

Article XV.—THE NORTH AMERICAN SPECIES OF *DRYOPHANTA* AND THEIR GALLS.

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PLATES XII-XVII.

The present paper constitutes the tenth installment of a series of articles on North American Cynipidæ and their galls, published by me in this Bulletin.

***Dryophanta bella* (Bassett).**

Cynips bella BASSETT, Can. Ent., Vol. XIII, 1881, p. 93.

Dryophanta bella MAYR, Gen. Gallenb. Cynip., 1881, p. 36; ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 48; MAYR, Verh. Zool.-Bot. Gesell. Wien, Vol. XXXVI, 1886, p. 371; Vol. LII, 1902, p. 290; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis bella DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 356.

Female: Head brownish black, very small, though transversely very broad. Vertex microscopically wrinkled. Eyes rather narrowly oval. Ocelli large, black and shining. Head and face covered with fine downy hairs. Antennæ short, slender, hairy, shining reddish brown, darker towards the tips, 14-jointed; first joint large, club-shaped or ovoid with the upper end truncate and hollow to receive the globular second joint; third joint one fourth longer than the first two taken together; fourth equal to the first and second; fifth to ninth gradually decreasing in length, tenth to fourteenth very short, scarcely longer than broad. Thorax covered with bright shining hairs. Anterior parallel lines extending from the collar three fourths the distance to the scutellum. Parapsidal grooves reaching from the scutellum to the collar. These are much nearer together at their starting point on the scutellum than is usual in the genus. There is the usual short line over the base of each wing. The posterior limit of the two parallel lines vanishes in a tuft of long hairs which, in common with the hairs on the thorax, converge into a ridge on each of the interlinear spaces. Scutellum small, but long in proportion to its breadth, slightly shagreened. Foveæ very shallow, confluent, smooth and shining. Legs dark shining, semi-translucent brown, with abundance of whitish hairs. Wings large, surface covered with short, nearly erect hairs, and numerous dark opaque and lighter cloudy spots. Veins dark shining brown and very heavy. Cubitus, as in *D. nubila*, is very broad and heavy at its union with the first transverse vein; second transverse broad and heavy, particularly at the base of the radial area. Areolet not large, but clearly defined. The radial vein at its termination forms a large triangular blotch with an indistinct areolet in the centre. By the curvature of the radial vein and its considerable backward extension along the margin of the wing and the upward extension of the costal vein beyond the base of the radial area, what may be termed a half open and perfectly radial area is formed. The anal vein is sometimes

branched or forked at the tip. Length, body 3.50 mm.; wings, 4 mm.; antennæ, 2 mm. (H. F. Bassett.)

Gall: (Plate XII, Figs. 1, 2, 3). On the under side of the leaves of a species of oak (probably *Quercus arizonica* Sarg.), often near the margin of the leaf, but more commonly on the mid-rib. Monothalamous. Round, thin-shelled and brittle with a central larval cell held in position by fine radiating fibres. There are also other fine, wooly fibres attached to the inner surface of the shell but which do not reach to the larval cell. The gall when dry is brown or pinkish brown, and covered with a fine pubescence or nearly smooth, but not polished. Diameter, 12-22 mm.

Habitat: Arizona (Tucson).

The gall of this species somewhat resembles that of *D. dugesi* but occurs singly on a leaf; when fresh is probably green or yellowish, tinged with pink. The fly is very distinct and may be readily known by the numerous small dots in the apical cell of the fore wings, the large brown patch in the radial area and discal cell. The male is unknown.

Dryophanta nubila (Bassett).

Cynips. q. nubila BASSETT, Can. Ent., Vol. XIII, 1881, p. 56.

Dryophanta nubila, MAYR, Gen. Gallenb. Cynip., 1881, p. 36; Verh. Zool.-Bot. Gesell. Wien, Vol. XXXVI, 1886, p. 371; *ibid.*, Vol. LII, 1902, p. 290; ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 53; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Andricus nubila ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 128.

Diplolepis quercus-nubila DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 358.

Female: Head very small, dark reddish brown. Vertex finely punctate or crackled. Ocelli shining, of medium size. Antennæ 13-jointed, slender, the base prominent; first joint tapering from its abruptly truncate summit; second joint short, ovoid; third one fourth longer than the two preceding taken together; fourth equal to the first and second; fifth to eighth gradually shorter; ninth to twelfth subequal; thirteenth slightly longer than the twelfth. The joints, particularly the third, fourth and fifth closely connected, but with a slight enlargement at the nodes in these last mentioned. Thorax very dark reddish or yellowish brown, in certain lights appearing blackish covered with very short appressed hairs, which give a slight ashen hue to the surface as seen with the naked eye. Two fine, smooth, rather indistinct anterior parallel lines extending half way from the collar to the scutellum, between these lines black. Parapsidal grooves distinct, extending from the collar, converging to the scutellum and increasing in size as they approach that point. Lateral grooves black. Scutellum distinctly wrinkled or rugose. Legs very dark reddish brown, somewhat shining and paler and subtranslucent at the joints. Wings very large, hyaline. Veins heavy, black. Areolet very small. Radial area open, broad. The base of the radial area covered with a dark semi-transparent cloud which includes the second transverse vein. Cubitus distinct and extending to the first transverse vein. At their intersection there is a dark cloudy spot, and a still larger ashen cloud near the tip of the wing. This last does not touch the veins nor

the margin of the wing. Abdomen very large and, viewed laterally, nearly circular in outline; first segment a little longer than the four following together. These last are subequal, and each of a deep yellowish brown on the posterior half, but lighter anteriorly. All the light bands, together with the lateral portions of all the segments, covered with minute microscopic hairs. Sheath of the ovipositor small, with a brush of rather long hairs at the apex. Length, body 3.75 mm.; wing, 5 mm.; antennæ, 3.25 mm.

Gall: (Plate XVI, Fig. 3). On the mid-vein on the under side of the leaves of a species of oak (probably *Quercus arizonica* Sarg.) in November. Bright pinkish red, densely hairy, in subglobular or hemispherical clusters. The galls in each cluster grow from the same point on the leaf, and the clusters are from one half to one inch in diameter, and contain from one to five or more larval cells. These cells, when denuded of their hairs, are nearly globular, tapering somewhat to a blunt point at the base, and measure from about 5 to 12 mm. in diameter. The inner galls are very hard and brittle when dry, and the shell is about .50 mm. thick.

Habitat: Arizona (Mule Pass Mts.).

The type is in the collection of the American Entomological Society. Nothing further is known concerning the species.

Dryophanta dugesi Mayr.

Dryophanta dugesi MAYR, Verh. Zool.-Bot. Gesell. Wien, Vol. XXXVI, 1886, p. 370; *ibid.*, Vol. LII, 1902, p. 290; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Dryophanta dugesi DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 50.

Diplolepis dugesi DALLA TORRE and KIEFFER, Das. Tierreich, pt. XXIV, 1910, p. 355.

Female: Head reddish brown very finely rugose and moderately hairy. Antennæ 14-jointed, reddish brown, darker toward the tip. Thorax reddish brown, microscopically wrinkled, and with pits from each of which arises a short yellowish hair. Anterior parallel lines black, rather broad and polished. Parapsidal grooves deep, sharply defined and continuous. These grooves run obliquely from the collar to the scutellum where they are close together. Lateral grooves broad, long and running well forward, black and shining. Pleuræ very finely and evenly rugose with a large shining, smooth area. Scutellum finely rugose reddish brown, slightly hairy. Abdomen smooth reddish brown almost black posteriorly. Legs reddish brown and hairy. Wings glassy hyaline, transverse and radial veins dark brown, very heavy and margined with brown, other veins fine. Radial area open, first radial vein very short, the second curved and almost touching the costa. Areolet present. Cubitus continuous. In the apical cell are three brown dots, two small ones and one irregularly shaped larger one. Length, 2.10-3.10 mm.

Gall: (Plate XII, Figs. 6, 7). On the leaves of oak (*Quercus mexicana* = *Q. hypoleuca*). Monothalamous. Globular, very thin-shelled and pubescent, yellowish and beautifully shaded with pink or red, or finely marbled with red on the yellowish white surface. Inside there is a central egg-shaped larval cell which is held in position by numerous radiating delicate wool-like filaments somewhat like those of *D. bella*. Diameter, 6-18 mm.

Habitat: Mexico (Mts. of Guanajuato).

Closely allied to *D. bella* but the thorax is more shining and the spots on the wings are different. The gall is also similar to that of *bella*. The above description of the fly was made from specimens in the United States National Museum, collected by Dr. A. Dugés and the figures of the galls on Plate XII are copies of Mayr's illustrations.

***Dryophanta carolina* Ashmead.**

Dryophanta carolina ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, pp. 138, 145; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 49; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diptolepis carolina DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 365.

Female: Head reddish brown, or somewhat darker along the middle of the face and very minutely rugoso-punctate. Antennæ 14-jointed, reddish brown and pubescent, thorax shining black, reddish brown along the parapsidal grooves, finely rugoso-punctate. Parapsidal grooves broad and distinct. Anterior parallel lines extending to a little beyond the middle of the thorax, very distinct and shining. Lateral grooves extending well forward, broad, smooth and polished. Scutellum rugoso-punctate, pubescent, basal groove broad and shallow. Abdomen reddish brown or black, smooth and shining, ventral sheath with long hairs. Legs reddish brown, pubescent. Wings hyaline, veins brown and heavy, radial vein thickened at the costa, second transverse vein infuscated. Radial area open. Cubitus continuous to first cross-vein.

Gall: (Plate XII, Fig. 4). On the under sides of the leaves of white oak (*Quercus alba*) in September and October. Monothalamous. Rounded or spherical, somewhat pubescent. The outer shell is hard; inside of a spongy substance with an internal larval chamber. Brownish in color, sometimes somewhat pruinose. Diameter, 5-6.

Habitat: North Carolina (Asheville); New York; New Jersey.

The gall very much resembles that of *Philonix niger*, in shape and structure, but is softer, less pubescent and smoother. The type form of the fly has the abdomen reddish brown.

***Dryophanta multipunctata* Beutenmüller.**

Dryophanta multipunctata BEUTENMÜLLER, Ent. News, Vol. XXII, 1911, 67.

Female: Head yellowish brown, face broadly infuscated, eyes and ocelli black, microscopically evenly granulose and pubescent. Antennæ 14-jointed, first joint stout, second joint shorter, stout, third joint very long and slender, fourth to sixth joints slender, subequal and shorter than the third, remaining joints gradually becoming shorter and slightly thicker toward the tip, all pitchy brown black and pubescent. Thorax shining, finely and evenly pitted, with decumbent yellowish hairs, pitchy brown, somewhat rufous between the parapsidal grooves at the scutellum. Parapsidal grooves rather deep, widely separated anteriorly and converging

at the scutellum, where they are moderately widely separated. Anterior parallel lines very fine and indistinct. Lateral grooves distinct. Median groove wanting. Scutellum pitchy brown somewhat rufous, finely and evenly pitted with yellowish hairs, basal groove not distinct. Abdomen pitchy black or dull rufous, smooth and shining dorsally and covered with short pale hairs at the sides and venter. Legs pitchy brown or dull yellowish brown, pubescent. Wings hyaline, veins brown, cross-veins heavy, outer portion of wing beyond the middle with numerous small brown spots, except in the radial area; about the middle of the wings are two brown clouds situated on the veins. Areolet present. Cubitus extending to the first cross-vein. Length, 2.75-3 mm.

Gall: (Plate XII, Fig. 5). On the under side of the leaves of a species of white oak in autumn. Monothalamous. Spherical, gray brown, sometimes slightly flattened at the base where the gall is attached to the leaf. It is irregularly wrinkled and covered with dense, short and compact wooly substance and hairs. In general appearance it resembles the gall of *Philonix lanæglobula*. Diameter about 5 mm.

Habitat: California (Kern Co.).

The fly resembles that of *Dryophanta clavula*, but differs in having the abdomen hairy and more spots on the outer part of the fore wings.

***Dryophanta clavula* Beutenmüller.**

Dryophanta clavula BEUTENMÜLLER, Ent. News, Vol. XXII, 1911, p. 67.

Female: Head rufous, infuscated along the face and on the vertex around the ocelli, evenly and finely reticulately punctate, sparsely hairy; eyes black. Antennæ 14-jointed, first joint stout, short, second joint much smaller and stout; third to sixth joints long and slender, third longest, remaining joints short and subequal, all dusky brown somewhat darker toward the tip. Thorax pitchy brown, rufous posteriorly and anteriorly at the sides, microscopically pitted especially anteriorly, shining and with scattered decumbent yellowish hairs. Parapsidal grooves deep and distinct, widely separated anteriorly and running obliquely backward to the scutellum where they are close together. Median groove wanting. Anterior parallel lines broad, shining smooth and scarcely extending to the middle of the thorax. Grooves at base of wing scarcely evident. Scutellum rugose, subopaque, dull rufous, finely and evenly rugose with an almost imperceptible basal groove. Abdomen pitchy brown somewhat rufous ventrally, smooth and shining, sheath yellowish with long hairs. Legs dull yellowish brown covered with short hairs. Wings hyaline, pubescent, veins brown, heavily marked, especially the cross-veins, apical region with about seven small brown dots and a large brown patch; three large brown clouds about the middle of the wing. Radial area almost closed with the veins thickened at the costa. Areolet present. Cubitus faint and extending to the first cross-vein. Length, 1.50-2 mm.

Gall: (Plate XIII, Fig. 7). On the under side of the leaves of a species of white oak (*Quercus lobata*). Monothalamous. Narrow and almost parallel to about the middle, thence suddenly becoming inflated into club with the apex pointed. At the extreme base it is slightly broader and is attached by a point to the leaf. The gall very much resembles a miniature Indian club in shape. Brown in color (when dry) and the larva lives in the inflated part of the gall in a round cell. Length, 5-7 mm.; width of narrow part, 1 mm.; of inflated part, 1.75 mm.

Habitat: California (Napa and Sonoma Co.).

Dryophanta eburnea Bassett.

Dryophanta eburnea BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 70; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. XXIII, 1907, p. 466.

Dryophanta eburnea DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 50; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis eburnea DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 368.

Dryophanta glabra GILLETTE, Can. Ent., Vol. XXVI, 1894, p. 237; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 52; COCKERELL, Can. Ent., Vol. XXXII, 1900, p. 92; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis glabra DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 367.

Female: Head black, finely punctate, with a few minute hairs, sometimes narrowly dark rufous around the eyes. Antennæ 14-jointed, black, short and rather stout, first joint thick, second less so and two thirds as long, third as long as the two preceding taken together, fourth half as long as the third, remaining ones short, all with minute hairs. Thorax black, smooth and shining. Parapsidal grooves deep, microscopically rugoso-punctate and with a few scattered hairs on each side. Pleuræ finely rugose with a polished area. Scutellum sub-opaque, finely rugose as is also the depression at the base. Abdomen black and shining. Legs blackish brown with reddish brown joints. Wings hyaline, pubescent, veins brown, moderately heavy. Radial area long, open. Areolet very small. Cubitus very faint and almost colorless the entire length to the first cross-vein. Length, 1.50-2.50 mm.

Gall: (Plate XVI, Figs. 1, 2). In number on the upper and under side of the leaves of oak (*Quercus undulata* and *Q. gambelii*) in August and September. Monothalamous. Straw-colored, becoming brown with exposure. Semi-globular, flattened at the base and as a rule situated along the mid-rib. A number of the galls usually occur on the same leaf and sometimes closely pressed together, so they are far from globular. The outer shell is rather hard and thick and inside are filled with fine silvery white hairs that radiate from the single larval cell that is attached to the base of the gall.

Habitat: Southern Utah; Arizona; Colorado (Manitou).

The type of *D. eburnea* Bassett is from Southern Utah, and of *D. glabra* from Manitou, Colorado. The latter is identical with *D. eburnea*, there being absolutely no differences between the flies and galls.

Dryophanta simillima Dalla Torre.

Dryophanta similis BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 71.

Dryophanta simillima DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 54; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis simillima DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 368.

According to H. F. Bassett, this species resembles *Dryophanta eburnea*, but is much smaller, the body being only 1.50 mm., the wing 3 mm., and the antennæ 1.75

mm. in length, and the cubital vein in the lower half is subobsolete. The gall is also similar to that of *D. eburnea* in all respects, save color, which is a shining brownish buff.

Habitat: Southern Utah.

The types are with the American Entomological Society. They are exactly like *D. eburnea*, except in size. I consider the species small specimens of *D. eburnea*. The name *D. similis* Bassett was preoccupied by *D. similis* Alder of Europe, and changed to *D. simillima* by Dalla Torre.

***Dryophanta polita* (Bassett).**

[*Cynips polita* BASSETT, Can. Ent., Vol. XIII, 1881, p. 99.

Dryophanta polita MAYR, Gen. Gallenb. Cynip., 1881, p. 36; Verh. Zool.-Bot. Gesell. Wien, Vol. XXXVI, 1886, p. 371; *ibid.*, Vol. 411, 1902, p. 290; ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296; *ibid.*, Vol. XIV, 1887, pp. 127, 135; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 53; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 261, pl. XII, fig. 3; Am. Mus. Journ., Vol. IV, 1904, p. 106, fig. 39; Ins. Galls Vicin. N. Y., 1904, p. 20, fig. 39; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53; FELT, Ins. Affect. Pk. and Woodl. Trees, 1906, p. 625.

Diplolepis polita DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 366.

Female: Head brownish black or rufous, finely and evenly punctate, particularly the vertex. Antennæ 14-jointed, blackish or dark rufous. Thorax black, smooth and highly polished. Parapsidal grooves deep and distinct. Anterior parallel lines short and indistinct. Lateral grooves long and shallow. Pleuræ rugulose with a large, polished area and with a few scattered hairs. Scutellum finely wrinkled, rounded posteriorly; basal groove narrow. Abdomen black, polished. Legs reddish brown. Wings glassy hyaline, veins moderately heavy. Radial area open, broad by the curvature of the vein. Areolet present. Cubitus very pale and slender. Length, 2.50 mm., wings, 3.50 mm.

Gall: (Plate XIII, Figs. 1, 2, 3). On the upper and under side of the leaves of post oak (*Quercus minor*) August and September into October. Monothalamous. Bright yellow, sometimes more or less tinged with red. Brown when old and dry. Round, thin shelled containing a central larval cell held in position by radiating fibres. Single or in clusters. Diameter, 10-15 mm.

Habitat: New York; New Jersey; southward into Florida and Texas.

The gall in general appearance very much resembles that of *Andricus singularis*, and occurs singly on red oak in spring. The insect may be readily known by the highly polished thorax and glassy wings. The gall is quite local, and hundreds of them may be found on young shoots and young trees. The insect matures late in autumn but does not emerge until the following spring. In the vicinity of New York the gall is found in the sandy pine regions of New Jersey.

Dryophanta lanata Gillette.

Dryophanta lanata GILLETTE, Bull. Ill. Lab. Nat. Hist., Vol. III, 1891, p. 198, pl. ix, fig. 5; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 52; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis lanata DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 363.

Female: Face scabrous, shining, with very few hairs; vertex black, subopaque, finely and densely sculptured; ocelli considerably elevated, clypeus polished, emarginate, punctured. Antennæ black, 14-jointed (in one specimen 13-jointed) a trifle over 2 mm. in length; joints 1 and 2 stout, the latter subglobular, joint 3 one third longer than joint 4, last joint scarcely longer than the preceding. Thorax: mesothorax covered with a fine network of depressed lines leaving irregular raised portions that are highly polished, parapsidal grooves narrow but well defined, polished at the bottom and reaching the collar, median groove showing plainly at the scutellum but soon disappearing as it runs forward; the two parallel grooves from the collar narrow at first, then spreading out in broad furrows with sloping sides, traceable about one third of the way to the scutellum; lateral grooves plainly marked, extending well forward, and approximating the parapsides at their anterior extremity; pleurae finely aciculate and shining. Scutellum bifoveate, the foveæ shallow, separated, not by a septum, but by a number of polished raised lines that run into the smooth surfaces of the bottoms of the foveæ; lateral borders of the scutellum strongly aciculate anteriorly, the lines becoming crooked and broken posteriorly and forming a densely and deeply rugose surface; scutellum black at base and tip and rufous in the middle. Abdomen dark rufous to black, second segment occupying one half of tergum, posterior half of the second segment and all of the following segments rather densely punctured, all of the segments highly polished. Wings hyaline, rather densely ciliate, 4 mm. long, submedian and 1st and 2nd transverse nervures stout and black, areolet medium. Length, 3.50–4 mm. (C. P. Gillette.)

Gall: (Plate XIV, Figs. 1, 2, 3). On the undersides of the leaves of red oak (*Quercus rubra*), scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), black-jack oak (*Quercus marylandica*), hybrid oak (*Quercus phellos* × *Quercus marylandica* = *rudkini* Brit.), and scrub oak (*Quercus nana*), in August, September and early in October in clusters of from two to eight or more, appearing externally as bunches of pale brown wool, somewhat resembling the gall of *Callirhytis flocci*. Each individual gall when denuded of its wool, is triangular or irregularly conical in shape and when fresh is fleshy and rather soft. They are closely pressed together and form a rounded mass of wool, showing the outlines of the individual galls. When mature they are hard and woody with a large internal larval chamber. The pointed part of the gall is attached to the leaf. Diameter, 5–15 mm.

Habitat: Canada (Toronto); Massachusetts; Rhode Island; Connecticut; New York; New Jersey; Pennsylvania; Ohio; Illinois; Iowa.

This species was described from two females bred from galls taken at Ames, Iowa. I have taken hundreds of the galls, but have not succeeded in rearing the flies. According to C. P. Gillette this is a robust, black species, with more or less rufous on face, mesonotum, scutellum, and sides

of abdomen. The galls drop to the ground late in September and early in October and the larva reaches maturity after the galls have fallen.

***Dryophanta echinus* (Osten Sacken).**

Cynips quercus echinus OSTEN SACKEN, Trans. Am. Ent. Soc., Vol. III, 1870, p. 56.

Cynips echinus ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 295; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 68; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 59; Das Tierreich, pt. XXIV, 1910, p. 440.

Andricus speciosus BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 81; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 101; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 65.

Dryophanta speciosa MAYR, Verh. Zool.-Bot. Gesell. Wien, Vol. LII, 1902, p. 290.

Diplolepis speciosa DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 368.

Female: Head dark brown, reddish around the eyes, finely rugose; cheeks with a furrow. Antennæ 14-jointed, first and second joints subequal, third joint very long, slender, fourth joint shorter, remaining joints shorter, all brownish black. Thorax brownish black, slightly tinged with rufous, and sparsely covered with minute hairs, surface minutely reticulated. Parapsidal grooves deep and rapidly converging toward the scutellum. Anterior parallel lines broad, smooth and extending to about the middle of the thorax. Lateral grooves broad, extending well forward and almost touching the parapsidal grooves. Scutellum deep brown black, finely rugose, slightly hairy, basal groove distinct, somewhat shining. Abdomen brown black with short hairs on the sides of the base. Legs dark reddish brown, pubescent. Wings hyaline, veins heavy and brown, second transverse vein angulated and infuscated, first transverse also infuscated. Cubitus fine and continuous. Radial area open. A large brown spot near the base of the marginal cell (apical) and one in the submarginal cell. Length of body, 2-3 mm.; wings, 2-3.50 mm.

Gall: (Plate XIII, Fig. 6). On the under side of the leaves of *Quercus agrifolia*. Sometimes also on the upper side. Monothalamous. Rounded and covered with many pointed processes which are not much shorter than the diameter of the gall. Bright red or pinkish and covered with a crystalline substance. Inside the gall is hard (when dry) and contains a single cell in the centre. Diameter, 5-8 mm.

Habitat: California (Placer and Napa Counties).

I have examined the types of the flies and galls of *Cynips echinus* and *Dryophanta speciosa* and find them to be one and the same species.

***Dryophanta rubræ* (Karsch).**

Diplolepis quercus rubræ KARSCH, Zeitsch. Gesammt. Naturw. Berlin, Bd. V, 1880, p. 293, figs. 4, 4a, 4b.; MAYR, Verh. Zool.-Bot. Gesell. Wien, Vol. XXXVI, 1886, p. 369; DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910.

Dryophanta rubræ DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Female: Body, antennæ and legs brown. Body covered with fine, short, yellowish brown hairs, giving the dark insect a light appearance. Antennæ 14-jointed, and not thickened at the tip. Scutellum rounded behind and with long hairs at the apex. Parapsidal grooves and foveæ at the base of the scutellum readily discernible when seen under a lens. First abdominal segment drawn out into a point and beset with strong hairs. Wings (Plate XIII, Fig. 5) very characteristic; the radial area is not entirely closed and in the outer cubital cell is a zigzag mark near the outer margin, of a dark brown color. Veins dark brown. Cubitus not extending to the first cross-vein. Length, 4 mm. Expanse of wings about 10 mm.

Gall: (Plate XIII, Fig. 4). On red oak (*Quercus rubra*). Globular, very thin-shelled and flatted at place of attachment. Yellowish with irregular reddish brown marks, base whitish. Inside is an irregularly shaped larval cell held in position by radiating fine yellowish fibres. Diameter about 20 mm.

Habitat: North America (without definite locality, probably Texas).

The types, two females and two galls, are in the Berlin Museum, and the species is unknown to me. The above are translations of Karsch's description of the flies and galls. The specimens were received from Van Zandt on "*Quercus rubra*." The figures of the gall and wing of the fly on Plate XIII, were re-drawn from Karsch's illustrations.

***Dryophanta centricola* (Osten Sacken).**

Dryophanta centricola MAYR, Verh. Zool.-Bot. Gesell. Wien, Vol. LII, 1902, p. 290.

Diplolepis quercus-centricola DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 369.

This species was transferred from the genus *Holcaspis* to *Dryophanta* by Mayr in 1902, and an account of the same will be found in my paper on the species of *Holcaspis* and their Galls (Bull. Am. Mus. Nat. Hist., Vol. XXVI, 1909, p. 42, pl. ix, fig. 1).

***Dryophanta douglasi* (Ashmead).**

Dryophanta douglasi MAYR, Verh. Zool.-bot. Gesell. Wien, Vol. LII, 1902, p. 290.

Diplolepis douglasi DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 369.

Mayr placed this species in the genus *Dryophanta* and an account of the insect and gall will be found in my paper on the species of *Holcaspis* and their Galls (Bull. Am. Mus. Nat. Hist., Vol. XXVI, 1909, p. 37, pl. viii, figs. 10, 11). It was originally described as a *Holcaspis*.

***Dryophanta corrugis* Bassett.**

Dryophanta corrugis BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 71; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 49; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis corrugis DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 363.

Female: Head black or pitchy brown black with extremely fine reticulations. Antennæ thick, short, becoming stouter toward apex, 14-jointed, first heavy, club-shaped; second thicker than the first and almost equal in length, third two-thirds as long as the first two and extremely slender, all light yellowish brown; fifth yellowish to dark brown at the tip, a little thicker than the fourth; remaining joints very dark brown, very short and thick, the thirteenth and fourteenth separated by an indistinct articulation, and the thirteenth not so dark brown as the preceding. Thorax black, narrow, subopaque; anterior parallel lines present, parapsidal grooves narrow not extending to the anterior part of thorax; all grooves are quite slender and indistinct. General surface of the mesonotum finely, evenly and very beautifully transversely wrinkled. Pleuræ finely rugose. Scutellum black, rather large, more finely wrinkled than the mesonotum and less shining with a transverse depression at base. Abdomen dark reddish brown black posteriorly or wholly black, polished, subdepressed, second segment rather long, third half as long as the second, others concealed in the dry specimens. Legs: femur and tibia dark brown, except the joints which with the coxæ and tarsi are yellowish-brown, unguis simple. Wings hyaline, veins pale yellow, almost colorless. Areolet very faint or wanting. Cubitus so indistinct as to be traced with difficulty even half way to the first transverse vein. Radial area large, almost closed; first transverse does not reach quite to the anterior edge of the wing. Length of body, 2.50 mm.; wings, 2.50 mm.; antennæ, 2 mm.

Habitat: Connecticut (Waterbury).

The flies of this species were captured by H. F. Bassett while in the act of ovipositing in the buds of dwarf chestnut oak (*Quercus prinoides*) in spring. The gall is not known.

***Dryophanta texana* Ashmead.**

Dryophanta texana ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 145; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 54; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis texana DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 357.

Female: Head and thorax black, antennæ, legs (including the coxæ) and abdomen brownish red, first two joints of antennæ brownish yellow, head finely punctate, ocelli large. Antennæ 14-jointed, reaching to the tip of the scutellum. Thorax smooth, shining with two parapsidal grooves. Pleuræ and metathorax rugose, the disk of mesopleuræ smooth and polished. Scutellum large, rugoso-punctate, projecting over the metathorax. Wings hyaline, veins stout, black, marginal nervure greatly incrassated towards the tip which does not reach the costal margin; second transverse vein in a smoky cloud. Areolet present, cubitus continuous. A smoky

cloud at the break in the anal nervure and the thickened cubital nervure does not quite reach the apical margin. Radial area open. Length, 4.25 mm.

Habitat: Texas.

Described from a single female, the type of which is in the United States National Museum. It is a fine species and may be known by the black head and thorax and the red abdomen. The male and gall are unknown.

***Dryophanta pumiliventris* Bassett.**

Dryophanta pumiliventris BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 69; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 54; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53; Das Tierreich, pt. XXIV, 1910, p. 361.

Male: Head yellowish brown; ocelli pale yellow; vertex and face somewhat rugose, face with a distinct median ridge, cheeks grooved. Antennæ 15-jointed, very long and slender, third joint very long and slightly curved, following joints shorter and subequal. Thorax narrow, smooth and shining, yellowish brown. Parapsidal grooves deep. Pleuræ slightly darker, shining. Scutellum finely rugose, opaque, basal depression very shallow and slightly shining. Abdomen very small, yellowish brown, and on a peduncle. Legs long, brown. Wings hyaline somewhat dusky, very long, veins brown. Radial area open. Areolet present. Cubitus almost colorless. Length of body, 3 mm.; abdomen, 1.25 mm.

Habitat: Not known (probably Connecticut).

This species was bred by H. F. Bassett from galls sent to him through the mail. He states that the galls are probably green, soft and succulent, growing in clusters in the axils leaves and when fresh may have been as large as a chestnut or hazel nut. They seem to vary in size and form and are polythalamous. Bassett's galls were shrunken and distorted and a good discription was impossible from the material he had at hand. The female is unknown.

***Dryophanta radicola* Ashmead.**

Dryophanta radicola ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1893, p. 116; BRIDWELL, Trans. Kans. Acad. Sci., Vol. XVI, 1899, p. 204; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53; Das Tierreich, pt. XXIX, 1910, p. 360; COOK, Proc. Ind. Acad. Sci., 1904, p. 225; 29th Rep. Dept. Geol. Nat. Hist. Indiana, 1904 (1905), p. 360, fig. 29.

Female: Brick red, antennæ pale brownish toward tips; eyes brown-black. Head minutely and confluent punctate; collar rugose; disk of mesopleura smooth, polished; mesonotum smooth, polished, the two parapsidal grooves broad and well defined; scutellum cushion-shaped, coarsely, reticulately rugose, with two transverse, nearly confluent, foveæ at base. Wings hyaline, veins blackish, the areolet and cubital cell distinct. Length, 3 mm.

Gall: (Plate XV, Figs. 9, 10). In clusters on the stems of white oak (*Quercus alba*) and post oak (*Quercus minor*), just below the surface of the ground. Polythalamous. Fig-shaped, yellow, and when partly exposed to the sun becomes bright red.

Habitat: New York; Missouri (Cadet); Kansas; Indiana; Texas.

According to W. H. Ashmead the gall of this species was found on the roots of oak collected at Cadet, Missouri.

Dr. Mel. T. Cook found the gall in Indiana on white oak and the figures on Plate XV, are copies from his illustrations. The adult was described from a single female, reared May 21, 1886.

***Dryophanta pulchella* Beutenmüller.**

Dryophanta pulchella BEUTENMÜLLER, Ent. News, Vol. XXII, 1911, p. 357.

Female.—Head rufous or pitchy brown, finely punctate, median ridge rather broad. Antennæ 14-jointed, dark brown, first and second joints yellowish brown. Thorax dark reddish brown or black, smooth and shining. Parapsidal grooves sharply defined with the margins rounded; they are widely separated anteriorly and very close together at the scutellum. Median groove broad anteriorly and gradually becoming narrower and very fine at the scutellum. Anterior parallel lines and lateral grooves wanting. Pleuræ punctate with a large, smooth, glossy area. Scutellum dark rufous or black, rugose, with two large depressions or foveæ at the base, separated by a fine carina. Abdomen rufous, smooth and shining. Legs rufous. Wing long, hyaline with a number of large brown clouds and patches of different sizes. Veins heavy, brown and infuscated. Areolet small, cubitus continuous to the first cross-vein. Radial area open, radial vein curved and running outwardly for a short distance below the costal margin. Length, 3-3.50 mm.

Habitat: Catalina Island, California (C. F. Baker); Hood River, Oregon, June 20.

In the specimen from Oregon the thorax is black, otherwise it does not differ from the form with the red thorax. It is a beautiful species and may be readily known by the large spots and cloud on the fore wings. The male and gall are unknown.

***Dryophanta rydbergiana* Cockerell.**

Dryophanta rydbergiana COCKERELL, Can. Ent., Vol. XXXV, 1903, p. 217.

Diplolepis rydbergiana DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 370.

Female: Body 2.50 mm. long, stout, jet black, smooth, neither punctured nor conspicuously hairy; mesothorax and scutellum with a few scattered hairs; front and vertex minutely tessellate; no frontal groove; middle ocellus somewhat depressed, face without carinæ; molar space long, wrinkled; flagellum black, 12-jointed; the last five joints (at least) longitudinally grooved; whole flagellum hairy; first flagellar

joint about one-fourth longer than second; basal of antennæ dark red; the small first joint punctate. Parapsidal grooves deep and strong, completely converging posteriorly; scutellum large and swollen, longitudinally keeled, with a depression on each side anteriorly; anterior margin of scutellum raised into a sharp ridge; posterior part coarsely cancellate. Mesothoracic ridges very widely spaced. Legs red; tarsi hairy; claws of posterior legs simple; wings hyaline, not spotted, but hairy; veins strongly marked with dark brown; marginal cell not quite attaining costa; areolet present. Ovipositor black; concealed; ventral spine red, covered with long ferruginous hairs. (T. D. A. Cockerell.)

Gall: On the leaf of *Quercus rydbergiana*. Monothalamous. Spherical, faintly shining, light ferruginous, with a microscopically tessellate surface and a scattered stellate pubescence; base concave, point of attachment small. Contains a single large cell; the space between the cell and the exterior filled with a spongy tissue, which is light green within and ferruginous outwardly. Diameter, 6 mm.

Habitat: Las Vegas Hot Springs, New Mexico, about 7000 feet.

Described from a single specimen cut from a gall which was found March 31, 1903, on a leaf of the previous year's growth. Prof. Cockerell places this species in the genus *Dryophanta*, because it seems on the whole to go there best, and states that it does not exactly agree with any described American genus. Nothing further concerning the species is known and we do not know where the type is.

Dryophanta emoryi Ashmead.

Dryophanta emoryi ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 115; COCKERELL, Trans. Kans. Acad. Sci., Vol. XVI, 1899, p. 213; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diptolepis emoryi DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 367.

Female: Form rather slender, polished black; antennæ and legs dark brown, almost black, the articulations and tarsi dark honey yellow or slightly reddish. The head and thorax are covered with long sparse pile; lower part of face with some coarse punctures, and a poorly defined median ridge. The antennæ extend to the base of the abdomen, pubescent, 14-jointed, the third joint more than one third longer than the fourth; flagellar joints three, four, five and six are rounded at apex; the others are short, slightly widened and truncate at apex, but narrowed and rounded at base; the terminal joint one third longer than the preceding, fusiform. The thorax has two broad, distinct, parapsidal grooves; scutellum minutely rugose, elevated and rounded posteriorly, but with a small, smooth, shining spot on the disk; at base it is transversely depressed and apparently without the usual foveæ; if they exist they are small. The mesopleura are smooth, shining, but when carefully examined a few striæ can be detected anteriorly and basally. The abdomen is large, polished, longer than the head and thorax together, compressed, and, when viewed from the side, obovate in outline; the ventral valve projects considerably, and is armed and hairy. Legs rather densely pubescent. Wings long, hyaline, pubescent, the veins strongly developed, dark brown, slightly piceous. Length, 2 mm. (W. H. Ashmead).

Gall: (Plate XIV, Figs. 4, 5, 6, 7). In clusters on the under surface of the leaves of oak (*Quercus emoryi*). Monothalamous. Brown, thin-shelled, semiglobular or almost globular and attached by a small point to the leaf. Internally there is a small, central kernel, held in place by delicate hair-like fibers. Diameter, 2-3.50 mm.

Habitat: New Mexico (Silver City); Mexico (Tatilla), Sept.

In specimens from Tatilla, Mexico, received from Prof. A. D. Hopkins, the head is reddish brown, the anterior parallel lines and lateral grooves of the thorax are wanting, and the parapsidal grooves are sharply defined. The second transverse vein is infuscated and the radial area is open, that is the first vein scarcely touches the *cō*sta.

Dryophanta pulchripennis Ashmead.

Dryophanta pulchripennis ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 115; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis pulchripennis DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 357.

Dryophanta porterae COCKERELL, Can. Ent., Vol. XXXII, 1900, p. 32.

Diplolepis posterae DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 367.

Female: Brownish yellow, the second abdominal segment apically dark brown. In one of the two specimens in the collection, the mesonotum, scutellum, and metathorax are brownish; eyes, ocelli and unguis dark brown. Head, thorax and pleura smooth, shining; the head much wider than the thorax and thick antero-posteriorly. Antennæ about as in *D. emoryi*, the fourteenth joint, however, not being distinctly separated from the thirteenth, connate. Mesonotum short, nearly as broad as long, with two parapsidal grooves, but not as distinct as usual in the genus. Abdomen as long as the head and thorax together, compressed when viewed from the side, truncate behind; the ventral valve projects very considerably and is armed with an unusually long, hairy spine, half the length of hind femur. Wings hyaline, the front wings being beautifully clouded or spotted with brown blotches as follows: A blotch in the cubital cell near the basal vein, one at the break in the anal vein, one in the cell formed by this vein and the branch of the cubitus which extends to the apical margin, and in the space known as the second submarginal cell are two blotches, one near the apex, the other at the base, the last inclosing the whole tip of the radius. Veins brown, the radius slightly thickened at tip: the vein at base of radial cell slightly clouded. Length, 1.8-2 mm. (W. H. Ashmead.)

Gall: (Plate XIV, Fig. 8). In numbers on the under side of the leaves of oak (*Quercus undulata*). Almost hemispherical, pale brown, subopaque, reticulate, and with scattered, very minute, reddish tubercles, which have some white hairs basally. Diameter about 3 mm.

Habitat: Arizona; New Mexico (Las Vegas Hot Springs), January.

The type of the fly of *D. porterae* is in the United States National Museum and it does not differ from *D. pulchripennis*. The gall of *D. pulchripennis* very much resembles that of *D. emoryi* but the former is more

convex. The fly may be readily known by the brown blotches and clouds on the forewings, which are wanting in *D. emoryi*. The gall of *D. porterae*, according to T. D. A. Cockerell, occurs on leaves of *Q. undulata*, and judging from the shape of the leaf, *D. pulchripennis* is found on *Quercus chrysolepidis*.

Dryophanta gemula (Bassett).

Cynips gemula BASSETT, Can. Ent., Vol. XIII, 1881, p. 104.

Dryophanta gemmula MAYR, Gen. Gallenb. Cynip., 1881, p. 36; Verh. Zool.-Bot. Gesell. Wien. Vol. XXXVI, 1886, p. 371; ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 52; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Dryophanta gemula ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 131.

Diplolepis gemmula DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 359.

Female: Head black, very finely and minutely rugose. Antennæ 14-jointed, first and second joints pale yellowish brown, the remaining joints brown, becoming darker terminally. Thorax black, shining and microscopically wrinkled, under a high power lens (smooth to the naked eye). Parapsidal grooves well defined, rather deep. Anterior parallel lines and lateral grooves scarcely evident. Mesopleura shining, the other minutely rugose. Scutellum black, finely rugose with a few microscopic hairs; basal groove narrow. Abdomen shining black or pitchy brown black. Legs uniform clear yellow, claws black. Wings hyaline, somewhat dusky. Veins well-defined and dark. Cubitus extending to the first cross-vein. Radial area slightly open. Areolet present and rather well defined. Length, 1.75-2 mm.

Male: Antennæ 15-jointed, first and second joints darker than in the female, third joint slightly curved. Thorax narrow. Wings longer. Abdomen very small and compressed laterally. Color as in the female. Length, 2-2.25 mm.

Gall: (Plate XVI, Figs. 11, 12). Singly in the center of both the flowering and leaf buds of dwarf chestnut oak (*Quercus prinoides*) early in May. Monothalamous. Rounded or oval, sometimes pointed at the apex, thin shelled, containing no larval chamber; it is usually hidden in the surrounding bud and difficult to detect. Blackish in color. Length, 2.50 mm.; diameter, 1.25 mm.

Habitat: Connecticut (Waterbury); New Jersey (Lakehurst).

Dryophanta pallipes Bassett.

Dryophanta pallipes BASSETT, Trans. Am. Ent. Soc., Vol. XXVI, 1900, p. 327; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis pallipes DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 358.

Male: Body black. Head finely wrinkled, wider than the thorax. Antennæ 15-jointed, first joint smaller than the second, club-shaped, second globose, both pale, third to the fifteenth changing gradually from pale to dark dusky brown. Thorax black. Parapsides very distinct, closely converging at the scutellum. The space between these lines is polished and smooth and outside finely punctate. Scutellum rather coarsely rugose; foveæ wanting. Abdomen petiolate, compressed,

shining black. Legs very pale brownish yellow. Wings sub-fuscous; veins heavy, reddish brown. Radial vein heavy and ending very abruptly within the margin of the wing. Areolet distinct. Cubitus heavy, reaching the first transverse.

Females: The antennæ paler and the joints shorter and the male and the abdomen is below the average size in this genus. Length, 2.25 mm.; antennæ, 2 mm.; wings, 2.25 mm. (H. F. Bassett.)

Gall: (Plate XVI, Figs. 5, 6). Among the buds of thrifty young shoots of white oak (*Quercus alba*) early in May. The gall is oblong oval, thin-shelled and of a blackish brown color. It does not prevent the development of the leaves below it, but immediately surrounding its base half a dozen or more long, brown thread-like bodies appear. The fly emerges from the apex of the cell, leaving it resembling a miniature egg-shell with the end removed. Length about 2.50 mm.; diameter about 1.5 mm.

Habitat: Connecticut (Waterbury); New York; New Jersey; Pennsylvania.

The flies emerge from the gall during May.

Dryophanta ignota (Bassett).

Cynips ignota BASSETT, Can. Ent., Vol. XIII, 1881, p. 106.

Andricus ignotus ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 295.

Dryophanta ignota ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 127; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 52; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis ignota DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 360.

Female: Head black, finely rugose. Antennæ 13-jointed, first and second joints short, second slightly shorter, dusky yellowish brown, third joint long and slender, fourth shorter, remaining joints shorter and subequal, gradually becoming darker toward the tip. Thorax black, microscopically wrinkled or crackled. Parapsidal grooves present and rather distinct. Anterior parallel lines and lateral grooves not evident. Scutellum finely rugose, basal groove present, somewhat shining. Abdomen black. Legs pale yellowish brown, posterior femora infuscated. Wings hyaline, veins pale. Radial area open. Cubital vein slender and very faint. Areolet present. Length, 1.25–1.50 mm.

Gall: (Plate XIII, Fig. 10). On the mid-rib and principal veins on the under side of the leaves of swamp white oak (*Quercus platanooides*). Singly or in clusters of from two to ten. Monothalamous. Oval, rather thick-shelled and lie in a position nearly horizontal to the surface of the leaf. Brown, microscopically rugose with a number of short papillæ. Hollow inside. They are at first covered with short woolly hairs, but when mature become more or less denuded. Length about 3 mm. Width about 1.50 mm.

Habitat: Massachusetts; Connecticut; New York; New Jersey; Pennsylvania; Ohio; Illinois.

Dryophanta longicornis Bassett.

Dryophanta longicornis BASSETT, Trans. Am. Ent. Soc., Vol. XXVI, 1900, p. 327; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis longicornis DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 359.

Male: Head black. Antennæ long, 15-jointed, first and second joints short, globose and of equal length, third one-third longer than the first two, fourth equal to the first two, fifth almost equal to the fourth, the following gradually shorter, and all of a dark brown color. Thorax black and shining in that portion within the deep parapsidal grooves. Median and alar lines wanting. Scutellum coarsely rugose and with short, scattered hairs. Foveæ obsolete, but a slight depression takes their place, this rough like the rest of the scutellum. Abdomen black and smooth. Legs rather pale red or reddish brown. Wings large and smoky brown; veins all distinct and reddish-brown. Radial area open. Areolet absent. Cubitus full length, but slender towards the first transverse. Body, 1.75 mm.; antennæ, 2.75 mm.; wings, 3 mm.

Female: Body, 2.50 mm.; antennæ, 2.75 mm.; wings, 3 mm. (H. F. Bassett.)

Habitat: Connecticut (Waterbury).

Two males and one female were bred by H. F. Bassett from galls found among the galls from which *Andricus exiguus* and *Neuroterus exiguus* were bred. According to Bassett the galls of *D. longicornis* are probably moderate enlargements of the upper portion of very young and tender shoots, and not at all prominent. The antennæ of the female are 14-jointed.

Dryophanta papula (Bassett).

Cynips papula BASSETT, Can. Ent., Vol. XIII, 1881, p. 107.

Andricus papula ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 295.

Dryophanta papula ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 129; GILLETTE, 27th Rep. Agric. Mich., 1888, p. 470; Psyche, Vol. V, 1889, p. 187; Proc. Iowa Acad. Sci., Vol. I, pt. II, 1892, p. 113; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 53; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis papula DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 361.

Female: Head dark reddish brown, a few white hairs on the posterior edge of the vertex. Ocelli large. Vertex finely punctate. Antennæ brownish red, darker towards the extremity; 13-jointed, the last three joints joined, and forming a rather heavy club, such as is seen in many Braconides. Thorax black, lusterless, sparsely covered with very fine short hairs. Parapsidal grooves faint and indistinct; converging slightly as they approach the scutellum. A very fine median line, discernible on the posterior part of the mesothorax, extends one-third the distance to the collar. Scutellum finely rugose; foveæ present but indistinct. Legs reddish brown. Abdomen shining black. Sheath of the ovipositor yellowish. Ovipositor yellowish brown, and remarkable for its length. In all my dry specimens it is exerted to a length at least five times that of the entire body, and is coiled two or three times. Wings hyaline. Costal and first and second cross-veins fine clear reddish brown, the others fine and nearly colorless. Cubitus extremely faint, and disappearing before reaching the first transverse. Areolet small and elongated, and in some

specimens wanting. Radial area open. Length, body 2 mm.; wing, 1.75 mm.; antennæ, 1 mm. (H. F. Bassett).

Gall: (Plate XV, Fig. 11). In clusters on the upper side of the leaves of red oak (*Quercus rubra*) and black oak (*Quercus velutina*) in June. On the under side of the leaf they appear as scars, projecting a little. Monothalamous. The clusters are composed of small papillose or cone-like galls, projecting unequally and usually so crowded as to form a confluent mass of pustule-like elevations. Sometimes from forty to one hundred clusters are found upon a single leaf.

Habitat: Massachusetts; Connecticut; New Ycrk; New Jersey; Pennsylvania.

***Dryophanta parvula* Bassett.**

Dryophanta parvula BASSETT, Trans. Am. Ent. Soc., Vol. XXVI, 1900, p. 326; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis parvula DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 362.

Female: Entire body black. Head a little broader than the thorax. Antennæ 13-jointed; first joint large, short and dark, second large, globose and equalling the first in length, third rather long and slender, remaining joints equal in length, two to eleven yellowish brown, twelve and thirteen dark, dusky brown. Thorax — the two median lines which extend two thirds the distance from the collar to the scutellum, the parapsides and the lines at the base of each wing are all smooth and shining. The parapsides are not broad, and they converge closely at the scutellum. Scutellum finely wrinkled or rugose. Foveæ wanting. Abdomen polished and shining. Legs dark, translucent brown. Wings hyaline; veins faint and slender. Radial area broader than usual. Areolet wanting. Length of body, 1.25 mm.; antennæ, 1.25 mm.; wings, 1.75 mm. (H. F. Bassett.)

This species was described from a single specimen, found ovipositing in the buds of scrub oak (*Quercus nana*) May 26, 1871. Nothing further concerning it is known.

***Dryophanta palustris* (Osten Sacken).**

Cynips (Trigonaspis?) quercus palustris OSTEN SACKEN, Proc. Ent. Soc. Phila., Vol. I, 1861, p. 63.

Cynips q. palustris OSTEN SACKEN, Ent. Zeit. Stettin, 1861, pp. 409, 412; Proc. Ent. Soc. Phila., Vol. IV, 1865, pp. 343, 346, 349; BASSETT, Proc. Ent. Soc. Phila.; Vol. II, 1863, p. 329; WALSH, Proc. Ent. Soc. Phila., Vol. II, 1864, p. 488.

Cynips quercus palustris OSTEN SACKEN, Proc. Ent. Soc. Phila., Vol. IV, 1865, p. 359; Trans. Am. Ent. Soc., Vol. III, 1870, p. 54; PACKARD, 5th Rep. U. S. Ent. Com., 1890, p. 113.

Andricus (Callirhytis) palustris MAYR, Gen. Gallenb. Cynip., 1881, p. 28; ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 294; PROVANCHER, Addit. Fauna Canad. Hymen., 1886, p. 54; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 256.

Dryophanta palustris ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 129; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 53.

Andricus palustris BEUTENMÜLLER, Am. Mus. Journ., Vol. IV, 1904, p. 101, fig. 26; Ins. Galls Vicin. N. Y., 1904, p. 15, fig. 26; COOK, 29th Rep. Dept. Geol. Nat. Hist. Indiana, 1904 (1905) p. 829, fig. 22; JARVIS, 37th Rep. Ent. Soc. Ont., 1906.

Callirhytis quercus palustris DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 565.

Female: Head black, mouth and palpi yellowish brown, minutely rugoso-punctate. Antennæ 14-jointed, first to fourth yellowish brown, remaining joints dark brown, first joint stout, second globose and shorter, third long and slender, fourth shorter than third, the rest short and subequal. Thorax black, shining, apparently smooth, microscopically crackled under a high power lens. Parapsidal grooves distinct. Median groove more or less present. Scutellum finely rugose, with a deep basal groove. Abdomen black and shining. Legs very pale yellow, claws black. Wings hyaline, veins brown, cubitus continuous, faint. Areolet distinct. Basal vein usually clouded. Radial area closed. Length, 1.75-2 mm.

Male: Similar to the female. Antennæ 15-jointed, with the third joint thicker, and the basal joints darker. Length, 1.50-2 mm.

Gall: (Plate XV, Figs. 1, 2, 3, 4 and Plate XVII, Figs. 1, 2). On the leaves and buds and catkins of the pin oak (*Quercus palustris*), red oak (*Quercus rubra*), scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), scrub oak (*Quercus nana*), black jack oak (*Quercus marylandica*), willow oak (*Quercus phellos*), and probably other oaks belonging to the red oak group, in May. Monothalamous. Globular, succulent, hollow inside, containing a whitish globular kernel which rolls freely around. The gall is green, sometimes more or less tinged with red. It is smooth or somewhat pubescent, when found on oaks which have under sides of the leaves pubescent (*Q. nana*, *Q. velutina*, and *Q. marylandica*). Diameter, 5-12 mm.

Habitat: Canada (Ottawa). New England States; Middle States; Ohio; Illinois; Indiana; Michigan; Washington, D. C., and probably southward into Florida.

In the latitude of New York the gall appears commonly very early in spring, on the buds of the oak, before any leaves have appeared, and when the leaves are out the galls are usually close to the leaf stalk, or they take in the entire leaf. The gall occurs singly or in clusters of two or more. The flies emerge about the middle of May. In June, after all the flies have escaped, the gall shrinks and gradually disappears entirely.

***Dryophanta laurifoliæ* (Ashmead).**

Spathogaster q. laurifoliæ ASHMEAD, Trans. Am. Ent. Soc., Vol. IX, 1881, p. XVII.

Dryophanta laurifoliæ ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296; *ibid.*, Vol. XIV, 1887, p. 129; MAYR, Verh. Zool.-Bot. Gesell. Wien, Vol. XXXVI, 1886, p. 371; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 52; BRIDWELL, Trans. Kan. Acad. Sci., Vol. XVI, 1899, p. 204; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis quercuslaurifoliæ DALLA TORRE and KIEFFER, Das. Tierreich, pt. XXIV, 1910, p. 364.

Female: Black, head slightly but faintly punctured, mouth parts reddish, palpi yellowish. Antennæ 14-jointed, joints one and two yellowish, others dark reddish brown, pubescent, third joint nearly thrice as long as second; thorax smooth but appearing microscopically punctate with a high power, parapsidal grooves moderately distinct, longitudinal furrows distinct; scutellum deeply rugoso-punctate, opaque and slightly hairy; abdomen globose, smooth, black and highly polished; wings hyaline, veins black; legs yellowish-red, posterior coxæ excepting apex and feet black. Length, 2.50 mm. (W. H. Ashmead.)

Male: Antennæ 15-jointed; elevated and projecting posteriorly; wings very long reaching way beyond tip of abdomen; abdomen small, triangular, compressed, with a very long peduncle, slightly bent downwards before the middle; otherwise as in female. Length, 2 mm. (W. H. Ashmead.)

Gall: (Plate XV, Fig. 5). On leaf of laurel leafed oak (*Quercus laurifoliæ*) in February. Green, globular, hollow galls, growing through the leafy expansion of the newly formed leaf, projecting about equally from the upper and on the under surface of the leaf, the size of a cherry stone and when removed not unlike it in shape, containing a yellowish, slightly elongated kernel, which rolls freely about. Length, 5-6.25 mm. or 3.75 mm. or more through

Habitat: Florida (Jacksonville); Kansas.

I have examined the types of *D. laurifoliæ* and cannot find any essential differences between this species and *D. palustris*. But for the want of conclusive evidence I prefer to consider *D. laurifoliæ* tentatively distinct. The gall is also similar.

***Dryophanta aquaticæ* (Ashmead).**

Cynip q. aquaticæ ASHMEAD, Trans. Am. Ent. Soc., Vol. IX, 1881, p. XVI.

Dryophanta aquaticæ ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296; *ibid.*, Vol. XIX, 1887, p. 129; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 48; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis quercus aquaticæ DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 365.

Female: Head black, finely punctate, a slight depression at base of front ocelli, a few microscopical short whitish hairs on face, mandibles black, palpi whitish; antennæ 15-jointed, yellowish red, infuscated from fourth joint, joints regularly subequal, last joint being longer than penultimate; thorax black, smooth and shining, parapsidal grooves distinct, converging towards scutellum and separated from it by a slight ridge; scutellum punctate; abdomen longer and wider than thorax, black, smooth and shining; legs reddish-yellow, tibiæ to feet paler, basal half of coxæ black; wings hyaline, radial area open, areolet distinct, veins black. Length, 2.50. (W. H. Ashmead.)

Male: Mouth parts brownish, scutellum coarsely rugoso-punctate, peduncle long; leg yellowish-brown, coxæ yellowish, feet black. Length, 2 mm. (W. H. Ashmead.)

Gall: (Plate XV, Fig. 6). Growing through the leafy expansion of the newly formed leaf of water oak (*Quercus nigra* = *aquatica*) in March and April. Globular,

hollow, projecting about equally from the upper and the under side of the leaf, containing a yellowish, slightly elongated kernel, which rolls freely about. It is succulent and of a plum color. Diameter, 8-10 mm.

Habitat: Florida (Jacksonville).

The type is exceedingly close to *D. palustris* and may not be distinct. But from the lack of sufficient material I prefer not to unite *D. aquatica* with *D. palustris*.

Dryophanta liberæcellulæ Gillette.

Dryophanta liberæcellulæ GILLETTE, Bull. 7, Iowa Agricul. Exp. Sta., 1889, p. 283, fig. 27; Ent. Am., Vol. VI, 1890, p. 24, fig. 1; Proc. Iowa Acad. Sci., Vol. I, pt. II, 1892, p. 113; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 52; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis liberæ-cellulæ DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 360.

Female: Head shining black, with two deep pits at the base of the clypeus, one on either side; face finely rugose; mandibles black, sometimes yellowish at base; palpi light yellow to yellowish brown. Antennæ 14-jointed, first four or five joints light yellow, terminal joints black, first and second joints short and stout, third joint longest, terminal joint cone-shaped and a little longer than the penultimate. Thorax shining black and finely rugose, parapsidal grooves distinct; a medium impressed line begins at the scutellum between the parapsidal grooves and extends a short distance upon the thorax. Scutellum polished, bifoveate and more coarsely rugose than the thorax. Abdomen entirely black and polished; ovipositor sheaths slightly exserted and light yellow in color. Wings slightly smoky, and 3 mm. in length, areolet very small or entirely wanting. Feet light yellow, except the last tarsus, which is black. Length, 2.3 mm. (C. P. Gillette.)

Male: The yellow coloration of the antennæ shows for nearly the entire length on the upper surface, the number of the joints is fifteen, and they are more densely set with hairs than in the female. Otherwise as in the female. Length, 2 mm. (C. P. Gillette.)

Gall: Globular excrescences on the leaves of the red and scarlet oaks, sometimes taking into themselves the entire leaf and at others surrounded by the blade of the leaf of *Amphibolips nubilipennis* or *Andricus singularis*, either of which it very much resembles, but from which it differs by having a somewhat roughened and fuzzy exterior and a much thicker outer wall, and by having the larval cell perfectly free to roll about within. The galls vary from 6.5 to 9.5 mm. in diameter. (C. P. Gillette.)

Habitat: Iowa (Ames); Michigan.

I am fairly positive that this species will prove to be the same as *D. palustris*. The descriptions of flies and gall tally with *D. palustris*. A shrivelled type gall and fly are in the United States National Museum. I have examined these types and, according to my notes, do not find them different from *D. palustris*.

Dryophanta quercifoliæ *Ashmead*.

Andricus quercifoliæ ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 299.

Andricus (Callirhytis) quercifoliæ ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 295.

Dryophanta quercifoliæ ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 129; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 54; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis querci-foliæ DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 365.

Male: Black, shining, sparsely pubescent and microscopically scratched; antennæ 14-jointed, honey yellow, at base, brownish towards tip; thorax smooth, parapsidal grooves distinct; scutellum rugose, pubescent; abdomen polished black, slightly compressed; legs honey yellow; wings hyaline, veins brownish. Length, 1.75 mm. (W. H. Ashmead.)

Gall: On the leaves of turkey oak (*Quercus catesbæi*) in April and May. Succulent, round, green, with a loose, whitish kernel. Constructed in the same manner as *Dryophanta aquaticæ*, but much smaller.

Habitat: Florida (Jacksonville).

Closely allied to *D. palustris*. The thorax, however, appears to be smoother, and the gall is longer and somewhat cup-shaped.

Dryophanta confusa (*Ashmead*).

Cynips q. confusa ASHMEAD, Trans. Am. Ent. Soc., Vol. IX, 1881, p. XVIII.

Neuroterus confusus ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 296.

Dryophanta confusa ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 129; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 49; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis quercus-confusa DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 362.

Female: Head black, finely and evenly punctate. Antennæ reddish-brown, 14-jointed, third joint longest, joints to eighth subequal, others short and equal, terminal twice as long as penultimate. Thorax rugoso-punctate, parapsidal grooves distinct, converging posteriorly. Scutellum deeply rugoso-punctate, slightly elevated posteriorly and depressed and with a large deep foveæ at base, not pubescent. Pleuræ deeply aciculate. Wings hyaline, veins reddish-brown. Areolet nearly closed. Radial area open. Abdomen black and highly polished, last ventral valve projecting. Legs reddish yellow, coxæ black. Length 1.75 mm. (W. H. Ashmead.)

Gall: Attached to the principal vein on the under side of the leaf of laurel oak (*Quercus laurifolia*) in April. Small, globular, succulent, yellowish-green. Hollow inside with a pupa-like kernel. Diameter transversely, 1.50 mm.; vertically, 2.50 mm.

Habitat: Florida (Jacksonville).

The gall and flies are not known to me and the types should be in the United States National Museum. According to Ashmead the fly escapes by perforating a hole through the upper surface of the leaf.

Dryophanta notha (*Osten Sacken*).

Cynips q. notha OSTEN SACKEN, Trans. Am. Ent. Soc., Vol. III, 1870, p. 55.

Andricus (Callirhytis) notha ASHMEAD, Trans. Am. Ent. Soc., Vol. XII, 1885, p. 295.

Dryophanta notha ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 129; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 53.

Callirhytis notha DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 66.

Callirhytis quercus-notha DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 565.

Andricus (Callirhytis) pustulatoides BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 74.

Andricus pustulatoides DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 94.

Neuroterus notha ASHMEAD, Proc. Ent. Soc. Wash., Vol. IV, 1899, p. 332.

Callirhytis pustulatoides DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, 66; Das Tierreich, pt. XXIV, 1910, p. 570.

Female: Head punctate, black. Antennæ 14-jointed, first to fourth joints pale yellowish, remaining ones gradually changing to dark brown. Thorax black, smooth, polished, slightly rugose anteriorly and along the parapsidal grooves, which are distinct and converge closely at the scutellum. Lateral grooves and parallel anterior lines wanting. Median line at the scutellum very short. Scutellum finely rugose, foveæ at base longer than broad and distinct. Abdomen black, smooth and polished. Legs dark yellowish brown, coxæ black. Claws simple. Wings hyaline, slightly dusky. Veins distinct. Areolet wanting. Cubitus not extending to the first cross-vein. Radial area open. Length, 2.50 mm.

Gall: (Plate XVI, Fig. 4). Singly on the points of the acute lobes of the leaves of scarlet oak (*Quercus coccinea*), red oak (*Quercus rubra*), and pin oak (*Quercus palustris*), in May. Monothalamous. Blister or bubble-like, oblong, thin-shelled and succulent. It is green and the surface shows some longitudinal semitransparent veins. Hollow inside, containing a free seed-like kernel in which the larva lives. This kernel is oblong oval, rounded at one end and somewhat pointed at the other.

Habitat: Massachusetts; Connecticut; New York; New Jersey; Pennsylvania.

The species described by Bassett, as *Andricus (Callirhytis) pustulatoides* is the same as *Dryophanta notha*. The flies emerge late in May and early in June.

Dryophanta pedunculata *Bassett*.

Dryophanta pedunculata BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 72; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 53; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis pedunculata DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 364.

Female: Head dark brown black, minutely rugulose. Antennæ 14-jointed, first to fourth joints pale yellowish, all the others dark brown. Thorax microscopically punctate, black or very deep brown black, shining. Parapsidal grooves fine

but distinct. Anterior parallel lines and lateral grooves only visible in certain lights. Scutellum finely rugose, more so than the thorax; basal groove present, but not very distinct. Abdomen shining, black. Legs pale yellowish, middle of femora slightly darker. Wings hyaline, veins dark brown. Cubitus faint and continuous. Areolet present. Radial area closed. Length 2 mm.

Male: Color as in the female. Antennæ 15-jointed, third joint somewhat bent. Legs slightly darker. Abdomen very small, pedunculate. Length, 1.50 mm.

Gall: (Plate XIII, Figs. 8, 9). On the edges of the leaves of red oak (*Quercus rubra*) and scarlet oak (*Quercus coccinea*) in Spring. Ovate with a rather long, curved point at the apex. The gall is on a thread-like peduncle measuring from 5 to 12 mm. in length. When fresh it is glaucous and when dry dark olive brown. Thin-shelled, hollow inside with a free kernel in which the larva lives. Length of gall, 4-5 mm.; width, 2.5-3 mm.

Habitat: Connecticut; New York; New Jersey.

The galls from *Quercus obtusiloba* and *Q. prinus* recorded by Packard (5th Rep. U. S. Ent. Com., 1890, p. 114) belong to another species, probably *Andricus capsula* Bass.

Dryophanta cinereæ Ashmead.

Dryophanta cinereæ ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, pp. 129, 144; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 49; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

Diplolepis cinereæ DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 365.

Female: Head black, distinctly and finely reticulately punctate. Antennæ 14-jointed, brown. Thorax black, minutely punctate. Parapsidal grooves sharply defined posteriorly, less so anteriorly. Anterior parallel lines present, but not distinct. Lateral grooves wanting. Scutellum very finely rugose with a groove at base. Abdomen black, shining, smooth. Legs pale yellow, hind femora infuscated and a faint brownish blotch on the basal third of the posterior tibiæ. Wings hyaline, veins pale. Radial area closed. Length, 1.75 mm.

Male: Very similar to the female in color, but the head and thorax are less distinctly sculptured and the antennæ are 15-jointed.

Gall: (Plate XIII, Figs. 11, 12). On the under side of the leaves of upland willow oak (*Quercus brevifolia* = *Q. cinerea*), in April and May. Monothalamous. Greenish gray, somewhat longitudinally ribbed and rugose. Hemispherical or bag-shaped, thin-shelled, containing a loose kernel which rolls around freely. On the upper side the gall is indicated by a slight discoloration of the leaf. Diameter at base, 4 mm.; Height, 3.25 mm.

Habitat: Florida (Jacksonville).

The gall of *D. cinereæ* is practically the same as that of *Callirhytis saccularia* (Plate XV, Figs. 7, 8) and it is possible that the latter species will prove to be a synonym of *D. cinereæ*.

Dryophanta clarkei Bassett.

Dryophanta clarkei BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 69; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 49; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52; Das Tierreich, pt. XXIV, 1910, p. 361.

Dryophanta vesiculoides ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 114; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 53.

Diplolepis vesiculoides DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, p. 366.

Female: Head black minutely punctate. Antennæ 14-jointed, basal joints pale, terminal joints dark almost black. Thorax jet black, smooth and shining, with distinct heavy parapsidal grooves, as are also the lines over the base of the wings. Pleuræ glossy, smooth. Scutellum minutely rugose, shining foveæ at base small. Abdomen smooth and shining, black. Legs dark brown, yellowish brown at the joints, as are also the tarsi; claws dark. Wings hyaline, veins moderately heavy. Cubitus decreasing as it approaches the first cross-vein. Areolet present. Length, 1-1.50 mm.

Male: Similar to the female. Antennæ 15-jointed, first joint black, second globular, third rather short, curved and incised. Legs paler than those of the female. Abdomen very small and petiolate. Length, 1-1.5 mm.

Gall: (Plate XVI, Figs. 7, 8, 9, 10). Formed in the buds of the white oak (*Quercus alba*) and post oak (*Quercus minor*) in May. Polythalamous. Brown, small, round, thin-walled. Inside the larval cells are separated by very thin partitions. In general appearance the gall resembles that of *Neuroterus vesiculus*. Diameter about 3 mm.

Habitat: Massachusetts; New York; New Jersey (Lakehurst).

Bassett described this species from specimens received from Miss Cora H. Clarke, collected near Boston. I have received specimens from the same locality, also collected by Miss Clarke. In my specimens, all females, the antennæ are 14-jointed and not 13 as given by Bassett.

Dryophanta vesiculoides is the same as *D. clarkei*, and was bred from galls on post oak (*Quercus minor*).

Dryophanta discus Bassett.

Dryophanta discus BASSETT, Trans. Am. Ent. Soc., Vol. XXVI, 1900, p. 326; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 52.

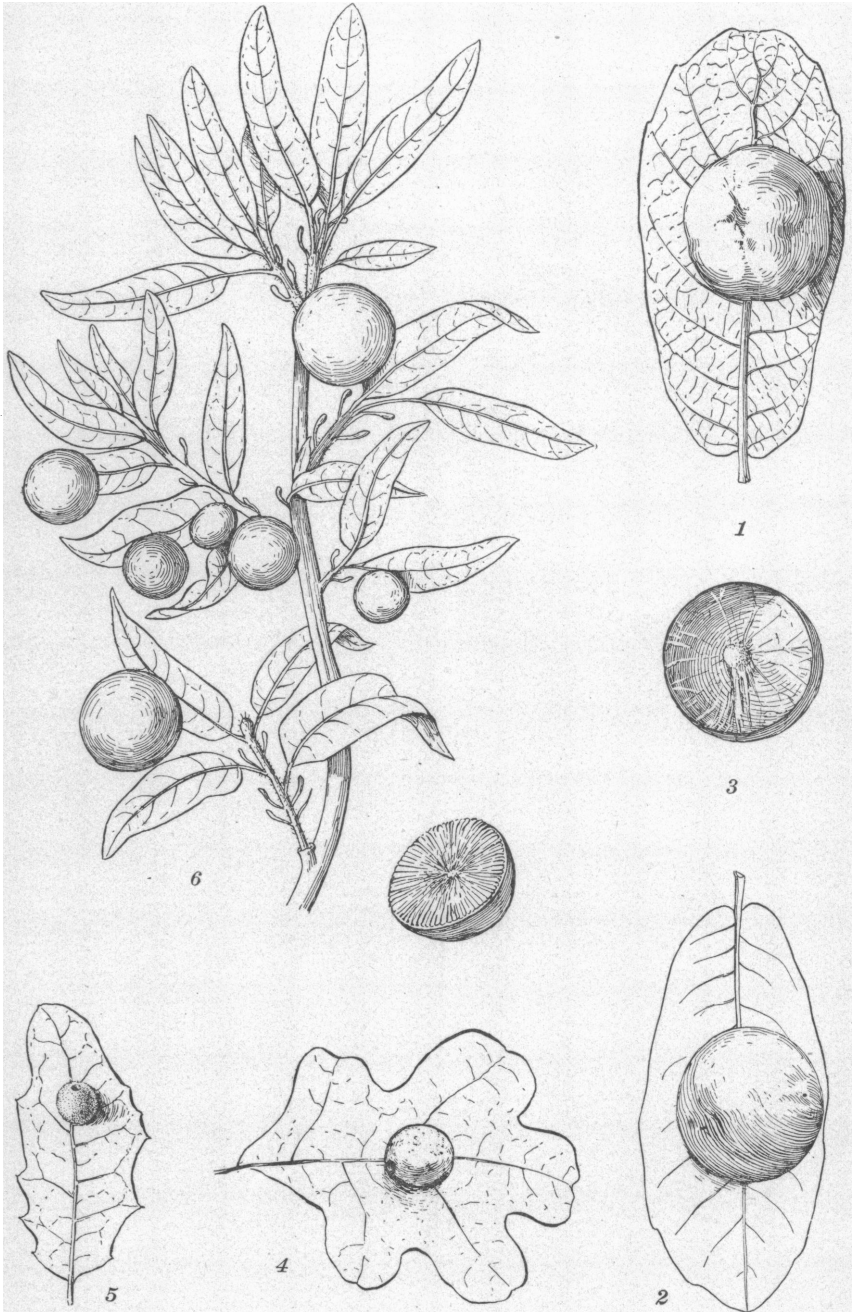
Diplolepis discus DALLA TORRE and KIEFFER, Das Tierreich, pt. XXIV, 1910, 362.

Female: Head black. Antennæ 13-jointed, first and second joints rather large, subequal, third long, fourth two thirds as long as the third, remaining joints gradually shorter, all yellowish red. Thorax smooth, shining, with a few scattered hairs and deep parapsidal grooves. Scutellum slightly rugose. Foveæ not distinct. Abdomen dark, shining brown. Legs dark brown. Wings rather large; veins very pale and almost colorless. Areolet wanting. Cubitus nearly obsolete. Radial area open. Length, body 1.50 mm.; antennæ, 1.25 mm.; wings, 1.75 mm.

Gall: (Plate XVI, Fig. 13). In clusters on the under side of the leaves of *Quercus undulata*? or a closely allied species of white oak. Monothalamous. Small, flattened, saucer-like with a very minute point in the center. Circular with the edge slightly raised; very much resembles the eastern oak-spangles (*Cecidomia poculum* O. S.). Purplish red. Diameter, 1.50–2 mm.; height, .75 mm.

Habitat: California (Napa City).

The types are in the collection of the American Entomological Society. Nothing further concerning this species is known. It will probably prove to be identical with *Andricus parmula* Bassett.



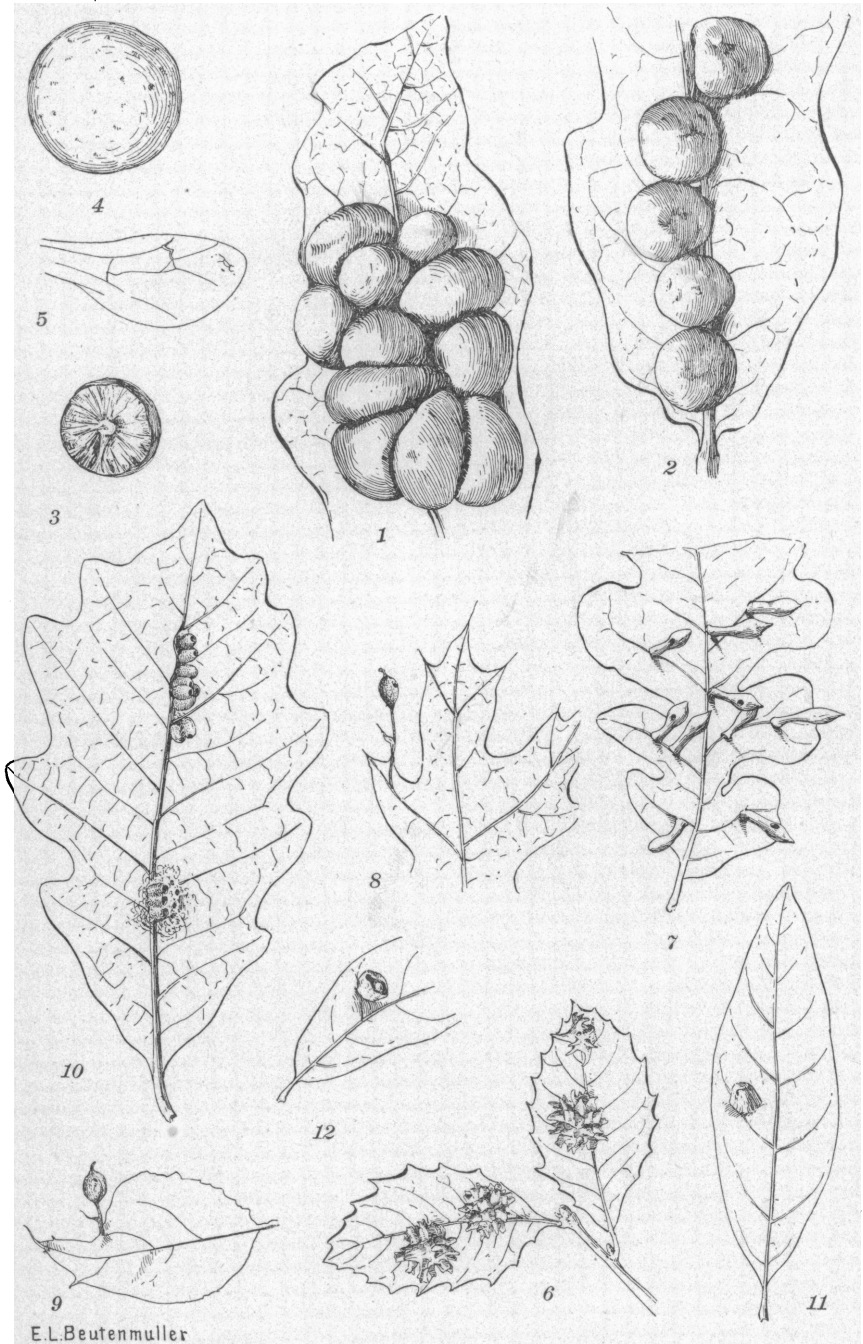
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1-3. *Dryophanta bella* (Bassett).

4. " *carolina* Ashmead.

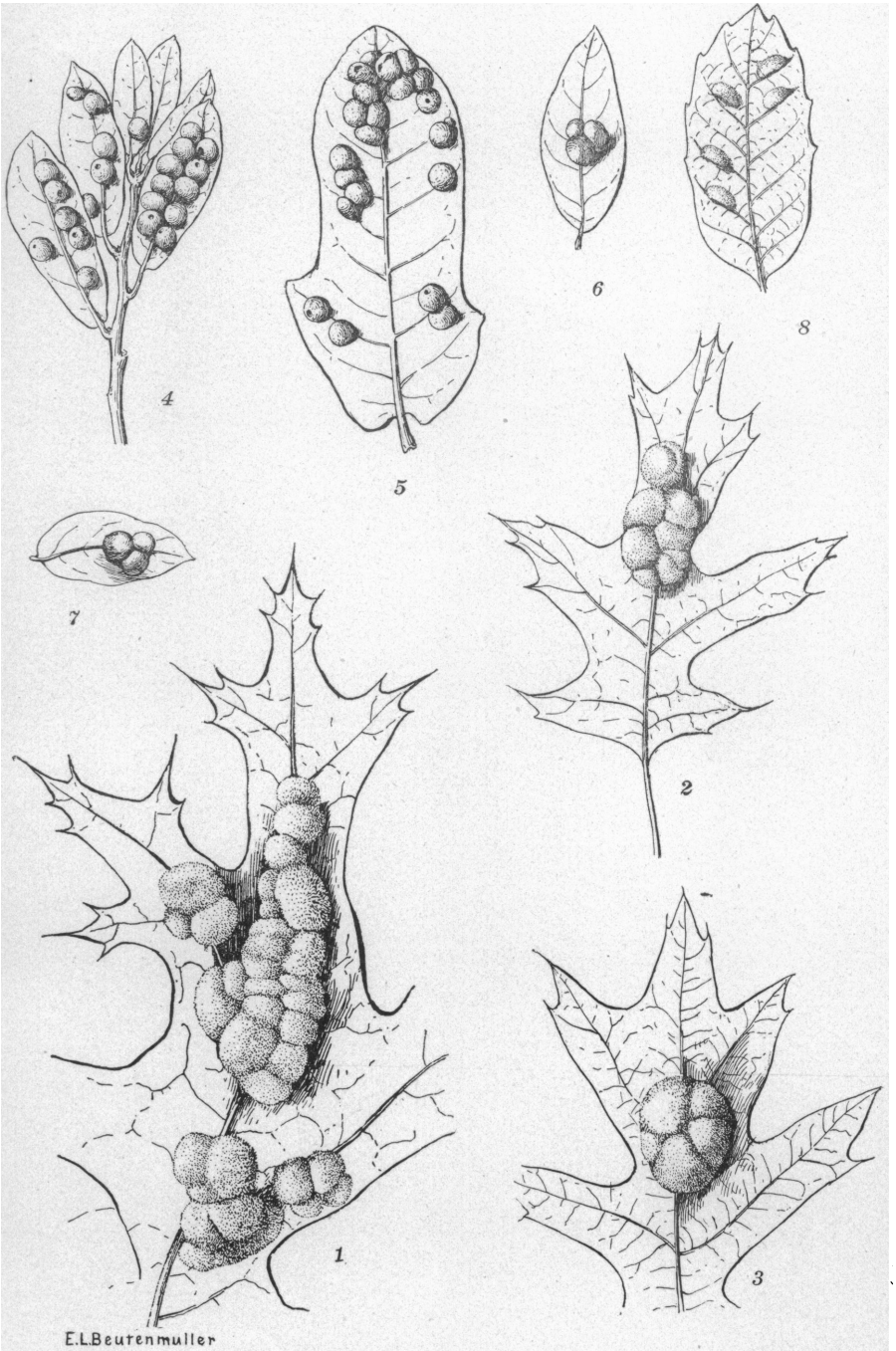
5. *Dryophanta multipunctata* Beutenmüller.

6, 7. *Dryophanta dugesi* Mayr.

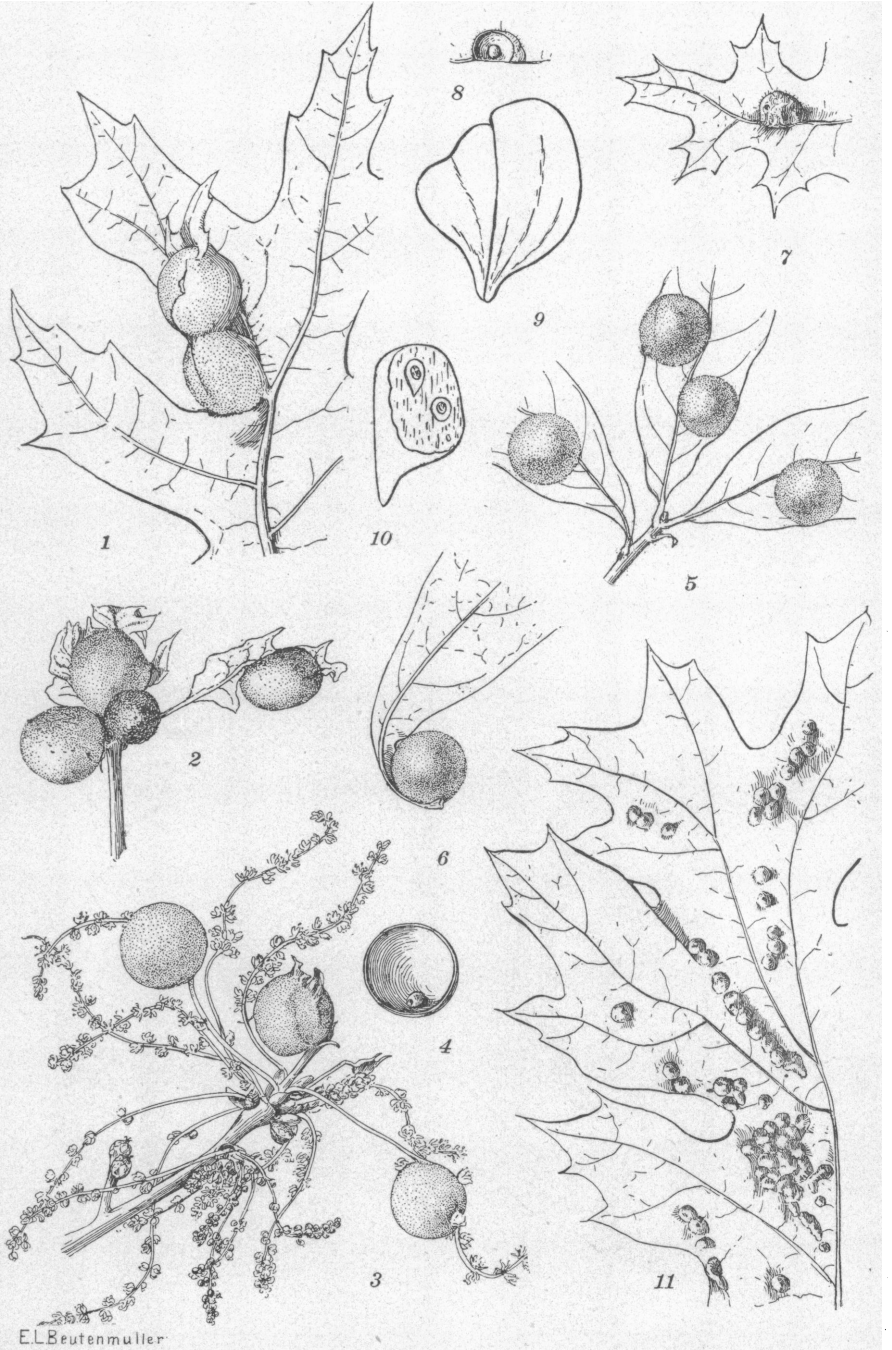


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1-3. *Dryophanta polita* (Bassett).
 4, 5. " *rubra* (Karsch).
 6. " *echinus* (Osten Sacken).
 7. *Dryophanta clavula* Beutenmüller.
 8, 9. " *pedunculata* Bassett.
 10. " *ignota* (Bassett).
 11-12. *Dryophanta cinerea* Ashmead.

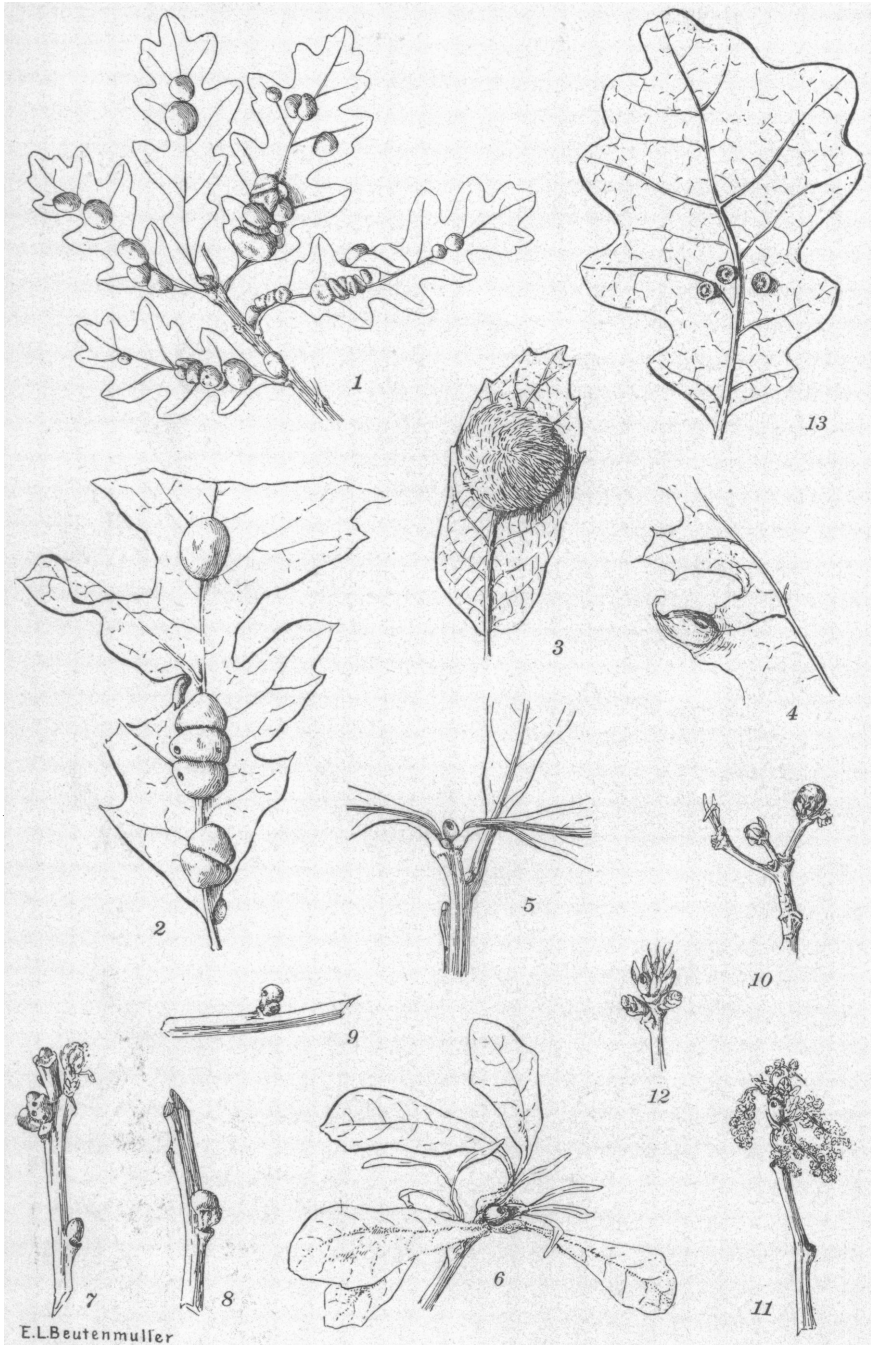


1-3. *Dryophanta lanata* Gillette.
4-7. " *emoryi* Ashmead.
8. " *pulchripennis* Ashmead.



1-4. *Dryophanta palustris* (Osten Sacken).
 5. " *laurifolia* (Ashmead).
 6. " *aquaticæ* (Ashmead).

7, 8. *Callirhytis sacularia* (Bassett).
 9, 10. *Dryophanta radicola* Ashmead.
 11. " *papula* Bassett.



E.L.Beutenmuller

- | | | | |
|----|------------------------------------|---------|-------------------------------------|
| 1. | <i>Dryophanta eburnea</i> Bassett. | 5, 6. | <i>Dryophanta pallipes</i> Bassett. |
| 2. | " <i>glabra</i> Gillett. | 7-9. | " <i>vesiculoides</i> Ashmead. |
| 3. | " <i>nubila</i> Bassett. | 10. | " <i>clurkei</i> Bassett. |
| 4. | " <i>notha</i> (Osten Sacken). | 11, 12. | " <i>gemua</i> (Bassett). |
| | 13. | | <i>Dryophanta discus</i> Bassett. |

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