

NEW RECORDS FOR THE FLORA OF ARIZONA

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ARALIACEAE

Hydrocotyle umbellata L., commonly known as Manyflower Marsh Pennywort, is an aquatic emergent that grows in slow moving water, marshes, ponds, and in some regions, lawns. The genus *Hydrocotyle* was previously included in Apiaceae, but is now placed in Araliaceae under the 2016 Angiosperm Phylogeny Group IV system (APG IV 2016). We recently discovered numerous populations growing in ditches and ponds at the City of Phoenix Tres Rios Wetlands, a managed wetland project that incorporates treated effluent released from the nearby 91st Avenue Wastewater Treatment Plant (City of Phoenix 2016, US Army Corps of Engineers 2010).

Previously collected specimens near this site and at the City of Phoenix Rio Salado Habitat Restoration Area Demonstration Wetlands, about ten miles east of Tres Rios, were incorrectly identified as *H. verticillata* by Poznik in 2003, Jenke in 2007, and Olmon in 2009 (Poznik 8, Jenke 53, Olmon 31, all at ASU). Both *H. umbellata* and *H. verticillata* have round, glossy, peltate leaves with shallowly crenate edges attached to a long petiole, but the differing types of inflorescences easily distinguish the two species: *H. umbellata* flowers are arranged in one simple umbel, while *H. verticillata* bears verticils, or several small whorls of flowers arranged along the inflorescence axis (Fig. 1). The plants spread from submerged stolons rooted in mud to create extensive floating mats along edges of ponds at Tres Rios Wetlands. Confusion about the identity of this Pennywort probably occurred because *H. umbellata* would match the characters in the key and description for *H. verticillata* using our primary botanical reference for Arizona, Arizona Flora (Kearney and Peebles 1960), while *H. umbellata* is not treated in the key.

These are the first collections of *Hydrocotyle umbellata* in Arizona, although it is broadly established in southern California and Texas, as well as throughout the eastern United States up to Nova Scotia, Canada (USDA NRCS 2016, Brouillet et al. 2010). It is possible that *H. umbellata* has somehow been overlooked until now, since natural distribution would be unlikely to “skip” wetlands in Arizona and New Mexico,

especially given that dispersal is facilitated by migratory birds. We speculate that *H. umbellata* was unintentionally introduced during the Tres Rios Wetlands restoration projects since all collections have been found post-construction near the Salt River/Gila River confluence.

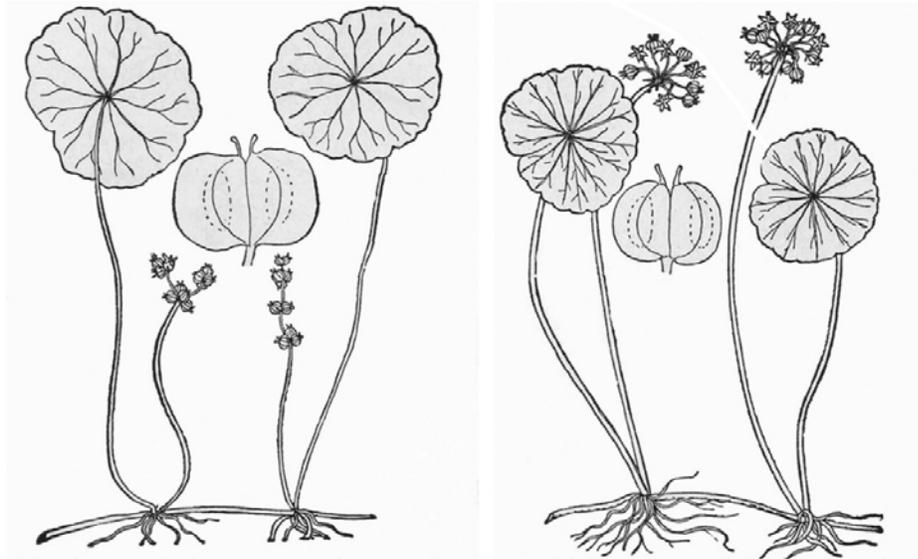


Figure 1. Left: *Hydrocotyle verticillata* with verticillate inflorescences. Right: *H. umbellata* with umbel inflorescences. From Britton & Brown. 1936. An Illustrated Flora of the Northern United States, Canada and the British Possessions. Vol. II. Second Edition. Lancaster Press, Inc. Lancaster, PA.

CRASSULACEAE

Bryophyllum daigremontianum (Raym.-Hamet & H. Perrier) A. Berger, a succulent plant native to Madagascar, is a common ornamental in the horticultural trade. Folk names include “Kalanchoe,” “Alligator Plant,” “Devil’s Backbone,” and “Mexican Hat Plant,” but “Mother-of-thousands” may be the most common colloquial reference because of the vegetatively produced plantlets that sprout along the edge of the leaves. In Arizona, specimens have been documented from what appear to be cultivated plants only.

Our new record (*Darrow 1202*, ASU) documents what appears to be a feral population in the common area of an apartment complex in Tempe, found while conducting surveys for the Central Arizona Phoenix Long Term Ecological Research Survey 200 program (CAP-LTER Survey 200) (CAP-LTER 2016). This record is significant because the species is known to easily escape from cultivation, and has thus become naturalized in tropical and subtropical regions, including southern Florida, Hawaii and Western Australia (USDA NRCS 2016, New South Wales Government Department of Primary Industries 2015). Although it is not frost tolerant, it is well-adapted to drought conditions. Our record is likely one of several small populations in the urban area, or a nucleus from which it could spread. Local master gardener, Deborah Sparrow (personal communication) verifies that *Bryophyllum daigremontianum* is commonly traded and planted throughout the urban area, especially around Tempe, and is established in our urban climate where it has sufficient shade and appropriate microclimate.

MALVACEAE

Malvastrum coromandelianum (L.) Garcke, commonly known as Threelobe False Mallow, is regarded as a pantropical weed, having spread from its origins in central South America to warm climates on all continents except for Antarctica (Hill 1982). In the U.S., collections have been documented for several southeastern and northeastern states, as well as Hawaii, but the first known record for Arizona was collected in April 2015 while conducting surveys for the CAP-LTER Survey 200 (*Darrow 1200*, ASU). We discovered sprawling, procumbent mats of this suffrutescent perennial volunteering in a non-irrigated lawn in central Phoenix on the property of a private school. Specimens were also collected in fruit and flower in July of 2015 (*Boydston & Holland s.n.*, ASU). There are possibly other populations of this plant throughout the metropolitan area, since it is well adapted to disturbance and is known as a “yard weed,” however, none were found during a subsequent search of adjacent irrigated lawns on the same property in February of 2016.

Malvastrum coromandelianum is similar to a closely related species found in southern Arizona and Mexico, *M. bicuspidatum*. *Malvastrum coromandelianum* can be distinguished by the mostly simple hairs concentrated on the veins of the ventral surface of the leaves. In contrast, *M. bicuspidatum* has scattered stellate hairs on the underside of the leaves (Fig. 2). The shape and ornamentation of the mericarps is also distinctive: *M. coromandelianum*'s mericarps have a slender apical spur, or cusp, in addition to two distal cusps, hence the common name “Threelobe,” referring to the cusps. *Malvastrum coromandelianum* also has numerous stiff erect hairs along the apical portion of the mericarps. The mericarps of *M. bicuspidatum* have fewer and shorter apical hairs and no apical cusp. The prostrate habit, flowers, and leaves of *M. coromandelianum* also superficially resemble another weedy Malvaceae, *Sida abutilifolia* P. Mill.

Malvastrum coromandelianum is a cosmopolitan species and sometimes an agricultural invasive, whereas, in Arizona, *M. bicuspidatum* is restricted to canyons of only a few mountain ranges in the central and southern part of the state (SEINet 2016). The similarities make for an interesting case study in how and why certain species become more widespread after human-caused introduction.



Figure 2. A comparison of leaf vestiture of *Malvastrum bicuspidatum* (left) and *M. coromandelianum* (right). Note scattered branching hairs of *M. bicuspidatum* and simple hairs mostly along veins of *M. coromandelianum*.

LITERATURE CITED

- APG IV. 2016. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants. *Botanical Journal of the Linnean Society* 181:1–20.
- Brouillet et al. 2010+. *Hydrocotyle umbellata* L. in VASCAN, the Database of Vascular Plants of Canada.
<http://data.canadensys.net/vascan/taxon/9214> [accessed July 2016]
- Central Arizona Phoenix Long Term Ecological Research (CAP-LTER). 2016. Ecological Survey of Central Arizona. <https://caplter.asu.edu/research/long-term-monitoring/survey-200/> [accessed July 2016]
- City of Phoenix. 2016. Wetlands Project Info.
www.phoenix.gov/waterservices/tresrios/wetlandsinfo [accessed June 2016]
- Hill, S.R. 1982. *A Monograph of the Genus Malvastrum A. Gray (Malvaceae: Malveae)*. *Rhodora* 84:837.
- Kearney, T.H. and R.H. Peebles. 1960. *Arizona Flora, second edition with supplement*. University of California Press, Berkeley, CA.
- New South Wales Government Department of Primary Industries. 2015. Mother-of-millions (*Brophyllum* species). <http://weeds.dpi.nsw.gov.au/Weeds/Details/93> [accessed July 2016]
- Southwest Environmental Information Network (SEINet) Arizona Chapter. 2009–2016. <http://swbiodiversity.org/seinet> [accessed June 2015–June 2016]
- US Army Corps of Engineers (Los Angeles District) and City of Phoenix Water Services Department. 2010. Tres Rios Phase 3 Ecosystem Restoration Project Phoenix, Arizona.
http://www.fcd.maricopa.gov/pub/docs/scanfcdlibrary%5CA126_981_TresRiosPhase3EcosystemRestorationProjectPhoenixArizona.pdf [accessed June 2016]
- USDA NRCS. 2016. The PLANTS Database. National Plant Data Team, Greensboro, NC 27401-4901 USA. <http://plants.usda.gov> [accessed July 2016]