New State Records of Immigrant Insects in the Hawaiian Islands for the Year 1999

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Abstract. Records are given for 43 species of insects and other small organisms not previously reported to be established in Hawaii. These species were first collected and identified during 1999 or earlier and are now believed to be established in the state. Known information on the taxonomy and biology is provided.

The following are new records for immigrant insects and other small arthropods and mollusks that have been found in the Hawaiian Islands (Kure Atoll to Hawaii Island) and identified during 1999 or before, but have not previously been reported as established in any publication. A complete listing of all new state records of terrestrial arthropods and mollusks in Hawaii, published during the eight-year period of 1991-1998, is presented in a separate paper (Kumashiro, Nishida, and Beardsley) in this volume. Common names for species are provided if they have been formally accepted. For other cases, the common name of the family and a host is given. These have been designated with "a" or "an." Contributors who have provided information for the records are acknowledged in parentheses at the end of each note. Voucher specimens for all species are deposited in the collection of the Hawaii Department of Agriculture (HDOA).

The following abbreviations are used in this paper:

APHIS-PPQ (Animal and Plant Health Inspection Service- Plant Protection and Quarantine, U.S. Department of Agriculture)
BMNH (The Natural History Museum at London, formerly British Museum [Natural History])
BPBM (Bernice Pauahi Bishop Museum)
CDFA (California Department of Food and Agriculture)
CES (Cooperative Extension Service, CTAHR, UH)
CTAHR (College of Tropical Agriculture and Human Resources, UH)
HDOA (Hawaii Department of Agriculture)
HDOH (Hawaii Department of Health)
HES Newsletter (*Hawaiian Entomological Society Newsletter*)
IIBC (International Institute of Biological Control)
IIE (International Institute of Entomology)
PHES (*Proceedings of the Hawaiian Entomological Society*)
PQ (Plant Quarantine Branch, Hawaii Department of Agriculture)
SEL (Systematic Entomology Laboratory, U.S. Department of Agriculture, Agricultural Research Service, Beltsville, MD)
UH (University of Hawaii)
Det. (Determined by)

I. (Island)
Syn. (Synonym)

ACARI

Eriophyidae: *Vittacus bougainvilleae* Abou-Awad & Elban Hawy, a bougainvillea mite

Infestations of this mite were found on bougainvillea at Kula, Maui by J. Tavares, CES, on January 26, 1999. L. Goff, UH acarologist, tentatively determined the species as *Vittacus bougainvilleae*, a species that was first described in 1991. The primary symptom is stunted terminal leaf growth. Although the plants were reported to have come from a Hawaii I. nursery, subsequent HDOA surveys did not reveal any detections on that island. This mite is known to occur in Florida, where it was first found on April 5, 1995, in Coconut Grove, Dade County. (D. Tsuda)

COLEOPTERA

Coccinellidae: *Cycloneda sanguinea* (L.), a ladybeetle aphid predator

Several specimens were collected at Salt Lake, Oahu, in May 1992, on ground cover plant by R. Heu, HDOA. Determination was made by B. Kumashiro, HDOA, and confirmed by R. D. Gordon, SEL.

This coccinellid was purposely introduced into Hawaii from California by Koebele twice in the 1890s and from Mexico by Weber in 1955. Weber (1956) reported that the Koebele introductions failed to become established. The 1955 Weber introduction also apparently failed, and the present record appears to be the result of a recent accidental introduction. This species is widespread in western North America and Mexico. (R. Heu & B. Kumashiro)

Clambidae: Undetermined genus and species, a fringe-winged beetle

Specimens were collected in pitfall traps at Nualolo Trail, Kauai, elevation 3700', during May 30–October 7, 1991, by W. Perreira. These were sent to SEL, but specialists were unavailable for determination. (B. Kumashiro)

Dermestidae: *Evorinea* sp., a dermestid

Several adult specimens of this beetle were collected from plumeria leaves in Hilo, Hawaii I. on May 27, 1993, by S. Matayoshi, HDOA. Determination was made by G.A. Samuelson, BPBM. The adult dermestid resembles a very hairy lady beetle. (B. Kumashiro)

Elateridae: *Heteroderes falli* Lane, a click beetle

Specimens were collected at Ewa, Oahu in light trap by J. Beardsley, UH, on November 15, 1977. Determination was made by P. Johnson, South Dakota Insect Museum. (B. Kumashiro)

Elateridae: *Platynychus adjutor* (Candeze), a click beetle

Specimens were collected at large at Kailua Beach, Oahu on May 28, 1990, by J. Jang. Additional specimens were collected by sweeping by W. Perreira at Kailua, Oahu on November 24, 1990. Determination was made by P. Johnson, South Dakota Insect Museum. (B. Kumashiro)

DIPTERA

Cecidomyiidae: *Mycodiplosis fungicola* (Felt), a plumeria rust midge

Several larval specimens of this midge were collected at Punchbowl, Oahu, on December 12, 1991, by L. Johnson and held for emergence of adults. They were feeding on spores of plumeria rust. Determination was made by R. Gagne, SEL. (R. Heu & B. Kumashiro)

Chloropidae: *Oscinella frit* (L.), frit fly

Several adult specimens were collected at Barbers Point Golf Course, Oahu, on hybrid Bermuda grass by R. Mau, UH, on August 14, 1998. Determination was made by D. Tsuda, UH, and confirmed by chloropid specialist, K. Kanmiya, Kurume University, Biological Laboratory School of Medicine, Japan. Larvae feed on the young shoots of grasses and cause patches of yellowing on golf courses. (D. Tsuda, R. Heu, & B. Kumashiro)

Sciaridae: Undetermined genus and species, a dark-winged fungus gnat

Specimens were collected at Aina Haina, Oahu, on January 16, 1996, in a residential home by S. Tamanaha. In August 1997, adult specimens were sent to sciarid specialist, W. Steffan, formerly with BPBM. He was unable to make an identification because only females had been sent, and males were required for determination. Kumashiro, HDOA, sorted through about 400 adults, but could not find any males, leading to the probability that this species may reproduce parthenogenetically. In 1997, huge swarms were observed at night, attracted to light in the house, and causing a terrible nuisance.

A breeding source has not been located, but it probably breeds in damp, decaying vegetable matter. It usually becomes abundant after a period of sustained rainfall. Of the sciarids in Hawaii, this species is among the largest. (B. Kumashiro)

Tipulidae: Limoniinae: *Limonia* sp., a giant crane fly

Specimens were collected at large at Ainaloa, Hilo, Hawaii, on October 26, 1992, by L. Shimoda, Hawaii Dept. of Health, Vector Control Branch. Later, it was collected in Hilo by D. Hashimoto on January 20, 1995. On Maui, it was collected by G. Uchida, HDOA, at Kahanu Botanical Gardens, Hana, on a tree on July 28, 1996. Determination was by J. Gelhaus, Acad. Nat. Sci., Philadelphia.

This is a very large tipulid; the specimen collected by Hashimoto measures 25mm from head to tip of the folded wing and the forelegs measure 40mm. It probably breeds in decaying vegetable matter. (L. Shimoda, N. Evenhuis, & B. Kumashiro)

HETEROPTERA

Coreidae: *Physomerus grossipes* (Fab.), a stout-legged bug

Specimens of this coreid bug were first collected on hibiscus at Leeward Community College at Waiawa, Oahu, in August 1997, by M. Ramadan, HDOA. Determination was made by B. Kumashiro and M. Chun, HDOA, and confirmed by T.J. Henry, SEL. This is the only species representing the family Coreidae in Hawaii, and is not known to occur on mainland US.

The femur on each hind leg of this species is enlarged, with those of the male being much larger than those of the female. Also, there is a spine on the tibia of each hind leg of the male. This species is abundant in the Malay Peninsula, Indonesia and the Philippines. It was found in Guam in 1960 and Palau in 1986.

P. grossipes is known to feed on the shoots and young fruits of Convolvulaceae. The eggs are laid in clusters of 70 or more and are often laid on plants that are not hosts on which the immatures can develop, but are in close proximity to the hosts. The nymphs and adults tend to form clusters of many individuals.

Additional specimens were later collected from moonflower, morning glory, Aiea morning glory, white-flowered morning glory, wood rose, sweet potato, and swamp cabbage, all in the family Convolvulaceae. Damage that these bugs cause on plants are not obvious. They feed on the plant juices by inserting their stylets into the stems or vines to which they cling. Subsequent localities of establishment include Waipahu, Kunia, Wahiawa, Mililani, Manoa, Waimanalo, and Kailua.

During field surveys for the coreid, Ramadan discovered adults which had eggs attached on their bodies. The parasitized adults were held and later adults of the Trinidad stink bug tachinid, *T. pilipes* (Fabricius) emerged. This biocontrol agent was introduced to Hawaii from Trinidad in 1962 to aid in controlling the Southern green stink bug, *Nezara viridula*. The parasitism of *P. grossipes* ranged from 4%-50% during 1997. (M. Ramadan, R. Heu, M. Chun, B. Kumashiro, & T. Culliney)

HOMOPTERA

Aleyrodidae: *Aleuroclava jasmini* (Takahashi), a jasmine whitefly

Specimens were collected at Moanalua Gardens, Oahu, from pikake, *Jasminum sambac*, on November 28, 1993, by D. Tsuda, UH. It was determined by S. Nakahara, SEL. Subsequently, it was collected at Pauoa, Oahu, by R. Hamasaki on March 7, 1997, from lime, *Citrus aurantiifolia*, leaves.

Nakahara states that this species is frequently intercepted on jasmine leaves from Southeast Asia. It is known from India, Thailand, Sumatra, Malaysia, Singapore, Philippines, Hong Kong, People's Republic of China, Taiwan, and Guam. Hosts include *Citrus* spp., mock orange, pikake, gardenia, *Magnolia* sp., koka, and Rangoon creeper. (D. Tsuda & S. Nakahara)

Aleyrodidae: *Aleurotrachelus* sp.#1 (apparently undescribed), an aroid whitefly

Specimens were collected at Keanae, Maui, on November 20, 1991, on ape (*Alocasia* sp.) by T. Hori, CES. Determination was made by S. Nakahara, SEL.

According to Nakahara, it is known from Florida, the Dominican Republic, Mexico, and Guatemala. Hosts in the U.S. National Museum collection include *Nephthytis* sp., *Philodendron* sp., and *Syngonium* sp. It is also frequently found on palm.

In December 1997, R. Gill, CDFA, sent specimens to Nakahara that were intercepted by quarantine inspectors at Concord, California. They were found on palms that originated from Kula, Maui. Nakahara determined them to be this species. (D. Tsuda, B. Kumashiro & S. Nakahara)

Aleyrodidae: *Aleurotrachelus* sp. #2 (apparently undescribed), a fringed guava whitefly

On November 19, 1992, S. Matayoshi, HDOA, collected specimens from guava foliage at Kainaliu, Kona, Hawaii I. Determination was made by S. Nakahara, SEL. Nakahara mentions that this is a new record for Hawaii and the US. It closely resembles some unidentified *Aleurotrachelus* specimens from Trinidad and Barbados, and is found on a variety of plants.

On October 21, 1993, Matayoshi, R. Heu, and W. Nagamine, all from HDOA, collected specimens from Honaunau, Kona, Hawaii I., on guava. On May 26, 1993, C. Campbell, R.

Heu, and T. Culliney, all from HDOA, collected specimens at Kilauea, Kauai on guava foliage for a new island record. It was later collected from kava, *Piper methysticum*, on December 17, 1996, at Wailua, Kauai, by K. Rohrbach, UH. R. Gill, CDFA, mentioned that California inspectors were intercepting specimens of probably this species from *Piper lolot* and *Piper betle* that were imported from Hawaii. (S. Matayoshi, R. Heu, W. Nagamine, & B. Kumashiro)

Aleyrodidae: *Aleurotrachelus* sp. #3 (apparently undescribed), a guava whitefly

Specimens were collected from guava foliage at the Pearl City Urban Garden Center, Oahu, on December 11, 1996 by R. Heu. Additional collections were made on December 24, 1996, by R. Heu & M. Chun, HDOA, from the same location. Determination was made by S. Nakahara, SEL. Nakahara mentions that it occurs in SE Asia and has been intercepted by plant quarantine inspectors in Honolulu and California on guava. Additional collections were made on December 24, 1996, and held for emergence of parasitoids. One species emerged and was sent to A. Polaszek, IIE, who determined it as *Encarsia aseta* Hayat and Polaszek, which is a new state record (Huang and Polaszek, 1998). (S. Matayoshi & B. Kumashiro)

Aleyrodidae: *Aleurotrachelus trachoides* Back, a solanaceous whitefly

Specimens were collected from chili pepper at Nuuanu, Oahu by R. Hamasaki, CES, on January 20, 1998. Determination was made by A. Jensen and S. Nakahara, SEL. Nakahara mentions that this species is commonly found on peppers and *Solanum* spp., and also reported from other hosts. It occurs in the Caribbean area, Bermuda, Florida, Tahiti, and Reunion I.

There was a total of four new species of *Aleurotrachelus* discovered during 1991 to 1998. All appear to be Neotropical in origin (the Caribbean area or Florida). The following are characteristics that may be useful in distinguishing the species: species #2 has a white waxy fringe around the margin of the larval instars, while species #3 does not. The younger instars of #3 are yellow, while those of #2 are black. The last instars of both species are black.

Nakahara provided further characteristics for distinguishing species #1 from *A. trachoides*: for #1, the width of the sections of the granular band on the submargin and dividing line of the sections are not distinct, but for *trachoides*, the sections are narrower and more distinctly separated. The type of granules which are arranged in rows are different between the two species. Also, the tip of the lingula of #1 is an oval knob, while the lingula for *trachoides* has an enlarged bifurcated tip. (D. Tsuda, B. Kumashiro, & S. Nakahara)

Aleyrodidae: *Dialeurodes* sp., a schefflera whitefly

Specimens were collected by S. Sakamoto, HDOA, on July 23, 1991, on potted *Schefflera arboricola* in a HDOA office. Determination was made by S. Nakahara, SEL. (B. Kumashiro)

Aleyrodidae: *Trialeurodes abutiloneus* (Haldeman), bandedwinged whitefly

Specimens were collected at Keahole, Hawaii, on October 8, 1990, on *Euphorbia hirta* by S. Matayoshi and L. Doi. Determination was made by S. Nakahara, SEL. (S.Matayoshi & B. Kumashiro)

Aphididae: *Aphis sedi* Kaltenbach, a sedum aphid

Specimens were collected at Pawaa, Oahu, from kalanchoe (*Kalanchoe* sp.) from a cage outside the insectary, HDOA, on May 19, 1997, by H. Lee. Determination was made by G. Miller, SEL. According to Miller, this aphid attacks *Sedum*, which are succulents in the family Crassulaceae. Kalanchoe belongs to this family. There are many *Sedum* spp. in Hawaii. (B. Kumashiro)

Aphididae: *Capitophorus hippophaeus* (Walker), a polygona aphid

In January 1992, APHIS-PPQ inspectors found this aphid on polygona and mint being shipped out of Hawaii. Determination was made by M. Stoetzel, SEL, on May 5, 1992. Because produce is often consolidated, neither the name of the farm nor the island on which it was collected was known. In October 1993, APHIS-PPQ inspectors reported that this aphid was being frequently intercepted from out-of-state shipments of knotweed, *Polygonum odoratum* (=*P. chinense*), especially during the summer and fall months. In December 1993, joint HDOA/CES surveys uncovered aphid infestations on knotweed at Kahaluu, Oahu. These were determined to be *C. hippophaes* by B. Kumashiro. This represents the first field collection of the aphid in the State. (R. Kunishi, R. Heu, & B. Kumashiro)

Aphididae: *Pemphigus* sp., a root aphid

Specimens were collected at Mountain View, Hawaii I., on April 4, 1990, by S. Matayoshi, HDOA, on roots of dryland watercress. Determination was made by M. Stoetzel, SEL. Since the infestation appeared to be localized within one farm, an eradication project was attempted by HDOA in 1990, but was unsuccessful.

In November 1993, specimens were collected at Omaopio, Maui (480 m elevation), on broccoli, cauliflower, and kai choi by R. Shimabuku, CES. Determination was made by M. Stoetzel, SEL, who noted that these specimens appeared to be the same as the ones collected on dryland watercress on Hawaii I.

On May 17, 1995, specimens were collected from a nursery at Huelo, Maui on various ornamental plants by G. Uchida and C. McGrath, HDOA. Additional specimens of the same species were collected from a nursery at Wailuku, Maui on various ornamental plants on June 2, 1995, by Uchida and McGrath. Determination was made by M. Stoetzel and G. Miller, SEL, as *Pemphigus* sp.

The genus *Pemphigus* is very difficult to determine to species because there are no definite distinguishing characters. Many species are determined by host plants. Although Stoetzel said that the specimens that attacked dryland watercress and head cabbage appeared to be the same, it is interesting to note that head cabbage growing in the vicinity of the watercress on Hawaii I. was not infested. Furthermore, bittercress was the only other host on Hawaii I. On Maui, other cruciferous hosts included, broccoli, mustard cabbage, shephard's purse, Virginia pepperweed, black mustard, wild mustard, swinecress, pak choi, gailan, choi sum, and daikon. Until more studies are made, it is not known whether there are more than one species of *Pemphigus* represented in Hawaii. (S. Matayoshi, R. Shimabuku, C. McGrath, G. Uchida, & B. Kumashiro)

Aphididae: *Takecallis arundinariae* (Essig), a bamboo aphid

Specimens of this aphid were collected by S. Matayoshi and C. Hirayama, both from HDOA, from wild bamboo (poss. *Phyllostachys aurea*) at Puna, Hawaii I., on May 21, 1997. Determination was made by N. Reimer and B. Kumashiro, both from HDOA, and confirmed by G.L. Miller, SEL. According to Blackman and Eastop (1984), only alate adults are usually found, although apterous forms are known to occur at high altitudes in Taiwan. The aphid is normally found under the mature leaves of bamboos. The natural distribution of this species includes India, China, Taiwan, Korea, and Japan, and it was introduced to England and North America. (S. Matayoshi, C. Hirayama, & B. Kumashiro)

Coccidae: *Vinsonia stellifera* (Westwood), stellate scale

APHIS-PPQ inspectors at the Honolulu International Airport intercepted specimens of this soft scale on coconut fronds that were being shipped to Puget Sound, Washington State, on April 16, 1997. Determination was made by R. Kunishi, APHIS-PPQ, and confirmed by

D. Odermatt, APHIS-PPQ. The fronds were to be used as decorations for a graduation party, but, although inquiries were made, the source of the infested material could not be determined.

This scale is very distinctive in having seven waxy rays that give it the appearance of a miniature starfish, thus having the common name stellate (star-shaped) scale. According to Kunishi, besides attacking coconut fronds, it is also a pest of orchids. Hodgson (1994) indicates that this species is nearly cosmopolitan in distribution. According to Hamon (1986), this scale was reported to have been established in Florida in 1953, but was successfully eradicated; however, it has been intercepted many times since then by the plant quarantine division at Miami.

In January 1998, R. Heu and M. Chun, both from HDOA, collected fifteen specimens from mango foliage at Aiea, Oahu to confirm the establishment of the scale in Hawaii. (R.Kunishi, R. Heu, & B. Kumashiro)

Diaspididae: *Aspidiella sacchari* (Cockerell), a grass scale

Specimens were collected at Mililani, Oahu, from centipedegrass on July 6, 1993, by W. Kobayashi, HDOA. Determination was made by M. Chun and B. Kumashiro, both from HDOA, and was confirmed by G.L. Miller, SEL. Specimens were also collected at Makakilo, Oahu, by R. Ito from seashore paspalum on October 14, 1993, and Kula, Maui, on January 15, 1997, from centipedegrass by J. Tavares, CES. On seashore paspalum, all stages were recovered on both underground rhizomes and exposed stolons.

This grass-infesting scale has been reported from many of the sugarcane growing areas of the world. It occurs in Florida and probably some other states, but is not mentioned in Tashiro (1987). The mature scales are variable in size but not larger than Ruths scale. Larger scales are similar in appearance to Ruths scale, especially when situated beneath the leaf sheaths. Distribution includes Florida, Caribbean islands, Venezuela, Guyana, Mauritius, Kenya, Sri Lanka, and Micronesia. (W. Kobayashi,D. Tsuda, M. Chun, B. Kumashiro, & J. Beardsley)

Diaspididae: *Aulacaspis yatsumatsui* Takagi, a cycad scale

Specimens were collected by K. Murai, HDOA, at Ahuimanu, Kaneohe, Oahu in September 1998, on Japanese sago palm, *Cycas revoluta*. Determination was made by R. Kunishi, APHIS-PPQ, and confirmed by D. Odermatt, APHIS-PPQ.

McLaughlin (1998) mentions that this scale is native to Thailand and southern China, and is presumed to have been accidentally introduced into Florida through the importation of cycads. Similarly, *A. yatsumatsui* apparently found its way to Hawaii through the importation of cycads from Florida.

Aulacaspis yatsumatsui affects cycads of the genus *Cycas*, which includes *Cycas revoluta* (sago palm, Japanese sago, or king sago) *and Cycas rumphii* (tree sago or queen sago). In Hawaii, *C. revoluta* appears to be the more susceptible of the two, with severe infestations occurring on the leaves, petioles, and trunk.

Surveys by HDOA staff revealed heavy to severe infestations of this scale in residential areas of windward Oahu from Kaneohe to Kahaluu, and in leeward Oahu from Ewa Beach to Waipahu and Pearl City to Salt Lake. In March 1999, an infestation of sago palm in Kahala was reported and confirmed. (K. Murai, R. Heu, M. Chun, R. Kunishi, & B. Kumashiro)

***Diaspididae: Odonaspis* sp.(undescribed), a bamboo scale**

Specimens were collected at Kawaihae, Kona, Hawaii, on April 26, 1998, on bamboo by H. Kunewa, HDOA PQ inspector. Determination was made by N. Reimer, HDOA. Speci-

mens were forwarded to J. Beardsley, UH (retired), who sent them on to Ben-Dov for description of species. (N. Reimer)

Diaspididae: *Pseudaulacaspis pentagona* (Targioni-Tozzetti), white peach scale

Specimens of the white peach scale were collected from papaya trees at a commercial farm at Hakalau, Hawaii I., on September 11, 1997, by M. Nishina, CES. Determination was made by D. Tsuda, UH, and confirmed by D. Miller, SEL. According to Williams and Watson (1988), the scale is reported to have a cosmopolitan distribution. It has been collected from plants, such as hibiscus, soybean, tomato, plumeria, pepper, and papaya and has been found on bark, leaves, and on fruit.

On papaya plants, occasionally heavy infestations on the trunks were observed to overflow onto lower fruits. These infested fruits may present marketing problems to papaya growers and affect intra-state shipments.

P. pentagona (as *Diaspis amygdali* Tryon) was first reported on peaches at Makaweli, Kauai, by Smith (1903), but was probably extirpated and never seen again until now. According to J. Beardsley, the scale on peaches and other deciduous plants in temperate areas may not be the same as the tropical form on papaya, etc. This species was reported over 30 times as quarantine interceptions in Hawaii from 1897 through the 1920s, but never confirmed as established in Hawaii. Thus, this constitutes a new state record. (D. Tsuda, R. Heu, B. Kumashiro, J.Beardsley, & G. Nishida)

Pseudococcidae: *Antonina pretiosa* Ferris, a bamboo mealybug

A HDOA plant quarantine inspector collected specimens of this mealybug from bamboo, *Bambusa* sp. at a nursery at Kawaihae, Hawaii I., in April 1997. Determination was made by N. Reimer, HDOA.

This mealybug resembles a "black seed" with long, waxy filaments, and is usually found in leaf axils. It occurs in California and Florida, and was probably introduced from Japan on bamboo. The only recorded host is bamboo. It is known to be common throughout California, but is not regarded as a serious pest. Surveys in 1997 did not uncover any evidence of this mealybug on Oahu or Maui. (N. Reimer, R. Heu, & B. Kumashiro)

Pseudocoocidae: *Phenacoccus solenopsis* Tinsley, a mealybug on cochorus

APHIS-PPQ inspectors intercepted several specimens from saluyote, *Cochorus olitorius* L., in February 1996. Since produce is often consolidated, it could not be determined from which island it was established. Determination was made by D. Odermatt, APHIS-PPQ. On September 5, 1997, K. Murai, HDOA, collected specimens from false mallow, *Malvastrum coreomandelianum*,on the gounds of HDOA at Pawaa, Oahu. Later, Murai collected specimens on amaranth, *Amaranthus spinosus* at the same location. Determination was made by J. Beardsley, UH.

This species was described from New Mexico (Tinsley 1898), and is known to be widespread in the Nearctic and Neoptropical regions, as far south as Ecuador. It has a fairly wide host range among the Asteraceae, Chenopodiaceae, Cucurbitae, Euphorbiaceae, Leguminosae, Malvacease, Nyctaginaceae, Rubiaceae, Solanaceae, and Verbenaceae. See Ben Dov (1994) or Williams & Granara de Wilink (1992) for details. (K. Murai, R. Kunishi, J. Beardsley, & B.Kumashiro)

Psyllidae: *Ctenarytaina eucalypti* (Maskell), blue gum eucalyptus psyllid

Specimens were collected by R. Sher, HDOA, at Kula, Maui, on May 25, 1993, from eucalyptus. Determination was made by G. Miller, SEL. This is an Australian species which was accidentally introduced into California in 1991. The principal hosts are *Eucalyptus*

globulus, *E. bicostatus*, and *E. leucoxylon* (Gill 1991). In California, it is under biological control by a purposely introduced encyrtid parasitoid. (B. Kumashiro & J. Beardsley)

HYMENOPTERA

Aphelinidae: *Encarsia inaron* (Walker), an ash whitefly parasitoid
Syn.= *Encarsia partenopea* (Masi)

Specimens were obtained from ash whitefly, *Siphoninus phillyreae* (Haliday) material, which was held for parasitoid emergence. The whitefly material was collected at Waikiki, Oahu, in February 1992, by R. Macapinlac, HDOA. Determination was made by M. Schauff, SEL. (B.Kumashiro)

Aphelinidae: *Encarsia lutea* (Masi), a silverleaf whitefly parasitoid

Specimens were obtained from siverleaf whitefly, *Bemisia argentifolii* Bellows and Perring, material that was held for parasitoid emergence.

The whitefly material was collected by S. Matayoshi, HDOA, at Hoolehua, Molokai, in December 1992. Determination by made by A. Polaszek, IIE. (S.Matyoshi & B.Kumashiro)

Aphelinidae: *Encarsia luteola* Howard, a silverleaf whitefly parasitoid
Syn.= *Encarsia deserti* Gerling & Rivnay

Specimens were obtained from silverleaf whitefly material, which was held for parasitoid emergence. The whitefly material (on eggplant) was collected by S. Matayoshi at Hilo, Hawaii I., on October 5, 1990. Determination was made by S. Viggiani, Inst. Agric. Ent., Italy and A. Polaszek, IIE. (S.Matayoshi & B. Kumashiro)

Aphelinidae: *Encarsia nigricephala* Dozier, a silverleaf whitefly parasitoid

Specimens were obtained from silverleaf whitefly material which was held for parasitoid emergence. The whitefly material was collected by S. Matayoshi at Waiakea Uka, Hawaii I. on July 17, 1992. Determination was made by A. Polaszek, IIE. It was also collected by S. Matayoshi and L. Doi, HDOA at Kona, Hawaii I., on November 19, 1992, from silverleaf whitefly material. (S. Matayoshi & B. Kumashiro)

Aphelinidae: *Encarsia strenua* (Silvestri), a Kirkaldy whitefly parasitoid

Specimens were obtained from Kirdaldy whitefly material, *Dialeurodes kirkaldyi* (Kotinsky), held for parasitoid emergences. The whitefly material (on jasmine) was collected by S. Matayoshi at Napoopoo, Kona, Hawaii I., on November 19, 1993. He noticed that the parasite pupal development and morphology resembled that of *E. transvena*, except that the meconia bits weren't at the usual position and the size was smaller. Determination was made by B. Kumashiro, HDOA and confirmed by A. Polaszek, IIE. Also, specimens were collected from *D. kirkaldyi* at Keahole-Kona on May 13, 1994, by S. Matayoshi. (S. Matayoshi & B. Kumashiro)

Formicidae: *Tetramorium insolens* (Fr. Smith), an ant

On October 16, 1998, Arizona plant quarantine inspectors intercepted specimens of this ant from a container of nursery stock originating from Papaikou, Hawaii I. Determination was made by C. Baptisa, Arizona Dept. of Agriculture and confirmed by D. Smith, SEL. Baptisa notified N. Reimer, HDOA, of the interception. Later, Reimer checked the HDOA insect reference collection and found, mixed within the box for *T. bicarinatum* (Nylander), 4 misidentified specimens of *T. insolens*. These had been collected at Panaewa, Hawaii I.,

on roots of *Rhapis* sp.palm on November 3, 1993, by S. Sugai and V. Kashiwamura, HDOA. (N. Reimer)

LEPIDOPTERA

Cosmopterydigae: *Ithome lassula* Hodges, a leucaena moth

C. Sorenson, UH graduate student, collected specimens at Waimanalo, Oahu, on December 22, 1986, from *Leucaena macrophylla*. Determination was made by R. Hodges, SEL. (B. Kumashiro)

Sphingidae: *Hippotion rosetta* (Swinhoe), a sphingid moth

A single specimen was collected by N. Reimer, HDOA, at light at his residence in Manoa on January 15, 1998. Two days later, a second specimen was collected at Honolulu International Airport from a LD3 cargo container from Taiwan by V. Nakamoto, HDOA PQ inspector. Specimens feeding on *Boerhavia* sp. were later collected by M. Ramadan at Pawaa, Oahu, indicating its establishment. Determination to genus was made by N. Reimer and B. Kumashiro, HDOA. It was sent to SEL for species determination, where J. Brown further identified it as *Hippotion* and suggested that we send specimens to sphingid world authority, J.-M. Cadiou, St. Cloud, France. Cadiou determined it as *H. rosetta* (Swinhoe)and provided the following information. "This species is close to *H. boerhaviae*. These two are very difficult, if not impossible, to separate based on external characters, except in some cases when a slightly paler median line happens to be visible on the underside of the abdomen. (Cadiou did not specify which species.) Unfortunately, while a positive determination can be made when the line is visible, the converse is not true. These two species coexist nearly throughout their range, except apparently in the Solomon Islands." Cadiou mentions that genetalia dissections and comparisons with reference specimens make it clear that they are *H. rosetta*. He notes that old foodplant records of *H. boerhaviae* date from the time that the two species were confused, and are not attributable with certainty to either of the two. One other useful character is that the larva of *rosetta* has a short caudal horn, while that of *boerhaviae* has a long one. In Java, green and brown forms are known for *rosetta* larvae, while only the black form is known for *boerhaviae*. However, color forms may depend heavily on the location where they were collected from. The confirmed distribution of *rosetta* includes Thailand, Hong Kong, Borneo, and Java, but it obviously occurs in many other places as well.

D. Jamieson, HDOH, Vector Control Branch (retired), reported that a specimen of *H. rosetta* was collected by B. Freitas at Omao, Kauai, on November 18, 1998, for a new Kauai record. In December and January 1999, M. Feather, Wings Over Hawaii, collected three specimens at Wailua Homesteads, Kauai. (N. Reimer, J.-M. Cadiou, B. Kumashiro, M. Ramadan, & D. Jamieson)

ORTHOPTERA

Gryllidae: *Trigonium* sp., a cricket

S. Matayoshi, HDOA, collected specimens of this green-colored cricket resting on ornamental plants at Puna, Hawaii I., on March 17, 1997. Determination was by D.A. Nickle, SEL. (S.Matayoshi & B. Kumashiro)

PHASMATODEA

Heteronemiidae: Necrosiinae: *Necrosia* sp., a walking stick

One specimen of this walking stick was collected at a nursery at Panaewa, Hawaii I., on April 15, 1994, by a staff person at the U.H. agricultural farm and submitted to L. Arita-Tsutsumi, UH Hilo. Determination was by D. Nickle, SEL. A second specimen was later collected at the same location. This group is herbaceous, feeding on trees and shrubs. Subsequent collections were made at Keaau, Hawaii I. on July 18, 1994, by Arita-Tsutsumi; at Hilo, Hawaii I., on February 23, 1995, on wall of residence by M. Takehiro; and at Kurtistown, Hawaii I., on October 19, 1995, by C. Mello.

This is the first species of walking stick found in Hawaii. Walking sticks are nocturnal and are general phytophagous feeders. They usually remove large chunks from the leaves or skeletonize them. Both Nickle & J. Beardsley (pers. comm.) mention that the walking stick is probably a South Pacific species. Later it was found to feed on a variety of plants in the lab by the HDOA-PQ staff. (L. Arita-Tsutsumi, S. Matayoshi, & B. Kumashiro)

THYSANOPTERA

Thripidae: *Chaetanaphothrips signipennis* (Bagnall), banana rust thrips

Specimens were found damaging *Dracaena* leaves at a commercial farm in Panaewa, Hawaii I., on June 20, 1996, by B. Bushe, CES. Determination was by D. Tsuda, UH, and confirmed by S. Nakahara, SEL. Additional hosts included ti, anthurium, and banana. Subsequently, it was found on ti at Kaanapali, Maui, in 1998 by J. Tavares, CES, and on ti and possibly banana (on yellow sticky traps) on Oahu in 1999 by R. Hamasaki, CES.

Sakimura (1975) first reported *C. signipennis* (which he collected) for the Hawaiian Islands, but did not consider it established. He mentions that this thrips seems to have failed to become firmly naturalized. Subsequently, *C. signipennis* was reported for Hawaii in Commonwealth Institute of Entomology's *Distribtion Maps of Pests, Ser. A* (CIE, 1981) and by Mound (1983). Vouchers for the subsequent reports are unknown and the presence was probably was based on Sakimura's report. Because it appears that Sakimura's single collection was an isolated event, and no other specimens were collected since 1954 until recently, this is being considered as a new state record. (D. Tsuda, G. Nishida, & B. Kumashiro)

Thripidae: *Frankliniella cephalica* Crawford, a thrips on emilia

Specimens were collected at Pulehu, Maui, in April 1998, on Flora's paintbrush, *Emilia sonchifolia*, by J. Cho, CTAHR. Determination was made by D. Tsuda, UH and confirmed by S. Nakahara, SEL. (D. Tsuda)

Thripidae: *Hercinothrips bicinctus* (Bagnall), banana silvering thrips

R. Hamasaki, CES, collected specimens at Pauoa, Oahu on *Coccinia grandis* in May 1998. Determination was made by M. Chun and B. Kumashiro, HDOA, and D. Tsuda, UH. It was confirmed by S. Nakahara, SEL. The population was very large and feeding damage was quite apparent.

A resident, S. Nelson, collected immature thrips on awa, *Piper methysticum*, on June 18, 1999, in Hilo, Hawaii I., for a new island record. B. Bushe, CES in Hilo, reared out two adult thrips from this material. Determination was made by D. Tsuda.

As the name implies, the banana silvering thrips is a minor pest of bananas. Its distribution includes Australia, Africa, and the West Indies. Other hosts are passion fruit, Flora's

paintbrush, *Solanum* sp., *Chamaedorea fragrens* (in a glasshouse in Belgium), and grasses in India. (D. Tsuda, B. Kumashiro, & M. Chun)

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