

## Some Observations on Forest Insects at the Nauhi Nursery and Vicinity on Hawaii

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(Presented at the meeting of November 5, 1931)

Through the courtesy of the department of forestry, the writers had the opportunity of spending a week the latter part of September and beginning of October, 1931, at the forest nursery on Nauhi Gulch, at an elevation of 5,250 feet. This is at the upper edge of the Hilo Forest Reserve, and in the land of Honohina, about 12 miles up from the coast. This region of this great forest belt on windward Hawaii has never been explored entomologically. During the few days there, we studied the insect faunas of the chief trees making up the jungle in the forest reserve, and the remaining trees in the ranch land which occupies a wide belt above the forest. We also went up the side of Mauna Kea above the forest line to an elevation of 8,500 feet, and one day made the ascent to the summit of Mauna Kea, under the guidance of the forest ranger, Joe Ignacio. (The insects captured at the summit are listed on pages 191-192 of this issue.)

The koa (*Acacia koa*) is a prominent tree of the region, and, as evidenced by standing dead trunks and rotten logs, formerly made up a considerable part of the forest that previously covered the land which has been occupied as ranch for a long period of time. There are some remaining living trees on the ranch area, particularly in and along the gulches. The most prevalent tree in the forest reserve is the ohia lehua (*Metrosideros polymorpha*). It also extends somewhat up into the ranch area. The mamani (*Sophora chrysophylla*) makes up a considerable belt of open forest at an elevation of 7,000 to 8,500 feet, with scattering trees at lower elevations. The naio (*Myoporum sandwicense*) has scattered stands in the ranch area. Koolea (*Suttonia lessertiana*) is found sparsely in the forest reserve and also somewhat higher up. The same applies to olapa (*Cheirodendron gaudichaudii*). The mamake (*Pipturus albidus*) is not common and *Broussaisia arguta* is more in evidence in the forest reserve. A species of

Coprosma is quite common in the jungle of the forest reserve and is also found in the gulches at higher elevations.

Of the undergrowth making up the jungle of the forest reserve there are many pulu ferns (*Cibotium chamissoi*). *Dryopteris paleacea* is another very abundant fern. There are thickets of akala (*Rubus hawaiiensis*), and clumps of a tall species of ohelo (*Vaccinium* sp.) are common. Puakeawe (*Cyathodes tameiameia*) is also abundant in places.

Certain trees which are usually components of the endemic forests were not observed in the region, namely: *Straussia*, *Bobea*, *Pelea*, *Elaeocarpus*, *Antidesma*, *Perrottetia* and *Maba*. It is significant to note that although there were quite a number of kinds of insects present whose habits are feeding on dead and decaying wood, no termites were found in the region. In any other regions where we have studied the insect relations to the endemic forest trees, the large termite, *Neotermes connexus* Snyder, has been found inhabiting dead branches and logs of nearly every kind of tree. Whether the elevation was higher than the natural habitat of this termite remains yet to be determined. It will be a problem of interest to ascertain just what is the upper limit in the distribution of this termite, which inhabits the native forests of all the islands, not, however, coming down onto the lowlands, though it has been found as low as about 500 feet on Oahu. It is also worthy of mention that none of the immigrant ants of the lowlands were found in the Nauhi region, nor any earwigs, nor was the widespread carpenter bee observed.

None of the large centipede was seen, but the short small lithobiid centipedes were everywhere abundant, as were also sowbugs and millipeds in rotten wood and under bark. Other animal life of interest in the region: abundance of egg-masses of *Succinea* snails, clear, glass-like, watery, and glistening, hanging from fern fronds in the damp koa forests; well before dusk a bat is on the wing at Nauhi; in the mamani zone a few of the Hawaiian buzzard (*Buteo solitarius* Peale) were seen on the wing or perched in trees; the native parrot-like *Loxioides bailleni* Oust. was quite abundant in the mamani trees.

The list of insects which follows gives a fair indication of the native insect fauna of the region, but much more time would be

required to make a complete entomological survey of the native forest trees growing there.

## HYMENOPTERA

### APIDAE

**Apis mellifera** Linn. Common, even far up in the mamani belt (*Sophora chrysophylla*) 8,000 feet or more elevation, where they were seen at the flowers of this tree.

### HYLAEIDAE

27 **Nesoprosopis difficilis** Perkins. Collected on *Sophora* and *Raillardia*.  
1 **Nesoprosopis comes** Perkins.

### PEMPHREDONIDAE

1 **Nesomimesa hawaiiensis** Perkins. One female on koa at Keanakolu. Rare.

### CRABRONIDAE (The fly-catching wasps)

3 **Xenocrabo polynesiensis** (Cameron).  
3 **Xenocrabo atripennis** (Perkins). One from cocoon in soil.  
1 **Xenocrabo hawaiiensis** (Perkins).  
3 **Hylocrabo tumidoventris** var. **leucognathus** (Perkins). From cocoons in rotten logs.  
25 **Nesocrabo rubrocaudatus** (Blkb. & Cam.). Rather abundant. Several of its nesting sites were found. Above the highwater mark of a permanent stream in Nauhi gulch, nest holes of one to two, or possibly more cells were found under stones in black sandy soil, and one cocoon from the lot collected yielded a wasp. Three more were reared from cocoons in decayed logs. Several females were observed on a mossy little hummock of soil, excavating burrows. One of these wasps, carrying a metallic green or blue native sarcophagid fly, was captured. These flies were very abundant in the Nauhi region.

### EUMENIDAE (Caterpillar-catching wasps)

21 **Odynerus peles** Perkins.  
1 **Odynerus venator** Perkins.  
3 **Odynerus cyphotes** Perkins.  
13 **Odynerus heterochromus** Perkins.  
2 **Odynerus sociabilis** Perkins.

### PSAMMOCHARIDAE (Spider-catching wasps)

1 **Anoplius luctuosus** (Cress.). Not plentiful at Nauhi, 5,250 feet; also seen at 8,500 feet, and at Lake Waiau, 13,007 feet, and at the summit of Mauna Kea, 13,750 feet. At Lake Waiau, where there were a few small weeds and grass and various stray insects, a rather large active evidently diurnal lyeosid (?) spider was active, and it is not impossible that the *Anoplius* wasp preyed upon this spider here and was not, as with most other insects, merely a wind-blown visitant to these bleak heights.

## BETHYLIDAE

- 10 **Undetermined Sierola**, several species. Swept from several kinds of trees.
- 5 **Sclerodermus** sp. Collected in dead koa log. Probably parasitic on *Oodemas corticis*.

## DRYINIDAE

- 1 **Pseudogonatopus perkinsi** (Ashm.). Swept from lehua. Probably parasitic on *Leialoha lehuae hawaiiensis*.

## PROCTOTRYPOIDEA

- Exallonyx philonthiphagus** Williams. Nauhi gulch, Sept. 30, in an old *Acacia koa* log, 6 larvae of the staphylinid beetle *Philonthus turbidus*, apparently pupating, were found parasitized by a rather large species of this wasp. Each beetle larva had a proctotrypid pupa partly extruded from the underside of the abdomen. Several of the wasps matured.

## FIGITIDAE

- 2 **Eucoila impatiens** (Say). Parasitic on dipterous larvae in cowdung.
- 4 Undetermined species.

## ICHNEUMONIDAE

- 2 **Amblyteles koebelei** (Swezey). Common in ranch lands. Parasitic on armyworms.
- 2 **Amblyteles purpuripennis** (Cress.). Common in ranch lands. Parasitic on armyworms.
- 4 **Amblyteles** sp. (A smaller species).
- 3 **Ephialtes hawaiiensis** (Cam.).
- 1 **Diplazon laetatorius** (Fab.).
- 1 **Enicospilus tyrannus** Perkins. Reared from cocoon in rotten log. It had evidently parasitized a larva of *Scotorythra hyparcha*, and the larva had formed its pupal cell in the log.
- 4 **Enicospilus longicornis** Ashm. One from a cocoon in rotten log, and evidently a parasite of some species of *Scotorythra*.
- 7 **Enicospilus castaneus** Ashm.
- 1 **Enicospilus funereus** Perkins.
- 1 **Eremotyloides orbitalis** (Ashm.).
- 2 **Angitia blackburni** (Cam.). Reared from larvae of *Omiodes scotaea* on *Astelia*.
- 3 **Hyposoter exiguae** (Vier.). Reared from *Scotorythra* larvae on several kinds of trees.
- 10 **Atrometus flavifrons** Ashm. Swept from various trees.

## ALYSIIDAE

- 6 **Aphaereta muscae** Ashm. On manure. A parasite of the puparia of the hornfly and other Diptera.
- 12 **Aspilota konae** Ashm.

## MISCOGASTERIDAE

- 2 **Toxeuma** sp. Probably parasitic on *Proterhinus ferrugineus* in tree ferns.

## ENCYRTIDAE

- 1 *Eupelmus chalcoprepes* Perkins.

## PTEROMALIDAE

- 1 *Spalangia cameroni* Perkins. Parasitic in hornfly puparia.

## EULOPHIDAE

- 2 *Secodella metallicus* (Ashm.).

## MYMARIDAE

- 2 *Polynema pyrophila* Perkins. Swept from koa and lehua.  
6 Undetermined chalcid-flies.

## COLEOPTERA

## CARABIDAE

- 4 *Colpodiscus lucipetens* (Blkb.).  
3 *Colpocaccus hawaiiensis* Sharp. In dead stems of tree ferns.  
4 *Mesothriscus hawaiiensis* Sharp.  
45 *Mecyclothorax konanus* Sharp. In rotten koa logs and dead stems of tree ferns.  
2 *Mecyclothorax* sp. near *vulcanus* (Blkb.). In dead stems of tree fern.  
3 *Mecyclothorax* sp. near *montivagus* (Blkb.).  
16 *Thriscothorax gracilis* Sharp. In rotten koa logs.  
1 *Thriscothorax* sp. near *bembidioides* (Blkb.). In dead stem of tree fern.  
5 *Thriscothorax variipes* Sharp. In dead stems of tree ferns.  
8 *Thriscothorax karschi* (Blkb.).  
5 *Metrothorax deverilli* (Blkb.). In dead stems of tree ferns and under bark of lehua.

## DYTISCIDAE

- 1 *Rhantus pacificus* (Boisd.). Adults common in a Nauhi stream; larvae in boggy pool by trail.

## STAPHYLINIDAE

- 1 *Philonthus longicornis* Steph. Common in cowdung.  
6 *Philonthus turbidus* Erichs. Pupal cells found in rotten koa logs.  
A proctotrypid parasite reared from some of the larvae.  
4 Undetermined staphylinids.

## NITIDULIDAE

- 23 Undetermined specimens collected from tree ferns, lehua, *Coprosma* and *Sophora*.

## ELATERIDAE

- Eopenthes kona* Blkb. Fragments in rotten koa log.

## MELASIDAE

- Dromaeolus perkinsi* Sharp. Elytra in rotten koa log.  
*Dromaeolus obtusus* (Blkb.). (?). Elytra in rotten koa log.

## HISTERIDAE

- 1 Undetermined specimen in dead stem of tree fern.

## COCCINELLIDAE

- 4 *Pullus kinbergi* (Boh.).  
 1 *Lindorus lophanthae* Blaisd.  
*Coelophora inaequalis* (Fab.). Observed but not collected.  
*Cryptolaemus montrouzieri* Muls. Observed but not collected.

## CHRYSOMELIDAE

- 8 *Diachus auratus* (Fab.). On various kinds of trees.

## CIOIDAE

- 3 *Cis porcatus* Sharp. Beaten from lehua and Coprosma.  
 2 *Cis cognatissimus* Perkins. Under bark of Coprosma.  
 2 *Cis signatus* Sharp.  
 12 *Cis pacificus* Sharp. In bracket fungus.  
 14 *Apterocis* n. sp. near *strigosus* Perkins. In bracket fungus on dead koa.

## CERAMBYCIDAE

- 1 *Neoclytarus claviger* (Shp.). Collected on post at Keanakolu.  
 10 *Plagithmysus blackburni* Sharp. Collected on dead mamani tree; larvae numerous in dying trees.  
 18 *Plagithmysus varians* Sharp. Mostly reared from larvae and pupae in dead branches of koa. One collected on Myoporum. One collected in cabin at Keanakolu (Ignacio).  
*Plagithmysus perkinsi* Sharp. Larvae in dying Myoporum tree. One adult beetle issued August 21, 1932.  
*Plagithmysus vitticollis* Sharp. Larvae found in Rubus, but none reared.  
*Aeschrithmysus swezeyi* Perkins (?). Borings found in stems of Raillardia at 8,500 feet elevation; one larva found which failed to mature. Borings were found in Cyathodes also at the same place, which might have been by larvae of a related species.  
*Aeschrithmysus* n. sp. Larvae found in *Vaccinium peleanum* at 8,500 feet elevation. One adult beetle matured November 27.

## PROTERHINIDAE

- 1 *Proterhinus blackburni* Sharp.  
 6 *Proterhinus vulcanus* Perkins. Collected from Coprosma and dead stems of tree fern.  
 24 *Proterhinus ferrugineus* Perkins. Abundant in dead stems of tree ferns.  
 4 *Proterhinus deceptor* var. *major* Perkins. Beaten from dead branches of lehua.  
 3 *Proterhinus* sp. near *innotabilis* Perkins. Beaten from dead branches of Suttonia.  
 1 *Proterhinus* (undetermined). From Myoporum.

## CURCULIONIDAE

- Pantomorus godmani** (Grote). Common on various kinds of trees and plants, sometimes destructive to recently planted young seedling trees.
- 1 **Listroderes apicalis** Waterh. Under koa bark.
- 6 **Dryophthorus declivis** Sharp. In dead koa logs.
- 20 **Dryophthorus insignis** Sharp. In rotten koa logs and dead stems of tree ferns.
- 22 **Dryophthorus n. sp.** In koa and lehua logs.
- 3 **Pentarthrum prolixum** Sharp. In dead stems of tree ferns. Not so common as usual.
- 22 **Oodemas corticis** Perkins. Common in standing dead koa trunks.
- 11 **Oodemas n. sp.** between **chrysodorum** and **cupreum**. In pith of dead *Rubus* stems.
- 20 **Nesotocus munroi** Perkins. Collected on *Cheirodendron* on the Laupahoehoe trail by Joe Ignacio, the forest ranger.

## PTINIDAE

- 3 **Xyletobius proteus** Perkins. In dead *Coprosma*.

## LEPIDOPTERA

Unless otherwise stated, the moths of this list were taken at lights when they came very abundantly on some of the nights. Hundreds would be present at a time on the outside of the windows and the porch ceiling. An attempt was made to secure samples of all species observed. Probably the most numerous among these moths were *Scotorythra paludicola*, *Scotorythra hyparcha* and several species of *Scoparia*. The numbers of specimens given in the list will indicate the relative abundance of the different species.

## CARADRINIDAE

- 2 **Hyssia compsias** (Meyr.).
- 2 **Cirphis unipuncta** (Haw.). Pupae were common in rotten koa logs in grassy places.
- 1 **Lycophotia margaritosa** (Haw.). Found under stone at 7,000 feet elevation.
- 1 **Euxoa baliopa** (Meyr.).
- 1 **Agrotis selenias** Meyr.
- 1 **Agrotis coniotis** Hamp.

## PLUSIADAE

- 2 **Hypenodes altivolans** (Butl.).

## HYDRIOMENIDAE

- 2 **Eucymatoge monticolans** (Butl.). One reared from larva but its host tree not recorded—probably *Cyathodes*.

## SELIDOSEMIDAE

22 *Scotorythra paludicola* (Butl.). This is the moth whose caterpillars defoliated the koa trees in the forest east of Olinda, Maui, in 1926. A few caterpillars were found on the koa trees at Nauhi, but not enough to be injurious. None was reared. A few caterpillars found on *Sophora* might have been the same species.

1 *Scotorythra oxyphractis* Meyr.

7 *Scotorythra hyparcha* Meyr. All were males. No caterpillars of this abundant species were found. It is thought that they feed on the lehua tree. Several of their pupae were found in rotten koa logs and 2 or 3 moths reared from them. A parasite, *Enicospilus tyrannus* Perk., issued from a cocoon in one of the pupal cells where it had issued from a caterpillar of this moth.

## NYMPHALIDAE

*Vanessa tammeamea* Esch. This butterfly was observed, and its caterpillars also observed on *Pipturus*. None was reared or collected.

## PIERIDAE

*Pontia rapae* (Linn.). One butterfly seen on the wing at 8,500 feet elevation.

## LYCAENIDAE

*Lycaena blackburni* (Tuely). A few larvae were found on new foliage of koa. None reared.

## PYRAUSTIDAE

1 *Omiodes accepta* (Butl.). The common grass leafroller.

4 *Omiodes scotaea* (Hamps.). Reared from larvae on *Astelia*.

8 *Phlyctaenia endopyra* Meyr. The larvae found on leaves of *Rubus*, a very abundant shrub.

9 *Phlyctaenia pyranthes* Meyr. The larvae feed on the leaves of *Vaccinium calycinum*. There were many clumps of this shrub, and the leaves were badly eaten. None reared.

2 *Nomophila noctuella* Schiff.

3 *Scoparia balinopis* Meyr.

1 *Scoparia orthoria* Meyr.

5 *Scoparia halirrhoa* Meyr.

9 *Scoparia crataea* Meyr.

1 *Scoparia pyrseutis* Meyr.

3 *Scoparia thyellopis* Meyr.

1 *Scoparia melichlora* Meyr.

7 *Scoparia meristis* Meyr.

1 *Scoparia platyscia* Meyr.

## PTEROPHORIDAE

3 *Platyptilia fuscicornis* Z.

4 *Platyptilia insularis* Walsm.

## GELECHIADAE

*Thyrocopa indecora* (Butl.). One reared from larva in dead wood of *Sophora*.



## DIPLOSARIDAE

**Hyposmocoma chilonella triocellata** Walsm. One reared from larva in pith of dead *Rubus*.

## CARPOSINIDAE

1 **Heterocrossa gracillima** Walsm. Larva feeds in the fruits of *Cyathodes*.

**Heterocrossa sp.** Larva in terminal bud of *Vaccinium*. Not reared.  
**Heterocrossa sp.** Larvae in fruits of *Vaccinium*. Not reared.

## TORTRICIDAE

**Adenoneura plicatum** Walsm. One swept from *Sophora*. Probably the moth whose larvae feed in *Sophora* pods.

1 **Adenoneura montanum** Walsm.

**Argyroploce illepeda fulva** (Walsm.). Four reared from koa pods. The pods were found badly infested. A count was made of 87 pods, and 61% of the seeds were found to have been destroyed.

**Bactra straminea** (Butl.). Larvae found boring in the stems of *Carex*. One reared.

**Archips postvittanus** (Walk.). One each reared from *Rubus* and pumpkin vine.

**Eulia sp.** Larvae boring stems of *Suttonia*. None reared.

**Epagoge infaustana** Walsm. Larvae were found in terminal buds and leaves of *Pipturus*. None reared.

## TINEIDAE

**Opogona omoscopia** (Meyr.). Abundant. Larvae abundant in rotten logs and other decaying vegetation.

## DIPTERA

## MYCETOPHILIDAE

**Sciara sp.** One male.

## CHIRONOMIDAE

**Ceratopogon sp.** One female.

**Tanytarsus sp.** Swarms of males of this delicate green midge hovering over the water of a small stream.

## PSYCHODIDAE

**Psychoda alternata** Say.

## CULICIDAE

**Culex quinquefasciatus** Say. An egg-raft of this mosquito and some larvae probably of the same species found in a wooden water trough at Keanakolu. An adult heard buzzing in a cabin room at night at the same place. Larvae seen also in a spring pool at Nauh. (Eggs of *Culex* have been found in a rain barrel, at an altitude of over 6,000 feet on Hualalai by the junior author, in 1929).

## LIMNOBIIDAE (Crane-flies)

Adults common, probably several species.

## DOLICHOPODIDAE

**Medeterus sp.** One male.

**Campsicnemis spp.** At least 4 species of water-riding flies of this family. The males have the middle pair of legs somewhat modified.

## BORBORIDAE

Undetermined species on manure at 6,000 feet elevation.

## LONCHOPTERIDAE

14 **Lonchoptera furcata** Fallen (?).

## DROSOPHILIDAE

**Drosophila sp.** A large species common at a wound on a *Coprosma* tree at Keanakolu.

**Drosophila sp.** One specimen of a large species in water at Nauhi.

## ANTHOMYIDAE

2 **Lispocephala dexioides** (Grims.).

Several undetermined species.

## MUSCIDAE

1 **Phormia regina** (Meig.). Collected above 7,000 feet elevation.

## SARCOPHAGIDAE

7 **Prostethochaeta obscura** Grims. (?) Abundant.

## OESTRIDAE

**Gastrophilus intestinalis** De Geer. One reared from a puparium found in horse manure at Hopuwai.

## EPHYDRIDAE

**Brachydeutera hebes** Cress. Common on and about puddles at Nauhi. Breeding in water in an iron pot at Keanakolu.

**Scatella sex-notata** Cress. Breeding in the water in an exposed tree hollow at 6,000 feet at Nauhi.

**Scatella hawaiiensis** Grims. At creek pool at Nauhi.

**Scatella** wings in log water trough at Keanakolu.

## HIPPOBOSCIDAE

1 **Melophagus ovinus** (Linn.). In saddle room at Keanakolu.

## HETEROPTERA

## CIMICIDAE

9 **Oechalia grisea** Burm. Common on lehua, koa, mamani, *Coprosma*, and other trees.

**Coleotichus blackburniae** White. Nymphs numerous on koa pods at Keanakolu (Ignacio).

## GEOCORIDAE

14 **Nesocymus calvus** (White). On *Carex*.

**Nysius spp.** Four undetermined species quite common on koa, *Railardia*, *Sophora*, and *Astelia*.

## NABIDAE

- 1 *Reduviolus capsiformis* (Germ.).
- 9 *Reduviolus subrufus* (White). On lehua and koa.
- 6 *Reduviolus kahavalu* Kirk. On Sophora.

## GERRIDAE

- 3 *Microvelia vagans* White. This minute water-strider was common on pools at Nauhi. Sometimes gathered about fallen insects.

## ANTHOCORIDAE

- 1 *Lasiochilus denigratus* (White). In dead stem of tree fern.

## MIRIDAE

- 1 *Hyalopeplus pellucidus* (Stal).
- 3 *Nesiomiris* sp. near *hawaiiensis* Kirk. On Cheirodendron.
- 4 *Koanoa hawaiiensis* Kirk. On lehua and Cheirodendron.
- 9 *Koanoa* n. sp. On Raillardia at 8,500 feet elevation.
- 1 *Sarona adonias* Kirk. On lehua.
- 28 *Tichorhinus perkinsi* (Kirk.). Very abundant on Coprosma.
- 45 *Tichorhinus* sp. Very abundant on Coprosma.
- 3 *Tichorhinus* sp. On lehua and Suttonia.
- 15 *Psallus* sp. near *swezeyi* Kirk. Common on Sophora.

## ACANTHIIDAE

- 2 *Acanthia oahuensis* (Blkb.). About Nauhi streams.

## POEKILOPTERIDAE

- Siphanta acuta* (Walk.). Common on lehua and most kinds of trees.

## CIXIIDAE

- 2 *Oliarus kakananus* Kirk. On lehua.
- 6 *Oliarus filicicola* Kirk.
- 2 *Iolania perkinsi* Kirk.

## DELPHACIDAE

- 20 *Leialoha lehuae hawaiiensis* Muir. On lehua.
- 10 *Iburnia koae* (Kirk.). Common on koa.
- 18 *Iburnia pseudorubescens* (Muir). Common on koa.
- 14 *Iburnia ipomoeicola* (Kirk.). On Sadleria and Lythrum.
- 27 *Iburnia chambersi* (Kirk.). On Raillardia at 8,500 feet elevation.
- 12 *Iburnia mauiensis* Muir. On Tetramolopium at 8,500 feet elevation.
- 1 *Iburnia* sp. near *nesopele* Muir. On Astelia.
- 1 *Iburnia* sp. On Dubautia.

## CICADELLIDAE

- 22 *Nesosteles* sp. Common on Cyathodes.
- 4 *Nesophrosyne* sp. On Pipturus.
- 7 *Nesophrosyne* sp. On Broussaisia.
- 13 *Nesophrosyne* sp. On Coprosma.
- 5 *Nesophrosyne* sp. On Coprosma.
- 2 *Nesophrosyne* sp. On lehua.

## PSYLLIDAE

- 3 *Trioza hawaiiensis* Crawfd. On lehua. Unusually scarce.

## CORRODENTIA

- 2 *Psocus sylvestris* Perk. On Myoporum.
- 2 *Elipsocus inconstans* Perk. On lehua.
- 1 *Elipsocus psyloides* Perk. On Cheirodendron.
- 2 *Elipsocus criniger* Perk. On Suttonia and Sophora.
- 5 *Elipsocus vinosus* McLach. On Suttonia and Cyathodes.
- 1 *Elipsocus micramaurus* Perk. On lehua.
- 1 *Caecilius analis* Banks. On Cheirodendron.

## ORTHOPTERA

## GRYLLIDAE

- Paratrigonidium* sp. Several feebly-chirping crickets were heard down the Nauhi gulch.
- Leptogryllus* sp. A few found in tree fern stems.

## LOCUSTIDAE

- Oxya chinensis* (Thunb.). One collected on grass down Nauhi gulch.

## BLATTIDAE

- 5 *Allacta similis* (Sauss.). This roach which is common in hollow stems and under bark at lower elevations, was found only indoors at Nauhi, the specimens all taken in the cabin.

## ODONATA

## AGRIONIDAE

- Agrion deceptor* McLach. Rare. One male taken at 6,000-7,000 ft. elevation.
- Agrion* sp. Two nymphs were taken at the leaf bases of the small *Astelia* plants, 5,150 ft. elevation. The alimentary tract of one specimen contained what appeared to be a mite (Acari).
- Agrion* sp. Nymphs were common in a little stream. Stomach contents showed that they fed largely on chironomid larvae, probably *Tanytarsus*, and oribatid mites.

## LIBELLULIDAE

- Pantala flavescens* Fabr. One adult observed above 8,000 ft.
- Anax strenuus* Perkins. Two adults seen. Nymphs reported by the forester.

## NEUROPTERA

## HEMEROBIIDAE

- 2 *Nesomicromus vagus* Perkins.
- 1 *Anomalochrysa hepatica* Perkins. Collected on lehua.

## COLLEMBOLA

- A number of these minute insects collected in and under decayed wood, etc.