Jacquemontia sandwicensis ‘Puhala Bay’: A Compact Maui Island Selection of Pā‘ūohi‘iaka with Gray-green Wavy Leaves

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The demand for native plants in Hawaii has increased in the past two decades as a result of state laws that promote their use in publicly funded landscaping projects. In 2015, a revised bill called Act 233(15) was passed and sets a timeline for increasing the minimum percentage of native plants in designs and specifications from 10% by 1 Jan. 2019 to 35% by 1 Jan. 2030 (Hawaii State Legislature, 2015). In addition, the law also specifies that wherever and whenever possible, plants used for projects should be sourced from the island or ahupua‘a (a Hawaiian system of subdividing land) where it is found or known to occur. As a result of these revisions, the demand for source-identified Hawaiian plant selections is expected to increase. Collection, selection, and evaluation of island-specific phenotypes must be done to meet this demand.

The vine *Jacquemontia sandwicensis* A. Gray (Convolvulaceae) is endemic to the coasts of the Hawaiian Islands. It was formerly classified as a subspecies of *J. ovalifolia* (Vahl ex West) Hallier f., but a recent study by Namoff et al. (2010) supports it as a distinct species (Shay and Drake, 2018). It

typically grows up to 3 m long and is found near the ocean, especially on the leeward sides of the islands, in dry plains, rocky slopes, and barren lava flows from sea level to 30.4 m (Robertson, 1974; Wagner et al., 1999). In Hawaii, *J. sandwicensis* is called pā‘ūohi‘iaka. The name translates to “Hi‘iaka’s skirt” in reference to Hi‘iaka, one of the goddess sisters of Pele, the Hawaiian goddess of fire and volcanoes (Bornhorst, 2005; Elliot and Tamashiro, 2009).

During the past two decades, *J. sandwicensis* has been promoted and used as a native groundcover for landscaping. Its tolerance to wind, salt spray, and saline soils makes it useful for exposed locations near the beach (Bezóna et al., 2009). According to Bornhorst (2005), it can also do well in large containers and hanging baskets.

In situ, *J. sandwicensis* populations and individuals can exhibit morphological variability. Stems, leaves, inflorescence branches, and calyces are glabrous to densely tomentose (Robertson, 1974). Stem color also varies from purple to yellow-green (Degener and Degener, 1956). Flower color ranges from white to pale blue, and leaf shape is elliptic to suborbicular (Wagner et al., 1999). Recent morphological characterization of six accessions collected from the islands of Oahu, Maui, and Hawaii indicate that plants with pubescent leaves tend to exhibit suborbicular leaves, whereas plants with glabrous leaves tend to exhibit elliptic leaves (Antesco and Baldos, 2020).

The development of *J. sandwicensis* horticultural selections has been limited despite the existence of morphological variability. To our knowledge, no selections of the species have been named for use in containers and landscapes. In 2016 and 2017, six accessions of *J. sandwicensis* were collected from

cultivated and wild sources on the islands of Hawaii, Maui, and Oahu. Antesco and Baldos (2020) characterized these accessions and identified suitable selections for hanging baskets.

Origin

‘Puhala Bay’ originated from seeds that were collected from a wild population in north Maui in April 2016. Plants from that collection were grown and maintained at the Maui Nui Botanical Gardens (MNBG) in Kahului. In July 2017, stem cuttings were harvested at MNBG from a plant originating from that collection and were brought to the University of Hawaii at Manoa’s Magoon Research Facility in Honolulu for stock-plant increase. Morphological characterization and hanging basket evaluations were conducted by Antesco and Baldos (2020) from 2017 to 2018 and ‘Puhala Bay’ was identified as a promising accession in 2018.

Description

Descriptions of ‘Puhala Bay’ were based on plants grown and evaluated by Antesco and Baldos (2020). Four- to six-node cuttings were treated with 1000 ppm indole-3-butyric acid (Hormex 1; Maia Products Inc., Westlake Village, CA) and rooted under mist in a 1:1 (v/v) mix of perlite and vermiculite. Rooted cuttings were transplanted in Deepot Cells D40H (volume, 656 mL; Stuewe and Sons, Tangent, OR) filled with a 1:1 (v/v) mix of coconut coir and 1.9-cm-diameter black cinder. Growing media were also amended with controlled-release fertilizer (13N–4.8P–9.1K, Nutricote; Arysta LifeScience America Inc., New York, NY) at a rate of 6.992 g·mL⁻¹. Plants were grown under full sun conditions, with sprinkler irrigation delivering 220 mL water daily. After 1 month, plants were potted into 15-cm pots with the same media and rate of controlled-release fertilizer, and were grown again for another month. Plants were then pruned back 10 cm from the base of the stem and allowed to regrow for 1 month before characterization.

‘Puhala Bay’ has dense pubescence that casts a grayish-green or silver-green tint to the plant when viewed at a distance. Stems are densely pubescent and yellow green [Royal Horticultural Society (RHS) 145D] (Royal Horticultural Society, 2007). Leaves are densely pubescent, thick (0.5 mm, on average), and suborbicular (3.6 cm long and 3.0 cm wide, on average). Among the six accessions characterized by Antesco and Baldos (2020), ‘Puhala Bay’ is the only one with a wavy/undulate leaf margin. This unique leaf characteristic adds ornamental value, even when the plant is not in flower. Flowers of ‘Puhala Bay’ are violet blue (RHS 91B) and have an average diameter of 11.3 mm. Plants characterized 1 month after pruning have 19 flowers per plant (Antesco and Baldos, 2020). Capsules are 4 to 6 mm in diameter (Wagner et al., 1999) and do not contribute any ornamental value.

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Fig. 1. *Jacquemontia sandwicensis* 'Puhala Bay' used as a landscape groundcover (**top**) and as a potted plant in a 20.32-cm hanging basket (**bottom**).

Compared with other accessions, 'Puhala Bay' exhibits a compact growth habit resulting from short internode lengths (1.2 cm, on average). It is also responsive to pinching and pruning. Pruning resulted in a greater number of lateral branches compared with other accessions (Antesco and Baldos, 2020). Because of these characteristics, it can be used as a container plant and as a groundcover (Fig. 1).

Propagation

'Puhala Bay' is propagated easily using simple or compound (serpentine) layering, or by cuttings. Cutting propagation is accomplished using 4- to 6-node stem sections with leaves and preformed root initials (Antesco and Baldos, 2020). To improve rooting, flowers and peduncles need to be removed. Rooting hormone is not required (Bornhorst, 2005). Cuttings could either be rooted in well-drained rooting media before transplanting or planted directly in a pot with moist potting mix. Propagating under mist conditions is detrimental because the dense pubescence on the leaves can hold too much water and leads to rotting (Antesco, 2019). Rooting under subirrigated conditions can result in 90% rooting (O. Baldos, personal observation). Cuttings can be potted 3 weeks after propagation and transplanted 4 weeks after potting.

Availability

'Puhala Bay' is made available in Hawaii by the University of Hawaii and the Maui Nui Botanical Gardens. Cuttings can be made available to interested nurseries in the state. Contact Orville Baldos (e-mail: obaldos@hawaii.edu) or Maui Nui Botanical Gardens for inquiries.

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