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# New plant records for the Hawaiian Islands 2011–2012[1]

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We document 8 new naturalized records, 4 new state records, 9 new island records, one range extension, and two corrections found by us and other individuals and agencies. In addition, several species showing signs of naturalization are mentioned. A total of 21 plant families are discussed. Areas surveyed to document these records include sites in and around botanical gardens on O'ahu. Many of the records reported here have likely been naturalized for a considerable amount of time, in particular those that are likely escapes from cultivation. On the other hand, the accidental introductions reported here may be recent introductions.

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*. Voucher specimens are deposited at Bishop Museum's *Herbarium Pacificum* (BISH), Honolulu, Hawai'i.

**Araceae**

***Dieffenbachia maculata*** (Lodd.) Sweet **New island record**

*Dieffenbachia maculata,* a frequently cultivated plant already collected as naturalized on the islands of Maui and Kaua'i, was found on O'ahu spreading extensively in localized patches in an unmanaged portion of Wahiawā Botanical Garden.

*Material examined*. **O'AHU**: Wahiawā Botanical Garden, in unmanaged areas west of collection, 21.500577°N, 158.021°W. Upright herb to 3.2 m growing in dense shade. Patch of 6–10 in localized area, occasional in gulch, sometimes forming thickets. Mesic lowland secondary forest, canopy dominated by *Ficus* sp., understory primarily *Odontonema cuspidatum*, *Costus* sp., *Megaskepasma erythrochlamys*, 9 Jul 2012, *OED 2012070904*.

**Asclepiadaceae**

***Dischidia ovata*** Benth. **New naturalized record**

Native to Queensland and Papuasia, *Dischidia ovata* is an attractive epiphytic plant used only rarely in cultivation. A small patch of it was spotted in an unmaintained portion of a botanical garden on O'ahu. In addition to this patch, garden staff mentioned it had spread to and established in scattered locations in the garden. Description of this species, from the *Flora of Australia* (Forster & Liddle 1996):

> "Vine. Leaves with petiole 2–9 mm long; lamina succulent, ovate, 2–5 cm long, 0.5–3.5 cm wide, rounded at base, apiculate, light green to brownish, cream-mottled on upper surface, not mealy; colleters 2. Inflorescence of 1 or 2 fascicles. Flowers 5–6 mm long, 3.5–4 mm diameter; pedicels 2–3 mm long. Corolla broadly urceolate, white; lobes ovate, c. 2 mm long, 1 mm wide, minutely papillose outside .... Staminal corona lobes stalked with obcordate incurved apices. Follicles 55–65 mm long."

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*Material examined*. **O‘AHU**: Waimea Valley, 21.634N, 158.058W. Epipetric/epiphytic vine covering a 3 x 3 m area, rooting at nodes and clinging to rock, growing in dappled shade. Leaves thick, medium-green, white along the veins, purple-tinged throughout; flowers tightly packed, bell-shaped, light green to light yellow with orange striations; no fruits seen. No seedlings seen in area. Lowland cultivated setting, up side gulch in unmaintained area, canopy dominated by *Cordia alliodora, Aleurites moluccana, Ficus* sp., understory of *Urochloa maxima,* 23 Oct 2012, *OED 2012102301.*

**Cactaceae**

***Cereus uruguayanus*** R. Kiesling **New island record**

*Cereus uruguayanus,* or hedge cactus, native to South America and cultivated worldwide, was found sparingly naturalized in Koko Crater Botanical Garden. It has been found as naturalized previously on Maui and Kaua‘i, and is widespread on the island of O‘ahu. Both the typical and ‘Monstrosus’ forms (typified by its misshapen stems) were seen spreading in the crater.

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden, near trailhead of Crater Rim Trail, near *Plumeria*. Upright succulent 2 m tall, branches upright or flopping over, tightly clustered and twisted, ‘Monstrosus’ form. Very sparingly naturalized throughout crater, a few large individuals growing on crater slopes. *Leucaena*-dominated mixed-alien scrub, 8 Mar 2012, *OED 2012030802;* Koko Crater Botanical Garden, east side of crater, 21.28669°N, 157.678538°W. Tree cactus with several ascending branches, about 3 m tall, naturalized in crater, with a scattered distribution. Dry lowland *Prosopis/Leucaena* forest, 12 Mar 2012, *A. Lau & D. Frohlich 2012031201*.

**Costaceae**

***Costus scaber*** Ruiz & Pav. **New island record**

*Costus scaber,* a species native to Mexico, the West Indies, Central America, and South America, was previously described as naturalizing in a pasture on Kaua‘i (Frohlich & Lau 2012). It was found to be well established in a botanical garden on O‘ahu, spreading in a gulch, downstream from the currently maintained collection. This species has been seen escaping in several other areas of O‘ahu as well.

*Material examined*. **O‘AHU**: Wahiawā Botanical Garden, down gulch from currently maintained area, 21.501°N, 158.0188°W. Over 50 plants seen in localized area, locally common, forming dense thickets in deep shade, primarily in gulch bottom, no seedlings seen. Lowland mesic secondary forest, canopy dominated by *Ficus* sp., understory primarily *Odontonema cuspidatum, Dieffenbachia maculata*, and *Megaskepasma erythrochlamys,* 28 Jun 2012, *OED 2012062802.*

**Cupressaceae**

***Juniperus bermudiana*** L. **New island record**

This gymnosperm, previously collected as naturalized from Maui and Lāna‘i, was found on O‘ahu in a disturbed roadside area, as well as in several forested areas off the road.

*Material examined*. **O‘AHU**: Pālehua Road above second gate in residential area, in *Eucalyptus*-dominated understory, m any plants along road in several places and in forested areas off road, 4 Jun 2012, *US Army 288.*

**Euphorbiaceae**

***Euphorbia ingens*** E. Mey. ex Boiss. **New naturalized record**

*Euphorbia ingens*, a succulent tree native to eastern Angola, eastern South Africa, and Swaziland, where it is common in dry montane and wooded grasslands from 10–1600 m elevation (Flora Zambesiaca Online 2011), was found naturalizing throughout Koko Crater Botanical Garden, and is well established on much of the inner crater walls.

Although *E. ingens* is popular as an ornamental in rock gardens in South Africa and the mainland United States, Koko Crater is the only known location for this species in the Hawaiian Islands. This species received a score of 7 (High Risk) on the Hawai‘i-Pacific Weed Risk Assessment (Chimera 2009c). *Euphorbia ingens* is a distinctively large succulent, reaching heights from 4 to as much as 15 m. Terminal branches rebranch to form a large, broadly rounded crown; the terminal branches are fleshy and square in cross-section, with stout wings up to 3 cm wide. Spine shields are corky, 6 x 5 mm, and very obtusely triangular, with stout spines up to about 5 mm long. Leaves are deltoid on older growth and soon deciduous, while oblanceolate leaves can be found on seedlings and young growth. Golden yellow cyathia are clustered in cymes towards the apices of the branches, 1–3 at each flowering eye. Fruit is a 2–3-locular capsule exserted on a stout pedicel 5 mm long. Seeds are grayish brown speckled with paler brown and compressed. [Full description at Flora Zambesiaca Online (2011)].

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden, crater floor about 10 m off of main path, 21.294°N, 157.678°W. Individuals scattered extensively throughout crater, seedlings/small unbranched plants as well as larger, well-formed trees, very likely an escape from an accessioned plant. Succulent tree 2 m tall, trunk gray with copious milky sap, branching from 1 m above base. Area dominated by *Leucaena leucocephala, Cenchrus ciliaris*, 8 Mar 2012, *OED 2012030803.*

***Euphorbia tirucalli*** L. **New island record**

*Euphorbia tirucalli,* or Pencil tree, a curiosity plant sometimes seen in home gardens and previously collected as naturalized on the islands of Kaua‘i and Hawai‘i, has now been spotted on O‘ahu spreading sparingly in a local botanical garden.

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden, NW side of main crater floor, 21.288°N, 157.682°W. Sparingly naturalized in the crater, well scattered, dense thickets forming in areas where its planting status is unclear. Plant 2–3 m tall, a knocked-over tree resprouting. Dry Lowland *Leucaena* forest/shrubland, 22 Mar 2012, *OED 2012032202.*

**Fabaceae**

***Albizia adianthifolia*** (Schum.) WWight **New state record**

This naturalized record is the first collection of *Albizia adianthifolia* in the state. Over 100 individuals were found in a localized area along a forested roadside on military land. It is possible that this species was originally introduced to the area as a forestry species, since it is known to be used for erosion control and for timber in its native range in tropical Africa (Orwa *et al.* 2009); however, the planting history is unknown. This species is known to be highly adaptable to a range of environmental conditions and occurs most frequently in secondary forest, forest edges, roadsides, and abandoned farmland in its native range (Flora Zambesiaca Online 2011). It received a score of 9 (High Risk) on the Hawaii-Pacific Weed Risk Assessment (Chimera 2009a). Its limited distribution on O‘ahu and high weed ranking make this species an excellent candidate for control.

*Albizia adianthifolia* can reach up to 30 m in height, and has branchlets covered in dense, rather coarse, rusty pubescence, which sometimes turns gray as the branchlets age. Leaves are pinnate, with 5–8 pairs of pinnae per leaf; leaflet of the two distal pinnae are in 9–17 pairs, mostly about 7–17 $\times$ 4–9 mm, and are rhombic-quadrate to rhombic-oblong. Stipules and bracts at the base of the peduncles are ovate, peduncles are pubescent. Flowers are subsessile, on pubescent pedicels about 1 mm (up to 2 mm) long; corollas are white or greenish white, and pubescent on the inside. Fruit is a flattened, sometimes plicate, pale brown, dehiscent pod. [Full description at Flora Zambesiaca Online (2011)].

*Material examined*. **O‘AHU**: Schofield Barracks, Kolekole Pass Road. Naturalized in area, over 100 individuals of various size classes. Large tree over 10 m tall with compound leaves, flowers in clusters with exserted staminal tubes, honey fragrance, *Albizia*-type flat pods. Mixed alien tree overstory, *Panicum maximum* understory, 21 Jan 2011, *J. Beachy & K. Kawelo US Army 248.*

***Erythrina speciosa*** Andrews **New naturalized record**

*Erythrina speciosa* is native to southern Brazil, and has been introduced elsewhere in the world as an ornamental. It has escaped cultivation on Norfolk Island, and is well-adapted to subtropical climates (Green 1994). This self-compatible species has bright red corollas and is primarily pollinated by hummingbirds, although it is capable of being pollinated by a range of taxa, including bees (Vitali-VeigaI & Machado 2000). *Erythrina speciosa* can be differentiated from other species of *Erythrina* by a tubular corolla, where the keel petals are much longer than the wings; both keel and wing petals are auriculate-sagittate at the base. It is a shrubby tree armed with spines, with subterminal, upright inflorescences. Despite its moderate popularity as an ornamental in other parts of the world, in Hawai‘i it is presumably quite rare in cultivation (the only record of it in the *Herbarium Pacificum* prior to this collection is from a local botanical garden). A small naturalized population was found in Pālolo Valley, spreading down a shady gulch. Plants in this population are treelike, some stems growing upright to 8+ m tall, others arching and occasionally trailing along the ground or forming thickets, although the latter is likely due to impacts of flooding in the stream. One local resident reported attempting to control the plant near his yard, with little success. It received a score of 11 (High Risk) on the HP-WRA (Chimera 2009b), and due to its limited distribution, would be an excellent candidate for control.

*Material examined*. **O‘AHU**: Pālolo Valley, along La‘i Rd, in Pükele Stream, 21.316°N, 157.783°W. Locally naturalized at this site, occasionally forming thickets due to arching branches over stream, likely an escape from cultivation. Lowland wet secondary forest/roadside area, 11 Apr 2012, *M. O’Conner s.n.* (BISH 752430).

**Iridaceae**

***Sisyrinchium exile*** E.P. Bicknell **New island record**

This species has previously been documented as naturalized on Moloka‘i, Maui, and Hawai‘i Island, and has now been found in open, disturbed areas of a military landing zone on O‘ahu.

*Material examined*. **O‘AHU**: Schofield East Range, Ku Tree Landing Zone. Mostly open area, growing among *Acacia confusa, Citharexylum caudatum, Andropogon virginicus*. Herbs to ca. 10 cm tall, blades flat, 14 May 2012, *J. Gustine-Lee & J. Beachy US Army 280*.

**Moringaceae**

***Moringa stenopetala*** (Baker f.) Cuf. **New naturalized record**

This species has been given the common name Cabbage tree, for its use as a leaf vegetable in its presumed native range in Ethiopia and Kenya. It is likely very rare in cultivation in Hawai‘i, perhaps only grown locally in botanical gardens, where it was first collected in 1992. It appears to be relatively rare in general cultivation outside its presumed native range, and information about it as a naturalized species is lacking. It can be distinguished from other members of the family by its tree habit; 2–3-pinnate leaves; irregular, perigynous flowers; leaflets 3.3–6.5 × 1.7–3.3 cm; and fruits 20–57 cm long (Verdcourt 1985). It was seen spreading in a dry lowland botanical garden along the slopes of Koko Crater, locally established with scattered small trees and saplings establishing at least 70 m from planted individuals.

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden, growing on crater wall with *Leucaena leucocephala* in mixed alien scrub. Small tree about 3.5 m tall. Inflorescences immature, leaves strongly scented, bark smooth and grey, fruits twisted, 12 Mar 2012, *A. Lau & D. Frohlich 2012031202.*

**Myrsinaceae**

***Ardisia kusukusensis*** Hayata **New state record**

This species as treated here is endemic to Taiwan (Yang & Lu 1998), though it has been treated as a synonym of *Ardisia crenata* Sims by recent floral treatments outside its range (Chen & Pipoly 1994). These two species as seen in Hawai‘i differ significantly in both their descriptions in these floras as well as their morphology, including diagnostic features such as habit and inflorescence characters. It appears to be rarely cultivated worldwide, including in Hawai‘i, where it was very likely introduced as an ornamental at a botanical garden. It was not previously known to be naturalized anywhere else in the world. It has become naturalized on O‘ahu in wet to mesic non-native forest, where scattered individuals are found occasionally both in and well outside of a botanical garden on the windward side. It grows in well-shaded, open understory among *Oplismenus hirtellus* and common weedy tree species such as *Schefflera actinophylla*. It can be distinguished from other species of *Ardisia* in Hawai‘i by its habit as a low-growing, often stoloniferous subshrub to about 30 cm, with very short (1–2 cm long in Hawai‘i) inflorescence branches. A description and key can be found in the *Flora of Taiwan* (Yang & Lu 1998), which is paraphrased here: “Suffrutescent subshrubs ... stems erect, short puberulous when young. Leaves oblanceolate, elliptic, or oblong-obovate, 10–17 cm long, 2.5–3.8 cm wide ... margins crenate, green and glabrous above, grey green and glabrescent beneath; petioles 3–5 mm long, slightly short puberulous when young. Inflorescences umbellate, axillary and/or terminal; peduncle 6–7 mm long, puberulous flowering branches to 10 cm long .... Flowers pinkish or white; calyx lobes linear-triangular ... pedicels ca. 1 cm long, puberulous. Fruit globose, red.”

*Material examined*. **O‘AHU**: Kāne‘ohe, Likeke Trail, mauka of Ho‘omaluhia Botanical Garden. Low-growing, somewhat woody shrub, mature stems only about 30 cm tall (or less). Inflorescences usually on very short (1–2 cm) side branches, usually leafless but occasionally with leaves; flower petals white, 4- or 5-merous with black dots. Fruit ripening red, single-seeded. Wet/mesic secondary vegetation among *Oplismenus, Psidium cattleianum, Ardisia elliptica*, other common weeds, 17 Jun 2011, *A. Lau & D. Frohlich OED 2011101702*.

**Myrtaceae**

***Eugenia brasiliensis*** Lam. **New island record**

This species has previously been recorded as naturalized on Maui and Hawai‘i islands, establishing in at least wet disturbed sites. It is not common in cultivation on O‘ahu, and may not have been planted in forest reserves (not recorded in Skolmen [1980]), yet was found established in what appeared to be one rather extensive population in lowland, mesic to wet, non-native forest in the southern Ko‘olau Mountains.

*Material examined*. **O‘AHU**: On ridge between Pauoa and Nu‘uanu Valleys, at about 395 m (1300 ft) elev, mesic to wet lowland non-native forest, 5 Apr 2012, *T. Marsh 20120405Misspe.*

**Poaceae**

***Schizachyrium condensatum*** (Kunth) Nees **New island record**

This name had previously been misapplied to populations of *Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb. var. *pumilus* (Vasey) L.H. Dewey on O‘ahu (Snow & Lau 2010), and although it has been recorded as an invasive species on Hawai‘i Island and is thoroughly naturalized on Kaua‘i, it was not known to occur on O‘ahu until the collection documented here. It was found along non-public, military access and/or training roads in open, disturbed roadside areas in Schofield Barracks East Range, from at least two relatively small, disjunct populations. These dirt roads are subject to occasional soil movement through road widening and maintenance activities, which may make for an additional dispersal mechanism. It has been targeted for control with the goal of eradication.

*Material examined*. **O‘AHU**: Schofield Barracks East Range, on road leading up to Schofield-Waikāne Trail, roadside through mixed native/non-native forest, ca. 425 m (1400 ft) elev. Caespitose grass 1 m tall, 27 Feb 2012, *J. Beachy US Army 268*.

***Urochloa decumbens*** (Stapf) R.D. Webster **New island record**

This species has previously been documented as naturalized on Hawai‘i, Kaho‘olawe, and Kaua‘i islands. It is documented here as naturalized in open, highly disturbed areas at a military landing zone on O‘ahu.

*Material examined*. **O‘AHU**: Schofield Barracks East Range, at “Lower 72” landing zone. Weedy, open area cleared for landing zone operations, surrounding area is mesic mixed native/non-native forest. Grass 0.5 m tall, 15 Mar 2012, *J. Beachy, J. Hawkins, M. Akiona, D. Frohlich & A. Lau US Army 272.*

**Polygonaceae**

***Homalocladium platycladum*** (F. Muell.) L.H. Bailey **New naturalized record**

Common names for this species include Ribbon bush or Centipede plant, in reference to the appearance of the segmented, flat stems of this plant. It is native to the Solomon Islands, but is now grown in tropical areas worldwide as an accent plant. It has escaped cultivation and become naturalized in some tropical areas. It was introduced to Hawai‘i by 1917 (Staples & Herbst 2005), where it is at least occasional in cultivation, but until now has not been recorded as naturalized here. This species is readily distinguished from other members of Polygonaceae in Hawai‘i by its habit as a mound-forming shrub, and especially by its flattened, ribbon-like stems that appear jointed. Its leaves appear on young shoots and are soon deciduous. The fruit is a smooth, triangular achene enclosed in a fleshy, deep red to purplish floral receptacle (Staples & Herbst 2005). It was collected here naturalized in mesic secondary forest adjacent to sites of home cultivation, most likely as a garden escape.

*Material examined*. **O‘AHU**: Pālehua, on road leading to Mike Myers’ house and abandoned house area, growing with *Eucalyptus* sp. and introduced grasses in understory. Flat, somewhat succulent plant to 2.5 m tall, no flowers or fruit, 24 Jul 2012, *OISC 2012072401*.

**Polypodiaceae**

***Drynaria rigidula*** (Sw.) Bedd. **New naturalized record**

One common name applied to this species is Basket fern, presumably in reference to its habit of catching significant amounts of plant material at its base wherever this epiphytic fern establishes along tree trunks and branches. Although it is cultivated in and outside its native range (which includes Australia, Malaysia, and some Pacific islands), it apparently

has not previously been documented as naturalized anywhere else in the world. In Hawai‘i it seems to be rare in cultivation, perhaps only found in botanical gardens. It is documented here as escaping from cultivation throughout secondary forest and on planted botanical garden tree species in Wahiawā on O‘ahu. It is distinguished from other members of the genus by having fully pinnate foliar fronds (stalked pinnae). Further description from the *Flora of Australia* is paraphrased here: “Rhizome c. 1 cm thick, deciduous-scaly .... Nest fronds narrowly ovate to ovate, 4–39 cm or more long, 3.5–14 cm wide, shallowly or deeply lobed; lobes rounded. Foliage fronds 20–120(–200) cm long .... Lamina narrowly ovate, 1-pinnate; pinnae linear, 4–25 cm long, 0.4–3 cm wide ... with a short narrowly winged stalk ... margins shallowly incised (1 incision between each pair of main lateral veins) .... Sori round, 1–2 mm diam ... impressed into the laminal surface, producing small rounded protuberances on the upper surface.” (Bostock & Spokes 1998)

*Material examined*. **O‘AHU**: Wahiawā Botanical Garden, Hawaiian section. UTM 601689, 2378186. Mesic lowland botanical garden setting in open area, canopy of *Hibiscus* cf. *arnottianus*. Epiphytic fern with rhizome curling around branch, ca 30 cm tall. Fronds green, basal shield fronds light green when young, quickly becoming dry, light brown, papery, persistent, 12 Jun 2012, *D. Frohlich & A. Lau 2012071201*.

**Tiliaceae**

***Grewia truncata*** Mast. **New naturalized record**

This species from southeastern Africa was first collected in Hawai‘i in 1992 from an O‘ahu botanical garden. It is apparently very rare if at all cultivated elsewhere in the world, and therefore has very little information available about weed behavior. It is likely very rare in cultivation in Hawai‘i, possibly limited to the botanical garden where it was first collected. Though it occasionally forms dense thickets in its native range, where it is most commonly found in riparian areas (Flora Zambesiaca Online 2011), it was seen naturalized on O‘ahu with a very scattered, low-density distribution over a large area in a dry, lowland tuff cone crater among *Leucaena leucocephala* scrub vegetation. It can be distinguished from other species of *Grewia* in Hawai‘i by its oblong or obovate-oblong leaves with a retuse to truncate apex; white sepals (1.5–2.5 cm long) and petals (10–16 mm long); and relatively large (1.5 cm diam), deeply 4-lobed fruit (Flora Zambesiaca Online 2011). A full description and keys to the genus are currently available at Flora Zambesiaca Online (2011).

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden. Saplings, seedlings, matures scattered along slope above Madagascar section in *Leucaena*-dominated scrub. Shrub ca. 2 m tall, sepals white inside, petals less conspicuous, white, curled down, flowers mildly fragrant mid-day, some fruits persisting, dry, deeply lobed, 12 Mar 2012, *D. Frohlich & A. Lau 2012031204*.

**Urticaceae**

***Laportea aestuans*** (L.) Chew **New state record**

*Laportea aestuans*, a species that had not been known to be in the state until it was collected by the Hawaii Department of Agriculture (HDOA) staff, has been found in several nurseries on the windward side and North Shore of the island of O‘ahu, and on Hawai‘i Island. It is believed to be popping out of potting mix, but it is still unclear where the soil may have originated (B. Azama, 2012, HDOA, pers. comm.). *Laportea aestuans* is an agricultural weed, invading banana plantations in its native range of Central America and the West Indies, and is naturalized in Florida. It is shade tolerant, matures rapidly, reproduces prolifically, and is covered in stinging hairs (Clifford 2009). *Laportea aestuans* is an annual herb,

about 1–10 dm tall, with sparse to dense stinging hairs and stipitate, non-stinging glandular hairs. Leaf bases are rounded to abruptly attenuate or auriculate, and margins are regularly serrate or toothed. Inflorescences are in panicles; female flowers are appressed, with a persistent hooked, beaklike style that becomes knoblike in fruit. Fruits are strongly compressed, and more or less orbicular, about 0.9 × 1.3 mm (Boufford 1997). HDOA staff are working with nurseries to ensure this species is being controlled where found.

*Material examined*. **O‘AHU**: Waimānalo, in a nursery. Naturalized, somewhat established at this site, seen at another Waimānalo nursery as well. Upright herb to ca. 1 m, leaves variable in size, up to ca. 15 cm. Flowers greenish, held on upper side of inflorescence branches. Fruits appearing tan-colored. Stinging hairs not causing noticeable reaction to collectors, 3 May 2012, *D. Arakaki s.n.* (BISH 752428).

***Pilea hyalina*** Fenzl **New state record**

*Pilea hyalina*, a species in the Urticaceae that lacks stinging hairs, was reported to the Hawai‘i Department of Agriculture by a nursery grower on the Big Island, where it was found growing in the pots of plants shipped from Costa Rica (B. Azama, 2012, pers. comm.). It grows from sea level up to 1800 m in its native range in Central America and is a weed of coffee plantations in Guatemala. The only known record of it as a weed (other than this record from Hawai‘i) is from Belgium, where it is occasionally seen naturalizing in greenhouses. *Pilea hyalina* is shade tolerant, can form thickets in the understory of forests, and has very small seeds that can easily be accidentally introduced. This annual herb has angulate, hyaline stems with elliptic cystoliths (frequently obscure); the leaves are ovate to nearly rhomboid with serrate margins, membranous to sub-chartaceous, with three nerves from the base, and lateral nerves that are visible for 3/4 or more of the leaf length, never reaching the leaf apex. Inflorescences are axillary, 1–2 per axil, and bisexual, bearing 1–7 staminate and 30–330 pistillate flowers. The fruit is a sub-compressed, ovoid achene, 0.5–0.7 mm long (Monro 2009).

*Material examined*. **HAWAI‘I**: Kea‘au, volunteer plant in nursery, growing in container with potted palm. Herb ca. 30 cm long, stems fleshy, no stinging hairs, flowers minute, clustered in leaf axils, fruit present, 1 Apr 2012, *K. Onuma& R. Kihara s.n.* (BISH 751164).

**Zygophyllaceae**

***Guaiacum sanctum*** L. **New naturalized record**

The common name Holywood lignum-vitae has been applied to this species, whose native range includes Florida and parts of the Caribbean and Central America. It does not appear to be intensively cultivated outside of its native range, and seems to be very rare in Hawai‘i. It was found spreading from a few cultivated individuals in Koko Crater to shaded *Leucaena* and *Prosopis*-dominated areas of dry lowland alien forest on the crater floor. It is also reported to be spreading to open sites along the inner crater walls. This species can be distinguished from the similar-looking *G. officinale* by having more leaflets (6–10) with acute apices (rounded in *G. officinale*) (Staples & Herbst 2005).

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden, near Cacti/Americas section. Dry Lowland *Prosopis/Leucaena* forest. Small tree/shrub 3 m tall, with spreading branches. Corolla light lavender, in pairs, 29 Mar 2012, *A. Lau & D. Frohlich 2012032901*.

**Species showing signs of naturalization**

**Apocynaceae**

***Acokanthera schimperi*** (A. DC.) Schweinf.

*Acokanthera schimperi* is an economically important plant in Africa, used for ornamental purposes as well as for medicine and as a powerful poison for killing wild animals and stray dogs. On O‘ahu, it is only known from Koko Crater and Foster Garden. This is the first specimen of this species to have been submitted to the Bishop Museum’s *Herbarium Pacificum*. A few individuals of this species were found spreading from planted sites in a local botanical garden, and the species was recommended for removal to prevent its further spread.

*Material examined*. **O‘AHU**: Koko Crater Botanical Garden, 21.2844°N, 157.6803°W. Spreading in garden, but so far rare. Shrub ca. 2.5 m tall, growing on rock. Leaves glossy, flowers small, white, few, no fruits seen. *Ficus microcarpa*, *Grewia micrantha* overstory, 12 Mar 2012, *OED 2012031206.*

**Araceae**

***Anthurium urbanii*** Sodiro

This record describes the first specimen of this species to be submitted to the Bishop Museum’s *Herbarium Pacificum*. A single individual was found in a thicket of *Arthrostemma ciliatum* in dense shade well off of a local hiking trail. It is unclear how it got to that location, but it appears not to have been planted.

*Material examined*. **O‘AHU**: Windward O‘ahu, Kāne‘ohe, off portion of Likeke Trail, 21.3834°N, 157.8115°W. Single individual apparently naturalized among a thicket of *Arthrostemma ciliatum,* in more or less dense shade. Herb 4.5 ft tall with above-ground prop roots. Broken stem initially white, becoming orange when oxidized. Leaf blades glossy green, ca. 0.75 m long, 0.5 m wide, basal lobes overlapping, heart-shaped, with acuminate tips, petiole reddish orange at point of attachment to blade. Peduncle 0.5 m long, spathe light green with purplish markings, curling. Lowland mesic to wet secondary forest understory, 17 Oct 2011, *OED 2011101701.*

**Bombacaceae**

***Pachira aquatica*** Aubl.

*Pachira aquatica,* or Guiana chestnut, a species sometimes grown in Hawai‘i as a food source or ornamental (Staples & Herbst 2005)*,* was seen spreading downhill from a small grouping of mature plants. Hundreds of seedlings were spotted in the area along the side of a hiking trail. This is the first record of *P. aquatica* spreading in Hawai‘i. It is unclear whether this species was originally planted in this area, but the number of adventive seedlings was notable.

*Material examined*. **O‘AHU**: Kāne‘ohe, Likeke Trail, 21.379N, 157.810W. From grouping of 6–10 mature plants 10–15 ft tall with hundreds of seedlings underneath less than 30 cm tall, not spreading beyond the immediate area around matures. Flowers seen on ground, fruit immature. Growing with *Dicranopteris linearis, Oplismenus hirtellus, Clidemia hirta,* 17 Oct 2011, *OED 2011101704.*

**Cactaceae**

***Peniocereus hirschtianus*** (K. Schum.) D.R. Hunt

This species is not known from cultivation worldwide, and it is rarely seen in its native range in Central America (N Taylor, 2012, Singapore Botanic Gardens, pers. comm.). It was spreading along the crater walls in Koko Crater Botanical Garden, but it was unclear

whether it had been planted in this area. The following description of the species is taken from a description of *Nyctocereus guatemalensis*, which is now considered a synonym of *Peniocereus hirschtianus*, from Britton and Rose (1913):

> "Stems half-erect, arching, creeping, or even prostrate, 3 to 6 cm. in diameter: ribs 8 to 12, very low; radial spines about 10; centrals 3 to 6, usually much longer than the radials, the longer ones 3 to 4 cm. long; flowers very fragrant, 4 to 5 cm. long; ovary somewhat tuberculate, each tubercle crowned by an areole bearing a cluster of pinkish or brownish spines; outer sepals brownish; petals lanceolate, acute, nearly white; stamens much shorter than the petals, attached all along the surface of the wide throat; style stout, 3 cm. long; fruit small (about 2 cm. long), spiny; seeds black, shining, 3 mm. in diameter."

*Material examined*. **O'AHU**: Koko Crater Botanical Garden, 21.284°N, 157.682°W. Scattered distribution in open rocky areas, dry lowland exposed rocky ridge. Sprawling cactus, stems arching or lying on ground. Stems flat green, ribs strongly compressed, spines usually grey. Flowers open in morning, sweetly fragrant, petals white on inner surface, filaments white, anthers and stigma cream-colored, 22 Mar 2012, *OED 2012032205.*

**Euphorbiaceae**

***Synadenium grantii*** Hook.f.

*Synadenium grantii,* a hardy member of the Euphorbiaceae, was seen spreading sparingly near a farm on O'ahu. The two individuals found did not appear to have been planted in the area, but the population is so far not self-perpetuating.

*Material examined*. **O'AHU**: Wahiawā, Waihī Farms, among roadside shrubbery. Two plants in area, no seedlings or saplings found. Tree 20–30 ft tall with hanging branches, 22 Nov 2011, *OISC 2011112201.*

**Fabaceae**

***Acacia robusta*** Burch. subsp. ***clavigera*** (E. Mey.) Brenan

This African species of *Acacia* was previously unknown to occur in Hawai'i, and is perhaps only growing in one botanical garden on O'ahu. It commonly forms 6 cm-long stipular spines that can persist in dense aggregations on trunks and branches, particularly on young trees. It was seen spreading sparingly from planted sites where 2 young trees were establishing by seed, one of them at significant dispersal distance. Removal of this species was recommended to garden staff.

*Material examined*. **O'AHU**: Koko Crater Botanical Garden. Tree 6 m tall with drooping branches, some touching the ground, growing in a cleared area with *Prosopis pallida*. Total of 3–4 cultivated trees, 2 or more adventive saplings/small trees. Stipular spines ranging from less than 1 cm to 7 cm, some persisting on trunk and major branches. Flowers fragrant, filaments white. Leaves and flowers arising from callused, cushion-shaped leaf axils. Pods dehiscent on tree, seeds hanging from arils, 12 Mar 2012, *D. Frohlich & A. Lau 2012031205*.

**Lauraceae**

***Neolitsea cassia*** (L.) Kosterm.

A single mature tree of this very rarely planted species in Hawai'i was found along a trail at great distance from what is presumed to be a parent plant at a nearby botanical garden in windward O'ahu, growing in wet lowland alien forest. It is possible that a more extensive population of this species exists in the area, as off-trail surveys for this species have not yet been performed.

*Material examined*. **O'AHU**: Kāne'ohe, Likeke trail near Wilson Tunnel. Lowland wet forest/*Dicranopteris linearis*, with *Pachira aquatica, Schefflera actinophylla*. Tree to 6 m tall, trunk

straight. Leaves glossy green above, pale/glaucous below. Immature fruit green, 17 Oct 2011, *A. Lau & D. Frohlich 2011101703*.

**Orchidaceae**

***Dendrobium* 'Jaquelyn Thomas'** hybrid

A single individual of what belongs to a complex hybrid of *Dendrobium* species was found well away from any sites of cultivation in native forest in the Wai'anae Mountains. Various hybrids of this complex are common in general cultivation. Further off-trail surveys may reveal a greater population size, though it may be just as likely this is either a rare event of spread, or the population covers an extremely large area at very low density.

*Material examined*. **O'AHU**: West Makaleha, off of trail to Three Points exclosure, 730 m (2400 ft) elev, growing as an epiphyte next to *Polystachia concreta* on nearly dead *Antidesma platyphylla*, 13 Oct 2011, *K Kawelo US Army 235.*

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**Literature Cited**

**Bostock P.D. & Spokes, T.M.** 1998. *Drynaria. Flora of Australia* **48**: 474–478.

**Boufford, D.E.** 1997. *Laportea*. *Flora of North America* **3**: 405–406.

**Britton, NL. & Rose, J.N** 1913. Studies in Cactaceae–I. *Contributions from the U.S. National Herbarium* **16**(7): 239–242.

**Chen, J. & Pipoly III, J.J.** 1994. *Ardisia*. *Flora of China* **15**: 10–29.

**Chimera, C**. 2009a. *Albizia adianthifolia*. Hawai'i-Pacific Weed Risk Assessment. Available from: http://www.hear.org/pier/wra/pacific/Albizia_adianthifolia.pdf. [Last accessed: 1 Feb 2013]

———. 2009b. *Erythrina speciosa*. Hawai'i-Pacific Weed Risk Assessment. Available from: http://www.hear.org/pier/wra/pacific/Erythrina%20speciosa.pdf [Last accessed: 1 Feb 2013]

———. 2009c. *Euphorbia ingens*. Hawai'i-Pacific Weed Risk Assessment. Available from: http://www.hear.org/Pier/wra/pacific/Euphorbia%20ingens.pdf [Last accessed: 1 Feb 2013]

**Clifford, P**. 2009. *Laportea aestuans*. Hawai'i-Pacific Weed Risk Assessment. Available from: http://www.hear.org/pier/wra/pacific/Laportea%20aestuans.pdf [Last acces-

sed: 6 Feb 2013]

**Flora Zambesiaca Online**. 2011. Royal Botanic Gardens, Kew. Available from: http://apps.kew.org/efloras/search.do. [Last accessed: 6 Feb 2013]

**Forster**, **P**.**I**. **& Liddle**, **D**.**J**. 1996. *Dischidia*. *Flora of Australia* **28**: 237–240.

**Frohlich**, **D**. **& Lau**, **A**. 2012. New plant records for the Hawaiian Islands. *Bishop Museum Occasional Papers* **113**: 27–54.

**Green**, **P**.**S**. 1994. *Erythrina*. *Flora of Australia* **49**: 180–181.

**Monro**, **A**.**K**. 2009. *Pilea*. *Flora Mesoamericana* website. Available from: http://www.tropicos.org/Project/FM. [Last accessed: 6 Feb 2013]

**Orwa**, **C**., **Mutua**, **A**., **Kindt**, **R**., **Jamnadass**, **R**. **& Simons**, **A**. 2009. Agroforestree database: a tree reference and selection guide version 4.0. Available from: http://www.worldagroforestry.org/af/treedb/. [Last accessed: 6 Feb 2013]

**Skolmen**, **R**.**G**. 1980. Plantings on the forest reserves of Hawaii 1910–1960. Honolulu, Institute of Pacific Islands Forestry, U.S. Forest Service. 481 pp.

**Snow**, **N & Lau**, **A**. 2010. Notes on grasses (Poaceae) in Hawai‘i. *Bishop Museum Occasional Papers* **107**: 46–60.

**Staples**, **G**.**W & Herbst**, **D**.**R**. 2005. *A tropical garden flora.* Bishop Museum Press, Honolulu. xxiv + 908 pp.

**Verdcourt**, **B**. 1985. A synopsis of the Moringaceae. *Kew Bulletin* **40**(1): 1–23 + ix.

**Vitali-VeigaI**, **M**.**J**. **& Machado**, **V**.**L**.**L**. 2000. Flowering visitors of *Erythrina speciosa* Andr., Leguminosae. *Revista Brasileira de Zoologia* **17**(2): 369–383.

**Wagner**, **WL**., **Herbst**, **D**.**R**. **& Sohmer**, **S**.**H**. 1999. *Manual of the flowering plants of Hawai‘i*. Revised edition. 2 vols. University of Hawai‘i Press and Bishop Museum Press, Honolulu. 1919 pp.

**Yang**, **Y-P**. **& Lu**, **S**.**-Y**. 1998. *Ardisia*. *Flora of Taiwan* **4**: 40–47.