

Pest Alert

Florida Department of Agriculture and Consumer Services
Division of Plant Industry

***Nymphoides cristata*, Crested Floating Heart, a Recently Listed State Noxious Weed**

Patti J. Anderson, Patti.Anderson@FreshFromFlorida.com, Botanist, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

Marc S. Frank, Botanist, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

INTRODUCTION: The perennial, emergent aquatic plant, *Nymphoides cristata* (Roxb.) Kuntze (Menyanthaceae), has been added to the Florida Noxious Weed and Invasive Species List. This plant was proposed for listing and evidence was presented to the Noxious Weed Review Committee. Numerous ecological studies and weed assessments by the USDA and the University of Florida provided information. Invasive plant managers with the Florida Fish and Wildlife Conservation Commission (FWC) and South Florida Water Management District are currently trying to control the spread of this plant. Crested floating heart is an aggressive pest plant that develops dense mats and quickly covers lakes and ponds. This species is documented as naturalized in eight counties in Florida and is also listed by the Florida Exotic Pest Plant Council as an invasive species that has altered natural plant communities.

The committee found that the species exhibited the following invasive characteristics:

- vegetative reproduction from plant fragments, bulbils and tubers
- rapid colonization of fresh water bodies
- persistent roots, rhizomes and leaf fragments make control extremely difficult
- easily spread by boat traffic

Mats of *N. cristata* reduce or eliminate the light required by native plant species below the water surface, and thereby eliminate these plants from the water column. The decay of this dense vegetation also reduces oxygen in the water and results in stagnant areas with reduced water quality for wildlife habitat and recreational activities such as swimming, boating and fishing. Fragmentation of the mats and dispersal is facilitated by boats and flooding. Based on the risk for invasion of natural areas and impact on human activities by this species, *N. cristata* is now included on the list of regulated plants in Florida. It is unlawful to introduce, multiply, possess, move or release any noxious weed or invasive plant regulated by the Florida Department of Agriculture and Consumer Services, except under permit issued by the department.

IDENTIFICATION: Crested floating heart is a rhizomatous, perennial, aquatic plant that is usually rooted in the substrate of shallow waters (Fig. 1), but small vegetative propagules may be free-floating. The alternately arranged leaves typically float on the water surface. The leaf blades are somewhat leathery, ovate to circular in outline and often reddish or purplish below. The leaf margins are usually entire and often tinged red. Clusters of flowers are borne at the distal stem nodes. The flowers develop under water and rise above the surface at maturity. The corolla of crested floating heart is white with a yellow eye and is 1–2 cm ($\frac{1}{2}$ – $\frac{3}{4}$ in) wide. Each petal has a ruffled crest running lengthwise down the center. The petal margins are slightly wavy to ruffled and sometimes fringed distally. The fruit are capsules to 6 mm ($\frac{1}{4}$ in) long and contain up to twenty seeds, each of which is less than 1.5 mm ($\frac{1}{20}$ in) long and covered with small, rounded warts.



Florida Department of Agriculture and Consumer Services
Adam H. Putnam, Commissioner

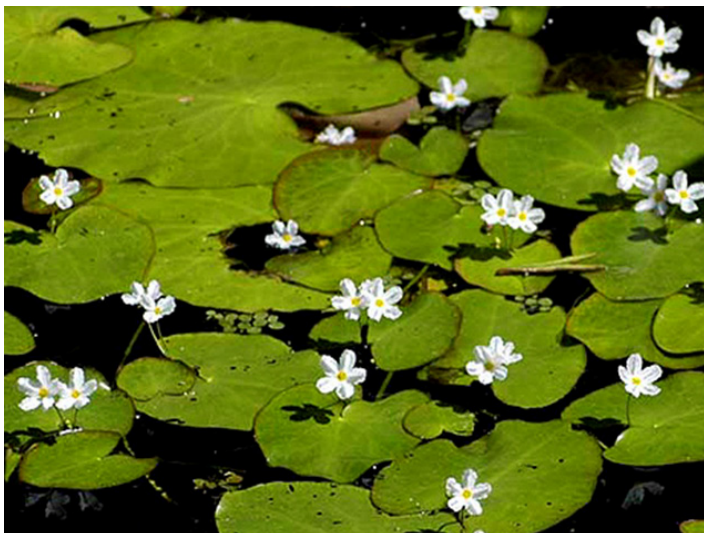


Fig. 1. *Nymphaoides cristata* (crested floating heart). Dense floating canopies shade aquatic vegetation and alter the ecology of water bodies. Photography credit: Walter K. Taylor, Atlas of Florida Vascular Plants



Fig. 2. *Nymphaoides cristata* (crested floating heart). Each petal has a ruffled crest running longitudinally down the center. Note the red margins on the leaves. Photography credit: Bob Upcavage, Atlas of Florida Vascular Plants

SIMILAR SPECIES IN FLORIDA: Five species of *Nymphaoides* occur in Florida. *Nymphaoides aquatica* and *N. cordata* are native, while *N. cristata*, *N. indica* and *N. peltata* were introduced to Florida through the aquatic plants trade and subsequently escaped from cultivation. All bear flowers with five white petals, except yellow floating heart which has five golden yellow petals. Crested floating heart can be distinguished by the longitudinal, ruffled crest or fold running down the center of each petal. Water lilies in the genus *Nymphaea* are also floating aquatic plants, but they have eight or more petals and numerous stamens.

DISTRIBUTION: Crested floating heart is native to subtropical and tropical regions of eastern India, Vietnam and southern China and is typically found in still, shallow waters, such as ponds, lakes and canals, but may also occur in slow-moving streams. It has been reported from Florida, South Carolina, Mississippi and Texas. Herbarium specimens document the occurrence of crested floating heart in at least the following eight counties: Broward, Collier, Hillsborough, Lee, Orange, Palm Beach, Sarasota and St. Johns.

MITIGATION STRATEGIES: This species mainly reproduces vegetatively through the production of bulbils (formed on the undersides of the leaves), tubers and rhizomes that break off and disperse to new areas. Management of this weed may be difficult because plant fragments can be unintentionally dispersed to new areas by mechanical control efforts such as dredging, boats moving from infested to uninfested waters and other human activities. Chemical controls are discussed in UF/IFAS publications (e.g., http://plants.ifas.ufl.edu/caip_files/edis/Nymphaoides_cristata_extension_pub.pdf). Chemical treatments might kill leaves, but rhizomes or bulbils remain below the water surface to reinfest the area.

ADDITIONAL INFORMATION: *Nymphaoides cristata* is available from online nurseries, increasing the opportunity for new introductions.

This species has been known by several earlier names that are no longer accepted, including:

- *Limnanthemum cristatum* (Roxb.) Grisebach
- *Menyanthes cristata* Roxb.
- *Villarsia cristata* (Roxb.) Spreng.

For more information: <http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Bureaus-and-Services/Bureau-of-Entomology-Nematology-Plant-Pathology/Botany/Noxious-Weeds/Nymphaoides-spp>

REFERENCES:

Burks, K.C. 2002. *Nymphoides cristata* (Roxb.) Kuntze, a recent adventive expanding as a pest plant in Florida. *Castanea* 67: 206–211.

Willey, L.N. and K.A. Langeland. 2011. Aquatic weeds: crested floating heart (*Nymphoides cristata*). Publication SS-AGR-344. Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Gainesville, Florida. 5 p. <http://edis.ifas.ufl.edu/ag354> [accessed 2014 September 18].

Center for Aquatic and Invasive Plants. 2014. Crested floating heart -- *Nymphoides cristata*: non-native to Florida. Institute of Food and Agricultural Sciences, University of Florida. Gainesville, Florida. <http://plants.ifas.ufl.edu/node/291> [accessed 2014 September 19].

Plant Epidemiology and Risk Analysis Laboratory. 2012. Weed risk assessment for *Nymphoides cristata* (Roxb.) Kuntze (Menyanthaceae) – crested floating heart. United States Department of Agriculture. Raleigh, North Carolina. 16 p. http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/wra/Nymphoides_cristata_WRA.pdf [accessed 2014 September 18].

Westbrooks, R.G., L. McCord and S.T. Manning, 2012. U.S. national early detection and rapid response system for invasive plants EDRR Fact Sheet: *Nymphoides cristata*. Federal Interagency Committee for the Management of Noxious and Exotic Weeds. 2 p. http://plants.ifas.ufl.edu/misc/pdfs/EDRR_FactSheet_CrestedFloatingHeart_Revised103112.pdf [accessed 2014 September 19].
