

insects. Spores lack a thick resistant coat, which may indicate that their longevity is brief, probably measured in days at most. Due to the weak differences between seasons, there seems to be no evidence of seasonality in growth or reproduction. Additional information on reproductive cycles, longevity, specific environmental requirements, and limiting factors is not known (Linney 1989, Service 1999a).

Historically, *Adenophorus periens* was known from Kauai, Oahu, Lanai, East Maui, and Hawaii Island. Currently, it is known from several locations on Kauai, Molokai, and Hawaii. On Molokai, it is found in a single occurrence containing seven individuals on private land (GDSI 2000, HINHP Database 2000).

On Molokai, *Adenophorus periens* is an epiphyte usually growing on *Metrosideros polymorpha* trunks, and is found in *Metrosideros polymorpha*-*Myrsine lessertiana* forest at elevations between 811 and 1,508 m (2,660 and 4,946 ft). It is found in habitats of well-developed, closed canopy providing deep shade and high humidity. Associated native species include *Anoectochilus sandwicensis* (jewel orchid), *Broussaisia arguta*, *Cheirodendron trigynum*, *Cibotium glaucum* (hapuu), *Coprosma ochracea*, *Cyanea* sp., *Cyrtandra* sp. (haiwale), *Dicranopteris linearis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Ilex anomala*, *Labordia hirtella* (NCN), *Leptecophylla tameiameia*, *Machaerina angustifolia* (uki), *Melicope* sp., *Psychotria* spp., *Stenogyne kamehamehae* (NCN), *Syzygium sandwicensis*, *Vaccinium calycinum* (ohelo), or *Viola chamissoniana* ssp. *robusta* (pamakani) (HINHP Database 2000, Linney 1989, Service 1999a).

The threats to this species on Molokai are habitat degradation by feral pigs and goats, and competition with the non-native plant *Psidium cattleianum* (strawberry guava) (HINHP Database 2000, Service 1999a, 59 FR 56333).

Alectryon macrococcus (mahoe)

Alectryon macrococcus, a long-lived perennial member of the soapberry family (Sapindaceae), consists of two varieties, *macrococcus* and *auwahiensis*, both of which are trees with reddish-brown branches and leaves with one to five pairs of sometimes asymmetrical egg-shaped leaflets. The underside of the leaf has dense brown hairs only when young in *A. macrococcus* var. *macrococcus* and whether young or mature (persistent) in *A. macrococcus* var. *auwahiensis* (only found on East Maui). The only member of its genus found in Hawaii, this species is distinguished from other

Hawaiian members of its family by being a tree with a hard fruit 2.3 cm (0.9 in) or more in diameter (Wagner *et al.* 1999).

Alectryon macrococcus is a relatively slow-growing, long-lived tree that grows in xeric (dry) to mesic sites and is adapted to periodic drought. Little else is known about the life history of this species. Flowering cycles, pollination vectors, seed dispersal agents, and specific environmental requirements are unknown (Service 1997).

Historically and currently, *Alectryon macrococcus* var. *macrococcus* is known from Kauai, Oahu, Maui, and Molokai. On Molokai, it is found on private land, along the Puu Kolekole jeep road, Kaunakakai Gulch, and Kamiloloa Gulch in a total of six occurrences containing nine individuals on State and privately owned lands (GDSI 2000, HINHP Database 2000).

On Molokai, *Alectryon macrococcus* var. *macrococcus* typically grows on talus slopes or in gulches within dry or mesic lowland forest between elevations of 534 and 1,120 m (1,751 and 3,674 ft). Associated native plants include *Dodonaea viscosa*, *Lipochaeta* sp. (nehe), *Myrsine* sp. (kolea), *Nestegis sandwicensis*, *Nothocestrum* sp. (aiea), *Pleomele* sp. (halapepe), *Psychotria* sp., or *Streblus pendulina* (aiiai) (HINHP Database 2000, Service 1997, Wagner *et al.* 1999).

The threats to *Alectryon macrococcus* var. *macrococcus* on Molokai include habitat degradation by feral goats and pigs; competition from non-native plant species, such as *Melinis minutiflora*, *Pennisetum clandestinum* (kikuyu grass), *Psidium cattleianum*, or *Schinus terebinthifolius*; damage from the black twig borer (*Xylosandrus compactus*); seed predation by rats, mice (*Mus domesticus*), and insects (probably the endemic microlepidopteran (small caterpillar) *Prays* cf. *fulvocanella*); loss of pollinators; and catastrophic extinction through a single natural or human-caused environmental disturbance (e.g., fire) due to the very small remaining number of individuals and their limited distribution on Molokai (HINHP Database 2000, Service 1997, 57 FR 20772).

Bonamia menziesii (NCN)

Bonamia menziesii, a member of the morning glory family (Convolvulaceae) and a short-lived perennial, is a vine with twining branches that are fuzzy when young. This species is the only member of the genus that is endemic to the Hawaiian Islands and differs from other genera in the family by its two styles, longer stems and petioles, and rounder leaves (Austin 1999).

Little is known about the life history of *Bonamia menziesii*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999a).

Historically, *Bonamia menziesii* was known from Kauai, the Waianae Mountains of Oahu, Molokai, Maui, and Hawaii Island. Currently, this species is extant on Kauai, Oahu, Lanai, Maui, and Hawaii. This species was last collected on Molokai in 1918 from Maunaloa by J. F. Rock (HINHP Database 2000).

Nothing is known of the preferred habitat of or native plant species associated with *Bonamia menziesii* on Molokai.

Nothing is known of the threats to *Bonamia menziesii* on Molokai.

Brighamia rockii (pua ala)

Brighamia rockii, a long-lived perennial member of the bellflower family (Campanulaceae), is an unbranched plant with a succulent stem that is bulbous at the bottom and tapers toward the top, ending in a compact rosette of fleshy leaves. This species is a member of a unique endemic Hawaiian genus with only one other species, found on Kauai, from which it differs by the color of its petals, its longer calyx (sepal) lobes, and its shorter flower stalks (Lammers 1999).

Observations of *Brighamia rockii* by Gemmill (1996) have provided the following information: The reproductive system is protandrous, meaning male flower parts are produced before female parts, in this case, separated by several days; only five percent of the flowers produce pollen; very few fruits are produced per inflorescence; there are 20 to 60 seeds per capsule; and plants have been known to flower at nine months of age. This species has been observed in flower during August. Little is known about the life history of this species. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2000, Service 1996a).

Historically, *Brighamia rockii* ranged along the northern coast of East Molokai from Kalaupapa to Halawa and may possibly have grown on Lanai and Maui. Currently, it is only extant on Molokai in a total of 5 occurrences with between 121 and 131 individual plants occurring on State and privately owned lands. It occurs on steep, inaccessible sea cliffs along East Molokai's northern coastline from Anapuhi Beach to Wailau Valley on private lands, and on the relatively inaccessible State-owned sea stack of Huelo, east of Anapuhi Beach (GDSI