



On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

IN MEMORY OF DUANE FERRIS

[Ed note. Duane was a charter member of the Native Plant Society and was instrumental in its founding. He gave us classes, lectures, and field trips that were enjoyed by all.]

We recently lost a dear friend, fellow botanist, and all-around good naturalist. Duane Ferris passed away February 4th after suffering complications from a car accident. Duane had been a past board member with the Native Plant Society of Northeast Ohio and enjoyed attending many of the field trips over the years.

Duane will always be remembered by the grin on his face and the hat he always wore. He loved sharing nature with anyone he ran across, especially children. Before retiring, Duane taught high school chemistry during the week and spent weekends at Big Creek Park as Geauga Park District's first naturalist.

After retiring, Duane had the life many of us dream of. He spent his days outdoors exploring northeast Ohio for unusual bird and plant sightings. He was always the first one to know when the harbinger of spring poked its head up through the leaf litter and when the tundra swans first appeared on one of the local reservoirs each November. Even after his mobility was limited, you could still find him driving the Amish back roads of Geauga County on the lookout for rough-legged hawks, snow buntings, and short eared owls; then stopping into the nature center with his oxygen tank in tow to share what he had seen.

I first really got to know Duane when I came to work for Geauga Park District 15 years ago. Because I

was a fellow botanist, Duane showed me many of his secret places around the county having those special plants such as green violet, early saxifrage, and coral root at Swine Creek Reservation; harbinger of spring at Big Creek; and the unusual cream colored form of the red trillium at Parkman Gorge. Duane also loved photography. Many of the slides used at the Park District today are ones that Duane had taken years before.

Even though he was officially retired from the Park, he volunteered his time for many programs. Besides plants, Duane also had a love for birds and geology. He always helped with bird banding programs, pointing out unique characteristics of these migrants before setting them on their way. He loved interpreting the landscape and how the glaciers had formed the kames, kettles, and moraines around the county. He could be found sharing folklore on Geauga Park District's wagon rides, and no one could tell the story of the Eldon Russell Park "Onion Wars" like Duane. On Tuesdays Duane could be found leading his Geauga Walkers group to some natural area around northeastern Ohio.

I'll always remember the day of the Celebration of his Life. It was a beautiful sunny day and I was on my way to share with friends and family stories of Duane's life, when a red-tailed hawk soared past me and hovered over the field. To me, it was as if he was saying, "I'm still here." Duane will be truly missed by all.

— Judy Bradt-Barnhart

The Native Plant Society lost two other friends in 2003: Dick Evans, our printer, and Jim Naso, his pressman, who together faithfully and expeditiously shepherded *On The Fringe* and miscellaneous other publications for us for over 20 years. They saw to it that all our publications were produced beautifully and on time. Dick provided his services at no profit to himself, and was one of our staunchest patrons. We send our sympathy to Dick's and Jim's families and to the staff at Evans Printing in Solon.



Mark your calendar! Annual Dinner: October 22, 2004

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The Journal of the Native Plant Society of Northeastern Ohio is published 4 times a year at Novelty, Ohio. Questions or comments are welcome and may be addressed to the Editor, Jane McCullam, 9880 Fairmount Road, Newbury, Ohio 44065, 440-338-3253; npsohio@hotmail.com, or to Ann Malmquist, 6 Louise Drive, Chagrin Falls, Ohio 44022; 440-338-6622, inky5@juno.com

Spring and Early Summer Programs

APR 24, Sat: Russell Uplands Preserve Explore this rich 118-acre property recently purchased by the Chagrin River Land Conservancy. Rolling hills, forested wetlands, and streams highlight this scenic property in Geauga County. Directions: From the intersection of St Rt 306 and Rt 87 in Russell Township, head west approx. 1 mile to Russell Road. Head south to 15200 Russell Road, 3rd drive on right. Park across street along Runnymede Rd just before drive and walk down drive. To register call Judy Barnhart at 440-564-9151 (H) or 440-286-9516 (W). **2:00 pm**

MAY 8, Sat am: Poland Woods/Vujevic Gardens & lunch Poland Woods is a lowland mixed mesophytic forest which is one of the best spots in the area for spring ephemerals and migrating warblers. In early May the Virginia Bluebells which carpet much of the lowland will be giving way to the trilliums and May-apple. Blue-eyed-Mary may be starting and remnants of Globe-flower should be seen. There may be pleasant surprises resulting from last summer's record flooding. Expect magnificent Sycamores and White Oaks. **Meet at 10am.**

Driving to Poland from Cleveland or Akron, take the Turnpike or I-76 to just outside Youngstown. Traverse Youngstown on I-680. South of Youngstown, exit 680 on US 224 heading east, and travel only a mile east to the center (clock tower) of the Village of Poland. Branch right on Ohio Rt. 170 (S. Main St.), and again right, a block later, on College St. Go to the end of College St. which becomes the parking lot for Poland Woods.

Continuing After Poland Woods The group will be met by NPS member, Gordon Vujevic, and will caravan to the Vujevic home for lunch and a tour of the fabulous gardens. Gordon has done an inspired job of gardening with horticultural and native plants in the beautiful garden and natural areas surrounding the family home. Please bring a potluck dish to share with the group.

MAY 15, Sat: Presque Isle Joint field trip with Northeast Ohio Naturalists led by Jim Bissell. Participants will visit the park's Bicknell's geranium site and do a little stewardship--turning over soil and counting the plants. From there search for several species of willow, including blue willow and slender willow. Directions: Exit from I-90 at PA Rt 832 and go north to Presque Isle State Park Entrance. Proceed into the park on Peninsula Drive to the parking lot at Administration Building on the right side of the road. LIMIT 10. Call Natural Areas Division of the Cleveland Museum of Natural History for reservations. 216-231-4600 Ext 3505. **10:00 am**

JUNE 12, Sat: Medina County Park District Paul Saldutte, Natural Resource Manager, using as an example the wetland he recently restored, will speak on **wetland mitigation and restoration**. He will discuss plant choices and procurement sources. Expect to see the end result of his work in the park. Plants include fragrant water lily and iris *versicolor* among others. Meet at the **Wolf Creek Environmental Center in Medina**. For directions, call Jean Roche at 330-562-4053. **9:00 am**

Something Special!

By Jean Roche

The Native Plant Society program schedule this year is something special! The first two events were attended by not only a large number of present members but by many who wanted to join the Society and be notified about upcoming happenings. It is wonderful to see the enthusiasm.

The January 17 talk and slide show about the Bruce Peninsula presented by Tom Sampliner was an entertaining example of Tom's talents both as an orchid expert and photographer. The Bruce Peninsula is a destination that anyone interested in orchids is excited about. It was a real treat to be able to see the beautiful flora through the lens of Tom's camera. Now, a trip to The Bruce is a must!

The January 31 visit to the Cleveland Botanical Garden was quite a revelation both for those who had visited the areas before and those who had not. Again, it was Tom Sampliner, as CBG docent, who led us through the wonders of the two distinct ecosystems. The Garden provides a wonderful opportunity for Clevelanders to enjoy the flora and fauna of other parts of the world. Everyone appreciated the beautiful butterflies, the nesting birds, tortoises and hedgehogs. It made the frigid weather outside disappear for just a little while. There was so much to see and to learn that the group stopped for lunch afterward to discuss and absorb it all.

Please take a look at your schedule and join us for our next outing. You'll be glad you did.

WOODLAND WILDFLOWERS

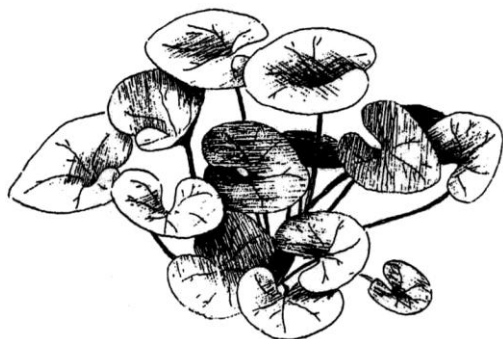
Easy Propagation of *Asarums* or Wild Gingers – Third in a Series

by Jane Rogers

Wild Ginger is a splendid plant for the woodland garden. It is a greatly underrated genus, found across North America, Europe, and Asia. Its soft, rounded leaves emerge from a thick blanket of dead leaves to form a cool green blanket. When it is massed, areas of Wild Ginger can bring beauty and even elegance to a woodland garden. If you do well with shade-loving woodland plants you can succeed with *Asarums*.

DESCRIPTION:

Deciduous Wild Ginger, *Asarum Canadense*, (the focus of most of this article) is usually found growing in rich woods and does best in partial to full shade. It is pleasing to the eye when used as an edging plant along a path, in a mass, or when interplanted with other shade-tolerant plants. The plant is an incomparable ground cover for heavily shaded, woodland soils but will also succeed in the home garden in light or filtered shade. Its leaves are especially attractive when combined with evergreen shrubs or wildflowers or non-natives, such as *Hosta*. The English garden writer, Angela Overy, said, “to complete the look of luxuriant greenness, an emerald carpet of foliage is needed.” Wild Ginger would certainly fill this bill.



In early spring, Wild Ginger is still hugging the ground with its stems looking like brown sticks that have been casually tossed there. The flat growth buds are turning up slightly and are colored light green with a tinge of brown. The soft, velvety, wrinkled, greenish-gray leaves start at ground level and slowly unfurl over the next few weeks. At this stage, they are reminiscent of the perennial Lamb's Ear. The thick, spreading rhizomes are at, or just below, the surface of the ground while the network of fibrous roots penetrates deeper into the soil. Later, when the plants have reached their full growth, the wide mid-green leaves are 4" to 8" across on stems up to a foot in length. The leaves are often described as being heart-shaped or round or kidney-shaped. During the winter months, their leaves wither and disappear.

FLOWERS:

Hidden underneath the downy leaves are unusual brownish-red flowers. This flower has no petals but has three sepals joined together into a bell. The 1½" flower grows on a short stem in the crotch at the base of the two hairy leaf stalks very near the soil. Sometimes dead leaves must be brushed away to find the hidden flower growing right at ground level.



Mrs. William Dana Starr, writing in 1903 in *How to Know the Wild Flowers*, described the Wild Ginger flowers as “odd” and “unlovely” and thought that the flower seeks protection beneath the plant's long-stemmed fuzzy leaves to hide “its head upon the ground as if unwilling to challenge comparison with its more brilliant brethren.”

Nature's real reason for positioning the flower at ground level is probably somewhat more practical: newly hatched gnats, flies and beetles pollinate Wild Ginger as they crawl along the ground looking for a warm place to hide. After spending the cold winter as maggots or grubs under the dead leaves, they enter the flower and help deposit pollen. Later, as the flower deteriorates, ants obligingly disperse the seeds.

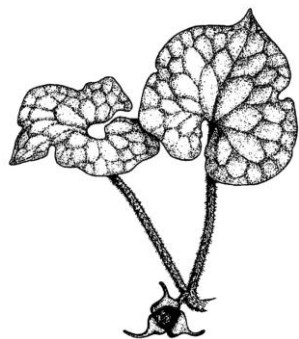
PROPAGATION:

In my Zone 5 woods, late May is the first time to check for ripening seeds in the flower. To remove the flower, one will need to gently dig under the leaf litter. The oval seeds are formed in the base of the flower. Break it open to check the seed color. Properly ripe Wild Ginger seeds are brown. Depending on the spring weather, seeds in my garden reach this brown stage anytime from late May until mid-June. This timing can be adjusted for other zones and regions. Seeds are ripe 4 to 7 weeks after the flower first appears. Because they are easily overlooked, it is a good idea to mark one's calendar as a reminder.

When the seeds are ripe, gather all the flowers. Before gathering them, one might want to put on lightweight protective gloves, because seed cleaning can stain one's fingers. Split open the base of the flower and clean out all the seeds from the pulp. Plant the seeds at once ½" deep wherever you want the plants to become established. The following spring, tiny, two-leaved green seedlings will appear. The second spring, the leaves will be rounded and by the third spring, the Wild Ginger will be a full-sized plant. This same process works for non-native European Ginger, *Asarum Europaeum*, but note that its flower is only ½" long and its seeds should turn dark gray. All *Asarum* seeds,

whether native or non-native, must not be allowed to dry or they will most likely fail to germinate.

Another easy method to increase these plants is with



mallet cuttings. In the fall after their deciduous leaves have withered, remove a small piece of the rhizome where a pair of leaves had been attached. Plant these pieces ½" deep with the bud tip just below the surface of the soil. Water the area and then generously mulch with shredded leaves.

CULTIVATION:

As noted earlier, Wild Ginger is an excellent ground cover for a wooded or shaded area. Its shallow roots can co-exist with fibrous trees like maple or beech but it could overwhelm delicate neighbors such as Rue Anemone or Dutchman's Breeches. Better companions would be Fern, Hosta, Solomon's Seal, Hepatica, Columbine, Blue or Black Cohosh, or White Baneberry. It grows best in filtered to full shade, in soils that remain moist but not wet and with a pH of 5 to 7.5. They will even grow in heavy soils, but will do best in either native or generously amended soil. Protect them from drying winds. They wilt easily when newly transplanted, so water regularly until they are established. Once established, Wild Ginger is a good "indicator" plant during the summer months, as its leaves are among the first to wilt at the onset of a dry period. This will signal the need to water regularly until the weather changes. Some gardeners may need to apply snail/slug bait. Gingers do not need much fertilizer, but could be fertilized lightly with a slow-release fertilizer, if desired.

FRAGRANCE AND FOLKLORE:

Although Wild Ginger's rhizomes and leaves have a ginger-like fragrance, it is not related to the true ginger (*Zingiber officinale*), a tropical plant related to bananas. When any part of the plant is broken, it gives off a pleasant ginger aroma, which accounts for the plant's common name. While many sources refer to Wild Ginger as having edible roots, it should not be eaten, as it contains several potentially poisonous compounds according to William Cullina, Head Propagator of the New England Wildflower Society garden. Even so, Native American Indians used the plant for upset stomach, cough, cold, to reduce fever, as a poultice, and as a birth control agent. Wild Ginger was used by the Ojibway to keep meat from spoiling. Early settlers were taught by Indians to boil the rhizomes with sugar as a substitute for the spice from the West Indies.

EVERGREEN ASARUMS:

There are over 75 species of ginger and most originated from Japan, although seven or eight of these species are native to eastern North America or the Northwest. Gingers are revered far more in Japan and the rare ones can

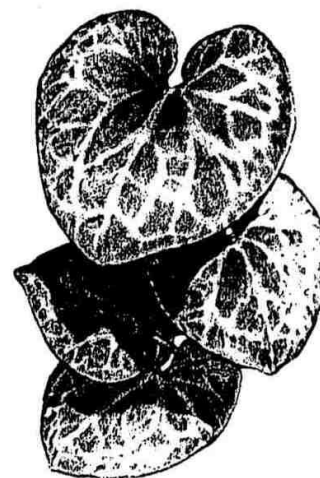
command huge prices. These Japanese *Asarums* and many American native gingers are often evergreen and have become much sought after.

Various evergreen gingers are scattered throughout the South – in predominately the mountainous regions of Virginia, Tennessee, Georgia, and the Carolinas. Though they often occur as only a single plant in dry piedmont woods, it is not uncommon to find spectacular drifts.

Gardeners in Zones 6 and 7 can have better success with both their native evergreen gingers and those from Japan, but some *Asarums* will decline in both the cold and heat found outside their native range. Some may fail to thrive because they lack the specific insects they need for pollination. I have grown four types of deciduous and evergreen American gingers in my Zone 5 woods but have only had real success with *A. Canadense*.

With the evergreen gingers, each plant can have unique mottled or marbled leaves varying from almost all green to mostly silver. Some leaves are more arrow-shaped or shiny and some have more open bell-shaped flowers. Their flowers can be highly decorative, striped, or brightly colored. Cultivation is basically the same except evergreen varieties are more tolerant of dry conditions. These lesser-known species need a somewhat more acid soil with a pH close to 5.

In summary, of the various gingers native to North America, the most important and prevalent one is still the deciduous *Asarum canadense*.



NATIVE PLANT CONSERVATION:

The propagation by seed discussed in this series is based on personal experience and results that have produced hundreds of native wildflowers in my small city garden and woods. You, too, can have the same success. I find that seed harvesting and planting is a simple way to increase one's native plants. The keys to success with most woodland wildflowers are:

1. determining whether the species is suited to one's site
2. learning to recognize the fruit or seedpod
3. learning to determine when the seed is properly ripe
4. knowing how to treat the seed for optimum germination.

Unlike the seeds of some prairie natives, if most woodland native plant seeds are allowed to dry out, even for a few days, or lack good contact with moist soil, reproduction could be cancelled. By "helping" Mother Nature and hand planting properly ripe seeds one can, hopefully, increase the germination rate by 20 to 100 times! Have patience, because woodland seeds usually need a year

to emerge, and some seeds may need two or three years to germinate; but all are worth the wait.

Whether one has a small shady corner, or a large wooded area, increasing the population of wildflowers can be a valuable effort. As we see woodlands being lost to development, protecting and propagating wildflowers and native plants can be a satisfying and important conservation effort. It is also satisfying to return the native plants one has nurtured to the woods where they truly belong. Conservation by propagation is a noble goal. Try to teach these easy

methods to your neighbors, children, or grandchildren and just think how many thousands of wildflowers we can add to the earth each year! Good luck!

Jane Rogers, a wildflower enthusiast and photographer, is dedicated to raising public awareness of the plight of native plants and hopes to encourage others to preserve and value woodland wildflowers. She speaks to garden clubs and conservation groups and also volunteers with wildflower rescue and related efforts.

Spring Wildflower Pilgrimages

54th Annual Wildflower Pilgrimage, Smoky Mountain National Park, April 19-25, 2004

For the past few years, my husband and I have attended the Wildflower Pilgrimage sponsored by the University of Tennessee, Smoky Mountain National Park, Arrowmont School of Arts and Crafts, and Southern Appalachian Botanical Society. This year will be the 54th Annual Wildflower Pilgrimage and will run from Monday, April 19th to Sunday, April 25th. The event consists of a variety of wildflower, fauna, and natural history walks, motorcades, photographic tours, art classes, and indoor seminars led by knowledgeable people such as botany professors from the University of Tennessee and surrounding states and park naturalists. Walks are well-described and carefully rated for difficulty in their program notes. There are 150 activities to choose from. The activities are mostly held outdoors in Smoky Mountain National Park around the Gatlinburg TN area. This is a wonderful way to become familiar with our spring wildflowers as they bloom there in great profusion, and the region hosts such a huge diversity of plants. Flowers, trees, mosses, ferns, and Native American and medicinal uses of plants are covered by different hikes.

There is a registration fee of about \$25 and one must be registered to attend a hike. Walks fill up quickly and are limited in the number of participants. Trailheads are reached by trolley and organized car pool, and only ticket holders may attend. One can register by phone (865) 436-7318 from 8:00 to 4:30 PM EST on weekdays. Registration starts after the middle of March. One can also register online at www.springwildflowerpilgrimage.org.

VISA and Master Card are accepted. However one registers, one must check in at Mills Auditorium in Gatlinburg to pick up registration packets.

– Betsy Wilson, President, Central Region of the Indiana Native Plant and Wildflower Society

43rd Annual West Virginia Wildflower Pilgrimage, Blackwater Falls State Park, Davis, WV May 6-9, 2004

A dozen different tours will depart Saturday and Sunday from Blackwater Lodge. Speakers, interesting programs, entertainment, and exhibits will be featured throughout the evenings. Specialists will be on hand to answer questions and point out interesting flora. Each year approximately 300 people attend this event.

Fees include \$15 for registration and various prices for lodging, depending on number of nights and accommodations (about \$25-35/night). Saturday night banquet is \$17. Registration deadline is May 1.

For information or registration forms, call Emily Fleming or Vickie Hash at (304) 558-3370 or write WV Division of Natural Resources, State Capitol Complex, Building 3, Room 732, Charleston WV 25305.

E-mail: enviroresources@dnr.state.wv.us

The Wildflower Pilgrimage is sponsored by the West Virginia Division of Natural Resources and the West Virginia Garden Club, Inc.

Natural Bridge Wildflower Weekend, April 30 to May 2, 2004

Join us for the annual Natural Bridge Wildflower Weekend, April 30 - May 2, 2004. Wildflower Weekend is an opportunity for native plant enthusiasts to enjoy one of the most ecologically diverse areas in Kentucky in bloom. We'll have dozens of field trips throughout the park and the Red River Gorge National Geologic Area for all levels of participation, from beginners to advanced wildflower enthusiasts and from short easy walks to long hikes. Trips focus on a variety of topics, from trees to rare plants, and are led by university professors, professional biologists, and experienced hobbyists. This year our evening programs are scheduled to include Dr. Wilson Francis, coauthor of the new *Wildflowers and Ferns of Kentucky*, the Indiana Department of Natural Resources' Mike Homoya on native orchids of the region, and ferns of the Smokies with Dr. Pat Cox of the University of Tennessee.

Registration is \$5 per adult upon arrival; no pre-registration is required.

For accommodation information please call 1-800-325-1710 or 1-606-663-2214.

Zeb Weese, Park Naturalist, Natural Bridge State Resort Park

INVASIVE PLANTS OF OHIO

Tree-of-Heaven *Ailanthus altissima***DESCRIPTION:**

Tree-of-heaven is a rapidly growing non-native tree that reaches a maximum height of about 80 feet. The bark is gray to brownish-gray, often turning nearly black with age. Twigs and stems range from light to dark brown. The leaves are pinnately compound with 11-41 leaflets. Each leaflet has an entire margin except for 1-5 small gland-tipped teeth near its base. In late spring, tree-of-heaven produces dense clusters of small, 5-6 petaled, yellow-green flowers near the ends of the upper branches. Seeds develop in the fall and may remain on the tree throughout the winter. Each seed is borne in the middle of a twisted, flattened, wing-like structure. The wood is light in color and weak, rotting quickly when dead. Leaves and young stems have an unpleasant odor that resembles rancid peanut butter. Care should be taken in identification to avoid confusing tree-of-heaven with native species such as walnut and sumac.

**HABITAT:**

Tree-of-heaven can be found in nearly any habitat except wetlands. It thrives in disturbed soils in both urban and natural areas. In natural areas, tree-of-heaven invades fencerows, roadsides, woodland edges, successional forests, and open forest thickets. Tree-of-heaven thrives in poor soils and tolerates pollution well, a reason why it is often planted in urban areas.

DISTRIBUTION:

Tree-of-heaven was introduced to the United States from China. It was first brought to Philadelphia as a garden plant in 1784. By the mid 1800's, it was well established as a nursery tree because of its ability to grow nearly anywhere. Chinese immigrants that came to the United States to work in the gold mines also introduced it to California as a medicinal plant. Absent only from the northern plains of the United States, tree-of-heaven is found throughout Ohio. It poses the greatest threat to successional forest areas of Ohio.

PROBLEM:

One mature tree-of-heaven can produce up to 350,000 seeds per year. These seeds are easily airborne and can be transported by water and birds as well. Germination of seeds is quite high. Mature trees also reproduce extensively by sending up root suckers and sprouts from cut stumps. Sapling growth can reach 3-4 feet a year and can outgrow nearly any native tree, out-competing natives for light. The roots give off a toxin that acts as a herbicide that can kill or inhibit the growth of other plants. Tree-of-heaven is somewhat shade-tolerant and can grow quickly when released by gaps in the forest canopy caused by windfalls, logging, or defoliation due to insect pests such as gypsy moth.

CONTROL:

Mechanical: Young seedlings may be successfully hand-pulled if the entire root system is removed. If small portions of the root system are left, regeneration is likely. Cutting alone is usually not effective since this merely stimulates aggressive root suckering and stump sprouting. However, cutting large trees can help control its spread by removing seed-producing trees.

Chemical: It is of utmost importance to kill the entire root system. Systemic herbicides such as Roundup®, or Glypro® may be effective as a foliar spray on seedlings. For larger trees, cut stump treatment or basal bark application using a systemic herbicide such as Garion® is best especially if treated in late winter or late summer. Using Tordon K® can increase success of basal bark or cut stump application but care must be used as Tordon K® can translocate from the root system of the target tree and kill non-target plants.

Biological: No biological controls are currently available.

ADDITIONAL INFORMATION SOURCES:

Bartlow, J., K. Johnson, M. Kertis, T. Remaley, S. Ross, E. Simet, T. Smith, D. Soehn and G. Taylor. 1996. Invasive Exotic Pest Plants in Tennessee. Tennessee Exotic Pest Plant Council.

Hoshovsky, M. 1999. Element Stewardship Abstract for Tree-of-Heaven. The Nature Conservancy.

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FOR MORE INFORMATION:

Ohio Division of Natural Areas and Preserves, 1889 Fountain Square Dr., Bldg. F-1, Columbus, Ohio 43224, (614) 265-6453 www.dnr.state.oh.us/odnr/dnap/dnap.html

Reprinted from *Invasive Plants of Ohio*, Fact Sheet 17, Ohio Department of Natural Resources, May 2000.

The Cleveland Museum of Natural History Paleobotanist Honored

Dr. Shyamala "Shya" Chitaley, curator and head of The Cleveland Museum of Natural History's Paleobotany Department, is highly respected among her scientific peers. Recently, at a two-day Indian National Conference on "Recent Advances in Botany" in Bhandara, India, she was honored with four awards:

- a medal for Excellence in Paleobotany;
- a citation and shawl for Lifetime Achievement and Excellence in the Field of Botany-Paleobotany;
- a plaque in Recognition of Lifetime Merit in Fossil Botany; and
- a plaque for Meritorious Achievement in Fossil Botany

Shya is 85 years old, and her service to Ohio and the Cleveland Museum is actually her second career. She retired in 1978 at the age of 60 after serving as head of two Botany Departments, first at the Institute of Science in Nagpur, India, and subsequently at the Institute of Science in

Bombay, India. She joined the Museum staff in 1980, helped to establish the Paleobotany Department, and was then named curator and head. Through her efforts the Museum's collection of fossil plants has grown tremendously, and the Department is internationally recognized for its research. Her major current research area involves plant fossils from the Cleveland Shale.

In 1996, the Museum recognized Shya's work with the prestigious Jared Potter Kirtland Award for her outstanding professional achievement in the field of Natural Science. Shya made a presentation at the first Ohio Systematist meeting, and we hope that she returns in the future. We are honored and privileged to have Dr. Shya Chitaley living and working in Ohio, congratulate her on the honors she has accumulated, and wish her well in her research and studies.

Reprinted from *BioOhio*, a quarterly newsletter of the Ohio Biological Survey, August 2003

Headlands Dunes State Nature Preserve

Dedicated - May 1976

Extensive development along the shores of Lake Erie has all but totally eliminated the presence of sandy beaches and dunes at the western mouths of river bays and inlets from Sandusky Bay to Dunkirk, New York. Headlands Dunes State Nature Preserve remains today as one of the last of its kind in the entire State of Ohio.

This community is much more than merely an accumulation of sand along a shoreline. It is a living assemblage of fascinating and highly specialized plants and animals occurring in an environment too hostile for most other organisms to survive.

The establishment of Atlantic Coastal Plain species into the Great Lakes Region probably took place many thousands of years ago during Algonquin Time. This was a period of time when the sea extended into the present basin of Lake Ontario due to a depression of the basin brought on by the weight of continental glaciation.

Until recently, several East Coast species persisted as pioneers on the dunes east and west of Cleveland, but these dune grasses and forbs were virtually eliminated by "beach improvements" and other forms of land development along Lake Erie. One isolated locality for sandy beach and dune communities still persists here at Mentor Headlands.

Atlantic Coastal Plain species such as sea rocket, beach pea, seaside spurge, beach grass, and purple sand grass still persist on the sand dunes at Mentor Headlands. These coastal plants are not found growing naturally farther inland in Ohio. In addition, many species not found generally in

northeastern Ohio grow abundantly along the Headlands dunes, such as switchgrass, Canada wild-rye, wafer ash, and wild bean. Many western xerophytes, i.e., plants tolerant to dry conditions, such as winged pigweed, clammy weed, sand drop-seed, and four-o'clock are afforded eastern range extensions due to the Headlands dunes.

The most important dune developers along the Lake and Ashtabula County coast are switchgrass and/or beach grass (Hicks, 1934). Switchgrass or beach grass becomes established on the upper beach along with annuals such as cocklebur and sea rocket. These lone grass plants quickly spread into huge root-like mats. Sand rapidly drifts into the relatively quiet vicinity of the switchgrass crown, and deposition occurs. Switchgrass and beach grass have an adaptation shared by many dunal plants (e.g., cottonwood, red osier, Canada wild-rye, sandbar willow, etc.): coincidental with the accumulation of sand around its crown, switchgrass or beach grass continues to grow upward through the sand. Eventually it will grow several feet above the original locality of germination or initial rhizome establishment.

As the dune becomes more or less stabilized by the switchgrass or beach grass, grape vines and poison ivy become established on the dunes; eventually, cottonwood and willow appear, and finally oak (usually black oak).

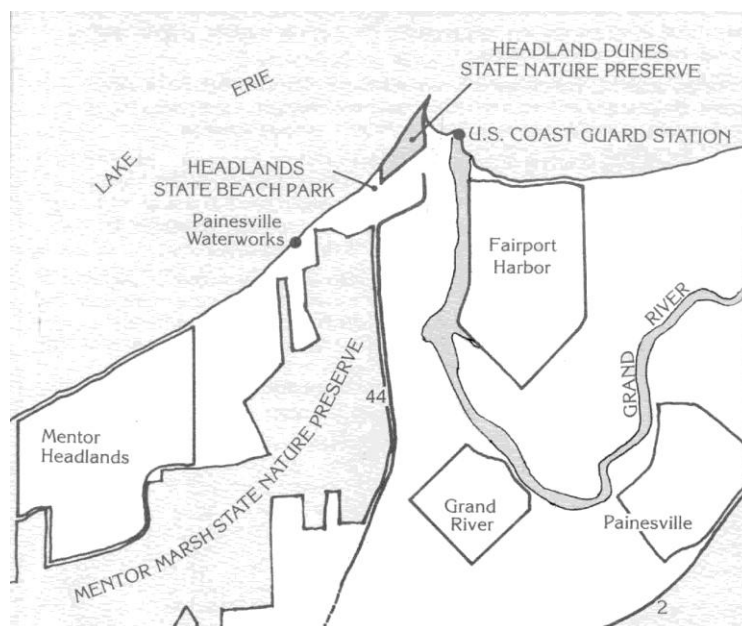
The important position of switchgrass as one of the dominant dune builders is apparently rather specific to the Lake Erie beaches, since dune grass and sand reedgrass



The historical factors which allowed the migration of the coastal species into the Great Lakes are no longer at play; once we lose our sand dune communities, they will be lost forever. The dedication of Headlands Dunes State Nature Preserve will protect a vestige of the Lake Erie Dune community for this as well as future generations of Ohioans.

Beach grass	<i>Ammophila breviligulata</i>
Beach pea	<i>Lathyrus maritimus</i>
Canada wild-rye	<i>Elymus canadensis</i>
Clammy weed	<i>Polanisia graveolens</i>
Cocklebur	<i>Xanthium strumarium</i>
Four-o'clock	<i>Mirabilis nyctogineus</i>
Purple sand grass	<i>Triplasis purpurea</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Sand reedgrass	<i>Calamovilfa longifolia</i>
Sea rocket	<i>Cakile edentula</i>
Seaside spurge	<i>Euphorbia polygonifolia</i>
Switchgrass	<i>Panicum virgatum</i>
Wafer ash	<i>Ptelea trifoliata</i>
Wild bean	<i>Strophostyles helvola</i>
Winged pigweed	<i>Cycloma atriplicifoliu</i>

Black oak	<i>Quercus velutina</i>
Cottonwood	<i>Populus deltoides</i>
Willow	<i>Salix nigra</i>



Reprinted from "Headlands Dunes State Nature Preserve," ODNAP, April 1997

Sponsored by the Ohio Division of Natural Areas and Preserves – April 2, 2004, 8:30am – 4pm

The Nature Conservancy, Ohio Chapter 6375, Riverside Drive, Suite 50, Dublin, Ohio 43017, 614.717.2770 x18
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● Ohio Biological Survey announces the late March
● publication of *The Macrolichens of Ohio*, by Ray
● Showman and Don Flenniken. For more
● information email ohiobiosurvey@sbcglobal.net

The Mysteries of Mosses

Part I. Morphological Features

By Dr. Barbara Andreas

Mosses are plants that are little known to most botanists; they may even be somewhat mysterious. Most people have a hard time relating to mosses. The values we ascribe to other members of the plant kingdom don't apply: we can't eat them, smell them, commercialize them, or easily landscape with them. To many, they are annoying green stuff growing between bricks on patios or competing with grass in a shaded lawn. Yet, there are more species of mosses than evergreens and seedless vascular plants combined. They play important roles in ecological succession, soil formation, and prevention of erosion on freshly exposed land.

In many ecological studies of plant communities, mosses are ignored. This may be because they are small (usually less than 5 centimeters), considered unimportant, but most likely because mosses are hard to identify in the field. To accurately identify to species, mosses require microscopic examination.

Mosses belong to the plant kingdom and may have evolved from green algae (Chlorophyta). Unlike green algae, mosses and other plants are primarily terrestrial. The evolutionary conquest of the land from a green algae ancestor probably occurred sometime between the late Cambrian (500 m.y.a. = million years ago) and early Silurian (455 m.y.a.) when the Earth's atmosphere was changing to provide a gaseous shield from UV light. Prior to this the land was barren and dry, with a high-energy environment

that may have been a major obstacle to colonization by land plants.

Vascular plants evolved a cuticle (waxy covering), lignin (strengthening), conducting tissue, and anchoring devices that permitted them to grow in size; but mosses did not. Without conducting tissue, mineral-carrying water is absorbed directly into cells. A few mosses have evolved a central cylinder of specialized cells that aid in water and nutrient transport. The lack of conducting tissue is a factor limiting the height and size of

mosses.

The fossil record is poor for all plants and almost non-existent for mosses. The first clearly identifiable moss fossil is from Devonian (395-345 m.y.a.). The frequent assertion that mosses are primitive is not supported in the fossil record. There are vascular plant fossils that pre-date mosses, although mosses don't fossilize well.

The Phylum Bryophyta traditionally includes liverworts, hornworts and mosses. Worldwide there are about 10,000 species of mosses in 700 genera. In the U.S., there are about 1400 moss species belonging to slightly more than 300 genera in 72 families. About 400 moss taxa belonging to 157 genera in 56 families have been reported for Ohio.

Mosses have two plant bodies

The Gametophyte

Mosses consist of two life cycle phases, the gametophyte and the sporophyte, each with a distinct body form. Sometimes this is termed "alternation of generations," adding even more mystique. The gametophyte is the plant with which we are most familiar. This phase consists of a juvenile, usually filamentous phase (protonema), and a more complex phase, the leafy green plant or gametophore that produces the sex organs. In most species the gametophore is perennial, but in a few it is the protonema that is perennial. The gametophore, although vascular plant enthusiasts may dispute the use of these terms, consists of a central axis called the stem, with leaves and hair-like anchoring rhizoids.

About half of the mosses are acrocarps (acrocarpous) (Figure 1). These grow in tufts where individual "stalks" of moss plants can be separated. They can be branched or forked by a process called innovations. Other mosses grow more or less horizontally forming interwoven mats and are termed pleurocarps (pleurocarpous) (Figure 2). In acrocarps the sex organs (and eventually the sporophyte) are produced at the tips of the main stem whereas in pleurocarps these structures develop on short lateral branches.

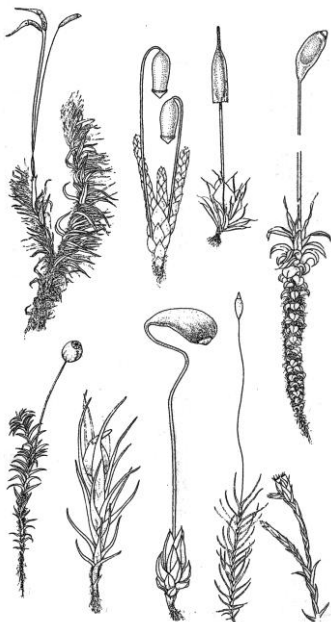


Figure 1. Examples of acrocarpous mosses. Note central axis with sporophytes at tip of stem (after, Schofield, 1985).



Figure 2. Examples of pleurocarpous mosses. Note branching pattern and location of sporophytes (after Schofield, 1985).

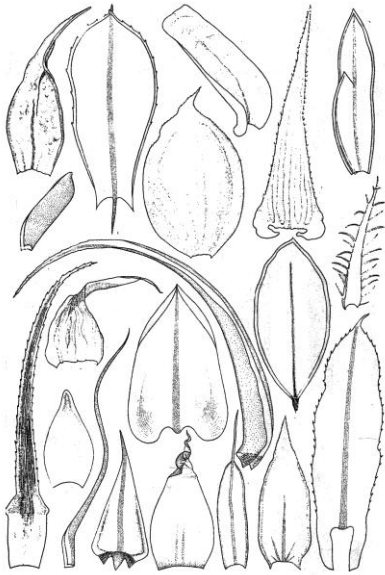


Figure 3. Variation in moss leaf shapes, margins and costas (after Schofield, 1985).

Moss leaves are typically one cell layer thick and contain most of the morphological features on which identification via a dichotomous key is based. Leaves are sessile and rarely lobed. In some leaves a central “vein,” or costa, is present. Leaves may have a single costa that extends to the tip of the leaf or beyond, or it may stop around the middle (Figure 3). In other leaves the costa may be branched, ending just above the leaf base, or extend above the middle.

Some leaves don’t have a costa and are called ecostate.

Leaf cells are commonly elongate, sometimes having a length/width ratio of 12:1, but in some the cells are hexagonal or round. Leaf cells are diverse in size, cell wall thickness, and wall ornamentation (such as bumps called papillae). Cells at the margin of the leaves can differ from those of the remainder of the leaf (Figure 3). Leaf features are usually similar at the genus level, but measurement of cell and leaf size is essential to distinguish species.

At the base of the leaf near the point of attachment is a triangular area of cells differing in size, shape or color from the other leaf cells. This is the alar region with alar cells (Figure 4). These cells can be quadrangular and dense, pigmented, or large and balloon-like. Alar cells may function in changing leaf orientation, usually in response to moisture changes to help control water loss. They often fold up along stem when dry (imbricate), or diverge outward when moist (divergent). This change based on moisture, makes plants look entirely different, and a field bryologist who recognizes a species in a “dry state” may have problems in the field after a rain!

The green gametophytic plant produces sex organs at the tip of the stem. Often each plant bears only one type of sex organ, and thus there may be extensive colonies with only male or female plants. Little is known about patterns of mating in natural bryophyte populations.

The male gametes (sperm) are produced in a sac called an antheridium. The sperm move by whiplash flagella and must reach the egg via a water film. Fertilization depends on continuous film of water provided by rain splash, seepage, or even rivulets from snow melt.

The female sex organ (archegonium) is flask-shaped and each archegonium encloses a single egg. When mature, the archegonial neck canal cells disintegrate, releasing a fluid

material that exudes outward into water that bathes it. When sperm encounter the diffused fluid, they swim towards the site of its greatest concentration, and thus down the archegonial neck to the egg. The sperm burrows through the wall of the egg, the nucleus unites with the egg nucleus and a diploid zygote results. This is the first cell of the sporophyte.

The Sporophyte

The mature sporophyte consists of the foot penetrating the gametophyte, a seta raising the sporangium well above the green plant, and the sporangium itself, covered by a sheath of gametophyte tissue called the calyptra (Figure 5).

The calyptra is important in survival and morphogenesis of the sporophyte. It remains living until the sporangium enlarges. Its physical presence is necessary for sporangial differentiation. Part of its function is protection of the apical meristem and the thin-walled diving cells beneath, where desiccation could be lethal. Another function may be in physically controlling the movement of materials within the differentiating sporangium. If the calyptra is removed very early, the seta will continue to grow, but no sporangium differentiates.

Characters such as the type of calyptra, the length of the seta, the size and shape of the sporangium, and whether it is erect or curved, are useful in identification. Some groups of mosses have unique and characteristic sporophytes.

The sporangium, or capsule, eventually produces haploid spores. The upper part of the capsule can be separated, much like a lid being removed from a pot. This lid, or operculum, pops off when spores are mature. Frequently underneath the operculum is the peristome, a ring of teeth folded inward. As the capsule dries out, the teeth bend outward tossing spores. Additionally, the peristome provides important characteristics that distinguish the major groups of mosses.

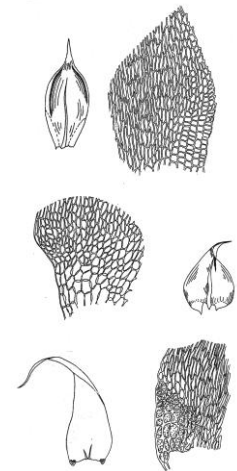


Figure 4. Examples of alar cells. The enlargements are taken from the alar regions of the adjacent leaf (after Crum and Anderson, 1981).

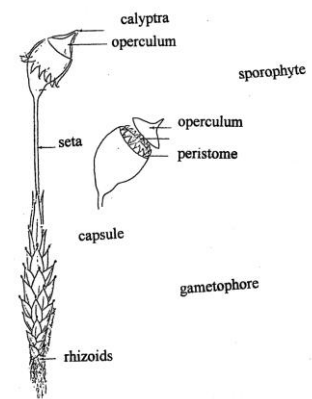


Figure 5. Typical gametophyte and sporophyte (after Schofield, 1985).

Once released into the environment, most spores that find suitable growth conditions (favorable moisture, temperature, light), germinate within 24 hours. Most bryophyte spores are viable for brief periods, while a few are viable for as many as 20 years or longer. These spores grow into the protonema, or the first phase of the gametophyte, and thus the cycle is completed.

Whether a plant produces sex organs is determined by temperature, moisture and the age of the plant. In some bryophytes, sexual reproduction is unknown. Because of this feature, there are various means of asexual reproduction



Figure 6. Examples of asexual propagules (after Crum, 2001).

using specialized groups of cells called gemmae, brood or miniature plants (Figure 6). Sometimes small parts of the plant can grow into a new one.

Using characteristics of the leafy gametophyte and the sporophyte, many mosses can be identified to genus and even species in the field, especially using a 20x hand

lens. Knowing the habitat of the various taxa also helps. To identify others, especially the smaller acrocarpous mosses, microscopic work is essential.

Information for this article comes from a variety of sources, including Schofield (1985) and Crum (2001). For more information about the morphology of mosses and the distribution of various taxa in Ohio consult the references below.

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- Dr. Barbara Andreas, vice president and charter member of Native Plant Society, is Professor of Biology at Cuyahoga Community College, adjunct Professor at Kent State University, and received the National Stewardship Cup for her work with the Native Plant Conservancy.

Look Again: Hepatica

by Dick Smith

One of the very earliest of the spring arrivals that we seek out in the rich mountain woods is Hepatica, or Liverleaf.

Whether the flowers are white or some delicate shade of blue, lavender or rose, they are undeniably pretty-and would be considered so even if it were not for the fact that they often are the first blooms after the drabness of winter. It comes as a surprise, then, to learn that they have no petals (the colorful parts are petaloid sepals, and what look like three green sepals are actually bracts). There are a number of other genera in the Buttercup Family that lack petals, and some of them, like Black Cohosh (*Cimicifuga*) and Meadow Rues (*Thalictrum*) even lose their small sepals as soon as the flowers open.

Our most common species is Sharp-lobed Hepatica (*H. acutiloba*) in which, as the names indicate, the leaf segments are pointed. White flowers seem to be the rule rather than the exception.

Round-lobed Hepatica (*H. americana*) is less common in our mountain province. It is a slightly smaller plant, and the sepals tend to be broader and slightly spatulate. Flowers of this species are more likely to be colored, especially favoring the blues.

Although hybrids occur, it is quite easy to distinguish the two species. The new foliage does not develop until later, but bronzed leaves from the previous year are almost always present. If all else fails, remember that the lobes of the bracts correspond to those of the *americana* leaves-rounded or blunt pointed depending upon the species.

Reprinted from *Shortia* 9(1) spring 1987, via *Chinquapin*, the newsletter of the Southern Appalachian Botanical Society, Spring 2002.



Great Blue Lobelia 2002 Wildflower of the Year

by **Mary Carol Cooper**, Native Plant Program Coordinator, Salato Wildlife Education Center

Wildflower enthusiasts from all across Kentucky have selected great blue lobelia (*Lobelia siphilitica*) as the Salato Native Plant Program's Wildflower of the Year, 2002. The Wildflower of the Year is chosen based on the number of nominations it receives and how well it fits the established criteria: must be native, common and widespread across the state, seeds must be readily available, must be easy to grow, and must have wildlife value.

Great blue lobelia is common on stream sides and frequent throughout the state. It is a member of the Campanulaceae (Bellflower) family as is cardinal flower, our Wildflower of the Year in 1998. It is a very hardy perennial that produces 1-1/2 to 3 foot tall spikes of bluish lavender flowers throughout September. The leaves are alternate and lanceolate, tapering to a sessile base. White-flowered individuals of this species are sometimes found. The flower is about one inch long and the stamen-ring and pistil are included within the corolla tube. In this position, pollination is accomplished by bees that light on the tower tip and crawl into the tube.

Great blue lobelia attracts bees, and some sources say it attracts hummingbirds and butterflies, too. In the garden, the contrasting color of the two lobelias, great blue and cardinal flower make a beautiful combination.

Historically the Native Americans used the root of great blue lobelia as a tea for syphilis (hence the species name *siphilitica*) and a tea from the leaves for colds, fevers, stomach troubles, worms, croup,



and nosebleeds. They gargled leaf tea for coughs, and the leaves were poulticed for headaches and hard-to-heal sores. Formerly, it was used to induce sweating and urination. Today, this plant is not used medicinally, as it is potentially poisonous as is cardinal flower.

Great blue lobelia seeds and plants are available from many native plant nurseries and are fairly inexpensive. It is also very easy to propagate either by seeds, or division. Since the seeds are very tiny, they must be sown very thinly to avoid crowding. A two-month cold period promotes germination. Sow seeds in a flat in December or January, cover the seeds with a very minimal dusting of soil, and place the flat in a sunny unheated area as the seeds need light to germinate.

Lobelia can also be propagated by division. A healthy plant produces a dense clump of basal foliage that consists of several offset rosettes or crowns. Divide plants in the

fall or spring by separating these offsets from the mother plant, then replant the divisions, and water immediately.

Seeds of great blue lobelia are easily collected in the fall. Cut the spikes off the plant after they have dried and the pods are full of seeds that shake out easily. Place the spikes upside-down in a paper bag, let them dry even more for several days, then shake the bag to dislodge all the seeds. Collect and store them in a jar until ready to plant.

Reprinted from *The Lady Slipper*, Spring 2002. Kentucky Native Plant Society.

Botany 101 – fourteenth in a series

Reproduction in Gymnosperms

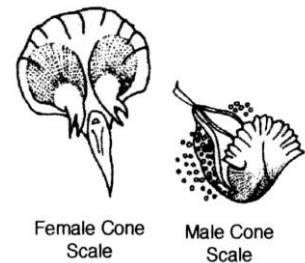
by **Dr Rebecca Dolan**

Have you ever seen a flower on a pine tree? Remember that flowers are composed of whorls of parts (sepals, petals, stamens, and carpels) and that fertilization occurs in ovules found in the ovaries of the carpels. You know that pine trees and other conifers bear their seeds in cones, not flowers. How are cones different and how does fertilization occur in conifers and other gymnosperms? I'll use pine as an example.

Most pines have separate male and female cones. The male cones are usually borne on lower branches, female on higher branches, presumably to lower the chances of self-fertilization. Male cones are small and non-woody. They function to produce winged pollen grains that are released into the air in spring. If you park your car under a pine releasing pollen, you will need your windshield wipers!

Woody pinecones are female cones. They are actually modified branches. Ovules containing eggs are produced on woody cone scales that have

an underlying sterile papery bract. These scale/bract units are spirally arranged along the axis of each cone.



Female cones take two years to mature and produce seed. The first year, the cones are green and closed. In the spring, they open slightly and a drop of sticky fluid on the outside of each scale/bract unit traps pollen and pulls it inside the closed cone as it evaporates. This is pollination.

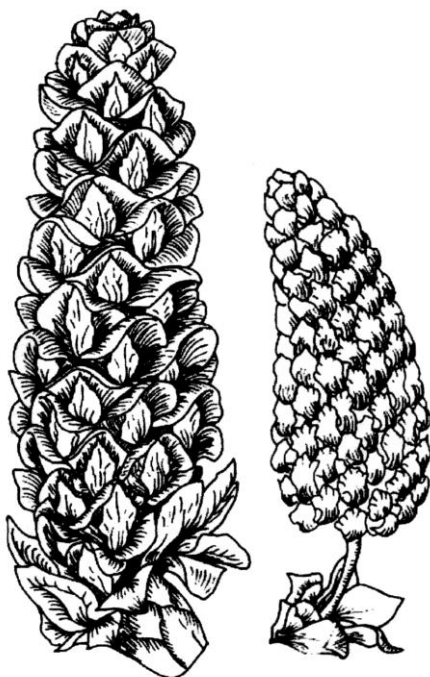
Fertilization occurs in the ovules of the still-closed cones. It may take as long as 15 months after pollination for it to occur. During this time, pollen tubes have been growing and the egg has been formed. Each pollen grain produces two sperm, as in flowering plants. One sperm joins with the egg during fertilization. The other disintegrates. Do you remember what happens to the second sperm in flowering plants? Recall it fuses with the polar nuclei to form endosperm that feeds the developing embryo. Gymnosperms do not have this double fertilization, and do not produce endosperm.

Mature cones release seeds in the second fall following pollination. A pine seed contains an embryo, nutritive tissue formed from structures inside the ovule without double fertilization, and a seed coat. Wings on the seeds help propel them away from the tree.

Other gymnosperms have greater or lesser variations on this theme.

Becky Dolan is Director of the Friesner Herbarium at Butler University.

Illustrations by Jan Glimn Lacy, botanical illustrator, from her book Botany Illustrated



Female Pine Cone

Male Pine Cone

Book Reviews

The Origins of Fruit & Vegetables

By Jonathan Roberts (New York: Universe Publishing, 2001, 228 pages, hardcover, \$22.50, ISBN 0-7893-0656-5)

Promising gardeners and foodies “a little history in their book diet,” *The Origins of Fruit & Vegetables* delivers a sumptuous banquet, a feast for the eyes and the mind.

Tracing the natural and cultural histories of more than 40 edible species, each entry in the book (from asparagus to watermelon) explores where the fruit or vegetable originated, its first recorded use and its importance in antiquity through to the present. Lavishly illustrated with an astonishing range of historic and contemporary drawings, paintings, and photographs; the section on olives, for example, includes a photo of a Greek amphora, showing olive gathering c.520 B.C., alongside a Picasso pastel of a dove bearing an olive branch. This book is both a gorgeous coffee-table book and a useful reference guide. If you’ve ever wondered about the origins of the fruits and vegetables on your dinner table or growing in your garden, you’ll find answers (for 40 of them, anyway) in this wonderful book.

Reviewed by Lorraine Johnson

Lichens of North America

By Irwin Brodo, Stephen Sharnoff, and Sylvia Duran Sharnoff (New Haven, Connecticut: Yale University Press, 2001, 795 pages, hardcover, \$69.95, ISBN 0-300-08249-5)

I haven’t had the nerve to weigh this mighty tome, but let’s just say it’s worth every pound ... and every tired arm muscle that lifts it off the shelf again and again to explore the treasures within. Only the very hardy will lug this extraordinary guide into the field; the rest of us will lose ourselves in its 795 pages of glorious photographs and definitive text, all celebrating the long-neglected, often-overlooked, lowly lichen.

Lichens of North America is the compendium of scientific knowledge on lichens – thought to be among the oldest living things on Earth – and their crucial role in the health of our planet. Open the book up to any page, and I guarantee that you’ll never be able to look at a lichen-crusted rock in the same way again; you’ll find yourself wondering, is that powderfoot British soldier, deflated tube lichen, crowned pixie cup, organ pipe, or moonglow? And how do these mysterious organisms survive such hostile environments, often growing just millimetres per year? Reading this book, you’ll probably become as obsessed with lichens as the author (emeritus research scientist at the Canadian Museum of Nature) clearly is and a whole new wonderful world of beauty and diversity will be revealed.

Reviewed by Lorraine Johnson

Cultivating Delight: A Natural History of My Garden

By Diane Ackerman (New York: HarperCollins, 2002, 261 pages, hardcover, \$25, ISBN 0-06-019986-5)

The trouble with many experts on the great green world is that they tend to be boring. Their plodding prose is often over-detailed and full of long sentences lacking the human touch.

That’s what makes naturalist Diane Ackerman so inspiring. Whatever she’s writing about, it could be a tree frog or the scent gene in snapdragons, Ackerman makes the subject come alive. In fact, reading her latest book, *Cultivating Delight*, I often felt as if I were accompanying her in a stroll around her upstate New York property, and listening to her point out items of interest.

Ackerman is clearly a diligent researcher and she manages to pack an amazing amount of information into this book. In chapter after chapter, I learned so many entertaining and useful things about people, plants, birds, squirrels, insects, history and the world in general. It was illuminating to discover, for instance, that “spring travels north at about 13 miles a day, which is 47.6 feet per minute, or about 1.23 inches a second” and that our genes differ from chimpanzees’ by only about one percent. As for the business of gardening, she’s remarkably knowledgeable about roses, and slips in much practical stuff about the kinds of roses that will cope with northern climates. And her descriptions of winter are some of the most eloquent I’ve ever read.

I have one quibble: sometimes Ackerman can get a bit precious. Reading how she reclines, sipping tea, on yellow and purple cushions in her study and how she habitually hauls hundreds of rose blooms indoors, to arrange in elegant vases I was tempted to say “Aw, c’mon.” And I did wonder at her benign, tolerant attitude towards squirrels and deer, which consistently attack her tulips and corn. (I cope with a northern country garden similar to Ackerman’s and I confess that I’ve learned to loathe these persistent trespassers.)

Even so, *Cultivating Delight* lives up to its name. It’s a delightful read and a perfect choice to curl up with on a cold, winter night.

Reviewed by Sonia Day, a gardening author who lives in Wellington County, Ontario.

The Landscaping Revolution: Garden with Mother Nature, Not Against Her

By Andy Wasowski with Sally Wasowski (Lincolnwood, Illinois: Contemporary Books, 2000, 166 pages, hardcover, \$27.95, ISBN 0-8092-2665-0)

If you’ve been toiling away in your backyard, creating wildlife habitat using native plants, conserving water, enhancing biodiversity and generally making the planet a better place, welcome to the Landscaping Revolution! Author Andy Wasowski has written a call to arms for gardeners like you who are searching for a better way to plant, maintain and enjoy their gardens. At once informed, provocative, compelling, and, above all, humorous, Wasowski traces the history of the grassroots (make that native-plants-roots) revolution that is slowly but surely sweeping across North America. He presents commonsense approaches to gardening with a wealth of information on plants, trees, and shrubs, along with profiles of gardens across North America. Full of gorgeous photographs and illustrations, this book is a gem.

Reviewed by Lorraine Johnson

All reviews are reprinted from the *Newsletter of the North American Native Plant Society*, Fall 2002

FAKAHATCHEE: a northern extension of the Amazon?

By Tom Sampliner

According to Florida State Parks ranger-naturalist, Mike Owen, this preserve in southwestern Florida is the equivalent of a northern extension of the Amazon rainforest. Mike supports his conclusion by pointing to various research teams that have worked the preserve during his tenure. Data obtained reveals that from ground level to a height of eleven feet an ecosystem exists here that is quite similar to those along the Amazon River, thus giving rise to vegetation one expects much further south.

It is well known that the peninsula of Florida is one giant shell midden. Most of FL is coral reef overlaid with sand. In addition, the sand and gravel substrate mixed in with the shells gives rise to an alkaline land mostly at, sometimes even below sea level. In this preserve, not only does this scenario exist, but water also percolates upward from many springs. This is further augmented by rainfall as well as runoff. Perhaps further contributing to the apparent highness of the water table here, a number of service roadbeds were built for some modest (?) major logging operations that used these raised beds for railroads going deep into the preserve. Logging ended during the 1940s.

The tree canopy is largely responsible for the dynamics of the local ecosystem. Trees shield plant life from the desiccating rays of the sun. They shield tender vegetation from fierce winds such as during hurricane season. They manufacture and help retain humidity, preventing some moisture from escaping. Natural life cycle results in tree leaves, flowers, fruits, and other debris falling into the water, decaying, breaking down into simpler material, and creating a rich layer of peat and humus. This in turn becomes a nursery for young vegetation. This process is quite similar to what we see in our northern fens and bogs. Certainly a major threat to such an ecosystem is the ever-expanding call upon the water table by Floridians due to increasing population and commercial development.

As mentioned, the tree canopy provides a sheltered ecosystem for plants that otherwise could not survive here. Mid-story trees such as pop ash (*Fraxinus caroliniana*) and pond apple (*Annona glabra*) are common. So too, red maple (*Acer rubra*) and southern tupelo (*Nyssa sylvatica*) make their presence known. Many host a wide assortment of epiphytes. These include orchids, bromeliads, ferns, pepperomias, and more. Among the conifers, bald cypress, (*Taxodium distichum*) is the major player. This tree is well known for its "knees" that protrude from the water. Once thought to be aids in gas exchange, they are now believed to be more useful in support or buttressing. Incidentally, those knees remaining below the surface of the water, as well as fallen woody debris are among the many obstacles to walking one faces in traversing the preserve. They certainly don't help ambulation when one is carrying a tripod either; just one more thing to catch equipment upon.

The Fakahatchee is known for harboring rare species; from birds to plants, insects to animals, and much more. If

you want to see the uncommon and diverse in nature have I got a preserve for you! Part of the reason for the continued existence of such wonders is the inhospitable conditions when viewed from most peoples' perspective. Wading is often waist-deep, and the presence of gators and snakes and insect nuisances all make this an unpopular place for a stroll. Footing is unstable enough that an occasional slip into the drink is not unexpected. Furthermore, if this was not enough, saw grass abounds. This obnoxious denizen of the preserve can grow thick, tall, and in compact colonies that not only give one claustrophobia, but the fine serrations along each grass blade cut flesh to ribbons with a wound quite like a paper cut. Long pants and sleeves are a must. Had I known before what I know now, I would have added gloves and a bandana around my neck or hooded sweatshirt. Red for a color might be good – it will match the blood you will spill.

On Sunday, November 2nd, 2003, I joined a small group of local orchid nuts that are willing to spend the better part of a day dealing with these conditions in search of our main quarry, native orchids. We hoped we would find some blooming worthy of photographing; otherwise, why were we building up a sweat carrying in heavy tripods and backpacks loaded with gear? Fortunately, this was one of those times of year and/or days when the insects were mostly on holiday. Except for along the open canopy of the roadbeds into the portion of the wetland we were targeting, mosquitoes were not a problem. The sunny open roads were more bothersome.

We five intrepid orchidophiles were on the prowl looking for both terrestrials and epiphytes. As long as a photogenic bloom was presented we would not be fussy. Rare would also be nice, but then much of what is here automatically meets that criterion. The preserve lists 36 species. This is a high number as many entire states don't have so high a total. Many species here can no longer be found elsewhere in the United States. This of course brings on poaching problems. Orchid fanciers are willing to pay for specimens and not ask how they were obtained. Fortunately, the ranger staff is on the lookout for such behavior. Furthermore, you need ranger permission and cooperation to get behind the locked barrier gates, unless you enjoy a lengthy hoof back to some point of entry. It would be an interesting study to compare the increase of poaching attempts to the release of the never-ending publications about orchid thieves.

All five of us suffer from what may be called orchid fever. In case you ever meet one of the afflicted, here are the symptoms. If the person is willing to drop whatever they are doing to rush to a distant place because an orchid hunt is about to commence, you have met one of us. Currently, there is no known cure for the affliction, and furthermore, none of us is anxious for one to be found.

Now it is time to meet our motley crew. Organizer of this particular venture was Michael Plecas of Tampa. He was the most experienced hunter for this particular location having wandered the preserve for some twenty years now, looking and documenting orchid species. Michael is in the restaurant business and talked to me about his familiarity with various cuisines on the drive in. He must have been forewarned of the group's voracious appetites for he brought not one sample of his culinary efforts for us to sample. As did most of the others, he carried in a load of photographic gear well protected inside his backpack with a dry bag.

Next is ranger-naturalist Mike Owen. Mike has some ten years here at this preserve and is well versed in its biodiversity. He could answer my numerous questions, whether they were about birds, plants, insects, or the ecosystem. Mike did not carry camera gear. In fact, he was the only one not to do so. However, he kept meticulous notes documenting whatever we saw. He also frequently noted GPS readings to help a computer inventory and tracking of our orchid quarries. Mike was the entertainer for the group. He comes equipped with a variety of calls, jokes, and other amusing actions and sounds. The vocalizations are necessary as one frequently loses sight of companions in the dense vegetation. This can be quite unnerving to the novice such as myself. You never know for sure whether that hard object you are stepping on is nothing more intimidating than fallen timber, or if in the alternative you are about to need some assistance. Even if to serve as nothing more than a comforting human voice in what appears otherwise as primeval swamp, Mike's unique hooting call assures you fellow man is present.

Saul and Russ both came heavily laden with camera equipment of the first order. Both also demonstrated by technique and handling lengthy background as experienced nature photographers.

Meet Saul Friess first. Saul was as well versed as any on Florida orchids. His field experience also was apparent, as he had carefully selected a complete wardrobe for walking such places. He apparently is a contributor to the park educational efforts as he came armed with a plastic sleeve he was donating to Mike for the park filled with beautiful shots of native orchids. While Michael Plecas talked of food, Saul became the hit of the trip by furnishing each of us with delicious sandwiches and beverages after our work was done. He had even thought about dessert – his ravenous fellow travelers made short work of his left-over Halloween candy. For some strange reason, hiking over, through, and under fallen woody debris, cut grasses and vines ripping at your clothes, sinking into occasional holes for some 5-6 hours really works up an appetite.

Russ Clusman rounded out our group. Russ was also well versed in orchids. Comment must be made about Russ's unique call for location. Whether we were witnessing a frustrated opera star or would-be contestant on American idol, I cannot say; however, I believe we all got a kick out of his refrain from the popular western ballad, *Mariah*. Russ seemed particularly adept at taking equipment in and out of

his backpack without incident. From changing lenses to employing flash to filters, he was ever-active switching gear. This brings up the necessity of learning to use "dry bags" to replace the typical compartments inside most camera bags. The plastic containers both seal and roll up and fasten with plastic toggles to keep even the heavier equipment dry if one has a mishap into the water. I can testify from prior bitter experience that such accident is neither pleasant nor inexpensive. My largest lens elected to take a swim at Corkscrew Sanctuary some years ago. After an expensive repair I was half expecting to be deemed man of the year by the repair shop.

Entry into the preserve is generally achieved by hiking or driving beyond a locked barrier gate along a former raised bed which was once a railroad logging road. We drove part way and then hiked further to the designated point of entry where Michael knew various species awaited. The open canopy roadways often enable visual encounter with such local reptiles as gators, snakes, perhaps even a mammal, if you get lucky. The sunny open straightaways also are where you will find the peskiest assemblage of insects. This is where we were bothered a bit by mosquitoes, not in the cool rather refreshing waters of the swamp. These slightly higher drier areas are also where you can encounter vegetation that requires freedom from constantly wet feet. Native royal palm (*Roystonea elata*) literally lines the edges of portions of these tramways. In fact, Mike mentioned that if you do become lost, remember these stately guardians of the roadway will direct you even from a distance to a way out. A shrub that puts on quite a show with bright orange tubular florets, called firecracker bush (*Hamelia patens*) also is found on the roadways. Insects load the flower-laden limbs. In particular, butterflies and dragon and damselflies abound. You could stay for hours documenting species and their actions. Birds such as hummingbirds also stop by for a nectar drink. This is one tree in particular that should convince you of the close affinity with lands much farther south.

Now it is time to take that long step down into the refreshingly cool waters of the Fakahatchee. Watch that first step into the unsteady footing beneath the water. Somehow an ethereal peacefulness pervades. I felt transported to some distant foreign destination. I learned how to keep myself upright as I slowly moved through the swamp. No one would mistake my ambulation for that of a ballerina; especially when I felt I had to grasp the nearest vegetation such as the cutgrass. With exposed hands and wrists I should have worn red to better blend in with the assorted cuts.

Many of the orchid species we saw were not in bloom; nine species by our collective notes and memories. However, we did catch up with five more that were. One of the most attractive had to be the clamshell orchid, (*Prosthechea* (*Encyclia*) *cochleata* var. *triandra*) With a maroon and white lip surrounded above by the five stringy other corolla parts in cream color, this species more than any other conveys the image of an epiphyte most would expect from south of this country in the tropics.

While the next I describe has an entire raceme of florets upon a thin wispy stalk, each is so tiny that you need either a hand lens or view through macro lens to do any justice to the species; I speak of the Florida adder's-mouth (*Malaxis spicata*). Once you do magnify the blossom, you enjoy bright orange as well as white and green. Each delicate floret is held out from the stalk by a pedicel longer than the floret. This orchid was growing on a mossy island that appeared to be a cypress knee.

Upon a branch of a pond apple tree, the thick dark green closely-packed leaves of false butterfly orchid (*Maxillaria crassifolia*) showed off a couple of individually-stalked lemon-yellow flowers. These were not quite as big as the *Encyclia* but certainly much larger than the *Malaxis*. Best of all, one could sit in a crotch of a couple of pond apple trunks and shoot or simply use the tripod standing in the water with the orchid at about my eye level. Many orchids here are too high for us short guys to even consider shooting.

During this short four-day trip to Florida, I had already seen a number of toothed rein orchids (*Habenaria odontopetala*). The very tall light green stalks are home to many florets. Their configuration and presence suggest some insects. This is a terrestrial and was also upon a hummock.

Finally, the water spider orchid, (*Habenaria repens*) emerged from another hummock to display some 15 or more florets that are best described as lightly colored spiders.

Departure from this wetland of great beauty, solitude, and rare species was almost sad. Hunger, fatigue, and sensory satisfaction eased the sense of loss. I am sure all silently concurred, as we munched our late lunch that circumstances would allow us a return for more in the not too distant future.

Tom Sampliner is a past president of the Native Plant Society of Northeastern Ohio, a photographer and leader of native plant tours.

THE FIDDLEHEAD DILEMMA

By George Ellison

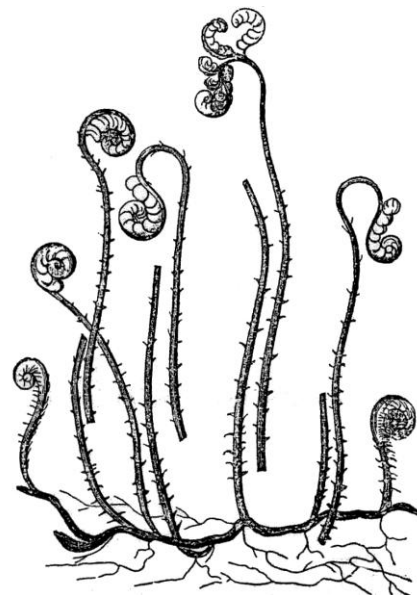
Pretty soon now fiddleheads will be emerging from the leaf litter in our forests. Almost everyone, even those not especially interested in plants, has heard of fiddleheads and knows that they're supposedly edible. Whenever I teach a plant identification workshop for the Smoky Mountain Field School or the North Carolina Arboretum or elsewhere, someone inevitably brings up the topic.

For that reason, earlier this spring, I devoted one of the Nature Journal columns I contribute to the *Asheville* (N.C.) *Citizen-Times* to fiddleheads. There was a good response. Accordingly, Dan Pittillo and I thought it might be interesting for me to rewrite that column for the more botanically sophisticated audience that *Chinquapin* reaches.

When leading field trips, my first response to fiddlehead queries is the obvious one. I point out that fiddleheads aren't a species of fern but a growth form. Most fern species display the characteristic fiddlehead shape when they arise from the plant's underground rhizomes. The "fern leaf" (pteridophyll or frond) differs from the "true leaf" (euphyll) of the flowering plants in its veneration, or manner of expanding from the bud. In the ferns, veneration is circinate; that is, the leaf unrolls from the tip, with the appearance of a fiddlehead, rather than expanding from a folded condition.

This unfurling strategy helps the immature frond make its way upward through the soil and leaf litter. It also protects the developing leaflets (pinna) that will comprise the leafy portion of the mature frond. The first fronds to appear in a new season's growth are purely vegetative; fronds unfurling later bear the spore capsules (sporangia).

The technical name for a fiddlehead is crozier (also spelled crosier). This is derived from the crooked end of a bishop's staff, which is sometimes referred to as a pastoral staff. Such a staff has a curved top symbolic of the Good Shepherd and is carried by bishops of the Roman Catholic, Anglican, and some European Lutheran churches and by



Beech fern *Polypodium phegopteris*

abbots and abbesses as an insignia of their ecclesiastical office and, in former times, of temporal power.

In addition to being highly functional, the emerging fiddleheads of some fern species are quite beautiful. Those of cinnamon fern (*Osmunda cinnamomea*) are a pale lime green and can stand a foot or more high before unfurling. Species in the wood fern group (*Dryopteris* spp.) often display woolly greenish-brown fiddleheads.

But now we get to the heart of the matter. When most people bring up fiddleheads, they do so because they've heard they're edible. They want to know which species can be harvested for consumption. My answer is that few of the ferns in the southeastern United States where I live and work

are edible. And the one that's said be particularly tasty is also thought to be dangerous.

Bracken (*Pteridium aquilinum*) is distributed world-wide, being commonly found along roadsides and in disturbed areas with poor soil. They display exquisite silvery-gray fiddleheads shaped like an eagle's claw. My wife and I have never eaten them, but they are reputed to be delicious. I doubt that light consumption of boiled bracken fiddleheads would be harmful to anyone; nevertheless, scientific research indicates the plant contains a number of toxic substances that readily kill livestock and might cause stomach cancers in human populations (as in Japan and China) that eat substantial amounts of the rootstock or fiddleheads. Unfortunately, for us, the North American fern species bearing fiddleheads that's reputed to be the most delicious and absolutely safe to eat doesn't grow wild in our region. That's the ostrich fern (*Matteuccia struthiopteris*). Its distribution range has been described as Alaska to Newfoundland, south to British Columbia, Alberta, Saskatchewan, North Dakota, Missouri, Illinois, Indiana, Ohio, West Virginia, and Virginia in North America; Scandinavia, Central Europe, Russia, and Asia; with significant naturalization in Ireland and Great Britain.

This species is described as displaying emerald-green fiddleheads and, when mature, having clumping leaflets (somewhat like Cinnamon fern) that taper all the way down to ground level. In this latter regard it resembles the well-known New York fern (*Thelypteris noveboracensis*), which is common throughout eastern North America as far south as Georgia. Although edible, I can attest that New York fern is not tasty.

The solution to the fiddlehead dilemma for persons living outside of the ostrich fern distribution area might be relatively simple. Ostrich fern is readily available from nursery sources listed on the Internet. It's advertised as establishing "vigorous" stands rather quickly in damp, partially shaded situations. One Internet source that I located

offers a "Pkg. of 2 – \$5.75." Why not purchase, say, 8 plants from a reputable grower (i.e., one not harvesting them in the wild) and propagate them for home consumption (as with asparagus) once a stand is established? My wife and I, who live on the North Carolina side of the Great Smokies, have decided to do just that. We would appreciate hearing from anyone who has experience growing ostrich fern for consumption outside of its natural range.

There is an Internet site devoted to fiddleheads at, you guessed it, www.fiddle-heads.com, where a visitor is advised on the opening page that "Fiddlehead Greens are the premium wild forage vegetable of Spring."

I do not know if there is a concern within the natural distribution range of ostrich about over-harvesting, as there is here in my region with ginseng, ramps, galax, and many other plants. In that instance, raising them in cultivated situations might be a remedy.

I did locate one online study regarding wild populations by Michel E. Bergeron and Line Lapointe, "Impact of one year crozier removal on long-term frond production in *Matteuccia struthiopteris*," *Canadian Journal of Plant Science*, 81: 155-163, www.pubs.nrc-cnrc.gc.ca/aic-journals/2001ab/cjps01/jan01/cjps99-176.html.

Bergson and Lapointe studied populations that had been subjected to crozier harvesting over the past 25 years. They found that "it appears necessary to limit crozier harvesting per crown to less than 50% in understory populations to preserve wild populations of *M. struthiopteris*."

The lessons in that summary for anyone growing cultivated ostrich ferns are apparent.

George Ellison is a writer and naturalist who lives in Bryson City, N.C. He can be contacted at ellisongeorge@cs.com

Illustration from Besette & Chapman, eds., *Plants and Flowers*, Dover, 1992, p 130.

Reprinted from *Chinquapin*, newsletter of the Southern Appalachian Botanical Society, Spring 2003

Tulip Tree and Franklinia

By Art Hopkins

This summer I traveled to the place where my ancestors settled on the western frontier – western New Jersey. Yes, 300 years ago, there still was wilderness that far East, and my ancestors were hard at work destroying it. My Quaker forebears founded Haddonfield, New Jersey, right across the Schuylkill River from that other Quaker settlement, Philadelphia – which, just a few decades later would become the second-biggest English-speaking city in the world. (That didn't last, though.)

In 1728, another Quaker, John Bartram, bought a 102-acre farm on the northwest bank of the Schuylkill, a short journey (four miles) downstream from Philadelphia. Although his parents could not afford to educate him, he was fascinated with plants. Legend has it that by age 12 he could name every plant in eastern Pennsylvania. He borrowed books, hired a private Latin tutor, and, while working as a

farmer and stone carver, he became one of the great scientists of his age. His botanical explorations took him north to Lake Ontario, south to Florida, and west to the Ohio River. He recorded, collected, and exchanged plant specimens with correspondents far and wide. He founded the American Philosophical Society, along with his friend Benjamin Franklin and others. In 1765, he was named Royal Botanist by the disreputable English monarch of that day.

I suppose the most amazing thing, from a modern perspective, is that John Bartram could make enough money from farming, and take enough time off to do all that. He had only one son, William, also an accomplished explorer, botanist and author.

Today the Bartram farmhouse and surrounding grounds are a museum and arboretum in inner-city Philadelphia. An Association and professional staff are working to restore and

interpret what remains of the many specimens planted there by the Bartrams. Much has disappeared, not surprisingly. The Bartram's Farm brochure claims that the Native Plant Exhibit "features some 1,000 herbaceous and 500 woody plants, all native species that were listed in the Bartrams' 1783 catalogue . . ."

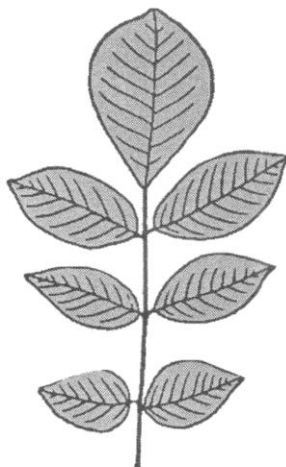
However, when I visited in late July, I could find only a tiny fraction of those numbers of plants. Yet, I'm glad I went. For one thing, I was there when the *Franklinia alata* trees were in bloom, and their spicy-sweet fragrance was delightful. It was the Bartrams who discovered that species along the Altamaha River in Georgia, named it for their good friend, and brought home seeds to plant in their garden. It has never been found in the wild since 1803; all *Franklinias* alive today are descended from those seeds. (Dr. Michael Dirr, in a private conversation, has offered this explanation for the *Franklinia's* disappearance from its native home: "Some believe that soil that has grown cotton is always contaminated with *Phytophthora* fungus, and that with the spread of cotton farming, contaminated soil washed into streams and killed off the native *Franklinias*.")

My favorite find at Bartram's Garden was the Yellowwood tree (*Cladrastis kentuckea*, formerly *C. lutea*). Bartram's specimen is about five feet in diameter-the trunk, mind you-or about five times the size of the biggest Yellowwood I'd ever seen before. A staffer assures me that this specimen still blooms in May – what a sight that must be! Yellowwoods are native to Indiana; native populations exist in Yellowwood and Brown County State Parks. However, Brown County, Indiana, is an outlying island of Yellowwood country; the main locus of its range is central Tennessee and Kentucky, with another big island in western Missouri and Arkansas. To quote again from the Bartram's brochure: "...this Yellowwood is said to have been collected in Tennessee or Kentucky by French plant explorer André Michaux and sent to William Bartram in the 1780's."

I've long thought Yellowwoods were beautiful trees, and should be used more often. Their weakness, literally, is their brittle wood, which often breaks up under wind or ice loads. Gary Hightshoe's *Manual* says that Yellowwood's longevity is only "Medium – commonly 120 to 160 years, shorter-lived in midwest." In that light, perhaps we should say that André Michaux rescued that tree – if it is the same tree – 220 years ago.

Another giant specimen of *Cladrastis kentuckea* may be seen at the Morris Arboretum, also in the Philadelphia area, and also well worth a visit. (And also created by Quakers, as it happens).

Liriodendron tulipifera (tulip poplar, yellow poplar, etc.) is unquestionably native to Indiana; it is our state tree and its leaf graces our INPAWS logo. In fact, it is native to



Yellowwood
(*Cladrastis kentuckea*)

almost all of the U.S. east of the Mississippi, and is the state tree also of Tennessee. A dozen tulip poplars grow on my own three acres, where they are constantly dropping branches and seeding hundreds of offspring. I thought I knew this tree, though I could never understand the English landscape gardener Russell Page's statement "Of all large deciduous trees I know none nobler than the tulip tree, *Liriodendron tulipifera*." Surely, nobility should be evidenced by other traits than scattering trash and offspring in one's wake.

My eyes were opened along Tookany Creek in Cheltenham, Pennsylvania. Tookany Creek is a city creek there, with heavily-used jogging trails along both banks, and a busy commuter road alongside. (A mile downstream, the creek enters Philadelphia city limits, where it becomes Tacony Creek and turns into an expressway.) But, along Tookany Creek grow some of the biggest trees I've seen in America. From a wide, flaring base, straight trunks soar up thirty or forty feet, perfectly straight and un-branched, until they're lost to view in the thick canopy of July. It took several minutes of hard peering to be sure that the leaves I saw up there belonged, in fact, to the trunks in question and were, in fact, tulip poplar. Also, the bark of these mature trees looked nothing like my thirty-year-old specimens'. The Tookany tulip trees' bark was a warm, rich brown color (not at all gray), and deeply furrowed. Noble, indeed.

Sometimes you have to step back some distance to gain a good perspective on the thing you're looking at. From the twenty-first century, I can regret the primeval landscape that my ancestors chopped and burned – "developed" – into farmland, even as I'm glad they were able to raise enough food to survive and reproduce. From urban Philadelphia, I gained new appreciation of one of my favorite and one of my less-favorite species of Indiana native trees.

To learn more about historic Bartram's Garden:
www.bartramsgarden.org

Art Hopkins, a landscape architect, has been associate editor of the Newsletter of the Indiana Native Plant and Wildflower Society since autumn 1998.

Reprinted from the Indiana Native Plant and Wildflower Society News, Winter 2000

Twinsburg and Summit County Parks

Summit County MetroParks has acreage adjacent the property mentioned in the last issue in "A Very Special Place" and is managing the park areas with Twinsburg. The Summit County MetroParks area is called Pond Brook MetroPark and will likely open to the public in 2004.

Making the World More Beautiful

Alan Ginsburg

In the award-winning children's book *Miss Rumphius*, author Barbara Cooney tells the tale of the "Lupine Lady," a woman who made her world more beautiful by sowing seeds of blue, rose, and purple lupine along the Maine coast. Miss Rumphius is based on the life of Hilda Hamlin, who cultivated lupine imported from England and scattered its seeds as she hiked along the coastline. Now lupine blooms so commonly along the coast that many people believe the flower is native to Maine.

For Holly Emmons, who spends summers with her family near Hamlin's house by the sea, the legend of the Lupine Lady is more than a delightful tale. It's a reminder of Emmons' own efforts to propagate and transplant a native species in areas where it has declined.

Unlike the Lupine Lady, Emmons' aim has been to restore a native habitat rather than to introduce exotic species. Emmons propagates *Lupinus perennis*, New York State's wild native lupine species, which previously had never been grown in a greenhouse and successfully reintroduced into its natural habitat.

Helping to restore habitat Emmons, a professor of plant science at the State University of New York College of Agriculture and Technology at Cobleskill, undertook her project after The Nature Conservancy asked her to propagate lupine for transplanting in the Pine Bush Preserve near Albany, New York. The preserve protects 2,300 acres of a rare ecosystem – the Pine Barrens – that once covered more than 25,000 acres from Albany to Glens Falls, New York. The Pine Bush preserve is home to the endangered Karner blue butterfly, *Lycaeides melissa samuelis*, whose larvae feed exclusively on native lupine.

Wild lupine is an early successional plant, which means it is one of the first plants to colonize disturbed soil. When a fire or other disturbance destroys a forest landscape, lupine moves in to take advantage of the increased sunlight. It will flourish for several years until bushes or trees provide too much shade for it to grow and blossom. Wild lupine grows as tall as two feet and blooms purplish-blue in early June. The female butterfly then lays its eggs on the plant.

Native Americans and early settlers burned the land often, and thus ensured an abundant lupine population. In recent decades, however, the combination of fire suppression and the return of higher successional forests has depleted both the lupine and the Karner blue butterfly. The only places lupine is consistently found are areas – such as the Pine Barrens – where the soil is too poor to allow dense undergrowth. Wild blue lupine also is native in restricted

habitats that are home to the Karner blue in parts of New Hampshire, Indiana, Michigan, Minnesota, and Wisconsin.

For the past 10 years, Emmons and teams of students from her wildflower culture and propagation course have successfully grown native lupine from seed in the campus green-house, then transplanted the seedlings into designated areas where the Pine Bush Commission hopes to re-establish colonies of the plant to increase the endangered butterfly populations.

Neil Gifford, who oversees the lupine project for the Nature Conservancy, says there's no doubt that what Emmons and her students have done will help support the Karner blue's habitat. "Lupine is the only known food plant for the Karner blue caterpillars, so without lupine you don't have Karner blue butterfly habitat," Gifford says. "The main goals of our Karner Blue management are to maintain and expand existing populations of lupine where the butterflies are established and to create new patches between existing butterfly colonies to link them together. The knowledge and expertise that Holly has brought to this program have been critical in enabling us to do that successfully." Gifford adds that project members hope to extend the wild plant populations throughout much of the 2,300-acre preserve.

Gifford explains that unlike some butterflies that fly long distances, the Karner blue spends its entire life within an area of about 200 meters. "So what we're trying to do is create a new habitat within 200 meters of an existing population, then lead the butterflies along to the new habitat by planting clumps of lupine that act as "stepping stones," Gifford says. But the Pine Bush has many barriers to extending the butterflies' habitat, including highways, forested areas, and other obstructions caused by development.

Propagating native lupine was a more challenging task than Emmons expected, even though "several wildflower experts told me it would be a waste of time to attempt to grow wild lupine in the green-house," she recalls. At first, the lupine grew well from seed. The first batch of plants Emmons and her students grew seemed to be doing well, but then died. She had the greatest success when conditions in the greenhouse matched the soil, temperature, and light intensity of the Pine Bush. Her students inoculated the seeds with a nitrogen-fixing bacteria, made room for the plants' long taproots in special pots, and moved plants out of the greenhouse within five months. Emmons used biological controls rather than insecticide to rid the plants of common greenhouse pests such as thrips, aphids, and fungus gnats, because insecticide residue on the transplants would kill the Karner blue butterflies.



After the first year however, Emmons judged the project a failure: hundreds of plants died in the greenhouse and hundreds of transplants withered in the field. She attributed the field losses to drought. The following year, however, several hundred healthy wild lupine were successfully propagated in the greenhouse, and more transplants thrived when a student volunteered to water them during the summer months.

"We've now developed and tested a successful recipe for large-scale propagation of wild lupine," Emmons says, noting that with proper care, the greenhouse wildflowers seem to survive the rigors of the Pine Bush better than natural seedlings. "It took 10 years, but we've finally worked out all the bugs and are seeing larger populations of transplanted lupine survive," she says.

Many of the wild lupine transplants have flourished in a garden setting in the Pine Bush, Emmons says, but adds, "Success still depends on a gardening approach. We can't just plunk the greenhouse plants into the ground and assume Mother Nature will take over." Stephanie Gebauer, former director of Albany Pine Bush Research and Management,

agrees. "We've discovered that greenhouse lupine need a lot of initial tending to survive. Whenever we transplant them, we try to get a volunteer to water them."

"Propagating blue lupine for reintroduction into its natural habitat is a feasible task for the hobby horticulturist," says Emmons. "It's an undertaking that would certainly help save this unique plant species while helping to ensure the survival of the endangered Karner blue butterfly." And, like the Lupine Lady in *Miss Rumphius*, planting wild lupine is something that anyone can do to help "make the world more beautiful."

FURTHER READING:

The Pine Barrens of Clinton Co., NY. by K. Adams & D.

Franzi. *Wildflower* 10(2):30-33.

Miss Rumphius, by Barbara Cooney. Viking, 1982.

Alan Ginsburg teaches journalism at SUNY Cobleskill and works as a reporter and feature writer for the Daily Gazette, a newspaper in Schenectady, New York.

Reprinted from *Wildflower*, Autumn 2001

Growing Lupines From Seed

Alan Ginsberg

Two techniques are essential to successfully propagate wild lupine in the greenhouse: inoculation and accommodation of the taproot.

SOAK THE SEEDS: Pour warm water over cleaned seeds that have been placed in a container. Allow the seeds to soak overnight, or about eight hours. Good seeds will sink; duds will float and can be skimmed off. The treatment softens the hard seed coat so germination can occur. Expect a germination rate of 85 to 90 percent.

INOCULATE THE SEEDS: Use a kitchen strainer to drain the water off the seeds. Put the seeds back into the container and sprinkle the inoculant over them. The inoculant is a black powder composed of nitrogen-fixing *Rhizobium* bacteria. (Lupine-specific inoculant is available from Liphatech, at 800-558-1003.) One tablespoon of inoculant is enough for several hundred seeds. Spread the inoculated seeds onto a paper towel to dry for a few minutes before handling them.

PREPARE THE POT: Put a small amount of long-fiber sphagnum mass (or shredded newspaper) in the bottom of 3 inch-square by 5.5- or 9-inch-deep, band-type pots. Bands are bottomless pots that have a crossbar to keep media in but let roots out; they accommodate the developing taproot and promote good drainage. (Bands are available from Anderson Die and Manufacturing Company, 503-654-5629, in case lots only.)

The pot's height is determined by how long the plants will be kept in them. Lupines should not be kept in pots longer than four to five months or they will decline. Fill pots with a 50/50 mixture of coarse sand and commercial potting medium, tap the pots firmly to settle the medium.

SOW THE SEED: Put three or four seeds in each pot. Cover the seeds lightly with the same medium. Put the pots in a greenhouse kept at 65-70°F. Bottom heat will enhance germination; supplemental lighting during the winter will enhance growth. Do not allow the soil's surface to dry out during germination, which will occur within a week under ideal conditions.

PLANT CARE: Lupine seedlings grow best when there is more than one plant per pot. Thinning the seedlings is not necessary. As the plants grow, resist the temptation to apply standard liquid fertilizers. High-nitrogen fertilizers will interfere with the action of the *Rhizobium* and inhibit formation of nitrogen-fixing nodules. However, one or two applications of root-stimulating hormone can be beneficial and may promote the development of flowering stalks the first season. When it is time to transplant the lupines outdoors, take care not to damage the taproot.

Reprinted from *Wildflower*, Autumn 2001

Black Cohosh

By Barry Glick, Sunshine Farm and Gardens

I can't seem to resist walking past a patch of *Cimicifuga racemosa* in flower without tickling my nose with the delicate feel and fragrance. I've always found it hard to accept the common name "Bugbane," as the fragrance is quite pleasing, at least to humans. But the genus name tells you otherwise. *Cimex* means bug in Latin and *fugare*, to drive away. The other common name, "Black Cohosh," is a Native American term.

It seems that recently the Horticultural Taxonomic Community has deemed it necessary to change the classification of this plant to *Actaea racemosa*. I think it will be a long time until the gardening public accepts this change, so until I delve more deeply into their reasoning, I'll stick with *Cimicifuga racemosa*. I have to admit though, it's difficult, without close inspection to tell the difference between the foliage of *Cimicifuga racemosa* and *Actaea pachypoda* when the plants are in early stages of growth. Once flowering commences however, there is no question.

There is a related native species, *Cimicifuga americana*. Their foliage is somewhat similar, but this plant is much smaller in stature.

Cimicifuga racemosa is currently in great demand as a medicinal herb. It's been long used in pregnancy and childbirth and as always, I'll call on Steven Foster to tell you more about the medicinal uses:

<http://www.stevenfoster.com/education/monograph/bkcohosh.html>

There's also GREAT website with copious amounts of data on Medicinal Herbs called Herbmed. Herbmed, <http://www.herbmed.org/> is an interactive, electronic herbal database that provides hyperlinked access to the scientific data underlying the use of herbs for health. It is an evidence-based information resource for professionals, researchers, and general public. It's a project of the Alternative Medicine Foundation and is provided as a freely available, public resource. What I like most about Herbmed is that it's non-commercial and they're not trying to sell you anything.

Cimicifuga racemosa is a great plant to use as a focal point in your shade garden, as its imposing height and architectural stature stands out high above most other plants.

There are a couple of very garden-worthy cultivars of the European counterpart *Cimicifuga ramosa*. 'Brunette' <http://www.shared-visions.com/explore/gardens/Perennials/Perennials%20C-.htm> been around for about 10 years and *Cimicifuga ramosa* 'Hillside Black Beauty' <http://pss.uvm.edu/ppp/aug01.jpg> has the darkest foliage yet.

Propagation is easy by the copious amounts of seeds set, but seed-grown plants take several years to reach maturity. A mature rhizome can be divided easily into

several pieces; make sure that each piece has a bud, they will re-establish quickly and usually flower the following year.

Taxonomic Hierarchy

Kingdom - Plantae - Plants
 Subkingdom - Tracheobionta - Vascular plants
 Superdivision - Spermatophyta - Seed plants
 Division - Magnoliophyta - Flowering plants
 Class - Magnoliopsida -dicotyledons
 Subclass - Magnoliidae
 Order - Ranunculales
 Family - Ranunculaceae
 Genus - *Cimicifuga*
 Species - *racemosa*
 Common name - genus - "Cohosh"
 Common name - species - "Black Cohosh", "Bugbane"
 Synonyms - *Actaea cimicifuga*
 Native range - Eastern United States.
 USDA Hardiness Zone - 5, maybe 4
 Light preference - Full shade to dappled sunlight
 Soil fertility preference - Rich
 Soil moisture preference - Moist to average
 Bloom time - Early Summer
 Bloom color - White, fragrant
 Foliage - Dark green
 Spread - 18" - 36"
 Height - 48" - 96"
 Landscape uses - Medicinal plant garden, Wild shade garden or shady border
 Related species - *Cimicifuga americana*, *Cimicifuga ramosa*, *Cimicifuga japonica*
 Medicinal uses - See -
<http://www.stevenfoster.com/education/monograph/bkcohosh.html> and
<http://www.herbmed.org/herbs/herb7.htm>

North American Wood Frog in Winter *Rana sylvatica*

The North American wood frog belongs to a small group of animals that are freeze tolerant. The wood frog can live north of the Arctic circle. As the temperature drops below freezing each winter, the wood frog drifts into a deep hibernation, its breathing and heartbeat grind to a halt, and as much as 65% of the water in its body gradually crystallizes into ice. Sound uncomfortable? The wood frog seems not to mind terribly much, as it spends the winter months frozen, with its body temperature ranging between -1°C and -6°C. When spring finally arrives, the ice melts, heartbeat and breathing return, and the frog resumes its daily activities.



Chapters of the Ohio Native Plant Society

Cincinnati Wildflower Preservation Society
Dr. Vic Soukup
338 Compton Road
Wyoming OH 45215
513-761-2568

Central Ohio Native Plant Society
Susan Ramser
1411 Cambridge Road
Columbus OH 43212
614-488-3671

Native Plant Society of the Miami Valley
Nancy Bain
444 Acorn Drive
Dayton OH 45419
937-698-6426

The Mohican Native Plant Society
Mike Klein
1778 Dougwood Drive
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J. Roche, President
640 Cherry Park Oval
Aurora OH 44202
330-562-4053
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The Botanizers
The Wilderness Center
Stan Watson
4134 Shelby Circle
Wooster OH 44691
<http://www.wildernesscenter.org>

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- Promote conservation of all native plants and natural plant communities through habitat protection and other means
- Encourage public education and appreciation of native plants
- Support proper ethics and methods of natural landscaping
- Encourage surveys and research on natural plants and publication of the information
- Promote cooperation with other programs and organizations concerned with the conservation of natural resources

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The Fiddlehead Dilemma – George Ellison
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