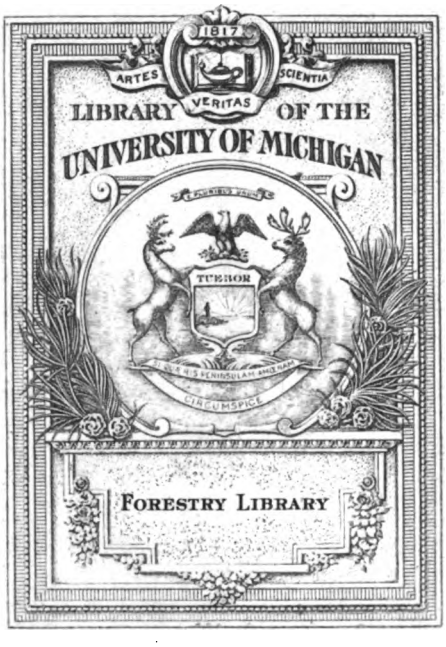

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CALIFORNIA GALL-MAKING CYNIPIDAE

WITH

DESCRIPTIONS OF NEW SPECIES

PLATES I AND II

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CONTENTS

INTRODUCTION

It is well known to the biologist that the deformations of plants designated as galls are mainly growths induced by insect larvae. These represent several orders of insects which need not be enumerated here. Chief amongst these are the gall-wasps belonging to the family Cynipidae, subfamily Cynipinae, of the order Hymenoptera.

California Cynipid gall fauna, as now known, consists of one hundred and ten species, twenty-one of which are herein described as new. Examples of all but eleven of these are to be found in the Stanford entomological collection, where it is hoped a complete series of western forms, at least, will eventually be deposited.[1]

With respect to their habits, the Cynipinae form two groups, the true gall-makers and their inquilines. Most of the former are accompanied by one or more of the latter. Of the twenty-one new species herein described, seven are gall-makers and fourteen are inquilines.

The object of this paper is to bring together the known species of California Cynipidae and their galls. Galls only are herein described, except in the case of new species. With the exception of seven gall-species not as yet in the Stanford Museum, galls are described from specimens at hand.

Biology of Gall-Making Cynipinae

The adult gall-making Cynipid female places its egg in the undifferentiated tissue of the bud in a part destined to become leaf, stem, or flower, in one of these parts after the bud has burst, or at the base of the tree trunk. At this point by means of some stimulus an excrescence known as a "gall" begins development simultaneously with the hatching of the larva, and continues its development as long as the larva continues to feed. The gall is the food-chamber of the larva.

Galls thus produced vary in form, size, color, and structure with the gall-wasp species producing them. Thus every gall-species, except perhaps certain twig swellings, has its unmistakable gall-structure. Each host plant, therefore, produces as many kinds of galls as there are kinds or species of gall-insects infesting it. Certain gall-species are restricted to one host-species only, while others are not so restricted. The meaning of this is not yet understood. Many facts regarding the unusual habits of

[1] Valuable contributions of paratypes and identified species have been received from Wm. Beutenmüller, Lewis Weld, S. A. Rohwer of the U. S. N. M., and Alfred Kinsey, to whom our thanks are due.

this interesting group require careful study and analysis before we arrive at an understanding of the group.

The few careful observations made relative to the beginning of Cynipid gall growth indicate, as stated, that this is simultaneous with the hatching of the larva from the egg. The investigation of Cozens [2] seems to demonstrate that the gall begins and continues development by means of an enzyme secreted by the larva and capable of changing starch into sugar. The undifferentiated tissue is at first changed into nutritive tissue. This not only becomes the feeding ground of the larva but accelerates the growth of surrounding tissue in such a way as to form a gall-structure peculiar to the species. Cell proliferation in the form of a gall is, according to this point of view, the response of the protoplasm of the host to this additional and continuous food supply, the material thus supplied furnishing nourishment for both larva and gall. Some unknown factor is present, however, for this does not account for the great variety of gall growths on the same tree and even on the same leaf.

A growing gall may be demonstrated in section to consist of a central nutritive layer immediately inclosing the larval cavity, surrounded usually by an area of protective cells, and a peripheral or epidermal layer. In certain galls the larval chamber or kernel is suspended in the center by a series of long spindling fibers as in *Callirhytis vaccinifolia* Ashm. and *Cynips maculipennis* Gillette. In mature galls of some species, as in *Dryophanta atrimenta* (K), these fibres may break away from the periphery, thus freeing the kernel. Other galls are hollow, the larva lying in a small kernel of nutritive cells adjacent to the periphery and at the base of the cell. In still other galls, minute in size, the larva occupies the whole inner area of the structure. Within the larval chamber the footless larva lies in immediate contact with the nutritive layer feeding upon its cell contents.

Examination of the large cells of the nutritive area in the gall of *Andricus californicus* (Bass), (the so-called oak-apple of the California valley oak, *Quercus lobata*) shows the condition demonstrated by Cozens,[3] following the view of Kustenmacher,[4] regarding the manner of larval feeding, namely, a mass of large cells with watery cell-contents, and in their midst, a number of empty cells, the cell walls broken and all contents evidently extracted. That the highy nutritious cell contents only are extracted accounts for the absence of frass in the larval chamber. Old galls, from which the adult insects have escaped, are made up for the most part of a

[2] Cozens, A. "Morphology and Biology of Insect Galls." *Trans. Can. Inst.*, 9: 297, 378, pls. XI, XII, XIII. 1912.

[3] Cozens, loc. cit.

[4] Kustenmacher, N. "Beiträge zur Kenntniss der Gallenbildungen mit Berücksichtigung des Gerbstoffes," Pring, *Jahr. Bot.*, 26: 82–182, 1894.

mass of empty cells, cell walls, more or less ligneous, which become the feeding ground of larvae of many insects.

The length of time in egg, larval and pupal stages, has been observed in but few species. It varies with the species within certain limits. Certain spring galls appearing with the bursting of the buds and blossoming of the oaks, have a relatively rapid growth. In some cases within a week or ten days after their appearance the galls are mature and the insects, male and female, make their exit. These are bisexual forms and presumably, in some cases, at least, perhaps in all, have alternate fall agamic generations. Other galls, appearing also in the spring, mature slowly and support a relatively long larval life of the insect. These are agamic species (females) and represent in some cases, presumably, the alternate generation of certain bisexual species, in others perhaps representing pure agamy as recorded by Adler,[5] for *Aylax glechomae* (L).

Insects from these galls may emerge in the late fall or early winter and seek the winter buds at once to oviposit, or the galls may fall to the ground from or with the leaves where the insects winter within the gall, either in larval or adult stage, as the case may be. In the late winter or early spring the adult females gnaw their way through the galls and emerge ready to oviposit.

Biology of Non-gall Makers, Inquilines

Of the biology of inquilines or guest wasps we know even less than of the gall-makers. Larvae of these are found within pockets in the galls surrounded by tissue of the protective zone and immediately encircled by nutritive cells. The inquiline has, presumably, the same power to assist in the manufacture of its food that pertains to the true gall-maker, and thus it derives the same benefit from the gall as its host.

The student of this group is struck by the fact that all species of inquilines are bisexual while, as stated, gall-makers are in part bisexual (notably those of rose, *Rubus,* herbaceous plants, etc.) and in part agamous.

Due to the many difficulties in the way of observation and study of this group, of the five hundred or more recorded American species, life cycles are known of but ten (Kinsey [6]) and of some of these, more or less incompletely. For no California species has a life history been completely worked out or alternation of generations been demonstrated.

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[5] Adler, Felix. "Beiträge zur Naturgeschichte der Cynipiden." *Deut. Ent. Zeit.,* 21: 209–248, 1877.

[6] Kinsey, Alfred C., "Life Histories of American Cynipidae," *Amer. Mus. Nat. Hist.,* 17: 319–357.

Family CYNIPIDAE Westwood

Sub-Family **CYNIPINAE** Thompson

The family Cynipidae as pointed out by Dalla Torre and Kieffer[1] takes its name from the genus *Cynips*, as established by Linnaeus in 1746, to designate all Hymenopterous insects obtained from galls. The Linnaean genus thus included Chalcids, Prototrupids, and other parasitic wasps, as well as Cynipids.

Pending a revision of the family by a student of this group, the synonomy as adopted by Dalla Torre and Kieffer, Beutenmüller and others, is here used, recognizing that careful morphological and biological studies will probably modify the standing of certain genera.

Galls on Oaks

Genus **BIORHIZA** Westwood

1. Biorhiza californica (Beutenmüller)

Philonix californica Beutenmüller, *Ent. News*, 22: 69, 1911.
Biorhiza californica (Beutenmüller), Fullaway, *Ann. Ent. Soc. of Amer.*, 4: 334, 1911.
Felt, *N. Y. State Mus. Bull.*, No. 200, p. 107, 1918.

Gall.—"On surface of leaves of a species of white oak. Monothalamous. Rounded, flattened disc-like, becoming slightly elevated toward the middle. The sides are flat and thin and the gall rests closely on the leaf. The larva lies in the center of the elevated part. The color is pinkish or purplish with the apex sometimes yellowish. Width 3–4 mm. Height 1 mm." (Beutenmüller).

Type.—"U. S. Nat. Mus. (female)."

Host.—Galls in the Stanford Museum, collected by Mr. Lewis Weld, are on *Quercus dumosa* Nuttall.

Type locality.—This species was described by Beutenmüller from Kern County, California. The Weld galls in the Stanford collection are from Paraiso Springs, Monterey County, California.

The insect from this gall is described by Beutenmüller to have aborted wings.

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[1] Dalla Torre and Kieffer, *Genera Insectorum*, fas. 9, 10, 1902, (Cynipidae).

Genus **NEUROTERUS** Hartig

2. **Neuroterus saltatorius** (Edwards)

Cynips saltatorius Edwards, *Pac. Rur. Press*, **8**: 33, fig. 1, 1874. Riley, *Amer. Nat.*, **10**: 218, 1876. *Trans. St. Louis Acad. Sci.*, **3**: cxci, 1878. *Proc. U. S. Nat. Mus.*, **5**: 634, 1883. *Ann. Mag. Nat. Hist.*, 5th Ser., **12**: 142, 1883.

Cynips saltatoria Riley, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 448, 1910.

Cynips saltitans Dodge, *Field and Forest*, **2**: 56, 1876.

Neuroterus saltatorius Ashmead, *Trans. Amer. Ent. Soc.*, **14**: 128, 1887. Cresson, *Trans. Amer. Ent. Soc.*, Supl. vol., p. 309, 1887. Dalla Torre, "Cat. Hymen,"**2**: 46, 1893. Howard, Bull. 54, Bur. Ent., p. 81, 1905. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **28**: 125, 1910, pl. 11, fig. 12. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 335, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 18, 1915. Felt, *N. Y. State Mus.*, Bull. No. 200, p. 106, fig. 107 (9 and 12), 1918.

GALL.—Small, 1 mm. to 1¼ mm. in longest diameter, sub-spherical, finely striate from base to within a short distance of the apex; apex drawn to a blunt point, thin-shelled; larval cell occupying whole interior of gall; very easily detached from leaf, falling to the ground from or with the leaves in the autumn.

Host.—*Quercus douglasi* Hooker and Arnott, *Quercus lobata* Née, *Quercus dumosa* Nuttall, and *Quercus garryana* Douglas.

Type locality.—Edwards described this species from specimens collected in Alameda County, California.

Specimens in the Stanford Entomological Museum are from Stockton, San Joaquin County; Brentwood, Contra Costa County; and Stanford campus, Santa Clara County. It has been recorded by Beutenmüller also from Marysville, Yuba County.

NOTE.—This species takes its name from the interesting habit of the insect within the gall of causing the gall to "jump" a few millimeters or so from the surface upon which it rests.

3. **Neuroterus decipiens** Kinsey

Neuroterus decipiens Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 292, pl. 24, fig. 9, 1922.

GALL.—Small, round, closely clustered galls in the leaf-blade of young leaves, involving both surfaces of the leaf, green when young, yellowish or reddish when mature. Monothalamous. Insects emerging from either upper or lower surface of leaf.

Host.—*Quercus douglasi* Hooker and Arnott, *Quercus dumosa* Nuttall, and *Quercus durata* Jepson.

Type.—"Amer. Mus. Nat. Hist." *Paratypes.*—"Kinsey Collection" and Stan. Ento. Mus. (contributed by Kinsey).

Type locality.—Kinsey records this species from Redding, Shasta County, California, and Three Rivers, Tulare County, California. In the Stanford collection there are specimens from Brentwood, Contra Costa County, and the Stanford campus (I. McC. col.), where it is found very abundantly in early spring, and from Redding (contributed by Kinsey).

4. Neuroterus fragilis Bassett

Neuroterus fragilis Bassett, *Trans. Amer. Ent. Soc.*, **26**: 335, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hym. Cynipidae," p. 51, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **38**: 133, pl. 13, fig. 1. "Das Tierreich," pt. 24, p. 330, 1910. Thompson, "Cat. Amer. Ins. Galls," p. 14, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 90, fig. 85 (1).

Neuroterus batatus Fullaway (not Fitch), *Ann. Ent. Soc. Amer.*, **4**: 334, 1911.

Neuroterus pacificus Beutenmüller, *Bull. Brook. Ent. Soc.*, **13**: 119, 1918.

GALL.—A plump, fleshy thickening of the midrib, particularly near base of leaf, or of veins, and involving more or less of the leaf tissue. Leaves affected become aborted or distorted. Adults (males and females) emerge from the gall while it is yet green and fleshy, usually in May. The shrivelled and hardened galls persist until fall. Polythalamous.

Host.—Of type not recorded. Galls in the Stanford collection are on *Quercus douglasi* Hooker and Arnott, where it is most common, and on *Quercus lobata* Née.

Host locality.—Bassett describes this species from specimens collected "at or near San Diego," California (Mrs. D. B. Hamilton col.). Stanford specimens are from Stephens Creek, Santa Clara County (R. Patterson col.), from Paso Robles, San Luis Obispo County (Weld col.), and from the Stanford campus (Weld and McC. col.).

Mr. Weld has called attention to the fact of the identity of this species and *Neuroterus batatus* Fullaway (not Fitch).

5. Neuroterus varians Kinsey

Neuroterus varians Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 294, pl. 24, figs. 17, 18, 1922.

GALL.—Blunt, distorted, terminal or lateral stem thickenings, the gall growths involving bud growths and young stem. Kinsey describes the larval cells as "closely compacted, located mostly toward the periphery; cells oval, averaging 1.5 to 1.8 mm., but varying in size; cells with a distinct, shell-like lining which is not, however, separable."

Host.—*Quercus lobata* Née.

Host locality.—Byron, Contra Costa County, California.

Type.—"Amer. Mus. Nat. Hist." *Paratypes.*—In the "Kinsey collection" and Stan. Ento. Mus. (contributed by Kinsey).

In the Stanford Museum there are specimens of this gall from Byron, Contra Costa County; Paso Robles, San Luis Obispo County (Kinsey col.); Stevens Creek, Santa Clara County (R. Patterson col.); and Sunol, Alameda County (I. McC. col.).

This is an early spring gall, adults emerge in March to May.

6. Neuroterus engelmanni Kinsey

Neuroterus engelmanni Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 293, pl. 24, fig. 14, 1922.

GALL.—Small blister-like swellings on the leaf tissue, scattered singly over the leaf surface, bulging slightly from both surfaces of the leaf. In specimens at hand, insects have emerged from under surface of leaf. Monothalamous.

Host.—Quercus engelmanni Greene.

Host locality.—Kinsey describes this species from Alpine and Fallbrook, San Diego County, California.

Type—"Amer. Mus. Nat. Hist." *Paratypes.*—In the "Kinsey collection" and Stan. Ento. Mus. (contributed by Kinsey).

This is an early spring gall.

Genus **DRYOPHANTA** Forster

7. Dryophanta clavula Beutenmüller

Dryophanta clavula Beutenmüller, *Ent. News*, **22**: 67, 1911. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **23**: 347, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 106, fig. 7, 1918.

Diplolepis clavula (Beutenmüller), Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 337, 1911.

GALL.—On underside of leaves of *Quercus lobata,* on midrib of vein, occasionally found on *Quercus douglasi.* Narrow stalk inflated into a club with pointed apex, slightly broadened at the base, but attached to the leaf by a narrow point, thin-walled, 1 to 2 mm. wide, 5 to 7 mm. long, the larva occupying the inflated part of gall, adult emerging from side. Monothalamous. This gall is green, tinted with red, ripening to brown and dropping to the ground with the leaves in the fall. From galls collected in November female adults emerged in the breeding room in January.

Host.—Quercus lobata Née. Occasionally on *Quercus douglasi* Hooker and Arnott.

Type locality.—This species was described by Beutenmüller from specimens sent to him from Napa and Sonoma Counties, California.

Specimens in the Stanford collection were collected in the Stanford University environs, Santa Clara County.

8. Dryophanta echina (Osten-Sacken)

Cynips quercus-echinus Osten-Sacken, *Trans. Amer. Ent. Soc.*, **3**: 56, 1870.

Cynips echinus Osten-Sacken, Ashmead, *Trans. Amer. Ent. Soc.*, **12**: 295, 1885. Dalla Torre, "Cat. Hymen," **2**: 68, 1893. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p. 59, 1902. "Das Tierreich," pt. 24, p. 440, 1910.

Andricus speciosus Bassett, *Trans. Amer. Ent. Soc.*, **17**: 81, 1890. Dalla Torre, "Cat. Hymen," **2**: 101, 1893. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p. 65, 1902.

Dryophanta speciosa Basset, Mayr, *Vehr. K. K. Zool. Bot.*, Gesell. Wien., **52**: 290, 1902.

Diplolepis speciosa Bassett, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 368, 1910.

Diplolepis echina (Osten-Sacken), Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 337, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 106, fig. 99, (6).

Dryophanta echinus (Osten-Sacken), Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **30**: 351, 1911.

GALL.—Bright coral color when ripe, white to pink in young stages, globular, covered with numerous short, blunt-pointed processes, attached to undersides of leaves, hard and brittle. A conspicuous gall, falling to the ground with the leaves in the fall. From galls collected in December, females emerged in the breeding room in January. This is probably premature emergence.

Host.—*Quercus douglasi* Hooker and Arnott.

Type locality.—Osten-Sacken described this species from specimens sent to him from Placer County, California, in "low hills of the Sierra Mountains."

Bassett described *Dryophanta speciosa* from specimens sent from Napa City, Napa County, California.

The specimens in the Stanford collection are from St. Helena, Napa County, and Hornitos, Mariposa County, California.

9. Dryophanta douglasi (Ashmead)

Holcaspis douglasi Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 127, 1896. Cockerell, "Ent. Stud.," **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 53, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **26**: 37, pl. 8, figs. 10, 11, 1909. Thompson, "Cat. Amer. Ins. Galls," p. 10, 1915.

Dryophanta douglasi Ashmead, Mayr, *Vehr. K. K. Zool. Bot.*, Gesell. Wien, **52**: 290, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **30**: 352, 1911.

Diplolepis douglasi Ashmead, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 369, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 338.

Disholcaspis douglasi Ashmead, Felt, *N. Y. State Mus. Bull.*, No. 200, p. 106, fig. 64 (10, 11), 1918.

GALL.—Pink, star-shaped, covered with a pale bloom, on undersides of leaves, 8 mm. high, 10 mm. in diameter, widening abruptly from narrow basal point to rim, which bears a varying number of irregular points forming the "star." Walls comparatively thick, larval chamber attached to wall by delicate, thin fibers. Ripe persistent galls fall to the ground in autumn with leaves, where they turn brown with age.

Females emerge in breeding room in January and February from galls collected in December from ground, or in November from trees.

Host.—Ashmead attributes this species to *Quercus douglasi* Hooker and Arnott. It is most commonly found on *Quercus lobata* Née.

Type locality.—Ashmead describes this species from specimens sent

to him by Mr. Albert Koebele from Marin County, California. There are specimens in the Stanford collection from Marin County and from several points in Santa Clara County, California.

10. Dryophanta dubiosa (Fullaway)

Diplolepis dubiosa Fullaway, *Ann. Ent. Soc. Amer.*, 4: 339, pl. 23, figs. 1, 2, 1911. *Dryophanta dubiosa* (Fullaway), Felt, *N. Y. State Mus. Bull.*, No. 200, p. 116, 1918.

GALL.—Small, glossy brown, thin-shelled, irregular club-shaped, arising singly or in clusters in the staminate flowers of *Quercus agrifolia*, occasionally on edge of leaves, length 3 mm., width 4 mm., a fold or ridge on one side, opposite side rounded and bulging apically with one or two more or less rounded processes. Monothalamous.

Galls appear with the staminate flowers from March to May, dependent upon season, adults emerge soon after blossoms ripen.

Host.—*Quercus agrifolia* Née.

Type.—Stan. Ento. Mus.

Type locality.—Stanford University environs, Santa Clara County, California.

This species has been found at many places on the San Francisco Peninsula (San Francisco, San Mateo, and Santa Clara Counties) and in Alameda County.

11. Dryophanta pulchella Beutenmüller

Dryophanta pulchella Beutenmüller, *Ent. News*, 22: 357, 1911. *Bull. Amer. Mus. Nat. Hist.*, 30: 355, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 120, 1918.

GALL.—Unknown.

Host.—Unknown.

Type locality.—Beutenmüller described this species from specimens from Catalina Island, California, and also records it from Hood River, Oregon.

12. Dryophanta lobata new species

FEMALE.—Black with yellow areas as follows: palpi, mandibles basally, first two segments of the antennae, tegulae, legs from the distal part of coxae to third tarsal segment, and sheath of ovipositor. *Head* reticulate, sparsely pubescent, front of face rugose, two conspicuous pits at extremities of the clypeo-frontal suture, longitudinal depressions between bases of antennae and compound eyes extending ventrad, depression below median simple eyes. Antennae 14-segmented, first and second stout, third longest, fourth and following progressively shorter except the last, which is longer than the penultimate. *Thorax.* Pronotum very narrow in the middle, rugose, pubescent. Mesonotum reticulate with a few scattered hairs. Parapsidal grooves complete, converging posteriorly. Smooth and shining areas on either side of parapsidal grooves and lateral grooves over

base of wings distinct. Subalar areas of the mesopleurae reticulate above, irregularly corrugated and pubescent below. Mesopleurae aciculate with smooth and shining patches, sparsely pubescent. Scutellum cushion-shaped, rugose, with an arcuate transverse groove at base. Metanotum reticulate medially. Propodeum rugose, pubescent laterally with large spiracles. Legs pubescent. Claws bidentate. Wings hyaline, pubescent, radial cell open along the margin, areolet distinct, basal, subcostal and radial veins heavy, a short shaded spur on the medial part of the medial nerve, cubitus reaching basal vein. *Abdomen* smooth and shining, sparsely pubescent basally and distally, second tergite occupying more than half its length, ventral valve pubescent. Length 2.4 mm.

MALE.—With 15-segmented antennae, all segments of which are black; legs with a greater extent of dark area. Length 2.5 mm.

GALL.—(Plate I, fig. 9.) A small, thin-shelled bud gall. Externally longitudinally ridged, each ridge ending in pointed process some distance before the apex, the apex drawn into a point. Internally hollow. Color light green. Monothalamous. The size varies from 4 to 7 mm. in length. This gall matures within a short time of its first appearance on the twig in spring with the bursting of the leaf buds.

Host.—Quercus lobata Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County (McCracken collector).

Described from fifteen females and fifteen males collected April, 1917.

13. Dryophanta pedicellata (Kinsey)

Plate I, Fig. 6

Andricus pedicellatus Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 284, 1922.

GALL.—Small, spindle-shaped galls at edge of leaves. Base drawn out into a long petiole which is a prolongation of the vein. Gall thin-walled without kernel. Monothalamous.

Host.—Quercus douglasi Hooker and Arnott.

Type.—"Amer. Mus. Nat. Hist." and in the "Kinsey collection."

Type locality.—Three Rivers, Tulare County, Kinsey collector.

Mr. Kinsey records this species also from Oroville, Butte County. It is a very common species of *Quercus douglasi* on the Stanford campus, appearing in the early spring with the opening of the buds.

14. Dryophanta atrimenta (Kinsey)

Plate I, Fig. 2

Andricus atrimentus Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 279, pl. 24, figs. 15, 16, 1922.

GALL.—Kinsey describes this gall as a small inflated capsule in the

leaf-blade. Monothalamous. Spherical, 3–5 mm. in diameter, about smooth, leaf-green when fresh, soon paling, finally drying yellow-brown. Walls thin, a thin-walled larval cell about 1.5 mm. in diameter, is connected with the outside wall by a tangle of dense, but not definitely branched fibers. In the leaf-tissue, projecting about equally on either side, usually near the edge of young leaves.

Host.—*Quercus douglasi* Hooker and Arnott.

Type.—"Amer. Mus. Nat. Hist." and the "Kinsey collection." Mr. Kinsey has placed paratype galls in the Stanford Entomological Museum.

Type locality.—Kinsey records this species from Three Rivers, Tulare County, and Redding, Shasta County. It is a very common gall in Santa Clara, Contra Costa, and Alameda Counties, California.

The small pea-shaped galls appear in early spring a glistening pea-green on undersides or edge of leaves or on petiole. Internal kernel black, fine radiating fibers white. Monothalamous. This gall in Santa Clara County appears early in April with the unfolding of the leaves, the dried and old gall persisting many months.

Genus **DISHOLCASPIS** Dalla Torre and Kieffer

15. **Disholcaspis truckeensis** (Ashmead)

Holcaspis truckeensis Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 127, 1896. Cockerell, "Ent. Stud.," **1**: 10, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hym. Cynipidae," p. 53, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **26**: 38, pl. 8, fig. 13, 1909.

Disholcaspis truckeensis Ashmead, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 380, 1910. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 62, fig. 64 (13). Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 340, 1911.

GALL.—The gall of this species is described by Ashmead as an "irregular, inflated, hard wood gall over an inch long and about half an inch in diameter, issuing from a slit in a terminal twig."

Host.—*Quercus chrysolepus* var. *vaccinifolia* Kellogg and *Quercus chrysolepis* Lieb.

Type.—No. 3080, U. S. Nat. Mus.

Type locality.—"California."

We have found this species at Huntington Lake, Fresno County, California, on *vaccinifolia* and in Santa Clara County on *chrysolepis*. The agamic females emerged in the fall from galls collected in August.

16. **Disholcaspis chrysolepidis** (Beutenmüller)

Holcaspis chrysolepidis Beutenmüller, *Bull Amer. Mus. Nat. Hist.*, **26**: 44, pl. 8, figs. 8, 9, 1909. *Ent. News*, **22**: 68, 1911.

Disholcaspis chrysolepidis (Beutenmüller), Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 341. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 62, figs. 8, 9.

GALL.—Sessile, 15 or more occurring in a cluster, more or less sur-

rounding the twigs. A smooth, irregularly lobular basal part supporting a more or less cushion-shaped part 3 or 4 mm. in diameter. Reddish or beef-colored when fresh. Monothalamous.

This gall furnishes a sweetish secretion favored by ants.

Females emerge in the breeding room in December from galls collected the previous September.

Host.—*Quercus chrysolepis* Liebman.

Type.—"U. S. Nat. Mus."

Type locality.—This species was described by Beutenmüller (1911) from Placer County, California.

In the Stanford collection there are specimens of this species collected at Alma Soda Springs, Santa Clara County, by Professor William Dudley, and from Stanford campus.

17. Disholcaspis eldoradensis (Beutenmüller)

Holcaspis eldoradensis Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **26**: 38, pl. 9, figs. 6, 7, 1909.

Disholcaspis eldoradensis (Beutenmüller) Fullaway, *Ann. Soc. Amer.*, **4**: 340, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 68, fig. 63, (6, 7).

GALL.—Small, reddish-brown, sessile, cushion-shaped galls. Base emerging from slit in bark, several galls in a row, adjacent, persistent. Deep wine color in growing stage. Upper surface is pitted and exudes a sweetish secretion attractive to ants. 3 to 5 mm. in diameter, 3 mm. high.

Agamic females emerge in December in the breeding room from galls collected in September. Mature galls opened during the winter months are found to contain imagoes, these not emerging until spring. Monothalamous.

Host.—*Quercus lobata* Née, *Querus durata* Jepson, and *Quercus dumosa* Nuttall.

Type.—"Amer. Mus. Nat. Hist."

Type locality.—Beutenmüller describes this species from Sonoma County, California.

In the Stanford Entomological Museum there are specimens collected on the Stanford campus by McCracken and Patterson.

18. Disholcaspis plumbella Kinsey

Plate II, Fig. 4

Disholcaspis plumbella Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **42**: 314, pl. 26, figs. 34, 36, 1920.

GALL.—"Small brown bullet-galls, bearing a sharp projecting point at the apex. Monothalamous. Entirely spherical, 9 mm. or less in diameter, yellowish or reddish-brown, the surface of the dried galls shrivelled, but essentially smooth, bearing a sharp point at the apex which is about 1.5 mm. long. Internally the gall is filled with a loosely granular yellow

tissue. The larval cell is hardly distinct from this surrounding tissue. On twigs of *Quercus dumosa.*" (Kinsey.)

Type.—"Harvard Mus. Compar. Zool."

Type locality.—Kinsey described this species from an insect cut from a gall collected in San Diego County by D. Cleveland.

It is a common gall on the foothills of the Stanford environs, Santa Clara County, California.

Galls of this species in the Stanford collection are mahogany-red on exposed side, bright yellow on shaded side, covered with golden-yellow very slightly raised spots, subspherical with apex drawn to a point, 6 to 8 mm. in diameter when mature. Monothalamous.

This is a very conspicuous gall, growing in the axils of leaves. The old galls are persistent, turning brown on weathering. It is very abundant on both *dumosa* and *durata.* (This gall is figured in Kellogg's "American Insects," fig. 663, p. 471.)

Genus **BASSETTIA** Ashmead

19. **Bassettia ligni** Kinsey

Bassettia ligni Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 291, pl. 24, fig. 1, 1922.

GALL.—Kinsey describes this gall "within wood of small twigs, usually not distorting the stem, or producing hardly noticeable swelling. Each cell is elongate oval, about 1.0 by 2.5 mm., with a shell-like lining, distinct from but hardly separable from the wood, the cells lie wholly within the wood which is not particularly modified; often a hundred or more are closely crowded in dense clusters. Exit holes clearly circular, about 0.5 mm. in diameter, disclose the infestation."

Type.—"Amer. Mus. Nat. Hist." *Paratypes.*—"Kinsey collection."

Type locality.—Galt, Sacramento County, California.

Host.—*Quercus douglasi* Hooker and Arnott.

In the Stanford Entomological Museum are galls of this species sent by Kinsey from his type locality, on *Q. douglasi,* and galls apparently of this species collected on Black Mountain, Santa Clara County, on *Q. dumosa,* by L. Weld, and near Corvallis, Oregon, on *Q. garryana,* by R. W. Doane.

Genus **TRICHOTERAS** Ashmead

20. **Trichoterus coquilletti** Ashmead

Trichoterus coquilletti Ashmead, *Psyche,* **8**: 68, 1897. Cockerell, "Ent. Stud.," **1**: 10, 1900. Ashmead, *Psyche,* **10**: 150, 1903. Dalla Torre and Kieffer, "Das Tierreich, pt. 24, p. 404, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 341, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 18, 1915. Felt, *N. Y. State Mus. Bull,* No. 200, p. 102, 1918.

GALL.—Described by Ashmead as "small, brown, subopaque, globular

galls, averaging 6 to 8 mm. in diameter, and internally with a central kernel or larval cell held in place by radiating filaments. Galls on under surface of leaves.

Host.—(Of type, not known.)

Type.—"No. 3498, U. S. Nat. Mus."

Type locality.—This species was described by Ashmead from insects reared from galls collected by D. W. Coquillett at Los Angeles, California.

In the Stanford collection there are galls of this species collected by Mr. Lewis Weld on *Quercus wilcoxi,* in the Santa Catalina Mountains.

Genus **CYNIPS** Linneas

21. **Cynips canescens** (Bassett)

Holcaspis canescens Bassett, *Trans. Amer. Ent. Soc.,* **17**: 66, 1890. Dalla Torre, "Cat. Hymen," **2**: 55, 1893. Cockerell, "Ent. Stud.," **1**: 10, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 53, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.,* **26**: 34.

Disholcaspis canescens Bassett, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 378, 1910.

Cynips canescens Bassett, Fullaway, *Ann. Ent. Soc. Amer.,* **4**: 342. Felt, *N. Y. State Mus. Bull.,* No. 200, p. 68, 1918.

GALL.—Brown, globular, 10 to 15 mm. in diameter, usually occurring singly in axils of leaves, or on twigs displacing buds, sometimes considerably roughened, usually more or less smooth, young galls greenish. Females emerge in January from galls collected in December. Monothalamous.

Host.—*Quercus douglasi* Hooker and Arnott, *Quercus lobata* Née.

Type—"Amer. Ent. Soc. Phil."

Type locality.—Bassett described this species from Napa City, Napa County, California, received from Mrs. E. H. King.

In the Stanford collection there are specimens from Hornitos, Mariposa County, and Stanford University environs, Santa Clara County.

Galls of this species collected August, 1919, furnished living parasitic larvae February, 1921.

This is a very common gall on *Q. douglasi,* found occasionally on *Q. lobata* and rarely on *Q. durata.*

22. **Cynips corallina** (Bassett)

Holcaspis corallinus Bassett, *Trans. Amer. Ent. Soc.,* **17**: 66, 1890. Cockerell, "Ent. Stud.," **1**: 9, 1900.

Holcaspis corallina Dalla Torre, "Cat. Hymen," **2**: 55, 1893. Dalla Torre and Kieffer, "Gen. Ins. Hymen.," p. 53, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.,* **26**: 37, pl. 9, figs. 13, 14, 1909.

Disholcaspis corallina Bassett, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 377, 1910.

Cynips corallina Bassett, Fullaway, *Ann. Ent. Soc. Amer.,* **14**: 343, 1911. Felt, *N. Y. State Mus. Bull.,* No. 200, p. 68, fig. 63 (13, 14), 1917.

GALL.—Reddish, spherical, surface covered with fuzzy, irregular tubercles, 12 mm. in diameter, borne on twigs in axils of leaves of *Quercus douglasi* Hooker and Arnott. Monothalamous.

Type.—Amer. Ent. Soc. Phila. *Paratypes.*—Amer. Mus. Nat. Hist.

Type locality.—Bassett described this species from Napa City, Napa County, California, received from Mrs. E. H. King.

In the Stanford collection there are specimens from Mt. Diablo, collected by Dr. Van Dyke and Mr. Essig; and Brentwood, Contra Costa County, California, collected by I. McCracken.

23. Cynips maculipennis (Gillette)

Holcaspis maculipennis Gillette, *Can. Ent.*, **26**: 236, 1894. Cockerell, *Trans. Kan. Acad. Sci.*, **16**: 213, 1899. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 54, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **26**: 43, pl. 10, figs. 2, 3, 1909.

Disholcaspis maculipennis Gillette, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 375, 1910.

Cynips maculipennis Gillette, Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 344, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 100, fig. 65 (4, 5), 1918.

GALL.—Described by Beutenmüller as found "single or in clusters of two or more on the upper sides of the leaves of oak (*Quercus wrightii, Quercus undulata, Quercus garryana*), and probably allied species. Globular, yellowish, composed of a thin outer shell and a single larval cell held in place by radiating fibers. Yellowish-brown when dry and covered with darker brown rounded spots. Diameter 15 to 30 mm."

This description answers equally well for *Callirhytis vaccinifoliae* Ashmead.

The galls in the Stanford collection labelled "*Cynips maculipennis* Gillette" are 30 mm. or more in diameter, yellowish to yellowish brown, thickly specked with brownish red spots. Outer shell thin, the larval chamber held in place by radiating fibers, and connected with the base by a hollow fibrous stalk. The kernel is much larger than in *Callirhytis vaccinifoliae* Ashmead, and surface more conspicuously spotted.

Host.—The type material was described from the oak *Quercus undulata* v. *wrightii.* The specimens so labelled in the Stanford collection were found on *Quercus garryana* Hooker.

Type locality.—Gillette described this species from Oregon Mountain, New Mexico.

The Stanford specimens have come from Mt. Conaughy, Siskiyou County, collected by Miss Patterson; Salem, Oregon, collected by Carl Duncan; and Yreka, Mendocino County, collected by D. Overman.

The female adult in the Stanford collection answers Beutenmüller's description of this species, but does not strictly answer to that of Gillette.

I am inclined to consider it different, in which case *Cynips maculipennis* Gillette is recorded doubtfully from California.

24. Cynips multipunctata (Beutenmüller)

Dryophanta multipunctata Beutenmüller, *Ent. News*, 22: 67, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 103, 1918.

Cynips multipunctata Beutenmüller, Fullaway, *Ann. Ent. Soc. Amer.*, 4: 343, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 66, 1918.

GALL.—Small, dark brown, globular, singly or in clusters of few to several on upper or under sides of leaves, or on stems. Normally spherical, but when clustered, more or less irregular in shape, due to crowding, 8 to 10 mm. in diameter. Surface rugose when ripe. Monothalamous.

Host.—*Quercus lobata* Née.

Type.—U. S. Nat. Mus.

Type locality.—Beutenmüller describes this species from Kern County, California.

Specimens in the Stanford collection are from the Stanford University environs, Santa Clara County, California.

Fullaway expresses a doubt as to the identity of *Dryophanta multipunctata* and *Cynips multipunctata* Beut. and Felt lists them as separate species.

25. Cynips heldae Fullaway

Cynips heldae Fullaway, *Ann. Ent. Soc. Amer.*, 4: 343, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 106.

GALL.—Brown, glossy, irregular—irregularity due to ridged and pointed tubercles miscellaneously projecting from the surface.

Host.—*Quercus lobata* Née.

Type.—Stan. Ent. Mus.

Type locality.—Ukiah, Mendocino County, Miss Held collector.

26. Cynips kelloggii Fullaway

Cynips kelloggii Fullaway, *Ann. Ent. Soc. Amer.*, 4: 345, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 56, 1918.

GALL.—"An irregular swelling of the twig at a node, about 20 mm. long and 10 mm. wide; outer wall same as bark of twig. Polythalamous.

Host.—*Quercus dumosa* Nuttall and *Quercus lobata* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stevens Creek, Santa Clara County, California. There are specimens of this species in the Stanford collection from several places in Santa Clara County and from Paso Robles, California.

27. Cynips rufescens new species

FEMALE.—Reddish brown with dark brown areas as follows: eyes, patches in ocellar area, tips of mandibles, margins of the antennal fossae, distal margin of last eight antennal segments, ridges on the metanotum, petiole. Last tarsal segment, hind tibiae, last eight antennal segments (except distal margins) fuscous. *Head* pubescent, vertex and genae reticulate, front and clypeus punctate, clypeo-frontal suture in a deep groove, depression below simple eye, cheeks bulging behind the eyes. Antennae 15-segmented, first and second stout, third longest, fourth and fifth subequal, following segments progressively shorter, except the last, which is a little longer than the penultimate. *Thorax*. Pronotum narrow in the middle, pubescent. Parapsidal grooves complete, median line not reaching middle, median longitudinal lines reaching middle and ending in depressions, smooth and shining areas on either side of parapsidal grooves and lateral grooves over the base of wings distinct. Mesopleurae finely corrugated and pubescent, with small non-pubescent shining areas above the middle. Scutellum cushion-shaped, punctate, pubescent, foveae deep, separated by two carinae, bottoms corrugated, glossy. Legs pubescent, claws bidentate. Wings hyaline, pubescent, radial cell long, open on the margin; basil, subcostal and radial veins heavy, basal part of radial vein angulate, areolet large, distinct, cubitus reaching basal vein. *Abdomen* smooth and shining, pubescent laterally and on the dorsum basally; second tergite occupying more than half its length, valves prominent. Length 3.5 mm.

GALL.—Hard, woody, irregular, polythalamous, twig swelling. Sometimes the twigs become aborted through the growth of the gall. About 10–20 mm. in diameter. Larvae found in thin walled chambers. Galls collected in fall, adults cut out in February.

Host.—*Quercus dumosa* Nuttall.

Type.—Stan. Ento. Mus.

Type locality.—Black Mountain, Santa Clara County, California, D. Egbert collector.

28. Cynips washingtonensis Gillette

Cynips washingtonensis Gillette, *Can. Ento.*, **26**: 335, 1899. Dalla Torre and Kieffer, in "Wytsman Gen. Ins.," p. 60, 1902; "Das Tierreich," pt. 24, p. 531, 1910. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 64, 1918.

GALL.—Described by Gillette as "ellipsoid, from 5 to 7 mm. in greatest diameter, smooth, monothalamous and snuff colored, both externally and internally, and attached by a small projection to the side of small twigs."

Host.—*Quercus garryana* Douglas.

Type locality.—This species is described from Olympia, Washington.

Galls in the Stanford collection identified as belonging to this species are round, rather than ellipsoid, and are found abundantly on *Quercus lobata* Née, and occasionally on *Quercus durata* Jepson, and *Quercus dumosa* Nuttall, in Santa Clara County.

The young galls are covered with a velvety mass of hairs, and begin development in the early spring. On certain trees in May one finds galls of all sizes from very young galls to galls mature in size. Within the latter the very immature small larva lies within a relatively large central cell.

Genus **ANDRICUS** Hartig

29. **Andricus californicus** (Bassett)

Cynips quercus-californicus Bassett, *Can. Ent.*, **13**: 51, 1881. Riley, "Amer. Nat.," **15**: 402, 403, 1881.

Andricus californicus Bassett, Mayr, "Gen. Gallenben. Cynip.," p. 28, 1881. Dalla Torre and Kieffer, in "Wytsman Gen. Ins.," p. 62, 1902. Felt., *N. Y. State Mus. Bull.*, No. 200, p. 62, 1918.

Andricus (Callirhytis) californicus Bassett, Ashmead, *Trans. Amer. Ent. Soc.*, **12**: 294, 1885.

Andricus quercus-californicus Bassett, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 531, 1910.

GALL.—Subglobular or varying in form from balloon-shaped to kidney-shaped, 40 to 100 mm. in diameter, sessile, emerging from a slit in the bark. This is by far the largest gall reported in the state and the most abundant on *Quercus lobata,* where it occurs sometimes by the thousands on a single tree. It occurs less frequently on *Q. douglasi* and more rarely upon *Q. durata* and *Q. dumosa.* Apple green, when young, reddish on side exposed to sun, turning to tan when ripe, polythalamous, two to twelve insects in a gall.

Insects emerge in October, November, and December from persistent galls. The galls appear early in the winter as small nodules covered by bark. They break through the bark in early spring and ripen in July. Adults emerge in late fall or early winter. The old galls then persist until decay sets in, becoming the feeding ground of other insects.

Host.—*Quercus lobata* Née, *Quercus douglasi* Hooker and Arnott, *Quercus dumosa* Nuttall, *Quercus durata* Jepson.

Type.—"Amer. Mus. Nat. Hist."

Type locality.—Redwood City, San Mateo County, California.

In the Stanford collection there are specimens from Santa Rosa, Sonoma County, California, and Stanford University campus, Santa Clara County, California (I. McC. col.), and other parts of the state.

30. **Andricus chrysolepidis** Ashmead

Andricus chrysolepidis Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 119, 1896. Cockerell, "Ent. Stud.," **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipi-

dae," p. 62, 1902; "Das Tierreich," pt. 24, p. 553, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 346, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 68, 1918.

GALL.—Ashmead describes this gall as "very hard ovate or globular, with a nipple at the apex and a centrally embedded larval cell. Externally it is covered with a dense fine, short pubescence like the pubescence on a peach, although this is sometimes rubbed off. Diameter 5 to 8 mm."

Host.—Quercus chrysolepis Liebmann.

Type.—"No. 3066, U. S. N. M."

Type locality.—Ashmead describes this gall from Colfax, Placer County, California, collected by Albert Koebele.

Not in Stanford collection.

31. **Andricus congregatus** Ashmead

Andricus congregatus Ashmead, *Proc. U. S. Nat. Mus.*, 19: 120, 1896. Cockerell, "Ent. Stud., 1: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p. 62; "Das Tierreich," pt. 24, p. 533, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 347, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 8, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 62, 1918.

GALL.—Described by Ashmead as "an irregular, rugose, yellowish brown, woody swelling, containing numerous cells, growing apparently from the extreme tip of very slender twigs of *Quercus chrysolepis,* the galls appearing to have a long peduncle, or it may be found at the apex of the petiole of a leaf, the leaf in consequence being aborted. Varies in length from 2 to 4 cm. and in diameter from 1 to 2 cm. Polythalamous."

Host.—Quercus chrysolepis Liebmann(?) and *Quercus agrifolia* Née.

Type.—"No. 3068, U. S. N. M."

Type locality.—Oakland, Alameda County, California.

Specimens in the Stanford collection from the Stanford campus on *Quercus agrifolia,* upon which it is a very common gall. These galls appear in the early spring with the blossoms and young leaves. They are formed in the petioles of the leaves or blossoms. On the latter the petioles become greatly elongated, the galls frequently covered with remnants of aborted stamens. At the apex of the petiole of the leaf the leaves, as stated by Ashmead, "become greatly aborted" and wither beyond the gall. It is believed that *Quercus chrysolepis* is a case of mistaken host identity for this species.

32. **Andricus pacificus** Ashmead

Andricus pacificus Ashmead, *Proc. U. S. Nat. Mus.*, 19: 118, 1896. Cockerell, *Ent. Stud.*, 1: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hym. Cynipidae," p. 64, 1902; "Das Tierreich," pt. 24, p. 532, 1910. Fullaway, *Ann. Amer. Ent. Soc.*, 4: 348, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 33, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 68, 1918.

GALL.—This varies in shape from a small, irregularly rounded gall without apex to a more or less evenly spindle-shaped gall, the apex elon-

gated and sharply pointed. It tapers to a point at the base, where it is sessile, attached to a twig in the axil of a leaf stem. The surface may be smooth or wrinkled, green during growth or greenish gray mottled with purple, turning brown when ripe. The larval cell is at the center of gall at distal end of a tube which is open at base. Insect emerges near base of gall. Monothalamous. From persistent galls gathered in Santa Clara County in November adults emerged in the breeding room during the following February and March.

Host.—*Quercus chrysolepis* Liebmann, *Quercus vaccinifolia* Engelm.

Type.—"No. 3064, U. S. Nat. Mus."

Type locality.—Ashmead described this species from Placer County, California (Albert Koebele collector).

In the Stanford collection there are specimens from Stevens Creek, Santa Clara County (Patterson col.); Permenente Creek, Santa Clara County (Florence col.); Congress Springs, Santa Clara County.; California Redwood Park, Santa Cruz County (McCracken col.); and from Fallen Leaf, Eldorado County (Van Dyke, Bentley, I. McC.).

33. **Andricus wisliceni** Ashmead

Andricus wisliceni Ashmead, *Proc. U. S. Nat. Mus.*, 19: 119, 1896. Cockerell, "Ent. Stud.," 1: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p. 65, 1902; "Das Tierreich," pt. 24, p. 534. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 351, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 9, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 68.

GALL.—Ashmead describes this gall as a "small globular gall, with a slight projection at the base where it is attached to the twig. It varies in color from a yellow-brown to a brown, and some are mottled with purple-brown. It is hard and contains in the center a small larval cell. Diameter 3 to 4 mm.

Host.—*Quercus wisliceni* A. de Candolle.

Type.—"No. 3065, U. S. N. M."

Type locality.—Ashmead describes this species from Sacramento County, California, from specimens collected by Albert Koebele. Not in Stanford collection.

34. **Andricus crystallinus** Bassett

Andricus crystallinus Bassett, *Trans. Amer. Ent. Soc.*, 26: 319, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen," p. 62, 1902; "Das Tierreich," pt. 24, p. 548, 1914. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 348, 1911. Thompson, "Amer. Ins. Galls," p. 19, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 109, 1918.

GALL.—Irregular, pallisadal, covered with crystalline filaments, clustered into a compact semi-spherical mass on undersides of leaves (exceptionally on upper sides). The individual galls are 8 or 9 mm. in length and 3 or 4 mm. in width, hollow with the kernel in the basal half. The

galls form masses 20 to 25 mm. broad and abort the leaves upon which they grow. Monothalamous. Deciduous.

Host.—*Quercus dumosa* Nuttall, *Quercus durata* Jepson, and occasionally on *Quercus douglasi* Hooker and Arnott and *Quercus lobata* Née.

Type.—"Amer. Mus. Nat. Hist."

Type locality.—Bassett describes this species from Napa County, California.

In the Stanford collection are specimens from St. Helena, Black Mountain, Santa Clara County, DeSabla, Butte County, California, and the Stanford Campus, Santa Clara County, California.

35. Andricus dasydactyli Ashmead

Andricus dasydactyli Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 117, 1896. Cockerell, "Ent. Stud.," **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen," p. 61, 1902; "Das Tierreich," pt. 24, p. 532, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 349, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 72, 1918.

GALL.—Ashmead describes this gall as consisting of "an oblong or elongated, woody tube, in shape not unlike a date seed; it is 2 centimeters long by one and one-half to three-quarters of a centimeter in diameter, one end being attached sessilely to the branch and covered with long, brownish-yellow wool. Internally there is a cylindrical hollow, which, however, does not extend its entire length, being interrupted or stopped up by the small larval cell which is situated near its center. Sometimes three or more of these galls occur close together on the branch, and with their woolly covering present a curious appearance."

Host.—*Quercus chrysolepis* Liebmann.

Type.—"No. 3063, U. S. N. M."

Type locality.—"California."

The identity of this species is in doubt.

36. Andricus kingi Bassett

Andricus kingi Bassett, *Trans. Amer. Ent. Soc.*, **26**: 316–317, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen.," p. 63, 1902; "Das Tierreich," pt. 24, p. 539. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 350, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 108.

GALL.—Small, pink, semi-conical, attached mainly to the underside of leaves by a very minute stalk, saucer-shaped basally and open at apex. The closed larval cell lies at the base of the otherwise hollow gall. Sides finely reticulate, sparsely covered with white hairs. Leaves discolored at point of attachment in mature specimens. On *douglasi*, these galls are prettily striped with deep pink or red. Galls drop to ground with or on falling leaves in the autumn. Adults appear in the breeding rooms in April from galls collected in October and November. Monothalamous.

Host.—*Quercus lobata* Née and *Quercus douglasi* Hooker and Arnott.

Type.—"Amer. Ento. Soc. Phila."

Type locality.—Bassett described this species from Napa City, Napa County, California (E. H. King collector).

In the Stanford collection there are many specimens from the Stanford campus, where it is very abundant on both *Quercus lobata* Née and *Quercus douglasi* Hooker and Arnott, particularly upon the former.

37. Andricus parmula Bassett

Andricus parmula Bassett, *Trans. Amer. Ent. Soc.*, **26**: 312, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p. 64, 1902; "Das Tierreich," pt. 24, p. 546, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 350, 1911. Thompson, "Cat. Amer. Ins. Galls, p. 18, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 108, 1918.

Dryophanta discuss Bassett, *Trans. Amer. Ent. Soc.*, **26**: 326, 1900. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **30**: 368, pl. 16, fig. 14, 1911. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 336, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 18, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 109, fig. 68 (13), 1918.

GALL.—Small, reddish, disc-shaped, 2 to 3 mm. in diameter, on undersides, rarely on upper sides of leaves. These galls are smooth and shiny with entire contour, the larva lying in the center in a slightly elevated kernel. Monothalamous. Galls drop to the ground with the leaves. Adults emerge the following spring.

Host.—*Quercus lobata* Née (less frequently on *Quercus douglasi* Hooker and Arnott, and rarely on *Quercus durata* Jepson).

Type.—?

Type locality.—Bassett described this species from Napa City, Napa County, California.

This is a very common gall on the Stanford campus and has been collected also at San Jose and other places in Santa Clara County.

38. Andricus wiltzae Fullaway

Andricus wiltzae Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 353, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 75.

GALL.—Bud galls in the axils of leaves, an aborted bud, the surface of gall covered with a mass of small aborted leaves. Polythalamous. Persistent. Adults in early spring from galls collected in October and November.

Host.—*Quercus lobata* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford campus, Santa Clara County, California.

39. Andricus pattersonae Fullaway

Plate II, Fig. 3

Andricus pattersonae Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 352, pl. 23, fig. 3, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 107.

GALL.—Thin, disc-shaped, very much flattened, on the under surfaces

of leaves. Green and very inconspicuous when young, turning brown when ripe. Finely reticulate, somewhat flecked with greenish gray or delicate lilac. Margin irregularly pinked or serrate, 5 to 6 mm. in diameter. Monothalamous. Deciduous.

Host.—*Quercus douglasi* Hooper and Arnott.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County, California.

40. Andricus brunneus Fullaway

Andricus brunneus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 353, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 92, 1918.

GALLS.—Thin-shelled, globular, brownish, 3 mm. in diameter, on the under surface of leaves, not unlike in form and structure, the spring gall *Dryophanta atrimenta* Kinsey and found on the same host. Monothalamous. These galls ripen and fall to the ground in the autumn.

Galls gathered from the ground in October produced females in November.

Host.—*Quercus douglasi* Hooker and Arnott.

Type.—Stan. Ent. Mus.

Type locality.—Stanford campus, Miss Patterson collector.

41. Andricus yosemite Beutenmüller

Andricus yosemite Beutenmüller, *Can. Ent.*, 43: 211, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 68.

GALL.—Beutenmüller describes this gall as follows: "Polythalamous. Irregularly rounded or almost globular, with a small nipple at the apex. It is covered with many short spine-like projections. The surface is also somewhat wrinkled. Light yellowish brown with some of the spines tipped with pink. Inside, it is completely filled with a light brown porous or pulpy substance, and at the base at the place of attachment to the twig are a number of hard oval larval chambers close together, and imbedded in the soft part of the gall. Diameter about 20 mm. Larval chamber 4 mm. long."

Host.—"*Quercus chrysolepis* Liebmann."

Type locality.—This species was described from "the foot of Yosemite Falls, about 4,000 feet, Sierra Nevada Mountains, California (Burrell col.)."

Not in the Stanford collection.

42. Andricus eldoradensis Beutenmüller

Andricus eldoradensis Beutenmüller, *Bull. Brook. Ent. Soc.*, 8: 102, (fig. 12?), 1912. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 118, 1918.

GALL.—Beutenmüller describes this species as possibly from an acorn gall (larval kernels within the acorn), on *Quercus agrifolia* Née.

Type.—"U. S. Nat. Mus." *Paratype.*—"Collection of Beutenmüller."
Type locality.—"Los Angeles, California."
Galls in the Stanford collection.

43. Andricus fullawayi Beutenmüller

Andricus fullawayi Beutenmüller, *Trans. Amer. Ent. Soc.*, **39**: 224, 1914. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 114, 1918.
Andricus quercus flocci Fullaway (not Walsh), *Ann. Ent. Soc. Amer.*, **4**: 352, 1911 (misidentification).

GALL.—Brown, elliptical, thin-walled, surface reticulate and covered with a rusty brown mat of fibers, two to many galls on a leaf, lying adjacent or strung along on the midrib, usually beginning at the base of the leaf, ½ mm. in diameter. Persistent, falling to the ground with the leaves in the fall. Adults emerge in the breeding room in March. Monothalamous.

Host.—*Quercus lobata* Née.
Type.—Collection of Beutenmüller. *Paratype*—Stan. Ent. Mus.
Type locality.—Stanford University campus.

44. Andricus castanopsidis Beutenmüller

Andricus castanopsidis Beutenmüller, *Can. Ent.*, **49**, 345, 1917. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 53, 1918.

GALL.—Round as a marble, 11 to 25 mm. in diameter, smooth, glossy, green or tinged red when young, dark mahogany brown when ripe, on staminate blossoms of the western chinquapin. Filled internally with light flaky tissue, the kernel embedded in the center. A light pithy gall attached lightly to the petioles of the blossoms and dropping to the ground when ripe. Monothalamous. Galls collected from the ground in December furnish adults in the breeding room in July of the following year.

Host.—*Castanopsis chrysophylla* A. de Candolle and *Castanopsis sempervirens* Dudley.
Type.—Beutenmüller collection. *Paratypes.*—Stan. Ent. Mus.
Type locality.—Beutenmüller describes this gall from Pacific Grove, Monterey County, California.

In the Stanford Entomological Museum collection there are specimens of this gall from Pacific Grove, Monterey County, California (C. P. Smith collector); Fallen Leaf Lake, Eldorado County, California (M. Wildman collector); and California Redwood Park, Santa Cruz County, California (I. McC. collector).

45. Andricus serricornis Kinsey

Andricus serricornis Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 228, pl. 24, fig. 3, 1922.

GALL.—Described by Kinsey as "dense clusters of grain-like cells, yellow or yellow-brown. Bithalamous, though often several cells will fuse; the whole cluster rounded or elongate-oval, containing 20 to 40 or more cells. The cells are thin-walled, almost wholly hollow except for the partition separating the larval chambers. Apparently modified anthers of aborted, compacted aments, the clusters on young twigs of *Q. wislizeni* and *Q. agrifolia.*"

Host.—*Quercus wislizeni* A. de Candolle and *Quercus agrifolia* Née.

Type.—Amer. Mus. Nat. Hist. *Paratypes.*—"U. S. Nat. Mus." and Stan. Ento. Mus. (contributed by Kinsey, collector).

Type locality.—Three Rivers, Tulare County, California. Kinsey records this species also from Alpine, San Diego County.

46. Andricus perfoveatus Kinsey

Plate I, Fig. 5

Andricus perfoveatus Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 287, pl. 24, fig. 8, 1922.

GALL.—Kinsey describes these galls as small, fleshy-walled capsules imbedded in the leaf blade. Monothalamous. Spherical or elongate, about 6 mm. in diameter (perhaps larger when fresh), leaf-green, drying brown, projecting about symmetrically from either surface of the leaf. The walls are thick, succulent, the cavity (in shrivelled galls) about oval, 2x3 mm., with a distinct larval cell lining, but the cell inseparable (at least in the shrivelled gall). [The whitish kernel is easily separated in the fleshy young gall.]

Host.—*Quercus kelloggii* Newberry and *Quercus agrifolia* Née.

Type.—"Amer. Mus. Nat. Hist." *Paratypes* in the "Kinsey collection" and galls in the Stanford Ento. Mus. sent by Kinsey from his collection.

Type locality.—Santa Rosa, California.

This is a rather common gall on *Q. kelloggii* in Santa Clara County, California, and is found occasionally on *Q. agrifolia.* The fleshy leaf-green galls appear in the spring. Adults in the Stanford collection emerged in May, 1915.

47. Andricus perdens Kinsey

Andricus perdens Kinsey, *Bull. Amer. Mus. Nat. Hist*, **46**: 286, pl. 24, fig. 5, 1922.

GALL.—Irregular stem swelling, varying greatly in length and width, characterized by a splitting of the bark longitudinally and raggedly over the matured, flattened, seed-like cell, which thus protrudes and eventually drops to the ground.

Host.—*Quercus kelloggii, Quercus wislizeni,* and *Quercus agrifolia.*

Type.—"Amer. Mus. Nat. Hist." *Paratypes.*—"Kinsey collection and

U. S. Nat. Mus." Mr. Kinsey sent galls of this species to the Stanford Entomological Museum from the type locality.

Type locality.—Ashland, Oregon. Kinsey also records this species from Gilroy, Santa Clara County; Placerville, Eldorado County; and Ukiah, Mendocino County, California.

This is a very common gall on *Quercus agrifolia* Née and particularly *Quercus wislizeni* in California, in Santa Clara County, and in the Santa Cruz Mountains.

From galls collected in September, 1919, living adults (females) were cut out in March, 1920.

48. Andricus spectabilis Kinsey

Andricus spectabilis Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 290, pl. 24, figs. 11, 12, 1922.

GALL.—The galls of this species are large, elongate, more or less spindle-shaped stem thickenings, polythalamous with from few to many scattered larval cells. The stem wood is greatly distorted, the larval cell imbedded in its peripheral area adjacent to the greatly thickened, less compact bark. Galls in Stanford collection average about 8 cm. in length, 3 cm. in width. Kinsey notes that the "exit holes upon aging show a distinct smoother area on the bark." This appearance is quite characteristic of weathered galls.

Type.—"Amer. Mus. Nat. Hist." *Paratypes.*—"U. S. Nat. Mus." in the "Kinsey collection" and in Stan. Ento. Mus. (Kinsey col.).

Type locality.—Pasadena, California.

Host.—*Quercus chrysolepis* Liebmann.

In the Stanford collection are many galls of this species collected from various localities in Santa Clara and Santa Cruz Counties, California, where it is a very common gall. Kinsey records this species from San Jacinto Mountains, Riverside County; San Bernardino and Upland, San Bernardino County; Placerville, Eldorado County; and Auburn, Placer County.

Insects from galls collected in the California Redwood Park in April, 1915, emerged in the breeding room in May of the same year.

49. Andricus attractans Kinsey

Andricus attractans Kinsey, *Bull. Amer. Mus. Nat. Hist*, **46**: 281, 1922.

GALL.—Kinsey describes this gall as sticky, protruding from buds, each cell monothalamous, about 2x3 mm., oval, but with rather flattened ends; only microscopically roughened, marbled red to dark green when fresh, drying brown; thin-walled, hollow, under bud scales, but often protruding, covered with a sticky secretion; often several in a bud.

Host.—*Quercus wislizeni* A. de Candolle.

Type.—"Amer. Mus. Nat. Hist." *Paratype.*—"Kinsey collection." Mr. Kinsey has placed in the Stanford Entomological Museum a paratype male and gall of this species.

Type locality.—Redding, Shasta County, California.

50. Andricus humicola Kinsey

Andricus humicola Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 283, pl. 24, fig. 13, 1922.

GALL.—Kinsey describes these galls as large, irregular, tuber-like, woody swellings of the bark and new wood of roots. Agglomerate. The swellings are very irregular, smooth and rounded when fresh, roughened with age; the fresh bark covering is more reddish brown than the roots; length up to 10.5 cm., the diameter 7.5 cm. on large galls. Affecting both wood and bark, including wood below the normal line of the bark; larval cells lying toward the bark, oval, 3.5 by 4.5 mm., with a thin, distinctive tissue lining the cells, but not separable from the wood. On the sides of large roots well below the surface of the ground, on *Quercus kelloggii.*

"*Range.*—Oregon: Ashland."

Types.—Holotype, paratypes: "Amer. Mus. Nat. Hist." Galls in Stan. Ent. Mus., the "U. S. Nat. Mus.," and in the "Kinsey collection."

51. Andricus gigas Kinsey

Andricus gigas Kinsey, *Bull. Amer. Mus. Nat. Hist.*, **46**: 282, pl. 24, fig. 14, 1922.

GALL.—The galls are small aborted anthers about 1 mm. in diameter by 2 mm. long, scattered amongst the aments of the oak catkins. Monothalamous. In color like the anthers.

Host.—Quercus douglasi and *Quercus lobata.*

Type.—"Amer. Mus. Nat. Hist." *Paratypes.*—"U. S. Nat. Mus.," "Kinsey collection," and Stan. Ento. Mus.

Type locality.—Kinsey described this species from Merced Falls, Merced County, California.

In the Stanford collection are adults and galls from Merced Falls, contributed by Kinsey, and galls from Black Mountain, Santa Clara County, collected by Weld and I. McC.

52. Andricus reniformis new species

Plate I, Fig. 7

FEMALE.—Black, with reddish brown areas as follows: ocelli, spot above compound eyes, first two segments of antennae, mandibles basally, palpi, tegulae, small area cephalad of tegulae, spot on pronotum adjoining tegulae, deep grooves over base of wings, areas on mesonotum posteriorly, scutellum dorsally except for median patch, legs for the most part, sheath of ovipositor and ventral valve. *Head* reticulate, face pubescent. Antennae 14-segmented, third longest, a little longer than fourth; fourth and

following progressively shorter, except last, which is longer than penultimate. *Thorax*. Pronotum narrow in the middle, rugose, pubescent. Mesonotum medially very finely reticulate and shining, dull and slightly rugose on parapsides anteriorly. Parapsidal grooves percurrent, median longitudinal lines reaching nearly to middle and ending in depressions, smooth and shining areas on either side of parapsidal grooves and lateral grooves over base of wings distinct. Subalar areas of mesopleurae pubescent. Mesopleurae polished with aciculated area below middle, sparsely punctate, each puncture bearing a hair. Scutellum cushion-shaped, reticulate, pubescent, foveae ovate, separated by a median rugose area. Legs pubescent, claws bidentate. Wings hyaline, pubescent, radial cell long, open on the margin, areolet distinct, basal part of radial vein angulate, cubitus not reaching basal vein. *Abdomen* smooth and shining, slightly pubescent basally and apically, second tergite occupying less than one-half its length, third tergite wide, following tergites, except seventh, narrow, sheath of ovipositor and dorsal valve, pubescent. Length 3 mm.

GALL.—Kidney-shaped, polythalamous bud-gall. Color yellowish green to tan when mature, brown when weathered. Internally composed of a hard woody substance. Five to 25 mm. in length.

Host.—Quercus vaccinifolia Kellogg.

Type.—Stan. Ent. Mus.

Type locality.—Fallen Leaf, Eldorado County, California (Bentley, Van Dyke, McCracken, col.).

This may prove to be a variety of *Disholcaspis truckeensis* Ashmead.

53. **Andricus confertus** new species

Plate I, Fig. 1

FEMALE.—Dark brown with light brown areas as follows: orbital margin, area between bases of antennae and simple eyes, face laterally, mandibles basally, pronotum laterally, mesonotum above lateral grooves, scutellum posteriorly, subalar area, mesopleurae posteriorly, outer area of the tegulae, distal area of the coxae and trochanters, inner surface and distal half of the femora, fore and middle tibiae at base and apex, tarsal segments of fore legs (except last), tarsal segments of middle and hind legs (except last distally), abdomen ventrally and ventral spine. *Head* reticulate, pubescent, antennae 13-segmented, gradually thickening toward tips, first very stout, elongate, second cylindrical, third longest, a little longer than fourth, succeeding segments progressively shorter, except the last, which is twice as long as the penultimate. *Thorax*. Pronotum except medially, mesonotum and scutellum covered with rather long recumbent hairs. Pronotum reticulate, parapsidal grooves deep and complete, median grooves very short, median longitudinal lines extending to the middle, smooth areas on either side of parapsidal grooves and lateral

grooves over base of wings distinct. Subalar areas of mesopleurae pubescent. Mesopleurae smooth and shining, lower half pubescent. Scutellum cushion-shaped. Foveae ovate, bottoms shining, widely separated by a rugose area. Wings hyaline, pubescent, radial cell long, open along the margin, areolet distinct with veins light on two sides, basal part of radial vein slightly angulate, cubitus not reaching basal vein. *Abdomen* smooth and shining, pubescent patch on third tergite laterally, third tergite occupying less than half length of abdomen, following segments narrow, valves conspicuous. Lenth 2.5 mm.

GALL.—A rounded, closely packed mass of galls occurring on the midribs of lateral veins on the undersides of leaves (rarely on upper side). The masses are from 6 to 8 mm. long and almost as wide, each mass containing from few to 20 or more galls. Each gall is rounded on the outer surface and compressed basally. Easily detached when ripe and deciduous. Color pink or rose when fresh, tan when old and dry; 1 to 3 mm. in diameter. Monothalamous.

Host.—Quercus lobata Née.

Type—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County, California.

NOTE.—This species is described from ten females cut out in March from galls collected in November and December. Many galls opened in March contained insects still in larval stage.

Some individuals are darker than type. It has been noted that in many cases specimens cut out of galls may run lighter in color than specimens emerged normally.

Genus **CALLIRHYTIS** Förster

54. Callirhytis agrifoliae (Bassett)

Cynips quercus-agrifoliae Bassett, *Can. Ent.*, 13: 53, 1881.

Andricus (Callirhytis) agrifoliae Bassett, Mayr, "Gen. d. Cynipidae," p. 28, 1881. Ashmead, *Trans. Amer. Ent. Soc.*, 12: 294, 1885.

Callirhytis agrifoliae Bassett, Cockerell, "Ent. Stud.," 1: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 60, 1902. Thompson, "Cat. Amer. Galls," p. 9, 1917. Felt, *N. Y. State Mus. Bull*, No. 200, p. 66.

Callirhytis quercus-agrifoliae (Bassett), Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 567, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 356, 1911.

Callirhytis clarimontis Kieffer, *Bull. Soc. Met.*, Ser. 2, 11: 132, 1904. Kieffer, *Invert. Pacifica*, 1: 43, 1904. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 359, 1911.

GALL.—Spherical, brown when mature, growing in the axil of twig or leaf. Attached very lightly, dropping to the ground when mature. Surface microscopically pubescent. Internally composed of corky tissue with central larval cell, 10 mm. in diameter. Monothalamous. These galls drop to the ground in the fall and insects emerge in the breeding room, December, January, and February.

Host.—Quercus agrifolia Née.

Type.—"Amer. Ent. Soc. Mus." *Co-types.*—"Amer. Mus. Nat. Hist."

Type locality.—This species was described by Bassett from specimens sent to him from San Francisco, California. In the Stanford Entomological Museum collection there are galls of this species from the Stanford campus, Santa Clara County; Oakland, Alameda County; and from Claremont, Los Angeles County. The latter were sent to the Stanford Entomological Museum by Professor Baker and are co-type with specimens sent to Kieffer, which he described as *Callirhytis clarimontis.*

55. Callirhytis pomiformis (Bassett)

Cynips Q. pomiformis Bassett, *Can. Ent.*, 13: 74, 1881.

Andricus pomiformis Bassett, Ashmead, *Trans. Amer. Ent. Soc.*, 12: 295, 1885. Cockerell, "Ent. Stud.," 1: 9, 1900. Thompson, "Cat. Amer. Ins. Galls," p. 8, 1915.

Callirhytis pomiformis Bassett, Mayr, *Verh. Zool. K. K. Ges. Wien.*, 52: 289, 1902. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 62.

Callirhytis quercus-pomiformis Bassett, Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 568, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 355, 1911.

Callirhytis maculipennis Kieffer, *Bull. Soc. Metz*, ser. 2, 11: 131, 1904; *Invert. Pac.*, 1: 42, 1904. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 358, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 76, 1918.

GALL.—Brown, subspherical, varying from one to two inches in diameter, surface more or less roughened by slight longitudinal elevations, sometimes quite smooth; internally consisting of a more or less soft mass of yellowish brown cellular tissue, within which lie embedded near the base a group of many larval cells. Galls of *pomiformis,* particularly those found on *wisliceni,* are sometimes covered more or less with sharp wart-like or spiny projections. Persistent, polythalamous. Insects emerge in breeding room in February from galls collected in December.

Host.—Quercus agrifolia Née and *Quercus wisliceni* A. de Candolle.

Type.—"Amer. Ent. Soc. Phila." "Duplicates in Amer. Mus. Nat. Hist."

Type locality.—Bassett described this species from specimens sent from "California."

In the Stanford collection there are specimens from Stanford University campus, Santa Clara County; Mount Hermon and California Redwood Park, in the Santa Cruz Mountains, Santa Cruz County (I. McC. col.); Pasadena, Los Angeles County, and Descanso, San Diego County (Kinsey col.); and Claremont, Los Angeles County. The latter were sent to the Stanford Entomological Museum by Professor Baker and are co-types of specimens sent to Kieffer which he described as *Callirhytis maculipennis.*

Specimens of this gall on *Q. wislizenii* frequently are quite spiny.

56. Callirhytis suttoni (Bassett)

Cynips Q. suttoni Bassett, *Can. Ent.*, **13**: 54, 1881.

Andricus (Callirhytis) suttoni Bassett, Mayr, "Gen. d. Cynip.," p. 28, 1881. Ashmead, *Trans. Amer. Ent. Soc.*, **12**: 294, 1885.

Callirhytis suttoni Bassett, Cockerell, *Ent. Stud.*, **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 67, 1902. Thompson, "Cat. Amer. Ins. Galls," p. 7, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 60, 1918.

Callirhytis quercus-suttoni (Bassett), Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 564, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 357, 1911.

GALL.—Spherical or elongate twig swelling 20 to 30 mm. in length, 15 to 25 mm. in diameter, covered with normal bark, ligneous within. Polythalamous.

Host.—Quercus agrifolia Née..

Type.—"Amer. Ent. Soc. Phila." *Co-types.*—"Amer. Mus. Nat. Hist." Stan. Ent. Mus. Co-types in Stanford collection contributed by Mr. William Beutenmüller.

Type locality.—Oakland, Alameda County, California.

In the Stanford collection there are specimens from Oakland, Alameda County; Claremont, Los Angeles County; and the Stanford campus, Santa Clara County.

57. Callirhytis chrysolepidicola (Ashmead)

Cynips chrysolepidicola Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 124, 1896. Cockerell, "Ent. Stud.," **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 59, 1902. Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 439, 1910. Thompson, "Cat. Amer. Ins. Galls," p. 7, 1915.

Callirhytis chrysolepidicola (Ashmead), Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 334, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 59.

GALL.—Ashmead describes this gall as "an irregular swollen enlargement surrounding a twig or branch of *Quercus chrysolepidis* exactly similar to the galls of *Andricus medullae* Ashmead, and indistinguishable from it, varying in length from half an inch to one and a half or more." "Bred out in January and February."

Host.—Quercus chrysolepis Liebmann.

Type.—"No. 3075, U. S. Nat. Mus."

Type locality.—Ashmead describes this species from "Pine Canyon, Mt. Diablo, California."

No identified specimens of this species in the Stanford collection.

58. Callirhytis vaccinifoliae (Ashmead)

Callirhytis vaccinifoliae Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 130, 1896. Cockerell, *Ent. Stud.*, **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p 67, 1902; "Das Tierreich," pt. 24, p. 583, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 357, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 17, 1917. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 98, 1918

GALL.—Exceedingly thin-shelled, very brittle, light yellow or tan

when mature, and speckled with dark irregular spots, spherical, about 20 mm. in diameter. A small kernel is suspended in the center by delicate radiating filaments as in the gall attributed to *Cynips maculipennis*. It is attached lightly by a minute stem to the twigs, easily detached and leaving a minute scar when it drops off. Monothalamous. Galls collected in August furnished adults in the breeding room in December. This was probably premature emergence, as in their natural habitat they would be on the ground under the snow at this season.

This gall, externally and internally, has somewhat the structure of the gall attributed to *Cynips maculipennis* found on *Quercus garryana*. The wall and radiating fibers of the latter are firmer than that of the former and the kernel or larval cell is twice the size.

Host.—*Quercus vaccinifolia* Kellogg.

Type.—"No. 3087, U. S. Nat. Mus."

Type locality.—Ashmead described this species from Truckee, Nevada County, California, collected by Professor Comstock.

In the Stanford collection there are specimens from Fallen Leaf, Eldorado County, collected by Miss Bentley, Professor Van Dyke, and others.

59. Callirhytis apicalis (Ashmead)

Andricus apicalis Ashmead, *Proc. U. S. Nat. Mus.*, 19: 120, 1896. Cockerell, *Ent. Stud.*, 1: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 61, 1902. Thompson, "Cat. Amer. Ins. Galls," p. 5, 1915.

Callirhytis apicalis (Ashmead), Mayr, *Verh. Zool. Bot. Ges. Wien*, 52: 289, 1902. Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 573, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 354, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 54, 1918. Weld, *Proc. U. S. Nat. Mus.*, 59: 222, pl. 34, fig. 22.

GALL.—Ashmead describes this species as having "irregular, brownish globular galls of a dense pithy substance, growing on the roots of *Quercus wisliceni*, sometimes three or four together, pressing each other into irregular shapes. Diameter usually about one-half inch."

Host.—*Quercus wisliceni* A. de Candolle. (Weld reports this species on *Quercus agrifolia* Née.)

Type.—"No. 3067, U. S. Nat. Mus."

Type locality.—Ashmead described this species from Sacramento, California.

Weld reports this species from "the San Gabriel Mountains, at Los Gatos, Santa Clara County; Bagley, Mariposa County; Sequoia National Park, Dunsmuir, Siskiyou County; Carpinteria, Santa Barbara County; Santa Margarita, San Luis Obispo County; Paraiso Springs, Monterey County; and St. Helena, Napa County."

In the Stanford collection there are specimens from Sonoma, Sonoma County, collected by Mr. Weld, and from the Stanford campus (I. McC.

col.). Galls collected on the Stanford campus are found at the base of the tree trunk at or immediately beneath the surface of the ground. They are, as described by Weld, greenish tinged with apple red when in the fleshy stage. When ripe, they turn a golden yellow before weathering. Internally the "brittle cavernous tissue" is also yellow. The larval cell at the base of the sessile gall remains attached to the bark after the gall has weathered away and insect has emerged.

60. Callirhytis lasia Ashmead.

Callirhytis lasius Ashmead, *Proc. U. S. Nat. Mus.*, 19: 132, 1896. Cockerell, *Ent. Stud.*, 1: 9, 1900. Thompson, "Cat. Amer. Ins. Galls," p. 20, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 115, 1918.

Callirhytis lasia Ashmead, Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 66, 1902; "Das Tierreich," pt. 24, p. 567, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 356, 1911.

GALL.—Spherical or subglobular covered by a mass of yellowish or reddish brown filaments, not so woolly as in *C. eriophora* Kieffer, more like that of *A. fullawayi* Beutenmüller, but longer; 5 to 7 mm. in diameter, on undersides of leaves, on midrib. Polythalamous. From galls collected in November female adults emerged at once in the breeding room.

Host.—*Quercus chrysolepis* Liebmann.

Type.—"No. 3091, U. S. Nat. Mus."

Type locality.—Ashmead described this species from Placer County, California, from galls collected by Mr. Albert Koebele.

In the Stanford collection there are specimens from Stevens Creek Canyon and Permenente Creek, Santa Clara County, collected by Miss Laura Florence and others, and Placer County, California, collected by Professor E. C. Essig.

61. Callirhytis rossi Kieffer

Callirhytis rossi Kieffer, "Marcellia," 2: p. 84, 1903. Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 575, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 361, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 76.

GALL.—"In the axils of leaves probably of *Quercus chrysolepis*, spherical, brownish yellow, diam. 40 mm., surface covered with projections especially the upper half, projections obtaining a maximum heighth of 1 mm. and often confluent so as to form irregular, longitudinal or transverse wrinkles. Prolonged distally into a conical point, 5 mm. high, broad at base. Interior spongy with woody center inclosing a number of larval cells separated from one another by a wall. Each encloses an internal gall of same size, extremely thin and fragile. Emergence in May of second year. Named from 19 insects from a single gall." (Translated from Kieffer.)

Type locality.—This species was described by Kieffer from "California" collected by Dr. Ross.

Not in the Stanford collection. Galls of *Callirhytis pomiformis* Bassett on *Q. wislizeni* answer Kieffer's description of galls of *C. rossi,* and the species may prove to be identical with Bassett's species.

62. Callirhytis bakeri Kieffer

Callirhytis bakeri Kieffer, *Bull. Soc. Metz.,* Ser. 2, 11: 132, 1904; *Invert. Pac.,* 1: 44, 1904. Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 586, 1910. Fullaway, *Ann. Ent. Soc. Amer.,* 4: 360, 1911. Felt, *N. Y. State Mus. Bull.,* No. 200, p. 76, 1918.

GALL.—Kieffer describes this gall as oval, about 13 mm. high and 11 mm. thick, smooth, glabrous, ligneus, apically with a thin, longitudinally striated, thick and more or less bent point which is about 8 mm. high and 1.5 mm. thick; proximally with some bud-scales lying close to base of gall, inner substance spongiose.

Host.—Quercus chrysolepis Liebman (*crassipocula*).

Type locality.—Kieffer described this species from specimens sent to him by Professor C. F. Baker from "California."

A specimen of this species sent to the Stanford Entomological Museum by Mr. Baker, co-type with material sent to Kieffer, is from "mountains near Claremont," Los Angeles County. This is, therefore, no doubt, the type locality of this species. The gall of this species in the Stanford collection has the appearance of *Andricus pacificus* Ash. and may prove to be the same species.

63. Callirhytis eriophora Kieffer

Plate II, Fig. 1

Callirhytis eriophora Kieffer, *Bull. Soc. Metz,* Ser. 2, 11: 132, 1904; *Invert. Pacif.,* 1: 43, 1904. Fullaway, *Ann. Ent. Soc. Amer.,* 4: 359, 1911. Felt, *N. Y. State Mus. Bull.,* No. 200, p. 76, 1918.

GALL.—The single example of this gall in the Stanford collection is small, 7 mm. long, 5 mm. in diameter, smooth, hard-shelled, completely covered by a dense, soft, woolly mass of light-colored fibers. Monothalamous.

Host.—Said to have been collected on *Quercus wislizenii* A. de Candolle.

Type locality.—Kieffer described this species from material sent to him by Professor C. F. Baker from "California."

A specimen of this species sent by Professor Baker to the Stanford Entomological Museum, co-type with material sent to Kieffer, is labelled "Mountains near Claremont," Los Angeles County. This is, therefore, no doubt, the type locality of this species. In the Stanford collection there are several galls resembling this on Q. *chrysolepis,* collected by Mr. H. Morrison on Mt. Diablo, Contra Costa County, which may, however, prove to be a different species.

64. **Callirhytis guadaloupensis** Fullaway

Plate II, Fig. 5

Callirhytis guadaloupensis Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 363, pl. 23, fig. 4, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 108, 1918.

GALL.—Hard, smooth, disc-shaped, upper surface slightly convexed, on under sides of leaves, 5 to 6 mm. in diameter. Monothalamous.

Adults emerged in the breeding room in January from galls collected in December by R. Patterson.

Host.—Quercus chrysolepis Liebmann.

Type.—Stan. Ent. Mus.

Type locality.—Guadaloupe, Santa Barbara County, California.

65. **Callirhytis sanctae-clarae** Fullaway

Callirhytis santae-clarae Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 363, pl. 23, fig. 5, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 118, 1918.

GALLS.—These galls, designated "acorn-galls" by Fullaway on account of their peculiar acorn-shape, grow in the axils of leaves, thereby displacing the buds. They may be terminal or lateral. The gall is made up of two sections, the basal section is sessile, subspherical, somewhat smaller than outer portion. Outer portion broad at base, compactly fitted into basal portion. Internal structure pithy. Monothalamous. Female adults emerged in breeding room in the spring from galls collected in the fall.

Host.—Quercus chrysolepis Liebmann.

Type.—Stan. Ent. Mus.

Type locality.—Stevens Creek, Santa Clara County, California, collected by Miss Rose Patterson.

66. **Callirhytis nigra** Fullaway

Callirhytis nigra Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 362, 1911.

GALL.—An irregular swelling or enlargement of terminal twigs, subglobular, 5 mm. to 12 mm., apparently monothalamous. Insects in February.

Host.—Quercus lobata.

Type.—Stan. Ent. Mus.

Type locality.—San Jose, Santa Clara County; collected by Miss Patterson.

67. **Callirhytis fulva** Weld

Callirhytis fulva Weld, *Proc. U. S. Nat. Mus.*, **59**: 226, 1921.

GALL.—Weld describes this species as "hemispherical when single or forming a hemispherical group with individual galls compressed laterally into an angular cross-section by mutual pressure, produced on roots just under surface of ground. Single galls measure up to 22 mm. in diameter by 18 mm. high, groups of two to eight measure up to 35 mm. diameter.

Tissue of gall mustard yellow, pithy distally, becoming more compact about proximally placed larval cell."

Host.—"*Quercus chrysolepis* Liebmann."

Type.—"Cat. No. 22572, U. S. N. M."

Type locality.—San Gabriel Mountains, Los Angeles County, California.

In the Stanford collection there are specimens of this species from San Gabriel Mountains, contributed by Mr. Weld.

68. **Callirhytis hartmani** Weld

Callirhytis hartmani Weld, *Proc. U. S. Nat. Mus.*, **59**: 214.

GALL.—Weld describes this gall as a "large area of greatly thickened bark causing a large swelling at the base of saplings or rough swollen areas at the crown of large trees, especially the callus tissue. This thickened bark contains hundreds of larval cells about 6 mm. long. Such areas also occur where a limb bends over and the elbow touches the ground. The bark becomes over an inch thick and the wood underneath very rough and knotty. On trees in moist gulches."

Host.—*Quercus chrysolepis* Liebmann.

Type.—"Cat. No. 22566, U. S. N. M." *Co-types.*—Stan. Ent. Mus.

Type locality.—Weld described this species from Los Gatos, Santa Clara County, California.

Mr. Weld also collected galls of this species in the San Gabriel Mountains, Los Angeles County, and at St. Helena, Napa County, California.

In the Stanford collection there are galls of this species contributed by Mr. Hartman from Los Gatos and specimens collected by Weld and McC. on Black Mountain, Santa Clara County.

This species is found on hillside trees as well as on trees in moist gulches as stated by Weld.

69. **Callirhytis flavens** new species

Plate I, Fig. 4

FEMALE.—Yellowish brown; eyes and tips of mandibles, blackish; antennae, tegulae and legs except tarsi terminally, a little lighter than the body. *Head* reticulate, pubescent, antennae 13-segmented, gradually thickening toward tips, first and second stout, third longest, 4–6 subequal, following segments progressively shorter except the last, which is about twice as long as the penultimate. *Thorax.* Pronotum narrow in the middle, reticulate, pubescent laterally. Mesonotum reticulate, sparsely pubescent, parapsidal grooves complete, wide posteriorly, median longitudinal lines nearly reaching the middle, lines on either side of parapsidal grooves and lateral grooves over base of wings distinct. Subalar areas of the mesopleurae pubescent. Episterna transversely aciculate, pubescent below. Scutellum

cushion-shaped, finely rugose, foveae ovate, bottoms smooth and shining, approximate, separated by a carina. Tarsal claws simple. Wings hyaline, pubescent, radial cell long, open at the margin, areolet indistinct, cubitus not reaching basal vein. *Abdomen* smooth and shining, sparsely pubescent basally, second tergite occupying about two-thirds of the whole surface, valves conspicuous. Length 1.5 mm.

GALL.—Subglobular, found singly, in clusters, or several grown together on leaves projecting above and below and sometimes inhibiting the growth of the leaf. The color when mature is light green, sometimes tinged with red. Internally composed of a pithy substance. Diameter, 2–5 mm.

Host.—Quercus vaccinifolia Kellogg.

Type.—Stan. Ent. Mus.

Type locality.—Fallen Leaf, Eldorado County, California.

In the Stanford collection there are galls apparently of this species collected on Black Mountain, Santa Clara County, on *Quercus chrysolepis* Liebmann.

The type material was collected by Miss Georgie Bentley in May. Adults emerged in the breeding room during the summer.

70. **Callirhytis trimaculosa** new species

Plate I, Fig. 3

FEMALE.—Black with brownish-yellow areas as follows: antennae, face laterally, clypeus, mandibles basally, genae, orbital area dorsally, legs (except coxae basally, and last tarsal segment terminally), and ventral valve. *Head* reticulate, slightly pubescent, antennae, 13-segmented, first and second stout, third longest, succeeding segments progressively shorter except the last, which is about twice as long as the penultimate. *Thorax.* Pronotum narrow in the middle, slightly pubescent and corrugated laterally. Mesonotum polished. Parapsidal grooves deep and complete. Median longitudinal lines reaching about to middle. Lateral grooves over base of wings distinct. Subalar areas of the mesopleurae corrugated. Mesopleurae polished, scutellum cushion-shaped, roughly but not deeply rugose. Foveae ovate, approximate, separated by a median carina. Legs pubescent, claws simple. Wings hyaline, pubescent, radial cell open along the margin, areolet distinct, shaded, one large spot basally and two small spots distally in the third cubital cell, a short spur on median part of medial nerve ending in a shaded area, cubitus reaching basal vein. *Abdomen* smooth and shining with a few hairs on second tergite laterally, second tergite occupies more than half the length, long hairs on ventral valve. Length, 1.5 mm.

GALL.—Small, reddish-brown, subglobular, covered densely with crystalline spicules, found singly or in clusters of two on the undersides of leaves. Monothalamous. Diameter, 2–5 mm.

Host.—*Quercus lobata* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford campus, Santa Slara County, California.

This species was described from two females. In the paratype there is but one small spot in the distal area of the third cubital cell. Galls collected in December. Adults emerged in early summer.

71. **Callirhytis bicornis** new species

Plate I, Fig. 8

FEMALE.—Yellowish-brown with dark brown areas as follows: compound eyes, three spots in ocellar region, tips of mandibles, last three segments of the antennae, sternum, propodeum except medially, petiole and dorsal valve. Legs lighter than the body except tarsal segments terminally. *Head* very finely reticulate and shining, face below antennae, the clypeus and genae pubescent, parallel depressions from the insertion of the antennae to the clypeus. Antennae 14-segmented, first and second stout, third longest (narrowed basally), fourth and following progressively shorter except the last, which is a little longer than the penultimate; all segments pubescent. *Thorax.* Pronotum very narrow in the middle, smooth and highly polished medially, pubescent laterally. Mesonotum about as long as wide, smooth and highly polished, a few hairs laterally. Parapsidal grooves wide, deep and complete, median line percurrent. Median longitudinal lines barely indicated. Lateral grooves over base of wings distinct. Subalar areas of the mesopleurae pubescent, mesopleurae smooth and highly polished, very sparsely pubescent below. Scutellum cushion-shaped, slightly rugose and reticulate, foveae large, ovate, deep, bottoms smooth and shining, approximate, separated by a median carina. Tarsal claws simple. Wings hyaline, pubescent, veins yellowish, radial cell long, open on the margin, basal part of radial vein angulate, areolet distinct, cubitus not reaching basal vein. *Abdomen* smooth and shining, pubescent laterally at the base, second tergite occupying about half its length with a vertical suture faintly indicated. Length, 1.5 mm.

GALL.—A thin-shelled leaf gall found in great numbers along mid ribs and lateral veins on the under side of leaves. Small, oval with its upper, outer corners drawn out into nodules. When detached a scar is left on the vein. The color is greenish when young, turning tan to dark brown when mature. Larval cell occupying whole interior. Monothalamous. Length, 2 mm.

These galls are very common in Santa Clara County in late summer, autumn and winter, and may be found sparingly throughout the year. Oaks infested by them are badly disfigured, the leaves turning brown beyond the attachment of the gall due to withdrawal of sap. They are at times exceedingly abundant, forty or fifty having been counted on a single leaf with

nearly every leaf of certain trees affected. Mature galls drop to the ground from or with the leaves while the insects are in the larval form. This gall is more disfiguring to the oaks than any other gall in Santa Clara County.

Host.—*Quercus agrifolia* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford campus, Santa Clara County, California.

This species has also been found at Saratoga, Santa Clara County, and Burlingame, San Mateo County, California.

The species was described from thirty females cut from galls collected from November to February, 1917. Adults cut out in February.

72. **Callirhytis essigi** new species*

FEMALE.—Brown, eyes, tips of mandibles, distal half of antennae, palpi, pronotum medially, mesonotum, tegulae, scutellum laterally, posteriorly and medially, mesonotum and propodeum medially, abdomen dorsally, and distal half laterally, femora dorsally, tibiae, first and fifth tarsal claws and empodia, dark brown. Rest of body light brown. *Head* rugose, slightly pubescent apically (mouthparts basally), radial striations between front and genae. Clypeus with deep foveae laterally. Antennae 14-segmented. *Thorax.* Pronotum coarsely rugose, corrugated laterally. Mesonotum delicately rugose. Mesopleurae reticulate, subalar area rugose. Parapsidal grooves percurrent, each groove wide at base. Medial longitudinal lines prominent, reaching half way to posterior margin. Scutellum coarsely rugose at bottom and bordered anteriorly by an arcuate ridge separated from posterior ridge of mesonotum by a deep groove. Legs clothed with fine pubescence. Wings hyaline, radial cell long, open at margin, subcostal vein reaching margin, vein at base of radial cell sharply angulate outwardly, basal vein straight, cubitus reaching basal vein, areolet distinct, first intercubitus and second segment of cubitus equal in length, and nearly twice as long as second intercubitus. Subcostal, first radial and basal veins heavy and dark, other veins faint. *Abdomen* glossy, finely reticulate. Length, 3¼ mm.

GALL.—In acorns, six to eight kernels in each acorn, the acorns thus affected appearing normal except that they are undersized, with very slight elevations on the surface. Polythalamous.

Host.—*Quercus agrifolia* Née, *Quercus kelloggii* Newberry, and *Quercus wislizeni* A. de Candolle.

Type.—Stan. Ent. Mus.

Type locality.—Berkeley, Alameda County, collected by Professor Essig.

These galls have also been collected on the Stanford campus.

A number of these galls were sent to Stanford Entomological Museum by Professor Essig October, 1917. Twenty adults were cut out January,

* I have learned that Mr. Lewis Weld has described this species under the name of *Callirhytis milleri* in a paper being published by the U. S. Nat. Mus., and which will probably appear before present paper. I. McC.

1921. Of these, six were alive and active. These insects thus remained alive inclosed in the gall, disconnected from the tree for over three years.

Genus **COMPSODRYOXENUS** Ashmead

73. **Compsodryoxenus brunneus** Ashmead

Compsodryoxenus brunneus Ashmead, *Proc. U. S. Nat. Mus.*, **19**: 129, 1896. Cockerell, *Ent. Stud.*, **1**: 9, 1900. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 78, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **26**: 281, pl. 51, figs. 9–13, 1909. Dalla Torre and Kieffer, "Das Tierreich," No. 24, p. 704, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 376, 1911. Thompson, "Cat. Amer. Ins. Galls," p. 10, 1915. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 11, fig. 65 (9–15), 1918.

GALL.—Ashmead describes this species from "elongate, oval twig-galls, found on scrub-oak." "Monothalamous."

Host.—Indefinite in Ashmead's record.

Type.—"No. 3085, U. S. N. M."

Type locality.—Pine Canyon, Mount Diablo, Contra Costa County, California.

Ashmead also reports this gall from Martinez, Contra Costa County, California.

NOTE.—Agamic females only described.

Genus **TRIGONASPIS** Hartig

74. **Trigonaspis obconica** Weld

Trigonaspis obconica Weld, *Proc. U. S. Nat. Mus.*, **59**: 202.

GALL.—Weld describes this species as "an underground cluster of fleshy white galls at base of stumps similar to galls of *T. radicola* (Ashmead) but with longer and more slender pedicels. After flies emerge galls decay. In May."

Type.—"Cat. No. 22583, U. S. N. M. Female type, allotype and 10 male paratypes."

Host.—"*Quercus douglasi* Hooker and Arnott."

Type locality.—Los Gatos, Santa Clara County, California.

Weld collected this species also at Paso Robles in San Luis Obispo County. Mr. Weld sent specimens from each of these localities to the Stanford Entomological Museum.

GALLS ON WILD ROSE

Genus **RHODITES** Hartig

75. **Rhodites politus** Ashmead

Rhodites politus Ashmead, "Bull. 1, Colorado Biol. Assoc.," p. 14, 1890. Cockerell, *Ent. Stud.*, **1**: 10, 1900. Gillette, *Ent. News*, **3**: 246, 1892. Beutenmüller, *Bull.*

Amer. Mus. Nat. Hist., 23: 644, 1907. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 79, 1902; "Das Tierreich," pt. 24, p. 715, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 377, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 148, 1918.

Rhodites polita Ashmead, Thompson, "Cat. Amer. Ins. Galls," p. 23, 1915.

GALL.—Globular, varying in size from 5 to 10 mm. in diameter. Thin walled and hollow inside, the outer half beset with weak spines sometimes completely rubbed off in old specimens. It occurs on the leaves and stems of the California wild rose. Monothalamous. Galls harboring inquilines become thick-walled, tissue of the walls at times nearly obliterating central cell by proliferation, each gall harboring many inquilines. These galls appear singly or in great masses, sometimes partly grown together. Males and females emerge in February from galls collected in January.

Host.—*Rosa californica* Ch.d Schl.

Type.—"U. S. N. M."

Type locality.—Ashmead describes this species from Los Angeles, California. Gillette records it from Manitou, Colorado.

Specimens in the Stanford collection are from the Stanford University campus, Santa Clara County; California Redwood Park, Santa Cruz County; and Point Arena, Mendocino County, California.

76. Rhodites weldi Beutenmüller

Rhodites weldi Beutenmüller, "Insecutor Insc.," 1: 93, pl. 2, 1913. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 148.

GALL.—Beutenmüller describes this species as found "in clusters on leaves of wild rose (*Rosa* sp.), monothalamous and green when fresh. Rounded at base, thence gradually becoming broader, in general form somewhat resembling a miniature simlin squash. The top is covered with rather long, well developed, pointed projections, each of which has a long, hairy, tentacle-like appendage at the top, which readily becomes detached when handling, especially when the gall is dry and old.

Length 4 to 5 mm. and about 1 mm. at extreme base at place of attachment to the leaf.

Galls densely clustered together in indistinguishable mass on leaf." Galls July 1, 1900, flies March 3, 1911.

Host.—*Rosa* sp.

Type.—?

Type locality.—Beutenmüller described this species from "Quail Flat," Tulare County, altitude 7,200 feet, from galls collected by Dr. E. C. Van Dyke and Mr. L. Weld. Not in the Stanford Museum collection.

77. **Rhodites californicus** Beutenmüller

Rhodites californicus Beutenmüller, *Bull. Brook. Ent. Soc.*, **9**: 88, pl. 5, figs. 11, 13, 1914. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 144.

GALL.—On the terminal parts of branches or axils of leaves, displacing buds on wild rose. (*Rosa* sp.) Large, 20 to 35 mm. in diameter, irregularly rounded, densely covered with aborted leaflets and filaments, giving it a mossy appearance. In young specimens the stem may pass through the gall, but dies back as gall develops. Internally it is of a dense, pithy structure, with numerous larval cells. Polythalamous. Males and females emerge in May from galls collected in April.

Host.—*Rosa* sp.

Type.—?

Type locality.—Beutenmüller describes this species from specimens sent to him by Dr. E. C. Van Dyke from Berkeley, Alameda County, California.

In the Stanford Entomological Museum collection there are examples of this species from Palo Alto, Santa Clara County; Mitchell Gorge, Mt. Diablo, Contra Costa County; and from McConaughy, Siskiyou County, California.

Dr. Van Dyke reports the Berkeley specimens to have been found on a species of wild rose introduced into a Berkeley garden from San Jacinto Valley, Riverside County, California. The Palo Alto specimens likewise came from an introduced rose in an old abandoned garden.

78. **Rhodites bicolor** Harris

Cynips bicolor Harris, "Rep. Ins. Mass. Inj. Veget.," p. 399, 1841.

Rhodites bicolor Harris, Osten Sacken, *Proc. Ent. Soc. Phila.*, **2**: 43–48, 1863. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 377, 1911 (misidentification).

Fullaway recorded this species from California, but this is believed to be a doubtful record.

Genus **LYTORHODITES** Kieffer

79. **Lytorhodites arefactus** (Gillette)

Rhodites arefactus Gillette, *Can. Ent.*, **26**: 157, 1894. Cockerell, *Ent. Stud.*, **1**: 10, 1900.

Rhodites similis Ashmead, *Proc. U. S. Nat. Mus.*, **9**: 136, 1897. Cockerell, *Ent. Stud.*, **1**: 10, 1900. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **23**: 641, 1907.

Lytorhodites arefactus Ashmead, Kieffer, *Bull. Soc. Nat. Hist. Metz*, Ser. 2, **10**: 97, 1902. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 79, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **33**: 640, 1907; "Das Tierreich," pt. 24, p. 723, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 378, 1911.

GALL.—Dense corky enlargements, irregularly cone-shaped, involving the young twigs either terminal or lateral, usually ending in a sharp spine, sometimes in the remnant of the twig. Rusty brown in color, irregularly

marked as with overlapping scales grown together. Appears hard, but is easily indented with the nail, always free from spines (except spine-like apex). Males and females emerge in the breeding room in March from galls collected in October of the previous year.

Host.—*Rosa* sp. (of California specimens).

Type.—"In the Gillette collection." "*Co-types* in the Amer. Mus. Nat. Hist."

Type locality.—Gillette recorded this species from Fort Collins, Colorado.

In the Stanford Entomological Museum collection there are galls and flies of this species from the Stanford campus, Santa Clara County, California.

Galls on Rubus

Genus **DIASTROPHUS** Hartig

80. **Diastrophus kincaidi** Gillette

Diastrophus kincaidi Gillette, *Can. Ent.* **25**: 110, 1893. Thompson, "Cat. Amer. Ins. Galls," p. 24, 1915.

Diastrophus kincaidi Gillette, Kieffer, *Bull. Soc. Nat. Hist. Metz.*, Ser. 2, **10**: 92, 1902. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Cynipidae," p. 73, 1902. Beutenmüller, *Bull. Amer. Mus. Nat. Hist.*, **26**: 138, 1909. Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 662, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 375, 1911. Felt, *N. Y. State Mus. Bull.*, No. 200, p. 142, fig. 141 (2, 3), 1918.

Gall.—Large, irregular swelling on the stem of the thimble berry, varying in size. Polythalamous.

Host.—*Rubus nutkanus.*

In the Stanford Entomological Museum collection there are galls of this species from Pt. Arena, Mendocino County (Patterson), and from Santa Clara and Santa Cruz Counties, California (I. McC.).

Galls on Microseris

Genus **AYLAX** Hartig

81. **Aylax microseris** new species

Plate I, Fig. 10

Female.—Black, with brownish-yellow areas as follows: mandibles except tips, antennae except first two segments, legs, tegulae, tubercles on the propodeum and sheath of ovipositor. Abdomen dark reddish-brown. *Head* reticulate, sparsely pubescent, cheeks long, face with reticulate bulging area medially and striated laterally, striae converging at the clypeus. Antennae 14-segmented with the third segment shorter than the fourth, fourth longest, fifth and following progressively shorter, except the last, which is much longer than the penultimate. *Thorax*, reticulate. Pronotum wide in the middle, pubescent on small anterior lateral areas,

with a transverse groove anteriorly, separating a narrow collar-like area. Mesonotum sparsely pubescent, parapsidal grooves complete, shallow median longitudinal lines not reaching the middle, lines on either side of the parapsidal grooves over the base of wings distinct. Mesopleurae aciculate and reticulate, posteriorly reticulate only. Scutellum cushion-shaped with deep oblique narrow foveae very widely separated. Propodium pubescent with two almost parallel ridges widely separating the median from the lateral areas, lateral lobes overhanging spiracles. Petiole corrugated. Tarsal claws simple, middle and hind coxae with a series of long hairs extending whole length of outer and hinder ridges. Wings hyaline, pubescent, veins delicate, radial cell open along the margin, areolet entirely wanting, cubitus not reaching basal vein. *Abdomen* smooth and shining, second tergite occupying more than half its length, third about half as long, valves conspicuous. Length 5 mm.

GALL.—An irregular stem-swelling. Internally of a dense whitish spongy substance. Central larval chamber is divided into several areas. Polythalamous. Diameter 10–20 mm. Length 20–30 mm.

Host.—Microseris sp.

Type.—Stan. Ent. Mus.

Type locality.—Stanford campus, Santa Clara County, California (I. McCracken collector).

This species was described from twenty-one females from galls collected in the spring of 1916.

INQUILINES IN GALLS

Genus **SYNERGUS** Hartig

82. Synergus oneratus-oneratus (W. Harris)

Cynips oneratus Harris, "Treat. Ins. N. Eng.," p. 398, 1842. Fitch, "Fifth Rept. Ins. N. Y.," p. 810, 1861. Harris, "Treat. Ins. Injur. Veg.," p. 548, 1862.

Synergus (*Cynips*) *oneratus* Harris, Osten-Sacken, *Proc. Ent. Soc. Phila.*, **1**: 67, 1861. Walsh, *Proc. Ent. Soc. Phila.*, **2**: 498, 1864.

Synergus oneratus Harris, Osten-Sacken, *Proc. Amer. Ent. Soc.*, **4**: 373. Gillette, *Trans. Amer. Ent. Soc.*, **23**: 89–90.

Synergus oneratus-oneratus Harris, Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 70, 1902; "Das Tierreich," pt. 24, p. 632, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 366, 1911.

Host.—Harris, according to Gillette, bred this synergid probably from *Holcaspis globulus* (Fitch) (*Disholcaspis*).

Type.—"Boston Soc. Nat. Hist."

Insects in the Stanford Entomological collection identified for Fullaway as *Synergus oneratus-oneratus* (Harris) were bred from galls of *Disholcaspis eldoradensis* Beutenmüller on *Quercus durata* Jepson and *Quercus lobata* Née, collected on the Stanford campus.

Flies from the galls on *Quercus durata* emerged in March, and from those from *Q. lobata* in April, May, and August.

If this identification is correct it indicates an interesting and unusual distribution.

83. **Synergus dimorphus** Osten-Sacken

Synergus dimorphus Osten-Sacken, *Proc. Ent. Soc. Phila.*, **4**: 376, 1865. Cresson, *Trans. Amer. Ent. Soc.*, Suppl. Vol., pt. 2, p. 180, 1887. Dalla Torre, "Cat. Hymen.," **2**: 110, 1893. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 69, 1902; "Das Tierreich," pt. 24, p. 629, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 365.

Host.—The host from which this species was described is unknown. Gillette bred specimens from "woody twig galls on red oak."

Specimens in the Stanford Entomological Museum collection identified as *Synergus dimorphus* Osten-Sacken for Fullaway were bred from galls of *Cynips multipunctata* (Beutenmüller) on *Quercus lobata* Née, the inquilines emerging in March from galls collected in February, in Santa Clara County, California.

If this identification is correct it also indicates an interesting distribution.

84. **Synergus punctatus** Gillette

Synergus punctata Gillette, *Trans. Amer. Ent. Soc.*, **23**: 90–94, 1896.

Synergus punctata Gillette, Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 70, 1902; "Das Tierreich," pt. 24, p. 634, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 367, 1911.

Host.—Gillette described this species from *Holcaspis rubens* Gillette and *Dryophanta glabra* Gillette.

Type locality.—Manitou, Colorado.

Specimens in the Stanford Entomological Museum collection identified as this species were bred from galls of *Holcaspis eldoradensis* (Beutenmüller) on *Quercus lobata* Née, collected in the foothills of the University campus.

As with *Synergus oneratus* Harris and *Synergus dimorphus* Osten-Sacken, this species also is interesting in its distribution.

While here recording these three species from California it is recognized that this may be mistaken identity.

85. **Synergus agrifoliae** Ashmead

Synergus agrifoliae Ashmead, *Trans. Amer. Ent. Soc.*, **23**: 189, 1896. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 69, 1902; "Das Tierreich," pt. 24, p. 628, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 364, 1911.

Host.—Ashmead described this species from a gall "not unlike *Neuroterus saltatorius* Edwards, occurring on *Quercus agrifolia.*"

Type locality.—Los Angeles, California.

Not in the Stanford collection.

86. Synergus brevicornis Ashmead

Synergus brevicornis Ashmead, *"Trans. Amer. Ent. Soc.*, 23: 189, 1896. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 69, 1902; "Das Tierreich," pt. 24, p. 682, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 365, 1911.

Host.—Described by Ashmead from an unknown gall-species (a twig gall).

Type locality.—"Eldorado County, California."

Not in the Stanford collection.

87. Synergus flavus Kieffer

Synergus flavus Kieffer, *Bull. Nat. Hist. Soc. Metz*, Ser. 2, 11: 133, 1904; *Invert. Pacif.*, 1: 45, 1904. Dalla Torre and Kieffer, "Das Tierreich," pt. 24, p. 639, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 365, 1911.

Host.—The type of this species is recorded as bred from galls of *Callirhytis maculipennis* Kieffer = *Callirhytis pomiformis* Bass.

Type.—(?) *Co-types.*—Stan. Ent. Mus.

Type locality.—This species was sent to Kieffer by C. F. Baker from Claremont, Los Angeles County, California.

The co-types of this species in the Stanford Entomological Museum collection were sent by Professor C. F. Baker.

88. Synergus maculatus Fullaway

Synergus maculatus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 371, 1911.

Host.—"Small yellowish brown galls" depressed, globular, on *Quercus agrifolia* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus; Alameda County, California (R. W. Patterson).

This species of *Synergus* was bred from unnamed galls on *Quercus agrifolia* Née. This gall is small, round, brown, 1½ to 2 mm. in diameter, with a minute central pit. It is a common gall on the upper sides of leaves of *Quercus agrifolia* Née, dropping easily from the leaves when ripe. This gall has furnished two species of inquilines (*Synergus maculatus* Fullaway and *Synergus obscurus* n. sp.), the host species not as yet having been bred out.

89. Synergus multiplicatus Fullaway

Synergus multiplicatus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 370, 1911.

Host.—Galls of *Cynips kelloggii* Fullaway, on *Quercus lobata* Née, and *Quercus douglasi* Hooker and Arnott.

Type.—Stan. Ent. Mus.: Paratypes, U. S. N. M.

Type locality.—Stanford University campus, Santa Clara County, California (I. McCracken); San Jose, Santa Clara County, California; Frohm, California (Patterson); and Paso Robles, San Luis Obispo County, California (Morehouse).

90. Synergus niger Fullaway

Synergus niger Fullaway, *Ann. Ent. Soc. Amer.*, 4: 369.

Host.—*Disholcaspis eldoradensis* (Beutenmüller) on *Quercus lobata* Née (Patterson).

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County, California.

This species has been bred also from *Disholcaspis eldoradensis* (Beautenmüller) on *Quercus durata* Jepson.

91. Synergus ochreus Fullaway

Synergus ochreus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 368, 1911.

Host.—*Cynips multipunctata* (Beutenmüller) on *Quercus lobata* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stevens Creek, Santa Clara County, California.

92. Synergus splendidus Fullaway

Synergus splendidus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 369, 1911.
Synergus dubiosus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 372, 1911.

Host.—According to Fullaway, "found in jar with galls from *Quercus lobata.*"

This species has been bred by the authors from galls of *Callirhytis pomiformis* (Bassett) on *Quercus agrifolia* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County, California.

These synergids are similar to those described by Fullaway as *Synergus dubiosus,* also from *Callirhytis pomiformis* (Bassett).

93. Synergus varicolor Fullaway

Synergus varicolor Fullaway, *Ann. Ent. Soc. Amer.*, 4: 317, 1911.

Host.—*Callirhytis pomiformis* (Bassett) on *Quercus agrifolia* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus (R. Patterson).

This species has also been reared from *Callirhytis pomiformis* (Bassett), collected in California Redwood Park, Santa Cruz County, California.

94. Synergus variegatus new species

FEMALE.—*Head.* Face below antennae, genae, orbital margin, yellowish brown; eyes, tips of mandibles, ocellar and occipital areas brown. Face radiately striate, pubescent. Antennae light brown, long, 14-segmented, first and second stout, third longest, 4–6 subequal, following progressively shorter, except the last, which is about twice as long as the

penultimate. *Thorax*. Black. Tegulae, subalar areas, pronotum and mesonotum, laterally, reddish-brown. Pronotum, mesonotum and scutellum set with recumbent hairs. Pronotum narrowed in the middle finely reticulate. Mesonotum finely transversely wrinkled. Parapsidal grooves incomplete. Median longitudinal lines indistinct. Lines on either side of parapsidal grooves and lateral grooves over base of wings distinct. Subalar areas of the mesopleurae pubescent. Mesopleurae with transversely aciculate and smooth and shining areas. Areas beneath hind wings sparsely pubescent below. Scutellum rugose, basal foveae ovate, bottoms rough, approximate, separated by a median carina. Legs light yellow except last tarsal segment terminally. Wings; veins light yellow, radial cell closed along the margin, areolet distinct, cubitus not reaching basal vein. *Abdomen* reddish-brown with dark area dorsally, second tergite completely covering following segment; valves conspicuous. Length 2 mm.

MALE.—Differs from the female in having 15-segmented antennae with the third segment strongly emarginate. Light yellow in color, with eyes, tips of mandibles, ocellar area black. Episterna, metanotum, scutellum and abdomen reddish-brown. *Abdomen* longer than wide. Length 1.5 mm.

Host.—Galls of *Andricus pacificus* Ashmead, on *Quercus vaccinifolia* Kellogg.

Type.—Stan. Ent. Mus. *"Paratype,* Cat. No. 24500, U. S. N. M."

Type locality.—Fallen Leaf, Eldorado County, California.

This species was described from seven female specimens and four male specimens.

95. Synergus digressus new species

FEMALE.—Black with yellowish areas as follows: face beneath the antennae except tips of mandibles and a slightly darkened medial area, genae, orbital margin, ocelli, antennae (except extreme tips), tegulae, subalar area, legs from apex of coxae to the last tarsal segment and tarsal claws. *Head* reticulate and deeply punctate, rugose on vertex, face radiately striate and pubescent, antennae 13-segmented, first and second stout, third longest, succeeding segments progressively shorter except the last, which is much longer than the penultimate. *Thorax*. Pronotum (except medially), mesonotum and scutellum uniformly set with recumbent hairs. Pronotum wide in the middle, wrinkled. Mesonotum transversely wrinkled. Parapsidal grooves complete but faint anteriorly, wide posteriorly, median longitudinal lines indistinct. Lines on either side of the parapsidal grooves over base of wings distinct. Subalar areas of mesopleurae pubescent. Mesopleurae aciculate, pubescent below. Scutellum cushion-shaped, rugose, foveae ovate, bottoms rugose, approximate, separated by a carina. Wings hyaline, pubescent, radial cell closed on the margin, areolet

distinct, basal part of radial vein arcuate, cubitus not reaching basal vein. *Abdomen* smooth and shining, second tergite completely obscuring the following segments. Length, 2.5 mm.

MALE.—Resembles female in color. Antennae 14-segmented. Third segment emarginate.

Host.—Twig swelling of an unknown gall on *Quercus agrifolia* Née.

Type.—Stan. Ent. Mus. *"Paratype*—Cat. No. 24996, U. S. N. M."

Type locality.—Stanford University campus, Santa Clara County, California.

This species was described from two males and thirty females; issued February, March, and April. These were reared from small twig swellings. No true gall-makers emerged.

96. Synergus reniformis new species

FEMALE.—*Head.* Face below antennae, genae, orbital margin, brownish-yellow; eyes, ocelli, tips of mandibles, face above antennae, vertex and occiput, black. Face radiately striate, pubescent, vertex and occiput reticulate and sparsely punctate with carina passing from the bases of antennae through the ocular area. Antennae 14-segmented, first and second stout, third longest, a little longer than first and second together; fourth and fifth subequal; sixth and following progressively shorter except the last, which is nearly twice as long as the penultimate. In color first segment dark basally, light distally; second, third, fourth light, fifth basally light, distally dark; sixth and terminal dark, remaining segments dark above, light below. *Thorax.* Pronotum reticulate and narrow in the middle, rugose and pubescent laterally. Mesonotum transversely wrinkled, set with short recumbent hairs. Parapsidal grooves and lateral grooves over base of wings distinct. Subalar areas of the mesopleurae yellowish dorsally, pubescent. Mesopleurae uniformly transversely aciculate, pubescent below. Scutellum cushion-shaped, rugose with large ovate foveae, bottoms rough, shining, approximate, separated by a median carina. Legs yellow, except hind coxae basally, and last tarsal segment terminally. Wings hyaline, pubescent, radial cell closed, areolet distinct, basal part of radial vein arcuate, cubitus not reaching basal vein. *Abdomen* reddish-brown with black area dorsally; petiole black, second tergite smooth and shining, obscuring the greater part of the abdomen, incised dorsally at apex, microscopically punctate posteriorly, pubescent at apex, valves conspicuous. Length, 4 mm.

MALE.—Differs from the female in having 15-segmented antennae with the third segment emarginate, light yellow. Pronotum yellow except medially. Second tergite entirely covering the following segments. Length, 3 mm.

HOST.—Galls of *Andricus reniformis* McCracken and Egbert, on *Quercus vaccinifolia* Kellogg.

Type.—Stan. Ent. Mus. "*Paratype*—Cat. No. 24998, U. S. N. M."

Type locality.—Fallen Leaf, Eldorado County, California.

This species was described from one female and seven males issued June, 1915.

97. **Synergus bellus** new species

FEMALE.—Black with reddish-brown areas as follows: face below antennae (except tips of mandibles), genae, orbital margin of ocelli, lateral areas on the pronotum and lateral patch on the abdomen basally. Antennae (except tips), tegulae and legs (for the most part), yellowish-brown; last tarsal segments, hind coxae and tibiae (except light spots distally), dark. *Head* finely reticulate, punctate, pubescent, face radiately striate, antennae 13-segmented, third longest, fourth–eighth subequal, following progressively shorter, except the last, which is much longer than the penultimate. *Thorax.* Pronotum, mesonotum and scutellum set with recumbent hairs. Pronotum wide in the middle, rugose. Mesonotum coarsely transversely wrinkled, parapsidal grooves incomplete, median longitudinal lines reaching about half way to the middle, lines on either side of the parapsidal grooves and lateral grooves over the base of wings distinct. Subalar area of the mesopleurae pubescent. Mesopleurae transversely aciculate with small smooth patches dorsad to the middle, pubescent below. Scutellum rugose. Foveae ovate, bottoms rugose, shallow, approximate, indistinct. Wings hyaline, pubescent, radial cell closed along the margin, basal part of radial vein arcuate, areolet distinct, cubitus not reaching basal vein. *Abdomen* smooth and shining, second tergite wholly obscuring the following segments, valves conspicuous. Length 2.5 mm.

MALE.—Differs from female in having 15-segmented antennae with third segment emarginate, head yellowish except vertex and compound eyes. *Thorax* (except tegulae) and *abdomen* entirely black. Length 2 mm.

Host.—Twig swellings of an unknown gall on *Quercus chrysolepis* Liebmann.

Type.—Stan. Ent. Mus. "*Paratype.*—Cat. No. 24997, U. S. N. M."

Type locality.—California Redwood Park, Santa Cruz County, California.

These inquilines emerged in May, 1915, from galls collected earlier the same month.

The species is described from seven females and seven males.

98. **Synergus flavens** new species

FEMALE.—Yellowish-brown with black areas as follows: tips of mandibles, eyes, face above antennae continuing through ocellar area, spot between antennae, occiput, thorax, except posterior part of pronotum, area on the abdomen dorsally and dorsal valve. Tegulae and legs (except last tarsal segment) lighter than body. *Head* finely reticulate, pubescent, face radiately striate, antennae 14-segmented, first and second stout, third longest, fourth–sixth subequal, following progressively shorter, except the last, which is longer than the penultimate. *Thorax.* Pronotum, mesonotum, and scutellum set with recumbent hairs. Pronotum wide in the middle, finely rugose. Mesonotum finely transversely wrinkled. Parapsidal grooves complete, weak anteriorly. Median longitudinal lines not reaching the middle. Lines on either side of the parapsidal grooves and lateral grooves over the base of wings distinct. Subalar area of the mesopleurae pubescent. Mesopleurae transversely aciculate with triangular smooth patches beneath hind wings, pubescent below. Scutellum cushion-shaped, rugose, foveae ovate, bottoms rough, approximate, separated by a carina. Wings hyaline, pubescent, veins light yellow, radial cell closed on the margin, areolet distinct, cubitus not reaching basal veins. *Abdomen* smooth and shining, second tergite obscuring the following segments, valves conspicuous. Length 2.5 mm.

Host.—Gall of *Callirhytis flavens* McCracken and Egbert, on *Quercus vaccinifolia* Kellogg.

Type.—Stan. Ent. Mus.

Type locality.—Fallen Leaf, Eldorado County, California.

This species was described from four females cut out of galls collected May, 1915, C. Bentley col.

In some specimens the extent of the dark area is greatly increased.

99. **Synergus confertus** new species

FEMALE.—Black with yellowish areas as follows: antennae, head (except eyes, ocellar area, tips of mandibles), tegulae, legs, except last tarsal segment, terminally. *Head* finely reticulate, pubescent, face radiately striate, antennae 14-segmented, first and second stout, third longest, fourth–eighth sub-equal, succeeding segments progressively shorter, except the last, which is about twice as long as the penultimate. *Thorax.* Pronotum, mesonotum, scutellum set with recumbent hairs. Pronotum wide in the middle, reticulate medially, finely wrinkled. Mesonotum transversely wrinkled. Parapsidal grooves incomplete, median longitudinal lines not reaching the middle, lines on either side of parapsidal grooves and lateral grooves over the base of wings distinct. Subalar areas of the mesopleurae pubescent. Mesopleurae transversely aciculate with a large, smooth, and shining area dorsally, pubescent below. Scutel-

lum rugose, foveae ovate, approximate, separated by a median carina. Wings hyaline, pubescent, veins pale yellow, radial cell closed along the margin, areolet distinct, basal part of radial vein arcuate, cubitus not reaching basal vein. *Abdomen* smooth and shining, second tergite obscuring the following segments. Length 2 mm.

MALE.—Differs from the female in having 15-segmented antennae with the third segment emarginate. Face and legs yellow. Length 1.5 mm.

Host.—Galls of *Andricus confertus* McCracken and Egbert on *Quercus lobata* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County.

These inquilines emerged in June, 1916, from galls collected November and December, 1915.

This species described from three females and five males.

100. **Synergus pacificus** new species

FEMALE.—Black, with yellowish-brown areas as follows: antennae ocelli, genae, face (except on ventral margin), legs (except hind coxae dorsally), last tarsal segment terminally, ovipositor. *Head* finely reticulate, face radiately striate (except between the antennae), pubescent. Antennae 14-segmented, first and second stout, third longest, fourth and following progressively shorter, except the last, which is longer than the penultimate. *Thorax.* Pronotum, mesonotum, and scutellum set with recumbent hairs. Pronotum narrow in the middle, rugose. Mesonotum transversely wrinkled. Parapsidal grooves incomplete. Median longitudinal lines not reaching the middle. Lateral grooves over base of wings distinct. Subalar areas of the mesopleurae pubescent. Mesopleurae transversely aciculate with triangular smooth patches beneath the hind wings, pubescent below. Scutellum rugose. Foveae subcircular, shallow, bottoms rough, approximate, separated by a median carina. Wings hyaline, pubescent, veins yellowish, radial cell closed, areolet faint on two sides, cubitus faint and not reaching basal vein. *Abdomen* smooth and shining, second tergite obscuring the following segments, microscopically punctate posteriorly. Length 2 mm.

MALE.—Differs from female in having 15-segmented antennae, with third segment strongly emarginate. *Head* yellow except tips of mandibles, eyes, patch from bases of antennae through ocellar area and occiput. Length 2 mm.

Host.—Galls of *Andricus pacificus* Ashmead, on *Quercus chrysolepis* Liebmann.

Type.—Stan Ent. Mus.

Type locality.—California Redwood Park, Santa Cruz County, California.

This species was described from one female and five males issued April, 1915.

101. **Synergus nigro-ornatus** new species

FEMALE.—Yellowish-brown with black areas as follows: eyes, tips of mandibles, ocellar area, median patch on pronotum, median area on scutellum, sternum, metathorax, petiole, abdomen dorsally. Tegulae and legs lighter yellow except last tarsal segment terminally. *Head* reticulate, rugose, pubescent. Face radiately striate, carina passing from the bases of the antennae to outer simple eyes. Antennae 14-segmented, first and second stout, third longest, following segments progressively shorter except the last, which is longer than the penultimate. *Thorax*. Pronotum, mesonotum and scutellum set with recumbent hairs. Pronotum wide in the middle, rugose, corrugated laterally. Mesonotum transversely wrinkled. Parapsidal grooves complete. Median longitudinal lines reaching about half way to the middle. Lines on either side of parapsidal grooves and lateral grooves over base of wings distinct. Subalar area of the mesopleurae pubescent. Mesopleurae transversely aciculate, pubescent below. Scutellum cushion-shaped, rugose, with large ovate foveae, bottoms rough, approximate, separated by a median carina. Wings hyaline, pubescent, radial cell closed, basal part of radial vein acute, areolet faint on two sides, cubitus not reaching basal vein. *Abdomen* smooth and shining, second tergite obscuring following segments, punctate on posterior margins. Length, 3 mm.

MALE.—Differs from female in having 15-segmented antennae, with third segment emarginate. Entire space between the parapsidal grooves, scutellum, large area on abdomen, black. Length, 2.5 mm.

Host.—Galls of *Andricus pacificus* Ashmead on *Quercus chrysolepis* Liebmann.

Type.—Stan. Ent. Mus.

Type locality.—California Redwood Park, Santa Cruz County, California.

These inquilines emerged in June, 1915, from galls collected in March, 1915.

The species was described from one female and one male specimen.

102. **Synergus obscurus** new species

FEMALE.—Brownish-yellow with black areas as follows: eyes, tips of mandibles, ocellar area, triangular patch on occiput, pronotum on anterior margin and medially, anterior, median and dorsal areas of mesonotum, mesopleurae (except the subalar area and a patch on the episternum dorsally), sternum, scutellum in the area of the foveae and laterally, metathorax,

petiole, dorsal area of abdomen. Tegulae and legs, except tarsal claws terminally, lighter yellow. *Head* finely reticulate, punctate, pubescent. Face radiately striate, antennae 14-segmented, first and second stout, third longest, fourth to sixth subequal, following progressively shorter except last, which is longer than penultimate, last six segments conspicuously grooved. *Thorax*. Pronotum (except medially) mesonotum and scutellum, set with long recumbent hairs. Pronotum wide in the middle, smooth medially, rugose laterally. Mesonotum finely transversely wrinkled. Parapsidal grooves complete, weak anteriorly. Median longitudinal lines reaching about half way to middle. Lines on either side of parapsidal grooves and lateral grooves over base of wings, distinct. Subalar areas of mesopleurae pubescent. Mesopleurae transversely aciculate medially, with smooth and shining areas above and below. Scutellum cushion-shaped, rugose with elongate foveae, bottoms shining but not smooth, approximate, separated by a median carina. Wings hyaline, pubescent, veins light yellow, radial cell closed on margin, basal part of radial vein arcuate, areolet distinct, cubitus not reaching basal vein. *Abdomen* smooth and shining, second tergite obscuring the following segments. Length, 2.5 mm.

Host.—Small round brown galls 2 mm. in diameter on upper sides of leaves of *Quercus agrifolia* Née.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus.

This species described from four females issued April, 1915.

103. **Synergus distinctus** new species

FEMALE.—Head (except palpi and mandibles basally), first segment of antennae and second basally, thorax (except tegulae), coxae, trochanters (except distally), last tarsal segments dorsally, petiole, extreme base of abdomen, dorsal valve distally, black. Abdomen and legs reddish brown. *Head* reticulate, punctate, rugose on vertex behind simple eyes. Antennal fossae raised. Conspicuous lateral carinae passing backward from antennae through ocular area. Face radiately striate. Antennae 14-segmented, first and second stout, third longest, fourth and following progressively shorter except last, which is longer than penultimate. *Thorax*. Pronotum, mesonotum and scutellum set with recumbent hairs. Pronotum wide in the middle, rugose. Mesonotum transversely wrinkled. Parapsidal grooves deep and complete. Median longitudinal lines reaching about half way to middle. Lines on either side of the parapsidal grooves and lateral grooves over base of wings, distinct. Subalar area of mesopleurae pubescent. Mesopleurae transversely aciculate, pubescent below. Scutellum cushion-shaped, very coarsely rugose with basal foveae deep, large, subcir-

cular, bottoms rough, approximate, separated by a median carina. Tarsal claws bidentate. Wings hyaline, pubescent, veins brownish, radial cell closed along the margin, basal part of radial vein arcuate, areolet distinct, cubitus reaching almost to basal vein. *Abdomen* smooth and shining, second tergite incised dorsally at apex, exposing following segments, microscopically punctate posteriorly. Length, 4 to 4.5 mm.

MALE.—Differs from female in having 15-segmented antennae, with third segment emarginate. *Abdomen* dark brown, with second tergite obscuring following segments. Length, 3.5 mm.

Host.—Galls of *Cynips canescens* (Bassett) on *Quercus douglasi* Hooker and Arnott.

Type.—Stan. Ent. Mus. *"Paratype.*—Cat. No. 24502, U. S. N. M."

Type locality.—Stanford University campus, Santa Clara County, California.

104. **Synergus profusus** new species

FEMALE.—Black with yellowish-brown areas as follows: mandibles basally, patch beneath compound eyes, oral margins, antennae (except first segment dorsally and toward tips), tegulae, legs (except coxae), femora dorsally exclusive of apex, first tarsal segment terminally, and ventral valve. *Head* finely reticulate, punctate. Face radiately striate, pubescent. Antennae 14-segmented, first and second stout, third longest, fourth to sixth, subequal, following segments progressively shorter except last, which is longer than penultimate. *Thorax.* Pronotum, mesonotum and scutellum set with recumbent hairs. Pronotum wide in the middle, rugose, corrugated laterally. Mesonotum transversely wrinkled. Parapsidal grooves complete, weak anteriorly. Median longitudinal lines on either side of parapsidal grooves and lateral grooves over base of wings distinct. Subalar areas of the mesopleurae pubescent. Mesopleurae transversely aciculate, with smooth shining areas beneath hind wing, pubescent below. Scutellum cushion-shaped, rugose with basal foveae large, oblong, shallow, bottoms rough, approximate, separated by a median carina. Wings hyaline, pubescent, veins light yellow, radial cell closed, basal part of radial vein arcuate, areolet distinct, cubitus not reaching basal vein. *Abdomen* smooth and shining, finely punctate posteriorly, second tergite wholly obscuring following segments. Length, 3 mm.

MALE.—Differs from female in having 15-segmented antennae, with third segment strongly emarginate. Antennae brown, slightly dusky toward tips, legs yellowish-brown except hind coxae dorsally. Face below antennae, cheeks laterally and genae, yellowish-brown. Length, 2 mm.

Host.—Galls of *Cynips canescens* (Bassett) on *Quercus douglasi* Hooker and Arnott.

Type.—Stan. Ent. Mus. *"Paratype.*—Cat. No. 24501, U. S. N. M."

Type locality.—Stanford University campus, Santa Clara County, California.

This species was described from 40 females and 24 males, issued March, 1915, from galls collected in February, 1915.

The following color varieties have been noted: light patch on head beneath compound eyes wanting, orbital margin sometimes light. Femora in a few specimens entirely dark except at base and apex, in others entirely light.

105. **Synergus rutulus** new species

FEMALE.—Head rufous with black markings as follows: vertex, tips of antennae, post genae and mandibles. *Thorax* rufous with black spots, as follows: on pronotum medially, mesopleurae, metanotum, propodium and basal half of petiole; brown spots on meso- and metacoxae; admixture of brown and rufous on mesonotum and scutellum. *Abdomen* rufous, with wide dorso-medial brown areas reaching almost to tip. *Head* pubescent, face and genae radially striate basally, orbital area finely reticulate, vertex coarsely rugose (except median ocellar area), microscopically reticulate, including ocellar area. *Thorax.* Pronotum wide and smooth medially, punctate and rugose laterally. Mesonotum transversely rugose. Parapsidal grooves complete. Median lines present anteriorly, but more or less obscured by the rugose integument. Lines on parapsides distinct, smooth, reaching half way to the pronotum. Scutellum rugose with large, deep, rugose foveae. Mesopleurae transversely striate. Propodium finely reticulate, median area set off by carina, lateral areas with tubercles ventrad of large spiracles. *Abdomen* smooth and shining dorsally and laterally, finely punctate posteriorly.

Host.—Galls of *Disholcaspis plumbella* Kinsey on *Quercus durata* Jepson.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County, California. Described from one female.

Genus **CEROPTRES** Hartig

106. **Ceroptres pomiformis** Ashmead

Ceroptres pomiformis Ashmead, *Trans. Amer. Ent. Soc.*, **12**: 300, 1895. Dalla Torre and Kieffer, in "Wytsman Gen. Ins. Hymen. Cynipidae," p. 71, 1902; "Das Tierreich," pt. 24, p. 647, 1910. Fullaway, *Ann. Ent. Soc. Amer.*, **4**: 272, 1911.

Host.—This inquiline was bred by Ashmead from the gall of *Callirhytis pomiformis* (Bassett) on *Quercus agrifolia* Née.

Type locality.—"California." Not in Stanford collection.

107. **Ceroptres dorsalis** Provancher

Ceroptres dorsalis Provancher, "Addit. Hym. Quebec," p. 398, 1888. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 372, 1911.

Host.—Not recorded.

Type locality.—"Los Angeles."

Provancher describes both female and male of this species from Los Angeles, collected by Coquillett.

Not in Stanford collection.

108. **Ceroptres niger** Fullaway

Ceroptres niger Fullaway, *Ann. Ent. Soc. Amer.*, 4: 373, 1911.

Host.—Disholcaspis eldoradensis (Beutenmüller) on *Quercus lobata* Née.

Type.—Stan. Ent. Mus. (female only).

Type locality.—Stanford University campus, Santa Clara County, California.

These inquilines appear in March from galls collected the previous February.

Genus **PERICLISTUS** Förster

109. **Periclistus californicus** Ashmead

Periclistus californicus Ashmead, *Trans. Amer. Ent. Soc.*, 23: 188, 1896. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 374, 1911.

Host.—Ashmead described this inquiline from the gall of *Rhodites polita* Ashmead. This is a very common inquiline on this rose gall.

Type locality.—Ashmead bred out this gall from material collected in California by Mr. Alfred Koebele.

In the Stanford Entomological Museum collection there are specimens bred from *Rhodites polita* collected by Miss Patterson in Mendocino County, and by Miss Smith at Ferndale, Humboldt County, California.

110. **Periclistus obliquus** Provancher

Periclistus obliquus Provancher, Addit. Hymen (Quebec), p. 397, 1888. Fullaway, *Ann. Ent. Soc. Amer.*, 4: 379, 1911.

Type locality.—Recorded by Provancher from Los Angeles, from material collected by Coquillett.

Not in Stanford collection.

111. **Periclistus piceus** Fullaway

Periclistus piceus Fullaway, *Ann. Ent. Soc. Amer.*, 4: 374, 1911.

Host.—Galls of *Rhodites politus* Ashmead on *Rosa californicus.*

Type.—Stan. Ent. Mus. *"Paratype.*—Cat. No. 24503, U. S. N. M." Inquilines of this species emerged in February.

112. **Periclistus arefactus** new species

FEMALE.—Black, with brownish-yellow areas as follows: mandibles basally, palpi, antennae except tips, tegulae, legs from coxae distally to last tarsal segment terminally, and dorsal valve. *Head* finely reticulate, face with striae converging toward the clypeus and bulging above the clypeus, pubescent. Antennae 12-segmented, first and second stout, third–sixth subequal, succeeding progressively shorter except last, which is more than twice as long as penultimate. *Thorax.* Pronotum except medially, mesonotum and scutellum set with recumbent whitish hairs. Pronotum wide in the middle, very finely rugose. Mesonotum closely and finely punctate. Parapsidal grooves incomplete, wide posteriorly. Median longitudinal lines not reaching middle. Lines on either side of parapsidal grooves over base of wings distinct. Subalar areas of the mesopleurae pubescent. Mesopleurae sparsely punctate, finely aciculate with smooth and shining patch beneath the hind wings, pubescent laterally and below. Scutellum cushion-shaped, foveae deep, ovate, bottoms smooth and shining, approximate, separated by a median carina. Wings hyaline, pubescent, radial cell closed on the margin, areolet distinct, cubitus not reaching basal vein. *Abdomen* smooth and shining with the second segment occupying about two-thirds of its length, pubescent basally and distally, punctate on posterior margin. Length 2.5 mm.

MALE.—Differs from the female in having 14-segmented antennae with the third segment strongly emarginate, second tergite occupying about one-half of its length. Length 2.5 mm.

Host.—Galls of *Rhodites arefactus* Gillette on *Rosa californicus.*

Type.—Stan. Ent. Mus. *"Paratype.*—Cat. No. 24504, U. S. N. M."

Type locality.—Palo Alto, Santa Clara County, California.

These inquilines emerged in March, 1917, from galls collected October, 1916,

This species was described from nine females and fifteen males.

113. **Periclistus confertus** new species

FEMALE.—Reddish-brown. Tegulae, legs and ovipositor lighter brown. Eyes, tips of mandibles, sternum, dorsal valve, black. *Head* finely reticulate, pubescent. Face laterally with striae converging toward the clypeus, slightly bulging above the clypeus. Antennae 14-segmented, first and second stout, fourth a little longer than third, fifth–sixth subequal, following segments progressively shorter, except last, which is longer than penultimate. *Thorax.* Pronotum, mesonotum, and scutellum covered with short recumbent hairs. Pronotum wide in the middle, reticulate, two median ridges curved outward, meeting above and inclosing a reticulate area. Mesonotum finely reticulate. Parapsidal grooves com-

plete, but weak anteriorly. Median longitudinal lines faint and not reaching middle. Lines on either side of parapsidal grooves faint. Lateral grooves over base of wings distinct. Subalar area of mesopleurae reticulate and pubescent. Mesopleurae smooth and shining, pubescent below. Scutellum cushion-shaped, finely rugose. Basal foveae ovate, approximate and separated by a carina. Tarsal claws bidentate. Wings hyaline, pubescent, veins light yellow, radial cell closed along the margin, areolet distinct, basal part of radial vein curved, cubitus barely reaching basal vein. *Abdomen* closely punctate and pubescent basally, smooth and polished beyond basal segment, second tergite reaching more than half way to apex, divided by a vertical suture, dorsal valve prominent. Length 2 mm.

Host.—Galls of *Andricus confertus* McCracken and Egbert.

Type.—Stan. Ent. Mus.

Type locality.—Stanford University campus, Santa Clara County, California.

These inquilines emerged in the summer of 1916 from galls collected December, 1915.

The species was described from two females.

TABLE I. CALIFORNIA CYNIPIDS AND THEIR PLANT HOSTS

	Quercus agrifolia Née	*Quercus wislizeni* A. de C.	*Quercus douglasi* H. A.	*Quercus lobata* Née	*Quercus chrysolepis* Lieb.	*Quercus dumosa* Nuttall	*Quercus durata* Jepson	*Quercus kelloggi* Newberry	*Quercus vaccinifolia* Kellogg	*Quercus garryana* Hooker	*Castanopsides sempervirens* Dudley	Wild Rose	*Rubus*	*Microseris* sp.	Unknown	*Quercus engelmanni* Greene	*Quercus wilcoxi*
Andricus attractans Kinsey		+	++	+		+	+										
Andricus brunneus Full.				+													
Andricus californicus (Bass.)				+	+		+	+			+						
Andricus castanopsidis (Beut.)																	
Andricus chrysolepidis Ashm.				+													
Andricus conferius n. sp.	+			+	+	+	+								+		
Andricus congregatus Ashm.					+												
Andricus crystallinus (Bass.)																	
Andricus dadydactyli (Ashm.)																	
Andricus eldoradensis (Beut.)																	
Andricus fullawayi Beut.																	
Andricus gigas Kinsey																	
Andricus humicola Kinsey																	
Andricus kingi (Bass.)																	
Andricus pacificus Ashm.																	
Andricus parmula Bass.																	
Andricus pattersonae Full.																	
Andricus perdens Kinsey																	
Andricus perforeatus Kinsey																	
Andricus reniformis n. sp.																	
Andricus serricornis Kinsey																	
Andricus spectabilis Kinsey																	
Andricus wiltgae Full.																	
Andricus wisliceni Ashm.																	
Andricus yosemite Beut.																	
Aylax microseris n. sp.																	
Bassettia ligni Kinsey																	
Biorhiza californica Beut.																	
Callirhytis agrifolia (Bass.)																	
Callirhytis apicalis Ashm.																	
Callirhytis bicornis n. sp.																	
Callirhytis chrysolepidicola (Ashm.)																	
Callirhytis eriophora Kieffer																	
Callirhytis flarens n. sp.																	
Callirhytis fulva Weld																	
Callirhytis guadaloupensis Full.																	
Callirhytis hartmani Weld																	
Callirhytis lasia Ashm.																	
Callirhytis essigi n. sp.																	
Callirhytis nigra (Full.)																	
Callirhytis pomiformis (Bass.)																	
Callirhytis rossi Kieff.																	
Callirhytis sanctae-clarae Full.																	
Callirhytis suttoni Bass.																	
Callirhytis trimaculosa n. sp.																	
Callirhytis vaccinifolia Ashm.																	
Compsodryoxenus brunneus Ashm.																	
Cynips canescens (Bass.)																	
Cynips corallina (Bass.)																	
Cynips heldae Full.																	
Cynips hellogii Full.																	
Cynips maculipennis Gillette																	
Cynips multipunctata (Beut.)																	
Cynips rufescens n.sp.																	
Cynips washingtonensis Gillette																	
Diastrophus kincaidi Gillette																	
Disholcaspis chrysolepidis (Beut.)																	
Disholcaspis eldoradensis (Beut.)																	
Disholcaspis plumbella Kinsey																	
Disholcaspis truckeensis Ashm.																	
Dryophanta atrimenta Kinsey																	
Dryophanta clavula (Beut.)																	
Dryophanta discus (Bass.)																	
Dryophanta douglasi (Ashm.)																	
Dryophanta dubiosa Full.																	
Dryophanta echina (O.-S.)																	
Dryophanta lobata n. sp.																	
Dryophanta pedicellata Kinsey																	
Dryophanta pulchella Beut.																	
Lytorhodites arefactus (Gillette)																	
Neuroterus decipiens Kinsey																	
Neuroterus engelmanni Kinsey																	
Neuroterus fragilis Bass.																	
Neuroterus varioms Kinsey																	
Rhodites californicus Beut.																	
Rhodites politus Ashm.																	
Rhodites weldi Beut.																	
Trichoteras coquilletti Ashm.																	
Trigonaspis obconica Weld																	

TABLE II. CYNIPID INQUILINES AND THEIR HOSTS

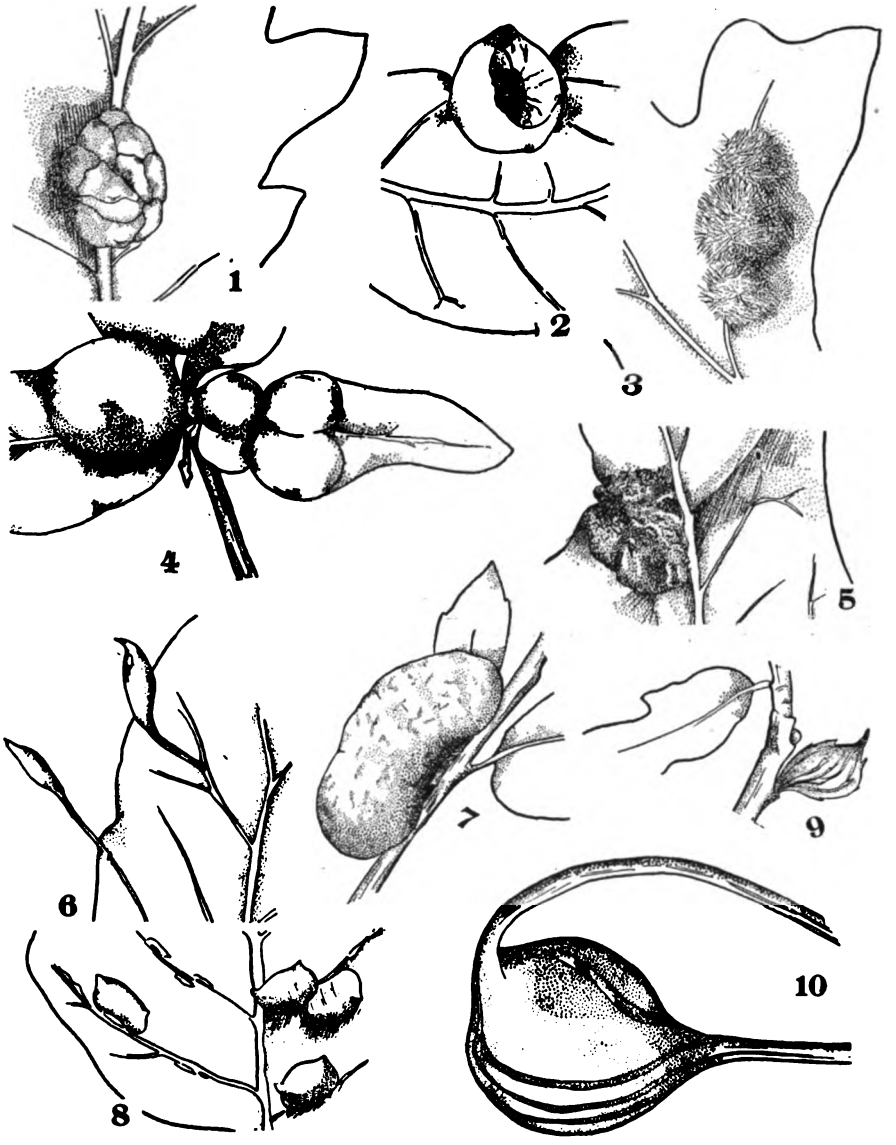
	Disholcaspis plumbella Kinsey	*Disholcaspis eldoradensis* (Beut.)	*Cynips multipunctata* (Beut.)	*Cynips canescens* (Bass.)	*Cynips kelloggii* Full.	*Callirhytis pomiformis* (Bass.)	*Callirhytis flavens* n.sp.	*Callirhytis suttoni* n. sp.	*Andricus pacificus* Ashm.	*Andricus reniformis* n. sp.	*Andricus confertus* n. sp.	*Neuroterus saltatorius* Edwards	*Rhodites arefactus* Gillette	*Rhodites politus* Ashm.	Unidentified twig swelling	Unidentified leaf-gall (on *agrifolia*)	Unknown gall
Synergus agrifolia Ashm.												+					
Synergus brevicornis Ashm.																	+
Synergus bellus n. sp.																	
Synergus confertus n. sp.											+						
Synergus digressus n. sp.																	
Synergus dimorphus n. sp.			+														
Synergus distinctus n. sp.				+													
Synergus flavens, n. sp.							+										
Synergus flavus Kieff.										+							
Synergus maculatus Full.																	
Synergus multiplicatus Full.		+			+												
Synergus niger Full.						+											+
Synergus nigro-ornatus n. sp.									+								
Synergus obscurus n. sp.										+							
Synergus ochreus Full.																	
Synergus oneratus-oneratus Harr.											+						
Synergus pacificus n. sp.									+								
Synergus profusus n. sp.																	
Synergus punctatus																	
Synergus reniformis n. sp.																	
Synergus rutulus n. sp.	+																
Synergus splendidus Full.																	
Synergus varicolor Full.																	
Synergus variegatus n. sp.																	
Ceroptres dorsalis Prov.																	
Ceroptres niger Full.		+															
Ceroptres pomiformis Ashm.																	
Periclistus arefactus n. sp.													+				
Periclistus californicus Ashm.														+			
Periclistus confertus n. sp.																	
Periclistus obliquus Prov.																	
Periclistus piceus Full.															+		
																+	+

INDEX TO GENERA AND SPECIES

PLATES
WITH EXPLANATIONS

Plate I.

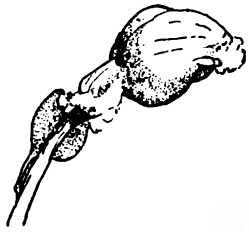
Fig. 1. *Andricus confertus* n. sp.
Fig. 2. *Dryophanta atrimenta* (Kinsey), (gall sectioned, exposing kernel).
Fig. 3. *Callirhytis trimaculosa* n. sp.
Fig. 4. *Callirhytis flavens* n. sp.
Fig. 5. *Callirhytis perfoveatus* Kinsey.
Fig. 6. *Dryophanta pedicellata* (Kinsey).
Fig. 7. *Andricus reniformis* n. sp.
Fig. 8. *Callirhytis bicornis* n. sp.
Fig. 9. *Dryophanta lobata* n. sp.
Fig. 10. *Aylax microceris* n. sp.



—Egbert

Plate II.

Fig. 1. *Callirhytis eriophora* Beut. (with woolly covering removed).
Fig. 2. *Andricus castanopsidis* Beut.
Fig. 3. *Andricus pattersonae* Full.
Fig. 4. *Disholcaspis plumbella* Kinsey.
Fig. 5. *Callirhytis guadaloupensis* Full.



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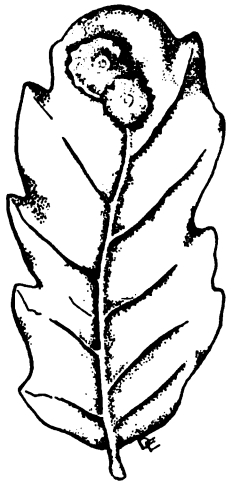

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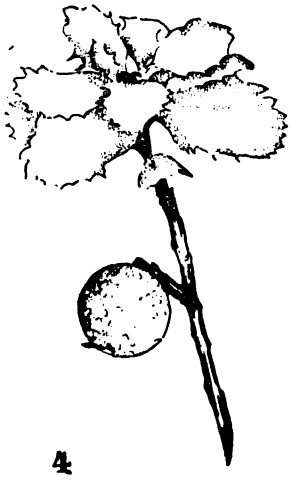

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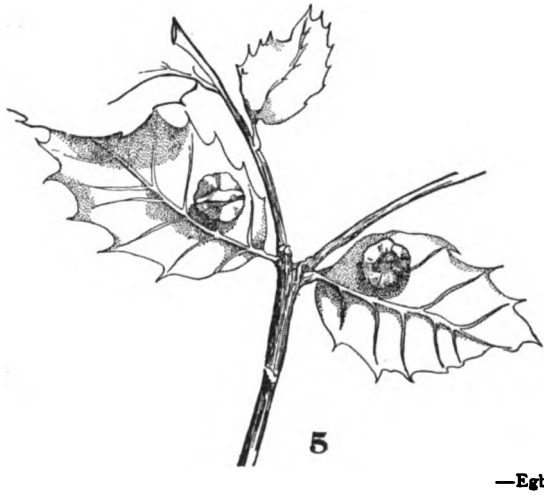

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