hackberry (*Celtis occidentalis*). Length about 3 to 5 mm.; width of base about 2 to 3 mm.

Habitat: Cincinnati, Ohio (Miss Ruth S. Harvey).

Described from two males and eight females.

***Cecidomyia rudbeckiæ* sp. nov.**

Male and female.— Head black, face yellow. Antennæ pale yellowish brown. Thorax pale yellowish brown, dull orange at the side and below. Abdomen bright red. Legs pale yellowish brown. Wings hyaline with pale golden yellow scales in form of patches and bright blue where there are no scales. The blue may be seen only when the insect is held in a certain light. Cilia pale yellow. Halteres pale yellow. Expanse 2.5 to 3 mm.

Gall (Plate XIII, Fig. 6).— This is a deformation and enlargement of the flowerlets of the cone-flower (*Rudbeckia hirta*), sometimes deforming all the flowers in the cone. The enlargements are in form of leaflets which are usually greenish in color or are tinged with brown or reddish.

Habitat.— Valley of the Black Mountains, North Carolina.

Described from two males and five females.

The larva is orange and leaves the flower to pupate in the ground. The fly emerges in August.

***Cecidomyia pudibunda* Osten Sacken.**

—, OSTEN SACKEN, Ent. Zeit. Stettin, 1861, p. 419, No. 18 (gall only).

Cecidomyia pudibunda OSTEN SACKEN, Mon. Dipt. N. Am., Vol. I, 1862, p. 202 (gall and larva); GLOVER, MSS. Notes, Dipt. 1874, p. 9, pl. xii, Fig. 30 (colored figure of gall); BERGENSTAMM & LOW, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 87 (gall only).

Male and female: Head black. Antennæ smoky brown, about as long as the body, ciliate. Thorax, abdomen and legs, semitranslucent, pale yellow. Wings hyaline, with a few dark hairs. Cilia pale yellow. Expanse 2 mm.

Gall (Plate XIII, Fig. 8).— Consists of a fold between the ribs on the leaf of hornbeam (*Carpinus caroliniana*) with the opening on the underside of the leaf. It is usually red above and pale green beneath. In length the galls vary from 4 mm. to the width of the leaf from the midrib to the margin. Usually several or many galls are found upon a single leaf. Formed in June and the larva leaves the gall to pupate on the ground. The adult appears in July. The larva, according to Osten Sacken, is exceedingly small and white; when magnified it appears semi-transparent, with an orange spot about the middle of the body, and with numerous short, erect bristles; the head is distinct, as well as the two short antennæ.

Habitat.— Bronx Park, New York City.

***Cecidomyia? chinquapin* sp. nov.**

Larva.— Orange red. Body elongate with the segments slightly incised at the junctions. Terminal segment with a few very minute filaments. Anchor-process or breast bone (Plate XIV, Fig. 14) narrow at base, gradually increasing in width to the apex, where there are two lateral prongs rounded at the tips. Length 1.75 mm.; width .5 mm.

Gall. (Plate XIV, Figs. 12, 13).— Consists of a small irregular swelling in the burr of chinquapin (*Castania pumila*). It contains a single larva which leaves the gall to pupate in the ground.

Habitat.— Valley of the Black Mountains, North Carolina (W. B.).

The gall may be found during the latter part of September. The adult is unknown.

***Cecidomyia? vernoniæ* sp. nov.**

Larva.— Yellow. Body slender and elongate. Terminal segment rounded without any projections. Anchor-process or breast bone (Plate XV, Fig. 8) long and slender, gradually increasing in width from the base to the apex which has two lateral teeth and a short median one. Length 2.5 mm.; width .5 mm.

Gall (Plate XV, Fig. 7).— Green, sometimes tinged with red, rounded or elongate, and of the texture of the stem of the plant. Inside it is soft, fleshy, and contains a single larva in an elongated, narrow channel. Length about 7 to 12 mm.; width, 5 to 9 mm.

When dry the gall becomes brown and pithy inside and somewhat resembles a cherry-pit. It is usually situated on the mid-rib of the leaf of ironweed (*Vernonia noveboracensis*).

Habitat.— Valley of the Black Mountains, North Carolina (W. B.), Staten Island, New York City (W. T. Davis), Indiana (Mel. T. Cook).

The gall is quite common during September, and the larvæ overwinter and transform in the gall. The adult is unknown.

Cecidomyia? pustuloides sp. nov.

Larva.—Orange. Body somewhat flattened, broad, ovate, with the segments at the sides rounded, and rather deeply incised at the junctions. Terminal segment with two very minute, rather wide-separated projections. Anchor-process or breast bone (Plate XVII, Fig. 2) very narrow from the base to about the middle, from which point it gradually expands, and has two lateral rounded projections at the apex. Length 1.25 mm.; width .8 mm.

Gall (Plate XVII, Fig. 1).—Circular, blister-like, and slightly protruding on each side of the leaf. It measures about 4 to 7 mm. in diameter. Found in clusters on the leaves of different kinds of oaks (*Quercus rubra*, *Q. coccinea*, *Q. tinctoria*, *Q. nana*, *Q. marylandica*), in September.

Habitat.—Valley of the Black Mountains, North Carolina; Lakehurst, New Jersey.

The adult is unknown.

Cecidomyia? meibomia sp. nov.

Larva.—Pale yellow. Body ovate, rather broad. Terminal segment with a deep notch at the middle and without projections. Anal slit deep. Anchor-process or breast bone (Plate XV, Fig. 11), short, slender from the base to the much expanded anterior portion which has two rather long lateral prongs at the apex. Length 1.25 mm.; width .5 mm.

Gall (Plate XV, Figs. 9, 10).—Dull green, subfusiform or elongate-oval, more or less tapering to a long point at the apex, which sometimes show parts of deformed leaves. Inside it is hollow, inhabited by a single larva in a rather large oval chamber at the base of the gall. Beyond this chamber it is lined with whitish fiber to the tip of the gall. It measures from 8 to 22 mm. in length and from 4 to 8 in width. Found during the latter part of August and in September in clusters of three or more at the terminal part of the stem of several species of tick-trefoil (*Meibomia rigida*, *M. lævigata*, *M. pauciflora*, etc.).

Habitat.—Valley of the Black Mountains, North Carolina (W. B.); Staten Island, New York City (W. T. Davis).

The adult is unknown.

Cecidomyia? semenivora sp. nov.

Larva.—Orange. Body apparently smooth with the segments incised a little at the junctions. Terminal segment rounded at the tip without any projections or filaments. Anchor-process or breast bone (Plate XV, Fig. 4) rather short, slender, from the base to the much enlarged anterior portion. This part is rounded at the sides with two well separated, large lateral teeth at the apex. Length 2 mm.; width .75 mm.

Gall (Plate XV, Figs. 1, 2).—Green, globular or irregularly rounded with a small nipple at the apex and it is attached by a short stalk to the base of the plant. Inside it is hollow and contains many larvæ (Plate XV, Fig. 3) which feed upon the

deformed seeds. The gall is about the size of a pea or gooseberry and measures from 6 to 14 mm. in diameter.

The gall is a malformation of the seed capsules of apetalous or cleistogamous flowers of stemless or acaulescent violets (*Viola cucullata*, *V. palmata*, *V. affinis*, *V. septentrionalis* and probably other species).

This gall was first recorded by E. L. Green (*Pittonia*, Vol. V, 1902, p. 103) and described by E. Brainerd (*Rhodora*, Vol. VI, 1904, p. 15). The specimens from which my descriptions were made were collected by Mr. W. DeW. Miller at Plainfield, New Jersey. According to Mr. Miller, the gall may be found from July until late in October. The larvæ when mature spin cocoons inside the gall and hibernate in this state. The adult is unknown.

***Cecidomyia? eupatorifloræ* sp. nov.**

Larva.—Bright orange red. Body very finely papillose under a high power lens; segments rather deeply incised at the junctions. Terminal segment on the dorsum with a prominent projection notched at the apex. At each side of this projection on the margin of the segment is a pair of very short filaments and a short blunt process; hind angles of segment produced. Anal slit extending across the posterior extremity which is rounded. Anchor-process or breast bone (Plate XVI, Fig. 5) long and slender to the very broad anterior portion, which is rounded at the sides and with two teeth at the apex. Length 3 mm.; width .8 mm.

Gall (Plate XVI, Fig. 4).—Green, succulent and pubescent. Globular or irregularly rounded, with or without a depression at the apex around which are deformed petals of the flowers. It is usually on a short stalk, like the flowers of the plant. Inside it is soft, watery, and is inhabited by several larvæ, which live in separate chambers. Length from about 10 to 16 mm.; width about 8 to 15 mm. The gall grows singly or in clusters among the flower-heads of *Eupatorium ageratoïdes*, in September.

Habitat: Valley of the Black Mountains, North Carolina (W. B.), Staten Island, New York City (W. T. Davis).

The adult is unknown.

***Cecidomyia? verbesinæ* sp. nov.**

Larva.—Orange red. Body slender, elongate. Terminal segment rounded, without projections. Anchor-process or breast bone (Plate XVI, Fig. 3) long, slender from base to the much enlarged anterior portion which is rounded at the sides and with two blunt lateral prongs at the apex. Length 3 mm.; width 1 mm.

Gall (Plate XVI, Fig. 1).—Bud-like, rounded, terminating in a blunt point at the apex. Sometimes several of the galls are confluent and are then irregular in shape. It is hollow (Plate XVI, Fig. 2) and contains a single larva, which leaves the gall to transform in the ground. When confluent it contains two or three cells. Found on the flower heads of *Verbesina alternifolia* in September.

Habitat.—Valley of the Black Mountains, North Carolina.

The adult is unknown.

***Cecidomyia? ramuscula* sp. nov.**

Larva.—Orange yellow. Body elongate, narrow, with the segments slightly rounded at the sides. Skin minutely papillose under a high power objective. Terminal segment rounded. Anchor-process or breast bone (Plate XVII, Fig. 9), long and of almost equal width to the much dilated anterior portion which has three sharp teeth at the apex and a lateral tooth on each side. Length 3.5 mm.; width .8 mm.

Gall (Plate XVII, Figs. 7, 8).—This is a fusiform swelling on the branches of asters (*Aster dumosus* and *Aster patens*). Inside is an elongate, narrow chamber, inhabited by a single larva, which remains in the gall to pupate. Length 10 to 20 mm.; width 5 to 8 mm.

Habitat.—Valley of the Black Mountains, North Carolina, in September.

The adult is unknown.

***Cecidomyia vaccinii* Osten Sacken.**

Cecidomyia sp., OSTEN SACKEN, Ent. Zeit. Stettin, 1861, p. 419, No. 9.

Cecidomyia vaccinii OSTEN SACKEN, Mon. Dipt. N. Am., Vol. I, 1862, p. 196; GLOVER, MSS. Notes, Dipt., 1874, p. 11; BERGENSTAMM & Löw, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 91.

Larva.—Orange red. Body somewhat flattened. Segments very slightly incised at the junctions. Terminal segment rounded with a few filaments. Anchor process or breast bone (Plate XVI, Fig. 12) very short, slender to the much enlarged-anterior portion which has two rather prominent lateral prolongations at the apex. Length, 2.75 mm.; width 1 mm.

Gall (Plate XVI, Fig. 10).—Green, cock's comb or oyster-shaped, and fastened to the ribs of the leaf by a hinge and when mature burst open like the valve of a shell. It is hollow inside (Plate XVI, Fig. 11) and contains one or two larvæ which leave the gall to transform in the ground.

Habitat.—Washington, D. C. (Osten Sacken); Valley of the Black Mountains, North Carolina (W. B.).

The gall is found in September and early in October on the underside of the leaves of *Vaccinium stamineum*. The adult is unknown.

***Cecidomyia impatientis* Osten Sacken.**

Cecidomyia impatientis OSTEN SACKEN, Mon. Dipt. N. Am., Vol. I, 1862, p. 204; WALSH & RILEY, Am. Ent., Vol. II, 1869, p. 63; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 269.

Cecidomyia impatientis GLOVER, MSS. Notes. Dipt., 1874, p. 8, pl. xi, fig. 16; BERGENSTAMM & Löw, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 95; BEUTENMÜLLER, Am. Mus. Journ., Vol. IV, 1904, p. 116, fig. 65; Ins. Galls Vicin. N. Y., 1904, p. 30, fig. 65.

Baron Osten Sacken described only the gall of this species, as a succulent swelling at the base of the flower of *Impatiens fulva* in September. Walsh and Riley described the gall and larva in detail, with figures of the gall and breast bone (Plate XVI, Fig. 8) of the larva. They also give

Impatiens fulva as the host plant. I have taken the gall at Pine Hill, Catskill Mountains, New York, and in the valley of the Black Mountains, North Carolina, in September, on *Impatiens pallida*. The gall (Plate XVI, Fig. 7) is very succulent and soon decays after the larvæ have escaped from it. The adult is unknown.

***Cecidomyia persicoides* Osten Sacken.**

Cecidomyia persicoides OSTEN SACKEN, Mon. Dipt. N. Am., Vol. I, 1862, p. 193; GLOVER, MSS. Notes, Dipt., 1874, p. 9; BERGENSTAMM & LÖW, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 88; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 267 pl. xiv, fig. 3; Am. Mus. Journ. Vol. IV, 1904, p. 114, fig. 60; Ins. Galls Vicin. N. Y., Vol. IV, 1904, p. 28, fig. 60.

Larva.—White. Body robust, broad with the segments of equal width, except the first and last which are narrower. Terminal segment bluntly rounded at the tip with the anal slit deep and extending across the segment. Anchor-process or breast bone (Plate XVII, Fig. 10) very slender with the anterior portion somewhat broader and lance-shape. Length 4 mm.; width 1.5 mm.

The gall only was described by Osten Sacken and subsequent writers. It is variable in size, round and covered with short down-like hairs. It occurs on the underside of the leaves of different kinds of hickory. The adult is unknown.

***Cecidomyia umbellicola* Osten Sacken.**

Cecidomyia sambuci umbellicola OSTEN SACKEN, Tr. Am. Ent. Soc., Vol. III, 1871, p. 52; GLOVER, MSS. Notes, Dipt., 1874, p. 10; BERGENSTAMM & LÖW, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 91; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 269.

The gall (Plate XVI, Fig. 9) of this species was found by Osten Sacken on the red-berried elder (*Sambucus pubens*). I have taken it in June on the common elder (*Sambucus canadensis*). The larva and adult are unknown.

***Cecidomyia ? racemicola* Osten Sacken.**

Cecidomyia sp., OSTEN SACKEN, Ent. Zeit. Stettin, 1861, p. 418, No. 11.

Cecidomyia racemicola OSTEN SACKEN, Mon. Dipt. N. Am., Vol. I, 1862, p. 196; GLOVER, MSS. Notes, Dipt., 1874, pp. 9, 18; BERGENSTAMM & LÖW, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 90.

Rhopalomyia racemicola FELT, New Spec. Cecidom., 1907, p. 24.

Gall (Plate XVII, Fig. 14).—Green, smooth, rounded, tapering to a point at the apex, giving it a bud-like appearance. Inside it is hollow and contains a single larva. Length about 3 mm. and 2.5 mm. in diameter.

Found singly, or in clusters, among the racemes of different kinds of goldenrod (*Solidago canadensis*, *S. puberula*, *S. serotina* and probably other species).

Larva.—Bright orange. Body apparently smooth, showing no granulations under the lens. Segments of equal width except the first, second, eleventh and

twelfth, which are narrower. Twelfth segment on the dorsum with two semitransparent rather broad projections, rounded at the tip. Posterior extremity evenly rounded with the anal slit prominent. Anchor-process or breast bone (Plate XVII, Fig. 15) rather long and narrow from the base to the broad anterior portion, which is slightly rounded at the sides, with two rather long, sharp teeth at the apex. Length 2.5 mm.; width .75 mm.

Habitat: Valley of the Black Mountains, North Carolina (W. B.); Staten Island, New York City (W. T. Davis); Washington, D. C. (Osten Sacken).

The galls may be found in September and are somewhat difficult to detect, owing to their resemblance to the buds of the goldenrod flowers. The larvæ leave the gall in autumn and enter the ground to transform. The adults described by E. P. Felt as *Rhopalomyia racemicola* are probably the gall makers of *Cecidomyia racemicola* O. S.

Lasioptera tumifica sp. nov.

Male and female.—Head black, sordid white or yellowish on the posterior edge, face silvery white. Antennæ nearly as long as the thorax, stout, reddish brown, salmon red, or almost black. Thorax black, covered with golden brown hairs forming two parallel lines, composed of erect hairs along the middle; front and sides of thorax to the base of the wings sometimes pale yellow or whitish; at sides deep red with two white spots composed of hairs. Abdomen deep velvety black with a broad white band on the posterior part of each segment. These bands are broken along the dorsum and do not reach the extreme sides of the abdomen. Underside of abdomen with the ground color usually reddish and heavily scaled with silvery white. Legs brown above, paler brown beneath. Wings hyaline with minute blackish scales, costa, black with a white mark a little beyond the middle. This mark is sometimes tinged with red. Cilia brown. Expanse 2.5 to 3.5 mm.

Gall (Plate XIV, Figs. 1, 2).—This is an irregular, rounded, elongate, or kidney-shaped, gnarly, leather-like swelling, usually on one side of the stalk of goldenrod (*Solidago rugosa*). Sometimes it almost or entirely encircles the stem. It is leathery outside and rather soft and pithy inside, containing many orange larvæ. It is found from close to the ground where the roots begin everywhere along the stalk to nearly the middle of the plant, but usually near the lower part. The gall measures from 8 to 24 mm. in length and from 5 to 15 mm. in width.

Larva (Plate XIV, Fig. 3).—Salmon red. Body very broad, ovate. Segments incised at the junctions. Terminal segment evenly rounded and without processes. Anchor-process or breast bone (Plate XIV, Fig. 4), very broad and bulb-like at the base, gradually narrowing to the very broad anterior portion, which is obtusely rounded at the sides and with three rather strong teeth at the tip. Length 3 to 3.5 mm.; width 1 to 1.5 mm.

Habitat.—Bronx Park, and Staten Island, New York City.

Described from ten males and thirty-two females. The larvæ transform in the gall and the adults emerge in May.

Lasioptera cornicola sp. nov.

Male and female.—Head black, front somewhat whitish. Antennæ short,

robust, black. Thorax velvety black with a broad grayish white band anteriorly. Underside black, marked with a little white. Abdomen velvety black with a rather broad white band on the anterior part of the first segment and an indistinct narrow one on the posterior part. A narrow band on each of the second, third and fourth segments posteriorly, remaining segments slightly edged with white scales. These bands do not reach the extreme sides of the body. Underside black with a broad white band along the middle. Anterior legs brown; middle and hind legs with femora and tibiae at base to the middle brown, remaining parts sordid white; all the tarsi brown. Wings hyaline with black scales, iridescent; costa black with a white mark a little beyond the middle. Halteres white. Expanse 3.75 mm.

Gall (Plate XIV, Figs. 7, 8, 9).—Woody swellings on the twigs, branches or trunks on the dogwood (*Cornus stolonifera*), measuring from about 6 to nearly 150 mm. in length. When situated on the twig, the gall is considerably smaller than those on the larger branches and trunk. It sometimes gnarls the trunk from about one to six inches or more in length. Inside (Plate XIV, Fig. 9) it is hard, woody, with many elongate chambers, each containing a larva.

Larva (Plate XIV, Fig. 10).—Pale yellow. Body very elongate, narrow and slender. Segments one to nine about equal in width; three last segments narrower. Surface of body under a high objective minutely papillose, giving it a granular appearance. Segments at the junctions slightly incised. Terminal segment rounded, finely serrate at the tip, with the anal slit line-like. Head retractile, basal part transversely rugose. Antennæ two-jointed, basal joint short, second joint longer, conical. Anchor-process or breast bone (Plate XIV, Fig. 11) very long, slender, anterior portion broad, slightly sinuate at the sides between the apex and the projecting part from which it gradually narrows to the base. Apex with two rather widely separated, prominent, broad, lateral teeth. Length 3 mm.; width .75 mm.

Habitat.—Bronx Park, and Staten Island, New York City.

Described from five males sixteen females.

The gall is rather common and may be found during all seasons of the year. The larvæ overwinter and pupate in the galls, and the adults emerge during May and June.

***Lasioptera asterifoliæ* sp. nov.**

Male and female.—Head black, whitish behind. Antennæ short, stout, black or red. Thorax deep black with the faint, narrow, parallel lines on the summit composed of golden brown erect hairs in the grooves. Abdomen deep red covered with black scales, posterior segments on each side of the dorsum narrowly edged with white and a row of white dots along each side. Underside of abdomen red, scaled with white. Legs dark brown above, paler beneath. Wings hyaline, finely scaled with black; costa black, with a white mark at the middle. Halteres brown. Expanse 3 to 4 mm.

Gall (Plate XIV, Fig. 15).—Circular, flattened, eye-like blotches on the leaf of a species of aster, measuring about 5 mm. in diameter. Purplish with a sordid whitish centre and margin. Underside dull whitish. Found singly or in numbers, all depending upon the size of the leaf.

Habitat.—Valley of the Black Mountains, North Carolina.

Described from three males and nine females.

The larva pupates within the gall and the fly emerges during the same year in August and early in September.

Lasioptera clavula (*Beutenmüller*).

Cecidomyia clavula BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 269, pl. xv, fig. 5; Am. Mus. Journ. Vol. IV, 1904, p. 29, fig. 64; Ins. Galls Vicin. N. Y., 1904, p. 29, fig. 64; TOWNSEND, Proc. Ent. Soc. Wash., Vol. II, 1893, p. 390; COOK, 29th Rep. Dept. Geol. Nat. Hist. Res. Ind., 1904 (1905), p. 840; Proc. Ind. Acad. Sci., 1904, p. 225.

Female.—Head small, black, face whitish. Antennæ short, black. Thorax black with golden brown hairs and a white spot on each side anteriorly. Abdomen brown black above with the segments tipped with white posteriorly. The white being visible only when the insect is held in a certain light. Abdomen beneath yellowish brown covered with white scales. Legs dark brown above, yellowish brown beneath. Wings hyaline, costa narrowly black with a white mark a little beyond the middle. Expanse 3 mm.

Larva.—Bright orange. Body elongate, rather broad. Skin finely papillose under a high lens. Terminal segment with two pointed, hook-like, projections, and two minute filaments at each side. Anchor-process or breast bone (Plate XIV, Fig. 6) short, slender, anterior portion much enlarged with two short lateral teeth. Length 3 mm.; width .75 mm.

Gall (Plate XIV, Fig. 5).—On the terminal twigs of dogwood (*Cornus florida*). It is club-shaped and about $\frac{1}{2}$ to 1 inch long. Inside is an elongate channel inhabited by one or more larvæ.

The larvæ leave the gall in September and October and enter the ground to transform. They overwinter and the adults emerge during May and June.

Lasioptera sambuci (*Felt*).

Cecidomyia sambuci FELT, 21st Rep. Inj. Ins. N. Y., 1905 (1906), p. 131, figs. 46-48.

Female.—Head black, collar white. Antennæ black. Thorax velvety black. Abdomen black above and along the sides, basal segment white and the third and fourth segments each with a white band on the posterior edges. Abdomen broadly white along the middle on the under side. Legs brown. Wings hyaline, costa black with a white mark a little beyond the middle. Cilia brown. Halteres white. Expanse 2.75 to 3 mm.

This species was heretofore known from the larva and gall only, and the adult is here described for the first time. The gall is an irregular gnarly swelling on one side of the stem of the elder (*Sambucus canadensis*). The larvæ overwinter and transform in the gall, and the adults emerge the following May and June. The gall is very common in the vicinity of New York.

Lasioptera nodulosa sp. nov.

Lasioptera farinosa SMITH, Bull. N. Agri. Exp. Sta., N. J., 1891, p. 14; 12th Ann. Rep. N. J. Agri. Exp. Sta., 1891 (1892), p. 382, fig. 15; WEBSTER, Bull. 45, Ohio Agricul. Exp. Sta., 1889, p. 188, fig. 14.

Female.—Head black, face sordid white. Antennæ black, basal joints sordid yellowish brown. Thorax deep black, pale whitish brown, in front and on sides to the base of the wings. Collar yellowish brown. Sides of thorax reddish. Abdomen red, covered with blackish brown scales; first segment almost wholly white, and a narrow whitish band on the posterior edges of the following segments. Underside pinkish with white scales. Legs, femora, and tibiæ black with the joints pale brown, tarsi black. Underside of legs pale yellowish brown. Wings hyaline with black scales; costa black with a white mark a little beyond the middle. Halteres reddish. Expanse, 3.5 mm.

Gall (Plate XV, Fig. 5).—Knot-like or gouty, elongate or rounded swelling on the smaller terminal branches of blackberry (*Rubus villosus*). Often there are several galls upon a single twig. Inside there is an elongate chamber inhabited by a single larva. The larva transforms in the gall and the adults emerge in May and June.

Larva.—Orange. Body elongate, narrow, minutely papillose under a high power objective. Terminal segment rounded at the tip with a few spiny processes. Anal slit extending across the segment. Anchor-process or breast bone (Plate XV, Fig. 6) long and narrow to the very broad anterior portion which has two lateral subacute teeth and traces of a very short median one at the middle. Length 2.5 mm.; width .5 mm.

Habitat.—Bronx Park, New York City (W. B.); Ohio (F. M. Webster); New Jersey (J. B. Smith).

Described from twelve females.

The galls and larvæ were described and figured by Professor John B. Smith and F. M. Webster as *Lasioptera farinosa* but they belong to the new species here described. The gall is quite common everywhere in the vicinity of New York City; it somewhat resembles the swellings produced by the larvæ of *Agrilus ruficollis*, which is found on the large stalks of blackberry.

Lasioptera farinosa (*Osten Sacken*).

Cecidomyia farinosa OSTEN SACKEN, Mon. Dipt. N. Am., Vol. I, 1862, p. 204; GLOVER, MSS. Notes, Diptera, 1874, p. 8; BERGENSTAMM & Löw, Verh. Zool.-Bot. Gesell. Wien, Vol. XXVI, 1876, p. 96; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 273.

Diplosis farinosa BRODIE, Biol. Rev. Ontario, Vol. I, 1894, p. 110.

Female.—Head black, face and mouth parts white. Antennæ stout, short, black. Thorax black above with a broad white border in front to the base of the wings. Abdomen black, posterior edges of the segments white; underside white. Legs pinkish with black scales. Wings hyaline with black scales, costa black with a white mark a little beyond the middle. Expanse, 3.5 mm.

Gall (Plate XV, Fig. 13).—Irregularly rounded and situated on the underside of the midrib or on the petiole at the base of the leaflet of blackberry (*Rubus villosus*).

It is covered with a farinaceous powder and when fresh is rather soft and fleshy, but becomes hard and woody when old. Inside are several cells inhabited by the larvæ. These overwinter in the gall and the adults emerge in May and early June. The gall measures from 6 to 12 mm. in diameter.

Larva.—Orange. Body broad, ovate. Anchor-process (Plate XV, Fig. 12) long and slender, gradually increasing in width to the two lateral teeth at the apex. Length 1-5 mm.; width .5 mm.

Habitat.—New York; New Jersey; Valley of the Black Mountains, North Carolina (W. B); Canada (Brodie).

This species was known heretofore only by the gall described very briefly by Osten Sacken. It is quite common locally in the vicinity of New York City and may be distinguished easily from *Lasioptera nodulosa*, with which it has been confounded by certain writers. *L. farinosa* always occurs on the leaves and petiole of the blackberry while *L. nodulosa* is a gouty swelling on the stems of this plant.

Lasioptera viburnicola sp. nov.

Male and female.—Head black, with the posterior portion, white, palpi white. Antennæ black. Thorax deep black with two not very distinct, median lines composed of white hairs; anterior portion of thorax to the base of the wings broadly white; sides black, scutellum rufous. Abdomen velvety black, first segment wholly white, second, third and fourth segments each with a broad, white, transverse band, on the posterior edges, remaining segments with a few white hairs on the posterior edges. Underside pure white. Legs sordid white, with a broad black band on the femora, and tibiæ; tarsi blackish above. Wings hyaline, with black hairs, costa broadly black, with a conspicuous white mark at the middle. Halteres white. Expanse, 3-3.50 mm.

Larva.—Orange. Body elongate, narrow. Skin finely papillose. Terminal segment rounded at the tip with a few very short setæ. Anchor-process of breast-bone (Plate XVII, Fig. 13) long, narrow from base to the anterior portion which gradually becomes broader. Apex with two rather long, lateral teeth. Length 2.75 mm.; width .66 mm.

Gall (Plate XVII, Figs. 11, 12).—Gnarly, elongate swellings on the larger branches of arrow-wood (*Viburnum dentatum*). It is soft, pithy inside, and the larvæ make long deep channels in the wood of the branch, beneath the pithy portion of the gall. Length 30 to 75 mm.; width 10 to 25 mm.

Habitat.—Bronx, New York City.

The larvæ overwinter and transform in the gall.

Lasioptera? linderæ sp. nov.

Larva.—Whitish with a pale orange tint. Body elongate, narrow, skin very finely papillose. Terminal segment rounded with a few very short setæ. Anal slit extending across the segment. Anchor-process or breast bone (Plate XVII, Fig. 6) narrow, gradually becoming broader at the anterior portion, which has two short lateral teeth at the apex. The teeth are widely separated and are rounded at the tip. Length 2 mm.; width .5 mm.

Gall (Plate XVII, Figs. 3, 4, 5).—Gnarly, elongate, woody swellings, on one side or surrounding the smaller twigs or branches of spicebush (*Lindera benzoin*). It is hard and woody inside with a number of elongate, narrow chambers, in which the larvæ live. Length 15 to 60 mm.; width 7 to 10 mm.

Habitat.—Bronx, New York City.

The larvæ overwinter and transform in the gall. The adult is unknown.

EXPLANATION OF PLATES.

PLATE XIII.

Figs. 1 and 2.—*Asphondylia autumnalis* sp. nov.

Figs. 3 and 4.—*Asphondylia patens* sp. nov.

Fig. 5.—*Cecidomyia ulmii* sp. nov.

Fig. 6.—*Cecidomyia rudbeckiæ* sp. nov.

Fig. 7.—*Cecidomyia nyssæcola* sp. nov.

Fig. 8.—*Cecidomyia pudibunda* O. S.

Fig. 9.—*Cecidomyia unguicula* sp. nov.

PLATE XIV.

Figs. 1 and 2.—*Lasioptera tumifica* sp. nov.

Fig. 3.—*Lasioptera tumifica*, larva.

Fig. 4.—*Lasioptera tumifica*, anchor-process.

Fig. 5.—*Lasioptera clavula* Beuten.

Fig. 6.—*Lasioptera clavula* anchor-process.

Fig. 7-9.—*Lasioptera cornicola* sp. nov.

Fig. 10.—*Lasioptera cornicola*, larva.

Fig. 11.—*Lasioptera cornicola*, anchor-process.

Fig. 12 and 13.—*Cecidomyia ? chinquapin* sp. nov.

Fig. 14.—*Cecidomyia ? chinquapin*, anchor-process.

Fig. 15.—*Cecidomyia ? asterifoliæ* sp. nov.

PLATE XV.

Figs. 1-3.—*Cecidomyia ? semenivora* sp. nov.

Fig. 4.—*Cecidomyia ? semenivora*, anchor-process.

Fig. 5.—*Lasioptera nodulosa* sp. nov.

Fig. 6.—*Lasioptera nodulosa* anchor-process.

Fig. 7.—*Cecidomyia ? vernoniæ* sp. nov.

Fig. 8.—*Cecidomyia ? vernoniæ*, anchor-process.

Figs. 9 and 10.—*Cecidomyia ? meibomiæ* sp. nov.

Fig. 11.—*Cecidomyia ? meibomiæ*, anchor-process.

Fig. 12.—*Lasioptera farinosa* O. S., anchor-process.

Fig. 13.—*Lasioptera farinosa* O. S.

PLATE XVI.

- Figs. 1 and 2.— *Cecidomyia* ? *verbesinæ* sp. nov.
Fig. 3.— *Cecidomyia* ? *verbesinæ* anchor-process.
Fig. 4.— *Cecidomyia* ? *eupatorifloræ*, sp. nov.
Fig. 5.— *Cecidomyia* ? *eupatorifloræ*, anchor-process.
Fig. 6.— *Asphondylia conspicua* O. S.
Fig. 7.— *Cecidomyia impatientis* O. S.
Fig. 8.— *Cecidomyia impatientis*, anchor-process.
Fig. 9.— *Cecidomyia umbellicola* O. S.
Figs. 10 and 11.— *Cecidomyia vaccinii* O. S.
Fig. 12.— *Cecidomyia vaccinii*, anchor-process.

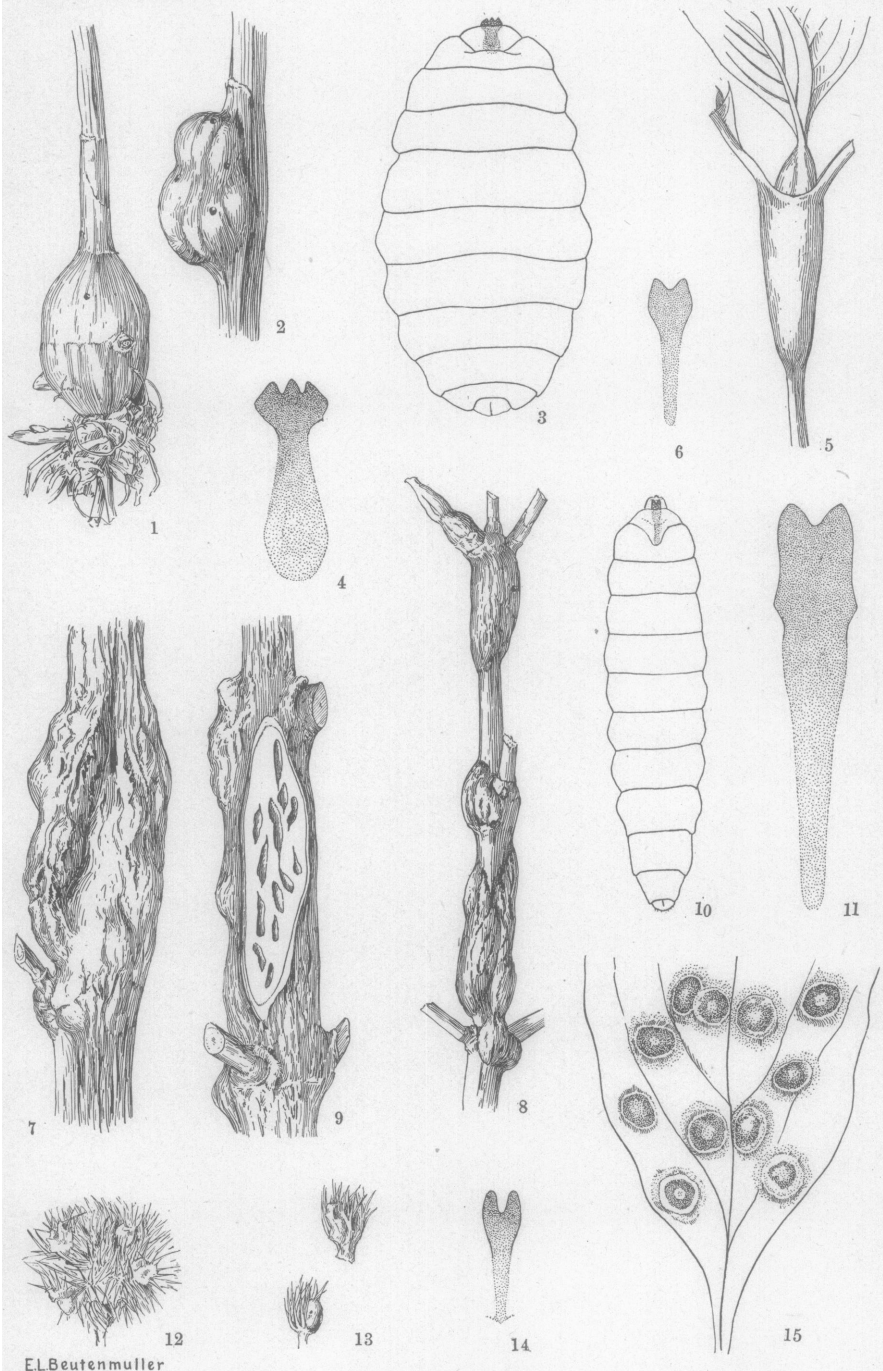
PLATE XVII.

- Fig. 1.— *Cecidomyia* ? *pustuloides* sp. nov.
Fig. 2.— *Cecidomyia* ? *pustuloides*, anchor-process.
Fig. 3-5.— *Lasioptera* ? *linderæ* sp. nov.
Fig. 6.— *Lasioptera* ? *linderæ*, anchor-process.
Figs. 7 and 8.— *Cecidomyia* ? *ramuscula* sp. nov.
Fig. 9.— *Cecidomyia* ? *ramuscula*, anchor-process.
Fig. 10.— *Cecidomyia* ? *persicoides* O. S., anchor-process.
Figs. 11 and 12.— *Lasioptera viburnicola* sp. nov.
Fig. 13.— *Lasioptera viburnicola*, anchor-process.
Fig. 14.— *Cecidomyia racemicola* O. S.
Fig. 15.— *Cecidomyia racemicola*, anchor-process.
Fig. 16.— *Asphondylia globulus* O. S.



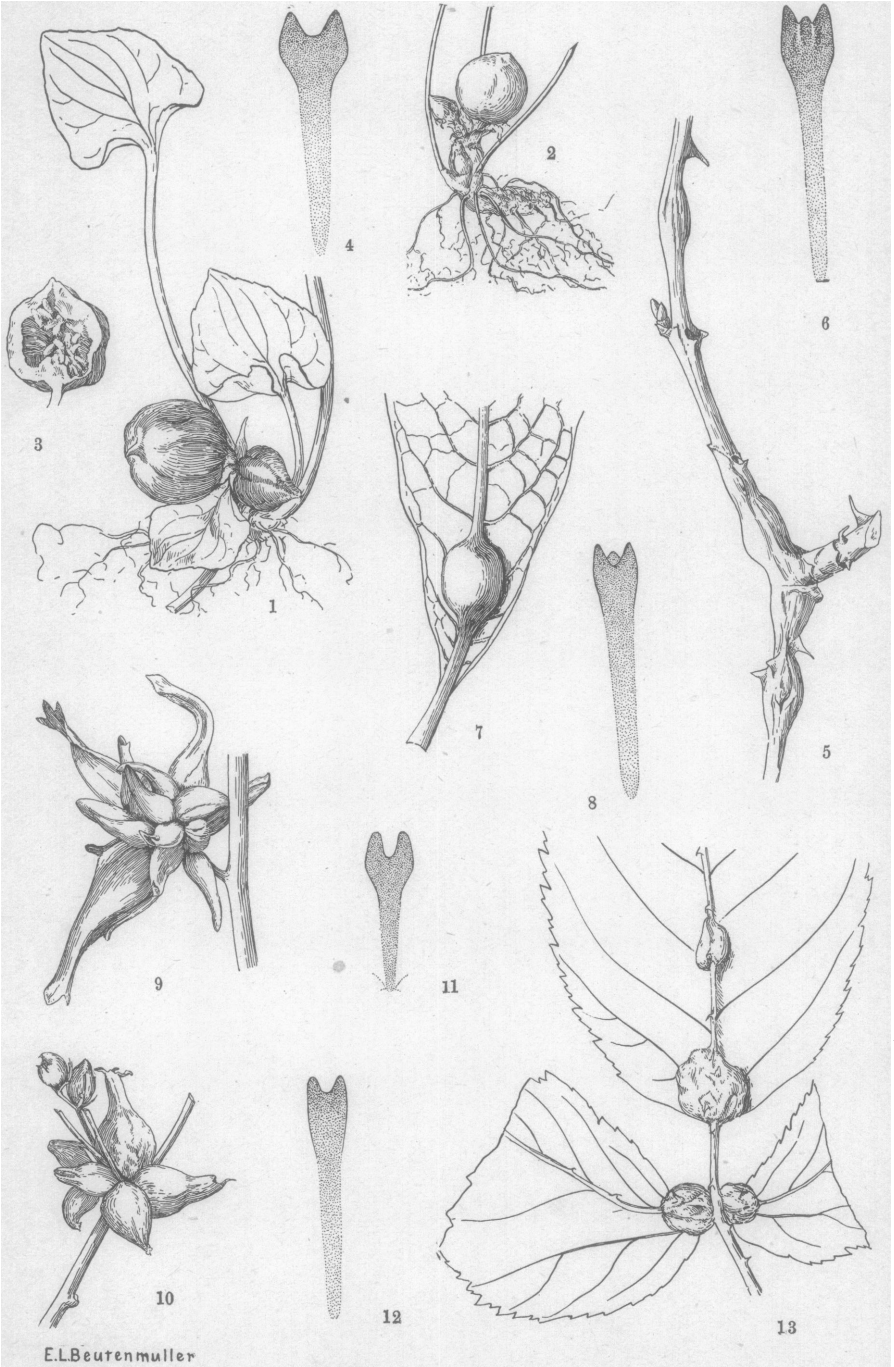
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GALL-PRODUCING CECIDOMYIIDÆ.

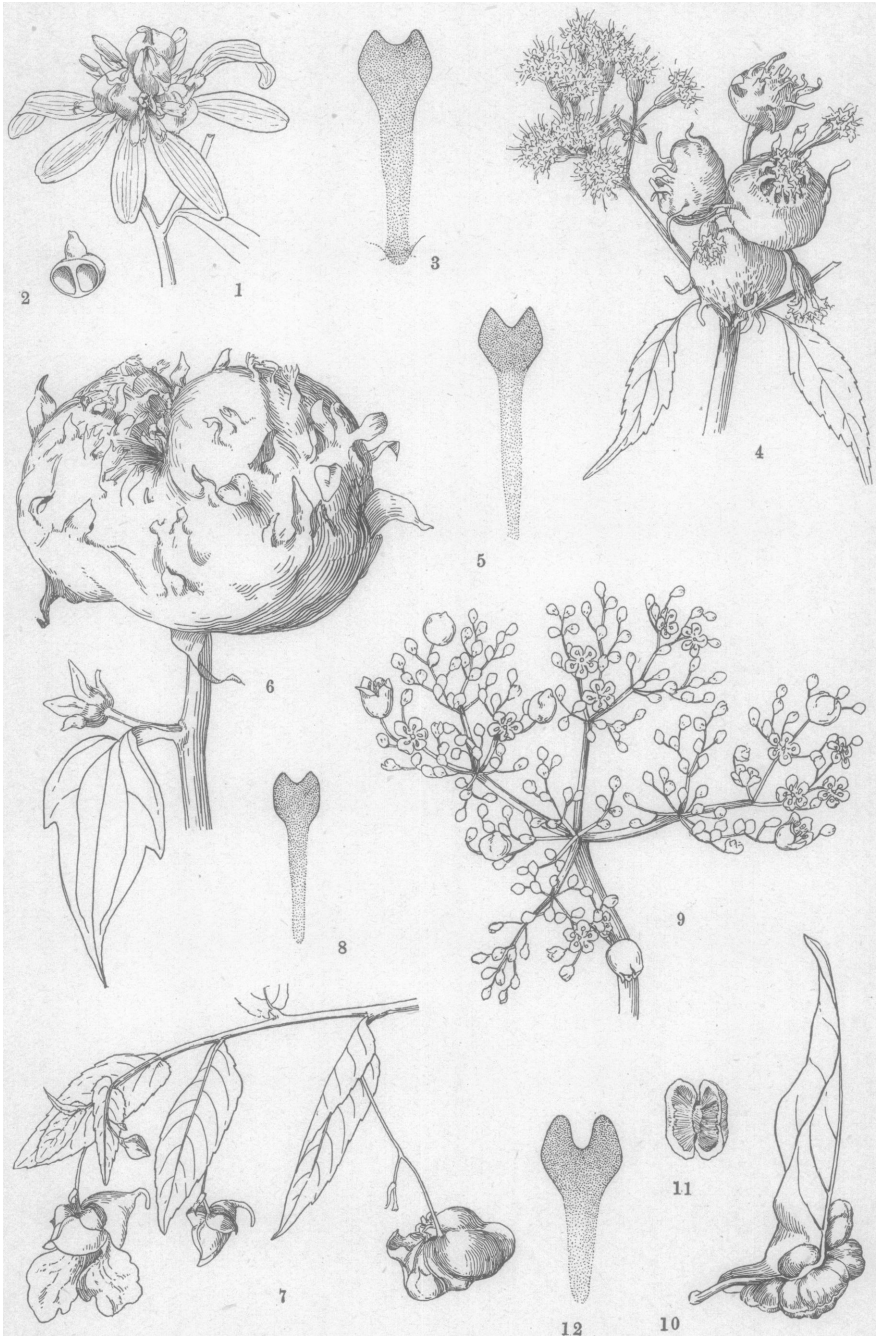


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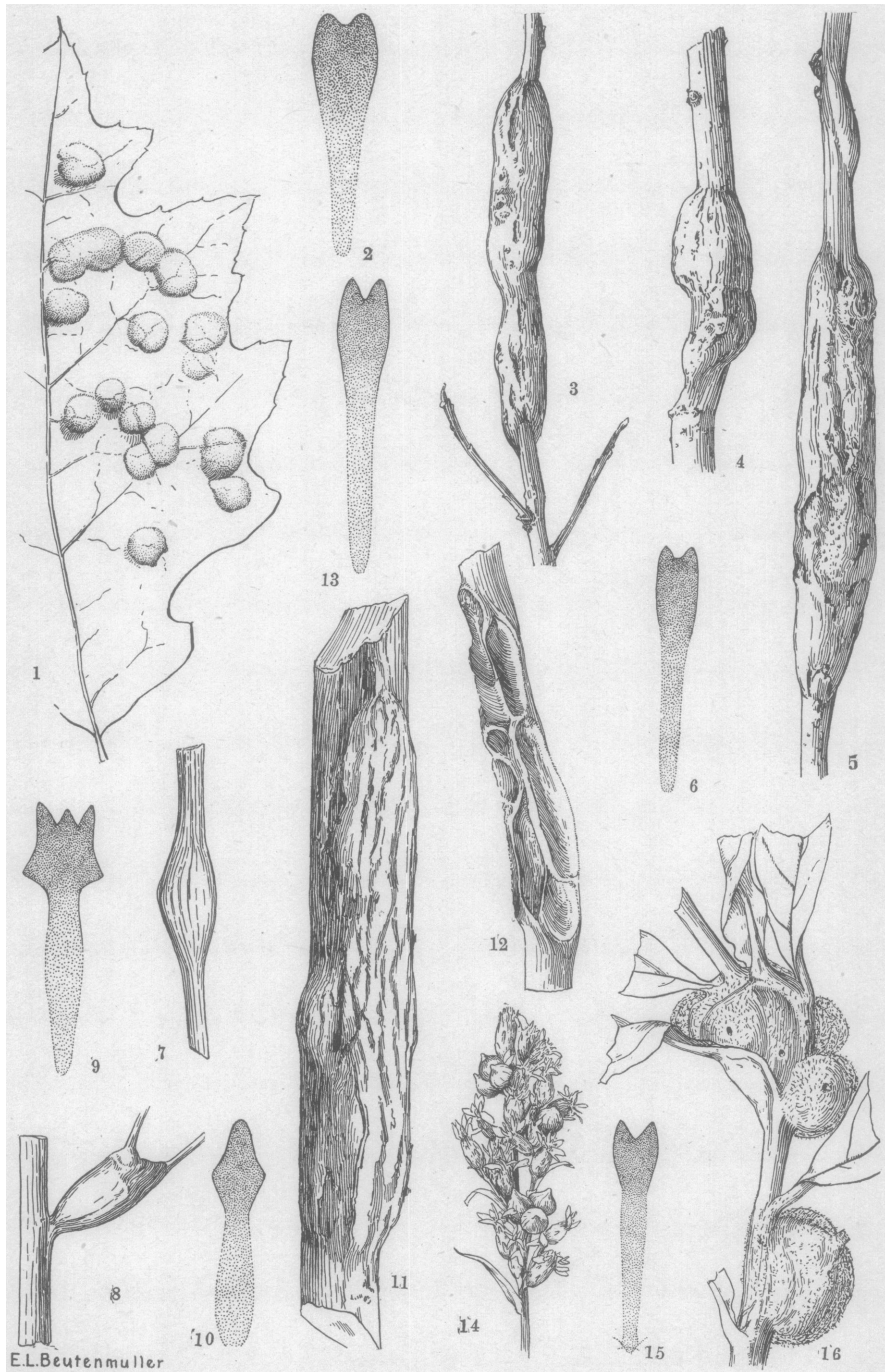


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