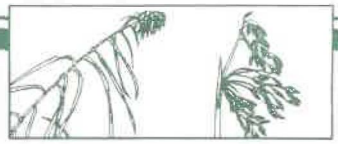


Aquatic Plant Identification and Management Workbook, *Series 3*

The Aquatic Plant Identification and Management Workbook Series is designed to acquaint pond owners in Maryland with naturally-growing aquatic plants and the general means for managing their growth. Aquatic plants play an important role in the natural ecology of ponds: they provide food and shelter for many fish, aquatic animals and other wildlife, and they provide oxygen, which can benefit fish production.

Sometimes, however, growth gets out of hand and the plants become so numerous they interfere with the intended use of the pond, for example, fishing, swimming, boating — they are then called aquatic weeds. When this occurs, control measures often become necessary.

The suggested chemical controls in this workbook series are intended as guidelines and must not replace directions on chemical labels. Separate fact sheets display each of the aquatic plants in this series and are available from the Maryland Sea Grant Extension Program or your local Cooperative Extension Office.

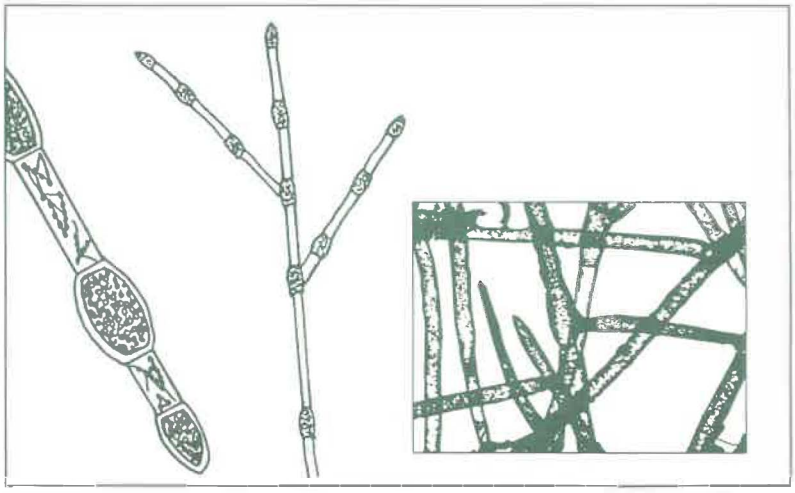
ALGAE

Water Wool or *Pithophora*

Reginal M. Harrell and Richard E. Bohn

University of Maryland Cooperative Extension Service, Sea Grant Extension Program

There are several kinds of algae that occur in Maryland's fresh and brackish water ponds. While some algae can be beneficial, often serving as a primary or secondary food supply for fish, even these can become too plentiful. Two primary forms of algae occur: planktonic and filamentous. Planktonic algae are usually the ones that are most beneficial, and are primarily responsible for giving a pond its greenish color. Filamentous algae are usually very troublesome in a pond, forming extensive mats of long strands of plant material that can trap fish. They can give a pond an offensive odor or even cause off-flavor in fish. Filamentous algae are commonly known as "pond scum" because they form greenish mats on the pond bottom that float up to the surface of the water. These plants can produce large amounts of oxygen during sunny days and this oxygen becomes trapped within the mats causing the plant mass to float up to the surface. Often completely covering a pond, the filamentous algae that produce large amounts of oxygen during daylight hours can cause severe oxygen depletion at night. They can also sometimes cause pH problems.



Credit: IFAS, University of Florida, Gainesville

Algae: Water Wool or Pithophora

Water Wool

(Pithophora spp.)

Water wool, or "green cotton-ball algae" as it is sometimes called, can cause tremendous problems in freshwater ponds. It is commonly found around small ponds, slow-moving streams, and canals. Water wool algae usually become a problem in summer when dense growth can interfere with fishing, deplete oxygen, provide a favorable mosquito breeding site, and give the water an undesirable color. Heavily infested ponds can remain a prob-

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CHEMICAL CONTROL. The following is a table of chemicals labeled to treat water wool or *Pithophora*. The table was compiled from information gathered from the aquatic chemical industry. *Inclusion in the table does not imply endorsement by the University of Maryland nor by the authors.* Omission of chemicals is a result of oversight on the authors' part or of new label registration. The table is for comparison purposes only and is not intended to replace the chemical label. Labels are subject to change; therefore, always check the label for treatment sites, rates, and precautions before purchasing or applying any chemical. **Do not use the table for treating aquatic plant problems.**

Water Wool (*Pithophora* spp.)

Chemical Name	Chemical Type	Application	Restriction	Comments
Slow-Release Algimycin PLL-C	elemental copper 5%	10-20 lb/acre–ft	none	apply to affected areas only; may be toxic to fish at low alkalinities
Cutrine-Plus	elemental copper 9.0%	0.6 gal/acre ft dilute with 10-20 parts water	none	apply on a sunny day water temp > 60° F. may be toxic to fish at low alkalinities
Cutrine-Plus Granular	elemental copper 3.7%	60 lb/acre	none	apply on a sunny day water temp. > 60° F. may be toxic to fish at low alkalinities
Weedtrine D	Diquat dibromide d	3.5-10.5 gal/acre ft	livestock watering, spraying, irrigation, rinking – 14 days	do not use in muddy water
Hydrothal 191 Liquid	Endothall 53.0%	0.4-1.1 gal/acre ft (0.3-0.8 ppm)	fishing – 3 days all other uses, up to 25 days	toxic to fish at 0.3 ppm
Hydrothal 191 Granular	Endothall 11.2%	27-82 lb/acre ft (0.5-1.5 ppm)	fishing – 3 days all other uses, up to 25 days	toxic to fish at 0.3 ppm; scatter on floating mats
K-Tea	elemental copper 8.0%	1.7-3.4 gal/acre ft dilute with 10-20 parts water	none	apply on a sunny day water temp > 60° F. may be toxic to fish at low alkalinities
912 Aquatic Weed Killer	Diquat dibromide	0.5-1.5 ppm	livestock watering, spraying, irrigation, swimming – 10 days drinking – 14 days	do not use in muddy water
Kocide	Copper sulfate pentahydrate 99%	1.0-1.5 ppm	do not exceed 1 ppm in potable water	toxic to fish at low alkalinities
Star Glow Powder	Copper sulfate pentahydrate 99%	3-6 lb/acre ft in 3-5 gal water	do not exceed 1 ppm in potable water	toxic to fish at low alkalinities
Copper Sulfate Crystals	Copper sulfate pentahydrate 99%	1.0-1.5 ppm (2.6-3.9 lb/acre ft)	do not exceed 1 ppm in potable water	toxic to fish at low alkalinities
Agway Copper Sulfate	Copper sulfate pentahydrate 99%	2.75-5.5 lb/acre ft	do not use water for any purpose – 7 days	toxic to fish at low alkalinities
Boliden Copper Sulfate	Copper sulfate pentahydrate 99%	2.6-3.9 lb/acre ft	do not exceed 1 ppm in potable water	toxic to fish at low alkalinities
Aquashade	Blue & Yellow Dye	0.25 gal/acre ft	not for human consumption	more effective in depths over 2 ft

lem throughout the year, especially if the fall and winter months are mild.

Initial growth is as attached algae to the bottom of the pond, but as density of the growth increases, mats of algae are formed. Gasses (oxygen and carbon dioxide) produced by the plants are trapped within the mat and cause them to float to the water's surface where they resemble a large mass of wet wool. The mats can vary in color from dark green to lime green; older growth of the mat, at the base, may be covered with iron deposits which give it a rust or black coloration.

The mats are coarse in texture and are not slimy as are many other filamentous algae. They are easy to pick up and difficult to pull apart. Water wool is usually found in waters that are high in nitrogen and phosphorus.

IDENTIFICATION

Pithophora is microscopically an irregular commonly branched filamentous alga that consists of long, multi-nucleate, cylindrical cells containing many green chloroplasts. The branches usually come off the main axis at right angles which may themselves develop secondary branches. The filaments range from 65 to 140 microns in width. Reproduction is by fragmentation and by akinetes found in the filaments. Akinetes are dark green or brown colored vegetative cells that contain a large amount of food reserves and often become long and swollen. They develop throughout the plant, but are usually found on the tips of the branches. These specialized spore-like cells are resistant to drying, and overwinter in sediments where they germinate in the spring to produce new growth.

CONTROL

When chemicals are used to control aquatic vegetation, certain precautions must be followed. Always read the label and follow the directions. It is best to spot treat areas where the algae are first sighted. Determine the water uses and any use restrictions associated with the chemical control. The most common control for algae contains some form of copper, and copper can be extremely toxic to aquatic animals if the water alkalinity is low (< 50 parts per million). Check your water alkalinity before adding any copper compound. You may have to add some form of carbonate (i.e., calcium carbonate or limestone, or sodium bicarbonate) to raise the alkalinity to a point where copper application is safer to use. Obtain all necessary permits. Make sure you have properly identified the aquatic plant and have chosen the correct chemical control. Mix and apply the chemical according to the label directions. Keep the necessary records as they are required by law. Finally, monitor the water for dissolved oxygen and pH shifts after treatment to determine the effectiveness of the treatment and whether any fish kill occurs. Heavy plant die-off can cause oxygen depletion, while heavy growth can cause pH shifts on a daily cycle.

REFERENCES AND FURTHER READING

Aulbach-Smith, Cynthia A., Steven J. de Kozlowski, and Lawrence A. Dyck. 1990. Aquatic and wetland plants of South Carolina. South Carolina Aquatic Plant Management Council and South Carolina Water Resources Commission, Columbia.

Lorenzi, Harri J., and Larry S. Jeffery. 1987. Weeds of the United States and their control. An AVI Book, Van Nostrand Reinhold Company, New York.

Traver, David P., John A. Rodgers, Michael J. Mahler, and Robert L. Lazor. 1978. Aquatic and wetland plants of Florida. Special Publication, Florida Department of Natural Resources, Bureau of Aquatic Plant Research and Control. Tallahassee, Florida.

NOTE: Because of the ecological role and sensitivity of aquatic vegetation, as well as Baywide efforts to restore this important resource, the state does not permit the use of chemical control in tidal waters, and greatly restricts their use in nontidal, flowing waters. Acquaint yourself with all regulations governing plant control activities, and obtain all necessary permits. Non-chemical means should be utilized where practicable.

FOR FURTHER INFORMATION

For general information about the Maryland Sea Grant Extension Program, visit the web:

http://www.mdsg.umd.edu/MDSG/Extension/index.html

For technical questions, contact an extension agent or specialist at one of these locations:

Maryland Sea Grant Extension
University of Maryland
Wye Research and Education Center
P.O. Box 169
Queenstown, MD
Telephone: (410) 827-8056

Maryland Sea Grant Extension
University of Maryland
Chespeake Biological Laboratory
P.O. Box 38
Solomons, MD 20688
Telephone: (410) 326-7356

Maryland Sea Grant Extension
University of Maryland
Cooperative Extension Service
NOAA Chesapeake Bay Office
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Annapolis, MD 21403
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FOR ADDITIONAL COPIES

Copies of Maryland Sea Grant Extension workbooks on aquatic plants, including color photographs for use in identifying species, are available on the web at:

http://www.mdsg.umd.edu/MDSG/Extension/Workbooks

Additional copies of printed workbooks are available from the Maryland Sea Grant College Program, 0112 Skinner Hall, University of Maryland, College Park, MD 20742-7640.

Illustration on page 1 provided by the Information Office of the University of Florida, IFAS, Center for Aquatic Plants (Gainesville) 1990.

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