Buddleja madagascariensis **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Scrophulariales	Buddlejaceae

Common name smoke bush (English), Madagascar buddleia (English), butterfly bush (English), buddleia bush (English), Madagascar butterfly bush (English)

Synonym
Buddleya madagascarienses , Lam.
Buddleia madagascarienses , Lam.
Adenoplea madagascariensis , Lam.
Buddleja heterophylla , Lindl.
Buddleja nicodemia
Buddleja madagascariensis
Nicodemia madagascariensis

Similar species *Buddleja davidii, Buddleja asiatica, Buddleja dyssophylla*

Summary *Buddleja madagascariensis* commonly known as smokebush, is a shrub native to Madagascar; it has been introduced outside its native range as an ornamental plant. Easily dispersed bird or wind-borne seeds and the ability to regenerate from stem fragments has led to the naturalisation of *B. madagascariensis* in many tropical and sub-tropical areas. As *B. madagascariensis* forms thick, impenetrable thickets, native vegetation can be smothered and excluded. As well as this, *B. madagascariensis* can cause throat allergies and coughing, nose swelling and eyelid blisters when dry. The sap of *B. madagascariensis* is also known to be toxic, potentially causing burning rashes and blisters. The need to exclude livestock from *B. madagascariensis* has resulted in an economic impact in some areas, especially as it is difficult to control.

view this species on IUCN Red List

Species Description
Buddleja madagascariensis is a sprawling shrub that grows to 2 -3 m tall with stems densely tomentose. Leaves are opposite and narrowly ovate between 7 - 12 cm in length and 2 - 4.5 cm wide. The upper surface of the leaves is glabrous, while the lower surface is densely tomentose. Petioles are between 1.5 and 2.5 cm long. Flowers grow in terminal, thyrsoid cymes and calyx is campanulate or bell-shaped. They are densely tomentose and are roughly 3 mm long with lobes about 0.5 mm long. Corolla is orange and densely tomentose externally while glabrous internally. Ovary is pubescent. Fruits are fleshy and spherical, appearing white while becoming bluish-purple at maturity. Fruit are indehiscent with ellipsoid seeds about 1 mm in length (Wagner *et al.*, 1999; in PIER, 2008). Each fruit may cantain hundreds of seeds with propellers that aid in wind dispersal (Hawaii Early Detection Network, 2010). Please follow this link for images of smokebush Starr & Starr, 2008.

Uses
Cultivated as an ornamental plant. Grown in Australia for rubber production (Hawaii Early Detection Network, 2010).

Habitat Description
Buddleja madagascariensis is known to grow as a weed in forests and on roadsides in Hawaii (Motooka *et al.*, 2003; in PIER, 2008) and Australia (FloraBase, 2010). In Australia, *B. madagascariensis* grows amongst tall trees (in *Eucalyptus patens* woodland); in gravelly soil, loam, sand (over limestone); occupying flats, limestone cliffs, steep slopes and river valleys (FloraBase, 2010). It is also capable of growing in disturbed natural vegetation and in gardens (FloraBase, 2010).
B. madagascariensis is known as an aggressive invader of disturbed areas in Hawaii, especially at low to mid elevations including open range, stream beds, and gulches (Hawaii Invasive Species, 2010). Also invades mesic to humic forests in Hawaii (Motooka *et al.*, 2003; in PIER, 2008), becoming naturalised in mesic areas between 900 and 1200 m above sea level (Wagner *et al.*, 1999; in PIER, 2008). In New Zealand, it occurs on sand dunes and coastal cliffs (Webb *et al.*, 1988; in PIER, 2008).

Reproduction
Buddleja madagascariensis can reproduce from stem fragments and is capable of resprouting quicky after a fire (FloraBase, 2010). Fruit are appealling to frugivorous birds, who then locally disperse seeds across the landscape (Hawaii Early Detection Network, 2010). While seeds are not produced in Australia, the ability to regenerate from stem fragments allows dispersal to distant locations as stems may be carried by birds humans or waterways (Stock & Wild, 2002, FloraBase, 2010). Flowers in April, July and August in Australia (FloraBase, 2010).

General Impacts
Buddleja madagascariensis forms dense impenetrable thickets that can smother and exclude native vegetation (FloraBase, 2010). Additionally, leaf litter accumulation does not impede regeneration of broken stems (FloraBase, 2010).
B. madagascariensis can cause throat allergies in some people (FloraBase, 2010) and when dry, a powdery dust can emerge which may cause coughing, nose swelling and eyelid blisters (Hawaii Early Detection Network, 2010). The milky white sap can also cause burning rashes and blisters (Hawaii Early Detection Network, 2010).
B. madagascariensis has had an economic impact on ranchers in Australia, as it has a toxic effect on cattle and horses and must be kept away at the rancher's expense (Hawaii Early Detection Network, 2010).

Management Info
Preventive measures: A Risk Assessment of *Buddleja madagascariensis* for Hawai‘i and other Pacific islands was prepared by Dr. Curtis Daehler (UH Botany) with funding from the Kaulunani Urban Forestry Program and US Forest Service. The alien plant screening system is derived from Pheloung *et al.*. (1999) with minor modifications for use in Pacific islands (Daehler *et al.*, 2004). The result is a score of 7 and a recommendation of: \"Likely to cause significant ecological or economic harm in Hawai‘i and on other Pacific Islands as determined by a high WRA score, which is based on published sources describing species biology and behaviour in Hawai‘i and/or other parts of the world.\"
Chemical: \"Katie Cassel of the Kōke‘e Natural History Museum (Kōke‘e Museum) reported good control of stems < 3 inches diameter with triclopyr ester at 20% in crop oil applied to basal bark and to larger stems that were frilled\" (Motooka *et al.*, 2003; in PIER, 2008). FloraBase (2010) suggests that for stems greater than 7 cm diameter, apply 250 ml Access® in 15 L of diesel to basal 50 cm of stem (basal bark) or cut and paint with 50% glyphosate.
Physical: Smaller plants (< 7 cm diameter) can be hand pulled, making sure to remove all stem material (FloraBase, 2010).

Pathway
Planted in Australia for rubber production (Hawaii Early Detection Network, 2010).Often cultivated as an ornamental plant (Hawaii Early Detectiion Network, 2010).

Principal source:

Compiler: IUCN SSC Invasive Species Specialist Group (ISSG) with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

Review:

Pubblication date: 2010-06-01

ALIEN RANGE

[3] AUSTRALIA
[1] FIJI
[1] NEW ZEALAND
[4] SAINT HELENA
[5] UNITED STATES
[1] BERMUDA
[2] NEW CALEDONIA
[1] PUERTO RICO
[1] SOUTH AFRICA

Red List assessed species 6: EX = 3; CR = 2; EN = 1;

Acalypha rubrinervis **EX**
Lachanodes arborea **CR**
Sium burchellii **EN**
Dryopteris ascensionis **EX**
Nesiota elliptica **EX**
Wahlenbergia linifolia **CR**

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Summary: The exotic ornamental scrambling bramble orange buddleia, B. madagascariensis, forms dense impenetrable thickets in various forest types in eastern Australia. The plant is widespread throughout the world and weedy in many locations. In Australia, it is found growing in patches in the national parks of the Border Ranges between Queensland and New South Wales where it is of great concern for the damage it might do to the rain forest where it grows. B. madagascariensis is sterile in Australia and no seeds have been seen on the plant despite extensive searches of plants in eastern Australia nor reported in the literature. It is therefore curious that the plant is able to establish and grow in the midst of national parks apparently distant from any source of infestation. This study investigates the hypothesis that B. madagascariensis can be spread by stem sections that may be carried by birds, water, or perhaps people, and that simply casting them upon the ground is sufficient to allow them to root and grow. Stems of B. madagascariensis were placed on the ground in rain forest under various circumstances and it was found that a small proportion of stems can root and grow under a wide range of conditions.
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