On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

Sidewalk Garden Is Native Plant Treasure at the Cleveland Metroparks Zoo

Jean Loria

Most people know about the wildlife inside the Cleveland Metroparks Zoo. But few know about the garden just outside the gates filled with native plant species. A border garden runs along the Fulton Parkway portion of the Zoo's All Purpose Trail. An amazing 100 yards of improved Zoo Perimeter Landscape are established and flourishing.

Cleveland Metroparks Zoo, formerly part of Brookside Reservation, is located on Cleveland's West Side. The Zoo, founded in 1884 on Wade Oval in University Circle, was moved to its current location in 1907. Cleveland Metroparks assumed operation of the Zoo in 1975 and dedicated it to responsible stewardship of our natural environment through exhibition of living animals and plants. The Zoo grounds cover 165 acres of rolling hills and high terraces drained by Big Creek. They're beautifully landscaped and well maintained. Vegetation harvested on site supplements feed for the animals. Both plant and animal exhibits are popular and enjoyed by large numbers of visitors to the Zoo each year.

Pebbles Bush, Zoo Horticulturist, began work on the plant border bed in 2002. The All Purpose Trail isn't an interpretive trail, but it's accessible and free to the public. To her credit, Pebbles elected to plant native woody and perennial species, making it a prime opportunity for passersby to get a feeling for our native plant heritage. Pebbles also chose to model the bed after a dynamic plant community rather than using the format of a plant collection.

The perimeter garden spans the space between the sidewalk along Fulton Parkway and a seven-foot barbed wire fence on the east side. The Zoo Perimeter Landscape Plan, drafted by Landscape Architect John Cardwell, was modified by Don Krock, Manager of Zoo Horticulture, with evergreen tree species substitutions and the addition of large boulders for hardscape. For Pebbles, the beauty, complexity and diversity of plants native to Ohio, rarely profiled in public or private gardens, offered a perfect palette for her design requirements.

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Starting with this issue, in each issue we will reprint an article from our archives that we think deserves a second reading. In this issue you will find Perry Peskin's essay on gentians, from our first year of publication, 1983.

2010 Grant Announcement

The 2010 Grant Announcement will be found on page 8. Please read it and pass on the information to anyone you think might qualify for it.

See the greatly expanded picture gallery at our web site:

www.NativePlantSocietyNEOhio.org

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Program Schedule — Summer 2010

Fern Workshop -- Geauga County -- Saturday, July 10 -- 9:00 a.m. - Noon, Woods Edge Shelter, Swine Creek Reservation. Discover the lush diversity of ferns found in the ravines and valleys of Swine Creek Reservation. Brief overview of fern morphology at the shelter will be followed by an off-trail hike to search for ferns. Over 12 species of ferns have been identified. Fern Finder booklet available for sale for $3.50. Joint program with Geauga Park District. Directions: From downtown Middlefield, take Rt. 87 east 2½ miles to Hayes Road. Turn right (south) 1½ miles to park entrance on right. Bear right to last parking area. 16004 Hayes Rd, Middlefield, 44062. Call Judy to register at 440-564-9151 (H) or 440-286-9516 ext 2011(W).

Walnut Beach -- Ashtabula County -- Saturday, August. 14 -- 10:00 a.m. Rick Gardner, ODNR Division of Natural Areas & Preserves Botanist, leads the trip to this Ashtabula park with some of the best remaining beach-dune communities in Ohio. Similar to Headlands Dunes State Nature Preserve, it has a great diversity of beach species including inland beach pea, inland sea rocket, seaside spurge, purple sand grass, beach grass, and sand dropseed, to name a few. The last sighting of bearberry in Ohio was at this beach. Directions: From I-90 take the Ashtabula (St. Rt. 11) exit north to Ashtabula. Follow St. Rt. 11 until it ends and go W. (left) on St. Rt. 531. Follow St. Rt. 531 across the Ashtabula River and drive about 0.4 mi. and turn right on Lake Ave (St. Rt. 531 turns left on Lake Ave). Drive about 0.25 mi. to the park entrance (straight ahead). Go down the hill and park. Call Diane to register at 216-691-1929 (H) or 216-666-4870 (Cell).

Butterflies: Love Them & Need Them -- Geauga County -- Sunday, August 15, 2:00-4:00 p.m., Meyer Center, Big Creek Park. Join Judy Semroc, Cleveland Museum of Natural History Natural Areas staff, as she presents how to attract and support butterflies and moths through the lure of nectaring plants, larval host plants, and scent attractors. This program will include a lecture and photos by Judy Semroc, followed by an easy hike to see some of these lovely creatures and the plants that support them. Joint program with Geauga Park District. Directions: From I-90 take Rt. 44 south about 2 miles to Clark Road. Turn left (east) on Clark about 2 miles to Robinson Road. Turn right on Robinson about 2 miles to park entrance on right. Bear left at the split to the first parking area on right. 9160 Robinson Rd. Chardon 44024. Call Judy to register at 440-564-9151 (H) or 440-286-9516 ext 2011(W).

Herrick Fen -- Portage County -- Saturday, September 18, 9:00 a.m.- Noon. Karen Adair, Nature Conservancy Land Steward, leads this trip to the 140-acre Ohio State Nature Preserve. See the restoration work being done to treat cattails around the lake and restore it to a sedge meadow. In this tamarack fen with sphagnum hummocks, see Kalm's lobelia, bayberry, alder-leaved buckthorn, round-leaf sundew, and water avens. Directions: From State Rt. 14 in Streetsboro take State Route 43 south for 0.2 miles. Turn right (southwest) on Seasons Road 2.2 miles to a gravel lane on the left (east) side just past a railroad crossing. Gravel parking lot on right. Call Judy to register at 440-564-9151 (H) or 440-286-9516 ext 2011(W).

Sidewalk Garden (continued from page 1)

The garden is in full sun and is windy. The sheer size and backdrop-like site of the border demand a bold show. Native prairie plant species account for 50% of the species planted, with the balance representing other biome ecologies. Evergreens, expected to mature to heights of 15 to 20 feet, and the boulder arrangements interspersed throughout the garden provide microclimate niches that Pebbles used to good advantage. The bed was prepared by adding topsoil and compost to the existing soil and installing an irrigation system. So far the garden suffers moderate but less than anticipated insult from litter and animal waste.

The Zoo Perimeter Landscape Plan begins south of the Employee parking lot off Fulton Parkway. Continuing south along the sidewalk, you'll see a stand of five Chokeberries *(Aronia melanocarpa)* planted again the fence. They are covered with white blooms in late spring that mature to a glossy black fruit midsummer. The berries persist through the winter, providing a feast for cedar waxwings and robins.

Sweet Black-eyed Susans *(Rudbeckia subtomentosa)* bloom all summer long next to the Chokeberry. This striking species is remarkably different from *Rudbeckia* cultivars popular in ornamental gardens. It tends to be taller, softer looking with finer petals, and the foliage is a cool, light green. It holds up better than *Rudbeckia goldstrum* in heat and drought. And although it seeds in freely, it has not run rampant in the border.

Purple Prairie Clover *(Dalea purpurea),* barely reaching a foot in height, has lanceolate leaves and is covered in July/August with one-inch, purple flowers. Pebbles encourages this species to weave throughout the border, filling in spots around boulders and close to the sidewalk. Its ability to fix nitrogen augments the fertility of the bed on a seasonal basis.

Blooming in May/June in concert with Columbine *(Aquilegia canadensis)* is Prairie Smoke *(Geum triflorum).* This diminutive groundcover has feathery pink seedheads not to be missed before they disperse in July. It works well in the drier soil edge of the sidewalk. Two Prairie Fire Crab trees add to the spring show. Clustered in front of the first are four Virginia Sweetspires (*Itea virginica* 'Little Henry'). Another May/June bloomer is Winterthur Smooth Witherrod *(Viburnum nudum* 'Winterthur') with multiple stems and beautiful shiny foliage with good fall color. Also along the back of the border is Nannyberry *(Viburnum lentago),* a bonus for wildlife food and carefree maintenance. The entire bed benefits from the three season appeal of Fothergilla *(Fothergilla gardenii).* These plants provide the bulk of the spring bloomers.

Purple Coneflower *(Echinacea purpurea)* and Pale Purple Coneflower *(Echinacea pallida)* stand with the Sweet Black-eyed Susans. The more difficult to cultivate Pale Purple Coneflower, although not spreading, is holding its own. Pebbles plans to try both *Echinacea tennesseensis* and *Echinacea angustifolia.* False Indigo *(Baptisia australis)* adds an impressive four-foot stand, fixing nitrogen, resisting drought, and sporting interesting seed pods long past the growing season.

Kalm's St. John's wort *(Hypericum kalmianum)* is another drought-tolerant native that is attractive in its own right for its pretty yellow flowers and dried-capsule seedheads that persist through the winter. It's a herbaceous plant rarely seen. In fact, it was listed as Extirpated from Ohio until it was reported by staff members of the Cleveland Museum of Natural History at Singer Lake. [See "On the Fringe" Vol. 19 No. 2, June 2002.] This species differs from the more widely cultivated *Hypericum calycinum* in that the flowers are smaller and the leaves narrower, and it has the distinguishing feature of exfoliating bark.

Wet spots in the deeper soil along the fence are exploited by the huge white to pale pink flower with blush red eye of Marsh Hibiscus *(Hibiscus moscheutos).* This hardy native plant can grow to four feet in height and circumference—a pleasant surprise for the unacquainted. Further down the border before the second Prairie Fire crab is another moisture lover, Blue Vervain *(Verbena hastata).* It seeds freely, is four to five feet tall and is considered a valuable medicinal. In front of this second crab is Foxglove Penstemon *(Penstemon digitalis).* It has white flowers and differs from more common cultivars in that the stems and leaves are not burgundy.

Mixed throughout is Sullivant's Milkweed *(Asclepias sullivantii).* Fragrant blooms in June/July/August attract insects, including monarch butterflies. Happily, this species is not a concern for spreading. Sullivant's and Swamp Milkweed *(Asclepias incarnata)* are part of ongoing habitat trials in this multipurpose bed.

From July to September, three Silphium species, Prairie Dock *(Silphium terebinthinaceum),* Cupplant *(Silphium perfoliatum),* and Rosinweed *(Silphium integrifolium)* bloom on the fence-side, south end of the border. These spectacular species tower to 7 or 8 feet and tolerate average garden soil. Pebbles used five

species of grasses for their bold architecture as well as their contribution to food for wildlife and ability to hold soil. Noteworthy for gardeners looking for a plant to thrive in dry shade is Bottlebrush grass *(Hystrix patula)*. Goldenrods and Sweet Fern *(Comptonia peregrina),* a sub-shrub with a pleasant fragrance and texture, end the border along the All Purpose Trail.

The Zoo All Purpose Trail border garden conforms to the concept of a natural garden relying on the use of native plant species—species that the public rarely has an opportunity to observe and enjoy in an urban area. In addition, it is a good example of an ecological garden. Irrigation water requirements are minimal. Fertilizer and chemical pesticides are simply unnecessary. The site was carefully designed, assembling species that work well together to protect the soil from erosion, conserve moisture, boost soil fertility and attract wildlife. It is dramatic and tough with close-up appeal. This is a garden well worth viewing.

Zoo Perimeter Landscape Plan

Common Name	Botanical Name
Perennials and Grasses	
Big Bluestem	Andropogon gerardii
Blue False Indigo	Baptisia australis
Blue Vervain	Verbena hastata
Blue-Stemmed Goldenrod	Solidago caesia
Bottlebrush Grass	Hystrix patula
Columbine	Aquilegia canadensis
Cupplant	Silphium perfoliatum
Dogtooth Daisy or Sneezeweed	Helenicm autumnale
Foxglove penstemon	Penstemon digitalis
Heart-leaved Blue Wood Aster	Aster cordifolius
Indian Grass	Sorghastrum nutans
Ironweed	Vernoniafasciculata
Little Bluestem	Schizachyrium scoparium
Marsh Hibiscus	Hibiscus moscheutos
Meadow Blazingstar	Liatris ligulistylis
Nodding Onion	Allium cernuum
Ohio Goldenrod	Solidago ohioensis
Pale Purple Coneflower	Echinacea pallida
Prairie Dock	Silphium terebinthinaceum
Prairie Smoke	Geum triflorum
Purple Coneflower	Echinacea purpurea
Purple Prairie Clover	Dalea purpuea
Rosinweed	Silphium integrifolium
Smooth Aster	Aster laevis 'Blue Bird'
Stiff Goldenrod	Solidago rigida
Sullivant's Milkweed	Asclepias sullivantii
Swamp Milkweed	Asclepias incarnata
Sweet Black-eyed Susan	Rudbeckia subtomentosa
Switch Grass	Panicum virgatum
Woody Plants	
Black Chokeberry	Aronia melanocarpa
Dwarf Fothergilla	Fothergilla gardenii
Eastern White Pine	Pinus strobus
Kalm's St. Johnswort	Hypericum kalmianum
Little Henry Dwarf Virginia Sweetspire	Itea virginica 'Little Henry'
Nannyberry	Viburnum lentago
Northern Bayberry	Myrica pensylvanica
Prairie Rose	Rosa setigera
Sweet Fern	Comptonia peregrina
Winterthur Smooth Witherrod	Viburnum nudum 'Winterthur'

Jean Loria lives in Cleveland Heights and is a long-time member of the Native Plant Society of Northeastern Ohio. Pebbles Bush has been a Horticulturist at the Cleveland Metroparks Zoo for 11 years. She is currently working on a degree in Environmental Science and was awarded Trailblazer by Hard Hatted Women in recognition for her role as a woman in non-traditional jobs.

Ohio Natural Heritage Database

http://www.dnr.state.oh.us/RarePlantSpeciesbyCount/tabid/20404/Default.aspx

Access rare plant lists by Ohio county. The database contains more than 17,000 records which represent known locations for Ohio's rare plants and animals, high quality plant communities and other natural features. Current as of June 2008.

Black Gum: Rabbit Traps & Bee Gums

By George Ellison

> The wilderness, rough, harsh, and inexorable, has charms more potent in their seductive influence than all the lures of luxury and sloth. And often he on whom it has cast its magic finds no heart to dissolve the spell... — Francis Parkman, *History of the Conspiracy of Pontiac* (1851)

The ancient Cherokees and, subsequently, the white settlers here in the Blue Ridge lived close to the natural world. In some ways, of course, it was a cold, messy, and even, at times, cruel existence. But in other ways such a life must have also been very rewarding. You and I have to flip a switch in our minds in order to shift from our modern technological ambiance to make some sort of connection with our natural environments. Every single day, for better or worse, those folks woke up as an integrated part of the glorious world that surrounded them.

They were attentive to all aspects of the land—landscapes, flora, and fauna—because these provided the basics for survival and the necessary commodities for creature comforts. Back then, medicines, foods, dyes, and building materials couldn't be purchased at Lowe's or Wal-Mart or local pharmacy, grocery, and hardware stores. It's my supposition that because they had to pay closer attention to the everyday world the Cherokees and early settlers felt closer to and more at home in that world than many of us do today. In this regard, let's consider how the early settlers used hollow black gum trees for multiple purposes.

Some botanical background is in order. Most folks associate black gum or tupelo (also called black tupelo, bowl gum, gum, pepperidge, sour gum, stinkwood, swamp gum, swamp tupelo, tupelo gum, yellow gum, yellow gum tree, wild pear tree, and other names) with swamps and moist low-lying areas, not mountainous terrain. Indeed, the initial black gum variety taxonomically described as *Nyssa sylvatica* was a swamp-growing type, with the generic name assigned in honor of Nyssa, the mythological Greek water nymph. The specific epithet means "of the woods." As for the common name black gum, the first part refers to the dark leaves, but no one seems to know for sure what the designation "gum" referred to originally. Tupelo was derived from *ito opilwa,* the Creek Indian name for the tree.

There are, however, two varieties of *Nyssa sylvatica* that botanists now recognize—based on



Nyssa sylvatica



Leaves, flowers, & fruit

variances in leaf shapes, fruit sizes, seed characteristics, and preferred habitats. One can be aptly distinguished as swamp tupelo *(Nyssa sylvatica* var. *biflora),* since it grows in wet woods and swamps. The only region where it has been located in the Southern Blue Ridge Province is in the northwestern corner of South Carolina. When occurring in frequently flooded sites, the bases of the trunks for this variety are usually swollen, as is the instance with cypress trees.

To the other variety *(Nyssa sylvatica* var. *sylvatica),* we can apply the common name black gum. It grows throughout the eastern United States, being common in dry sites throughout the Blue Ridge (often in oak and pine forests) up to 5,000 feet or more. Black gum, which can be 100 feet tall, is usually somewhat larger than swamp tupelo. During the fall color season, its leaves turn an eye-catching lipstick red. The wood possesses an interlocked grain—so that, like sycamore, it just about can't be split, not even with the use of wedges. Accordingly, the early settlers used the wood for mauls, tool handles, skid poles, and rough floors for outbuildings.

Now we get to the interesting part. Perhaps every other mature black gum tree here in the Blue Ridge is to a greater or lesser extent hollow. This is because the species is highly susceptible to heart rot fungi. This infection occurs when aerially disseminated spores from various decay fungi are deposited on or near fire scars or dead branch stubs of susceptible hosts. After these spores germinate, the fungi's vegetative strands (mycelium) grow slowly into the vulnerable wood tissues. The fungi that invade black gum attack only the

tree's central column of physiologically inactive (non-living) heartwood. An infected tree retains its outer vascular tissues for support and nutrient transport, but internally it becomes hollow.

For wild critters, hollow black gum trees make wonderful nest and refuge sites. For the Cherokees and early settlers, they represented a utilitarian item that could be used in numerous ways. Sections were fitted with bottoms and made into containers. Interconnected sections also served as pipes or troughs for channeling or diverting water. Pits or wells could be cased at the surface with a hollow black gum log in order to prevent an inflow of surface water.

A small hollowed section of black gum could also be closed at one end, fitted with a triggered sliding door at the other end, baited, and used as a rabbit trap. When I was a boy, an uncle of mine showed me how to make these traps, which he called "rabbit gums." I did catch the occasional rabbit. But most of the time, when I turned the trap up on its back end and slid the door open to see what was inside, there was a 'possum staring up at me. That was OK. My grandmother paid twenty-five cents per 'possum, which she placed in a cage, "fatted up" for a couple of weeks on vegetables, and then baked along with sweet potatoes.

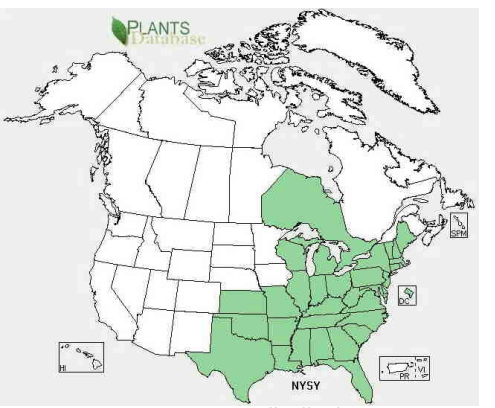
But the most noteworthy use of hollow black gum logs was as "bee gums" that became a haven for honeybees and a source of "sweetenin'." Their construction is described in some detail in *Foxfire 2* (1973), a volume compiled and edited by Elliott Wigginton and his high school students in north Georgia:

> *Hollow sections of the tree would be brought home and the inside rounded out smooth and uniform with a long chisel. 'Middleways' of the gum, four holes would be bored—one at each point of the compass—and two sticks run horizontally through the gum at right angles to each other. These sticks acted as supports from which the bees would suspend their brood combs. The bees would automatically save the top half of the gum for their honey and would hang those combs from the plank lid, or 'head,' that was set over the top of the gum. The head was often held in place by a stick run through two wooden eyes . . . Then a slanted, easily removable lid was usually set above the head to keep rain from running into the gum. Beekeepers always set the gums on flat platforms. Small rocks could be set under one edge of the gum tilting it slightly so the bees could enter; or "V"-shaped notches were cut into the bottom on one side to serve the same purpose. The platform extended several inches beyond the entrance to provide a landing area.*

Most hives these days are prefabricated, box-shaped units. But throughout the nineteenth century and into the early twentieth century, black gum hives were prevalent in the Blue Ridge backcountry. As related at the Internet site titled "Will Walker—Legend of Tuckaleechee Cove," William Marion ("Big Will") Walker moved with his wife, Nancy Louisa Caylor Walker, into the wilderness of Middle Prong of Little River in east Tennessee the year they were married in 1859. Walker felled and hewed logs and put them up for the house when they first moved into the valley— a home that sheltered them for all sixty years of their marriage. It's recorded that "Will had 75 stands of bees in only one location, at a place he called the 'Slowdown,' where the wind had felled a grove of poplar trees several miles upstream from their home. Most of the bees at this location and others were in sections of hollow black gum logs—bee gums. Will sold big quantities of honey."

This essay originally appeared in the collection of George Ellison's work titled *Blue Ridge Nature Journal: Reflections on the Appalachians in Essays and Art,* (Charleston SC: Natural History Press, 2006), which includes 30 of his essays on the natural areas, flora and fauna of the southern mountains, as well as 40 full-color watercolors and 30 illustrations by his wife, Elizabeth Ellison. He is currently editing for the same press a two-volume collection titled *High Vistas: An Anthology of Nature and Descriptive Writing from Western North Carolina and the Great Smoky Mountains, 1540-2007.)*

Reprinted from *Chinquapin*, the newsletter of the Southern Appalachian Botanical Society, Summer 2007.



Nyssa sylvatica distribution
Source: USDA Plants Database

Middle Bass

Debbie Woischke

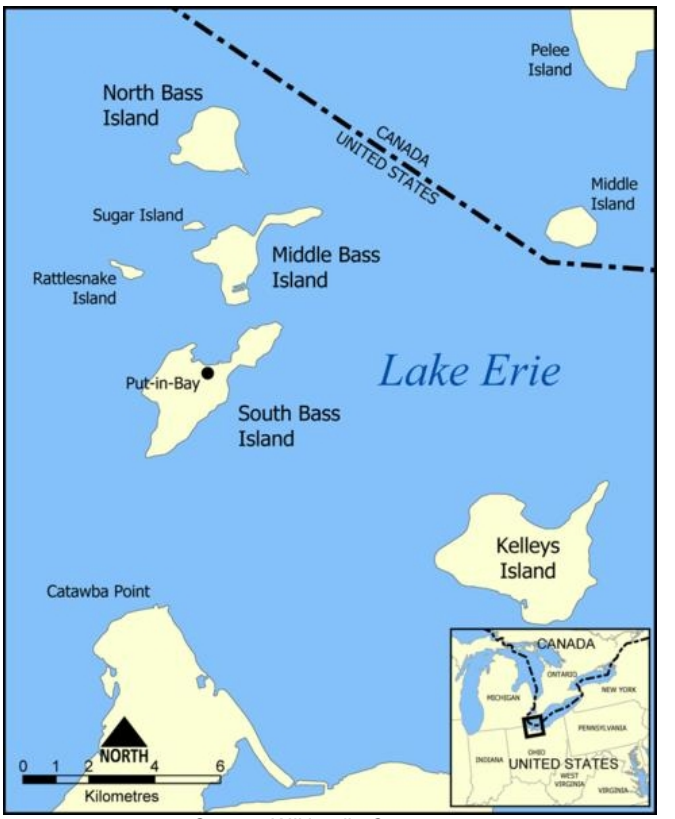
Middle Bass Island, like the other Lake Erie western basin islands, is home to many rare plants and animals, and other significant natural features. At 750 acres, it is the third largest American island. Approximately 146 of these acres are protected as Middle Bass Island State Park (124 acres), Kuehnle Wildlife Area (20 acres) and Petersen Woods (1.5 acres).

Perhaps the most significant feature is the first bald eagle nest on a Lake Erie island since 1962. Located between Kuehnle Wildlife Area and the airport runway, the nest was built in the spring of 2003 although no eggs were laid that year. The eagles returned in 2004, laid at least one egg, and on March 14th hatched an eaglet. In 2005, the pair returned to try again and incubation started but an aerial survey by the Division of Wildlife on April 13th revealed an apparently empty nest. In spite of this mixed success, it is very encouraging and exciting that eagles have returned to nest on the islands. Hopefully, the pair will return in 2006 and succeed in raising young.

A substantial expanse of glacial grooves is located behind the old Lonz Winery next to a small pond within Middle Bass Island State Park. The grooves cover an area about 85 feet long and 60 feet wide. They are a very nice example of this ice age phenomenon to explore and ponder the workings of the glacier that left them behind. Smaller segments of grooves can also be seen in various locations along the shoreline around the island.

Rare plants found within the State Park include the harebell, northern bog violet, the largest population of Drummond's rock-cress in Ohio, and the elegant sunburst lichen. All of these grow along and on the cliffs and rocky shoreline. The lichen is actually a combination of a fungus and an alga growing in a mutually beneficial relationship (called symbiosis) and is therefore not a plant. It grows in large orange patches exposed to full sunlight, and inhabits the huge dolomite boulders that have fallen away from the cliffs. The eastern fox snake has been seen in the State Park, as well as several other locations around the island.

Kuehnle Wildlife Area is significant for harboring rare plants such as Richardson's pondweed, wapato, southern wapato, limestone savory, Oakes' evening primrose, Baltic rush, inland sea rocket and American water-milfoil. The state threatened limestone savory was found growing between the pond and the road. This small-flowered member of the mint family blooms



Source: Wikipedia Commons

all summer and has a mat-like growth habit which makes it easy to overlook. Oakes' evening primrose, on the other hand, is about a foot tall and has yellow flowers. Also state threatened, it blooms from mid-summer into early fall and is very difficult to tell apart from the common evening primrose. In Ohio, Oakes' evening primrose is limited to sand dune and beach areas, frequently exposed to recreational use, which makes the survival of this plant more difficult. At Kuehnle, it was found on the gravel bar between the lake and pond.

Baltic rush, frequently found around the Great Lakes, prefers wet or moist, calcareous habitats. It was found along the shore of the pond in full sunlight. This rush spreads by rhizomes, and its leaves consist of reddish-brown sheaths around the base of the stem. It has an unusual appearance in that the flower-stalk extends laterally from the side of the stem rather than from the top. Baltic rush flowers through the summer and is listed in Ohio as potentially threatened. The American water-milfoil is an aquatic plant that was found years ago within the pond but could not be located during a recent survey. This plant may have

been out-competed by the more aggressive and non-native Eurasian water-milfoil. Currently listed as state threatened, the American water-milfoil's status may change to endangered if it continues to lose ground (or in this case, water!).

Animals found at Kuehnle include the Lake Erie water snake, which is also found in many other locations around the island, and Blanding's turtle. Never wandering too far from water, Blanding's turtle can be identified by its yellow throat and chin. In Ohio, this turtle's range occurs in wet areas, including streams, meadows and marshy shorelines, in the northern counties bordering Lake Erie. The only other Lake Erie islands this turtle has been found on are North Bass and Kelleys.

Although no rare plants have yet been found growing in Petersen Woods, it does provide some shoreline habitat for the Lake Erie water snake. In addition, the neighboring eagles have been seen perching in the trees.

When Burgundy Bay Marina was still known as Fishers Pond, it supported many rare species of mussels including the rayed bean, purple wartyback, deertoe, fawnsfoot, snuffbox, threehorn wartyback, northern riffleshell and eastern pondmussel. Sadly, loss of habitat and the invasion of the zebra and quagga mussels have virtually eliminated all native mussel species from Lake Erie.

Wehrle's Pond was described in 1949 by Edward Sinclair Thomas, Columbus Dispatch nature columnist, as having "large areas of marsh grasses like the blue-joint reed bentgrass and other patches of dark green bulrush …. In wetter places, where the grasses had not obtained dominance, there were swamp rose-mallows, with pretty, clear pink, hollyhock flowers." This area is now the state park marina, where the aquatic Richardson's pondweed (potentially threatened) can be seen growing in profusion.

© Debbie Woischke. August 2005. Reprinted from the newsletter of the Lake Erie Islands Chapter, Black Swamp Conservancy, Aug-Sept. 2005.

Grant Announcement for 2010

The Native Plant Society of Northeastern Ohio will consider applications and nominations for an Annual Grant(s) to be awarded to a person or persons working in the field of botany or conservation in northeastern Ohio for a project that demonstrates excellence in research, conservation or education, and that clearly supports the mission of the Native Plant Society of Northeastern Ohio. Land trusts or other organizations or causes that support that mission are also eligible for the Annual Grant.

The Society's mission includes:

- Conservation of all native plants and natural plant communities through habitat protection and other means
- Public education and appreciation of native plants
- Proper ethics and methods of natural landscaping
- Surveys and research on native plants and publication of the information
- Cooperation with other programs and organizations concerned with the conservation of natural resources.

The amount of the grant will be up to $500. The number of grants available will be dependent on funding. The deadline for submissions is September 1st, 2010, and the grant(s) will be awarded at the Annual Meeting of the Society in the fall.

Applications should include contact information, a summary of the project, and a description of how money will be used. Awardee(s) will be asked to give a brief presentation on the project the following year at the Annual Meeting.

Please e-mail your application to **bunchberry1@windstream.net** or submit 3 copies to: **Judy Barnhart, President, Native Plant Society of Northeastern Ohio, 10761 Pekin Road, Newbury, Ohio 44065.**

From the Archives:
Reprinted from On The Fringe, September 1983, Vol. 1, No. 7.

The Elusive Gentians

Perry Peskin

Looking for members of the gentian family in northern Ohio? It can be frustrating.

I remember the first gentian I ever found as a result of a "hot tip" that the plants were blooming on the shale bank adjoining Chagrin River Road south of US 422. On a clear October day, after locating the shale bank and doggedly climbing up the slope, slipping down two feet for every three feet ascended, I found on the few level places, growing under the first autumn leaf-fall, a delicate-stemmed plant with narrow, opposite leaves; one or two vase-shaped flowers at the top; and lightly-fringed petals of a peculiar smokey blue. As anyone might be, I was justly proud of having discovered the celebrated wildflower—*Gentiana crinita*, the fringed gentian.

Actually I hadn't. The diminutive gentian growing on shale banks was, as in most cases, *Gentiana procera*, the small fringed gentian (or in Ohio a hybrid between the two species). To become acquainted with the real thing, I found out years later that one has to travel to mucky bottomlands, such as Stumpy Basin of Summit County, or to sterile borrow pits, waste areas depleted of topsoil by construction projects, such as the well-known location on Boston Mills Road, north of Peninsula, which is next to, and created by, the Ohio Turnpike.

Here, in all its glory, grows the true fringed gentian, with stout stems ranging up to three feet in height, broad leaves surmounted by dozens of flowers, and petals all deeply fringed at the ends and along the sides–a beautiful but hardly delicate wildflower, and an unlikely companion to the coarse, hardy mulleins, asters, and grasses that it competes with in a marginal type of habitat.

For the gentian family, competition is the name of the game. Like the North American heaths and orchids, attractive but rare plants, the gentians seem to prosper in habitats shunned by most plants as too dry, rocky, sandy, or boggy. They seldom are found in large stands or among familiar climax vegetation, such as a beech-maple forest. In poor, treeless habitats, since they do not run the risk of being shaded out, most gentians bloom from midsummer to late fall, as do their relatives in the milkweed and dogbane families.

The giant of the family in Ohio, the American columbo (*Swertia caroliniensis*), blooms in June on sunny slopes, such as the toboggan run in Virginia Kendall Park. Its small, greenish-white, butterfly-like flowers do not resemble those of the other gentians. Even when not in bloom, it can be recognized by its great size and the rosette of huge, strap-like leaves growing from the base.

By contrast, the midget of the family, the yellow bartonia (*Bartonia virginica*) pokes its wiry leafless stems only a few inches above the moss in dark swamp forests, such as Towner's Woods near Kent or Grand River Terraces in Ashtabula County. In a striking case of plant mimicry, the tiny, yellow-green flowers of bartonia look for all the world like the inedible spore capsules of the haircap moss (*Polytrichum*) that it lives among, and thus perhaps it escapes predation from herbivores.



A large group of attractive, pink-flowered gentians (genus *Sabatia*) live in wet or rocky habitats. The rose-pink (*S. angularis*) can be found in the Cuyahoga Valley's Deep Lock Quarry Park growing quite comfortably in the quarry itself, where water seeps out of the rocks. Most of the *Sabatias* have a yellow, star-shaped pattern in the center of the flower to attract pollinating insects.

In contrast, many of the blue gentians found in Ohio have flowers partly closed at the top, as if to discourage insects. Stiff gentian (*G. quinquefolia*), found on dry hillsides, such as the shale bank on River Road, has many small tube-like flowers clustered near the top. The petals point inward and partially block the flower tube. The bottle gentian (*Gentian andrewsii*) and the rarer closed gentian (*G. clausa*), both found on slopes, roadsides, or stream banks, go further. They have "elastic" strips along the petals to make sure that even if the flower is forced open, it will snap shut again. One would expect that the chief pollinators would be tiny flies that can creep into the narrow opening at the top. A little observation soon dispels the notion. The major pollinating insects are large, clumsy bumblebees that force an entry past the elastic-lined opening and disappear inside the flower, which closes on top of them. After a few seconds, in which they somehow turn around, they emerge head first, pushing their way out of the "bottle", having gathered nectar and pollinated the plant at the same time. Undaunted by the effort, they usually aim for another closed gentian and repeat the process.

Perhaps the rarest gentian in Ohio, the white-flowered aquatic bog-bean (or buckbean), now known from only two locations, resembles the fringed gentian most closely with its cup-shaped abundant flowers, and deeply fringed petals. Sometimes placed in a separate family, *Menyanthes trifoliata* seems to be a northern plant displaced by the last glacier and surviving only in cold bogs, a companion of pitcher plants and rose pogonia orchids. Although it blooms in July in Canada, bog-bean blooms in mid-May in Ohio, if at all, for late frosts often kill the flower buds.

Because of their habitat preferences, most of Ohio's gentians are listed as endangered, threatened, or potentially threatened by the Natural Heritage Program, which has been mapping and inventorying the 600 rarest of the native plants since 1978. Since the fringed gentian chooses a wide variety of marginal habitats, it is rated as potentially threatened; however, due to its great fame and attractiveness, it tempts too many people to pick or transplant it from the wild. They might be disappointed when they find it is a biennial or annual. A better garden subject, the bottle gentian, which is a perennial and not on the endangered list, can be bought as cuttings from wildflower dealers, transplanted easily into ordinary garden soil, and expected to bloom every year, attracting the bumblebees to perform their eccentric acrobatics before winter closes in. Frustrated plant hunters can thus enjoy one of the elusive gentians close to home.

Perry Peskin is a retired teacher, a volunteer at the Cleveland Museum of Natural History and an amateur plant hunter and photographer. He spends a great part of the summer looking for endangered plants in Ohio and reporting the findings to the Natural Heritage Program.

He is an active and valued member of the Native Plant Society of Northeastern Ohio. His most recent book is *The Search For Lost Habitats*, *30 Years of Exploring For Rare and Endangered Plants,* available at the Cleveland Museum of Natural History gift shop and all book stores. He is working on a companion volume.

On a Bog Garden

Don Peters

About two-and-a-half years ago, my wife and I decided that we would turn a wet area of our property into a bog garden. In preparation we went searching for a book on the subject. Much to our dismay we discovered that there doesn't seem to be one dedicated to bog gardens. We did find information and guidance, but it was in bits and pieces, normally in a chapter or section of a book on water gardens. These sources usually contain information concerning where to locate a bog garden, how to construct one, soil and acidity, the requirement for drainage and plant material; they are useful tools, and anyone starting down this road should refer to at least one. But there is nothing like the experience of actually creating a bog, especially with respect to construction and drainage, so some reflections and considerations arising from our very satisfying endeavour follow. They come from our efforts and limited experience, not from any expertise, and I hope they will be of some assistance to other bog gardeners.

The literature is unanimous as to where to put in a bog garden. Not surprisingly, experts recommend a low area, ideally the lowest place available, so that water can accumulate. If the bog can be adjacent to, or almost an extension of, another water feature where it will be close to a water source and appear more natural, so much the better. We utilized the lowest portion of a large swale that Mother Nature provided for us. (Lois Addison and Dorothy Richardson, who run Bedrock Gardeners, a nursery in eastern Ontario, have a bog in a swale that was the initial inspiration and model for ours.)

Most of the literature suggests that the bog be 15 to 18 inches deep. When we started to dig, we hit almost solid rock at about 3 inches down. Using pry-bars and a large hand sledge, we attacked the rock and probably removed about 3 tons from an area 12 feet by 24 feet. We eventually dug down about 18 inches all over.

The hole can be lined to hold water in a number of ways. The use of a prefabricated pool or pond form, a child's wading pool form or a plastic liner of some sort is recommended. Because they are easy to work with and because we had a used one available, we went with a plastic pool liner cut so that it was about 2 feet larger on all sides than the hole. To protect the liner from the exposed rock at the bottom of the hole, we spread a 1-inch layer of soil over the rock surface, tamped it down and added another thin covering of soil.

Once we had the liner positioned in the hole, we put in a shallow layer (1 to 2 inches) of small rocks to provide a drainage layer for excess water. (This is probably not necessary if you punch holes in the liner or have sub-soil that is very water-retentive.) We then added 3 to 4 inches of soil, on top of which we laid a length of soaker hose (with the female end plugged and above ground level) to enable us to keep water in very dry seasons. We filled the hole with soil almost to the level of the surrounding ground, cut the excess liner off at the fill level and then added another 3 to 4 inches of soil. You may find, as we did, that the soil compacts during the first season, so be prepared to add more, either initially or at a later date.

One of the problems with a bog, especially one the size of ours, is getting into it to plant and weed, etc. Small bogs, which can be reached from the edges, do not require special consideration. For large bogs it is suggested that access paths be created by putting down a base of rock or heavy material, which will not retain the water and will stay relatively dry and solid, before the bog is filled with soil. We did not do this, opting instead to use a couple of long 2 by 8 pieces of lumber which we can put down where required and thus get into any area we choose when necessary. One of the benefits of not putting in a path is that its existence does not inhibit future planting arrangements.

The issue of drainage was not covered adequately in the literature we read. Most experts advise the gardener to punch a few holes in the bottom of the liner, but how does one know how many holes are needed? We didn't know, so we didn't punch, our reasoning being that if we needed more drainage we could punch holes in the liner later.

Since the first season was something of a testing period, we didn't mound up our initial plantings, as many experts recommend.. We paid for it as our first season was a disaster. We were inundated with water and we lost almost everything, including our sense of humour. To our rescue came Gillian Boyd, a member of the Ottawa-Carlton Master Gardeners Society. She advised us that yes, a bog was supposed to be wet, not *dry,* but *too dry* was much better than *too wet.* So we dug down to the liner and cut four holes in the bottom.

Only then did we come across an article in the October/November 2000 issue of *Canadian Gardening* concerning Dianne Dietrich's gardens, and her approach to bogs put the drain holes one-third to half-way up the sides, 4 to 5 inches apart, all the way around the liner. How logical, the bottom part can be waterlogged while the top part is dry one's plants can have a choice about where they send their roots. If we were to do it all over again, we'd use Dianne's drainage system initially, give the bog a one or two-year test period and then put holes in the bottom if required. We've also started planting in little hillocks.

The bog-gardener-to-be doesn't face much of a problem finding out which plants to grow. The books we referred to had extensive listings, usually in sections devoted to "moisture-loving" or "marginal" plants, or indicated them using keys such as "moist soil" or "plants for moist areas." These lists usually contain native plants that grow in wet swampy areas.

Although you won't have any problems finding out which plants to put in your bog, actually finding them at nurseries is a different story. But keep at it – the bog, in its final form, will be worth your efforts.

Don and Non Peters live and garden near Franktown in eastern Ontario.

Reprinted from The Blazing Star, newsletter of the North American Native Plant Society, Spring 2002.

Round-Leaved Sundew

Gordon Mitchell

Sometimes, a plant species lives in environments that lack certain nutrients. Either these nutrients are not present at all or they are present, but are not available to the plant. Although the plant can probably survive alone in these environments without those nutrients, the plant may need those nutrients in order to thrive and to reproduce.

These plants may obtain those extra nutrients from the insects. To catch those insects, the plant has acquired certain mechanisms to both trap and digest those insects. These types of plants are called carnivorous or insectivorous plants. One of these plant species is the Round-leaved Sundew (*Drosera rotundifolia* L.).



Round-leaved Sundew
Drosera rotundifolia

The Round-leaved Sundew is a member of the Sundew Family (*Droseraceaea*). The generic name, *Drosera*, is from the Greek words, *droseros*, which is "dewy" or "covered with dew", or from *drosos*, which is "dew". (Both of those words refer to the dewdrops upon the leaves.) The specific epithet, *rotundifolia*, is Latin for "round leaved". (*Rotundus* is "round" and *folium* is "leaf".) Previous scientific names for this plant were *Drosera longifolia* L. and *Drosera septentrionalis* (Scopoli) Stokes.

At different times and places, some of the other common names for this plant have been Bed Rot, Dewgrass, Dew Plant, Eyebright, Lustwort, Moonwort, Moorgrass, Red Rot, *Rosa Solis*, *Rossalis folia rotunda*, Sindew, Youthroot, and Youthwort.

How the Round-Leaved Sundew Catches an Insect

The top of each leaf has up to 100 or more reddish hairs (or tentacles), with each hair having a single, ovate, tiny red gland at its tip. These glands exude a sticky, viscid, and mucilaginous substance that resembles dewdrops, especially when seen in the sunlight. It is this sticky dewdrop that traps the insect.

The flying insect will see the shiny dewdrops, think that it is nectar, land upon the dewdrops, and then get stuck. When the insect struggles to break free, it may come into contact with the sticky dewdrops on the adjacent tentacles, and will become even further trapped.

This struggle triggers certain bio-mechanisms within the leaf, which then release the growth hormone auxin (indoleacetic acid). The auxin stimulates cell growth on one side of the adjacent tentacles, which causes these tentacles to bend over toward the trapped insect and attach to it. These tentacles will only move if they are touched several times in only a few seconds. This cell growth process may take as little as 1 minute.

Usually, the insect lands upon the middle of the leaf. If the insect should land upon the edge of the leaf, these tentacles will then move the trapped insect towards the center of the leaf. The tentacles located near the margins of the leaves are usually longer than the tentacles located near the center of the leaf.

When enough of the tentacles have the insect, the auxin within the plant increases cell growth on the bottom side of the leaf and causes the entire leaf to fold over the insect. This leaf folding may take about 10-20 minutes. Eventually the insect will drown from the tentacle's fluids.

The same glands that exuded the sticky dewdrops also exude an anesthetic to slow down the struggling insects. These glands also exude various acids and proteolytic enzymes, such as acid phosphatase, esterase, peroxidase, and

protease. These acids and enzymes break down the soft tissue of the insect. The nutrients from the insect's soft tissues are then absorbed by the tentacles and are then translocated to other parts of the plant.

It may take several weeks for the plant to completely digest the insect. When the leaf is finished with the insect, it will unfold, leaving only the insect's chitinous exoskeleton. The exoskeleton will then fall off of the leaf. Afterwards, the leaf is ready for the next insect. A single leaf usually catches about 3 insects before it finally dies and falls off of the plant.

Other Uses

Aside from possibly removing a few nuisance insects, the Round-leaved Sundew can also benefit humans in other ways. Most of these benefits were used by the Native Americans and by the early European settlers.

The juice from the leaves can make lukewarm milk curdle within 1-2 days. The juice has been used as a substitute for rennet. Dr. Manasseh Cutler, a founder of both Marietta and the Ohio University, wrote this about the Round-leaved Sundew: "If the juice be put into a strainer, through which the warm milk from the cow is poured, and the milk set for a day or two to become acescent it acquires a consistency and tenacity neither the whey nor the cream will separate".

This plant contains many chemicals. One such chemical is alizarin. If boiled with ammonia, the alizarin can make a yellow dye for wool. The red parts of the plant have been used for making red ink. The plant also contains resins, tannin, organic acids, minerals, and glucose.

The Round-leaved Sundew also contains plumbagin (or plumbagon). Plumbagin can be used as an anti-bacterial, as an anti-fungal, and as an anti-viral medicine. This chemical may be used to fight the *pneumococcus*, the *staphylococcus*, and the *streptococcus* bacteria. However, because of this plant's rarity, it is not harvested for medicinal purposes. There are other medicines available that are just as effective as plumbagon.

The Round-leaved Sundew has been used for other medicinal purposes, too. The Round-leaved Sundew was made into a tea or into a tincture and was used for treating arteriosclerosis, hyperglycemia, hypertension, measles, spasms, and numerous respiratory ailments, such as asthma, bronchitis, and whooping cough. A poultice was made for treating acne, corns, and, warts. It was American botanist Constantine Samuel Rafinesque who had stated that the plant's juice was used to "destroy warts and corns; with milk for freckles and sunburns".

Despite this plant's medicinal uses, it does have some toxic properties. The Round-leaved Sundew is toxic to livestock, especially to sheep.

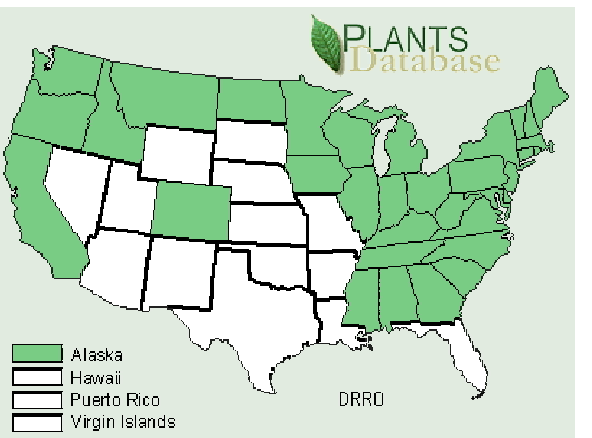
Observations of the Round-Leaved Sundew

The Round-leaved Sundew has fascinated botanists for centuries, many of whom studied this plant intensively.

In 1779, a German physician and botanist, Dr. A. W. Roth, studied this plant and observed that its tentacles could move. He even observed the tentacles closing in around its insect prey.

In 1791, an American botanist, William Bartram, studied this plant and observed that this plant caught insects. However, Bartram did not know the reason for that. That same year, Erasmus Darwin, the grandfather of English naturalist Charles Darwin, also studied the plant and thought that the dew protected the plant from insect predators.

Erasmus' grandson, Charles Darwin, made many studies of this plant over several years. He placed several objects upon the leaves to test their reaction. He observed the leaves rejecting non-



Sundew Distribution Source: USDA Plants Database

edible objects. He once observed 13 insects trapped in only one leaf at one time. In 1860, he wrote this to American botanist Asa Gray: "At the moment, I care more about *Drosera* than the origin of all species in the world." The Round-leaved Sundew was frequently mentioned in Darwin's 1875 book, *Insectivorous Plants*.

Description

Annual or perennial.
Height: 2-12 inches.
Stem: Erect. Leafless. Slender. Smooth.
Leaves: Arranged in a 3 inch-wide basal rosette. Oval or rounded leaf blades. Blades may be ¼-1 inch diameter. The leaf petiole is flat and is about ½-2 inches long. The leaf margins are entire. The leaves are green when young, but will later turn red when exposed to the sun.

In the late fall, the outer leaves turn black and die. The newer leaves form winter buds that form spherical hibernacula, which protect the plant from winter's frost damage.
Flowers: White, pink, purple, red, or yellow. Radially symmetrical. These flowers are arranged in a single-sided, elongated, and linear racemous, branched or unbranched cluster of 2-15. Each flower is about 1/8-1/2 inch wide and has 5-6 separate petals, 5 united sepals, and 5 stamens. Although these flowers are insect-pollinated, they are non-fragrant.

The flowers will usually open around 9-10 A.M. when it is sunny, but will probably close around 2 P.M. They usually bloom one at a time, starting with the lowest flower. Flowering season is usually June to September.
Fruit: Capsule. Each capsule is long and has about 2-5 chambers. All of the capsules are arranged in a short spike. Each capsule contains numerous small seeds.
Seeds: The seeds are light brown, shiny, tubular, elliptical, tapered at both ends, and have fine lines.
Roots: Black. Fibrous. Fine. Shallow.
Habitat: Open acidic sphagnum peat bogs and wet acidic or sandy areas, with a pH of 3.2-7.3.
Range: Eastern Canada, New England, Great Lakes states, eastern coast to Florida, and northern Eurasia. It is the most widely distributed *Drosera* species in both North America and Eurasia.

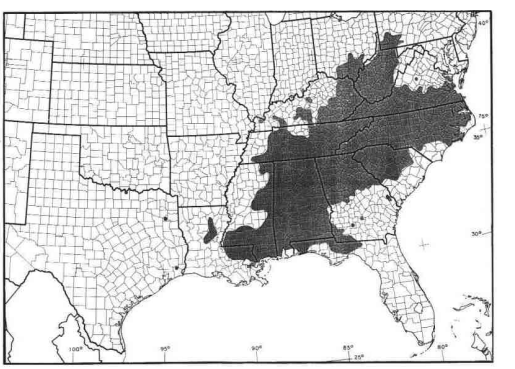
Gordon Mitchell works for the Columbus, Ohio, Metroparks and was a member of the Central Ohio Native Plant Society, now merged with the Columbus Historical Society in the Spring of 2010.

A Rare Find: Sourwood *Oxydendrum arboreum* (L.) DC

Marion T. Jackson, Professor Emeritus of Ecology, Indiana State University

When the heath family (Ericaceae) is mentioned, we usually think of such broad-leaved evergreen or semi-evergreen shrubs as the beautifully flowering rhododendron, mountain laurel, or azalea, or such fruiting shrubs as blueberry, cranberry, huckleberry, or bearberry. Largely evergreen ground-layer herbs as pyrola or pipsissewa may also come to mind. In North America, Ericaceous tree species are few. Eastern U.S. has a single species, sourwood, not counting the occasional mountain laurel or rhododendron that reaches tree size. Three lovely madrone species are heath family trees in Western U.S., primarily in Texas, Arizona, and California.

Sourwood, also called sorrel tree, is a handsome native hardwood tree species that is rather widespread in Eastern U.S., ranging from Pennsylvania westward to southern Indiana and Illinois, thence south across western Kentucky and Tennessee to Louisiana, Mississippi, Alabama, and the panhandle of Florida. Sourwood reaches its best development in the Great Smoky Mountains, southern Appalachians, and the Cumberland Plateau of eastern Kentucky and Tennessee, ascending to about 3,500 feet in the mountains.



Distribution of Sourwood

In natural communities, it just reaches into Indiana in the two Ohio River border counties of Perry and Harrison. My good friend and outstanding Hoosier field botanist, Mike Homoya, informs me that the IDNR Division of Nature Preserves has record of only 12 present-day occurrences in Indiana, all but one in Perry County. Most populations are small, in the range of 10-50 individual trees. The largest stand (in Harrison County) has approximately 100-150 trees located on a sandstone cliff overlooking the Ohio River.

The species is typically found on dry-mesic to dry upland slopes and ridges, often on soils derived from sandstone, and often associated with oaks, hickories, gums, and occasionally American beech or hemlock. Rarely, if ever, a large member of the forest canopy—it is usually less than 60 feet tall and 20 inches dbh—sourwood is still a distinctive, lovely tree in all seasons.

In winter, its drooping, somewhat contorted branches and the gray bark tinged with red in the deep longitudinal furrows are somewhat reminiscent of sassafras, but the paniculate fruiting clusters that are often retained well into winter definitely say sourwood to the careful observer.

In spring the wondrously fresh-looking long (5-7 inch) strap-like glossy yellow-green leaves that are entire (or nearly so) separate the tree from all others. Other leaf characteristics, incidentally, are the basis for the tree's common name, sourwood. The leaves are acidulous, hence cooling and refreshing to the mouth and tongue, and are sometimes chewed by hikers to quench their thirst during hot, humid treks. Teas from sourwood leaves, containing their natural coolant, were once used in mountain medicine to lower fevers in children.

In summer, sourwood trees are resplendent in blossoms. June or July is the time when the branch tips of the entire tree crown are covered with sprays of tiny lily-of-the-valley-like, urn-shaped glossy white flowers. Their collective fragrance attracts multitudes of honey bees, whose combined hum announces the presence of sourwood long before you see the tree. Sourwood is one of the most prized of all wild honeys, quite the contrast to mountain laurel and rhododendron honeys, which are toxic.

A couple of years ago while visiting the Cades Cove Visitor Center in the Great Smokies, I found a pint jar of sourwood honey in the comb, and savored it for weeks by careful rationing.

Autumn is when sourwood trees reach their greatest glory. In the long-slanted October sunlight, the long leaves turn the most vivid of scarlets. It is then



Sourwood Tree
Oxydendron arboreum

that sourwood crowns fairly shout with color in preparation for the fall dance of gusty November.

The wood is quite hard and heavy (at 46+ pounds/cubic foot), comparable to several of the oaks and hickories, but it is little used because of the species' generally small size and the fact that it often occurs in small populations at a given site. It is used locally in turnery, for tool handles, and the red-brown, fine-grained wood makes a pretty paneling. In years past, it was the preferred wood for wooden machinery bearings, such as the "boxings" in which horse-drawn disk-harrows rotated, lubricated with axle grease.

Mountain farmers also once used slender sourwood trunks as runners for their farm sleds, the natural crooks in the tree forming the upturned ends of the sled runners.

But the real promise for sourwood's future is its use as an ornamental tree. Its generally small size makes it suitable for most lawns or landscaping sites, and it is hardy at least as far north as Indianapolis, especially if given some shelter from cold north or westerly winds.

I know of one tree in Terre Haute that is about 8 or 10 inches in diameter, and some 20-25 feet tall. I drive by the site a few times each year just to admire this lovely tree.

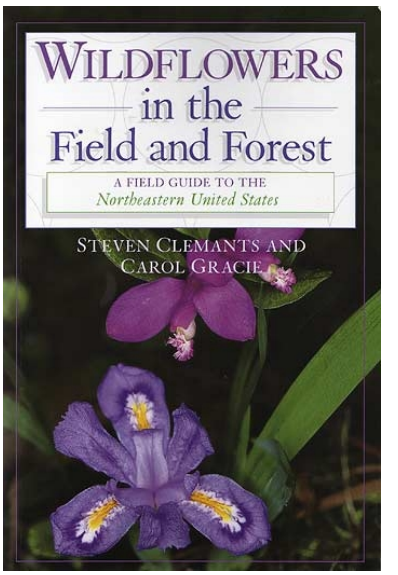
Reprinted from INPAWS Journal, Indiana Native Plant and Wildflower Society, Summer 2007.

Book Review

Wildflowers in the Field and Forest
A Field Guide to the Northeastern United States

Steven Clements and Carol Gracie

Paperback: 480 pages
Publisher: Oxford University Press, USA (April 13, 2006) $39.99 (Amazon.com, $26.39, free shipping)



Many of us have stopped to admire wildflowers as they flourished in fields, hiking trails, and roadsides. Always appreciated but not always recognized, now these beauties can easily be identified with Wildflowers in the Field and Forest, a new book penned by Brooklyn Botanic Garden's vice president of Science, Steve Clements.

A respected author of numerous articles on plants for local and international publications, Steve takes particular pride in his most recent achievement—"For 30 years I have learned about the plants of the Northeast and Midwest. Here is my chance to give that learning back."

Both serious botanists and casual nature observers will welcome this detailed guide, which describes over 1,400 species of wild-flowers of the northeastern United States, from the most common and conspicuous wildflowers to the lesser known, and often overlooked, species. Each two-page spread features on one side a concise but thorough description and range map showing both where the plant grows and what time of year it is likely to be in bloom and on the other side a color photo of the plant.

Designed for easy use, plants are first grouped by flower color, the feature first noticed by the observer; and then by type of leaves and number of flower parts. There is also a simple key in the beginning of the book that allows one to quickly narrow the search to a few pages. Wildflowers in the Field and Forest is available now at the Brooklyn Botanical Garden's gift shop and online at http://shop.bbg.org.

Reprinted from Brooklyn Botanic Garden, Members News, September 2006

Parasitic Plants of Central Pennsylvania

by Joel McNeal

By turning atmospheric carbon dioxide into carbohydrates through photosynthesis, plants serve as the base of the food chain for most terrestrial animals and fungi. Not all plants are innocent victims, however. Carnivorous plants are the best known example, fighting back by supplementing their nutrient uptake with digested animals, primarily insects. Some plants have opted to join the ranks of the heterotrophic animals and fungi by preying on their photosynthetic brethren for water, carbohydrates, and other nutrients. Referred to as parasitic plants, they have evolved numerous times in various unrelated plant lineages, all

sharing the trait of forming a direct connection, known as a haustorium (plural, haustoria), with the host plant in order to sap nutrients.

Oftentimes referred to as parasitic plants are another group commonly called saprophytes, but technically referred to as mycoparasites. These plants sometimes closely resemble parasitic plants, but rather than attacking another plant, they extract nutrients from fungal hosts. If the fungi are, in turn, attached to a different plant, the mycoparasites are indirectly gathering nutrients from a plant host; the term "parasitic plant", however, is usually reserved for those plants that directly connect to a host plant. Indian Pipe *(Monotropa uniflora),* Pinesap (*M. hypopithys),* and Coral-root orchids *(Corallorhiza spp.)* are examples of common mycoparasites in central Pennsylvania.



Indian Pipes
Source: edu.pic.net

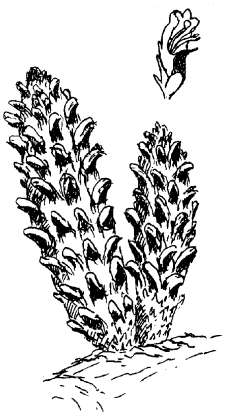


Pinesap
www.commons.wikipedia.com

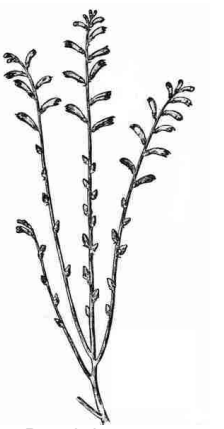
True parasitic plants come in a variety of forms that may be classified by morphological traits, such as growth form and photosynthetic ability. Root parasites, as their name suggests, connect their roots to the roots of a host plant to gain nutrients. Most parasitic plants fall into this category. Stem parasites, by contrast, attach to above-ground portions of their hosts. Mistletoes, perhaps the most widely recognized parasitic plants, are stem parasites. Parasites that do not have any chlorophyll, the green photosynthetic pigment found in most plants, are known as holoparasites. They are completely dependent on their host plants for carbohydrates and other nutrients. Some parasitic plants retain photosynthetic ability, and thus produce at least some of their own carbohydrate needs. They still attach to host plants in order to gain supplemental water, carbohydrates, or other nutrients from a host. These are known as hemiparasitic plants (mycoparasites also display a range of photosynthetic abilities, and can be referred to as holo- or hemimycoparasites).

Some of the most exotic and interesting of all plants are parasites. The largest single flowers in the world belong to plants in the parasitic genus Rafflesia, from Southeast Asia. What Rafflesia boasts in flowers that measure over a meter wide it makes up for by lacking a plant body of any kind; it has no roots, stems, or leaves. The plant grows completely inside of its host vines as fungus-like strings of tissue. The only time when Rafflesia makes itself visible (and boy, is it visible) is when the basketball-sized flower bud bursts unexpectedly out of the host and opens into the huge, stinky, five-petaled flower used to attract flies.

One need not venture to exotic locations to observe a wide array of parasitic plants, however. Many occur right here in central Pennsylvania. Two of the most common are Squawroot *(Conopholis americana)* and



Squawroot



Beechdrops

Beechdrops *(Epifagus virginiana)*. These members of the plant family Orobanchaceae, along with One-Flowered Cancer Root *(Orobanche uniflora)* are holoparasites and are completely dependent on their seeds germinating near a host. In many such parasitic plants, the seeds actually need chemical stimulation from a nearby host root to sprout, ensuring that the seedling has not germinated in vain. Indian Paintbrush *(Castilleja coccinea),* False Foxgloves *(Aureolaria spp.),* Gerardias *(Agalinis spp.),* Lousewort *(Pedicularis canadensis),* and Cow Wheat (*Melampyrum lineare*) are hemiparasitic plants of central Pennsylvania listed in field guides as being members of the Snapdragon family *(Scrophulariaceae)*. Recent evidence has shown that they are actually close relatives of the parasites in the Orobanchaceae, and are now placed within that family instead. The family shows a gradation of parasitism from those that photosynthesize and can survive long periods without a host to those that are obligate holoparasites, making an interesting group to study how parasitism evolves.

Another lineage of parasites is the Sandalwood family *(Santalaceae)*. Bastard Toadflax *(Comandra umbellata)* is found across North America and can be found parasitizing oaks, particularly Scrub Oak, throughout Pennsylvania. It is a colonial hemiparasite with clusters of small white flowers that top a green leafy stem. A distant cousin of Bastard Toadflax in the family Viscaceae, American Christmas Mistletoe *(Phoradendron serotinum)* was once found sporadically in the southern half of the state, but probably no longer occurs, although it is common throughout the southern U.S. Dwarf Mistletoe *(Arceuthobium pusillum)* is found almost exclusively on Black Spruce, which occurs in central Pennsylvania, but this tiny Mistletoe is currently only known from the northeast portion of the state. Its stems barely surpass the needles of the spruces, but it often causes the branches to deform into "witches brooms." Keep an eye out for this species around the area; you may find the southernmost known population!

Finally, dodders *(Cuscuta spp.)* may be found across Pennsylvania in late summer. These twining, yellow-orange relatives of morning glories have only minute scales for leaves and have no roots when seen smothering a host. They send small, peg-like haustoria into the host in abundance, deriving water and all essential nutrients through them. Unlike most of the other parasites in the area, the damage to the host inflicted by dodder is often obvious, and may be quite severe once the plant's tiny clusters of white flowers begin to produce seeds, which may number in the thousands from a single individual. The most



Dodder (*Cuscuta* sp)

frequently encountered species is *Cuscuta gronovii,* which grows in abundance along streams and ponds on various host plants, especially jewelweeds, knotweeds, nettle and composites.

While parasitic plants are often thought of as "freeloaders," they have simply adapted to exploit the same abundant resources produced by autotrophic plants that terrestrial fungi and animals, including humans, use. Though some are weedy, and even become agricultural pests in parts of the world, others are endangered species, limited by their highly specialized life histories. All of them, however, are interesting to observe at work in the environment. Keep your eyes open for these adaptive marvels of nature!

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Redbud—*Cercis canadensis* Linnaeus.

Robert L. Tener

The redbud is one of those flowering trees rivaled only by the dogwood for its spring beauty bloom in late April. Because it became my sister's favorite tree I sometimes refer to it as the Dawn-Spring. When I first saw it in bloom, I did not know what it was called. One day in late April when I was driving through Stow, Ohio, on my way to work at Kent State University, I saw on a front lawn a small tree filled with rich mauve-pink breath-taking blossoms over its flat crown. That afternoon I stopped at a nursery and asked about it, but my description was so vague that the clerk could not identify it. After several fruitless attempts elsewhere, I reached an old nursery in Stow and tried to describe the tree to the owner. He said it was probably a Judas Tree. "Fine," I said, "thanks." But he said that he didn't have any.

I stopped the next day at a Kent , Ohio, nursery and found one. But the nursery man said it was called a redbud. Later I learned why it was sometimes referred to as Judas Tree.

The redbud is also called Red Judas Tree, Salad Tree, Judas Tree, American Redbud Tree, Eastern Redbud, and Wild Pea. *Cercis* is the classical name for the oriental Judas Tree; canadensis means associated with Canada. The term *Cercis* is from a Greek word for shuttle and was applied to the Judas Tree probably by Theophrastus because its fruit resembles a weaver's shuttle. The common name comes from the pink flowers and the deep red calyx. Of the 7 or 8 species in

this genus, 2 are in America: ours, *C. canadensis,* and *C. occidentalis* in the Southwest. The rest are in Europe and western Asia. There is a white variety called *C. alba* and several cultivars such as "Withem's Pink Charm," "Forest Pansy," "Pink Bud," "Royal White," "Silver Cloud," and several others.

This is a small fruit-tree-size deciduous tree or shrub ranging from 25 to 40 feet, though it may hit 50 feet, with a trunk diameter from 6 to 18 inches. About 10 or 12 feet above the ground the trunk separates into stout branches and usually starts to develop a flat, wide but open crown. Its bark is black and slightly brown with an orange cambium. It is the only legume tree in the United States with leaves which are alternate, simple, large, 3 to 5 inches long, broad, and heart shaped with smooth entire margins, palmately veined, dark lustrous green above, paler beneath, turning a bright yellow in the fall. They emerge a reddish purple and turn a dark green in summer. The flowers are usually perfect, rose purple pink, butterfly shaped, 1/2 inch long, hanging in groups 4 to 8 in a cluster, appearing only on the twigs of the previous year's growth in April or May when the leaves start to emerge. The fruits are thin, papery, flat, oblong pods, 2 to 4 inches long with 6 to 10 quarter-inch seeds. At first the pods are a pale green, but as the seeds ripen, the pods change to a rosy hue and then to a purple in September and October. During the winter the pods tend to persist on the tree but the flowers' buds may be killed by extreme cold. Its wood is heavy, hard, not strong, red brown, close grained, of no commercial value.

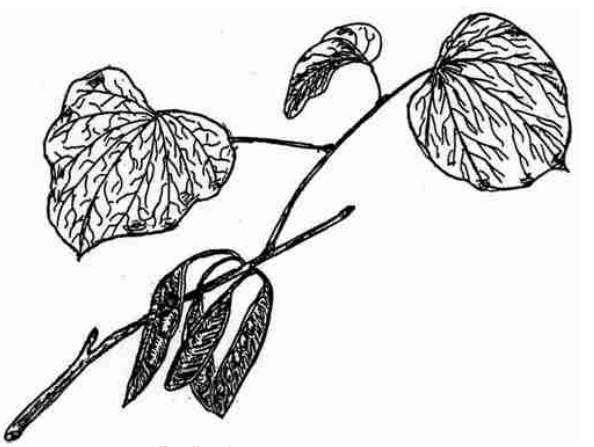
The redbud thrives best in sandy loams, growing under taller trees along streams, borders of fields, hillsides, and valleys, and wide hilly berms along highways. It is abundant in southwestern United States and on the limestone soils of southwestern Ohio. Roaming from Pennsylvania south to Florida and west to Nebraska, it then works its way south to Texas. In Ohio it grows in all the counties except for a narrow band from Ashtabula west to Henry and south to Mahoning then west to Van Wert. It reaches its largest size in Arkansas.

One year my wife and I were driving south to Portsmouth, Ohio, in April, and along the way I noticed scores of flowering redbuds growing wild in the hilly berm beside the highway. I asked myself where had I been all my life not to have noticed that before. The redbud makes a fine ornamental tree for lawns and parks. On my nursery farm I have four of them and each year I anxiously wait their blossoming.

In Greece and Asia Minor the Cercis Tree was called the Shuttletree because its fruit resembled the weaver's shuttle. A legend associated with it is that Judas Iscariot hanged himself in remorse from one of its branches, hence its name, the Judas Tree. As the legend continues, ashamed of its disgrace, the tree yearly hides itself in blushes when it awakens from its winter sleep. The legend suggests that at one time its blossoms were white and turned pink.

Its immature seed pods can be breaded and fried, though they have a slightly sour taste; the colorful flowers and buds are edible in salad. Its new bark dyes cloth red while its new plant shoots are often woven into baskets. It is relatively free from diseases though it can get cankers and verticillium wilt.

The tree is clearly of ornamental value to human beings just as its seeds are nutritional to Bob Whites.



Redbud, *Cercis canadensis*

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Illustration by Robert L.Tener.

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The Pleasing Persimmon

by Maggie Whitson

With large orange fruit dangling from bare branches like Halloween ornaments, the American persimmon (*Diospyros virginiana* L.) puts on a striking late fall display along our fields and roadsides. The numerous sweet fruits were notable enough to find their way into the genus name, which means "fruit (*-pyros*) of the gods (*dios*)."

Persimmons are common in Kentucky and occur throughout the state. The species is found as far south as Florida and ranges up the Gulf Coast to Connecticut. It laps from the Southeast on to the Midwest and peters out around eastern Texas. Like many widespread plants, persimmons have a variety of common names, ranging from picturesque to puzzling. To list a few: date-plum, seeded-plum, winter-plum, simmon, lotus-tree, Jove's-fruit, and possum-wood.

Though the typical persimmon has a trunk ranging from about 6" to 24" in diameter, given optimum growing conditions and plenty of time, they can get much larger. Kentucky's champion persimmon is located in Ballard County, and is 113.5" around, or about 36" wide. The U.S. champion tree is in Portsmouth, Ohio, and is a whopping 142" in circumference and 82 feet high.

Due to their deeply ridged bark which forms block-like plates, persimmons are easily recognized even in the leafless condition. The twigs are also distinctive, if only internally, as they often have diaphragmed piths. That is, when a twig is cut at an angle, its exposed center displays ladder-like divisions. Persimmon leaves are relatively nondescript, being simple, entire, alternate, and ovate. However, the undersides are often marked with fine black speckles (probably tannins).

While persimmons look similar throughout their range, they actually vary in chromosome number. A 60-chromosome race is common in the Southeast, while a 90-chromosome race is found throughout most of the Midwest. It is thought that there may also be a 30-chromosome race in southern Florida. These races do not readily hybridize with one another.

Persimmons bloom in May and June and are typically dioecious, with separate male and female trees. However, individuals capable of self-pollination are occasionally found, and sometimes a tree will produce flowers of both sexes one year and flowers of only one sex the next. The small, bell-shaped white flowers are eagerly pollinated by bees, and their industrious buzzing may be more obvious than the flowers, which are nearly invisible high up in the leafy branches.

Persimmons belong to the Ebenaceae, or ebony family, which has only three genera. *Diospyros* is by far the largest, and with about 450 species single-handedly saves the family from obscurity. Most persimmon relatives are woody, and this pantropical group is well-represented on the Malay peninsula, in Africa and Madagascar, and in Central and South America. Interestingly, while people eat the fruit of many species in this genus, the few temperate species are the most famous fruit producers.

As a member of the ebony family, it is perhaps unsurprising that *D. virginiana's* other claim to fame is its incredibly hard heartwood. In the Old World tropics, *D. ebenum* and *D. reticulata* are the best producers of ebony, though most species in the genus also produce hard, dark wood. Here in the U.S., the wood of *D. virginiana* was best known for its use in golf clubs, but was also used to produce other items such as tool handles, mallets, shuttles, and the lasts on which shoes were made and repaired. These days, synthetic materials are more commonly used for many of these products.



Persimmon flower
Source: oldgeezer.info



Persimmon leaves, flowers, fruit
Britton & Brown



Persimmon fruit
commons.wikipedia.org

The Southwestern U.S. hosts our only other native *Diospyros*, the chapote, or *D. texana*. It has fuzzy, blackish fruit which are edible as well as being used as a source of natural dye. These shrubs or small trees range from Texas into northern Mexico, and like *D. virginiana*, the hard wood has been used locally for products requiring durability. The bark is smooth and attractively peeling, giving these plants potential value as ornamentals.

In the temperate zones, there are three species of persimmons commonly eaten. The Asian persimmon, *D. kaki*, is widely cultivated in China and Japan and is now appearing more frequently in American supermarkets.

The date plum, *D. lotus*, is a similar species from Eurasia and has long been eaten in Europe. Finally, our own *D. virginiana* was particularly enjoyed by both the native Americans and early settlers. Persimmons are mentioned in the writings of early explorers such as Don Fernando de Soto and Captain John Smith. By 1626, many English gardens sported American persimmon trees. However, since fruits were most often simply harvested from wild trees, there are few improved varieties available today. Most of our native persimmons are cultivated for wood, as ornamentals, or as grafting stock for Asian persimmons.

Ripening throughout the Fall, the l"-2" fruits approach tangerine orange (or occasionally blackish-brown) upon maturity. They vary widely in shape, ranging from nearly round, to somewhat flattened, to long ovals. (One can see similar variation in cultivated Asian persimmons.) Shape aside, they're all full of seeds. A single persimmon berry can contain up to eight, flat, woody seeds. At almost 1/2" long by 1/3" wide, the seeds themselves are quite large. During the shortages of the Civil War, Southerners supposedly drilled holes in them and used them as buttons. The large seeds don't deter true fans from eating the ripe berries, which are a favorite of wildlife, hunters, children, livestock, and occasionally dogs.

Though there is some interest in improving fruiting varieties of our native persimmon, only limited progress has been made. While ripe persimmons have a rich and intensely sweet flavor, even slightly unripe fruit are astringent with tannins, and will leave your mouth with an unpleasant, bitter, puckery feel—not unlike eating a very green banana. Though non-astringent Asian varieties have been bred, this breakthrough has not yet been achieved in the American persimmon. Thus, the fruit can only be harvested when dead ripe. In fact, the best persimmons are usually those that have just fallen from the tree. Since ripe persimmons are almost pudding-like in texture, they often split when they fall and certainly do not ship well. Persimmons are also generally flecked with dark tannin deposits, which doesn't effect the flavor, but does make them look imperfect. Add all this to the relatively small fruit and large seeds, and American persimmons so far remain in the realm of home-garden curiosities, rather than commercial fruit production.

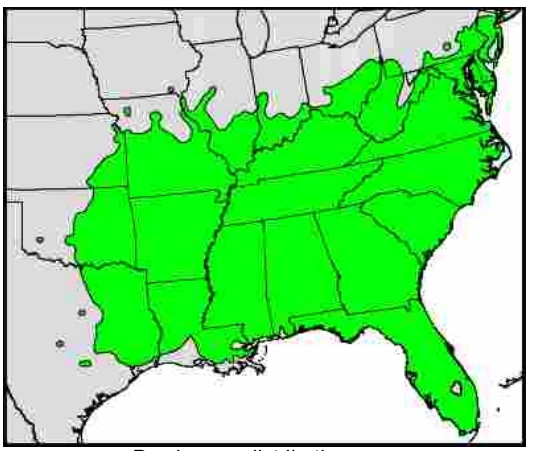
Nonetheless, both the Indiana Nut Growers Association (INGA) and the North American Fruit Explorers have several web pages dedicated to American persimmons and the challenges involved in selecting quality fruiting cultivars. Jim Claypool of Illinois may be the most famous amateur persimmon breeder, and he amassed a collection of over 2,000 trees. When his health failed, INGA inherited much of his collection, which they continue to use for breeding work. The Missouri Agricultural Experiment Station also keeps a persimmon germplasm collection and has an orchard planted with 21 cultivars selected from Claypool's trees.

Several mail-order nurseries carry American persimmon cultivars, including Meader, Early Golden, Garretson, John Rick, and Prok. More unusual are the hybrid varieties made by crossing American and Asian persimmons. The most common are Nikita's Gift and Russian Beauty, both of which were bred in the Ukraine. They have slightly larger fruit than the typical American persimmon while being much cold-hardier than the Asian species. One Green World Nursery in Oregon and Raintree Nursery in Washington state both carry American cultivars, Asian cultivars, and the hybrids.

Not only can American persimmons be eaten fresh or dried, but they have been cooked in a variety of ways. Settlers commonly made persimmon puddings, bread, and preserves. In addition to eating the fruit, they fermented it and made persimmon beer, brandy, and wine. Today, there is still a limited market for frozen persimmon pulp, which can be used in anything from ice cream to cookies to cakes. Persimmons generally work well in recipes designed for pumpkin, and introducing 50% persimmon pulp into a pumpkin pie recipe is a simple and tasty way to enter the field of persimmon cookery.

While American persimmons may never surpass bananas, apples, and oranges at the supermarket, they are attractive, easily grown trees with a long and interesting history. A ripe persimmon makes a wonderful late fall treat, and is a ecologically friendly way to enjoy the woodland resources of our state. So

next time you're out enjoying the fall wildflowers, don't miss the opportunity to admire the persimmons, as well.



Persimmon distribution map
Source: www.treetrail.net

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Ohio Native Plant Graces Swedish Postage Stamp

In 2007, in honor of the 300th anniversary of the birth of Carl von Linné (Linnaeus), Sweden issued a pair of postage stamps, one of which is an engraving of a mayapple, *Podophyllum peltatum*. The mayapple was described by Linnaeus in 1737 in his *Critica Botanica*.

The plant on the left is a banana, *Musa x paradisiaca*.



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