

plant taxa include naupaka kuahiwi, 'uki, *Bidens* sp. (ko'oko'olau), and *Freycinetia arborea* ('ie'ie) (HHP 1994i1, 1994i7, 1994i9 to 1994i11).

*Cyanea st. johnii* is threatened by habitat degradation and/or destruction by feral pigs, potential predation by rats, competition with the noxious alien plant Koster's curse, and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining populations and individuals. The plants between the summit of Aiea and Halawa Trail are also threatened by trampling by hikers (HHP 1994i7, 1994i9, 1994i10; J. Lau, C. Russell, and J. Yoshioka, pers. comms. 1994).

In 1945 St. John collected a plant specimen on Oahu that he and W.B. Storey named *Cyrtandra dentata* (St. John and Storey 1950). In the same paper, St. John and Storey also described *Cyrtandra frederickii*, now considered synonymous with *Cyrtandra dentata* (Wagner et al. 1990). The specific epithet refers to the toothed margin of the leaf blades.

*Cyrtandra dentata*, a member of the African violet family (Gesneriaceae), is a sparingly branched shrub ranging from 1.5 to 5 m (5 to 16 ft) tall. Papery in texture, the leaves are broadly elliptic to almost circular or broadly egg-shaped to egg-shaped, 9 to 33 cm (3.5 to 13 in) long, and 3 to 17 cm (1.2 to 6.7 in) wide. Three to nine white flowers are arranged on an inverse umbrella-shaped flower cluster which arises from the leaf axil. The main flower stalk is 25 to 50 mm (1 to 2 in) long and the individual flower stalks are 15 to 33 mm (0.6 to 1.3 in) long. The leaf-like bracts are 12 to 30 mm (0.5 to 1.2 in) long. The tubular portion of the flower is 12 to 25 mm (0.5 to 1 in) long and 4 to 9 mm (0.2 to 0.4 in) in diameter. The upper flower lobes are 2 to 6 mm (0.08 to 0.2 in) long and 3 to 7 mm (0.1 to 0.3 in) wide, while the lower lobes are 3 to 17 mm (0.1 to 0.7 in) long and 4 to 9 mm (0.2 to 0.4 in) wide. The round white berries are 1 to 2.6 cm (0.4 to 1 in) long. This species is distinguished from others in the genus by the number and arrangement of the flowers, the length of the bracts and flower stalks, and the shape of the leaves (Wagner et al. 1990).

*Cyrtandra dentata* was historically known from six populations in the Waianae Mountains and three populations in the Koolau Mountains of Oahu (HHP 1994j1 to 1994j9). Currently this species is found only in the Waianae Mountains in Pahole Gulch and Kapuna Valley on State land (within Pahole NAR) and in Ekahanui Gulch on State and private land (within TNCH's Honouliuli Preserve) (HHP

1994j2, 1994j6, 1994j7). The 3 known populations total fewer than 50 individuals. *Cyrtandra dentata* typically grows in gulches, slopes, or ravines in mesic forest with 'ohi'a, 'ohi'a ha, and *Aleurites moluccana* (kukui) at elevations from 580 to 720 m (1,900 to 2,360 ft) (HHP 1994j2, 1994j6, 1994j7; St. John 1966; Wagner et al. 1990).

Competition with the alien plants Koster's curse and strawberry guava, potential predation by rats, potential fire, and stochastic extinction and/or reduced reproductive vigor, due to the small number of extant populations and individuals, are the major threats to *Cyrtandra dentata* (HHP 1994j6; J. Lau, C. Russell, and J. Yoshioka, pers. comms. 1994).

Hillebrand (1888) collected a specimen on Oahu that he named *Cyrtandra gracilis* var. *subumbellata*. St. John and Storey (1950) elevated the variety to full species status. The authors of the current treatment of the family concur with this designation (Wagner et al. 1990). St. John's (1966) variety *intonsa* is not currently recognized (Wagner et al. 1990). The specific epithet refers to the umbrella-like flowering stalk.

*Cyrtandra subumbellata*, a member of the African violet family, is a shrub 2 to 3 m (6.6 to 10 ft) tall. Papery in texture, the leaves are almost circular to egg-shaped, 12 to 39 cm (4.7 to 15.4 in) long, and 3 to 19 cm (1.2 to 7.5 in) wide. The upper leaf surface is wrinkled, whereas the lower surface has conspicuously raised net-like veins and is moderately covered with white glands. Five to 15 white flowers are densely arranged on an inverse umbrella-shaped flowering stalk which arises from the leaf axil. The main flower stalk is 2 to 8 mm (0.08 to 0.3 in) long. The style is approximately 10 mm (0.4 in) long. The round, white berries are 1 to 1.5 cm (0.4 to 0.6 in) long. This species is distinguished from others in the genus by the number and arrangement of the flowers, the lengths of the style and main flower stalks, and the texture of the leaves (Wagner et al. 1990).

Historically *Cyrtandra subumbellata* was known from six scattered populations in the central Koolau Mountains on the island of Oahu (HHP 1994k1 to 1994k6). This species is now known from three populations in the central Koolau Mountains—Schofield-Waikane Trail and Puu Ohulehule on private and State land and Kaukonahua drainage on Federal land within Schofield Barracks Military Reservation (HHP 1994k2, 1994k5, 1994k6). The total number of plants currently is estimated to be fewer than 50. This species typically grows on moist,

forested slopes or gulch bottoms dominated by 'ohi'a or a mixture of 'ohi'a and uluhe, between 460 and 670 m (1,500 and 2,200 ft) elevation. Associated plant taxa include 'uki, *Adiantum raddiantum*, *Boehmeria grandis* ('akolea), *Broussaisia arguta* (kanawao), and *Thelypteris* sp. (HHP 1994k2, 1994k5, 1994k6; St. John 1966; Wagner et al. 1990).

The primary threats to *Cyrtandra subumbellata* are competition with the noxious alien plant Koster's curse, potential impacts from military activities, potential predation by rats, potential fire, and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of extant populations and individuals (HHP 1994k6; J. Lau, C. Russell, and J. Yoshioka, pers. comms. 1994).

In 1950, St. John and Storey first described *Cyrtandra viridiflora* based on a specimen collected by Joseph Rock in 1911. Other published names now considered synonyms of this species are *Cyrtandra crassifolia* and *C. pickeringii* var. *crassifolia* (Hillebrand 1888, Rock 1918a, St. John 1966, Wagner et al. 1990). The specific epithet refers to the conspicuous green flowers.

*Cyrtandra viridiflora*, a member of the African violet family, is a small shrub 0.5 to 2 m (1.6 to 6.6 ft) tall. The thick, fleshy, heart-shaped leaves are 6 to 15 cm (2.4 to 6 in) long, 3.5 to 7.5 cm (1.4 to 3 in) wide, and have toothed margins. Both the upper and lower surfaces have long, velvety, pale hairs. One to five green flowers are arranged on an inverse umbrella-shaped flowering stalk. The pale green calyx is 12 to 15 mm (0.5 to 0.6 in) long. The round, white berries are 1.3 cm (0.5 in) or longer. This species is distinguished from others in the genus by the leaves, which are thick, fleshy, heart-shaped, and densely hairy on both surfaces (Wagner et al. 1990).

Historically *Cyrtandra viridiflora* was known from seven scattered populations in the Koolau Mountains on the island of Oahu (HHP 1994L1 to 1994L7). This species is now known only from four populations in the northern Koolau Mountains—Kawainui-Laie summit divide, Kawainui-Kaipapau summit divide, Maakua-Kaipapau Ridge, and the Peahinaia Trail. A total of fewer than 10 plants is known from these 4 populations on State land and private land leased by the DOD for Kawaihoa Training Area (HHP 1994L4 to 1994L7). *Cyrtandra viridiflora* is usually found on wind-blown ridge tops in cloud-covered wet forest or shrubland at elevations of 690 to 850 m (2,260 to 2,800 ft). Associated plant taxa include kanawao,