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New State Records and Additions to the Alien Terrestrial Arthropod Fauna in the Hawaiian Islands

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Abstract. An annotated list of 393 adventive terrestrial arthropod species plus three new varieties of known established species, which have been recorded in Hawaii since the Fourth Edition of Bishop Museum's Hawaiian Terrestrial Arthropod Checklist (Nishida 2002), is presented. This compilation includes records of over 362 nonnative arthropod species published between the years of 2001 and 2017 as well as over 30 new Hawaii State records that have not been previously recorded. Annotations include date first detected, island distribution, citation, relevant biological notes, and for new state and island records, the collection data. A separate table with about 150 entries lists the synonyms, misidentifications, deletions, and changes of status for species included in the 2002 checklist that were discovered during our research. However, the latter list is not comprehensive as a complete revision of the 2002 checklist was beyond the scope of our project. Also included is a bibliography of the approximately 270 source documents that were consulted. We intend for this publication to be a useful supplement to the 2002 edition of the Hawaiian Terrestrial Arthropod Checklist.

Key words: New state records, Hawaii, insects, arthropods, checklist

Since its first edition was published in 1992, the Hawaiian Terrestrial Arthropod Checklist (Nishida 1992) has been an indispensable reference not only for Hawaii's entomologists but for biologists from all areas of study. The Checklist is an "authority file of non-marine arthropod names for the Hawaiian Islands" and has been the basis for determining the status of both native and adventive arthropod species. While at the Bishop Museum, Nishida updated The Checklist three times: in 1994, 1997, and, finally, in 2002. Since Nishida's departure from the museum, an update has not been issued in over sixteen years. The realization that invasive species pose many of the greatest threats to Hawaii's environment, agriculture, native ecosystems, and people justifies the high priority given to maintaining an updated checklist of established alien species in the Hawaiian Archipelago.

Biologists working in numerous fields rely on this checklist and refer to it when making administrative decisions and rules, identifications, or diagnostics, as well as for data entered into reports and publications on invasive species and new arrivals into the Islands. Biosecurity officials refer to this checklist when interceptions are made on both imports and exports. When State Plant Quarantine inspectors intercept arthropod pests coming into Hawaii's ports, the Checklist is consistently consulted to determine if the species is already established in the state or not known to occur. If the species in question is identified as not known to occur in Hawaii, dispositions of those shipments may include destroying, treating, or refusing entry of the shipment. The United States Department of Agriculture (USDA) also regularly requests establishment data of arthropod pests in Hawaii to regulate importation of plants and plant products from Hawaii to the U.S. mainland. The Checklist also assists in the conservation of native Hawaiian arthropod species by providing a quick reference on the status and island distribution of both native and potentially harmful alien species. It also has proven to be a resource for showing where the distribution and information gaps are, which have facilitated surveys and new research initiatives. The inclusive data allows researchers to keep better track of recognized indigenous and endemic species, therefore contributing to the studies of endangered species, conservation, and biodiversity. While the list included herein does not include an update of the native taxa, the listing of alien species can provide insight into the balance of native and adventive groups over time. Corroborating the usefulness of the Checklist was the sudden increase of new records published after the advent of the earlier editions, as researchers discovered that many of the species they were studying had not yet been formally recorded.

In the latest edition (2002), Nishida estimated around 3049 adventive arthropod species were established in the state, which was 286 species more than recorded in the 1997 edition. Since then [the 2002 edition had a listing cutoff date of around 1999 (Kumashiro et al. 2002)], hundreds of additional immigrant arthropod species have been discovered in Hawaii. These new arrivals have been recorded in various peer-reviewed scientific journals, technical reports, and other literature including some in obscure journals. These scattered references are often difficult for researchers and other stakeholders to access. Because these records are scattered, efficiently finding establishment data is often a time-consuming and onerous task. In addition, many new records have not been published

for a variety of reasons, such as the following:

- Only a few individuals or a single population may have been collected once and not collected again. In such cases, it may not be possible to identify the species or determine establishment until additional specimens or biological data become available.
- The continuing decline in the number and availability of classical taxonomists and specialists able to assist in the identification of newly discovered species in the state, especially when the species is new to science or in groups in need of revision. Thus, many collections may remain unidentified until an appropriate taxonomist is available.
- The latter problem is greatly exacerbated since there are more species of arthropods in the world than any other taxonomic group, and arriving alien species can come from anywhere through commerce and actions of people. This often leads to misidentification of specimens, synonymies, or constant confusion of correct taxonomic classification.
- Finally, with the significant decline in number of local entomologists, new records may not be discovered and published in a timely matter.

Updating the Hawaiian Terrestrial Arthropod Checklist is an enormous task which can take years, even with someone fully dedicated to the project. In an effort to gather the scattered records of newly established arthropods and to consolidate them into one easily accessible source, a USDA Farm Bill project was undertaken. To distribute our work more widely, the results of this project will be published in two parts: The addition to the 2002 Bishop Museum Arthropod Checklist (included herein) and a pathway analysis of how these immigrants arrived in the Islands.

The goal of this paper is to compile a list (Table 1) of the immigrant non-marine arthropod species that have been discovered since Nishida 2002. We include both published records as well as new records not previously published. The latter include species believed to be established that are known to us and have been authoritatively identified with voucher specimens deposited in an entomological collection. Excluded are new records for indigenous and endemic species. Since the beginning of this project, keeping up with a continuous stream of new records has delayed its publication; therefore, to disseminate the list in a timely manner, most unpublished new state records added to this list were capped at 2015, with a few relevant exceptions. New arrivals identified after this cutoff will be published in a subsequent paper. Known records published by others have been added to the list, up to the date of submission.

The arrangement of taxa follows that used in the previous checklist (Nishida 2002). That is, the taxa are arranged alphabetically within the next higher category, which is also arranged alphabetically. Thus, species are listed alphabetically within their genus, which is alphabetized within its family, and so on.

To make the list more useful, we include citations to the pertinent literature, year of earliest detection in Hawaii, collection data for previously unpublished records, island distribution, and notes on each species. New island records noted in this list refer to new records after the initial new state record listed was published, but do not include new island records of species already listed in Nishida 2002. While every effort was taken to ensure accuracy, some errors inevitably occur in a work of this magnitude. The most up-to-date name and classification scheme is used for the listed species. When applicable, synonyms and previous names are included. However, names change not only from corrections of misidentifications, but also from improvements in our understanding of the taxonomy of a group.

While compiling this list, several synonyms, misidentifications, deletions, and changes in status were discovered, in the noted source documents, for many of the species recorded in Nishida 2002. These emendations, which total about 150 changes, are included in Table 2; however, it was beyond the scope of this project to conduct an exhaustive or complete search of changes since Nishida 2002.

Over 270 source documents were consulted for included establishment records and taxonomic changes. These added published records for approximately 361 species of alien arthropods to the known fauna of Hawaii. In addition, this report adds another 33 new state establishment records that have not been reported previously, which brings the total to approximately 396 species added to the fauna since Nishida 2002 (Table 1). This brings the total number of alien, non-marine arthropod species reported to occur in Hawaii to over 3,829. However, many of these may have been extirpated and are no longer present, or populations have not established. The collection data and relevant biological notes documenting each new state and island record for these taxa as well as notes on the status changes are provided in the Collection Data and New Record Summaries section.

The information in this article is as accurate as the authors could verify; however, there may be errors or pertinent data which we missed. If any errors are detected, please contact us.

Abbreviations

BPBM Bernice Pauahi Bishop Museum
HDOA Hawaii Department of Agriculture
UH University of Hawaii
USDA-APHIS-PPQ United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection & Quarantine
USDA-ARS-PBARC United States Department of Agriculture, Agricultural Research Service, Daniel K. Inouye U.S. Pacific Basin Agricultural Research Center
USDA-ARS-SEL United States Department of Agriculture, Agricultural Research Service, Systematic Entomology Laboratory

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Collection Data and New Record Summaries

Collection data for new state and island records and notes on selected status changes to the Hawaiian Terrestrial Arthropod Checklist (Nishida 2002).

Arachnida: Acari

Eriophyidae
***Aceria guerreronis* Keifer**
NEW STATE RECORD

Although this species was recorded on Maui as far back as 1991, this identification was based on associated host plant damage to coconut fruit. Since then, this eriophyid has reached Oahu in 2002, Molokai in 2014, and Kauai in 2016. A morphological identification was finally provided by E. McDonald in 2016.

Collection records: MAUI, Lahaina, 1.VII.1991, ex. *Cocos nucifera* fruit, coll. D. Tsuda, det. B. Kumashiro. **OAHU,** Nanakuli, 15.IX.2000, ex. *C. nucifera* fruit, coll. L. Nakahara & R. Heu. **MOLOKAI,** Kalamaula, 10.XII.2014, ex. *C. nu-*

cifera fruit, coll. L. Buchanan, det. B. Kumashiro, 21.XII.2014. **KAUAI**, Kilauea, 11.I.2016, ex. *C. nucifera* fruit, coll. R. Ward, det. E. McDonald.

***Phyllocoptes bougainvilleae* Keifer**
New island record

Collection records: HAWAII, Kona, Kealakehe, 29.IV.2016, ex. *Bougainvillea* sp. foliage, coll. B. Bushe, det. G.A. Evans, 27.XII.2016. Vouchers at HDOA.

Arachnida: Araneae

Lycosidae
***Hogna crispipes* (L. Koch)**
New island record

This species was first listed from Kahului in 2002 as *Lycosa* sp. A and provisionally considered native (Howarth and Preston 2002); however, the form of the male pedipalp is closer to extra-limital species of *Hogna* rather than the native Hawaiian wolf spiders. *Hogna* is the largest genus of wolf spiders with a nearly world-wide distribution. The Maui specimen proved to be the same species as an adventive species found on Kauai and Oahu, which was recently identified by V. Framenau as *H. crispipes* (L. Koch, 1877). This species is widespread in Australia and many Pacific islands (Framenau et al. 2006).

Collection records: KAUAI, Lihue, 21°58'52"N, 159°22'16", 23.IX.1997, coll. D. Jameson, 1 female; Kahili Mountain Park, near Koloa, 800 ft. elev., 21°56'12''N; 159°28'45''W, 8.II.1998, spotlighting on lawn, coll. J.W. Berry, 2 males, 4 females, 10 juv.; Same data except: 10.III.1998, lab reared, 1 male. **OAHU**, Kunia, Village Park, 8.X.1988, coll. A. Manning, 1 female; Kahaluu, 1.XI.1993, in yard, no coll., 1 male; Kaneohe, near Valley of Temples, 3.XII.1993, outside house, coll. I. Santos Bear, 1 female with spiderlings. Det. V. Framenau.

Insecta: Coleoptera

Anthribidae
***Eucorynus crassicornis* (Fabricius)**
NEW STATE RECORD

An adult weevil emerged from a Chinese imported garlic bulb purchased from an Oahu supermarket in 2010. According to G.A. Samuelson, a single specimen was turned in to him by W.D. Perreira previous to this collection, in 2005. Additional adults have been found at large in homes that had similar Chinese imported garlic bulbs sitting out on countertops. Specimens have also been found at large associated with *Pritchardia* palms and rotting *Cassia*. G.A. Samuelson sent one specimen to Barry Valentine to confirm the identification.

The following records are in BPBM: **Collection records: OAHU**, Kalaeloa, 40 ft elev., 26.V.2005, rotting *Cassia*, coll. W.D. Perreira, det G.A. Samuelson; Honolulu, Kalihi Valley, 21°20.7'N, 157°51.6'W, 5.VI.2011, 120 m, at light, coll. F.G. Howarth, det. G.A. Samuelson.

The following records are in HDOA: **Collection records: OAHU**, Aiea, 29.VIII.2010, ex. garlic bulb imported from China, coll. C. Young, Sent to SEL- no ID yet; Waimea Valley Arboretum, 6.VI.2011, at large on *Pritchardia* sp., coll. W. Nagamine, det. F.G. Howarth.

Chrysomelidae
***Trachymela sloanei* (Blackburn)**
NEW STATE RECORD

Trachymela sloanei was first discovered in 2011 on *Eucalyptus camaldulensis* trees exhibiting peculiar notches along leaf edges, characteristic of caterpillar feeding. A closer inspection of the red gum trees revealed numerous larvae and two adult chrysomelids under the tree bark. Species identification was confirmed by Alexander Konstantinov at USDA-ARS-SEL in December, 2011.

This native to Australia ferociously invaded New Zealand in 1976 (Brockerhoff and Bain 2000), defoliating eucalyptus trees throughout the country. In 1998, it was detected in California, the first record of this species in the U.S. This species is known to be intercepted at Honolulu ports of entry on shipments of cut myrtle. This discovery of *T. sloanei* in Waimanalo represented the first records of the Australian tortoise beetle in Hawaii. In May 2013, *T. sloanei* was collected from red gum trees at Kapalua, Maui, a new island record.

Trachymela sloanei adults and larvae are nocturnal, feeding at night on the leaves, and hiding under the tree bark during the day. They sometimes hide high up in the trees and it is common to see the feeding damage but not find the culprits. The adult is 6-7 mm long, entirely brown with darker mottled spots and can be mistaken for a ladybug. Eggs are laid under the bark or on the leaves. *T. sloanei* is reported to feed on a variety of *Eucalyptus* species, but in Hawaii it has only been confirmed feeding on *E. camaldulensis* thus far.

Collection records: OAHU, Waimanalo, University of Hawaii Research Station, 24.II.2011 (Correction to Conant 2013- printed as first collection in 2009), ex. *Eucalyptus camaldulensis* foliage, coll. W. Nagamine, det. A. S. Konstantinov, 20.XII.2011. **MAUI,** Kapalua, 10.V.2013, ex. *E. camaldulensis* foliage, coll. C. Baker, det. B. Kumashiro, 16.V.2013. Vouchers at HDOA.

Clambidae
Undetermined genus sp. A

Without specific identifications, it is not possible to determine whether the specimens from Kauai and Maui represent one or two species, or whether they are native and therefore not adventive.

Curculionidae
***Atrichonotus taeniatulus* (Berg)**
NEW STATE RECORD

Several adult weevils were initially dissected from the crop of a deceased black francolin bird in 2009, however, field collected specimens were not found until 2010 when adults were observed infesting *Medicago lupulina*.

Collection records: HAWAII, South Kohala/North Kona, 26.I.2009, ex. crop of dead black francolin, coll. J. Bright, det. J. Prena, 25.II.2009; Waimea, 7.IV.2010, ex. *Melilotus alba,* coll. W. Okamura, det. B. Kumashiro, 12.IV.2010; North Kohala- Kaauhuhu, 7.VI.2010, ex. *Medicago lupulina*, coll. W. Okamura, det. B. Kumashiro, 8.VII.2010. Vouchers at HDOA.

***Naupactus leucoloma* Boheman**

The white-fringed weevil, *Naupactus leucoloma*, was first detected swarming outside of a homeowner's porch, near pasture land on the Big Island. This species was reported by Conant (2013), however collection data for this new state record is reported here.

N. leucoloma and *Atrichonotus taeniatulus*, were both collected in and around North Hawaii island ranchlands and cattle pastures of Waimea and Kohala. These species are well known pests of alfalfa (*Medicago sativa*, Fabaceae) and other legumes used as cattle graze in pastures. In addition, *N. leucoloma* is a polyphagous pest of over three-hundred known species of agricultural crops, pastures, ornamentals, and other plant species where they are established [Southern United States, Central and South America, Australia, New Zealand, and South Africa (Walker 2006)]. Some hosts recorded in literature include *Brassica* spp., *Glycine max*, *Citrullus lanatus*, *Solanum lycopersicum*, *Ipomoea batatas*, and *Zea mays*. Adult weevils feed on the foliage of hosts, while larvae cause the greatest damage by feeding on roots in the soil (Capinera 2008). Both *A. taeniatulus* and *N. leucoloma* have fused elytra and are therefore limited in dispersal capabilities by crawling and human aided hitchhiking.

Collection records: HAWAII, Waimea, 3.VIII.2013, ex. at large, congregating outside home near pasture, coll. P. Conant, det. L. Chamorro, 30.X.2013; Waimea, 10.IX.2013, ex. *Amaranthus spinosus*, coll. S. Chun, M. Fukada, R. Curtiss, det. B. Kumashiro, IX.2013. Vouchers at HDOA.

***Scolytogenes* sp. A**
NEW STATE RECORD

Specimens identified by Donald J. Bright as *Scolytogenes* sp. A were collected from coffee berry borer traps (BROCAP traps with a mixture of 3:1 methanol:ethanol) at two separate coffee farms on Hawaii island.

Collection records: HAWAII, Kainaliu Experiment Station, 2.XI.2010, coffee berry borer trap, coll. J. Scharff; Pahala, 8.XII.2010, coffee berry borer trap, coll. C. Hirayama, det. D.J. Bright, 2011. Vouchers at HDOA.

Nitidulidae
***Aethina tumida* (Murray)**
New island record

Collection records: KAUAI, Kapaa, 22.V.2012, ex. managed *Apis mellifera* hive at residence, coll. J. Conrow, det. M. Ramadan, 24.V.2012. Voucher at HDOA.

Scarabaeidae
***Protaetia orientalis* (Gory & Percheron)**
New island records

While *Protaetia orientalis* was first discovered on Oahu in 2002, populations have exploded in recent years, making this relatively large beetle (between 2 cm and 2.5 cm) a surprising sight to residents and a consistently reported pest. Adults can be sometimes be seen aggregating in large numbers on overripe fruit and fruit-producing flowers, especially the inflorescence of palm trees, mangoes, and lychee. Although reports from Oahu residents have suggested that these larger groups of feeding beetles can damage flowers and in some cases reduce fruit yield, there have not been any scientific studies to date.

Collection records: HAWAII, Keaukaha, 30.I.2013, ex. larvae under ironwood log, coll. Q. Maeda, det. B. Kumashiro, 1.II.2013. Hawi, 11.II.2014, on *Cocos nucifera* foliage, coll. K. Fujimoto, det. M. Ramadan, 16.V.2014. **KAUAI**, Lihue, 20.V.2015, on avocado tree, coll. S. Rapozo, det. B. Kumashiro; Puhi, 24.VI.2015, ex. larvae in mulch at residence, coll. Angelo, det. B. Kumashiro. **MAUI,** Kahului, 15.IX.2010, ex. feeding on *Zea mays* corn ear, coll. M. Fukada, det. B. Kumashiro, 4.X.2010. Vouchers at HDOA.

Tenebrionidae
Bolitophagini?; Undetermined genus sp. A
First field collection, unknown establishment

A single collection of several adult Tenebrionids was made from wet lumber in Hilo. While the lumber was imported, it would have been shipped dry and become moist while sitting on the property, making it difficult to determine if these beetles may have hitched a ride with the shipment or not. The specimens were sent to G.A. Samuelson for identification, however, they were unidentifiable past the tribe level. Samuelson believes a specialist on Tenebrionidae will need to examine these beetles for species identification.

Collection records: HAWAII, Hilo, 16.XII.2013, coll. J. Morell, ex. wet wood, det. G.A. Samuelson, 18.II.2014. Vouchers at HDOA.

***Menephilus arciscelis* Marseul**
NEW STATE RECORD

Several adults were collected at a Mililani residence over the course of two years. Not much can be found in literature (in English), but this species is known to be native to Japan.

Collection records: OAHU, Mililani, 24.IX.2009, coll. W. Nagamine, at large in home; Mililani, 10.VII.2010, coll. W. Nagamine, at large, under lumber; Mililani, 9.IX.2011, coll. W. Nagamine, at large, on wall outside. All listed collections det. G.A. Samuelson, 18.II.2014. Vouchers at HDOA & BPBM.

***Stethotrypes raffrayi* (Thomson)**
NEW STATE RECORD

Hundreds of tiny dark brown beetles with gold patches were found crawling around wooden nursery benches covered in

algae. Adult beetles, larvae, and pupae crowded under and within potted plants, in corners of nursery benches, and under wet rocks and bricks. With the expertise of Dr. Wolfgang Schawaller, an identification was finally determined.

According to Schawaller, *Stethotrypes raffrayi* is known from Java, Sumatra, and the Philippines. While species in the tribe Leiochrinini are not known to be pests, the high numbers of these beetles not previously known to occur in the U.S. were becoming problematic in some nursery plants exported to the mainland U.S. These tenebrionids are just over 2 mm and resemble coccinellid beetles with their round, dome-like elytra.

Collection records: HAWAII, Panaewa, 31.VIII.2012, coll. C. Hirayama, ex. on wooden nursery benches covered with algae, det. W. Schawaller, 5.II.2018; Hilo, 13.VI.2015, ex. under plant pots and bricks in residential yard, coll. B. Azama. Vouchers at HDOA & BPBM.

Insecta: Diptera

Agromyzidae

***Liriomyza* sp. A** (apparently undescribed)

NEW STATE RECORD

Specimens of this leafminer were reared from blotch mines on the leaves of crown flower (*Calotropis gigantea*) and tropical milkweed (*Asclepias curassavica*) planted at the University of Hawaii at Manoa. Adults and associated host plant damage appeared to be new to Hawaii and specimens were sent to USDA-ARS-SEL, then referred to Owen Lonsdale at the Canadian National Collection of Insects, Arachnids and Nematodes.

According to O. Lonsdale, this leafminer appears to be an undescribed species of *Liriomyza* most closely related to *L. asclepiadis* and *L. subasclepiadis*. Larvae produce blotch mines on leaves of *Calotropis gigantea*. Populations of this undescribed *Liriomyza* sp. appears to be controlled on Oahu by several locally established parasitoids, including *Closterocerus utahensis* Crawford and *Chrysocharis* sp. (Eulophidae- larval endoparasitoids) and *Digliphus begini* (Ashmead) (Eulophidae), a larval ectoparasitoid.

Collection records: OAHU, Manoa, University of Hawaii campus, ex. mining *Calotropis gigantea* foliage, 15.VIII.2013, coll. D. Tsuda; Kaneohe, ex. mining *C. gigantea* foliage, 13.II.2013, coll. M. Ramadan & W. Nagamine; Kunia, ex. mining *C. gigantea* foliage, 26.III.2013, coll. J.N. Matsunaga. Vouchers at HDOA.

Ceratopogonidae

***Atrichopogon levis* (Coquillett)**

New island record

Collection records: OAHU, Honolulu, Moanalua Stream, 21°21'N, 157°52.7'W, sweeping stream margin, coll. F.G. Howarth, 9.I.2009, 2 males, 3 females; same data except 25.I.2009, 3 males, det. F.G. Howarth, 2009. Vouchers at BPBM & HDOA.

***Culicoides jamaicensis* Edwards**

New island record

Collection records: OAHU, Kalaeloa, Barbers Point, 7.X.2000, pan trap beneath light, W.D. Perreira, 1 female; Honolulu, Kalihi, 21°20.6'N, 157°51.6'W, -.IV.2007, 120m elev., ex. at light, coll. F.G. Howarth, 1 female; same data except 4-5.VIII.2007, 1 male, 3 females; 16.XI.2007, 1 female; 29-30.I.2009, det. F.G. Howarth, 2009. Vouchers at BPBM & HDOA.

***Forcipomyia* cf. *quasiingrami* Macfie**

New island record

Collection records: HAWAII, Kurtistown, 19°34.8'N, 155°04'W 290 m elev., 21.X.2007, ex. at blacklight, coll. F.G. Howarth and F.D. Stone, 1 male. **OAHU,** Honolulu, Kalihi, 21°20.6N, 157°51.6'W, 4.XII.2007, 120 m elev., ex. at light, coll. F.G. Howarth, 1 male; same data except 28.XII.2007, 1 male, 1 female; 25.I.2009, 1 male; 28.I.2009, 1 male; 31.I.2009, 1 male, 1 female, det. F.G. Howarth, 2009. Vouchers at BPBM.

Chironomidae

***Apedilum elachistus* Townes**

NEW STATE RECORD

Wolff (2002) reported collecting pupae of an unidentified species of *Apedilum* during a survey of the invertebrates living in streams on Oahu. The adults identified here most likely represent the same species. *A. elachistus* is widespread in North America. Larvae are blood worms and live in eutrophic sediments in streams and shallow water bodies. When abundant, the swarming adults can become a nuisance.

Collection records: OAHU, Honolulu, Moanalua, 21°20.9N; 157°53.7W, 11.XI.2008, ex. sweeping stream margin, coll. F.G. Howarth; Same collection data except collected 29.IV.2013. Det. F.G. Howarth, conf. P. Cranston, 2013. Vouchers at BPBM and HDOA.

Culicidae

***Aedes japonicus* (Theobald)**

New island record

Aedes japonicus has been established on Hawaii island since 2004 (Larish and Savage 2005) and while a single individual was detected in a monitoring trap at Honolulu International Airport, Oahu in 2012 (Yang and Hasty 2013), this mosquito has not been collected from the field on other main islands until 2013 (Magnacca 2015). In addition to Magnacca's (2015) list of new island establishments on Oahu and Kauai, this single specimen collected at The Nature Conservancy's Waikamoi Preserve on Haleakala, Maui is evidence of this species' spread across the Hawaiian Islands.

Collection record: MAUI, Haleakala, Waikamoi Preserve, 8.X.2016, coll. M. Fukada, det. J.N. Matsunaga, XI.2016. Voucher at HDOA.

Insecta: Hemiptera

Aleyrodidae

***Aleurotrachelus atratus* Hempel**

New island record

Collection records: HAWAII, UH Hilo Campus, 23.XII.2013, ex. *Cocos nucifera* foliage, coll. S. Cabral, det. B. Kumashiro, 31.I.2014. Vouchers at HDOA.

***Metaleurodicus cardini* (Back)**

New island record

Collection records: OAHU, Ala Moana, 24.IV.2009, ex. unknown plant foliage, coll. W. Nagamine, det. W. Nagamine, 24.IV.2009; Kakaako, 28.IV.2009, ex. *Psidium guajava* foliage, coll. W. Nagamine, det. W. Nagamine, 28.IV.2009. Vouchers at HDOA.

Anthocoridae

***Montandoniola confusa* Streito & Matocq**

The predaceous anthocorid bug, under the name *Montandoniola moraguesi* (Puton), was introduced into Hawaii from the Philippines in 1964 for the biological control of the Cuban laurel thrips (*Gynaikothrips ficorum*). According to Pluot-Sigwalt et al. (2009), *M. moraguesi* had been misidentified for over 45 years. Species in the genus *Montandoniola* are easily confused, as it is difficult to separate them by external morphology alone. Genitalia dissections are necessary to identify key diagnostic features. Pluot-Sigwalt et al. (2009) examined the genitalia of type specimens from various parts of the world and concluded that three cryptic species have been confused under the species name *Montandoniola moraguesi*. As a result, Pluot-Sigwalt et al. (2009) determined that *M. moraguesi* appears restricted to the Mediterranean region and Africa. *M. thripodes* and *M. pictipennis* are known from Hong-Kong and Japan, respectively.

Montandoniola confusa Streito & Matocq, described as a new species in Pluot-Sigwalt et al.'s review (2009), was discovered in Guadeloupe, and is found in Florida, Bermuda, Australia (Pluot-Sigwalt et al. 2009), Mexico (Cambero-Campos et al. 2010), Brazil (Tavares et al. 2013), and presumably Philippines where the Hawaiian introduction originated. Historical specimens from Hawaii were examined in this study and determined to be *M. confusa* and not *M. moraguesi*.

Prior to the 2009 study there was confusion over another name: *Macrotrachelia thripiformis* Champion, 1901, which has been used for two different species in Hawaiian literature. Lattin (2005) reviewed the literature and examined specimens from Bishop Museum. He concluded that the name *Macrotrachelia thripiformis*, listed by Nishida (2002) very likely refers to *Montandoniola moraguesi* (now *M. confusa*).

In addition, the 1965 introduction of what was then reported as "*Macrotrachelia thripiformis* (Davis & Chong 1966)" to Hawaii from Mexico was misidentified. Lattin (2005) identified a series of voucher specimens from the 1965 Mexico population release as *Macrotrachelia nigronitens* (Stal 1860). No field established collections of *M. nigronitens* (= *M. thripiformis*) are known, and this species appears not to have established in Hawaii. However, as noted by Lattin (2005), anthocorids are tiny and easily missed in surveys.

Asterolecaniidae

***Planchonia stentae* (Brain)**

NEW STATE RECORD

In 2009, stems of *Hoya imperialis* var. *rauchii* from Keaau, Hawaii, were found to be infested with pit scales. Specimens were then identified by D.R. Miller as *Planchonia stentae* (Brain), the South African pit scale. Following this 2009 verification, previously unidentified specimens (Waimea, 2007) were found in HDOA's reference collection, reexamined, and consequently identified as *P. stentae*. This species has now been collected on Hawaii, Maui, and Oahu.

This South African pit scale, also known as the Euphorbia pit scale, has been recorded in California and Florida, where it has become a major pest of at least 49 introduced and native plant species (Stumph and Lambdin 2000). This species can severely weaken small and young plants, causing major stem deformation, especially at apical tips.

Collection records: HAWAII, Keaau, 22.IV.2009, ex. *Hoya imperialis* var. *rauchii,* coll. C. Noel, det. D.R. Miller, 3.IX.2009; Waimea, 19.XI.2007, ex. *Sophora chrysophylla* stems, coll. J. Higashino, det. J.N. Matsunaga, 28.IX.2009. **MAUI,** Pukalani, 12.III.2013, ex. *Asclepias physocarpa* stems, coll. M. Fukada, det. J.N. Matsunaga, 25.III.2013. **OAHU,** Honolulu, Pawaa, 12.VII.2014, ex. *Heliotropium anomalum* var. *argenteum* stems, coll. J.N. Matsunaga, det. J.N. Matsunaga, 25.VIII.2014. Vouchers at HDOA.

Cicadellidae

***Draeculacephala portola* Ball**

NEW STATE RECORD

Draeculacephala portola Ball was reported from Hawaii in 1959 by Young and Davidson (1959), however, according to Napompeth and Nishida (1974) this was in error. In 1992, Christopher H. Dietrich (Formerly USDA-ARS-SEL, now University of Illinois Urbana-Champaign) who published a revision of the genus *Draeculacephala*, examined Hawaiian specimens. All Hawaii specimens were of *D. californica*, *D. inscripta*, and *D. minerva*, reinforcing the previous misidentification record. The 2012 collection represents a new state record for *D. portola*.

Collection records: HAWAII, Ninole, 19.XII.2012, ex. *Nasturtium officinale* foliage, coll. S. Bergfield, det. S.H. McKamey 20.II.2013. Vouchers at HDOA.

Coccidae

***Ceroplastes eugeniae* Hall**

NEW STATE RECORD

D.R. Miller tentatively identified Hawaii specimens as *Ceroplastes* poss. *rusci*, but noted that these had more stig-

matic setae than typical *C. rusci* and seemed slightly larger. Slide-mounted specimens were forwarded to Ana Lúcia B. G. Peronti, Universidade Federal de São Carlos, as she worked on the revision of the genus in Brazil. Peronti subsequently provided a firm identification as *Ceroplastes eugeniae* Hall. Previous notes of *Ceroplastes rusci* collections should be changed to *C. eugeniae*.

Collection records: OAHU, Aiea, 8.VII.2009, ex. *Aonidia merrillii* foliage, coll. R. Heu, M. Lee, C. Young, det. A. L. Peronti, 21.I.2013. **HAWAII,** Kurtistown, 22.VII.2009, ex. *Annona muricata,* coll. B. Bushe, det. A. L. Peronti, 21.I.2013. **KAUAI,** Kilauea, 9.IX.2010, ex. *Cyperus papyrus,* coll. M. Schultz, det. J.N. Matsunaga, II.2013. Vouchers at HDOA.

***Ceroplastes stellifer* (Westwood)**
[= *Vinsonia stellifera* Westwood]
New island record

Collection records: HAWAII, Captain Cook, 6.V.2010, ex. *Schefflera arboricola* coll. M. Ramadan, det. M. Ramdan and J.N. Matsunaga, 19.V.2010. Vouchers at HDOA.

***Pulvinariella mesembryanthemi* (Vallot)**
NEW STATE RECORD

Heavily infested samples of what was called "akulikuli" by the collector, were brought to the attention of UH-CTAHR, and further handed on to HDOA for identification. A tentative identification and further confirmation by G.A. Evans concluded that this was the ice plant scale, *Pulvinariella mesembryanthemi* (Vallot). After some confusion of the initial plant from which it was collected, it was discovered that the host was actually *Lampranthus roseus*, mini ice plant, and not one of the native akulikuli species (*Sesuvium portulacastrum*). Within several months, Maui and Oahu infestations were also detected, suggesting that *P. mesembryanthemi* has been present in Hawaii for some time. Interestingly, an infestation detected in Kona was found in the Kona International Airport's landscaping, while the Oahu infestation was also found near the Honolulu International Airport, in the Mapunapuna roadside landscaped areas. It is highly likely that the iceplant scale was spread via nursery stock used for these landscaped areas.

Recorded host plants of the ice plant scale include *Carpobrotus* spp., *Disphyma* spp., *Mesembryanthemum* spp. (Aizoaceae); *Atriplex vesicaria* and *Lampranthus* spp. (Chenopodiaceae) (García Morales et al. 2016). In addition, according to Qin and Gullan (1992), *S. portulacastrum* is a possible host plant in Australia.

Collection records: HAWAII, Kamuela, I.2012, ex. *Lampranthus roseus,* coll. S. Keith, det. G.A. Evans, 26.IV.2012. **MAUI,** Wailuku, 28.VIII.2012, ex. *Lampranthus* sp. coll. M. Fukada, M. Lee & C. Young, det. B. Kumashiro, 12.IX.2012. **OAHU,** Mapunapuna, 19.VII.2012, ex. *Carpobrotus* sp. coll. M. Lee & C. Young, det. B. Kumashiro, 24.VII.2012. Vouchers at HDOA.

Coreidae
***Acanthocoris* sp. A**
NEW STATE RECORD

According to T.J. Henry, this group is in need of serious revision; adults are not identifiable to species. There are many similar species and no identification keys to separate them. *Acanthocoris* sp. A represents the second of two alien leaf-footed bugs which feed on *Ipomoea* spp. to establish in Hawaii. *Physomerus grossipes*, which has become common on sweet potato, was first detected in 1997.

Collection records: KAUAI, Lihue, 24.VII.2009, ex. at large, coll. E.J. Garcia. Anahola, 14.VI.2011, ex. *Ipomoea batatas*, coll. M. Ko & C. Lao; Kalaheo, 24.V.2012, ex. *I. batatas*, coll. N. Hori, det. T.J. Henry, 30.X.2015. Vouchers at HDOA.

***Physomerus grossipes* (Fabricius)**
New island records

Collection records: KAUAI, Lihue, 28.II.2011, ex. *Ipomoea obsuta* foliage, coll. M. Ko & C. Lao, det. B. Kumashiro, 1.III.2011. **HAWAII**, Kohala, 1.IX.2016, ex. *Ipomoea batatas*, coll. D. Fuertes, det. J. Matsunaga, 13.X.2016. Vouchers at HDOA.

Cydnidae
***Fromundus biimpressus* (Horváth)**
NEW STATE RECORD

Thousands of burrowing bugs at a Keaukaha school and surrounding areas on Hawaii island were reported by the public to HDOA in 2015. The burrowing bugs were attracted to the bright lights of the athletic field and gym at night and could be found in masses around the school on sidewalks, along buildings, in the baseball dugouts, and on landscaping in following days. In addition, swarming in masses at various beach parks (Onekahakaha and Richardson's Beach Park) in the Keaukaha area were also reported around the same week.

It first appeared that this was a new unrecorded species of Cydnidae, however, a review of the HDOA collection found unidentified specimens collected from Oahu in the 1980's which were identical to the Keaukaha individuals. Shortly after the Keaukaha swarms, a single specimen was submitted from Kauai. Further, a review of a cydnid first reported as "Genus? sp. A" in Howarth and Preston 2002 was also the same species. Specimens were forwarded to USDA-ARS-SEL for identification in 2015 but remained pending. With the assistance of Joe Eger, an identification was provided and confirmed by James N. Zahniser USDA-ARS-SEL after re-submitting additional specimens.

Fromundus biimpressus is known from South East Asia (China, Indonesia, Laos, Malaysia, Thailand, Vietnam). In 2004 it was discovered on Guam under similar circumstances, at lights during the night (Lis and Zack 2010).

Collection records: OAHU, Honolulu International Airport, 16.XII.1982, ex. light trap, coll: D. Preston, det. J.M. Matsunaga, IX.2017. **HAWAII**, Keaukaha, 12.X.2015, 19.X.2015, ex. swarming at school athletic field at night, coll. S. Chun,

det. J.N. Zahniser, 14.IX.2017. **KAUAI**, Kapaa, 22.X.2015, ex. at large, in home fumigated for termites, submitted by Aloha Termite, det. J.N. Matsunaga, IX.2017. Vouchers at HDOA.

Diaspididae
***Andaspis numerata* Brimblecombe**
NEW STATE RECORD

Stems of a reported dying *Hibiscus rosa-sinensis* plant initially thought to be weakened by disease, was further examined for the possibility of insect boring damage. Microscopic examination revealed the entire surfaces of the woody stems were covered in layers and layers of armored scales, reaching several millimeters thick. The layers were so thick that it appeared as if the armored scale coverings were the bark of the tree. An additional collection of this scale was found nearby several months later, however, it has not yet been reported outside of the Kapahulu, Honolulu, Oahu area. It can easily go undetected, camouflaged with the bark of woody plant stems.

Andaspis numerata Brimblecombe, identified by D.R. Miller on May 23, 2011, represents both a new Hawaii record and a new U.S. record. According to Miller (2011 pers. comm., 23 May), *A. numerata* has been intercepted from Samoa in Honolulu in 1931 on (?) *Agrostrophyllum rheineckianum* (Orchidaceae). It has also been intercepted in San Francisco in 1952 on *Hibiscus* sp.; and from Fiji at DC in 1956 on *Erythrina fusca* (Fabaceae) cuttings. *A. numerata* is distributed throughout Australasia (American Samoa, Australia, Fiji, Papua New Guinea, Tonga, Western Samoa) and India (García Morales et al. 2016) where it is a serious pest to tea plants (Das 1976).

Collection records: OAHU, Kapahulu, 23.III.2011, ex. *Hibiscus rosa-sinensis,* coll. M. Ko, det. D.R. Miller, 23.V.2011; Kapahulu, 18.VIII.2011, ex. *Hibiscus* sp. coll. M. Ko & C. Lao, det. J.N. Matsunaga, 30.VIII.2011; Kunia, 30.IV.2015, ex. *Sesbania tomentosa* stems, coll. J.N. Matsunaga, det. J.N. Matsunaga, 23.II.2016. Vouchers at HDOA.

***Aonidiella orientalis* (Newstead)**
First detection, unknown establishment

A single collection of this species was found infesting the fruits of a potted loulu palm plant (*Pritchardia* sp.) in a Waimanalo nursery in May 2009. Specimens were forwarded to D.R. Miller and identified as *Aonideilla orientalis* (Newstead), the Oriental scale. Upon subsequent surveys, no other infestations could be found. It is unknown if *A. orientalis* is established.

Collection records: OAHU, Waimanalo, 27.v.2009, ex. *Pritchardia* sp. fruits, coll. B. Azama, det. D.R. Miller, 2. IX.2009. Vouchers at HDOA.

***Fiorinia phantasma* Cockerell & Robinson**
New island records

Collection records: HAWAII, Kona, Keahole Agricultural Park, Hawaii, 7.II.2012, ex. *Chrysalidocarpus lutescens* foliage, coll. L. Larish. det. Kumashiro, 17.II.2012. **KAUAI,** Hanamaulu, 29.XI.2016, ex. *C. lutescens*, coll. L. Ishii, det. J.N. Matsunaga, 9.XII.2016. Vouchers at HDOA.

***Pseudaonidia trilobitiformis* (Green)**
New island record

Collection records: LANAI, Manele Bay, 18.VII.2012, ex. *Poncirus trifoliata*, coll. M. Fukada & C. Young, det. B. Kumashiro, 12.VII.2012. Vouchers at HDOA.

***Pseudaulacaspis pentagona* (Targioni-Tozzetti)**
New island records

Collection records: KAUAI, Kapaa, 13.VI.2008, ex. *Carica papaya* fruit, coll. R. Redfern, det. B. Kumashiro, 4.VIII.2008. **MAUI,** Haiku, 10.IX.2008, ex. *Carica papaya* fruit, coll. B. Yonahara, det. B. Kumashiro, 12.IX.2008. Vouchers at HDOA.

Kerriidae
***Paratachardina pseudolobata* Kondo & Gullan**
New island record

Collection records: MAUI, Wailuku, 18.V.2016, roadside landscaping, ex. stems of *Osteomeles anthyllidifolia* and *Dodonea viscosa*, coll. M. Fukada, det. J. N. Matsunaga, 26.VII.2016. Vouchers at HDOA.

Membracidae
***Stictopelta marmorata* Goding**
NEW STATE RECORD

Individual adult specimens were collected in Waianae Valley, Oahu, on three separate occasions, all attracted to light. Host plants in Hawaii remain unknown. This species occurs in the southwest United States and the Neotropics.

Collection records: Oahu, Waianae Valley, 31.III.2003, at light; coll. G. Imoto, det. S.I. McKamey, 9.IX.2009; Waianae Valley, 6.VI.2007, at light, coll. G. Imoto, det. B. Kumashiro, 9.IX.2009. Voucher at HDOA.

Miridae
***Kundakimuka queenslandica* Cassis**
NEW STATE RECORD

The 2 mm-long predaceous *Kundakimuka queenslandica* Cassis was discovered while looking for specimens of the leaf-tying moth, *Choreutis* sp. (Lepidoptera: Choreutidae), on *Ficus benjamina* and *F. retusa*. Specimens were found inside of leaves folded by *Choreutis* sp., and in several cases, a dead, early-instar *Choreutis* sp. was present. Specimens of *K. queenslandica* were first collected in May 2002 in Waimanalo, Oahu, however, remained unidentified until an additional collection in 2009. The September 2009 discovery was serendipitous, found while looking for the recent immigrant, *Apotomorhinus cribratus* (Coleoptera: Curculionidae).

In December 2010, T.J. Henry identified the predator as close to the species *Kundakimuka queenslandica* Cassis. In January 2011 G. Cassis confirmed this identification. *K. queenslandica* was described from specimens collected from Australia, where it preys on larvae of the moth *Neodrepta*

luteotactella (Walker) (Lepidoptera: Xyloryctidae) that infest the paperbark tree, *Melaleuca integrifolia*.

Collection records: OAHU, Waimanalo, 15.V.2002, ex. *Choreutis* sp. larvae feeding on *Ficus retusa* foliage, coll. W. Nagamine, det. W. Nagamine, 3.I.2010; Kaimuki, 16.IX.2009, on *Eugenia jambolana* fruit, coll. W. Nagamine, det. G. Cassis, 12.I.2011. Vouchers at HDOA.

***Polymerus testaceipes* Stal, 1860**
NEW STATE RECORD

Polymerus testaceipes was found infesting *Gerbera jamesonii* (gerbera daisy) cultivars in Volcano, Hawaii, causing significant damage to the flowers. Upon closer inspection, lygaeids, aphids, and thrips were also found feeding on the flowers at high densities, causing uneven opening, however, the mirid appeared to be a new species in Hawaii. Specimens were sent to USDA-ARS-SEL in January 2013 and identified by T.J. Henry in December 2014.

According to T.J. Henry, *Polymerus testaceipes* is a highly variable species distributed throughout the Neotropics and established in Florida. Recorded hosts include various Asteraceae species, *Borreria verticillata* (Rubiaceae), *Chenopodium quinoa* (Chenopodiaceae) (Logarzo et al. 2005), *Phaseolus* sp. (Fabaceae) (CABI 2015).

Collection records: HAWAII, Volcano, 27.IX.2012, ex. gerbera daisy, coll. S. Chun, det. T.J. Henry, 14.XII.2014. Voucher at HDOA.

Pentatomidae
***Bagrada hilaris* (Burmeister)**
New island records

Collection records: KAUAI, Kokee cabins, 5.IV.2017, ex. various crucifers (kale, broccoli raab, chard, etc.) in home garden, coll. W. Jacinto, L. Ishii, C. Kaneshige, det. J.N. Matsunaga, 10.IV.2017. **MOLOKAI,** Hoolehua, 14.IV.2017, ex. various mustard greens, coll. G. Teves, det. J.N. Matsunaga, 18.IV.2017. Vouchers at HDOA.

***Piezodorus oceanicus* (Montrouzier)**

Piezodorus oceanicus was first recorded as a new state record from Maui by Howarth and Preston (2007) as *P.* sp. nr. *grossi* Staddon, 1997. In a subsequent survey and report, this species was identified and listed by Howarth et al. 2012 as *P. hyberni* (Gmelin, 1790).

A separate collection from Oahu in 2009 was independently sent by HDOA to Hemiptera specialist T.J. Henry, who initially identified the Oahu species as *Piezodorus hyberni*, but after closer examination and dissection confirmed that the Oahu population was in fact *P. grossi* Staddon and not *P. hyberni*. The Maui and Oahu populations were compared and verified as the same species. *P. grossi* Staddon, 1997 was synonymized under *P. oceanicus* (Montrouzier, 1865) by Cassis and Gross (2002) and therefore *P. oceanicus* is the correct and revised name for the species established on Oahu and Maui.

Members of *Piezodorus* feed on legumes and some species are significant agricultural pests. Historically, there was much confusion on the identity of *P. oceanicus* as it is difficult to separate many of these closely related species (Bundy et al. 2018).

Collection records: MAUI, Kahului Airport area, three collections in 2006 using fogging of *Macroptillium atropurpureum*, gas aspirator and sticky trap (Howarth et al. 2012), vouchers at BPBM. **OAHU,** Moanalua, 19.I.2009, ex. *Alysicarpus vaginalis,* coll. D. Tsuda, det. T.J. Henry, 7.X.2009, vouchers at HDOA.

Pseudococcidae
***Antonina pretiosa* Ferris**
New island record

Collection records: MAUI, Kula, 3.VII.2010, ex. *Bambusa* sp. stems, coll. E. Rezents, det. J.N. Matsunaga, 26.VII.2010. Vouchers at HDOA.

***Pseudococcus* sp. A (nr. *aurantiacus* Williams and *cryptus* Hempel)**
NEW STATE RECORD

Specimens of an unidentified *Pseudococcus* sp. A were collected from Manila palm on Oahu and betel nut palm on Hawaii within the span of four months in 2010. Populations appeared small, with only a few mature females and several immatures found on each plant. Females sat upon ovisacs similar to those of *P. cryptus*. It did not appear to be causing any major damage to host plants, however, in each case, individuals were commonly surrounded by other palm pests, including *Fiorinia phantasma* and *Aleurotrachelus trachoides*.

Specimens were identified by D.R. Miller as *Pseudococcus* sp., apparently undescribed. According to Miller, "These specimens are very similar to *P. aurantiacus* Williams and might even be that species, but several details don't fit. There are many more oral collars and multilocular pores on *P. aurantiacus* and the oral rims seem to be more consistently placed." In these specimens, "the 'oral rims' sometimes are without obvious rims. It is also similar to *P. cryptus*, but has more oral collars on the thorax and head. This most likely is an introduced species, probably from Asian Pacific and needs further study." Palm trees are commonly shipped between islands for landscaping purposes, and was the likely pathway between the two islands. This represents both a new Hawaii and U.S. record.

Collection records: OAHU, Kunia, 27.II.2010, ex. *Veitchia merrillii* foliage, coll. J.N. Matsunaga, det. D.R. Miller, 30.IX.2010; Kunia, 4.II.2011, ex. *Cocos nucifera* foliage, coll. J.N. Matsunaga, det. J.N. Matsunaga, 25.II.2011. **HAWAII**, Panaewa, 10.VI.2010, ex. *Areca catechu* foliage, coll. S. Cabral, det. D.R. Miller, 30.IX.2010. Vouchers at HDOA.

***Vryburgia brevicruris* (McKenzie)**
NEW STATE RECORD

Mealybug masses were observed and collected off *Senecio*

madagascariensis plant roots from around Hale Pohaku, off Mauna Kea access road (~9,300 ft elevation). The infestation was very low, and only a few mature females were found. Specimens were verified by D.R. Miller as *Vryburgia brevicruris* (McKenzie), a species typically found on aerial parts of its hosts. This species has previously been intercepted in Hawaii from *Caralluma nebrowni* (Asclepiadaceae) imported from California (holotype female), but has never been collected in the field until now.

Collection records: HAWAII, Mauna Kea, Hale Pohaku, ~ 2,835 m elev., 31.V.2011, ex. *Senecio madagascariensis* roots, coll. J.N. Matsunaga, det. D.R. Miller, 8.II.2012; Mauna Kea, Hale Pohaku, ~ 2,835 m elev., 25.I.2013; ex. *S. madagascariensis* roots, coll. J.N. Matsunaga, P. Conant, C. Young, det. J.N. Matsunaga II.2013. Vouchers at HDOA.

Psyllidae

***Cacopsylla tobirae* (Miyatake)**

NEW STATE RECORD

A suspected new psyllid infesting Japanese pittosporum (*Pittosporum tobira*) on the University of Hawaii campus in Manoa, Oahu was reported to HDOA in July 2013. Subsequent surveys found several sites with heavy infestations around the Pawaa, Honolulu areas on *P. tobira* plants. Specimens were tentatively identified as *Cacopsylla tobirae* (Miyatake) (Conant 2013) and forwarded to USDA-ARS-SEL quickly after. Identifiers at USDA-ARS-SEL could not provide a species identification and thus these samples remained unidentified.

A publication by Bertone in 2016 revealed that North Carolina State University was able to confirm the identity of *C. tobirae* collected in North Carolina in 2014 with the help of USDA-ARS-SEL. With this publication, additional samples collected in 2013 were resubmitted to USDA-ARS-SEL in June, 2017 and quickly confirmed as *C. tobirae* by Cheryl O'Donnell shortly after.

Cacopsylla tobirae, a native of Asia, is an invasive pest species of the common ornamental Japanese pittosporum plants and has been recorded from California (Percy et al. 2012), North Carolina (Bertone 2016), and now Hawaii. In 2013, severe leaf curl and stunting of terminal branches, as well as extreme sooty mold growth was seen on infested plants at several sites around urban Honolulu. Follow-up surveys in 2017 revealed that *P. tobira* plants at three of four sites with infestations in 2013 were removed, though it is uncertain why. It can be speculated that the infestation was so severe that plants were either dying or too hard to maintain. However, the original site at University of Hawaii Manoa maintained the plants. A much lower population density was found with the discovery of a pupal endoparasitoid. In May 2017, a species of *Pysllaephagus* (Hymenoptera: Encyrtidae) was found parasitizing the pupae at rates over 60%. This species is pending identification, but also appears to be a new state record for Hawaii.

Collection records: OAHU, Manoa, University of Hawaii campus, 8.VII.2013, ex. *Pittosporum tobira* foliage, coll. S. Nelson, det. W. Nagamine, 8.VII.2013; Pawaa, 9.VII.2013; ex. *P. tobira* foliage, coll. M. Tauyan, det. W. Nagamine, 9.VII.2013, conf. C. O'Donnell, 8.VI.2017; Manoa, University of Hawaii campus, 31.V.2017, ex. *P. tobira* foliage, coll. J.N. Matsunaga & K. Wong, det. J.N. Matsunaga, 31.V.2017. Vouchers at HDOA.

Rhyparochromidae

***Horridipamera inconspicua* (Dallas)**

NEW STATE RECORD

Horridipamera inconspicua is widespread in the tropics from the Ethiopian Region to South Asia and Japan. It is sometimes abundant in its preferred habitat, which is early successional disturbed grassland mixed with Euphorbiaceae weeds. Its hosts are unknown, but it presumably prefers grass seeds (Slater and Zheng, 1984).

Collection records: HAWAII, Laupahoehoe, 27.X.2008, ex. mixed lawn grass (bermuda, manienie, seashore paspalum, Tiffton), coll. Art Hollinger; Laupahoehoe, 7.VII.2009, ex. *Euphorbia hirta*, coll. R. Hamasaki, det. T.J. Henry, 18.V.2011; Laupahoehoe, 7.X. 2009, on patio floor-attracted to light, coll. R. Hamasaki. Vouchers at HDOA.

Insecta: Hymenoptera

Agaonidae

***Josephiella* n. sp. A** (apparently undescribed)

NEW STATE RECORD

An agaonid wasp new to science was discovered causing galls on the stems of *Ficus microcarpa*. Terminal stems of affected trees appeared unhealthy with a sparse foliar canopy. Initial observers of this damage were under the assumption that the same species which causes leaf galling on *F. microcarpa* (*Josephiella microcarpae*) was also causing the galling on stems of the same plant. However, closer examination of the stem-galling wasps showed that while both the leaf-galler and the stem-galler are morphologically similar in many ways, this in fact may be a different species. Both leaf and stem-gallers can be found on the same plant. Jean-Yves Rasplus, co-author of the leaf-galling *J. microcarpae*, agreed that this could be an undescribed species and is currently working on its species description.

Subsequent to the initial discovery of this stem-galler on Oahu in 2012, infested *F. microcarpa* were quickly noted on Hawaii and Maui. In May, 2016, galled *F. microcarpa* stems with exit holes were collected from Molokai and in July, 2017, from Kauai. However, material from these islands were too old and no adults could be recovered. Therefore, we do not list the collection data below, and in the list of new species we noted a question mark next to these islands until the adults are confirmed. *Josephiella* n. sp. A, along with *Josephiella microcarpae*, lobate lac scale (*Paratarchardina pseudolobata*), and other ficus-feeding species has contributed to the weakening of large banyan trees on Oahu.

Collection records: OAHU, Manoa, 13.VII.2012, ex. *Ficus microcarpa* stems, coll. D. Hulbert, det. J.-Y. Rasplus, 6.X.2012. **HAWAII**, Hilo, 30.VII.2012, ex. *F. microcarpa* stems, coll. C. Hirayama, L. Larish & S. Chun, det. B. Kumashiro, VIII.2012. **MAUI**, Wailuku, 6.VIII.2012, ex. *F. microcarpa* stems, coll. M. Fukada, VIII.2012. Vouchers at HDOA.

Aphelinidae
***Encarsia cubensis* Gahan**
NEW STATE RECORD

Specimens of *Encarsia cubensis* were first reared from *Aleurotrachelus trachoides* (Hemiptera: Aleyrodidae) infesting pepper plant (*Capsicum* sp.) foliage in Hilo in 2008. *E. cubensis* is a parasitoid of various whitefly species, including *A. trachoides* and *Aleurothrixis floccosus* (Noyes 2014), two economically important pests in Hawaii.

Collection records: HAWAII, Hilo, Waiakea Uka, 21.V.2008, ex. *Aleurotrachelus trachoides* on *Capsicum* sp. foliage, coll. S. Matayoshi, det. G.A. Evans, 21.X.2008; Hilo, Waiakea Uka, 28.IX.2009, ex. *A. trachoides* on *Capsicum* sp., coll. S. Matayoshi. **OAHU**, Makiki, 17.IV.2009, ex. prob. *A. trachoides*, coll. D. Oishi, C. Young & M. Lee, det. W. Nagamine, IV.2009. Vouchers at HDOA.

***Encarsia diaspidicola* Silvestri**
NEW STATE RECORD

Pest calls regarding high infestations of *Pseudaulacaspis pentagona* attacking papaya trees in Manoa were reported in June, 2012. Samples of the scales were taken and held for emergence of any parasitoids that may be present. Unexpectedly, a species of *Encarsia* emerged, and was tentatively identified as *E. diaspidicola* Silvestri, and subsequently confirmed by G.A. Evans. Evans also revisited specimens which were reared from sago palm fronds infested with *Aulacapis yasumatsui* and other scale insects in 2008. He identified these as *E. diaspidicola* in 2012.

This was surprising not only because it would constitute a new record for Hawaii, but because *Encarsia diaspidicola* was a candidate biological control agent of *P. pentagona* (Diaspididae) in Hawaii by USDA-ARS-PBARC entomologists, and had not yet been released (Neumann et al. 2010). Shortly after the Oahu discovery, lab-reared *E. diaspidicola* were released on Hawaii island in papaya fields to control the *P. pentagona* infestations devastating this crop in Hawaii (Follett et al. 2015).

Collection records: OAHU, Hawaii Loa Ridge, 3.XI.2008, ex. reared from *Cycas revoluta* infested with *Aulacaspis yasumatsui* and possibly other scale insects, coll. J. (Garcia) Matsunaga, det. G.A. Evans, 2012; Manoa, 5.XI.2012, ex. *Pseudaulacaspis pentagona,* on *Carica papaya*, coll. W. Nagamine, det. G. A. Evans, 16.II.2013. Vouchers at HDOA.

Encyrtidae
***Psyllaephagus bliteus* Riek**
New island record

Collection records: OAHU, Waimanalo, 24.II.2011, ex. *Glycaspis brimblecombei* on *E. camaldulensis,* coll. W. Nagamine, det. W. Nagamine, 5.V.2011. Vouchers at HDOA.

***Psyllaephagus* sp. A** (not *P. blastopsyllae*)
NEW STATE RECORD
See ***Cacopsylla tobirae* (Miyatake)**
Collection records: OAHU, Manoa, University of Hawaii campus, 31.V.2017, ex. *Cacopsylla tobirae* pupae, coll. J.N. Matsunaga & K. Wong, det. J.N. Matsunaga/M. Ramadan, VII.2017; Manoa, University of Hawaii campus, 21.VI.2017, ex. *C. tobirae* pupae, coll. J. Ocenar & K. Wong, det. M. Ramadan, VII.2017 (Identification to species pending). Vouchers at HDOA.

Eulophidae
***Cirrospilus* sp. A** (not *C. vittatus*)
NEW STATE RECORD

When blister galls began forming on lemon-scented gum tree foliage in Aiea, Oahu, leaves were collected and held for the emergence of potential gall-forming insects. What was discovered turned out to be an assemblage of about six separate species. Additional samples from Honolulu produced similar results. All samples of Oahu *Corymbia citriodora* blister galls, produced *Cirrospilus* sp. A, *Epichrysocharis burwelli* (presumed gall former), and four additional species of unidentified Hymenoptera (Chalcidoidea). *Cirrospilus* sp. A is possibly a parasitoid species; however, it is unknown which of the five other species found in the leaf material may be its host. *C. vittatus* is the only other established species of *Cirrospilus* recorded in Hawaii (Kauai, Maui, and Oahu) but is known to attack *Cremastobombycia lantanella* (Lepidoptera: Gracillariidae). The *Cirrospilus* reared from *C. citriodora* blister galls can be described as yellow, slender-bodied, highly patterned, with a somewhat iridescent thorax. Also see ***Epichrysocharis burwelli***.

Collection records: OAHU, Aiea, 1.IV.2001, ex. *Corymbia citriodora* foliage with blister galls, coll. R. Heu. Aiea, 12.VII.2005, ex. *C. citriodora* foliage with blister galls, coll. R. Heu; Honolulu, Tantalus, 19.VII.2005, ex. *C. citriodora* foliage with blister galls, coll. R. Heu, M. Chun, & W. Nagamine. All det. J. La Salle, VI.13.2005.

?***Closterocerus* sp. A** (not *C. utahensis*)
NEW STATE RECORD

Eucalyptus sp. foliage with blister galls collected from West Maui was held for the emergence of gall formers. At least two species of Tetrastichinae wasps emerged- a possible *Closterocerus* sp. A and an *Ophelimus* sp. A. According to La Salle (2005 pers. comm., 14 June), this possible *Closterocerus* sp. A is most likely a parasitoid of the *Ophelimus* sp. A, which is probably the gall former on this *Eucalyptus* sp. material. On Oahu, *Closterocerus utahensis* has been recorded attacking species of *Liriomyza* (Diptera: Agromyzidae). Also see ***Ophe-***

***limus* sp. A.**

Collection records: MAUI, Honokawai, 10.V.2005, ex. *Eucalyptus* sp. foliage with blister galls, coll. M. Fukada and A. Shishido; Camp Maluhia, 16.VIII.2005, ex. *Eucalyptus* sp. foliage with blister galls, coll. M. Fukada. All det. J. La Salle, VI.13.2005.

***Epichrysocharis burwelli* Schauff**
New island record

Epichrysocharis burwelli is a blister gall former on lemon-scented gum (*Corymbia citriodora*) leaves. It was originally described from California in 2000 (Schauff & Garrison 2000), but is most likely native to Australia. While *E. burwelli* is a presumed gall former in the *C. citriodora* material from Oahu, it may not be the only gall former of the six species which emerged from the same material. Also see ***Cirrospilus* sp. A.**

Collection records: OAHU, Aiea, IV.2001, ex. *Corymbia citriodora* galled foliage, coll. R. Heu; Aiea, 12.VII.2005, ex. *C. citriodora* foliage with blister galls, coll. R. Heu; Honolulu, Tantalus, 19.VII.2005, ex. *C. citriodora* galled foliage with blister galls, coll. R. Heu, M. Chun, & W. Nagamine. **MAUI**, 10.V.2005, ex. *C. citridora* foliage with blister galls, coll. M. Fukada & A. Shishido. All det. J. La Salle, VI.13.2005.

***Ophelimus* sp. A** (maybe not *O. eucalypti*, not *O. maskelli*)
NEW STATE RECORD

Ophelimus sp. A adults emerged from blister galls of *Eucalyptus* sp. foliage collected on Maui. La Salle speculates that this is most likely the gall former from this species of *Eucalyptus*. This is not *O. maskelli* (a known gall former on *Eucalyptus* causing problems in other areas of the world) and it may not be *O. eucalylpti*- According to La Salle (2005, pers. comm. 24 August), the taxonomy of these small gall forming eulophids on *Eucalyptus* spp. is unresolved, with most of the species (and probably some of the genera) being undescribed. Also see **?*Closterocerus* sp. A.**

Collection records: MAUI, Camp Maluhia, 16.VIII.2005, ex. *Eucalyptus* sp. foliage with blister galls, coll. M. Fukada, det. J. La Salle, 24.VIII.2005.

Formicidae
***Monomorium dichroum* Forel**
Revised identification, new island record

Previously identified as *Monomorium bicolor* complex by Brian E. Heterick in 2008, Heterick confirmed that the species in Hawaii is *Monomorium dichroum* in January 2016. Antweb lists specimens from Haleakala National Park, Maui (*M. bicolor* complex), while Starr and Starr (2011) reported specimens (*M. bicolor* complex) from Molokai and Kahoolawe.

Collection records: OAHU, Moanalua, Pearl Harbor Naval Base NEX, 30.VI.2005, ex. red imported fire ant baited vial, coll. T. Suh. **HAWAII,** Kawaihae Pier, 14.VII.2005, ex. red imported fire ant baited vial, coll. P. Conant. **KAUAI**, Kekaha, Kikialoa Harbor, 26.VI.2007, ex. red imported fire ant baited vial, coll. C. Kaneshige & E.J. Garcia, etc. B.E. Heterick, I.2016. **MOLOKAI**, Hoolehua Airport, 30.X.2015, ex. red imported fire ant baited vial, coll. B. Dietrich et al. Vouchers at HDOA.

***Pheidole navigans* (= *moerens*) Forel**
New island record

This species was previously reported as *Pheidole moerens* Wheeler in Gruner et al. (2003) from Hawaii and by Starr and Starr (2013) from Maui. Sarnat et al. 2015 removed *Pheidole navigans* Forel, 1901 from synonymy with *P. moerens* after examining type specimens, as well as representatives from Hawaii. A single minor worker was collected from Lihue, Kauai at a rental car parking lot near the Lihue Airport (13.X.2015, ex. peanut butter baited vial, coll. B. Dietrich, voucher at HDOA), however, we cannot confirm *P. navigans* without additional specimens including major workers. We report the following Oahu collections as a new island record.

Collection records: OAHU, Mililani, 3.X.2008, at large at a nursery with plants from Hawaii island, coll. R. Change, det. C. Young, 6.X.2008; Waimanalo, 21.VIII.2013, peanut butter baited vial at nursery, coll. D. Arakaki, det. C. Young, 22.VIII.2013. Vouchers at HDOA.

***Trichomyrmex destructor* (Jerdon) "dark form"**
Record of note/Establishment uncertain

Ants collected from Ford Island by a private pest control company were somewhat morphologically similar to local *Trichomyrmex* (= *Monomorium*) *destructor* populations, however, with minor differences and darker coloration. Individuals from this collection site were also similar to *M. mayri* (not established in Hawaii), however, DNA analysis (using COI) by R. Clouse and M. Janda placed this population within a *T. destructor* clade which falls between a *T. destructor* clade from Madagascar and a *T. destructor* clade from Melanesia, India, and Palau.

While this population falls within *T. destructor,* it is important to note that this potentially represents a recent and separate invasion of *T. destructor* to Hawaii. Further DNA analysis of local *T. destructor* populations should be done to verify this conclusion, however, the location and cicumstances of the infestation in addition to morphological differences point to a new introduction of a very invasive pest ant species in Hawaii. Vouchers at HDOA.

Collection records: OAHU, Ford Island, 12.X.2012, vienna sausage baited vial, coll. C. Agena, det. R. Clouse and M. Janda, 22.II.2013. Vouchers at HDOA.

Megachilidae
***Megachile lanata* (Fabricius)**
New island records

Collection records: MOLOKAI, Hoolehua, 14.XI.2008, ex. at large, at residence; coll. E. Lani, det. K. Magnacca. **KAUAI,** Kalaheo, 12.IX.2011, ex. at large, at residence, coll.

D. Silva. Kalaheo, 31.X.2011, ex. at large, at residence, coll. D. Silva, det. K. Magnacca via photos. Vouchers at HDOA.

Vespidae
***Polistes dominula* (Christ)**
Establishment uncertain

Adults of the European paper wasp were first collected in the field in June, 2006 by the City and County of Honolulu Parks and Recreation personnel on Oahu (HDOA 2007). Workers were stung as they were trimming trees at Keehi Lagoon Beach Park, where a nest was subsequently found and collected from one of the trees. Keehi Lagoon Beach Park is in close proximity to the Honolulu International Airport and the Honolulu Harbor, which are both less than a mile away. Surveys following this discovery did not reveal additional adult wasps or nests.

A second collection of *P. dominula* from Volcano, Hawaii was reported by David Foote, U.S. Geological Survey, Pacific Island Ecosystems Research Center. A student on a school bus was stung by aggressive European paper wasps which flew in through the bus' open windows. A nest was found attached to the outside of one of the windows.

Finally, a third collection of the European paper wasp was made when a nest was discovered attached to the undercarriage of an imported firetruck in Kahului after aggressive wasps were reported to be flying around the truck.

Polistes dominula adults have been intercepted at Hawaii ports of entry on numerous occasions, commonly hitchhiking in shipping containers, in Christmas tree shipments, and in nests attached to vehicles coming from the western mainland U.S. The three collections of this species have been found at large, though at circumstances that may not particularly confirm establishment. After nests were contained from all three collections, there have been no known reports of the European paper wasp known to the authors. The European paper wasp is known from cooler, seasonal climates. It is possible that this species exists in small numbers within similar habitats to *Vespula pennsylvanica*, and therefore, the two yellow and black patterned wasps could easily be misidentified if only flying in the distance. If the European paper wasp becomes well established, there may be concerns for native bees and lepidoptera, as well as its aggressive nature and propensity to sting people.

Collection records: OAHU, Keehi Lagoon Park, 16.VI.2006, at large around nest in tree, coll. K. Bernie, det. D. Oishi and B. Kumashiro, VI.2006. **MAUI,** Kahului, 26.VIII.2008, at large around nest on a firetruck shipped from San Diego, California, coll. A. Shishido, det. B. Kumashiro, VIII.2008. Vouchers at HDOA. **HAWAII,** Volcano, 2008, flying around a nest attached to the window of a school bus, coll. D. Foote.

***Polistes jokahamae* Radoszkowski**
Previous misidentification & Synonym

According to Carpenter (2008) *Polistes macaensis* (Fabricius), now considered a synonym of *P. olivaceus* (De Geer), was recorded from Hawaii in the 1800s. However, a review by Carpenter showed that *P. macaensis* was a misidentification for *P. jokahamae* Radoszkowski. In addition, *P. jadwigae* Dall Torre as listed by Nishida 2002 is a synonym of *P. jokahamae*. J.M. Carpenter reviewed HDOA's collection of Vespinae specimens and the misidentification of *Polistes jokahamae* under *P. olivaceus*. Adults of *P. jokahamae* correctly identified by Carpenter were collected on Oahu as far back as 1905, and on Hawaii island in 1988. This paper wasp is native from India to Japan and has been introduced to many Pacific islands by commerce. Vouchers at HDOA.

***Vespula alascensis* (Packard)**
Revised name

Close morphological and molecular evaluation of specimens identified as *Vespula vulgaris* from Europe, New Zealand, Australia, and the U.S. by Carpenter and Glare (2010) concluded that the N. American *V. alascensis* was previously misidentified as *V. vulgaris*, its close Eurasian counterpart. Hawaii adults previously identified as *Vespula vulgaris* were collected from Maui as far back as 1973 and verified by Carpenter as *V. alascensis* in 2011. This Hawaii population arrived from Northwestern North America probably as hibernating queens in Christmas tree shipments. Vouchers at HDOA.

Insecta: Lepidoptera

Choreutidae
***Choreutis* sp. A**
New island records

Collection records: HAWAII, Kohala, 31.V.2013, ex. *Ficus binnendijkii* foliage, coll. R. Hamasaki, det. B. Kumashiro. **KAUAI**, Hanapepe, 26.IV.2017 ex. *Ficus* prob. *celebensis* foliage, coll. E.J. Garcia, det. J.N. Matsunaga. Vouchers at HDOA.

Erebidae: Arctiinae
***Secusio extensa* (Butler)**
Biological control release, NEW STATE RECORD

Secusio extensa was imported by HDOA to control the invasive weed *Senecio madagascariensis* (fireweed) in the Hawaiian Islands. After thirteen years of research and permit applications, *S. extensa* was released on Maui and Hawaii Islands in 2013. This agent is now established on both islands.

Secusio extensa larvae were collected at the Palehua-Palikea area, Oahu, on *Delairea odorata* vines being eradicated from the area. This collection was the first on Oahu, as this agent was not purposefully released on that island. Establishment is questionable, as Oahu does not have large concentrations of *S. extensa*'s host plants (*S. madagascariensis* and *Delairea odorata*). HDOA and Pulama Lanai have conducted releases on Lanai to control fireweed in the area, though establishment has not been confirmed. There have also been reports *S. extensa* sightings on Kahoolawe; however, no specimens have been obtained.

Geometridae
Undetermined genus sp. A
NEW STATE RECORD

A small (1 cm wingspan) pale green species of an inch worm.

Collection records: OAHU, Honolulu, Kalihi Valley, 5.VI.2007, 120 m, 21˚20.7'N, 157˚51.6'W, at light, coll. F.G. Howarth, 1 male; same data except 5.VI.2011, 2 females. Vouchers at HDOA.

Lycaenidae
***Zizina otis* (Fabricius)**
New island records

Collection records: HAWAII, Paukaa, 25.V.2016, at large, at grassy field, coll. S. Chun., det. J.N. Matsunaga. **KAUAI,** Lihue, 7.X.2009, at large coll. L. Ishii, det. B. Kumashiro; Port Allen, 23.X.2015, at large, flying around weeds, at port/pier, coll. J.N. Matsunaga, det. J.N. Matsunaga. Vouchers at HDOA.

Pieridae
***Phoebis agarithe* (Boisduval, 1836)**
New island record

Collection records: KAUAI, Wahiawa Bay, 8.III.2006, at large, coll. C. Kaneshige, det. B. Kumashiro.

Insecta: Orthoptera

***Nanixipha nahoa* Otte, Shaw & Carvalho**
New island record

This species has also been documented on Maui through digital macro photography, however, no specimens have been vouchered that are known to the authors.

Collection records: OAHU, Pawaa, 9.X.2014, at large, coll. J.N. Matsunaga, det. B. Kumashiro. Voucher at HDOA.

Insecta: Psocoptera

Philotarsidae
***Haplophallus* sp A & B.**

Gruner (2004) and Howarth et al. (2012) report *Haplophallus* species from Molokai and Maui respectively. It is necessary to compare voucher specimens from the two islands to determine whether these represent the same or separate species.

Insecta: Thysanoptera

Thripidae
***Frankliniella occidentalis* (Pergande)**
New strain record "invasive greenhouse/glasshouse strain"

Two farms on Hawaii island reported extremely heavy damage and high losses by thrips feeding to various plants and flowers, including jade vine, crown flower, chrysanthemum, and gerbera daisies in the summer of 2010. According to the growers, these thrips were exhibiting atypical pesticide resistance. Upon initial examination, these thrips appeared to have minute morphological differences from than typical *F. occidentalis* in Hawaii, and subsequently specimens were forwarded to USDA-ARS-SEL for identification assistance. Steve Nakahara identified the specimens as mostly *F. occidentalis*, with some individuals exhibiting slight differences and informed us of a study by Rugman-Jones et al. (2010) indicating that Western flower thrips, *F. occidentalis*, is a complex of two cryptic species (western flower thripsL and western flower thripsG) needing further study and species name revisions. Through nuclear-mitochondrial barcoding, the authors discovered two distinct genetic entities, morphologically similar, and sometimes found on the same plants. Additional specimens from these collections were forwarded to authors Paul Rugman-Jones and Mark Hoddle for DNA analysis and subsequently all returned with as *Frankliniella occidentalis*, the invasive greenhouse/glasshouse strain (western flower thripsG). *Frankliniella occidentalis* has been recorded in Hawaii since 1966, however, this is the first record of the invasive greenhouse/glasshouse strain.

Collection records: HAWAII, Panaewa Ag Lots, 5.V.2010, ex. *Calotropis gigantea* flowers, coll. S. Cabral; Panaewa, 3.VI.2010, ex. *Chrysanthemum* flowers, coll. S. Cabral; Panaewa Ag Lots, 4.VI.2010, ex. *Gerbera* flowers, coll. S. Cabral. All identified as *Frankliniella occidentalis* and *F.* prob. *occidentalis* by S. Nakahara, 28.IX.2010 (morphological identification).

***Holothrips* sp. A**
NEW STATE RECORD
Collection records: OAHU, Kaneohe, Hoomaluhia Botanical Garden, 1.VII.2009, ex. *Sabal texana* seeds, coll. M. Lee and R. Heu, det. S. Nakahara, 20.VIII.2009. Voucher at U.S. National Entomological Collection.

Insecta: Thysanura

Lepismatidae
***Lepisma saccharina* Linnaeus**
Establishment uncertain

The blue silverfish or common silverfish has been previously reported in Hawaii, but the earlier records were apparently based on misidentifications of *Ctenolepisma longicaudatum* (Escherich, 1905) (Zimmerman 1948a; Nishida 2002). *L. saccharina* is easily distinguished from *C. longicaudata* in life by its smaller size (body length 5–9 mm), shorter caudal filaments (a little longer than one half abdominal length), uniform dark slate-blue dorsal color, and quicker movements. In *C. longicaudata*, the body length is 10–13 mm; the caudal filaments are longer than the abdomen; the dorsal scales are silvery gray and often mottled; and its movements are slower and more directed towards cover. Additional diagnostic characters for *L. saccharina* are smooth macrosetae, caudal tergite slightly longer than wide with a truncate or slightly rounded hind margin, terminal segment of labial palpus large and wider than long, and presence of a group of about three macrosetae near the posterior margin along the midline of each abdominal sternite, which is far removed from the lateral group of ventral macrosetae (Wygodzinsky 1972). A single colony of

this species was found in a container of old cat food, which had been in Hawaii for several years. No further specimens have been found, and the species may not have established.

Collection records: OAHU, Honolulu, Kalihi Valley, 21˚20.7‘ N, 157˚51.6‘ W, 7.II.2010, 120 m, ex. container of old dry cat food, in house, coll. F.G. Howarth, 25 specimens, det. F. G. Howarth, 2010.

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Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002.

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
ARACHNIDA: ACARI			
Cunaxidae			
Pulaeus nr. *glebulentus* Den Heyer, 1979	1998	Mi	Nishida and Beardsley 2002
Pulaeus sp. #1	1998	Mi	Nishida and Beardsley 2002
Pulaeus sp. #2	1998	Mi	Nishida and Beardsley 2002
Eriophyidae			
Aceria guerreronis Keifer, 1965	2000	Ka, Ma, Mo, Oa	NSR+
Phyllocoptes bougainvilleae Keifer, 1959	1999	Ha, Ma	Kumashiro et al. 2002; NIR+
Galumnatidae			
Pergalumna bryani (Jacot, 1934)	1999	Ma	Howarth and Preston 2002
Knemidokoptidae			
Knemidokoptes jamaicensis Turk, 1950	2009?	Ha	Gaudioso et al. 2009
Pionidae			
Piona lapointei Smith & Cook, 2004	1997	Ha, Oa	Lapointe 2002; Smith and Cook 2004
Stigmaeidae			
Ledermuelleriopsis plumosus Willmann, 1951	1991	Ka	Swift and Goff 2001

1 = Island distribution: Ha=Hawaii, Ka=Kauai, Kh=Kahoolawe, Ku=Kure, Ln=Lanai, Ma=Maui, Mi=Midway, Mo=Molokai, Ne=Necker, Oa=Oahu
+ = Indicates accompanying text in Collection Data and New Record Summaries section
r = Biological control release. NIR = New Island Record. NSR = New State Record

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Varroidae			
Varroa destructor Anderson & Trueman, 2000	2007	Ha, Oa	HDOA 2008; Ramadan et al. 2008
Veigaiidae			
Gamasolaelaps whartoni (Farrier, 1957)	1991	Ka	Swift and Goff 2001
ARACHNIDA: ARANEAE			
Linyphiidae			
Erigone bifurca Locket, 1982	2003	Ha	Krushelnycky et al. 2013
Erigone fradeorum (Berland, 1932)	2002–2003	Ma	Krushelnycky et al. 2007
Undetermined Genus sp. A	2002–2003	Ma	Krushelnycky et al. 2007
Lycosidae			
Hogna crispipes (L. Koch, 1877)	1988	Ka, Ma, Oa	Howarth et al. 2012; NIR[+]
Salticidae			
Habronatus pyrrithrix (Chamberlin, 1924)	2010	Oa	Krushelnycky et al. 2013
Hakka himeshimensis Doenitz & Strand, 1906	1923	Ha, Ne	Berry and Proszynski 2001
Myrmarachne nigella Simon, 1901	2009	Oa	Krushelnycky et al. 2013
Pellenes sp. A	1995	Ha	Proszynski 2002- Single specimen, Est.?
Pseudicius sp. A	2012	Oa	Krushelnycky et al. 2013
Ptocasius sp. A	1966	Oa	Proszynski 2002- Single specimen, Est.?

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Theridiidae			
Steatoda capensis Hann, 1990	2002	Ha, Oa	Krushelnycky et al. 2013
ENTOGNATHA: COLLEMBOLA			
Hypogastruridae			
Brachystomella insulae Najt & Thibaud, 1988	2004	Ha	Krushelnycky et al. 2013
Brachystomella sp. A	2004	Ha	Krushelnycky et al. 2013
Isotomidae			
Cryptopygus benhami Christiansen & Bellinger, 1980	2002–2003	Ma	Krushelnycky et al. 2007
Folsomides angularis (Axelson, 1905)	2002	Ha	Krushelnycky et al. 2013
INSECTA: COLEOPTERA			
Aderidae			
Xylophilus cf sp. A	2000	Ma	Howarth et al. 2012
Anthicidae			
Cyclodinus mundulus (Sharp, 1885)	?	Oa	Chandler 2005
Anthribidae			
Eucorynus crassicornis (Fabricius, 1801)	2005	Oa	NSR^{+}
Bostrichidae			
Heterobostrychus hamatipennis (Lesne, 1895)	2003	Oa	HDOA 2004

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Callirhipidae			
Callirhipis robusta Waterhouse, 1877	1989	Oa	Samuelson 2006a
Carabidae			
Agonum muelleri (Herbst, 1784)	2006	Ha	Liebherr et al. 2009
Trechus obtusus Erichson	1998	Ha, Ma	Liebherr and Takumi 2002; Evenhuis and Imada 2013
Cerambycidae			
Acalolepta aesthetica (Olliff, 1890)	2009	Ha	Conant 2013
Cerylonidae			
Ceryloninae: Undetermined genus sp. A	~2000	Oa	Preston et al. 2007
Chrysomelidae			
Altica carinata (Germar, 1824)	2002–2003	Ma	Krushelnycky et al. 2007- single specimen only
Diabrotica balteata LeConte, 1865	2008	Ma	HDOA 2010a
Specularius impressithorax (Pic, 1932)	2001	Ha, Ka, Kh, Ma, Oa	HDOA 2004; Samuelson 2006b
Trachymela sloanei (Blackburn, 1896)	2011	Ma, Oa	Matsunaga 2013b[+]
Clambidae			
Undetermined genus sp. A	1991	Ka, Ma	Kumashiro et al. 2002; Howarth and Preston 2002[+]
Coccinellidae			
Cycloneda sanguinea (Linnaeus, 1763)	1992	Oa	Kumashiro et al. 2002

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Diomus sp. A	2002–2003	Ma	Krushelnycky et al. 2007
Cryptophagidae			
?*Cryptophagus* sp.	2002–2003	Ma	Krushelnycky et al. 2007
Curculionidae			
Apotomorhinus cribratus Boheman, 1844	2009	Oa	HDOA 2010a
Atrichonotus taeniatulus (Berg, 1881)	2009	Ha	NSR[+]
Blosyrus asellus (Olivier, 1807)	2009	Ha, Ka, Oa	Heu et al. 2009; HDOA 2010a; McQuate et al. 2016
Cathormiocerus curvipes (Wollaston, 1854)	2013	Ma	Ewing and Krushelnycky 2014
Gonipterus scutellatus Gyllenhal, 1833	2004	Ma	Haines 2006
Hypothenemus hampei (Ferrari, 1867)	2010	Ha	Garcia 2010; Burbano et al. 2011
Euplatypus parallelus (Fabricius, 1801)	1999	Ma	Howarth and Preston 2002
Naupactus leucoloma (Boheman, 1840)	2013	Ha	Conant 2013[+]
Scolytogenes sp. A	2010	Ha	NSR[+]
Tychius picirostris (Fabricius, 1787)	2002–2003	Ma	Krushelnycky et al. 2007
Xyleborinus andrewesi (Blandford, 1896)	2007	Ha, Oa	Cognato and Rubinoff 2008
Xylosandrus germanus (Blandford, 1894)	2007	Oa	Cognato and Rubinoff 2008
Xylosandrus morigerus (Blandford, 1894)	2007	Ha	Cognato and Rubinoff 2008

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Dermestidae			
Evorinea sp. A	1993	Ha	Kumashiro et al. 2002
Elateridae			
Conoderus posticus (Eschscholtz, 1822)	2015	Oa	Johnson et al. 2017
Melanotus punctosus (Walker, 1858)	1999	Ma	Howarth and Preston 2002; Johnson and Samuelson 2006
Platynychus adjutor (Candèze, 1873)	1990	Oa	Kumashiro et al. 2002
Rismethus scobinula (Candèze, 1857)	1972	Ma	Johnson and Samuelson 2006
Hydrophilidae			
Cercyon fimbriatus Mannerheim, 1852	1999	Ma	Howarth and Preston 2002
Cercyon sp. nr. *lividulus* Orchymont, 1926	1937	Ha, Oa	Hansen 1993; Gruner 2004
Laemophloeidae			
Laemophloeus sp. A	2000	Ma	Howarth et al. 2002
Nitidulidae			
Aethina tumida (Murray, 1867)	2010	Ha, Ka, Ma, Mo, Oa	Robson 2012; NIR^{+}
Phenolia attenuata (Reitter, 1879)	1998	Ka, Oa	Ewing 2004
Stelidota geminata (Say, 1825)	1997	Ha, Ka, La, Ma, Mo, Oa	Ewing 2004
Passandridae			
Passandra elongatula Grouvelle, 1874	1977	Oa	Samuelson and Ramsdale 2006

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Phalacridae			
Phalacrus sp. A	2003	Nu	Ramsdale and Samuelson 2006
Scarabaeidae			
Cyclocephala pasadenae (Casey, 1915)	2007	Ha	HDOA 2009; Jameson et al. 2009
Oryctes rhinoceros (Linnaeus, 1758)	2013	Oa	Kumashiro et al. 2014; Matsunaga 2013c
Protaetia orientalis (Gory & Percheron, 1833)	2002	Ha, Ka, Ma, Oa	HDOA 2004; NIR^{+}
Temnorrhynchus retusus (Fabricius, 1781)	2007	Ha	HDOA 2009; Jameson et al. 2009
Silvanidae			
Silvanoprus scuticollis (Walker, 1859)	1999	Ma	Howarth and Preston 2002
Staphylinidae			
Astenus sp. A	2003	Ma	Howarth and Preston 2006
Hesperus sp. A	2000	Ma	Howarth and Preston 2006
Pselaphinae sp. A	2000	Ma, Oa	Preston et al. 2007; Howarth et al. 2012
Rugilus sp. A	2006	Ma	Howarth et al. 2012
Tachyporus sp. A	2002–2003	Ma	Krushelnycky et al. 2007
Tenebrionidae			
Bolitophagini?: Undetermined genus sp. A	2013	Ha	Undetermined; NSR^{+}

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Lepidocnemeplatia sericea (Horn, 1870)	2000	Ma	Howarth and Preston 2002- Single specimen, established?
Lyphia sp. A	2002	Ma	Howarth et al. 2012
Menephilus arciscelis Marseul, 1876	2008	Oa	NSR$^+$
Stethotrypes raffrayi (Thomson, 1878)	2012	Ha	NSR$^+$
Strongylium cultellatum Mäklin, 1867	2005	Oa	Samuelson and Howarth 2013
Ulus hirsutus Champion, 1885	1982	Ka, Oa	Steiner 2003
INSECTA: DIPTERA			
Agromyzidae			
Liriomyza sp. A	2013	Oa	Apparently undescribed; leaf miner ex. *Calotropis gigantea*; NSR$^+$
Asilidae			
Leptopteromyia mexicanae Martin, 1971	2007	Ma	Howarth et al. 2012
Asteiidae			
Loewimyia ?*bifurcata* Sabrosky, 1943	1998	Mi	Nishida and Beardsley 2002
Canacidae			
Dasyrhicnoessa clandestina Munari, 2002	1958	Oa	Munari and Evenhuis 2011
Dasyrhicnoessa fulva (Hendel, 1913)	1981	Ma, Oa	Munari and Evenhuis 2011- possibly indigenous
Tethina albula (Loew, 1869)	?	?Ha, Ka, Kh, Ma, Oa?	Mathis and Foster 2007; Foster and Mathis 2008 Munari and Evenhuis 2011- No listed specimens, but believed established

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Tethina pallipes (Loew, 1865)	1932	La, Oa	Munari and Evenhuis 2011
Cecidomyiidae			
Mycodiplosis fungicola Felt, 1911	1991	Oa	Kumashiro et al. 2002
Ceratopogonidae			
Atrichopogon levis (Coquillett, 1901)	2006	Ma, Oa	Howarth et al. 2012; NIR$^+$
Culicoides jamaicensis Edwards, 1922	2000	Ma, Oa	Howarth and Preston 2007; NIR$^+$
Forcipomyia biannulata Ingram & Macfie, 1924	2006	Ha, Ma, Oa	Howarth and Preston 2007; Grogan et al. 2017
Forcipomyia pulcherrima Santos Abreu, 1918	2000	Ma, Oa	Howarth and Preston 2007 as *F. chrysolopha* (Kieffer, 1911); Grogan et al. 2013
Forcipomyia cf. *quasiingrami* Macfie, 1939	2006	Ha, Ma, Oa	Howarth and Preston 2007; NIR$^+$
Chironomidae			
Ablabesmyia sp. A	1999	Ka, Ma, Oa,	Wolff et al. 2002; Howarth et al. 2012
Apedilum elachistus Townes, 1945	1999	Oa	Wolff et al. 2002- as *Apedilum* sp.; NSR$^+$
Chironomus sp. A	2006	Ma	Howarth and Preston 2007
Eukiefferiella sp. A	1999	Oa	Wolff et al. 2002
Kiefferulus longilobus (Kieffer, 1916)	2006	Ma, Oa	Howarth and Oishi 2013
Parakiefferiella sp. A	1999	Oa	Wolff et al. 2002
Paratanytarsus sp. A	1999	Oa	Wolff et al.2002

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Stempellinella sp. A	1999	Oa	Wolff et al. 2002
Chloropidae			
Oscinella frit (Linnaeus, 1758)	1998	Oa	Kumashiro et al. 2002
Culicidae			
Aedes japonicus (Theobald, 1901)	2004	Ha, Ka, Ma, Oa	Larish and Savage 2005; Magnacca 2015; NIR[+]
Anopheles punctipennis (Say)	2003	Oa	Furumizo et al. 2005- Single specimen, not established
Dolichopodidae			
Achradocera shannoni (Van Duzee, 1930)	2008	Oa	Evenhuis and Bickel 2012
Chrysotus crosbyi van Duzee	1998	Oa	Evenhuis 2015
Sympycnus turbidus Becker, 1932	2011	Ka	Evenhuis and Bickel 2012
Drosophilidae			
Amiota sp. A	2007	Oa	Leblanc et al. 2009
Drosophila carbonaria Patterson & Wheeler, 1942	1995	Ha, Ma, Mo	O'Grady 2002
Drosophila nasutoides Okada, 1964	2008	Oa	Leblanc et al. 2009
Hirtodrosophila sp. nr. *unicolorata* (Wheeler, 1959)	2005	Ha, Ma	Leblanc et al. 2009
Mycodrosophila sp. A	1969	Ma, Oa	O'Grady 2002
Scaptodrosophila sp. A	2005	Ha	Leblanc et al. 2009
Stegana coleoptrata (Scopoli, 1763)	1976	Ha, Mo, Oa	O'Grady 2002; Leblanc et al. 2009

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Zaprionus ghesquierei Collart, 1937	1978	Ha, Ma, Mo, Oa	O'Grady 2002; Leblanc et al. 2009
Ephydridae			
Philygria debilis Loew, 1861	2002	Ha	Krushelnycky et al. 2013
Heleomyzidae			
Tephrochlamys japonica Okadome, 1967	Pre 2002	Ma	Okadome 2002
Limoniidae			
Dicranomyia sp. A	1999	Ma	Howarth and Preston 2002
Libnotes sp. A nr. *trukensis* (Alexander, 1972)	1996	Ha, Mo	Gruner 2004- apparently undescribed
"*Limonia*" s.l. sp. A	1992	Ha	Kumashiro et al. 2002
Lonchaeidae			
Silba sp. A	2002	Ha	Krushelnycky et al. 2013
Muscidae			
Coenosia humilis Meigen, 1826	2002	Ha	Krushelnycky et al. 2013; voucher specimens were not compared between Coenosiinae Genus sp. and *Coenosia humilis*, therefore we list both records.
Coenosiinae: Undetermined genus? sp. A	1999	Ma	Howarth and Preston 2002; see *Coenosia humilis*
Mycetophilidae			
Sciophila sp. A	2000	Ma	Howarth and Preston 2006

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Sciaridae			
Hyperplasion sp. A	2006	Ma	Howarth and Preston 2007
Syrphidae			
Ocyptamus dimidiatus (Fabricius, 1781)	2008	Oa	HDOA 2010; Evenhuis 2015
Tipulidae			
Undetermined genus sp. A	2006	Ma	Howarth and Preston 2007- not *Nephrotoma suturalis*
Xylomyidae			
Solva sp. A	2014	Oa	Evenhuis 2016
INSECTA: HEMIPTERA			
Aleyrodidae			
Aleuroclava jasmini (Takahashi, 1932)	1993	Oa	Kumashiro et al. 2002
Aleurodicus dugesii Cockerell 1896	2002	Ha, Ka, Ma, Oa	Heu et al. 2002
Aleuroglandulus subtilis Bondar, 1923	2006	Ha, Oa	HDOA 2008; Nagamine and Garcia 2011
Aleurotrachelus atratus Hempel, 1922	2006	Ha, Ma, Oa	HDOA 2007; NIR^{+}
Aleurotrachelus sp.1	1991	Ma	Kumashiro et al. 2002- apparently undescribed
Aleurotrachelus sp.2	1992	Ha, Ka	Kumashiro et al. 2002- apparently undescribed
Aleurotrachelus sp.3	1996	Oa	Kumashiro et al. 2002- apparently undescribed
Aleurotrachelus trachoides (Back, 1912)	1998	Oa	Kumashiro et al. 2002

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Dialeurodes schefflerae Hodges & Dooley, 2007	1988/1991	Oa	Kumashiro et al. 2002- as *D.* sp. A; Hodges and Dooley 2007
Metaleurodicus cardini (Back, 1912)	2003	Ha, Oa	HDOA 2005; NIR[+]
Paraleyrodes bondari Peracchi, 1971	2003	Oa	Kumashiro and Martin 2004 pers. comm.; Evans 2008; HDOA 2008
Paraleyrodes minei Iaccarino, 1990	2003	Oa	HDOA 2004; Dooley 2006
Trialeurodes abutiloneus (Haldeman, 1850)	1990	Ha, Oa	Kumashiro et al. 2002
Anthocoridae			
Buchananiella continua (White, 1879)	~2000	Ha	Brenner and Lattin 2001- Single collection, but likely established
Dufouriellus ater (Dufour, 1833)	1971	Ha	Lattin 2005
Montandoniola confusa Streito & Matocq 2009	1965[r]		Lattin 2007; Pluot-Sigwalt et al. 2009[+]
Xylocoris flavipes (Reuter, 1875)	1920	Oa	Lattin 2005; 2007
Aphalaridae			
Blastopsylla occidentalis Taylor, 1985	1993	Ka	Beardsley and Uchida 2002 as Psyllidae
Ctenarytaina eucalypti (Maskell, 1890)	1993	Ma	Kumashiro et al. 2002 as Psyllidae
Glycaspis brimblecombei Moore, 1964	2001	Ha, Ma, Oa	HDOA 2001; Nagamine and Heu 2001
Aphididae			
Aphis coreopsidis (Thomas, 1878)	2004	Ka, Ma, Mo, Oa	Messing et al., 2006; Foottit et al. 2012

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Aphis eugeniae van der Goot, 1917	1994	Ka, Oa	Foottit et al. 2012
Aphis sedi Kaltenbach, 1848	1997	Ka, Oa	Kumashiro et al. 2002; Foottit et al. 2012
Aphis spiraecola Patch, 1914	1939	Ha, Ka, Ma, Mo, Ha	Foottit et al. 2012- previously treated as junior syn. of *A. citricola*
Capitophorus formosartemisiae (Takahashi, 1921)	2003	Oa	Foottit et al. 2012- Single collection, established?
Capitophorus hippophaes (Walker, 1852)	1993	Oa	Kumashiro et al. 2002
Cerataphis lataniae (Boisduval, 1867)	1909	Ha, Ma, Oa	Fullaway, 1910; Messing et al. 2012
Cinara cupressi (Buckton, 1881)	2000	Ha, Ka, Ma	Foottit et al. 2012; Messing et al. 2012
Cinara watsoni Tissot, 1939	2003	Ka, Ma, Mo	Foottit et al. 2012
Coloradoa campestrella Ossiannilsson, 1959	2003	Oa	Foottit et al. 2012- Single collection, established?
Dysaphis foeniculus (Theobald, 1923)	1942	Ha, Ka Ma, Oa	Foottit et al. 2012- previously misidentified
Ericaphis scammelli (Mason, 1940) group	2003	Ma	Messing et al. 2006 (referred to as *E. fimbriata*); Foottit et al. 2012
Glyphinaphis bambusae van der Goot, 1917	2009	Ka	Foottit et al. 2012
Greenidea ficicola Takahashi, 1921	2011	Oa	Nagamine and Garcia 2012
Hyadaphis coriandri (Das, 1918)	2003	Ha, Ma, Oa	Messing et al., 2006; Foottit et al. 2012
Hyadaphis foeniculi (Passerini, 1860)	2003	Ha, Ka	Foottit et al. 2012
Hyperomyzus carduellinus (Theobald, 1915)	1975	Ha, Ka, Ma, Mo, O	Messing et al., 2006; Foottit et al. 2012

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Illinoia borealis (Mason, 1925)	1965	Ma	Foottit et al. 2012- Single collection, established?
Illinoia goldamaryae (Knowlton, 1938)	2005	Mo	Foottit et al. 2012 - Single collection, established?
Macrosiphum rosae (Linnaeus, 1758)	2004	Ka	Foottit et al. 2012; Previous records of this species (Kirkaldy 1908, Zimmerman 1948b) refer to *Sitobion ibarae*
Metopolophium dirhodum (Walker, 1849)	2003	Ka, Ma	Messing et al. 2006
Micromyzus katoi (Takahashi, 1925) group	1983	Ha, Ka, Oa	Foottit et al. 2012; possibly collected earlier- previous collection identified as *Pentalonia nigronervosa* may be this species
Myzus hemerocallis Takahashi, 1921	2003	Ka, Oa	Messing et al. 2006; Foottit et al. 2012
Nearctaphis bakeri (Cowen, 1895)	1938	Ha	Foottit et al. 2012 – one slide only, established?
Neotoxoptera oliveri (Essig, 1935)	1939	Ka, Ma	Foottit et al. 2012
Pemphigus populitransversus Riley, 1879	1990	Ha, Ma, Oa	Kumashiro et al. 2002- as *Pemphigus* sp.; Foottit et al. 2012; Messing et al. 2012
Pentalonia caladii van der Goot, 1917	1939	Ha, Ka, Ma, Mo, Oa	Foottit et al. 2010; Foottit *et al.* 2012
Sipha elegans del Guercio, 1905	2005	Mo	Foottit et al. 2012
Sitobion anselliae (Hall, 1932)	1948	Ha, Oa	Foottit et al. 2012
Sitobion fragariae (Walker, 1848)	2003	Ha, Ka, Ma	Messing et al., 2006; Foottit et al. 2012
Sitobion phyllanthi (Takahashi, 1937)	2003	Ha, Ka, Ma, Mo, Oa	Messing et al., 2006; Foottit et al. 2012

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Takecallis arundinariae (Essig, 1917)	1997	Ha	Kumashiro et al. 2002
Uroleucon erigeronense (Thomas, 1878)	2003	Ma	Foottit et al. 2012- Single collection, established?
Asterolecaniidae			
Planchonia stentae Brain, 1920	2007	Ha, Ma , Oa	NSR$^+$
Carsidaridae			
Mesohomotoma hibisci (Froggatt, 1901)	2005	Oa	HDOA 2006
Cicadellidae			
Draeculacephala portola Ball, 1927	2013	Ha	NSR$^+$- Single collection?
Homalodisca vitripennis Germar, 1821	2004	Oa	Heu et al. 2004b- as *Homalodisca coagulata* (Say)
Macrosteles sp. nr. *severini* Hamilton, 1983	2001	Oa	Smith et al. 2002
Coccidae			
Ceroplastes eugineae Hall, 1931	2008	Ha, Oa	HDOA 2010- as *Ceroplastes rusci* (Linnaeus); NIR$^+$
Ceroplastes stellifer (Westwood, 1871)	1998	Ha, Oa	Kumashiro et al. 2002- as *Vinsonia stellifera* (Westwood); Peronti et al. 2008- name change; NIR$^+$
Pulvinariella mesembryanthemi (Vallot, 1829)	2011	Ha, Ma, Oa	NSR$^+$
Coreidae			
Acanthocoris sp. A	2009	Ka	NSR$^+$

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Physomerus grossipes (Fabricius, 1794)	1997	Ha, Ka, Ma, Oa	Kumashiro et al. 2002; NIR[+]
Cydnidae			
Fromundus biimpressus (Horváth, 1919)	1982	Ha, Ka, Ma, Oa	Howarth and Preston 2002 as Genus? sp. A; Species identified and NIR[+]
Pangaeus bilineatus (Say, 1825)	2009	Oa	Garcia 2011a
Diaspididae			
Andaspis numerata Brimblecombe, 1959	2011	Oa	NSR[+]
Aonidiella orientalis (Newstead, 1894)	2009	Oa	Single collection, possibly not established[+]
Aspidiella sacchari (Cockerell, 1893)	1993	Oa	Kumashiro et al. 2002
Aulacaspis yasumatsui Takagi, 1977	1998	Ha, Ka, Oa	Kumashiro et al. 2002
Fiorinia phantasma Cockerell & Robinson, 1915	2004	Ha, Ka, Ma,	HDOA 2010; Garcia 2011b; NIR[+]
Fiorinia proboscidaria Green, 1900	1994	Oa	Beardsley 2002
Odonaspis saccharicaulis (Zehntner, 1897)	2012	Ma, Oa	Matsunaga 2013a
Odonaspis sp.	1998	Ha	Kumashiro et al. 2002- apparently undescribed
Pseudaonidia trilobitiformis (Green, 1896)	2004	Ha, La, Oa	HDOA 2006; NIR[+]
Pseudaulacaspis brimblecombei Williams, 1973	<2000	Ma	HDOA 2007
Pseudaulacaspis pentagona (Targioni-Tozzetti, 1886)	1997	Ha, Ka, Ma, Oa	Kumashiro et al. 2002; NIR[+]
Eriococcidae			
Eriococcus ironsidei Williams, 1973	2005	Ha	Conant et al. 2005; HDOA 2006

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Tectococcus ovatus Hempel, 1900	2011[r]	Ha, La, Ma, Oa	Johnson pers. comm. 2015; Johnson 2016
Kerriidae			
Paratachardina pseudolobata Kondo & Gullan, 2007	2012	Oa	Garcia 2013
Membracidae			
Stictopelta marmorata Goding, 1892	2003	Oa	NSR[+]
Liviidae			
Diaphorina citri Kuwayama, 1908	2006	Ha, Ka, La, Ma, Mo, Oa	Conant et al. 2006; HDOA 2007; Formerly Psyllidae
Miridae			
Microtechnites minutus (Reuter, 1885)	2000?	Ka, Oa	HDOA 2001- as *Halticus tibialis* Reuter
Kundakimuka queenslandica Cassis, 1995	2002	Oa	NSR[+]
Polymerus testaceipes Stal, 1860	2012	Ha	NSR[+]
Rubrocuneocoris calvertae Henry, 2017	2011	Ha	Henry 2017
Undetermined genus sp. A [of T.J. Henry]	2011	Ha	Ex. *Citrus* sp.
Nabidae			
Stenonabis sp. A	2006	Ma, Oa	Howarth et al. 2012
Pentatomidae			
Bagrada hilaris (Burmeister, 1835)	2014	Ha, Ka, Ma, Mo, Oa	Matsunaga 2016; NIR[+]
Nezara viridula f. *aurantiaca* Costa, 1884	2004	Ha	Golden and Follett 2006

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Piezodorus oceanicus (Montrouzier, 1865)	2006	Ma, Oa	Howarth and Preston 2007- as *P. hybneri* (Gmelin); NIR[+]
Pseudococcidae			
Antonina pretiosa Ferris, 1953	1997	Ha, Ma	Kumashiro et al. 2002; NIR[+]
Delottococcus confusus (DeLotto, 1977)	2009	Ma	Miller and Giliomee 2011
Hypogeococcus pungens Granara de Willink, 1981	2005	Oa	HDOA 2007
Paracoccus marginatus Williams & Granara de Willink, 1992	2004	Ha, Ka, La, Ma, Oa	Heu et al. 2004a; HDOA 2005
Phenacoccus solenopsis (Tinsley, 1898)	1996	Ma, Oa	Kumashiro et al. 2002
Planococcus minor (Maskell, 1897)	2005	Ha, Oa	Rung et al. 2008
Pseudococcus elisae Borchsenius, 1947	1984	Mo, Oa	Beardsley 1986
Pseudococcus sp. A	2010	Ha, Oa	NSR[+] Near *P. aurantiacus* and *P. cryptus*, possibly undescribed.
Vryburgia brevicruris (McKenzie, 1960)	2011	Ha	NSR[+]
Psyllidae			
Cacopsylla tobirae (Miyatake, 1964)	2013	Oa	Conant 2013[+]
Reduviidae			
Sinea rileyi Montandon, 1893	1999	Ma	Howarth and Preston 2002
Rhizoecidae			
Rhizoecus americanus (Hambleton, 1946)	2006	Ha	HDOA 2007

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Rhyparocromidae			
Horridipamera inconspicua (Dallas, 1852)	2009	Ha	NSR^{+}
Tingidae			
Corythucha gossypii (Fabricius, 1794)	2001	Ha, Ka, Ma, Oa	Miller and Nagamine 2005
INSECTA: HYMENOPTERA			
Agaonidae			
Josephiella microcarpae Beardsley & Rasplus 2001	1989	Ha, Ka, Ma, Mo, Oa	Beardsley and Perreira 2000 as *Josephiella* n. sp.; Beardsley and Rasplus 2001
Josephiella sp. A [of J.-Y. Rasplus]	2012	Ha, Ka(?), Ma Mo(?), Oa	Apparently undescribed; stem galler ex. *Ficus* spp.; NSR^{+}
Platyscapa quadraticeps (Mayr, 1885)	2006	Oa	HDOA 2008
Aphelinidae			
Encarsia cubensis Gahan, 1931	2008	Ha, Oa	NSR^{+}
Encarsia diaspidicola Silvestri, 1909	2012^{+}	Ha^{r}, Oa^{+}	Follet et al. 2015^{r}; NSR^{+}
Encarsia dispersa (= *haitiensis*) Polaszek, 2004	1979	Oa	Lai et al. 1982 as *E.* ?*haitiensis*; Polaszek et al. 2004
Encarsia brasiliensis (= *hispida*) (Hempel, 1904)	1998^{r}	Ha^{r}, Oa^{r}	Culliney et al. 2003; now established
Encarsia inaron (Walker, 1839)	1992	Oa	Kumashiro et al. 2002
Encarsia lutea (Masi, 1910)	1992; 1998^{r}	Ha^{r}, Mo, Oa^{r}	Kumashiro et al. 2002; Culliney et al. 2003
Encarsia luteola Howard, 1895	1990^{r}; 1998^{r}	Ha^{r}, Oa^{r}	Kumashiro et al. 2002; Culliney et al. 2003

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Encarsia mineoi Viggiani, 1982	1998[r]	Ha[r], Oa[r]	Culliney et al. 2003
Encarsia nigricephala Dozier, 1937	1992	Ha	Kumashiro et al. 2002
Encarsia strenua (Silvestri, 1927)	1993	Ha	Kumashiro et al. 2002
Apidae			
Ceratina smaragdula (Fabricius, 1787)	1984	Ha, Oa, Ma, Mo	Arakaki et al. 2001; Howarth and Preston 2007; Magnacca pers. comm. 2018 (visual observations only)
Bethylidae			
Goniozus cf. foveolatus Ashmead, 1887	2000	Ma	Updated to current name; Howarth and Preston 2002- as *G. cf. columbianus* Ashmead
Braconidae			
Apanteles sp. nr. *carpatus* (Say, 1836)	2000	Ma	Howarth and Preston 2002
Ascogaster sp. A	2000	Ma	Howarth and Preston 2002
Glyptapanteles sp. A	2000	Ma	Howarth and Preston 2002
Heterospilus sp. A	2000	Ma	Howarth and Preston 2002
Leiophron sp. A	1997	Ha	Gruner 2004
Phanerotoma sp. A	2000	Ma	Howarth and Preston 2002
Phanerotoma sp. B	2000	Ma	Howarth and Preston 2002
Chalcididae			
Dirhinus sp. A	2006	Ma	Howarth and Preston 2007; et al. 2012

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Colletidae			
Hylaeus (*Hylaeus*) *leptocephalus* (Morawitz, 1871)	1994	Oa	Magnacca et al. 2013- possible rediscovery
Hylaeus (*Prosopisteron*) sp.	2012	Oa	Magnacca et al. 2013- single specimen, possible interception?
Hylaeus strenuus (Cameron, 1897)	2007	Ka, Oa	Magnacca et al. 2011; Magnacca and King 2013; Magnacca 2015
Encyrtidae			
Ageniaspis citricola Logvinovskaya, 1983	2000	Ha, Ka, Ma, Mo, Oa	Nagamine and Heu 2000; HDOA 2001
Anagyrus agraensis Saraswat, 1975	1999	Oa	Beardsley and Triapitsyn 2002
Diaphorencyrtus aligharensis Shafee, Alam, & Agarwal, 1975	2012	Oa	Matsunaga 2014- Parentheses were placed were placed around authors in error
Psyllaephagus bliteus Riek, 1962	2006	Ma, Oa [+]	Daane et al. 2005; NIR[+]
Psyllaephagus pilosus Noyes, 1988	2002	Ha, Ma	HDOA 2006
Psyllaephagus sp. A	2017	Oa	NSR[+]; ex. *Cacopsylla tobirae*; not *P. blastopsyllae*
Eulophidae			
Aleuroctonus vittatus (Dozier, 1933)	2007	Ha, Ma, Oa	HDOA 2009
Aprostocetus sp. #3 [of HDOA, 2007]	2006	Oa	HDOA 2007; ex. *Hypogeococcus pungens*
Aroplectrus dimerus Lin, 1963	2010[r]	Ha, Ka, Ma, Oa	Bautista et al. 2014
Asecodes sp. A	1997	Ha	Gruner 2004
Cirrospilus sp. A [of La Salle]	2001	Oa	*C.* sp. not *vittatus*; NSR[+]

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
?*Closterocerus* sp. A [of La Salle]	2005	Ma	?*C.* sp. not *utahensis*; NSR[+]
Elasmus sp. A	2000	Ma	Howarth et al. 2012
Elasmus sp. B	2000	Ma	Howarth et al. 2012
Entedon erythrinae Gumovsky & Ramadan, 2011	2006	Ma, Oa	Gumovsky and Ramadan 2011
Epichrysocharis burwelli Schauff, 2000	2001	Ma+, Oa	HDOA 2006; NIR[+]
Horismenus sp. A	2000	Ma	Howarth and Preston 2002
Ophelimus sp. A [of La Salle]	2005	Ma	Not *O. maskelli,* possibly not *O. eucalypti*; NSR[+]
Quadrastichus erythrinae Kim, 2004	2005	Ha, Ka, Ma, Mo, Oa	Heu et al. 2005b
Tamarixia sp. prob. *radiata* (Waterston, 1922)	2012	Oa	Matsunaga 2014
Zagrammosoma sp. A	2006	Ma	Howarth and Preston 2007- possibly *Z. multilineatum* (Ashmead, 1888)
Eurytomidae			
Eurytoma erythrinae Gates & Delvare, 2008	2008[r]	Ha, Ka, Ma, Mo, Oa	HDOA 2009
Eurytoma sp. A	1999	Ma	Howarth and Preston 2002
Formicidae			
Monomorium dichroum Forel, 1902	-	Ha, Ka, Kh, Ma, Mo,	Starr and Starr 2011 & Antweb 2017 as *Monomorium bicolor* complex[+]
Monomorium indicum Forel, 1902	2005	Ha	HDOA 2008

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Pheidole navigans Forel, 1901	2000	Ha, Ma, Oa	As *Pheidole moerens* in Gruner et al. 2003, Starr and Starr 2013; NIR[+]
Solenopsis globularia (Smith, 1858)	2005	Oa	HDOA 2008
Solenopsis sp. HI01	2000	Ha, Mo, Oa	Heu and Chun 2000; Gruner et al. 2003; AntWeb 2017
Tapinoma sessile (Say, 1836)	2009	Ma	Buczkowski and Krushelnycky 2012
Technomyrmex difficilis Forel, 1892	1994?	Ka, Ko, Ma, Mo, Oa	Bolton 2007; Antweb 2017; Starr and Starr 2012
Technomyrmex pallipes Smith, 1876	-	Oa	Antweb 2017
Technomyrmex vitiensis Mann, 1921	-	Ha, Ka, Ma, Mo, Oa	Bolton 2007; Antweb 2017
Tetramorium caldarium (Roger, 1857)	-	Ha, Ka, Ma, Oa	Bolton 1997; Antweb 2017
Tetramorium insolens (F. Smith, 1861)	1993	Ha	Kumashiro et al. 2002; Previously misidentified as *T. bicarinatum*
Tetramorium lanuginosum Mayr, 1870	2008	Oa	HDOA 2010a
Halictidae			
Lasioglossum (*Dialictus*) *imbrex* Gibbs, 2010	2005	Ha, Mo, Oa	Magnacca et al. 2013
Lasioglossum (*Dialictus*) *microlepoides* (Ellis, 1914)	2010	Oa	Magnacca et al. 2013
Ichneumonidae			
Hypsicera sp. A	2000	Ma	Howarth and Preston 2002- not *H. femoralis*

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Hypsicera sp. B	2000	Ma	Howarth and Preston 2002- not *H. femoralis*
Triclistus nr. *aitkeni* (Cameron, 1897)	1998?	Ha, Ka, Ma, Oa	Kaufman et al. 2008
Woldstedtius flavolineatus (Gravenhorst, 1829)	2006	Ha, Ma, Oa	Cappadonna et al. 2009
Cremastini Genus? sp. [of Howarth and Preston, 2002]	2000	Ma	Howarth and Preston 2002
Leucospidae			
Leucospis sp. A	2000	Ma	Howarth and Preston 2007- not *L. affinis*
Megachilidae			
Megachile lanata (Fabricius, 1775)	2008	Ka, Ma, Mo, Oa	Magnacca et al. 2013; Magnacca 2015; NIR[+]
Mymaridae			
Gonatocerus ashmeadi Girault, 1915	2004	Oa	HDOA 2006
Gonatocerus sp. A	2000	Ma	Howarth and Preston 2002
Platygastridae			
Aphanomerus rufescens Perkins, 1905	1998	Ha	Gruner 2004
Pteromalidae			
Callocleonymus swezeyi (Yoshimoto & Ishii, 1965)	2000	Ma	Howarth Preston 2006
Idioporus affinis LaSalle & Polaszek, 1997	2005	Oa	HDOA 2005
Pachyneuron sp. A	2000	Ma	Howarth and Preston 2002

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Zolotarewskya sp. A	1995	Ha, Mo	Gruner 2004
Scelionidae			
Baeus sp. A	2006	Ma	Howarth and Preston 2007
Trimorus sp. A	1997	Ha	Gruner 2004- single specimen, established?
Trichogrammatidae			
Trichogramma achaeae Nagaraja & Nagarkatti, 1970	2011	Ka, Oa	Wright and Stouthamer 2011
Vespidae			
Parancistrocerus fulvipes (de Saussure, 1855)	1998	Mi	Nishida and Beardsley 2002
Polistes dominula (Christ, 1791)	2006	(Ha, Ma, Oa)$^{+}$	HDOA 2007; Established?$^{+}$
Polistes jokahamae Radoszkowski, 1887	1905	Ha, Ku, Mi, Oa	Specimens previously misidentified^{+} Carpenter 2008
INSECTA: LEPIDOPTERA			
Choreutidae			
Choreutis sp. A	2001	Ha, Ka, Ma, Oa	HDOA 2004; NIR^{+}
Cosmopterygidae			
Ithome lassula Hodges, 1961	1986	Oa	Kumashiro et al. 2002
Crambidae			
Diaphania nitidalis (Stol, 1781)	2003	Ha, Ka, Ma, Oa	HDOA 2005; Heu et al. 2005a

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Erebidae			
Oraesia excavata (Butler, 1878)	2009	Ka, Ma, Oa	Haines et al. 2011
Secusio extensa (Butler, 1880)	2013[r]	Ha[r], Ma[r]	NSR[+]
Autostichidae			
Undetermined genus (nr. *Autosticha*) sp. A	2000	Ma	Howarth and Preston 2002- as Gelechiidae
Geometridae			
Scopula personata (Prout, 1913)	1976	Ma, Oa	Howarth and Preston 2002
Undetermined genus sp. A [of F.G. Howarth]	2007	Oa	Pending identification; NSR[+]
Gracillariidae			
Caloptilia coruscans Walsingham, 1908	1991[r]–1994	Ha[r]	Markin 2001- as *C.* sp. nr. *schinella* (Walsingham); Davis *et al.* 2011
Phyllocnistis citrella Stainton, 1856	2000	Ha, Ka, Ma, Mo, Oa	Nagamine and Heu 2000; HDOA 2001
Limacodidae			
Darna pallivitta (Moore, 1887)	2001	Ha, Ma, Oa	Conant et al. 2001; HDOA 2003
Lycaenidae			
Zizina otis (Fabricius, 1787)	2008	Ha, Ka, Oa	Snyder et al. 2008; NIR[+]
Noctuidae			
Ctenoplusia albostriata Bremer & Gray, 1853	1996	Ma, Oa	Howarth and Preston 2002; Confirmed M.G. Pogue, 6.V.2013

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Feltia subterranea (Fabricius, 1794)	2006	Ha, La, Ma	Prestes 2014
Pieridae			
Abaeis nicippe (Cramer, 1779)	2013	Ha, Ka, Ko, Ma, Mo, Oa	Rubinoff et al. 2015
Phoebis agarithe (Boisduval, 1836)	2004	Ka, Ma, Oa	HDOA 2005; NIR^{+}
Pyralidae			
Loryma cf. *recusata* (Walker, 1863)	1998	Ha, Ma	Howarth and Preston 2002 -as unknown Crambid; Howarth et al. 2012
Sphingidae			
Hippotion rosetta (Swinhoe, 1892)	1998	Ha, Ka, Ma, Oa	Kumashiro et al. 2002; Howarth and Preston 2002
Tineidae			
Genus sp. [of Howarth and Preston, 2002]	2000	Ma, Oa	Howarth and Preston 2002
INSECTA: NEUROPTERA			
Chrysopidae			
Mallada albofacialis Winterton, 1995	2007	Oa	Tauber and Tauber 2011- single specimen, established?
INSECTA: ORTHOPTERA			
Gryllidae			
Anele ulia Otte, Shaw & Carvalho, 2003	2002	Ma	Otte et al. 2003
Nanixipha nahoa Otte, Shaw & Carvalho, 2003	2002	Ha, Oa^{+}	Otte et al. 2003; NIR^{+}

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Trigonidium sp.	1997	Ha	Kumashiro et al. 2002
INSECTA: PHASMATODEA			
Diapheromeridae			
Sipyloidea sipylus (Westwood, 1859)	1994	Ha, Ka, Oa	Kumashiro et al. 2002- as Heteronemiidae; *Necrosia* sp.; Leiner 2013
INSECTA: PSOCOPTERA			
Archipsocidae			
Archipsocus sp. A	2003	Ma	Howarth and Preston 2006
Caeciliidae			
Stenocaecilius sp. A	2002	Ha	Krushelnycky et al. 2013
Ectopsocidae			
Ectopsocus briggsi McLachlan, 1899	1997	Ha	Gruner 2004
Ectopsocus californicus (Banks, 1903)	2002–2003	Ma	Krushelnycky et al. 2007
Ectopsocus vachoni Badonnel, 1945	2002–2003	Ma	Krushelnycky et al. 2007
Elipsocidae			
Elipsocus hyalinus (Stephens, 1836)	2002–2003	Ma	Krushelnycky et al. 2007
Lachesillidae			
Lachesilla tectorum Badonnel, 1931	2002–2003	Ma	Krushelnycky et al. 2007

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Lepidopsocidae			
Pteroxanium kelloggi (Ribaga, 1905)	2005	Ha	Krushelnycky et al. 2013
Liposcelidae			
Liposcelis bostrychophila Badonnel, 1931	2002–2003	Ma	Krushelnycky et al. 2007
Liposcelis deltachi Sommerman, 1957	2002	Ha	Mockford & Krushelnycky 2008
Liposcelis rufa Broadhead, 1950	2002	Ha	Mockford & Krushelnycky 2008
Myopsocidae			
Myopsocus sp. A	2006	Ma	Howarth and Preston 2012
Philotarsidae			
Aaroniella sp. A	2003	Ma	Howarth and Preston 2012
Haplophallus talilus? Thornton & New	2002–2003	Ma	Krushelnycky et al. 2007
Haplophallus sp. A	1997	Mo	Gruner 2004- same as *H*. sp. B?
Haplophallus sp. B	2000	Ma	Howarth and Preston 2012- same as *H*. sp. A?
Pseudocaeciliidae			
Austropsocus sp. A	2002	Ha	Krushelnycky et al. 2013
INSECTA: THYSANOPTERA			
Phlaeothripidae			
Adraneothrips alajuela Mound & Marullo, 1996	2016	Ha	Mound et al. 2017
Adraneothrips russatus (Haga, 1973)	2016	Ha	Mound et al. 2017

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Androthrips ramachandrai Karney, 1926	2006	Oa	Boyd and Held 2006
Azaleothrips siamensis Okajima, 1978	2016	Ha	Mound et al. 2017
Cartomothrips neboissi Mound & Walker, 1982	2016	Ha	Mound et al. 2017
Gynaikothrips uzeli (Zimmerman, 1900)	2003	Ha, Oa	Held and Boyd 2008; Mound et al. 2017
Haplothrips kurdjumovi Karny, 1913	2011	Ha	Mound and Matsunaga 2017
Hoplandrothrips sp. A	2002–2003	Ma	Krushelnycky et al. 2007
Hoplothrips magnaccai Mound, 2017	2016	Ma, Oa	Mound 2017
Klambothrips myopori Mound & Morris, 2007	2009	Ha	Conant et al. 2009; HDOA 2010a
Dolichothrips franae Mound & Okajima, 2015	2010	Ha, Ka, Oa	Mound and Okajima 2015; Mound et al. 2017
Plectrothrips sp. A	2016	Ha, Oa	Mound et al. 2017
Pygothrips sp. A	2016	Ha	Mound et al. 2017
Sophiothrips annulatus Okajima, 1994	2016	Ha	Mound et al. 2017
Thripidae			
Anisopilothrips venustulus (Priesner, 1923)	2010	Ha	Mound et al. 2016
Baileyothrips arizonensis (Morgan, 1913)	1980	Oa	Bianchi 1981
Chirothrips manicatus Haliday, 1836	2002–2003	Ha, Ma	Krushelnycky et al. 2007; Mound et al. 2017
Coremothrips pallidus Hood, 1925	2016	Ha, Oa	Mound et al. 2017
Dichromothrips smithi Zimmermann, 1900	2007	Ha	HDOA 2009; Hollingsworth et al. 2012

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
Frankliniella cephalica (D.L. Crawford, 1910)	1998	Ha, Oa	Kumashiro et al. 2002
Frankliniella occidentalis (Pergande, 1895) "invasive greenhouse/glasshouse strain"	2010	Ha	Species is established, but first record of the "invasive greenhouse strain"+
Frankliniella crotolariae Mound & Marullo, 1996	2002–2003	Ma	Krushelnycky et al. 2007
Hercinothrips bicinctus (Bagnall, 1919)	1998	Ha, Oa	Kumashiro et al. 2002
Holothrips sp. A (of Nakahara)	2009	Oa	NSR+
Pezothrips kellyanus (Bagnall, 1916)	2001	Ha, Ma, Oa	HDOA 2007; Mound et al. 2017
Scirtothrips perseae Nakahara, 1997	2006	Ha, Ma	HDOA 2007; Mound et al. 2016; Mound et al. 2017
Thrips safrus Mound & Masumoto 2005	2003	Ma	Misidentified as *Thrips imaginis* Bagnall, 1926 in HDOA 2007; Mound et al. 2017
Thrips maculicollis (Hood, 1918)	2000	Ha	Hollingsworth 2003- as *Thrips* sp. nr. *leeuweni* (Priesner, 1938); Mound et al. 2016
Thrips parvispinus (Karny, 1922)	2006	Ha, Oa	HDOA 2008
INSECTA: THYSANURA			
Lepismatidae			
Lepisma saccharina Linnaeus, 1758	2010	Oa	NSR+
INSECTA: TRICHOPTERA			
Hydroptilidae			
Hydroptila icona Mosely, 1937	2001	Ma, Mo, Oa	Flint et al. 2003

Table 1. New records of immigrant terrestrial arthropods post–Nishida 2002 (continued).

TAXON	Year 1st detected	Island distribution[1]	Citation and notes
CHILOPODA: GEOPHILOMORPHA			
Mecistocephalidae			
Tygarrup javanicus Attems, 1929	1964	Ha, Oa	Bonato et al. 2004
DIPLOPODA: POLYDESMIDA			
Paradoxosomatidae			
Helicorthomorpha holstii (Pocock, 1895)	2008	Oa	Howarth and Shelley 2010
CRUSTACEA: MAXILLOPODA: PENTASTOMIDA:			
Raillietiellidae			
Raillietiella indica Gedoelst, 1921	<2004	Oa	Barton and Riley 2004- parasite of toads

1 = Island distribution: Ha=Hawaii, Ka=Kauai, Kh=Kahoolawe, Ku=Kure, Ln=Lanai, Ma=Maui, Mi=Midway, Mo=Molokai, Ne=Necker, Oa=Oahu
+ = Indicates accompanying text in Collection Data and New Record Summaries section
r = Biological control release. NIR = New Island Record. NSR = New State Record

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002.

Name in Nishida 2002	Current name/Status	Reference/Notes
ARACHNIDA: ARANEAE		
Clubionidae	**Corinnidae**	
Corinna cetrata (Simon, 1888)	*Creugas gulosus* Thorell, 1878	Bonaldo 2000
Clubionidae	**Trachelidae**	
Meriola arcifera (Simon, 1886)	*Meriola arcifera* (Simon, 1886)	Ramírez 2014
Linyphiidae		
Lepthyphantes tenuis (Blackwall, 1852)	*Tenuiphantes tenuis* (Blackwall, 1852)	Merrett 2004
Pholcidae		
Artema mauritiana Walkenaer, 183	*Artema atlanta* Walkenaer, 1837	Beatty et al.2008
Hedypsilus culicinus (Simon, 1893)	*Modisimus culicinus* (Simon, 1893)	Beatty et al.2008
Pholcus phalangioides (Fuesslins, 1775)	Delete	Misidentified; Beatty et al.2008
Salticidae		
Habronattus ?tarsalis (Banks, 1904)	*Habronattus tarsalis* (Banks, 1904)	Nishida 2002- Unk.; Proszynski 2002- Est. Ha; Howarth et al. 2012- Est. Ma
INSECTA: COLEOPTERA		
Anobiidae	Moved into **Ptinidae**	Arango & Young 2012
Cerambycidae		
Prosoplus bankii (Fabricius, 1775)	*Rhytiphora bankii* (Fabricius, 1775)	Slipinski & Escalona 2013

+ Indicates accompanying text in Collection Data and New Record Summaries section
Est. = Established, adventive; End. = Endemic; Ind. = Indigenous; Unk. = Unknown establishment

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
The species in the following genera listed in Nishida 2002 have been separated from Curculionidae to the Dryophthoridae.		
Curculionidae	**Dryophthoridae**	Bouchard et al. 2011
Cosmopolites	*Cosmopolites*	"
Dioclandra	*Dioclandra*	"
Dryophthorus	*Dryophthorus*	"
Myocalandra	*Myocalandra*	"
Polytus	*Polytus*	"
Rhabdoscelus	*Rhabdoscelus*	"
Scyphophorus	*Scyphophorus*	"
Sitophilus	*Sitophilus*	"
Sphenophorus	*Sphenophorus*	"
Stenommatus	*Stenommatus*	"
Curculionidae	**Brachyceridae**	Bouchard et al. 2011
Stenopelmus	*Stenopelmus*	"
Elateridae		
Brachylacon beardsleyi Ohira & Becker, 1978	*Adelocera oblongus* (Fleutiaux, 1934)	Johnson 2002
Nitidulidae		
Stelidota sp. [of Beardsley et al., 1992]	*Stelidota chontalensis* Sharp, 1890	Ewing 2004

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
INSECTA: DIPTERA		
Ceratopogonidae		
Dasyhelea excellentis Borkent, 1997	*Dasyhelea bifida* Zilahi-Sebess, 1936	Dominiak 2012- Synonymy, End. to Adv. species; Borkent 2013
Drosophilidae		
Drosophila bizonata Kikkawa and Peng	*Drosophila bizonata* Kikkawa & Peng	Nishida 2002- Not Est.; Leblanc et al. 2009- Est. Ha, Ma
Scaptomyza graminum (Fallén, 1823)	*Scaptomyza elmoi* Takada, 1970	Leblanc et al. 2009
Otitidae	All Hawaiian species moved to **Ulidiidae**	Evenhuis 2004
Tethinidae	Moved to subfamily within **Canacidae**	Munari and Evenhuis 2011
Tipulidae		
Limoniinae	Subfamily raised to **Limoniidae**	Evenhuis 2004
INSECTA: HETEROPTERA	Moved to suborder within **HEMIPTERA**	Forero 2008
INSECTA: HOMOPTERA	Split into suborders Auchenorrhyncha and Sternorrhyncha within order **HEMIPTERA**	Forero 2008
Aleyrodidae		
Aleurothrixus antidesmae Takahashi, 1933	*Asiothrixus antidesmae* Takahashi, 1933	Dubey et al. 2010
Aleurotuberculatus minutus (Singh, 1933)	*Minutaleyrodes minuta* (Singh, 1933)	Evans 2008
Bemisia argentifolii Bellows & Perring, 1994	*Bemisia tabaci* (Gennadius, 1889)	De Barro et al. 2005; Evans 2008

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Crenidorsum sp. [of Nakahara 1985]	*Crenidorsum aroidephagus* Martin and Aguiar, 2001	Martin et al. 2001
Paraleyrodes naranjae Dozier, 1927	*Paraleyrodes pseudonaranjae* Martin, 2001	Martin 2001
Dialeurodes citrifolii (Morgan, 1893)	*Singhiella citrifolii* (Morgan, 1893)	Jensen 2001
Anthocoridae		
Alofa sodalis (White, 1878)	*Alofa sodalis* (White, 1878)	Lattin 2007- Adv. to Ind. species
Cardiastethus fulvescens (Walker, 1872)	*Amphiareus constrictus* (Stal, 1860)	Brenner and Lattin 2001
Lyctocorinae	Subfamily raised to **Lyctocoridae**	Lattin 2007
Macrotrachelia thripiformis Champion, 1901	= *Montandoniola confusa* (in part) = *Macrotrachelia nigronitens* (Stal, 1860)	Misidentified; Lattin 2005; 2007+ Misidentified; Lattin 2005; 2007+ (in part) possibly not established
Montandoniola moraguesi (Puton, 1896)	*Montandoniola confusa* Streito and Matocq, 2009	Lattin 2007; Pluot-Sigwalt et al. 2009+
Physopleurella mundula (White, 1877)	*Physopleurella mundula* (White, 1877)	Lattin 2007- Adv. to Ind. species
Xylocoris discalis (Van Duzee, 1914)	*Xylocoris galactinus* (Fieber, 1837)	Lattin 2007
Aphididae		
Acyrthosiphon porosus (Sanderson, 1901)	*Rhodobium porosum* (Sanderson, 1901)	Foottit et al. 2012
Anuraphis tulipae (Boyer de Fonscolombe, 1841)	*Dysaphis tulipae* (Boyer de Fonscolombe, 1841)	Foottit et al. 2012- Est.?
Aphis citricola Van der Goot, 1912	*Aphis fabae* Scopoli, 1763 [in part]	Foottit et al. 2012- *A. citricola* was treated as a senior syn. of *A. spiraecola* but is now considered a syn. of *A. fabae*

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Aphis citricola Van der Goot, 1912	*Aphis spiraecola* Patch, 1914 [in part]	Foottit et al. 2012- *A. spiraecola* was treated as a junior syn. of *A. citricola*
Aphis papaveris Fabricius (of Kirkaldy, 1909)	Unknown, possibly *Aphis fabae*	Foottit et al. 2012
Aulacorthum circumflexum (Buckton, 1876)	*Neomyzus circumflexus* Buckton, 1876	Foottit et al. 2012
Cerataphis palmae (Ghesquiere, 1934)	*Cerataphis brasiliensis* (Hempel, 1901)	Messing et al. 2012; Foottit et al. 2012
Cerataphis orchidearum (Westwood, 1879)	A mix of: *C. brasiliensis* (Hempel, 1901) *C. lataniae* (Boisduval, 1867) and *C. orchidearum* (Westwood, 1879)	Foottit et al. 2012
Eriosoma lanigera (Hausmann, 1802)	*Eriosoma lanigerum* (Hausmann, 1802)	Foottit et al. 2012
Eulachnus sp. [of Funasaki, 1975]	*Eulachnus rileyi* (Williams, 1911)	Mondor et al. 2007
Greenidea formosana (Maki, 1917)	*Greenidea psidii* van der Goot, 1917	Messing et al. 2006; Foottit et al. 2012
Lipaphis erysimi (Kaltenbach, 1843)	*Lipaphis pseudobrassicae* (Davis, 1914)	Blackman and Eastop 2000; Foottit et al. 2012
Pleotrichophorus chrysanthemi (Theobald, 1920)	Delete?	Foottit et al. 2012- Extripated?
Reticulaphis distylii fici (Takahashi, 1923)	*Reticulaphis distylii* (van der Goot, 1917)	Foottit et al. 2012
Siphonatrophia cupressi (Swain, 1918)	Delete?	Foottit et al. 2012- Extripated?
Tetraneura nigriabdominalis (Sasaki, 1899)	*Tetraneura fusiformis* Matsumura, 1917	Blackman and Eastop 2006; Foottit et al. 2012
Therioaphis maculata (Buckton, 1899)	*Therioaphis trifolii* (Monell, 1882)	Foottit et al. 2012
Uroleucon illini (Hottes & Frison, 1931)	Delete?	Foottit et al. 2012- Unsupported record
Asterolecaniidae		
Asterolecanium bambusae (Boisduval, 1869)	*Bambusaspis bambusae* (Boisduval, 1869)	Borchsenius 1960 in Ben-Dov 2006

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Asterolecanium miliaris (Boisduval, 1869)	*Bambusaspis miliaris* (Boisduval, 1869)	Stumpf and Lambdin1999
Asterolecanium pseudomiliaris Green, 1922	*Bambusaspis miliaris* (Boisduval, 1869)	Stumpf and Lambdin1999
Asterolecanium pustulans (Cockerell, 1892)	*Russellaspis pustulans pustulans* (Cockerell, 1892)	Borchsenius 1960 in Ben-Dov 2006
Asterolecanium robustum Green, 1908	*Bambusaspis miliaris* (Boisduval, 1869)	Stumpf and Lambdin1999
Asterolecanium scirrosis Russell, 1941	*Pauroaspis scirrosis* (Russell, 1941)	Tang and Hao 1995
Cicadellidae		
Sophonia rufofascia (Kuoh & Kuoh, 1983)	*Sophonia orientalis* (Matsumura, 1912)	Webb and Viraktamath 2004
Coccidae		
Coccus acutissimus (Green, 1896)	*Prococcus acutissimus* (Green, 1896)	Avasthi 1993
Vinsonia stellifera (Westwood, 1871)	*Ceroplastes stellifer* (Westwood, 1871)	Kumashiro et al. 2002- Est. Oa; Peronti et al. 2008- new combination
Cydnidae		
Geotomus pygmaeus (Dallas, 1851)	*Fromundus pygmaeus* (Dallas, 1851)	Lis 1994
Microporus shiromai Froeschner, 1976	*Byrsinus varians* (Fabricius, 1803)	Lis and Zack, 2010
Diaspididae		
Abgrallaspis palmae (Cockerell, 1893)	*Hemiberlesia palmae* (Cockerell, 1893)	Williams and Watson, 1988
Andaspis leucophloeae Rao, 1952	*Andaspis leucophleae* Rao in Rao and Ferris, 1952	Nishida 2002- Misspelled; Miller et al. 2015
Carulaspis minima (Targioni-Tozzetti, 1868)	*Carulaspis minima* (Signoret, 1869)	Signoret, 1869; Miller et al. 2015
Chortinaspis subcortina (Laing, 1929)	*Chortinaspis subchortina* (Laing, 1929)	Nishida 2002- Misspelled; Miller et al. 2015

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Genaparlatoria pseudaspidiotus (Lindinger, 1905)	*Parlatoria pseudaspidiotus* Lindinger, 1905	Miller et al. 2015
Lepidosaphes machili (Maskell, 1898)	*Lepidosaphes pinnaeformis* (Bouche, 1851)	Miller et al. 2015
Melanaspis aliena (Newstead, 1901)	*Acutaspis aliena* (Newstead, 1901)	Deitz and Davidson 1986
Odonaspis saccharicaulis (Zehntner)	*Odonaspis saccharicaulis* (Zehntner)	Nishida 2002- Unk. Est.; Matsunaga 2013a- Not Est. to Est.
Pseudaulacaspis major (Cockerell, 1894)	*Rutherfordia major* (Cockerell, 1894)	Miller et al. 2015
Eriococcidae		
Eriococcus coccineus Cockerell, 1894	*Acanthococcus coccineus* (Cockerell, 1894)	Hodgson and Miller 2010
Anthocoridae		
Lyctocoris	Genus moved to **Lyctocoridae**	Henry 2008
Lyctocoris hawaiiensis (Kirkaldy, 1902)	*Lyctocoris campestris* (Fabricius, 1794)	Lattin 2007- End. to Adv.
Margarodidae		
Icerya	Genus moved to **Monophlebidae**	Hodgson and Foldi 2006, García Morales et al. 2016
Miridae		
Halticus bractatus (Say, 1832)	*Microtechnites bractatus* (Say, 1832)	Tatarnic and Cassis 2012
Halticus chrysolepis Kirkaldy, 1904	*Microtechnites chrysolepis* (Kirkaldy, 1904)	Tatarnic and Cassis 2012
Ortheziidae		
Nipponothezia guadalcanalia Morrison, 1952	*Nipponorthezinella guadalcanalia* (Morrison, 1952)	Kozár 2004
Orthezia insignis Browne, 1887	*Insignorthezia insignis* (Browne, 1887)	Kozár 2004

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Pseudococcidae		
Chorizococcus lounsburyi (Brain, 1912)	*Vryburgia amaryllidis* (Bouché, 1837)	Ben-Dov and Cox 1990
Ferrisia consobrina Williams & Watson, 1988	*Ferrisia malvastra* (McDaniel, 1962)	Williams 1996
Geococcus	Genus moved to **Rhizoecidae**	Hodgson 2012
Rhizoecus	Genus moved to **Rhizoecidae**	"
Ripersiella	Genus moved to **Rhizoecidae**	"
Psyllidae		
Blastopsylla	Genus moved to **Aphalaridae**	Burckhardt and Ouvraurd 2012
Psyllidae		
Calophya	Genus moved to **Calophylidae**	"
Diaphorina	Genus moved to **Liviidae**	"
Leptynoptera	Genus moved to **Triozidae**	"
INSECTA: HYMENOPTERA		
Agaonidae		
Josephiella n. sp. [of Beardsley & Perreira, 2000]	*Josephiella microcarpae* Beardsley & Rasplus 2001	Beardsley and Rasplus 2001
Anthophoridae	Moved to subfamily within **Apidae**	Danforth et al. 2013
Aphelinidae		
Aspidiotiphagus citrinus (Craw, 1891)	*Encarsia citrina* (Craw, 1891)	Noyes 2016

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Aspidiotiphagus lounsburyi (Berlese & Paoli, 1916)	*Encarsia lounsburyi* (Berlese & Paoli 1916)	Schmidt and Polaszek 2007; Noyes 2016
Encarsia ?haitiensis Dozier, 1932	*Encarsia dispersa* Polazek, 2004	Polaszek et al. 2004; Noyes 2016
Encarsia hispida De Santis, 1948	*Encarsia brasiliensis* (Hempel, 1904)	Noyes 2016
Encarsia opulenta Silvestri, 1927	*Encarsia perplexa* Huang & Polaszek, 1998	Misidentification; HDOA 2002; Culliney et al. 2003; Huang & Polaszek 1998
Encarsia transvena (Timberlake, 1926)	*Encarsia sophia* (Girault & Dodd, 1915)	Noyes 2016
Aphidiidae	Moved to subfamily within **Braconidae**	Achterberg 1984; Shaw & Huddleston 1991
Braconidae		
Lysiphlebus ambiguus (Haliday, 1834)	*Lysiphlebus ambiguus* (Haliday, 1834)	Culliney et al. 2003- Est. on Ha
Elasmidae	Moved to tribe within **Eulophidae**	Gauthier et al. 2000
Encyrtidae		
Cheiloneurus americanus (Perkins, 1906)	*Cheiloneurus flaccus* (Walker, 1847)	Guerrieri and Viggiani 2005
Tetracnemoidea pretiosus (Timberlake, 1929)	*Tetracnemoidea brevicornis* (Girault, 1915)	Gruner 2004- Est. on Ka
Formicidae		
Cardiocondyla nuda (Mayr, 1866)	*Cardiocondyla minutior* Forel, 1899	Misidentification- Seifert 2003
Cardiocondyla wroughtoni (Forel, 1890)	*Cardiocondyla obscurior* (Wheeler, 1929)	Seifert 2003
Monomorium destructor (Jerdon, 1851)	*Trichomyrmex destructor* (Jerdon, 1851)	Ward et al. 2014

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Monomorium sechellense Emery, 1894	*Syllophopsis sechellensis* (Emery, 1894)	"
Paratrechina bourbonica (Forel, 1886)	*Nylanderia bourbonica* (Forel, 1886)	LaPolla et al. 2010
Paratrechina clandestina (Mayr, 1870)	*Nylanderia clandestina* (Mayr, 1870)	"
Paratrechina vaga (Forel, 1901)	*Nylanderia vaga* (Forel, 1901)	"
Scelionidae		
Aphanomerus	Genus moved to **Platygasteridae**	Gruner 2004
Signiphoridae		
Thysanus dactylopii (Ashmead, 1900)	*Chartocerus dactylopii* (Ashmead, 1900)	Gruner 2004
Thysanus aspidioti Ashmead, 1900	*Signiphora aspidioti* Ashmead, 1900	Gruner 2004
Vespidae		
Polistes carnifex carnifex (Fabricius, 1775)	Delete	Dubious record- No published records or vouchers known
Polistes jadwigae Dalla Torre, 1904	*Polistes jokahamae* Radoszkowski, 1877	Misidentification & synonym- Carpenter 2008
Polistes tepidus malayanus Cameron, 1906	Delete	Record based on labeling error- Carpenter 2008
Vespula vulgaris (Linnaeus, 1758)	*Vespula alascensis* (Packard, 1870)	Removed from synonymy/ revised name- Carpenter and Glare 2010
INSECTA: LEPIDOPTERA		
Crambidae		
Synclita obliteralis (Walker, 1859)	*Elophila obliteralis* (Walker, 1859)	Pohl et al. 2016

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Gelechiidae		
Autosticha	Genus moved to **Autostichidae**	Hodges 1998; Van Nieukerken et al. 2011
Noctuidae		
Discestra trifolii Hufnagel, 1767	*Anarta trifolii* (Hufnagel, 1767)	Fibiger and Hacker 2005
Pseudaletia unipuncta (Haworth, 1809)	*Mythimna unipuncta* (Haworth, 1809)	Hacker et al. 2002
Trichoclea edwardsi Smith, 1888	*Anarta edwardsii* (Smith, 1888)	Mustelin 2006
Trichoclea postica Smith, 1891	*Anarta decepta* (Grote, 1883)	"
The species in the following genera listed in Nishida 2002 have been separated from the Noctuidae to the Erebidae.		
Noctuidae	**Erebidae**	
Achaea	*Achaea*	Lafontaine and Schmidt 2010;
Anomis	*Anomis*	Zahiri et al. 2012
Antiblemma	*Antiblemma*	"
Ascalapha	*Ascalapha*	"
Athetis	*Athetis*	"
Bocana	*Bocana*	"
Eublemma	*Eublemma*	"
Eudocina	*Eudocina*	"
Hypena	*Hypena*	"
Hypocala	*Hypocala*	"
Melipotis	*Melipotis*	"

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Ophiusa	*Ophiusa*	Zahiri et al. 2012
Pandesma	*Pandesma*	"
Polydesma	*Polydesma*	"
Schrankia	*Schrankia*	"
Simplicia	*Simplicia*	"
Pyralidae		
Corcyra cephalonica (Stianton, 1866)	*Aphomia cephalonica* (Stainton, 1866)	Pohl et al. 2016
Ectomyelois ceratoniae (Zeller, 1839)	*Apomyelois ceratoniae* (Zeller, 1848)	"
Sphingidae		
Deilephila nerii (Linnaeus, 1758)	*Daphnis nerii* (Linnaeus, 1758)	Kitching 2017a
Psilogramma menephron (Cramer, 1780)	*Psilogramma increta* (Walker, 1865)	Previously misidentified-Kitching 2017b
INSECTA: THYSANOPTERA		
Thripidae		
Apterothrips secticornis (Trybom, 1896)	*Apterothrips apteris* (Daniel, 1904)	Mound et al. 2016
Ceratothrips frici (Uzel, 1895)	*Tenothrips frici* (Uzel, 1895)	Bhatti 1990
Chirothrips fulvus Moulton, 1936	*Arorathrips fulvus* (Moulton, 1936)	Nakahara and Foottit 2012
Chirothrips mexicanus Crawford, 1909	*Arorathrips mexicanus* (Crawford, 1909)	Nakahara and Foottit 2012
Dolichothrips	Genus moved to **Phlaeothripidae**	Mound et al. 2016
Dolichothrips nesius [prob.] Stannard, 1961	*Dolichothrips indicus* (Hood, 1919)	Mound and Okajima 2015

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Scolothrips priesneri Sakimura, 1954	*Scolothrips takahashii* Priesner, 1950	Mound 2011
Trichromothrips oahuensis (Nakahara, 1993)	Delete	Quarantine interception only
Phlaeothripidae		
Haplothrips fissus Bianchi, 1947	*Haplothrips davisi* Bianchi, 1946	Mound and Matsunaga 2017
Haplothrips sesuvii Priesner, 1933	*Haplothrips robustus* Bagnall, 1918	Mound and Matsunaga 2017
Hoplothrips intermedius (Bagnall, 1910)	*Hoplothrips perkinsi* (Bagnall, 1910)	Mound 2017
Hoplothrips hawaiensis Moulton, 1936	*Hoplothrips lanaiensis* (Bagnall, 1910)	Mound 2017
Hoplothrips mauiensis Moulton, 1928	*Hoplothrips laticornis* (Bagnall, 1910)	Mound 2017
Hoplothrips nigricans (Bagnall, 1910)	*Hoplothrips perkinsi* (Bagnall, 1910)	Mound 2017
Hoplothrips swezeyi Moulton, 1928	*Hoplothrips perkinsi* (Bagnall, 1910)	Mound 2017
Nesothrips brevicollis (Bagnall, 1914)	*Nesothrips minor* (Bagnall, 1921)	Okajima 2006
INSECTA: TRICHOPTERA		
Hydropsychidae		
Cheumatosyche pettiti (Banks, 1901)	*Cheumatosyche analis* (Banks, 1903)	Flint et al. 2003
Hydroptilidae		
Hydroptila arctia Ross, 1938	*Hydroptila potosina* Bueno-Soria, 1984	Flint et al. 2003
CHILOPODA: GEOPHILOMORPHA		
Geophilidae		
Honuaphilus alohanus Chamberlin, 1926	*Tuoba sydneyensis* (Pocock, 1891)	Bonato et al. 2004- Synonymy, End. to Ind. or Adv.?

Table 2. Name changes and deletions to the names of alien species listed in Nishida 2002 (continued).

Name in Nishida 2002	Current name/Status	Reference/Notes
Mecistocephalidae		
Fusichila waipaheenas Chamberlin, 1953	Delete	Bonato et al. 2004
Schendylidae		
Marsikomerus lanaius (Chamberlin, 1953)	*Marsikomerus bryanus* (Chamberlin, 1953)	Bonato et al. 2004- Synonymy
Marsikomerus pacificus Attems, 1938	*Marsikomerus bryanus* (Chamberlin, 1953)	Bonato et al. 2004- Synonymy
Nyctunguis bryanus Chamberlin, 1926	*Marsikomerus bryanus* (Chamberlin, 1953)	Bonato et al. 2004

+ Indicates accompanying text in Collection Data and New Record Summaries section
Est. = Established, adventive; End. = Endemic; Ind. = Indigenous; Unk. = Unknown establishment