

## New arthropod records from Maui Nui

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The following contributions include new arthropod records from the islands of Kaho‘olawe (19), Lāna‘i (1), Moloka‘i (3), and Maui (1). Voucher specimens were collected by the authors, Kaho‘olawe Island Reserve Commission (KIRC) staff, Maui Invasive Species Committee (MISC) staff, and students in the MISC Hō‘ike environmental curriculum program. Most of the ants (Hymenoptera: Formicidae) were collected using peanut butter lures during surveys for the little fire ant (*Wasmannia auropunctata*) and were determined by either the authors or Paul Krushelnycky, University of Hawai‘i, College of Tropical Agriculture and Human Resources (CTAHR). Non-ant specimens were determined by the authors. Vouchers are housed in Bishop Museum, Honolulu.

### Araneae: Araneidae

*Gasteracantha mammosa* Koch, 1844

#### New island record

Native to India and Sri Lanka, and now found throughout much of Asia and Hawai‘i (McCormack, 2007), *Gasteracantha mammosa* (Asian spinybacked spider) was reported by Nishida (2002) from all the main islands except Kaho‘olawe. This hard bodied spider that can occasionally reach pest levels is now also known from Kaho‘olawe, where it was found on a building at the Base Camp at Honokanai‘a.

*Material examined.* **KAHO‘OLAWA:** Honokanai‘a, on outside wall of galley at Base Camp, 33 ft [10 m], 27 Dec 2010, *Starr, Starr, & Bruch 101227-02* (1 specimen).

### Blattodea: Blattidae

*Euthyrrhapha pacifica* (Coquebert, 1804)

#### New island record

Native to Brazil, Madagascar, and Polynesia (Walker, 1868), but an immigrant to the Hawaiian Islands (Nishida, 2002), *Euthyrrhapha pacifica* (Pacific cockroach) was previously reported from the islands of Kaua‘i, O‘ahu, Maui, and Hawai‘i (Nishida, 2002). This dainty cockroach with two orange spots on the wing cases is now also known from Kaho‘olawe, where it was found on planted *a‘ali‘i* (*Dodonaea viscosa*) on the summit of the island.

*Material examined.* **KAHO‘OLAWA:** Pu‘u Moaulanui, swept from *a‘ali‘i* (*Dodonaea viscosa*), 1450 ft [442 m], 29 Dec 2010, *Starr, Starr, & Bruch 101229-01* (1 specimen).

### Coleoptera: Coccinellidae

*Cryptolaemus montrouzieri* Mulsant, 1853

#### New island record

Native to Queensland and New South Wales (CSIRO, 2004), *Cryptolaemus montrouzieri* (mealybug destroyer) was purposefully introduced to the Hawaiian Islands and was previously reported from Midway Atoll, and all the main islands except Kaho‘olawe (Leeper, 1976; Nishida, 2002). This lady bird beetle with a taste for soft bodied insects is now also known from Kaho‘olawe, where it was found on an experimental grove of native *wiliwili* (*Erythrina sandwicensis*) near the summit.

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*Material examined.* **KAHO'OLAWE:** Pu'u Moaulanui, on wiliwili (*Erythrina sandwicensis*) in grove planted by Niftal, 1400 ft [428 m], 29 Dec 2010, *Starr, Starr, & Bruch 101229-02* (1 specimen).

#### **Diptera: Syrphidae**

*Allograpta obliqua* (Say, 1823)

#### **New island record**

Established throughout most of the continental United States, Hawai'i, Bermuda, Mexico, and the West Indies (Weems, 2004), *Allograpta obliqua* was first recorded from the Hawaiian Islands when Fullaway (1923) reported finding this new immigrant syrphid fly in collections from Waimea in May 1921 on the island of Hawai'i. Nishida (2002) reported the fly from all the main islands except Kaho'olawe and Ni'ihau. These aphid eating flies are now also known from Kaho'olawe where they were collected in pan traps by Lua Kealialalo pond in 1997 (D. Foote, pers. comm.), and were still at Lua Kealialalo in 2010, where they were found on vegetation near the wetland.

*Material examined.* **KAHO'OLAWE:** Lua Kealialalo, vegetation near wetland, 800 ft [244 m] 28 Dec 2010, *Starr, Starr, & Bruch 101228-01* (2 specimens).

#### **Diptera: Tephritidae**

*Dioxyna sororcula* (Wiedemann, 1830)

#### **New island record**

Widespread throughout the tropics and subtropics, and first found in Hawai'i in 1966, *Dioxyna sororcula* breeds in flower heads of *Bidens*, *Coreopsis*, and probably other composites (Hardy, 1967). Nishida (2002) reported this nearly cosmopolitan fly from the islands of Kaua'i, O'ahu, Moloka'i, and Hawai'i. This yellowish fly with mottled wings is here reported from Kaho'olawe where it was found on vegetation at the island summit.

*Material examined.* **KAHO'OLAWE:** Pu'u Moaulanui, swept from a'ali'i (*Dodonaea viscosa*), 1450 ft [442 m], 29 Dec 2010, *Starr, Starr, & Bruch 101229-04* (3 specimens). Pu'u Moaulanui, swept from pluchea (*Pluchea indica*), 1450 ft [442 m], 29 Dec 2010, *Starr, Starr, & Bruch 101229-05* (2 specimens).

#### **Hymenoptera: Formicidae**

*Anoplolepis gracilipes* (Smith, 1857)

#### **New island record**

Most likely native to tropical Asia (Wetterer 2005), and first recorded from the state in 1952 (Krushelnycky *et al.*, 2005), *Anoplolepis gracilipes* (long-legged ant, yellow crazy ant) was previously known from Kaua'i, O'ahu, Maui, and Hawai'i (Nishida, 2002). This large invasive ant is now known from Moloka'i, where it was found in Kaunakakai by a student working with the Hō'ike project.

*Material examined.* **MOLOKA'I:** Kaunakakai, Kaiwi St., collected in yard by student, 150 ft [45 m], 10 May 2010, *Starr & Starr 100510-01* (4 specimens).

*Camponotus variegatus* (Smith, 1858)

#### **New island record**

Native to the Indo-Pacific area and first recorded from Hawai'i in 1879 (Krushelnycky *et al.*, 2005), *Camponotus variegatus* (carpenter ant) was previously known from Midway, Laysan, and all the main islands except Kaho'olawe (Nishida, 2002). This widespread ant that nests in tree cavities is now also known from Kaho'olawe, where it was found nesting in a rotten limb of wiliwili (*Erythrina sandwicensis*) at Pu'u Moaulanui in 1997 (D. Foote, pers. comm.) and was still present on wiliwili in the same area in 2010.

*Material examined.* **KAHO'OLAWE:** Pu'u Moaulanui, branch of wiliwili (*Erythrina sandwicensis*) tree, in experimental grove planted by Niftal, 1400 ft [428 m], 29 Dec 2010, *Starr, Starr, & Bruch 101229-03* (1 specimen).

***Monomorium* sp. *bicolor* complex****New island records**

Brian Heterick (Curtin University of Technology, Australia) has determined this to be an as yet undescribed species in the *Monomorium bicolor* complex of species. This species is similar to *M. pharaonis*, from which it can be distinguished by the absence of two pairs of erect hairs on the pronotum (present in *M. pharaonis*) and a more globular post-petiole. Previously known from O‘ahu, Maui, and Hawai‘i (AntWeb, 2010), the *M. bicolor* complex is now also known from Moloka‘i and Kaho‘olawe. It was found in Kaunakakai, Moloka‘i by a student in the Hō‘ike program and at Honokanai‘a on the west side of Kaho‘olawe by the authors during little fire ant surveys.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, Base Camp, attracted to peanut butter baits, 33 ft [10 m], 21 Dec 2009, *Starr & Starr 091221-12* (7 specimens). **MOLOKA‘I:** Kaunakakai, Pano Pl., collected by student by mango tree, 10 ft [3 m], 14 Apr 2010, *Starr & Starr 100414-01* (12 specimens).

***Monomorium destructor* (Jerdon, 1851)****New island record**

Native to Africa or India, and first recorded from the state in 1899, (Krushelnycky *et al.*, 2005), *Monomorium destructor* (Singapore ant) was previously known from Laysan, French Frigate Shoals, Kaua‘i, O‘ahu, Kaho‘olawe, and Hawai‘i (Nishida, 2002; Starr *et al.*, 2004). This tramp ant is now also known from Maui where it was found at a nursery near Kealia Pond in Kihei by MISC staff during little fire ant surveys.

*Material examined.* **MAUI:** Kihei, Nursery, attracted to peanut butter bait, 20 ft [6 m], 19 Jul 2010, *Starr & Starr 100719-01* (12 specimens).

***Monomorium floricola* (Jerdon, 1851)****New island record**

Native to India and SE Asia, and first recorded from the state in 1899 (Krushelnycky *et al.*, 2005), *Monomorium floricola* (bicolored trailing ant) was previously known from a few of the Northwestern Hawaiian Islands and all the main islands except Kaho‘olawe and Ni‘ihau (Nishida, 2002). This elongate and shiny ant is now also known from Kaho‘olawe, where it was found along the coast on the northwest part of the island by the authors during little fire ant surveys.

*Material examined.* **KAHO‘OLAWE:** Kaukaikapapa, at peanut butter baits, 10 ft [3 m], 21 Dec 2009, *Starr & Starr 091221-01* (6 specimens). Kealaikahiki, at peanut butter baits, 10 ft [3 m], 22 Dec 2009 *Starr & Starr 091222-01* (1 specimen).

***Monomorium pharaonis* (Linnaeus, 1758)****New island record**

Possibly native to Africa, and first recorded from the state in 1913 (Krushelnycky *et al.*, 2005), *Monomorium pharaonis* (pharaoh ant) was previously known from French Frigate Shoals, Kaua‘i, O‘ahu, Maui, and Hawai‘i (Nishida, 2002). This dull yellow ant is now also known from Moloka‘i where it was found in Kaunakakai by a student in the Hō‘ike program.

*Material examined.* **MOLOKA‘I:** Kaunakakai, Kapaakea Loop, collected by student by mango tree, 10 ft [3 m], 16 May 2010, *Starr & Starr 100516-01* (4 specimens).

***Ochetellus glaber* (Mayr)****New island records**

Native to Australia and New Caledonia and first recorded from the state in 1977 (Krushelnycky *et al.*, 2005), *Ochetellus glaber* (black house ant) was previously known from Kaua‘i, O‘ahu, Kaho‘olawe, Maui, and Hawai‘i (Nishida, 2002; Starr *et al.*, 2004). This dark ant is now also known from Lāna‘i and Moloka‘i where it was found in residential locations by students in the Hō‘ike program.

*Material examined.* **LĀNA'I:** Lāna'i City, Palawai Ln, collected by student by papaya tree, 1500 ft [457 m], 22 Apr 2010, *Starr & Starr 100422-01* (4 specimens). **MOLOKA'I:** Kaunakakai, Pano Pl., collected by student by mango tree, 10 ft [3 m], 14 Apr 2010, *Starr & Starr 100414-02* (1 specimen). Kalae, Koala Pl., collected by student by house, 1500 ft [457 m], 15 May 2010, *Starr & Starr 100515-01* (2 specimens). Kaunakakai, Kahinani St., collected by student in kitchen, 100 ft [30 m], 15 May 2010, *Starr & Starr 100515-02* (2 specimens).

***Nylanderia bourbonica* (Forel, 1886)**

**New island record**

A recent taxonomic revision has transferred the majority of taxa formerly placed in the genus *Paratrechina* to *Nylanderia*, including *P. bourbonica* (LaPolla *et al.*, 2010). First recorded from the state in 1879, with no clear indication where it is native to (Krushelnicky *et al.*, 2005), *N. bourbonica* was previously known from Midway Atoll and all the main islands except Ni'ihau and Kaho'olawe (Nishida, 2002). This small dark ant is now known from Kaho'olawe, where it was found by KIRC staff on the offshore islet of Pu'u Koa'e.

*Material examined.* **KAHO'OLAWA:** Pu'u Koa'e, J. Bruch, peanut butter bait, 124 ft [38 m], 20 Apr 2010, *Starr & Starr 100420-01* (12 specimens).

***Tetramorium caldarium* (Roger)**

**New island record**

*Tetramorium caldarium* is believed to be native to Africa and is now widely distributed across the Pacific and other tropical regions (Sarnat, 2010). *T. caldarium* is nearly indistinguishable from *T. simillimum*, and many instances of *T. caldarium* are likely misidentified as *T. simillimum* (Sarnat, 2010). Such was our case, until Paul Krushelnicky brought the previously overlooked species to our attention while confirming our ant identifications. *T. caldarium* can be separated from *T. simillimum* by a weak antennal scrobe, a narrower node and peduncle, and an indented posterior margin of the head (Sarnat, 2010). This small reddish ant, which shares a close resemblance to the little fire ant (*Wasmannia auropunctata*), was previously reported from Kaua'i, O'ahu, Maui, and Hawai'i (AntWeb, 2010). It is now also known from the island of Kaho'olawe, where it was found in coastal locations on the west side of the island by the authors during little fire ant surveys.

*Material examined.* **KAHO'OLAWA:** Kaukaupapa, at peanut butter baits, 10 ft [3 m], 21 Dec 2009, *Starr & Starr 091221-10* (5 specimens). Honokanai'a, Base Camp, attracted to peanut butter baits, 33 ft. [10 m], 21 Dec. 2009, *Starr & Starr 091221-11* (3 specimens).

**Hymenoptera: Sphecidae**

***Ampulex compressa* (Fabricius, 1781)**

**New island record**

Native throughout India, Burma, and Ceylon, and inhabiting a wide range of areas elsewhere, *Ampulex compressa* (emerald cockroach wasp) was purposely introduced in 1940 from New Caledonia to the islands of Kaua'i, O'ahu, and Maui (Williams, 1942). Nishida (2002) has this cockroach parasite documented from Midway Atoll and all the main islands except Ni'ihau, Lāna'i, and Kaho'olawe. This large iridescent wasp is now known from Kaho'olawe where it was collected from "fly paper" at Smuggler's Cove compound and commonly observed around camp in 1997 (D. Foote, *pers. comm.*; Lindsey, 1997), and was still at Base Camp on hau (*Hibiscus tiliaceus*) foliage in 2010.

*Material examined.* **KAHO'OLAWA:** Honokanai'a, swept from hau (*Hibiscus tiliaceus*) tree, 33 ft [10 m], 28 Dec 2010, *Starr, Starr, & Bruch 101228-02* (1 specimen).

**Hymenoptera: Vespidae*****Delta campaniforme esuriens* (Saussure, 1852) New island record**

First collected in the Hawaiian Islands in 1976 (Beardsley, 1980), *Delta campaniforme esuriens* (yellow and black potter wasp) was previously only known from the island of O‘ahu. This colorful wasp is now also known from Kaho‘olawe where it was found on an *iliahii* (*Santalum ellipticum*) shrub near the shore at Honokanai‘a.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, on *Santalum ellipticum* bush near shore, 15 ft [5 m], 27 Dec 2010, *Starr; Starr; & Bruch 101227-05* (1 specimen).

***Polistes aurifer* Saussure, 1853****New island record**

Native to western North America, and noted as plentiful all over the islands in 1880 (Carpenter, 2008), *Polistes aurifer* (paper wasp) was previously documented from Kure, Midway, and all the main islands except Kaho‘olawe (Nishida, 2002). This widespread wasp is now known from Kaho‘olawe where it was collected by sweeping in mixed shrubs under *Prosopis* above Kamohio Bay in 1997 (D. Foote, pers. comm.), and was common on buildings and vegetation at Base Camp at Honokanai‘a in 2010.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, swept from nest on volunteer hut, 33 ft [10 m], 28 Dec 2010, *Starr; Starr; & Bruch 101227-06* (3 specimens). Honokanai‘a, swept from hau (*Hibiscus tiliaceus*) tree, 33 ft [10 m], 28 Dec 2010, *Starr; Starr; & Bruch 101228-03* (2 specimens).

***Polistes exclamans* Viereck, 1906****New island record**

Native to southeast North America (Carpenter, 2008), *Polistes exclamans* (common paper wasp) was first recorded in Hawai‘i in 1951 when colonies of the wasp were destroyed at a house at Aiea, O‘ahu following complaints that children were being stung (Clagg, 1952). Previously known only from O‘ahu and Moloka‘i (Nishida, 2002), this wasp is now also known from Kaho‘olawe where it was found visiting the hau (*Hibiscus tiliaceus*) tree at Base Camp at Honokanai‘a.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, swept from hau (*Hibiscus tiliaceus*) tree, 33 ft [10 m], 28 Dec 2010, *Starr; Starr; & Bruch 101228-04* (1 specimen).

**Lepidoptera: Geometridae*****Anacamptodes fragilaria* (Grossbeck, 1909) New island record**

Pemberton (1964) reported *Anacamptodes fragilaria* (koa haole moth, citrus looper) as native to California. This geometrid first appeared at Pearl Harbor in August 1944, when a dozen adults were caught in a light trap operated by the Navy. By February 1945 it was found widespread over most of O‘ahu up to 500 m elevation. Being fairly large and a good flyer, this moth quickly spread to all of the main islands. The looper caterpillars were found defoliating some 30 different plants, many of which were of ornamental or other economic value (Pemberton, 1964). Nishida (2002) reported this moth from all the main islands except Kaho‘olawe. This common lowland moth is now also known from Kaho‘olawe where it has ample host plants, most notably *kiawe* (*Prosopis pallida*), and was found attracted to lights at the Base Camp at Honokanai‘a.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, at light by buildings, 33 ft [10 m], 27 Dec 2010, *Starr; Starr; & Bruch 101227-04* (2 specimens).

***Macaria abydata* Guenée, 1857****New island record**

Native from Northern Argentina to the Caribbean and southern U.S.A. (Holloway, 2011), *Macaria abydata* (koa haole moth, dot-lined angle) was first recorded from the Hawaiian

islands (as “*Semiothisa* probably *sanctaremaria*”) by Funasaki (1972) from catches from a light trap at Hālawā, O‘āhu during October 1970. It quickly spread and was recorded just one month later on Kaua‘i. Nishida (2002) listed this moth from all the main islands except Ni‘ihau and Kaho‘olawe. This common moth is now also known from Kaho‘olawe, where it was abundant at lights at Honokanai‘a and would flush from vegetation throughout much of the island.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, at light by buildings, 33 ft [10 m], 27 Dec 2010, *Starr, Starr, & Bruch 101227-03* (4 specimens).

#### **Lepidoptera: Noctuidae**

*Achaea janata* (Linnaeus, 1758)

#### **New island record**

Widespread in the tropical and subtropical Pacific, Australia, and the Orient, *Achaea janata* (castor semi-looper) was first recorded from the Hawaiian Islands in December 1944 (Williams, 1945) where it was collected as a caterpillar on the grounds of the Hawaii Sugar Planters’ Association Experimental Station in Honolulu. This large moth, often associated with castor bean (*Ricinus communis*), was previously reported from Midway Atoll, Nihoa, and all the main islands except Ni‘ihau and Kaho‘olawe (Nishida, 2002). It is now known also from Kaho‘olawe, where it was found visiting lights at the Base Camp at Honokanai‘a.

*Material examined.* **KAHO‘OLAWE:** Honokanai‘a, at light by buildings, 33 ft [10 m], 29 Dec 2010, *Starr, Starr, & Bruch 101229-06* (1 specimen).

#### **Mantodea: Mantidae**

*Hierodula patellifera* (Serville, 1839)

#### **New island record**

Native to Java and the Philippines and first recorded in the Hawaiian Islands from Waimea, Kaua‘i on April 1, 1924 (Swezey, 1933), *Hierodula patellifera* (giant Asian mantis) was next recorded in Pukalani, Maui in 1989 (Beardsley, 1992), and on O‘āhu by Nishida (2002). Noted from Kaho‘olawe in 1997 (D. Foote, pers. comm.), this species was locally common on vegetation at Lua Kealialalo and the summit area of Kaho‘olawe in 2010.

*Material examined.* **KAHO‘OLAWE:** Lua Kealialalo, vegetation near wetland, 800 ft [244 m] 28 Dec 2010, *Starr, Starr, & Bruch 101228-05* (1 specimen).

#### **Odonata: Libellulidae**

*Tramea lacerata* Hagen, 1862

#### **New island record**

Well distributed throughout the mainland U.S. and the Hawaiian Islands since at least 1935 (Williams, 1936), *Tramea lacerata* (black saddlebags, raggedy skimmer) was previously known from all the main Hawaiian islands except Ni‘ihau and Kaho‘olawe (Nishida, 2002). This large distinctive skimmer is here documented from Kaho‘olawe, where several were found hawking for insect prey by a wetland and nearby kiawe (*Prosopis pallida*) trees.

*Material examined.* **KAHO‘OLAWE:** Kaukaikapapa, near wetland, 10 ft [3 m], 27 Dec 2010, *Starr, Starr, & Bruch 101227-01* (1 specimen).

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