Wetterer, J.K. 2022. A naturalized population of *Melastoma malabathricum* in Martin County, Florida. Phytoneuron 2022-51: 1–8. Published 28 October 2022 ISSN 2153 733X

A NATURALIZED POPULATION OF *MELASTOMA MALABATHRICUM* IN MARTIN COUNTY, FLORIDA

JAMES K. WETTERER
Wilkes Honors College
Florida Atlantic University
5353 Parkside Drive
Jupiter, Florida 33458
wetterer@fau.edu

ABSTRACT

Melastoma malabathricum, an evergreen shrub native to Asia, has been documented only once outside of cultivation in the continental USA — in Martin Co., Palm City, Florida, in 2000. Here, I report a well-established *M. malabathricum* population in Stuart, Florida, about 4 kilometers from the Palm City site. I found no *M. malabathricum* growing at any of the other sites that I searched in Palm City, Stuart, nor anywhere else.

The Malabar melastome, *Melastoma malabathricum* L. (Melastomataceae) (Figs. 1–2), is an evergreen shrub native to Asia, where it is often considered a noxious weed. The purple/lavender flowers have five or six petals and distinctive dimorphic stamens (Fig. 2). The purple stamens with yellow bases appear to be primarily for reproduction, while brightly contrasting yellow stamens appear to be primarily for attracting pollinators and providing them with a pollen food reward (Fig. 1). Luo et al. (2008) found that "pollen from the purple 'fertilization' stamens is dramatically more likely to land on stigmas than pollen from the yellow 'feeding' stamens." The fruit of *M. malabathricum* (Fig. 1) are edible but stain one's mouth black (pers. obs.). In Latin, "*melastoma*" means "black mouth" and "*malabathricum*" means "from Malabar" (a region on the southwestern coast of India).

In its native range, the roots, stems, leaves, and flowers of *Melastoma malabathricum* are used in many traditional medicines (Joffry et al. 2012; Zhang et al 2021). Due to its ability to bio-accumulate metals, including aluminum, lead, arsenic, and uranium, *M. malabathricum* is sometimes grown for soil remediation (Selamat et al. 2014; Saat et al. 2015). In much of Asia, however, *M. malabathricum* is considered "a serious weed in many crops, derelict and abandoned farmlands, and arable lands" (Faravani & Bakar 2007). This species can also dominate natural areas in its native range. For example, in Way Kambas National Park, Indonesia, *M. malabathricum* covers 88% of the Kalibiru Swamp (Master et al. 2020).

There is disagreement over the taxonomic boundaries of *Melastoma malabathricum*. Corner (1939) wrote that "On account of the great variation among the plants which must be identified as *M. malabathricum* in the wide sense, no satisfactory classification of them has been proposed ... My observations tend to show that these variations are not correlated so that very many forms must be distinguished if one is to distinguish any: and all these are probably mutually fertile and thus constitute one natural species." In fact, Ng et al. (2020) wrote that in the genus *Melastoma* "natural hybridisation has been observed to happen whenever two or more species co-occur." Meyer (2001) listed 66 synonyms of *M. malabathricum* subsp. *malabathricum.* Plants of the World Online currently lists 44 synonyms of *M. malabathricum* subsp. *malabathricum* (Kew 2022).

In the New World, *Melastoma malabathricum* has been reported as an exotic in Cuba and Jamaica (Acevedo-Rodríguez & Strong 2012). It has been reported as a common invasive species in Hawaii (Plucknett & Stone 1961). However, the weedy *Melastoma* species in Hawaii is considered by some to be *Melastoma septemnervium* Lour. (e.g., Conant & Hirayama 2001) or *Melastoma candidum*

D. Don (e.g., Zimmerman et al. 2008). Meyer (2001) reported records of both *M. malabathricum* subsp. *malabathricum* and *M. septemnervium* in Hawaii (and considered *M. candidum* to be a synonym of *M. septemnervium*). The Florida Department of Agriculture and Consumer Services includes *M. malabathricum* on its "Noxious Weed List" (FDACS 2020) and the U.S. Department of Agriculture (USDA 2022) designates *M. malabathricum* as a "Federal Noxious Weed." Despite its status as a "Federal Noxious Weed," seeds of *M. malabathricum* are available for purchase from online sites.

Outside of cultivation in the continental USA, *Melastoma malabathricum* is known only from a single collection (USF): **Florida**. "Martin County: Danforth Park. Located on the northwest corner of Mapp Road and Martin Hwy (SR 714) in Palm City. A single plant apparently naturalizing in the middle of wet flatwoods. Also growing nearby is a profusion of *Rhodomytus tomentosus*; flowers purple/lavender. This seems to be a Florida record. N 27.16121°; W -80.27040°. Plant is still flowering on 29 April 2000, *Woodmansee 472*, 18 March 2000" (https://cdn.plantatlas.org/img/specimens/USF/233113.jpg). Steve Woodmansee sent me a map with slightly different approximate collection location marked (N 27.1603º; W -80.2709º; X in Fig. 3; Woodmansee, pers. comm.) and wrote that "the land manager likely killed this plant." Cheek et al. (2021) and Nesom (2021) cited this one record as indicating that *M. malabathricum* is considered naturalized in Florida. The Floristic Inventory of South Florida lists *M. malabathricum* known from just one natural area, Danforth Park (in Palm City), with the notation "Presumed Extirpated" (Gann et al. 2022).

METHODS

On 26 April 2022, I photographed several melastome shrubs in the nature preserve of Martin's Crossing, Stuart, which I later identified as *Melastoma malabathricum* using the website iNaturalist.org and comparison with a photo of the vouchered specimen from Palm City. On 26 April – 15 May 2022, I returned to the Martin's Crossing site several more times to photograph additional *M. malabathricum* plants and map their distribution. The photos were posted to the iNaturalist.org website and vouchers have been deposited at the University of Florida Herbarium (FLAS). Alan Franck identified the specimens as *M. malabathricum* subsp. *malabathricum.*

In addition to intensively searching areas around Martin's Crossing and Palm City, I looked for *Melastoma malabathricum* in preserves, parks, gardens, and other accessible vegetated areas in Palm City and Stuart.

RESULTS

Here, I document a well-established, naturalized population of *Melastoma malabathricum* in Martin's Crossing nature preserve in Stuart, Florida, confirming its naturalized existence in Florida as known from a previous collection (*Woodmansee 472*, USF, as cited above). The new collection ws made about 4 kilometers from the earlier site record in Palm City Within the nature preserve, I photographed *Melastoma malabathricum* at >50 locales (Figs. 3–4). In total, I saw many hundreds of *M. malabathricum* shrubs, often growing in tight clusters. Almost all individuals over 1 meter tall were in flower. The tallest ones were ~3.5 meters. All were growing in a wet flatwoods area along a 140 meter stretch on the eastern edge of a marsh, primarily in open patches among slash pines (*Pinus elliottii*) and saw palmettos (*Serenoa repens*). In almost every *M. malabathricum* photo, one or both these other species is visible (e.g., Fig. 1). The trunks of many of the pines and palmettos were charred from an apparently recent burn (e.g., see Fig. 1).

Other plant species commonly seen growing with the *Melastoma malabathricum* include *Vitis rotundifolia, Smilax auriculata, Acacia auriculiformis,* and *Lygodium microphyllum*. Immediately south of where I found *M. malabathricum*, dense blankets of the invasive *Lygodium* covered much of the vegetation.

I found no *Melastoma malabathricum* growing at any of the other sites searched in Palm City, Stuart, nor anywhere else. There are several photos posted on the iNaturalist website identified as *M. malabathricum* in Orange Co., Florida, but I have not confirmed whether these observations are correctly identified and from naturalized populations.

There are vouchers of cultivated specimens identified as *Melastoma malabathricum* from six sites in North America, including four from Florida:

FLORIDA. Hillsborough Co.: Tampa, private garden, 22 Jul 1971, USF; <cdn.plantatlas.org/img/specimens/USF/99211.jpg>; also identified as *M. candidum*; <gbif.org/occurrence/2235803691>

FLORIDA. Seminole Co.: Altamont Springs, private garden, 10 Jan 1986; FTU; <idigbio.org/portal/mediarecords/6e9c2556-a87d-452c-9ed0-433525b29b97>

FLORIDA. Alachua Co.: Gainesville, University of Florida Student Agricultural Gardens, 6 Jan 2014; FLAS; <cdn.flmnh.ufl.edu/Herbarium/jpg/241/241014a1.jpg>.

FLORIDA. Miami-Dade Co.: Coral Gables, Fairchild Tropical Garden, 23 May 1996; UMO; <legacy.tropicos.org/Specimen/1572500>

PENNSYLVANIA. Chester Co.: Longwood Gardens, 1 Nov 1971; USNC; <idigbio.org/portal/records/a1e00078-6bb6-4789-bd0a-1734d7f79f85>

MARYLAND. Prince George's Co.: Beltsville, 24 May 1972; USNC; <gbif.org/occurrence/2235976306>

DISCUSSION

In view of the persistence of *Melastoma malabathricum* in the Palm City/Stuart area, I was surprised that I could find no other populations. Certainly, there appears to be much suitable habitat (i.e., wet flatwoods with primarily slash pine and saw palmetto) for this species across much of Florida. The shrubs are highly visible when in flower, so land managers may be eliminating *Melastoma malabathricum* from natural areas. Although the species may have been extirpated from the Palm City site since 2000, it seems likely that the Stuart population, just 4 kilometers from Palm City, descends from the same introduced population.

ACKNOWLEDGEMENTS

I thank M. Wetterer, S. Wetterer, and A. Franck for comments on this manuscript, S. Woodmansee for information about his *M. malabathricum* voucher, A. Franck for preparing herbarium vouchers and identification, and Florida Atlantic University for financial support.

LITERATURE CITED

Acevedo-Rodríguez, P. and M.T. Strong (eds.). 2012. Catalogue of Seed Plants of the West Indies. Smithson. Contr. Bot. 98: 1–1192.

Cheek, M.D., R.G.C. Boon, K.M. Wong, and M. Hadebe. 2021. Assessment of the degree of establishment of five introduced Melastomataceae taxa in South Africa. S. Afr. J. Bot. 142: 502–508.

Conant, P. and C. Hirayama. 2001. Two new host records for *Rhyncopalpus brunellus* Hampson (Lepidoptera: Arctiidae). P. Hawaii. Entomol. Soc. 35: 145–146.

Corner, E.J.H. 1939. Notes on the systematy and distribution of Malayan phanerogams III. Gard. Bull. Straits Settlem. 10(3): 1–55.

Faravani M. and B.B. Bakar. 2007. Effects of light on seed germination, growth pattern of Straits rhododendron (*Melastoma malabathricum* L.). J. Agr. Bio. Sci. 2: 1–5.

FDACS (Florida Department of Agriculture and Consumer Services). 2020. Florida Noxious Weeds: Rule 5B-57.007. Florida Department of Agriculture and Consumer Services <https://www.flrules.org/Gateway/View_notice.asp?id=23639596>

Gann, G.D., C.S. Stocking, and collaborators. 2022. Floristic Inventory of South Florida Database Online. The Institute for Regional Conservation, Delray Beach, Florida. <https://

regionalconservation.org/ircs/database/plants/PlantPage.asp?TXCODE=Melamala> Accessed 15 May 2022.

Joffry, S.M., N.J. Yob, M.S. Rofiee, M.M.R.M.M. Affandi, Z. Suhaili, F. Othman, A.M. Akim, M.N.M. Desa, and Z.A. Zakaria. 2012. *Melastoma malabathricum* (L.) Smith ethnomedicinal uses, chemical constituents, and pharmacological properties: A review. Evid.-based Complement. Altern. Med. 2012: Article ID 258434 ref.78

Kew. 2022. *Melastoma malabathricum* subsp. *malabathricum*. Plants of the World Online. Royal Botanic Gardens, Kew <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:77178047-1#synonyms> Accessed 17 August 2022.

Luo, Z., D. Zhang, and S.S. Renner. 2008. Why two kinds of stamens in buzz-pollinated flowers? Experimental support for Darwin's division-of-labour hypothesis. Funct. Ecol. 22: 794–800.

Master, J., I. Qayim, D. Setiadi, and N. Santoso. 2020. Autecology of *Melastoma malabathricum*, an invasive species in the Way Kambas National Park, Indonesia. Biodiversitas 21: 2303–2310.

Meyer, K. 2001. Revision of the Southeast Asian genus *Melastoma* (Melastomataceae). Blumea 26: 351–398.

Nesom, G.L. 2021. Melastomataceae. Pp. 365–376, in Flora of North America Editorial Committee (eds.). Flora of North America North of Mexico. Vol. 10. Oxford Univ. Press, New York and Oxford.

Ng, W.L., G. Huang, W. Wu, Q. Zhou, Y. Liu, and R. Zhou. 2020. Molecular confirmation of natural hybridisation between *Melastoma sanguineum* and *M. malabathricum* (Melastomataceae). Gard. Bull. Singapore 72: 65–75.

Plucknett, D.L and B.C. Stone. 1961. The principal weedy Melostomaceae in Hawaii. Pac. Sci. 15: 301–303.

Saat, A., A.S. Kamsani, W.N.A.N. Kamri, N.H.M. Talib, A.K. Wood, and Z. Hamzah. 2015. Potential of *Melastoma malabathricum* as bio-accumulator for uranium and thorium from soil. AIP Conf. Proc. 1659: 050001–1-050001-7. <doi.org/10.1063/1.4916871>

Selamat, S.N., S.R.S. Abdullah, and M. Idris. 2014. Phytoremediation of lead (Pb) and arsenic (As) by *Melastoma malabathricum* L. from contaminated soil in separate exposure. Int. J. Phytoremediat. 16: 694–703. <doi: 10.1080/15226514.2013.856843>

USDA (United States Department of Agriculture). 2022. State noxious-weed seed requirements recognized in the administration of the Federal Seed Act. United States Department of Agriculture <ams.usda.gov/sites/default/files/media/StateNoxiousWeedsSeedList.pdf>

Zheng, W.-J., Y.-S. Ren, M.-L. Wu, Y.-L. Yang, Y. Fan, X.-H. Piao, Y.-W. Ge, and S.-M. Wang. 2021. A review of the traditional uses, phytochemistry and biological activities of the *Melastoma* genus. J. Ethnopharmacol. 264 (2021): 113322. <doi: 10.1016/j.jep.2020.113322>.

Zimmerman, N., R.F. Hughes, S. Cordell, P. Hart, H.K. Chang, D. Perez, R.K. Like, and R. Ostertag. 2008. Patterns of primary succession of native and introduced plants in lowland wet forests in eastern Hawai'i. Biotropica 40: 277–284.

Figure 1. *Melastoma malabathricum* in Stuart, Florida, 27 April 2022.

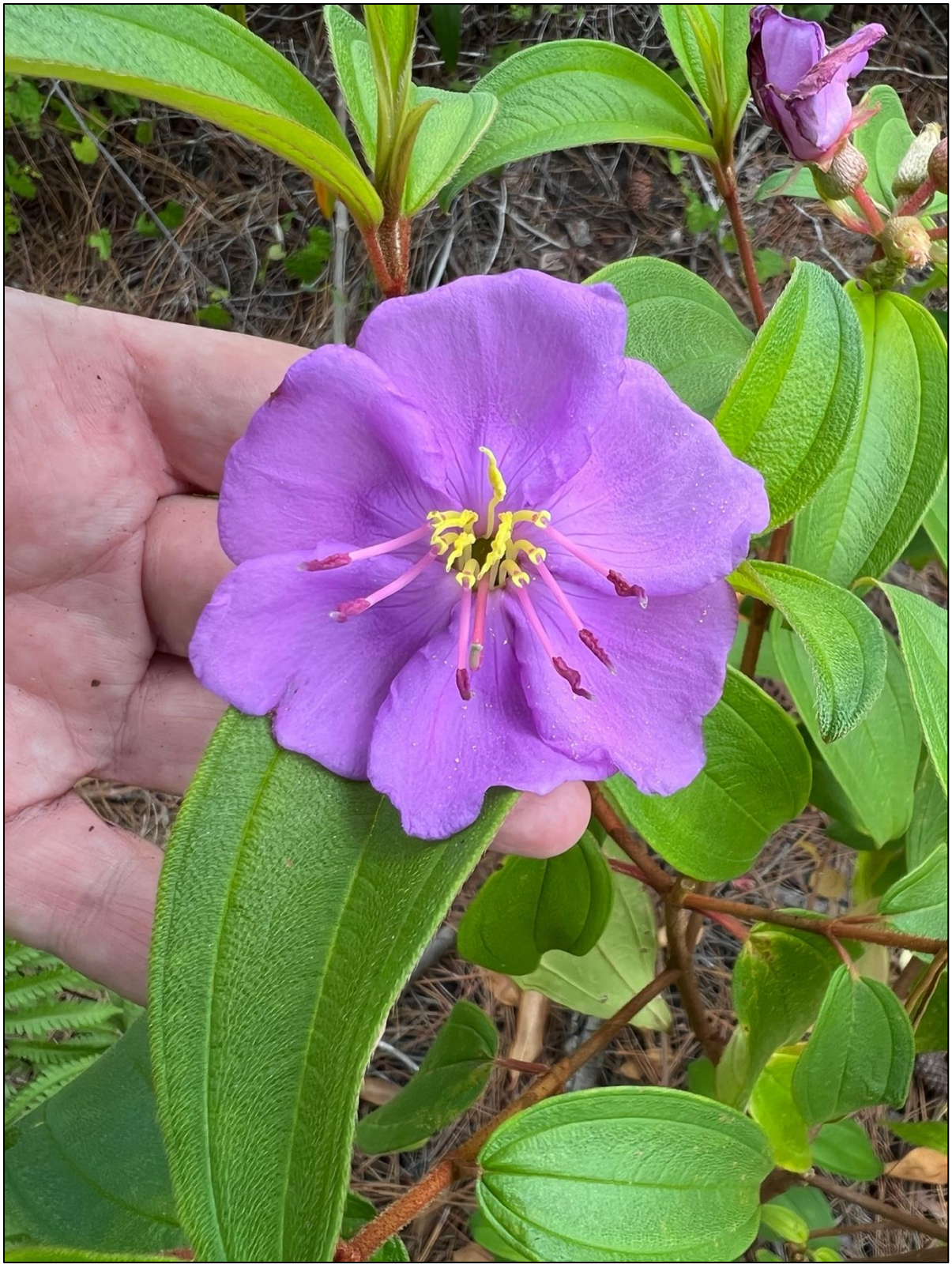

Figure 2. *Melastoma malabathricum* in Stuart, Florida, 30 April 2022.

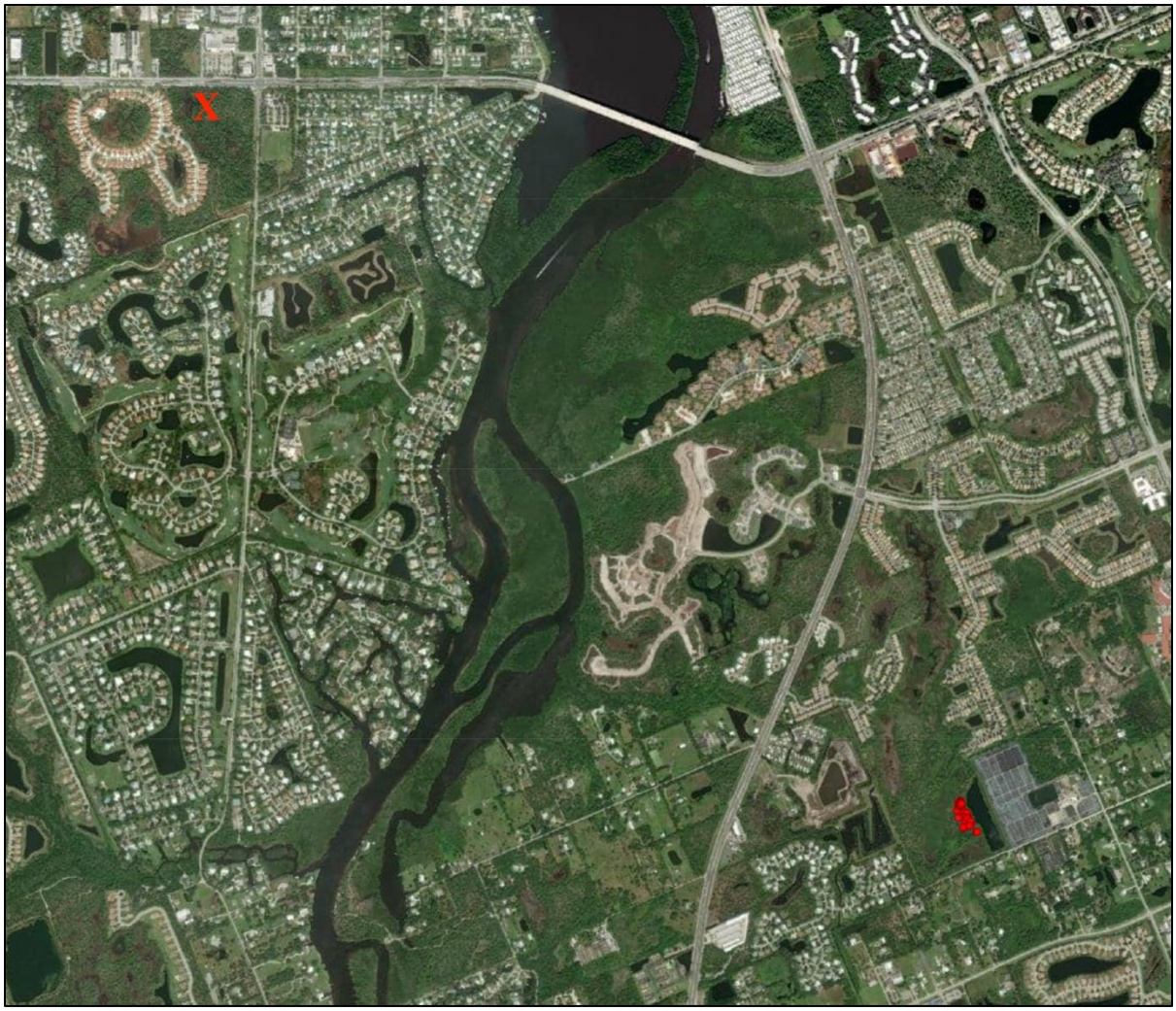

Figure 3. Location of the photographed *Melastoma malabathricum* shrubs in Martin's Crossing preserve (red dots), 4.1 km southeast of the Palm City voucher site (X). Map made using carto.com.

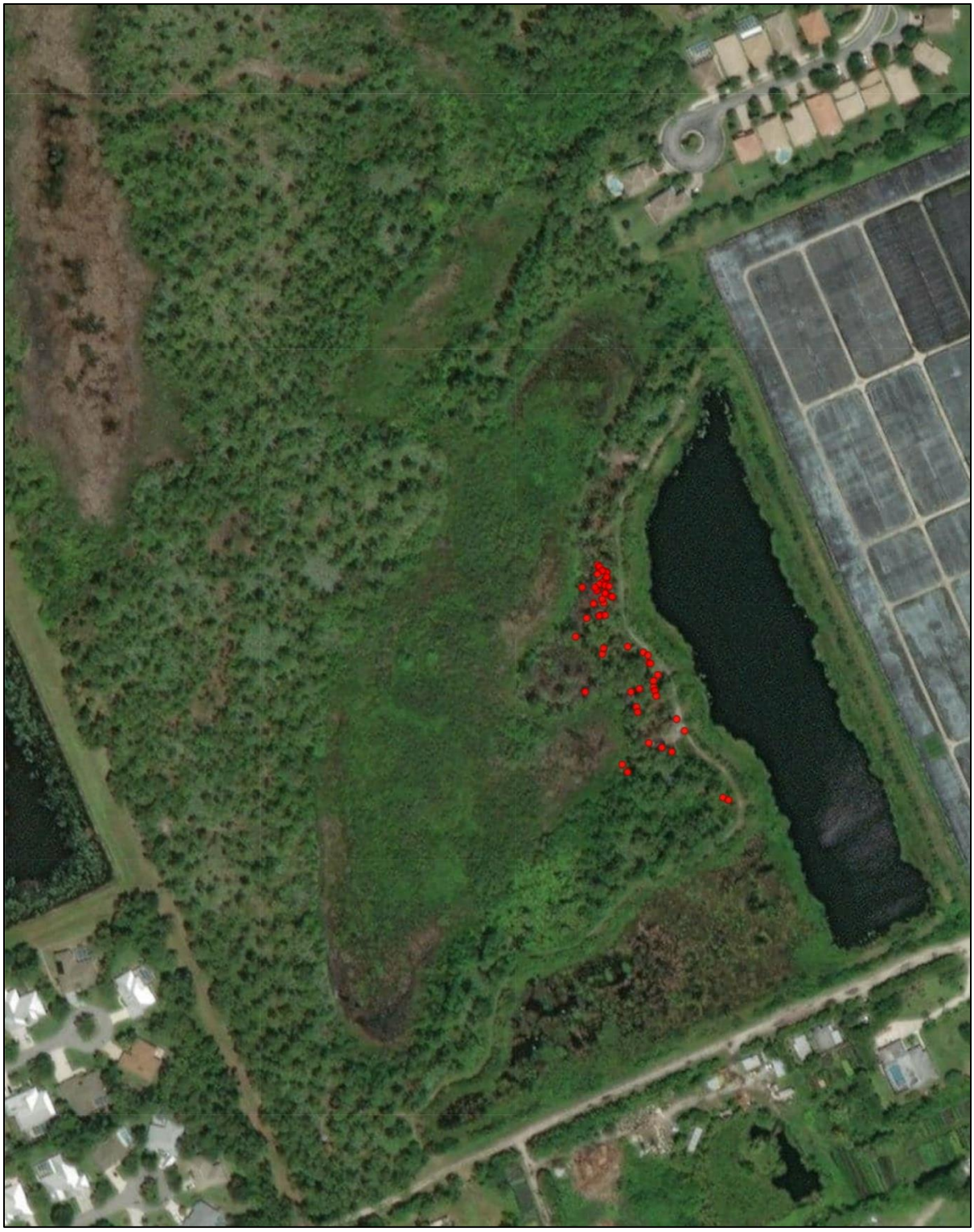

Figure 4. Distribution of photographed *Melastoma malabathricum* within Martin's Crossing preserve (red dots), on the eastern edge of wetlands, west of a trail along a berm next to an artificial lake. Map made using carto.com.