The Lady-Slipper

Kentucky Native Plant Society Number 22:2 Summer 2007

A Message from the President

July weather in May is not a good sign for a great summer of wildflowers in Kentucky. It has been near 90 most days and we are more than 5" below our normal rainfall. I have noticed many species of plants flowering a good three weeks early and then staying in flower for just a short period of time. Add to this the late freeze throughout much of the state and both plants (there will be no red oak acorns next year for wildlife and most hard mast in the form of nuts and berries will be limited this year) and wildlife will be affected as food becomes a hard commodity to come by. If you haven't begun reading about how you and your lifestyle affects global climate change and indirectly native plants, perhaps this summer is a good time to begin that process, especially when it is too hot to go outside except in the early morning or evening.

A recent Cornell University study of the phenology of spring wildflowers at a site in the Hudson Highlands of southeastern New York found significantly earlier bloom (averaging 19.8 days over a period of 50 years) in 6 of the 15 wildflower species examined. One in every five species of wild flower could die out over the next century if levels of carbon dioxide in the atmosphere double in line with predictions, scientists reported in a national study. A study of the impact of global warming on plants has found that most of the environmental changes are likely to result in a substantial loss of plant life. Even though plants need carbon dioxide to survive, the research found that higher levels of the gas reduced numbers of wild flowers by 20 per cent, and cut overall plant diversity by 8 per cent.

Scientists from Stanford University in California altered the environment of 36 open-air plots of land - on which between five and 20 wild plants had been growing - over a period of three years. They doubled carbon dioxide, increased "rainfall" by 50 per cent, caused average temperatures to rise by 1.7C and added nitrogen pollutants to the soil - all of which are likely to happen because of global warming. Their study, reported in the Proceedings of the National Academy of Science, concluded that one in every five species of wild flower could die out over the next century if levels of carbon dioxide

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KNPS Annual Fall Conference

November 3, 2007
Otter Creek State Park, Kentucky

Join The Kentucky Native Plant Society for this exciting conference at the scenic Otter Creek State Park which contains 2,600 acres including grand views of the Ohio River (Brandenburg, KY near Louisville).

11:00 a.m. Keynote address
Invasive Plants – Coming to Kentucky
by Randy G. Westbrooks, Ph.D.
Invasive Species Prevention Specialist
U.S. Geological Survey (see bio, p. 8)

12:00 p.m. Discussion to establish early detection and rapid response teams
12:30 p.m. Lunch (Bring your own)
2:00 p.m. hike led by Bryan Lewis, park naturalist

Family cabins are available for rent. Contact Pat Haragan for more information (caribpat@aol.com). Call 502-574-4583 (in Louisville) or 502-942-3211 (elsewhere) for park information. This event is being sponsored by the KNPS and a donation from the Kentucky Natural History Society.

In this issue--

The Lady-Slipper

is intended to be published by the Kentucky Native Plant Society [IRC 501(c)(3)] in March, June, Sept., and Dec. Deadlines are the 15th of the prior months, but Editorial Committee members welcome article submissions at any time.

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ARISTOLOCHIACEAE: INSECTS, HUMANS AND THE BIRTHWORT FAMILY

by Amy McIntosh

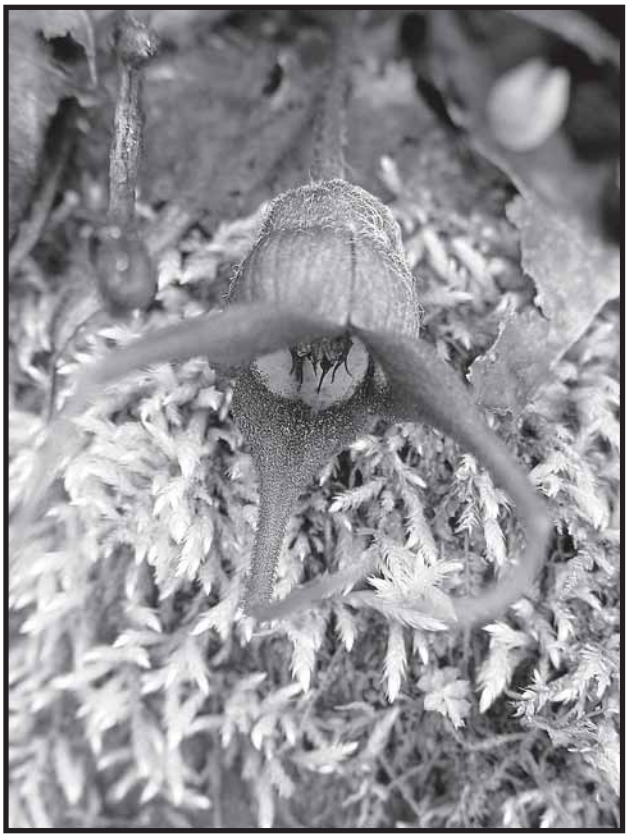
Introduction

Members of the Birthwort Family, Aristolochiaceae, have a complex array of relationships with insects and humans. Interactions with pollinators, non-pollinating butterflies, and seed/fruit dispersers (along with the plants' pollination mechanisms and the creation and use aromatic oils) provide insight into the family's co-evolution with insects.

Human relationships with the birthwort family have a long history involving herbal and food use. Current interests in the family include collection of garden and greenhouse specimens, breeding of ornamental varieties and determining effectiveness of possible anticancer chemicals within some species. Human degradation of habitat in areas of endemic and otherwise limited populations has threatened 35 species at last count.

Attracting Pollinators

Unlike some flowering plants that boast a bright, colorful perianth, most Aristolochiaceae members possess green, brown, black, deep purple or pale yellow calices (Huber 1993). Some members of the family utilize self-pollination as the major means of sexual reproduction (e.g., *Asarum europaeum*-European wild ginger) (Huber 1993). *Aristolochia serpentaria* (Virginia snakeroot) is suspected to exhibit cleistogamy (propagation by means of closed, self-pollinating flowers) (Pfeifer 1966). Others have flower maturation that restricts self-pollination temporally (for example, *Aristolochia maxima* (Florida dutchman's pipe) is protogynous (explained below)) (Sakai 2001).



Asarum canadense, photo by Amy McIntosh

Species of Aristolochiaceae which are dependant on pollinators attract true flies (Diptera), beetles (Coleoptera) and thrips (Thysanoptera) with odor and floral food rewards (Sakai 2001). Warmth is an attractant as well (Thein et al. 2000). The lack of colorful flowers and the presence of floral odors suggest the early evolution of the family among angiosperms (Pellmyr and Thien 1986).

Floral odors

Aristolochiaceae flowers generally emit strong, fetid floral odors mimicking musky fruit, fungus, urine, feces or carrion (Huber 1993; Sakai 2001; Cronquist 1981). In some carrion-scented flowers it is suggested that this scent is evidence of an adaptation to attract unsuspecting pollinators that originally fed

Hexastylis arifolia, photo by Amy McIntosh

and oviposited on carrion but now utilize floral tissues (Pellmyr and Thein 1986). *Aristolochia grandiflora (pelicanflower, an exotic growing in Florida)* was noted (on a label of a herbarium specimen deposited at the New York Botanical Gardens) as having a "strong odor of putrid meat [that] attracts the insects 100 or more feet from the flower" (Reis and Lipp 1982). The odors produced by early angiosperms (such as Aristolochiaceae) may even trigger insect mating (Pellmyr and Thein 1986).

Thermogenesis

Aristolochiaceae flowers produce heat through biochemical processes (called thermogenesis). Maximum heat production is synchronized with the stigma(s) ability to receive pollen. This production of heat is theorized to benefit basal angiosperms in many ways including enhancing floral odor release and pollen germination. The warmth also benefits pollinators by conserving the insects' energy and providing a good environment for breeding and development of larvae (Thein et al. 2000).

Flower rewards

Floral tissues are rich in energy and provide a competitive edge for ovipositing female insects and resulting larvae (Pellmyr and Thein 1986). *Hexastylis* is pollinated by thrips (Thysanoptera), which eat pollen grains and flower epidermal tissue. Thrips spend most of their life cycle within the flowers (USFW, 1990), (Sakai 2001). Two species of *Aristolochia* flowers (*A. maxima* and *A. inflata*) are known to provide ovipositing substrate for pollinators. The pollinators of these two flowers are predominantly female, indicating a coevolved link between the reproduction of the insects and plants (Sakai 2001).

Diptera (true flies) have specialized mouthparts that allow the imbibing of sweet floral liquids that are found on basal angiosperms' stigmas, ovaries and stamens (Thein, et al. 2000). Although flies of several families are known to pollinate *Aristolochia*, the attraction is usually deceptive, and nectar and similar liquids may or may not serve as a reward depending on the plant species. These liquids may serve an alternative role in attraction, feeding the pollinator only during entrapment, or simply in attaching pollen grains to the insects' bodies (Sakai 2001).

Pollination Mechanisms

In addition to these means of attracting pollinators, many Aristolochiaceae flowers are equipped with mechanisms that assist in insect pollination: floral traps and protogynous floral maturation. Floral trapping techniques allow for entrance and retention of a potential pollinator until the flower has been pollinated. This is accomplished by utilization of stiff directional hairs in the perianth tube leading to the utricle and/or an oily covering on epidermal cells which prevents traction (Huber 1993). Such trapping utricles limit competition for flower rewards and provide a safe haven for mating insects (Pellmyr and Thein 1986).

Protogynous flowers (observed in Aristolochia species) have "female" and "male" stages (days). On the first (female) day, the flowers may emit an odor to attract pollinators. The female organs are mature and prominent; stigmas are able to accept pollen and heat is produced inside the utricle. On the second (male) day the anthers become prominent and dehisce, covering the trapped insect with pollen. Subsequently perianth tube hairs wither and allow for the insect's movement to another female-day flower in need of pollination (Pfeifer 1966; Hickey and King 1998).

Food Plant use by Papilionidae

Several genera of Papilionidae (swallowtail) butterflies utilize Aristolochiaceae for food plants. In fact, entire

Pipevine swallowtail caterpillar, photo by Amy McIntosh

swallowtail tribes (Serynthiini and Troidini) are host-specific to Aristolochiaceae. Caterpillars that feed on Aristolochiaceae plants are able to utilize aristolochic acids as predator deterrent (Tree of Life 2004).

Pipevine swallowtail, photo wc.pima.edu

In North America *Battus* (pipevine swallowtails) predate on *Aristolochia* species. Several genera of the Papililionidae are parasites on Asian Aristolochiaceae species. *Archion* and *Zerynthia* are distributed in the western palaearctis with their host plants. Bragantieae and some *Aristolochia* are eaten by *Troides* species (Huber 1993).

The swallowtail butterfly has two broods a year; the larvae consumes all of the foliage of the plant on which it emerges and seeks additional host plant individuals. Such ravenous feeding by the larvae results in lower plant reproduction success. These selective forces, over time, have resulted in adaptations by some species to prevent herbivory: tough leaves low in nutritional value and taste; high root-shoot ratios to store food for high predation years; and underground flower and fruit production (which are preferred to foliage by the insects) (Rausher and Feeny 1980).

Seed/Fruit dispersal

Aristolochiaceae utilizes a variety of fruit and seed dispersal mechanisms. Like many other temperate woodland herbs, ant-plant mutualism (called myrmecochory) plays an important role in the distribution of herbaceous species' seeds (notably *Asarum* and *Hexastylis*). *Aristolochia* is dispersed by wind after fruits dehisce. Sticky seeds, edible fruit and water dispersal are alternative means of dispersal utilized by the family.

Hexastylis seeds have copious eliasomes (fat bodies) which are readily eaten by ants. In fact, Gaddy (1986) noted consistent 100% removal rates of *Hexastylis* seeds by ants in experiments where a wide range of seed types were made available. This rich food source results in hoarding of the seeds at ant nest sites, where germination in clusters occurs the following spring (USFW, 1990). Similar observations have been made of *Asarum europaeum* seeds, which are dispersed by *Formica polyctena* (Gorb and Gorb 2003).

Asarum (wild ginger) seed are prone to desiccation (Kelly 1998). This coupled with dispersal limitations of myrmecochory may play a role in limited range of *Asarum* (in comparison to *Aristolochia*).

Many *Aristolochia* species have winged seeds that are dispersed when the fruits dehisce (Huber 1993). Some additional groups are distributed by animals: *Aristolochia* by means of sticky seeds that attach to animal bodies and *Paristolochia* by encouraging consumption of fragrant, edible fruits (Huber 1993). *Aristolochia clematitis* (birthwort) and two Amazonian species of the family possess fruits and seeds that are adapted for distribution by water (by means of floating) (Wulff 1943; Huber 1993). *Aristolochia*'s variety of dispersal techniques which favor a longer-distance results can help to explain the group's wide distribution, including colonization of many isolated islands in Central America and Asia.

Dehisced *Aristolochia* fruit, photo www.mobot.org

Human History of Medicinal Use

Members of the Aristolochiaceae have a long history of medicinal use, as evidenced by the inclusion of *Aristolochia clematitis* in medieval woodcut-illustrated herbals and commonly in later engravings. In fact, the name *Aristolochia* has roots in the Greek: *Aristos* (meaning best) and *lochia* (meaning delivery/birth) (Pfeifer 1966). Pliny referenced the use of *Aristolochia* by midwives, and termed it *aristi lekhousais* (translated—best for women giving birth) (Coffey 1993). The common name of *Aristolochia clematitis* further recognizes this common use of the "herb". In addition, in keeping with the Doctrine of Signatures, the flower bud of members of *Aristolochia* was determined to resemble the human fetus or swollen womb and was utilized accordingly to remedy the pain of childbirth (Pfeifer 1966), and as an abortive agent, conception aid (and, ironically, preventative), and birth inducer (Coffey 1993).

Aristolochiaceae members have been determined in the past to possess many additional medicinal benefits. The family's widespread use for a myriad of ailments is

indicated by the use of its name by an honorary society of herbalists in the United States—The Aristolochite Society (now known as Rho Chi) (Pfeifer 1966). *Aristolochia serpentaria* (of North America) was prized as an antidote for snakebite, with records of this fact dating as early as 1633 (Coffey 1993). *A. schippi* (Honduras) and *A. trilobata* (Martinique) were used similarly for snakebikes, and *Aristolochia bracteolata* (of Tropical East Africa) for snakebite and scorpion stings (Reis and Lipp 1982; Verdcourt 1986). In keeping with a strong Chinese awareness of potential uses of herbs, Chapman and Wang (2002) list *Aristolochia debilis* as possessing antirheumatic, and diuretic properties. Other historical uses of the *Asarum* and *Aristolochi*a include to cure ulcers, syphilis, rheumatism, cholera, relieve toothache, fever, indigestion, coughs, heart conditions, throat ailments, cramps, gas and to promote sweating (Foster 2000; Coffey 1993).

Recent research has shown that medicinal usefulness of the plants is not unfounded. *Asarum*'s rhizomes contain essential oils (sesquiterpenes and phenlypronanoid compounds), and aristolochic acid from aporphines is found in Tribe Bragantieae and Tribe Aristolochieae members (Huber 1993). These agents are currently being researched for anti-cancer and antibiotic properties, although the family also bears a reputation of possessing poisonous and carcinogenic properties (Foster 2000; Coffey 1993; Polunin 1969).

Aristolochia elegans print, artist unknown, www.meemelink.com

Non-medicinal Uses

Aristolochiaceae members have been utilized for a variety of non-medicinal applications. Fruits, leaves, rhizomes and stems of the *Aristolochia debilis* were suggested in a circa 1406 AD list (the *Chiu Huang Pen Tsao*) as famine foods (Chapmand and Wang 2002). *Aristolochia bracteolata* (Africa) is reportedly used for food as well (Verdcourt 1986). Wild ginger (*Asarum canadense* of North America) has been known as a substitute for true tropical ginger (*Zingiber* spp.) (Coffey 1993). *Pararistolochia* (*Aristolochia*) *triactina* is used as a rope for various applications including binding hut materials in its native Uganda, Angola and nearby countries (Verdcourt 1986). *A.daemoniana* shares a similar use in British Guiana (Reis and Lipp 1982).

The unusual flower shape in many *Aristolochia* species have made them prized for ornamental use. *Aristolochia gigantea* (Brazilian dutchman's pipe) and *A. littoralis* (calico flower) are common greenhouse tropicals and *A. macrophylla* (Dutchman's pipe) is grown in many temperate gardens of the world (Pfeifer 1966). *Aristolochia* and *Asarum* species have been manipulated through hybridization to produce large, showy and unusual forms for collector-gardeners in many parts of the world.

Aristolochia tomentosa www. missouriplants.com

Aristolochiaceae in Kentucky

Kentucky boasts eight species of the birthwort family, including representatives of three genera. Dutchman's pipe (*Aristolochia macrophylla*) is a woody vine of mixed mesophytic forests and can be found growing to diameters exceeding 2 1/2". Pipe-vine (A. tomentosa), is also a lianas, but inhabits swamps and wet woods of the Mississippi embayment.

Virginia snakeroot (A. serpentaria), a herb, completes the state's constituents of the *Aristolochia* genus. Wild ginger, *Asarum canadense*, is

Hexastylis contracta photo by James Kiser

Report on Inaugural Meeting of Kentucky Old Growth Forest Society

by Ron Jones

On March 29, 1935, E. Lucy Braun delivered a talk to the Garden Club of Kentucky (for the text of the talk, see pages 47 and 48 of *Plant Life of Kentucky*). The subject of her speech was a description of a 2,500 acre tract of virgin forest on Lynn Fork, in Perry County, which included a tuliptree nearly 24 feet in circumference, and a plea to save it from being timbered. After the talk she organized the formation of one of Kentucky's first conservation groups, the "Save Kentucky's Primeval Forest League." Unfortunately, despite all the group's efforts, this ancient forest was clear cut in 1937. Braun later witnessed and described the destruction of most of the remaining old growth forests in the Cumberland Mountains region.

Conference participants prior to hike at Blanton Forest, photo by Ron Jones

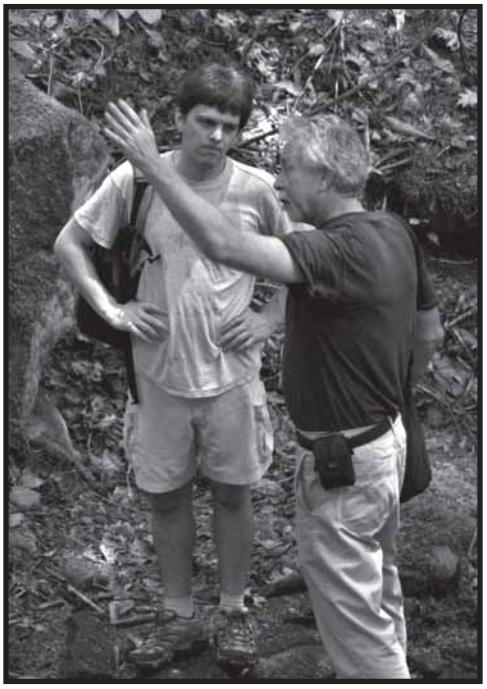
Today only a few old growth sites are known to occur in Kentucky. Some are federally-owned (Big Woods of Mammoth Cave and Rock Creek Research Natural Area, and several sites in Daniel Boone National Forest), and others are state-protected (Lilley Cornett Woods and Blanton Forest). There are no doubt other sites with old growth that remain to be identified. There is now a new effort to form a group that will work to discover and protect these sites.

A meeting to discuss the status and future of old growth forest in Kentucky was held on June 15 and 16 at Pine Mountain State Park. The meeting was organized by Marc Evans of the Kentucky State Nature Preserves Commission and Neil Pederson of EKU. About 30 people attended the meeting, including 8 speakers. The meeting kicked off with an introduction by Neil, followed by the following speakers: 1) Bob Leverett, who spoke about the increased awareness of old growth forests in eastern U.S., and the urgent need to search for more stands of old growth; 2) Ryan McEwan, who described his studies of ancient trees in the Bluegrass, and the puzzling discovery that before the early 1800s the trees produced much narrower growth rings than they did afterward, suggesting that they had been "released" from some environmental suppression of growth (possibly intense tree-to-tree competition imposed by a closed-canopied forest within the Bluegrass?); 3) Jeff Stringer, who discussed ways to enhance the old growth attributes of second growth stands in Kentucky, as best evidenced in Robinson Forest; 4) Rob Messick, who spoke about his archival search for materials relating to attempts to preserve forests in the first half of the 20th century in eastern Kentucky, especially the efforts of E. Lucy Braun; 5) Lee Frelich, who shocked many participants with his warnings of upcoming ecological devastations caused by exotic earthworms, these events (involving the almost complete removal of leaf cover and subsequent decline of tree regeneration) already happening in the northern U.S. forests, and imminent in more southerly forests; 6) Marc Evans, who reviewed the role of the Kentucky State Nature Preserves Commission in the preservation of old growth forests, including the use of modern technology in discovering and mapping these sites, and provided examples of sites across the state; 7) Neil Pederson, who provided background on the techniques of dendrochronology, and how tree-ring data can be used to provide information not only on tree age, but on a variety of topics relating to past climatic and ecological changes; and 8) Bill Martin, who provided an overview of issues relating to discovering, defining, managing, and preserving old growth forests. Bill, widely acknowledged as one of the nation's leading experts on old growth forest, and recently recognized by the KSNPC with the 2006 Biological Diversity Protection Award (see Don Dott's

article in and *Land Air and Water*, Spring 2007), provided a most fitting conclusion to the talks. After the talks, the participants met at Blanton Forest, where Bob Leverett gave demonstrations on how to accurately measure tree height, and Neil Pederson demonstrated proper coring techniques. Neil also pointed out that some of the trees sampled in Blanton Forest also show the peculiar pattern of suppressed growth before the early 1800s, and better growth afterward, as was noted by Ryan McEwan in his studies of Bluegrass oaks. The hemlock woolly adelgid (HWA), which threatens to decimate the eastern hemlock, was also observed at Blanton Forest (as evidenced by white cottony tufts on the branches). We also saw an unusual amount of hemlock needles on the forest floor, and that any slight breeze brought a "rain" of needles from the trees. Could this be another effect of the adelgid? What makes these observations most alarming is that a small amount of HWA was just discovered in Blanton last November. It seems to have exploded in the intervening months. For more information on the hemlock woolly adelgid, see the article in the most recent issue of *Land Air and Water*, Spring 2007, by Tim McClure. Many of the group then participated in a hike to various sites in Blanton Forest, led by Marc Evans.

Dr. Bill Martin, EKU emeritus, photo by Ron Jones

This meeting served to raise the awareness of those attending on many issues relating to old growth forest in Kentucky, and especially of the need to search for more stands of old growth and work to keep these preserved. More information will be forthcoming on the formation of a "Kentucky Old Growth Forest Society." One goal of the society will be to organize teams of people to search for old growth across the Commonwealth. Those interested should contact Neil Pederson at neil.pederson@eku.edu.



Neil Pederson, left, and Marc Evans, right, photo by Ron Jones

Who are we?

This time, the *Who Am I?* applies to both the plant and the insect. Name both!

The plant—
I am a common plant of roadsides and fields in the summer. My leaves are alternate and simple, and my flowers are orange, with special sac-like structures to hold the pollen. My fruit is a follicle.

The insect—
I am mostly black, with spoon-shaped tail, and have bright green (if male) or iridescent blue (if female) hind-wings. My forewings have ivory-white spots, and orange spots occur on my hindwings. My wings spread out to 3 or 4 inches.
My caterpillars live in folded leaf shelters and eat the leaves of native species in the sassafras family. As an adult I like to eat a variety of nectars, including those from azalea, Japanese honeysuckle, thistle flowers, and from plants in the picture with me.

The last *Who Am I?* answer:
Heteranthera limosa

The following KNPS members correctly identified the last species:
Robert Oney
Rebecca Carbonell
Chris Bidwell

***Send your answer including** family name, genus and species name, the correct author citation, and the geographic range of the species to **ron.jones@eku.edu**!*

Preisdent's Message, continued from page 1

increase as predicted. Even though plants need carbon dioxide to survive, the research found that higher levels of the gas reduced numbers of wild flowers by 20 per cent, and cut overall plant diversity by 8 per cent. They described their findings as "dramatic". For more information about the problem with global climate change I would recommend you visit the International Union of Concerned Scientist site at http://www.ucsusa.org/global_warming/.

There are some very exciting things happening with respect to native plants around Kentucky and the first is the inaugural meeting of Kentucky Old Growth Forest Society which held their first meeting at Pine Mountain State Resort Park on June 15 and 16. There is more information about this program on our website and on page 6 of this newsletter.

We are so excited about the upcoming fall meeting that Pat Harrigan has arranged in bringing one of the nation's top weed experts to the Commonwealth. Randy Westbrooks, from USDA-APHIS will be our featured speaker at the fall meeting which will be held at Otter Creek Park on November 3. The day before the fall meeting Randy will spend the day at the University of Kentucky trying to put together a coalition of folks who are willing to attack our weed problem (which will continue to get worse as a result of global warming by the way) and we encourage you to contact the Department of Forestry at UK for more information about his seminar and visit there. We are so grateful as a society to one of our sister organizations, the Kentucky Society for Natural History, and the University of Kentucky Department of Forestry for helping us sponsor Randy coming to Kentucky. Finally I would like to report that the gift book on *Precious Plants, Conserving the Rare Wildflowers of Kentucky* is at the publisher and will be available in print by next spring. It will feature the writing of Deb White and Marc Evans of the Kentucky Nature Preserves Commission and my photography with 220 images of state and federally listed plants that are rare in Kentucky.

Finally, make sure you check out our website for upcoming field trips and other items of interest. It is a great resource for all. As always if you have concerns please do not hesitate to contact me at tbarnes@uky.edu or 859-257-8633.

--Tom Barnes

KNPS Committees

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Randy G. Westbrooks, Ph.D. KNPS Annual Fall Conference Keynote Speaker

Randy Westbrooks, a native of Gaffney, South Carolina, received his B.S. and M.S. degrees in biology from the University of South Carolina, and his Ph.D. in Botany and Weed Science from North Carolina State University. Since 1979, Dr. Westbrooks has served as an Invasive Species Prevention Specialist with the U.S. Government, in the USDA and DOI. Internationally, Dr. Westbrooks is working to develop a Global Early Warning System for Invasive Species – in cooperation with the IUCN Invasive Species Specialist Group, based in Auckland, New Zealand. On the domestic front, Dr. Westbrooks is working with numerous interagency groups to develop a National Early Detection and Rapid Response System for Invasive Plants in the United States. Currently, the effort is focusing on the establishment of State EDRR Coordinating Committees to coordinate the development of the local, state, and regional elements of the National EDRR System. These includes Regional Invasive Plant Atlases (data synthesis and volunteer training), State Invasive Species Councils (interagency coordination), Volunteer Networks (detection and reporting of new invaders), and Invasive Plant Task Forces (rapid response to confirmed invaders).

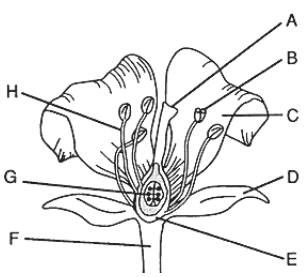
Dr. Westbrooks' Motto is: *Partnerships Now.... Weeds Won't Wait*!

Native Plant Certification Courses for Fall 2007 Semester

Core Course:

Basic Plant Taxonomy

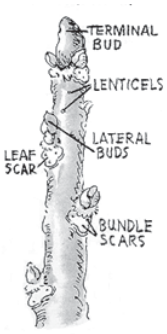
Sept. 8, 15, 22, 29
9:00 to 12:00
Instructor: Maggie Whitson



This course provides an introduction to the principles and practices of plant taxonomy. Included are an overview of the history of taxonomy, botanical nomenclature, descriptive terminology of flowering plants, and basic classification of flowering plants. Emphasis will be placed on the major plant families and genera, especially those common to Kentucky. Some field study.

Elective Course:

Woody Plants of Kentucky



Oct. 6, 13, 20, 27
9:00 to 12:00
Instructor: Larry Brewer

This course will focus on the identifying characteristics of Kentucky's woody flora such as the leaves, bark, and fruit. Additional topics will include the ecology, natural history, and landscape use of many of our most common woody species. Emphasis will be placed on the study of those groups that tend to commonly stump people such as the oaks, hickories, and ashes. The final session of the class will be a field trip to a yet to be determined location.

Contact: Linda J. Nesbitt, Director, Community Connections, Northern Kentucky University, Phone: 859.572.1463; Email: nesbitt@nku.edu

KNPS 2007 Hike Schedule

Walks are limited to twenty participants. Please call the number provided and register prior to each hike.

September 15, 2007. Otter Creek State Park, Brandenburg, KY. A moderately difficult walk through scenic Otter Creek State Park with naturalist, J. Bryan Lewis. Meet at the main building located at 850 Otter Creek Park Rd at 9:00 a.m. Call 502-574-4583 or 942-3211 for information.

October 6, 2007. Powerline/right-of-way walk with Dave Taylor not far from Cumberland Falls SRP, KY. The location is off KY 92. Meet at 10:00 a.m at Dupont Lodge parking lot, and drive back east to the site. Call 859-745-3167 for information.

Membership Renewal

Kentucky Native Plant Society
Membership Form

Name(s) _____

Address _____

City, State, Zip _____

KY County _____

Tel.: (home) _____

(work) _____

E-mail _____

o Add me to the e-mail list for time-critical native plant news
o Include my contact info in any future KNPS Member Directory

Membership Categories:

o Individual $15 o Lifetime $200
o Family $25

o This is a renewal o This is a new membership

Membership $_____
Gift (optional) $_____
Gifts are tax deductible [IRC 501 (c)(3)]
Total $_____
(Payable to Kentucky Native Plant Society)

Return form & dues in enclosed envelope to:
KNPS Membership, P.O. Box 1152, Berea, KY 40403

Note: *You membership is paid through the year that is noted on your newsletter address label. Annual memberships are for the January-December calendar year.*

2007 KNPS Wildflower Weekend in Review

by Brian Gasdorf
Park Naturalist at Natural Bridge State Resort Park

On a walk in the forest today I noticed the angular fruit of the halberd leaved violet, *Viola hastata*. I admired the fruit and thought to myself, how quickly time moves on and seasonal changes occur in the forest. It seems like just yesterday KNPS members and other nature enthusiasts were viewing the spring wildflowers in their colorful splendor at the 27th Annual Wildflower Weekend at Natural Bridge State Resort Park.

The weather threw our spring wildflowers a curve ball this past year with unseasonably warm temperatures followed by extremely cold temperatures. Fortunately, the spring wildflowers had just enough time to bounce back and provide wonderful viewing opportunities on the fieldtrips. Saturday turned out to be warm and sunny and naturally, fieldtrips on the

Mary Carol and her birders, photo by John Tierney

Wildflower hike, photo by John Tierney

Rock Garden Trail, Whittleton Trail, and Edwards Branch were especially popular.

Patricia Haragan, Botanist and Herbarium Curator with the Louisville Olmstead Parks Conservancy and Vice-president of the KNPS, gave a wonderful presentation entitled "Rediscovering the Flora of Cherokee Park." Patricia shared her discoveries of rare plant species found at Cherokee and also shared her experiences with the woodland restoration project she is currently involved in. Dr. Maggie Whitson, Assistant Professor of Biology and Director of the herbarium at Northern Kentucky University shared her knowledge and expertise on plants in the genus *Physalis* (tomatillos). Maggie skillfully led us into the world of these amazing plants and shared many great tips on identifying *Physalis* in the field. Other speakers included Tom Barnes, President of KNPS; John Tierney, former Naturalist at Carter Caves; and Noelle Theres, Naturalist at Natural Bridge.

As a new naturalist at Natural Bridge, I enjoyed the opportunity to meet many new people that share the same interest in Kentucky's flora. I am excited about the possibilities for the 28th Annual KNPS Wildflower Weekend on April 17 – 20, 2008. Invite a friend and share your passion for the amazing diversity of plants that Kentucky has to offer!

Four generations attended the 2007 Wildflower Weekend

common in moist woods throughout Kentucky and varies in floral color from

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greenish to deep burgundy with a wide range of sepal length.

In Kentucky the heartleaf and little brown jugs (genus Hexastylis) are restricted to the Appalachian region. One species, H. arifolia is relatively common, but the other three species, H. virginica, H. contracta, and H. heterophylla, are all rare and state-listed (Jones 2005).

Outlook for Aristolochiaceae

According to the World Conservation Monitoring Centre (1997), 35 Aristolochiaceae species are included on "red list" of threatened plants. These include four species and one variety found in the southeast of the United States: *Hexastylis contracta* (KY, NC,TN), *H. naniflora* (NC, SC), *H. rhomiformis* (NC), *H. speciosa* (AL), and *H. shuttleworthii* var. *harperi* (AL, GA).

Although some species of the family have been heavily harvested in the past for medicinal use (Coffey 1993), this threat has mostly subsided. High endemism (including some island endemism) and small ranges for many species make even minimal habitat destruction have an enormous impact.

Continued habitat degradation for agriculture and timber harvesting in tropical region impose a significant threat to much of the Aristolochieae tribe. Other potential concerns are present for species highly co-evolved with pollinators and seed dispersers if insect populations are reduced.

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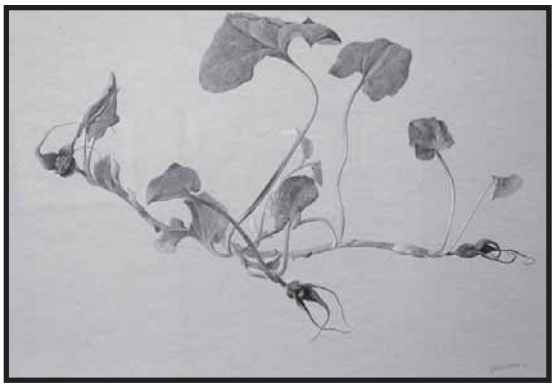

Asarum caudatum, by A. R. Valentien

Calendar of KNPS and Other Native Plant-related Events

Natural Bridge Events:

Invasive Species Volunteer Workshops:
Aug 4, Nov 3, 2007

Help stop this invasion of exotic plants by volunteering to assist the naturalist staff in pulling and cutting some of the worst invaders. This is great opportunity for individuals and groups to improve the environmental health of our public lands! Each volunteer day begins at 9:00 am at Natural Bridge's Hemlock Lodge, and ends whenever you get tired! Preregistration is encouraged, contact Brian Gasdorf at 606 663-2214 or brian.gasdorf@ky.gov for more info.

Fall Native Plant Sale

Mark your calendar!

Saturday, August 25, 2007
9 a.m.- 4 p.m.
Salato Wildlife Education Center
#1 Sportsmans Lane
Frankfort, KY
(502)564-7863
www.fw.ky.gov

All plants $5 or $6, depending on container size.

SEE PAGE 2 FOR CONTACT INFORMATION.
(Return address below is for POST OFFICE USE ONLY.)

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