COVID-19 Policy: The Missouri Native Plant Society has suspended all field trips and in-person meetings until further notice. Please check our website and Facebook page for updates.
https://monativeplants.org/ https://www.facebook.com/groups/MONPS/

PETAL PUSHER

May—June 2020 Newsletter of the Missouri Native Plant Society Volume 35 No.3
"… to promote the enjoyment, preservation, conservation, restoration, and study of the flora native to Missouri."

In this issue

Fruit

By John Oliver

What follows is a simplistic approach to a large topic. I hope it will provide a non-threatening, understandable account of the varied ways in which plants use flowers to produce seeds. I will try, and fail, to minimize technical jargon. Botanists describing plant structures have invented a bewildering number of terms to describe each type and its variations. Many of these terms are useful but taken as a whole can be overwhelming. I'll use native plants as examples but will also include some familiar non-native fruits as well.

In a general sense, a fruit is the result of successful flowering (where the flower has had a successful pollination). In a flower, the enlarged basal portion of the pistil, the female organ of a flower, is called an ovary. The ovary will mature into a fruit, either dry or fleshy, enclosing the seeds. The ovary contains ovules, which develop into seeds upon fertilization.

One way to begin organizing the fruits is to divide them into two large categories: dry and fleshy.

Fruit Types

Dry Fruits
1. Indehiscent, one-seeded
2. Dehiscent, multiple seeds

Fleshy Fruits
1. Simple—from flowers with one ovary
2. From flowers with multiple ovaries
   - Aggregate fruits from one flower with many ovaries
   - Multiple fruits from many tightly clustered flowers

Indehiscent Fruits: one-seeded dry fruits that do not split at maturity

Achene: one-seeded, seed separate from ovary wall. Technically a **cypsela**, which is an achene that originates from an inferior ovary and has a hairy pappus. (The pappus is the fluffy part of the dandelion fruit, consisting of highly modified sepals.)

Taraxacum officinale (dandelion)—Asteraceae

Ranunculus fascicularis (early buttercup)—Ranunculaceae

Nut: like the cypsela, a few other, more widely recognized one-seeded fruits are best understood as being modified achenes. A nut is like an achene, but larger, and the pericarp (ovary wall) is thick and hard.

Quercus macrocarpa (bur oak)—Fagaceae

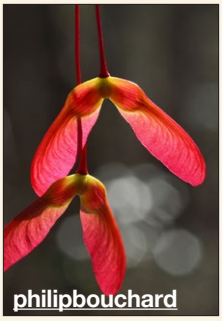
A **GRAIN** is like an achene, but the pericarp (ovary wall) is papery-thin and tightly adherent to the seed. The fruits of the grass family (Poaceae) form the basis of practically all agricultural economies, as rice, corn, barley, oats, wheat, and millet.

A **SAMARA** is an achene with a wing, enabling dispersal by the wind. The whirlybird-helicopter fruits of ash, elm, and maple are familiar examples of samaras.

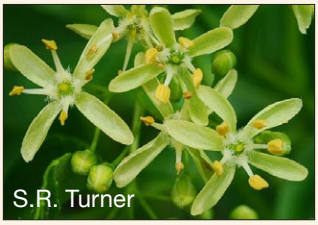
Acer negundo (box elder)

A. saccharinum (silver maple)

A. saccharum (sugar maple)

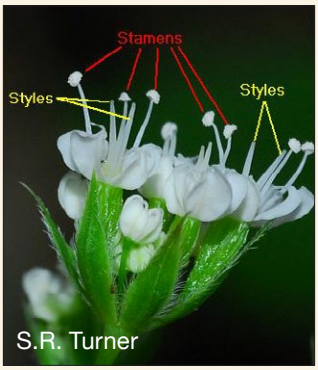


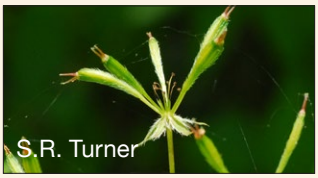
A. rubrum (red maple)



Ptelea trifoliata (hop tree or wafer ash)—Rutaceae

In the plant family Apiaceae, the gynoecium (female part of the flower) is syncarpous, with two joined carpels, each of which contains a single ovule (seed). At maturity, the sweet-cicely fruit is a **SCHIZOCARP** that separates into achene-like, one-seeded "mericarps." Each carpel continues to enclose its seed, but the carpels separate from one another.





Osmorhiza longistylis (sweet cicely)—Apiaceae

One place to see illustrations of these structures is in the spice aisle at the grocery store.

Dry Fruits

Dry fruits may consist of either a single seed or **ACHENE** which does not split at maturity (indehiscent) or ones with multiple seeds that are dehiscent and split into one-seeded segments at maturity along a seam or seams. In the first category are plants that produce individual seeds not connected to the ovary wall.

Indehiscent Fruits

A **NUT** is a fruit composed of an inedible hard shell and a seed, which is generally edible. In general usage, a wide variety of dried seeds are called nuts, but in a botanical context "nut" implies that the shell is indehiscent (does not open to release the seed). There are several plant families with species that produce nuts, such as Fagaceae which includes Beech (genus *Fagus*), Chestnut (genus *Castanea*), Oak (genus *Quercus*), and Betulaceae, which includes Hazels and Filberts (genus *Corylus*) and hornbeams (genus *Carpinus*). Other "nuts" like Walnuts and Hickories (Juglandaceae) have fruits that are awkward to classify. They are considered to be nuts under some definitions but are also referred to as drupaceous nuts. **Tryma** is a specialized term for hickory fruits. See also the section on drupes.

GRAINS, here defined as seed of members of the grass family (Poaceae), have small, hard, dry seeds, with or without an attached hull or fruit layer, sometimes called a **caryopsis**, a type of simple dry fruit—one that is monocarpellate (formed from a single carpel) and indehiscent (not opening at maturity) and resembles an achene, except that in a caryopsis the pericarp is fused with the thin seed coat

A **SAMARA** is a winged achene, a type of fruit in which a flattened wing of papery tissue develops from the ovary wall. A samara is a simple dry fruit and indehiscent (not opening along a seam). The shape of a samara enables the wind to carry the seed farther away than regular seeds from the parent tree and is thus a form of anemochory (which is botany speak for seed or spore dispersal by the wind). In some cases, the seed is in the center of the wing, as in tree of heaven (*Ailanthus altissima*), the elms (genus *Ulmus*), and the hoptree (*Ptelea trifoliata*). In other cases, the seed is on one side, with the wing extending to the other side, making the seed autorotate as it falls, as in the maples (genus *Acer*) and ash trees (genus *Fraxinus*).

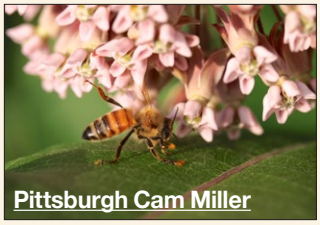
Dehiscent Fruits: several to many seeded, splitting at maturity

In the fabulous Fabaceae family, the characteristic fruit type is a fairly simple one, the **LEGUME**, a dry fruit derived from a unicarpellate gynoecium that splits along two lines or sutures.

Senna marilandica (wild senna)—Fabaceae

The best example of a **FOLLICLE**, is the milkweed pod. (Pod, by the way, is not any particular type of fruit.)

Milkweed flower anatomy and pollination ecology are special. The pollen, instead of being distributed as individual grains, is carried as packets consisting of an entire stamen's worth of pollen. Called pollinia, the pollen packets are snagged inadvertently by bees or butterflies sipping nectar from the flower's bowl-like "hoods" and then carried saddlebag-like to a subsequently visited flower.



Asclepias syriaca (common milkweed) –Asclepiadaceae

Follicle: unicarpellate, splits along one side

As shown in this cross-section, each milkweed flower has two ovaries. It is believed that 3 stigmas serve one ovary, and two serve another. Thus it is possible for a flower to have both ovaries pollinated and both may develop into follicles. Two fruits from one flower!

An example of such "twin" fruits on *Asclepias syriaca* (common milkweed), Note that, on the left, the two follicles are attached to a single pedicel (flower stalk) whereas on the right, the two fruits are simply from separate flowers within the same umbel (flower cluster).

The most widespread dry fruit is the **CAPSULE**. Capsules are derived from a syncarpus gynoecium (more than one carpel) and they split open to release their seeds. Capsules can split in various ways and are often sub-categorized on that basis (picky-picky!).

Silene regia (royal catchfly)—Caryophyllaceae

This is an example of a *septicidal* capsule, i.e., one that splits along the plane of carpel union. (Other ways a capsule might split are longitudinally, or by pores at the top.)

A **SILIQUE** is a special capsule found only in the mustard family (Brassicaceae). The distinction is internal. There's usually a papery partition inside that divides the fruit into two chambers that runs across the two carpels of which the fruit is composed.

Alliaria petiolata (garlic mustard)—Brassicaceae

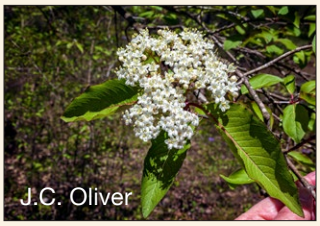
Simple Fleshy Fruits: from a flower with one ovary

Fleshy fruits are categorized, in part, according to whether all of the fruit is fleshy, or instead there are bony or leathery parts. A **BERRY** is the fleshiest of the fleshy, with the outer covering (exocarp), mid-section (mesocarp) and closely seed-surrounding center (endocarp) all being soft and digestible. Berries can be one or several-seeded. Edibility may vary among animal species. Raw pokeweed berries for example, are toxic to humans, delicious to birds.

Phytolacca americana (pokeweed)—Phytolaccaceae

Other plants which in botanical terms produce berries, include avocadoes, bananas, blueberries, currants, elderberries, gooseberries, grapes, persimmons, kiwi fruit, May apples, peppers and tomatoes.

Another very important, widespread fleshy fruit is the **DRUPE,** also known as a "stone fruit," is fleshy nearly throughout, except that it has a "pit," i.e., a thick bony endocarp surrounding a single seed in the center. Not only the peach, but also the cherry, plum, and almond are familiar drupes that happen to all be within the same genus, *Prunus* (family Rosaceae).



Viburnum prunifolium (blackhaw)—Caprifoliaceae

Drupe-producing plants are quite varied, and include *Lonicera* (honeysuckle), *Sambucus* (elderberry), coffee, mango, olives, and even *Carya* (Hickory nuts and pecans), and *Juglans* (walnuts) are specialized drupes.

The **PEPO** is a fruit type found in only one plant family, the gourd family (Cucurbitaceae). The pepo (gourd) is essentially a berry with a somewhat thickened rind having an inferior ovary and a peculiar way the seeds are attached inside the fruit, termed "parietal placentation". Pumpkin, various squash, watermelon, cantaloupes, and cucumber are household examples.

Leaf

Staminate flowers

Pistilate flowers

Fruit

Sicyos angulata (bur cucumber)—Cucurbitaceae

Aggregates and multiples: derived from several to many ovaries

Aggregate fruits have *two* main features:

- The flower producing them has more than one simple pistil
- The maturing pistils stick together and behave as a single fruit

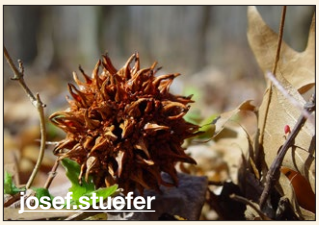
AGGREGATE FRUITS are clusters of small fruits derived from the separate carpels of a single (apocarpous) flower. Since aggregate fruits and multiple fruits are clusters of some other fruits, it isn't enough to say simply that something is an aggregate fruit or a multiple fruit; you have to actually say what fruitlets it is an aggregate or multiple *of*. The raspberry is an aggregate of "drupelets" (little drupes).

Rubus argutus (highbush blackberry)—Rosaceae

Rubus occidentalis (black raspberry)

MULTIPLE FRUITS can be traced back to separate flowers themselves tightly bunched in a head-like flower cluster ("capitulum" inflorescence type). Sweetgum produces inch-wide spiny balls that fall to the ground specifically to annoy people.

Other multiple fruits: mulberries, pineapples, sycamore, Osage orange, breadfruit



Liquidambar styraciflua (sweetgum)—Altingiaceae

In maples, the shape of the samaras and the timing of their production provides a valuable clue as to the species. *Acer negundo* (box elder) produces seeds in early summer which often remain on the tree over winter. *A. saccharinum* (silver maple) flowers as early as January and drops its seeds from April to June. *A. rubrum* (red maple) produces seeds in May and June which are usually red. *A. saccharum* (sugar maple) has reddish brown samaras produced in late summer from August to October.

In the Apiaceae (carrot family), in Geraniaceae (genus *Geranium*) and some others, fruits are **SCHIZOCARPS**, which contain two or more mericarps each with a single seed. These can open to expose (or sometimes eject) the achene-like seeds.

Dehiscent Fruits

A second type of dry fruit is formed when flowers with many ovules produce multiple seeds encased in a containing structure which opens at maturity by a process called dehiscence. Again, this may take several forms.

Simple Fleshy Fruit

As a simple fruit, a **BERRY** is derived from a single ovary of an individual flower. **DRUPES** are fleshy fruits with a hard inner layer (endocarp or stone) surrounding the seed. And a **PEPO** is an indehiscent fleshy one-celled many-seeded berry (such as a pumpkin, squash, melon, or cucumber) that has a hard rind and is the characteristic fruit of the gourd family.

A **MULTIPLE FRUIT** is one formed from carpels derived from several flowers, such as a pineapple.

AGGREGATE FRUITS are formed from several carpels derived from the same flower, e.g. a raspberry.

An **ACCESSORY FRUIT** is a fleshy fruit that includes some other part of the flower in addition to that which is derived from the ovary. Accessory fruits are usually indehiscent. A special form of accessory fruit is the **POME**—an accessory fruit composed of one or more carpels surrounded by accessory tissue. The accessory tissue is interpreted by some specialists as an extension of the receptacle and is then referred to

Accessory Fruits: derived from more than ovary tissue alone

Fruit type: **POME**, (example: an apple or pear), is the characteristic fruit of just one subfamily (Pomoidea) of the rose family (Rosaceae). It is derived from an inferior ovary (hence the accurate distinction between the "stem end" and the "blossom end" of an apple) which is the "core" deep inside all the delicious fleshiness. The fleshy part of the pome is the hypanthium.

Amelanchier arborea (service berry, shadbush)—Rosaceae

Enlarged hypanthium surrounds the ovary (Forms the "core" of the mature fruit.)

ACCESSORY FRUIT: Found only in two genera in the rose family (*Fragaria* and *Duchesnia*). Strawberries turn the notion of a fruit inside-out! The strawberry flower is a typical rose family bloom: regular symmetry, separate flower parts (except for a small hypanthium), and most importantly, an apocarpous gynoecium with many spirally inserted carpels sitting on a thimble-shaped base called the **receptacle**.

When the strawberry progresses into the fruiting stage, the receptacle becomes swollen and fleshy while the *actual* fruits, single-seeded ACHENES, remain attached, sunken into small pits on the surface of the receptacle.

Fragaria virginiana (wild strawberry)—Rosaceae

as "fruit cortex", and by others as a fused hypanthium. It is the most edible and commonly consumed part of this fruit.

Throughout this article, I've relied heavily on the photographs from **MissouriPlants.com**. This amazing resource had its start in a project started by a gifted young botanist named **Dan Tenaglia**. His dream was to provide an online resource for the identification of all Missouri plant species, with detailed photos showing them growing in the wild, as well as closeups of leaves flowers, fruits, and concise descriptions of their morphology. Unfortunately, Dan's life was cut short by a tragic bike accident, and the project stalled. More recently, the Missouri Botanical Garden gained control of his website and photos and has added to the list of species and quality of photos, updating names to match the current taxonomic standard. Much of the work on these improvements is due to the hard work of **Steve Turner**, an expert photographer, MONPS member, and a specialist on Missouri botany. You'll find many of their pictures in this article, credited to them. I encourage you to visit the website and to bookmark it for your future use. Thanks to Steve and the Garden for their generosity and assistance.

Last Chance to Nominate Someone for a Missouri Native Plant Society Award!

Nominations Due July 1

Do you know a person or organization in Missouri who has gone above and beyond for native plants? Please consider nominating them for a Missouri Native Plant Society Award! MONPS offers six awards for various aspects of supporting our native flora:

1. **Erna Eisendrath Memorial Education Award**, recognizing individuals who, through teaching, writing, or other activity have conveyed to others a significant appreciation and knowledge of Missouri's native flora.
2. **Arthur Christ Research Award**, recognizing an individual's significant contribution in furthering the knowledge of Missouri flora.
3. **Plant Stewardship Award**, recognizing an individual or organization for the preservation of important elements of Missouri's flora through purchase, registry, and/or management practice.
4. **The John E. Wylie Award**, recognizing individuals who have provided exceptional service to the Society.
5. **Plant Conservation Award**, recognizing an individual or organization for outstanding contributions to the conservation or preservation of native plants or plant communities in Missouri. This award differs from the Plant Stewardship Award in that it is not tied to direct acquisition or management of tracts of land, but instead may recognize various types of outstanding achievements or efforts, such as conservation planning, advocacy, or new ways of looking at old problems.

Elderberry Blossom Wine

Recipe from Matt & Lina Perun, given to Casey Burks by Dan Henehan

- 1 quart elderberry blossoms (petals only)
- 9 pounds granulated sugar
- 1 package wine yeast
- ½ cup lemon juice
- 3 gallons water
- 3 pounds raisins

Place blossoms in a brown grocery bag and let dry for 24 hours. Then, shake the stems gently to release blossoms. Place blossoms in a colander with small holes, and gently shake to remove seeds. Pour cleaned blossoms in a one-quart jar packing down to make a solid quart. The blossoms may be refrigerated overnight if you need to gather more the next day.

Bring 3 gallons of water to a boil. Stir in sugar until dissolved. Boil 5 minutes, then stir in 1 quart of blossoms. Remove from heat and let cool. When lukewarm, add lemon juice and yeast that has been dissolved in ½ cup water. Pour into a 5 or 6 gallon crock.

Keep in a cool place for 6 days stirring 3 times per day to bring blossoms up from the bottom. Keep covered with a clean cloth. On the seventh day, strain through a cloth to remove all blossoms. Pour the liquid into 4 one-gallon jars with screw tops. Divide the raisins into the 4 jars. Cap loosely and store in a dark, cool place for 6 months.

After 6 months, strain off the raisins and strain again to remove any residue. At this time, you can pour into bottles or leave in the gallon jars and use as needed.

Note from Casey: I've made this recipe four years in a row and never had a flop. Makes great Christmas gifts.

Cut out and add to your recipes!

6. **Julian A. Steyermark Award**, the Society's highest award, given to an individual who has made outstanding contributions to any and all aspects of Missouri botany.

The deadline for nominations is July 1. Your written nomination should contain the full name of the nominee and the name of the person making the nomination, and they should describe the contributions of the individual or organization that merits recognition. Award recipients need not be members of MONPS.

Please submit nominations to Awards Committee Chairwoman, Michelle Bowe. Department of Biology, Missouri State University, 901 S National Ave, Springfield MO 65897, mbowe@missouristate.edu.

From the Editor

From Geoffrey Chaucer's *The Canterbury Tales*:

> Whan that Aprille with his shoures soote,
> The droghte of March hath perced to the roote,
> And bathed every veyne in swich licóur
> Of which vertú engendred is the flour;

Translated:

> When April with his showers sweet with fruit
> The drought of March has pierced unto the root
> And bathed each vein with liquor that has power
> To generate therein and sire the flower;

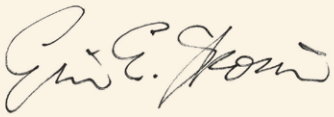
Chaucer, Geoffrey, and John Urban Nicholson. *Canterbury Tales, Rendered into Modern English.* Garden City Pub. Co., 1934.

Every April, as I watch the endless showers, I recite the prologue of *The Canterbury Tales*. In May are born the flowers, which, if successful, produce fruit. These fruits nourish us as well as rely on us and other animals for their ultimate genetic dispersal.

Many of us are watching from our windows this year as the sweet liquor of xylem and phloem spreads into leaf veins, inflates flowers, and incites the fruiting process. In spite of humanity's struggles, our flowering plants continue with the ebb and flow of seasons to produce new life.

Thanks to Michelle Bowe, Dana Thomas, Malissa Briggler, the board, and all of the authors who made this issue possible.

Sincerely,



Erin Skornia, *Petal Pusher* Guest Editor

Almost Fruit, but Fertile

By Justin Thomas

Hunting through the underbush. Dodging the predators that hunt me. Hot on the scent and heavy with the deed, I duck under a limb and scamper into the camouflaged comfort of leaves. I peer out with an intensely pluralistic awareness of the world around me—I see it all. There, in a spot of sun, shines the object of my affection—a bulbous, gray-green, boulder of fruit half or more the size of my body. Enraptured by the act, I drag it home where I strip off its edible skin and discard its hard, inedible center into the garbage heaps—the middens surrounding our encampment. A feast ensues. Other sisters arrive dragging their ornate and delicious finds. A large, flat, bowl-shaped object with a slightly forked beak. It is variegated with shades of green. Next, a spherical bodied beauty with a long conical appendage. And lastly, the highly-prized, purple-streaked, sponge-bottomed, fruit of all our affections. As I begin to caress its fecundity with my antennae and tear into it with my mandibles, I startle awake, with a flooding awareness that I am me, at home, in my chair. The lateness of the night, and the deprivation from sleep, having sneaked upon me as I pored over diagnostic keys to the sedge specimens before me. Glancing down I cannot explain, for I have no memory, how each has been mysteriously identified. *Carex umbellata, Carex molesta, Carex jamesii,* and *Carex retroflexa.*

Perigynium (pronounced as "pair-uh-jén-ee-um") is the term for the decorative and stylized bract that completely ensconces the achene (one-seeded, hard-hulled fruit) of the sedge genus we call *Carex*. We most often discuss the perigynium in the plural tense "perigynia", which may seem like foreign wordplay, but we do the same with such Latin or Greek words as addendum to addenda, datum to data, memorandum to memoranda, minimum to minima, moratorium to moratoria, referendum to referenda, and as one could do with aquaria, gymnasia.

Perigynia appear to be fruits, but they are not. Rather, each contains a fruit. When you break the word down into its parts you have "peri" which means "surrounding"—as in perimeter—and gynia(um) which refers to the female flower. So, literally "surrounding the female flower". Perigynia are sort of a surrogate for fruit, in that they do what fruit does, but instead of coming from ovary tissue, they are derived from a modified bract beneath the female flower. As such, the morphology of the perigynium becomes the plaything of natural selection likely through the discerning eyes of insect dispersers like ants.

Carex grayi (Photo by Nathan Aaron)

Given that *Carex* is the largest genus of plants in eastern North America, and because you could pretty much define all our natural community types and conditions by the *Carex* found within them, they're kind of a big deal. There are 146 recognized expressions ("species") of *Carex* in Missouri, including two hybrids. There are roughly 400 species in eastern North America and 2-3000 worldwide. Being sedges, their vegetative bodies are rather grass-like and quite non-descript to the layperson. Even professional caricologists (one who studies sedges) must rely heavily, almost exclusively, on the unique expressions of shape, size, and color of perigynia to classify each uniquely patterned species of *Carex*.

Loving *Carex* is a matter of scaled appreciation. You must get small, like the ant, and look out from your compound eyes to see the deep beauty and high fashion, the sartorial splendor of perigynia expressions. There, one finds but another key to a library of nature's complexly creative and functional forces. Forces that manifest in smooth or saw-toothed beaks, impressed or expressed veins, trigonous or lenticular bodies, and a series of possible venation patterns of ventral and dorsal orientations all subsumed in spikes in various gender-plural combinations. There is a poetry to perigynia, first in their form, then in the words we use to describe the reality, the nature, that each of their stories tell. As in nature, we are compelled to tell these stories with words derived from the intensely magical and mysterious forms they show us are possible.

Carex meadii (Photo by Nathan Aaron)

Carex jamesii (Photo by Nathan Aaron)

Remembering Linda Susan Ellis

June 27, 1951—March 3, 2020

Linda was leading the two-year long plant survey at Valley Water Mill when one of the group saw a yellow flower that wasn't a buttercup. She recognized it immediately as a bladderpod.

By Barbara Kipfer

Just before our world became captive to a pandemic virus, a very special friend, Linda Ellis, quietly left us after a long illness. Linda was an amazing and knowledgeable botanist and artist, freely and cheerfully sharing her knowledge and talent with others. She was a member of, and resource for the Southwest Chapter of the Missouri Native Plant Society, Arkansas Native Plant Society, Idalia Society of Mid-American Lepidopterists, Springfield Plateau Chapter of Missouri Master Naturalists and the Missouri Archeological Society.

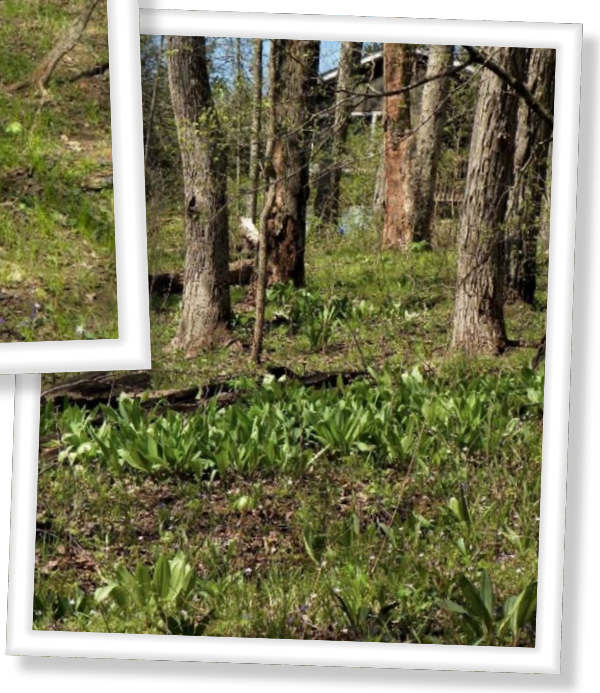
She participated in many botanical and natural history field studies throughout the Ozarks. Linda was a great companion on a native plant "walk." Actually, there was far more stopping, carefully examining, teaching others, lying down for a photo, and sometimes taking a sample for identification, that it was very slow walking indeed. She stooped so long and often over a plant, I gave her the title, "My Favorite Bottomist," instead of botanist.

Her talent as an artist and botanical illustrator was exceptional. For proof pull out your three-volume set of *Steyermark's Flora of Missouri* and enjoy many drawings by L.S.E. Linda's talent can also be seen in her illustrations in *Projectile Points of Missouri and Portions of Adjacent States* by Jack Ray of M.S.U. Center for Archeological Research.

What can't be seen are her spirit, wit, and sense of humor. We miss all these and the ability to remember them with her friends and loved ones. Meanwhile we will wear the T-shirts Linda designed for the Master Naturalists and Center for Archeological Research and think of her many gifts.

Chapter Updates

An update from our January fire workshop activity. This is what the area looks like now.



Hawthorn

Submitted by Michelle Pruitt, Chapter Representative

At our March 9th meeting, Danielle Fox (Community Conservationist in the Columbia City Sustainability Office) reviewed history and future plans for cost cutting and environmental sustainability through the incorporation of native vegetation in Columbia. Danielle's position includes education, personal mentoring, public speaking, alien species removal, habitat restoration, and coordination of planning, permits, funding, and management among several different departments. She consults with schools and homeowners about planning native gardens that comply with the upgraded weed ordinance. She coordinates the hiring of ecological consultants to execute plans for restoration of about 83 acres along city roadsides. Danielle directs restoration projects at Gans Creek Recreation Area, Twin Lakes Park, and the MKT Trail. In about three to four years when the native acreages are growing, her data shows it will save Columbia $250-300,000 per year in mowing expenses along roadsides as well as providing significant reductions in carbon emissions and increased habitat for small wildlife and insects.

During the stay-at-home order and in spite of all our public plant sales being cancelled, the Hawthorn Chapter nursery has disbursed approximately 700 new native plants for gardens while maintaining social distancing. There is also a contest to cut the most aliens during the month of April. The winner gets ten plants and second place gets four plants. We also encourage members to stay busy by sending out links to virtual educational and social opportunities focused on native plants.

Videos and Podcasts

Deep Roots KC Virtual Series:
Live events are Tuesdays and Thursdays at 4:00 p.m., and video recordings are available. Topics include: Help your pollinators reproduce, Finding Stress Relief in the Garden, Starting Native Gardens from Scratch. https://deeprootskc.org/stayhomekc/

Natural Areas Association Webinar Series:
Topics include: Assessing the Nation's Native Seed Supply, Invasive Species Control Using Goats.
https://www.naturalareas.org/webinars.php

Missouri Prairie Foundation YouTube Series:
Topics include: How to Create a Native Container Garden with Mervin Wallace of Missouri Wildflowers Nursery, Carol Davit's TED Talk "Why Prairie Matters—New Relevancies of a Vanishing Landscape."
https://www.youtube.com/channel/UCwRTOCg02RJINQ8w5LiQREQ

Native Plant Conservation Campaign:
View entomologist and author Doug Tallamy's recent video.
https://vimeo.com/396957344

Hometown Habitat feature film virtual screenings:
https://themeadowproject.com/hometown-habitat/

Social Media/Citizen Science

iNaturalist.org:
Install the app on your smart phone, and you can upload your plant observations and help others identify theirs on the go. "Missions" displays a list of plants you are likely to see based on your location.
https://www.inaturalist.org/

Track leaf-out on Journey North:
Also tracks hummingbird and monarch migrations each year.
https://journeynorth.org/

Facebook groups

Missouri Native Plant Society
MONPS has helpful experts who will help you ID plants if you upload a photo. The discussion is limited to natives, not general gardening questions.
https://www.facebook.com/groups/MONPS/

Missouri Prairie Foundation
https://www.facebook.com/MOPrairie/

Grow Native!
https://www.facebook.com/grownativemidwest/

Native Plant Conservation Campaign
https://www.facebook.com/plantsocieties/

Instagram hashtags

https://www.instagram.com
#missourinativeplants #grownative #moprairie

Plant ID and selection

Native Plant Finder
From the National Wildlife Federation: As simple as entering your zip code, the Native Plant Finder displays lists of flowers and grasses, and trees and shrubs ranked by the number of butterfly and moth species that use them as host plants for their caterpillars:
https://www.nwf.org/NativePlantFinder/Plants

Grow Native! Plant Picker:
From the Missouri Prairie Foundation, choose your criteria and the plant picker will suggest plants:
https://grownative.org/native-plant-info/plant-picker/

Lady Bird Johnson Wildflower Center Native Plant Database:
Lady Bird Johnson Wildflower Center is located at the University of Texas at Austin. The Native Plant Database is useful for locations across the country:
https://www.wildflower.org/plants/

Biota of North America Project (BONAP):
You may have seen range maps from BONAP on native plant nursery sites but the site has multiple resources:
http://bonap.org/

Wildflower Search:
This website helps those of us with limited knowledge of botany to identify plants that are found outside of gardens. This help is provided by presenting you with small images of plants. You can use many search techniques to get to the images that are most likely the plant you are looking for. When you click on a plant image the program shows you links to plant descriptions and more plant images. This site has many ways of searching for a plant.

A crowd-sourced site that includes detailed information about when and where the plant was seen. Not strictly natives:

https://www.wildflowersearch.org/

USGS Land Cover Viewer:
This ArcGIS tool may seem intimidating at first, but you can use the map to view the types of land cover at or near your home, and make an educated guess about what plants would have been there historically by examining nearby "green areas" on the map that may not be as developed as your residential neighborhood:
https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/introduction-land-cover-viewer?qt-science_center_objects=0#qt-science_center_objects

Missouri Plants:
MissouriPlants.com is a user-friendly collection of vascular plants in Missouri curated by the Missouri Native Plant Society. You can easily identify species by flower color or leaf arrangement, and you can view very helpful photos with identifying characters.
http://missouriplants.com/

AmazonSmile Donates to MONPS When You Shop!

AmazonSmile is an easy way to support MONPS. Every time you shop on smile.amazon.com, the AmazonSmile Foundation donates 0.5% of your purchase of eligible products to MONPS.

Simply visit smile.amazon.com and search for Missouri Native Plant Society Inc. After you finish shopping, Amazon will automatically donate to MONPS. You may also click the AmazonSmile link on monativeplants.org.

Make sure to navigate to smile.amazon.com each time you shop. The default amazon.com will not result in a donation, and your smart phone application may not support AmazonSmile.

Visit About AmazonSmile to read more about the AmazonSmile Foundation.

amazonsmile

Saint Louis

Submitted by Rick Gray, Chapter President

On February 26th, Cal Maginel, Natural History Biologist with the Missouri Department of Conservation, St. Louis Regional Office gave a presentation on conclusions drawn from several studies on the effects of long-term fire management in the Missouri Ozarks.

Meetings are held at the Sunset Hills Community Center, 3915 S. Lindbergh Blvd., St. Louis, Missouri 63127. Activities begin at 7:30 pm or join the speaker for dinner at 5:30 pm.

However, further meetings and activities have been suspended until further notice due to the coronavirus outbreak.

Mill Park Native Plant Sale

WATERSHED COMMITTEE OF THE OZARKS

The Watershed Committee of the Ozarks (WCO) is partnering with the Missouri Prairie Foundation to host a native plant sale to be held **May 30th at Valley Water Mill Park**. This year's sale is being modified to accommodate pre-orders with purchased plants available for pickup via drive through. While the list of participating vendors is still being finalized, plants available through the WCO's Watershed Natives program may be pre-ordered by visiting their store at https://watershedcommittee.org/store/.

Purchasing Watershed Natives not only benefits our watersheds and wildlife, but also promotes our educational programs. In a unique collaboration between WCO and Springfield Public Schools, students involved in the Environmental Resource Management College & Careers Pathway and Future Farmers of America are directly involved in the production and restoration efforts involving native plants. More information about these programs can be found at the Watershed Natives' site.

New Members

St. Louis
Alisa Blatter, St. Louis

Columbia
Erin Skornia, Jefferson City

State Level Membership
Mark Brase, Wentzville

Dues are Due

By Ann Earley, Membership Chair

Membership renewals for the July 2020–June 2021 year are due. If you receive your newsletter by postal service delivery, please check the top line of your mailing label. If it shows the date 20200630, your dues are now payable. When renewing, please remember to include your contact information **including email address**, and your society and chapter dues preferences. Membership renewal online is also available via our website at **www.monativeplants.org** which offers the option of online payment via PayPal.

For those members receiving their newsletter by email without a mailing label, or for others with questions about their membership status, please contact me or your chapter representative (see back page for contact details) for information about your membership expiration date. We value our members and urge you to renew today!

Jim Long's Sweet Golden Cupcakes

- 2 cups flour
- 3 to 4 tablespoons goldenrod flowers (I use elm-leaved goldenrod, *Solidago ulmifolia*.)
- 1½ cups sugar
- ½ cup butter
- 1 cup milk
- 3½ teaspoons baking powder
- 1 teaspoon salt
- ½ teaspoon vanilla
- 3 eggs
- Makes 9 cupcakes

Combine goldenrod flowers and flour in a food processor and process a few seconds. Set aside.

Cream the butter and sugar in the food processor. Then add eggs and remaining ingredients. Blend just enough to combine well.

Pour into cupcake containers and bake 35–40 minutes in a 350 °F oven.

Top with whipped cream or powdered sugar for a delicious treat from Mother Nature.

Cut out and add to your recipes!

Join Us! Become a New Member or Renew

You may become a member online at https://monativeplants.org/membership/, or you may fill out this form and mail to:

Missouri Native Plant Society
PO BOX 440353
St. Louis, MO 63144-4353

First Name _____ Last Name _____

Street _____

City, State ZIP Code _____

Phone _____ E-mail _____

Company/Organization _____

Membership Status

Choose one: ❑ New member ❑ Returning member

State Membership

(Choose one):

❑ Student ($5.00)
❑ Regular ($10.00)
❑ Contributing ($20.00)
❑ Life ($200.00)

Chapter Membership

In addition to society dues:

❑ Empire Prairie (Saint Joseph) (+$5.00)
❑ Hawthorn (Columbia) (+$6.00)
❑ Kansas City (+$5.00)
❑ Osage Plains (Clinton) (+$5.00)
❑ Ozarks (West Plains) (+$5.00)
❑ Paradoxa (Rolla) (+$5.00)
❑ Perennis (Cape Girardeau) (+$5.00)
❑ Saint Louis (+$5.00)
❑ Southwest (Springfield) (+$5.00)
❑ None

Optional Contributions:

Hudson Fund:

I wish to donate an extra amount to the Hudson Research Grant Fund.

$_____

Other Contribution:

I wish to donate an extra amount to general Society business.

$_____

Newsletter Delivery:

❑ I wish to receive the complimentary email newsletter

❑ I wish to receive my newsletter by postal mail (+$10.00)

Total Membership/Donation Amount: $_____

Make check payable to: Missouri Native Plant Society

Missouri Native Plant Society
PO BOX 440353
St Louis, MO 63144-4353
monativeplantsociety.org
monativeplants.org

Please Recycle

RETURN SERVICE REQUESTED

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

—Aldo Leopold