

**Literature Cited**

- Arnold, T.H. & B.C. de Wet, eds.** 1993. Plants of southern Africa: names and distribution. *Mem. Bot. Surv. S. Afr.* **62**: iv + 825 p.
- Correll, D.S. & M.C. Johnston.** 1979. *Manual of the vascular plants of Texas*. Univ. of Texas at Dallas, Richardson, Texas. 1881 p.
- Evenhuis, N.L. & S.E. Miller, eds.** 1995. Records of the Hawaii Biological Survey for 1994. Parts 1 & 2. *Bishop Mus. Occas. Pap.* **41, 42**.
- Hymowitz, T. & C.A. Newell.** 1981. Taxonomy of the genus *Glycine*, domestication and uses of soybeans. *Econ. Bot.* **35**: 272–88.
- Kartesz, J.T.** 1994. *A synonymized checklist of the vascular flora of the United States, Canada, and Greenland*. 2 vols. Timber Press, Portland.
- Kern, J. H.** 1974. Cyperaceae. In: van Steenis, C.G.G.J., ed., *Flora Malesiana*. Ser. I. **7**: 435-753.
- Koyama, T.** 1979. Cyperaceae. In: Howard, R. A., *Flora of the Lesser Antilles* **3**: 220–60.
- Lackey, J.A.** 1977. *Neonotonia*, a new generic name to include *Glycine wightii* (Arnott) Verdcourt (Leguminosae, Papilionoideae). *Phytologia* **37**: 209–12.
- Lock, J.M. & K. Simpson.** 1991. *Legumes of west Asia, a check-list*. Royal Botanic Gardens, Kew. xi + 263 p.
- Mabberley, D.J.** 1990. *The plant-book*. Reprinted with corrections. Cambridge Univ. Press, New York. xii + 707 p.
- Neal, M.C.** 1965. In gardens of Hawaii. Second edition. *Bishop Mus. Spec. Publ.* **50**, 924 p.
- Obata, J.** 1992. *Gouania vitifolia*—rediscovered! *Newsl. Hawaii. Bot. Soc.* **30**: 7.
- St. John, H.** 1973. *List and summary of the flowering plants in the Hawaiian Islands*. Pacific Tropical Botanical Garden, Lawai, Kauai, Hawaii. 519 p.
- Verdcourt, B.** 1991. Boraginaceae. In: Polhill, R.M., ed., *Flora of tropical East Africa*. 124 p.
- Wagner, W.L. & D.R. Herbst.** 1995. Contributions to the flora of Hawai'i. IV. New records and name changes. *Bishop Mus. Occas. Pap.* **42**: 13-27.
- Wagner, W.L., D.R. Herbst & S.H. Sohmer.** 1990. *Manual of the flowering plants of Hawai'i*. 2 vols. Univ. Hawaii Press & Bishop Museum Press, Honolulu.
- Wiersema, J.H., J.H. Kirkbride, Jr. & C.R. Gunn.** 1990. Legume (Fabaceae) nomenclature in the USDA germplasm system. *U.S. Dep. Agric. Tech. Bull.* **1757**, 572 p.

**Contributions to the Flora of Hawai'i. V**

DERRAL R. HERBST (U.S. Army Corps of Engineers, CEPOD-ED-ES, Fort Shafter, HI 96858) and WARREN L. WAGNER (Department of Botany, MRC 166, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560)

Publication of the *Manual of the flowering plants of Hawai'i* (Wagner *et al.* 1990) has provided a modern accurate account of the angiosperms occurring indigenously and naturalized after introduction by humans directly or indirectly. Collecting efforts after the cut-off date for the *Manual* project (September 1987) have resulted in a substantial number of new distributional records and detection of additional naturalized species. Also,

recent publications have resulted in new classifications or nomenclatural changes for species that occur in the Hawaiian Islands. This paper provides records for naturalized species documented for the first time in the Hawaiian Islands, new range extensions for naturalized, and a few native species within the archipelago. The first 2 papers in the series (Wagner *et al.* 1986, 1989) were published as precursors to the *Manual*, while the others were published to update that work (Lorence *et al.* 1995, Wagner & Herbst 1995). These records and changes can be considered a supplement to the *Manual* (Wagner *et al.* 1990). In reporting additions to the flora we give diagnostic characters so that this paper can be used in conjunction with the *Manual* for identifications. We use the same definition for “naturalized” as used in the *Manual* (Wagner *et al.* 1990: 1645). We report 7 new island records for naturalized species. We also call attention to 6 newly naturalized species in the Hawaiian Islands. We discuss the rediscovery of *Tetramolopium capillare* and a novel form at a new locality for the rare *Munroidendron racemosum*. All identifications have been made by the authors except for those made by specialists listed in the acknowledgments.

### **Aizoaceae**

### **New island record**

#### ***Trianthema portulacastrum* L.**

The following collection represents a new island record for Maui. It was previously known from O‘ahu (Wagner *et al.* 1990: 179).

*Material examined.* MAUI: West Maui, Launiupoko, Kapuali, along cane road, 46 m, 5 March 1993, *Hobdy 3543* (BISH, US).

### **Araliaceae**

#### ***Munroidendron racemosum* (C. Forbes) Sherff** **Notable discovery**

A collection of this species made in the Waimea Canyon from a single tree had the leaves just expanding, but it is clear that they are atypical in being glabrous. Previously all plants of this species were known to only have a densely whitish stellate-furfuraceous abaxial leaf surface. *Munroidendron* had previously been known from 3 areas: Nounou Mountain, Napali Coast, and Ha‘upu Ridge (Lowry 1990: 229). This glabrous collection also extends the range to the Waimea Canyon. Another collection listed below represents a new locality for the typical pubescent form of the species, extending the range from the Napali Coast to Limahuli Valley.

*Material Examined.* KAUA‘I: Waimea District., Koaie Canyon, lip of a precipice on a N-facing slope beyond Lonomea rest stop, 550 m, 1 tree, 12 Nov 1988, *Fay & Robinson s. n.* (BISH). Hanalei District, Limahuli Valley, 70° N-facing slope, 580 ft., degraded mixed mesophytic forest, population of 2 saplings and 2 mature individuals, 15 Dec 1989, *Wichman 218* (BISH).

### **Asteraceae**

#### ***Ageratina riparia* (Regel) R. King & H. Rob.** **New island record**

The following collection represents a new island record from the island of Kaua‘i. *Ageratina riparia* was previously known in the Hawaiian Islands from O‘ahu, Moloka‘i, Maui, and Hawai‘i (Wagner *et al.* 1990: 255).

*Material examined.* KAUA‘I: boundary of Lihue and Kawaihau Districts, headwaters of the N fork of the Wailua River, 600–670 m, 11 Mar 1993, *Flynn et al. 5279* (BISH, PTBG, US).

### ***Flaveria trinervia* (Spreng.) C. Mohr**

### **New island record**

The following collection represents a new island record for this species. It was previously known from Barber’s Point to Sand Island and Koko Head, O‘ahu (Wagner *et al.*

1990: 317), and recently reported from Kaua'i (Lorence *et al.* 1995).

*Material examined.* KAHO'OLAWA: Smuggler's Cove, 25 Jan 1991, *Ellshoff 196* (BISH).

***Hypochoeris glabra* L.**

**New island record**

The following collection represents a new island record for this species. It was previously known from all of the main islands except Ni'ihau and Lana'i (Wagner *et al.* 1990: 327).

*Material examined.* LEHUA: weathered cinder cone, common herb on N side, 0–700 ft., 10 Jan 1992, *Flynn 4859* (BISH).

***Tetramolopium capillare* (Gaud.) St. John**

**Rediscovery**

The following record represents a rediscovery of a species presumed to be extinct by Lowrey (1990: 363). This species was last collected in 1955 in the Lahaina Luna area of West Maui (*St. John 25604*, BISH). Several previous unsuccessful attempts had been made to relocate populations of this species.

*Material examined.* MAUI: West Maui, West Maui Mountains, back west side of Kauaula Valley, just above where main valley divides, and where 2 streams meet at a narrow gorge, 3020 ft., cliff walls with *Sadleria*, *Artemisia*, and *Lobelia hillebrandii*, [population of] about 100 plants, 16 Sep 1993, *Perlman 13764* (BISH, NY, PTBG, US).

**Begoniaceae**

***Begonia reniformis* Dryander**

**New island record**

The following collection represents a new island record for this species. It was previously known from North and South Kona districts, Hawai'i (Wagner *et al.* 1990: 384).

*Material examined.* O'AHU: Waikane Gulch, along gully floor and steep slopes along gully, ... dominant plant in this gulch, 366 m, 29 Dec 1993, *Obata s. n.* (BISH).

**Brassicaceae**

***Capsella bursa-pastoris* (L.) Medik.**

**New island record**

The following collection represents a new island record, the first record of this species from the Northwestern Hawaiian Islands. It was previously known from O'ahu, Lana'i, Maui, and Hawai'i (Wagner *et al.* 1990: 403).

*Material examined.* MIDWAY ATOLL: Sand Island, Jul 1988, *Herbst & Takeuchi 9087* (BISH).

**Dipsacaceae**

***Scabiosa palaestrina* L. s.l.**

**New state record**

The following collection of a species of pincushion flower represents a new state record to the naturalized flora of the Hawaiian Islands. *Scabiosa* can be characterized by its opposite oblong to oblong-spatulate or linear, sometimes pinnatifid leaves, flowers in heads up to 5 cm in diam., subtended by involucre bracts, the florets are tubular, each with a basal epicalyx of connate bracteoles which are expanded into a corona, calyx of 5 bristle-like parts that lengthen and stiffen in fruit forming a star-like structure, corolla cream-colored, 2-lipped with 5 unequal lobes, 4 stamens, and fruit dry and indehiscent, enclosed in the epicalyx and surmounted by the persistent calyx.

*Material examined.* HAWAII: Pu'u Kapu Homestead, E of Waimea along Hwy 19, Marie McDonald's *Protea* and cut-flower farm, escaping cultivation, 23 Jun 1985, *Wagner et al. 5545* (BISH).

**Fabaceae*****Caesalpinia major* (Medik.) Dandy & Exell      New island record**

The following record represents a new island record of this probably naturalized species. It was formerly (Geesink *et al.* 1990: 648) known from Ni'ihau, O'ahu, Moloka'i, Lana'i, and Hawai'i.

*Material examined.* MAUI: West Maui, West Maui Mountains, Honokowai, Haenanui Gulch, 550 m, 26 Feb 1994, *Hobby et al.* 3645 (BISH).

**Fagaceae*****Quercus suber* L.      New state record**

The following collection represents a new state record for the cork-bark oak, which appears to be adventive or sparingly naturalized.

*Material examined.* HAWAI'I: Hamakua District, Mauna Kea Forest Reserve, near Pu'u Ko'ohe, 2042 m, 25 Mar 1993, *Herbst* 9638 (BISH).

**Najadaceae*****Najas guadalupensis* (Spreng.) Magnus      New state record**

The unidentified species of *Najas* discussed in a note by Wagner *et al.* (1990: 1466) has been identified as *N. guadalupensis* (Spreng.) Magnus, the common water-nymph. Additional material has been collected; it is definitely naturalized on the island of Hawai'i. It is characterized by: plants monoecious with much-branched stems up to 6 dm long; leaves 1–2.5 cm long, 0.5–1 mm wide, generally evenly-spaced, flexible, the sheath rounded to obtuse at the junction with the blade, few-toothed, 1-celled, the apex with 1–4, short, 1-celled spines; staminate flowers 2–3 mm long, anthers 4-celled; pistillate flowers 2–3 mm long, stigmas 2–3; fruit surface dull, conspicuously reticulate, pitted. *Najas guadalupensis* is native to North, Central and South America; it occurs in freshwater ponds, sluggish streams, and ditches. In the Hawaiian Islands it is known only from Lokoaka Pond and Wailoa estuary, both in Hilo, Hawai'i.

*Material examined.* HAWAI'I: Lokoaka Pond, submerged, uncommon, 20 Aug 1987, *Stemmermann & Warshauer* 7189 (BISH); Wailoa estuary, Hilo, submerged aquatic weed, 25 Jul 1987, *Stemmermann & Luce* 7178 (BISH).

**Poaceae*****Hyparrhenia dregeana* (Nees) Stent      New state record**

The following record of *Hyparrhenia dregeana* represents the first state record of this species in the Hawaiian Islands. It is naturalized at least at this 1 locality. This species is distinguished from the other 2 species naturalized in the archipelago by culms 15–20 dm, basal sheaths silky pubescent in the lower part; raceme bases subequal, the upper 1 1–1.5 mm long, flattened, stiffly bearded, usually with a scarios lobe ca. 0.5 mm long at the apex; 10–25 awns per raceme-pair. *Hyparrhenia dregeana* is native to Africa, and is apparently not widely naturalized outside of its native range.

*Material examined.* LANA'I: Disturbed pasture along Keomuku Rd, 2.5 mi from Koele, clump grass of open, dry [sites], 30 April 1975, *Herbst & Spence* 5289 (BISH).

***Ischaemum timorense* Kunth      New state record**

The following collection represents a new state record for *Ischaemum timorense*. It is distinguished from *I. byrone* (Trin.) Hitchc. by leaf blades 10–20 mm wide, distinctly

petiolate, the petiole up to 5 mm long; racemes 1.2–5 cm long, appressed at first but separating as maturity approaches; stalked spikelet 2.5–3.5 mm long, the awns 5–8 mm long; lower glume of sessile spikelet not keeled. *Ischaemum timorense* is native to the Malesian area, India, and Sri Lanka.

*Material examined.* MAUI: Nahiku, Hana, in pasture, 500 ft, 16 July 1941, *Hosaka 2596* (US).

## Rosaceae

### *Heteromeles arbutifolia* (Lindley) M. Roemer **New state record**

This shrub or small tree known as toyon was planted in or near Mauna Kea State Recreation Area, and is now apparently sparingly naturalized. It represents a state record for this species. It has simple, alternate, evergreen, coriaceous leaves 4–11 cm long, upper surface shiny dark green, the lower surface dull and paler, the margins sharply serrate. Flowers in terminal open, flat-topped panicles; hypanthium 2–3 mm long; sepals 1–2 mm long; petals 2–4 mm long, white; stamens 10 in pairs opposite the sepals. Fruit 5–10 mm in diam., bright red with mealy pulp, containing 3–6 compressed brown seeds. It is endemic to California, but widely cultivated.

*Material examined.* HAWAII: Hamakua District, Mauna Kea State Park, Pohakuloa area, 6300 ft, cultivated, 1 July 1968, *Herbst 1187* (BISH); Pohakuloa Training Area, naturalized on 1/4 acre site (area 1), 31 January 1989, *R. Bachman s. n.* (BISH).

## Acknowledgments

We thank various specialists for determinations of specimens or comments on certain problems: D.S. Goyder (*Scabiosa*); R.R. Haynes (*Najas*). We appreciate comments on an earlier draft of this paper by Robynn Shannon, by which it was greatly improved.

## Literature Cited

- Geesink, R., W.L. Wagner & D.R. Herbst.** 1990. Fabaceae, p. 629–721. *In:* Wagner, W.L., D.R. Herbst & S.H. Sohmer, *Manual of the flowering plants of Hawai'i*. University of Hawaii Press & Bishop Museum Press, Honolulu.
- Lorence, D.H., T.W. 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.
- Lowrey, T.** 1990. *Tetramolopium*, p. 361–69. *In:* Wagner, W.L., D. R. Herbst & S.H. Sohmer, *Manual of the flowering plants of Hawai'i*. University of Hawaii Press and Bishop Museum Press, Honolulu.
- Lowry, P.P.** 1990. Araliaceae, p. 224–37. *In:* Wagner, W.L., D.R. Herbst & S.H. Sohmer, *Manual of the flowering plants of Hawai'i*. University of Hawaii Press and Bishop Museum Press, Honolulu.
- Wagner, W.L. & D.R. Herbst.** 1995. Contributions to the flora of Hawai'i. IV. New records and name changes. *Bishop Mus. Occas. Pap.* **42**: 13–27.
- , **D.R. Herbst & S.H. Sohmer.** 1986. Contributions to the flora of Hawai'i I. Acanthaceae to Asteraceae. *Bishop Mus. Occas. Pap.* **26**: 102–22.
- . 1989. Contributions to the flora of Hawai'i II. Begoniaceae-Violaceae and the Monocotyledons. *Bishop Mus. Occas. Pap.* **29**: 88–130.
- . 1990. *Manual of the flowering plants of Hawai'i*. University of Hawaii Press and Bishop Museum Press, Honolulu. 1853 p.