

Observations on Some Adventive Species in the Hawaiian Flora

Kenneth M. Nagata¹

ABSTRACT

Since the early days of exploration in Hawai'i, botanists have concentrated on the unique native flora and have largely ignored the introduced species. Consequently, early species records that would be useful to biogeographers, ecologists, botanists, and foresters are often unknown. This paper documents the presence and spread of 22 adventive species, many previously unreported in the literature. Additional commentary is provided for 3 recently reported species.

INTRODUCTION

The Hawaiian Archipelago is the most isolated island group in the world, and the resulting biota has long been noted for its remarkable diversity and uniqueness. Since the early days of scientific exploration in Hawai'i, botanists have concentrated most of their efforts on collecting native species. Naturalized plants have been largely ignored; generally only species useful to man are mentioned by the early explorers. Although new introductions occur continually, records of them are uncommon. Too often such information remains in personal field books or in memory and is unavailable in the literature. This paper documents 25 new records or otherwise noteworthy adventive species in the Hawaiian flora. New information on 3 species (*Ruellia prostrata*, *Erigeron bellioides*, and *Crassocephalum crepidioides*) previously treated by Wagner et al. (1986) is presented. Acronyms for depositories are according to *Index Herbariorum*.

ACANTHACEAE

***Blechum brownei* Jussieu**

Blechum brownei was discovered on O'ahu as a naturalized weed in the lawn of Manoa Elementary School in 1984 (Nagata 2977, HLA). This prostrate to ascending brittle herb has green-bracted terminal inflorescences up to 6 cm long; its ovate leaves, up to 6 cm long, are often much reduced just below the inflorescence.

***Justicia spicigera* Schlecht.**

Commonly known as Mexican indigo, this orange-flowered shrub has been cultivated in Hawai'i since at least 1934, when McEldowney first collected it at the Wahiawa Nursery on O'ahu (McEldowney s.n., BISH). Five years later, Neal collected it as a hedge plant in Honolulu (Neal 1177, BISH). Although no subsequent collections exist at Bishop Museum, it is still occasionally seen as a cultivated shrub. In 1983 it was found to be naturalized in several areas along the secondary roads in Hälawa Valley on Moloka'i (Nagata 2671, HLA, BISH, HAW). Mexican indigo was originally reported in the Hawaiian Islands as *Jacobinia spicigera* (Schlecht.) Bailey by Neal (1965).

1. Research Associate, Harold L. Lyon Arboretum, 3860 Mänoa Road, Honolulu, Hawai'i 96822, USA.

Ruellia prostrata Poir.

Originally reported in the Hawaiian Islands as *Ruellia repens* L., this straggling species was collected by Neal first as a creeping yard weed in Honolulu in 1944 (Neal s.n., BISH) and again in Honolulu in 1946 (Neal s.n., BISH). More recently, it has been found growing in cultivated areas (Nagata 831, HLA; Nagata 1220, HLA, BISH), as well as in wayside scrub (Nagata 2039, HLA, BISH, US). Because of its adaptability as a prostrate herb, it tolerates mowing and occasionally occurs as a lawn weed; but it can grow to a height of nearly 50 cm in protected areas. Differences between *R. prostrata* and *R. repens* have been discussed by Wagner et al. (1986).

AMARANTHACEAE

Gomphrena celosioides Mart.

This weak-stemmed straggling herb is spreading rapidly on O'ahu. First collected in 1983 (Nagata 2730, HLA) along the Ke'alia Trail in the Wai'alu District on O'ahu, it is now common along the highway from Mokulē'ia (Nagata 3264, HLA, BISH) to Mililani (Wagner & Mill 5483, BISH). Recently this species has been collected along Likelike Highway near Bishop Museum in Honolulu (Wagner & Herbst 5644, BISH).

ASTERACEAE

Boltonia indica (L.) Benth.

Boltonia indica was discovered in 1982 as a garden escape in Kāne'ohe. This stoloniferous herb with purple, asterlike capitula is cultivated as an ornamental. Thus far only 3 naturalized populations in Kāne'ohe are known (Nagata 2457, HLA, K; Nagata 2664, US; Nagata 3350, HLA, BISH, NY).

Crassocephalum crepidioides (Benth.) Moore

Spm. reidentificat *Kalimeris cf. pinnatifida*
by W. Wagner, 1986.

First collected in 1929 by E.H. Bryan, Jr., as a roadside weed in Hau'ula, O'ahu (Bryan 702, BISH), this upright annual superficially resembles, and has been misidentified as, *Erechtites hieracifolia* (L.) Raf. After being overlooked for nearly 50 years, it was recorded in 1976 in Pahole Gulch in the Wai'anae Mountains (Stemmermann et al. 1153, BISH). By 1978 it had spread to other parts of O'ahu: in Lyon Arboretum in Honolulu as a weed in cultivated areas (Nagata 1654, HLA, BISH, US, L), near Kahalu'u as a roadside weed (Nagata 1793, HLA, BISH, HAW), and near Wahiawā (Nagata 1810, HLA, BISH, US, L, HAW); and it was again collected in Pahole Gulch (Nagata 1601, HLA, SI; Nagata 1772, HLA). Its achenes are easily disseminated by wind and other agents and it is now an established adventive on O'ahu. In 1979 it was discovered on Kaua'i as a roadside weed between Puihi and Kalaheo (Nagata 1963, HLA, BISH), and in 1984 it was collected on Maui at the Ke'anae Arboretum (Hobby 1921, BISH) and in Hilo, on the island of Hawai'i (Herbst 8552, BISH). It has also been reported from Moloka'i (Hobby, pers. comm.).

Erigeron bellioides DC.

This diminutive rosette herb is characterized by its small, spatulate leaves, basal stolons, and solitary capitula less than 5 mm tall on slender, erect peduncles 3–7 cm tall. Although first observed by D. Herbst in 1977 in plantings along Dole Street at the University of Hawaii Manoa campus, no collections were made until 1984 when it was simultaneously collected at the university campus (Wagner 5392, BISH) and in Kāne'ohe (Nagata 3063, HLA, BISH, US). In 1985 it was collected in the vicinity of He'eia-Kahalu'u (Stemmermann 7012, BISH) and in Punalu'u (Wagner et al. 5642, BISH); it was also observed in lawn areas

at Ho'omaluhia (Kāne'ōhe) by the author and at the corner of Beretania and Punchbowl streets in Honolulu by D. Herbst. This delicate, innocuous herb appears to be spreading slowly in moist, cultivated sites in Honolulu and on the windward side of O'ahu.

Parthenium hysterophorus L.

The Santa Maria is a common, shrubby wayside species abundant along roadways and in disturbed sites, especially in the Kona region on the island of Hawai'i. It was first collected in 1960 at Kealakekua Ranch, island of Hawai'i (*Kawasaki s.n.*, BISH), and has since been recorded from Kaua'i in 1973 (*Herbst et al. 2908*, BISH), Maui in 1984 (*Wagner et al. 5455*, BISH), and Moloka'i in 1985 (*Hobby 2368*, BISH).

BEGONIACEAE

Begonia reniformis Dryander

A robust species with stalks 1 m tall, *Begonia reniformis* is a well-established adventive in the North and South Kona districts on the island of Hawai'i. It is common in many areas along the main highway and can also be found growing in old lava fields and waste places. No early collections exist, and it is not mentioned in Neal (1965) or St. John (1973). It was first collected in 1976 in South Kona (*Herbst & Spence 5633*, HLA, BISH). *Begonia reniformis* is 1 of 3 naturalized begonias in the Hawaiian Islands. *Begonia hirtella* is commonly found in wet forest areas behind Honolulu and elsewhere in the Ko'olau Mountains on O'ahu, as well as on the island of Hawai'i between Hilo and Pāhoa. *Begonia foliosa* var. *miniata*, first collected in 1917 (*Rock 12996*, BISH), is sparingly naturalized in the 'Ōla'a-Puna region on the island of Hawai'i.

BRASSICACEAE

Descurainia sophia (L.) Webb

Descurainia sophia was first collected in the Hawaiian Islands in 1963 along Saddle Road, island of Hawai'i (*Kawasaki 8*, BISH). The only other record is from Maui, where it was collected in 1982 at a disturbed site near the Haleakala National Park headquarters parking lot (*R. Nagata 82-5*, HLA). It is a European species and is uncommon and probably restricted to cool regions in the Hawaiian Islands.

Lepidium hyssopifolium Desv.

This species was first collected in 1975 on Pu'u Ahumoa, island of Hawai'i (*Herbst & Spence 5321*, HLA, BISH). Because of its resemblance to *L. virginicum* L., it is easily misidentified and overlooked. It was again collected in 1983 along the Saddle Road (*Nagata 2644*, HLA, US), where it is an occasional wayside species. The naturalized lepidiums in the Hawaiian Islands will be discussed in detail in a forthcoming paper by R. Rollins (in prep.).

Sisymbrium officinale var. **leiocarpum DC.**

Variety *leiocarpum* was collected as early as 1911 on Hualālai, island of Hawai'i (*Forbes 201H*, BISH). This yellow-flowered biennial is easily mistaken for var. *officinale*, which is also present on that island, and thus is overlooked. It was recorded from Lana'i in 1930 (*Munro 503*, BISH) but was not collected again until 1983 along Saddle Road, island of Hawai'i (*Nagata 2647*, HLA). The var. *leiocarpum* differs from var. *officinale* in having essentially glabrous siliques.

CHENOPODIACEAE

Bassia hyssopifolia (Pall.) Kuntze

A stiff, spreading or upright shrub, often with long basal branches, *Bassia hyssopifolia* is a recent addition to the adventive flora. It was first collected in 1982 growing in coral rubble and dredged soil from Kuapā Pond in Hawai'i Kai, O'ahu (Nagata 2514, HLA). One year later it was found in central Maui growing on recently disturbed salty soil (Hobby 1773, BISH).

IRIDACEAE

Neomarica gracilis (Herb.) Sprague

This ornamental species, long cultivated in the Hawaiian Islands, is easily propagated by plantlets that develop viviparously on the inflorescences. Small naturalized populations have become established where quantities of plants are dumped with garden refuse. Two such populations were found in 1985 on the upper shady banks of Mānoa Stream at the University of Hawaii campus (Nagata 3265, HLA).

Trimezia steyermarkii R. Foster

Trimezia steyermarkii has been in the local nursery trade for several years. It is an attractive plant, 1 m tall with yellow flowers ca. 3 cm diam, and is easily grown from plantlets that develop viviparously. As with *Neomarica gracilis*, this species may eventually become naturalized on the periphery of cultivated areas. It differs from *T. martinicensis* in its more robust habit, much larger leaves, and larger flowers. *Trimezia martinicensis* has been in the Hawaiian Islands since at least 1943 and is naturalized in several sites in Nu'uuanu and Pālolo, O'ahu. (Nagata 3051, HLA, MO.)

LABIATAE

Lamium amplexicaule L.

Another recently recorded species is the henbit, a native of Europe. It was first collected in 1982 near the parking lot at Haleakala National Park Headquarters, Maui (R. Nagata 82-4, HLA). According to R. Nagata, the park's resource management specialist, it was first observed in the park in 1981 and is slowly spreading. At present it is restricted to disturbed sites in the park.

LEGUMINOSAE

Stylosanthes guianensis (Aubl.) Sw.

Stylosanthes guianensis was first collected in 1973 on Moloka'i in Waiahewahewa Gulch (Pekelo 24, BISH). In 1985 it was found on O'ahu as an uncommon species along secondary roads and in weedy pastures behind Waiialua (Nagata 3252, HLA, BISH). A year later it was collected on Lana'i along Keōmuku Road in Mahana (Nagata 3475, HLA). It is easily distinguished by its 5-mm-long yellow flowers, tripartite leaves, and glandular pubescence.

MELASTOMATACEAE

Medinilla venosa (Blume) Blume

Medinilla venosa has been in the Hawaiian Islands since at least 1957 (Emory s.n., BISH). It is an upright shrub, 2-3 m tall, with coriaceous, oval leaves and pink flowers at least 2 cm wide. Despite its distinctive appearance, it was not recorded again until 1973 when it was collected on Maui along the Hāna Highway (Ishikawa 349, HLA, BISH). Ten years

later it was recorded as "occasional" along that highway (*Nagata 2668*, BISH). Presently this species seems to be restricted to the mixed secondary wet forests along the Hāna Highway between Nāhiku and Hāna. The Emory collection lacks locality data but is most likely from the same region.

***Tibouchina herbacea* Cogn.**

When first collected in 1979, this species was recorded as "locally abundant" along the Saddle Road near Hilo, island of Hawai'i (*Watanabe s.n.*, BISH). Three years later it was found several miles closer to Hilo in Kaūmana (*Wagner & Stemmermann 4641*, BISH) and subsequently in the Upper Waiakea Forest Reserve along Stainback Highway south of Hilo (*Nagata 2731*, HLA, BISH; *Wagner et al. 5250*, BISH). In 1982 it was discovered proliferating in a gully on Waihe'e Ridge, West Maui (*Hobby 1693*, BISH). *Tibouchina herbacea* is a weak-stemmed, upright shrub about 2 m tall with soft pubescence and attractive magenta flowers. It seeds freely and grows rapidly.

***Tibouchina longifolia* (Vahl) Baill. ex Cogn.**

A 3rd melastome new to the Hawaiian Islands is *Tibouchina longifolia*, found in 1983 in disturbed sites along the periphery of the native wet forests in the Waiakea Forest Reserve, island of Hawai'i (*Nagata 2636*, BISH). A large but rather inconspicuous shrub, this species can be distinguished by its white flowers with corolla lobes 5 mm long, ciliate at the margin and abruptly acuminate. It is presently restricted to the forest in the lower portion of Stainback Highway, island of Hawai'i.

MYRTACEAE

***Rhodomyrtus tomentosa* (Ait.) Hassk.**

This well-known species has long been established as an adventive on Kaua'i. Prior collections from O'ahu have been from cultivated material. In 1985 naturalized populations were found on O'ahu: in native forest on Wiliwilinui Ridge at 485 m (1,600 ft) elevation (*K. Nagata & R. Nagata 3248*, HLA) and on Keahiakahoe at 727 m (2,400 ft) elevation (*Nagata et al. 3306*, HLA, BISH).

ONAGRACEAE

***Fuchsia boliviana* Carriere**

Previously unreported in the Hawaiian flora, *Fuchsia boliviana* is now an established species in Kōke'e, Kaua'i. It was first collected in early 1983 (*Nagata 2657*, HLA, US) from a precipitous bank along a small side trail where it was thought to be naturalized. Other collections, however, are from apparently planted populations along the secondary roads (*Wagner et al. 5052*, BISH; *Wagner et al. 5149*, BISH). It is easily distinguished from the more common *F. magellanica* by its more upright, robust habit (up to 3 m tall), brilliant red flowers with tubes 5–7 cm long, much larger leaves, and its large, drooping inflorescences. A 3rd naturalized *Fuchsia* species, *F. paniculata*, differs in having smaller, magenta flowers 2 cm long in upright, compact panicles.

POLYGONACEAE

***Polygonum aviculare* L.**

Polygonum aviculare was first collected on the island of Hawai'i in a pasture at Parker Ranch at 1,212 m (4,000 ft) elevation in 1932 (*Ewart 196*, BISH); it was not recorded again until it was collected in 1982 at the research station at Haleakala National Park, Maui (*K. Nagata & R. Nagata 2567*, HLA, BISH, HAW). The Maui specimens are more robust,

with narrower leaves and much longer internodes than the Hawai'i Island specimen. It is uncommon in the Hawaiian Islands.

***Polygonum chinense* L.**

This sprawling perennial herb was collected in 1977 in a sugar cane field at Manukā, island of Hawai'i (*Mikami s.n.*, BISH). In 1983 it was collected on the same island in a moist ravine between Laupāhoehoe and Hilo, where it was recorded as common (*Nagata 2649*, HLA, BISH, US). Although there have been no further collections, this species was still present in 1985 and may be slowly spreading to other moist ravines along the Hamakua Coast (pers. observ.).

SOLANACEAE

***Solanum mauritianum* Scop.**

First discovered in Hawai'i and described by Rock (1913) as *Solanum carterianum*, this arborescent species was originally thought to be an endemic restricted to Waiāhole Valley, O'ahu. In 1967, when it was revealed that it was actually an introduced species (Stone 1967), it was still restricted to the Waiāhole Valley area. The numerous herbarium specimens at BISH have all been collected from Waiāhole, Waikāne, Waianu, and Kahana valleys on the windward side of the Ko'olau Mountains, O'ahu. In 1985 a small population was discovered at 485 m (1,600 ft) elevation on Wiliwilinui Ridge on the leeward side of the Ko'olau Mountains (Honolulu District) (*K. Nagata & R. Nagata 3247*, HLA, BISH).

LITERATURE CITED

- Neal, M.C. 1965. In gardens of Hawaii. Bernice P. Bishop Mus. Spec. Publ. 50. 924 p.
- Rock, J.F. 1913. The indigenous trees of the Hawaiian Islands. Publ. privately, Honolulu. 518 p. (Reprinted 1974, Charles E. Tuttle Co., Vermont. 548 p.)
- St. John, H. 1973. List and summary of the flowering plants in the Hawaiian Islands. Pac. Trop. Bot. Gard. Mem. 1. Lāwā'i. 519 p.
- Stone, B.C. 1967. Notes on the Hawaiian flora. *Pac. Sci.* 21: 550-57.
- Wagner, W.L., D.R. Herbst & S.H. Sohmer. 1986. Contributions to the flora of Hawai'i. I. Acanthaceae-Asteraceae. Occas. Pap. Bernice P. Bishop Mus. 26: 102-22.