

New plant records for the Hawaiian Islands 2014¹

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Here, O'ahu Early Detection documents two new state records, three new naturalized records, five new island records, 1 range extension, and 1 species showing signs of naturalization. A total of 10 plant families are discussed.

Information regarding the formerly known distribution of flowering plants is based on the *Manual of the flowering plants of Hawai'i* (Wagner *et al.* 1999) and information subsequently published in the *Records of the Hawaii Biological Survey*. All supporting voucher specimens are deposited at B.P. Bishop Museum's *Herbarium Pacificum* (BISH), Honolulu, Hawai'i.

Acanthaceae

Barleria repens Nees

New island record

This species has been previously documented as naturalized on Kaua'i, O'ahu, Lāna'i, and Maui (Staples 2002; Oppenheimer 2003; Oppenheimer & Bustamente 2014). It is now known to be at least sparingly naturalized on Hawai'i island, where it was seen growing in open areas in a lowland windward coastal setting at the Pu'u honua o Hōnaunau National Historical Park. Park staff are considering implementing a control program for this species on their lands.

Material examined. **HAWAI'I:** Pu'u honua o Hōnaunau, near admin building, 10 Dec 2014, *M. Hayes s.n.* (BISH 762053).

Bromeliaceae

Aechmea cephaloides J.A. Siqueira & Leme

New state record

This large epiphytic bromeliad was only recently described as a new species in 2007 (Siqueira & Leme 2007) and is currently believed to be endemic to Pernambuco, Brazil, where it is considered a vulnerable species. Aside from the collection documented here, it does not appear to be known from cultivation anywhere outside its native range. It is unclear when it first arrived in Hawai'i, but appears to have been accessioned by a local botanical garden. It is now spreading beyond planted sites to various parts of the garden, established as an epiphyte high in trees. The individual collected as a voucher came from a fallen *Samanea saman* branch, but had been growing in dense shade in the middle canopy. The characters used to differentiate this species from similar-looking relatives include the inflorescences of globose-capitate heads; membranous, red, narrow (4–5mm) floral bracts that do not conceal the flowers (others are coriaceous, yellowish to orange, and 13–14 mm wide); short-pedicillate (vs. sessile) flowers; obovate (vs. subelliptic)

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sepals; and shorter petals (22–23 mm vs. 30–34 mm) with longer basal appendages (4–5 mm vs. 2–3 mm) (Siqueira & Leme 2007).

Material examined. O'AHU: Waimea Valley Botanical Garden, lowland cultivated setting, epiphytic herb ca 1 m tall, leaves ca 1 m long, with dark spines along margins, flowers golden yellow, salmon at base, 14 Jan 2014, D. Frohlich & A. Lau 2014011405.

Cyperaceae

Rhynchospora inexpansa (Michx.) Vahl New state record

This sedge is native to the southeastern United States, where it is commonly found in sandy soils. It appears to have been accidentally introduced to Hawai'i, most likely through military training and operations, as it is so far only known from landing zones at Schofield Barracks. It was seen as occasional in disturbed, open areas characteristic of landing zone sites, and appeared to withstand frequent mowing. This species is distinguished from other *Rhynchospora* species known in Hawai'i by the following combination of characters: inflorescences with 3–6 clusters of spikelets along the main axis, these clusters drooping at the tips; 6 antrorsely barbellate perianth bristles; and conspicuously flattened, oblong achenes. A key to many species in the genus and a full description of the species can be found in the *Flora of North America* (Kral 2003).

Material examined. O'AHU: Schofield Barracks East Range, "Upper 72" military landing zone, open, disturbed habitat surrounded by mesic, mixed native/non-native forest, 5 Dec 2013, J. Beachy 2013120505.

Fabaceae

Adenantha pavonina L. New island record

This species has been documented as highly invasive elsewhere in the Pacific (Meyer 2000), and has been documented as naturalized on Kaua'i (Wagner & Herbst 1995) and Maui (Starr & Starr 2011). It is documented here as naturalized on O'ahu as well, where an established population was seen in the lower section of the Mālaekahana Trail, where 40-foot trees and abundant recruitment were seen just beyond farm lands in non-native dominated vegetation.

Material examined. O'AHU: Mālaekahana Trail, naturalized, growing with *Syzygium cumini*, *Casuarina equisetifolia*, *Clidemia hirta*, *Panicum maximum*, *Psidium guajava*, 16 Feb 2014, K. Kawelo & J. Rohrer US Army 341.

Leucaena diversifolia (Schltdl.) Benth. New island record

Leucaena diversifolia is the most widely cultivated species of *Leucaena* after *L. leucocephala*, and is cultivated for similar purposes, which include livestock fodder, reforestation, and as a shade tree on coffee plantations (Hawaii-Pacific Weed Risk Assessment 2014). The invasiveness of this species is much less well-documented than *L. leucocephala*, but it possesses similar biological traits: year-round flowering and fruiting, abundant seed production, self-fertility, a long-lived seed bank, and the ability to resprout after fire (Hughes 1998). It has been found naturalizing in Jamaica and spreading from a strawberry and green onion farm on 'Ulupalakua Ranch, East Maui (Starr *et al.* 2008), and received a score of 9 (high risk) on the HPWRA (Hawaii-Pacific Weed Risk Assessment 2014). The only known locations of this species on O'ahu are Waimea Valley, Ho'omaluhia Botanical Garden, and the University of Hawai'i Research Station in Waimānalo. Several individuals of this species were mapped spreading down the Waimea River.

Material examined. O'AHU: Waimea Valley Botanical Garden, lowland mesic riparian area, along a seasonal streambank, sparingly naturalized in garden, 27 Feb 2014, A. Lau & D. Frohlich 2014022702.

Heliconiaceae

Heliconia stricta Huber

New naturalized record

Heliconia stricta is widely cultivated throughout the world, and over 200 cultivars of the species are known. It has been recorded as naturalized in Puerto Rico (Acevedo-Rodríguez & Strong 2005), but worldwide, few records of naturalization exist for this species. The 'Dwarf Jamaican' cultivar of this bird-dispersed species was collected in Waimea Valley, where it is a recognized weed of the area, naturalized and scattered throughout the understory of the botanical collection, usually in dense shade. This species can be easily confused with the similar-looking *H. bihai*, from which it differs in having dark green flowers with white tips (Staples & Herbst 2005). A key to the species of *Heliconia* in Hawai'i, as well as a description of the species and the common cultivars grown here, can be found in *A Tropical Garden Flora* (Staples & Herbst 2005).

Material examined. O'AHU: Waimea Valley Botanical Garden, mesic lowland cultivated setting, herbs to 75 cm tall, established throughout understory areas in the garden, often growing in deep shade, 14 Jan 2014, A. Lau & D. Frohlich 2014011404.

Meliaceae

Swietenia mahogani (L.) Jacq.

New naturalized record

Also known as West Indian mahogany, this commercially important species native to parts of the Caribbean has been introduced to various parts of the tropics as a timber tree (Staples & Herbst 2005). It has become naturalized in some other areas where it has been introduced, including Puerto Rico (Francis & Liogier 1991). It has been planted as a street and shade tree in Hawai'i, and is rarely seen spreading from those plantings. A large planting in Lualualei has resulted in the establishment of a naturalized population in Hālonā Valley, where dozens of small mature trees and many saplings occur, the saplings establishing in dense to partial shade. A description of the species and a key separating it from other cultivated Meliaceae in Hawai'i can be found in *A Tropical Garden Flora* (Staples & Herbst 2005).

Material examined. O'AHU: Lualualei, Hālonā Valley, dry lowland forest, ca 20 or more plants in area, growing in a dense pocket, other individuals scattered, saplings growing in dense shade, 21 Aug 2014, A. Lau & D. Frohlich 2014082101.

Poaceae

Andropogon bicornis L.

New island record

An invasive species in Hawai'i previously documented from Kaua'i (Snow & Lau 2010) is here documented from Hawai'i island as well. It was seen established in an area cleared for utility lines through mixed native/non-native 'ōhi'a forest, just off the trail at the Lava Tree State Monument park. Observations from other botanists suggest this species may be established in multiple other areas of the island.

Material examined. HAWAII: Puna, Lava Tree State Monument, wet lowlands, disturbed open area with scattered 'ōhi'a present, bunchgrass with culms to 2.5 m, locally common, 28 Dec 2013, A. Lau 2013122801.

Pteridaceae***Adiantum macrophyllum* Sw.****New naturalized record**

This native of tropical America has been documented in cultivation, including in Hawai'i. It does not appear to be a common weed outside its native range. It was found sparingly naturalized on O'ahu in a relatively remote area of Waikāne Valley. At the time of collection, only one patch of plants was known from the general area, where it was growing in dense shade in a wet gulch. This species can be distinguished from other members of the genus known to occur in Hawai'i by its glabrous petioles and odd-pinnate fronds with large, sessile segments. A key and full description of the species can be found in *A Tropical Garden Flora* (Staples & Herbst 2005).

Material examined. O'AHU: Waikāne Valley, lowland wet forest gulch, sparingly naturalized, ca 12 plants in a 10 x 10 m, remote area, clumping habit with runners, largest fronds 6–12 inches long, 24 Feb 2014, P. Zweng (sub *US Army 342*).

Scrophulariaceae***Lophospermum erubescens* D. Don****Range extension**

An invasive species native to Mexico, this escaped ornamental vine was previously documented from O'ahu (Ko'olau Mountains), Hawai'i, and East Maui (Wagner *et al.* 1999; Starr *et al.* 1999). It has now also been documented as established in the Wai'anāe Range on O'ahu, where a population was found in native-dominated habitat, in and around a restoration site. Natural resource managers in the area have conducted some control on this Wai'anāe population.

Material examined. O'AHU: Lower Ka'ala Natural Area Reserve, Manuwai Gulch, co-occurring with *Diospyros sandwicensis*, *Sapindus oahuensis*, *Erythrina sandwicensis*, *Nestegis sandwicensis*, *Syzygium cumini*, and *Psidium cattleianum*, 15 Oct 2012, M. Walker *US Army 297*.

Veronica arvensis* L.*New island record**

This small, weedy herbaceous species has been collected previously on the islands of Moloka'i, Maui, and Hawai'i (Wagner *et al.* 1999), and now on O'ahu, where it was found by O'ahu Army Natural Resources Program staff, spreading in the wash area of their base-yard.

Material examined. O'AHU: OANRP West Base, Schofield Barracks, mesic disturbed area, growing in gravel, ca 50 plants present, 28 Jan 2014, J. Beachy *US Army 336*.

Species showing signs of naturalization**Annonaceae*****Cananga odorata* (Lam.) Hook.f. & Thomson**

This species is documented as naturalized elsewhere in the Pacific region. Despite rare to occasional cultivation in Hawai'i since at least 1927 (Imada *et al.* 2005), it has yet to become naturalized in Hawai'i. A few small individuals of this species were mapped spreading a moderate distance downstream from a large, persisting individual in lowland O'ahu non-native secondary forest.

Material examined. O'AHU: Waimea Valley, 'Elehāhā drainage, species persisting cultivation and beginning to escape from planted sites, 11 Oct 2013, A. Lau, D. Frohlich & C. Frohlich 2013101101.

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