

## Arthropods From ‘Ōhi‘a *Lehua* (Myrtaceae: *Metrosideros polymorpha*), With New Records for the Hawaiian Islands

DANIEL S. GRUNER (Department of Zoology, University of Hawaii at Manoa, Honolulu, 96822,  
USA; email: dgruner@hawaii.edu)

### INTRODUCTION

This paper presents new records, range extensions, and a checklist of arthropod species found associated with the most common and widespread native tree in the Hawaiian Islands, ‘ōhi‘a *lehua* (Myrtaceae: *Metrosideros polymorpha* Gaudichaud-Beaupré). *Metrosideros polymorpha* is found on all the main islands, naturally occurs from sea level to tree line (>2000 m), in dry, mesic, and wet forests, and is the canopy dominant in old growth and the first woody colonist on recent basaltic lava flows (Dawson & Stemmerman, 1990). Numerous insect species use ‘ōhi‘a *lehua* as a resource for either food or habitat space, and it may have the largest fauna of any native plant (Southwood, 1960; Stein, 1983). *Metrosideros* is an important, year-round nectar resource for native bees, moths, thrips and other insects, and for native nectarivorous birds, such as the ‘apapane (*Himatione sanguinea*), ‘i‘iwi (*Vestiaria coccinea*), and ‘akohekohe (*Palmeria dolei*). *Metrosideros* also provides important habitat for birds that forage for arthropod prey in the foliage (e.g., ‘akepa [*Loxops coccineus*]) and bark (e.g., Hawai‘i creeper [*Oreomystis mana*]). It can be argued that *M. polymorpha* is the backbone of Hawaiian forests and one of the most important resources for the long-term stability of ecosystems and watersheds in the islands.

There is a rich history of entomological work on *Metrosideros polymorpha* in the Hawaiian Islands. Wayne Gagné pioneered pyrethrum fogging as a method for sampling arthropods in forest canopies as part of the Island Ecosystems unit of the International Biological Program. Gagné studied *Metrosideros polymorpha* and *Acacia koa* along the Mauna Loa elevational gradient and provided the first detailed lists of arthropods associated with these trees (Gagné, 1976, 1979, 1981; Gagné & Howarth, 1981). Stein (1983) later compiled these lists with anecdotal host information reported by Swezey (1954) and others (e.g., Zimmerman, 1978). Since those descriptive studies, there have been several quantitative studies of *Metrosideros* arthropods to assess food resources for insectivorous birds at Hakalau Forest National Wildlife Refuge on Hawai‘i Island (Peck, 1993; Fretz, 2000). These studies focused on biomass and abundance of potential bird prey types without the taxonomic detail of earlier work. Additional studies have examined endemic psyllids (Homoptera: Trioizidae), many of which are host-specific gall-formers on *Metrosideros*, and their herbivory (Nishida *et al.*, 1980; Lee, 1981). Most recently, Swift & Goff (2001) assessed in detail the mite fauna sampled from *Metrosideros* and its various microhabitats at two sites on Kaua‘i.

In this contribution, I report 9 new state records and range extensions for 43 additional taxa collected from *Metrosideros*. The Hawaiian terrestrial arthropod checklist (Nishida, 2002) was the primary reference used to assess known island distributions. I do not list collections by other investigators beyond the scope of this *Metrosideros* survey,

with the exception of several new state records. In addition to the species accounts, a complete checklist of all recorded species from trees at sites on Kaua'i, Moloka'i, and Hawai'i is included. The checklist includes biogeographic status, feeding guild assignments, collections by site, and determiner.

### SITES AND METHODS

Arthropods were collected from *Metrosideros polymorpha* at 11 sites on Hawai'i, Moloka'i, and Kaua'i during 1996–2001 (Table 1). Six of these sites, widely distributed within Hawaii Volcanoes National Park, were sampled in pilot qualitative canopy fogging studies in October 1996. A heated suspension of pyrenone 100 (1% pyrethrins, 5% piperonyl butoxide, and 94% isoparaffinic petroleum) was projected from the ground using a Curtis Dyna-Fog® Golden Eagle™ fogging machine. Stunned arthropods dropped for one hour onto an array of white sheets or collecting trays beneath the canopy, where they were collected into 70% ethanol. In contrast to all later collections, trees were not sampled with standardized, quantitative methods, and all arthropods were collected opportunistically. If a species is not reported for the 1996 collections, it does not imply that species was not collected. New records and range extensions are reported preferentially.

Collections from 1997 and later were designed for quantitative ecological studies (Table 1). Every specimen collected was scored, logged, and labeled with unique specimen codes in Biota database software (Colwell, 1997), and identified consistently across arthropod orders. The sites used for fogging in 1997 were situated adjacent to ongoing ecosystem research sites selected for optimal similarity in climatic and forest structural variables (Crews *et al.*, 1995; Gruner & Polhemus, 2003). These five sites on Hawai'i, Moloka'i, and Kaua'i were in mature mesic forests (2500 mm average annual precipitation) at approximately 1200 m elevation and dominated in the canopy by *Metrosideros polymorpha*. In addition, foliage clipping samples were taken over three years (1998–2001) on the 1881 historical pāhoehoe flow near the Tree Planting Road, Mauna Loa, in the Upper Waiākea Forest Reserve on Hawai'i Island. This site is wetter than the other sites (~4000 mm a.a.p.), and the small statured vegetation is comprised of a depauperate mix of early successional shrubs, ferns, and fern allies, along with *M. polymorpha* (Gruner, 2004).

Sampling methods certainly influenced the taxonomic composition obtained in the studies. There are no known methods that produce unbiased samples of complete arthropod communities (Basset *et al.*, 1997). Following Gagné, most of the species reported herein were obtained by pyrethrum canopy fogging (Gruner & Polhemus, 2003), which produces large, taxonomically comprehensive snapshots of arthropod communities that are useful for reliable comparisons across forested sites (Stork & Hammond, 1997). However, this method is biased against extremely active species, some endophagous species, and some groups that are bound to the substrate. For instance, case-bearing moth caterpillars (e.g., Cosmopterigidae: *Hyposmocoma* spp.), immature gall-formers (e.g., Homoptera: Trioizidae), and web-building spiders (e.g., Araneidae: *Cyclosa*) were under-represented. Even so, pyrethrum fogging flushes out many internal feeders, such as wood-boring Coleoptera (e.g., Scolytidae, Aglycyderidae: *Proterhinus*), which were obtained in large numbers. An additional problem with fogging is that it is difficult to avoid by-catch from different tree species situated nearby. *Metrosideros* dominates the canopy at all of the sites used in these studies (Gruner & Polhemus, 2003), greatly alleviating this problem. Table 1 lists all the sites and personnel for the fogging studies.

Table 1. Localities, dates, method and collectors for *Metrosideros polymorpha* arthropod studies.

Site	Locality	Lat. (N)§	Long. (W)§	Elev. (m)	Date(s)	Method	Collector(s)‡
<b>Hawaii</b>							
HP	Hilina Pali & Chain of Craters	19.3790°	155.2379°	1055	21–22.x.1996	fogging	DSG, DAP, DF
KI	Kipuka Ki, Mauna Loa Rd	19.4438°	155.3190°	1305	24–25.x.1996	fogging	DSG, DAP, DF
ML	Keāmoaku flow, Mauna Loa Rd	19.4764°	155.3647°	1725	24.x.1996	fogging	DSG, DAP
OL	‘Ōla’a tract, Wright Rd	19.4640°	155.2472°	1170	25.x.1996	fogging	DSG, DAP, KNM
BP	Near Bird Park, Mauna Loa Rd	19.4328°	155.2981°	1200	25.x.1996	fogging	DSG, DAP
VO	Thurston Lava Tube & Escape Rd.	19.4156°	155.2354°	1200	23.x.1996	fogging	DSG, DAP, DF
VO	Thurston Lava Tube & Escape Rd.	19.4156°	155.2354°	1200	6–8.x.1997	fogging	DSG, DAP
TP	Upper Waiakeā Forest Reserve, Tree Planting Rd, 1881 flow	19.6642°	155.2836°	1280	†	clipping	DSG
LA	Laupāhoehoe Forest Reserve, Blair Rd	19.9277°	155.2958°	1220	3–5.vi.1997	fogging	DSG, DAP
LA	Laupāhoehoe Forest Reserve, Blair Rd	19.9277°	155.2958°	1220	6.xi.1997	fogging	DSG, JSF, LSS
KH	Kohala Forest Reserve	20.0519°	155.6812°	1150	12–14.x.1997	fogging	DSG, DAP
<b>Molokai</b>							
MO	TNC Kamakou Preserve, Kolekole	21.1053°	156.9000°	1185	22–24.x.1997	fogging	DSG, DAP
<b>Kauai</b>							
KA	Nāpali-Kona Forest Reserve	22.1422°	159.6264°	1130	29–30.x.1997	fogging	DSG, DAP

The first six sites, all sampled in 1996, were located in Hawaii Volcanoes National Park and were sampled qualitatively only (presence/absence). Beginning with the second sampling near Thurston Lava Tube in 1997, all remaining localities were sampled with quantitative methods.

§ North American Datum 1983.

‡ Collectors: DSG = Daniel S. Gruner, DAP = Dan A. Polhemus, DF = David Foote, KNM = Karl N. Magnacca, JSF = J. Scott Fretz, LSS = Lou S. Santiago.

† Upper Waiakeā Forest Reserve site was sampled on multiple dates: 25–28.viii.1998, 24.vi.1999, 30.vii.1999, 30.viii.1999, 29.ix.1999, 31.x.1999, 14.xii.1999, 12.v.2000, 1.vi.2000, 16–16, 24–25.iv.2001, 1–3.v.2001.

Other samples were obtained by branch clipping and shaking (Johnson, 2000), which is a more directed, although spatially restricted, technique for sampling arthropods from plants. In this method, described in detail elsewhere (Fretz, 2002; Gruner, 2004), branches are quickly clipped, bagged, shaken in the laboratory, and all arthropods collected with an aspirator. Although endophages may be undersampled, branch clipping is equally effective for both sessile and mobile arthropods and across all orders that occupy terminal branches. This technique also is more useful in assessments of the fauna tightly bound with the host species, either directly or through its other inhabitants (e.g., parasitoids). However, branch clipping was used only on an early successional historical lava flow on Hawai'i Island (Table 1). Plant and arthropod communities were depauperate at this site relative to sites in mature forest used for fogging studies (Gruner, 2004).

Bulk material and most voucher specimens, unless otherwise noted, are deposited at the Bishop Museum (BPBM). Additional voucher specimens are deposited at the Canadian National Collection of Insects and Arachnids, Ottawa, Ontario, Canada (CNCI), Cornell University (CIUC), Illinois State University (ISUC), Natural History Museum, London (BMNH), National Museum of Natural History (USNM), United States Department of Agriculture, Systematic Entomology Laboratory (USDA), and the University of Tasmania School of Zoology (UTSZ). With new records for which few specimens are known, I also list unique numeric specimen codes that can be used to locate specimens at BPBM or the other institutions listed. The "scratch" notation indicates opportunistic, non-quantitative collections not assigned accession codes.

## RESULTS AND DISCUSSION

Altogether, more than 50,000 individual arthropods from at least 23 orders, approximately 130 families, and 711 species in 280 genera were recovered from *Metrosideros polymorpha* at the 11 sites (see Appendix<sup>1</sup>). All specimens were identified to species where possible; determiners are listed also in the Appendix. Of the 711 species listed, there were 497 native taxa (495 endemic, 2 indigenous), 118 adventive, 11 intentionally introduced, and 85 of undetermined origin. New state and island records are listed and annotated below. Numerous putative new species were collected and are listed in the Appendix, but were not treated as new records pending formal description by colleagues. Except in the case of those cryptogenic invaders that were confirmed by appropriate specialists as new introductions, species identified to genus were not recognized as legitimate records for the Hawaii Biological Survey. In addition, range extensions of endemic taxa were not reported as such in cases where only singletons were collected. Moreover, I did not attempt to identify several taxonomic groups beyond morphospecies. For example, the acari fauna on *Metrosideros* is diverse (Swift & Goff, 2001) but poorly known, and systematic resources are too scarce to justify the considerable effort necessary to understand this group.

For some species or localities, only immatures were recovered (e.g., Heteroptera: Pentatomidae: *Oechalia*), or I was unable to associate juveniles with adults (e.g., Psocoptera: Psocidae: *Ptycta*), males with females (e.g., Hymenoptera: Chalcidoidea) or females with males (e.g., Orthoptera: Gryllidae: *Trigonidium*). This problem was especially acute with Lepidoptera. Caterpillars were identified to the lowest level possible, which for many groups was the family level. Most described endemic moth species are known only from adults, but I ignored adult moths and did not attempt rearing studies.

1. Appendix. List of arthropod species collected from *Metrosideros polymorpha* during 1996–2001. [Archived at: <<http://hbs.bishopmuseum.org/data/gruner-app.pdf>>]

Although some may use nectar opportunistically, moths are not considered feeding members of the *Metrosideros polymorpha* food web (i.e., they are tourists *sensu* Moran & Southwood, 1982). In addition, several endemic lineages are extraordinarily diverse, but current taxonomy is unsatisfactory, in dire need of revision, or incomplete. Three lineages were particularly abundant and diverse in my collections but were not identified beyond morphospecies designations: *Proterhinus* (Coleoptera: Aglycyderidae), *Sierola* (Hymenoptera: Bethyilidae), and *Kilauella* (Psocoptera: Elipsocidae). I describe details of the latter two below.

There are 179 described species of bethylid wasps in the genus *Sierola*, but the current taxonomy can be questioned on numerous grounds. Fullaway (1920) added 170 species to the fauna based on the examination of only 500 specimens, 65% (111) of which were based on single specimens. A striking 87% of the fauna are species described by Fullaway as single island endemics from either O'ahu or Hawai'i. The remaining 23 species, either found on a different island or distributed on two or more islands, include all 9 species described by earlier authors. Many characters Fullaway selected are in fact quite variable, as one discovers when examining a series of specimens. In my examination of over 240 specimens, there was no indication that Kaua'i or Moloka'i samples were more or less diverse than Hawai'i. Thus, I rejected Fullaway's systematics and hypothesized that wider sampling beyond O'ahu and Hawai'i would have revealed fewer species with larger ranges.

Psocids in the genus *Kilauella* provide a contrasting case. In total, there are only 7 described species in this endemic genus, but Thornton (1981) believed there are at least 145 species in the islands. In the current study from 11 sites on three islands, only one of the 19 morphospecies (*K. micramaura*) can be reconciled with existing descriptions. *Kilauella* is a hyperdiverse genus that has been virtually ignored and underappreciated to this point. Less extreme but qualitatively similar situations exist with the native psyllids (Homoptera: Triozidae) and other groups.

The checklist presented (Appendix) cannot be regarded as definitive proof of intimate plant-arthropod associations. Feeding preferences for most species, gathered from the literature, personal observation, and communication with systematists, are listed in the Appendix. Although many of the phytophagous insects (chewer, gall-former, sap-sucker [xylem, phloem, or mesophyll], seed-feeder, wood-borer) collected in these studies are host specific to *Metrosideros*, other records from 'ōhi'a *lehua* may indicate chance encounters of mobile arthropods more common in other areas of the forest. Species known to be incidental or nonfeeding on *Metrosideros*, or with unknown or highly omnivorous feeding habits, were recorded as tourists. Members of other guilds (e.g., detritivores, fungivores, predators) may be more loosely associated with the tree than herbivores. Relative abundance information and the numbers of immatures recovered, not presented here, helped to assess the importance of *M. polymorpha* for particular taxa.

## **Class Arachnida: Order Araneae**

### **Araneidae**

#### ***Neoscona crucifera* (Lucas)**

#### **New island record**

This large-bodied adventive orb weaver was recently reported from Kaua'i and O'ahu (Beatty *et al.*, 2000).

*Material examined:* **HAWAII:** Laupāhoehoe Forest Reserve, Blair Rd, 800 m, iii.1997, in vegetation along side of road (not collected from *Metrosideros polymorpha*), DSG (1 female).

**Linyphiidae*****Tenuiphantes tenuis*** (Blackwall)**New island record**

Formerly known as *Lepthyphantes tenuis* (Blackwall, 1852), this immigrant species was previously recorded only from Hawai'i.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (2 specimens: 0339-003, 0426-004).

**Theridiidae*****Argyrodes argentatus*** Cambridge**New island record**

Beatty *et al.* (2000) recently recorded this adventive species from Hawai'i. No species in this genus have previously been reported for Moloka'i.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (2 specimens: 0339-002, 0387-004).

***Theridion mauense*** Simon**New island record**

This endemic species was previously reported only from Maui.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (3 specimens: 0143-001 imm., 0285-001, 0426-003).

**Class Insecta: Order Coleoptera****Ciidae*****Apterocis variegatus*** Perkins**New island record**

This distinctively marked endemic species was described from Maui but was abundant in samples from Moloka'i tree canopies. Two similar specimens were also collected from the Kohala Mountains but were sufficiently distinct to be excluded from this record pending systematic study.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (51 specimens).

***Cis nigrofasciatus*** Blackburn**New island records**

This endemic species, light brown with lightly impunctate elytra and a black head, was known only from Lāna'i collections by R.C.L. Perkins and Rev. T. Blackburn.

*Material examined:* **HAWAI'I:** Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (2 specimens: 4050-001, 4093-001), 6.xi.1997, DSG, JSF & LSS (2 specimens: 5176-001, 5176-002); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0698-001). **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (2 specimens: 0010-002, 0373-002).

***Cis pacificus*** Sharp**New island record**

This robust-bodied endemic species was reported only from O'ahu.

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (1 specimen: 1069-001); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (7 specimens: 0519-008, 0531-007, 0531-008, 0619-008, 0619-001, 0659-001, 0659-002).

***Cis porcatus*** Sharp**New island record**

*Cis porcatus* was the most common ciid species collected from *Metrosideros* in this study but was reported previously only from Hawai'i, Lāna'i, O'ahu, and Kaua'i. The collections from Moloka'i mark the first time it has been recorded from that island.

*Material examined:* **HAWAII:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (14 specimens); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 25.viii.1998, 17.iv.2001, 01.v.2001, DSG (4 specimens); Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (10 specimens), 6.xi.1997, DSG, JSF & LSS (6 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (126 specimens); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (42 specimens); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (24 specimens).

### *Cis setarius* Sharp

### New island record

This endemic species was recorded previously from Hawai'i, O'ahu, and Kaua'i. Specimens collected from Moloka'i in this study mark the first record for that island.

*Material examined:* **HAWAII:** Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (10 specimens), 6.xi.1997, DSG, JSF & LSS (5 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (40 specimens); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (8 specimens).

### Hydrophilidae

### *Cercyon* sp. nr. *lividulus* Orchymont

### New state record

There are two *Cercyon* species recorded from the Hawaiian Islands: *C. laminatus* Sharp and *C. quisquilius* (Linnaeus). However, Hansen (1993: 281) briefly noted a third species collected by F.X. Williams from Lulumahu Valley on O'ahu in 1937. It was never identified thus was not reported in Nishida (2002). This species fits Hansen's (1993) description and matches voucher specimens at the University of Hawai'i, most notably by lacking a black head and by having transverse, crescent-shaped light swaths on the elytra. Although the species was not identified, Hansen (1993) considered the Lulumahu specimens to be closely related to *C. lividulus* Orchymont from southern India. The genus has not been revised recently, and it is probable that this species is undescribed (M. Fikacek, pers. comm.).

*Material examined:* **HAWAII:** Laupāhoehoe Forest Reserve, Blair Rd, 6.xi.1997, DSG, JSF & LSS (1 specimen: 5008-001); **O'AHU:** Lulumahu Valley, ex rotting banana stems, F.X. Williams, 1937 (2 specimens: University of Hawai'i [UH]).

### Lathridiidae

### *Aridius nodifer* (Westwood)

### New island record

Although this is the first published record from Kaua'i, this adventive species was considered widespread before the turn of the 20th century (Blackburn & Sharp, 1885). *Aridius nodifer* was previously recorded from Hawai'i, Maui, Lāna'i, and O'ahu.

*Material examined:* **HAWAII:** Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0485-003); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (1 scratch specimen).

### Nitidulidae

### *Epuraea ocularis* Fairmare

### New island record

Formerly known as *Haptoncus ocularis* (Fairmaire) (Ewing & Cline, 2004), this adventive species was reported previously from Kaua'i, O'ahu, Lāna'i, Maui, and Hawai'i.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen: 0292-001).

**Ptiliidae*****Acrotrichis discoloroides* Johnson****New island record**

Two species, *A. africana* Johnson and *A. discoloroides* Johnson, are recorded as adventives to the islands, but their distributions are not recorded. The two species belong to different subgenera, *Acrotrichis* Motschulsky and *Ctenopteryx* Flach, respectively, distinguished primarily by pronotal and genitalic characters. All the current specimens match descriptions of *A. discoloroides*. Native to the Afrotropical Region, this species has become cosmopolitan in distribution and has been recorded from Madagascar, the Cape Verde and Seychelles archipelagoes, Sri Lanka, Trinidad, New Guinea, and the Galápagos, Society, and Marquesas island groups (Johnson, 1985).

*Material examined:* **HAWAII'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (7 specimens: 0797-001, 0947-001, 1015-002, 1042-005, 1042-006, 1042-007, 1069-002); Laupāhoehoe Forest Reserve, Blair Rd, 6.xi.1997, DSG, JSF & LSS (1 specimen: 5182-005).

**Order Diptera****Cecidomyiidae*****Monardia recondita* Hardy****New island record**

This endemic lestreminiine species was known previously from O'ahu and Hawai'i. Collection made on Moloka'i during this study marks the first record of this species from that island.

*Material examined:* **HAWAII'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (1 specimen: 1102-005); Laupāhoehoe Forest Reserve, Blair Rd, 6.xi.1997, DSG, JSF & LSS (1 specimen: 5172-006); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0575-009); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen: 0300-009).

***Trisopsis oleae* Kieffler****New island record**

This adventive species, known previously from O'ahu, is easily recognized by the eyes which are divided into three distinct patches. On O'ahu, *T. oleae* larvae were reported feeding on *Pedronia* scales on *Dicranopteris* ferns (Hardy, 1960).

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (4 specimens: 0047-010, 0090-006, 0171-010, 0311-011).

**Drosophilidae*****Scaptomyza univitta* Hardy****New island record**

Reported previously from O'ahu and Kaua'i, this species is predominantly yellow with 6 rows of acrostichal setae, a single brown median vitta and distinctively blunt male claspers and other genitalic features (Hardy, 1965). Similar but questionable specimens from Hawai'i Island, currently designated *Scaptomyza* nr. *univitta*, were not included with this record.

*Material examined:* **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (1 specimen: 1326-001); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (26 specimens).

**Ephydriidae*****Hydrellia tritici* Coquillett****New island record**

This is an adventive species known previously from Hawai'i, Kaho'olawe, Maui, and



Kaua'i. This species was common and abundant at two sites on Hawai'i Island but comparatively uncommon on Moloka'i where it is recorded here for the first time.

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (53 specimens); Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (58 specimens), 6.xi.1997, DSG, JSF & LSS (31 specimens); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (3 specimens: 0201-001, 0321-011 + 1 scratch).

### Limoniidae

*Libnotes* n. sp. nr. *trukensis* Alexander

#### New state record

This species is cryptogenic but presumed adventive, since it is larger (males: 12–15 mm body length, 15–17 mm wings) and more conspicuous than *L. perkinsi* or any native *Dicranomyia* and was found at three sites. This species is an undescribed species, most closely resembling *L. trukensis* Alexander from Micronesia (G.W. Byers, pers. comm.). The basal radial cell of the wing is broader apically than in *Libnotes perkinsi*, with the radial sector ( $R_3$ ) nearly straight across the junctions with distal cells, rather than deeply arched at the first radial cell.

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, 'Ōla'a Tract, Wright Rd, 25.x.1996, DSG, KNM & DAP (1 scr. specimen); Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (1 specimen: 0853-001); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (3 specimens: 0585-010, 0651-003, 0774-004); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen: 0120-002).

### Phoridae

*Diplonevra peregrina* (Wiedemann)

#### New island record

This distinctively marked adventive species is widespread throughout the islands but had not yet been recorded for Moloka'i. The first, the anterior half of the second, and sixth abdominal terga are yellow, all the rest are dark but with a small yellow triangular marking in the center.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen: 0171-008).

### Psychodidae

*Trichomyia hawaiiensis* Quate

#### New island record

This endemic species was previously known from Hawai'i and Maui. The specimens collected in this study mark the first record from Moloka'i. This species is distinguished from *T. oahuensis* by the broken  $R_{2+3}$  vein near its base (Hardy, 1960).

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (42 specimens); Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (8 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (2 specimens); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (25 specimens); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (1 specimen).

### Sciaridae

*Sciara prominens* Hardy

#### New island records

*Sciara prominens* is readily identifiable by a conspicuous submedian spine on the internal margin of the male claspers. This endemic species was previously known only from

Hawai'i and O'ahu. Collections from Moloka'i and Kaua'i during this study mark the first records from those islands.

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (19 specimens); Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (1 specimen: 4318-001); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (18 specimens); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (12 specimens).

### *Plastosciara adrostylata* Hardy

### New island record

*Plastosciara* is differentiated from other sciarids by two segmented palpi, with the second segment minute. This endemic species was known previously from O'ahu and Hawai'i.

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (7 specimens); Kohala, Parker Ranch, Kemola, 4000 ft, 31.v.1977, J.W. Beardsley (13 specimens); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (1 specimen: 1306-001).

## Order Heteroptera

### Reduviidae

#### *Haematoloecha rubescens* Distant

### New island record

This conspicuous red and black adventive species was recorded previously from Kaua'i, O'ahu, and Maui. *Haematoloecha rubescens* probably is present on all the main islands.

*Material examined:* **HAWAI'I:** Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0535-005 [USNM]); Kohala, Parker Ranch, Kemola, 4000 ft, 31.v.1977, J.W. Beardsley (1 specimen); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 27.v.1999, DSG (1 specimen).

## Order Homoptera

### Aphididae

#### *Greenidea formosana* (Maki)

### New island records

Reported to feed on guava, also in the Myrtaceae, this aphid was locally abundant on *Metrosideros* at several sites. This adventive species from Asia was recorded recently for O'ahu (Beardsley, 1995) and in unpublished records for Hawai'i, Moloka'i, and Mau'i (Heu, 2003). Interestingly, males were also collected but were not known previously for this species (Blackman & Eastop, 2000). Aphid males are more often collected from high elevation sites in Hawai'i than in the lowlands (B. Kumashiro, pers. comm.), and may be present only in the autumn months because of the aphid annual reproductive cycle (M. Stoetzel, pers. comm.).

*Material examined:* **HAWAI'I:** Hawaii Volcanoes National Park, Hilina Pali and Chain of Craters, 21–22.x.1996, DSG, DF & DAP (11 specimens); Hawaii Volcanoes National Park, Kīpuka Kī, Mauna Loa Rd, 24–25.x.1996, DSG, DF & DAP (15 specimens); Hawaii Volcanoes National Park, 'Ōla'a Tract, Wright Rd, 25.x.1996, DSG, KNM & DAP (200+ females, 7 males); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 30.viii.1999, 14.xii.1999, 12.v.2000, 1.vi.2000, 17–18,25.iv.2001, 1–3.v.2001, DSG (80 specimens); Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG & DAP (4 specimens), 6.xi.1997, DSG, JSF & LSS (505 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (64 specimens); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen).

***Idiopterus nephrolepidis* Davis****New island record**

Zimmerman (1948b) believed this introduced species to be much more widely distributed than “current records indicate.” It feeds on ferns, including *Elaphoglossum* and *Asplenium*, both of which were growing on *Metrosideros* trees at this location. This species was recorded previously from O‘ahu, Maui, and Hawai‘i.

*Material examined:* **KAUA‘I:** Nāpali-Kona Forest Reserve, Alaka‘i swamp trail, 29–30.x.1997, DSG & DAP (1 specimen: 1454-002).

**Cercopidae*****Philaenus spumarius* (Linnaeus)****New island record**

This adventive froghopper is listed only from Hawai‘i. *Philaenus spumarius* feeds on various grasses, and is recorded on ‘ōhi‘a lehua as an incidental.

*Material examined:* **HAWAI‘I:** ‘Ōla‘a Tract, Wright Rd, 25.x.1996, DSG, KNM & DAP (1 specimen); Laupāhoehoe Forest Reserve, Blair Rd, 6.xi.1997, DSG, JSF & LSS (1 specimen: 5107-001). **KAUA‘I:** Nāpali-Kona Forest Reserve, Alaka‘i swamp trail, 29–30.x.1997, DSG & DAP (1 specimen: 1460-005 [USNM]).

**Delphacidae*****Leialoha lehuae* (Kirkaldy)****New island record**

This apparently widespread *Metrosideros* specialist is known from every high island except Moloka‘i, Kaho‘olawe, and Ni‘ihau. In this study, it was collected only on Moloka‘i, marking the first record of this species from that island.

*Material examined:* **MOLOKA‘I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 adult, 32 nymphs).

**Triozidae*****Kuwayama minuta* Crawford****New island record**

This endemic *Metrosideros* specialist was known previously from Hawai‘i and Kaua‘i.

*Material examined:* **HAWAI‘I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (3 specimens); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 30.viii.1998, 16,18,25,30.iv.2001, 2–3.v.2001, DSG (29 specimens); Laupāhoehoe Forest Reserve, Blair Rd, 3–5.vi.1997, DSG, JSF & LSS (33 specimens), 6.xi.1997, DSG, JSF & LSS (16 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (79 specimens); **MOLOKA‘I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (3 specimens); **KAUA‘I:** Nāpali-Kona Forest Reserve, Alaka‘i swamp trail, 29–30.x.1997, DSG & DAP (2 specimens).

**Order Hymenoptera****Agaonidae*****Odontofroggata galili* Wiebes****New island record**

This adventive *Ficus* gall wasp, like its sibling species *Odontofroggata ishii* Wiebes, was recorded only from O‘ahu. This species is distinguished from *O. ishii* by the serrate antennae in the female, the shorter, broader head across the ocelli, and by propodeal characters (Wiebes, 1980).

*Material examined:* **HAWAI‘I:** Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 18.iv.2001, DSG (1 specimen: 7139-004).

**Braconidae*****Leiophron* sp.****New state record**

*Leiophron* Nees, a cosmopolitan euphorine genus (except Australia) with 19 described North American and many undescribed Neotropical species, has not been recorded from the Hawaiian Islands. The following characters distinguish the genus: the tergum and sternum of the petiole are totally separate ventrally, the occipital carina is incomplete dorsally, and the wing venation is often reduced such that the first submarginal and discal cells are open apically (Shaw, 1997). Most known *Leiophron* parasitize late instar nymphs and adults of Miridae (Shaw, 1997). *Leiophron* sp. is a minute (1.5 mm), undescribed, cryptogenic species (H. Goulet, pers. comm.).

*Material examined:* **HAWAII:** Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (2 specimens: 0474-006, 1 scratch [CNCI]); Laupāhoehoe Forest Reserve, Blair Rd, 6.xi.1997, DSG, JSF & LSS (1 specimen: 5133-009).

**Diapriidae*****Trichopria subtilis* (Perkins)****New island record**

*Trichopria subtilis* (Perkins) is the only described species with 3 apical segments of the female antennal club expanded and nearly equal in width. As with most endemic *Trichopria*, this species was known previously only from O'ahu.

*Material examined:* **HAWAII:** Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 27.iv.1998, 1.vi.2000, DSG (2 specimens: 2279-001, 2945-003).

**Encyrtidae*****Hypergonatopus* sp.****New island record**

No species in the endemic genus *Hypergonatopus* Timberlake, 1922 have been recorded from Kaua'i. These wasps are hyperparasitoids on dryinids, presumably *Dicondylus perkinsi* (Ashmead) and others (Beardsley, 1976a, 1976b). The wasps are black, and the wings are often reduced in size with a transverse infusate streak.

*Material examined:* **KAUAI:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (2 specimens: 1307-004 [BPBM], 1449-002 [BMNH]).

***Rhopus* sp.****New island record**

Although the specific identity of these specimens has not been confirmed, no species from the genus *Rhopus* Förster have previously been recorded from Kaua'i. There are six described endemic and one adventive species in the islands, the majority of which are recorded only from O'ahu. *Rhopus* are mealybug parasitoids.

*Material examined:* **KAUAI:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (2 specimens: 1298-006 [BMNH], 1351-001 [BPBM]).

***Tetracnemoidea brevicornis* (Girault)****Name change, New island record**

This species was introduced into Hawai'i intentionally for biological control of mealybugs, but there is no record of its establishment and current distribution. *Tetracnemoidea pretiosus* (Timberlake), presently considered a junior synonym of *T. brevicornis*, is listed in the latest Hawaiian arthropod checklist (Nishida, 2002) without a known island distribution. The male has spectacular ramose antennae.

*Material examined:* **KAUAI:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (1 male: 1359-007).

**Eulophidae*****Asecodes* sp.****New state record**

The genus *Asecodes* Förster is in taxonomic turmoil. Species formerly described in the genus *Asecodes* have since been reassigned to numerous genera, 4 of which have representatives in Hawai'i (*Ceranisus*, *Diglyphus*, *Neochrysocharis*, *Pediobius*). The specimens reported here do not belong in these genera (Michael Gates, pers. comm.), but the specific identity could not be determined. *Asecodes* wasps parasitize Lepidoptera larvae, in particular those that are leafminers.

*Material examined:* **HAWAII:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (2 females: 0885-003, 0885-005).

***Elachertus advena* Timberlake****New island record**

*Elachertus advena* is an adventive species well established on O'ahu, Maui, and Midway.

*Material examined:* **HAWAII:** Hawaii Volcanoes National Park, Kīpuka Kī, Mauna Loa Rd, 24–25.x.1996, DSG, DF & DAP (1 specimen).

***Pauhiana swezeyi* Yoshimoto****New island record**

This variable species attacks native psyllids (Homoptera: Trioizidae) and their galls on *Metrosideros*, emerging from galls after chewing a round hole through the leaf surface. It was abundant in collections at every site except Laupāhoehoe on Hawai'i Island, but like the native psyllids, was less abundant on Moloka'i and Kaua'i. *Pauhiana swezeyi* was previously unrecorded from Kaua'i.

*Material examined:* **HAWAII:** Hawaii Volcanoes National Park, Hilina Pali and Chain of Craters, 21–22.x.1996, DSG, DF & DAP (3 specimens); Hawaii Volcanoes National Park, Kīpuka Kī, Mauna Loa Rd, 24–25.x.1996, DSG, DF & DAP (8 specimens); Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (13 specimens); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 26–28.viii.1998, 24.vi.1999, 29.ix.1999, 31.x.1999, 14.xii.1999, 1.vi.2000, 16–18, 24–25.iv.2001, 1–3.v.2001, DSG (192 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (46 specimens); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (5 specimens); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (9 specimens: 1246-005, 1298-003, 1380-005, 1380-006, 1380-007, 1380-008, 1398-005, 1441-002, 1494-004).

**Eupelmidae*****Eupelmus***

This large endemic complex of species has not been revised since Perkins added 46 species (Perkins, 1910). Many species were described from single specimens, the vast majority biased to collections on O'ahu and Hawai'i Islands. Although these wasps appear to be ubiquitous in forest ecosystems, few workers have attempted to identify native *Eupelmus* since the turn of the century. Many species probably more widely distributed and new island records are not surprising. I examined all the type holdings at BPBM and compared these specimens to descriptions and keys (Perkins, 1910). Males could not be associated with females and were not identified, and several possible range extensions are not reported for single specimens. These wasps probably parasitize Lepidoptera.

***Eupelmus axestias* Perkins****New island record**

The species was described and known only from O'ahu.

*Material examined:* **HAWAII'I:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (1 female: 1153-009); **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (3 females: 0050-006, 0050-008, 1 scratch).

***Eupelmus chloropus* Perkins****New island record**

This species was described and known only from O'ahu. This record includes two specimens that may represent a new species.

*Material examined:* **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (3 females: 1229-003, 1398-003, 1459-002).

***Eupelmus xanthotarsus* Perkins****New island record**

This species was described and known only from O'ahu.

*Material examined:* **MOLOKA'I:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (2 females: 0367-003).

***Eupelmus xestias* Perkins****New island record**

*Eupelmus xestias* was known previously only from Hawai'i.

*Material examined:* **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (2 females: 0119-008, 0367-003).

**Mymaridae*****Polynema pyrophila* Perkins****New island record**

*Polynema pyrophila* is an endemic species previously known from Hawai'i and Moloka'i.

*Material examined:* **HAWAII'I:** Hawaii Volcanoes National Park, Hilina Pali and Chain of Craters, 21–22.x.1996, DSG, DF & DAP (2 specimens); Hawaii Volcanoes National Park, 'Ōla'a Tract, Wright Rd, 25.x.1996, DSG, KNM & DAP (1 specimen); Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (21 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0454-004); **KAUA'I:** Nāpali-Kona Forest Reserve, Alaka'i swamp trail, 29–30.x.1997, DSG & DAP (4 specimens: 1229-002, 1239-004, 1267-002, 1403-001).

**Platygastridae*****Aphanomerus rufescens* Perkins****New state record**

Perkins (1905) described four species in the genus *Aphanomerus* from Queensland, Australia. These minute wasps parasitize eggs of fulgoroid leafhoppers and planthoppers, and were described as part of an exploration for natural enemies of sugarcane pests. *Aphanomerus pusillus* Perkins, listed incorrectly under the family Scelionidae in Nishida (2002), is the only species of the genus previously recorded from the Hawaiian Islands. *Aphanomerus pusillus* was purposely introduced to the Hawaiian Islands to control the introduced flatid *Siphanta acuta* and is known from Hawai'i, Maui, Moloka'i, and O'ahu. However, the thorax and abdomen of *A. pusillus* are uniformly yellow or lightly ferruginous, whereas all the specimens reported here have a black head and thorax, and the abdomen is dark to moderately ferruginous, which identify it as *A. rufescens*. Antennal and other characteristics also match the holotype specimen (BPBM) and description of *A. rufescens* in Perkins (1905). This species may be adventive in Hawai'i, or it may have been purposely introduced but without record in the heyday of biological control in the early part of the 20th century.

*Material examined:* **HAWAII:** Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 27.viii.1998, 18.25.iv.2001, 2.v.2001, DSG (21 specimens: 2289-001, 7100-004, 7111-003 [9], 7111-007, 7111-008, 7111-009, 7111-010, 7111-011, 7111-012, 7139-001, 7139-005, 7208-002, 7680-001); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0564-005).

### Pteromalidae

#### *Toxexuma nubilipennis* Ashmead

#### New island records

Previously known from Kauaʻi, Lānaʻi, and Maui, specimens of *Toxexuma nubilipennis* were collected on Molokaʻi and several sites on Hawaiʻi.

*Material examined:* **HAWAII:** Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (6 specimens); Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (4 specimens); **MOLOKAʻI:** Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (10 specimens); **KAUAʻI:** Nāpali-Kona Forest Reserve, Alakaʻi swamp trail, 29–30.x.1997, DSG & DAP (6 specimens).

#### *Zolotarewskya* sp.

#### New state record

This is the first state record of this exceptional cleonymine genus, otherwise restricted to the Australasian, Oriental, Afrotropical, and Palearctic Regions. The dentate hind margins of the metafemora distinguish this genus from other Cleonymini genera. There are eight described species, but these specimens represent a new species of obscure origin (Gibson, 2003). The male has spectacular ramose antennae: the flagellum has a single anellus and 6 funicular segments prolonged into ramae, each approximately the same length as the 7th segment and ovoid clava together. The female has a distinct finger-like projection extending from the apical funicular segment along the clava. Host records for this genus are not definitive, but it is suspected that *Zolotarewskya* species parasitize wood-boring beetles in the families Anobiidae, Buprestidae, Curculionidae, and Scolytidae (Gibson, 2003).

*Material examined:* **HAWAII:** Hawaii Volcanoes National Park, Hilina Pali and Chain of Craters, 21–22.x.1996, DSG, DF & DAP (1 male); Hawaii Volcanoes National Park, Kípuka Kī, Mauna Loa Rd, 24–25.x.1996, DSG, DF & DAP (1 female); **MOLOKAʻI:** Mapulehu nr. Iliiopae Heiau, 60 ft [18 m], 19.viii.–02.ix.1995, yellow sticky board traps, WD Perreira (1 male); Pālāʻau State Park, 1500 ft [460 m], 1–15.ix.1995, W.D. Perreira (1 female).

### Scelionidae

#### *Baeus persordidus* Perkins

#### New island record

This minute (<1 mm), wingless adventive species has been in Hawaiʻi for more than a century (Perkins, 1910) but was recorded previously only from Oʻahu. It is apparently widespread on Hawaiʻi Island.

*Material examined:* **HAWAII:** Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (2 specimens: 1109-012, 1148-001); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 18.iv.2001, DSG (1 specimen: 7164-005); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0589-002).

#### *Trimorus* sp.

#### New state record

*Trimorus* Foerster is a Holarctic genus with over one hundred described species. This species could not be placed to a definitive species identity. The specimen is shining black with a green metallic tinge, a broad head, densely reticulate scutum, sparse body setation, and a single strong epinotal spine.

*Material examined:* **HAWAII**: Laupāhoehoe Forest Reserve, Blair Rd, 6.xi.1997, DSG, JSF & LSS (1 female: 5227-005).

### Signiphoridae

*Chartocerus dactylopii* (Ashmead)

#### Name change, New island record

Recorded in Nishida (2002) as *Thysanus dactylopii* (Ashmead, 1900), this adventive species was previously recorded only from O'ahu and Moloka'i.

*Material examined:* **HAWAII**: Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 24–25.iv.2001, DSG (2 specimens: 7111-006, 7459-004).

*Signiphora aspidiotei* Ashmead

#### New island records

Recorded in Nishida (2002) as *Thysanus aspidiotei* (Ashmead, 1900), this adventive species was recorded previously from O'ahu and Necker.

*Material examined:* **HAWAII**: Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (1 specimen: 1070-002); Upper Waiākea Forest Reserve, Tree Planting Rd, 1881 flow, 18.iv.2001, DSG (1 specimen: 7266-001); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 0615-002); **MOLOKA'I**: Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen: 0050-005).

### Order Psocoptera

#### Ectopsocidae

*Ectopsocus briggsi* McLachlan

#### New state record

This species is recorded in the checklist (Nishida, 2002) as adventive but not confirmed as established. Collection of a specimen in the Kohala mountains confirms that this species is established on the Big Island.

*Material examined:* **HAWAII**: Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (1 specimen: 8082-008).

#### Elipsocidae

*Kilauella micramaura* (Perkins)

#### New island record

This minute (~1 mm) endemic species has distinctively marked wings, with patterned infuscations, the pterostigmal boundaries thickened, and the areola postica completely fused with the media (Zimmerman, 1948a). It was known previously only from Hawai'i and O'ahu, but it is not surprising to find range extensions and many new species in this neglected but hyperdiverse genus.

*Material examined:* **HAWAII**: Hawaii Volcanoes National Park, Thurston Lava Tube and Escape Rd, 6–8.x.1997, DSG & DAP (2 specimens); Kohala Forest Reserve, nr. Parker Ranch, 12–14.x.1997, DSG & DAP (12 specimens). **MOLOKA'I**: Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (20 specimens).

#### Philotarsidae

*Haplophallus* sp.

#### New state record

This is the first record for Philotarsidae in the Hawaiian Islands. The specimen did not match descriptions for congeneric Pacific species *H. boninensis*, *H. fuscistigma*, or *H. orientalis*. It is either a new species or it originates from outside the Pacific basin (E. Mockford, pers. comm.).

*Material examined:* **MOLOKA'I**: Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (1 specimen: 8001-009).



**Class Malacostraca: Order Amphipoda****Talitridae***Platorchestia* sp.**New island record**

Although this species was abundant underneath 'ōhi'a *lehua* tree bark and within mosses in Kamakou Preserve, no talitrids have been recorded formally from Moloka'i (Nishida, 2002). However, Wayne Gagné collected examples of this species in Upper Kawela Gulch in 1981, and reported informally the widespread occurrence of talitrids on all main islands but Hawai'i (Gagné, 1975). Although this species is close to *Platorchestia lanipio* Richardson, further study probably will reveal this to be a distinct new species (A.W.W. Richardson, pers. comm.). An additional species from the genus *Hawaiiorchestia* was collected by fogging on Kaua'i that will probably prove to be novel (A.W.W. Richardson, pers. comm.).

*Material examined:* **MOLOKA'I:** Upper Kawela Gulch, 1200 m, 5.i.1981, sweeping vegetation, W.C. Gagné (1 specimen), 6.i.1981, on mossy trees, W.C. Gagné (7 specimens); Kamakou Preserve, Kolekole, 22–24.x.1997, DSG & DAP (355 specimens [10 to UTSZ]).

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**Appendix.** List of arthropod species collected from *Metrosideros polymorpha* during 1996-2001. Two-letter site abbreviations refer to quantitative collection localities listed in Table 1, and “1996” includes all sites in Hawai`i Volcanoes National Park sampled by non-quantitative pyrethrum fogging techniques. Quantitative sites are scored by presence (+) or absence (-). Site codes are listed for 1996 when positively recorded, but absence is not noted because of the qualitative nature of these collections. New state (NSR) or island (NIR) records are listed in place of (+) where appropriate; questionable range extensions are noted (?) but not reported. Determiners are: AMMR = Alastair M.M. Richardson, AV = Amy Vandergast, BRK = Bernarr R. Kumashiro, CAT = Catherine A. Tauber, CPE = Curtis P. Ewing, DAP = Dan A. Polhemus, DMP = Diana M. Percy, DSG = Daniel S. Gruner, ELM = Ed L. Mockford, GAPG = Gary A.P. Gibson, GAS = G. Al Samuelson, GWB = George W. Byers, JAB = Joe A. Beatty, JEG = Jessica E. Garb, JKL = Jim K. Liebherr, JSN = John S. Noyes, JTH = John T. Huber, KTA = Keith T. Arakaki, KYK = Ken Y. Kaneshiro, LM = Lubomir Masner, MA = Manfred Asche, MAA = Miquel A. Arnedo, MLG = M. Lee Goff, MWG = Michael W. Gates, NJR = Neil J. Reimer, NLE = Neal L. Evenhuis, RGG = Rosemary G. Gillespie, RJG = Ray J. Gagné, SLM = Steve L. Montgomery, TAB = Todd A. Blackledge.

Taxon	Origin†	Guid‡	1996	VO	TP	LA	KH	MO	KA	Det.
<b>CLASS ARACHNIDA</b>										
<b>Order Acari</b>										
Family <b>Anystidae</b>										
Anystidae g. sp. 1	adv	pred	HP VO	+	+	+	+	+	+	MLG
Families undet.										
Acari g. sp. 2	?	?		-	+	-	-	-	-	DSG
Acari g. sp. 3	?	?		-	+	-	-	-	-	DSG
Acari g. sp. 4	?	?		-	+	+	+	-	-	DSG
Acari g. sp. 5	?	?		-	+	-	-	-	-	DSG
Acari g. sp. 6	?	?		-	+	-	-	-	-	DSG
Acari g. sp. 7	?	?		-	+	+	-	+	-	DSG
Acari g. sp. 8	?	?		-	+	+	-	-	-	DSG
Acari g. sp. 9	?	?		-	+	+	-	-	-	DSG
Acari g. sp. 10	?	?		-	+	-	+	+	+	DSG
Acari g. sp. 12	?	?		-	+	-	-	-	-	DSG
Acari g. sp. 13	?	?		-	+	+	-	-	-	DSG
Acari g. sp. 14	?	?		-	+	-	-	-	-	DSG
Acari g. sp. 15	?	?		-	+	-	+	-	+	DSG
Acari g. sp. 16	?	?		+	-	+	+	+	-	DSG
Acari g. sp. 17	?	?		-	-	+	-	-	-	DSG
Acari g. sp. 18	?	?		-	-	+	-	-	-	DSG
Acari g. sp. 19	?	?		-	-	+	+	+	-	DSG
Acari g. sp. 20	?	?		-	-	+	-	-	-	DSG
Acari g. sp. 21	?	?		-	-	-	+	-	-	DSG
Acari g. sp. 22	?	?		-	-	-	+	-	-	DSG
Acari g. sp. 23	?	?		-	-	-	+	-	-	DSG
Acari g. sp. 24	?	?		-	-	-	+	-	-	DSG
Acari g. sp. 25	?	?		-	-	-	+	-	-	DSG
Acari g. sp. 26	?	?		-	-	-	+	-	-	DSG
Acari g. sp. 27	?	?		+	-	-	-	-	-	DSG
Acari g. sp. 28	?	?		+	-	-	-	-	-	DSG
Acari g. sp. 29	?	?		-	-	-	-	+	+	DSG
Acari g. sp. 30	?	?		-	-	-	-	+	-	DSG
Acari g. sp. 31	?	?		-	-	-	-	+	-	DSG
Acari g. sp. 32	?	?		-	-	-	-	+	-	DSG
Acari g. sp. 33	?	?		-	-	-	-	+	-	DSG
<b>Order Araneae</b>										
Family <b>Araneidae</b>										
<i>Araneus emmae</i> Simon, 1900	end	pred		+	+	+	+	+	+	JAB
<i>Araneus kapiolaniae</i> Simon, 1900	end	pred		+	+	-	-	-	-	JAB
<i>Araneus</i> sp. 1	end	pred		-	+	-	-	-	-	JAB
<i>Argiope trifasciata</i> (Forsk., 1775)	adv	pred		-	+	-	-	-	-	JAB

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Cyclosa perkinsi</i> Simon, 1900	end	pred		-	+	-	-	-	-	TAB
<i>Cyclosa simplicicauda</i> Simon, 1900	end	pred		-	-	-	-	-	NIR?	TAB
<i>Cyclosa</i> sp. 2	end	pred		-	-	-	-	+	+	DSG
Family <b>Dysderidae</b>										
<i>Dysdera crocota</i> C.L. Koch, 1838	adv	pred		-	-	-	-	+	-	JAB
Family <b>Linyphiidae</b>										
<i>Erigone autumnalis</i> Emerton, 1882	adv	pred		+	+	+	+	NIR?	+	JAB
Linyphiidae g. sp. 1	adv	pred		-	NSR?	-	-	-	-	DSG
Linyphiidae g. sp. 2	adv	pred		+	+	-	-	-	-	DSG
<i>Tenuiphantes tenuis</i> (Blackwall, 1952)	adv	pred		-	-	-	-	NIR	-	JAB
<i>Cheiracanthium mordax</i> L. Koch, 1866	adv	pred		-	+	-	-	-	-	DSG
Family <b>Philodromidae</b>										
<i>Pagiopalus atomarius</i> Simon, 1900	end	pred		+	+	+	+	+	+	JAB
Family <b>Salticidae</b>										
<i>Havaika navatus</i> (Simon, 1900)	end	pred		-	-	-	-	-	+	JAB
<i>Havaika pubens</i> (Simon, 1900)	end	pred		-	-	-	-	+	-	JAB
<i>Havaika</i> sp. 3	end	pred		+	+	+	+	-	-	JAB
Family <b>Tetragnathidae</b>										
<i>Tetragnatha</i> "golden dome" Gillespie	end	pred		+	-	+	+	-	-	AV
<i>Tetragnatha</i> "long clawed" Gillespie	end	pred		-	-	-	+	-	-	RGG
<i>Tetragnatha</i> "small spiny" Gillespie	end	pred		-	-	+	-	-	-	RGG
<i>Tetragnatha acuta</i> Gillespie, 1992	end	pred		+	+	-	-	+	-	DSG
<i>Tetragnatha anuenue</i> Gillespie, 2002	end	pred		+	+	+	+	-	-	AV
<i>Tetragnatha brevignatha</i> Gillespie, 1991	end	pred		-	-	+	+	-	-	AV
<i>Tetragnatha hawaiiensis</i> Simon, 1900	end	pred		+	+	+	-	-	+	AV
<i>Tetragnatha kauaiensis</i> Simon, 1900	end	pred		-	-	-	-	-	+	DSG
<i>Tetragnatha kea</i> Gillespie, 1994	end	pred		-	-	+	-	-	-	RGG
<i>Tetragnatha maka</i> Gillespie, 1994	end	pred		-	-	-	-	-	+	DSG
<i>Tetragnatha perkinsii</i> Simon, 1900	end	pred		-	+	-	-	-	-	AV
<i>Tetragnatha quasimodo</i> Gillespie, 1991	end	pred		+	+	+	+	+	-	AV
Family <b>Theridiidae</b>										
<i>Achaearanea</i> cf. <i>riparia</i> (Blackwall, 1834)	adv	pred	KI	-	+	-	-	-	-	JAB
<i>Argyrodes argentatus</i> Cambridge, 1880	adv	pred		-	-	-	-	NIR	-	JAB
<i>Argyrodes corniger</i> (Simon), 1900	end	pred		-	-	+	-	-	-	JAB
<i>Argyrodes</i> sp. 1	end	pred		+	-	+	-	-	-	DSG
<i>Argyrodes</i> sp. 2	end	pred		+	-	+	-	-	-	DSG
Theridiidae g. sp. 4	?	pred		-	-	-	+	-	-	DSG
<i>Theridion grillator</i> Simon, 1900	end	pred		+	-	+	+	+	-	DSG
<i>Theridion mauense</i> Simon, 1900	end	pred		-	-	-	-	NIR	-	MAA
<i>Theridion melinum</i> Simon, 1900	end	pred		-	+	+	-	-	-	MAA
<i>Theridion</i> n. sp. 1	end	pred		-	-	-	-	-	+	MAA
<i>Theridion praetextum</i> Simon, 1900	end	pred		-	+	+	-	-	-	MAA
<i>Theridion</i> sp. 6	end	pred		-	-	-	-	-	+	MAA
Family <b>Thomisidae</b>										
<i>Mecaphesa naevigerum</i> (Simon), 1900	end	pred		-	-	+	-	-	-	JEG
<i>Misumenops anguliventris</i> (Simon, 1900)	end	pred		-	+	-	+	-	+	JEG
<i>Misumenops discretus</i> (Suman), 1970	end	pred		-	-	-	-	-	+	JEG
<i>Misumenops facundus</i> (Suman, 1970)	end	pred		-	+	+	-	-	-	JEG
<i>Misumenops junctus</i> (Suman), 1970	end	pred		-	-	+	-	-	-	JEG
<i>Misumenops</i> sp. 5	end	pred		-	-	-	+	-	-	DSG
<i>Misumenops</i> sp. 6	end	pred		-	-	-	-	+	-	DSG
CLASS INSECTA										
Order <b>Blattodea</b>										
Family <b>Blattellidae</b>										
<i>Balta similis</i> (Saussure, 1869)	adv	detr	HP VO	+	-	+	+	+	+	DSG
Order <b>Coleoptera</b>										
Family <b>Aglycyderidae</b>										
<i>Proterhinus</i> sp. 1	end	wood		-	-	+	+	-	-	DSG
<i>Proterhinus</i> sp. 2	end	wood		+	-	+	+	-	-	DSG
<i>Proterhinus</i> sp. 3	end	wood		-	-	-	+	-	-	DSG
<i>Proterhinus</i> sp. 4	end	wood		-	-	+	+	-	-	DSG
<i>Proterhinus</i> sp. 5	end	wood		+	-	-	-	-	-	DSG
<i>Proterhinus</i> sp. 6	end	wood		-	-	+	+	-	-	DSG
<i>Proterhinus</i> sp. 7	end	wood		-	-	+	-	-	-	DSG
<i>Proterhinus</i> sp. 8	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 9	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 10	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 11	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 12	end	wood		-	-	-	-	+	-	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Proterhinus</i> sp. 13	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 14	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 15	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 16	end	wood		-	-	-	-	+	-	DSG
<i>Proterhinus</i> sp. 17	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 18	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 19	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 20	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 21	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 22	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 23	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 24	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 25	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 26	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 27	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 28	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 29	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 30	end	wood		-	-	-	-	-	+	DSG
<i>Proterhinus</i> sp. 31	end	wood		-	-	-	+	-	-	DSG
<b>Family Anobiidae</b>										
<i>Mirosternus</i> sp. 1	end	wood		-	-	-	-	-	+	DSG
<i>Mirosternus</i> sp. 2	end	wood		-	-	-	-	-	+	DSG
<i>Xyletobius collingei</i> Perkins, 1910	end	wood		-	-	-	+	-	-	DSG
<i>Xyletobius proteus proteus</i> Perkins, 1910	end	wood		+	-	-	-	-	-	DSG
<i>Xyletobius</i> sp. 1	end	wood		+	-	-	-	-	-	DSG
<i>Xyletobius</i> sp. 2	end	wood		-	-	-	+	-	-	DSG
<i>Xyletobius</i> sp. 3	end	wood		-	-	-	-	+	-	DSG
<i>Xyletobius</i> sp. 4	end	wood		-	-	+	-	-	-	DSG
<b>Family Anthribidae</b>										
<i>Araecerus varians</i> Jordan, 1946	adv	fung		-	-	+	-	-	+	GAS
<b>Family Carabidae</b>										
<i>Blackburnia abax</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia aterrima</i> (Sharp, 1903)	end	pred		-	-	-	-	-	+	JKL
<i>Blackburnia cheloniceps</i> (Perkins, 1917)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia constricta</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia fraudator</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia hawaiiensis</i> (Sharp, 1903)	end	pred		+	-	-	-	-	-	JKL
<i>Blackburnia kilauaea</i> Liebherr & Zimmerman, 2000	end	pred		+	-	-	+	-	-	JKL
<i>Blackburnia kukui</i> Liebherr, 2000	end	pred		-	+	-	-	-	-	JKL
<i>Blackburnia longipes</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia pavidata</i> (Sharp, 1903)	end	pred		-	-	-	-	-	+	JKL
<i>Blackburnia sphodriiformis</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia tricolor</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Blackburnia vagans</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Laemostenus complanatus</i> (Dejean, 1828)	adv	pred	VO, OL	+	-	-	-	-	-	JKL
<i>Mecyclothorax deverilli</i> (Blackburn, 1879)	end	pred		-	+	+	+	-	-	JKL
<i>Mecyclothorax molokiae</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Mecyclothorax</i> n. sp. nr. <i>platysminus</i> (Sharp, 1903)	end	pred		-	-	-	-	+	-	JKL
<i>Mecyclothorax oculatus</i> Sharp, 1903	end	pred		-	-	-	-	+	-	JKL
<i>Mecyclothorax paradoxus</i> (Blackburn, 1879)	end	pred		-	+	-	-	-	-	JKL
<i>Mecyclothorax variipes</i> (Sharp, 1903)	end	pred		-	-	-	+	-	-	JKL
<b>Family Cerambycidae</b>										
<i>Curtomerus flavus</i> (Fabricius, 1775)	adv	wood	HP	-	-	-	-	-	-	DSG
<i>Plagithmysus bilineatus</i> Sharp, 1896	end	wood		-	-	-	+	-	-	DSG
<b>Family Chrysomelidae</b>										
<i>Diachus auratus</i> (Fabricius, 1801)	adv	tou	KI	-	-	-	-	-	-	GAS
<b>Family Ciidae</b>										
<i>Apterocis ephistemoides</i> (Sharp, 1885)	end	fung		-	-	-	-	+	-	DSG
<i>Apterocis hawaiiensis</i> Perkins, 1900	end	fung		-	-	+	-	-	-	DSG
<i>Apterocis hystrix</i> Perkins, 1900	end	fung		-	-	-	-	NIR?	-	DSG
<i>Apterocis variabilis</i> Perkins, 1900	end	fung		-	-	-	-	-	NIR?	DSG
<i>Apterocis variegatus</i> Perkins, 1900	end	fung		-	-	-	-	NIR	-	DSG
<i>Apterocis</i> nr. <i>variegatus</i> Perkins, 1900	end	fung		-	-	-	+	-	-	DSG
<i>Cis calidus</i> Sharp, 1885	end	fung		-	-	-	-	-	+	DSG
<i>Cis evanescens</i> Sharp, 1879	end	fung		-	-	-	-	-	+	DSG
<i>Cis insulicola</i> Dalla Torre, 1911	?	fung		+	-	-	-	-	-	DSG
<i>Cis molokaiensis</i> Perkins, 1900	end	fung		-	-	-	-	+	-	DSG
<i>Cis nigrofasciatus</i> Blackburn, 1885	end	fung		-	-	NIR	NIR	NIR	-	DSG
<i>Cis pacificus</i> Sharp, 1879	end	fung		NIR	-	-	NIR	-	-	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Cis porcatus</i> Sharp, 1879	end	fung		+	+	+	+	NIR	+	DSG
<i>Cis setarius</i> Sharp, 1885	end	fung		-	-	+	+	NIR	-	DSG
<i>Cis signatus</i> Sharp, 1879	end	fung		+	-	+	+	+	+	DSG
<i>Cis</i> sp. 1	end	fung		-	-	-	+	+	-	DSG
<b>Family Coccinellidae</b>										
<i>Halmus chalybeus</i> (Boisduval, 1835)	pur	pred	KI OL	-	-	+	+	+	+	DSG
<i>Scymnodes lividigaster</i> (Mulsant, 1853)	pur	pred	KI	-	-	+	-	-	-	DSG
<b>Family Cucujidae</b>										
<i>Cryptomorpha desjardinsi</i> (Guerin-Meneville, 1844)	adv	pred		-	-	+	+	-	+	DSG
<i>Psammoechus insularis</i> (Sharp, 1885)	adv	pred	HP OL	-	-	-	-	-	-	GAS
<b>Family Curculionidae</b>										
<i>Acalles</i> n. sp. 1	end	wood		-	-	-	-	+	-	GAS
<i>Asynonychus godmanni</i> Crotch, 1867	adv	tou		+	-	+	+	-	+	DSG
<i>Deinocossonus nesiotus</i> Perkins, 1900	end	wood		-	-	-	-	-	+	DSG
<i>Hypera postica</i> (Gyllenhal, 1834)	adv	tou		-	-	-	+	-	-	GAS
<i>Nesotocus munroi</i> Perkins, 1900	end	tou		-	-	+	+	-	-	DSG
<i>Oodemus corticis</i> Perkins, 1900	end	tou		-	-	-	-	+	-	DSG
<i>Oodemus multiforme</i> Perkins, 1900	end	wood		-	-	-	+	-	-	DSG
<i>Oodemus paludicola</i> Perkins, 1933	end	wood		-	-	-	-	+	-	DSG
<i>Stenotrupis prolixia</i> (Sharp, 1878)	end	tou		-	-	-	-	+	-	GAS
<i>Syagrius fulvitaris</i> Pascoe, 1875	adv	tou		+	-	-	-	-	-	GAS
<b>Family Dermestidae</b>										
<i>Labrocerus laticornis</i> Sharp, 1908	end	detr		-	-	+	-	-	-	DSG
<b>Family Elateridae</b>										
<i>Conoderus exsul</i> (Sharp, 1877)	adv	pred		-	-	-	+	-	-	GAS
<i>Eopenthes kona</i> Blackburn, 1885	end	pred		-	+	-	-	-	-	DSG
<i>Eopenthes tinctus</i> Sharp, 1908	end	pred		-	+	-	-	-	-	DSG
<b>Family Eucnemidae</b>										
<i>Dromaeolus</i> n. sp. nr. <i>puncticollis</i>	end	wood		+	-	-	+	-	-	DSG
<b>Family Histeridae</b>										
<i>Aeletes subalatus</i> (Scott), 1908	end	detr		-	-	-	-	+	-	DSG
<b>Family Hydrophilidae</b>										
<i>Cercyon</i> sp. 1	adv	detr		-	-	NSR	-	-	-	DSG
<b>Family Lathridiidae</b>										
<i>Aridius nodifer</i> (Westwood, 1839)	adv	fung		-	-	-	+	-	NIR	GAS
<b>Family Nitidulidae</b>										
<i>Eपुरaea ocularis</i> Fairmaire, 1849	adv	detr		-	-	-	-	NIR	-	CPE
<i>Eupetinus curtus</i> Scott, 1908	end	detr		-	-	-	-	+	-	CPE
<i>Eupetinus impressus</i> (Sharp), 1878	end	detr		-	-	-	-	-	+	CPE
<i>Eupetinus spretus</i> (Blackburn), 1885	end	detr		-	-	-	+	-	-	CPE
<i>Eupetinus striatus</i> (Sharp), 1881	end	detr		+	+	+	-	-	-	CPE
<i>Eupetinus sulcatus</i> Scott, 1908	end	detr		-	-	-	-	+	-	CPE
<i>Gonioryctus molokaiensis</i> Sharp, 1908	end	detr		-	-	-	-	+	-	CPE
<i>Goniothorax inaequalis</i> (Sharp), 1908	end	detr		-	-	+	-	-	-	CPE
<i>Nesopeplus floricola</i> (Blackburn), 1885	end	detr		-	-	-	-	-	+	CPE
<i>Nesopeplus inauratus</i> (Sharp), 1881	end	detr		-	-	+	+	-	-	CPE
<i>Nesopeplus latiusculus</i> Scott, 1908	end	detr		-	-	-	-	+	-	CPE
<i>Nesopetinus rudis</i> Sharp, 1908	end	detr		-	-	-	+	-	-	CPE
<i>Nesopetinus varius</i> (Sharp), 1881	end	detr		-	-	+	-	-	-	CPE
<i>Orthostolus germanus</i> Sharp, 1908	end	detr		-	-	-	-	+	-	CPE
<i>Stelidota geminata</i> Say	adv	detr		-	-	-	+	-	-	CPE
<b>Family Ptiliidae</b>										
<i>Acrotichis discoloroides</i> Johnson, 1969	adv	detr		NIR	-	NIR	-	-	-	DSG
<i>Ptiliodes insignis</i> Scott, 1908	end	detr		-	-	-	+	-	-	DSG
<b>Family Scolytidae</b>										
<i>Xyleborinus saxeseni</i> (Ratzeburg, 1837)	adv	wood		+	-	-	+	-	-	GAS
<i>Xyleborus hiitaka</i> Samuelson, 1981	end	wood		-	-	-	+	-	-	DSG
<i>Xyleborus simillimus</i> Perkins, 1900	end	wood		+	-	+	-	-	-	DSG
<i>Xylosandrus crassiusculus</i> (Motschulsky, 1866)	adv	wood	HP	-	-	-	-	-	-	GAS
<b>Family Staphylinidae</b>										
<i>Aleochara</i> sp.	adv	pred		-	+	+	-	-	-	DSG
<i>Anotylus</i> sp. 1	adv	pred		-	-	-	+	-	-	DSG
<i>Anotylus</i> sp. 2	adv	pred		-	+	-	-	+	-	DSG
<i>Atheta coriaria</i> (Kraatz, 1856)	adv	pred	HP	-	-	-	-	-	-	DSG
<i>Creophilus maxillosus</i> (Linnaeus, 1758)	adv	pred		-	+	-	-	-	-	DSG
<i>Myllaena</i> sp. 1	end	pred		-	-	-	+	-	-	DSG
<i>Myllaena</i> sp. 2	end	pred		-	+	-	-	-	-	DSG
<i>Oligota glabra</i> Sharp, 1880	end	pred		-	+	-	-	-	-	DSG
<i>Oligota</i> sp. 1	end	pred		-	-	-	+	+	-	DSG



Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Oligota</i> sp. 2	end	pred		-	-	-	-	-	+	DSG
<i>Oligota</i> sp. 3	end	pred		-	-	+	-	-	-	DSG
<i>Oligota</i> sp. 4	end	pred		+	+	+	+	-	-	DSG
<i>Oligota</i> sp. 5 nr. glabra	end	pred		-	-	+	-	-	-	DSG
<i>Oligota</i> sp. 6	end	pred		-	-	-	+	-	-	DSG
<i>Osorius rufipes</i> Motshulsky, 1857	adv	pred		-	-	+	+	-	-	DSG
<i>Sunius debilicornis</i> (Wollaston, 1857)	adv	pred		-	-	-	-	+	-	DSG
<i>Thoracophorus blackburni</i> (Sharp, 1880)	end	pred		+	-	-	-	-	-	DSG
<b>Order Collembola</b>										
<b>Family Entomobryidae</b>										
<i>Entomobrya laha</i> Christiansen & Bellinger, 1992	end	detr		+	+	+	+	-	+	DSG
<i>Entomobrya mauka</i> Christiansen & Bellinger, 1992	end	detr		-	-	-	-	+	-	DSG
<i>Entomobrya sauteri</i> Börner, 1909	adv	detr		+	-	-	-	-	-	DSG
<i>Entomobrya socia</i> (Denis, 1929)	adv	detr		+	+	+	-	-	-	DSG
Entomobryidae g. sp. 3	?	detr		-	-	-	-	-	+	DSG
<i>Salina celebensis</i> (Schaeffer, 1898)	adv	detr		+	+	+	+	+	+	DSG
<i>Tomocerus minor</i> (Lubbock, 1862)	adv	detr		+	+	-	-	+	-	DSG
<i>Willowsia kahlertae</i> Christiansen & Bellinger, 1992	end	detr		-	-	-	+	-	-	DSG
<b>Family Isotomidae</b>										
<i>Isotoma notabilis</i> Schaeffer, 1896	adv	detr		-	+	-	+	-	-	DSG
<i>Isotoma sensibilis</i> Tullberg, 1876	adv	detr		-	+	-	-	-	-	DSG
<b>Family Sminthuridae</b>										
<i>Dicyrtoma brevifibra</i> Snider, 1990	end	detr		-	-	-	-	+	-	DSG
<b>Order Diptera</b>										
<b>Family Agromyzidae</b>										
<i>Phytoliriomyza montana</i> Frick, 1953	end	wood		-	-	-	+	-	-	DSG
<b>Family Anisopodidae</b>										
<i>Sylvicola cinctus</i> (Fabricius, 1787)	adv	detr	VO	+	-	+	+	-	-	DSG
<b>Family Asteidae</b>										
<i>Asteia apicalis</i> Grimshaw, 1901	end	detr		+	-	-	+	-	-	DSG
<i>Asteia molokaiensis</i> Hardy & Delfinado, 1980	end	detr		-	-	-	-	+	-	DSG
<b>Family Calliphoridae</b>										
Calliphoridae g. sp. 1	?	detr		-	-	+	-	-	-	DSG
Calliphoridae g. sp. 2	?	detr		-	-	+	-	-	-	DSG
Calliphoridae g. sp. 3	end	detr		+	-	-	-	-	-	DSG
<b>Family Cecidomyiidae</b>										
Porricondyliinae g. sp.	adv	?		+	-	-	-	-	-	RJG
<i>Contarinia</i> sp. 1	adv	flow		+	-	-	+	-	-	RJG
<i>Cecidomyiinae</i> g. sp.	end	detr		+	-	-	+	+	-	RJG
<i>Monardia recondita</i> Hardy, 1960	end	detr		+	-	+	+	NIR	-	DSG
<i>Mycophila fungicola</i> Felt, 1911	adv	fung		NIR?	-	-	-	-	-	DSG
<i>Trisopsis oleae</i> Kieffler, 1912	adv	pred		-	-	-	-	NIR	-	DSG
<b>Family Ceratopogonidae</b>										
<i>Dasyhelea hawaiiensis</i> Macfie, 1934	end	detr		-	+	+	+	+	+	KTA
<i>Dasyhelea platychaeta</i> Hardy, 1960	end	detr		-	-	-	-	NIR?	-	DSG
<i>Forcipomyia hardyi</i> Wirth & Howarth, 1982	end	detr		+	+	+	+	+	+	KTA
<i>Forcipomyia pholeter</i> Wirth & Howarth, 1982	end	detr		+	-	-	-	-	-	DSG
<b>Family Chironomidae</b>										
<i>Orthocladius grimshawi</i> Hardy, 1960	end	detr		-	-	-	-	-	NIR?	DSG
<i>Orthocladius membranisensoria</i> Hardy, 1960	end	detr		-	-	-	+	-	-	DSG
<i>Orthocladius</i> sp. 2	?	detr		-	-	-	-	+	-	DSG
<i>Orthocladius williamsi</i> Hardy, 1960	end	detr		+	+	+	+	+	-	DSG
<i>Pseudosmittia paraconjuncta</i> (Hardy, 1960)	end	detr		+	-	-	-	-	-	DSG
<b>Family Dolichopodidae</b>										
<i>Campsicnemus bryophilus</i> (Adachi, 1954)	end	pred		-	-	-	-	+	-	DSG
<i>Campsicnemus calcaritarsus</i> Adachi, 1953	end	pred		-	-	-	-	+	-	DSG
<i>Campsicnemus distinctus</i> Hardy & Kohn, 1964	end	pred		-	-	+	-	-	-	DSG
<i>Campsicnemus modicus</i> Hardy & Kohn, 1964	end	pred		+	-	-	-	-	-	DSG
<i>Campsicnemus norops</i> Hardy & Kohn, 1964	end	pred		-	-	-	-	-	+	NLE
<i>Campsicnemus scolimerus</i> Hardy & Kohn, 1964	end	pred	VO	-	-	-	-	-	-	NLE
<i>Campsicnemus</i> sp. 6	end	pred		-	-	-	+	-	-	DSG
<i>Dolichopus exsul</i> Aldrich, 1922	adv	pred		-	-	+	-	-	-	DSG
<i>Eurynogaster argentata</i> Hardy & Kohn, 1964	end	pred		-	-	-	+	-	-	DSG
<i>Eurynogaster hawaiiensis</i> (Grimshaw, 1901)	end	pred		-	-	-	+	-	-	DSG
<i>Eurynogaster maculata</i> Parent, 1940	end	pred		+	-	+	+	-	-	DSG
<i>Eurynogaster</i> n. sp. 1	end	pred		-	-	-	-	+	-	DSG & NLE
<i>Eurynogaster</i> n. sp. 2	end	pred		-	-	-	-	+	-	DSG & NLE
<i>Eurynogaster</i> sp. A	end	pred		-	-	-	-	+	-	DSG
<i>Eurynogaster variabilis</i> Hardy & Kohn, 1964	end	pred		-	+	-	-	-	-	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<b>Family Drosophilidae</b>										
<i>Drosophila canipolita</i> Hardy, 1965	end	fung		+	-	+	-	-	-	KYK
<i>Drosophila conformis</i> Hardy, 1965	end	detr		+	-	+	+	-	-	KYK
<i>Drosophila demipolita</i> Hardy, 1965	end	fung		-	-	+	-	-	-	DSG
<i>Drosophila immigrans</i> Sturtevant, 1921	adv	tou		-	-	+	-	-	-	DSG
<i>Drosophila medialis</i> Hardy, 1966	end	detr		-	-	+	+	-	-	DSG
<i>Drosophila melanoloma</i> Hardy, 1965	end	detr		-	-	-	-	+	-	DSG
<i>Drosophila molokaiensis</i> Grimshaw, 1901	end	detr		-	-	-	-	+	-	DSG
<i>Drosophila</i> nr. <i>musae</i> Hardy, 1965	end	detr		-	-	-	-	+	-	DSG
<i>Drosophila</i> nr. <i>paracracens</i> Hardy & Kaneshiro, 1979	end	detr		-	-	+	-	-	-	KYK
<i>Drosophila paucitarsus</i> Hardy & Kaneshiro, 1979	end	detr		-	-	-	-	+	-	DSG
<i>Drosophila percnosoma</i> Hardy, 1965	end	detr		-	-	+	-	-	-	DSG
<i>Drosophila simulans</i> Sturtevant, 1919	adv	detr		-	+	-	-	-	-	DSG
<i>Drosophila sordidapex</i> Grimshaw, 1901	end	detr		-	-	+	-	-	-	KYK
<i>Drosophila</i> sp. A	end	detr		-	-	+	-	-	-	DSG
<i>Drosophila</i> sp. B	end	detr		-	-	+	-	-	-	DSG
<i>Drosophila</i> sp. C	end	detr		-	-	-	-	+	-	DSG
<i>Drosophila suzukii</i> (Matsumura, 1931)	?	detr		-	-	+	-	+	-	KYK
<i>Drosophila tanythrix</i>	end	detr		-	-	+	-	-	-	KYK
<i>Scaptomyza articulata</i> Hardy, 1965	end	detr		-	-	-	-	+	-	DSG
<i>Scaptomyza bryani</i> (Wirth, 1952)	end	para		-	-	+	+	+	-	DSG
<i>Scaptomyza buccata</i> Hackman, 1962	end	detr		-	-	-	+	-	-	DSG
<i>Scaptomyza eurystylata</i> Hardy, 1965	end	detr		+	-	-	-	-	-	DSG
<i>Scaptomyza exigua</i> (Grimshaw, 1901)	end	detr		-	-	-	+	-	-	DSG
<i>Scaptomyza inaequalis</i> (Grimshaw, 1901)	end	detr		+	-	+	+	-	-	DSG
<i>Scaptomyza infurcula</i> Hardy, 1965	end	detr		-	+	+	-	-	-	DSG
<i>Scaptomyza longipecten</i> Hackman, 1959	end	detr		-	-	-	-	+	-	DSG
<i>Scaptomyza longisetosa</i> Hackman, 1959	end	detr		+	-	-	-	-	-	DSG
<i>Scaptomyza mauiense</i> (Grimshaw, 1901)	end	detr		-	-	-	-	+	-	DSG
<i>Scaptomyza neoevexa</i> O'Grady et al., 2003	end	para		-	-	-	-	+	-	DSG
<i>Scaptomyza neokauaiensis</i> O'Grady et al., 2003	end	para		-	-	-	-	-	+	DSG
<i>Scaptomyza neosilvicola</i> O'Grady et al., 2003	end	para		+	-	+	-	-	-	DSG
<i>Scaptomyza setosiscutellum</i> (Hardy, 1965)	end	para		+	-	+	+	+	-	DSG
<i>Scaptomyza</i> sp. A Hardy, 1965	end	detr		-	-	+	-	-	-	DSG
<i>Scaptomyza</i> sp. B Hardy, 1965	end	detr		+	-	-	+	-	-	DSG
<i>Scaptomyza swezeyi</i> (Wirth, 1952)	end	para		-	-	-	-	-	+	DSG
<i>Scaptomyza univitta</i> Hardy, 1965	end	detr		-	-	-	-	NIR	+	DSG
<i>Scaptomyza</i> nr. <i>univitta</i> Hardy, 1965	end	detr		-	-	-	+	-	-	DSG
<i>Scaptomyza xanthopleura</i> Hardy, 1965	end	detr		-	-	+	-	-	-	DSG
<b>Family Ephydriidae</b>										
<i>Hydrellia tritici</i> Coquillett, 1903	adv	tou		+	-	+	-	NIR	-	KTA
<b>Family Hybotidae</b>										
<i>Chersodromia dissita</i> Collin, 1960	end	detr		-	-	-	-	+	-	DSG
<b>Family Keroplatidae</b>										
<i>Trigemma infurcata</i> (Hardy, 1960)	end	detr		-	-	-	+	-	-	DSG
<b>Family Lauxaniidae</b>										
<i>Homoneura unguicalata</i> (Kertész, 1913)	adv	detr		-	-	-	+	-	-	DSG
Lauxaniidae g. sp. 1	?	?		+	-	-	-	-	-	DSG
<b>Family Limoniidae</b>										
<i>Dicranomyia hawaiiensis</i> (Grimshaw, 1901)	end	detr		+	-	+	+	-	-	DSG
<i>Dicranomyia kauaiensis</i> (Grimshaw, 1901)	end	tou		-	-	+	-	+	-	DSG
<i>Dicranomyia</i> sp. nr. <i>pontophila</i> Tokunaga	?	detr		-	-	+	-	-	-	DSG
<i>Dicranomyia grimshawi</i> (Alexander, 1919)	end	detr		-	-	-	+	-	-	DSG
<i>Dicranomyia</i> spp. (larvae)	end	detr		+	-	+	+	+	+	DSG
<i>Dicranomyia stygipennis</i> (Alexander, 1919)	end	detr		-	-	+	+	+	-	DSG
<i>Dicranomyia swezeyi</i> (Alexander, 1919)	end	detr		-	+	+	+	+	-	DSG
<i>Dicranomyia variabilis</i> (Grimshaw, 1901)	end	detr		-	+	-	-	-	-	DSG
<i>Libnotes</i> n. sp. nr. <i>trukensis</i> Alexander	adv	detr	OL(NSR)	-	-	-	NSR	NSR	-	GWB
<b>Family Muscidae</b>										
<i>Brontaea quadristigma</i> (Thomson, 1869)	adv	tou		-	-	+	-	-	-	DSG
<i>Lispocephala longipes</i> (Grimshaw, 1901)	end	detr		-	-	+	-	-	-	DSG
<i>Lispocephala</i> sp. 1	end	detr		-	-	-	+	-	-	DSG
<b>Family Phoridae</b>										
<i>Diplonevra peregrina</i> (Wiedemann, 1830)	adv	?		-	-	-	-	NIR	-	DSG
<b>Family Pipunculidae</b>										
<i>Cephalops holomelas</i> (Perkins, 1910)	end	para		-	-	-	-	+	-	DSG
<i>Cephalops injectivus</i> (Hardy, 1964)	end	para		-	-	+	-	-	-	DSG
<i>Cephalops juvator juvator</i> (Perkins, 1905)	end	para		-	-	+	-	-	-	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Cephalops</i> n. sp. 1	end	para		+	-	+	+	-	-	DSG
<i>Cephalops terryi</i> (Perkins, 1905)	end	para		-	-	-	-	-	+	DSG
<i>Cephalops timberlakei</i> (Hardy, 1953)	end	para		+	-	-	+	-	-	DSG
<b>Family Psychodidae</b>										
<i>Psychoda alternata</i> Say, 1824	adv	detr		-	-	-	+	-	-	DSG
<i>Psychoda</i> sp. 1	?	detr		-	-	+	-	-	-	DSG
<i>Trichomyia hawaiiensis</i> Quate, 1954	end	?		+	-	+	+	NIR	NIR	DSG
<b>Family Scatopsidae</b>										
<i>Coboldia fuscipes</i> (Meigen, 1830)	adv	detr		-	+	-	-	-	-	KTA
<b>Family Sciaridae</b>										
<i>Bradysia impatiens</i> (Johannsen, 1912)	adv	detr		-	-	-	-	+	-	DSG
<i>Bradysia molokaiensis</i> (Grimshaw, 1901)	end	detr		+	-	-	+	+	-	DSG
<i>Bradysia setigera</i> (Hardy, 1960)	end	detr		+	-	+	+	-	-	DSG
<i>Bradysia spatitergum</i> (Hardy, 1956)	adv	detr		-	-	-	+	-	-	DSG
<i>Ctenosciara hawaiiensis</i> (Hardy, 1956)	end	detr		+	+	+	+	+	+	DSG
<i>Hyperlasion magnisensoria</i> (Hardy, 1965)	end	detr		+	+	+	+	+	+	DSG
<i>Lycoriella hoyti</i> (Hardy, 1956)	end	detr		-	-	+	+	-	-	DSG
<i>Platosciara adrostylata</i> Hardy, 1956	end	detr		+	-	-	+	-	NIR	DSG
<i>Scatopsiara nigrita</i> Hardy, 1956	end	detr		+	-	-	+	-	-	DSG
<i>Sciara prominens</i> Hardy, 1956	end	detr		+	-	+	-	NIR	NIR	DSG
Sciariidae g. sp. 1	?	detr		-	-	-	-	-	+	DSG
Sciariidae g. sp. 4	?	detr		-	+	-	-	-	-	DSG
Sciariidae g. sp. 10	?	detr		+	-	-	-	-	-	DSG
<b>Family Sepsidae</b>										
<i>Sepsis biflexuosa</i> Strobl, 1893	adv	detr		+	-	-	-	-	-	DSG
<b>Family Sphaeroceridae</b>										
<i>Leptocera</i> sp. 1	?	?		-	-	+	-	-	-	DSG
<i>Opalimosina mirabilis</i> (Collin, 1902)	adv	?		+	-	-	-	-	-	KTA
<b>Family Stratiomyidae</b>										
<i>Exaireta spinigera</i> (Wiedemann, 1830)	pur	pred		-	-	-	+	+	-	DSG
<b>Family Syrphidae</b>										
<i>Allograpta obliqua</i> (Say, 1823)	adv	pred		-	-	+	+	-	-	DSG
<b>Order Heteroptera</b>										
<b>Family Anthocoridae</b>										
<i>Lasiochilus montivagus</i> Kirkaldy, 1908	end	pred		+	-	-	+	-	-	DAP
<i>Lasiochilus silvicola</i> Kirkaldy, 1908	end	pred		-	-	-	-	-	+	DAP
<b>Family Lygaeidae</b>										
<i>Glyptonysius hylaeus</i> (Kirkaldy), 1910	end	seed		-	-	-	-	-	+	DAP
<i>Glyptonysius</i> n. sp. 1	end	seed		-	-	+	-	-	-	DAP
<i>Neseis fasciata</i> Usinger, 1942	end	seed		-	-	+	+	-	-	DAP
<i>Neseis hiloensis interoculatus</i> Usinger, 1942	end	seed		-	-	-	-	+	-	DAP
<i>Neseis</i> sp. KA1	end	seed		-	-	-	-	-	+	DAP
<i>Nysius blackburni</i> White, 1881	end	seed		+	+	-	-	-	-	DAP
<i>Nysius coenosulus</i> Stal, 1859	end	seed		-	-	-	-	+	-	DAP
<i>Nysius lichenicola</i> Kirkaldy, 1910	end	tou		-	+	-	-	-	-	DSG
<i>Nysius nemorivagus</i> White, 1881	end	seed		-	-	-	-	+	+	DAP
<i>Oceanides gruneri</i> Polhemus, 2002	end	seed		-	-	-	-	+	-	DAP
<i>Oceanides ptericolida</i> (White, 1881)	end	seed	HP KI	-	-	-	-	-	-	DAP
<i>Oceanides</i> sp. KA1	end	seed		-	-	-	-	-	+	DAP
<i>Oceanides</i> sp. KA2	end	seed		-	-	-	-	-	+	DAP
<i>Oceanides vulcan</i> (White, 1881)	end	seed	HP VO KI OL VO	+	+	+	+	-	-	DAP
<i>Remaudiereana nigriceps</i> (Dallas), 1852	adv	seed		-	-	-	-	-	-	DAP
<b>Family Miridae</b>										
<i>Hyalopeplus pellucida</i> (Stal, 1859)	end	sap		-	+	+	+	-	-	DAP
<i>Kamehameha lunalilo</i> Kirkaldy, 1902	end	pred?		-	-	+	-	-	-	DAP
<i>Koanoa hawaiiensis</i> Kirkaldy, 1902	end	sap	KI	-	+	+	+	+	-	DAP
<i>Nesiomiris ehu</i> Kirkaldy, 1902	end	tou		-	-	-	-	-	+	DAP
<i>Nesiomiris hawaiiensis</i> Kirkaldy (1902)	end	tou	VO OL	+	-	+	-	-	-	DAP
<i>Nesiomiris williamsi</i> Gagne, 1997	end	tou		-	-	+	-	-	-	DAP
<i>Opuna sharpianus luteus</i> (Kirkaldy), 1902	end	sap		-	-	-	-	-	+	DAP
<i>Orthotylus</i> n. sp. "coprosmicola"	end	tou		-	-	-	-	+	-	DAP
<i>Orthotylus kakananus</i> Kirkaldy, 1902	end	tou		+	-	+	+	-	-	DAP
<i>Orthotylus kassandra</i> Kirkaldy, 1902	end	sap		+	-	-	-	-	-	DAP
<i>Orthotylus</i> n. sp. "metrosideri"	end	sap		+	-	+	+	-	-	DAP
<i>Orthotylus</i> n. sp. "metrosideroides"	end	sap		-	-	-	-	+	-	DAP
<i>Orthotylus</i> n. sp. KA1	end	sap		-	-	-	-	-	+	DAP
<i>Orthotylus</i> n. sp. KA2	end	sap		-	-	-	-	-	+	DAP
<i>Pseudoclerada</i> sp. KA1	end	pred?		-	-	-	-	-	+	DAP

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Pseudoclerada</i> sp. KH1	end	pred?		-	-	-	+	-	-	DAP
<i>Pseudoclerada</i> sp. MO1	end	pred?		-	-	-	-	+	-	DAP
<i>Sarona adonias</i> Kirkaldy, 1902	end	sap	VO	+	+	+	+	+	-	DAP
<b>Family Nabidae</b>										
<i>Nabis blackburni</i> White, 1878	end	pred	VO KI							
<i>Nabis curtipennis</i> Blackburn, 1888	end	pred		-	+	-	-	-	-	DAP
<i>Nabis morai</i> (Kirkaldy, 1902)	end	pred		-	-	-	-	-	+	DAP
<i>Nabis</i> n. sp. "kilauea"	end	pred		-	+	-	-	-	-	DAP
<i>Nabis oscillans</i> Blackburn, 1888	end	pred	HP VO KI	+	+	+	+	-	-	DAP
<i>Nabis sharpianus</i> (Kirkaldy, 1902)	end	pred		-	-	-	-	-	+	DAP
<i>Nabis silvicola</i> (Kirkaldy, 1908)	end	pred		-	-	-	-	+	-	DAP
<b>Family Pentatomidae</b>										
<i>Coleotichus blackburniae</i> White, 1881	end	tou		-	-	-	+	-	-	DSG
<i>Oechalia</i> sp. KA1	end	pred		-	-	-	-	-	+	DAP
<i>Oechalia</i> sp. MO1	end	pred		-	-	-	-	+	-	DAP
<i>Oechalia</i> sp. VO1	end	pred		+	-	-	-	-	-	DAP
<b>Family Reduviidae</b>										
<i>Haematoloecia rubescens</i> Distant, 1883	adv	pred		-	NIR	-	NIR	-	-	DAP
<b>Family Rhyparochromidae</b>										
<i>Brentiscerus australis</i> (Bergroth)	adv	seed		-	-	-	+	+	-	DAP
<b>Family Veliidae</b>										
<i>Microvelia vagans</i> White, 1878	end	tou		-	-	+	-	-	-	DAP
<b>Order Homoptera</b>										
<b>Family Aphididae</b>										
<i>Greenidea formosana</i> (Maki, 1917)	adv	sap		-	NIR	NIR	NIR	NIR	-	BRK
<i>Idiopterus nephrolepidis</i> Davis, 1909	adv	tou		-	-	-	-	-	NIR	DSG
<i>Toxoptera aurantii</i> (Fonscolombe, 1841)	adv	sap		-	+	+	+	-	-	DSG
<b>Family Cercopidae</b>										
<i>Philaenus spumarius</i> (Linnaeus, 1758)	adv	tou		-	-	+	-	-	NIR	DSG
<b>Family Cicadellidae</b>										
<i>Nesophrosyne giffardi</i> Kirkaldy, 1910	end	sap		-	+	+	-	-	-	DAP
<i>Nesophrosyne</i> sp. HA1	end	sap		+	-	-	-	-	-	DAP
<i>Nesophrosyne</i> sp. HA2	end	sap		-	-	+	-	-	-	DAP
<i>Nesophrosyne</i> sp. KA1	end	sap		-	-	-	-	-	+	DAP
<i>Nesophrosyne</i> sp. KA2	end	sap		-	-	-	-	-	+	DAP
<i>Nesophrosyne</i> sp. KA3	end	sap		-	-	-	-	-	+	DAP
<i>Nesophrosyne</i> sp. MO1	end	sap		-	-	-	-	+	-	DAP
<i>Sophonia rufofascia</i> (Kuoh & Kuoh), 1983	adv	sap	HP KI	-	+	-	-	-	-	DSG
<b>Family Cixiidae</b>										
<i>Iolania perkinsi</i> Kirkaldy, 1902	end	tou	VO	+	+	+	+	-	-	DSG
<i>Oliarus consimilis</i> Giffard, 1925	end	tou?		-	-	-	-	-	+	DSG
<i>Oliarus filicicola</i> Kirkaldy, 1909	end	tou		+	-	+	-	-	-	DSG
<i>Oliarus halemanu</i> Giffard, 1925	end	sap?		-	-	-	-	-	+	DSG
<i>Oliarus inaequalis</i> Giffard, 1925	end	sap		-	+	+	+	-	-	DSG
<i>Oliarus inconstans</i> Giffard, 1925	end	sap		+	+	-	-	-	-	DSG
<i>Oliarus kahavalu</i> Kirkaldy, 1909	end	sap		-	-	-	-	+	-	DSG
<i>Oliarus koanoa</i> Kirkaldy, 1902	end	tou		+	-	-	-	-	-	DSG
<i>Oliarus similis</i> Giffard, 1925	end	sap?		-	-	-	-	+	-	DSG
<b>Family Delphacidae</b>										
<i>Leialoha hawaiiensis</i> Muir, 1916	end	sap		+	+	+	+	-	-	DSG
<i>Leialoha kauaiensis</i> Muir, 1916	end	sap		-	-	-	-	-	+	DSG
<i>Leialoha lehuae</i> (Kirkaldy, 1910)	end	sap		-	-	-	-	NIR	-	DSG
<i>Leialoha ohiae</i> (Kirkaldy), 1910	end	sap		-	-	-	-	-	+	DSG
<i>Nesosydne koeae</i> Kirkaldy, 1907	end	tou		-	-	+	-	-	-	MA
<b>Family Flatidae</b>										
<i>Siphanta acuta</i> (Walker, 1851)	adv	sap	HP	+	+	+	+	-	-	DSG
<b>Family Pseudococcidae</b>										
Pseudococcidae g. sp. 1	?	sap		-	+	-	+	-	-	DSG
Pseudococcidae g. sp. 2	?	sap		-	+	-	-	-	-	DSG
Pseudococcidae g. sp. 3	?	sap		-	-	-	-	+	-	DSG
Pseudococcidae g. sp. 4	?	sap		-	-	-	-	-	+	DSG
<b>Family Trioziidae</b>										
<i>Kuwayama minuta</i> Crawford, 1918	end	gall?		+	+	+	+	NIR	+	DMP
<i>Kuwayama</i> n. sp. 1	end	gall?		-	+	-	+	-	-	DSG
<i>Kuwayama nigricapita</i> Crawford, 1918	end	gall?		+	+	+	+	+	-	DMP
<i>Kuwayama</i> sp. 3	end	gall?		-	-	+	+	+	-	DSG
<i>Kuwayama</i> sp. 4	end	gall?		-	-	-	+	+	-	DSG
<i>Kuwayama</i> sp. 5	end	gall?		-	-	-	+	+	-	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<i>Kuwayama</i> sp. 6	end	gall?		-	-	-	-	+	-	DSG
<i>Kuwayama</i> sp. 7	end	gall?		-	-	-	-	-	+	DSG
<i>Trioza hawaiiensis</i> Crawford, 1918	end	gall		+	+	+	+	-	-	DMP
<i>Trioza kauaiensis</i> Crawford, 1925	end	gall		-	-	-	-	-	+	DSG
<i>Trioza molokaiensis</i> Crawford, 1927	end	gall		-	-	-	-	+	-	DSG
<i>Trioza</i> sp. nr. <i>molokaiensis</i>	end	gall		-	-	-	-	+	-	DSG
<i>Trioza ohiacola</i> Crawford, 1918	end	gall		+	+	+	+	+	-	DMP
<i>Trioza</i> sp. 2 nr. <i>ohiacola</i>	end	gall		+	+	+	+	-	-	DMP
<i>Trioza</i> sp. 5	end	gall		-	+	+	+	-	-	DSG
<i>Trioza</i> sp. 6	end	gall		-	-	-	+	-	-	DSG
<b>Order Hymenoptera</b>										
<b>Family Agaonidae</b>										
<i>Odontofroggata galili</i> Wiebes, 1980	adv	tou		-	NIR	-	-	-	-	DSG
<b>Family Aphelinidae</b>										
<i>Aphytis</i> g. sp. 1	adv	para	KI	+	-	+	+	-	+	DSG
<b>Family Bethyridae</b>										
<i>Sierola</i> sp. A	end	para		-	-	-	-	+	+	DSG
<i>Sierola</i> sp. B	end	para		-	+	-	-	-	+	DSG
<i>Sierola</i> sp. C	end	para		-	-	-	-	-	+	DSG
<i>Sierola</i> sp. D	end	para		-	-	-	-	-	+	DSG
<i>Sierola</i> sp. E	end	para		-	-	-	-	-	+	DSG
<i>Sierola</i> sp. G	end	para		-	-	-	-	-	+	DSG
<i>Sierola</i> sp. I	end	para		-	-	-	-	+	-	DSG
<i>Sierola</i> sp. J	end	para		-	-	-	-	+	-	DSG
<i>Sierola</i> sp. K	end	para		-	-	-	-	+	-	DSG
<i>Sierola</i> sp. M	end	para		+	-	+	+	+	-	DSG
<i>Sierola</i> sp. N	end	para		+	+	+	+	-	-	DSG
<i>Sierola</i> sp. O	end	para		-	-	+	+	-	-	DSG
<i>Sierola</i> sp. R	end	para		-	-	-	-	+	-	DSG
<i>Sierola</i> sp. S	end	para		-	-	-	-	+	-	DSG
<i>Sierola</i> sp. T	end	para		-	-	-	+	-	-	DSG
<i>Sierola</i> sp. U	end	para		-	+	-	-	-	-	DSG
<i>Sierola</i> sp. V	end	para		-	+	-	-	-	-	DSG
<i>Sierola</i> sp. W	end	para		-	-	+	-	-	-	DSG
<i>Sierola</i> sp. X	end	para	VO	-	-	-	-	-	-	DSG
<i>Sierola</i> sp. Y	end	para		+	-	-	-	-	-	DSG
<i>Sierola</i> sp. Z	end	para		-	+	-	-	-	-	DSG
<b>Family Braconidae</b>										
<i>Apanteles opacus</i> (Ashmead, 1905)	adv	para	KI	-	-	-	-	-	-	DSG
<i>Apanteles trifasciatus</i> Muesebeck, 1946	adv	para	HP	-	-	-	-	-	-	DSG
<i>Aspilota kona</i> Ashmead, 1901	end	para		-	-	+	-	-	-	DSG
<i>Glyptapanteles militaris</i> (Walsh, 1861)	pur	para		-	-	+	-	-	-	DSG
<i>Leiophron</i> sp. 1	?	para		-	-	NSR	NSR	-	-	JTH
<i>Meteorus laphygmae</i> Viereck, 1913	pur	para	VO	-	-	+	-	+	-	DSG
<i>Ontsira palliatus</i> (Cameron, 1881)	adv	para		-	-	-	+	-	-	DSG
<i>Ontsira syagrii</i> (Fullaway, 1922)	pur	para		+	-	-	-	-	-	DSG
<b>Family Colletidae</b>										
<i>Hylaeus coniceps</i> (Blackburn, 1886)	end	tou		-	-	+	-	-	-	DSG
<i>Hylaeus connectens</i> (Perkins, 1899)	end	tou	ML	-	-	-	-	-	-	DSG
<i>Hylaeus pubescens</i> (Perkins, 1899)	end	tou		-	+	-	-	-	-	DSG
<i>Hylaeus unicus</i> (Perkins, 1899)	end	tou		-	-	-	-	+	-	DSG
<b>Family Diapriidae</b>										
<i>Trichopria</i> nr. <i>subtilis</i> (Perkins, 1910)	end	para		-	NIR	-	-	-	-	DSG
<i>Trichopria soror</i> (Perkins, 1910)	end	para		+	-	+	-	-	-	DSG
<b>Family Dryinidae</b>										
<i>Dicondylus perkinsi</i> (Ashmead), 1901	end	para		+	+	+	+	+	+	DSG
<b>Family Encyrtidae</b>										
<i>Anagyrus</i> ? <i>nigricans</i> Perkins, 1910	end	para		+	+	+	+	+	-	JSN
<i>Anagyrus</i> sp. 2	end	para		+	-	+	+	+	-	DSG
<i>Anagyrus</i> sp. 3	end	para		+	-	-	+	-	-	DSG
<i>Anicetus annulatus</i> Timberlake, 1919	adv	para		-	+	-	-	-	-	JSN
<i>Cerchysiella</i> ? <i>perkinsi</i> (Timberlake, 1924)	adv	para		-	-	-	-	+	-	DSG
<i>Cerchysiella</i> sp. 2	?	para		-	-	-	-	-	+	JSN
<i>Coelopencyrtus</i> sp. 1	?	para		+	-	-	+	-	-	JSN
<i>Coelopencyrtus</i> sp. 2	?	para		-	-	-	-	+	-	JSN
<i>Coelopencyrtus</i> sp. 3	end	para		-	-	-	-	-	+	JSN
<i>Copidosoma floridanum</i> (Ashmead, 1900)	pur	para		+	-	-	-	-	-	JSN
Encyrtidae g. sp. 22	?	para		-	-	-	-	-	+	DSG
Encyrtidae g. sp. 25	?	para		-	-	-	+	-	-	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
Encyrtidae g. sp. 26	?	para		-	-	-	+	-	-	DSG
<i>Hypergonatopus</i> sp. 1	end	para		-	-	+	-	-	-	JSN
<i>Hypergonatopus</i> sp. 2	end	para		-	-	-	-	-	NIR	DSG
<i>Hypergonatopus</i> sp. 3	end	para		-	-	-	-	+	-	DSG
<i>Hypergonatopus</i> sp. 4	end	para		-	+	-	-	-	-	DSG
<i>Metaphycus</i> ? <i>alberti</i> (Howard, 1898)	adv	para		-	+	-	+	-	-	DSG
<i>Metaphycus</i> ? <i>stanleyi</i> Compere, 1940	adv	para		-	-	-	-	+	-	DSG
<i>Microterys flavus</i> (Howard), 1881	adv	para		+	+	+	+	-	+	JSN
<i>Ooencyrtus erionotae</i> Ferriere, 1931	pur	para		+	-	-	-	-	-	JSN
<i>Plagiomeris hospes</i> Timberlake, 1920	adv	para		+	+	+	+	+	+	JSN
<i>Rhopus</i> sp. 1	?	para		-	-	-	-	-	NIR	JSN
<i>Tetracnemoidea brevicornis</i> (Girault)	adv	para		-	-	-	-	-	NIR	JSN
<b>Family Eucolidae</b>										
Eucolidae g. sp. 1	end	para		-	+	+	-	+	+	DSG
<i>Pseudodiranchis</i> sp. 1	end	para		-	-	+	-	+	-	DSG
<b>Family Eulophidae</b>										
<i>Asecodes</i> sp.	pur	para		NSR	-	-	-	-	-	MWG
<i>Elachertus advena</i> Timberlake, 1926	adv	para	KI(NIR)	-	-	-	-	-	-	DSG
Euderinae g. sp. 1	?	para		-	-	-	-	-	+	MWG
<i>Euderus metallicus</i> (Ashmead, 1901)	adv	para		+	+	-	+	+	+	DSG
Eulophidae g. sp. 4	?	para		-	-	-	+	-	-	DSG
Eulophidae g. sp. 8	?	para		-	-	-	+	-	-	DSG
<i>Euplectrus platyhyphenae</i> Howard, 1885	pur	para		-	+	-	-	-	-	DSG
<i>Pauahiana metallica</i> Yoshimoto, 1965	end	para		-	+	-	-	-	-	MWG
<i>Pauahiana</i> n. sp. "incenta"	end	para		-	-	+	-	-	-	DSG
<i>Pauahiana swezeyi</i> Yoshimoto, 1965	end	para		+	+	-	+	+	NIR	MWG
<i>Sympiesis hawaiiensis</i> (Ashmead, 1901)	end	para		-	-	-	-	NIR?	-	MWG
<i>Sympiesis kona</i> Ashmead, 1901	end	para		-	-	-	-	NIR?	NIR?	DSG
<b>Family Eupelmidae</b>										
<i>Eupelmus axestias</i> Perkins, 1910	end	para		NIR	-	-	-	NIR	-	DSG
<i>Eupelmus chloropus</i> Perkins, 1910	end	para		-	-	-	-	-	NIR	DSG
<i>Eupelmus</i> nr. <i>chloropus</i> Perkins, 1910	end	para		-	-	-	-	-	+	DSG
<i>Eupelmus epilamprops</i> Perkins, 1910	end	para		+	-	-	-	-	-	DSG
<i>Eupelmus euprepes</i> Perkins, 1910	end	para	KI	-	-	-	-	-	-	DSG
<i>Eupelmus leptophyas</i> Perkins, 1910	end	para		-	+	-	-	-	-	DSG
<i>Eupelmus leucothrix</i> Perkins, 1910	end	para		-	-	-	NIR?	-	-	DSG
<i>Eupelmus</i> n. sp. 1	end	para		+	-	-	+	-	-	DSG
<i>Eupelmus paraxestops</i> Perkins, 1910	end	para		-	-	-	-	NIR?	-	DSG
<i>Eupelmus xanthotarsus</i> Perkins, 1910	end	para		-	-	-	-	NIR	-	DSG
<i>Eupelmus xestias</i> Perkins, 1910	end	para		-	-	-	-	-	NIR	DSG
<i>Eupelmus xestops</i> Perkins, 1910	end	para	VO	-	-	+	+	-	-	DSG
<b>Family Formicidae</b>										
<i>Paratrechina bourbonica</i> (Forel, 1886)	adv	omni	HP	-	-	-	-	-	-	DSG
<i>Pheidole megacephala</i> (Fabricius, 1793)	adv	omni	HP	-	-	-	-	-	-	DSG
<i>Solenopsis papuana</i> Emery, 1900	adv	omni		-	-	-	-	+	-	DSG
<i>Tetramorium bicarinatum</i> (Nylander, 1847)	adv	omni	HP	-	-	-	-	-	-	DSG
<b>Family Ichneumonidae</b>										
<i>Diadegma blackburni</i> (Cameron, 1883)	adv	para		+	+	-	-	-	-	DSG
<i>Diadegma insularis</i> (Cresson, 1883)	pur	para	KI	-	-	-	-	-	-	DSG
<i>Enicospilus molokaiensis</i> Ashmead, 1901	end	para		-	-	-	+	-	-	DSG
<i>Pimpla punicipes</i> Cresson, 1873	adv	para	VO	-	-	+	+	+	-	DSG
<i>Pristomerus hawaiiensis</i> Perkins, 1910	end	para		-	+	+	+	-	-	DSG
<i>Spolas</i> spp. (Ashmead), 1906	end	para		+	+	+	+	-	+	DSG
<i>Vulgichneumon diminutus</i> (Matsumura, 1912)	adv	para	VO	-	+	+	-	-	-	DSG
<b>Family Megaspilidae</b>										
<i>Dendrocerus</i> sp. 1	?	para	KI	-	-	-	-	-	-	DSG
<b>Family Mymaridae</b>										
<i>Alaptus</i> sp. 1	adv	para		-	-	-	-	+	-	JTH
<i>Polynema hawaiiensis</i> Ashmead, 1901	end	para		-	-	-	-	+	-	DSG
<i>Polynema jassidarum</i> Perkins, 1910	end	para		-	-	-	-	+	-	DSG
<i>Polynema</i> n. sp. "waikamoienne"	end	para		-	-	-	-	+	-	DSG
<i>Polynema pyrophila</i> Perkins, 1910	end	para		+	-	-	+	-	NIR	DSG
<i>Polynema</i> sp. 1	end	para		-	+	-	-	-	-	DSG
<b>Family Proctotrupidae</b>										
<i>Brachyserphus hawaiiensis</i> (Ashmead, 1901)	?	para	KI	-	+	-	-	-	+	DSG
<b>Family Platygasteridae</b>										
<i>Aphanomerus rufescens</i> Perkins, 1905	adv	para		-	NSR	-	NSR	-	-	DSG
<b>Family Pteromalidae</b>										
<i>Cyrtogaster fuscitarsis</i> (Ashmead, 1901)	adv	para		+	-	+	-	-	+	GAPG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
Miscogasterini g. sp. 1	?	para		-	+	-	-	-	+	MWG
nr. <i>Gastrancistrus</i> sp. 1	?	para		-	-	-	+	+	-	MWG
Pteromalidae g. spp.	?	para		-	-	-	+	-	-	DSG
<i>Toxeuma affinis</i> Ashmead, 1901	end	para		-	-	-	-	-	+	DSG
<i>Toxeuma ferrugineipes</i> Ashmead, 1901	end	para		+	-	-	-	-	-	DSG
<i>Toxeuma hawaiiensis</i> Ashmead, 1901	end	para		-	-	-	+	-	-	DSG
<i>Toxeuma</i> n. sp. 1	end	para		-	-	+	-	-	-	DSG
<i>Toxeuma</i> n. sp. 2	end	para		+	-	-	+	-	-	DSG
<i>Toxeuma nubilipennis</i> Ashmead, 1901	end	para		NIR	-	-	NIR	NIR	+	MWG
<i>Zolotarewskya</i> n. sp. 1	adv	para	KI(NSR)	-	-	-	-	-	-	GAPG
<b>Family Scelionidae</b>										
<i>Bæus persordidus</i> Perkins, 1910	?	para		NIR	NIR	-	NIR	-	-	DSG
<i>Opisthacantha nigricornis</i> (Ashmead), 1901	end	para		NIR?	-	NIR?	NIR?	+	-	DSG
<i>Opisthacantha</i> sp. nr. <i>oahuensis</i> (Perkins, 1910)	end	para		NIR?	-	NIR?	-	-	-	DSG
<i>Opisthacantha tarsalis</i> (Ashmead), 1901	end	para		-	-	-	NIR?	-	+	DSG
<i>Telenomus</i> sp. 1	end	para		+	+	+	+	+	-	DSG
<i>Trimorus</i> sp. 1	pur	para		-	-	NSR	-	-	-	LM
<b>Family Signiphoridae</b>										
<i>Chartocerus dactylopii</i> (Ashmead, 1900)	adv	para		-	NIR	-	-	-	-	DSG
<i>Signiphora aspidioti</i> (Ashmead), 1900	adv	para		NIR	NIR	-	NIR	+	-	DSG
<b>Family Sphecidae</b>										
<i>Ectemnius tumidoventris</i> (Perkins, 1899)	end	pred		-	+	-	-	-	-	DSG
<i>Rhopalum</i> sp. 1 [of Beardsley & Perreira, 2000]	adv	pred		+	-	+	+	-	-	DSG
<b>Family Trichogrammatidae</b>										
<i>Trichogramma</i> sp. 2	?	para		-	-	-	-	+	-	MWG
<b>Family Vespidae</b>										
<i>Vespula pensylvanica</i> (Saussure, 1857)	adv	pred		+	+	-	-	+	-	DSG
<b>Order Lepidoptera</b>										
<b>Family Carposinidae</b>										
<i>Carposina</i> caterpillar sp. 1	end	chew		-	+	+	-	-	-	DSG
<i>Carposina</i> caterpillar sp. 2	end	chew		+	-	+	-	-	-	DSG
<i>Carposina</i> caterpillar sp. 3	end	chew		-	-	-	+	-	-	DSG
<i>Carposina</i> caterpillar sp. 4	end	chew		-	-	-	+	-	-	DSG
<i>Carposina</i> caterpillar sp. 5	end	chew		-	-	-	-	+	-	DSG
<i>Carposina</i> caterpillar sp. 6	end	chew		-	-	-	-	+	-	DSG
<b>Family Geometridae</b>										
<i>Eupithecia monticolens</i> Butler, 1881	end	chew		+	+	+	+	+	-	SLM
<i>Eupithecia</i> n. sp. 2 [Montgomery, 1982]	end	pred		-	-	-	-	-	+	SLM
<i>Eupithecia</i> nr. <i>niphoreas</i> (Meyrick, 1899)	end	pred		-	-	+	-	-	-	SLM
<i>Eupithecia orichloris</i> (Meyrick, 1899)	end	pred		-	-	+	+	-	-	SLM
Larentiinae g. caterpillar sp. 1	?	chew		-	-	-	+	-	-	DSG
Larentiinae g. caterpillar sp. 4	?	chew		-	+	-	-	-	-	DSG
<i>Scotorythra</i> caterpillar sp. 1	end	chew		+	-	-	+	+	+	DSG
<i>Scotorythra</i> caterpillar sp. 4	end	chew		+	-	-	+	+	-	DSG
<i>Scotorythra</i> caterpillar sp. 5	end	chew		-	-	-	+	-	-	DSG
<i>Scotorythra</i> caterpillar sp. 7	end	chew		-	-	+	-	+	+	DSG
<i>Scotorythra</i> caterpillar sp. 8	end	chew		-	-	-	-	+	-	DSG
<i>Scotorythra</i> caterpillar sp. 9	?	chew		-	-	+	-	+	-	DSG
<i>Scotorythra</i> caterpillar sp. 11	?	chew		-	-	-	-	+	-	DSG
<i>Scotorythra</i> caterpillar sp. 15	end	chew		-	-	+	+	+	+	DSG
<b>Family Oecophoridae</b>										
<i>Thyrocopa</i> caterpillar sp. 2	end	detr		-	-	-	+	-	-	DSG
<i>Thyrocopa</i> caterpillar sp. 3	end	detr		-	-	-	-	+	-	DSG
<i>Thyrocopa</i> caterpillar sp. 4	end	detr		-	-	-	-	-	+	DSG
<i>Thyrocopa</i> caterpillar sp. 11	end	detr		-	-	+	-	-	-	DSG
<b>Family Pyralidae</b>										
Pyralidae g. caterpillar sp. 5	?	chew		-	-	+	+	+	-	DSG
Pyralidae g. caterpillar sp. 14	?	chew		-	-	+	-	-	-	DSG
Pyralidae g. caterpillar sp. 17	?	chew		+	-	-	+	-	-	DSG
Pyralidae g. caterpillar sp. 19	?	chew		-	-	-	+	-	-	DSG
Pyralidae g. caterpillar sp. 20	?	chew		-	-	-	+	-	-	DSG
Pyralidae g. caterpillar sp. 21	?	chew		-	-	-	-	+	-	DSG
<b>Family Sphingidae</b>										
<i>Hyles wilsoni wilsoni</i> (Rothschild 1894)	end	chew		-	-	+	+	-	-	DSG
<b>Family undet.</b>										
Lep. g. caterpillar sp. 18	?	chew		-	-	-	+	-	-	DSG
Lep. g. caterpillar sp. 22	?	chew		-	-	-	-	-	+	DSG

Taxon	Origin†	Guild‡	1996	VO	TP	LA	KH	MO	KA	Det.
<b>Order Mantodea</b>										
Family <b>Mantidae</b>										
<i>Tenodera angustipennis</i> Saussure, 1869	adv	pred		-	+	-	-	-	-	DSG
<b>Order Neuroptera</b>										
Family <b>Chrysopidae</b>										
<i>Anomalochrysa hepatica</i> McLachlan, 1883	end	pred		-	+	+	-	-	-	CAT
<i>Anomalochrysa maclachlani maclachlani</i> Blackburn, 1889	end	pred		-	+	+	-	+	+	CAT
Family <b>Hemerobiidae</b>										
<i>Hemerobius pacificus</i> Banks, 1897	adv	pred		-	+	+	-	-	-	CAT
<i>Micromus brunnescens</i> (Perkins), 1899	end	pred		-	-	-	-	+	-	CAT
<i>Micromus longispinosus</i> (Perkins), 1899	end	pred		+	-	-	-	-	-	CAT
<i>Micromus minimus</i> (Perkins), 1899	end	pred		-	-	-	+	-	-	CAT
<i>Micromus rubrinervis</i> (Perkins), 1899	end	pred		+	+	+	-	-	-	CAT
<i>Micromus subochraceus</i> (Perkins), 1899	end	pred		-	-	-	+	-	-	CAT
<i>Nesobiella hospes</i> (Perkins), 1899	ind	pred		-	-	+	-	-	-	CAT
<b>Order Orthoptera</b>										
Family <b>Gryllidae</b>										
<i>Leptogryllus elongatus</i> Perkins, 1899	end	detr		+	-	-	-	-	-	DSG
<i>Leptogryllus kauaiensis</i> Perkins, 1899	end	detr		-	-	-	-	-	+	DSG
<i>Leptogryllus molokai</i> Perkins, 1899	end	detr		-	-	-	-	+	-	DSG
<i>Leptogryllus</i> nr. <i>forficularis</i> (Brunner, 1896)	end	detr		-	-	-	+	-	-	DSG
<i>Trigonidium atroferrugineum</i> (Brunner, 1896)	end	detr		-	-	-	-	+	-	DSG
<i>Trigonidium crepitans</i> (Perkins, 1899)	end	detr		-	-	-	-	-	+	DSG
<i>Trigonidium neogrande</i> Otte, 1994	end	detr		+	-	-	-	-	-	DSG
<i>Trigonidium neovarians</i> Otte, 1994	end	detr		-	-	+	-	-	-	DSG
<i>Trigonidium procrustum</i> Otte, 1994	end	detr		-	-	-	-	-	+	DSG
<i>Trigonidium</i> sp. 1	end	detr		-	-	-	-	+	-	DSG
<i>Trigonidium</i> sp. 2	end	detr		-	-	-	-	-	+	DSG
<i>Trigonidium</i> sp. 3	end	detr		-	-	-	-	-	+	DSG
<i>Trigonidium</i> sp. 4	end	detr		-	+	-	-	-	-	DSG
<i>Trigonidium waimea</i> Otte, 1994	end	detr		-	-	-	+	-	-	DSG
Family <b>Tettigoniidae</b>										
<i>Banza affinis</i> (Perkins, 1899)	end	tou		-	-	-	-	-	+	DSG
<i>Banza nitida nitida</i> (Brunner, 1896)	end	tou		-	-	+	+	-	-	DSG
<b>Order Psocoptera</b>										
Family <b>Caeciliidae</b>										
<i>Stenocaecilius analis</i> (Banks, 1931)	adv	detr		+	-	-	+	+	-	ELM
<i>Valenzuela badiostigma</i> (Okamoto, 1910)	adv	detr		-	+	+	+	-	+	ELM
Family <b>Ectopsocidae</b>										
<i>Ectopsocus briggsi</i> McLachlan, 1899	adv	detr		-	-	-	NSR	-	-	ELM
Family <b>Elipsocidae</b>										
<i>Kilauella micramaura</i> (Perkins, 1899)	end	detr		+	-	-	+	NIR	-	DSG
<i>Kilauella</i> sp. 2	end	detr		-	+	-	+	-	-	DSG
<i>Kilauella</i> sp. 3	end	detr		-	+	+	+	+	-	DSG
<i>Kilauella</i> sp. 4	end	detr		+	+	+	+	-	-	DSG
<i>Kilauella</i> sp. 5	end	detr		+	-	+	-	-	-	DSG
<i>Kilauella</i> sp. 6	end	detr		-	-	+	+	-	-	DSG
<i>Kilauella</i> sp. 7	end	detr		-	-	+	+	-	-	DSG
<i>Kilauella</i> sp. 9	end	detr		+	-	+	-	+	-	DSG
<i>Kilauella</i> sp. 11	end	detr		-	-	-	+	-	-	DSG
<i>Kilauella</i> sp. 12	end	detr		-	-	-	+	-	-	DSG
<i>Kilauella</i> sp. 13	end	detr		-	-	-	-	+	-	DSG
<i>Kilauella</i> sp. 15	end	detr		-	-	-	-	+	-	DSG
<i>Kilauella</i> sp. 16	end	detr		-	-	-	-	+	-	DSG
<i>Kilauella</i> sp. 18	end	detr		-	-	-	-	-	+	DSG
<i>Kilauella</i> sp. 19	end	detr		-	-	-	-	-	+	DSG
<i>Kilauella</i> sp. 20	end	detr		-	-	-	-	-	+	DSG
<i>Kilauella</i> sp. 21	end	detr		-	-	-	+	+	+	DSG
<i>Kilauella</i> sp. 22	end	detr		-	-	-	-	-	+	DSG
<i>Kilauella</i> spp.	end	detr		+	-	+	+	+	+	DSG
<i>Palistreptus hyalinus</i> Thornton, 1990	end	detr		-	-	+	-	-	-	DSG
<i>Palistreptus inconstans</i> (Perkins, 1899)	end	detr		-	-	-	+	-	-	DSG
<i>Palistreptus</i> n. sp. 1	end	detr		-	-	+	-	-	-	ELM
<i>Palistreptus pictifrons</i> Thornton, 1990	end	detr		-	-	-	-	+	-	DSG
<i>Palistreptus setosus</i> Thornton, 1990	end	detr		-	-	-	-	-	+	DSG
Family <b>Lepidopsocidae</b>										
<i>Lepidopsocus aureus</i> Thornton, 1981	adv	detr	HP	-	-	-	-	-	-	ELM
<i>Lepolepis pictus</i> Thornton, 1981	adv	detr	HP	-	-	-	-	-	-	ELM



Family <b>Philotarsidae</b>		adv	detr	-	-	-	-	NSR	-	ELM
<i>Haplophallus</i> sp. 1										
<b>Taxon</b>	<b>Origin†</b>	<b>Guild‡</b>	<b>1996</b>	<b>VO</b>	<b>TP</b>	<b>LA</b>	<b>KH</b>	<b>MO</b>	<b>KA</b>	<b>Det.</b>
Family <b>Pseudocaeciliidae</b>										
<i>Lobocaecilius monicus</i> Lee & Thornton, 1967	adv	detr		+	+	+	+	+	+	ELM
Family <b>Psocidae</b>										
<i>Ptycta apicantha</i> Thornton, 1984	end	detr		+	-	-	+	-	-	DSG
<i>Ptycta dicrosa</i> Thornton, 1984	end	detr		-	-	-	-	+	-	DSG
<i>Ptycta disclera</i> Thornton, 1984	end	detr		-	-	-	-	+	-	DSG
<i>Ptycta distinguenda</i> (Perkins, 1899)	end	detr		+	-	-	-	+	-	DSG
<i>Ptycta haleakalae</i> (Perkins, 1899)	end	detr		-	-	-	-	+	-	ELM
<i>Ptycta hardyi</i> Thornton, 1984	end	detr		+	-	+	+	-	-	DSG
<i>Ptycta hawaiiensis</i> Thornton, 1984	end	detr		+	-	-	-	-	-	DSG
<i>Ptycta kauaiensis</i> (Perkins, 1899)	end	detr		-	-	-	-	-	+	DSG
<i>Ptycta lanaiensis fusca</i> Thornton, 1984	end	detr		-	-	-	-	+	-	DSG
<i>Ptycta</i> n. sp. 1	end	detr		-	-	-	-	-	+	DSG
<i>Ptycta persimilis</i> Thornton, 1984	end	detr		-	-	-	-	-	+	DSG
<i>Ptycta pikeloi</i> Thornton, 1984	end	detr		-	-	-	-	+	-	DSG
<i>Ptycta simulator kilauea</i> Thornton, 1984	end	detr		-	-	-	+	-	-	DSG
<i>Ptycta</i> spp.	end	detr		+	+	-	+	+	+	DSG
<i>Ptycta telma</i> Thornton, 1984	end	detr		-	-	-	-	-	+	DSG
<i>Ptycta zimmermani</i> Thornton, 1984	end	detr		-	-	-	-	-	+	DSG
Order <b>Thysanoptera</b>										
Family <b>Phlaeothripidae</b>										
<i>Hoplothrips davisii</i> Bianchi, 1946	end	fung		-	+	+	+	-	-	DSG
<i>Hoplothrips flavitibia</i> Moulton, 1928	adv	tou		-	-	-	-	-	+	DSG
<i>Hoplothrips swezeyi</i> Moulton, 1928	end	fung		-	-	+	-	-	-	DSG
<i>Karnyothrips flavipes</i> (Jones, 1912)	adv	pred		+	-	-	-	-	-	DSG
Family <b>Thripidae</b>										
<i>Asprothrips seminigricornis</i> (Girault, 1926)	adv	tou		-	-	-	+	+	-	DSG
<i>Frankliniella</i> sp. 1	adv	tou		-	+	-	-	-	-	DSG
<i>Heliothrips haemorrhoidalis</i> (Bouche, 1833)	adv	sap		+	+	+	+	-	+	DSG
<i>Neurisothrips</i> sp. 1	?	flow		-	-	+	+	-	-	DSG
Thysanoptera g. sp. 6	?	tou?		-	-	-	-	+	-	DSG
CLASS <b>CHILOPODA</b>										
Order undet										
Family undet										
Chilopoda g. sp. 1	?	pred		-	-	-	-	+	-	DSG
Order <b>Lithobiomorpha</b>										
Family <b>Lithobiidae</b>										
<i>Lithobius</i> sp. 1	?	pred		-	-	-	-	+	-	DSG
CLASS <b>DIPLOPODA</b>										
Order <b>Julida</b>										
Family <b>Blanulidae</b>										
<i>Proteroiulus fuscus</i> (Am Stein, 1857)	adv	detr		-	-	+	-	-	-	DSG
Family <b>Julidae</b>										
<i>Cylindroiulus latestriatus</i> (Curtis, 1844)	adv	detr		-	-	-	+	-	-	DSG
Order <b>Polydesmida</b>										
Family <b>Paradoxosomatidae</b>										
<i>Akamptogonus novarae</i> (Humbert & Saussure, 1869)	adv	detr		-	-	+	-	-	-	DSG
<i>Oxidus gracilis</i> (C.L. Koch, 1847)	adv	detr	VO	-	-	-	-	-	-	DSG
Order <b>Spirostreptida</b>										
Family <b>Cambalidae</b>										
<i>Nannolene</i> sp. 1	end	detr		-	-	+	-	-	-	DSG
<i>Nannolene</i> sp. 2	end	detr		-	-	-	-	-	+	DSG
CLASS <b>MALACOSTRACA</b>										
Order <b>Amphipoda</b>										
Family <b>Talitridae</b>										
<i>Hawaiiorchestia</i> n. sp. nr. <i>gagnei</i>	end	detr		-	-	-	-	-	+	AMMR
<i>Platorchestia</i> n. sp. nr. <i>lanipo</i>	end	detr		-	-	-	-	NIR	-	AMMR
Order <b>Isopoda</b>										
Family undet.										
Isopoda g. sp. 1	?	detr		-	-	-	-	-	+	DSG
Family <b>Philosciidae</b>										
<i>Australophiloscia societatis</i> (Maccagno, 1932)	ind	detr		+	-	+	+	+	+	DSG
Family <b>Porcellionidae</b>										
<i>Porcellio scaber</i> Latreille, 1804	adv	detr	HP VO   OL	+	+	+	+	+	+	DSG

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† Origin: adv = adventive; end = endemic; ind = indigenous; pur = purposely introduced; ? = undetermined.

‡ Guild: chew = chewer; detr = detritivore; flow = flowers; fung = fungivore; gall = gall-former; omni = omnivore; pred = predator; para = parasitoid; sap = xylem, phloem, or mesophyll feeder; seed = seed feeder; tou = tourist; wood = wood- or twig-borer; ? = undetermined.