

- . & **D.R. Herbst**. 1995. Contributions to the flora of Hawai'i. VI. *Bishop Mus. Occas. Pap.* **42**: 13–27.
- . **D.R. Herbst** & **S.H. Sohmer**. 1999. *Manual of the flowering plants of Hawai'i*. Revised edition. 2 vols. University of Hawai'i Press & Bishop Museum Press, Honolulu. 1919 p.
- Whistler, W.A.** 2000. *Tropical ornamentals*. Timber Press, Portland. 542 p.
- Windler, D.R., & S.G. Skinner**. 1999. *Crotalaria*, p. 656–663. In: Wagner, W.L., D.R. Herbst, & S.H. Sohmer, *Manual of the flowering plants of Hawai'i*. University of Hawai'i Press & Bishop Museum Press, Honolulu.
- Wu Zhengyi & P.H. Raven**. 1998. *Flora of China*. Vol. 18. Scrophulariaceae through Gesneriaceae. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis.

New plant records from the Hawaiian Archipelago

FOREST STARR¹, KIM STARR¹, and LLOYD L. LOOPE¹ (United States Geological Survey – Biological Resources Division, P.O. Box 369, Makawao, Hawai'i 96768, USA; email: fstarr@usgs.gov).

The following contributions include new island records, new naturalized records, new state records, and range extensions of plants located on Midway Atoll, Kaua'i, Maui, and Hawai'i. Voucher specimens are housed in the Bishop Museum's *Herbarium Pacificum*, Honolulu (BISH).

Asclepiadaceae

Calotropis gigantea (L.) W.T. Aiton **New island record**

Previously reported to be naturalized on Maui (Starr *et al.*, 2002), *C. gigantea* is now also known from Kaua'i, where this common ornamental is locally established in sandy areas along the coast in the Kekaha/Mānā Plain area. This collection represents a new island record for Kaua'i.

Material examined: **KAUA'I**: Kekaha, Kekaha Beach Park, on sand near coast, 10 ft [3 m], 26 Feb 2002, Starr & Starr 0202263.

Asteraceae

Centratherum punctatum Cass. subsp. *punctatum* **New island record**

Previously known from Kaua'i (Lorence *et al.*, 1995) and Hawai'i (Oppenheimer, 2003), *C. punctatum* is now also known from Maui, growing in sidewalk cracks and other spots of opportunity in the town of Makawao. These collections represent a new island record for Maui.

Material examined: **MAUI**: East Maui, Makawao, Makawao Elementary School, growing in lawn border, 1600 ft [487 m], 12 Sep 2002, Starr & Starr 020912-1; East Maui, Makawao, Brewer Rd, escaping down gulch, 1600 ft [487 m], 5 Nov 2001, Starr & Martz 011105-2.

1. Research Associate, Hawaii Biological Survey, Bishop Museum, 1525 Bernice Street, Honolulu, Hawai'i 96817-2704, USA.

Erigeron bellioides* DC.*New island record**

Previously known from O‘ahu, Moloka‘i, Maui, and Hawai‘i (Wagner *et al.*, 1990; Nagata, 1995; Oppenheimer & Bartlett, 2000; Oppenheimer, 2003; Staples *et al.*, 2003), the easily overlooked *E. bellioides* is now also known from Kaua‘i, where it is in lawns. This collection represents a new island record for Kaua‘i.

Material examined: **KAUA‘I:** Kapa‘a, Burger King on Kūhiō Hwy near Kalaloku Rd, scattered in lawn, 25 ft [8 m], 25 Feb 2002, *Starr & Starr 020225-1*.

Bignoniaceae***Podranea ricasoliana* (Tanfani) Sprague****New naturalized record**

Native to southern Africa and cultivated in Hawai‘i since at least 1940 (*Neal s.n.*) (Neal, 1965; Whistler, 2000), *P. ricasoliana* (pink trumpet vine, Zimbabwe creeper) is now sparingly naturalized in upcountry Maui, where it has been observed spreading in the Ha‘ikū, Makawao, Olinda, and Kula areas. Papery seeds are produced, and spread also occurs through long underground tuberous roots. *Podranea ricasoliana* is identified by its vine-like habit; opposite, pinnately compound leaves with 7–11 leaflets; funnel-shaped pink flowers with red lines inside; and fruits that are long, narrow capsules, up to 35 cm long [14 in], containing numerous papery seeds (Whistler, 2000). This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: **MAUI:** East Maui, Makawao, Māliko Gulch, sprawling in gulch and near-by lot, producing abundant winged seeds, 1600 ft [488 m], 30 Apr 2000, *Starr & Martz 000430-1*.

Caryophyllaceae***Cerastium glomeratum* Thuill.****New state record**

Native to Africa, temperate and tropical Asia, and Europe (GRIN, 2001), and reported from the State of Hawai‘i by St. John (1973) without locality, *C. glomeratum* is now known from Maui, where it is present in lawns in Makawao and Olinda. These collections represent a new state record for the Hawaiian Islands.

Material examined: **MAUI:** East Maui, Olinda, scattered in lawn, 2600 ft [792 m], 2 Feb 2002, *Starr & Martz 020202-1*; East Maui, Makawao, scattered in lawn, 1600 ft [488 m], 8 Mar 2002, *Starr & Starr 020308-1*.

Commelinaceae***Tradescantia zebrina* Bosse****Range extension**

A common houseplant that occasionally escapes from cultivation (Wagner *et al.*, 1990), *T. zebrina* was previously documented as naturalized on Kaua‘i and West Maui (Lorence & Flynn, 1997; Oppenheimer & Bartlett, 2000). It is now also known from Makawao, East Maui. This collection represents a range extension to East Maui.

Material examined: **MAUI:** East Maui, Makawao, climbing steep bank near town, 1600 ft [488 m], 23 Oct 2001, *Starr & Martz 011023-1*.

Convolvulaceae***Poranopsis paniculata* (Roxb.) Roberty****New naturalized record**

Native to temperate and tropical Asia (GRIN, 2001), *P. paniculata* (bridal bouquet, snow-in-the-jungle) is known from BISH specimens to have been in Hawai‘i since at least 1936 and to have been collected from the islands of Kaua‘i, O‘ahu, and Hawai‘i. This rampant vine is now also known from Maui, where it is spreading well beyond initial plantings

in Makawao. It can be identified by its ability to grow up to 30 ft [9 m] into the canopy of trees, heart-shaped leaves to 6 in [15 cm] long with white pubescence underneath, and small, 5/16 in [0.8 cm] white flowers growing in dense masses (Bailey & Bailey, 1976). This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Makawao, Māliko Gulch, sprawling into gulch, 1600 ft [488 m], 5 Jan 1999, *Starr & Martz 990105-4*.

Cuscutaceae

Cuscuta campestris Yuncker

Range extension

Cuscuta campestris was known to be sparingly naturalized on O`ahu, Hawai`i, and West Maui (Wagner et al., 1990; Oppenheimer, 2003). This orange parasitic vine is now also known from East Maui, where it is hosting on *Sphagneticola trilobata* along the Hāna Hwy. This collection represents a range extension to East Maui.

Material examined: MAUI: East Maui, Hāna Hwy., mile marker 7, near Pāpa`a`ea reservoir, near roadside growing on *Sphagneticola trilobata*, 800 ft [243 m], 14 Aug 2002, *Starr & Starr 020814-1*.

Euphorbiaceae

Croton guatamalensis Lotsy

New naturalized record

According to BISH specimens, *C. guatamalensis* has been cultivated on O`ahu since 1977. It is now naturalized on Maui, where it escaped from the Agricultural Experiment Station in Pi`iholo. This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Pi`iholo, Agricultural Experiment Station, spreading from plantings, W. Haines, 1800 ft [548 m], 3 Sep 2002, *Starr, Starr, & Haines 020903-1*.

Flueggea virosa (Roxb. ex Willd.) Voigt

New state record

Native to tropical Africa and Asia to Japan, Australia, and Polynesia and a weed in Florida (FLEPPC, 1999), *F. virosa* (Chinese waterberry, white currant) is naturalized in the Ha`iku area of East Maui, where it is common in pastures and waste areas along Ha`ikū Rd. Distinguished by the following set of characteristics. "Shrubs up to 4 m high, side branches, especially lower ones often with thorny end. Stipules 1.1–1.7 by 0.7–0.8 mm, margin often fimbriate. Leaves: petiole 36 mm long; blade elliptic to obovate, 18 by 0.6–5 cm, index c. 1.6; base usually attenuate, apex rounded to slightly acuminate, dark green above, light greenish beneath; venation indistinct on both sides, nerves 6–13. Staminate flowers c. 1.5 mm in diameter, greenish to yellowish, pendulous, sweet scented; pedicel 2–6.5 mm long, pale light greenish; sepals 0.7–1.2 by 0.31.1 mm, light greenish with white margin; filaments 1.2–2 mm long, white, anthers 0.3–0.5 by 0/20.3 mm, light yellow; disc glands fleshy, yellow; pistillode 1.5–2.3 mm long, basally connate, deeply divided into 3 branches, apical 0.3–0.7 mm bent and stigmalike. Pistillate flowers c. 2 mm in diameter; pedicel 2–12 mm long; sepals 0.71 mm diameter, disc annular, thin entire, 0.71 mm diam; ovary c. 1 by 0.8 mm wide; style 0.5–0.7 mm long, stigmas 0.8–1.1 mm long, upper third split. Fruits 3.4–5.2 mm in diameter, white. Seeds 2.2–2.4 by 1.2–1.8 mm." (Barker & van Welzen, 2003). This collection represents a new state record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Ha`ikū, in pasture near Ha`ikū reservoir, 450 ft [137 m], *Starr & Martz 001128-2*.

Iridaceae***Gladiolus dalenii*** Van Geel**New state record**

Native to Eastern Cape of South Africa and through tropical Africa to Ethiopia and W. Arabian Peninsula (Brickell & Zuk, 1997), and previously not known in the state, *G. dalenii* has recently been collected from pastures in Kula, Maui and Waimea, Hawai'i. *Gladiolus* is a genus of "between 250 and 300 spp. of perennial herbs with truncate corms, native to Europe, Mediterranean region, the Near East, but chiefly to tropical and South Africa; stems usually unbranched, leafy; leaves basal and cauline, swordshaped, less frequently linear or cylindrical; flowers showy, in 1-sided spike, irregular, borne in 2 spathe-valves, perianth segments 6, united basally into a curved, funnelform tube, the upper 3 segments larger than the lower 3, stamens 3, filaments not united, borne below the throat, style branches 3, entire; fruit a 3-valved capsule." (Bailey & Bailey, 1976). *Gladiolus dalenii* is distinguished by the following characteristics. "Robust, cormous perennial, spreading freely by underground runners, with linear or swordshaped leaves, to 24 in [60 cm] long. Bears onesided spikes of few to many hooded, funnelshaped flowers, 2 in [5 cm] across, which are red, orange, or yellow, sometimes spotted green or brown." (Brickell & Zuk, 1997). These collections represent a new state record for Hawai'i.

Material examined: MAUI: East Maui, Kula, side of road near Rice Park on Kula Hwy, 3040 ft [926 m], 31 Aug 2000, *Starr & Martz 000831-1*. HAWAII: Waimea, in open dry pasture near Waikoloa Stream, 23 May 2000, *Herbst 9879*.

Lamiaceae***Plectranthus verticillatus*** (L.f.) Druce**New naturalized record**

Native to South Africa (Northern Transvaal, Eastern Transvaal, Eastern Cape), Swaziland, and Mozambique (Brickell & Zuk, 1997), *P. verticillatus* is known from BISH specimens to have been first collected in Hawai'i on O'ahu in 1986 and is now naturalized in Pi'iholo and Olinda, Maui where it can be seen growing wild on many stretches of road. *Plectranthus verticillatus* is also apparently established and spreading on O'ahu. This prostrate herb can be distinguished from other *Plectranthus* in the state by the following combination of characteristics. "Mat-forming, semi-succulent perennial with creeping stems rooting at the nodes. Ovate to rounded coarsely toothed, soft, fleshy leaves, 1/2–1 1/2 in [1.5–4 cm] long, have purplish green undersides. Terminal spikes, 6 in [15 cm] long, of whorled, tubular, 2-lipped, purple-speckled, white or pale mauve flowers, 1/2–1 in [1.5–2.5 cm] across." (Brickell & Zuk, 1997). These collections represent a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Pi'iholo, growing on steep banks, 3100 ft [945 m], 26 Oct 2001, *Starr & Martz 011026-2*. O'AHU: Honolulu Distr, Wiliwilinui Trail, apparently established from discarded plant material dumped on this slope, now spreading, 26 Aug 2001, *Imada, Caraway, & Smith 2001-57*.

Lauraceae***Cinnamomum burmannii*** (Nees) Blume**New island record**

Previously known from O'ahu, Maui, and Hawai'i (Wagner *et al.*, 1990; Wagner & Herbst, 1995; Wagner *et al.*, 1997; Meidell *et al.*, 1997), *C. burmannii* is also growing wild on Kaua'i in mesic forest near Limahuli Garden on the north shore. This collection represents a new island record for Kaua'i.

Material examined: **KAUAI:** Hanalei, growing in disturbed forest with *Schefflera actinophylla*, *Ficus microcarpa*, and *Syzygium cumini*, 30 ft [9 m], 25 Feb 2002, *Starr & Starr 020225-6*.

Malvaceae

Malva parviflora L.

New island record

Previously known from disturbed areas of French Frigate Shoals and all the main islands (Wagner *et al.*, 1999), *M. parviflora* is now also documented from Midway Atoll, where this weedy herb is uncommon in the north part of Sand Island. Previously collected in 1988 and reported from Midway in Brueggemann (1998) but not in Wagner *et al.* (1999). These collections represent a new island record for Midway Atoll.

Material examined: **MIDWAY ATOLL:** Sand Island, in field of Bermuda grass (*Cynodon dactylon*) and other common lawn weeds, across from barracks, 20 ft [6 m], 20 May 2001, *Starr & Martz 010520-1*; Sand Island, 6 Jul 1988, *Herbst & Takeuchi 9077*.

Sida ciliaris L.

Range extension

Previously known from Kaua'i, O'ahu, and West Maui (Wagner *et al.*, 1997; Oppenheimer & Bartlett, 2000; Staples *et al.*, 2003), *S. ciliaris* is now known from East Maui, where it is found near roadsides in the Kanahā Beach area of Kahului. This collection represents a range extension to East Maui.

Material examined: **MAUI:** East Maui, Kahului, Kanahā Beach, growing on side of Amala Rd along with *naupaka* (*Scaevola sericea*) and *Indigofera suffruticosa*, 15 ft [5 m], 23 Nov 2001, *Starr & Martz 011123-1*.

Meliaceae

Sandoricum koetjape (Burm. f.) Merr.

New naturalized record

Native from India to the East Indies (St. John, 1973), *S. koetjape* (santol) is known from BISH specimens to have been first collected on O'ahu in 1933 and has recently been collected spreading from plantings on both East and West Maui. Distinguished from other Meliaceae in Hawai'i by the following. "The santol is a fast-growing, straight-trunked, pale-barked tree 50 to 150 ft [15–45 m] tall, branched close to the ground and buttressed when old. Young branchlets are densely brown-hairy. The evergreen, or very briefly deciduous, spirally-arranged leaves are compound, with 3 leaflets, elliptic to oblong-ovate, 4 to 10 in [20–25 cm] long, blunt at the base and pointed at the apex. The greenish, yellowish, or pinkish-yellow, 5-petaled flowers, about 3/8 in [1 cm] long are borne on the young branchlets in loose, stalked panicles 6 to 12 in [15–30 cm] in length. The fruit (technically a capsule) is globose or oblate, with wrinkles extending a short distance from the base; 1 1/2 to 3 in [4–7.5 cm] wide; yellowish to golden, sometimes blushed with pink. The downy rind may be thin or thick and contains a thin, milky juice. It is edible, as is the white, translucent, juicy pulp (aril), sweet, subacid or sour, surrounding the 3 to 5 brown, inedible seeds which are up to 3/4 in [2 cm] long, tightly clinging or sometimes free from the pulp." (Morton, 1987). These collections represent a new naturalized record for the Hawaiian Islands.

Material examined: **MAUI:** East Maui, Hāna Hwy, at Ulumalu Rd intersection, many young seedlings spreading in gulch from nearby planting, reported by Monroe Bryce, 550 ft [168 m], 30 Jan 2002, *Starr & Martz 020130-1*; West Maui, Lahaina Distr, Honokōhau Valley, spreading locally from plantings made ca. 1932, 60 ft [18 m], 1 Jul 2003, *Oppenheimer & Bartlett H70302*.

Myrtaceae***Metrosideros kermadecensis* W.R.B. Oliv. New naturalized record**

Native to New Zealand including Raoul Island (Brickell & Zuk, 1997), *M. kermadecensis* (*pohutakawa*) is known from BISH specimens to have been first collected in Hawai'i on O'ahu in 1995 and is now spreading from plantings at the Agricultural Experiment Station in Kula, where it is sparingly naturalized and a pest for the station. This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Kula, Kula Agriculture Station, numerous seedlings and saplings spreading from plantings, 3100 ft [944 m], 15 Aug 2002, Starr & Starr 020815-3.

Ochnaceae***Sauvagesia erecta* L. New island record**

Previously known from Moloka'i (Wagner *et al.*, 1990), *S. erecta* is now also known from Maui where it is along roads on the moist windward coast of East Maui. This collection represents a new island record for Maui.

Material examined: MAUI: East Maui, Wahinepe'e, a couple small patches growing in first clearing after bamboo forest at Waikamoi/Wahinepe'e gate on Hāna Hwy, 800 ft [243 m], 3 Aug 2002, Starr & Starr 020803-3.

Onagraceae***Oenothera kunthiana* (Spach) Munz New state record**

Native from Texas to Guatemala (Bailey & Bailey, 1976), *O. kunthiana* (Kunth's evening primrose) is known from a single site near Pu'u o Kali, Maui. *Oenothera kunthiana* can be distinguished from other *Oenothera* in Hawai'i by the following characteristics. "Evening-flowering perennial, stems slender, to 2 ft [0.6 m]; basal leaves oblanceolate, 1–4 in [2.5–10.2 cm] long, sinuate-pinnatifid, stem leaves reduced; flowers few, petals 5/16–5/8 in [1.6 cm] long, whitish to pink; capsules obovoid, about 0.5 in [1.3 cm] long, 4-winged above." (Bailey & Bailey, 1976). This collection represents a new record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Pu'u o Kali, near third gate on south road to enclosure, 750 ft [228 m], 18 May 2002, Starr & Starr 020518-1.

Piperaceae***Piper aduncum* L. New naturalized record**

Native to the West Indies and tropical America (PIER, 2003) and considered one of the worst weeds in Papua New Guinea up to 2000 m [6562 ft] (Leps *et al.*, 2002), *P. aduncum* (spiked pepper) is known from BISH specimens to have been first collected in the state of Hawai'i in 1986. This rapidly growing tree is now well established in the Nāhiku area of East Maui, where it is occasionally a dominant in open or recently cleared areas.

Piper aduncum can be distinguished from other *Piper* species in Hawai'i by the tree habit and compound leaves. The following characteristics describe this species: "Small tree to 7 m tall, with short silt roots and soft, brittle wood; foliage and twigs aromatic. Branches erect, but with drooping twigs and swollen, purplish nodes. Leaves alternate, distichous, elliptic, 12–22 cm long, shortly petiolate; lamina scabrid above, with sunken nerves, softly hairy beneath. Inflorescence a leaf-opposed, curved spike on a 12–17 cm peduncle, white to pale yellow, turning green with maturity. Flowers crowded in regular

transverse ranks. Perianth absent; usually 4 stamens. Fruit a 1-seeded berry, blackish when ripe. Seeds brown to black, 0.7–1.25 mm long, compressed with a reticulate surface.” (Waterhouse & Mitchell, 1998). This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Nāhiku, numerous plants of all size classes spreading and forming thickets in disturbed areas, 400 ft [121 m], 13 Sep 2002, *Starr, Starr, & Fukada 020913-2*.

Poaceae

Axonopus compressus (Sw.) Beauv.

New island record, range extension

Previously known from O‘ahu, Moloka‘i, and West Maui (Oppenheimer, 2003, 2004), *A. compressus* is now also known from Kaua‘i and East Maui, where this common carpeting grass is in lawns. These collections represent a new island record for Kaua‘i and a range extension to East Maui.

Material examined: KAUA‘I: Hanalei Bay, growing in lawn at park at end of ‘Ama ‘Ama Rd, 15 ft [5 m], 25 Feb 2002, *Starr & Starr 020225-3*. MAUI: East Maui, Makawao, growing in moist and unmaintained area of lawn, 1600 ft [488 m], 5 Nov 2001, *Starr & Martz 011105-1*.

Brachiaria plantaginea (Link) Hitchc.

Range extension

Previously known from O‘ahu, Moloka‘i, and West Maui (Wagner & Herbst, 1995; Oppenheimer & Bartlett, 2002), *B. plantaginea* is now also known from East Maui, where it is a roadside grass in the Makawao area. This collection represents a range extension to East Maui.

Material examined: MAUI: East Maui, Makawao, Brewer Rd, 1600 ft [488 m], 31 Oct 2001, *Starr & Martz 011031-1*.

Cenchrus setigerus Vahl

New naturalized record

Known from BISH specimens to have been first collected in the state in 1940, and known from an adventive collection in 1976 on Moloka‘i (Wagner *et al.*, 1990), *C. setigerus* (cow sandbur) is now also known from Kaua‘i, where it is a roadside grass on the Mānā Plain. This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: KAUA‘I: Waimea Distr, Mānā Plain, on the side of the road along Kauhāli‘i Hwy near Tartar Rd, 50 ft [15 m], 26 Feb 2002, *Starr & Starr 020226-6*.

Hemarthria altissima (Poir.) Stapf & C.E. Hubb. **New state record**

Native to Africa, temperate and tropical Asia, and Europe (GRIN, 2001), *H. altissima* (limpo grass) is locally common on Maui in pastures and roadsides from Pi‘iholo to Ha‘iku. This robust grass can be distinguished by the following characteristics. “Perennial; culms ascending from a long creeping base, compressed and 2-edged, 40–80 cm long, freely branching toward the ends; blades flat, 3–8 mm wide; flowering branches often short and fascicled, the racemes 3–5 cm, sometimes 10 cm long, compressed; pedicel free or partly adnate to the rachis joint; sessile spikelet 5–7 mm long, the keels of the first glume very narrowly winged toward the apex; pedicellate spikelet 5–6 mm long, acute.” (Hitchcock, 1971). These collections represent a new state record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Ha‘ikū, West Kūiaha, in pasture and side of road, 1100 ft [335 m], 29 Jun 2001, *Starr & Martz 010629-1*; East Maui, Makawao, Makawao Forest Reserve, on side of Kahakapau Rd, 2400 ft [731 m], 30 Oct 2001, *Starr & Martz 011030-1*.

Panicum antidotale* Retz.*Range extension**

Previously known from O'ahu, Moloka'i, West Maui, and Hawai'i (Wagner *et al.*, 1990; Starr *et al.*, 2003), *P. antidotale* is now also known from East Maui. This collection represents a range extension to East Maui.

Material examined: MAUI: East Maui, Kihei, Kawililipoa, growing in sand dunes behind beach with *Cenchrus ciliaris* and *Leucaena leucocephala*, 10 ft [3 m], 1 Feb 2002, Starr & Martz 020201-1.

Pennisetum polystachion* (L.) Schult.*New island record**

Previously known from O'ahu, Lāna'i, Maui, and Hawai'i (Wagner *et al.*, 1990; Starr *et al.*, 2002; Starr *et al.*, 2003), *P. polystachion* is now also known from Kaua'i, where it is a roadside grass on the Mānā Plain. This collection represents a new island record for Kaua'i.

Material examined: KAUA'I: Waimea Distr, Mānā Plain, on the side of the road along Kaunuaui'i Hwy near Tartar Rd, 50 ft [15 m], 26 Feb 2002, Starr & Starr 020226-5.

Rytidosperma semiannulare* (Labill.)*New naturalized record**

Conner & Edgar

Previously known to be adventive on Maui under the name *Danthonia semiannularis* (Wagner *et al.*, 1990), *R. semiannulare* (Tasmanian wallaby grass) is known from BISH specimens to have been first collected on Maui in 1937 and was described by previous collectors as "common". This pasture grass is indeed naturalized and locally common on both East and West Maui. These collections represent a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Polipoli, Waiakoa Loop Trail, growing at margin of disturbed forest comprised of *Eucalyptus* spp., *Pinus radiata*, and *Morella faya*, 6000 ft [1828 m], 8 Aug 2002, Starr & Starr 020808-9. West Maui, Hana'ula Iki, 3500 ft [1066 m], May 1985, Hoby 2389. Pu'u Nianiau, Haleakalā, common in open pasture, 6000 ft [1828 m], 28 Jan 1937, Hosaka 1767. Makawao, Haleakalā, common in grassy slope among *Styphelia*, 5000 ft [1524 m], 12 Apr 1939, Hosaka 2427.

Rutaceae***Flindersia breyleyana* F. Muell.****Range extension**

Introduced by the State Division of Forestry to all the main islands, and previously known to be naturalized on West Maui and Hawai'i (Wagner *et al.*, 1990; Oppenheimer, 2003), *F. breyleyana* is now also known to be naturalized on East Maui, where it is escaping from forestry plantings into adjacent open wet forest along the Hāna Hwy. This collection represents a range extension to East Maui.

Material examined: MAUI: East Maui, Kūhiwa Forest Reserve, Hāna Hwy, spreading from forestry plantings into native *uluhe* (*Dicranopteris linearis*) dominated areas, 925 ft [28 m], 13 Sep 2002, Starr & Starr 020913-5.

Ruta graveolens* L.*New naturalized record**

Native to south eastern Europe (Brickell & Zuk, 1997), *R. graveolens* (common rue) is known from BISH specimens to have been first collected in Hawai'i on Maui in 1927 and was noted to be "locally common and naturalized in pastures". Today, this plant is still naturalized and locally common in pastures and along rock walls in Kula, Maui. This herb

can be distinguished by the following characters. "Rounded to erect, evergreen shrub producing alternate, broadly ovate to rounded, 2-pinnatisect, aromatic, glaucous, blue-green leaves, to 6 in [15 cm] long, with numerous obovate lobes. Cymes of cup-shaped, 4-petaled, dull yellow flowers, 3/4 in [2 cm] across." (Brickell & Zuk). These collections represent a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: East Maui, Kula, Calasa Rd., below fire station, common on margins of pastures, 2650 ft [807 m], 15 Aug 2002, *Starr & Starr 020815-5*. Kula, locally common and naturalized in pastures, 30 Jun 1927, *Degener 28138*. Kēōkea, Kula, rare, 27 Jan 1937, *Hosaka 1757*.

Sapindaceae

Filicium decipiens (Wight & Arn.) Thwaites **Range extension**

A common tree that has escaped cultivation on O'ahu, West Maui, and Hawai'i (Staples *et al.*, 2002; Oppenheimer, 2003), *F. decipiens* is now also known from East Maui, where it is locally established in Kīhei. This collection represents a range extension to East Maui.

Material examined: MAUI: East Maui, Kīhei, Kama'ole, Lioholo Pl., seedling under trees and nearby, spreading from plantings, 140 ft [42 m], 17 Jun 2002, *Starr & Starr 020617-2*.

Solanaceae

Solanum rostratum Dunal **New island record**

Previously known from Pōhakuloa, Hawai'i in 1977 until all plants were removed (Wagner *et al.*, 1999), *S. rostratum* is now known from Maui, where it was recently collected as a volunteer in a cinder pile in 'Ulupalakua. Similarly, all known plants were removed. This collection represents a new island record for Maui.

Material examined: MAUI: East Maui, 'Ulupalakua, around 1700 ft [518 m], 12 Jun 2001, M. Steuermann, *Starr & Martz 010612-1*. HAWAII: Ka'ohe, Pōhakuloa State Park, 7 Jul 1977, *Herbst 5944*.

Verbenaceae

Citharexylum caudatum L. **New island record**

Previously known from O'ahu, Maui, and Hawai'i (Wagner *et al.*, 1990; Starr *et al.*, 1999; Oppenheimer, 2003), *C. caudatum* is now also known from Hilo, Hawai'i and from the eastern coast of Kaua'i along Keālia Rd. This collection represent new island record for Kaua'i.

Material examined: KAUA'I: Kawaihau Distr, Anahola, locally established along Keālia Rd. near Kūhiō Hwy, 175 ft [53 m], 25 Feb 2002, *Starr & Starr 020225-2*.

Vitaceae

Cissus rhombifolia Vahl **New naturalized record**

Native to tropical America (Brickell & Zuk, 1997), *C. rhombifolia* (grape ivy) is known from BISH specimens to have been first collected in the state on O'ahu in 1961. This vine is now sparingly naturalized in Wailuku, Maui. *Cissus rhombifolia* is distinguished from other *Cissus* in the state by the following characteristics: "Vigorous climber producing forked tendrils and 3-palmate, dark green leaves, to 6 in [15 cm] long, with ovate to diamond-shaped leaflets, boldly veined and coarsely toothed, with rust-red hairs beneath. Bears hairy green flowers in cymes 1 1/4–3 in [3–8 cm] long, opposite the leaves, followed by blue-black berries, 1/4–1/2 in [0.5–1.5 cm] across." (Brickell & Zuk, 1997). This collection represents a new naturalized record for the Hawaiian Islands.

Material examined: MAUI: West Maui, Wailuku, crawling on fence and vegetation in empty lot, 275 ft [90 m], 22 Feb. 2001, *Starr & Martz 010222-2*.

Acknowledgments

We thank Peter Van Welzen at Leiden, Holland for determination of *Flueggea virosa*; Peter Goldblatt at Missouri Botanical Garden for determination of *Gladiolus dalenii*; Warren L. Wagner at the Smithsonian for determination of *Oenothera kunthiana*; W.D. Clayton at Kew for determination of *Hemarthria altissima*; Monroe Bryce, Pat Bily, Fern Duvall, Mach Fukada, Will Haines, Robert Hobdy, Hank Oppenheimer, Michelle Steuermann, and Patti Welton for help with voucher specimens; and especially George Staples, Derral Herbst, and Clyde Imada at BISH for their continued assistance.

Literature Cited

- Bailey, L.H. & E.Z. Bailey.** 1976. *Hortus*. Third edition. Macmillan General Reference, New York.
- Barker, C. & P.C. van Welzen.** 2003. Flora of Thailand. Biodiversity Research and Training Programme, Thai Research Fund and Thai National Center for Genetic Engineering and Biotechnology. [<http://www.nationaalherbarium.nl/thaieuph/>] [Version: 24 September 2003] [Accessed: 18 June 2004].
- Brickell, C. & J.D. Zuk.** 1997. *The American Horticultural Society A–Z encyclopedia of garden plants*. DK Publishing, Inc., New York.
- Brueggemann, M.M.** 1998. Report on a botanical survey of Midway Atoll, April 1–7, 1995. U.S. Fish & Wildlife Service, Honolulu.
- Flynn, T. & D.H. Lorence.** 2002. Additions to the flora of the Hawaiian Islands. *Bishop Mus. Occas. Pap.* **69**: 14–16.
- FLEPPC (Florida Exotic Pest Plant Council).** 1999. List of Florida's Most Invasive Species. [<http://www.fleppc.org/99list.htm>] [Version: 1999] [Accessed: 14 July 2004].
- GRIN (Germplasm Resources Information Network).** 2001. Online Database. United States Department of Agriculture, Agricultural Research Service, National Germplasm Resources Laboratory, Beltsville. [<http://www.ars-grin.gov/>] [Version: 11 October 2001] [Accessed: 29 June 2004].
- Hitchcock, A.S.** 1971. *Manual of the grasses of the United States*. Dover Publications, Inc., New York.
- Leps, J., V. Novotny, L. Cizek, K. Molem, I. Brus, W. Boen, R. Kutil, J. Auga, M. Kasbal, M. Manumbor & S. Hiuk.** 2002. Successful invasion of the Neotropical species *Piper aduncum* in rain forests in Papua New Guinea. *Appl. Veg. Sci.* **5**: 255–262.
- Lorence, D.H. & T. Flynn.** 1997. New naturalized plant records for Kaua'i. *Bishop Mus. Occas. Pap.* **49**: 9–13.
- , **T. Flynn & W.L. Wagner.** 1995. Contributions to the flora of Hawai'i. III. New additions, range extensions, and rediscoveries of flowering plants. *Bishop Mus. Occas. Pap.* **41**: 19–58.
- Morton, J.F.** 1987. *Fruits of warm climates*. J.F. Morton, Miami. 505 p.
- Meidell, J.S., H.L. Oppenheimer & R.T. Bartlett.** 1997. New plant records from Pu'u Kukui Watershed and adjacent areas, Maui. *Bishop Mus. Occas. Pap.* **49**: 17–19.
- Nagata, K.M.** 1995. New Hawaiian plant records. IV. *Bishop Mus. Occas. Pap.* **42**: 10–13.
- Neal, M.C.** 1965. *In gardens of Hawaii*. Revised edition. Bishop Museum Special Publication 50. Bishop Museum Press, Honolulu.

- Oppenheimer, H.L.** 2003. New plant records from the main Hawaiian Islands. *Bishop Mus. Occas. Pap.* **73**: 3–30.
- . & **R.T. Bartlett.** 2000. New plant records from Maui, O‘ahu, and Hawai‘i Islands. *Bishop Mus. Occas. Pap.* **64**: 1–10.
- . & **R.T. Bartlett.** 2002. New plant records from the main Hawaiian Islands. *Bishop Mus. Occas. Pap.* **69**: 1–14.
- PIER (Pacific Islands Ecosystems at Risk).** 2004. Invasive plant species: *Buddleia madagascariensis*. [<http://www.hear.org/pier>] [Version: 27 February 2004] [Accessed: 18 June 2004].
- St. John, H.** 1973. *List and summary of the flowering plants in the Hawaiian Islands*. University of Hawaii Press, Lawai, Hawaii.
- Staples, G.W., Imada, C.T. & D.R. Herbst.** 2003. New Hawaiian plant records for 2001. *Bishop Mus. Occas. Pap.* **74**: 9–23.
- . 2002. New plant records for 2000. *Bishop Mus. Occas. Pap.* **68**: 3–18.
- Starr, F., K. Martz & L. Loope.** 1999. New plant records from East Maui for 1998. *Bishop Mus. Occas. Pap.* **59**: 11–15.
- ., **K. Martz & L. Loope.** 2002. New plant records for the Hawaiian Archipelago. *Bishop Mus. Occas. Pap.* **69**: 16–27.
- ., **K. Starr & L.L. Loope.** 2003. New plant records for the Hawaiian Archipelago. *Bishop Mus. Occas. Pap.* **74**: 25–34.
- Wagner, W.L. & D.R. Herbst.** 1995. Contributions to the flora of Hawai‘i. IV. *Bishop Mus. Occas. Pap.* **42**: 13–27.
- ., **D.R. Herbst & S.H. Sohmer.** 1990. *Manual of the flowering plants of Hawai‘i*. 2 vols. University of Hawai‘i Press & Bishop Museum Press, Honolulu.
- ., **D.R. Herbst & S.H. Sohmer.** 1999. *Manual of the flowering plants of Hawai‘i*. Revised edition. 2 vols. University of Hawai‘i Press & Bishop Museum Press, Honolulu.
- ., **R. Shannon & D.R. Herbst.** 1997. Contributions to the flora of Hawai‘i. VI. *Bishop Mus. Occas. Pap.* **48**: 51–65.
- Waterhouse, B.M. & A.A. Mitchell.** 1998. Northern Australia quarantine strategy weeds target list. Australian Quarantine & Inspection Service, Miscellaneous Publication No. 6/98. P. 59–60.
- Whistler, W.A.** 2000. *Tropical ornamentals*. Timber Press, Portland.

Limoniidae and Ulidiidae in Hawai‘i (Insecta: Diptera)

NEAL L. EVENHUIS (Hawaii Biological Survey, Bishop Museum, 1525 Bernice Street, Honolulu, Hawai‘i 96817-2704, USA; email: neale@bishopmuseum.org)

The most recent checklist of Hawaiian arthropods (Nishida, 2002) listed species of Hawaiian tipuloids and otitids in a broad sense of those families. Nishida’s checklist is based on published references to taxa occurring in Hawai‘i and, despite higher classifications that recognized the raising of certain subfamilies in Tipulidae to family level, no