



NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

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On the Fringe

THE JOURNAL OF THE OHIO NATIVE PLANT SOCIETY

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CHANGE IN ANNUAL DINNER DATE

THE ANNUAL DINNER DATE WILL BE SATURDAY, NOVEMBER 5TH

The Cleveland Museum of Natural History is having the Dinosaurs return from September through January. Therefore, we will be unable to have our Dinner in the Museum. The Garden Center has very graciously extended their hospitality to us. We will meet for the reception hour and the dinner at 5:30 at the Garden Center. After the dinner, we will move across to the Museum for the lecture. We will try to have vans to transport those who do not wish to walk across if the weather is inclement.

This is going to be a nice change and will work out very well. The large hall at the Garden Center will lend itself beautifully to our dinner. We are deeply indebted to Director Alex Apanius for helping us out.

The change from Friday to Saturday was necessitated because the Museum will be open on Friday nights for the dinosaurs, and parking would have been impossible. This way, we will have the place to ourselves.

If any members have vans that they would bring and transport members, please let me know at 338-6622.

PROGRAMS:

May 1 (Sunday) State Nature Preserves - 2:00 p.m. - Tinkers Creek Spring Wildflower Walk. Join us as we welcome the awakening season in the woods and ponds.

May 7 (Saturday) State Nature Preserves - 10:30 a.m. - Eagle Creek Wildflower Romp! Enjoy over seventy different flowers in bloom along the trails beneath the trees.

May 7 (Saturday) Cleveland Chapter - 10:00 a.m. - Black Hand Gorge, Newark, OH. Dr. Jeanne Willis, who gave us a lecture on Black Hand Gorge in 1987, will lead us on a field trip of this state nature preserve. Jeanne knows every nook and cranny, and is aware of the geologic as well as botanic characteristics of this unusual area. **Reservations to 338-6622 by May 1.** You may want to plan to go down Friday evening and we can give you motel suggestions.

May 7 (Saturday) State Nature Preserves - 11:30 a.m. - Howard Collier Scenic River Area Spring Hike. Identify the many sights and sounds of Spring. Bring your wildflowers books.

May 7 (Saturday) Wilderness Center - 2:00 - 4:00 p.m. - Fowlers Woods - A swamp forest remnant with a board walk and good spring flowers. Leader, Glenna Sheaffer. Meet at the Fowler Woods parking lot.

May 8 (Sunday) Wilderness Center - 1:30 - 4:00 p.m. - Spring Wildflower Walk at the Wilderness Center.

May 14 (Saturday) State Nature Preserves - 11:00 a.m. - Fowler Woods Walk. Enjoy all the aspects of the woods, especially the trees.

May 14 (Saturday) State Nature Preserves - 2:00 p.m. - Kyle Woods Spring Discovery Hike. Birds, wildflowers, the woods and fields are alive during this natural stroll.

May 15 (Sunday) State Nature Preserves - 2:00 p.m. - Hach-Otis Sanctuary Forest Ecology Walk in the Big Woods.

May 15 (Sunday) Cincinnati Chapter - (no time) - Indian Creek Park, Butler County. See Dodecatheon meadia (Shooting Star).

May 16 (Monday) Columbus Chapter - 7:30 p.m. - Spring Hollow Park Lecture.

May 16 (Monday) Dayton Chapter - 7:30 p.m. - Cox Arboretum. Orchids of Ohio lecture by Bill Culbertson.

**** May 19 (Thursday) Cleveland Chapter - 7:30 p.m.** - Holden Arboretum. Panel discussion on "What Is A Native Plant". See page

May 21 (Saturday) Cleveland Chapter - 9:30 a.m. - Holden Arboretum - Our favorite Dr. Walter Macior returns to lead us on a field trip on "Insect Pollination". He has given us two lectures on the subject and now we will see the process in the field.

May 21 (Saturday) Wilderness Center - 2:00-4:00 p.m. - Field trip to Russell Slutz Farm. Call for directions.

- May 22 (Sunday) State Nature Preserve - 2:00 p.m.** - Eagle Creek - Identification, lore, and natural history of our native hardwoods.
- May 27 - May 29 (Friday-Sunday) Cincinnati Chapter - Adams Prairie - Ohio Native Plant Society 1988 Weekend.** Call 338-6622 for information.
- May 29 (Sunday) State Nature Preserves - 1:30 p.m.** - Jackson Bog Spring Walk. Carnivorous plants, glaciers, running water and chemistry come to life.
- June 4 (Saturday) State Nature Preserves - 10:30 a.m.** - Eagle Creek - Ferns and Their Allies. Discover the secret lives of some of our oldest and flowerless plants.
- June 4 (Saturday) Wilderness Center - 2:00-4:00 p.m.** - Field trip to Willis Woods.
- June 4 (Saturday) State Nature Preserves - 1:00 p.m.** - Fowler Woods Walk.
- June 5 (Sunday) State Nature Preserves - 1:30 p.m.** - Kyle Woods - Discover the variety and character of our native trees and shrubs.
- June 9 (Thursday) Cleveland Chapter - 7:30 p.m.** - North Chagrin Reservation - Dr. Gail Corbett will give us a class-lecture on how to identify the various composite plants, such as cone flowers, asters, goldenrods, etc. Using slides, she will point out the various characteristics to look for and what clues will lead us in the right direction. Dr. Corbett is one of the leading authorities in this area.
- June 11 (Saturday) State Nature Preserves - 10:30 a.m.** - Fowler Woods - Tree and bark identification.
- June 12 (Sunday) Dayton Chapter - 2:00 p.m.** - Cedar Bog - A wonderful chance to see this alkaline fen with Paul Knoop.
- June 18 (Saturday) Wilderness Center - 2:00-4:00 p.m.** - Field trip for Twayblades and Roundleaf orchid.
- June 18 (Saturday) State Nature Preserves - 10:00 a.m.** - Conkle's Hollow - The steep-walled cliffs offer a striking example of powerful erosional forces at work.
- June 20 (Monday) Dayton Chapter - 7:30 p.m.** - Cox Arboretum - Slide lecture by Richard E. Moseley, Jr. about wildflowers in the State Nature Preserves.
- June 26 (Sunday) State Nature Preserves - 1:30 p.m.** - Headlands Dunes - Dune ecology. Sand, shoreline, and unique beach plants all play vital roles in a fast disappearing and highly specialized community.
- June 26 (Sunday) State Nature Preserves - 1:00 p.m.** - Conkle's Hollow - Ecology of the Rim. The rugged environment of the Rim Trail plays host to a number of plant species that are not found in the cooler, moist hollow below.

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PRINT SALE

In the January issue of **On The Fringe** we announced the sale of the print **Spring Majesty** by Karen Keary. The proceeds from the sale of the print will fund the Endowment for the Annual Grant. The print is on display at the Holden Arboretum and the Fireside Book Shoppe in Chagrin Falls.

Sales are going very slowly. **MEMBERS, PLEASE BUY!!** It is one way to give \$35.00 to the Society and get something in return. The print is a good size to hang just about anywhere in your home or office, and makes a fine gift for friends or families interested in nature. Our Annual Grant has done a great deal of good and it is important that we continue it. The letter below is from Dr. Walt Macior who received the award in 1986. The Grant fulfills our charge in the Constitution of the Society to support scientific research.

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LETTER FROM PROFESSOR MACIOR - Recipient of Annual Grant

Dear Mrs. Malmquist:

In December 1986, the Native Plant Society awarded me \$500 in support of research at the University of Akron. The award was turned over to the Dept. of Biology restricted fund to be used for DNA restriction mapping and sequencing on native species of **Pedicularis**.

I'm pleased to be able to report that our work has been initiated, after a delay in replacing an ultracentrifuge, and is progressing very well. Our geneticist, Dr. Turner, and I together with two undergraduate honors students and two graduate students are working on isolating specific fragments of chloroplast DNA to be used as probes in identifying similar DNA sequences in other species. This will give us some idea of how closely different species are genetically related.

This summer, I plan to collect fresh leaves from about 18 other **Pedicularis** species in North America to extend the study.

The support from the Native Plant Society has been a great encouragement for this work. We are all very grateful to the Society.

Sincerely yours,

Lazarus Walter Macior, Ph.D.

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BISSELL AWARD

At the March 18th Burroughs Club Meeting, member Jim Bissell received the 1988 Lake County Environmental Award for his work in inventorying and preserving the unique natural areas of Lake County. In addition to the award, the Lake County Board of Commissioners passed a resolution congratulating Jim and recognizing his achievements.

THE HALOPHYTES ARE COMING? THE HALOPHYTES ARE HERE!

by Perry K. Peskin

"Why do you keep that awful-looking weed?" asked one of our more outspoken neighbors a few years ago. The plant in question, growing next to our front steps, was over six feet tall, with many thick stalks, bearing long drooping leaves and topped with spikes of small golden-yellow flowers.

I was not offended by the remark. In fact, I was rather pleased she had noticed. After all, who else has a genuine seaside goldenrod in their front yard, and in such thriving condition? Seaside goldenrods are one of a small group of plants called **halophytes** that tolerate salt water in the soil or salt spray in the air. For this reason they are usually found on ocean beaches, in salt meadows, around salt marshes, or in specialized inland habitats, such as alkali deserts. The seaside goldenrod (***Solidago sempervirens***) can be found growing among dunes on the Atlantic coast from Newfoundland to Mexico—and also along a road a few miles north of Painesville, Ohio, where I obtained my specimen.

I felt no qualms about disturbing the environment by digging up my plant. In fact, there was not much environment to disturb. The clumps of goldenrod lined a weedy strip between the road and the railroad tracks serving a large chemical factory. On the other side of the road I had an unobstructed view of several dismal bodies of water called settling ponds. In this blighted landscape, accompanied by the roar of trucks and an occasional freight train, I set about selecting and digging up a small clump of goldenrod, which was still in bloom despite the cold wind and sleety rain typical of the end of October.

After I brought the plant home, I waited for the first warm, sunny day and transplanted it to the part of my garden with the worst soil, a sandy, gravelly patch, probably part of the rubble left behind when the bulldozers finished the house years ago. In my ignorance I even mixed a pinch of table salt into the soil around the roots. Later I learned that very few halophytes actually require salt; they are adapted to tolerating it, but do very well without it. In fact, seaside goldenrod grows only 2 to 3 feet tall in Atlantic coastal dunes but soars to over 7 feet in a freshwater habitat.

At any rate, my plant has adapted itself to its new home almost too well (to the extent of partly blocking the path to the front door) but, with its evergreen leaves, as indicated by its Latin name ***sempervirens***, and its masses of golden flowers, adds a touch of color to the garden in late fall. Best of all, since it resists diseases and insect pests, it requires absolutely no care.

According to Jim Bissell, curator of botany of the Cleveland Museum of Natural History, who has discovered many recent halophyte immigrants to Ohio, it is this toughness and adaptability that characterizes the halophytes and explains their presence here. Since halophytes have been observed in Ohio mainly after 1950, it is safe to assume that the construction of the interstate highway system and the heavy salting of the roads have helped the spread of salt-tolerant plants. Although the actual mechanism of their dispersal is yet unknown, perhaps for years seeds of halophytes from the Atlantic coast have been "hitching a ride" on trucks, trailers,

campers, and other vehicles going west, without surviving in significant numbers. But heavy concentrations of salt on the road shoulders and at entrance and exit ramps have opened up new opportunities. Certain side roads off the interstates leading to chemical factories, salt mines, brine pools, and similar industrial developments are now lined with plants never seen until recent years. This is probably how my seaside goldenrod found its way to the industrial Lake Erie shore north of Painesville.

Other halophytes took different routes. A few from the salt flats of the Far West, such as Western sea-blite, or pahute-weed (*Suaeda calceoliformis*), have obviously arrived by freight train, since they have seldom been observed growing far from railroad tracks. Aquatic halophytes present another problem. Ditch-grass (*Ruppia maritima*), a flowering plant that spends nearly its whole life cycle submerged in salt water and somewhat resembles one of the algae, has recently been discovered inhabiting Northern Ohio brine pools. Since the seeds of ditch-grass survive in damp mud, it is thought that perhaps they are transported on the feet of migratory birds, such as ducks and geese.

Likewise, one of the greatest cosmopolites of the plant kingdom—reed grass (*Phragmites australis*), found from Canada through Mexico in North America and also in large areas of Eurasia, South America, Africa, and Australia—has probably attained its great range on the feet of birds. It too is a halophyte and before the 1950's was found in a limited are of Ohio, mainly along the Lake Erie shore and around inland lakes and swamps, the usual areas where migratory shore birds and waterfowl would put down to rest. It seldom occupied roadside ditches and was rather scarce even in Mentor Marsh. In those places it had to compete with common and narrow-leaved cattails (*Typha latifolia* and *T. angustifolia*).



Phragmites communis. Plant. X 1/3. Spikelet and flower. X 3. (Hitchcock 1898, N. Dub.)

The picture has changed drastically. All along the interstates reed grass has ousted cattails. Mentor Marsh is a sea of *Phragmites*, its plumes up to 12 feet high (occasionally to 18 feet), presenting a solid green wall, like a forest of bamboo, frustrating to bird watchers and other would-be observers of wildlife. The reed grass has obviously taken advantage of the great increase in the salinity of Mentor Marsh, documented since the 1950's when large quantities of low-grade salt "tailings" accumulated from the nearby Lake Erie salt mines. At that time it was still legal to dump salt into the marsh and its tributaries, with the result that we see today: the largest habitat for halophytes in Ohio.

While it is fairly clear how and why halophytes spread to Ohio, plant physiologists are still puzzled how they can survive in

their chosen habitat. This is strange when we consider that the original land plants, the primitive ancestors of all of today's higher plants, evolved from green algae that emerged from the sea in Silurian times, 360 million years ago—and were all halophytes. Since then, geologists believe, the oceans have become more saline, and the present-day plants have lost their genetic adaptability to salt water.

Listing the various Atlantic coastal halophytes reveals that they have little in common. First of all, they differ in ancestry. Among the monocots are a great many grasses, sedges, rushes, and members of obscure aquatic families. Among the dicots are sand spurrey among the pinks; seaside goldenrod, salt water asters, and woody species (marsh elder, high water bush) from the composites; and orach, glassworts, and sea-blite from the goosefoot, or chenopod family. Other halophytes belong to the mallow, primrose, gentian, leadwort, and plantain families.

If any single family deserves the name halophyte, the chenopods probably have the greatest claim. Most of the weedy, colorless members of this group grew originally by the seashore or in salt deserts and bear such names as lamb's-quarters, pigweed, Russian thistle, greasewood, bugseed, winterfat, and povertyweed, testifying to their hardiness and humble appearance. (In all fairness, one should mention the cultivated members of this family, spinach and beets.)

Secondly, halophytes certainly differ in appearance. Some are prostrate; others, upright. A few are woody; most are herbaceous. Some are broadleaved, others narrowleaved, and still others leafless. Quite a few have fleshy, or succulent, leaves. Most of them have imperfect or colorless flowers, but a few, such as the seaside goldenrod, perennial salt-marsh aster, the seashore and rose-mallows, and the sea-pinks, are attractive exceptions. In size we have the greatest variation within the grass family, from the tiny alkaligrass of less than 4 inches to the giant **Phragmites**.

The quality that distinguishes halophytes is the ability to control the flow of soil water in and out of the root tissues to a finer degree than most other plants are capable of. In the process called osmosis, a normal plant will absorb water from the soil through tiny structures called root hairs, one cell in width, found on the growing tips of roots. The root hairs pass the water to conducting cells in the roots and eventually to every cell in the plant.

Through this conducting, or vascular, system, water will reach the leaves, where it combines with gases to create food for the plant in another process called photosynthesis. Eventually the leaves discharge much of the water to the outside in the form of vapor. The whole cycle thus depends on the cell structure of the root hairs.

In freshwater habitats water will flow into the root hairs because their cells contain a higher concentration of salts and sugars than is present in the surrounding soil. This follows a law of physics which states, in effect, that water molecules tend to flow from a weaker solution to a stronger solution. However, in soils inundated by salt water, the reverse process takes place. The soil now has a heavier concentration of salts than the cells have, and water flows out of the root hairs. Eventually, in a drying-out process, called plasmolysis, the whole plant loses water.

First, the leaves droop, and then the stem. If the process is not arrested, the plant dies.

Halophytes act differently. By means of special devices on the molecular level, still not understood by plant physiologists, halophytes are able to withstand indefinitely above-normal concentrations of salt next to the root hairs. Some halophytes have actually developed special glands in the leaves that excrete salt water. These roughly correspond to kidneys in a human being. Other halophytes appear to be protected by special substances within the cells, such as the amino acid proline. Apparently each group of halophytes has its own range of tolerance to salt water and its own method of coping with the salt-water problem and thus can exploit successfully a habitat "off-limits" to ordinary plants.

Success, however, has its costs. As evolution has taken its course, most halophytes with their associated animals are found in salt-water habitats and nowhere else. They have become specialized and usually cannot flourish over a long period in any other habitat. A sudden environmental change can be fatal. For instance, if a salt-water inlet is cut off from the sea by a barrier beach and is flooded with fresh water, the fringe of halophytes surrounding the inlet will not be killed off. Instead, by a process called ecological succession, they may be slowly crowded out by the fresh-water aquatic plants that will inevitably arrive by seed and compete more strongly for the new habitat. A tidal flat may thus turn into a fresh-water meadow and later a swamp forest, with its own plants and associated animals.

At present the reverse process is taking place in Ohio on a small scale. Salt pollution is attracting halophytes and also their animal associates. A former brine settling pond in Painesville's industrial section has attracted a bushy ground cover of sea-blite. Underneath have been found two species of harmless ground beetles, of the genus **Bembidion**, which are common in saline areas of the West but have never before been reported from Ohio.



Similarly, the salt conditions of Mentor Marsh has attracted two species of salt-water mosquito as an unwelcome addition to the 31 native species already present. Most notorious is **Aedes sollicitans**. While it does not breed in Mentor Marsh itself, it has caused concern in the surrounding area since its first appearance in the 1950's. On the East Coast it has a bad reputation as an aggressive biter and carrier of encephalitis. However, in Mentor Marsh it was found breeding only in holding ponds near salt wells, restricted areas from which it was eradicated by pesticides. The other salt-water mosquito, **Culex salinarus**, is an equally annoying night biter and a potential vector of St. Louis encephalitis.

Dr. Sonja Teraguchi, curator of entomology at the Cleveland Museum of Natural History, believes that one of the ways salt-water mosquitoes disperse into Northern Ohio is by riding wind currents. **Aedes sollicitans** has been observed flying 110 miles offshore with the assistance of the wind. Theoretically it could travel from the East Coast to Ohio in one journey. As in the case of plant seeds, trucks and other vehicles can transport adult insects or soil containing eggs. Lastly, mud on the feet of ducks and other migrating water birds may hold salt-water insect eggs, which, if released in a suitable environment, will hatch into larvae.

In the case of another salt-tolerant newcomer, the brine fly (**Ephydra riparia**) breeds in Black Brook, a tributary of Mentor Marsh. Found in very saline water all over North America, including Great Salt Lake, the brine fly is now found in the saltiest part of the Mentor Marsh area in an inlet which has suffered heavily from dumping of saline water from salt mines. Resembling a halophyte in its ability to cope with water loss, the brine fly is able to drink salt water and keep its cell contents in balance with the salty water it swims in.

As we go up the food chain to the creatures that eat these insects, we may expect to see in the near future Atlantic coastal species of birds making longer stops in Mentor Marsh and other areas where halophytes flourish. In recent decades at Mentor Marsh or nearby, the first tricolored, or Louisiana, heron (**Hydranassa tricolor**) was seen in 1976; the first snowy egret (**Egretta thula**) in 1977; and possibly the first black rail (**Laterallus jamaicensis**) in 1965. Although these sightings may be coincidences or the result of more thorough bird watching than before, they do suggest that bird species almost exclusively associated with the Atlantic Coast are being seen more often in Northeastern Ohio.

What is the future outlook for halophytes in Ohio? For one thing, they will increase in numbers and diversity. Just in the past few years a homely new plant, giving off a foul odor, the fetid marigold (**Dyssodia papposa**), a composite from the Great Plains states, has appeared on the interstate between Cleveland and Columbus. It may prove to be a halophyte, for it grows with short-rayed aster (**Aster brachyactis**), an Atlantic halophyte already well established on the interstate.



Secondly the increase of gas and oil wells throughout the state has necessitated huge quantities of brine as a waste product. Since building settling ponds to collect the brine is expensive, it is often pumped into trucks and dumped illegally at night along back roads and into streams. We now have salt pollution affecting many local wells and drinking-water sources. In some cases researchers have found poisonous

hydrocarbons—benzene, toluene, xylene, and others—in the brine, to further complicate the job of water purification systems. Bringing illegal brine dumpers to court may be difficult, but public prosecutors should become aware of a sure-fire test for the presence of brine—halophytes. As an example, there is a sealed-off salt well in an industrial area near Barberton, Ohio, that is surrounded by concentric zones of a grass called sprangletop (**Diplachne fascicularis**) and a chenopod called orach (**Atriplex patula**). The owners of the property might just as well have put up a sign, stating in big letters, "DANGEROUS SALT LEAK," for the above-named plants are halophytes. Thus, the day may come when halophytes will be used regularly as "stool pigeons" against brine dumpers.

Lastly, if the interstates get too salty, as is likely, nothing will be able to grow on the road shoulders and median strips except halophytes. If state highway officials are in the market for an attractive halophyte to prevent soil erosion, I would like to nominate seaside goldenrod. It is a perennial and thus does not need replanting every year. It is insect and disease resistant. Its leaves never turn brown in the summer. It has a colorful appearance in the fall, and, despite what the neighbors say, I like it.

Perry K. Peskin is a retired teacher and volunteer at the Cleveland Museum of Natural History. He is widely known as an excellent botanist.

Sources and Suggestions for Further Reading

The only nontechnical book on plant physiology which I found useful was Doris M. Stone's **The Lives of Plants** (New York: Scribner's, 1983).

Dr. Sonja Teraguchi's small pamphlet **Mosquitoes, People and Mentor Marsh** is available from the Cleveland Museum of Natural History, Wade Oval, Cleveland, Ohio 44106. She also recommends an article in the **Ohio Journal of Science** by Carl E. Venard and Frank W. Mead entitled "An Annotated List of Ohio Mosquitoes," (53: 327-331, November, 1953).

Jim Bissell's article on Ohio halophytes has not been published yet.

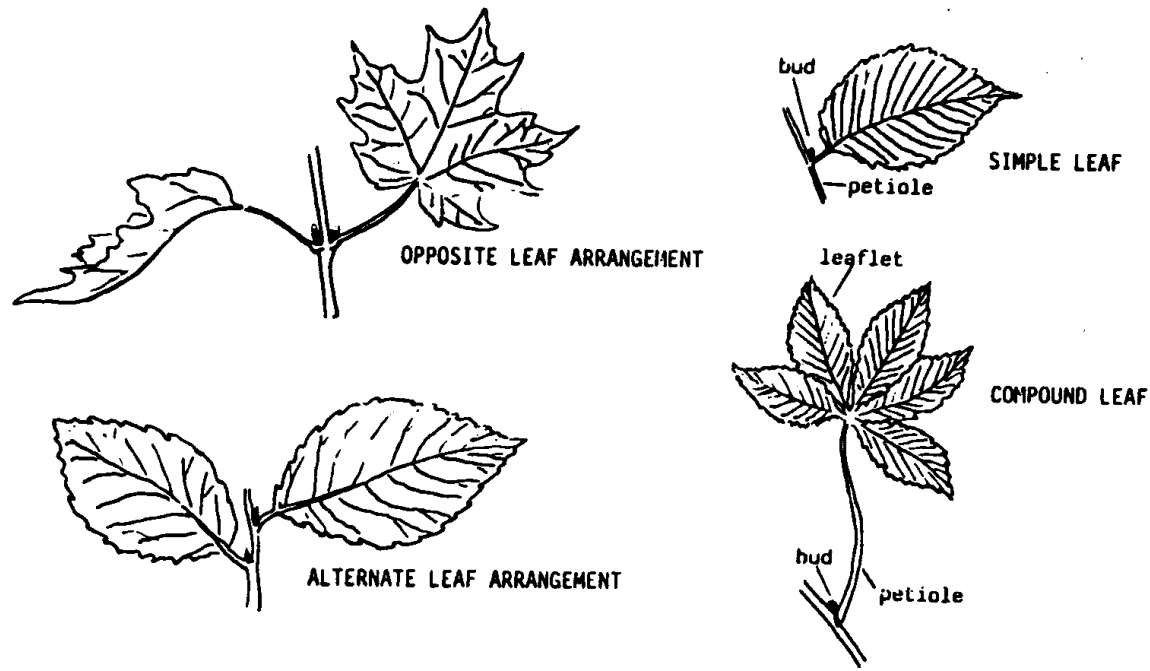
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FREEMAN TILDEN AWARD

At the National Interpreters Meeting in St. Louis, member Carol Spears, A CVNRA ranger, was awarded the prestigious Freeman Tilden Award for outstanding interpretation. Carol has designed a unique interpretation program involving visitor participation in park resource management activities. The program allows national park visitors to use the same equipment and procedures used by rangers conducting studies in the field.

The award is co-sponsored by NPCA and the National Park Service and was given to her by NPS Director William P. Mott. Its purpose is to recognize outstanding individual achievement in park interpretation and to stimulate creative initiative on the part of NPS interpreters.

EASY STEPS TO PLANT IDENTIFICATION by Mary L. Wilmoth



Do you wish you could identify trees and shrubs quite readily, but have difficulty distinguishing a dogwood from a pine? Take heart! Learning to recognize woody plants is easier than you think. Here are a few tips to get you started:

Take a close look at one of the deciduous trees in your neighborhood. Look at the leaf and branch arrangement. Are the leaves arranged alternately along the stem or is it an opposite leaf arrangement? (See illustration). If the tree has an opposite leaf arrangement, the possibilities have narrowed.

Here is a mnemonic device used to remember which woody plants have opposite leaves and branches: MAD BEV stands for maple, ash, dogwood, buckeye, euonymus, and viburnum.* This little memory tool covers most of the opposite branched trees and shrubs in this area.

Learn to recognize simple and compound leaves. This is an important step in summer plant identification. The position of the bud determines whether a leaf is simple or compound. (See illustration to understand the difference.)

While you are examining the leaf bud to distinguish simple from compound leaves, notice the shape and color of the buds. Buds often are good identification features. They are present on woody plants from midsummer until the following spring when the leaves emerge from them. In addition, some leaf buds are so distinctive that alone they are enough to identify the plant.

For instance, beeches have large, cigar-shaped buds, white ashes have terminal buds that resemble Hershey kisses, and tulip poplars have large duck-bill buds.

Growth habit (vase-shaped, pyramidal, horizontal, etc.) is often distinct in certain

plants. See April 1987 **The Dawes Arboretum Newsletter** for "Tree ID at 55, or Leaf in the Fast Lane" for more about the growth habits of trees.

What about needled evergreens? Can you distinguish a pine from a spruce or a hemlock? Take a close look at one of the evergreen trees in your area. Are the needles in bundles (packages) or are they borne singly along the stem? If the needles are in packages, it is a pine. If the needles are single, sharp, four-sided, and spirally arranged along the stem, it is a spruce. If the needles are soft, two-ranked (on sides of twig but not top or bottom), flattened, with two white stripes beneath, it is a hemlock.

One last tip: do not make the common mistake of trying to learn too many plants at one time. Start with a few. Practice these until you can recognize the plants in any situation. Then add a few more trees and shrubs to your repertoire. If you are having difficulty, remember that the process of elimination is helpful. It is sometimes more important to know what a plant is not than what it is.

* Ed. Note: Another version for trees is MAD BUC (maple, ash, dogwood, buckeye, euonymus, and catalpa.)

This article is a reprint from *The Dawes Arboretum Newsletter*, Vol. 20, No. 7, 7/87.

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LANDSCAPING WITH NATIVE OHIO PLANTS - BIG TREES by John P. Bowles

I like to recommend native Ohio plants for landscape use. I don't know why exactly, but since they are just as "good" as many of the exotic plants commonly grown (often better), there certainly isn't any reason why I shouldn't recommend them. And loyal Buckeyes (even transplanted ones like me) it seems to me that we should stand by our own.



Following is a list of tall growing (usually maturing at over 40 feet) trees native to Ohio that are also excellent in their ornamental characters. It is a partial list; I included my favorites only. Many are frequently used in landscapes, others are not. Information supplied applies to the species, not necessarily to horticulturally selected varieties.

All rate good to excellent in disease and pest resistance if, as for all plants, they are grown in the right situation. But most are as tolerant (or even more so - after all they already grow here "by choice") of prevailing central Ohio conditions, as their exotic landscape counterparts.

Notes: All of the trees listed are very attractive, landscape-worthy plants. But for many of the trees (pecan for instance) it is

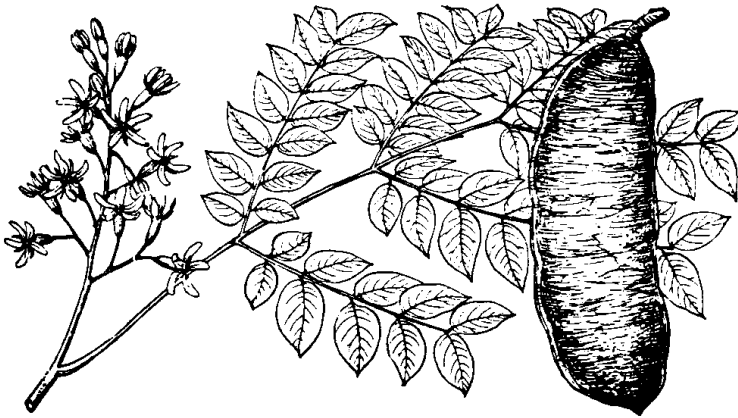
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difficult to tabularize ornamental quality because their beauty is in the sum of many characters rather than one or two outstanding ones.

I consider a good shade tree to have broad-spreading rather horizontal branching and rated the plants on the list accordingly. A specimen tree is one with an attractive or interesting outline and growth habit.

Bark is listed as being ornamental in the winter because that is when it is most noticed.

Height after 10 years is measured after the landscape planting of a five-foot-tall sapling; the five feet are included and good growing conditions are assumed.



1. *Gymnocladus dioica* K. Koch. Kentucky Coffee-tree.

6. *Carya ovata* K. Koch. Shellbark Hickory. Shagbark Hickory.

Key

I Best Ornamental Characters
 flowers = Fl
 fruit = Fr
 leaves = Lv
 bark = Bk

Season of Interest
 spring = S
 summer = U
 autumn = A
 winter = W

II Shade tree or specimen?
 shade = Sh
 specimen = Sp
 either = E

III Edible fruit?
 IV Cultivars available?
 V Expected ht (ft) in 10 yrs.
 VI Mature ht (after 30 yrs.)

	I	II	III	IV	V	VI		I	II	III	IV	V	VI
1. <i>Acer rubrum</i> red maple	Fl/S Fr/S Lv/A	SH		Yes	20	50							
2. <i>Aesculus octandra</i> yellow buckeye	Fl/S Fr/A Lv/A	SP			20	50							
3. <i>Betula lenta</i> sweet birch	Fl/W Lv/A Bk/W	SP			25	45							
4. <i>Betula nigro</i> river birch	Fl/W Bk/W	E	Yes		30	50					Yes	25	60
5. <i>Carya illinoensis</i> pecan	Lv/A	E	Yes*	Yes	20	50						20	45
6. <i>Carya avata</i> shagbark hickory	Lv/A Bk/W	SP	Yes		15	45						20	45
7. <i>Diospyros virginiana</i> persimmon	Fr/A	SP	Yes		15	40						20	50
8. <i>Fraxinus americana</i> white ash	Lv/A	SH		Yes	25	60						15	45
9. <i>Gleditsia triacanthos</i> honeylocust	Lv/S Lv/U Fr/W	E		Lots	30	45						20	50
10. <i>Gymnocladus dioica</i> Kentucky coffee tree	Lv/U Lv/A Bk/W	E			15	45						20	50
11. <i>Juglans cinerea</i> butternut	Lv/U	SP	Yes		15	45							
12. <i>Liquidambar styraciflua</i> sweetgum	Lv/A Fr/W	E		Yes	20	50							
13. <i>Liriodendron tulipifera</i> tulip-poplar	Fl/U Lv/A	E		Yes	25	60							
14. <i>Morus rubra</i> red mulberry	Fr/U	SH	Yes		20	45							
15. <i>Nyssa sylvatica</i> sour-gum	Lv/U Lv/A	SH			20	45							
16. <i>Quercus alba</i> white oak	Lv/A	SH			20	50							
17. <i>Quercus macrocarpa</i> bur oak	Bk/W	E			15	45							
18. <i>Thuja occidentalis</i> eastern arborvitae	Lv/W	SP		Lots	20	50							
19. <i>Tilia americana</i> American linden	Fl/U	SH		Yes	20	50							
20. <i>Tsuga canadensis</i> hemlock	Lv/W	SP		Yes	20	45							

* Ed. note: Edible in southern Ohio; fruits don't mature here.

LANDSCAPING WITH NATIVE OHIO SHRUBS by John P. Bowles

Shrubs detailed in this article are (usually) multi-stemmed plants growing between three feet and fifteen feet tall. Because some have qualities that merit mention besides those listed in the table, I've included additional notes at the end.

None of the plants are considered rare, but many are uncommon in landscape settings. All are relatively pest and disease free when grown in appropriate conditions. Sizes are listed according to landscape expectations.

As with trees, decisions about which plants to discuss were difficult — there are many more native Ohio shrubs, and all are excellent (in the right place).

If you are willing to "dig a little deeper," I think you will be researching or searching out these plants: *Amelanchier spicata*, dwarf serviceberry; *Calycanthus fertilis*, pale sweetshrub; *Cornus rugosa*, roundleaf dogwood; *Dirca palustris*, Atlantic leatherwood; and *Viburnum rafinesquianum*, *Rafinesque viburnum*.

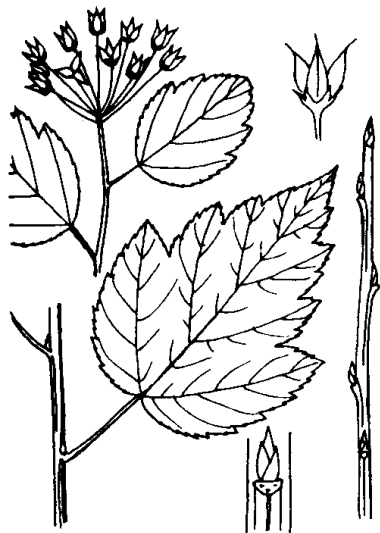
Key

- I Expected landscape ht (ft)
- II Expected width or spread (ft)
- III Showy flowers? (seasons for fruit)
- IV Attractive fruit?
 - Sp = spring
 - Su = summer
 - A = autumn
 - W = winter

- V Good fall color?
- VI Preferred light conditions:
 - Sh = shade
 - PS = part shade
 - FS = full sun
 - AD = adaptable

- VII Preferred soil conditions:
 - M = moist, well-drained
 - D = dry
 - We = Wet
 - AD = adaptable; moist well-drained usually preferred

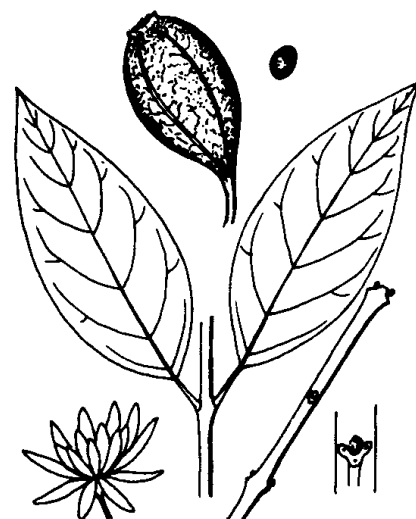
	I	II	III	IV	V	VI	VII		I	II	III	IV	V	VI	VII
1. <i>Calycanthus floridus</i> sweetshrub	6	6	Su		OK	AD	M	14. <i>Rhododendron maximum</i> rosebay rhododendron	15	15	Su			Sh	M
2. <i>Cornus racemosa</i> gray dogwood	12	12	Sp	Su,A	Yes	AD	AD	15. <i>Rhododendron</i> <i>periclymenoides</i> pinxterbloom azalea	6	6	Sp		Yes	Sh	D
3. <i>Cornus sericea</i> red-osier dogwood	8	10	Sp	Su	Yes	AD	AD	16. <i>Rhododendron</i> <i>prinophyllum</i> northern roshell azalea	6	6	Sp			Sh	M
4. <i>Euonymus americanus</i> strawberry-bush	6	5		Su,A	Yes	Sh	M	17. <i>Rhus aromatica</i> fragrant sumac	7	7	Sp	Su,W	Yes	AD	AD
5. <i>Hamamelis virginiana</i> Virginis witchhazel	15	20	W,Sp		Yes	PS	M	18. <i>Salix discolor</i> pussy willow	25	20	Sp			FS	We
6. <i>Hydrangea arborescens</i> smooth hydrangea	5	5	Sp			Sh	AD	19. <i>Sambucus canadensis</i> common elderberry	10	10	Su	Su,A	OK	AD	AD
7. <i>Juniperus communis</i> common juniper	10	7		A,W		FS	D	20. <i>Shepherdia canadensis</i> buffalo-berry	8	8		Su		FS	D
8. <i>Kalmia latifolia</i> mountain-laurel	10	8	Sp			Sh	M	21. <i>Staphylea trifolia</i> bladdernut	14	12		Su,W	OK	PS	M
9. <i>Lindera benzoin</i> spicebush	12	12	W,Sp		OK	PS	AD	22. <i>Symphoricarpos albus</i> snowberry	4	4	Sp	Su,W		AD	AD
10. <i>Myrica pensylvanica</i> northern bayberry	6	6		A,W		AD	AD	23. <i>Taxus canadensis</i> Canada yew	5	8		Sp		Sh	M
11. <i>Physocarpus opulifolius</i> ninebark	9	9	Sp	Su	Yes	AD	AD	24. <i>Viburnum prunifolium</i> black-haw	12	10	Sp	Su	Yes	AD	AD
12. <i>Potentilla fruticosa</i> bush cinquefoil	4	4	Sp,A			FS	D	25. <i>Viburnum trilobum</i> American cranberry- bush viburnum	10	10	Sp	Su,A	Yes	AD	M
13. <i>Rhododendron</i> <i>calendulaceum</i> flame azalea	7	10	Sp		Yes	PS	AD								



Common Ninebark



Canada Buffaloberry



SWEET SHRUB

1. Flowers are dark reddish-brown and smell like very ripe apples.
3. Sometimes listed as *Cornus stolonifera*.
4. Also called hearts-a-bursting. Of questionable hardiness north of Columbus, except at Lake Erie.
5. Will stand full sun if soil conditions are good.
6. Spreads gradually by suckers near the base, can cover large areas. Flower heads hang on all winter. Some good cultivars (Annabelle, Grandiflora) are available.
7. A needled evergreen. Cultivated varieties (cultivars), generally dwarf or ground-cover types, are what are usually grown.
8. A broadleaf evergreen, must be protected from winter wind and does best in a highly organic, acid soil. In good sites, can get larger than indicated.
9. Does well in full sun if soil is moist.
10. Semi-evergreen.
11. Dwarf and yellow leaved cultivars available.
12. Many cultivars available.
14. See 8
15. Also listed as *Rhododendron nudiflorum*. Clump-forming.
16. Also listed as *Thododendron roseum*. Tolerant of alkaline soils.
17. Gro-Low, a dwarf cultivar, is available.
18. Will grow in most soils, but won't get as big or live as long unless conditions are good.
20. Has silvery leaves. Prefers poor soil.
23. Spreads by the rooting of the lowest stems. Good groundcover.
24. Fruit is edible after frost.
25. Fruit edible, cultivars, including dwarfs, are available.

These two articles by John P. Bowles, Horticulturist, are reprinted from The Dawes Foundation Newsletter Vol. 20, No. 7, July 1987.

WHEN BULLDOZERS COME TO THE MARSH, WHO DO YOU CALL? by Peter Weber

Every year 400,000 acres of wetlands are turned into cropland. This trend of destruction, now the primary cause of wetland loss, could soon be turned around through the application of the "swampbuster" provision of the 1985 Farm Act.

Swampbuster states that farmers who convert a wetland for crop production cannot retain their eligibility for federal farm subsidies. Although the provision does not directly prohibit wetland conversion, it offers a strong disincentive because farmers are heavily dependent on federal crop subsidies.

Already, private citizens are helping to enforce the swampbuster provision by reporting suspected violations to federal, state, and local officials (see **Audubon Activist**, Nov/Dec 1987). If you see someone tampering with a wetland (bulldozing trenches, building dams, diverting streams) here is what you can do:

The United States Department of Agriculture has an established national hotline (1-800-424-9121)—direct to the Inspector General's Office—for reports of agricultural violations. A call to the hotline can start the ball rolling, but don't stop there: In the USDA's sprawling bureaucracy, your report could be lost or misplaced.

The next step is to contact local officials who are close to the problem. Staunch wetland allies can be found at the local offices of the United States Fish and Wildlife Service and in state fish and game departments. If you have not already documented the existence of the wetland with photographs, and through determination of soil type, vegetation, and animal life, these wildlife specialists can help you.

The USDA also has local offices that should hear from you because they are the ultimate swampbuster enforcers. Try contacting one of the following USDA subdivisions: the Soil Conservation Service (SCS), the Agricultural Soil and Conservation Service (ASCS), the Farmers Home Administration (FmHA), or the Federal Crop Insurance Corporation (FCIC). If the first person you talk with cannot help, try calling a different USDA branch.

Every one of these offices normally plays a role in the enforcement of swampbuster, but not every employee will know what to do. Remember to note the date of the call, the name of the person with whom you spoke, and his or her response. Make a file of all the information you gather, and send summaries or copies to Audubon's Washington, D.C. office.

Don't go it alone. Solicit allies. At your next Audubon meeting, report that a wetland is being destroyed and that something can be done about it through swampbuster. Together you can gather more facts and make follow-up calls to local officials. Other groups dedicated to wetland preservation, such as the National Wildlife Federation and Ducks Unlimited, will also want to know and help out.

Were this a perfect world, you could call the USDA and its officials would enforce the law as intended. Unfortunately, the reality of wetland protection may lie more in local interpretations of the law and regulations. Local USDA officials or the landowner may invoke one of the exemptions to swampbuster—that the wetland had been previously converted for agriculture or the conversion was started or planned before December 12, 1985, or that conversion would make no significant impact on

local wetland ecology. Or the SCS and ASCS could claim that the field in question is not wetland under their interpretation of the wetland definition.

If such is the case, don't take their word for it—make them prove it. Public scrutiny, attention, and involvement will bring the facts to light. If you and other wetland lovers get together and demonstrate your support for these vanishing habitats, local officials will pay attention. Besides, it is more fun to enjoy wetlands with friends than to stand alone with only a bulldozer for company.

Contact Maureen Hinkle or Peter Weber at the Washington, D.C. office for more information and to let them know how this law is working for your wetlands.

Peter Weber is an agricultural policy associate in Audubon's Capitol Hill office.

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THURSDAY, MAY 19th MEETING

The long awaited panel discussion on "What Is A Native Plant" will, we hope, provide some answers to the oft-disputed subject. We are fortunate to have some prominent botanists on the panel.

Dr. Charles C. King is Executive Director of the Ohio Biological Survey and Chairman of the Division of Natural Areas and Preserves Advisory Council. Dr. King's expertise is in pleistocene floristics and environmental analysis and is widely recognized as an outstanding ecologist. In addition, he is an adjunct professor at Ohio State University.

Dr. George Wilder is an Associate Professor of Botany at Cleveland State University and is a plant morphologist and taxonomist. He has a strong personal interest in native flora and teaches local floristics.

Dr. Norman Alldridge is Associate Professor of Plant Physiology at Case Western Reserve University and is a plant anatomist who studies the genetic engineering of plants. He has an excellent understanding of plant distribution on a national as well as local basis.

Mr. Jim Bissell is senior botanist at the Cleveland Museum of Natural History and is a widely recognized authority on plant taxonomy and ecology. Known for his discoveries of plants thought to be extirpated, Mr. Bissell is an expert on plant geography and movement.

Each panelist will be given 10 to 15 minutes to address the subject. Then questions will be submitted to the experts. The moderator will be Ohio Native Plant Society President Ann Malmquist. Ambulances and fire engines will be in attendance.

TREK TO SURVIVAL: THE WALKING FERN by Leslie P. Nyman & David A. Marchand

Ferns are at the same time one of the most interesting yet one of the more obscure elements of our flora. They lack the brightly coloured and showy flowers of angiosperms. Flowering plants are common and found in easily accessible areas, while ferns are less ubiquitous; few will be found in such rural areas as abandoned fields, or along roadsides. Most ferns require the deep shade of a mature forest, or a rock outcrop, and as a result are seen only occasionally by the highway traveller. Yet, any energetic and devoted naturalist can learn the limited number of Ontario species (approx. 70) by sight (most ferns are tropical in distribution). One of the easiest of the ferns to recognize is the unique **Camptosorus rhizophyllus**, the walking fern.

Restricted in distribution, the walking fern is found almost exclusively on limestone rocks. In the shade of a beech-maple forest, it will be found growing along the top and along the sides of moss-covered limestone outcroppings, but not on those exposed to the direct sun, or indeed in any area where drying conditions prevail. The population may vary in size from a few isolated individuals, to a large group composed of several hundred individuals and plantlets. Although found predominantly on limestone rocks, they also occur on outcroppings of sandstone, quartzite, and other rock types.

The distribution of the fern in Ontario is restricted to areas of exposed limestone rock, along the whole of the Niagara Escarpment, across the province at the contact point of the Canadian Shield and the Great Lakes Lowlands, and in the eastern part of the province in regions of limestone and marble outcroppings.

Fern fronds are usually thought of as broad, variously dissected leaves with a rather tropical appearance. The fronds of the walking fern however, are simple, with entire margins, and appear almost spear-like because of their long slender tips and heart-shaped bases. They are leathery, and usually remain evergreen, persisting throughout the winter. The typical form, however, varies widely. **Camptosorus rhizophyllus** forma **boycei** is a form in which the fronds are deeply dissected and lobed, while in forma **angustatus** the typical inch wide fronds seldom attain a width of greater than 3/8 inch. **C. rhizophyllus** forma **auriculatus** is relatively common, and in this form the auricles are greatly extended outward, sometimes to sharp points at the tips.

Two distinct stages characterize the life cycle of ferns. The dominant conspicuous stage that has fronds, roots, and produces the spores is the sporophyte. The short-lived, sexual stage, of much smaller size, is the gametophyte. The shifting from one stage to another within the life cycle of the fern is known as alternation of generation.

One the undersurface of the fronds of fern sporophytes, or on separate specialized fronds, are borne spore-containing structures called sporangia. Aggregates of these sporangia found on the lower surface of the frond are referred to as sori. These are the spore dots that are readily seen without magnification. In the walking fern, the sori are arranged in elongate bands radiating out from the main vein and

following the path of secondary veins. In **Camptosorus**, the sori are partially protected by an indusium. This flap-like structure originates from one side of the sorus and affords coverage to only a small fraction of the sporangia.

Ferns have a special mechanism to ensure spore dispersal. In **Camptosorus**, along one edge of the sporangium, lie a row of annulus cells that are very thick-walled along their inner surfaces. Only the outer, exposed wall is not thickened. In autumn, as the spores mature, the cells of the annulus dry out, causing the annulus to shrink and tearing the sporangium open. Many of the spores are released by this mechanism, while others remain attached to the annulus. With further evaporation of water, the remaining spores can be catapulted up to two centimeters as the annulus springs back to its original shape.

The extremely small spores of **Camptosorus rhizophyllus** have an ornately sculptured surface. This rough surface may allow it to become caught in the soil or rock when it lands and anchor it there, better assuring germination. Each sporophyte plant can produce upwards of half a million spores in a year. Of these copious numbers, only an infinitesimal fraction will land in the proper conditions of light, soil, moisture, and minerals. And only under these conditions can the spore germinate into the second stage of the fern's life, the gametophyte.

Fern gametophytes are rarely seen in the field because of their relatively short duration and small size. The mature gametophyte consists of a single, leaf-like thallus, lying directly on the moist soil. The thallus is a heart-shaped structure, often only one to two millimeters in diameter, and only a few cells thick. On the underside, the walking fern gametophyte also has rhizoids, (root-like appendages) which anchor the tiny organism and serve in the uptake of nutrients from the soil. The female archegonia, or ovule-bearing components of the sexual stage, are at the two-lobed pole of the heart, while the antheridia, which at maturity produce motile sperm, are usually embedded among the rhizoids. The characteristic flagellate sperm of ferns reflects their affinity with other primitive vascular plants, such as horsetails and club mosses. When there is a continuous film of water along the under-surface of the gametophyte, some of the sperm released from the antheridia will swim to the archegonia. The fertilized egg of the archegonia then produces a new sporophyte plant, growing out of the gametophyte thallus.

There are a number of important features in this reproductive mechanism. Sperm are released when eggs in the archegonia are still immature. This ensures cross fertilization, as the sperm must fertilize the mature eggs of other gametophytes. Thus, a built-in mechanism for crossing requires the new generation of sporophytes to be genetically diverse. The scope for diversity of types brings up a second interesting point, that of hybridization. Where **Asplenium** spp. (spleenworts) and **Camptosorus** are growing in the same habitat, intermediate forms are sometimes found — these variant types arising from cross-fertilization between gametophytes of the two different genera. Apparently **Asplenium** and **Camptosorus** are very closely related, and a number of hybrids have been described. **Camptosorus** species have been crossed with **Asplenium montanum**, **A. platyneuron**, and **A. cryptolepis**. The ease with which species of the two genera hybridize has led some workers to speculate that they all belong to the same genus, instead of two separate taxa.

Continuation of the species is facilitated by vegetative reproduction in the walking fern as well. The fronds expand in a curled fashion called circinate vernation so that the tip of the frond is somewhat inrolled toward the upper surface. The cells of the tip, protected as they are, even in very mature fronds, remain metabolically active and capable of producing a new plant. In autumn, many of the fronds actually produce young plantlets as their tips uncurl. As the plantlet grows, the tip of the old frond bends toward the soil, and eventually the roots of the new sporophyte touch down and become established. Thus the common name of the walking fern, for as each new sporophyte takes root, the colony slowly "walks," one frond length at a step, across the ground. Often the tip of the old frond remains as a persistent attachment to the young sporophyte, giving the characteristic matted appearance observed in the field. John Yarbrough, an anatomist then with Baylor University in Texas, as early as 1936 studied the leaves of this special plant and described the budding sporophytes as "foliar embryos"; they often had developed root and shoot primordia before the uncurling of the frond. He could also distinguish two frond types; those with long acuminate tips, which produced or had potential to produce plantlets, and those with rounded apices, which did not show signs of developing "foliar embryos."

Thus we have been able to follow the fern through one turn of its life cycle. By restoring diversity to the gene pool through sexual reproduction in the gametophyte stage, the plant has potential for adaptation in the event of changing of environmental conditions. By maintaining uniformity and stability of genetic information through progeny of vegetative reproduction in the sporophyte stage, new plantlets are produced which are perfectly adapted to the environment in which they will grow.

The walking fern has been appropriately adopted by the Bruce Trail Association as its botanical symbol. The main distribution of the fern in the province is along the Niagara Escarpment, the route for much of the Bruce Trail. And the unique character of the fern, its "walking ability," makes it a proper symbol for a hiking trail.

Simply to discover this fern in its natural habitat is a rare and exhilarating experience. Understanding more about its life cycle and modes of reproduction can enrich the experience even more.

* * * * *

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- Reprinted from **Wildflower**, North America's Magazine of Wild Flora, Vol. 3 (3), Summer 1987.

ON THE LOOSE by Cora A.M. Nelson

Warning: this plant can be hazardous to our wetlands' health.

If you've driven past the same marsh on your way to work over the last few summers, you may have observed a growing abundance of tall, purple flowers among the marshland plants. Or perhaps you've noticed an occasional cluster of purple blooms in a roadside ditch, or blanketing the shoreline of a river. If so, you've witnessed another addition to a long list of threats facing American and Canadian wetlands. The culprit is purple loosestrife (**Lythrum salicaria**).

To many home gardeners, a backdrop of the long-lasting showy blooms offered by lythrum (as all species and varieties of this genus are commonly called) is hard to match. It's a reliable and hardy perennial, flourishing in our northern clime. In a wetland, however, **Lythrum salicaria** can spell disaster.

If water is removed from a shallow wetland to expose the underlying mud, many types of plant seeds that have collected there will spout; but lythrum seedlings grow quickly and outcompete native varieties in the race for nutrients and light. Each mature plant is capable of producing over 100,000 seeds in its first year. At that rate, it's just a matter of time until lythrum fills the wetland basin with a dense, impenetrable stand, offering virtually no value to man or wildlife.

Native to Eurasia, lythrum seems to have been held in check in its homeland by insect pests. But when the plants crossed the ocean, the insects stayed behind. Its seeds were probably introduced to our shores when the ballast of early settler and cargo ships was dumped into eastern seaboard harbours. Since lythrum was often valued as an herb, some settlers may have intentionally brought seeds with them. They may also have been carried in the wool of sheep, or brought over in unwashed wools which were imported in abundance in the early days of settlement.

Whatever their method of travel, pioneer communities of lythrum soon began to appear all along the east coast and inland along interconnected waterways. It was first recorded in the 1930s as a troublesome weed in floodplain pastures along the St. Lawrence Seaway where it had overtaken and replaced native pasture plants.

Since then, lythrum has spread to many shallow wetlands in the northeastern region of this continent, with pockets appearing across the prairies and west, to the coast. Interestingly, it has been recommended to beekeepers as an excellent choice to "naturalize" along streams as a source of nectar.

To be healthy and productive, a habitat must contain a diversity of plant species. When lythrum becomes established in a shallow wetland, this diversity is forfeited. Cattails and bulrushes are choked out, eliminating nesting sites for waterfowl and material for shelter construction by muskrats. Open water areas grow in and can no longer be used as feeding sites.

Unlike native wetland plants, the tough stalks and branches of lythrum decay slowly, trapping nutrients stored in their tissues instead of releasing them to provide

fertile soil for new growth. This low rate of decay also means the wetland basin may fill in with dead plants which block moisture, warmth and light from the soil, inhibiting growth of other plants. The bottom line seems to be that when lythrum moves into a wetland, wildlife and the value of the area as habitat move out.

The challenge of ridding a wetland of unwanted or overgrown plants is a familiar task to biologists and marsh managers. Unfortunately, techniques used in the management of cattails or bulrushes don't work well for lythrum. Removing the water will rid a marsh of dense stands of native emergents, but exposed, damp mud provides just the conditions lythrum seeds required for germination. A manager may unknowingly stimulate a lythrum invasion by managing an area for another plant species.

Mowing doesn't appear to control lythrum either. While seeds are the primary mode of reproduction, lythrum can sprout vegetatively from cuttings of the main stalk. Each slice left behind by mowing may well be the beginning of a new plant. If cutting takes place prior to seed production, enough time may be left for the plants to resprout and set seed within the same growing season. Plants cut later in the year may have already produced seeds, which will sprout in the newly created openings.

Burning, another widely used wetland management technique, has also proved ineffective. In fact, repeated burns seem to stress native plants more than the target species. Lythrum's low ground root stock is protected from fire during the winter, and moisture in the spring and summer limits the burn's intensity. As with mowing, the openings created by fire give seeds already buried in the soil the chance to sprout and grow more vigorously than before.

Extensive flooding of young lythrum seedlings — or co-planting aggressive but favorable wetland plants in areas where lythrum is likely to grow — may offer solutions, but more information on the behavior of lythrum under these conditions is required.

It's ironic that a plant posing such a threat to wetlands can be promoted as an attractive home garden ornamental. The rationale, however, is that not all of the nursery cultivars have **L. salicaria** in their parentage. Unfortunately, the records conflict in describing the ancestry of some common cultivated varieties.

Records firmly indicate that Morden Pink, a popular strain, was developed as a nearly self-sterile cultivar from **L. virgatum**, a species native to Europe. This variety was then crossed with the native **L. alatum** to develop Morden Rose, Morden Gleam and Columbia Pink. Dropmore Purple is the product of a cross between **L. salicaria** and **L. virgatum**. The cultivars named Happy, Robert, Firecandle, Brightness, The Beacon, Lady Sackville and a few others probably have **L. salicaria** parentage.

In addition to this confusion, researchers are unsure of how each variety responds under different growing conditions. Some think that **L. virgatum** can become invasive, and there is no guarantee that other strains will not become just as problematic.

A conscientious home gardener trying to avoid unlabeled cultivars that may be associated with **L. salicaria** will have an impossible task trying to visually tell the varieties apart. And even if a garden is located far from a river or wetland, planted lythrum may still spread. All it takes is for the tiny seeds to wash into a storm sewer, be carried by birds, in the fur of animals, or be blown short distances on the wind, to be transported to just the type of habitat they require.

Too little is known about lythrum in all its varieties. What is certain is that once **L. salicaria** is established in a shallow wetland, the life of that wetland as a healthy, diverse ecosystem comes to an end. If you find lythrum growing in your area, inform a local conservation authority. If you already have it in your garden, consider replacing it. Dig it out, being careful to take all of the root, and put it with the garbage for proper disposal. Choose alternatives for planting such as Blazing Star, Morden Beauty, or Coral Bell. That way, you can enjoy the same showy displays in your back yard without contributing to the potential destruction of our fragile wetland environment.

Cora Nelson is program coordinator of the Fort Whyte Centre for Environmental Education in Winnipeg, Canada. Reprinted from **Nature Canada**, Spring 1988.

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PURPLE LOOSESTRIFE UPDATE

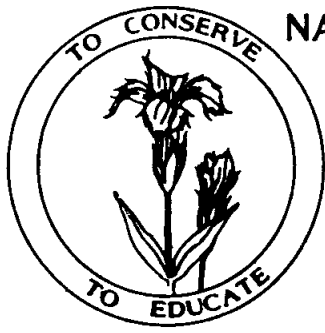
Recent word from the U.S. Fish and Wildlife Service and the U.S. Department of Agriculture Beneficial Insects Laboratory indicates that test releases of biological control agents of the noxious purple loosestrife plant may be possible in 2 or 3 years. Thanks to financial support by the USDA since 1981, selection of control agents (insects) is well underway and testing of selected species under guarantee conditions will begin in the near future. Research is now being funded by the U.S. Fish and Wildlife Service. A new book, **Spread, Impact, and Control of Purple Loosestrife in North American Wetlands**" by Daniel Thompson et. al. has just been published. This 1987 publication is available from Publications Unit, U.S. Fish and Wildlife Service, Washington, D.C. 20240. It is the ultimate source of information on this problem plant.

This is a reprint from the Illinois Native Plant Conservation Program Newsletter.

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GARDEN CENTER WILDFLOWER GARDEN

New member, Kate Harrington, is in charge of the Native Plant Garden at the Garden Center. A section has been given to the Native Plant Society to do with as they wish. WE NEED VOLUNTEERS to help with our plot, and to assist Kate in the rest of the garden. This project has been stumbling along for years, and now the Garden Center has committed its manpower and funds to the Native Plant Garden. Let's all help make it a success. Call the Garden Center and leave your name if you will work.



NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

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6 Louise Drive Chagrin Falls, Ohio 44022

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ADDRESS CORRECTION REQUESTED

Memberships are **DUE FOR RENEWAL** on January 1, 1988. Please continue to support your Society and renew at the **highest** possible category. Those of you who send us Sustaining and Patron memberships are enabling us to go on with our worthwhile projects. An active membership just about pays for the newsletter costs. However, economics aside, we need **EACH** of your memberships and each year we get stronger and better. The 1988 Program and Field Trips schedule will be worthwhile.

Please enroll me as a member of the NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO.

- | | |
|--|--|
| <input type="checkbox"/> ACTIVE.....\$ 7.50 | <input type="checkbox"/> SUSTAINING ...\$25.00 |
| <input type="checkbox"/> FAMILY\$15.00 | <input type="checkbox"/> PATRON.....\$50.00 |



Membership runs from January through December and is not pro-rated.

Make checks payable to: NATIVE PLANT SOCIETY
6 Louise Drive, Chagrin Falls, Ohio 44022

Name: _____ Phone: _____

Address: _____

City/State: _____ Zip: _____