On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

On The Fringe – Your New Editors

This is the first issue of *On The Fringe* that Bill Oberdick and I, Diane Christensen, will be your editors. We would like to thank Ann Malmquist and Jane McCullam for setting the high standards that we will be challenged to maintain. We are committed not to make any radical changes in the format or content. We will continue to publish articles that are scholarly and well-written and articles that concentrate on local plants and problems. We will maintain the uniformity of presentation and continue to issue the Journal on a quarterly basis. We believe that the Journal is more important than ever. Interest in native plants is high and the threats against them are growing. We will make every effort to publish articles that provide pertinent information about native plants as well as to highlight current issues regarding them. We look forward to hearing from our readers and welcome new ideas and new articles to publish.
We regularly cover a number of topics, including, but not limited to, the Native Plant Society programs and events, particular seasonally relevant local species, natural preserves, invasive species and problems, applied botany, ecology as it affects the preservation and conservation of native species, book reviews, history and biography of organizations and people concerned with local plants, geological history of our areas.
Whether your interest is in bringing native plants to your garden or getting more enjoyment and knowledge our of a walk in the woods, or learning the latest about the environment and ethical issues relating to native plants, we think you will continue to enjoy reading the Journal.

Membership Renewal Notice

In January you received the 2010 schedule of programs and field trips along with the annual membership renewal form. If you already renewed, thank you. If you have not had a chance, please renew promptly and at the highest level you can manage. We would like to sponsor more events and projects promoting and preserving native plants.

Don't forget to visit our new website at www. nativeplantsocietyneohio.org

Thank You Tom

The board of the Native Plant Society of Northeastern Ohio would like to thank Tom Sampliner for his many, many years of service to the board of the Plant Society. Tom stepped down from the board at the end of the year. He was president from the late 1980's to early 2000. In addition he became Journal editor in 1991 and continued through his presidency. He recently served as Education chair. Tom was recognized with a special plaque and a copy of the new *Wild Ohio* book by Jim McCormac, the author of which was our annual dinner speaker.

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Ohio Botanical Symposium

Friday, March 26, – Villa Milano, 1630 Schrock Road, Columbus, Ohio, 43229. The Native Plant Society of Northeastern Ohio is a sponsor of The Ohio Botanical Symposium, which brings botanists, naturalists, and other nature enthusiasts together to network, provide professional enrichment, and view posters and displays on Ohio's native flora, natural areas, and rare plants. In addition to the keynote speaker and at least six presentations, attendees have a chance to visit with exhibitors and vendors, including non-profit environmental and conservation groups, park districts, federal and state agencies, universities, and vendors of books, nature crafts, and nature education/lodging. For registration information go to http://www.dnr.state.oh.us/tabid/20259/Default.aspx

Greening the Community, Beyond Pesticides

28th National Pesticide Forum; Green Economy, organic environments and healthy people. Case Western Reserve University. April 9-10, 2010. Presented by CWRU Medical School's Swetland Center for Environmental Health and national environmental group Beyond Pesticides. Registration includes: Keynote speakers and panel discussions; Interactive, discussion-based workshops; Tour and hands-on demonstrations; Networking opportunities; Organic food and drink Forum packets, printed materials and more. For more information and registration, go to: www.beyondpesticides.org/forum/brochures/index.htm or call 202-543-5450 to register.

Program Schedule 2010

Wildlife Habitat Using Native Plants - Saturday, March 13, 2:00 – 3:30 p.m. – Chagrin Falls Library. Kathryn Hanratty of Enviroscapes Landscape Design and Bobbe Katzman of National Wildlife Federation will discuss the habitat needs of local wildlife and the native plants that will help you create a diverse oasis for wildlife in your own yard. Find out how to certify your yard as a Backyard Habitat. Chagrin Falls Library - 100 East Orange Street, Chagrin Falls, 44022, just east of Main Street. No registration required.

Thompson Ledges - Geauga County – Sunday, April 18, 2:00-5:00 p.m. – Explore the rock ledges and hotel history of this township park which overlooks Lake Erie and the Grand River valley. The dry northern exposure is habitat to chestnut oak, trailing arbutus, Canada yew and other northern plants while the cool, moist habitat below harbors many species of ferns and wildflowers. Afterwards, explore the hemlock woods on the north side of the road. Program entirely off-trail with some climbing. Sturdy footwear recommended. Joint program with Geauga Park District. Directions: Take I-90 east to Rt. 528. Head south approximately 5 miles to Thompson Square. Continue ¾ way around to the square and head east on Thompson Road approx. ¼ mile to park entrance on right. 16713 Thompson Rd, Thompson, OH 44086. Call Judy to register at 440-564-9151 (H) or 440-286-9516 x 2011.

Windsor Woods – Trumbull County - Saturday, May 8, 9:00 a.m. - Jim Bissell, Curator of Botany at Cleveland Museum of Natural History, leads this joint trip with NEON to the nearly 900 acre swamp forest complex along the west side of the Grand River in Mesopotamia and Windsor Townships. Spectacular buttonbush swamps, yellow birch-beech swamps, pin oak swamp forests, and bur oak-shumard oak-elm-ash-maple swamps highlight the property. Directions: Travel about three miles south of U.S. Rt. 322 on Ohio Route 534. The entrance to Windsor Woods is on the east side of the Road just past the Samco Gravel Company located on the west side of Ohio Route 534. Look for orange surveyors tape on a stake at the entrance drive. Call Diane to register at 216-691-1929 (H) or 216-666-4870 (Cell).

Sedge Identification Workshop – Geauga County – Thursday, June 3, 9:00 a.m. - 4:00 p.m. The West Woods Nature Center - Jim Bissell, Curator of Botany at Cleveland Museum of Natural History, leads this all day workshop covering the basics of sedge ID. Brief indoor class followed by outdoor session to look at sedges. Bring a 20X hand lens and lunch. Program almost entirely off-trail. If you have Michigan Flora Vol. 1 bring that as well. Joint program with LEAP: Lake Erie Allegheny Partnership. Directions: Take St. Rt. 87 east from Rt. 306 in Russell Township approx. 2 miles to the park entrance on south side of the road**.** 9465 Kinsman road, Novelty, Ohio 44072**.** Call Judy to register at 440-564-9151 (H) or 440-286-9516 ext 2011(W).

Wild Collecting Increases the Possibility of Extinction

Caution: Do not be duped into buying woodland wildflowers that have been collected from the wild.

The planting season is just around the corner and you may see bulbs, corms and bare root plants offered for sale at unbelievably low prices. In past years, some of these plants have been selling for as low as $1.98: Plants such as Hepatica, Virginia Bluebell, Wild Geranium, Trout Lily, Large-flowered Trillium, Bloodroot and Jack-in-the-pulpit have reported selling at these low prices.

Many of our native woodland plants are difficult to propagate and slow to mature. Some may take three or more years to grow from a seed to a viable plant, often requiring specialized soil and moisture conditions.

Would you sell a plant that took this much time and work for two dollars?

If the price seems too good to be true, be very suspicious.

When you consider purchasing these woodland wildflowers, first ask where the stock originated and how it was produced. Look for Nursery-Propagated plants not Nursery Grown. Nursery grown just means that the plants were brought in from somewhere else and repotted for sale.

This is how it works: An unscrupulous wholesale operation may buy a tract of land and hire cheap labor to dig up every valuable plant on it. Sometimes, they just scrape the forest floor and sort out the plants that they want. This is ugly, irresponsible and bad for the environment. This practice destroys habitat, encourages erosion and further opens the forest to invasive species. Sometimes, they pay people for valuable plants, turning a blind eye to those who poach the natives from private or public land. Poaching is not legal but it is difficult to monitor. The unscrupulous dealers then put the wild plants in nursery beds for a few months and sell them as "nursery-grown," often selling them to well meaning but unaware retailers or smaller wholesalers who make the trail harder to follow.

The only way to stop these unscrupulous practices is to dry up the market for wild collected plants. When buying wildflowers, ASK about their source. If the vendor doesn't know or refuses to tell you simply walk away. If you buy wild collected plants from unscrupulous sources you make it harder for responsible nurseries who are trying to provide quality native plants to stay in business.

Retailers will not have plants from Plant Rescues. Most legitimate Plant Rescues require volunteers to agree not to sell the plants.

Buy plants from reputable nurseries that know their stock and have researched the source of the plants that they carry. Ask about the source and let them know that you want to buy from responsible sources only.

Kathryn Hanratty / Enviroscapes Design

Native Plant Gardening
An Introduction to the Benefits of Landscaping With Nature

People come to native plant gardening along different paths: a concern for the environment, a passion for gardening, an intellectual or aesthetic curiosity about the way things were, or perhaps simply a desire to connect with the natural world.

Whether you experiment with just a few native plants in your garden or try to create an entire habitat, the diversity of native plants offers beauty and interest for every garden. There are native plants to suit any garden's conditions whether the site is sunny, shady, dry, wet, hot, cold, windy or sheltered.

Native plant gardens offer a low-maintenance and attractive alternative to lawns. Rather than spending your time mowing and trimming your grass, you can spend your gardening hours enjoying the natural beauty.

A native plant is one that existed in a particular region prior to European settlement. Not all plants that grow in the wild are native; some, such as Queen Anne's lace and dandelion, are non-native and were introduced to North America by the European settlers.

To determine whether or not a plant is native to your region you will need to do some investigation. A field guide to wildflowers, such as the Peterson series, is a good place to start. A local naturalist group, the provincial ministry of natural resources, and the Canadian Wildflower Society are other excellent sources of information. Another good way to learn about native plants is to explore natural areas in your region.

Attracting wildlife to your garden is easier and more successful with native plants because the native birds, insects and mammals have co-evolved with these plants, looking to them for food and shelter. With the addition of native plants, your own garden can become a welcome habitat.

As with any gardening project, the first few years of growing native plants will require some work. You will need to prepare the planting bed (digging up unwanted vegetation such as weeds), amend the soil if it has been disturbed, and plant the species of your choice. It is very important to select species that are adapted to your garden's conditions. For the first growing season, you will need to water the plants and remove weeds. Once established, however, native plant gardens are low maintenance, requiring relatively little care.

Native plants often propagate themselves by seed or vegetatively, so you won't need to purchase new bedding plants annually. Native plants are adapted to local conditions; hence, they do not require synthetic fertilizers or pesticides (which include herbicides, fungicides, insecticides, etc.). However, applying leaf mulch and compost every fall in the woodland garden (though not in the prairie or meadow garden) is an excellent way of promoting healthy native plants.

By planting native species in your garden, you are part of an important movement to preserve the genetic stock of plants and increase biodiversity. This will help to reverse the enormous loss of native vegetation in North America, so that future generations will be able to enjoy and appreciate a more natural environment. Native plant communities also provide food and shelter for insect, bird and animal species, thus helping to preserve and protect wildlife.

Tips For Getting Started

• An easy way to get rid of grass, without digging, is to "solarize" the lawn. Simply cover the grass with a sheet of plastic (black plastic will work faster but clear is fine) and leave it to "bake" for six to eight weeks. Lift off the plastic and plant seedlings directly in the soil; don't worry about removing the dead grass as it will eventually decompose and return its nutrients to the soil.

• Another option is to cover the lawn with newspapers (ten sheets thick) and then cover the newspapers with approximately eight cm of soil. Leave it to decompose for a few weeks, then plant directly in the soil.

• Woodland plants require nutrient-rich soil, full of organic matter. Dig in plenty of compost or well-rotted manure and mulch woodland plants with shredded dead leaves every fall.

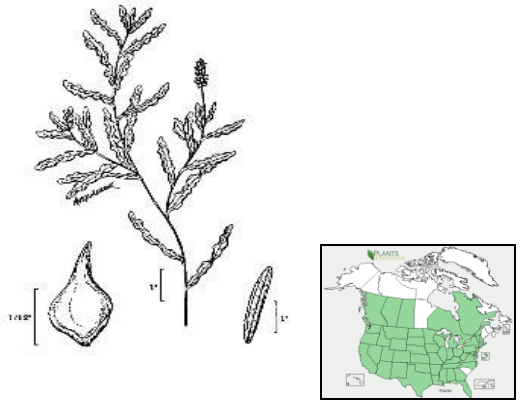
• Meadow and prairie plants will do fine in average soil conditions, so other than removing all weeds, you don't need to amend the soil. However, if your soil is extremely sandy or clayey, add compost to the meadow or prairie bed prior to planting.

Reprinted from Fact Sheet 1 published by the Canadian Wildflower Society (now the North American Native Plant Society), 1999.

Invasive Plants of Ohio
Lesser Naiad and Curly Pondweed
Najas minor, Potamogeton crispus

DESCRIPTION:

Lesser naiad is a non-native, small, branching aquatic annual with coarsely toothed leaves. The flowers are small, occurring in clusters along the leaf axils. Curly pondweed is a non-native submerged aquatic plant with oblong leaves alternately placed on the stem. Leaf margins are wavy and have minute teeth along their entire length. There are no floating leaves, but a spike of terminal flowers rises above the water.



Curly Pondweed

HABITAT:

Lesser naiad is most common in rivers and alkaline lakes. Curly pondweed grows in fresh and brackish streams and ponds. Both species often occur with other non-native invasive species, such as Eurasian water-milfoil (*Myriophyllum spicatum).*

DISTRIBUTION:

Lesser naiad is native to Europe and Asia. It has been speculated that seeds or plant parts were brought here accidentally on ships. Curly pondweed was introduced from Europe over 150 years ago and its increasing distribution may be due to migrating water birds. Both plants are common throughout the United States and are widely distributed in Ohio.

PROBLEM:

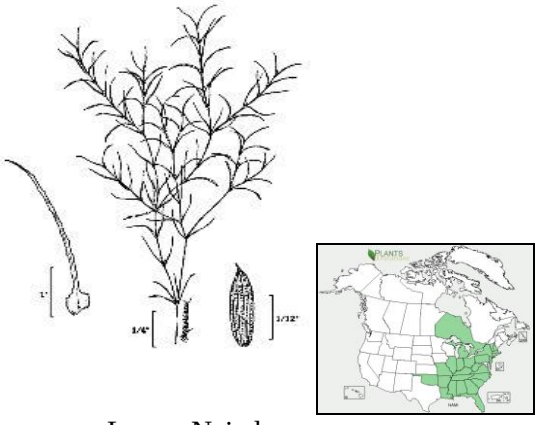
Once established, both lesser naiad and curly pondweed can be aggressive weeds. These plants grow profusely early in the season, often shading out and inhibiting the growth of native plants.

CONTROL:

Mechanical: Manual removal of lesser naiad may prove to be difficult due to the brittle nature of the plant. Avoid fragmenting the plants and remove all stems for effective control.

Chemical: Herbicides such as Cutrine, Weedtrine, Aquathol K, and Diquat can be used to effectively kill lesser naiad and curly pondweed.

Biological: No known biological control methods are currently available.



Lesser Naiad

ADDITIONAL INFORMATION SOURCES:

Borman, S. 1997. A field guide to aquatic plants. Wisconsin Lakes Partnership.

Schmidt, J.C. 1987. How to identify and control water weeds and algae. Applied Biochemists, Inc.

Reprinted from Invasive Plants of Ohio, A series of fact sheets describing the most invasive plants in Ohio's natural areas. Resources, Division of Natural Areas and Preserves, May 2000.

Pretty Partridgeberry

A Native Evergreen Groundcover With Lots of Star Potential

Marielle Anzelone

If you had to draw a picture of the northeastern deciduous forest, which plant species would you include? On its Nature of America stamp set released last year, the United States Postal Service whittled down the choices to 27 representative woodland flora and fauna. One surprising inclusion was the humble partridgeberry, a plant often underfoot and overlooked.

Surprising because partridgeberry *(Mitchella repens)* is the quiet, unassuming type. It lacks height, flashy flowers, and multihued fall foliage. Despite its ubiquity in the woods, it is uncommon in the horticultural trade. This is a shame, since it has many characteristics to recommend it to a gardener. It is that rare beast—a native, shade-tolerant, broad-leaved evergreen groundcover. Seasonal eye candy includes white flowers in spring and red berries that persist through winter. I can't help but think that once the secret gets out, partridgeberry won't be absent from the home landscape for long.

In its Natural State

In the wild, partridgeberry is a common component of the forest understory throughout eastern North America. It ranges from Newfoundland south to central Florida and from southern Ontario and Minnesota south to eastern Texas. The diminutive shrub inhabits the shady nooks of rich mixed-deciduous woods, preferring acidic soils. As an evergreen, it compensates for its low-light environment through its ability to photosynthesize during the entire winter season. From late spring to fall, the forest floor is cloaked in semidarkness, and mats of *Mitchella repens* lie prostrate, soaking up whatever sunlight penetrates the canopy above.

The creeping shrub hugs the ground, growing to only two inches in height. As the stems spread out, the branch and leaf nodes develop roots and anchor themselves into the soil. Eventually the slow-growing plant forms a dense carpet that may be several meters across. This scrambling cover spills down slopes and skirts the base of trees. By favoring such inclines, partridgeberry shrugs off fallen leaves that could otherwise smother it.

Through the Seasons

Unlike a paparazzi-crazed starlet, partridgeberry calls attention to itself infrequently throughout the year. It is most notable from late autumn through early spring, when its evergreen foliage contrasts with the grays and browns of the surrounding dead vegetation. These leathery leaves are small, about 1/4 inch across, are nearly round, and occur in pairs. The glossy deep green leaves are decoratively bisected by a white midrib.

As winter turns to spring and the growing season commences, partridgeberry recedes into the background. Maybe becoming indignant at the oversight, it garners some attention through the production of lightly fragrant white flowers in late spring (and often again in autumn). Less than an inch long, the tiny, tubular blooms are scattered along the stems in pairs.

Once the four petals retract, they expose the reproductive parts: a single pistil (female) and four stamens (male). The botanical lingo for partridgeberry's flowers is "distylous," since the neck of the pistil, or style, has two forms, or morphs—long-styled (pin) or short-styled (thrum). Each plant's flowers are all either one morph or the other. Distyly prevents self-fertilization and fertilization between like individuals, thus facilitating cross-pollination between pin and thrum morphs and, ultimately, genetic diversity within the species. Partridgeberry has another feature that promotes self-incompatibility: Only a few of its nectar-rich flowers are open at any given time, and this forces bumblebee pollinators to forage—and move pollen-between individual plants.

Interestingly, both flowers of the pair must be pollinated to produce a single viable fruit. After fertilization, the two flowers' ovaries fuse and mature into a solitary scarlet berry. This oval-shaped fruit is small-less than ¼ inch across—and contains eight seeds. Each berry bears two "dimples," telltale depressions that mark where the two flowers joined. Ripe by late summer, the fruit may persist through the winter to provide a welcome jolt of color while other vegetation is hibernating. The absence of berries may be blamed on the eating habits of some animals. Several birds seem partial to the fruits, such as the ruffed grouse, sharp-tailed grouse, northern bobwhite, and prairie chicken, as do the red fox, raccoon, and white-tailed deer.

Despite the fact that the fruit production for fertilized flowers is high (over 86 percent), flowers and fruit are not abundant. While an individual plant may cover a large swath of ground, it will bear only a few blossoms and berries at a time.

The plant's generic name was a nod by Linnaeus to Dr. John Mitchell, an 18th-century Philadelphia botanist and physician. The specific epithet, *repens,* is derived from the Latin for "creeping." Our partridgeberry is the only species in the United States of the genus. Fellow cohorts of the *Mitchella* genus are few and mostly found in Asia.

Common names are abundant: By some counts there are over 30. Some of the monikers denote the plant as a food source for animals (partridgeberry, deerberry, running fox). Others refer to its unique methodology of fruit production (oneberry, two-eyed berry) and floral display (twinflower). "Squawberry" and "squaw vine" refer to the plant's use by Native Americans: A tea was given to pregnant women to prepare the body and uterus for childbirth.

Growing Conditions

The best advice for growing native plants in a garden environment is to mimic their natural habitat as much as possible. Most often there is some latitude with these requirements. For example, despite occurring in the wild in acidic soils, partridgeberry isn't fussy about pH in the garden. It can even thrive among limestone rocks.

One thing the plant is particular about is drainage: Soils should be moist but well drained. Once the plant's root system is well established, usually after two growing seasons, it will tolerate some drought. It prefers partial to full shade; too much sun will cause the plant stress. Despite its delicate appearance, partridgeberry can survive very cold winters and retain its deep, lustrous greenery. As its wide distribution would suggest, the plant thrives in USDA Hardiness Zones 3 to 8.

Mitchella repens transplants well and can easily be propagated by dividing the roots. You can also cut root-bearing sections of the stem around the nodes and pot them in moist soil. Just a few of these cuttings will create a nice-sized evergreen mat for the garden when transplanted out. To ensure successful fruiting, remember that you'll need flowers from both pin and thrum morphs; so gather cuttings from at least two distinct plants. There is not much information available regarding partridgeberry's propagation by seed.

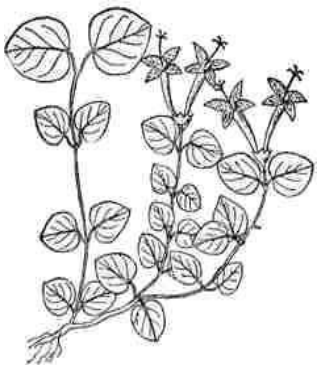
As a landscaping element, partridgeberry is best used in woodland, shade, or border gardens; along paths or walkways; or in rock gardens. As a ground-layer evergreen, it brings a verdant hue to the garden all year and may be a good alternative for folks who find the solid wall of color presented by some taller evergreens overwhelming. Mixed in with deciduous herbaceous perennials, it can really shine in the winter.

An occasional trim will keep your partridgeberry looking tidy. In autumn, be sure to remove fallen leaves from the plant. Since it is not an aggressive grower, it is not appropriate for large sites. A better application would be covering blank spaces in shady spots. Due to its petite size, it also makes an excellent plant to try in a terrarium, grown in full sun and fairly organic, well-drained, medium-moist soil.

Reprinted from ***Plants & Garden News***, the Brooklyn Botanical Garden, Fall-Winter, 2006-7







Wild Geranium: A Crane's Bill

Gordon Mitchell

By mid-spring the woodland floor should be filled with many different species of colorful spring wildflowers. Of all of the different colored flowers, there is one wildflower species that has large pink or purple flowers. That species is the Wild Geranium *(Geranium maculatum* L).

The Wild Geranium is a member of the Geranium Family *(Geraniaceae).* The generic name, *Geranium,* is from the Greek words, *geranian* or *geranos,* which is "crane", because the seedpod resembles the beak of a crane. The specific epithet, *maculatum,* is from the Latin words, *maculatus* or *macule*, which is "blotched", "mottled", or "spotted", because of the spotted leaves.

At both different times and places, other common names for this plant have been Alum Bloom, Alum Root, American Cranebill, American Cranesbill Root, American Kind, American Kino Root, American Tormentil, Astringent Root, Chocolate Flower, Chocolate Root, Common Crane's Bill, Crane's Bill, Crowfoot, Crowfoot Geranium, Dove's Foot, Fluxweed, hemlock, Old Maid's Nightcap, Racine a Becquet, Raven's Claw, Rockweed, Sailor's Knot, Shameface, Spotted Crane's Bill, Spotted Geranium, Storkbill, Wild Crane's Bill, Wood Geranium, and numerous variations in their spelling.



Description of the Wild Geranium
Perennial
Height: 1-3 feet.
Stem: Solitary. Upright. Hairy. Branched
Leaves: Simple. Rounded. Palmately divided into 3-7 toothed lobes with deep and irregular clefts. Each leaf is gray-green and hairy, is about 3-6 inches wide, and has brown spots. As the leaves age, these brown spots turn white. The basal leaves, which appear before the rest of the plant, have long petioles. The stem leaves, of which there is usually 1 pair, are opposite and are usually smaller than the basal leaves.
Flowers: Pink, purple, blue, lavender, rose, white, or any variations. The flowers are arranged in loose clusters of 2-5 at the tip of the stem. Each flower is radially symmetrical, is about 1-2 inches wide, and has 5 narrowly pointed and hairy sepals, 5 rounded and separate petals, 10 stamens that are arranged in 2 rows (with 1 row longer than the other), and 1 pistil with 5 styles and 5 bristly stigmas. These flowers may be in bloom for 1-3 days. Flowering season is usually April to July.
Each petal is about ¾ inch long and is translucent with prominent purple veins. These veins guide the pollinating insect towards the nectar, which is located at the base of the petal. The base of the petal has white wooly hairs, which protect the nectar from both the rain and the dew.
To prevent self-fertilization, all of the stamens on that plant mature before that plant's pistil. The stamens all mature one at a time and in sequence, with the outer row of stamens maturing first. When the weather is cloudy, cool, and wet, the stamens may be in their mature state for several days before they finally wilt and before the pistil matures. When the weather is sunny, warm, and dry, and the pollinating insects are active, both the stamens wilt and the pistil matures on that very same day.
Their pollen is unique. Unlike the pollen of most other plants, which is usually orange, the pollen of the Wild Geranium is light blue.
After fertilization, the petals wilt and fall. The pistil then elongates into the fruiting pod or capsule. The long style remains attached to the top of this capsule.

Fruit: Capsule or pod. This capsule is erect, elongated, and beaked with its style tip. The capsule is about 1 inch long and has 5 united chambers at its base. Each chamber will have only 1 seed. Fruiting season is usually June to July. When the seeds are mature and the pod is dry, the pod walls split lengthwise into 5 strips. These strips detach from their base and curve upwards. Each of these strips has 1 seed, which is catapulted for a distance of up to 30 feet. After the seeds are ejected, these 5 strips remain curled and remain attached to the top of the pod.
Seeds: Each seed is brown, pitted, and has an awn. This awn curls when it is dry and straightens when it is wet. This alternate curling and straightening enables the seed to propel itself to a suitable location for germination and for protection from seed-eating animals. These seeds are a favored food of the Mourning Dove *(Zenaida macroura* L.), the Bobwhite Quail *(Colinus virginianus* L.), and the Eastern Chipmunk *(Tamias striatus L).*
Rootstock: Thick. Tough. Coarse. Woody. Knobby. The rootstocks are about 2-6 inches long and have fibrous rootlets growing from their knobs. These rootstocks also have scars remaining from the previous years' stems and have buds ready for the next year's stems. When the rootstocks are young and fresh, they are light brown on their outside and fleshy and light-colored on their inside. When the rootstocks have been dried, they are hard, wrinkled, and gray-purple on their inside. These rootstocks are also odorless.
Habitat: Rich moist to dry woods, wood's edges, shaded meadows, thickets, floodplains, fencerows, rocky slopes. The Wild Geranium prefers areas of partial shade. They do not prefer deep woods or open areas.
Wild Geranium often grows in clumps. These clumps give the plant a bushy appearance.
Range: Most of the eastern U.S., north of Florida. This is the most common member of the genus *Geranium.*

Medicinal Uses of the Wild Geranium

There are several medicinal uses of the Wild Geranium. Both the Native Americans and the Europeans settlers used this plant as medicines.

The leaves and the rootstocks are both harvested for their medicinal purposes. Both parts are best harvested in the early spring, before flowering, when their tannin content is highest. The rootstock may also be harvested in the fall but will not yield as much tannin.

This plant contains about 10-20% tannin (especially tannic and gallic acid), which makes it useful as an astringent. (Astringent is from the Latin word, *astringere*, which is "to compress, constrict, or contract".) Astringents are used to shrink soft tissue and to stop hemorrhaging.

A tea made from this plant can be taken internally to treat various ailments of the digestive system, such as cholera, colic, colitis, diarrhea, dysentery, irritable bowel syndrome (IBS), and peptic and duodenal ulcers. This tea was considered safe and effective for both children and the elderly, and for those with highly sensitive systems.

This tea has other uses as well. It can also be used as a contraceptive, a diuretic, and as a tonic. It can also be used externally as eyewash or as both a mouthwash and a gargle for treating canker sores (a mouth ulcer), sore gums, sore throats, thrush (a fungal disease), and toothaches.

The rootstock was sometimes dried and ground into a brown powder and used externally. This powder was used as both a coagulant and a styptic for treating cuts, scratches, and other open wounds. It was also used externally as a folk remedy for treating cancer. A poultice made from the rootstocks was used for treating both hemorrhoids and other swellings.

The Wild Geranium may even have some antibiotic properties. It has been proven to inhibit some forms of bacteria.

Wild Geranium was listed in both the *U.S. Pharmacopoeia* (1820-1916) and the *National Formulary* (1916-1936). Even today, some pharmaceutical companies still use this plant.

Aside from medicinal uses, the Wild Geranium had some other uses as well. The leaves of this plant were sometimes mixed with other plants, which were used for cosmetics, deodorants, perfumes, and as mordant in dyes. The young leaves are also edible as a salad green. The tannin in this plant was sometimes used in tanning leather. The Wild Geranium also contains gum, pectin, resins, and starches.

History of the Wild Geranium

During America's early years, a few botanists observed this plant and its uses and made comments about it in their published works. In John Josselyn's *New England Rarities Discovered in Birds, Beasts, Fishes, Serpents, and Plants of that Country* (1672), he referred to it as "Raven's-Claw, which flowers in May, and is admirable for Agues (Malaria)". In Andre Michaux's *Travels into Kentucky, 1793-1796*, he visited Fort Massac, along the Ohio River, on October 25, 1795, and wrote: "In the neighborhood of Fort Cheroquis (Massac) the Geranium called

herbe or rather Racine a Becquet which is given for chronic Diseases during several weeks". In Frederick Pursh's *Flora Americana Sepentrionalis; or, A Systematic Arrangement and Description of the Plants of North America* (1814), he stated: "This species is known in some parts of the (Appalachian) Mountains by the name Alum-root, on account of the astringent taste of its roots, which are very successfully employed in curing the flux among the children, which is a disease very prevalent in those countries".

Many poets have mentioned the Geranium in their writings. The two most famous poems that mentioned Geraniums were Thomas Stearns (T.S.) Eliot's 1910-1911 poem, *Rhapsody on a Windy Night*, and Amy Lowell's 1914 poem, *Sword Blades and Poppy Seed.* However, none of these poets ever specified the exact Geranium species in their poems.

Conclusion

The Wild Geranium is probably not the same Geranium plant that would be sold in most garden stores. Most of those Geraniums are members of the *Pelargonium* genus and are imported species. Fortunately, the Wild Geranium is one Geranium species that is native to this area.



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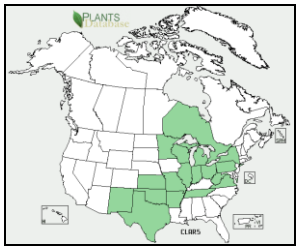
Wild Savory
Calamintha arkansana

Charles Kinsley

The word savory evokes images of warm, steamy dishes, comforting thoughts of home and hearth. These associations are direct, unambiguous.

Ambiguity is a word easily applied to the plant wild savory, however. More than most of its savage peers, *Calamintha arkansana* has had a checkered career - at least with regards to our understanding of where it fits in.

WILD SAVORY aka
Arkansas Mint
Calamint
Limestone Calamint
Limestone Savory
Low Calamint
Niagara Thyme
Ozark Calamint





Those of us with more than a passing interest in the natural world are used to a certain level of debate and uncertainty regarding taxonomic placement or nomenclature of plant and animal species. So *Hepatica americana* becomes *Anemone americana* even though it's still "commonly" a hepatica. *Felis concolor* (cougar, mountain lion) morphs into *Puma concolor* (or vice versa). To add confusion, different experts don't always agree on the current name, let alone the species genetic history and taxonomic affiliations.

Calamintha arkansana (I use the currently accepted binomial adopted in Ontario by the Ontario Plant List) puts the above two examples to shame with its rich history of names. There are no less than 12 synonyms for the Latin name *C. arkansana* and at least eight common-name possibilities in North America (see table).

Wild savory is 8-18 cm tall with two modes of growth. It produces ground-hugging stolons with thick oval leaves that vary from blue-green to deep green. This allows the plant to grow mat-like over the rocky terrain of its natural homes. It also sends up flowering leafy shoots with linear opposite leaves, bearing axillary flowers ranging from white to mid-purple. It shares several characteristics with its complex multitudinous mint family: bilabiate flowers, obscurely four-angled stems, opposite leaves and exceptional aromatic oils.

The strong scent may be a clue to its multiplicity of names. Or it could be that since it's a small and seemingly insignificant plant the European botanists who discovered it at different periods in history did not bother to check with their peers before assigning a family, genus or species to it. Linnaeus had no name for the plant.

For many years it was included in *Satureja*, the genus of two cultivated herbs with which it shares some morphological characteristics: *Satureja hortensis* (summer savory) and *S. montana* (winter savory). These two European plants have similar low-growing habits to wild savory, so the original association through genus is understandable. *Satureja* (also at one time *Satureia*) means savory although it's been linked with everything from Saturn to satyrs.

In the United States the presently accepted botanical name is *Clinopodium arkansanum*. This seems a bit of a mystery, as *Clinopodiums* are usually much larger with whorled axillary flowers, although both *Clinopodiums* and *Calaminthas* were once lumped together under *Satureja*.

It seems more plausible to classify it under *Hedeoma*, and wild savory is known in some circles as *H. glabra* or *H. arkansana*. Certainly its cousin *Hedeoma hispida* is sometimes confused with *C. arkansana* in plant collections although it has a more weedy habit with smaller flowers.

Neither *Clinopodiums* nor *Hedeomas* produce a scent like wild savory. *Calamintha arkansana* has a fragrance that easily rivals the potency of its cultivated *Satureja* relatives, but it's less peppery with more of a true mint sense. The strength is astonishing in such a delicate plant. A well-watered grouping of wild savory growing in full sun can easily be detected by scent 10 feet away. To walk through it is to be showered by its perfume. Mints in general have the reputation of producing oils more plentifully with dry treatment. Here, Calamint goes against type. Watering well will enhance its scent. Take care, however, not to drench it so that rot sets in.

In addition to sun and average to slightly better-than-average moisture wild savory requires a pH between 7.0 and 8.0. About this we must be scrupulous. After all, the plant has a coefficient of conservatism of 10 making it a very special find in wild places (*Lupinus perennis* also comes to mind).

Like all conservative plants it craves a narrow range of habitats. In the wild *Calamintha arkansana* occurs only in the following communities or habitats: lakeside alvars/limestone pavement lakeshores, treed alvars, limestone glades, damp interdunal hollows and calcareous seeps. In Ontario by far the most common sightings occur on the lakeshore pavements. Just go to the Bruce Peninsula, Manitoulin Island or Lake Erie (this last has precious few) and look for it there. I have also seen it growing quite abundantly on Georgian Bay with *Panicum lindheimeri* on a limey open beach composed of sand and large cobble.

For the gardener this conservatism demands strict adherence to a set of cultural/biological conditions. The key point is alkalinity. Most limestone/dolostone areas sport a pH from 6.8 to 8.0. If you don't have a suitably alkaline spot you can always haul out the dolomitic lime or even limestone screening to amend with. Here's a tip – combine the amended soil with flat limestone rocks and small gravel to create a path bordered with this wonderful-smelling herb. The roots will creep under rocks where the soil would be damp. Keep in mind that with very sandy soil the watering regime will be more rigorous, as the relatively shallow root system cannot bear to dry out.

Of course given the perfect conditions *C. arkansana*, like all other conservative plants, can be as prolific as dandelions on a lawn. But the scent alone is worth the effort of creating a special habitat for wild savory, and its free flowering over most of the summer is a distinct bonus for a wild plant. Wild savory usually grows more by stolons early in the year, sets up erect stems in early June, and starts to flower by mid to late June. The peak is usually late July, but some flowers will appear well into September with the right treatment.

One final cultural point to consider is the climate. The natural range of *C. arkansana* is Ontario to Minnesota and then south through Texas to (barely) New Mexico. In the northern limit of its range it is almost exclusively a

lakeshore plant where the proximity of the water has a moderating influence on the temperature. Try to plant it where it gets some protection from extremes.

Unfortunately, wild savory can no longer be found in much of its original range. It has been extirpated from both Kansas and New York. It is considered endangered in Indiana, rare in Virginia, threatened in Ohio and a species of concern in Wisconsin. Luckily, it is ranked as demonstrably secure in Ontario. It can remain that way with good conservation and good gardening practices.

Charles Kinsley is the owner of Ontario Native Plants Inc. Formerly a terrestrial biologist with the Toronto and Region Conservation Authority he has also worked as an independent ecological/landscape consultant.
Illustration by Brigitte Granton
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The Nature of Nectar
Much More Than Just Sugar Water

Niall Dunn

It's widely believed, even among plant lovers, that nectar is a simple, sugary secretion whose sole purpose is to lure flower pollinators with a sweet-tooth reward. But saying nectar is just a high-carb aphrodisiac for bees and butterflies is the equivalent of saying that a pint of Guinness stout is just a beer (yes, I'm Irish).

Nectar, you see, has a complex chemistry and ecology. It even has its own scientific discipline: "ambrosiology," named after ambrosia, the legendary food of the Greek gods. Two academic journals have recently devoted long, excruciatingly dry volumes to the biological investigation of nectar—so it must be important stuff.

Actually, researchers have been diving into open flower corollas and cavernous floral spurs (granted, with micropipettes) to plumb nectar's depths since the 1970s. They've found a lot more down there than just sugar and water, including significant amounts of proteins, lipids, antioxidants, minerals, vitamins—and even toxins.

Researchers have also been matching nectar characteristics such as sugar ratios and amino acid content with different types of pollinators. And there's been a lot of focus on nonfloral or "extrafloral" nectar, which can pop up almost anywhere on a plant and serve important defense functions.

In short, we're discovering that nectar inspires not only sweet symbiosis between plants and animals, but also intriguing and even dangerous interactions: insects battling for the finest quaff, chemical warfare against microbial intruders, and more. Take a spyglass out into the garden and you'll see what I mean.

Nectar Biology

Nectar is produced by specialized glands called nectaries on or embedded in the surfaces of many plants. These glands can vary in structure and position from plant to plant. For instance, under an electron microscope, leaf nectaries of cotton look like sunken pits or doughnut holes, while the petiole nectaries of passionflowers (*Passiflora* species) resemble fluffy pancakes.

Though we generally associate nectar with flowers and pollinator attraction, many botanists believe that nectaries appeared well before the evolution of flowering plants. (The most ancient nectar-producing plant still living today is the bracken fern, *Pteridium aquilinum*, which has extrafloral nectaries at the base of its leaves.) Indeed, some botanists have speculated that nectaries originally evolved as a means of actually excreting excess sugar (nice trick, eh?) from mature foliage.

The surface of each nectary is connected to the plant's vascular system via a group of specialized cells, which are either chock-full of chloroplasts (for photosynthesizing sugar) or starch (stored sugar). Basically, these cells supercharge plant sap with supplemental sugars and other substances as it passes through on its way to the nectary surface and is secreted as nectar.

Secreted nectar may cling to the open surface of a nectary, or it may drain into a flower corolla or nectar spur—the elongated spurs of columbines comes to mind—where it's harder for undesirable pollinators to reach and less vulnerable to

evaporation. Though floral nectaries can occur in almost any part of the flower, they are most often found at the base of petals and stamens.
Production of nectar has been found to vary with such factors as time of day, weather, flower age, plant size, and soil moisture. For many plants it's a major energy investment, costing them upwards of 37 percent of their daily photosynthetic effort. Not surprisingly, a lot of plants resorb and reuse their nectar.

Pollinator Preferences

Only three sugars occur in quantity in nectar—sucrose, fructose, and glucose—and their ratios vary widely depending on the plant species. Sucrose-rich nectars tend to be associated with concealed nectaries and long-tongued pollinators (bees, butterflies, moths, or birds), while fructose- and glucose-dominated nectars are linked to exposed nectaries and short-tongued bees and flies.

The sugar concentration of nectar is also important. Pollinating birds, bats, and butterflies prefer fairly dilute nectar with a 15 percent to 25 percent sugar concentration. Bees—big saps that they are—like it more syrupy, with concentrations at around 50 percent. Some plants, such as horse chestnut (*Aesculus hippocastanum*), secrete nectar that's up to 70 percent sugar; visiting bees need to dilute this nectar with their saliva before they can suck it up.

Sugar concentration is linked to the physical and behavioral traits of different pollinators. That's because as concentration goes up, so does the viscosity or gooeyness of the nectar. Animals with narrow feeding tubes (such as butterflies) or those that hover around a flower while eating (such as hummingbirds) are best served by a more liquid lunch.

There's a general rule of thumb that the bigger a pollinator is, the more nectar it needs—and the more nectar its adapted plants have. Bird-pollinated species of *Banksia* in Australia, for example, produce so much nectar in their dense flower heads that Aborigines also collect it for food.

There are correlations between the concentration of amino acids (the building blocks of proteins) in nectar and the type of floral visitor, indicating that nectar is a significant protein source for some animals (especially those that don't supplement their diet with pollen or other protein-rich material). For instance, butterflies need more protein in their nectar than birds, which can always eat the odd bug. I'm not sure what this says about the Atkins diet, but the most protein-rich nectars are found in nasty-smelling flowers that attract dung flies, like those of purple trillium (*Trillium erectum*).

Competition for Consumption

As an important energy and nutritional resource for many animals, nectar generates a good deal of competition. In many cases, animal hierarchies form around plants, with dominant species getting first dibs on the most desirable nectar. Such is the case, for instance, with weaver ants on extrafloral nectaries of barbwire vines (*Smilax australis*) in Queensland, Australia. The dominant ant species monopolizes the nectar with the highest amino acid and sugar concentrations and leaves the cruddy stuff for more subordinate species.

Researchers have found a similar hierarchy among four stingless bee species foraging on flowers of the tapi-tapi tree (*Santiria laevigata*) in the forests of Sarawak, Malaysia. In a slight variation of the "early bird catches the worm" adage, the most aggressive bee species feeds—and excludes other species from feeding—in the morning, when nectar flow from the flowers is at its peak.

Plant Defense

Extrafloral nectar protects plants indirectly by attracting beneficial insects that subsequently defend foliage, flowers, and developing fruit against herbivores. The best-known example of this kind of arrangement is the one between African *Pseudomyrmex* ant guards and swollen-thorn Acacia plants. Nectar rewards keep the foliage of the *Acacia* plants swarming with the aggressive stinging ants all year round, and these ants can repel even the most leathery-lipped of hungry giraffes.

University of Arizona researchers looking at barrel cacti (*Ferocactus wislizeni*) in the Sonoran Desert have found that ants on plants with active extrafloral nectaries feed much more aggressively on foraging caterpillars compared with ants on plants with inactive or no floral nectaries. They concluded that when ants load up on carbohydrates from nectar, their craving for protein increases—as does their efficiency as bodyguards. (Call it the "meat-and-potato syndrome.")

But it's not just ants getting in on the action. For example, jumping spiders feed on the extrafloral nectar of the partridge pea (*Chamaecrista nictitans*) in old farm fields in New Jersey. In exchange for the sweet treat, the spiders defend the leaves against herbivorous insects—a behavior that's been shown by scientists at Rutgers to boost seed production in the plants.

When situated near flowers, extrafloral nectaries attract insect guards that defend the flowers against "nectar robbers"—organisms that feed on nectar without providing any pollination service. Nectar robbers generally drill or chew holes into flowers and drain off nectar without ever contacting the plant's reproductive organs. And this can create problems. For instance, bumblebee thieving of scarlet gilia (*Ipomopsis aggregata*) nectar causes a reduction in visits by the plant's bona fide hummingbird pollinators and lowers the average number of seeds in the plant's fruit. The gilia could learn a few things from the morning glory *Ipomoea cornea*, which uses extrafloral nectar to woo ants into playing defense against nectar-robbing carpenter bees.

Complex Chemistry

The nectar of some plants can take an active role in defense, too. For example, a protein (nectarin 1) produced by floral nectaries of ornamental tobacco plants (*Nicotiana*) generates high levels of hydrogen peroxide in the nectar, which protect flower parts from fungal infection. Toxic compounds in northern catalpa tree (*Catalpa speciosa*) nectar are known to repel nectar-thieving ants but not make the nectar unpalatable to legitimate bee pollinators.

Something even more complex takes place in almond tree nectar. The presence of amygdalin (a cyanide-containing chemical) increases during the season and makes the nectar less and less attractive to nectar robbers. But it also deters the plants' bee pollinators. What gives? Scientists at the University of Tel Aviv, in Israel, think the toxic buildup comes from amygdalin-laced pollen grains falling into the nectar due to bee activity— the more visited the flower, the more toxin in the nectar. The bees are forced to search for the least toxic nectar, and this may ultimately be a strategy by the plants to increase bee movement between individual trees and enhance cross-pollination.

Now, that's some food for thought while you're out admiring the unadulterated beauty of your flowers.

Niall Dunne is editor of *Plants & Garden News*.
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Return of the American Chestnut

By Jim Durrell

By 1935 the chestnut blight had killed more than 99% of Native American chestnut trees and all efforts to control it had failed. Now restoration efforts have grown from a faint glimmer of hope to cautious confidence. By 1990 slightly resistant orchards had been developed by back-crossing Chinese-American hybrids to American chestnut, and by collecting rare specimens of surviving chestnuts with some tolerance to the blight. Also, a virus was discovered that killed the blight fungus.

None of these methods are very effective now, but they are being improved. In 1990 the Department of Fish and Wildlife teamed up with the Kentucky Nut Growers Association, Soil Conservation Service, and Division of Forestry to grow, buy, and distribute chestnut seedlings. In 2000 a Kentucky Chapter of The American Chestnut Foundation (TACF) was formed.

Volunteers help by reporting surviving chestnut trees, collecting seed and transplanting surviving sprouts. Hundreds of surviving chestnut trees have been reported in Kentucky, but unfortunately more than 95% of these turned out to be Chinese or hybrids.

The American Chestnut

American chestnuts (*Castanea dentata*) belong to family Fagaceae, which also includes beech and oaks. Worldwide there are several species of chestnut including Chinese, Japanese, European, American, and several chinquapins, which are "dwarf chestnuts."

Both American and Chinese chestnuts reach heights of 60 ft or more (originally over 100 ft in our native species), and both have 4-valved, spiny husks, each produces 2 or 3 nuts, each nut flattened on one side. They differ in that the American chestnut has nearly glabrous lower leaf surfaces (may be some unbranched hairs and tiny glands present), twigs, and buds, while the Chinese chestnut has parts with a velvety pubescence of branched

(stellate) hairs. The related dwarf chinquapin (*Castanea pumila*), which is rare in Kentucky, differs from the above two species in the smaller size (only to 15 or 20 ft tall, rarely taller), the leaves densely stellate pubescent, and the husks only 2-valved, with a solitary, rounded nut.

American chestnuts grew larger and faster than any other deciduous tree (rivaled only by tuliptrees) in the eastern United States and occurred throughout Kentucky, but were less frequent in the Bluegrass.

The strong, rot-resistant wood was the best for rail fences, fence posts, light poles, buildings, and furniture. The straight-grained wood was easy to work. Chestnuts were a great food for people, wildlife, and livestock. Early settlers fattened herds of hogs on chestnuts along with acorns and beechnuts. Ohio River steamboat manifests included chestnut lumber and nuts.

Chestnut Blight

Chestnut blight cankers are caused by a fungus (*Cryphonectria parasitica*), which was introduced to the Eastern United States from Asian chestnut trees around 1900

(see http://www.ppws.vt.edu/ griffin/blight.html and many other web sites). They kill the tree when they grow completely around it and cut off the flow of sap. Harry Caudell wrote in his *Night Comes to the Cumberlands* in 1963 that the trees dried up and died, beginning in the late 1920s, "as if hot steam had been applied to their roots and foliage." The fungus remains alive in Kentucky forests today, often harboring in oak trees. Young trees continue to sprout from old root stocks and may appear to be healthy for a few years, but the fungus soon attacks so that very few reach the fruit-bearing age.

Treatment

The simplest defense to inhibit the damage caused by the fungus is to cover the canker with mud, held in place by a plastic collar, and kept moist for several months. This mud can keep a tree alive long enough to produce seed. A better method is to infect the cankers with hypovirulence, the anti-blight virus. But this does not readily spread from one canker to another. In an orchard in Connecticut, Dr. Sandra Anagnosticas has repeatedly infected cankers with hypovirulence virus until it spreads from tree to tree. This virus can be spread by insects but apparently only when there is an abundance of it, as in an orchard.

Hybrid Resistance

All members of the chestnut genus (*Castanea*) are susceptible to the blight, but the Chinese species are very tolerant. Chinese-American hybrids have strong resistance, but usually do not make a tall majestic tree like the American. The American Chestnut Foundation (TACF) has back-crossed these hybrids onto American chestnuts three times, producing a 15/16 American chestnut. Some, but not all, of these plants are blight resistant with the tall straight trunk of the American chestnut. These seedlings will not be available for several years. Our Kentucky Chapter of The American Chestnut Foundation has been pollinating surviving Kentucky chestnuts with pollen from these orchards. This provides 31/32 pure American and preserves the genes of the local strains. Dr. Chuck Rhodes of the University of Kentucky planted these nuts on public lands, hoping to establish orchards of at least 20 different "lines" of native Kentucky strains.

The American Chestnut can also be crossed with the dwarf chinquapins, and Bernheim Forest in Bullitt County has three surviving chestnut-chinquapin hybrids. They grow about 20-30 feet tall and seem to resist blight more than American chestnut.



Family photo in front of American Chestnut; Tennessee, 1920

Natural Resistance

Less than one percent of the American chestnuts survived the blight as trees. American Chestnut Cooperators Foundation (ACCF) collected nuts and scion wood from some of these trees and established an orchard in Virginia. More susceptible trees were replaced or grafted with wood from more resistant ones. They grow and sell seedlings to members for less than $1.00 each. These are the plants the Fish and Wildlife Department buys to be distributed by Kentucky Nut Growers, (contact Jim Durell, 308 Meadow Lane, Frankfort, KY 40601)

Surviving Chestnuts

Most surviving American chestnuts are badly blighted and isolated. They usually cannot make nuts because there is no other chestnut within 65 yards to pollinate them. They make so much pollen that their female flowers are completely coated with it, so pollen from a flowering branch from another chestnut cannot reach the female flower. To overcome this, Chestnut Foundation (TACF) members and state foresters remove the male flower and bag the female flowers, then go back to hand pollinate and rebag them.

Kentucky Nut Growers will provide plants to grow pollinators for these isolated trees. The Fish and Wildlife Department pays for these plants, which can also be used for small new plantings. A better plan is to transplant native sprouts from nearby woods. Seedlings and sprouts must have open sunlight to grow.

Preserving Native Kentucky Strains

Some botanists believe that trees should be planted within 25 miles of the parent tree. This would indicate a need for a mother tree (natural seed source) in almost every county in the chestnut range. These mother trees are rare, but more can be grown from sprouts in the woods.

Native Sprouts

These native sprouts are plentiful. Many are seedlings which have been dying and resprouting for 40 years. Some are small enough to be transplanted to a sunny location where they will soon grow into trees. Sprouts should be located and tagged in the growing season so they can be identified and moved in the dormant season. These sprouts could be moved across the state and their nuts could be planted back in the county of origin. They could also be pollinated with the 15/16 pollen to grow a resistant "line" to take back to the home county.

Saving Nuts

Chestnuts are very delicate. Even a few hours of drying will lower the germination rate. They should be picked up every two or three days and stored with a moist paper towel in a zip-lock bag in the crisper of the refrigerator. A few holes should be punched in the bag with a toothpick. Nuts will survive being shipped in this bag. To prevent mold, the paper towel should be replaced with moist sphagnum moss if they are to be stored more than a few weeks. Nuts stored in the refrigerator like this will normally start to sprout in January or February and should be planted then or earlier. Nuts which fall on the ground and are wet by the dew every night may remain viable several days between pick-ups. They can be stored in a dry bag for perhaps 12 to 24 hours. If squirrels are a problem, the burs can be harvested when the first ones begin to crack. When they open, the nuts are separated and stored as described above. From 1990 to about 1995, several clumps of wild chestnut trees in Kentucky were producing nuts. In 2002 and 2003, no nuts were found except on imported planted trees.

Chestnuts as Food

For several years Clifford England of McKee has been paying $2 per pound for good chestnuts. Recognized Chinese hybrids are preferred and these usually grow on smaller trees rather than the large timber type American. The United States imports thousands of tons of chestnuts annually, so this market should remain steady. An acre of chestnuts will produce a light crop in about six years and produce about 1300 pounds in 10 or 12 years.



Insect Pests

Chestnuts frequently have worms and they get worse every year. They can be controlled with insecticides. Heating the nuts to 120 degrees in water for 20 minutes will kill the worms without hurting the nuts. These worms come out of the nuts and bore into the ground. They emerge as weevils next spring and lay eggs on the flowers. Some of the hybrids are resistant to a tip moth which may later become a problem.

New Chestnut Forests

Small chestnut woodlots of partially-tolerant trees can be established now. Some of their seedlings will succumb to the blight; others will be more resistant than their parents. How quickly these woodlots expand into forests will depend on public interest. Those interested in speeding the return of these forests can help in several ways:

1. Search for surviving American chestnuts. They make conspicuous white catkin flowers in June, drop nuts and burs in September, and hold their leaves in the fall after other trees drop theirs. Report to the Fish and Wildlife Department, Forestry Division or Jim Durell, 308 Meadow Lane, Frankfort, KY 40601. 502-875-5691.
2. Collect nuts from wild trees, or report them as listed above.
3. Transplant sprouts from the woods, or plant seedlings.
4. Help pollinate the surviving trees.
5. Join one of the organizations interested in chestnuts:

American Chestnut Cooperators Foundation. (ACCF) 2667 Forest Service Rd. 708, Newport, VA 24128. (a source of plants) $20.

The American Chestnut Foundation. (TACF) Rex Mann, U.S. Forest Service, 1 700 Bypass Rd., Winchester, KY 40391. $40.

Kentucky Nut Growers Association., David Leeper, 2209 Middleqround Dr.,Owensboro, KY 4Z301. $5.

Reprinted from *The Lady Slipper*, Summer 2005. Newsletter of the Kentucky Native Plant Society.

Devil's Walking Stick

George Ellison

"If you had to design a structure that could absorb sunlight, extract water and minerals from the earth, and protect itself from possible harm by animals, you probably could not come up with a simpler solution than Hercules'-club."
-Donald W Stokes, The Natural History of Wild Shrubs and Vines (1981)

Several years ago I was with a group botanizing the Big Laurel (Alarka Laurel) section of the Cowee Mountain Range just south of Bryson City, N.C. Walking along the Spruce Trail at about 4,000 feet (where the southernmost stand of red spruce in North America is located), we came to the old Nancy Green home site, which she maintained in this ethereal highland setting into the 1930's.

Apple trees, periwinkle, and other domesticated plants common to such sites were in evidence. But the most curious item by far was a stand of shrubby trees armed with prickly spines on their bare trunks and topped with enormous plumes of black fruit. Although it's a fairly frequent species throughout the region below 3,500 feet, *Aralia spinosa* is often overlooked despite its interesting growth strategies and human associations.

This curious plant belongs to the *Araliaceae* or Ginseng Family. The genus designation (*Aralia*) comes from "Aralie," the French-Canadian name applied by the Quebec physician who sent the first specimens back to Europe. The species designation (*spinosa*) obviously derives from the menacing thorns lining the main trunk and leaf stalks. These no doubt evolved as a most effective herbivore defense.

The common names devil's walkingstick, spikenard, and tear-blanket are no doubt derived

from these wicked appendages. My first encounter with the plant, years ago, was memorable. Working my way down a steep slope, I was reaching out and grabbing saplings for balance when I unwittingly seized upon *A. spinosa*. Like some people, some plants make such a vivid first impression that you never forget them.

The designation angelica-tree as a common name for *A. spinosa* seemingly arises from its huge, twice-compound leaves, which somewhat resemble those of herbaceous species in the genus *Angelica*. Hercules'-club as a common name probably arose in part because of the overall appearance of the tree, with its long, bare trunk topped by a club-like panicle of flowers or fruits; and. in part, because of its resemblance to a coastal and lowland plant also known as Hercules'-club (*Zanthoxylum clava-herculus*) with the same general appearance, including the thorns. To further complicate matters, each of these species is sometimes known as toothache tree and prickly ash.

As Donald W. Stokes has noted, *A. spinosa* usually grows in a single straight stem of up to 30 or more feet in height. The stem is topped by a winter end bud from which leaves and a large flower cluster radiate in the spring and summer. The white flowering cluster develops into a large plume of dark berries in late fall.

The general appearance and strategy of *A. spinosa* is that of a palm tree, another plant that extends huge foliage-flowering-fruiting systems into the sunlight of the upper canopy via a naked trunk. The twice-compound leaves and showy flower-fruit panicles are up to three feet in length.

Examine the trunk closely and you'll find a series of intricate patterns involving the thorns and two types of bark scars. Look for an inch-wide circular scar comprised of fine rings that occurs at intervals of a foot or more up and down the main stem. These circles indicate where the winter bud scales that dropped off in the spring were located; and the distance between circles represents a year's growth. Above each of these circular scars will be a V-shaped scar left by the leaves that appeared in a given year. Look closely at these scars through a pocket lens and you can observe a series of bundle scars that were once tube openings which allowed nutrients to flow from the main trunk into the leaves.

Back in earlier times when the average citizen was more keenly aware of the natural world, every plant was tested for its potential use as an implement, food, or medicine. Those that had actual or supposed medicinal properties were esteemed and sometimes cultivated so as to be nearby when required. This is no doubt why we found the plant persisting at 4,000 feet in the Cowees at Nancy Green's old home place.

A. spinosa was one of those easily cultivated items that had a wonderful use. When you've got a toothache and no dentist, you'll try anything, including popping the tooth out with pliers, if it gets that bad. According to Le Page du Praz in his *History of Louisiana* (1758), as quoted in Donald Culross Peattie's *A Natural History of Trees* (1950). "the inner bark has the property of curing the toothache. The patient rolls it up the size of a bean, puts it upon the aching tooth." Steven Foster and James A. Duke suggest in *A Field Guide to Medicinal Plants* (1990) that a "tincture of berries was also used for toothaches."

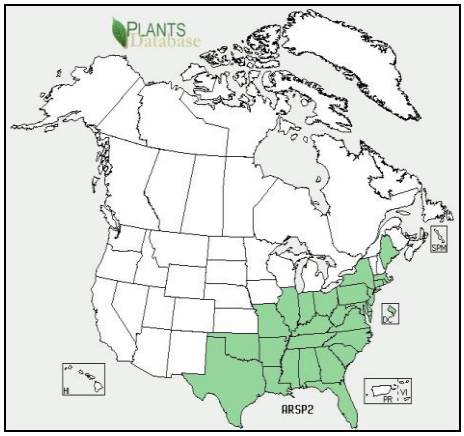
The European settlers learned these applications from the Cherokees and other Indians tribes of the region. Paul B. Hamel and Mary U. Chiltoskey in *Cherokee Plants: Their Uses: A 400-Year History* (1975) state that the plant was not only used for "ache of decaying teeth" but as a root-salve for old sores or as a root-tea for a variety of ailments.

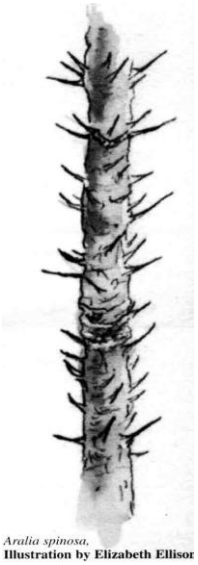
Let's bring this *A. spinosa* treatise to a conclusion by quoting Peattie yet again on another of *A. spinosa's* curious associations: "Back in the last century when trees were cultivated for their very grotesqueness, this strange, clumsy, disproportionate, at once pretentious and yet somehow insignificant little tree or tall shrub was in fashion. With the cast-iron mastiff on the lawn, the wooden gingerbread on the eaves, or if the mansion were stone-the castellations on the roof, a fine, flourishing, horrendous specimen of Hercules'-club produced an effect which might wake envy in the bosoms of less fortunate neighbors."

Unlike Peattie, I find *A. spinosa* to be a pretty item with uncommonly interesting botanical aspects and folk connections. Indeed, my wife and I wouldn't mind having a devil's walkingstick in the yard to go with our rooftop castellations and the iron mastiff.

(George Ellison is a naturalist and writer. His wife operates Elizabeth Ellison Watercolors on the town square in Bryson City, N.C. They can be contacted via www.georgellison.com or www.elizabethellisonwatercolors.com).

Reprinted from Chinquapin, the Newsletter of the Southern Appalachian Botanical Society, Winter 2002.





Book Review

Tom S. Cooperrider
Foreword by Hope Taft
Afterword by David E. Boufford
Botanical Essays From Kent
Observations on the Botanical Features of a University Town in Ohio

A leading Ohio botanist reflects on Kent's remarkable flora

During the latter half of the twentieth century, the world witnessed the rise of the modern environmental movement. Chronicling this significant occurrence in Ohio, and specifically in Kent, a university town in the American Midwest, Botanical Essays from Kent is a collection of writings and photographs that capture the spirit and excitement of botanical fieldwork during the 1960s, '70s, and '80s. Kent Bog, dedicated as a state nature preserve in 1987, is the book's focal point.

With personal narratives based on fifty years of experience, author Tom S. Cooperrider provides fascinating botanical tales on the study and conservation of Ohio flora, the Herrick Magnolia Garden, work of other local botanists, the protection of rare species and unique areas, such as Kent's tamarack bog, the discovery of lost plants, the survival of a famous cultivated tree, and the invasiveness of alien plant species.

Botanical Essays from Kent is a valuable addition to the understanding of local natural history and will be enjoyed by botanists, gardeners, and nature lovers alike.

"By turning the pages of this book and absorbing Tom's knowledge from its beautifully written passages, you will not only discover local history and fascinating information about plants, but also be drawn into the world of a botanist and have its secrets revealed in language every gardener can understand."—*Hope Taft, from the Foreword*

"Tom Cooperrider writes with the authority reflecting a lifetime devoted to the study of the world of Nature. He chooses his words carefully, inviting a closer look at wonders such as the Kent Bog, a living relic of the Ice Age that has somehow survived centuries of change in Northeast Ohio. His finely crafted portraits beckon readers

to appreciate a bounty of marvels that they might otherwise overlook." —*Roger J. DiPaolo, editor of the Kent-Ravenna Record-Courier*

A native Ohioan, Tom S. Cooperrider is a botanist, an expert on Ohio flora, and a professor emeritus of biological sciences at Kent State University. He has authored and coauthored numerous research articles and five books in the field of botany, including *Endangered and Threatened Plants of Ohio* and *Seventh Catalog of the Vascular Plants of Ohio*. Cooprrider is a Fellow of AAAS, the American Association for the Advancement of Science. Hope Taft is the former First Lady of Ohio and founder of the Ohio Heritage Garden at the Governor's residence. David E. Boufford is senior scientist at the Harvard University Herbaria.

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Illustrations, notes, index

A Floristic Inventory of Marco Island

Jean Roche, past President of the Native Plant Society of Northeastern Ohio has completed her latest project, a flora of Marcos Island, done with George Wilder. George was also a member of the NPS for many years and was president in 1992. He retired to Florida from the Botany dept at CSU. The article was published in the December 2009 *Journal of the Botanical Research Institute of Texas.*
To read the article go to:
http://www.brit.org/fileadmin/Publications/JBotResInstTexas_3_2/873-900_WilderRoche_MarcoIsland_JBRIT3_2__44.pdf

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Orchid Show Talking Points For Volunteers & Interested Staff

Tom Sampliner

Orchids are thought to have come into the world some 100 million years ago having diverged from their parent the lilies. Orchids are monocots, simply meaning that only one seed leaf appears upon germination of a new plant. Monocots share certain dependable traits such as parallel leaf venation and flower parts in an odd number. Dicots, on the other hand, have palmate or branching types of leaf venation. Other monocots, and therefore sharing some traits with orchids, would be: palms, iris, grasses, sedges, and the lilies from which orchids evolved.

Over time the orchids modified their structure and configuration to specialize a relationship with their pollinators. One trait is the union of the reproductive parts so that all grow off of a central column and a third petal, called a lip, which usually is different in configuration and/or color from the other petals. Orchids all have three flower parts, hence there are three sepals (the outermost petal-like whorl of parts) and the 3 petals, of which one, the aforementioned lip has become the different looking insect landing runway. This lip may be either lower- or uppermost of the flower parts. This is accomplished during bud maturation when the stalk each flower is on twists like a corkscrew – the process referred to as resupination.

Orchids grow from north of the Arctic Circle (six species) to the southern tip of South America at Tierra del Fuego. They can grow entirely in water, upon rocks, upon tree limbs, or in the ground as do all of Ohio's orchids.

Orchids can grow on sand dunes such as a species called *Epipactis dunensis* which grows near certain dwarf willow trees. Florida is home to a species growing in water, *Habenaria repens*, the water spider, which features small stalks loaded with tiny greenish-white finely cut flowers that can fill entire roadside ditches.

One of the world's tallest hails from Peru where *Sobralia altissima* can tower to 27-foot-high canes with 5- to 6-foot flowering stalks bearing 5" wide orchids. From Southeast Asia rivaled by another genus in Ecuador come the heaviest, some achieving a ton; *Grammatophyllum* sp. and *Cyrtopodium* sp., respectively. One of the smallest in the world (*Platystele jungermanniodes*) fits on the head of a pin.

Finally, having perhaps the most curious lifestyle are some Australian orchids that live their entire life cycle underground; one example is *Rhizanthella gardneri*. This was discovered during the last century when a farmer uncovered one plowing his wheat field. The entire plant has a pinkish cast with stem heavily bracted and tiny tubular flowers sitting in the same plane much like the head of a sunflower. They are pollinated by beetles.

Ohio has a rich orchid flora numbering in the upper 40's depending upon how one lumps or splits species. Compare this to Hawaii, which most lay folks think would be orchid paradise. However, it has only three native species, the wealth of others being introductions. Florida has the largest number of species topping 100. One epiphyte comes as far north as the Carolinas.

Orchids transport about the world sometimes by accident. During the last century, the tiny lawn orchid (*Zeuxine stratumatica*) came over in a shipment of ornamental centipede grass from China. After the civil war, a European orchid, the broad-leaved helleborine (*Epipactis helleborine*) appeared in upstate New York about 1869 and has spread all over eastern North America to the point I will call it the most common species here. In Hawaii, one sees tall bamboo-like canes featuring mostly purple but sometime white orchids all over. This is the Asian bamboo orchid (*Arundina bambusifolia*).

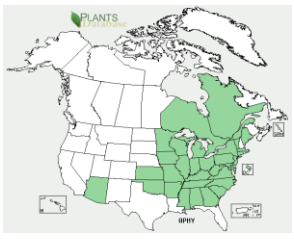
Orchids produce their dust-like seeds in pods. The seeds have neither a protective coating nor a nourishment pack (the endosperm) that most other seeds have. The orchid strategy is the shotgun approach producing light weight seeds for wind or water dispersion and the hope of finding both species-suitable substrate and a compatible mandatory fungal partner. The delicate balance with fungal symbiont is easily destroyed, one of the many reasons for not digging wild orchids to take home.

Ohio's native orchid season begins in May and runs until late October or the hard frost. Some of our natives put forth the most pleasant odors to attract pollinators while others are less desirable such as the helleborine mentioned earlier which attracts various wasps, especially yellow jackets.

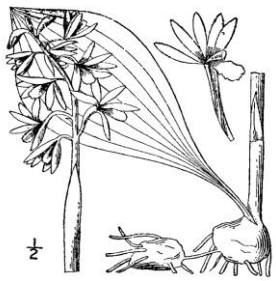
Not much herbal, culinary, medicinal or other use is documented for orchids. However, the commercial Vanilla orchid gives us the wonderful flavoring, and an Ohio native called puttyroot (*Aplectrum hyemale*) was collected and the corms crushed to make a glue or paste, hence the common name.

Tom Sampliner is a member of the Native Plant Society of Northeastern Ohio and a former Board Member.





Aplectrum-hyemale



A Duneland Carnivore

by Barbara Plampin

Nature celebrated July 4, 1976, by providing a spectacular and, apparently, never-repeated display: a broad river or ribbon of tiny, orchid-like Purple Bladderwort *(Utricularia purpurea)* which bisected the water lilies and other wetland plants in a certain Porter County lake. Monet couldn't have done better.

Whether aquatic, terrestrial, or amphibious, Bladderworts *(Lentibulariaceae)* fascinate me. Seven of the ten Indiana species state-listed Atlantic coastal plain disjuncts grow in the Dunes. Bladderworts, with their prominent lower lips and sometimes smaller upper lips and spurs or sacs atop stiff stalks resemble small purple or yellow orchids. Plants lack roots, may lie dormant for years, and are carnivorous. Fresh water crustaceans furnish the main part of their prey. *Bladder* designates the bubble-or bag-like trips growing amid the leaves; *wort* is Middle English for root or plant. Once, under my microscope, I saw a minute trap ingesting a minuscule pink shrimp!

Assertions that one can hear the traps operating appear to be incorrect. When a friend and I lifted a floating yellow Great Bladderwort *(U. vulgaris)* from still water and listened intently, we heard-nothing.

The leaves suffice to float the aquatics and anchor the terrestrials. To reproduce vegetatively, some leaves bunch themselves into tight little winter buds (turions) that may lie dormant for years until the right amount of moisture occurs. No one had ever noted Great Bladderwort in certain Lakeshore Blue Joint Grass meadows until the vigorous rains of 1991. Then we saw new lakes of sunshine yellow. Look for Bladderworts also in **pannes** (intradunal ponds formed where wind scoops out sand down to the water table), ponds, roadside ditches, and bogs).

Purple-white scraps of blossom characterize the extremely inconspicuous, self-pollinating form of Hair Bladderwort *(U. subulata).* Perhaps this species is the most challenging because its inch-tall, zig-zag, moss-fine stalks hide among much taller plants, including *Rhynchospora* species.

A possible accompaniment is the Toad Bug, a harmless insect which both looks like and hops like a toad. Be prepared to crawl about on hands and knees looking comical.

Books:

Deam, *Flora of Indiana;*
Gleason, *New Britton & Brown Illustrated Flora;*
Swink and Wilhelm, *Plants of the Chicago Region, Fourth Edition*; and
Yatskievych, *Field Guide to Indiana Wildflowers.*
Agnes Arber's *Water Plants,* a 1972 reprint of her 1920 book (ISBN 3 76820157 0) reports Central and South American Bladderworts growing in water collected by Bromeliads. One species boasts violet flowers atop yard-long stems.
J. and P. Pietropaolo's *Carnivorous Plants of the World* discusses cultivation.

Barbara Plampin is a trustee of the Shirley Heinze Environmental Fund, and a member of Save the Dunes Council. She has a Ph.D. in English literature from the University of Michigan. Botany has been her avocation all her life.

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Chapters of the Ohio Native Plant Society

Cincinnati Wildflower Preservation Society
Dr. Vic Soukup
338 Compton Road
Wyoming OH 45215
http://www.cincywildflower.org

Central Ohio Native Plant Society
Virginia Wagner
4897 East Walnut Street
Westerville, Ohio 43081

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
Mansfield OH 44904
419-774-0077
mklein1@neo.rr.com

The Native Plant Society of Northeastern Ohio
J. Bradt-Barnhart, President
10761 Pekin Road
Newbury OH 44065
440-564-9151
bunchberry1@windstream.net
http://www.NativePlantSocietyNEOhio.org

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- Promote cooperation with other programs and organizations concerned with the conservation of natural resources

On The Fringe

In this issue:

Wild Collecting Increases the Possibility of Extinction by Kathy Hanratty
Native Plant Gardening
Invasive Plants – Lesser Naiad and Curly Pondweed
Pretty Partridgeberry by Marielle Anzelone
Wild Geranium: A Crane's Bill by Gordon Mitchell
Wild Savory by Charles Kinsley
The Nature of Nectar by Niall Dunn
Return of the American Chestnut by Jim Durrell
Devil's Walking Stick by George Ellison
Book Review: Botanical Essays from Kent by Tom S. Cooperrider
A Floristic Inventory of Marco Island by Jean Roche and George Wilder
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A Duneland Carnivore by Barbara Plampin

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