

MISCELLANEOUS

Besides all of the insects mentioned, common inhabitants of the habitat among the moist debris at the leaf bases of ieie are several spiders, oribatid mites, sowbugs, the shrimp *Orchestia pickeringii* Dana, small millipeds and centipedes, earthworms and several kinds of snails.

Fruit-eating and Seed-eating Insects in Hawaii

BY O. H. SWEZEY

(Presented at the meeting of May 2, 1935)

In studies of the insect faunas of the various Hawaiian trees and plants, one finds nearly all kinds of fruits and seeds eaten by one or more special kinds of insects. This paper segregates observations on these habits so far as at present known, mostly the observations of the writer during the 30 years in which he has been interested in the Hawaiian insect fauna. Included also are immigrant insects which feed on fruits and seeds, whether of native plants or of introduced plants as well. The list is arranged by systematic orders of insects, the Lepidoptera including by far the largest number of species.

LEPIDOPTERA

Noctuidae

Chloridea obsoleta (Fab.). The caterpillars feed chiefly in the ears of green corn, scarcely an ear of recent years but what is affected by them. Others hosts are cotton bolls, tomato, *Malva* fruits, *Sida* buds and blossoms, *Malvastrum*, the flower heads of several Compositae as African daisy, marigold, *Ageratum*, *Siegesbeckia*, *Heterotheca grandiflora*, also the flowers of snapdragon, *Gossypium tomentosum* and *Euxolus*.

Phycitidae

Ephestia cautella Walker. The larvae feed in various grains and grain products.

Plodia interpunctella Hubner. The larvae feed in stored nuts, dried fruits, cereals, etc.

Myelois ceratoniae Zeller. The larvae feed on the seeds in the pods of several legumes as: *Ceratonia siliqua*, *Acacia farnesiana*, *Prosopis juliflora*, *Cassia bicapsularis*, *Erythrina monosperma*, *Caesalpinia sappan*, *Samanea samman*, *Haematoxylon campechianum*, and sometimes castor oil seeds.

Paralipsa modesta Butler. The larvae sometimes infest stored rice.

Rhynchephestia rhabdotis Hampson. The larvae destroy the seeds in the flower heads of the silversword plant (*Argyroxiphium sandwicense macrocephalum*) growing in the crater of Haleakala on Maui. They also feed at the base of the leaves and in the stem.

Pyraustidae

Terastia meticalis Guene. The larvae were once found feeding on the seeds in the pods of *Erythrina monosperma*.

Maruca testulalis (Geyer). The larvae feed on the seeds in the pods of Lima beans, string beans, peas, pigeon peas, *Mucuna urens*, and probably other legumes, also in the flowers of *Sesbania grandiflora*.

Orneodidae

Orneodes objurgatella Walsm. The larvae infest very extensively the fruits of *Plectronia odorata*.

Gelechiidae

Platyedra gossypiella (Saund.). This is the pink bollworm, a bad pest on cotton, feeding on the seeds and spoiling the cotton fiber in the unripened bolls. The seeds of *Gossypium tomentosum*, *Hibiscus youngianus*, *Hibiscadelphus hualalaiensis* and *Thespesia populnea* are also sometimes affected.

Phthorimaea operculella (Zeller). This is the leafminer in tobacco, potato, *Datura* and tomato. The larvae often feed in the tomato fruits.

Aristotelia elegantior Walsm. Reared from *Gouldia* berries.

Aristotelia compsodelta Meyrick. Reared from *Kadua* capsules.

Sitotroga cerealella (Oliv.). Infests corn and wheat.

Tortricidae

Crocidosema plebeiana Zeller. Has been reared from seeds of *Abutilon menziesii* and *Abutilon eremitopetalum*. The larvae commonly feed in *Sida* buds.

Crocidosema marcidellum (Walsm.). Reared from the seeds of *Hibiscus arnottianus*.

Crocidosema lantana Busck. The larvae feed in lantana berries, also in the flower heads and bore in the tender twigs.

Adenoneura parapteryx Meyrick. The larvae feed in the pods of *Canavalia galeata*, *C. microcarpa* and *C. turgida*.

Adenoneura plicatum Walsm.

Adenoneura latifemoris Walsm.

Adenoneura montanum Walsm. The larvae of these three species feed on the seeds of *Sophora chrysophylla*.

Adenoneura rufipennis Walsm. The larvae feed on the young seeds in green pods of *Acacia koa*. They also at times feed in the flower buds.

Argyroploce illepida (Butl.). This is the moth whose larvae cause such destruction to the seeds of *Acacia koa*. From numerous counts from various localities, the usual infestation of seeds in koa pods is from 50 to 90 percent. The larvae commonly infest the seeds of *Acacia confusa* and *Acacia farnesiana*. They have also been reared from macadamia nuts, litchi nuts, *Alectryon macrococcus* fruits, seeds of *Dodonaea viscosa* and *Mezoneurum kauaiense*, and rarely from the pulp part of a mango fruit.

Carposinidae

Heterocrossa olivaceonitens Walsm. The larvae live in the fruits of *Sideroxylon sandwicense*, also in the fruits, buds and flowers of several species of *Clermontia*.

Heterocrossa nigronotata Walsm. Reared from the berries of *Suttonia lessertiana*.

Heterocrossa inscripta Walsm. Reared from ohelo berries (*Vaccinium reticulatum*).

Heterocrossa crinifera Walsm. Reared from the capsules of *Kadua grandis*.

Heterocrossa divaricata Walsm. Reared from the fruits of *Elaeocarpus bifidus* and *Syzygium sandwicense*.

Heterocrossa gracillima Walsm. Reared from berries of *Styphelia tameiameia*.

Heterocrossa graminicolor Walsm. Reared from the native olive (*Osmanthus sandwicensis*).

Heterocrossa solutella Walsm. Reared from *Gouldia* berries.

There are 24 more species of *Heterocrossa* in Hawaii and probably the most of them live in various kinds of native fruits.

Lycaenidae

Lycaena boetica (Linn.). The bean butterfly. Its larvae feed on various legumes as string beans, peas, pigeon peas, and several species of *Crotalaria*.

Thecla echion (Linn.). The lantana butterfly whose larvae feed on the flowers of Lantana, but have occasionally been found feeding on the fruits of eggplant, *Solanum nodiflorum*, *Solanum sanitwongsei* and *Cordia sebestena*.

DIPTERA

Cecidomyiidae

Diplosis sorghicola Coq. The maggots feed on the growing seeds of sorghum and Johnson grass.

Ortalidae

Scholastes bimaculatus Hendel. The maggots feed in the meat of injured, sprouted or decaying coconuts.

Trypetidae

Chaetodacus cucurbitae (Coq.). The melonfly whose maggots feed in all kinds of melons, cucumbers, squash, and also in tomato, overripe papaia and string beans.

Ceratitis capitata Wied. The Mediterranean fruitfly whose maggots feed in 72 kinds of fruits including such native fruits as: *Vaccinium*, *Santalum*, *Scaevola* and *Wikstroemia*.

Tephritis crassipes (Thom.). The maggots feed on the growing seeds in flower heads of *Bidens pilosa*.

Tephritis cratericola Grim. The maggots feed on the growing seeds in the flower heads of the silversword (*Argyroxiphium sandwicense macrocephalum*).

Tephritis dubautiae Bryan. The maggots feed on the growing seeds in the flower heads of several species of *Dubautia*.

Tephritis sp. An undescribed species feeds in flower heads of endemic species of *Bidens*.

Tephritis sp. An undescribed species feeds in flower heads of several species of *Railliardia*.

Agromyzidae

Ophiomyia lantanae (Froggatt). The maggots feed in Lantana berries.

COLEOPTERA

Bruchidae

Megacerus alternata Bridwell. The larvae feed in the seeds of *Ipomoea pes-caprae*, *Ipomoea tuberculata* and *Ipomoea fistulosa*.

Bruchus amicus Horn. The larvae feed in the seeds of *Prosopis juliflora*.

Bruchus chinensis Linn. The larvae infest pigeon peas (*Cajanus cajan*).

Bruchus limbatus Horn. Has been reared from seeds of *Samanea saman*, *Acacia koa*, *Acacia confusa* and *Albizia lebbek*.

Bruchus obtectus Say. Infests common beans.

Bruchus phaseoli Gyll. Infests *Dolichos lablab*.

Bruchus pruininus Horn. Chiefly infests seeds of *Leucaena glauca* but also *Acacia confusa* to some extent.

Bruchus sallaei Sharp. Infests seeds of *Prosopis juliflora* and *Acacia farnesiana*.

Bruchus quadrimaculatus Fab. Has been reared from cowpeas, pigeon peas and peanut.

Bruchus prosopis Lec. Infests seeds of *Prosopis juliflora*, and has also been reared from *Acacia confusa*.

Pachymerus gonagra (Fab.). Infests seeds of *Prosopis juliflora*, *Tamarindus indica*, *Acacia farnesiana*, and to some extent the seeds of *Cassia fistula* and *Cassia grandis* also.

Anthribidae

Araecerus fasciculatus (DeGeer). Has been reared from palm seeds of various kinds, tamarind, *Caesalpinia sepiaria*, *Ceratonia siliqua*, *Ipomoea tuberculata*, climbing fig fruits, breadfruit and cotton bolls, also from dead dry sugar cane stalks and dead twigs.

Ptinidae

Mezium americanum Lap. Reared from sunflower heads and stored garden seeds.

Curculionidae

Anthonomus eugenii Cano. Infests fruits of garden peppers and *Solanum nodiflorum*, also eggplant fruits to some extent.

Cryptorhynchus mangiferae (Fab.). Lives in mango seeds, a high percentage of the seeds being destroyed.

Calendra oryzae (Linn.). Infests rice and corn.

Calendra linearis var. **striatus** (Thb.). Infests tamarind pods.

Sitophilus rugicollis (Casey). In India feeds in the seeds of *Shorea robusta* and *Dipterocarpus turbinatus*. Has been collected in Honolulu, but not reared.

Diacalandra taitense (Guer.). Sometimes occurs in the husk of the coconut, but usually bores in the bases of the leaf stems.

Scolytidae

Coccotrypes dactyliperda (Fab.). Feeds extensively in seeds of date palms and to some extent in seeds of other palms. Has been reared from the following: *Phoenix dactylifera*, *Livistona chinensis*, *L. rotundifolia*, *Oreodoxa regia*, *Washingtonia filifera* and *Pritchardia pacifica*.

Coccotrypes pygmaeus (Erich.). Has been reared from the seeds of the following palms: *Phoenix dactylifera*, *Livistona chinensis*, *Sabal palmetto*, *Sabal blackburniana*, *Cocothrinax argentea*, *Pritchardia thurstoni*. It has also been found infesting stored almonds.

A Day on Mt. Olympus

BY O. H. SWEZEY

(Presented at the meeting of April 4, 1935)

Mt. Olympus and vicinity was at one time my favorite collecting ground for insects of the native forest on the island of Oahu. It was accessible by the Castle trail which led up from Pauoa Flats to follow the main range along to Mt. Olympus and then down into Palolo Valley. Since this trail was closed to hikers in 1922, on account of being within a water reserve, I had not visited the region. Having recently complied with the necessary requirements for obtaining a pass to enter water reserves, Dr. Williams and I spent the day March 31 on a collecting trip up the ridge from Manoa Valley to the summit of Olympus, and on the main ridge in both directions from the peak. I was greatly interested to find that the collecting was as good as it used to be 13 years previously. I collected on the various kinds of trees and shrubs with the following results, over 50 species of insects being collected, or their presence noted: