



Mississippi Native Plants and Environmental Education

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



Volume 30 Number 4 Nature gives to every time and season some beauties of its own, C Dickens Winter 2012 - 13

The Mississippi Native Plant Society, is a non-profit organization established in 1980 to promote the preservation of native plants and their habitats through conservation, education, and utilization.

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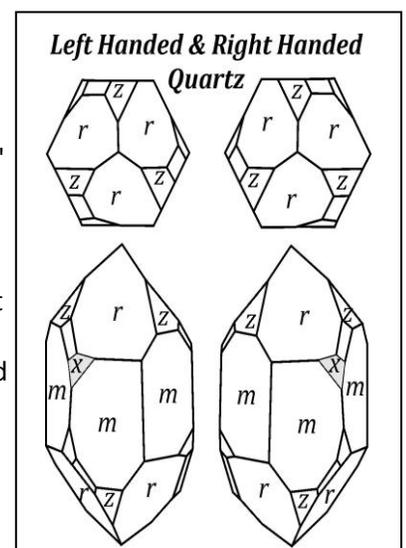
A Crystal Christmas and Christmas Crystals Your Editors Christmas Greeting

Last year we made Fabergé Christmas tree ornaments by growing crystals in eggs so this year I thought we would continue the crystal theme. Crystals are incredible natural gifts and their beauty is so much deeper than their sparkle - much like people. Crystals do contain energy and those who wear them around their necks will be delighted to be vindicated - you can see this energy and during this magical season is a good time to be amazed.

Let's start with a delicious little experiment. Bundle up, stick a bag of wintergreen lifesavers (must use the sugar variety) in your coat pocket and take the grandchildren on a night hike. In a dark place turn off your flashlights, give each a life saver and have them watch in each other's mouth as they crunch it. Watch for the beautiful blue sparks reminiscent of the blue in the depth of crevasses in glaciers, auroras or the Cherenkov glow of water following atomic particles' speedy passage. The spark comes from the release of binding energy in the sugar crystals and is colored blue by the fluorescing wintergreen oil. Now, give each a pair of large quartz crystals, as an early Christmas happy, and have them drag the point of one along a rough side of the other watching for a yellow piezoelectric glow. Don't buy perfect specimens but some of those rejects found outside rock shops in large boxes. A few calcite crystals and a black light will extend the warm glow into the evening and different calcite crystals produce different colors.

Now, let's return to the warmth of the den with its warm fire to see what else we can do with a crystal. For this you may want to use a cube shaped pyrite crystal and it will require a few nights advance planning on your part. Download the plans for a crystal radio, purchase the parts and build one for yourself so you are familiar with its construction and its operation. Many plans use a diode in place of a crystal and it would be good to have a few on hand if you cannot get the tickler and crystal working properly.

Quartz crystals can be left or right handed, like your hands. Look at the illustrations and the tops of your crystals (2 top pictures). Identify the surfaces labeled "r" and the flat face beneath each labeled "m" (shift to side view, lower illustrations) then note the position of the small facet labeled "x." If it is on the left it is a left hand crystal and if on the right it is a right hand crystal. There are a variety of illustrations on the internet, some with more detail if you need a different perspective. Quartz does not have a preferential handedness so you should be able to find right and left hand crystals for each child or grandchild.



**Merry Christmas and Happy Holidays
from your Editors!**

Greetings Fellow MNPS Members! by Dr. Lelia Kelly, MNPS President

Greetings and Holiday cheer!

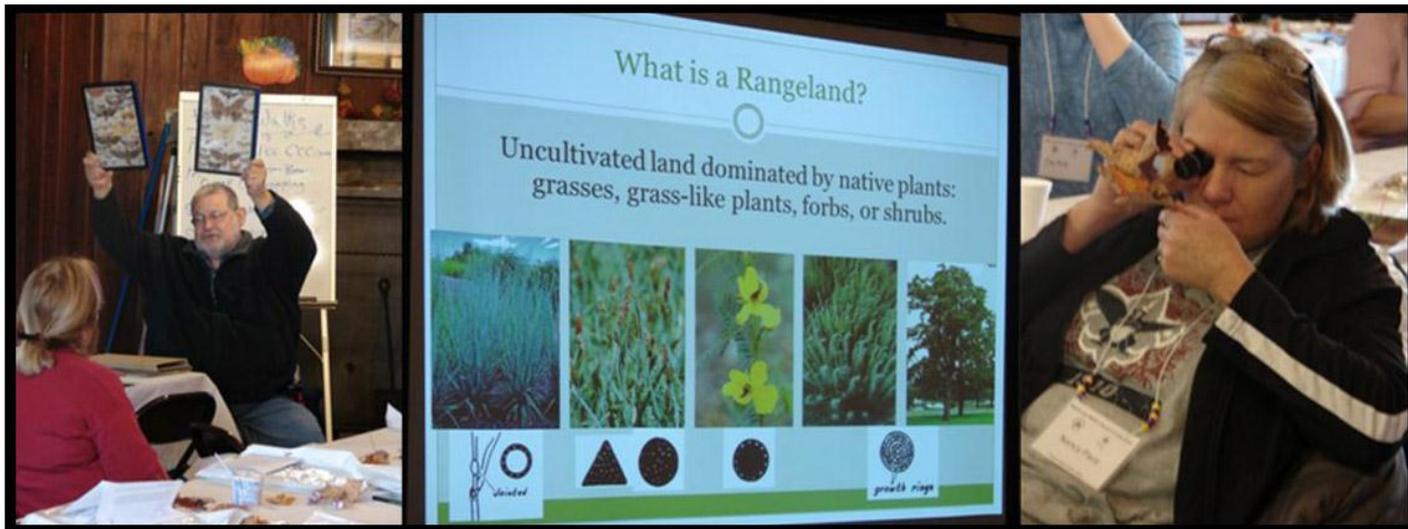
Hope everyone is enjoying the holiday break with friends and family. I know I am glad for a little down time. Our family plans to spend a few days at Fall Creek Falls Park close to Pikeville, TN, doing some biking, hiking and geocaching--of course eating like pigs, too!

We had a tremendously successful joint annual conference with the MEEA in early November at Tishomingo Park. If you weren't there you missed a grand time with great speakers and hikes through the beautiful park. A highlight of the conference was the trip to MNPS member, Bob Gresham's Native Plant Trail and Stone Quarry. I think conference attendees pretty much bought out his inventory of stone benches, owls, turtles, and frogs!

Keynote speaker, Jim Lacefield, delivered two excellent presentations—one a tantalizing geological history of this part of the southern U.S. and the other about the Cane Creek Canyon Nature Preserve that he and his wife Faye have created and preserved for future generations. I had a recent opportunity to visit this amazing place. Jim and Faye were such cordial hosts and spent the day showing me around and filling me with tons of information about the preserve and their fascinating family story about how it all came to be. I told them they need to write a book chronicling the story of Cane Creek Canyon and they told me it was on their "to do" list. I'm thinking we need to organize a MNPS field trip in the spring to the Lacefield's Preserve. Jim suggested the ideal time to see the most spring wildflowers is around early to mid-April in a typical year.

Looking forward to the New Year and if any of you have any suggestions of wonderful places to visit on a field trip let me or our field trip chair, Gail Barton know. - Lelia Kelly

Greetings MEEA and Others, by Jennifer Buchanan, MEEA President



Dear MEEA Members,

If you missed the annual MEEA conference this past fall at Tishomingo State Park, you missed some great hands-on activities, networking, camaraderie, and some great scenery. We learned, explored and made new friends. We went on walks through the woods, explored a quarry and a small cave and gazed at stars in a sky minimally polluted by light. The wide variety of activities on the agenda assured that everyone, both educators and botanizers, had a full range of activities from which to choose.

Additionally, we received an introduction to this year's current issue for the Envirothon, *Sustainable Rangeland Management of Montana* by Courtney Chambers. This topic will be a little tougher for our students this year because we do not have a lot of rangeland similar to that of the rangeland in Montana. So, I would like to put together a webinar to train our students on the current issue, and I will need all of your help if possible. I want to encourage all of you to adopt an Envirothon Team from your community this year and help them learn what they need to succeed at the national level of this competition. Perhaps you can host a viewing of the webinar at your site and bring in some nearby experts to assist in the program.

Of course, Sustainable Rangeland Management is just one component of this environmental competition for high schools. Other categories in this competition include Forestry, Wildlife, Soils/Land Use and Aquatics. If you have an expertise in one of these fields and would like to offer your services to a nearby team, please do not hesitate to contact me. I will be happy to steer you in the right direction. For more information on the international competition, check out the Envirothon website at www.envirothon.org. If you would like to help train or sponsor a Mississippi Envirothon team you can learn more at <http://www.mswcc.state.ms.us/envirothon/enviro.htm>. Live Green and Prosper!

Attention MEEA Members and Former Members

MEEA membership is a benefit of attending conferences. However, when you miss a conference your membership lapses along with any positions or offices you held in MEEA if your dues remain unpaid. It has recently come to our attention that you have not been receiving notices of this when you miss a conference. We hope you will continue to be a member of MEEA, the affiliate of the North American Association for Environmental Education. With recent advances in environmental education by the Southeastern Environmental Education Alliance the future is very exciting. To remain a member, please send your \$15 membership dues to Treasurer Peggy Guyton, PO Box 43, Mayhew, MS 39753 by February 1. Thank you. - MEEA Administration

Mark Your New Calendar; You Will Not Want to Miss This!

With a new year and a new calendar go ahead and make plans to be at the Crosby Library on Goodyear Blvd. in Picayune, MS for a presentation sponsored by the MSU Crosby Arboretum on April 6 at 10 AM with Dr. Charles Allen will present on edible native plants! After an enjoyable presentation Dr. Allen will invite you to sample a nice slice of nature as he fields questions while you dine on native plants. His talk will be complemented by several teas made from native plants, near the end of the session!

After his edible plant talk and lunch there will be a field trip to hillside bog, a very large bog/natural area, about five minutes from the arboretum lead by Longue Vue House & Gardens in New Orleans.

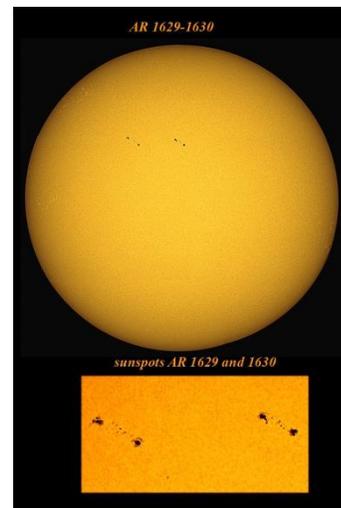
While Outside Party Hopping During the Holidays, Show your Astronomical Prowess

On Friday, December 21 winter begins in the Northern Hemisphere at 5:12 a.m. CST on the Winter Solstice. This is the shortest day of the year. This is a great time to watch for the first glimpse of the sun rising above the horizon and watching it dip below the western horizon, measuring the length of the day. The longest day of the year will be Summer Solstice. Day and night are approximately the same length on the Vernal and Autumnal Equinoxes. Get your friends or children together and make some measurements!

Mercury, Venus and Saturn are in a diagonal line in the southeast in the early morning sky. Mars is low in the southwest during the evening and Jupiter is in the southeast. By 10:00 or 11:00 Jupiter is high in the southern sky. Using 10-X binoculars and a steady support you can see Jupiter's Giant Red Spot and some of its moons that appear as pinpoints around Jupiter.

Solar Maximum is Coming to Earth by John Guyton, Ed.D.

Just as the earth goes through seasons the sun goes through cycles. The Chinese observed sunspots thousands of years ago, and we are more familiar with Galileo's sketches of sunspots and his reports of their movement, made with his telescope. Systematic daily observations of sunspots began at the Zurich Observatory in mid-1700. Monthly averages of sunspots revealed an 11 year cycle with peak sunspot activity at solar maximum. Sunspots range from near 0 to over 100 before decreasing again to near 0 when the next cycle begins. We are nearing solar maximum in Solar Cycle 24 - the 24th solar cycle since observations began. Solar Cycle 24 began on January 8, 2008. Cycle 19 in 1958 was the largest in recorded history with 201 sunspots in March of that year. Cycle 22 was the third largest with 159 sunspots in July 1989. Solar Cycle 24 will peak in mid-2013 with around 60 sunspots expected. The period between "solar maximums" is referred to as "solar minimum."



Sunspots are relatively cool areas that appear as dark blemishes on the face of the sun. They are formed when magnetic field lines just below the sun's surface are twisted and poke through the solar photosphere. The twisted magnetic fields above sunspots are sites where solar flares are observed to occur, and we are now beginning to understand the connection between solar flares and sunspots.

We have learned a few things studying sunspots. Evidence of sunspots' cycles show up in tree rings as estimated by carbon 14 abundance. The sun rotates on its axis once in about 27 days. The sun is a ball of gas so it is not restricted to the rigid rotation of earth. The equatorial regions of the sun rotate faster (24 days) than its polar regions (30 days).

I have enjoyed watching sunspots since I was a physics teacher at Wood College in the late 1970's and had students doing sun rotation studies using sunspots. During solar maximum I will often have a telescope and a solar filter handy and if you know when we will be close remind me to bring it and we will take a look at some sunspots. **The sun is dangerous to look at without proper protection.**

The image from spaceweather.com was recorded on December 9, 2012 and shows 2 sunspots.

Holiday Special

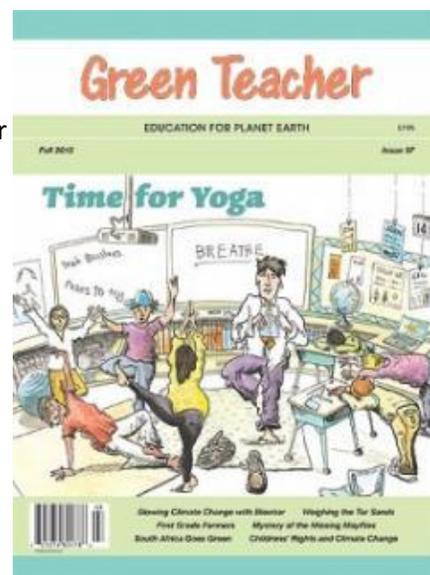
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Editor's note: If you are not familiar with Green Teacher and you do Environmental Education you are missing an incredible resource. I subscribe and thoroughly enjoy every issue. Without question, it is the best magazine for environmental educators or teachers who find their students enjoy environmental education activities!

MGCCC publishes new children's book, "The Watershed and Me A-Z"

What kinds of shoes do alligators wear when they do the alligator dance? That's a good question and one that is answered in the much-anticipated "The Watershed and Me A-Z" children's book published by Mississippi Gulf Coast Community College. The second in the series of A-Z books, it discusses the watershed of the Pascagoula River Basin. The beautifully illustrated volume teems with stories about the plants and animals that inhabit the streams, creeks and rivers that make up this incredible ecosystem, and highlights the interrelationship people and animals share.

Sandra Cassibry, visual arts instructor; Jeffery Jones, Graphic Design Technology instructor; and Kathryn Lewis, retired fine arts instructor, developed the book with community partnerships. Collaborators included elementary school students, college students and faculty, and individuals from local, state and federal agencies. Funding for



the book's publication was provided by Mississippi Gulf Coast National Heritage Area, Harrison County Soil and Water Conservation District, and the Mississippi Department of Environmental Quality.

"Creating and publishing this book has taken strong partnerships and a vision shared by the many collaborators," said Cassibry. "That vision, to ensure that we all recognize the importance and fragility of the ecosystem in which we live, can be seen on each page of the book. 'The Watershed and Me A-Z' is a celebration of our home and an invitation to all who read it to venture out and explore their surroundings."

The book is completely original in its approach to the discussion of the watershed. Elementary-school students presented "wonder questions" and linocuts about the plants and animals in their own backyards. Art and Graphic Design Technology students from Gulf Coast's Perkinston Campus documented the flora and fauna through photographs and wood-block prints. Gulf Coast science instructors and other resource professionals provided the scientific information. Gulf Coast music instructors and students created the watershed blues song.

"This project is about the children," Jones said. "They have inspired its creation and have provided many of the elements incorporated into it. We want them to see, smell and hear the many creatures, both familiar and strange, that are represented within its pages. We want them to recognize the relationship we all share with nature and hope that they are inspired to be good stewards of our home, the watershed of the Pascagoula River Basin."

A lesson plan and music supplement the book for use in elementary school classrooms. The lesson plan was prepared by Kathryn Lewis and Althea Jerome and is aligned with Common Core Standards and Mississippi's Framework. For more information about a presentation of the book and lesson plan in third- through fifth-grade classrooms, contact Lewis at klewis23@yahoo.com <<mailto:klewis23@yahoo.com>>.

The book is on sale through the MGCCC Foundation for \$10. For more help with purchasing, call 601-928-6344, or e-mail dena.hatten@mgccc.edu.

Remembering the King of the Forest by Clarissa Balbalian, Diagnostician/Laboratory Manager Plant Pathology Lab

In the 1500's as Hernando de Soto's expedition made its way through the old growth forests and fields of the Appalachian mountains, one member of the expedition wrote "Where there be mountains, there be chestnuts". Revered by people throughout history, American chestnut (*Castanea dentata*) has been immortalized in poetry, song and lore. The tree is also at the center of one of the greatest ecological disasters of our time. With *The Christmas Song* "chestnuts roasting on an open fire," accompanying our on-line search for the latest bargain, let us pause to reflect upon the lessons learned from the fall of this mighty giant.

Through the turn of the 20th century, American chestnut grew in the Appalachian Mountains from Maine to Georgia and west to Mississippi, sometimes in pure stands. The tree thrived in the southern Appalachians and the livelihood of many subsistence farmers in this region was intimately connected to the tree. Approximately one third of the Appalachian hardwood forest was American chestnut. Its fast growing, straight form dominated the forest canopy, sustaining wildlife that grazed beneath its branches, and carrying man from cradle to grave. The sweet tasting chestnuts, wrapped in a prickly burr, are low in fat and high in carbohydrate. The nuts fed not only wild game, but also people and their livestock, and provided a cash crop. The rot resistant wood was used to build furniture, homes, railroads, fences, and the caskets that would shelter one's bones at life's end. Every part of this tree was put to use, including the tannic acid it produced in abundance and which accounted for 50% of the vegetable tannins used in the U.S. leather tanning industry. After a tree was cut down it would quickly resprout from its roots, and this timber harvesting practice, called coppicing, renewed chestnut's presence in the forest with ease. American chestnut was a truly renewable resource that was an integral component of Appalachian ecology, economy and society.

In 1904, American chestnuts in the Bronx zoological park in New York City began dying from a fungus that invaded wounds on the bark of the tree and created lethal cankers that quickly girdled the trunk and branches. Chemical treatment did not stop the fungus once infection had occurred. The fungus spread rapidly and the total lack of resistance of the tree to infection led scientists to speculate that the fungus was an exotic pathogen, not native to the United States. The source of the fungus was traced back to a Long Island nursery that was unknowingly selling infected Japanese chestnut trees, which are resistant to the fungus. Modern genetic analysis confirms an Asian origin of the fungus and it is likely that there were multiple introductions of the fungus on nursery stock entering the U.S. from China and Japan.

Within 50 years of its introduction, chestnut blight decimated the entire range of American chestnut (about 4 billion trees), and is considered one of the most devastating plant disease epidemics in history. Chestnut blight was one of the reasons the U.S. established the Plant Quarantine Act of 1912 which regulates the importation of plant material in an effort to prevent the introduction of foreign pests and pathogens. Today USDA inspects shipments at our ports in an effort to prevent the introduction of exotic organisms that could threaten U.S. agriculture.

While chestnut blight has not rendered American chestnut extinct, it did lead to extinction in the southern Appalachians of at least 7 species of moth that depended on American chestnut, and was one of the final nails in the coffin of Appalachian subsistence agriculture. The fungus does not affect the root system of the tree and root sprouts of American chestnut can still be found in relative abundance throughout its native range. Now relegated to life as an understory shrub, rather than a dominant canopy species, chestnut rarely reaches reproductive maturity before it succumbs to blight, so nut production is very low. Numerous tree species such as oak, hickory, pine, beech and hemlock have filled the void in the canopy left by the demise of chestnut. However, no single tree species has replaced what was one of the most important natural resources in the Appalachian region.

One can still walk through the Appalachian forests and see the silver stumps of chestnuts killed more than a century ago. These ghosts are a testament to the rot resistance of this tree and a reminder that in this age of global commerce we need to be ever vigilant about unwittingly moving pests and pathogens to new places. Each year new pests and pathogens come to our shores along with the uncertainty: Is this the next chestnut blight?

Because American chestnut was such a beloved and iconic species, efforts to restore the tree to its native range have been pursued since the onset of blight. Breeding a resistant hybrid that has the tall, straight form of American chestnut and the resistance of Chinese chestnut has been one goal. After 25 years of intense breeding and selection efforts, resistant hybrid chestnuts are now being planted throughout the native range to further evaluate the strength of resistance as well as to test the hardiness of the hybrids in the varying climates throughout the native range of the tree.

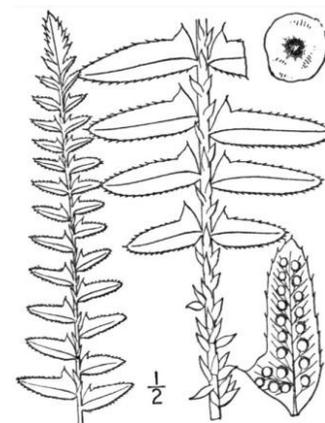
American chestnut also is playing a significant role in conservation throughout the coal mining areas of Appalachia. Forests are removed during mining operations and reclaimed mine sites have compacted soils and have usually been planted to aggressive, non-native grasses, which inhibit reforestation of these sites. Resistant American chestnut trees have been planted and thrive on reclaimed mine sites, providing hope that perhaps two man-made ecological injuries can be reduced by reforesting mine sites with a valuable native tree species that is tenaciously clinging to life in the mountain forests it once dominated.

If you are interested in learning about efforts to restore American chestnut to the eastern hardwood forests, The American Chestnut Foundation website www.acf.org is very informative.

Christmas Fern (Polystichum acrostichoides) by Brian Templeton

Polystichum acrostichoides is referenced by a variety of sources with several common names. One name is Dagger Fern, which is likely based on the tapered blade shape of the fronds or finely divided leaves. This common name is, however, also common to a few other ferns, so its use can commonly lead to confusion. It has also been referred to as Canker Brake, but no sources or etymology have been offered for this pseudonym. In the spirit of the season we will refer to its most oft used *nom de plume*, Christmas Fern.

There are quite a few theories as to how this fern, native to eastern North America, acquired this common name. The most obvious suggestion is that with the fronds being evergreen, this groundcover is one of the few green plants on the forest floor during that particular holiday season. An ancillary theory is that these ferns are one of the few easily acquirable green, living materials during that season, making its foliage an obvious choice for creating decorative holiday wreaths and adornments. A third offering is that the shape of a pinna, or individual leaflet, having an asymmetric lobe at the base, is reminiscent of a stocking, another traditional Christmas symbol. Reference for this pinna shape has also been made to another traditional holiday symbol, the rails or runners of a sleigh. While we may never know the definitive source or origin for this common name, we clearly have plenty of reasons for the holiday association.



Christmas fern is in the family Dryopteridaceae, commonly referred to as the Wood Fern or Shield Fern Family. The etymology of the botanical name has its roots in Greek. The genus, *Polystichum*, translates as many (*poly*) rows (*stichos*), and is a reference to the two rows of sori, clusters of sporangia, or spore bearing organs, that appear on the highest pinnae. The species name, *acrostochoides*, recalls its similarity to *Acrostichum*, a genus of tropical ferns exhibiting similar sori first delineated by Linnaeus. *Polystichum* is one of the most abundant genera in the

Dryopteridaceae family having over 250 species. The majority of the *Polystichums* can be found in Eastern Asia. While the majority of *Polystichum* species in North America are found in the Pacific Northwest, *Polystichum acrostochoides* has a broad but exclusively eastern range. It is the only one I could find with a listed range of eastern North America.

Christmas Fern is a perennial evergreen that is able to persist through hard freezes. A USDA Hardiness Zone rating of 4 – 9 reflects Christmas Fern's ability to withstand extreme low temperatures approaching -30°F. While the plant itself is evergreen, it also has traits that make it a perennial. During the cold winter months, the fronds droop and often lie on the ground. The deciduous leaf litter from the falling foliage that previously provided shade provides a layer of insulation that is further combined with snow in the colder ranges. The spent fertile fronds soon wither and die as the new crosiers, young fiddleheads, are emerging.

Christmas Fern is a rhizomatous plant, but it is clumping and does not creep or spread as readily as some other ferns. The clumps do grow in size, however, as the plant ages. The fertile fronds are obviously taller and more erect than the sterile ones which encircle and arch away from the center. The fronds can be 18" – 30" tall, up to 5" wide with 20 – 40 pinnae that decrease in length closer to the terminus forming a tapered frond. It is these more terminal pinnae that are fertile and carry the sori.

The sori form from June through October, and only occur on the abaxial, or underside, of the pinnae. As with most ferns the spores of Christmas Fern do not directly produce a seed or vegetative offspring, but instead they develop into a gametophyte producing both an egg and a sperm. When the sperm and egg fuse the gametophyte produces a sporophyte with the ability to grow into a mature fern. This process is as complicated as it sounds and requires almost precise conditions for each phase of the process to come to fruition. Due to the strict choreography of this dance and the intricate interplay of the staging, division is suggested as the easiest method for propagation.

Christmas Fern can be found in a wide range of soil types within an equally wide range of moisture regimes. It prefers full to partial shade, but can be found in areas with moderate direct sunlight. In cases of more sun the soil is usually wetter and prevents desiccation. Christmas fern can be found in both wet and rocky soils and usually near streams and stream banks. It is, however, reported that it has difficulty in the extremes of these environments. Overly saturated or rocky soils are not conducive to its vitality. It is also reported that it is more abundant on slopes and in areas where either limestone or sandstone bedrock are near the soil surface. It does not appear to be too particular of soil pH, but it does require good drainage and prefers a rich organic layer as its deep forest roots belie.



Christmas fern has no serious pests of note, and requires little management. It is particular about its location, but once established it asks very little from its environment. While 'tis the Christmas season and *Polystichum acrostochoides* does stand out and perhaps alone in

this season—at least on the forest floor—it truly carries the spirit of Christmas and unrequited giving throughout all the seasons. It is not showy, requires little attention, and will give of itself year after year. It reminds us that life continues in the coldest, darkest winter, even if it is blanketed in litter and snow, and we know that rebirth and growth are right around the corner with the beginning of Spring.

May you find yourself under mistletoe, wherever you may go.



Mississippi Native Plant Society Application

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

New member ____ Renewing ____ (note any changes below)

Name _____

Address _____
PO or Street Address City Zip Code

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Individual or Family \$10 Student \$7.50 Sustaining \$15

Contributing \$35 Life \$125

Newsletter preference Email or Regular mail (USPS)

Return form to Dr. Debora Mann, 114 Auburn Dr. Clinton, MS 39056-6002

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Committee interest: Strategic Planning, NCLI, Conference, Awards

Communication, Climate Change, MEEA Board

Return application with check to MEEA c/o Angel Rohnke, MS Museum of Natural Science, 2148 Riverside Dr., Jackson, MS 39202

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

Mississippi Native Plants & Environmental Education is the quarterly newsletter of the Mississippi Native Plant Society & the Mississippi Environmental Education Alliance.

Deadline for Articles
Winter - November 10
Spring - February 10
Summer - May 10

MEEA's Website: eeinmississippi.org
MPPS Website: mississippinativeplantsociety.org

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