

## Hydrilla

*Hydrilla verticillata* (L.f.) Royle  
**Frog's-bit Family (Hydrocharitaceae)**

### DESCRIPTION

Hydrilla is a rooted submergent aquatic that forms dense mats in still or slowly moving water. Small whitish tubers are produced on the roots late in the growing season.

Hydrilla is very similar to the native waterweeds (*Elodea canadensis* and *E. nuttallii*). The most obvious differences are the 4—8 visibly toothed leaves per node on hydrilla and the presence of tubers. Waterweed leaves occur in whorls of 3 and have an entire margin; tubers are not produced. Brazilian waterweed (*Egeria densa*), another non-native species in the Frog's-bit Family that is established in Pennsylvania, is also similar. Its leaves, in whorls of 4—8, are very finely toothed and crowded so that those from one whorl overlap the leaves from adjacent nodes. Brazilian waterweed does not produce tubers.

**Height** – The stems of hydrilla are 1 to many feet long, depending on the depth of the water.

**Stem** – Stems are slender and flexible, branching mainly near the water surface, and are nearly covered by the whorls of leaves. The stems are rooted at the base; in addition, adventitious roots may form at the nodes.

**Leaves** – Leaves are narrow and sharply toothed; they are arranged on the stem in whorls of 4—8 leaves at each node. The leaves are about as long as the space between nodes and do not overlap adjacent whorls of leaves.

**Flowers** – Flowers are solitary and unisexual; the female flower is white with 3 petals and 3 sepals, it is borne on a long slender pedicel that reaches the water surface. Male flowers are released and float to the surface of the water; they have 3 tiny stamens.

**Fruit and seed** – Fruits are cylindrical and contain up to 5 seeds.

### DISTRIBUTION AND HABITAT

The precise area of origin of hydrilla is not known, it is variously listed as Asia, Africa, and perhaps Australia. It grows in water from 1—12 feet deep depending on the clarity. Hydrilla is tolerant of various pollutants and a range of water chemistry. In Pennsylvania it is becoming increasingly prevalent in lakes and streams in the eastern and south central regions of the state.



*Hydrilla*

## **EFFECTS OF INVASION**

Hydrilla is a major aquatic weed throughout the southeastern United States; thick mats of hydrilla interfere with navigation, clog water intake screens, and hamper recreational boating. Hydrilla also competes with native submergent aquatic vegetation. Annual control efforts in Florida alone cost millions of dollars. It was designated as a federal noxious weed in 1979, and is identified in noxious weed laws in FL, LA, CA, TX, SC, NC, OR, WA, and AZ.

## **REPRODUCTION AND METHODS OF DISPERSAL**

As with many aquatic plants, hydrilla employs vegetative means of propagation very effectively. Living stem sections may break off and float, providing one means of dispersal. Even a small stem section containing a single node can produce adventitious roots and initiate a new colony. Modified stems called stolons form in the substrate and also serve as a means of vegetative spread. Late in the season whitish tubers form at the ends of the stolons; these tubers are resistant to herbicide treatment and allow for rapid recolonization of treated sites. Seed production appears to be minimal in our area.

## **CONTROL**

**Mechanical** – Mechanical removal is of limited utility due to the potential for stem fragments to spread and for tubers to remain behind in the lake bottom mud.

**Chemical** – Several herbicides have been used to control hydrilla including copper sulfate and endothal, which are contact poisons and the systemic chemicals fluridone and bensulfuron methyl.

**Biological** – Surveys for natural enemies of hydrilla have been conducted in the U.S. and in Africa, Asia, and Australia. More than 20 species of insects or pathogens have been considered as potential biological control agents. While evaluations of many of these are still going on, 4 insects have been released – 2 leaf-mining flies, a stem-boring weevil, and a tuber-attacking weevil.

## **NATIVE ALTERNATIVES FOR LANDSCAPE USE**

Native species of waterweed (*Elodea canadensis* and *E. nuttallii*) should be encouraged in place of hydrilla.

## **REFERENCES**

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