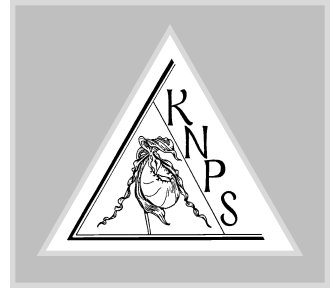


# The Lady-Slipper

Kentucky Native Plant Society

Number 17:2

Early Fall 2002



## 2002 KNPS Fall Weekend and Meeting Planned for October 18–20

by Charlie Lapham

THE KNPS FALL WEEKEND AND MEETING will be held at Mammoth Cave National Park from Friday, October 18 to Sunday, October 20, 2002. The park has given us permission to use its Maple Springs Research Housing Facilities for the meeting, programs, and accommodations. This is where visiting scientists stay when they are working in the cave and, being off season, it has been reserved for us this particular weekend.

In addition to space for our meeting, the Maple Springs facility includes 34 bunks in two bunkhouses plus nine more in a cottage. We will need to bring sleeping bags and food. Reservations can also be made to stay at the Mammoth Cave Hotel for those who prefer to be properly pampered at off season rates.

Maple Springs has complete shower and bathroom facilities as well as a commercial kitchen. It is equipped with cooking and eating utensils for those wishing to try a pot luck on Friday and Saturday evenings. One can pig out at the Pig Diner in Pig, Kentucky, too.

*There is no charge for participating in the fall weekend! Call Charlie Lapham 1-270-646-4060 for more details and to register. It's first come first served for the bunks!*

### PROGRAM AND SCHEDULE

**Friday** – Charlie Lapham and Michelle Webber, the park botanist at Mammoth Cave, will give a talk Friday evening on *Cypripedium reginae* which has not been verified in Kentucky for over 100 years. We have a historical record that it existed in either Edmonson or Barren County in 1875, but unfortunately no voucher. The Park Service has received a \$50,000 grant, based on a KNPS draft, to attempt to establish a self-replicating population of *C. reginae* in the park.

**Saturday** – Four prescribed burn areas were scheduled at Mammoth Cave in fiscal

2002, but the inability to get the people together when the weather was favorable did not permit doing two of the burns in the Wondering Woods area of the park. During the day on Saturday we will tour two of the areas that were burned, Temple Hill North and the old Job Corps Site, as well as the Wondering Woods Prairie that is now the top burn priority at MCNP. One can see why it has top priority!

Julian Campbell, who did the pre-burn surveys for these sites, will be with us so we will have a pretty good idea of the first year results while still in the field. The old Job Corps Site is a prairie restored by Randy Seymour. It is also a new home for the federally listed Eggert's sunflower, *Helianthus eggertii*, that we moved there last year.

On the way to Wondering Woods, we will stop at the original *H. eggertii* site. It was supposed to be bulldozed this year, but since construction was postponed we will have another chance to move the ones we missed last fall. Although our transplanting was successful, we missed many and will need to collect seed and move plants again this year (see Calendar on p. 12).

In addition to a brief KNPS business meeting, there are three events scheduled for Saturday night. Julian Campbell will give a talk on the Mammoth Cave burn plan. Julian spent several years working on this, and according to park officials, so far the plan has worked perfectly. This will probably be the first before-and-after public assessment of this pioneering NPS project.

Mammoth Cave National Park has recently taken a much deeper interest in its surface biota. Mark DePoy, MCNP Head of Science and Resource Management and Michelle Webber, the park's first Botanist, will talk to us about the new and anticipated botanical projects. They include chestnut, American

(Continued on page 2)

**Don't miss the  
KNPS  
FALL WEEKEND!**

**October 18–20,  
2002**

**Mammoth Cave  
National Park,  
Mammoth Cave, KY**

*Details at left!*

**BACK ISSUES of  
The Lady-Slipper  
and  
KNPS GRANT APPLICATION**  
details are posted  
on the  
KNPS WEB SITE—  
<http://www.knps.org>

### **In this Issue—**

**2002 KNPS Fall Weekend  
and Meeting Planned for  
October 18–20 – 1**

**KNPS Thanks and  
Acknowledgments – 2**

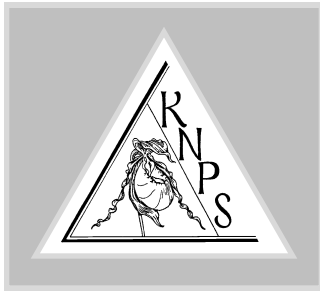
**Lady Bird Johnson  
Wildflower Center  
Seeks Interns – 2**

**The History of  
Human use of Bloodroot—  
*Sanguinaria canadensis* – 3**

**Book Review: Kentucky's  
Last Great Places – 10**

**Book Review: Toxic Plants  
of North America – 11**

**Calendar of Native  
Plant-related Activities – 12**



## *The Lady-Slipper*

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## KNPS FALL WEEKEND AND MEETING (Continued)

Elm and butternut restoration, lady slipper restoration, the Eggert's sunflower rescue, invasive plant control, improved protection from rare and medicinal plant poaching, 29 prescribed burns in 5 years, biological monitoring, and a new wildflower garden outside the new Science and Resources Building.

**Sunday** – On Sunday, Deborah White has agreed to take us to Eastview Barrens (on the way home for most of you). With luck, we will see the magnificent Kentucky Endangered prairie gentian, *Gentiana puberulenta*. This is one of the species we once had at MCNP and lost. Many of the Eastview species are things we will be looking for in the Mammoth Cave burn areas. Eastview is probably the best prairie remnant

in Kentucky. The Nature Conservancy and the Ky. State Nature Preserves Commission have used burning as a management practice at Eastview for several years.

**SO COME ONE, COME ALL** – Ninety-nine percent of the flora you will see cannot be found in the Red River Gorge in May! See some endangered and rare plants! See aliens gobbling up prime native habitat. See fire management up close in real time. Tell MCNP we like their new approach! See preservation and prairie restoration from the inside out.

*You can't beat the price or the company. Come on out! Don't delay; beat the rush; call now, 1-270-646-4060!*



**MANY THANKS** to outgoing KNPS officers and executive board members Wilson Francis, Steve Sensenig, and Deborah White...

**A HEARTY WELCOME** to incoming KNPS officers and executive board members Landon McKinney, Judy Dourson, and Steve Sensenig...

**AND SPECIAL THANKS** to KNPS members Helen Curtis, Andy Uterhart, Charles Chandler, and Mary Carol Cooper for manning our info booth at various environmental events!

## LADY BIRD JOHNSON WILDFLOWER CENTER Seeks Interns

THE LADY BIRD JOHNSON Wildflower Center, founded in 1982, is a national nonprofit organization dedicated to educating people about the economic, ecological, and aesthetic benefits of native plants. Located on 179-acres in Austin, Texas, it is a center for research, education, and inspiration for an estimated 100,000 annual visitors.

Currently, the Center is offering semester-long internships in each of five specialized areas: Environmental Education, Communications/Public Relations, Horticulture, Landscape Restoration, or Plant Conservation. Internships are open to undergraduates, graduates, and recent graduates (fewer than two years since graduation) who plan to pursue careers in biology, botany, conservation, horticulture, science/environmental education, natural resources management, communications, journalism/writing, public relations, or closely related subjects. Selections will be based on application materials, experience, course of study, and references.

The internships will run from January

14, 2003 through May 23, 2003 and the application deadline is October 18, 2002. Applicants will be notified of the Center's decisions by November 8, 2002. If selected, applicants must confirm intent to participate no later than November 18, 2002. Successful candidates must provide their own transportation to Austin and for the duration of the internship as well as secure their own housing.

Applicants should submit a letter of interest naming a desired area of specialization, a current resume with complete work, education, and extracurricular details, contact information, references, letters of recommendation, etc. *Complete program and application details are posted at*

<http://www.wildflower.org/jobs.html#NIP>

or contact:

**Megan Murphy, Director of Volunteer Services**  
**Lady Bird Johnson Wildflower Center**  
**4801 La Crosse Avenue**  
**Austin, TX 78739**  
**Phone: (512) 292-4200 ext. 102**  
**Email: [megan@wildflower.org](mailto:megan@wildflower.org)**



# The History of Human Use of BLOODROOT— *Sanguinaria canadensis*

*“When you first break the roots, they look like they are bleeding blood-red. It is very, very bitter.”*

—Charles Thurmond,  
contemporary Appalachian herbalist

*“Few medicinal plants unite so many useful properties; but it requires to be administrated with skillful hands, and may become dangerous in empirical hands.”*

—C. S. Rafinesque, 1830

*“If you are bilious in the spring, it will be well to physic with a sirup made of four ounces of bloodroot, four ounces of mandrake root [probably mayapple], ground or powdered fine, and stirred in half a pint of molasses.”*

—The Housekeepers Guide, 1854

*“[Bloodroot is] The best thing that’s happened since fluoride. What fluoride has done in fighting tooth decay, this material will do in preventing gum disease.”*

—A former surgeon general  
of Army Dental Corps, 1980s

*“Jim Duke has experienced tunnel vision from nibbling the root.”*

—CRC Handbook of Medicinal Plants, 1986

by Rob Paratley, Curator,  
University of Kentucky Herbarium

A QUICK READ OF the introductory quotations at the left demonstrates a number of strong sentiments about a very strong herb, bloodroot.

*Sanguinaria canadensis* is one of the earliest and best known wildflowers gracing our spring floral display. Common in rich woods, bloodroot appears in late March with the first floral signs of spring—spring beauty, hepatica, twinleaf, rue anemone, trout lily. Bloodroot is a small perennial herb, sending up a single large flower from the rhizome. The broken rhizome or “root” reveals a reddish-orange sap, from which the plant gets its colloquial name. (The generic name *Sanguinaria* comes from the Latin *sanguis*—blood.)

A single three to nine-lobed leaf begins growth in March, at first nearly enclosing

(Continued on page 4)

**Often in full bloom by late March, bloodroot (*Sanguinaria canadensis*) is one of Kentucky’s earliest, most well known, and best loved wildflowers.**



## The History of Human Use of BLOODROOT (Continued)

the single white flower. Soon the flower stalk elongates, opening the one-and-a-half inch blossom with typically eight but up to as many as sixteen petals. Unlike many other early spring flowers, bloodroot does not die back right after seed set. The leaf enlarges to more than six (as much as eight) inches across before beginning to die back later in the season.

Bloodroot was well used by Native Americans in its native range, from Canada's Atlantic maritime to the edge of the Canadian prairies, south to Oklahoma and to northern Florida along the Atlantic coast. There are many records of use by tribes living in the great North Woods of the Great Lakes (Ojibwa, Algonquin, Winnebago), upstate New York (Iroquois), northern New England (Penobscot) and Nova Scotia (Micmac). Use of the herb is also recorded for tribes living in the prairie-woodland border areas of the Midwest (Meskwaki of Iowa; Omaha of Nebraska), the Mid-Atlantic coastal area (Delaware; Rappahannocks) and for the Southern Appalachians (Cherokee) (Moerman, 1998; Duke, 1986).

In his 1744 *Histoire et description générale de la Nouvelle-France*, Jesuit missionary François-Xavier de Charlevoix described bloodroot under another of its colorful common names — dragon's blood.



### DYE PLANT

Many written reports by early Europeans mention bloodroot use as they came in contact with indigenous Americans and observed their customs. The first mention was by Captain John Smith, leader of the fledgling Jamestown colony. Referring to bloodroot by its local native name of pocone (or puccoon) he wrote of its use in 1612:

Pocones is a small roote that groweth in the mountaines, which, being dried and beate in powder turneth red: and this they use for... painting their heads and garments. (Vogel, 1970)

Other uses for the dye were also mentioned, "This they use to paint their mattes, targets, and such like." (Erichsen-Brown, 1979)

Bloodroot as a dye plant

is recorded for many tribes. Although the sap from the "root" (technically an underground stem or rhizome) appears bright red-orange, it dries to a more muted red-dish brown. An anonymous observer in 1724 recorded its use as a dye plant by the Illinois Miami tribe,

To dye red... they take the root, dry it, pulverize it in the mortar, and boil it with three times that many sumac berries. The red is very beautiful. (Erichsen-Brown, 1979)

In some instances, the dye color was yellow or orange. Commonly, juice from the plant was mixed with animal fat to dye articles of clothing, baskets, and to decorate weapons, especially arrow quills. Quite commonly, it became a ritual body and face paint for ceremonies, including "war paint."

English colonists saw the dye and adopted it for their woolens, while the French imported bloodroot for a dye throughout the 1700s (Sanders, 1993). The name puccoon in fact refers to the plant and its colored juice in the Algonquin language (Coffey, 1993). Other local names like redroot, red-puccoon, and red Indian paint refer to this. Bloodroot is still used as a dye today by a number of tribes, as, for example, the beautiful basketry of the Cherokee.

### DOCTRINE OF SIGNATURES

It is well known that Medieval European herbalists believed in a correspondence between the look, smell, and feel of a plant and its mode of action on the human system. This correspondence was understood in a Christian framework, where a benevolent creator placed signs on earth to help people's afflictions. If one had the sensitivity to read the signs, then cures for particular ailments could be found in nature. For every malady, it was felt, there was a remedy with a readable sign which resembled the part of the body which it could cure. Europeans were far from alone in believing this idea. Most indigenous cultures, as well as traditional (Asian) Indian and Chinese medicine, have similar concepts.

North American natives also believed in the correspondence between plant attributes and healing power, or, simply put, the idea that "like cures like." Bloodroot, then, was associated with blood because of the

color of its sap (Vogel, 1970). It's no surprise, then, that a number of important Native American uses related to blood and circulation. An early description of native use in Canada by Frère Marie-Victorin in the 1800s makes the connection explicit: "...it [bloodroot] is employed against hemoptysis [coughing up blood], no doubt an application of the ancient doctrine of signatures." (Coffey, 1993). Many tribes employed the herb as blood medicine (Cherokee; Delaware; Iroquois; Mohegan). Other records indicate use as a blood purifier (Iroquois), heart medicine (Algonquin; Iroquois), to arrest bleeding (Micmac; Ojibwa; Iroquois), or to regulate menstruation (Iroquois). (Moerhman, 1998). A local Appalachian folk name, she-root, is probably related to the latter use (Collins, *et. al.*, 1999). Warriors in the Penobscot tribe were said to prevent bleeding in battle by wearing a bloodroot necklace (Vogel, 1970).

Related to blood, of course, is the function of the heart. In the early 1800s, a treatise on medicinal botany noted some dose-dependent effects of administering the root, likening its effect on the heart to the well-known effect of foxglove.

When taken in large doses it irritates the fauces [back of the mouth], leaving an impression in the throat for a considerable time after it is swallowed. It occasions heartburn, nausea, faintness, and frequently vertigo and diminished vision. The above effects are produced by a dose of from eight to twenty grains of the fresh powdered root. When given in smaller doses...and repeated at frequent intervals, it lessens the frequency of the pulse in a manner somewhat analogous to the operation of *Digitalis*... Its primary operation seems to accelerate the circulation. (Bigelow, 1817–20)

In his monograph on the root, Millspaugh (1892) cited an effect on the heart, and warned that an overdose could lead to a number of complications, including cardiac paralysis. Mrs. Grieve later was a bit more optimistic in her *Modern Herbal* (1931), claiming that the root is good for "heart disease and weakness and palpitations of the heart." She didn't mention heart complications.

Bloodroot's principle active substances are alkaloids, a family of chemicals which often affect the human nervous system [see Chemistry box, p. 9]. Recent clinical



Charles Chandler

**Although its early-blooming cohorts, the spring ephemerals, have long since withered away, bloodroot's foliage can sometimes keep working until late June.**

studies have demonstrated that bloodroot's alkaloids are capable of depressing heart function, similar to those found in the related poppy (Lewis and Lewis, 1977; Fetrow and Avila, 2000). Modern published herbals generally do not consider bloodroot as blood or heart medicine. Problems of dosage, strength, and variation in individual response preclude recommending it for these purposes. Nevertheless, the idea of correspondence between the sap color and healing function remains strong for many folk herbalists. Appalachian herbalist Tommie Bass made the connection plain — "I was raised up thinking, and still do, that bloodroot is as good a medicine as we have for what it's made for — for the blood — because it's like blood itself." (Crellin and Philpott, 1990)

This description from Millspaugh's *Medicinal Plants* (1892) describes the collecting and preparing of the root for medicines such as those referred to by Bass.

The fresh root gathered when the seed is ripe, is chopped and pounded to a pulp and weighed. The two parts by weight of alcohol are taken, and after thoroughly mixing the pulp with one-sixth part of it the rest of the alcohol is added. After

(Continued on page 6)

## The History of Human Use of BLOODROOT (Continued)

having stirred the whole, pour it into a well-stoppered bottle and let it stand eight days in a dark, cool place. The tincture is then separated by decanting, straining, and filtering.

The root has also been used as a powder, ointment, or paste (see below). Tiny amounts are used in some homeopathic medicines (Peirce, 1999).

### POWERFUL EMETIC

Bloodroot, then, has long been recognized as very strong medicine, to be approached with caution. A common past use is that of emetic. An emetic is a substance used to induce vomiting, strong medicine indeed! In treatments where the stomach needs to be voided, as when poison or spoiled food are ingested, an emetic can be life-saving. Again, Euro-American settlers learned of this use from native tribes like the Iroquois and Mohegan, although, the Delaware tribe are recorded as using it to stop vomiting! (Moerman, 1998).

Employing an emetic requires great care. As early as the late 1700s, bloodroot was described as "...a strong emetic, but a very dangerous one." (Carver, 1974 ed.). In 1803, William Downey did a series of experiments on the effects of ingesting bloodroot using William Bartram (son of John Bartram, noted colonial botanist) as his subject. After giving his "guinea pig" eight grains of bloodroot powder dissolved in water, he reported,

In fifteen minutes a slight nausea came on with a burning at the stomach; forty, he complained of a head-ache, the nausea, at intervals, much more violent; sixty he was vomited twice, the motions pretty strong. (Vogel, 1970).

Many modern herbal texts also record bloodroot as a strong emetic and issue cautionary warnings (McGuffin, *et. al.*, 1997).

### SKIN SORES, WARTS, SKIN CANCERS

Probably the most notorious use for bloodroot is as a topical treatment for a number of sores, including throat and nose polyps (a polyp is a growth in some part of the mucous membrane), warts, ulcers, and skin cancers. Native American use in this fashion was not widespread. Hutchins (1973) commented on the general native practice: "As an external remedy, the powdered root or tincture acts energetically in cases of fungoid tumors, ringworms, tetter, warts, etc." Specific records are for the Cherokee as "nose medicine" (for polyps), Ojibwa for skin sores, and as a caustic topical for warts.

Although American colonists may have also learned this use from native healers, it is clear that by the 1800s its use as a topical medicine for skin sores was widespread in the U.S. compared to native practice. Rafinesque is an early recorder, stating that bloodroot cured "ill-conditioned ulcers," fungus tumors, and polyps, where the powder was "used like snuff." (Rafinesque, 1830). Barton's *Medical Botany* (1817) explicitly mentioned warts and polyps, and others mentioned skin cancers.

It was in England, however, that bloodroot's use in topical carcinomas became a short-lived medical vogue, due to the work of Dr. Weldon Fell at Middlesex Hospital in London in the 1850s. A report on the procedure demonstrates the combination of herbal and heroic medicine commonly seen in some 19th-century practice. The patients were administered two daily pills containing a combination of bloodroot, hemlock [poison hemlock?], and arsenic iodide. If this wasn't enough of an assault on the system, a topical ointment was created

...based on a paste of bloodroot extract and zinc chloride, flour, and water. The paste was smeared on a cloth or cotton and placed on the tumor daily (if healthy tissue covered the tumor, it was eroded with nitric acid.) When the tumor became encrusted, incisions were made about one-half inch apart, and the paste was inserted into the cuts daily. Generally within 2 to 4 weeks the disease was destroyed... leaving a flat healthy sore that usually healed rapidly. (Lewis and Lewis, 1977)

Stateside, John Gunn asserted in a widely read home health guide of the 1860s:

[Bloodroot] is also good applied in the form of fine powder, to any fungous growths, to old and indolent ulcers, destroying the proud flesh and exciting them to healthy action. A strong tincture of the root made in vinegar, is often sufficient to cure ringworm... For such purposes the tincture is best made from the fresh roots, first mashing them; and should be made as strong as possible. (Erichsen-Brown, 1979)

It wasn't long, however, until Fell's bold claims as an anti-cancer miracle were loudly denounced. In 1879 fellow Englishman C. D. F. Phillips stated flatly,

Sanguinaria, though little employed in England, is much esteemed by American physicians: the disuse of it here is due probably, in part, to the discredit thrown on it, some years back, by an absurd attempt to ascribe to the drug the power of curing cancer. (Crellin and Philpott, 1990)

Efficacy wasn't the only issue, for the root's caustic nature and its ability to literally eat into living tissue raised questions of the cure being worse than the problem. Some reports of the time even warned of a poison-ivy-like skin reaction (Sanders, 1993). Although bloodroot's effect on cancers fell into disrepute in official circles, it continued to be so used by folk healers into the 20th century.

Nearly one hundred years after Fell, clinical researchers in the 1960s revived an interest in bloodroot as a topical, and tested the active principles on carcinomas in mice and subsequently on human patients. Assessment of the results of these trials varies with the source. Lewis and Lewis (1977) stated that a paste similar to that employed by Dr. Fell,

...is being used with dramatic success against superficial carcinomas, including those of the nose and external ear... A majority of patients [were] completely healed of tumors with very few reoccurrences.

The Food and Drug Administration and others offered a much different view, stating of bloodroot's active substance:

Sanguinarine's efficacy in treating topical cancers, fungal infections, and nasal polyps has not been demonstrated in clinical trials, and oral ingestion is associated with tissue destruction. It cannot be used without additional studies. (Fetrow and Avila, 2000)

### RESPIRATORY AILMENTS

One of the most frequent records of use by Native American tribes has been for a variety of respiratory afflictions. Examples include throat problems (Ojibwa; Micmac), cough medicine (Cherokee; Iroquois), cold remedy (Micmac; Iroquois), respiratory aid (Cherokee; Iroquois), and even tuberculosis (Micmac). Euro-American folk healers enthusiastically adapted these practices. A common home remedy for sore throats in New England was to take bloodroot extract in a lump of maple sugar, to cut the bitterness of the root alone (Sanders, 1993). A mid-1800s catalog of natural healing plants by A. Clapp stated of bloodroot,

It frequently cures or relieves pneumonic inflammation, while it checks or suppresses expectoration. I have employed it with much advantage in incipient phthisis [tuberculosis], pneumonia, vesicular emphysema, and spasmodic asthma. (Crellin and Philpott, 1990)

In a 1928 *Materia Medica*, it was explained that

Sanguinaria depresses the respiratory as well as other nerve centers. It stimulates the secretion of bronchial mucus, and it is used as a sedative-expectorant." (Solis-Cohen and Githens, 1928)

Bloodroot's reported effects on various respiratory problems may be attributable to the stimulating or sedating actions of its alkaloids. A contemporary endorsement came from herbalist Tommie Bass, "It's right down the alley for coughs. I recommend it to people to gargle their throat. It's a tonic and a stimulant." (Crellin and Philpott, 1990). Charles Thurmond, another Appalachian herbalist, agrees, saying,

If you know someone who's got asthma, you might want to give them bloodroot. If you break those roots and touch the juice to your tongue, it opens your sinus areas. It can be fixed in teas or other fluids... Bloodroot can also be used for bronchial problems and stimulating your circulation and appetite. [It causes] you to sweat.

He is clearly describing effects of the root's alkaloids (Collins, *et. al.*, 1999). Herbalist David Hoffman (1998) also explicitly discusses its effect on the respiratory system through action on nerves,

While the stimulating properties show its power as an emetic and expectorant, it demonstrates relaxing action on the bronchial muscles. It thus has a role in the treatment of asthma, croup and laryngitis.

Bloodroot was included in two important pharmaceutical listings, the U.S. Pharmacopeia (from 1820 to 1926) and the National Formulary (till 1965), largely for its use in connection with respiratory problems (Vogel, 1970).

### LOVE MEDICINE

An interesting use for bloodroot originated in the beliefs of some Native American tribes and relates to the root's stimulating character. Several tribes apparently employed bloodroot as an aphrodisiac or love charm, including the Algonquin, Ponca, and Micmac (Moerman, 1998). Captain John Smith briefly described the plant and some of its uses in a 1612 journal that mentions this aspect, referring to a native bachelor: "... and at night where his lodging is appointed, they set a woman fresh painted red with Pocones [bloodroot] and oile, to be his bedfellow."

From the record of an expedition by Captain William Byrd in the Virginia area in 1728 comes an anecdote of

(Continued on page 8)



Constantine Rafinesque, professor at Lexington's Transylvania University from 1819–1826, included a detailed account of bloodroot in his *Medical Flora* (1828–1830).

## The History of Human Use of BLOODROOT (Continued)

telltale signs the morning after a rendezvous between some of his men and native women:

Our chaplain observ'd with concern, that the ruffles of some of our fellow travelers were a little discolor'd with poccoon [blood-root], wherewith the good man had been told those ladies us'd to improve their invisible charms.

There is no record of whether the good parson was satisfied with their explanation. (Coffey, 1993). Later, E. L. Corlett (1935) documented a method used by the eligible native male to charm the object of his affections:

...a bachelor would rub some of the root on his palm and would contrive to shake hands with the girl he desired; if successful in this, after five or six days she would be found willing to marry him.

One wonders why, if the root worked as stated, such a story didn't get wider play.

### ANTI-PLAQUE TOOTHPASTE

In the early 1980s, the American Dental Association called sanguinarine, the principle active ingredient, a promising plaque-fighter. (See also the exuberant quote at the front of the article from a former surgeon general of the Army Dental Corps.) Marketing of bloodroot as a dental product began in the 1980s by Vipont Laboratories, makers of Viadent toothpaste and mouth wash. Claims of anti-microbial action has been substantiated by several clinical tests (although one such study showed no significant results). (Fetrow and Avila, 2000). The weight of clinical opinion, then, is that sanguinarine and other active principles in the root work against mouth bacteria, which in turn play a role in plaque accumulation on teeth, bad breath, and gum inflammation (Peirce, 1999).

In spite of this small triumph for bloodroot in modern medicine, there appears

to be little precedent for similar use of the root in the past, by Native Americans or Euro-American settlers. A general reference to allaying gum pain (Hocking, 1994) suggests at least some past association with mouth problems, but it is likely a result of local numbing of tender nerves.

### WARNINGS

The dark side to the principle alkaloids in bloodroot can be seen as early as the writings of Rafinesque, who stated,

The seeds are violent narcotics, similar to those of Stramonium [jimson-weed, *Datura*], producing fever, delirium, dilated pupils. They are dangerous and deleterious. (Rafinesque, 1830)

Millspaugh (1892) warned of deaths by overdose, probably through depression of the action of the lungs and heart. In an early work on toxic plants, Fyles Faith warned,

It is hardly likely to be eaten, as it has a repulsive appearance and a very bitter taste. It is used medicinally, and Johnson [probably referring to L. Johnson's *Manual of Medical Botany of North America*] records fatal cases from overdoses. (Erichsen-Brown, 1979)

Today, standard references describe the root as a gastrointestinal irritant and explicitly classes the herb as one not to be taken by pregnant women (McGuffin, *et. al.*, 1997). Another source simply calls the root "violently toxic" (Krochmal and Krochmal, 1975), although Kingsbury in his major work on poisonous plants has a more tempered opinion,

In moderate quantity bloodroot may be expected to prove poisonous, but in North America it does not seem to have caused poisoning in livestock or human beings under natural conditions. (Kingsbury, 1964)

The FDA has banned it as an unsafe herb, citing its poisonous alkaloids. Another controversial study linked overuse of the active principles in the root to the onset of glaucoma, a serious eye disease caused by build-up of pressure in the eye. See also the quote at the front of this article concerning medicinal plant expert Jim Duke's short-lived experiment with ingesting the root! (Duke, 1986).

William Bartram had apparently recovered from William Downey's 1803 experiments when he illustrated bloodroot for Downey's "An Investigation of the Properties of the *Sanguinaria canadensis*; or Puccoon." The study was still of interest a century later when it was reprinted in the *Bulletin of the Lloyd Library* (1907).





Herbalist Jack Sanders' (1993) comments put the plant's toxicity into realistic perspective:

Sugar was necessary [when taking the root] because the taste is said to be so nauseating that it can cause "expectorant action"... Modern herbals...often warn that the plant is so strong that it should not be used without medical supervision. An overdose can kill a person, though its taste is so awful it is hard to believe anyone could swallow that much without causing "that expectorant action."

In other words, it tastes so bad that the body's reaction is to force it right back out again!



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## The Chemistry of *Sanguinaria canadensis*

BLOODROOT IS A MEMBER OF THE PAPAVERACEAE, or poppy family. Many members of this family are renowned for a group of powerful chemicals called alkaloids. Most famous of course is the opium poppy, *Papaver somniferum*, which produces morphine, codeine, and many lesser known alkaloids. Alkaloids are organic chemicals containing at least one nitrogen atom bound in a ring with several carbons.

There have been more than 20,000 alkaloids isolated by chemists. Many have a marked effect on the central nervous system, so ingesting them will create serious effects. Some, like caffeine and nicotine, are stimulants. Others, like the opium alkaloids, are sedating. Some alkaloids are known to have adverse effects on cell division. Many, though, are important medicines.

The root of *Sanguinaria canadensis* has an alkaloid content of about 4–7%, a fairly high concentration. The principle alkaloid, sanguinarine, is estimated to be 50 to 70% of the total alkaloid content of the rhizome. Sanguinarine was among the earliest alkaloids isolated from a plant (Evans, 1996). It, and several other alkaloids—chelerythrine, sanguilutine, homochelodine, protopine—are all derivatives of the same process and are part of a chemical "family" called isoquinoline alkaloids. These latter are widespread in the poppy family, as well as in related families like the buttercups, moonseeds, and barberries. Another widespread alkaloid from the barberries, berberine, is found in trace amounts in bloodroot.

It is most frequently sanguinarine which has been the subject of clinical studies, although sometimes the entire extract has been tested. Sanguinarine has been found to have anti-microbial, anti-fungal, and anti-inflammatory effects (Bruneton, 1999), but it has also been shown to induce chromosomal doubling in cell division (Evans, 1996). It may also have some depressing effect on the central nervous system.

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## BOOK REVIEWS:

**Barnes, Thomas G. 2002. *Kentucky's Last Great Places*. University Press of Kentucky. Cloth, 9"x 12", 216 pp. ISBN 0-8131-2230-9. \$29.95.**

THE TITLE OF Dr. Tom Barnes' latest book, *Kentucky's Last Great Places*, suggests a finality that is at first a bit disconcerting. Has Kentucky's quota for recognizing its natural wonders already been fully met, or is the book meant to signal that the end is near? Fortunately, the reader doesn't have to advance very far into the text before discovering that neither has to be true.

While much of Kentucky's natural heritage has been lost, the book is quick to point out that amazing glories remain. In fact, it celebrates Kentucky's biological diversity and special places in the context of the work that has gone into their identification and preservation. Ultimately, it is a hopeful challenge to appreciate what we have and do what we can to see that this good work continues.

Barnes prefaces his book with an assessment of how easy it is to lose what you never knew was there in the first place:

When I... mention the two million acres of prairie that existed in Kentucky before European settlement, I am often greeted by amazement. When I... mention that prickly pear cactus and Virginia agave are pretty common in Kentucky, I often hear, "I didn't know that." I have become convinced that the majority of people in Kentucky have little concept of the biological richness that exists in our old-growth forests, prairies, wetlands, glades, and other unique biological habitats. I hope this book changes that.

After a brief overview of natural area preservation in Kentucky during the 19th and early 20th centuries (or rather the lack of it), Barnes focuses on the formation in the mid-1970s of the KY State Nature Preserves Commission and the Kentucky Chapter of The Nature Conservancy. He finally documents the efforts of the many Kentuckians who helped create these organizations, and he provides a clear, useful delineation of their mutually supportive roles and methods.

Both of these groups have become very familiar to KNPS members. Over the last 16

years or so, many of our field trips have explored areas they were able to get set aside as preserves, and many of our trip leaders, officers, and board members have come from their ranks. It's gratifying to see their individual and organizational efforts recognized in such a public manner. Their familiar names and behind-the-scenes contributions are scattered throughout Barnes' book, and the Kentucky preserves they helped to establish and maintain are the exclusive subject of its second and largest part.

Barnes' tour of the state's great places progresses through each of the seven natural regions defined by its geology and geography. He begins his discussion of each area, with an overview of its natural features and the general state of its flora, fauna, and biological diversity. Then he's off—laden with curiosity, wonder, and photo gear—to fill in the details with stories of his own experiences in the area's nature preserves.

It will not surprise our members to learn that Dr. Barnes' photos, I counted 136 of them, are the chief glory of his book. His native plant portraits may be most prominently featured, but his equally wonderful landscape, wildlife, and habitat photos provide the context to complete the scene.

What may surprise, though, is the picture painting that runs throughout Barnes' text. In addition to the diverse colors that flow from his vibrant palette of common names for plants and animals, he tells good stories:

Dag nab it, this place was hot! I was sitting in the middle of a giant limestone rock in Flat Rock Glade, it was ninety-five degrees, the sun was bright, and I had to wait another half hour before the limestone fumeflower would open. What to do? Sit and sweat.

... First, prepare to get wet. Second, insert the hand all the way to the bottom of the river. Third, move your hand across the gravel until you feel something sticking up. Fourth, check to see if it is a mussel. This was more fun than playing in the mud, and we were getting paid to do it.

This book does a great job of putting Kentucky's last great places on the map. Whether Kentuckians visit on foot or only through its pages, they will certainly see what there is to lose. Maybe they'll want to keep all that, and more. You can find *Kentucky's Last Great Places* at your bookstore or

The University Press of Kentucky  
1-800-839-6855  
<http://www.uky.edu/UniversityPress>



Submitted by Charles Chandler



*What must we do to keep preserving great places in Kentucky? From Chapter Two...*

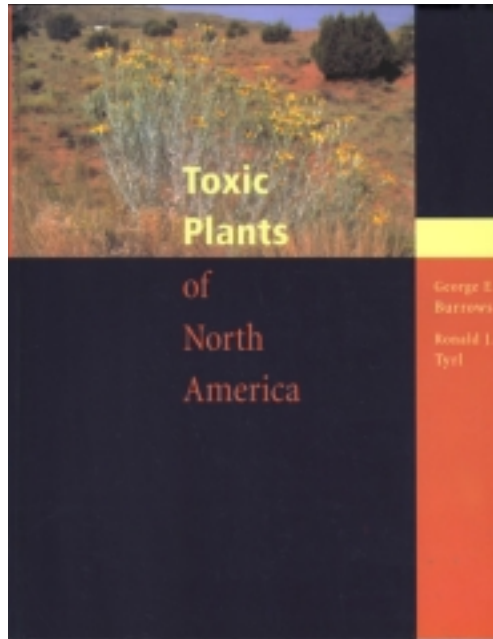
**Inventories of natural areas are the most important tool biologists have in determining the relative scarcity of natural communities. The timely completion of any state's natural area inventory is a critical factor in identifying the areas in need of protection and management. Nature Preserves developed the county natural areas inventory in 1988, but by 1996 it had sufficient resources to complete only 23 counties and anywhere from 10 to 80 percent of 50 additional counties, leaving 47 counties completely unassessed. At the present rate, it will take another 30 years to complete this inventory. By then much will be gone.**

**Burrows, George E., and Ronald J. Tyrl. 2001. *Toxic Plants of North America*. Iowa State University Press. Hardcover, 8½" x 11", 1342 pp. ISBN 0-8138-2266-1. \$174.99.**

THIS HUGE BOOK (1342 pages) is an encyclopedic account of the poisonous plants of North America. The book begins with a brief introduction describing the objectives, scope, organization and format of the text. Families of vascular plants are then listed alphabetically, with ferns, gymnosperms, monocots, and dicots all grouped into a single alphabetical list. For each family there is a family description with notes on the natural history and uses of the plants. The genera that include poisonous species are then listed alphabetically, and each generic account includes a description of the genus, a list of toxic species, distribution and habitat, disease problems, disease genesis, clinical signs, pathology, and treatment. Each family account then concludes with an extensive bibliography.

Both native species and commonly used ornamentals are included, and the toxic effects of these plants on animals and humans are extensively described and referenced. Also included are many notes on medicinal uses of the species. Although the text is dense and detailed, there are helpful listings in the side margins of each page, so that at a quick glance the reader can see a drawing of the plant, a map of its distribution, a listing of the problematic species, an indication of what plant parts are involved, a summary of the symptoms, and a list of the toxic compounds.

A total of 76 families are described in detail, beginning with the Aceraceae and concluding with the Zygophyllaceae. In addition there is a listing of families of questionable toxicity at the end of the text, as well as an account of how to identify toxic plants by using keys and manuals, and the diagnostic characters of 24 major families are given. Also there are several other helpful listings after



the taxonomic account: 1) listing of plant genera by their principal adverse effects, i.e., hallucinatory plants, plants causing hepatic damage, etc. 2) listing of plants of particular concern for pets; 3) an extensive glossary of botanical terms, and 4) a listing of terms related to toxic effects and symptoms, concluding with a 75-page index.

This text is the most comprehensive account ever published of toxic plants in North America. It will be extremely useful for a wide variety of professionals, including botanists, horticulturists, animal scientists, agronomists, toxicologists, range scientists, agricultural extension agents, personnel at poison control centers, wildlife biologists, ecologists, farmers, as well as for students and for anyone in the general public interested in learning more about the toxic effects of plants. I highly recommend it, and am already using it extensively in my own research and writing. *Toxic Plants of North America* can be ordered from:

Iowa State Press  
2121 State Avenue  
Ames, IA 50014-8300  
1-800-862-6657  
<http://www.isupress.com>



**Submitted by Ron Jones**

## WANTED...

- **Articles for *The Lady-Slipper*** about anything related to native plants that you find interesting. They can be submitted on paper, on disk, or via e-mail. *Contact any Editorial Committee member listed on page 2.*
- **KNPS members interested in serving the society** in any special capacity. *Contact anyone listed on page 2.*
- **To be e-mailed** about time-critical native plant rescues or activities, send your e-mail address to:  
*michaelwthompson@comcast.net*

## Kentucky Native Plant Society MEMBERSHIP FORM

Memberships are for the calendar year (January–December).

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Total \$ \_\_\_\_\_ (payable to *Kentucky Native Plant Society*)

*Return form & dues to:*

**KNPS MEMBERSHIP, P.O. Box 1152, Berea, KY 40403**

## MARK YOUR CALENDAR for These Native Plant-related Events

**Fri.–Sun., October 18–20 – KNPS FALL WEEKEND & MEETING,** Mammoth Cave National Park, Maple Springs Research Facility, Mammoth Cave, KY. *See page 1 for details.*

**Sun., October 20, 2–4 pm – Salato Center Seed Collection and Propagation Workshop,** Salato Wildlife Education Center, 1 Game Farm Road, Frankfort, KY. Join Salato Native Plant Program Coordinator Mary Carol Cooper for an introduction to collecting, preparing, storing and growing your own native plants from seed. Cost \$5.00, registration required at 1-800-858-1549. For details, click on “Upcoming events” at <http://www.kdfwr.state.ky.us>

**Sun.–Wed., October 27–30 – Symposium: Invasive Plants—Global Issues, Local Challenges,** Chicago Botanic Garden, Glencoe, IL. Registration required by October 18. Details at <http://www.chicagobotanic.org/symposia/jmpsymp.html>

**Fri.–Sun., November 8–10 – Sierra Club Cumberland Chapter Annual Meeting,** Carter Caves State Park, Olive Hill, KY. See <http://www.kentucky.sierraclub.org> for registration details.

**Sat., November 9 – EGGERT’S SUNFLOWER RESCUE 2002,** Mammoth Cave National Park, Mammoth Cave, KY. The *Helianthus eggertii* site at MCNP from which we relocated about 1200 plants last year, is as robust as ever. The bulldozing that was to happen this spring has been postponed to next year. This gives us one more chance to save more plants. Bring shovels and poison ivy protection. Call Charlie Lapham for logistics and details 1-270-646-4060.

**Sat., November 9 – Autumn Walk at Floracliff,** the Mary E. Wharton Nature Sanctuary at Floracliff, Fayette Co., KY, 1:00 pm. Enjoy autumn’s cooler temperatures and beautiful colors when we take a walk through the newly fallen leaves. We’ll talk about things we see along the way and how plants and animals prepare for the winter. Free. Call 859-351-7770 to register.

**Sun., November 10 – Floracliff Exotics Removal Volunteer Day,** the Mary E. Wharton Nature Sanctuary at Floracliff, Fayette Co., KY, 1:00 pm. This fall we will be targeting bush honeysuckle, an exotic invading the Bluegrass at an alarming rate. The work will involve using hand tools and herbicide and will last about three hours. Drinks and snack will be provided. Call 859-351-7770 to register.

**Sat., November 16 – Autumn Walk at Floracliff,** the Mary E. Wharton Nature Sanctuary at Floracliff, Fayette Co., KY, 1:00 pm. Same as on November 9 above. Call 859-351-7770 to register.

**Sat., November 16 – SERVICE TRIP TO RESTORE SHORT’S GOLDEN-ROD HABITAT,** Blue Licks State Park, Robertson Co., KY. Come help with an ongoing job. Before a southern Indiana population of Short’s goldenrod was discovered in 2001, the federally endangered species was known only from about a two-square mile area around Blue Licks State Park. You can help enlarge and enhance its habitat by carrying out cut cedar trees and branches to burn piles. Participants should wear work clothes, sturdy boots, and gloves. To register, contact: Dave Skinner (502-573-2886 or [david.skinner@mail.state.ky.us](mailto:david.skinner@mail.state.ky.us)) or Mary Carol Cooper (859-277-0656 or [marycarol@aol.com](mailto:marycarol@aol.com)).

(Newsletter return address ONLY.)

**SEE PAGE 2 FOR CONTACT INFORMATION.)**

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