

Hydrilla, a new noxious aquatic weed in California

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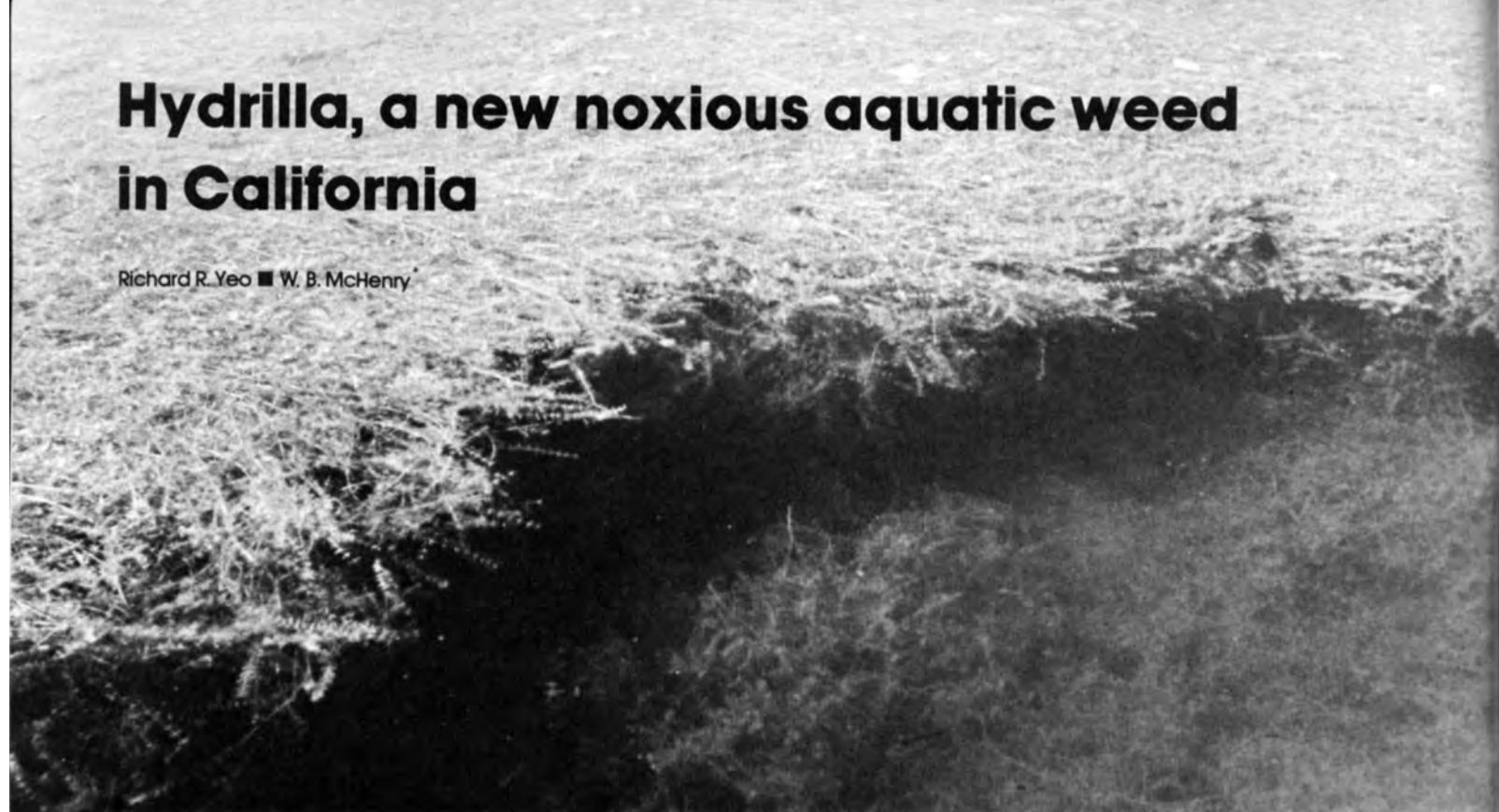


Fig. 1. Rampant growth of hydrilla in Lake Ellis, a 31-acre lake in Marysville, California. Photo was taken June 1976.



Fig. 2. Egeria (left), hydrilla (center), and American elodea (right) have similar growth habits. Although individual plants of all three species vary in length and number of leaflets in whorls and in the distance between whorls, the scratchy feel of hydrilla readily distinguishes it.

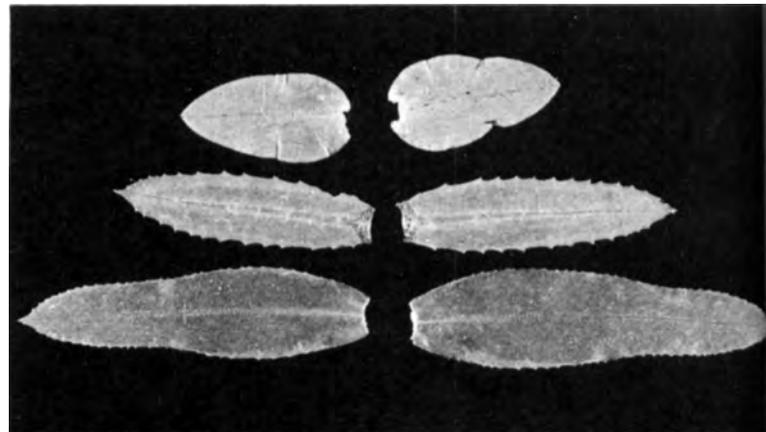


Fig. 3. Leaves of American elodea (top), hydrilla (center), and egeria (bottom). *Left*, upper surfaces; *right*, lower surfaces. Some elodea leaves are long and narrow, others are short and wide, as shown. They usually are shorter than hydrilla and egeria leaves, however. The spines on the leaf margins also are smaller than those on hydrilla. Upper and lower leaf surfaces are both smooth.



Fig. 4. Small thornlike projections, occasionally black on the tips, that protrude from the midrib on the lower side of the leaf are characteristic of hydrilla.



Fig. 5. Hydrilla tubers form beneath the soil surface and are white inside. They usually produce new plants in the spring.



Fig. 6. A stem fragment of hydrilla showing closely spaced leaf whorls, and two turions (arrows).

Since about 1776 California has been continually plagued by the inadvertent introduction of foreign plants that spread rapidly and become weeds. Examples include crabgrass (both smooth and hairy), yellow starthistle, oxalis, bermudagrass, and johnsongrass.

In October 1976, submersed aquatic weeds that would not respond to commonly recommended herbicides were identified as yet another foreign introduction—hydrilla [*Hydrilla verticillata* (L. F.) Royle]. Hydrilla was found first in the 31-acre Lake Ellis at Marysville, and more recently in Lake Murray, a 100-acre reservoir near San Diego, the All-American Canal, Imperial County, and two small ponds in Santa Barbara and Riverside counties.

This plant can invade farm ponds, reservoirs, canals, natural streams, and rice fields. Florida, where hydrilla is now widespread, is spending \$6 to \$8 million annually in attempts to check this weed.

The California Department of Food and Agriculture designated hydrilla a Class A noxious weed in 1977 and, together with local County Agricultural Commissioners, has mounted an intensive program to eradicate this aggressive species.

Occurrence

Hydrilla, believed to have originated in central Africa, is currently found in Europe, Asia, southeastern Africa, Australia, and Central and North America. It has not been reported in South America. In the United States, hydrilla was first observed on the west coast of Florida in 1958 and on the southeast coast in 1959. By 1967 hydrilla had become established on an estimated 35,000 acres throughout Florida; by 1969 it had infested 45,000 acres and spread into southern Georgia and Alabama; in 1976 it was reported in nearly all of Florida's waterways. Hydrilla has been found in Texas and Iowa and is probably growing undetected in other states. The plant was acquired by the U.S. aquaria trade, which very likely accounts for its rapid spread.

Hydrilla is a member of the frogbit family (Hydrocharitaceae), which also includes American elodea (*Elodea canadensis* Michx.) and egeria (*Egeria densa* Planch.), formerly called Brazilian elodea. Hydrilla's resemblance to these plants undoubtedly delayed its detection.

Hydrilla is distributed from one lake or waterway to another by boat trailers, and possibly by waterfowl. Power boats, sailboats, and aquatic

mowers hasten the spread of hydrilla and other species within a body of water. Hydrilla, which forms a dense canopy of branches that float near the water surface, has been observed growing at a depth of 50 feet. Its vigorous growth seriously limits the uses of waterways and displaces native plants important to aquatic ecosystems.

Propagation

Hydrilla propagates in North America by stem fragments, special buds called turions that form in the leaf axils, and by tubers that develop in the mud. This array of reproductive methods gives hydrilla a particularly formidable ability to spread.

Tubers reportedly develop within four weeks on newly rooted stem fragments, and turions form prolifically on the stems of free-floating fragments and on rooted plants. Ninety percent of the sprouting by turions and tubers occurs at temperatures between 64° and 91°F. Dormant propagules may persist at the bottom for several years.

The 3/4-inch long and 1/8-inch wide leaves are borne in whorls of 3 to 8 on the upper stems. The small, raspy spines along the leaf margin are sometimes red, and the leaf midrib is also sometimes red. Small, thornlike, 1/32-inch projections along the underside of the leaf midrib and occasionally on the stems are sometimes capped with a black substance. A simple test to distinguish hydrilla from American elodea and egeria is to draw the foliage through the hand. Egeria and elodea feel smooth; hydrilla feels harsh and scratchy because of the spines and projections.

Hydrilla is dioecious (two separate, sexed plants). Female plants, which are common, have small, dull flowers borne on long pedicels. Since male plants have not been found in the United States, there are no seeds or fruits here.

Farmers, boaters, anglers, ditch tenders, and others who believe they have seen hydrilla are encouraged to contact their County Agricultural Commissioner.

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