



Mississippi Native Plants and Environmental Education

Newsletter of The Mississippi Native Plants Society and the Mississippi Environmental Education Alliance



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Christmas, when family and friends warm the climate!

Winter 2015

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Don't Let the Grinch Steal Your Christmas!

by Re-C Carter, Ed. S. Mississippi State University Extension

Every *Who* down in *Whoville* liked Christmas a lot, but as we know the Grinch did not. Do you find yourself being a little bit like the Grinch, not caring for the noisy festivities of the holiday season? Maybe it's because you've not solved this puzzling thing called Christmas. Christmas comes without ribbons or tags, packages, boxes or bags. Yes, this puzzling thing doesn't come from the store at all. The true Christmas is created at your home and comes from within, not the mall! As you're figuring out this puzzling thing called Christmas, consider adding a touch of science to enhance those happy memories. After all, every *Who* down in *Whoville* is happy, creating a place where *Who* doesn't...

...like the smell and festive presence of a live Christmas tree like Cindy Lou? How long the festive spirit stays depends upon the caregiver. Mix together a little concoction to prolong the life of your tree while promoting healthy branches. Combine one gallon of water, one can of acidic soft drink (Sprite or 7-up), and 4 teaspoons of bleach (Clorox). Pour the concoction into the tree stand and check throughout the holidays, refilling as necessary. The solution can be stored in the refrigerator for two weeks. (Safety: Not for animal or human consumption. Take safety measures such as labeling the bottle of solution.)

...think there's something magical about Santa's milk? Pour enough whole milk to cover the bottom a pie dish. Dash a few sprinkles of red or green glitter on top of the milk (optional). Add small drops of food coloring to the outer edges of the pie dish. Drip one drop of dish soap in the center of the milk. Even the Grinch would be amazed as the colors begin to swirl—MAGIC!

...dream of a white Christmas? Maybe this isn't like the "ones you used to know" but can certainly add some holiday cheer. With adult supervision, mix three tablespoons of Borax (one TBSP at a time) to one cup of boiling water. Allow Borax to dissolve. Fill wide-mouth jars with the mixture and set aside. Twist white pipe cleaners into six-sided snowflake shapes. Tie one end of a string to one side of the snowflake and the other end to a pencil. Place the pencil across the mouth of the jar and allow the pipe cleaner snowflake to hang into the Borax solution. Put the jars in an out-of-the-way place so they won't be disturbed. Take a peek occasionally to see how your crystal snowflakes are developing. After snowflakes have crystallized, use them to decorate the tree.

...wonder how Santa gets down the chimney? This fun experiment demonstrates Newton's first law of motion, maybe with a little anxiety, but exciting none the less. Fill a glass two-thirds full of water. Position a metal pie pan on top of the glass of water. Be strategic in placing an emptied toilet paper tube or paper towel tube in the center of the pan. Place an egg on the top of the tube. Using a good swing of the hand, hit the edge of the pie pan horizontally. Plop, down comes the egg right into the glass of water. No sack of goodies for the "good boys and girls," but what a splash of holiday cheer!

...want to make the Grinch's heart grow larger? Add one cup of 6% hydrogen peroxide (found in salon stores like Sally's) with a few drops of red food coloring and a generous squirt of dish soap in a large plastic soda bottle. Take the wrapping off of bottle prior to so it will be more visible. Place the bottle on a cookie sheet or similar pan to catch the overflow. This is fun, but messy! Mix the solution by swirling the bottle but not shaking it. In a small bowl combine 3 TBSP of yeast with 6 TBSP of warm water. Mix well until all clumps are gone. Be ready for what happens! (It happens quickly and will shoot into the air so be prepared!) Pour the yeast into the bottle. May your heart will grow larger watching the eyes of the children in the room!

May you and your family experience the *Whoville* Christmas joy!

Greetings Fellow MNPS Members! by Dave Thompson, MNPS President

Hey Friends,

Merry Christmas to everyone! It seems like just yesterday we were at Roosevelt State Park enjoying some of the native species and good fellowship. We were all pleased with the great attendance and interaction; not to mention the fabulous field trips (thank you, Heather!). I hope our next annual conference will have even greater attendance. Gail Barton talked about germinating seeds and we had a fine time exchanging seeds. I hate to admit it, but the hot summer burned up most of the cuttings and seedlings I had worked so hard to grow. Wait till next year...

Hopefully everyone has heard by now that our 2016 annual meeting will be at the Crosby Arboretum on Friday April 22 and Saturday April 23. We get to celebrate Earth Day, Lyrid meteor shower, and a full moon! The Arboretum is having a native plant sale the same days, so we'll have lots of good stuff to buy!

There have been several conversations lately about having a Reunion Meeting at Crosby every fall. That will be one of our agenda items for the meeting in April. This could work really well in conjunction with the BugFest.

With the national focus on pollinators these days, some of our members might like to develop a pollinator garden. Many of you already have one, so we could use your help. It would be great to have talks about the combinations of plant types and their interactions with the insect world. This may pull in some new members as well; so share this newsletter with anyone you know who may have a desire to develop a pollinator garden.

Greetings MEEA and Others by Janet Chapman, MEEA President

MEEA has enjoyed a busy year! In addition to supporting several teacher workshops, the annual conference held at Paul B. Johnson State Park in early November was a big hit with all attendees! Our theme for the conference "Opening the Doors with Environmental Education So No One is Left Inside" guided our activities for the weekend. Jimmy Mordica, USFS, led an excellent field trip to a Long Leaf Pine Forest (complete with gopher tortoise burrows)! The Forest Service is no longer primarily tasked with timber production, but now seeks to manage for watershed health and historical forest restoration. Additional activities involved monarch butterflies, Project Learning Tree's new climate change curriculum, MSU Entomology's mini arthropod zoo, and an introduction to Mississippi's Forestry Conservation Teacher Workshops, which have been conducted annually for 50 years in the state. As the conference participants enjoyed a short nature hike, the sights seen along the trail provided ample subject matter to keep two experts busy answering questions: MSU Extension Consumer Horticulturalist Dr. Lelia Kelly and Heather Sullivan. The rain held off just long enough for David Blackledge of the MS Gulf Coast Community College Estuarine Education Center to give a well-received introduction to kayaking and related safety measures. Several participants chose to try their hand at the sport even as a light rain fell on the lake. A good time was had by all! The silent auction to raise funds for teacher mini-grants was successful. RFPs will go out early next year.

MEEA President-Elect Harold Anderson and I were able to attend a retreat in early December to work on an environmental literacy plan for the state. Other states in the Southeast, also members of the Southeast Environmental Education Alliance, met together to share information and agreed to collaborate on future endeavors. A lot of useful information was shared among the attendees.

Golden Silk Orb Weavers Moving North as Climate Warms by Dr. John Guyton

We recently brought a golden silk orb weaver spider (*Nephila clavipes*) home to our Arthropod Zoo from the MEEA conference south of Hattiesburg, Mississippi. This large orb weaver is commonly known as a "banana spider" to most people in south Mississippi. We have tried unsuccessfully to accommodate these beautiful spiders in our zoo. Golden silk spiders occur in Central and South America and the coastal zones throughout the southeastern U.S. but are seldom found north of I-20 in Mississippi.

After putting a specimen in the zoo it was not long before people were telling us of recent sightings in our area, and I was skeptical. Breanna Lyle and I watch spiders pretty closely and we definitely had not seen this one in nature locally. However, when our department head Dr. Jeff Dean photographed one in his back yard and Dr. Steve Reagan, Project Manager at



Golden silk orb weaver. Photo by J. Guyton.

the Sam D. Hamilton Noxubee National Wildlife Refuge, confirmed he had recently sighted them on the refuge, we were convinced. Breanna and I are inventorying the spiders on the refuge and this one has quietly slipped by us. The findings in two different areas, probably 15 miles apart, is particularly interesting. We are looking forward to collecting a voucher specimen and recording precisely where they are located on the refuge.

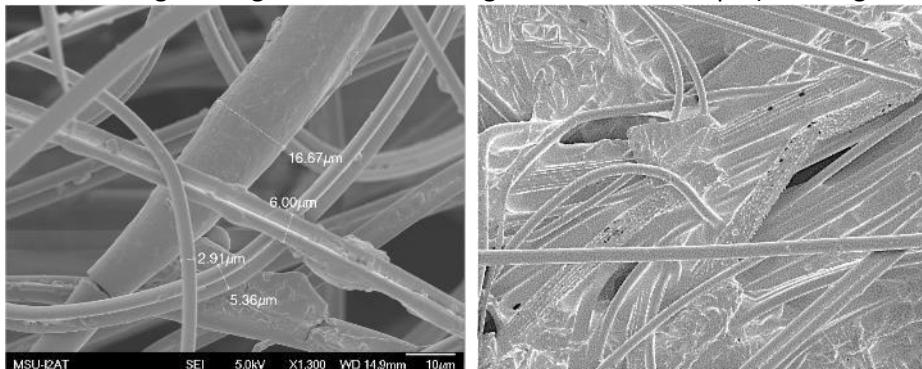
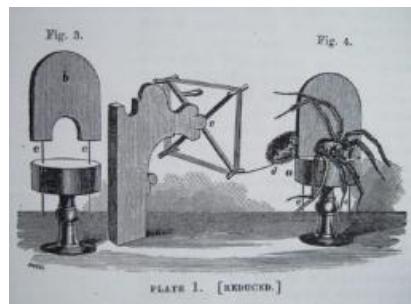
We expect insects and other arthropods to respond to environmental warming, but this is the first species I strongly suspect may have moved into our area because the climate has become more suitable. A single incidence may suggest a hitchhiker, two is interesting, and time will tell if the environment is now warm enough for their survival.

***The Golden Silk Orb Weaver Project* by Dr. John Guyton**

The golden silk orb weaver produces a beautiful web of golden silk. Father Jacob Paul Camboué, a French missionary in Madagascar during the 1880s and 1890s, built a hand-powered machine (see illustration) to extract silk from 24 spiders simultaneously without harming them. This inspired textile expert Simon Peers to build a replica with Nicholas Godley in modern times.

Godley and Peers used over a million female golden orb weavers to produce an 11-ft x 4-ft fringed tapestry. Teams of 80 people collected spiders every day and returned them to the countryside after work for over 4 years. The golden fabric was assembled into panels and then sewn together into the final tapestry (see picture).

This golden silk orb weaver produces one of the strongest silks, and silks are known for their incredible strength. When we were cleaning out the golden silk orb weaver cage, we saved some silk for Amanda Lawrence with the I²AT Center in our building to image with the scanning electron microscope (see images below).



Silk Arrow-proof Vests

Genghis Khan is thought to have issued his horsemen silk arrow-proof vests. Spider silk is stronger than Kevlar or steel and more flexible. It stretches up to 40 percent its normal length without breaking. Silk does not break when hit by an arrow and enables the warrior to easily extract it and continue fighting.

I am not sure what I am seeing in the images above but, for me, it is a start on learning more about the properties of silk. I thought you would enjoy seeing spider silk close up.

Resource: <http://www.vam.ac.uk/content/articles/g/golden-spider-silk/>

***MSU Beekeeping Camp 2016 Registration is Open* by Drs. John Guyton and Jeff Harris**

Many of our readers are familiar with the MSU Bug and Plant Camp, but not as many know about the MSU Beekeeping Camp, first offered in 2014. Our original intention in starting a beekeeping camp was to provide 4-Hers and Bug and Plant campers with an opportunity to advance their knowledge of insect rearing and learn the fundamentals of running a business. That focus has not changed, however, we accept campers age 10 and up at our intergenerational camps, so parents, teachers, and other adults can attend. During this 5-day, comprehensive academic camp, we will cover all the topics a new beekeeper needs to know to start keeping bees and utilizing or selling honey and wax. Nights

at beekeeping camp are not as long as those at bug and plant camp, enabling those in the local community to spend the night at home.

Extension Apiculturist and camp co-director Dr. Jeff Harris is an expert on hygienic behavior in honey bees, a natural defense against parasitic mites that are possibly the greatest obstacle facing bees. Jeff has bred honey bees that are capable of cleaning mites from their nests, which reduces the need for miticides. We will spend a significant amount of time preparing campers to monitor and manage mites.

Our goal is to make this as much of a hands-on experience as possible, so campers can expect to be in the hives daily. We start off with an introduction to the equipment, jargon, and personal protective equipment, followed by how to use a smoker (an important piece of safety equipment). If it is not raining, campers will learn how to open hives on the first day. We, or experienced mentors nearby, will continue to assist campers once they are back home and setting up their first hives.

Camp topics include: getting started with bees; finding, marking and clipping the queen; how to recognize if the queen is a good egg layer; seasonal management; stings and colony defense; diseases, pests, and parasites; harvesting honey; honey and pollen in human nutrition (myths and truths); basic bee biology; queen rearing (quality, grafting, and requeening); specialty honey; protecting combs; bee communication (learn to do the waggle dance); swarm management; gustation of honey in bees and humans; processing honey and wax; honey judging; how to buy bees; income and the slippery slope into business; and a trip to a commercial apiary or bee yard.

The 2016 MSU Beekeeping Camp will run from June 5–9 on the Mississippi State University campus. The registration form (for both camps) is on p. 5 of the September-October 2015 edition of the Gloworm, which can be accessed at http://msucares.com/newsletters/pests/gloworm/2015/volume.xxii_no5_09_10.pdf.

Common Winterberry, *Ilex verticillata* (L.) Gray by Brian Templeton



From: Curtis's Botanical Magazine, 1920, London., vol. 146 [= ser. 4, vol. 16]: Tab. 8832 - [1]. Matilda Smith del., John Nugent Fitch lith.

Ilex verticillata is a medium to large, deciduous shrub native to the Eastern United States. Despite its deciduous nature, this species is a favorite winter plant of many. As its most prevalent common name, winterberry, suggests, this species, or at least the females, provide an abundant display of bright red fruit during the traditionally dormant season. The displays of bright red drupes begin in late summer or early fall. If the numerous species of birds that consume the berries do not denude the plants they persist into winter, where they make a spectacular showing after leaf senescence. The fruits have a lower fat content than other fall and winter fruits, so they are usually not consumed until the fattier sources have been exhausted. The leaves rarely present even decent fall color, but they don't need to as the fruit is the show stopper. After the first hard frost of the season the leaves turn black or dark brown, which lends the common name black alder. They then quickly fall, revealing the spectacular veil of berries.

Like many of its holly relatives, *I. verticillata* is dioecious (di – two, oikia – Greek for house or dwelling), meaning it has male and female reproductive organs on separate plants. Knowledge of this fact is crucial to utilizing any dioecious plant whose fruit is desirable as an ornamental feature in the landscape. You must have both types of plants to have pollination and fertilization, and therefore fruit. It is also important for them to flower at the same time so pollination will be effective. Most suggestions call for one male for every four females, but some go as high as twenty. They should also be planted

in close proximity to each other to foster better pollination, within thirty to forty feet. This proximity is probably more important than the quantity. As this species works best in mass plantings such pairings are easy to achieve.

Ilex verticillata has other similarities to our other native hollies. The flowers are small, white, mostly inconspicuous, borne on new growth, and have little ornamental value. They are popular with many pollinators including honey bees, however. A relatively low-maintenance plant, it has few pests or problems. It tends to sucker and form colonies if left untended. If properly managed this can be used as a source of replacements or transplants as earlier stems age and deteriorate. *I. verticillata* is an adaptable species that can handle a wide pH range, although it prefers acidic soil, as well as broad moisture and light regimes. As with most plants the more full sun it gets, the better the flower and fruit production. It is often found growing in swamps and wet areas. Several sources claim it can survive with roots

completely submerged. It can be propagated by seed, but cuttings, especially softwood, are more successful and retain the parent's gender.

The genus name *Ilex* was borrowed from the holm oak, *Quercus ilex*, a broadleaf evergreen native to the Mediterranean region, denoting the similarities between the foliage. Interestingly, 'holm' is an ancient variation of 'holly,' and the oak tree is sometimes referred to as a holly oak. The specific epithet *verticillata* comes from Latin and means whorled or having whorls. It is a reference to the pseudo-whorled arrangement of the sessile fruits. The fruiting of the plants is so abundant and striking that many florists and decorators harvest and use the fruit-laden stems in their arrangements. In the ornamental landscape it can be used to great effect with a contrasting background, especially with a blanket of snow or a screen of evergreens.

Ilex verticillata was used by both the Iroquois and Ojibwa for a variety of medicinal purposes. The most common of these uses was to treat gastro-intestinal issues as a cathartic, emetic, or antidiarrheal. Many of these preparations were decoctions made from the bark of the plant. The Iroquois also used a bark decoction as a cure for craziness. The roots were used in a compound to relieve hay fever, perhaps the source of the less used common name fever bush. Several contemporary sources, including the USDA NRCS, claim the fruit to be toxic to humans, especially in large quantities. Additional sources claim the dried leaves can be used for tea, although there is disagreement over its caffeine content.

Several sources, including the venerable Ed Martin Jr., find this species to be so closely related to *Ilex decidua*, possumhaw, that they consider one a cultivar of the other. Another closely related species is *Ilex serrata*, finetooth holly. *I. serrata* is native to China and Japan, has slightly smaller and perhaps less vibrant fruits, and more finely toothed leaves. The U.S. National Arboretum produced very successful hybrids of *I. serrata* and *I. verticillata*, the most popular cultivars being 'Sparkleberry' (female) and 'Apollo' (male). The hybrids are lauded in the trade as having the prolific fruiting of the Asian parent with the larger fruit size and soil adaptability of the native species.

The morphological similarity between *I. serrata* and *I. verticillata* despite their geographical separation is an example of the 'Asa Gray disjunction.' Gray was perhaps the foremost American botanical taxonomist. His lengthy titled tome is still a standard and often referred to as *Gray's Manual*. He gave *I. verticillata* its name, hence the "Gray" listed in the title. He believed the flora of eastern North America was more closely related to flora of eastern Asia than western North America; each of these species were international siblings. This belief has been debunked by current scientific understanding as we have found other more closely related species and have more robust evolutionary explanations.

Keep your eyes open for bright red berries on slender, jagged, architectural stems as you travel this winter season, especially near low, wet areas. If you have time and permission, stop to take cuttings, and bring home or gift one of the most wonderful winter plants.

Perspectives of Forest Health by Matthew Thorn

Forest health is a term that, although it seems simple, can mean widely disparate things to different people. It also often involves contradictory goals to those asked to describe it (Abrams et al. 2005). Politically it is a loaded term that everyone wants described to suit their cause, but what does it really mean? That depends on how you view a forest. If your view of a forest is an agricultural crop to be harvested akin to cotton or soybean, then you would have a vastly different definition of forest health compared to someone who views the forest as a valuable haven for wildlife and biodiversity that has no need for human interference. These are strongly polarized viewpoints that represent two ends of a continuum of forest health meanings. They are referred to as the utilitarian and ecosystem perspectives, respectively.

The utilitarian perspective revolves around the idea that the forest is a resource here for human use (Kolb et al. 1994). Uses for forests can be as a crop, i.e., timber or wood pulp, or for recreation, but the forest's only purpose is to be of use to humans. Following this view means that a healthy forest is one that is able to provide benefits to humans (Abrams et al. 2005). This perspective generally involves the forest being pest and disease free and all trees healthy and growing. The wildlife in the forest is of no concern unless it impacts the human uses of the forest.

The ecosystem perspective, on the other hand, considers the forest and its biota "intrinsically valuable" (Kolb et al. 1994). People who follow this perspective of forest health hold that the value of the forest is its animal and plant life and that its purpose is to be a functioning ecosystem, not as a resource for humans. An ecocentric definition of forest health could be a forest in balance, one that is resilient to change and has all parts of its plant and animal communities present and operating (Kolb et al. 1994). Forest health from an ecosystem perspective is a much more complicated definition and does not involve the health of individual trees. A healthy forest may have diseases and pests present, but they are in

balance with the regenerative properties of the forest and are considered part of the healthy ecosystem (Kolb et al. 1994).

Between these two endpoints is a gradation between the two views. Most Americans hold a view somewhere in the middle where both human uses and wildlife are important (Abrams et al. 2005). This middle ground leads to a complex view of forest health. In this perspective both the ability of the forest to provide human needs and its ability to sustain a healthy ecosystem must be taken into account. This leads to definitions of forest health like the following from the USDA Forest Service: "A condition wherein a forest has the capacity across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resiliency while meeting current and future needs of people for desired levels of values, uses, products, and services" (2003). While this definition includes both utilitarian and ecosystem values, it becomes vague.

A definition like this can be used to support many contradictory forest management plans depending on one's meaning of "desired levels of values, uses, products, and services." High-intensity timber production may be one person's value, while wildlife habitat may be another's highest value. A more precise definition of forest health is desperately needed, but with so many people holding different views on what a healthy forest is, this becomes a very complex issue to resolve (Kolb et al. 1994, Abrams et al. 2005). As difficult as it is, a solid definition of forest health is necessary to be able to determine what forest management practices should be employed for a forest. There need not be one definition for every forest, but many definitions may exist and be correct depending on the desired uses of the forest.

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Using Persimmon Seeds and Wood to Forecast the Weather by Dr. John Guyton

Folklore holds that you can predict the weather with persimmon seeds. This ancient tree fed the megafauna of 10,000 years ago and survived that many winters, so it should "know" weather! Wait until the persimmons are ripe (around September, don't rush the prognosticator), then harvest at least 30 to 50 fresh persimmons from the area for which you want a weather prediction. You may have competition (there is a reason it is also called possumwood). Cut each fruit open and harvest the seeds. There may be 8 to 10 seeds in any one persimmon. Carefully slice each seed open and divide the seed into groups of spoons, forks or knives, depending on the shapes in the tissue of the seeds' interior. If your spoon group contains the most seeds, according to folklore and Dr. Lelia Kelly, program leader of the Mississippi Master Gardeners, you can expect a snowier winter. If forks are most numerous, a milder than normal winter can be anticipated. Numerous knives indicates a cold, icy winter.

And now a few more realistic facts to provide balance to this article. Persimmon's Latin name *Diospyros* means "food of the gods." The fruits may be eaten raw, cooked or dried. Cultivars today are often classified as astringent or non-astringent. Astringent cultivars must be very soft before eating while the nonastringent can be enjoyed while firm. The fruit pulp can be dried or made into pie, pudding, candy, molasses, or beer. The roasted seeds have been used as a coffee substitute and the leaves can be brewed into a tea.

The wood is hard, strong, heavy, close grained and excellent for turning on a lathe. Uses include pool cues, drumsticks, and golf club heads. It is in the Ebenaceae with ebony but not as dark, with a variety of color variants. Sapwood tends to be tan while the heartwood is dark brown. It is difficult to cure, somewhat prone to shrinkage and checking. Persimmon with worm holes has interesting patterns, making it very desirable. Some think the worm holes reduce the potential for cracking. If you are a wood worker, you will love persimmon! The seeds were used as buttons during the war between the states.



Seed showing a spoon predict more than usual snow for the winter of 2016 in Mississippi.

Bumble Bees, an Indicator Species, Are in Trouble by Dr. John Guyton

One of my first insects was a bumble bee and I guess that is where my interest in Hymenoptera (bees, wasps, and ants), the third largest order of insects, started. I was with my grandmother in her flower garden and pinched an althea bloom closed around a bumble bee as I twisted the flower off the plant. My delight was short lived when it stung me on the thumb through the flower petals and regained its freedom! I could return to the very spot today where I received that painful sting and learned that valuable lesson! Since preschool I have known bumble bees and carpenter bees.

A few years ago I was scanning campers' collections and was alarmed that not a single bumble bee had been collected. The following year there was only one in the campers' collections. By then I realized I had not collected or even seen one in the past year. My concern reached the point that I asked Dr. Richard Brown, Director of the Mississippi Entomological Museum, if he had noticed a decline in bumble bee populations and he said he had not, but indicated he had not been watching them. He studies Lepidoptera, so when there is a fluctuation in their populations in areas where he collects, he knows it. I have continued to watch for bumble bees and I am definitely not seeing as many.

In November, Carl Zimmer's enjoyable blog *Friday's Elk* directed my attention to his column in the *New York Times* with the lead: "Sometimes it can seem like all the thousands of specimens stored in museums are just a waste of space. But a new study shows the unexpected secrets that museums can reveal. I look at how museum specimens of bees show how they declined over the past century as they lost their preferred plants."¹ What follows is a synopsis of his article "Clues to Bees' History, Tucked Away in Drawers."

Bees are in trouble, and it is not just the European honey bee (*Apis mellifera*). The 20,000 native bees, and about a third of bumble bee species in the U.S. are declining with their host plants. Jeroen Schepers, a graduate student at Wageningen University in the Netherlands and colleagues are examining the records, including insects, in museums collected over the past 140 years. Schepers' study in the Netherlands revealed more than half of their 357 species of native bees are endangered because of the loss of plants they pollinate and depend on for their sustenance. Bees and their companion plants have been adapting together since the beginning of time, and as one goes, so goes the other.

Schepers and other scientists were able to study the insect-plant interactions by examining the pollen still adhering to the legs of bee specimens in insect museums and identifying the plants on which they depended. The intensity of agricultural practices, including land clearing and the use of toxic herbicides and fertilizers in the 1950s, had a devastating impact on native plant communities. As native plants declined, so did the pollinators that depended on them. Schepers also found a relationship relative to bee size. Larger bees are at greater risk because they require more food than the smaller bees.

Ignasi Bartomeus and colleagues at Rutgers University reconstructed the history of 30,000 wild bees in the Northeast using bee collections at the American Museum of Natural History, the New York State Museum, and a number of other universities. Their study lends support of Schepers' realization of a more devastating impact on larger bees. They discovered the overall bee diversity has declined by more than 15% and bumble bees by 30% between 1872 and 2011.

Bees in this case would be collectively referred to as indicator species. They give us an indication of the overall health of the environment. Are there other indicator species? Yes, and museums are the repository of a vast amount of important information that can be mined to better understand changes in the health of the planet. Herbariums are the Plantae (mosses, ferns, conifers, flowering plants, etc.) equivalent to entomological museums and they are equally useful in understanding the historical native plant communities. Mississippi has several herbariums and the Mississippi Museum of Natural Science has an excellent collection. Entomological museums and herbariums are expensive to maintain but they represent goldmines of information from generations of naturalists whose work is still increasing in value to us and future scientists.

¹ <https://mail.google.com/mail/u/0/?tab=wm&pli=1#inbox/149f6ef234d8d265>

² <http://www.nytimes.com/2014/11/25/science/clues-to-bees-history-tucked-away-in-drawers.html?ref=science&r=1>



*Your Editors Wish You a Very Merry Christmas
and More Newsletters in a Happy New Year*

Gingerbread house built by John & Peggy Guyton and Buck Swain in 2015.

Mississippi Native Plant Society Application

The Mississippi organization dedicated to the study and appreciation of native wildflowers, grasses, shrubs and trees. Renew or Join Today!

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MS Native Plant Society

mississippinativeplantsociety.org

Coastal Plains MNPS meets every 4th Monday in Gulfport. Contact President Edie Dreher at 228-864-2775 or mail to 100 24th St., Gulfport, MS 39507.

Join MNPS, MEEA or both!

MS Environmental Education

Alliance

eeinmississippi.org

The Mississippi Environmental Education Alliance conducts an annual fall conference and occasional workshops.

MNP&EE

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Deadlines for Articles:

Winter – November 10

Spring – February 10

Summer – May 10

Fall – August 10

MEEA Website: *eeinmississippi.org*
MNPS Website: *mississippinativeplantsociety.org*

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