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Notes on Some Introduced Flora in Hawai'i

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ABSTRACT

New records for the following adventive species are reported: *Etlingera cevuga, Hedyotis callitrichoides, Linum bienne, L. trigynum, Lupinus hybridus, Medicago rugosa, Murdannia nudiflora, Rubus niveus, Solanum torvum,* and *Veronica peregrina* ssp. *xalapensis.* New records for the naturalization of the potherb *Basella alba* and of the following ornamentals are also reported: *Buddleja madagascariensis, Calathea crotalifera, Chrysanthemum parthenium, Cotoneaster pannosa, Hebe stricta, Helianthus annuus, Lantana montevidensis,* and *Spiraea cantoniensis.* Also provided are additional notes on *Coccinia grandis,* a recently reported cucurbitaceous weed in Hawai'i, discussion of the correct name for torch ginger and black torch ginger, and the correct author citation for *Hedychium gardnerianum.*

INTRODUCTION

New plants are continually being introduced into Hawai'i for economic and scientific purposes, as ornamentals, and, less commonly, accidentally. An increasing number of these are becoming naturalized or adventive. A few of these are ornamentals or potherbs that have escaped from cultivation; several more have not been previously reported in the literature. New records of naturalized species have been recently published by Wagner et al. (1986) and by Nagata (1987). This paper is a further contribution toward our knowledge of the introduced flora in Hawai'i.

ASTERACEAE

Helianthus annuus L.

This is the well-known sunflower, and various forms have been cultivated in Hawai'i as ornamentals and for their edible achenes. It now occurs sporadically as an adventive in the upland regions on Hawai'i Island. In 1963 a wild form was collected on Mauna Loa (*Uehara s.n.,* BISH) and in 1985 the species was collected at Pōhakuloa (*Nagata 3351,* HLA). In its wild form, *H. annuus* grows to ca. 1 m tall with flower heads 6–10 cm in diameter.

Chrysanthemum parthenium (L.) Bernh.
[*Tanacetum parthenium* (L.) Schulz]

"Feverfew" is known to have escaped from cultivation in both North America and Europe. It is occasionally cultivated in Hawai'i and has become adventive along roadways and in vacant sites at Science City at ca. 300 m elevation near the summit of Haleakalā, Maui (*K. Nagata & R. Nagata 2578,* HLA, K).

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BASELLACEAE

Basella alba L.
[*B. rubra* L.]

Commonly known as Ceylon spinach, this plant has been cultivated in Hawai'i primarily as a potherb for about a century. It was not recorded in Hawai'i prior to 1840 (Nagata 1985), but by the latter part of the 19th century it had already become naturalized in certain places (Hillebrand 1888). This species has apparently been overlooked by botanists, as the earliest collection at Bishop Museum was not made until 1936 (*Yamaguchi s.n.*, BISH). The first naturalized collection, made in 1987, is from Waimanālo, O'ahu (*Nagata 3600,* BISH, HLA), where it is widespread along roadways and vacant areas.

BUDDLEJACEAE

Buddleja madagascariensis Lam.

The "smoke bush," cultivated in Hawai'i for its fragrant orange flowers and densely woolly leaves, has been collected on several occasions in wayside areas. The first collection, made in 1931, was from Woodlawn, O'ahu, along a dry stream bed (*Neal s.n.*, BISH). In 1972 it was recorded from along the Hāna Highway on Maui in secondary vegetation (*Ishikawa 201,* BISH, HLA) and in 1975 it was found in the Volcano Transfer Dump, Hawai'i I, probably escaping from garden refuse (*Herbst & Ishikawa 5526,* BISH, HLA). By 1984 it had spread outside the transfer dump and was common and firmly established along the adjacent highway (*Nagata 2936,* BISH, HLA).

COMMELINACEAE

Murdannia nudiflora (L.) Brenan

A native of Asia, *M. nudiflora* has been previously unreported in the Hawaiian literature. It was first collected in 1976 from a naturalized population in the lawn of Waterfront Park in Hilo, Hawai'i I (*Degener 33,371,* BISH). By 1984 it had spread north of Hilo to Hakalau, where it was recorded along the old Hakalau Road (*Nagata 2978,* US); it was also observed in grassy areas above Hakalau at ca. 300 m elevation (pers. observ.).

CUCURBITACEAE

Coccinia grandis (L.) Voight
[*C. cordifolia* Cogn.; *C. indica* Wight & Arn.]

In a recent article (Linney 1986) *C. grandis* is noted as a new weed in the Hawaiian flora, and the earliest record of its presence in Hawai'i is reported to be a 1969 introduction by Lyon Arboretum. According to the Linney (1986) article, populations were observed on O'ahu "several years before 1985" at the University of Hawaii Mānoa campus; in 1985 at several locations between Mānoa and Punchbowl, at Keolu Hills, Kailua; and on Hawai'i I in 1986 in the vicinity of Kailua-Kona. The article cites no herbarium specimens and no specimens have been deposited at Bishop Museum.

This species was in fact first collected in 1968 in the Punchbowl area near Roosevelt High School (*Nagata 365,* HLA). Material from the 1969 Lyon Arboretum introduction was distributed to Foster Gardens but was subsequently destroyed (Linney 1986), and no further distributions were made from the arboretum. The arboretum plants have always been confined to a very small area near the arboretum parking lot. The first fruits were recorded in 1974, but the plants seldom set fruits in the arboretum and no seedlings have been observed. By 1976 this species was being popularly cultivated and sold at "flea markets"

as a medicinal plant. By 1982 it had spread to Waihe'e on the windward side of the Ko'olau Mountains (*Nagata 2546,* HLA, K) and by 1986 into Enchanted Lakes, Kailua (*Nagata 3565,* HLA). More recently it has been found in Waimanālo (*Nagata 3598,* BISH, HLA).

Linney's article gives little information on the ethnobotany of the species, yet it is of considerable importance as a medicinal and food plant. *Coccinia grandis,* known as scarlet gourd or ivy gourd, has been cultivated in India since ancient times as an ayurvedic drug plant. It has been used especially to treat diabetes but also dyspnea, cough, emaciation, fever, convulsions, syphilis, gonorrhea, slow pulse, menorrhagia, boils and skin ailments, ringworm, bronchitis, jaundice, anemia, and blood disorders (Burkill 1966; Ramachandran & Subramaniam 1983). The fruits are eaten raw or cooked and the plant is used as a potherb in India, Thailand, and Indo-China. Several sweet cultivars have been selected in India. It is a common item in the vegetable markets from India to Thailand, and roots and stems are sold in drug shops in Java. The Hindu name for scarlet gourd is *kundru* and in Thailand it is known as *tam lûng* and *pak tam lûng.*

The presence of the scarlet gourd in Hawai'i can probably be attributed to several independent introductions by immigrants from SE Asia because of its medicinal and food value.

FABACEAE

Lupinus hybridus Lem.

Known from a single collection along the highway and side roads between Volcano Village and Hawaii Volcanoes National Park on Hawai'i I in 1984 (*Nagata 2956,* HLA, US), *L. hybridus* is the only lupine in the Hawaiian adventive flora.

Medicago rugosa Desr.

A native of Europe, *M. rugosa* was discovered in 1982 in pastures along the Saddle Road near Waikoloa on Hawai'i I (*Nagata 2435,* HLA, US). It is very similar to *M. polymorpha* but is easily distinguished by its large, glabrous fruits. It probably was introduced as fodder or as a contaminant of fodder.

LINACEAE

Two species of *Linum* are occasionally cultivated as ornamentals in Hawai'i. *Linum grandiflorum* Desf., an annual growing to ca. 0.75 m tall, has panicles of red flowers. "Flax" or "linseed" (*L. usitatissimum* L.) grows taller and has blue flowers. Two others, previously unreported, are now locally naturalized in Hawai'i.

Linum bienne Mill.

This rather attractive species was collected in 1982 at 1,270 m elevation at Wailaulau on the Pahihi Planeze, Maui (*Medeiros 239,* BISH). At present it seems to be restricted to that region.

Linum trigynum L.

Although it was first collected in 1912 in Mokule'ia on the slopes of Mt Ka'ala, O'ahu (*Forbes 1785.0,* BISH), *L. trigynum* has not since been seen in that district. Another population has been known since 1975 on 'Ohikilolo on the leeward slopes of the Wai'anae Mountains (*Herbst 5329,* BISH). This well-known population is situated in sunny, moist sites along the ridge crest between 100 and 200 m elevation.

MARANTACEAE

Calathea crotalifera S. Wats.

Calathea crotalifera has been cultivated in Hawai'i since at least 1945 (*St. John 21,361,* BISH) primarily for its attractive, yellow-bracted inflorescences, which are prized for floral arrangements. In 1986 it was found naturalized in the Kāne'ohe Forest Reserve below Pu'u Lanihuli on O'ahu (*Nagata 3486,* BISH, HLA). This is the first record of a member of the Marantaceae becoming naturalized in Hawai'i.

ROSACEAE

Cotoneaster pannosa Franch.

Occasionally cultivated as an ornamental in Hawai'i, *C. pannosa* was first collected as a cultivated plant at the University of Hawaii Mānoa campus in 1933 (*Chong s.n.,* BISH). In 1942 it was collected in the residential area of Hawaii Volcanoes National Park (*Fagerlund & Mitchell 214,* BISH). By 1984 it was found as an adventive along the roads near Volcano Village, Hawai'i I (*Nagata 2916,* HLA).

Rubus niveus Thunb.

First collected in Kona, Hawai'i I in 1965 (*Krauss 966,* BISH), this species has since been discovered on the opposite side of the island where a population was discovered in 1984 near the Volcano Transfer Dump (*Nagata 2939,* BISH, HLA, US). It is easily distinguished by its glaucous stems, leaflets that are densely tomentose on the lower surface, tomentose inflorescences, and red flowers.

Spiraea cantoniensis Lour.

The "Chinese spiraea" is another ornamental that has become naturalized in cool regions. It was first collected as a cultivated shrub at the University of Hawaii Mānoa campus in 1934 (*Oliveira s.n.,* BISH). In 1984 it was found growing as an adventive near residential areas in Volcano Village, Hawai'i I (*Nagata 2913,* HLA).

RUBIACEAE

Hedyotis callitrichoides (Griseb.) Lewis

First discovered in 1983 as a weed in a lawn in Waipahu, O'ahu (*Nagata 2659,* BISH, HLA, US), this innocuous herb has since been found on O'ahu at the Honolulu International Airport (*Hoe 1985.107,* BISH) and Bishop Museum (*Wagner & Herbst 5505,* BISH) in Honolulu, and in Kahalu'u (*Stemmermann 7013,* BISH). It is usually found in moist, cultivated areas and in lawns.

SCROPHULARIACEAE

Hebe stricta (Benth.) L.B. Moore

Hebe stricta is cultivated in Hawai'i mostly in cool regions. Its attractive inflorescences are used in floral arrangements and *wili lei.* It was first collected in Hawai'i from cultivated plants in the residential area at Hawaii Volcanoes National Park, Hawai'i I, in 1917 (*Rock 12,998,* BISH). In 1942 it was again collected from the same area (*Fagerlund & Mitchell 79,* BISH). In 1984 it was found as an adventive in vacant lots near the park headquarters (*Nagata 2918,* HLA).

Veronica peregrina ssp. ***xalapensis*** (H.B.K.) Pennell

First collected in 1984 near Hawaii Volcanoes National Park, Hawai'i I at ca. 1,200 m elevation (*Nagata 2935,* HLA), this New World introduction is similar to *V. arvensis* in its leafy bracted inflorescences and subsessile to sessile flowers. It differs by having narrower leaves, more shallowly lobed, glandular-pubescent capsules, and nearly whitish flowers. *Veronica arvensis* has ovate leaves, deeply lobed ciliate-pubescent capsules, and blue flowers. Another species of *Veronica* in Hawai'i, *V. serpyllifolia,* has ovate to oblong leaves and glandular-pubescent capsules but differs in having smaller-bracted racemes and flowers with pedicels 4–5 mm long.

SOLANACEAE

Solanum torvum Sw.

Although unreported in the local literature, *S. torvum* was collected in 1954 along 'Īao Stream near Wailuku, Maui (*Degener 23,636,* BISH). In 1987 it was found growing along the roadways and vacant areas in Waimanālo, O'ahu (*Nagata 3599,* HLA, BISH). It is cultivated in "community gardens" on O'ahu by Asian immigrants for its edible fruits (pers. observ.). This potential pest is much larger than the other weedy aculeate solanums in Hawai'i and can further be distinguished by its white flowers, small yellowish fruits, and stellate pubescence.

VERBENACEAE

Lantana montevidensis (Spreng.) Briq.

Lantana montevidensis has been cultivated in Hawai'i as an ornamental since as early as 1930 (*St. John 10514,* BISH). In 1986 it was found abundantly naturalized in vacant areas in and around Lana'i City and along pineapple fields on Lana'i (*Nagata 3497,* BISH, HLA). Because it is easily propagated from cuttings, it is probable that *L. montevidensis* is spreading vegetatively as well as from seeds, which it produces abundantly.

ZINGIBERACEAE

Hedychium gardnerianum Ker-Gawl.

For decades the ornamental *Kahili* ginger has been erroneously attributed to Roscoe, in *Scit. Pl.* t. 62 (1828). The correct citation should be Ker-Gawler, in *Bot. Reg.* t. 744 (1824).

Etlingera Gieseke

[*Nicolaia* Horan.; *Phaeomeria* Lindl. ex K. Schum.; *Geanthus* Reinw.; *Geanthus* Val.; *Achasma* Griff.]

In 1986, Burtt & Smith combined *Achasma* Griff., *Nicolaia* Horan., and *Geanthus* Valeton with *Etlingera.* Traditionally, *Achasma, Nicolaia,* and *Geanthus* had been separated primarily by peduncle length (elongated and high above the ground in *Nicolaia* and short and subterranean in *Geanthus* and *Achasma*) and labellum structure (short and often entire in *Geanthus* and *Nicolaia* and elongate and distinctly lobed in *Achasma*). Minor differences had also been noted in the involucre (showy in *Nicolaia* and much reduced in *Achasma* and *Geanthus*) and in the angle of the anther with respect to the staminal filament (more or less erect in *Geanthus* and *Nicolaia* and conspicuously angled in *Achasma*). Problems with retaining these 3 as separate genera had been noted by Backer & Bakhuizen (1968) and also by Holttum (1974) who suggested the possibility of a merger. After examining several species discovered

in SE Asia, Burtt & Smith (1968) found the characters separating the genera to be inadequate. They concluded that all 3 are congeneric with Giseke's 1792 genus, *Etlingera.*

Two cultivated species and 1 naturalized species in Hawai'i are affected by the change. The following combinations were proposed by Smith (1986):

Etlingera cevuga (Seem.) R.M. Smith [*Amomum cevuga* Seem.; *Geanthus cevuga* (Seem.) Loes.]

Etlingera elatior (Jack) R.M. Smith (torch ginger) [*Nicolaia elatior* (Jack) Horan.; *Nicolaia speciosa* (Blume) Horan.; *Phaeomeria magnifica* (Rosc.) K. Schum.; *P. speciosa* (Blume)]

Etlingera hemisphaerica (Blume) R.M. Smith (black torch ginger) [*Nicolaia hemisphaerica* (Blume) Horan.; *Phaeomeria hemisphaerica* (Blume) K. Schum.]

Etlingera cevuga (Seem.) R.M. Smith

The presence of *E. cevuga* as a naturalized plant in Hawai'i is somewhat of an anomaly. It is not an attractive species nor does it have any food or medicinal value; it is not known to be cultivated outside of botanical gardens. Yet an extensive naturalized population was discovered in the Kāne'ohe Forest Reserve below Pu'u Lanihuli on O'ahu in 1986 (*Nagata 3485,* BISH, HLA). It is native to Fiji, Samoa, and the Society Islands.

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