

Article XXII.—THE NORTH AMERICAN SPECIES OF *AULACIDEA* AND THEIR GALLS.

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PLATES XXIV–XXVI.

The present paper is the ninth installment of a series of papers on North American Cynipidæ and their galls, published by me in the Bulletin of the Museum of Natural History.

Aulacidea Ashmead.

Cynips (in part) BOUCHE, Natur. Ins., 1834, p. 164.

Aylax (in part) HARTIG, Zeitsch. für Ent., Vol. II, 1840, p. 195.

Aulax HARTIG, Zeitsch. für Ent., Vol. IV, 1843, p. 412; SCHENCK, Jahrb. Ver. Naturk. Nassau, Vols. XVII–XVIII, 1863, p. 216.

Aulacidea ASHMEAD, Psyche, Vol. VIII, 1897, p. 68; *ibid.*, Vol. X, 1903, p. 211; KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 92; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 75.

Pseudaulax ASHMEAD, Psyche, Vol. X, 1893, p. 213.

Closely allied to the genus *Aylax*, but the radial area is distinctly closed at the costal margin. Otherwise the characters are the same.

Type: *Aulax mulgediicola* Ashmead (= *Aulacidea bicolor* Gillette).

Aulacidea tumida (Bassett).

Aulax tumidus BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 92; BEUTENMÜLLER, Bull. Am. Mus. Nat. Hist., Vol. IV, 1892, p. 263; Journ. Am. Mus., Vol. IV, 1904, p. 109, fig. 46; Ins. Galls Vicin. N. Y., 1904, p. 23, fig. 46.

Aulax tumida DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 125.

Aulacidea tumida KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 96; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 76.

Aulax timidus JARVIS, Rep. Ent. Soc. Ont., 1906 (1907), p. 72.

Aulax sonchicola ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 134.

Aulacidea sonchicola KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 96; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 76.

Aulacidea solidaginis GIRAULT, Ent. News, Vol. XIV, 1903, p. 323.

Female. Head black, subopaque, subquadrate, facial ridge very broad, face, vertex and sides finely granulose. Antennæ 13-jointed, last joint very long, reddish brown. Thorax black with closely appressed microscopic whitish hairs, subopaque, finely and distinctly reticulated, collar very broad. Pleuræ finely aciculated. Me-

dian groove from the scutellum short and distinct. Parapsidal grooves continuous, fine and distinct, almost parallel until close to the scutellum where they slightly converge. Anterior parallel lines indistinct and short. Grooves at base of wings distinct, but not conspicuous. Scutellum black, rugose, with two large and shallow foveæ at the base. Abdomen inflated, reddish brown, semitranslucent, smooth and polished, piceous at the base dorsally. Legs reddish brown, microscopically pubescent. Wings somewhat dusky hyaline, veins yellowish brown and heavy, cubitus scarcely reaching the first cross-vein. Areolet more or less distinct, or wanting. Length, 2-3 mm.

Male. Similar to the female, black, except the legs and antennæ, which are reddish brown. Antennæ 14-jointed, third joint short and curved. Areolet more distinct. Length, 1.75-2.50 mm.

Gall. (Plate XXIV, Figs. 1-8.) On the stalks of wild lettuce (*Lactuca canadensis*), usually near the summit and often in the panicle, and then covered with short flower stalks. Polythalamous. More or less rounded or elongate irregular swellings of various shapes. Green when fresh and brown when old and dry. Inside (Fig. 8) the gall is pithy and contains numerous larval cells. Length, 25-75 mm.

Habitat: Canada; New England and Middle States, southward and westward.

I have examined the types of *Aulacidea sonchicola* Ashmead and *Aulacidea solidaginis* Girault and I cannot find any distinctive characters to separate them from *Aulacidea tumida*. *A. sonchicola* was bred from galls on the stems of the sow thistle (*Sonchus oleraceus*), a plant naturalized from Europe and closely allied to *Lactuca*. *A. solidaginis* was bred from galls on the stems of goldenrod, taken by Mr. Girault at Blacksburg, Virginia. The galls of the latter were collected in the winter when the plants of *Lactuca* and goldenrod may be readily mistaken for one another and I am much inclined to believe that the galls of *A. solidaginis* occur on *Lactuca* and not goldenrod. The galls of *A. tumida* are very variable in shape and the one figured on Plate XXIV, Fig. 2, was taken by me on *Lactuca canadensis* and it is a counterpart of the gall of *A. solidaginis* figured by Mr. Girault.

***Aulacidea podagræ* (Bassett).**

Aulax podagræ BASSETT, Trans. Am. Ent. Soc., Vol. XVII, 1890, p. 91; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 123.

Aulacidea podagræ KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, 57.

Female. Head black, finely reticulated or punctate, facial elevation distinct. Antennæ dark reddish brown becoming darker terminally, 13-jointed. Thorax black, subopaque, very finely and evenly wrinkled or reticulated; median groove from the scutellum very fine and extending to about the middle of the thorax. Anterior parallel lines short and very indistinct. Parapsidal grooves continuous, fine and almost parallel; grooves over the base of the wings present, but inconspicuous. Scutellum black, rugose, with the two foveæ at the base large, rugulose and

somewhat shining. Abdomen black or pitchy brown and polished. Legs reddish or yellowish brown. Wings hyaline, iridescent, veins dark brown, cubitus fainter. Areolet present and well defined. Length, 2-2.50 mm.

Male. Very similar to the female in color and marking, but somewhat smaller. It differs only by having the abdomen smaller, and 14-jointed antennæ with the third joint curved and incised.

Gall. (Plate XXV, Figs. 1-4.) In the pith of the stalks of wild lettuce (*Lactuca canadensis*). Polythalamous, sometimes causing a swelling of the stalk.

Habitat: Canada; New England and Middle States, south and westward.

The adult is closely allied to *A. tumida*, but differs from this species by being darker, and by the more evenly wrinkled thorax and more rugulose scutellum. The gall varies from small pits in the pith of the stalk without any traces of swellings externally, to swellings measuring from 10 to 300 mm. in length and from 10 to 60 mm. in diameter.

Aulacidea bicolor (Gillette).

Aulax bicolor GILLETTE, Bull. Ill. St. Lab. Nat. Hist., Vol. III, 1891, p. 201; DALLA TORRE, Cat. Hymen., Vol. II, 1893, p. 120.

Aulacidea bicolor KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 75.

Aulax mulgедиicola ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 133.

Aulacidea mulgедиicola ASHMEAD, Psyche, Vol. X, 1903, p. 211.

Aulacidea mulgедиicola KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95.

Aulacidea mulgедиicola DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 75.

Female. Head black, shading into rufous towards the mouth parts or wholly black, finely wrinkled and pubescent, face with a median ridge. Antennæ 13-jointed, dark rust brown. Thorax black, shoulders sometimes rufous, mesothorax finely sculptured, opaque and clothed with sparse recumbent pubescence. Parapsidal grooves distinct and rather deep. Median groove very short and broadened at the scutellum so as to be almost triangular. Anterior parallel lines very fine and short. Lateral grooves appear as polished lines. Pleuræ densely and rather coarsely aciculate. Scutellum black, with two small, shallow, oblique foveæ, the surface rather coarsely rugose. Abdomen ovate, rufous or yellowish red, smooth and shining. Legs reddish. Wings hyaline, radial cell closed. Areolet present. Length, 1.50-2.50 mm.

Male. Abdomen pitchy brown. Antennæ 14-jointed. Areolet very small or scarcely evident. Length, 1-2 mm.

Gall. (Plate XXV, Fig. 5.) Consists simply of a thin-shelled larval cell imbedded in the pith of wild lettuce, *Mulgedium* (*Lactuca*) *acuminata*, and *Lactuca canadensis*. Usually there are numerous cells crowded together side by side in the pith, and externally the stem or stalk shows no apparent gall, swelling or deformation, although occasionally a slight swelling of the stalk occurs.

Habitat: Massachusetts; Connecticut; New York; New Jersey; District of Columbia; North Carolina; Illinois.

The types of *Aulacidea bicolor* Gillette are in the Illinois State Laboratory of Natural History and were sent to me for examination by Mr. C. A. Hart. I have also seen the types of *Aulacidea mulgediicola* Ashmead in the United States National Museum and they are the same as *A. bicolor*.

***Aulacidea nabali* (Brodie).**

Aulax nabali BRODIE, Can. Ent., Vol. XXIV, 1892, p. 12; FYLES, Can. Ent., Vol. XXIX, 1897, p. 79.

Aulacidea nabali KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95.

Male and female. Head black, and finely punctate. Antennæ black or very dark piceous, 13-jointed in the female, 14 in the male. Thorax black, finely and evenly punctate, subopaque. Parapsidal grooves distinct, widely separated and slightly converging at the scutellum. Median groove from the scutellum extending to about the middle of the mesothorax. Anterior parallel lines short and indistinct. Pleuræ black, finely striate. Scutellum black, evenly rugose, foveæ at the base deep and distinct. Abdomen rufous or rufo-piceous, usually somewhat darker in the male. Legs rufous, somewhat paler than the abdomen. Wings hyaline, radial area closed. Areolet large. Veins brown.

Length, of male 1-2 mm.; of female 1.73-2.75 mm.

Gall. (Plate XXVI, Figs. 1-7). At the base of the stems of *Nabalus altissima*, usually in masses surrounding the stem, often extending down on the main root, rarely on the main fibres of the roots, usually about an inch under the ground, sometimes partly above the ground. Polythalamous. Roughly spherical, usually aggregated in irregular cylindrical masses of 4 to 14, resembling small knotty artichokes or irregular white potatoes. The exterior of the gall has the appearance and consistence of a raw potato. When mature, in September, the gall retains its pale appearance through the winter, but in spring darkens in color. When dry the interior presents the appearance of corky fibrous folds, with numerous larval cells. Diameter 5 to 10 mm.

Habitat: Canada (Toronto); Massachusetts; New York; New Jersey.

A fine lot of galls of this species, collected at Magnolia and North Brookfield, Massachusetts, were sent to me by Miss Cora H. Clarke and Mr. Frank Dobbin. The specimens were obtained in September and October, and the adults emerged late in December.

***Aulacidea ambrosiæcola* (Ashmead).**

Aulax ambrosiæcola ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 134.

Aulacidea ambrosiæcola KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 75.

Male and female. "In size and structure, and general appearance this species comes remarkably close to *A. mulgediicola*; but with a very high power lens the sculpture appears very distinct, the punctation being slightly transverse. There is a short acute median groove between the parapsidal grooves posteriorly, the scutel-

lar foveæ are not so sharply defined, while the color of the legs and abdomen will at once distinguish it from that species. In the female the legs and abdomen are reddish yellow, while the abdomen in the male is black. Length, 2-2.20 mm." (Ashmead).

Habitat: Missouri (Kirkwood).

Little is known regarding this species. The types are in the United States National Museum. Dr. Ashmead states that the insects from which his description was made, were received from Miss Murtfeldt with the statement that they were parasitic on a lepidopterous gall-maker on *Ambrosia*. Mr. Ashmead believes that there is some mistake in this statement as the flies are unquestionably true gall-makers and evidently form larval cells in the pith of *Ambrosia*, not observed by Miss Murtfeldt; and, moreover, their structural characters prove conclusively that they are not parasitic. It is also quite probable that the Lepidopteron is inquiline in the galls produced by this species. I have seen the types and believe the species will ultimately prove to be nothing more than a variety of *Aulacidea bicolor*.

***Aulacidea harringtoni* (Ashmead).**

Aulax harringtoni ASHMEAD, Trans. Am. Ent. Soc., Vol. XIV, 1887, p. 146; DALLA TORRE, Cat. Hymen. Vol. II, 1893, p. 12.

Aulacidea harringtoni KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95; DALLA TORRE and KIEFFER, Sen. Ins. Hymen. Fam. Cynip., 1902, p. 75.

Female. Head and thorax black, rugose, the sculpture being somewhat longitudinal. Antennæ 14-jointed, brown, reaching the tip of the abdomen, joints 3, 4 and 5 very nearly equal in length. Parapsidal grooves distinct. Median groove slight and extending from the scutellum not quite to the middle of the mesothorax. Scutellum rounded with two sharply defined, oblique foveæ at the base. Legs and abdomen reddish. Wings hyaline with distinct brown veins, a closed marginal cell, a rather large areolet and the cubital cell open at the base. Length, 3.25 mm.

Habitat: Canada (Ottawa).

The type, a single female, is in the United States National Museum. The thorax is somewhat shining, with the punctuation very minute. The parapsidal grooves sharply defined, and the median groove short and not extending to the middle of the thorax. The anterior parallel lines are extremely fine and scarcely evident, and the scutellum is evenly rugose. The abdomen, legs, and two basal joints of the antennæ are red brown, and the remaining joints of the latter are black. The gall is unknown.

***Aulacidea cavicola* (Ashmead).**

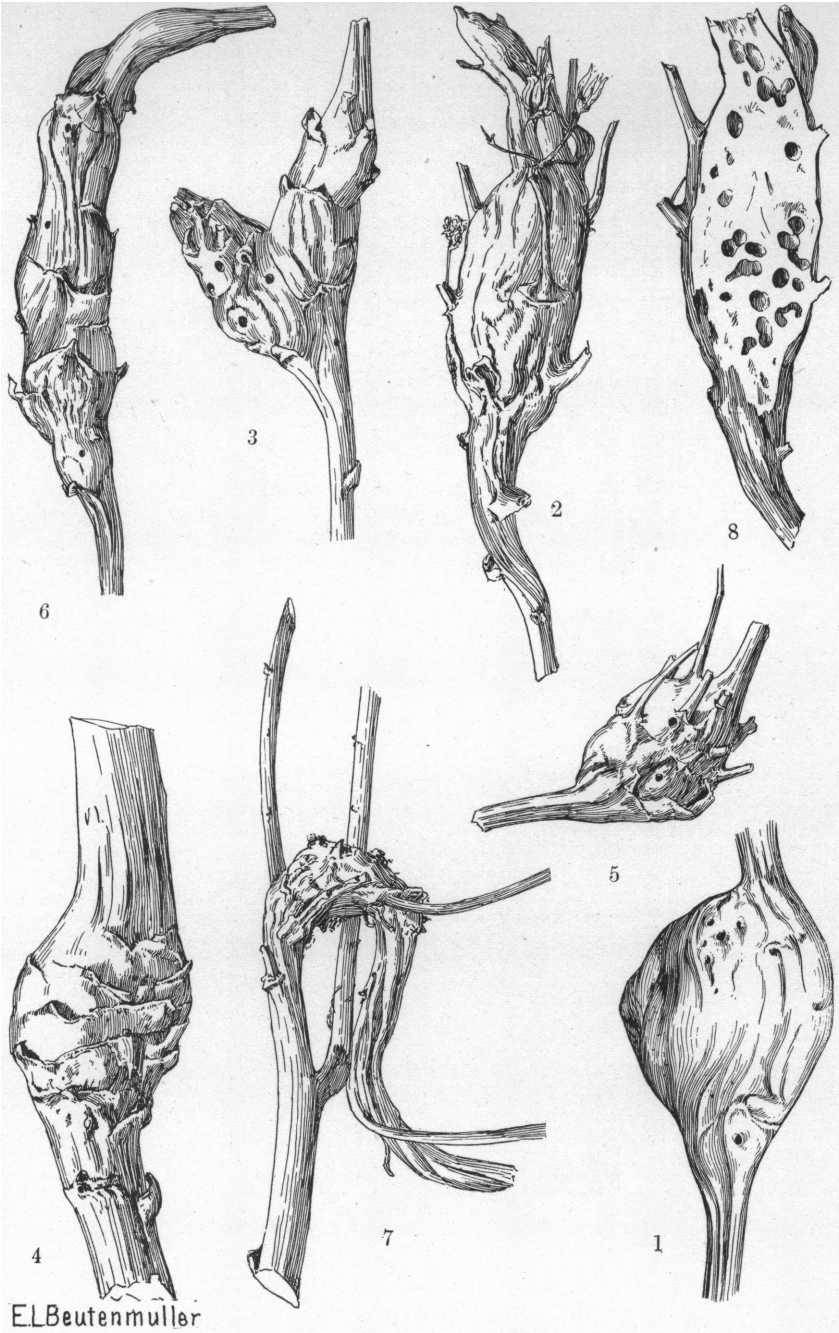
Aulax cavicola ASHMEAD, Proc. U. S. Nat. Mus., Vol. XIX, 1896, p. 134.

Aulacidea cavicola KIEFFER, Bull. Soc. Hist. Nat. Metz, ser. 2, Vol. X, 1902, p. 95; DALLA TORRE and KIEFFER, Gen. Ins. Hymen. Fam. Cynip., 1902, p. 75.

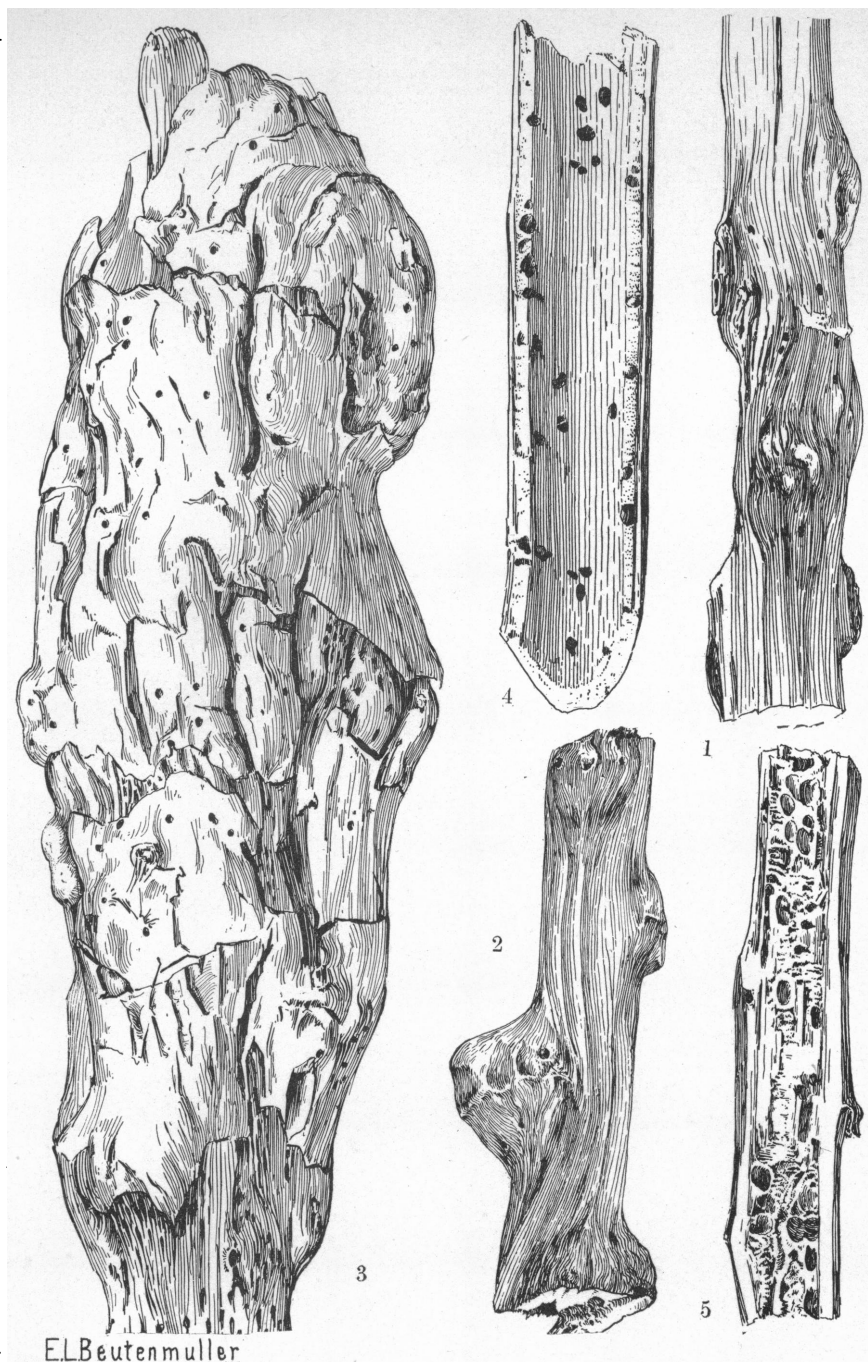
Female. "This species bears a very close resemblance to *A. mulgediicola*, but differs as follows: The face is without the median ridge; the short median groove of the mesothorax is longer, extending not quite to the middle; there is a distinct groove on the shoulders, extending from the base forward to at least half their length; the second and third abdominal segments dorsally at base are very dark, almost black, making the abdomen appear as if banded, while the basal joint of the posterior tarsi is longer than it is in *A. mulgediicola*. Length, 2.40 to 3 mm." (Ashmead).

Habitat: Missouri (Indian Cave).

The types, two females of this species are in the United States National Museum, and nothing concerning the gall is known. I have examined the types, but am not prepared to give an opinion upon them without further study. I am, however, inclined to believe that the species will prove to be the same as *Aulacidea tumida*.

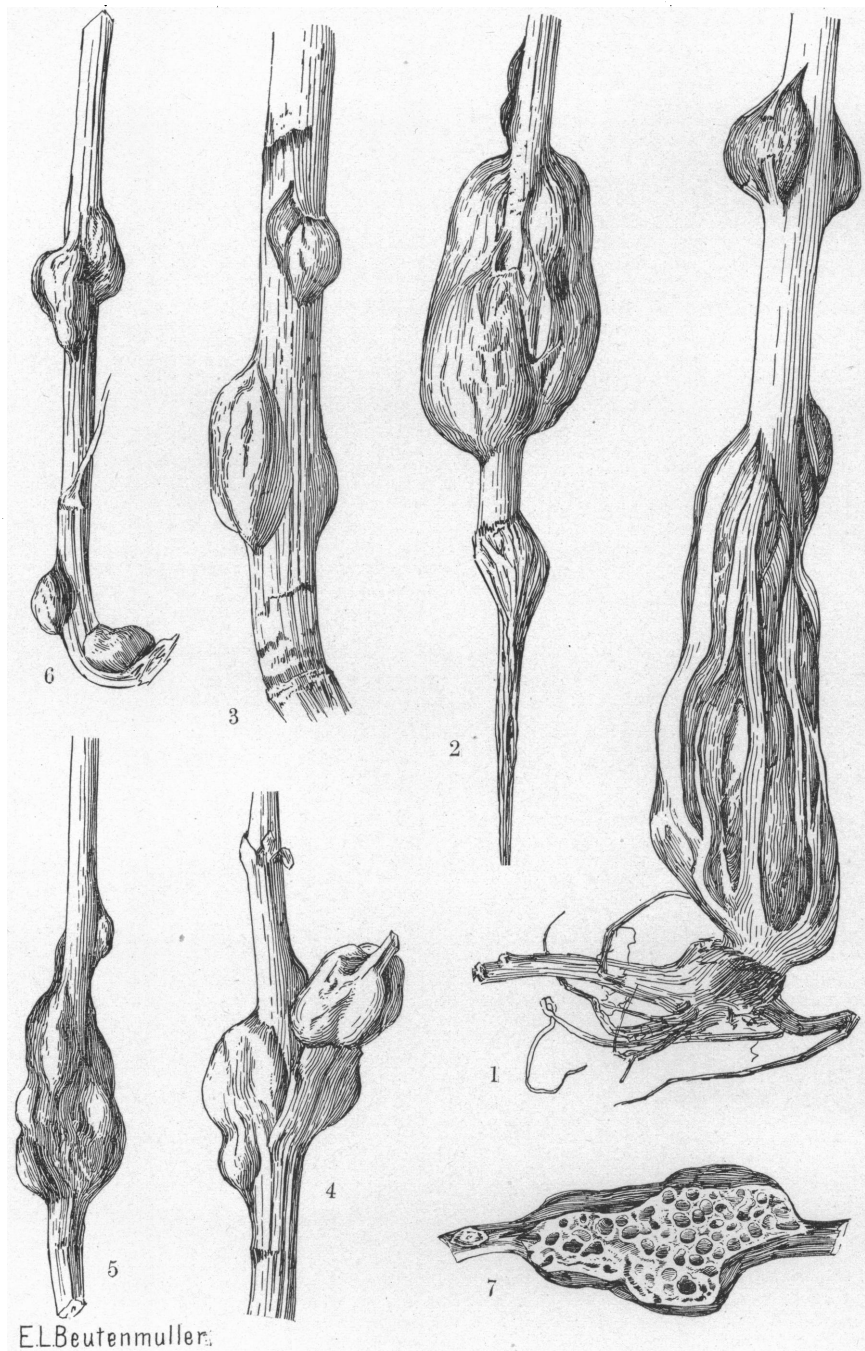


Figs. 1-8. *Aulacidea tumida* (Bassett).



Figs. 1-4. *Aulacidea podagra* (Bassett).

Fig. 5. *Aulacidea bicolor* (Gillette).



Figs. 1-7. *Aulacidea nabali* (Brodie).

