

NATIVE NOTES

THE WEST VIRGINIA NATIVE PLANT SOCIETY

Volume 3, Number 3

December, 1996

REMEMBERING THE PAINTED LEAVES OF OCTOBER

by Paul J. Harmon

October! The brightest, clearest blue sky of the year complements the tan and dirty yellows of spent grasses and goldenrods waving in fields, the -- bronze, scarlet, mauve, gold and vermilion colors edging the roads and streams of the Mountain State. The colors of autumn were brilliant this year!

When the broad-leaved trees show signs of painting their leaves in bright rainbows, and the cool, damp air has a hint of hickory smoke, I love to walk beneath a huge sugar maple tree at the edge of an open forest. I know of a magnificent old tree, over 100 feet wide across the crown, with sweeping lower branches that curve gracefully to the ground. In the prime of summer, it's a dark hideout, but come October, glowing golden light shining through its yellowing leaves turns it into an immense bright teepee. From beneath, I watch tiny blue pieces of sky peek in through thousands of moving windows between the golden leaves.

In early October, you're sure to find many leaves that still have a lot of the green pigment (chlorophyll) within them. It is responsible for the deep greens of summer, and for capturing sunlight energy in the photosynthetic manufacture of simple sugars, the tree's 'food'. In October, some leaves will likely appear as a collage of green, scarlet, yellow, and orange. If you look at the top surface of one of the leaves nearest the outer edge of the tree, you may find a leaf that is half green, and half red or orange. The edge of the leaf exposed to sunlight will be brightly colored, while the part that was covered by an overlapping leaf will appear quite green!

Why? What accounts for all the varied colors and the tapestry across our mountains and hills? To understand this mystery, we need to understand that green plants, such as maple trees, make their own food through a process botanists call photosynthesis.

This process of making sugars in the presence of water, nutrients and light is made possible by chlorophyll. It is a complex protein that miraculously enables packets of sunlight energy to be used in linking carbon molecules into chains, forming simple, water soluble sugars full of energy. Such sugars are then transported throughout the tree to be converted into other proteins, lipids, and other chemicals that make up the body of the tree. Sometimes, those same sugars are stored in the bark and roots for later use by the tree.

Photosynthesis - the word means "putting together with light" - happens during the daylight hours, but at night the tree uses the stored sugars' energy for growth. Luckily for us and the rest of the animals of the world, green plants make more sugar than they need, leaving some left-over energy for grazing deer, munching insects, and lovers of the sweet taste of maple syrup.

All these processes are made possible in part because of a constant stream of water from the soil, fed through tiny root hairs into tiny tubes that connect the roots of the tree to its leaves. As water evaporates from the surfaces of the leaves, it tugs on the columns of water throughout the tree until, down at the roots, more water is literally pulled inside the root hairs, bringing needed minerals with it.

Still, what actually causes deciduous trees to develop such colorful leaves and then drop them all at once each autumn? The dropping of their leaves is part of a complex process to help the broad-leaved trees minimize the amount of water that's lost during the colder winter months. Remember, even in the winter, living trees need a continuous flow of water to live. If, on a sunny winter day, the ground was cold enough to double the viscosity (thickness) of the water in the soil, and the air was warmer than the soil, evaporation would continue at the leaves surfaces, but no water could make its way through the particles of soil to replenish the trees supply. To prevent this from happening, deciduous trees nearly shut down their growth in the autumn, drop their

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by: Chris Gatens

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On July 13th, eight Chapter members endured the heat and humidity of Greenbottom Wildlife Management Area. Some of the many plants that were observed on this day included the Blue Ash (*Fraxinus quadrangulata*), Kentucky Coffeetree (*Gymnocladus dioicus*), Water Smartweed (*Polygonum coccineum*), Sandbar Willow (*Salix interior*), Common Water Plantain (*Alisma subcordatum*), and Swamp Rose (*Rosa palustris*). The beauty of Greenbottom was enjoyed by all.

On August 3, 1996 eight Chapter members attended a field trip to the Slaty Mountain Preserve in Monroe County to view rare shale barren plants. The field trip was lead by Diane Anestis and Doug Wood, for the WV Native Plant Society and The Nature Conservancy. Uncommon shale barren plants observed on this trip included Yellow Buckwheat (*Eriogonum alleni*), Kate's Mountain Clover (*Trifolium virginicum*), Shale Evening-Primrose (*Oenothera argillicola*), Dwarf hackberry (*Celtis tenuifolia*), and Shale Birdweed (*Convolvulus purshianus*). The Kanawha Chapter sure is thankful for Doug and Diane and their knowledge of the unique shale barren habitat.

If you would be interested in the monthly activities scheduled for this winter, call Chris Gatens at 304/458-2533.

REPORT FROM TRI-STATE CHAPTER WVNPS

by: Steve Mace

On June 30, 1996 members of the Tri-State Chapter of the WVNPS met at the Green Bottom Wildlife Management area. This area is located on Rt. 2, north of Huntington, WV. It includes open fields and swamp. We anticipated seeing plants that grow in and around wetland areas. We saw two plants listed on the West Virginia endangered plant list, a vine *Ampelopsis cordata* and wild indigo *Amorpha fruticosa*.

Another rare plant seen, which is not on the WV endangered plant list but probably should be, was Virginia mallow *Sida hermaphrodia*. Judy Dumke says this plant is common along the Kanawha and Ohio rivers from Charleston to Huntington. It is rare throughout the rest of its range. It is found nowhere else in the world.

Other plants observed in bloom were swamp milkweed *Asclepias incarnata*, monkey flower *Mimulus ringens*, teasel *Dipsacus sylvestris*, yarrow *Achillea millefolium*, water hemlock *Cicuta maculata*, Queen Anne Lace *Daucus carota*, spotted jewel weed *Impatiens capensis*, pimpernel *Anagallis arvensis* and Canada thistle *Cirsium arvense*.

Also of interest, the group observed a school of carp swimming up a small tributary of the Ohio river. They appeared to be spawning. A board walk for the public is to be finished this summer. The board walk will transverse the main swamp area. When completed, it will make the Green Bottom Wildlife Management area a worthwhile place to visit.

broad leaves, and chemically prepare to survive the cold winter.

These processes of dormancy actually begin in the midsummer. Buds that will protect the young growing shoots of next spring are formed and made dormant. Proteins within the leaves (including the green chlorophyll) gradually break down faster than they are recreated. Growth hormones begin to subside while a growth inhibitor (abscisic acid) increases in volume, slowing the growth in the above-ground parts, and hardening the tree against the winter cold and dry air. All of these changes occur principally because the leaves and buds detect a gradual shortening of days and lengthening of nights.

As the leaves slow in growth, minerals that will be critical to next spring's bud growth are moved out of the remaining leaves and into storage tissues within the trunk and roots. With shorter days, less and less chlorophyll is produced, compared to the amount that breaks down chemically at night. Gradually, the yellow and orange pigments (called xanthophylls and carotenes) that have been present throughout the summer, are unmasked, displaying the beautiful golds and rusts!

Other pigments (flavonoids, such as anthocyanin) which reflect red and violet light, aren't produced until cold night temperatures and bright sunny days encourage the concentration of sugars in the leaves. During the bright days of autumn, many sugars are still produced in the leaves, but during the cold nights, those sugars can't be moved out of the leaves very quickly. As a result, brilliantly sunny autumn days, cool to cold night, moderate rainfall, and a delayed first hard frost result in the most fiery reds, deep violets, and rich crimsons in the autumn foliage.

The red and violet pigments are water soluble and are found within large sac-like vacuoles near the middle of central leaf cells. The yellow, orange, and green pigments are found within chloroplasts (pigmented bodies that line the central leaf cells), and are not water soluble. So, if we get a large amount of rain while the soluble red and violet pigments are developing, those pigments will likely wash out of the leaf cells, but the yellow and oranges will remain. If we have cloudy days, less sugars will be produced in the leaves, resulting in less flaming reds. If cool nights follow sunny days, the sugars produced in the leaves during the day can't move

readily into the tree's trunk during the night, and the red and violet pigments can then be manufactured as the sugars concentrate in the leaves. If nights are too warm, the sugars in the leaves will be transferred into the tree's trunk, leaving less in the leaves to be converted into anthocyanin, and we will have to settle for the mellow golds.

As the autumn drama comes to a close, all the green, orange, yellow, red, and violet pigments disappear, leaving only the skeleton of the leaves -- the network of cell walls, whose tannin-filled fibers reflect brown tones. The brown leaves, chock full of calcium (which moves poorly from the leaves) and trace minerals, begin to fall from their branches as the cement that held them to the woody parts decays, and a puff of wind sends them swirling to the ground to rot and fertilize the soil.

With so many species of deciduous trees, and so many variables that affect color development in their leaves, our deciduous forests have an autumn beauty unmatched in the world! Each tree will vary from year to year in its general color, and a given tree may have a number of colors throughout its crown, but each species tends to have certain characteristic colors each autumn.

The most magnificent display of color in all the kingdom of plants is the autumnal foliage of the trees of North America. The following quote from Donald C. Peattie's, *A Natural History of Trees of Eastern and Central North America*, says it best. "Over them all, over the clear light of the Aspens and the Mountain Ash, over the leaping flames of sumac and the hell-fire flickering of poison ivy, over the war-paint of the many oaks, rise the colors of one tree - the sugar maple. Clearest yellow, richest crimson, tumultuous scarlet, or brilliant orange - the yellow pigments shining through the over-painting of the red the foliage of Sugar Maple at once outdoes and unifies the rest."

"P. J." Harmon is botanist for the West Virginia Nongame and Natural Heritage Program, Wildlife Resources, of the DNR, in Elkins.



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Annual Meeting of the West Virginia Native Plant Society

by: Steve Mace

The fourth annual meeting of the West Virginia Native Plant Society was held at Camp Arrowhead, just outside of Barboursville, in Cabell County, on September 20, 21 and 22, 1996. The weekend was hosted by the Kanawha Valley Chapter.

This enjoyable weekend got off to a start Friday at 7:00 p.m. with Emily Grafton's program, "From the Forests to the Medicine Cabinet". Emily gave a slide presentation on West Virginia plants that have been used for medicinal purposes. She explained the healing properties of selected native species based on their traditional uses and the scientific research which has identified the chemical agents responsible for the healing capabilities of these species.

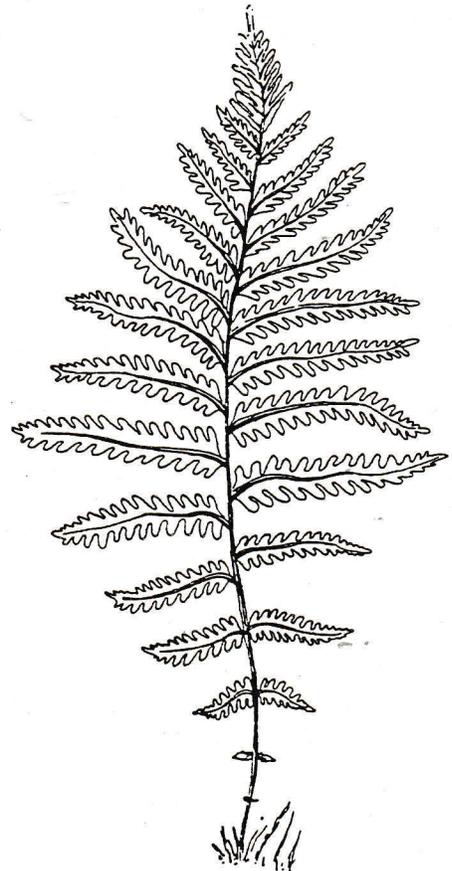
On Saturday, after a short plant/bird hike, P.J. Harmon gave his richly detailed workshop on "Plant Families Identification, Part II". The morning session consisted of slides, use of an overhead projector, and microscopes. The afternoon session was a field trip to Greenbottom Wildlife Management Area to put to use what we had learned that morning.

The evening program was "Native Orchids" by Bernard Cyrus. Bernard gave a slide presentation of our native orchids. He described his adventures in photographing these orchids along with other observations he has acquired over time about these beautiful plants. After the program Bernard and P.J. gave us some "native" music with their banjo and guitar.

After a Board of Directors meeting on Sunday the weekend ended at noon. I would like to thank many people for the success of the weekend, especially Christopher Gatens, Shirley Schweizer and Carolyn Welcker, all of the Kanawha Valley Chapter, and Helen Gibbins of the Tri-State Chapter. Also, thanks to Ray Franks of the Tri-State Area Council of the Boy Scouts of America for the use of Camp Arrowhead, and Emily Grafton, P.J. Harmon and Bernard Cyrus for their programs.

***Listed are those who attended all or part of
the weekend.***

Jim Arnold	Jarod Gatens
Mary Anderson	Maridith Gatens
Patrick Anderson	Helen Gibbins
Kitty Bolen	Neil Gibbins
Gay Brown	Russ Good
Becky Charles	Daniel Grafton
Libby Chatfield	Emily Grafton
Mark Chatfield	William Grafton
Bernard Cyrus	Anna Mae Harmon
Richard Cyrus	Annie Harmon
Galina Fet	Matthew Harmon
John Foose	P.J. Harmon
Donna Ford-Werntz	Terry Harmon
Christopher Gatens	Romie Hughart
Tina Long	Steve Mace
Mathew Marks	Michael Marks
Elinor Miller	Bill Reed
Rose Marie Riter	Shane Roby
Shirley Schweizer	Richard Thompson
Carolyn Welcker	Leon Wilson
Sandra White	



Darrell is known worldwide for his fantastic Hemerocallis (Daylily) introductions. He is also an extraordinary *plantsman* with limited garden space at the time, so his grant of space to a particular tree was my first clue. I was visiting his garden on a crisp, clear Autumn day. You know those kind of days when the sky is so blue that it's almost black, when I noticed a shapely tree with outstanding Autumn color. We strolled under the tree and before Darrell could fill me in, I glanced upwards at the banana like clusters of fruit hanging above like pendulums. The fruit was just ripening. Darrell being quite generous, got a five gallon bucket and vigorously shook the tree, pelting me and the bucket with fist sized fruits weighing over a half pound each. After the deluge, we sat down under the tree, peeled back the skins and feasted on one of the most unusual tastes and textures that I have ever experienced. Well.... I was hooked.

When I got home, I immediately pulled out all of my NAFEX (North American Fruit Explores) Journals and started "hitting the books" to learn more about Pawpaws. There were lots of interesting articles and the more I read, the more I wondered why this fruit wasn't more popular with the home gardener and the American fruit consuming public?

And now for a little history. One of first recorded historical references dates back to a De Soto expedition of 1540. That's De Soto the explorer, not the car. He wrote of Native Americans cultivating the Pawpaw and introducing it to the Europeans. In 1736 botanist John Bartram sent some Pawpaw specimens back to England. Not much was done with Pawpaws during the 1800's but after the turn of the century, new interest abounded. Many people lived on Pawpaws during the great depression, but after World War II, imported fruit became easily obtainable and interest in Pawpaws waned. That was until 1988. Enter West Virginia Native, Neal Peterson. Neal, justly referred to as the foremost Pawpaw expert in the Universe, founded the Pawpaw Foundation (PPF).

The PPF started as a one man crusade to enlighten the masses to the virtues of this unknown fruit. The foundation now has over 300 members in almost every state of the US and several foreign countries. Among its many activities, the PPF oversees two orchards at the University of Maryland totaling over 1900 trees.

They also lend technical assistance to scientists, horticulturists and geneticists studying Pawpaws and give advice to home gardeners who want to grow Pawpaws. Making fruits available for research and taste testing is just one of the many other functions of the group. The PPF also publishes a very informative newsletter which members receive free of charge. Annual dues are only \$15.00. What a bargain!

Another mecca of Pawpaw research is at Kentucky State University at Frankfort. There, Dr. Desmond Layne has picked up Pawpaw research where Dr. M Brett Callaway left off. The University has recently received a grant to become a USDA Germplasm storage site and hosted the second annual Pawpaw Conference October 10-12, 1996. Dr. Layne is also developing a KSU web site on the Internet that will be the Pawpaw Home Page. It will be a vast database and include color photos, extension/research articles, recipes etc. In the meantime, if you are online and would like more info on Pawpaws, the Pawpaw fact sheets are available at:
<http://newcrop.hort.purdue.edu/hort/newcrops/Crops/CropFactSheets/pawpaw.html>
and Pawpaws info can also be found at the California Rare fruit Growers Home Page:
<http://www.crfg.org>



By the way, did I tell you that the Pawpaw is the largest native fruit in North America????

Taxonomically speaking, The Pawpaw is a member of the Annonaceae family. The same family that is home to the tropical fruits Soursop, Custard Apple and the Cherimoya. The latter of which is becoming available at better grocery stores.

Pawpaw trees are not as difficult to grow as some people may have thought in the past. They can be finicky, but if you follow a few basic rules, you will succeed and they will prosper and reward you with bushels of delicious fruit. They prefer a slightly acid

soil pH 5.5-7.0. The soil should be well drained and fertile. If your site is in full sun, you can expect the tree to take on a narrowly pyramidal shape with dense drooping foliage down to the ground level. Grown in the shade, the habit is more of an open branching with few lower limbs and horizontally held leaves. Paw Paws are typically small trees, seldom reaching over 25 feet in height.

Several trees should be planted as most are self-infertile.

If all of these attributes weren't enough, research is underway to isolate compounds from the twigs that have been shown to have promising benefits in cancer therapy. Certain compounds from the Pawpaw are also being tested as organic pesticides. So far, one extract kills pests such as harmful nematodes, tobacco horn worms, bean beetles, potato bugs and cabbage loopers.

OK, so you have these great looking tropical trees growing in your backyard with buckets of fruit on them. What now? You can tell that Pawpaws are ripe with a gentle squeeze. They also take on a very sweet fragrance as they ripen. I like eating the fresh fruit right under the tree, but fruit can also be harvested before it ripens and stored in the fridge for a couple of weeks. The fruits perish quickly, so if you have more than you need and you've loaded up all of your friends and neighbors and you've had your fill of Pawpaw bread (substitute it for bananas and your favorite banana bread recipe), just puree it in the blender and freeze it. Then pull it out on a

Neal Peterson
Pawpaw Foundation
PO Box 23467
Washington DC 20026
202-484-1121

Jill Vorbeck
North American Foundation
Rt 1 Box 94
Chapin IL 62628
217-245-7589

Dr. Desmond Layne
KSU 129 Atwood arch
400 Main
Frankfort KY 40601-0091
502-227-5942

Barry Glick - Sunshine Farm & Gardens - Route 5,
Renick, WV 24996

CALLING ALL "FUNGIPHILES"

If you love mushrooms and would like to learn more about them, then you might want to consider joining the newly formed West Virginia Mycological Society

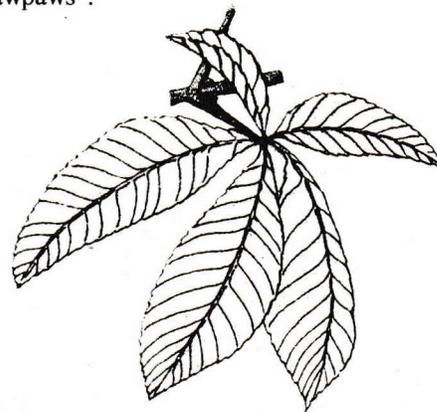
snowy night in the middle of the winter and voile its Summertime again.

How bout a Pawpaw Pie???

Take:

- 1 cup sugar 1 egg
- 1/4 tsp salt 1 cup milk
- 1 1/2 cups Pawpaws (peeled and seeded)

Place all of the ingredients into a stew pan and stir together. Cook over medium hear until thickened. Pour into an unbaked pie shell and bake until the crust is done. Top it with whipped cream. mmmmm For many more recipes and pawpaw nutriton information, contact Dr. Layne below and ask for a copy of his recent Extension Publication entitled "Cooking with Pawpaws".



If you're ready to grow Pawpaws, I suggest that you join the Pawpaw Foundation. In addition to keeping you informed about new developments in the culture of Pawpaws, you will be provided with resources for purchasing trees and networking with the experts in the field.

(WVMA). The WVMA publishes a newsletter that gives you mycological news, informative and entertaining articles, notice of outings, book reviews and recipes. The organization holds frequent meetings and outings. If interested, please write, Sam Norris, President; WVMA, Post Office Box 1823, Elkins, WV 26241. Or call, 304/636-7142.

WVNPS OFFICERS & NEWSLETTER EDITOR

Libby Chatfield, President
h/304/949-5028 w/304/558-4002
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h/304/882-2450
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**MEMBERSHIP REGISTRATION
COUPON**

Please sign me up as a member of WVNPS!

Name(s) _____ Phone: (h) _____

Address _____ (w) _____

Membership Dues:

Individual: \$8 (New members, only: Jan 1-Mar 31, \$8. APR 1-June 30, \$6. Jul. 1-Sep 30, \$4. Oct. 31-Dec. 31, \$2)

Family: \$12 (New members, only: Jan 1-Mar 31, \$12. Apr. 1-June, 30, \$9. Jul 1-Sept 30, \$6. Oct. 31-Dec. 31 \$3.)

Student: \$5 Life: \$200

Preferred Chapter: _____

I wish to make an additional contribution to the WVNPS in the amount of:

\$10 \$25 \$50 \$100 \$ _____

This is a gift membership. Please include a card with my name as donor:

**WVNPS
Corresponding Secretary
P.O Box 2755
Elkins, WV 26241**



JUDY DUMKE
7302 COUNTY ROAD #15
CHESAPEAKE, OH 45619

[12/31/96]



Division of Forestry

West Virginia University

College of Agriculture and Forestry

17 December 1996

Dear WVNPS Member:

In 1993 we initiated a program at West Virginia University to explore the social, economic, and biological importance of wild-harvesting activities in the state. Our main focus is on ginseng harvest. Preliminary observations suggest that in some northern counties ginseng berries are green and not ripe around the opening date for harvest (August 15th). Ripening obviously varies from year to year depending on rainfall, temperature, elevation, latitude, and other variables.

We are writing to request your help in learning more about ginseng harvest with our overall goal being sustainable harvest. We wish to initiate a statewide monitoring program and record ripening dates on as much ginseng as possible over the next several years. This mailing is preliminary (we realize that it may be difficult to remember back to August and September for ripening dates), in order to get feedback on the project idea, the data sheet, etc.

Please complete the enclosed data sheet (to the best of your memory) for the 1996 season. Add any comments you have on this study, including ways to make data collection more accurate, easier and more manageable for you. We are sending copies of this letter to selected employees in the Division of Forestry, the Division of Wildlife, and a few harvesters who have expressed an interest. If you know of additional people who might be interested and willing to help, please forward their names to us at your earliest convenience. Thank you very much for your time and interest. Please return the enclosed form by January 15, 1997.

Sincerely,

Dr. David E. Samuel, Professor
Division of Forestry
West Virginia University
Morgantown, WV 26506-6125

Other participants:
Dr. James McGraw and Martha Van der Voort
Dept. of Biology
West Virginia University

p. s. Please sign the data sheet and include your return address prior to returning it so that we will be able to contact you in the future! Thank you.

