

## New Plant Records from the Big Island for 2010–2011

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The Big Island Invasive Species Committee (BIISC) implemented its Early Detection program in May of 2008. Roadside Surveys were conducted on major, secondary, tertiary, and residential roads in the Puna, South Hilo, North Hilo, Hāmākua, and North Kohala Districts. Here, BIISC Early Detection documents 1 new state record, 11 new naturalized records, 1 potential naturalization, and 17 new island records.

Plants from 16 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), *A tropical garden flora* (Staples & Herbst 2005) and information subsequently published in the *Records of the Hawaii Biological Survey*. Voucher specimens are deposited at Bishop Museum's *Herbarium Pacificum* (BISH), Honolulu.

### Acanthaceae

#### *Justicia carnea* Lindl.

#### New island record

This popular ornamental from Brazil has previously been collected as naturalized from Maui (Oppenheimer 2004: 8). This collection was from the Mountain View area at an elevation of 1600 ft. Naturalized populations of this plant have also been observed in the North Kohala district near Kapa'au.

*Material examined.* HAWAII: Puna Distr. Hwy 11, Mountain View, 2162719N, 278357E. 6 ft tall shrub found on roadside with large simple leaves with purple undersides and bright pink inflorescence, 11 Oct 2010, J. Parker & R. Parsons BIED143.

#### *Sanchezia speciosa* Leonard

#### New island record

This commonly cultivated hedge plant has been seen naturalizing in a few locations around the island. It has previously been recorded as naturalized from Kaua'i (Lorence *et al.* 1995: 20).

*Material examined.* HAWAII: North Hilo Distr. Laupāhoehoe Point, 2211916N, 265217E. Growing on disturbed roadside in large thicket, 24 Aug 2010, J. Parker & R. Parsons BIED134.

### Apocynaceae

#### *Beaumontia multiflora* Teijsm. & Binn.

#### Potential naturalization

Easter-lily vine, native to Malaysia, Sumatra, Java, and Bali, is a large climber with 20 ft long stems and heavy foliage, which requires a spacious garden and sunny, well-watered location; "... in the wild, it produces paired, cucumber shaped pods containing 100–250 wind-dispersed seeds ... but does not set fruit or seed in Hawai'i" (Staples & Herbst 2005). No fruit was observed at this location but the Early Detection team will continue to monitor this population for seed set.

*Material examined.* HAWAII: North Kohala Distr. Akoni Pule Hwy, 2238538N, 210823E. Vine with large leaves and milky latex climbing 30 ft high over avocado, banyan, and mango trees. Large, white, showy flower with sweet, spicy fragrance, petals fused with pink-white calyx, 9 Feb 2010, J. Parker & R. Parsons BIED110.

**Arecaceae*****Arenga pinnata*** (Wurmb) Merr.**New naturalized record**

Sugar palm is a popular ornamental in the Hawaiian Islands and in its home range the male spadices are tapped for their sugary syrup which is made into a palm wine upon distillation (Mabberley 2008). This species has spread from 100+ year-old plantings in the Bond Historic Distr into the lower section of Waianaia Gulch, where mature flowering and fruiting trees were observed with many saplings. Naturalized specimens of this plant have been collected on O'ahu (Daehler & Baker 2006: 5).

*Material examined.* **HAWAII:** North Kohala Distr. Bond Historic Distr, Waianaia Gulch, 2236772N, 207675E. Large palm with fronds up to 9 m found in gulch in 'Iole *ahupua'a*. Large, flowering and fruiting population with black hairs and long spines on trunks, 6 Apr 2010, *J. Parker & R. Parsons BIED115*.

***Pinanga coronata*** (Blume ex Mart.) Blume**New island record**

This palm, native to Java and Sumatra, is popular in cultivation for its distinct inflorescence. It was previously collected as naturalized from the area around Lyon Arboretum on O'ahu (Daehler & Baker 2006: 5). A dense fruiting population was observed on a hillside in O'ōkala Gulch.

*Material examined.* **HAWAII:** North Hilo Distr. O'ōkala Gulch, 2214514N, 260809E. Tall clumping palms naturalizing on hillside of deep gulch. Flowers white, fruits white turning black at maturity, stems of inflorescence bright red, 31 Aug 2010, *J. Parker & R. Parsons BIED136*.

**Bignoniaceae*****Tabebuia heterophylla*** (DC.) Britton**New island record**

Pink trumpet tree is widely cultivated around the island and has previously been recorded as naturalized from Maui and O'ahu (Oppenheimer 2003: 8; 2004: 10). At this location, there are numerous, mature, naturalized trees spread around Kīlau Gulch.

*Material examined.* **HAWAII:** North Hilo Distr. Hwy 19, Laupāhoehoe, 2211534N 265485E. Pink-flowered trees naturalizing in Kīlau Gulch near cultivated specimens. Flowers visited by bees, 23 Sep 2010, *J. Parker & R. Parsons BIED139*.

**Cactaceae*****Pereskia aculeata*** Mill.**New naturalized record**

Barbados gooseberry is a leafy cactus with a vining habit that is native to the Caribbean and South America. Popular in botanical gardens as a specimen planting of a primitive cactus. It is also cultivated for its edible fruit and use as a living fence for cattle in South Africa. It was declared a noxious weed in South Africa in 1979 (Morton, 1987) and is capable of invading intact native forest there (I. Paterson, pers. comm.). An apparently naturalizing sterile specimen strongly resembling *Pereskia aculeata* was collected from Hālawā Valley on Moloka'i (*T. Lau s.n.*, 28 Sep 2001, BISH #683117). A fertile specimen needs to be collected from that population to confirm its identity. *P. aculeata* is described as a shrub or vine, clambering, 3–10 m. Stems to 3 cm dia, spiny; areoles to 15 mm dia, largest on basal portion of stem. Leaves lanceolate to ovate or oblong, 4.5–11.0 × 1.5–5.0 cm. Spines of 2 kinds; primary spines 2 per areole, recurved, clawlike, 4–8mm long; secondary spines to 25 per older areole, straight, 10–35 mm long. Flowers to 70 in terminal or lateral inflorescences, fragrant, 3.0 × 2.5–5.0 cm; pedicels 5–15 mm long; tepals perigynous; scales and areoles on prominent to inconspicuous tubercles; perianth whitish to light pink. Fruits yellow to orange, spheric, not angled, 40 × 15–25 mm, never proliferating. Seeds lenticular, 4.5–5.0 mm dia, glossy (Hawkes 2003). This species was recommended for control to the BIISC plant crew, and initial control has begun.

*Material examined.* **HAWAII:** North Kohala Distr. Akoni Pule Hwy, Hawi, 2240213N, 205473E. Two small populations of vining cactus near elementary school. Stipular, paired, recurved thorns with fleshy leaves lacking venation. Flowers and fruit observed, 2 Feb 2010, *J. Parker & R. Parsons BIED109*;

### **Elaeocarpaceae**

*Elaeocarpus angustifolius* Blume

#### **New island record**

Blue-marble tree ranges widely from India throughout Southeast Asia, Indonesia, and Melanesia to tropical Australia. The species often grows along riverbanks or in seasonally flooded watercourses in the wild (Staples & Herbst 2005). It was previously collected as naturalized from the area around Lyon Arboretum on O‘ahu (Daehler & Baker 2006: 7).

*Material examined.* **HAWAII:** North Kohala Distr. Bond Historic Distr, Waianaia Gulch, 2238675N, 208575E. Extensive population of tall, stately trees with hundreds of seeds and saplings throughout gulch on riverbanks and growing directly out of the water, 30 Mar 2010, *J. Parker & R. Parsons BIED113*.

### **Euphorbiaceae**

*Breynia disticha* J.R. Forst. & G. Forst.

#### **New island record**

This species is very popular in cultivation and has been found naturalizing near old home-sites in Pololū Valley. It has previously been collected as naturalized from Maui (Lorence *et al.* 1995: 35).

*Material examined.* **HAWAII:** North Kohala Distr. Pololū Valley, 2236127N, 214288E. Large, naturalized population with small green axillary flowers, 27 Apr 2010, *J. Parker & R. Parsons BIED119*.

*Phyllanthus reticulatus* Poir.

#### **New naturalized record**

This species has a large native range from Tropical and South Africa to India, China, SE Asia, Indonesia, and Malesia. It is described as usually a much-branched semi-scandent shrub, rarely a small tree. Leaves ovate-oblong to elliptic, produced on short lateral branchlets, giving the impression of compound leaves. Flowers in clusters on short axillary branchlets, small, yellowish, sexes separate on the same plant, flowering before or with the new leaves. The flowering shoots and pedicels are covered in short, velvety hairs. Fruit berry-like, blackish when ripe (Pickering & Roe 2009). The plants in Nīnole were thorny to the touch, most likely due to the stipules which become hard-spiny when dry and brown (Li & Gilbert 2008). The flowers emit a distinct smell that has been described as mashed potatoes in Africa, but likened more to soy sauce by people living near the Nīnole population, and may be responsible for the local legend that a Shoyu delivery truck crashed on the sharp turn near the population.

*Material examined.* **HAWAII:** North Hilo Distr. South of Maulua Gulch, Nīnole, 2207931N, 270676E. Large population of thorny sprawling shrubs with small, pink, drooping flowers, 23 Sep 2010, *J. Parker & R. Parsons BIED141*; Maulua Gulch, Nīnole. A shrub about 6 ft high, leafy branches in 1 plane. It could be an escape from cultivation, No date, *A. Kawasaki s.n.* (BISH #50402).

### **Fabaceae**

*Acacia mangium* Willd.

#### **New island record**

Native to Queensland, Australia, the Molucca islands and Papua New Guinea, *A. mangium* has been planted around the island for hardwood and biomass potential. Now spreading in ‘Uma‘uma, Pepe‘ekeo, Hawaiian Paradise Park, Hawaiian Acres, and Hawaiian Beaches subdivisions. It has previously been collected as naturalized on O‘ahu (Frohlich & Lau

2008:6). This species is reported as naturalizing on Kaua'i (Frohlich & Lau this volume).

*Material examined.* **HAWAII:** North Hilo Distr. Uma'uma, 2201741N 273807E. Naturalized trees in eucalyptus grove mauka Hwy 19 and spreading downhill along Kama'e'e Homesteads Rd, 13 Sep 2010, *J. Parker & R. Parsons BIED137*.

*Calliandra houstoniana* (Mill.) Standl.

var. *calothyrsa* (Meisn.) Barneby

**New island record**

Planted around the island as forage and firewood, this species has been seen spreading from cultivation frequently, and this collection was from grazed pastureland alongside *Gliricidia sepium*. Previously collected as naturalized from Lāna'i and Maui (Imada *et al.* 2008: 13; Starr *et al.* 2010: 64). This species is reported as naturalizing on Kaua'i (Frohlich & Lau this volume).

*Material examined.* **HAWAII:** Hāmākua Distr. Pa'auilo Makai, 2219437N, 249863E. Large shrubs with bipinnately compound leaves with red, terminal inflorescences, and numerous dry seed-pods which split open when mature, 14 Jun 2010, *J. Parker & R. Parsons BIED125*.

*Enterolobium cyclocarpum* (Jacq.) Griseb.

**New naturalized record**

Earpod tree is native to Central America and Northern South America and is described by Wagner as often cultivated and may be adventive (Wagner *et al.* 1999: 630). Seedlings observed on roadside and large trees naturalized in gulch probably spread from the small planting in O'ōkala town near the old cane overpass. The species is described as a large-trunked tree <25 m tall with widely spreading branches. Petioles 2–6 cm long, usually with sessile gland below the middle; pinnae 4–15 pairs, leaflets 20–30 pairs, linear-oblong, 8–15 mm long, apex acute, paler beneath. Inflorescence axillary, peduncle 1.5–4.0 cm long, heads many-flowered; calyx puberulent, 2.5 mm long; corolla tube glabrate to puberulent, <5 mm long, teeth ciliate; staminal tube included, filaments white. Legume compressed, 3–4 cm wide, curved into a nearly complete circle 8–10 cm dia, shiny, seeds ellipsoidal, flat, with conspicuous pleurogram (Howard 1988: 357). Growth of naturalized trees in O'ōkala resembling *Falcataria moluccana* in stature and trunk.

*Material examined.* **HAWAII:** North Hilo Distr. O'ōkala Gulch, 2214377N, 260854E. Large trees over 100 ft tall spreading from planting into gulch with seeds sprouting on side of road. White, mimosoid flowers and ear-shaped, fleshy, brown pods, 28 Jun 2010, *J. Parker & R. Parsons BIED128*.

*Erythrina crista-galli* L.

**New naturalized record**

The cock's spur coral tree, native to South America is planted widely around the island and was found naturalizing in a dry gulch in North Kohala. It is described as an evergreen tree 20–30 ft tall; bark thick, corky, branches with stout spines. Leaf petiole to 8 in long, often spiny; leaflets 3, ovate-oblong to broadly elliptic, leathery, glabrous. Inflorescence appearing with leaves, in terminal drooping racemes to 2 ft long, or axillary clusters of 2 or 3. Flower calyx bell-shaped, to 0.8 in long, entire; corolla upper petal (standard) reflexed, elliptic to broadly elliptic, crimson to blood red, base darker; wings and keel darker red, to 2 in long. Fruit cylindrical, curved, 3–8 in long, seeds 0.63 in long, dark brown (Staples & Herbst 2005). This species is reported as naturalizing on O'ahu (Frohlich & Lau this volume).

*Material examined.* **HAWAII:** North Kohala Distr. Kohala Ranch subdivision, 2223688N, 204750E. Naturalized population in dry gulch near grazed land. Fruits dark brown, 10 cm pod. Flowers red, numerous. Stems thorny, 19 Jan 2011, *J. Parker & R. Parsons BIED149*.

***Flemingia macrophylla*** (Willd.) Merr.**New naturalized record**

*Flemingia macrophylla* is native to tropical and subtropical Asia and Indonesia. It is described as a perennial, deep-rooting, leafy shrub, up to 3 m high. Growth habit ranges from prostrate to erect with numerous stems arising from the base. Leaves digitately trifoliolate, leaflets elliptic-lanceolate and 5–15 cm long, 2–8 cm wide, silky or hairless, papery when old. Inflorescences mostly axillary, in dense racemes, 5–30 cm long, with 15–40 papilionoid flowers. Calyx densely silky, 6–13 mm long with 5 lanceolate lobes; greenish standard with distinct red blotches or stripes and purple apex. Pods oblong, 11–15 mm long, 5–7 mm wide, dark brown and slightly silky, dehiscent, 2-seeded. Seeds globular, mottled brown or shiny black, 2–3 mm dia (Verdcourt 1979). Found naturalizing near agricultural land, it most likely spread from a planting for some agricultural use, such as a cover crop for nitrogen-enrichment. It has also been seen naturalizing in a vacant lot in Hakalau, and cultivated at a botanical garden in ‘Uma‘uma, but it is unknown how frequently this plant is cultivated.

*Material examined.* **HAWAII:** North Hilo District. Nīnole, 2207000N, 270347E. 8ft tall herbaceous shrub with winged petioles and spikes of pink leguminous flowers. Fruit an inflated pod that pops open at maturity. Found growing on upper edge of gulch, 30 Aug 2010, *J. Parker & R. Parsons BIED135.*

***Gliricidia sepium*** (Jacq.) Walp.**New naturalized record**

Madre de cacao trees, in their native range of Mexico and Central America, are planted to shelter young coffee and cacao plantations (Staples & Herbst 2005). This species was seen rarely in surveys but sometimes in massive plantings of over 100 trees. These naturalized plants were most likely spread from an agricultural planting.

*Material examined.* **HAWAII:** Hāmākua District. Pa‘auilo, 2219436N 249862E. 15ft tall woody shrub seen naturalizing in pasture land. Flowering and fruiting when leafless. Long panicles of pink-lavender flowers and long, fleshy seedpods, 14 Jun 2010, *J. Parker & R. Parsons BIED125.*

***Inga feuilleei*** DC.**New naturalized record**

This commonly cultivated tree has been seen naturalizing successfully on the windward side of the island. Ice-cream bean tree, or pacay, is native to Peru and Bolivia and is described as having 1×-pinnately compound leaves with 3–4 pairs of leathery, tapering-elliptic leaflets arranged oppositely along a winged axis (central stem). The white, mimosa-type, 1.25–1.50 in long flowers are borne in heads at the apexes of brownish-fuzzy stalks. The green pods are flattened, 8–24 in long and 2–3 in wide, and 4-angled by virtue of their distinctly raised margins (Staples & Herbst 2005).

*Material examined.* **HAWAII:** North Hilo Distr. Hwy 19, O‘ōkala, 2214290N 261272E. Group of small trees, ~20 ft tall, naturalized in pasture with *Panicum maximum*. White mimosoid flowers with 4-angled, thick, green pods. Compound dark-green leaves with winged petioles, 24 Aug 2010, *J. Parker & R. Parsons BIED133.*

***Senna alata*** (L.) Roxb.**New island record**

Candle bush is frequently cultivated and readily naturalizes where planted. It is previously recorded as naturalized from all of the major Hawaiian Islands except Ni‘ihau and Kaho‘olawe.

*Material examined.* **HAWAII:** South Hilo Distr. Hakalau, 2201461N, 277313E. Large naturalized population in vacant lot in residential area. Bright yellow flowers with large, dark-brown pods, 28 Sep 2010, *J. Parker & R. Parsons BIED142.*

**Magnoliaceae*****Liriodendron tulipifera* L.****New naturalized record**

Valued for its economically important timber in its native range of eastern North America, a large planting of tulip poplar was observed spreading on Tree Planting Rd off the Stainback Hwy. Rare in Hawai'i, this tree may be encountered at higher elevations on the Big Island and Maui (Staples & Herbst 2005). This was the only instance this tree was encountered and when assessed it scored a 2 (Evaluate) on the Hawai'i Weed Risk Assessment, however with its wind-dispersed seeds and persistent seed bank (Hicks 1998), cultivated specimens of tulip poplar should be watched for signs of naturalization.

*Material examined.* **HAWAI'I:** South Hilo Distr. Tree Planting Rd off Stainback Hwy, 2169329N, 266686E. Large, naturalizing population, possibly from planting. Most trees 80 ft tall with many naturalized saplings, 26 Oct 2010, *J. Parker & R. Parsons BIED144.*

**Moraceae*****Artocarpus heterophyllus* Lam.****New naturalized record**

Jackfruit is cultivated in most parts of the island for its abundant edible fruit and it was found naturalizing in the fertile valleys of the Bond Historic District in North Kohala. This species is reported as naturalizing on O'ahu (Frohlich & Lau this volume).

*Material examined.* **HAWAI'I:** North Kohala Distr. Bond Historic District, Waianaia Gulch, 2236905N, 207666E. 8-10 large fruiting adults with many saplings throughout gulch with large leaves with scabrous undersides and milky latex, 6 Apr 2010, *J. Parker & R. Parsons BIED116.*

***Ficus religiosa* L.****New island record**

Bodhi tree is popular in cultivation around the island and has previously been collected as naturalized on O'ahu (Frohlich & Lau 2008: 7). Due to its specific pollinator fig wasp, *Blastophaga quadraticeps* Mayr, being present in Hawai'i, it is likely that this tree will continue to naturalize across the islands.

*Material examined.* **HAWAI'I:** Hāmākua Distr. Hwy 19, mile marker 31, 2214536N, 259750E. Growing out of concrete supports on Kupapaulua Bridge. One 2.5ft tall sapling observed, 9 Aug 2010, *J. Parker & R. Parsons BIED129.*

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

Brazilian cherry can be found in cultivation over many parts of the island, especially from Hilo to Waimea. It has previously been recorded as naturalized from Maui (Starr *et al.* 2011: 29). Although not often seen spreading from cultivation, this shrub was seen colonizing the side of a gulch in the Bond Historic District in North Kohala.

*Material examined.* **HAWAI'I:** North Kohala Distr. Bond Historic Distr, Waianaia Gulch, 2236888N, 207681E. Small population of naturalized shrubs observed on hillside. Orange, flaky bark, with whorled leaves and white 4-petal flowers with persistent bracts, 22 Mar 2010, *J. Parker & R. Parsons BIED111.*

***Pimenta dioica* (L.) Merr.****New island record**

Allspice is commonly cultivated around the island and has previously been collected as naturalized from Kaua'i and Maui (Lorence *et al.*, 1995; Starr *et al.* 2003: 28). This tree has appeared naturalized numerous times, and was collected here from North Kohala. This species is reported as naturalizing on O'ahu (Frohlich & Lau this volume).

*Material examined.* **HAWAI'I:** North Kohala Distr. Honomaka'u Rd, Hāwī, 2240118N, 205543E. One large 15ft tall tree seen naturalized and flowering on roadside, 22 Mar 2010, *J. Parker & R. Parsons BIED117.*

**Oleaceae*****Jasminum multiflorum* (Burm. f.) Andrews      New naturalized record**

Star jasmine is native to tropical Asia and has been prized and cultivated in India and southern China for centuries. Its flowers are used for the extraction of jasmine scent and, like *J. sambac*, are dried for scenting tea (Staples & Herbst 2005). It is described as an evergreen scrambler or weak climber, pubescent. Leaves opposite, simple; petiole to 0.3 in long; blades broadly ovate, usually 1.4–2.0 in × 1.0–1.4 in, underside without small pits in axils of secondary veins and midvein, base truncate to cordate. Inflorescence terminal on branch tip and axils of upper leaves, more or less umbellate or clustered, 9 to many flowered. Flowers 1.0–1.8 in long, white fragrant or odorless; calyx lobes threadlike, 0.3–0.5 in long, pubescent; corolla tube 0.5–1.0 in long, lobes usually 7 or 8 (6–9), elliptic. Fruit rarely produced (Staples & Herbst 2005). One of the more common jasmines in cultivation, this collection represents the third species of jasmine to be found naturalized in Hawai‘i.

*Material examined.* **HAWAII:** Hāmākua Distr. Haina, Honoka‘a, 2223213N, 242008E. Large vining jasmine seen naturalized in invaded area near perimeter of county park. Flowers without scent and opposite leaves, 18 May 2010, *J. Parker & R. Parsons BIED124*.

**Pinaceae*****Pinus taeda* L.****New island record**

Loblolly pine, native to the eastern and southern United States, has been found naturalizing at this high elevation site (7100 ft) on the slopes of Mauna Kea, where it was planted. It has previously been collected as naturalized on Lāna‘i (Oppenheimer 2008: 31) and is recorded as potentially naturalizing on Kaua‘i (Frohlich & Lau this volume). Loblolly pine is fairly common throughout the island and has been seen possibly naturalizing in other higher elevation areas, i.e. Glenwood and Volcano.

*Material examined.* **HAWAII:** North Hilo Distr. Mauna Kea access road, 2181881N, 243646E. 60–80 ft tall grove of trees with cones strongly attached to stem, spreading from a planting, 18 Aug 2010, *J. Parker & R. Parsons BIED132*.

**Piperaceae*****Piper auritum* Kunth****New island record**

False ‘awa has previously been collected as naturalized on the islands of Kaua‘i and O‘ahu (Staples *et al.* 2006: 8), and East Maui (Starr & Starr 2011: 29). This shrub is native to tropical America and is used as a spice there. In Hawai‘i, it is grown for its use as a spice and because it is falsely believed to be true ‘awa, *Piper methysticum*. This collection was from a large, mature population covering about half an acre of land on one side of a gulch near Hilo. The shrubs were approximately 10 ft high.

*Material examined.* **HAWAII:** South Hilo Distr. Wainaku, 2183465N, 280644E. Large naturalized population on side of gulch. Large leaves with licorice scent and uneven leaf bases. White inflorescence, 2 Feb 2011, *J. Parker & R. Parsons BIED151*.

**Polygonaceae*****Emex australis* Steinh.****New state record**

*Emex australis*, or three-corner jack, is native to South Africa and was first collected from the island of Hawai‘i in 1931 in Makahālau on Parker Ranch lands. It is known to occur from west Kamuela down to the Saddle Road junction, and Saddle Road up to 6400 ft elevation. We have also seen it naturalized on roadsides up to the scenic overlook on Kohala Mountain Road. This plant had been misidentified as *E. spinosa* in collections until 2006, when the expert Karen L. Wilson of the National Herbarium of New South Wales (NSW)

reidentified the BISH specimens. *Emex spinosa* is now known to occur only on O‘ahu, Moloka‘i, and East Maui, while *E. australis* is known only from the Big Island. *Emex australis* can be differentiated from *E. spinosa* because it is more prostrate (average 56 cm vs. 80 cm tall), has fewer seeds per rosette (average 4.7 vs. 8.8), per node (average 2.2 vs. 6.2), and per plant (average 346 vs. 987) and the achenes are longer (average 8 mm vs. 5.5 mm) and wider (average 9.5 mm vs. 5.2 mm) than *E. spinosa* (Weiss and Julien, 1975). This collection was from the recently constructed bypass road in Kamuela, which we inspected after a partner got numerous calls about a weed popping bicycle tires. Both species of *Emex* are on the USDA/APHIS Federal Noxious Weed List, and *E. australis* appears to be a more serious threat to agriculture and livestock production than *E. spinosa*, based on experience in other parts of the world (Freeman 2005). Both species of *Emex* were targets for successful biocontrol releases between 1950 and 1966, where one species of weevil, *Perapion antiquum* successfully established on Maui and Hawai‘i, but failed to establish on Moloka‘i. Two other weevils, *P. neofallax* and *P. violaceum* were also released but did not establish (P. Conant, pers. comm.).

*Material examined.* **HAWAII:** South Kohala Distr. New bypass road, Kamuela, 2215327N, 221036E. Sprawling, prostrate herb with spiny 3-spiked fruit and large taproot, 30 Nov 2010, *J. Parker & R. Parsons BIED148*; Makahālu, Parker Ranch. Weed, Oct 1931, *R.A. Goff s.n.* (BISH #63678); 6 mi W of Pōhakuloa Park Stn, along Saddle Rd ~6400 ft roadside with *Chenopodium*. Decumbent, prostrate herb. Stems red or streaked with red. Leaves and petioles green. Tepals green, anther cream. Fruit green, tips of spines purple. Monoecious, 4 Mar 1979, *H. Kennedy & S. Ishikawa 3910*.

## Rosaceae

### *Cotoneaster pannosus* Franch.

#### New island record

Previously documented as naturalized on Kaua‘i and Maui (Lorence *et al.* 1995: 49; Herbarium Pacificum Staff 1999: 8), *Cotoneaster pannosus* grows vigorously at high elevation sites. A large naturalized population has been found near ‘Umikoa Village in the Hāmākua Distr.

*Material examined.* **HAWAII:** Hāmākua Distr. ‘Umikoa Village Rd, 2211318N, 252407E. Densely clustered shrubs with alternate, silvery leaves, white flowers and orange berries, no thorns. Spreading from gulch, 22 Jun 2010, *J. Parker & R. Parsons BIED127*.

### *Eriobotrya japonica* (Thunb.) Lindl.

#### New island record

Loquat has previously been documented as naturalized on Kaua‘i, O‘ahu, Lāna‘i, and Maui (Lorence *et al.* 1995: 49; Herbarium Pacificum Staff 1999: 8; Oppenheimer 2007: 31; Frohlich & Lau 2008: 8) and is a common, weedy shrub across the island.

*Material examined.* **HAWAII:** South Hilo Distr. Hwy 19, Pepe‘ekeo, 2198851N, 279188E. Small tree naturalized on roadside. White flowers on hairy brown inflorescence with yellow fruit. Green serrate leaves with white hairy undersides, 27 Oct 2010, *J. Parker & R. Parsons BIED146*.

### *Rubus sieboldii* Blume

#### New island record

Molucca raspberry is native to Japan, southern China, and Okinawa and was previously known from large infestations on Kaua‘i (Wagner, Herbst *et al.* 1999). Three small naturalized populations of this species were found within a half-mile of each other in Mountain View near Pszyk Rd. This species is on the State of Hawaii Noxious Weed List and will be recommended to the BIISC plant crew for control.

*Material examined.* **HAWAII:** Puna Distr. Pszyk Rd, Mountain View, 2162495N, 278628E. Large, stiff-leaved, thorny sprawler with white flowers. No fruit observed, naturalized near small drainage, 31 Jan 2011, *J. Parker & R. Parsons BIED152*.



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