

## New records of arthropods from the Hawaiian Islands<sup>1</sup>

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This paper reports new island and state records for arthropods collected during the course of three ecological studies conducted on Maui, O'ahu, and Hawai'i islands. The first of these studies examined the effects of invasive ants on arthropod communities at five sites on Maui and Hawai'i Island, and sampling methods and ecological results were reported in Krushelnycky & Gillespie (2008, 2010a,b). New records of arthropods for Haleakalā National Park, collected at the two Maui study sites, were reported in Krushelnycky *et al.* (2007), but new records for the three Hawai'i Island sites used in the study are reported here for the first time. The second study is an ongoing assessment of the effects of intensive rodent trapping on arthropod communities at three sites in the Wai'anāe Mountains of O'ahu. New records obtained to date are reported here. The third study, conducted at Ka'ena Point Natural Area Reserve (NAR), O'ahu, is also ongoing and is evaluating the ecological effects of invasive predator eradication, using a combination of intensive trapping and the construction of a predator proof fence (Young *et al.* 2013). Arthropod sampling methods are described in Young *et al.* (2012). New arthropod records obtained in this effort to date are reported here.

Each of these studies has employed numerous replicated standardized samples. In the interest of brevity, collection information for the material examined is combined such that samples obtained with the same collecting methods (including the same host plant), and that were collected on the same approximate dates at the same sites, are grouped. In addition, GPS coordinates and collector information are not included under material examined; unless otherwise noted, this information is consistent for each collection site, and is as follows:

Hawai'i Island, Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, 19.79372°N–19.79545°N, 155.61120°W–155.61234°W, specimens collected by P. Krushelnycky.

Hawai'i Island, Kīpuka 'Āināhou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, 19.68369°N–19.68377°N, 155.46290°W–155.46269°W, specimens collected by P. Krushelnycky.

Hawai'i Island, Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, 19.74919°N–19.75223°N, 155.5155°W–155.52058°W, specimens collected by P. Krushelnycky.

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- O'ahu Island, Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, 21.53981°N–21.54272°N, 158.19368°W–158.19570°W, specimens collected by P. Krushelnycky and O'ahu Army Natural Resources Program staff.
- O'ahu Island, Northern Wai'anae Mountains, Pahole NAR Valley, 500 m, 21.53768°N–21.54204°N, 158.18689°W–158.18919°W, specimens collected by P. Krushelnycky and O'ahu Army Natural Resources Program staff.
- O'ahu Island, Southern Wai'anae Mountains, Palikea area, 850 m, 21.40991°N–21.41418°N, 158.09668°W–158.10037°W, specimens collected by P. Krushelnycky and O'ahu Army Natural Resources Program staff.
- O'ahu Island, Ka'ena Point NAR, 1-21 m, 21.57256°N–21.57542°N, 158.27275°W–158.27974°W, specimens collected in March 2010 by Lindsay Young, specimens collected in April 2012 by Cynthia King.

Determinations of taxonomic identity, unless otherwise noted, were made by P. Krushelnycky. As indicated below, voucher specimens are deposited in the Bernice Pauahi Bishop Museum (BPBM), the University of Hawai'i Insect Museum (UHIM), or are currently being held in P. Krushelnycky's reference collection (PDK collection) until eventual deposition at BPBM or UHIM. Several specimens are also vouchered at the Florida State Collection of Arthropods (FSCA), the National Museum of Natural History (NMNH), the Institute of Systematics and Evolution of Animals (ISEA) at the Polish Academy of Sciences, the Finnish Museum of Natural History (FMNH), and the University of Guelph Insect Collection (UGIC).

## Class Arachnida

### Order Araneae

#### Linyphiidae

##### *Centromerus* sp. 2

##### New island record

This is one of three apparently undescribed *Centromerus* species first reported in Krushelnycky *et al.* (2007), and which may be endemic to Hawai'i. In addition to the Hawai'i Island specimens listed below, *Centromerus* sp. 2 has been collected in Haleakalā National Park and Poli Poli State Park on Maui, and in Kīpuka Ki in Hawai'i Volcanoes National Park on Hawai'i Island (Krushelnycky *et al.* 2007). Generic determination was made by Jeremy Miller.

*Material examined.* **HAWAI'I:** Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, beating *Coprosma ernodeoides*, 22 Aug 2003 (2♀, BPBM); pitfall trap, 30 Aug 2003 (1♀ 1♂ BPBM), 22 Aug 2005 (2♀ 4♂ 1 immature BPBM); litter extraction, 23 Aug 2003 (1♂ UHIM).

##### *Erigone autumnalis* Emerton, 1882

##### New island record

This adventive species has previously been recorded from Maui, Kaua'i and Hawai'i Island (Nishida 2002, Krushelnycky *et al.* 2007).

*Material examined.* **O'AHU:** Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, pitfall trap, 2–8 May 2009 (1♀ PDK collection, will be deposited in BPBM); Southern Wai'anae Mountains, Palikea area, 850 m, pitfall trap, 3–11 Nov 2009 (1♂ PDK collection, will be deposited in BPBM); vegetation sweeping, 3–5 Nov 2009 (2♀ PDK collection, will be deposited in UHIM), 20–21 Jul 2010 (1♂ PDK collection, will be deposited in UHIM).

***Erigone bifurca*** Locket, 1982**New state record**

This species joins *E. dentosa* from Maui (Krushelnycky *et al.* 2007) as another new adventive *Erigone* species now established in the state. It is known from Malaysia, the Philippines, and Krakatau (Platnick 2013). Determination was made by Jeremy Miller.

*Material examined.* **HAWAII:** Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, pitfall trap, 30 Aug 2003 (1♂, BPBM).

***Nesioneta lepida*** Millidge, 1991**New island record**

*Nesioneta lepida* is another small adventive sheet-web weaver, previously known from Maui, Kaua'i and Hawai'i Island (Nishida 2002, Krushelnycky *et al.* 2007).

*Material Examined.* **O'AHU:** Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, beating *Psidium cattleianum*, 12 May 2011 (1♀); Southern Wai'anae Mountains, Palikea area, 850 m, vegetation sweeping, 29 Mar–8 Apr 2010 (1♀). Both specimens in PDK collection, will be deposited in UHIM.

***Ostearius melanopygius*** (Cambridge, 1880)**New island record**

This is a cosmopolitan species (Platnick 2013) that is now widespread in Hawai'i, already recorded on Maui, Kaua'i and Hawai'i Island (Nishida 2002). Many individuals were collected in addition to those vouchered below.

*Material Examined.* **O'AHU:** Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, beating *Psidium cattleianum*, 15 Dec 2010 (1♀ PDK collection, will be deposited in BPBM) (an additional unvouchered specimen also collected on *Pisonia umbellifera*); Southern Wai'anae Mountains, Palikea area, 850 m, pitfall trap, 3–11 Nov 2009 (2♀ 2♂ PDK collection, will be deposited in UHIM); vegetation sweeping, 3–5 Nov 2009 (1♂ PDK collection, will be deposited in BPBM).

**Oonopidae*****Orchestina* sp.****New island record**

This tiny adventive species, previously recorded on Kaua'i and Hawai'i Island (Nishida 2002), is very abundant in the upland forests in the Wai'anae Mountains of O'ahu. Many individuals were collected in addition to those vouchered below, including specimens on *Charpentiera tomentosa*, in pitfall traps and in leaf litter samples. This may also be the same species designated *Orchestina* sp. B by Howarth *et al.* (2012) collected in the Kahului Airport environs, Maui.

*Material examined.* **O'AHU:** Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, beating *Pipturus albidus*, 2 May 2009 (3♀ PDK collection, will be deposited in BPBM); Northern Wai'anae Mountains, Pahole NAR, 500 m, beating *Pisonia umbellifera*, 23 Jun 2009 (2♀ PDK collection, will be deposited in BPBM); beating *Psidium cattleianum*, 23 Jun 2010 (1♂ PDK collection, will be deposited in UHIM); Southern Wai'anae Mountains, Palikea area, 850 m, vegetation sweeping, 3–24 Nov 2009 (10♀ 5 immatures PDK collection, will be deposited in UHIM).

**Philodromidae*****Pagiopalus nigriventris*** Simon, 1900**New island record**

This endemic species was previously known from Maui and Hawai'i Island (Nishida 2002). Specimens collected on O'ahu match Suman's (1970) genitalic descriptions and illustrations for *P. nigriventris*, representing an apparent range extension.

*Material examined.* **O'AHU:** Southern Wai'anae Mountains, Palikea area, 850 m, vegetation sweeping, 29 Mar–8 Apr 2010 (1♀ 3♂ 4 immatures PDK collection, will be deposited in BPBM), 15–16 Mar 2011 (5♂ PDK collection, will be deposited in UHIM).

**Salticidae****?*Afraflacilla* sp.****New state record**

The generic determination of this previously undocumented adventive jumping spider was made by Wayne Maddison. A possible alternate generic placement is in *Pseudicius*, a genus that includes species throughout Asia, the western and southern Pacific. The male pedipalp morphology in the Hawaiian specimen is similar to that of *P. javanicus*, *P. philippinensis* and *P. kraussi* (F.G. Howarth, pers. comm.).

*Material examined.* O'AHU: Northern Wai'anae Mountains, Pahole NAR, 500 m, beating *Charpentiera tomentosa*, 14 Dec 2010 (1♀ PDK collection, will be deposited in BPBM); beating *Pipturus albidus*, 14 Dec 2010 (1♂ PDK collection, will be deposited in BPBM).

***Habronattus pyrithrix* (Chamberlin, 1924) New state record**

This represents another new adventive jumping spider for the state. It is currently known from the US and Mexico (Platnick 2013). Determination made by Wayne Maddison.

*Material examined.* O'AHU: Ka'ena Point NAR, 5 m, coastal strand, yellow pan trap, 11 Mar 2010 (1 immature UHIM); invasive grassland, yellow pan trap, 12–13 Apr 2012 (1♂ UHIM); Naio shrubland, yellow pan trap, 12–13 Apr 2012 (1♂ UHIM).

***Myrmarachne nigella* Simon, 1901 New state record**

This adventive ant-mimicking jumping spider has been observed for some time on O'ahu, and now appears to be quite widespread on that island, but has only recently been identified. It is currently known only from the Philippines (Platnick 2013). The species determination was made by G.B. Edwards after examining an adult male and female specimen. Distribution on other islands is currently unknown. In addition to specimens vouchered below, individuals were collected in the Northern Wai'anae Mountains on *Pipturus albidus*, *Charpentiera tomentosa*, and *Psidium cattleianum*.

*Material examined.* O'AHU: Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, beating *Pisonia umbellifera*, 2 May 2009 (1 immature PDK collection, will be deposited in BPBM); Northern Wai'anae Mountains, Pahole NAR, 500 m, beating *Pisonia umbellifera*, 15 Dec 2009 (1 immature PDK collection, will be deposited in UHIM); Southern Wai'anae Mountains, Palikea area, 850 m, vegetation sweeping, 3–24 Nov 2009 (2 immatures PDK collection, will be deposited in UHIM), 25–27 Jul 2011 (1♂ FSCA), 13–15 Nov 2012 (2♂ PDK collection, will be deposited in BPBM, 1♀ FSCA); Honolulu, residence in Mānoa Valley, 100 m, 21.30020°N, 157.81179°W, hand collecting, foraging on ground (1♂ FSCA).

***Plexippus paykulli* (Audouin, 1826) New island record**

*Plexippus paykulli*, an adventive species, has previously been recorded on Kaua'i and Midway Atoll (Nishida 2002). The determination for the O'ahu specimen was made by Wayne Maddison.

*Material examined.* O'AHU: Southern Wai'anae Mountains, Pālehua, Hokulua cabin, 600 m, hand collected on outside of window on cabin by P. Krushelnycky, 20 Jul 2010 (1♀ PDK collection, will be deposited in UHIM).

**Theridiidae*****Argyrodes argentatus* Cambridge, 1880 New island record**

This adventive *Argyrodes* species was previously recorded on Kaua'i and Hawai'i Island (Beatty et al. 2000). In addition to the specimens vouchered from Palikea, individuals have also been captured in Kahanahāiki Valley and Pahole NAR in the Northern Wai'anae Mountains.

*Material examined.* **O'AHU:** Southern Wai'anae Mountains, Palikea area, 850 m, vegetation sweeping, 3–24 Nov 2009 (2♀ PDK collection, will be deposited in UHIM), 29 Mar–8 Apr 2010 (1♀ 1♂ PDK collection, will be deposited in UHIM).

***Argyrodus ilipoepoe* Rivera & Gillespie, 2010      New island record**

This endemic kleptoparasitic *Argyrodus* species was previously known only from wet and mesic forests of Kaua'i (Rivera and Gillespie 2010). A single male captured while beating *Pisonia umbellifera* in Pahole NAR, O'ahu matches the genitalic descriptions and illustrations for *A. ilipoepoe*, and represents a range extension for this species.

*Material examined.* **O'AHU:** Northern Wai'anae Mountains, Pahole NAR, 500 m, beating *Pisonia umbellifera*, 26 Jun 2012 (1♂ PDK collection, will be deposited in BPBM).

***Phycosoma altum* (Keyserling, 1886)      New island record**

This small adventive theridiid was previously collected on Hawai'i Island.

*Material examined.* **O'AHU:** Northern Wai'anae Mountains, Kahanahāiki Valley, 500 m, beating *Charpentiera tomentosa*, 15 Dec 2010 (1♀ PDK collection, will be deposited in UHIM); Northern Wai'anae Mountains, Pahole NAR, 500 m, beating *Psidium cattleianum*, 15 Dec 2009 (1♂ PDK collection, will be deposited in UHIM); Southern Wai'anae Mountains, Palikea area, 850 m, vegetation sweeping, 25–27 Jul 2011 (1♀ PDK collection, will be deposited in UHIM).

***Steatoda capensis* Hann, 1990      New state record**

*Steatoda capensis*, native to southern Africa (Hann 1994), is the third adventive *Steatoda* species to establish in the state, joining *S. grossa* (C.L. Koch, 1838) and *S. erigoniformis* (Cambridge, 1872). Although *S. grossa* and *S. capensis* are superficially similar, these two species can be easily differentiated by the male and female genitalia. Confirmation of the identity of *S. capensis* was provided by Sean Hann.

Both *S. grossa* and *S. capensis* form loose tangle webs under rocks and within leaf litter, and are extremely abundant in certain terrestrial habitats. They exhibit an interesting distributional pattern: *S. grossa* is dominant in subalpine habitats on Maui and Hawai'i Island, with only several specimens of *S. capensis* collected among many *S. grossa* on Mauna Kea and none collected on Haleakalā (Krushelnycky *et al.* 2007). In contrast, *S. capensis* is abundant and widespread in the forests of the Wai'anae Mountains of O'ahu, with no individuals of *S. grossa* encountered in this range in the current studies. This pattern may indicate differential elevational preferences between the two species, or it may indicate that *S. capensis* became established initially and relatively recently on O'ahu, and is now in the early stages of colonizing other islands. Many individuals of *S. capensis* were collected on O'ahu in addition to those vouchered below, most from terrestrial habitats but a few from vegetation sweeping samples.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (1♀ 1♂ BPBM); **O'AHU:** Northern Wai'anae Mountains, Kahanahāiki Valley, 600 m, pitfall trap, 7–14 Dec 2009 (2♂ PDK collection, will be deposited in BPBM); litter extraction, 15 Dec 2009 (1♂ PDK collection, will be deposited in UHIM); Northern Wai'anae Mountains, Pahole NAR, 500 m, pitfall trap 23 Jun 2010 (1♂ PDK collection, will be deposited in UHIM); Southern Wai'anae Mountains, Palikea area, 850 m, pitfall trap, 3–11 Nov 2009 (2♀ 2♂ PDK collection, will be deposited in BPBM); litter extraction, 3–11 Nov 2009 (1♀ 1♂ PDK collection, will be deposited in UHIM), 23 Mar–8 Apr 2010 (1♂ PDK collection, will be deposited in UHIM).

**Zodariidae*****Tropizodium molokai* Jocqué & Churchill, 2005 New island record**

This species was previously known only from Moloka'i (Jocqué & Churchill 2005). Like other zodariids, it is probably a specialized predator of ants (R. Jocqué pers. comm.). Although named for its type locality on Moloka'i, its provenance is uncertain, and its restricted known range may simply reflect a lack of studies of Asian and Oceanic zodariids (R. Jocqué, pers. comm.).

*Material examined.* O'AHU: Ka'ena Point NAR, 5 m, coastal strand, yellow pan trap, 11 Mar 2010 (1♀ 2♂ UHIM).

**Class Insecta****Order Coleoptera****Coccinellidae*****Scymnus horni* Gorham, 1897****New island record**

*Scymnus horni* has previously been found on O'ahu (Nishida 2002).

*Material examined.* HAWAII: Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Chenopodium oahuense*, 28–29 Aug 2002 (2 adults BPBM, 1 adult UHIM); beating *Myoporum sandwicense*, 28 Aug 2002 (1 adult BPBM); beating *Sophora chrysophylla*, 9 Aug 2004 (1 adult BPBM).

**Dermestidae*****Dermestes frischi* Kugelann, 1792****New island record**

This adventive dermestid beetle was previously collected on Nihoa, O'ahu, and Maui (Nishida 2002). Determination made by G.A. Samuelson.

*Material examined.* HAWAII: Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (2 adults BPBM).

**Order Collembola****Entomobryidae*****Entomobrya unostrigata* Stach, 1930****New island record**

This adventive entomobryid was previously reported only from Midway Atoll (Nishida 2002). It is here reported from Hawai'i Island, where it can attain very high densities in subalpine shrubland and woodland. Determination was made by Kenneth Christiansen.

*Material examined.* HAWAII: Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall traps, 7 Sep 2002 (25 individuals UHIM); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, pitfall traps, 5 Sep 2002 (7 individuals BPBM).

**Hypogastruridae*****Brachystomella insulae* Najt & Thibaud, 1988 New state record**

The establishment of this adventive species was determined by Wanda Weiner. It is native to New Caledonia (Najt & Thibaud 1988).

*Material examined.* HAWAII: Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 20 Aug 2004 (3 individuals ISEA).

***Brachystomella* sp.****New state record**

This undescribed species of *Brachystomella* is of unknown provenance. Determination was made by Wanda Weiner.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 20 Aug 2004 (23 individuals, ISEA).

### Isotomidae

#### *Folsomides angularis* (Axelson, 1905) **New state record**

This adventive isotomid species is recorded in Hawai'i for the first time. It currently occurs in Europe and western North America. Provisional determination was made by Arne Fjellberg, noting that this species belongs to a group with unresolved taxonomy.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, litter extraction, 24 Aug–3 Sep 2002 (5 individuals BPBM, 7 individuals UHIM); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, litter extraction, 26 Aug–2 Sep 2002 (9 individuals BPBM, 2 individuals UHIM).

#### *Proisotoma minuta* (Tullberg, 1871) **New island record**

This adventive springtail has been collected on the islands of Kaua'i, O'ahu, and Lāna'i (Nishida 2002), and is now also recorded from Hawai'i Island. Determination was made by Kenneth Christiansen.

*Material examined.* **HAWAII:** Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Hulululu NAR, 2040 m, pitfall trap, 30 Aug 2003 (3 individuals BPBM, 2 individuals UHIM), 22 Aug 2005 (4 individuals UHIM).

### Order Diptera

#### Cecidomyiidae

#### *Trisopsis oleae* Kieffer, 1912 **New island record**

*Trisopsis oleae*, native to South Africa (Hardy 1960), has previously been found on O'ahu (Nishida 2002) and Moloka'i (Gruner 2004).

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (1 adult BPBM); Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Hulululu NAR, 2040 m, pitfall trap, 30 Aug 2003 (1♂ UHIM), 22 Aug 2005 (2♂ BPBM, 1 adult UHIM).

#### Ephydriidae

#### *Philygria debilis* Loew, 1861 **New state record**

This shore fly is recorded from Hawai'i for the first time. It is a widespread species in the US and also known from British Columbia and Quebec in Canada (Mathis & Zatwarnicki 1995). Determination was made by Wayne Mathis.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (2♀ NMNH, 1♀ BPBM), 20 Aug 2004 (1♂ BPBM, 1♀ 1♂ UHIM); Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Hulululu NAR, 2040 m, pitfall trap, 22 Aug 2005 (2 individuals UHIM).

#### Lonchaeidae

#### *Silba* sp. **New state record**

The generic determination of this *Silba* species, new to the state, was made by Iain MacGowan. According to him, the two females examined likely belong to *Silba excisa* (Kertész, 1901), a species widely distributed in southern India, parts of Southeast Asia and northern Australia, and on islands across the Indian and Western Pacific Oceans. *Silba perplexa* (Walker, 1861) is another possibility, but males are needed for definitive identification.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, pitfall trap, 5 Sep 2002 (2♀ BPBM).

### Muscidae

***Coenosia humilis*** Meigen, 1826

#### New state record

*Coenosia humilis*, recorded here for the first time in Hawai'i, is widespread in North America (Huckett 1934). The specimen below was identified by Adrian C. Pont.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (1♂ BPBM).

### Mycetophilidae

***Sciophila*** sp.

#### New island record

This unidentified *Sciophila* species was previously recorded on Maui (Howarth & Preston 2006); determination made by Neal Evenhuis.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 20 Aug 2004 (1♀ BPBM).

### Sarcophagidae

***Ravinia anandra*** (Dodge, 1956)

#### New island record

This adventive flesh fly has previously been recorded on O'ahu, Moloka'i, and Maui (Nishida 2002), and is reported here from collections on Hawai'i Island.

*Material examined.* **HAWAII:** Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, pitfall trap, 30 Aug 2003 (2 adults BPBM, 3 adults UHIM), 22 Aug 2005 (1 adult BPBM, 1 adult UHIM).

### Sciaridae

***Corynoptera*** sp.

#### New island record

This undescribed *Corynoptera* species was first reported in the state from Haleakalā National Park, Maui (Krushelnycky *et al.* 2007). According to Pekka Vilkkamaa, it represents a new species whose provenance is unknown. It is relatively common at high elevations on both Maui and Hawai'i Island.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 20 Aug 2004 (3♀ FMNH, 3♀ UHIM); beating *Dubautia linearis*, 11 Aug 2004 (1♀ UHIM); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, pitfall trap, 5 Sep 2002 (1♀ FMNH, 1♀ BPBM, 1♀ UHIM); Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, pitfall trap, 30 Aug 2003 (1♂ FMNH).

### Sphaeroceridae

***Pullimosina pullula*** (Zetterstedt, 1847)

#### New island record

This sphaerocerid fly was first recorded as established in the state in the World Catalog of Sphaeroceridae (Roháček *et al.* 2001), but no locality or island was given. Our collection provides the first locality information for Hawai'i. The determination of the single female of this cosmopolitan species was made by Stephen Marshall.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, pitfall trap, 5 Sep 2002 (1♀ UGIC).



**Order Hemiptera****Aphididae*****Hayhurstia atriplicis*** (Linnaeus, 1761)**New island record**

*Hayhurstia atriplicis*, a native of Europe, has been found on the islands of O‘ahu, Moloka‘i, and Maui (Messing *et al.* 2012). Species determination was made by Michelle Tremblay.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, pitfall traps, 5 Sep 2002 (12 individuals); beating *Chenopodium oahuense*, 9 Sep 2002 (1 individual), 13 Aug 2004 (2 individuals); Mauna Kea Forest Reserve, near Pu‘u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (3 individuals), 20 Aug 2004 (5 individuals); beating *Dubautia linearis*, 11 Aug 2004 (1 individual). All specimens currently in PDK collection, will be deposited in UHIM.

***Therioaphis trifolii*** (Monell, 1882)**New island record**

Native to Europe, this aphid has previously been collected in the state on O‘ahu and Maui (Messing *et al.* 2012). The single specimen reported below was identified by Michelle Tremblay.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu‘u Ahumoa, 1880 m, beating *Dubautia linearis*, 3 Sep 2002 (1 individual PDK collection, will be deposited in UHIM).

**Cicadellidae*****Planiocephalus flavicosta*** (Stal, 1862)**New island record**

This adventive leafhopper has previously been collected on O‘ahu (Nishida 2002) and Maui (Krushelnicky *et al.* 2007).

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu‘u Ahumoa, 1880 m, pitfall trap, 20 Aug 2004 (2 adults BPBM).

***Scaphytopius loricatus*** (Van Duzee, 1894)**New island record**

This adventive species was previously known from Kaua‘i, O‘ahu, and Moloka‘i, and Nihoa (Nishida 2002); we now report it from Hawai‘i Island.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Chenopodium oahuense*, 9 Sep 2002 (1 adult UHIM).

**Order Hymenoptera****Sphecidae*****Solierella peckhami*** (Ashmead, 1897)**New island record**

*Solierella peckhami*, an adventive wasp, has been recorded on Ni‘ihau, Kaua‘i, O‘ahu, Moloka‘i, and Maui (Nishida 2002).

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, pitfall trap, 5 Sep 2002 (1 adult BPBM).

**Order Psocoptera****Caeciliidae*****Stenocaecilius*** sp.**New state record**

This unidentified *Stenocaecilius* species is a new arrival in the state. Its country of origin is unknown. Generic determination was made by Edward Mockford.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, pitfall trap, 7 Sep 2002 (1 ♀ PDK collection, will be deposited in BPBM), 20 Aug 2004 (2 adults PDK collection, will be deposited in BPBM); beating *Dodonaea viscosa*, 2–3 Sep 2002 (3 adults PDK collection, will be deposited in UHIM), 11–12 Aug 2004 (3 adults PDK collection, will be deposited in UHIM); beating *Dubautia linearis*, 11–12 Aug 2004 (3 adults PDK collection, will be deposited in BPBM).

### Ectopsocidae

#### *Ectopsocus californicus* (Banks, 1903)

#### New island record

*Ectopsocus californicus* was first recorded in the state on upper Haleakalā, Maui (Krushelnicky *et al.* 2007). It is a very common adventive psocid on vegetation in subalpine shrublands of Maui and Hawai'i Island. Species determination was made by Edward Mockford.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, beating *Dodonaea viscosa*, 2–4 Sep 2002 (4 adults); beating *Dubautia linearis*, 2–4 Sep 2002 (10 adults); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Chenopodium oahuense*, 26 Aug–9 Sep 2002 (3 adults); beating *Myoporum sandwicense*, 26 Aug–9 Sep 2002 (6 adults); beating *Sophora chrysophylla*, 26 Aug–9 Sep 2002 (12 adults); Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, beating *Vaccinium reticulatum*, 22 Aug 2003 (2 adults). All specimens currently in PDK collection, will be deposited in BPBM.

#### *Ectopsocus vachoni* Badonnel, 1945

#### New island record

As with *E. californicus*, *E. vachoni* was recently documented as newly established in the state from collections made on Maui (Krushelnicky *et al.* 2007). Here we report collections on Hawai'i Island. This species is very abundant in leaf litter. Determination was made by Edward Mockford.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, litter extraction, 24 Aug–3 Sep 2002 (58 individuals); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, litter extraction, 26 Aug–2 Sep 2002 (42 individuals); Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, litter extraction, 23 Aug 2003 (9 individuals), 13 Aug 2005 (1 individual). All specimens currently in PDK collection, will be deposited in BPBM.

### Lepidopsocidae

#### *Pteroxanium kelloggi* (Ribaga, 1905)

#### New state record

This adventive psocid is recorded in the state for the first time. It is currently known only from New Zealand. Determination was made by Edward Mockford.

*Material examined.* **HAWAII:** Kīpuka 'Āinahou Bird Sanctuary, near Kīpuka Pu'u Huluhulu NAR, 2040 m, pitfall trap, 22 Aug 2005 (2 adults PDK collection, will be deposited in BPBM).

### Philotarsidae

#### *Haplophallus talilus?* Thornton & New, 1977

#### New island record

Tentative determination of this species, also collected on Maui (Krushelnicky *et al.* 2007), was made by Edward Mockford.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, beating *Dubautia linearis*, 3 Sep 2002 (1 ♀ PDK collection, will be deposited in BPBM), 11 Aug 2004 (1 adult PDK collection, will be deposited in UHIM); beating *Dodonaea viscosa*, 12 Aug 2004 (1 adult PDK collection, will be deposited in UHIM).

**Pseudocaeciliidae*****Austropsocus* sp.****New state record**

This unidentified *Austropsocus* species is newly established in Hawai'i. Its country of origin is unknown. Generic determination was made by Edward Mockford.

*Material examined.* **HAWAI'I:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, beating *Dodonaea viscosa*, 11 Aug 2004 (2 adults PDK collection, will be deposited in BPBM); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Sophora chrysophylla*, 28 Aug 2002 (2 adults PDK collection, will be deposited in BPBM); pitfall traps, 5 Sep 2002 (4 adults PDK collection, will be deposited in UHIM); litter extraction, 2 Sep 2002 (3 adults PDK collection, will be deposited in UHIM).

**Trogiidae*****Lepinotus reticulatus* Enderlein, 1905****New island record**

*Lepinotus reticulatus* was previously collected in Hawai'i on Kaua'i, Maui, and Kure Atoll (Nishida 2002, Krushelnycky *et al.* 2007). We report it from collections on Hawai'i Island. Determination was made by Edward Mockford.

*Material examined.* **HAWAI'I:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, litter extraction, 24 Aug–3 Sep 2002 (50 individuals PDK collection, will be deposited in BPBM); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, litter extraction, 26 Aug–2 Sep 2002 (95 individuals PDK collection, will be deposited in BPBM).

**Order Thysanoptera****Aeolothripidae*****Aeolothrips bicolor* Hinds, 1902****New island record**

This adventive predatory thrips was previously reported from O'ahu, Moloka'i, and Maui (Nishida 2002, Krushelnycky *et al.* 2007). Determination was made by Sueo Nakahara.

*Material examined.* **HAWAI'I:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, beating *Dubautia linearis*, 11–12 Aug 2004 (1 adult BPBM); Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Chenopodium oahuense*, 26 Aug–2 Sep 2002 (1 adult BPBM).

***Aeolothrips nasturtii* Jones, 1912****New island record**

*Aeolothrips nasturtii* was previously collected on Maui (Nishida 2002); determination made by Sueo Nakahara.

*Material examined.* **HAWAI'I:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Chenopodium oahuense*, 28 Aug 2002 (1 adult BPBM).

**Phlaeothripidae*****Apterygothrips remotus* (Bianchi, 1947)****New island record**

The Hawai'i Island collection reported below represents a range extension for this endemic thrips species, previously known only from Maui (Nishida 2002). The specimen was identified by Sueo Nakahara.

*Material examined.* **HAWAI'I:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Myoporum sandwicense*, 8 Aug 2004 (1♀ BPBM).

***Haplothrips leucanthemi* (Schrank, 1781)****New island record**

This adventive thrips was previously known from Maui (Krushelnycky *et al.* 2007); determination made by Sueo Nakahara.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Pu'u Ahumoa, 1880 m, beating *Dubautia linearis*, 12 Aug 2004 (1 adult BPBM).

### Thripidae

#### *Frankliniella crotolariae* Mound & Marullo **New island record**

*Frankliniella crotolariae* was recently detected in the state, on Maui (Krushelnycky *et al.* 2007). We report the collection of specimens on Hawai'i Island. Species determination was made by Sueo Nakahara.

*Material examined.* **HAWAII:** Mauna Kea Forest Reserve, near Mauna Kea State Park, 2060 m, beating *Chenopodium oahuense*, 26 Aug 2002 (1♀ BPBM).

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