

Aristolochia littoralis

Calico flower
Aristolochiaceae

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OVERVIEW

Aristolochia littoralis, native to Brazil, is an ornamental vine cultivated in Hawai'i and other tropical areas for their colorful and unique pipe shaped flowers. *A. littoralis* is known to spread from initial plantings in several places where it is cultivated, including Hawai'i, Florida, South Africa, and other Pacific Islands (Foxcroft 1999, Wagner et al. 1999, PIER 2000, FLEPPC 2001). In Hawai'i, *A. littoralis* is naturalized on Kaua'i, O'ahu, and Maui (Wagner et al. 1999, Imada et al. 2000, Starr et al., in press). On Maui, *A. littoralis* is currently sparingly cultivated and was only recently documented as naturalized from a lowland site near Kipahulu. *A. littoralis* produces dehiscent capsules with numerous wind born seeds that readily germinate nearby plantings. Plants do spread from initial plantings, but it is uncertain if it will become a serious concern to natural areas or simply a secondary weed of lowland disturbed areas.

TAXONOMY

Family: Aristolochiaceae (Birthwort family) (Wagner et al. 1999).

Latin name: *Aristolochia littoralis* Parodi (Wagner et al. 1999).

Synonyms: *A. elegans* Mast., *A. elegans* Mast. var. *hassleriana* (Chod.) Hassl., and *A. hassleriana* Chod. (Brickell and Zuk 1997, Wagner et al. 1999, Wunderlin and Hansen 2000).

Common names: Calico flower, dutchman's pipe, elegant dutchman's pipe (Wagner et al. 1999, Wunderlin and Hansen 2000, PIER 2000).

Taxonomic notes: Aristolochiaceae is a family of plants made up of about 450 species in roughly 8-10 genera (Wagner et al. 1999). Literature sources report from 200 (Bailey and Bailey 1976) to 350 (Wagner et al. 1999) species worldwide from the genus *Aristolochia*. Most of the plants in the genus are evergreen deciduous climbers from moist woodlands of temperate and tropical regions of both hemispheres (Brickell and Zuk 1997). Though some are shrubs and perennial herbs (Wagner et al. 1999).

Nomenclature: The name is derived from the Greek *aristos*, meaning best, and *lochia*, meaning delivery, because it was valued in child birthing and the resemblance of the shape of the flower as a human fetus in the womb (Wagner et al. 1999).

Related species in Hawai'i: Neal (1965) notes that several species in the genus *Aristolochia* are rarely cultivated in Hawai'i. Besides *A. littoralis* (as *A. elegans*), Neal also mentions *A. grandiflora* Sw. (syn. *A. gigas* Lindl., *A. gigantea* Mart. & Zucc., not Hook) (pelican flower), a climber native to Jamaica, with larger bad smelling flowers. Many other *Aristolochia* species are cultivated worldwide and are possibly in Hawai'i as well. No other related species are currently known to be naturalized in Hawai'i.

DESCRIPTION

"Vigorous lianas. Leaves green on upper surface, lower surface glaucous, cordate-reniform, 7-9 cm long, 6-10 cm wide, pseudostipules auriculate, amplexicaul. Flowers solitary in the leaf axils, greenish yellow and dark blackish purple, the tube bent, ca. 3 cm long, the limb unlobed, disk-shaped, ca. 10 cm in diameter, abruptly spreading from the tube; gynostemium 8 mm high, 5 mm wide. Capsules cylindrical, 4.5 cm long, 2.5 cm in diameter. Seeds flat, ca. 6 mm long." (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: *A. littoralis* vines are widely cultivated in tropical areas throughout the world. They are vigorous growers and are usually planted for shade, screening, and for their unusual flowers (Neal 1965). The vines are heavy and require strong support (Brickell and Zuk 1997). It is also reported to have medicinal qualities. On Maui, *A. littoralis* is not very common and is occasionally planted in a few lowland sites.

Invasiveness: These aggressive woody climbers are known to escape cultivation in at least Florida, Hawai'i, South Africa, and elsewhere in the Pacific (Foxcroft 1999, Wagner et al. 1999, PIER 2000, FLEPPC 2001). Invading non-native lianas have the potential to over-run desirable vegetation, weigh them down, and create openings for further invasion. On Maui, *A. littoralis*, with numerous flat wind dispersed seeds born in a dehiscent capsule, readily germinates in places where it is cultivated. Numerous seedlings are found at several lowland sites on Maui, including Kipahulu, Waikapu, and Lahaina. *A. littoralis* has a similar habit, vigor, and appearance to that of *Coccinia grandis*, a Hawai'i state noxious weed currently being targeted for eradication on Maui by the Maui Invasive Species Committee and the Department of Agriculture. Like *C. grandis*, this vine would most likely be hard to control once established, due to numerous above and under ground stems and roots that require numerous herbicide applications in order to achieve complete control.

Pollination: *Aristolochia* are usually pollinated by flies which are attracted to the carrion-like odor and to the purple and brown color of the flowers (Wagner et al. 1999).

Propagation: *Aristolochia* can be propagated from woody cuttings, layering, and seeds (Bailey and Bailey 1976). According to Brickell and Zuk (1997), "Sow seed of hardy species at 55-61 degrees F (13-16 degrees C) and tender species at 70-75 degrees F (21-24 degrees C) as soon as ripe in spring. Divide perennials in spring, or insert root cutting in winter. Root softwood cuttings of climbing or scandent species grown under glass in early spring, and of hardy species in midsummer."

Dispersal: The seed pod of *A. littoralis* is a dehiscent capsule with numerous winged seeds that are dispersed by the wind (Barbadine 2000). People also spread the plant either in seed form or cuttings for ornamental purposes.

Pests and Diseases: *A. littoralis* may be affected by *Cercospora* leaf spot, gray mold, Southern blight, *Pythium* root rot, and aphids (Brickell and Zuk 1997).

DISTRIBUTION

Native range: *Aristolochia littoralis* is native to Brazil, South America. It is also reported as native to Argentina in Cordoba, Entre Rios, and Misiones; Bolivia; Columbia; Loja, Ecuador; Paraguay; and Peru (GRIN 2000).

Global distribution: In addition to its native range in South America, *Aristolochia littoralis* is cultivated throughout the tropics including Guam and Micronesia (PIER 2000) and is reported as naturalized in parts of northern and central Florida (Wunderlin and Hansen 2000), Hawai'i (Wagner et al. 1999, Imada et al. 2000, Starr et al. in press), Australia, Christmas Island, and New Caledonia (PIER 2000).

State of Hawai'i distribution: In Hawai'i, *Aristolochia littoralis* is cultivated occasionally and is sparingly naturalized on Kaua'i, O'ahu, Maui (Wagner et al. 1999, Imada et al. 2000, Starr et al. in press). On O'ahu, it is reported as sparingly naturalized in the Pearl Harbor area and was first collected in 1922 (Wagner et al. 1999). On Kaua'i, it was recently reported as naturalized from an open kiawe / opiuma (*Prosopis* / *Pithecellobium*) forest (Imada et al. 2000).

Island of Maui distribution: During baseline surveys of Maui in 2000, *A. littoralis* was observed in about a half a dozen lowland sites including Kapalua, Lahaina, Waikapu, Spreckelsville, and Kipahulu. Most of the plants appeared to be in cultivation, however in Waikapu, the homeowner revealed that plants previously believed to be cultivated by the authors have actually come on their own. At another site, near Kipahulu, the plant appeared to be sparingly naturalized and was coming up along the road and on nearby walls. Another site in Lahaina was recently observed with numerous seedlings coming up around a building and in cracks in the concrete. Most sites with *Aristolochia* were near sea level in both moist and dry lowland urban and disturbed areas.

CONTROL METHODS

There was not much documentation found on control of this species. Perhaps methods employed to control ivy gourd (*Coccinia grandis*), a similar looking vine, would be useful to control this species.

Mechanical control: It may be possible to pull up small seedlings. With other vines, such as *C. grandis*, cutting at the base without chemical treatment is usually not successful and actually makes control more difficult.

Chemical control: The preferred method of control for a similar vine, *Coccinia grandis*, is to leave the vines in place and use a basal bark application by applying Garlon 4 (triclopyr) at 100% to the base of the vine, as close to the root as possible. To allow proper translocation, do not cut vines. Repeat control is necessary to control any regrowth or stems that were originally missed.

Biological control: There are no known biological control programs for *A. littoralis*.

Cultural control: The public could be informed not to plant *A. littoralis* or other weedy vines that readily escape from gardens.

Noxious weed acts: In north and central Florida, *Aristolochia littoralis* is considered a category II invasive plant species by the Florida Exotic Pest Plant Council (FLEPPC 2001). Category II is defined as, invasive exotics that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by category I. In the Skukuza staff village of the Kruger National Park, South Africa, *A. littoralis* (as *A. elegans*) was listed as a priority 1 non-native plant slated for removal (Foxcroft 1999).

MANAGEMENT RECOMMENDATIONS

A. littoralis is sparingly cultivated in Hawai'i and is naturalized on Kaua'i, O'ahu, and Maui. On Maui, *A. littoralis* is not widely planted, and is currently distributed in a few lowland urban and residential areas. It is not certain how widespread and invasive this species will become, though it readily spreads from gardens via numerous flat winged seeds. With a habit and vigor similar to that of another weedy species, *Coccinia grandis*, this species could potentially be a nuisance once established. *A. littoralis* could be put on the Hawai'i noxious weed list to help prevent further spread through horticulture trade. Control of all known individuals on Maui at this time seems feasible.

REFERENCES

- Bailey, L.H. and E.Z. Bailey. 1976. *Hortus*. 3rd ed. Macmillan General Reference, NY.
- Barbadine. 2000. *Aristolochia littoralis*. Available: <http://www.barbadine.com> (Accessed: September 5, 2001).
- Brickell, C. and J.D. Zuk. 1997. *The American Horticultural Society A-Z Encyclopedia of Garden Plants*. DK Publishing, Inc., NY.
- Foxcroft, L. 1999. The Control of Alien Plants Within Personnel Villages, Other Staff Residences, and Rest Camps of the Kruger National Park. Scientific Services, Alien Biota, Kruger National Park. Available: http://www.parks-sa.co.az/conservation/scientific_services/ss_alienbiota.html (Accessed: September 9, 2002).
- FLEPPC (Florida Exotic Pest Plant Council). 2001. List of Florida's Invasive Species. Florida Exotic Pest Plant Council. Available: <http://www.fleppc.org/01list.htm> (Accessed: September 5, 2001).
- GRIN (Germplasm Resources Information Network). 2000. Online Database. United States Department of Agriculture, Agricultural Research Service, National Germplasm Resources Laboratory, Beltsville, MD. Available: <http://www.ars-grin.gov/> (Accessed: September 5, 2001).

Imada, C.T., G.W. Staples, and D.R. Herbst. New Hawaiian plant records for 1999. *Bishop Museum Occasional Papers* 63(1):9-16.

Neal, M. C. 1965. *In Gardens of Hawai'i*. Bernice P. Bishop Museum Special Publication 40, Bishop Museum Press, Honolulu, HI.

PIER (Pacific Island Ecosystems at Risk). 2000. Invasive Plant Species: *Aristolochia littoralis*. Pacific Island Ecosystems at Risk. Available: <http://www.hear.org/pier/arlit.htm> (Accessed: September 5, 2001).

Starr, F., K. Starr, and L. Loope. (in press). New plant records from the Hawaiian archipelago. *Bishop Museum Occasional Papers*.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999. *Manual of the Flowering Plants of Hawai'i*. 2 vols. Bishop Museum Special Publication 83, University of Hawai'i and Bishop Museum Press, Honolulu, Hawai'i.

Wunderlin, R. and B. Hansen. 2000. Atlas of Florida Vascular Plants. Institute for Systematic Botany, University of South Florida, Tampa, FL. Available: <http://www.plantatlas.usf.edu/> (Accessed: September 5, 2001).