

## New Plant Records from the Big Island for 2015

JAMES L. PARKER

*Botanical Survey Technician, Big Island Invasive Species Committee, 23 E. Kawili St, Hilo, Hawai'i 96720, USA; email: jameslp@hawaii.edu*

BOBBY PARSONS

*Invasive Species Program Associate, Big Island Invasive Species Committee, 23 Kawili St, Hilo, Hawai'i 96720, USA; email: rparsons@hawaii.edu*

The Big Island Invasive Species Committee (BIISC) Early Detection program in May of 2008. Roadside surveys are conducted in order to document the presence of newly naturalizing invasive plants. This contribution documents collections made between 2011 and 2014 on Hawai'i Island.

Here, BIISC Early Detection documents 1 new state record, 7 new naturalized records and 6 new island records. A total of 11 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 B.P. Bishop Museum's *Herbarium Pacificum* (BISH), Honolulu, Hawai'i.

### Acanthaceae

#### *Justicia spicigera* Schltldl.

#### New island record

Mexican indigo is native to Central America and has a variety of uses, including plant dye. It is not commonly cultivated on the Big Island and it is described as rarely fruiting in Hawai'i. This population was found in close proximity to the ocean even though it is described as being salt-intolerant (Staples & Herbst 2005). Previously documented as naturalized on O'ahu and Moloka'i.

*Material examined.* **HAWAII:** Puna Distr., Hwy 130, Kalapana, 2142187N 293446E, 6 ft tall shrub found on roadside with large simple leaves and slender, orange, tubular flowers, 11 Aug 2011, J. Parker & R. Parsons BIED161.

### Apocynaceae

#### *Vinca major* L.

#### New island record

Large periwinkle is a vigorous creeper but not as often cultivated as its congener *V. minor*. A naturalized population growing as a dense mat was found at high elevation (6,000 ft) in full sun. It has also been collected as naturalized on Maui. A description is included in this writeup to help distinguish from the more common *V. minor*. A low, slightly woody perennial with arching to ascending, often trailing vegetative stems up to 1.5 m length and flowering stems up to 30 cm length. The opposite and entire leaves are ovate, 2.5–9 cm long and 2–6 cm wide, have short petioles and ciliate margins. Bluish-purple flowers of 3–5 cm diameter grow solitary in the axils of leaves. Pedicels are 3–5 cm long. Fruits are spreading follicles of *c.* 5 cm diameter and 3.5–5 cm length. Seeds are oblong and 7–8 mm long (Weber 2003).

*Material examined.* HAWAII: North Hilo Distr., Mānā Road, 2196453N 254953E, naturalized population forming large mound, 3 Apr 2013, *J. Parker & R. Parsons BIED174.*

### Asteraceae

*Porophyllum ruderale* (Jacq.) Cass.

#### New state record

This strongly-scented, low-growing herb was found naturalizing in the vicinity of an agricultural park, growing in thickets up to 1 m tall. Determined *P. ruderale* as it has characteristics in between the two subspecies, *ruderale* and *macrocephalum*. In the reference following, the author mentions intermediate plants generally having floral characteristics of *macrocephalum* and vegetative characteristics of *ruderale*. The plants found in Hawai'i commonly have purple coloring on the leaves, stems, and involucre. Following is the description of *P. ruderale* ssp. *ruderale*: Blades 1–6 cm long, up to 30 mm wide, thin, elliptical, rarely ovate or obovate, rarely with glands scattered on the surface or without glands, apex mucronate to obtuse, base usually attenuate, sometimes acute, rarely obtuse; peduncles usually slightly to moderately clavate; phyllaries 16–22.5 mm long, 2–3 mm wide, apex acuminate; corolla 8.2–13.5 mm long; pappus 9–11.5 mm long, light to dark straw-colored; achenes 8.1–8.9 mm (Johnson 1969). Achene characteristics fit well within the description given for *macrocephalum*: Achenes 9.5–12.4 mm long, hispidulous (Johnson 1969). Subspecies *ruderale* is common as a weed in low, flat areas, such as fields and vacant lots, through much of its range. It usually is found at elevations below 1,300 m but may occur up to 2,500 m or more. In contrast, subsp. *macrocephalum* occurs more commonly at higher elevations in rocky terrain, although it is sometimes found in weedy situations, such as in roadside clearings, and even forms thickets near Progreso, Yucatan (Standley 1931).

*Material examined.* HAWAII: North Kona Distr., Keāhole Agricultural Park, Kaiminani Road, 2183897N 182587E, growing in rocks between a sod farm and a plumeria farm, strong smell associated with all parts of plant, 9 Jul 2014, *J. Parker & R. Parsons BIED176.*

*Tagetes patula* L.

#### New naturalized record

Marigolds are common in cultivation in gardens of Hawai'i, often because of their natural insecticidal properties. This species, French marigold, was found naturalizing near a garden plot, in a heavily disturbed area. Horticulturists distinguish this species from *T. erecta* with its shorter, more branched stature and smaller flowers often in deeper shades of orange, or red-brown, or with two-toned ray flowers (Staples & Herbst 2005). This collection represents a new naturalized record for Hawai'i Island.

*Material examined.* HAWAII: Puna Distr., Shipman Industrial Park, 2172616N 284889E, sprouting out of roadside corridor, many fruits and seeds. 1.5 ft tall with seeds germinating on mother plant. Corolla reddish-brown with pinnately lobed leaves, 28 Mar 2012, *J. Parker & R. Parsons BIED166.*

*Tithonia rotundifolia* (Mill.) S.F. Blake

#### New naturalized record

This Mexican sunflower is related to the more common *T. diversifolia* but differs in that it is a smaller species, up to 12 ft tall, with scarlet to orange-red ray flowers. Leaves are either entire or 3–5-lobed with coarsely toothed or serrate leaf margins and cordate leaf bases. Also, it has finely hairy involucre bracts in 2 or 3 whorls (Staples & Herbst 2005). This species is difficult to identify in its vegetative form due to its superficial similarity to the very common *Hyptis pectinata*.

*Material examined.* **HAWAII:** North Kona Distr., Donkey Mill Road, Hōlualoa, 2167127N 191318E, vigorous, bushy, multi-branched shrub about 8–10 ft tall, 6 Oct 2014, *J. Parker & R. Parsons BIED180*.

### **Begoniaceae**

***Begonia nelumbifolia*** Schlttdl. & Cham.

#### **New island record**

Originally collected by G. Staples on the Big Island in 2007, this *Begonia* is distinct with its circular, dinner-plate sized, lotus-shaped leaves, which give it its specific epithet. The material examined from our collection was from a steep hillside in a wet, shady valley in Honomū. Also collected by G. Staples in 2007 was material from O‘ahu and determined to be a new naturalized record.

*Material examined.* **HAWAII:** South Hilo Distr., Old Māmalahoa Hwy, Honomū Gulch, 2198093N 278941E, leaves over 12” across, white flowers on stalks 3–4 ft tall, 25 Jan 2012, *J. Parker & R. Parsons BIED165*; boundary between North and South Hilo Distr., roadside on Hwy 19, mauka side of highway, on crumbling lava embankment in heavy shade, damp pockets of humus on steep rock face, first naturalized record for the species on Hawai‘i Island, 15 Apr 2007, *G. Staples 1303*. **O‘AHU:** Pali Hwy, windward side, 50 ft uphill from pulloff parking area by hairpin turn, steep rock bank in deep shade, under secondary disturbed vegetation of *Psidium cattleianum*, *Citharexylum caudatum*, *Fraxinus*, *Schinus*, growing in pockets of humus on rock face, first genuinely naturalized record for this species on O‘ahu, 9 Mar 2007, *G. Staples 1300*.

### **Bignoniaceae**

***Markhamia lutea*** (Benth.) K.Schum.

#### **New naturalized record**

Nile tulip is a tree with pinnately compound leaves, broadly bell-shaped yellow flowers with red lines inside the tube, incompletely spathe-like calyxes, and leafy false stipules. It is native to tropical Africa, where it is a fast-growing second-growth tree, and is rarely cultivated elsewhere (Staples & Herbst 2005). In Hawai‘i, Nile tulip has been observed spreading in two locations in the Puna and North Kona districts. Cultivated specimens are often seen fruiting heavily, and with its wind-dispersed seeds, this species has been suggested to the committee to become an eradication target.

*Material examined.* **HAWAII:** Puna Distr., Hwy 11, Mountain View, 2162718N 278366E, trees to 40 ft tall, 6 Jan 2014, *J. Parker & R. Parsons BIED175*.

### **Fabaceae**

***Parkia timoriana*** (DC.) Merr.

#### **New naturalized record**

Tree bean is native to East Asia and several large specimens can be found cultivated in Hawai‘i. East of Hilo, at the collection site, hundreds of germinated seeds can be found littering the ground underneath a large specimen. Many saplings up to 20 ft tall were also observed. Trees attain 60–150 ft in height, with buttress roots 3–15 ft high at the trunk base; the leaves are 2x-pinnately compound with 14–30 pairs of pinnae, each pinna composed of 50–72 pairs of elongate, s-shaped, 0.25–0.4” long leaflets. The inflorescences, which hang downward in loose clusters of 4–7 on individual stalks 6–14” long, are globose or pear-shaped heads composed of hundreds of tiny, densely packed, white or yellowish mimosa-type flowers; only those at the apex are bisexual and capable of setting fruit. The black, indehiscent pods are strap-shaped, 8–14” long and 1.5–2.2” wide, and contain 12–20 crosswise-oriented seeds (Hopkins 1994). Tree beans are most often pollinated by bats and insects are rarely successful at pollination (Bumrungsri *et al.* 2008), which could be a limiting factor for its spread in Hawai‘i where the only bat present is insectivorous.

*Material examined.* **HAWAII:** South Hilo Distr., Hwy 11, Pana'ewa, 2175956N 283765E, tall tree with long, twisted bean pods, 7 Jan 2013, *J. Parker & R. Parsons BIED172*.

***Sesbania sesban* (L.) Merr.**

**New island record**

Egyptian river hemp is native to Northern Africa and the Middle East and has been collected as naturalized on Kaua'i and O'ahu. This specimen was collected from an abandoned field in South Kona. It is cultivated as an important source of fodder, fiber, and green manure. It also is a source for some interesting compounds known as molluscicidal saponins (Mabberley 2008). Although the tree fruits profusely, the seeds are apparently short-lived, especially in humid environments, and are heavily predated upon by insects (Gutteridge 1994).

*Material examined.* **HAWAII:** South Kona Distr., Old Tobacco Road, 2149502N 198119E, growing in an abandoned field, bipinnately compound leaves, attractive yellow flowers and long cylindrical seedpods, 30 Apr 2014, *R. Parsons, L. Nelson BIED177*.

**Marcgraviaceae**

***Norantea guianensis* Aubl.**

**New naturalized record**

Red-hot poker is a popular ornamental vine grown in many regions of the Big Island. This collection represents a new naturalized record for Hawai'i and the first time that fruit has been observed. It is a woody climber with alternate, leathery, elliptic to obovate leaves, 4–6" long and 2–3.25" wide. It bears terminal racemes to 4 ft long consisting of red-orange flowers, mostly hidden among similarly colored nectar-producing tubular appendages open at the top; these appendages (modified bracts) make up the visible bulk of the inflorescence (Staples & Herbst 2005). In a description of the family, it is mentioned that the fruit is a tardily dehiscent capsule, sometimes berry-like, with few to infinite small seeds with straight or weakly curved embryo in little or no endosperm (Mabberley 2008).

*Material examined.* **HAWAII:** Puna Distr., Leilani Estates, 2154339N 299706E, vine with large spikes of red, unusual flowers, fruit spherical, green and burgundy, multi-seeded with red juice, 16 Jul 2012, *J. Parker & R. Parsons BIED171*.

**Poaceae**

***Cenchrus elegans* (Hassk.) Veldk.**

**New naturalized record**

Burgundy giant is a tall cane grass with purple coloration over much of the foliage. It is the variety most often grown in Hawai'i and is sometimes referred to as Foxtail bamboo (Staples & Herbst 2005). This perennial has culms erect to geniculate at base, not rooting in the decumbent nodes, not stoloniferous, rhizomatous, 1–3 m long, solid, nodes glabrous. Ligule a ciliolate rim, c. 0.15 mm long. Blades flat, 10–65 cm by (6–)8–35 mm, margins scaberulous. Peduncle puberulous below the panicle. Panicle exserted, many-spikeled, 15–40 cm long, common axis puberulous. Involucre stipitate, disarticulating at base. Bristles many, rather stiff, scaberulous, unequal, longest ones 32–55 mm long. Spikelets 1 within the involucre, pedicelled, 4.5–6.5 mm long. Lower glume 1.25–1.75 mm long, 0.39–0.53 times as long as the upper glume; upper glume 2.5–3.4 mm long, 1-nerved. First lemma epaleate, acuminate, membranous, 3–5-nerved, glabrous, nerves smooth; second lemma membranous. Anthers 1.65–2.1 mm long, apex glabrous (Veldkamp 2014). A form with uniformly reddish purple stems, leaves, and panicles occurs between 1500–2100 m altitudes. This might be the same as what is known as the cv. Burgundy Giant of horticulturists (Veldkamp 2014).

*Material examined.* **HAWAII:** Puna Distr., Kalapana Seaview Estates, 2146873N 298234E, 12 ft tall stalks with long purple leaves more prominent in the top half, large cylindrical panicles, to 10", semi-erect to drooping, pale pink to purple, 1 Aug 2011, *J. Parker & R. Parsons BIED160*.

### Scrophulariaceae

*Linaria purpurea* (L.) Mill.

#### New naturalized record

Purple toadflax is a perennial herb from stout, woody rootstock, native to the Mediterranean region. Leaves 20–50 mm, linear to oblanceolate. Flower corolla 15–18 mm, lavender to purple, throat swelling darker; stigma lobes 0. Fruit about 3 mm containing one 1 mm seed, more or less pyramid shaped and ridged. Generally found at less than 500 m elevation in disturbed areas (Preston & Wetherwax 2016). The plants collected were found naturalizing on the easement not near any other cultivated plants.

*Material examined.* **HAWAII:** Ka'ū Distr., Hawaiian Ocean View Estates, 2114337N 209061E, 4 plants on road easement, ca 2.5 ft tall, stems slightly woody at base, leaves sage green, linear, whorled, sometimes alternate, 12 Apr 2012, *J. Parker & R. Parsons BIED169*.

### Solanaceae

*Capsicum annuum* L.

#### New island record

Chili peppers have been collected as naturalized on all the major Hawaiian Islands. This orange-fruited specimen was collected from near a garden plot in a heavily disturbed industrial park.

*Material examined.* **HAWAII:** Puna Distr., Shipman Industrial Area, 2172616N 284889E, roadside wash, fruit orange, probably Habanero, 28 Mar 2012, *J. Parker & R. Parsons BIED167*.

### Vitaceae

*Cissus verticillata* (L.) Nicolson & C.E. Jarvis **New island record**

Princess vine is native to tropical America, the Galapagos Islands, and Africa. It has been previously collected as naturalized from Kaua'i and O'ahu. It is known to be spreading in only a couple of locations on the Big Island.

*Material examined.* **HAWAII:** South Hilo Distr., Stainback Hwy, 2174901N 283586E, growing over areca palms on border of property and across street, inflorescence axillary with small, white flowers and large, dark, juicy fruit, 27 Apr 2011, *J. Parker & R. Parsons BIED155*.

### Acknowledgements

We thank the Bishop Museum *Herbarium Pacificum* staff, along with Alex Lau, for assisting us with plant identification and specimen cataloging. Thanks to Clyde Imada for his helpful "Native and Naturalized" plants list. A big thanks to the indispensable "Plants of Hawai'i" website hosted by Forest and Kim Starr, as well as the Flickr group they host, *Hawaii Plant ID*. Thanks to Laura Nelson of NRCS for requesting our assistance in collecting *Sesbania sesban*.

### Literature Cited

- Bumrungsri, S., Harbit, A., Benzie, C., Carmouche, K., Sridith, K. & Racey, P.** 2008. The pollination ecology of two species of *Parkia* (Mimosaceae) in southern Thailand. *Journal of Tropical Ecology* **24**(5): 467–475.
- Gutteridge, R.C.** 1994. The perennial *Sesbania* species. *Forage Tree Legumes in Tropical Agriculture*, pp. 49–64. Available at: <http://www.tropicalforages.info>. [Accessed 3 February 2016].

- Hopkins, H.C.F.** 1994. The Indo-Pacific species of *Parkia* (Leguminosae: Mimosoideae). *Kew Bulletin* **49**(2): 181–234.
- Johnson, R.R.** 1969. Monograph of the plant genus *Porophyllum* (Compositae: Heleniae). *University of Kansas Science Bulletin* **48**: 225–267.
- Mabberley, D.J.** 2008. *Mabberley's plant-book*. Third Edition. Cambridge University Press, Cambridge, UK.
- Preston, R.E. & Wetherwax, M.** 2016. *Linaria purpurea*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=31087](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=31087). Accessed 3 February 2016.
- Standley, P.C.** 1931. Flora of the Lancetilla Valley, Honduras. *Field Mus. Nat. Hist. Bot.* **10**:1–418 + 68 pl.
- Staples, G.W. & Herbst, D.R.** 2005. *A tropical garden flora*. Bishop Museum Press, Honolulu. 908 pp.
- Veldkamp, J.F.** 2014. A revision of *Cenchrus* incl. *Pennisetum* (Gramineae) in Malesia with some general nomenclatural notes. *Blumea* **59**: 59–75.
- Wagner, W.L., Herbst, D.R. & Sohmer, S.H.** 1999. *Manual of the flowering plants of Hawai'i*. Rev. ed. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu. 1919 pp.
- Weber, E.** 2003. *Invasive plant species of the world: a reference guide to environmental weeds*. CAB International, Wallingford, UK. 560 pp.