

## Notes on Hawaiian Alloxystidae and Cynipidae (Hymenoptera: Cynipoidea)

JOHN W. BEARDSLEY, JR.<sup>1,2</sup>

### ABSTRACT

The purpose of this short paper is to correct previously published misidentifications and present unpublished records for species of these families in Hawaii. Keys are given for the separation of the cynipoid families known from Hawaii, and for identification of Hawaii Alloxystidae.

Weld (1952) and earlier workers divided the Cynipoidea into three families; the Ibalidae, Liopteridae and Cynipidae. The latter was subdivided into the subfamilies Figitinae, Eucolinae and Cynipinae, of which only the last two were known to be represented in Hawaii. The Cynipinae was further subdivided by Weld into the tribes Charipini and Cynipini. However, Burks (1979), in the most recent Catalog of North American Hymenoptera, has raised not only the subfamilies Eucolinae and Figitinae, but also the tribe Cynipini and the nomenclatorial equivalent of the Charipini, all to full family status. Thus, we have represented in the presently known Hawaiian cynipoid fauna the families Eucoilidae, Cynipidae and Alloxystidae, the latter being equivalent to the Charipini of Weld. Of these, only the Eucoilidae contains species endemic to the Hawaiian Islands.

### KEY TO FAMILIES OF CYNIPOIDEA KNOWN FROM HAWAII

1. Scutellum with a distinct elevated keel-shaped or flat-topped "cup"<sup>3</sup> which often bears a conspicuous central or subapical pit, if cup not conspicuously elevated (a few species), then represented by a smooth, polished, relatively flat dorsal plate; parasites in the puparia of Diptera, suborder Cyclorhapha ..... Eucoilidae
- Scutellum without a cup, hump-like, convex dorsally without a distinct, flat, dorsal plate; not parasitic on Diptera ..... 2
2. Dorsum of scutellum smooth, polished or with barely discernible sculpture; size small, body less than 2 mm in length; hyperparasites in aphids ..... Alloxystidae
- Dorsum of scutellum strongly sculptured; generally larger species (ours ca. 2.5 mm long); developing in plant galls ..... Cynipidae

### FAMILY CYNIPIDAE (sens. str.).

This large, primarily phytophagous family is represented in Hawaii by a single immigrant species.

#### *Phanacis hypochaeridis* (Kieffer).

*Aulax hypochaeridis* Kieffer 1887. Zool.-Bot. Gesell. Wien. Verh. 37.

*Phanacis hypochaeridis* (Kieffer); Eady and Quinlan 1963. Handbook for Ident. British Insects 8:1(a):17. Burks 1979. Cat. Hymenop. North America 1:1068.

*Gillettea taraxaci*, Beardsley 1970. Proc. Hawaii. Entomol. Soc. 20:494 (misidentification).

<sup>1</sup>Department of Entomology, University of Hawaii, Honolulu, HI 96822.

<sup>2</sup>Journal Series No. 2851 of the Hawaii Institute of Tropical Agriculture and Human Resources.

<sup>3</sup>The term "cup" is descriptive of this structure in a few forms, such as our *Cothonaspis pacificus* Yoshimoto. However, in the majority of Eucoilidae it is not particularly cup-shaped.

In 1969, I reported this species, as a new record in Hawaii, under the name of *Gillettea taraxaci* (Ashmead), determined by B.D. Burks of the U.S. National Museum (Beardsley 1970). However, I suspected that this determination might not have been correct because host-associated specimens from Hawaii were all from stem galls of *Hypochoeris radicata* L., a common weed which occurs in Hawaii mainly at elevations above 5,000 feet on Maui and Hawaii, and not from the true dandelion, *Taraxacum officinale* Weber, which is the normal host of *taraxaci* (now also placed in the genus *Phanacis*). There are 11 specimens (10 females, 1 male) in the University of Hawaii collection, including one female from the collection determined by Burks, all of which appear to be *P. hypochoeridis*, based upon the key to British *Phanacis* in Eady and Quinlan (1963). These specimens are from elevations between 6,000 and 8,000 ft. on Haleakala, Maui and Mauna Loa, Hawaii. Several were reared from stem galls of *Hypochoeris radicata*. The oldest collection of this species from Hawaii which I know of is a specimen labeled Mauna Loa, Hawaii, Strip Road, 6600 ft., VI.24.1966, J.W. Beardsley, collector.

### FAMILY ALLOXYSTIDAE

Only one species belonging to this family, *Alloxysta brassicae* (Ashmead), has been reported previously in Hawaiian literature (Swezey 1947, Beardsley 1966). However, study of available Hawaiian specimens revealed the presence of two additional species, which are recorded below. The paper by F.G. Andrews (1978) was particularly useful in identifying the Hawaiian material. However, my determinations need to be confirmed by comparison with types or other authoritatively determined specimens.

### KEY TO HAWAIIAN SPECIES OF ALLOXYSTIDAE

1. Mesopleuron with a distinct transverse suture across lower portion (fig. 1) ..... *Phaenoglyphis ambrosiae* (Ashmead)
- Mesopleuron without such a transverse suture ..... 2
2. Radial cell relatively large (fig. 2), ratio of wing length to radial cell length ca. 4:1 to 5:1 ..... *Alloxysta brassicae* (Ashmead)
- Radial cell relatively small (fig. 3), ratio of wing length to radial cell length ca. 7:1 to 8:1 ..... *Alloxysta* sp., *magourae* (Ashmead) complex

#### *Alloxysta brassicae* (Ashmead).

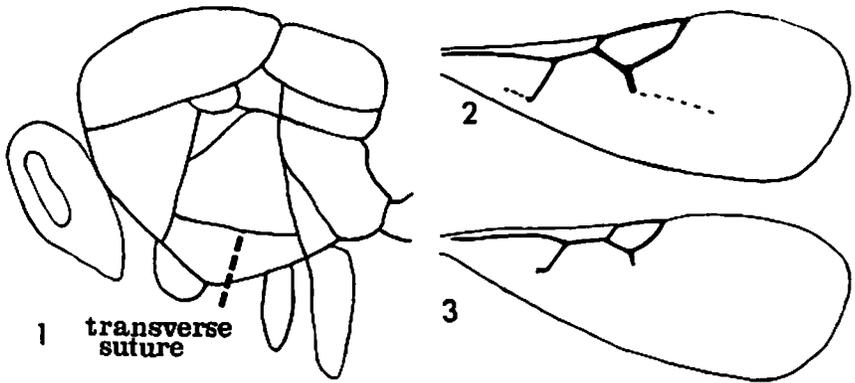
*Allotria brassicae* Ashmead 1887. U.S. Dept. Agric. Entomol. Bul. 14:14.

*Charips brassicae* (Ashmead); Dalla Torre and Kieffer 1902. Gen Insectorum 1:41.

*Xystus brassicae* (Ashmead); Swezey 1947. Proc. Hawaii. Entomol. Soc. 13:2.

*Alloxysta brassicae* (Ashmead); Andrews 1978. Calif. Dept. Food and Agric. Occas. Paper Entomol. 25:56.

Swezey (1947) first reported this species in Hawaii on the basis of specimens which he reared from the cabbage aphid, *Brevicoryne brassicae* (L.), on Oahu. These specimens are labeled "Quarantine Island, 15 March 1920". The oldest Hawaiian specimens which I have seen were collected at an unspecified locality on Oahu by D.T. Fullaway, 1918. The Bishop Museum collection contains a series of four specimens labeled "Napoopoo, Hawaii, 8.9.1919, O.H. Swezey, ex aphid on *Capparis*". A female labeled "Moiliili, Honolulu, I.2.1945, D.D. Jensen, ex *Myzus persicae*" and a female labeled "Paliku, Haleakala, Maui, 6000 ft., VI.1953, C.R.



**FIGURE 1.** Diagram of lateral aspect of thorax of *Phaenoglyphis ambrosiae* to show location of transverse suture (after Andrews 1978).

**FIGURE 2.** Diagram of forewing venation, *Alloxysta brassicae*.

**FIGURE 3.** Diagram of forewing venation; *Alloxysta* sp., *magourae* complex.

Joyce Collector" constitute the only other known collections of this species in Hawaii. The previous record of *Charips brassicae* from Maui (Beardsley 1966) was based on a misidentification of *Phaenoglyphis ambrosiae* (Ashmead) (see below).

*Alloxysta brassicae* is widely distributed in North America where it is a common hyperparasite of aphid primaries on cruciferous hosts (Burks 1979). Andrews (1978) recorded it also from Argentina. He pointed out that *A. brassicae* probably is a junior synonym of *A. ancylocera* (Cameron), a European species.

**Alloxysta species, magourae (Ashmead) complex.**

*Allotria magourae* Ashmead 1887. U.S. Dept. Agric. Div. Entomol. Bul. 14:19.

*Alloxysta magourae* (Ashmead) complex, Andrews 1978. Calif. Dept Food and Agric., Occas. Paper Entomol. 25:47.

The University of Hawaii and Bishop Museum collections together contain a series of 12 specimens which run to the *A. magourae* complex in Andrews' (1978) key. Andrews stated that he was unable to determine if this complex is a single variable species or seven or eight closely related ones. It appears that, for the present, a more precise determination of our species cannot be provided. This species has not been recorded previously in Hawaii. Collection data for the Hawaiian specimens are as follows: Molokai, Kawela Gulch, 3500 feet, III.19.1966, J.W. Beardsley (2 females), C.M. Yoshimoto (4 females); Hawaii, Mauna Loa Strip Road, 6600 ft., VII.19.1971, J. Leeper, ex *Acacia koa* (1 female); Hawaii, Ahumoa Crater, 6500 ft., VI.21.1966, J.W. Beardsley (5 females).

**Phaenoglyphis ambrosiae (Ashmead).**

*Allotria ambrosiae* Ashmead 1897. Proc. Entomol. Soc. Wash. 4:156.

*Charips ambrosiae* (Ashmead); Dalla Torre and Kieffer 1910. Das Tierreich 24:289.

*Alloxysta ambrosiae* (Ashmead); Burks 1979. Cat. Hymenop. No. America 1:1058.

*Phaenoglyphis ambrosiae* (Ashmead); Andrews 1978. Calif. Dept. Food and Agric., Occas. Papers Entomol. 25:30.

*Charips brassicae*, Beardsley 1966. Proc. Hawaii. Entomol. Soc. 19:143 (misidentification).

A series of about 100 specimens of *P. ambrosiae* is contained in the Bishop Museum and University of Hawaii collections. All the specimens seen were taken on the islands of Maui and Hawaii at elevations of 4,000 feet or above, including several from Lake Waiau, Hawaii at 13,000 feet. The oldest specimen seen is labeled: Paliku, Haleakala Crater, Maui, 6500 ft. VIII.1958, D.E. Hardy, collector. There are no reared specimens in this series. However, *P. ambrosiae* has been reared elsewhere as a hyperparasite of various Aphidiinae in many species of aphids (Andrews 1978).

#### REFERENCES CITED

- Andrews, F.G. 1978. Taxonomy and Host Specificity of Nearctic Alloxystinae with a Catalog of the World Species (Hymenoptera: Cynipidae). Calif. Dept. Food and Agric., Occas. Papers Entomol. No. 25, 129 p.
- Beardsley, J.W. 1966. Notes and Exhibitions. Proc. Hawaii. Entomol. Soc. 19:143.
- , 1970. Notes and Exhibitions. Proc. Hawaii Entomol. Soc. 20:494.
- Burks, B.D. 1979. Cynipoidea (p. 1045-1107) in: Krombein, K.V., P.D. Hurd, Jr., D.R. Smith and B.D. Burks. Catalog of Hymenoptera in America North of Mexico, vol. 1, Symphyta and Apocrita (Parasitica). Smithsonian Inst. Press, Washington, D.C.
- Eady, R.D. and J. Quinlan. 1963. Handbook for the Identification of British Insects. vol. 8, pt. 1(a) Hymenoptera: Cynipoidea. 81 p. Royal Entomol. Soc. London.
- Swezey, O.H. 1947. Notes and Exhibitions. Proc. Hawaii. Entomol. Soc. 13:2.
- Weld, L.H. 1952. Cynipoidea (Hym.) 1905-1950. 351 p. privately published.