

New naturalized record of *Kalanchoe glaucescens* on O‘ahu (Crassulaceae)¹

BRANDON NAJARIAN 

*Pacific Cooperative Studies Unit, University of Hawai‘i at Mānoa, 3190 Maile Way, Honolulu,
Hawai‘i 96822-2243, USA; najarian@hawaii.edu*

NOELLE MARTIN 

*Pacific Cooperative Studies Unit, University of Hawai‘i at Mānoa, 3190 Maile Way, Honolulu,
Hawai‘i 96822-2243, USA; noellejm@hawaii.edu*

ASHLEY OKINAKA 

*Pacific Cooperative Studies Unit, University of Hawai‘i at Mānoa, 3190 Maile Way, Honolulu,
Hawai‘i 96822-2243, USA; aokinaka@hawaii.edu*

KEVIN FACCENDA 

*Herbarium Pacificum, Bishop Museum, 1525 Bernice Street, Honolulu, Hawai‘i 96817-2704;
kevin.faccenda@bishopmuseum.org*

RONEN SHTEIN 

*Steinhardt Museum of Natural History of the Tel Aviv University, Klausner Street 12, Tel Aviv-Yafo,
Israel 6997801; ron3nshtein@gmail.com*

JESSICA IDLE 

*Pacific Cooperative Studies Unit, University of Hawai‘i at Mānoa, 3190 Maile Way, Honolulu,
Hawai‘i 96822-2243, USA; jjidle@hawaii.edu*

SHAYA HONARVAR

*Pacific Cooperative Studies Unit, University of Hawai‘i at Mānoa, 3190 Maile Way, Honolulu,
Hawai‘i 96822-2243, USA; honarvar@hawaii.edu*

Kalanchoe glaucescens was incidentally discovered in 2026 as a naturalized species on O‘ahu while the authors were hiking Kauaopu‘u Ridge in Wai‘anae Valley, where it has naturally dispersed on rocky outcrops and along the ridgeline. This species has a relatively broad distribution and is native to eastern Africa and the Arabian Peninsula. The material was identified by Brandon Najarian and Ronen Shtein. A specimen is stored at BISH, documenting its naturalization.

Crassulaceae

Kalanchoe glaucescens Britten

New state record

In March 2025, several unusual individuals of *Kalanchoe* were observed on Kauaopu‘u Ridge in Wai‘anae Valley on O‘ahu (Figure 1a). The U.S. Navy manages this area, and it is not accessible to the public. Kauaopu‘u Ridge is characterized by rugged basaltic terrain, exposed rock outcrops, shallow soils, and precipitous slopes prone to erosion and rockfall. Vegetation is representative of a lowland, dry-to-mesic shrubland, consisting of a mosaic of native and non-native species. Native species occur intermittently along the ridge, while invasive grasses and shrubs are present throughout, contributing to increased competition and fire risk.

1. Contribution No. 2026-010 to the Hawaii Biological Survey.

The exposed ridgeline is subjected to high winds, extended drought conditions, and intense rainfall events that can trigger soil erosion and debris falls. Access to the site is limited by the steep terrain and narrow ridgeline, which has likely contributed to the persistence of remnant native vegetation despite ongoing threats from invasive species, ungulate disturbance, and stochastic environmental events. Approximately 12 *Kalanchoe* individuals were observed at ca. 300 m elevation along a largely exposed ridgeline near the summit of Kauaopu'u. Juvenile plants exhibited succulent, rounded leaves that become oblong to ovate at maturity, with the leaf blades often folded upwards with the abaxial surface facing the sun (Figure 1). However, none of the approximately eight individuals were in flower at the time of the initial observation, making identification difficult. The plants were still in a vegetative state on a subsequent visit in June 2025.

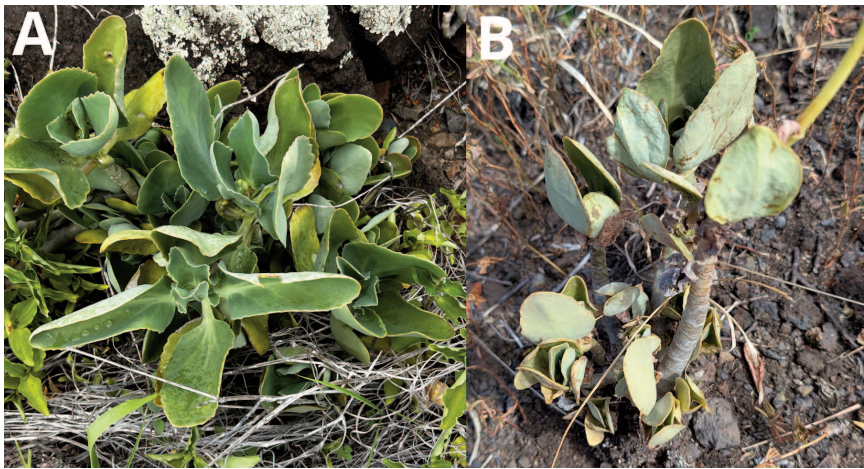


Figure 1. Leaf morphology of juvenile and mature individuals of *Kalanchoe glaucescens*, illustrating ontogenetic variation in leaf shape and size. **A**, after recent rains. **B**, at the end of the dry season; note streaking disease scars on lower leaf surface, especially towards the top left. Photograph A was taken on 4 March 2025, and Photograph B was taken on 23 June 2026.

One year later, in June 2026, following two Kona Low storms in March, surveyors documented two individuals in flower near the summit (Figure 2). The presence of reproductive structures allowed the plants to be positively identified as *Kalanchoe glaucescens* using the description by Britten (1871) and by comparison with the species description provided by Smith and Figueiredo (2017).

Vegetative populations of this *Kalanchoe* have also been documented in Makua-Kea'au, approximately 8 km NW from the Kauaopu'u site, where they are growing on a dry, west-facing roadcut with a population of ca. 100 plants. It is likely that further populations exist throughout the leeward Wai'anae range. The Makua-Kea'au population has been monitored by KF since 2021 and has yet to be observed in flower. The population at Makua-Kea'au is affected by an unidentified foliar disease that causes extensive scarring of the leaf surface. Similar symptoms were also observed in the Kauaopu'u population (Figure 1b). When plants from this population were brought into cultivation by KF with the goal of

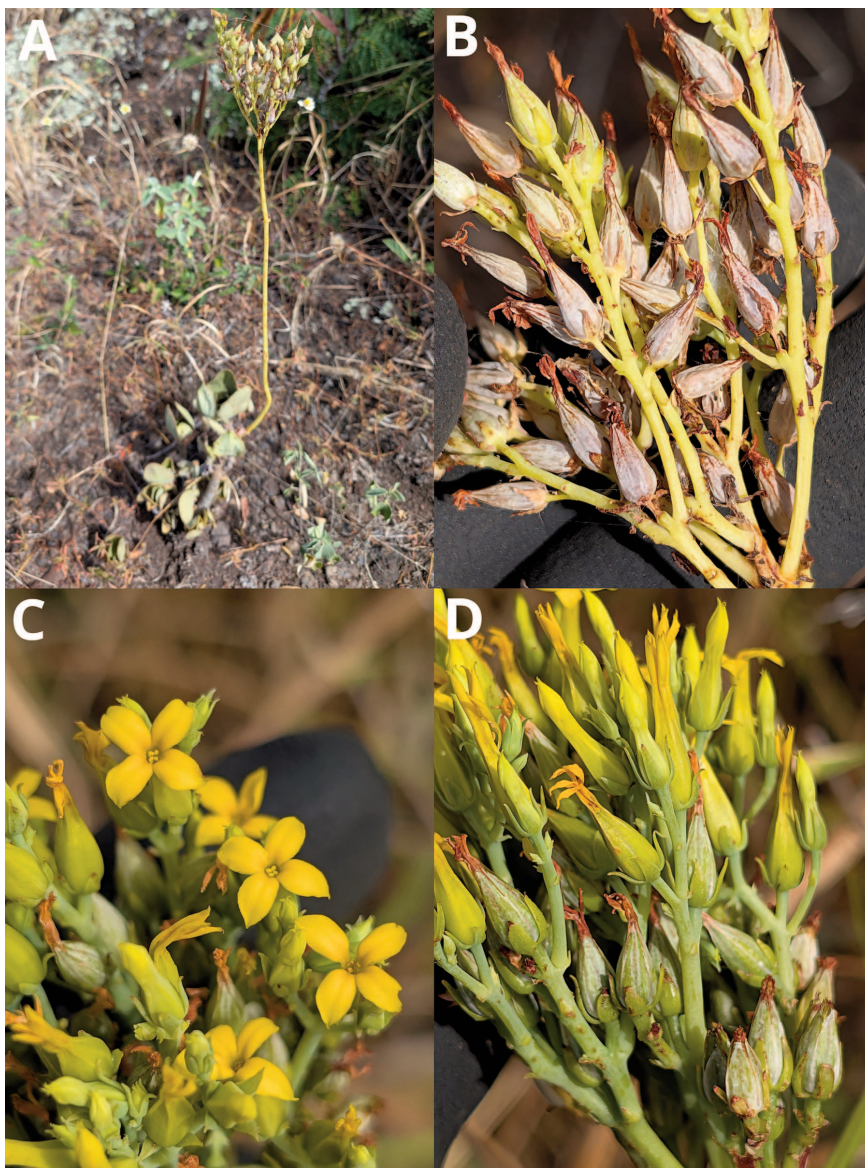


Figure 2. *Kalanchoe glaucescens* in situ collected and submitted as voucher material to the Herbarium Pacificum, Bernice P. Bishop Museum. **A**, habit with inflorescence. **B**, immature fruits. **C**, flowers, top view. **D**, flowers, lateral view. Photographs taken on 23 June 2026.



Figure 3. Habitat of *Kalanchoe glaucescens* along the ridgeline of Kauaopu'u, Wai'anae Valley, O'ahu, Hawai'i.

producing a flower for positive identification, the disease flared, ultimately killing the plant and further spreading to plants of *Kalanchoe daigremontiana* cultivated adjacent to it.

Initially, the authors identified the species as *Kalanchoe paniculata* based on the description provided by Smith and Figueiredo (2017). Because no comprehensive, accepted dichotomous key is currently available for the African taxa, Gideon Smith, co-author of that publication, was consulted via personal correspondence on 25 June 2026. In his response on 26 June, Smith indicated that the specimen likely represented a different, as-yet-unidentified species of *Kalanchoe*, based on several morphological characteristics (G. Smith, pers. comm. 2026). After further discussion, Ronen Shtein, a PhD student from the Steinhardt Museum of Natural History studying *Kalanchoe* species, provided an identification.

In contrast, *K. glaucescens* has very little published information regarding its morphological features. However, Britten (1871) described it as having stems that are terete and glabrous, occasionally producing elongate, ascending, pubescent branches that are nearly leafless below, reaching 0.6 m or more in height. The lower leaves are narrowly ovate, irregularly crenate, obtuse, and glabrous, measuring up to 12.5 cm long and gradually narrowing into broadly amplexicaul petioles. The inflorescence is glabrous and glaucous, with red to dark yellow flowers arranged in compact 2–3-chotomous panicles or in few-flowered peduncles arising from the upper nodes. The calyx lobes are glabrous, lanceolate, acute to subacute, somewhat spreading, and united at the base. The corolla tube is approximately 12.5 mm long, with short, narrowly ovate, acute lobes. The carpels are

glabrous and approximately 12.5 mm long, the squamae are brown, subacute, and about 4.2 mm long, and the seeds are oblong, dark brown, and approximately 1.1 mm long.

On O‘ahu, the species exhibits a strong affinity for rocky, open habitats within savanna vegetation and appears to have a limited ability to establish in dense grasslands, where competition from annual and perennial grasses may restrict recruitment and persistence.

The habitat occupied by the Kauaopu‘u population is consistent with the species’ documented ecology throughout its native range in eastern Africa and the Arabian Peninsula. The plants occur on a narrow, rocky ridgeline characterized by exposed basalt outcrops, shallow soils, and sparse vegetation, conditions that closely resemble the open, rocky hilltop habitats favored by the species in its native savanna ecosystems (Figure 3). The absence of dense grass cover at the site may also facilitate establishment and persistence via limited competition.

Kalanchoe glaucescens is traditionally used in African folk medicine to treat coughs and rheumatism, with crude extracts or freshly expressed plant juice administered either internally or externally, depending on the ailment (Kolodziejczyk-Czepas & Stochmal 2017). Although its ethnomedicinal use has received relatively little scientific attention, pharmacological investigations have yielded promising results. In a comparative study evaluating 57 extracts from 18 plant species, *K. glaucescens* exhibited the second-highest antioxidant activity and demonstrated considerable cytotoxicity against leukemia cells, suggesting that the species contains bioactive compounds with potential therapeutic value (Adam *et al.* 2018).

Studies investigating the effects of photosynthetic daily light integral (DLI) on the growth and flowering of six *Kalanchoe* species included *K. glaucescens* (Currey & Erwin 2011a). The species exhibited a facultative irradiance response, with node number decreasing as DLI increased, while stem length and dry biomass increased under higher light levels. In a subsequent study, *K. glaucescens* was classified as a short-day obligate species, requiring photoperiods of 13 hours or less for one week to induce flowering (Currey & Erwin 2014). These findings provide guidance for optimizing greenhouse production of high-quality flowering plants for use as potted ornamentals and bedding plants.

Kalanchoe species are cultivated worldwide as ornamental plants and are commonly grown as landscape plants, potted plants, and cut flowers in private gardens, public landscapes, and botanical gardens. In 2016, they were ranked the second most popular potted plant in Europe (Mackenzie *et al.* 2018). In addition to its documented medicinal uses, *K. glaucescens* has also been identified as having ornamental potential as a flowering potted plant (Currey & Erwin 2011b).

Although little has been documented regarding the distribution of *K. glaucescens* outside its native range, its ornamental value provides a plausible pathway for introduction to Hawai‘i. The species is reportedly present in the horticultural trade elsewhere in the United States (Currey & Erwin 2010) and was introduced to Hawai‘i for ornamental purposes (POH 2026). The timing of its introduction is unknown, and no herbarium specimens were deposited at BISH prior to those collected in this study. Available evidence suggests that *K. glaucescens* is only rarely cultivated in Hawai‘i, as it is absent from the treatments of Staples & Herbst (2005), Wagner *et al.* (1990), and Imada *et al.* (2025), and no earlier BISH specimens are known.

Outside Hawai‘i, *K. glaucescens* is cultivated in Central America (Davidse *et al.* 2015) and has been reported as naturalized in Mexico and Costa Rica (POWO 2026), although

little information is available regarding the ecology or spread of these naturalized populations. As with many *Kalanchoe* species, reproduction is characterized by prolific seed production, with some species producing up to 20,000 seeds. Seeds and plantlets are dispersed locally by rain-induced surface runoff and may be transported longer distances along watercourses during flooding. Secondary dispersal may also occur through epizoochory, as the minute seeds adhere to the fur or feathers of passing animals. Observations of populations established uphill and above flood lines further suggest that animal-mediated dispersal may facilitate spread beyond hydrological pathways (Hannah-Jones & Playford 2002).

Material examined. O'AHU: Kauaopu'u Ridge, vegetation representative of a lowland dry to mesic shrubland, 2 flowering individuals, ca. 8 other individuals of varying maturity and size seen nearby and on rocky outcrops below, 300 m, 21.468033, -158.147163, 2 July 2026, *B. Najarian s.n.* (BISH 804840).

REFERENCES

- Adam, M., Elhassan, G.O.M., Yagi, S., Senol, F.S., Orhan, I.E., Ahmed, A.A. & Efferth, T. 2018. In vitro antioxidant and cytotoxic activities of 18 plants from the Erkowit region, eastern Sudan. *Natural Products and Bioprospecting* **8**(2): 97–105.
<https://doi.org/10.1007/s13659-018-0155-0>
- Currey, C.J. & Erwin, J.E. 2010. Variation among *Kalanchoe* species in their flowering responses to photoperiod and short-day cycle number. *The Journal of Horticultural Science and Biotechnology* **85**(4): 350–354.
<https://doi.org/10.1080/14620316.2010.11512679>
- Currey, C.J. & Erwin, J.E. 2011a. Photosynthetic daily light integral impacts growth and flowering of several *Kalanchoe* species. *HortTechnology* **21**(1): 98–102.
<https://doi.org/10.21273/horttech.21.1.98>
- Currey, C.J. & Erwin, J.E. 2011b. Photoperiodic flower induction of several *Kalanchoe* species and ornamental characteristics of the flowering species. *HortSci* **46**(1): 35–39.
<https://doi.org/10.21273/hortsci.46.1.35>
- Currey, C.J. & Erwin, J.E. 2014. Basics and beyond: new *Kalanchoe* for cultivation. *Greenhouse Grower* **32**(13): 56–60.
<https://www.greenhousegrower.com/crops/basics-beyond-new-kalanchoe-for-cultivation/>
- Davidse, G., Sousa Sánchez, M., Knapp, S. & Chiang Cabrera, F. (eds.). 2015. *Flora Mesoamericana*. Vol. 2. Part 3. Saururaceae a Zygophyllaceae. Missouri Botanical Garden, St. Louis. 347 pp.
- Hannah-Jones, M.A. & Playford, J. 2002. The biology of Australian weeds 40. *Bryophyllum* Salisb. species. *Plant Production Quarterly* **17**(2): 42–57.
<https://caws.org.nz/PPQ%2017/PPQ%2017-2%20pp042-57%20HannanJones.pdf>
- Imada, C.T., Faccenda, K., Thomas, M.K., Gallaher, T., Oppenheimer, H., Kennedy, B. & Arthur, K. (eds.). 2025. Hawaiian native & naturalized vascular plants checklist (2025 update). *Bishop Museum Technical Report* **75**, 480 pp.
<https://hbs.bishopmuseum.org/publications/pdf/tr75.pdf>
- Kołodziejczyk-Czepas, J. & Stochmal, A. 2017. Bufadienolides of *Kalanchoe* species: an overview of chemical structure, biological activity and prospects for pharmacological use. *Phytochemistry Reviews* **16**(6): 1155–1171.
https://doi.org/10.1007/978-3-319-90698-0_19

-
- Mackenzie, K.K., Lütken, H., Coelho, L.L., Kaaber, M.D., Hegelund, J.N. & Müller, R.** 2018. *Kalanchoë*, pp. 453–479. In: Van Huylbroeck, J. (ed.), *Ornamental crops*, Springer International Publishing, Cham, Switzerland.
- Britten, J.** 1871. *Kalanchoe glaucescens*, pp. 393–394. In: Oliver, D. (ed.), *Flora of tropical Africa*. Vol. 2. L. Reeve and Co., London.
<https://www.biodiversitylibrary.org/page/407370>
- POH (Plants of Hawai‘i).** 2026. *Kalanchoe glaucescens*. Available from: <https://www.plantsofhawaii.org/detail/%7B3EE8E3A9-AE88-4505-B85F-B6B16FC99D17%7D>. (Accessed 29 Jul 2026).
- POWO.** 2026. *Plants of the world online*. Facilitated by the Royal Botanic Gardens, Kew. Available from: <https://powo.science.kew.org/> (Accessed 29 Jul 2026).
- Smith, G. & Figueiredo, E.** 2017. The identity of *Kalanchoe paniculata* Harv. (Crassulaceae), a common species in southeastern and south-tropical Africa. *Haseltonia* 2017(23): 72–78.
<https://doi.org/10.2985/026.023.0110>
- Staples, G.W. & Herbst, D.R.** 2005. *A tropical garden flora: plants cultivated in the Hawaiian Islands and other tropical places*. Bishop Museum Press, Honolulu. 908 pp.
- Wagner, W.L., Herbst, D.R. & Sohmer, S.H.** 1990. *Manual of the flowering plants of Hawai‘i*. University of Hawai‘i Press & Bishop Museum Press, Honolulu. 1,919 pp.