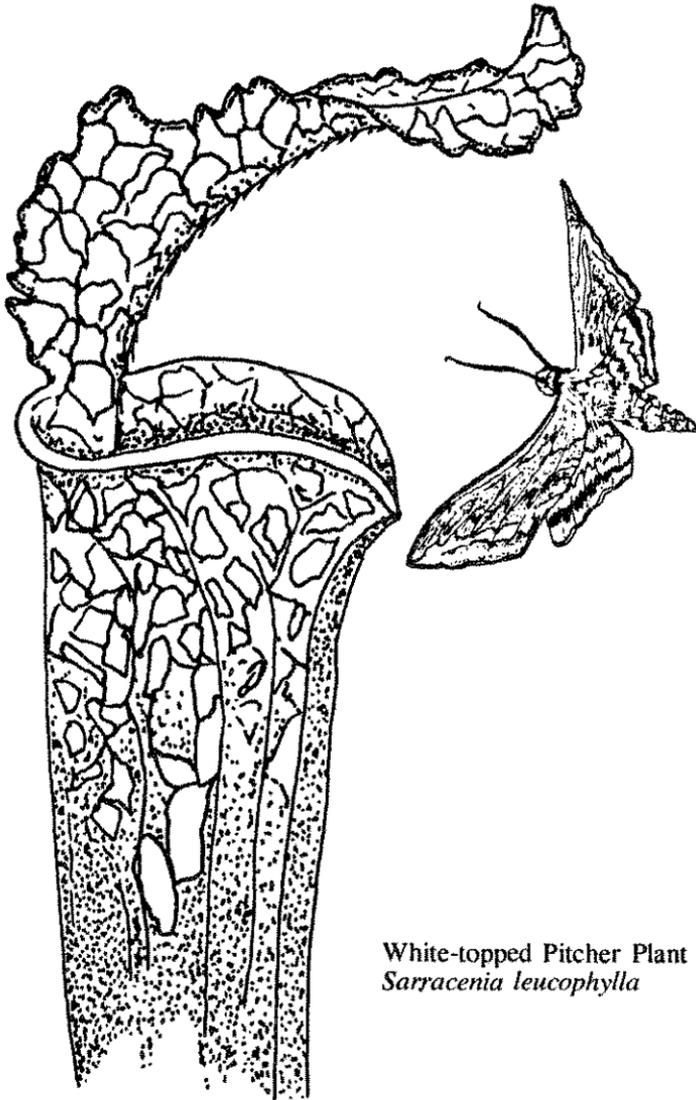


NORTH CAROLINA *wild flower* PRESERVATION SOCIETY, INC.



White-topped Pitcher Plant
Sarracenia leucophylla

**NORTH CAROLINA WILD FLOWER
PRESERVATION SOCIETY, INCORPORATED**

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NEWSLETTER
of
North Carolina Wild Flower Preservation Society

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"caterpillar. . .

cocoon. . .

butterfly—

can one not believe in miracles....?"

Gwen Frostic

Cover and all drawings of pitcher plants throughout this issue are by Dot Wilbur, Coordinator of Activities at the NC Botanical Garden, also editor and illustrator of the NC BOTANICAL GARDEN NEWSLETTER. She has also illustrated GROWING AND PROPAGATING WILDFLOWERS by Harry Phillips. She has a weekly spot of Public Radio WUNC at 8 A.M. and 3 P.M. Wednesday.

Editor's Note: We thank all of you who have contributed articles and news for the NEWSLETTER. Will you please continue? There is much longed-for information out there we want to publish. Our next deadline is September 15.



Dutchman's Breeches
Dicentra cucullaria

PRESIDENT'S MESSAGE

As many of you may have noticed in the Fall Newsletter, the Board unanimously voted to increase the membership dues effective in May of 1989. The increase came after long and serious discussion as we confronted the responsibility of keeping the Society solvent. We chose to act before financial difficulties set in.

Many factors were involved in our decision, including the need to reprint the membership brochure. Our supply is nearly exhausted and it is time for a revision and reprinting. Second, printing and mailing costs continue to increase, and we are committed to maintaining a quality Newsletter. In addition, the Scholarship/Grant Fund is receiving more applications and we need to build the Fund to meet these needs.

We will also need to reprint the Propagation Handbook soon and hope to print a new publication in the near future. Finally, we want to maintain sufficient funds to meet basic expenses of arranging exciting spring and fall meetings (and special local outings), to make appropriate thank-you gifts for help to The Nature Conservancy or other groups, and to provide annual support for the Botanical Garden.

The Society has a rich tradition of maintaining solvency while providing a bargain with our low membership dues. I know of no other organization which offers as much as we do for dues as low as even our new ones.

We are currently in the process of updating the Society's By-Laws. We hope we will be able to review the proposed changes at our February Board Meeting and be able to take action at the Spring Meeting.

IMPORTANT DATES

- February 26** BOARD MEETING at Jane & Bob Welshmer's
12:00 Lunch
1:00 Meeting
- April 8, 9** SPRING MEETING.
Camassia Slopes and the Roanoke River Valley
Headquarters: Roanoke Rapids
Leaders: Merrill Lynch & Harry LeGrand
- April 15** WORKSHOP: *Between People and Earth*, Kenan Center, Chapel Hill 9 A.M. to 5 P.M. led by Bibby Moore, Horticultural Coordinator for NC Botanical Garden and Kay Scott, writer and environmental educator. Call (919) 962-0521 or (704) 433-6123 9 to 5.
- July 27-29** 1989 Conference on Landscaping With Native Plants at Cullowhee
Julie Moore & Benson Kirkman are both on the program.
- FALL MEETING** Plans are to have the fall meeting at Hammock's Beach State Park (Bear Island) near Swansboro.
- Sept. 29, 30** S.E. Fern Conference, Boone, NC. To register, write Dr. Richard White, Department of Botany, Duke U. 2700.

The Triangle Land Conservancy has prepared an ambitious schedule for this spring. Many of the areas TLC is working with are of special interest to Wild Flower Society members. Listed below is the schedule for the three most well-known sites. Events are also scheduled for New Hope Creek and the Diabase Dikes in Durham County, Juniper Springs in Lee County, and The Rocks and Temple Flat Rock as well as canoe trips on Robertson's Pond and the Neuse River in Wake County. For a complete listing of TLC events contact Ann Carter (Administrative Coordinator), Triangle Land Conservancy, PO Box 13031, Research Triangle Park, NC 27709; Tel. (919) 833-3662.

SPRING TLC SCHEDULE

WHITE PINES NATURAL AREA, Chatham County

March 4 & WORK DAYS

March 18 —Meet at the site at 9:00 AM, drinks & cups will be provided; for more information call TLC office (833-3662) or Benson Kirkman (859-1187)

Projects: Trail construction & clearing

Finish demolition & removal of house

Bring: Appropriate tools and gloves

NATURE WALKS/HIKES

Participants should meet at 2:00 PM in the Pittsboro Town Hall parking lot. The Town Hall is immediately south of the old courthouse in the traffic circle at intersection of US 15-501 & US 64. Wear appropriate shoes; approximately 1.5 miles, 2 hrs.

Feb. 5 **SPECIAL WINTER HIKE** led by Dr. Fred White (N.C. Division of Forest Resources), Dr. Benson Kirkman (Manager, White Pines Natural Area), and Ed Swab (N.C.S.U. graduate student conducting research at W.P.N.A.)

In the event of rain, snow, etc., making this event prohibitive, we will reschedule for Feb. 12.

SPRING HIKES

March 19

April 2

April 16

April 30

May 14

May 28

June 10 **DEEP RIVER CANOE TRIP**; provide your own canoe (Details will be announced in Spring TLC Newsletter)

FLOWER HILL, Johnston County

Participants should meet at 2:00 PM at Moccasin Creek (Flower Hill) on NC 231, approximately 4 miles east of intersection of NC 39 and 231 (Emit). For more information, call TLC office, Donna Wright (365-5134) or Don Stephenson (553-2987).

SPRING HIKES

Feb. 5	March 19	April 30
Feb. 19	April 2	May 7
March 5	April 16	May 14

OCCONEECHEE MOUNTAIN, Orange County

Participants should meet at 2:00 PM in the parking lot of the Daniel Boone Village, just beyond the big Daniel Boone sign.

SPRING HIKES

April 9	April 23
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VIRGINIA NEWS

by Bob Tuggle

Imagine a primordial forest...an unbroken canopy with vines dropping from and returning to the treetops and lush greenery pushing around your feet and up to your knees; picture this and you'll have a good idea of an area along the Smith River near Fieldale which was visited as a side trip by a number of our group about three years ago. Trillium (pinkish *T. grandiflorum*), Twinleaf, Canada Violets, Canada Ginger, Large-Flowered Bellwort, Bloodroot, and Dwarf Larkspur are among the herbaceous plants which make up most of the ground cover.

However, a large population of Golden Seal was the element that finally caused the Virginia Natural Heritage Program to take an interest in the site. Golden Seal has a Virginia Classification of S-2 according to the Heritage Program's rating criteria. This affords any known stands of the plant monitoring and a certain amount of protection. After years of talking to people and trying not to get the wrong people interested, I was able to bring representatives from both the Nature Conservancy and the Natural Heritage Program to the site. Their verdict was that this area needs to be protected and that they would see to it. Once something is settled, I'll pass the information along.

Another item of interest is the Virginia Museum of Natural History. This institution which has just this year achieved full State accreditation and funding is located in Martinsville along U.S. Rt. 220 about 15 miles north of the North Carolina border. Among other activities the Museum has sponsored Wildflower hikes and programs. Future plans include a native plant garden. Museum hours are 9 to 5 weekdays and 1 to 5 Sundays. Ya'll come.

GROWING NATIVE CARNIVOROUS PLANTS AT HOME

Rob Gardner, Curator

North Carolina Botanical Gardens

Carnivorous plants have held the fascination of every new generation of gardeners. Who can resist the allure of plants that eat bugs?!

Several different kinds of plants fall into this category. In the southeastern United States are found butterworts (*Pinguicula*), bladderworts (*Utricularia*), sundews (*Drosera*), and the more well known pitcher plants (*Sarracenia*) and venus flytraps (*Dionaea*). Various kinds of butterworts, bladderworts, and sundews are found growing throughout the world, but the pitcher plant and venus flytrap are uniquely southeastern plants. The center of diversity of the pitcher plants is the deep South. Venus flytraps have an even more restricted range, being found in the extreme southeastern corner of North Carolina and a few counties in northeastern South Carolina.

Many growers are interested in cultivating these plants at home, and if you are one of them, you will be glad to know that carnivorous plants, CPs, pose no special problems as long as you do a reasonable job of duplicating their habitat.

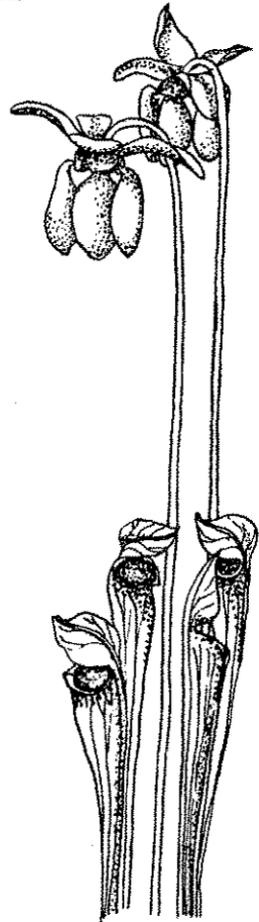
CPs are not houseplants. Although artificial light gardeners are successful growing them, they are best grown outside. Our native CPs are hardy plants. Although they are nice to have inside for short periods as novelty or conversation pieces, they are no more appropriate for prolonged indoor culture than jack-in-the-pulpits or trilliums.

It is important to understand that CPs have adapted to habitats with very specific conditions. These conditions are not difficult to duplicate at home but are absolutely necessary to have healthy, well-formed plants.

Most people seem to be interested in pitcher plants (*Sarracenia*) and venus flytraps (*Dionaea*) so the following discussion will be focused on these specific plants although the information pertains to almost all of our southeastern native CPs.

Most of our CPs grow in the acidic sandy-peat soils of the open grassy savannahs and wet ditch banks of the southeastern counties of North Carolina. These acidic soils are typified by low nutrients and a high water table.

Many different kinds of media have been used with success to grow CPs. The main qualities to look for in a mix are moisture retention and a high acidity. One



Sweet Pitcher Plant
Sarracenia rubra

of the most available and satisfactory materials that meet these requirements is peatmoss. Some growers plant their CPs in plain peatmoss, while others mix it with coarse sand, vermiculite or perlite to prevent the peatmoss from packing down too tightly, which prevents roots from penetrating. A good mix consists of approximately $\frac{3}{4}$ peatmoss and $\frac{1}{4}$ coarse vermiculite or coarse perlite. Peatmoss has an initial tendency to resist absorbing moisture. It should be premoistened before planting by adding a little water and mixing it in by hand. This medium should be moist to the touch, but should not produce any water when squeezed in the fist. Water all plants thoroughly after planting is completed.

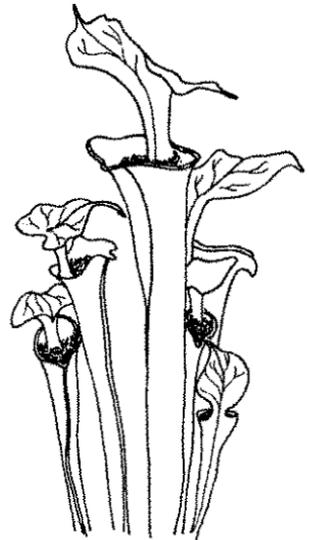
For most home gardeners CPs are best grown in plastic pots or other plastic containers. Pitcher plants in particular do well in plastic containers and can live for years if they are divided and repotted every two or three seasons. Repotting is best done in the early spring just before new growth is initiated.

The best method for growing CPs in pots is to keep a shallow tray of water under the container at all times. Water should be no higher than 1" to 1½" up the side of the pot, just enough to allow the medium access to water at all times during the growing season. For larger collections a plastic dishpan or similar container can be used to create a "minibog." Drill a hole 1½" to 2" in diameter half way up each end to provide a reservoir of water in the bottom and allow for drainage if too much moisture accumulates.

Many growers are uncertain about how often their houseplants should be watered. This is not a problem with CPs. Never allow the medium to dry out! If in doubt, water them. These plants have adapted to habitats with a very high water table and depend on constant moisture. They are not true water plants but are accustomed to savannahs, pocosins, bogs, and ditch margins whose soils are characteristically moist, even seasonally saturated.

In the wild, most CPs are found growing in open bogs and open grassy savannahs with only a few trees, if any. They are sun-loving plants. Attempts to grow them at home in less than 6 hours of direct sunlight will result in misshaped, unattractive plants. Containers of CPs should be located in open sunny spots in the yard, deck, patio, porch or garden. Although direct sun is necessary, CPs do not respond to excessive heat. Avoid placing the container of CPs in areas that do not receive adequate ventilation. One advantage of growing plants in containers is the ability to move them to different locations as the growing season progresses and patterns of sun and shade change.

Many people are interested to know if their CPs will benefit from being fertilized. They are green plants and manufacture their own food by photosynthesis, as well as getting nutritional supplements from the insects they capture. Should you fertilize your plants? The answer, contrary to most of the existing literature, is a tentative yes. Preliminary studies have shown that CPs, especially seedling and young pitcher plants, benefit from monthly applica-



Trumpets
Sarracenia flava

tions of ¼ strength water-soluble fertilizer during the growing season. Myracic, Rapidgrow, and Peters have all been used successfully in strengths up to 15-15-15.

All CPs are extremely sensitive to fertilizers. Be sure to apply in ¼ strength or less, no more than once every 25-30 days, and only during the active growing season. Discontinue fertilization regimes in the late summer. Never forget that a little fertilizer goes a very long way with CPs.

It is important to acknowledge that CPs are hardy perennials. That is to say, they can survive, and indeed require, the dormant period brought on by the colder winter temperatures. Allow your plants to go dormant by keeping them outside for the winter. Provide protection by burying pots and dishpans of CPs to their rims in your garden or other sunny spot for the winter. Monitor them every week or so until the ground freezes to be sure the medium does not dry out. Even in their dormant stage they must not become dry. Remove containers from their winter site and place in a sunny spot the following spring.

Pitcher plants are among the easiest of CPs to grow. They should be the first plants selected when starting a CP collection. At least three plants should be purchased to assure that your initial attempt is successful. Many desirable hybrids and selections of vigorous species are now available. Among the most suitable plants for home growers are the sweet pitcher plant (*Sarracenia rubra*) and the purple pitcher plant (*Sarracenia purpurea*).

Carnivorous plants constitute one of the largest groups of plants collected from the wild for commercial sale. Although they are not difficult to propagate, they are slower growing than many other perennials. This explains why many companies offering CPs for sale collect plants or, more commonly, buy collected plants wholesale. A wild collected plant is seldom as desirable as a nursery propagated plant. Many field collected plants are illegally collected from public and private lands. Collected plants usually change hands several times and receive rough treatment before reaching retail outlets. By purchasing these plants you are supporting the unethical acquisition and sale of CPs. Never buy CPs whose origin you are not certain of. Always ask the retailer if he propagated his own plants or if he purchased them from an ethical source.

Carnivorous plants are easy and satisfying to grow as long as you provide for their basic needs: proper planting mix, moisture, sunlight, fertilizer, and dormancy. Virtually no other group of native plants has the impact or conversation potential of CPs. Keep these cultural requirements in mind, and you will have beautiful, healthy carnivorous plants that will be the highlight of your garden.

Source of propagated carnivorous plants:

World Insectivorous Plants

P.O. Box 70513

Marietta, GA 30007

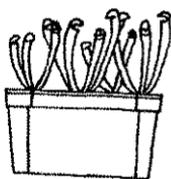
Catalog \$1.00 (The catalog itself is a wealth of information and very useful as a reference.)

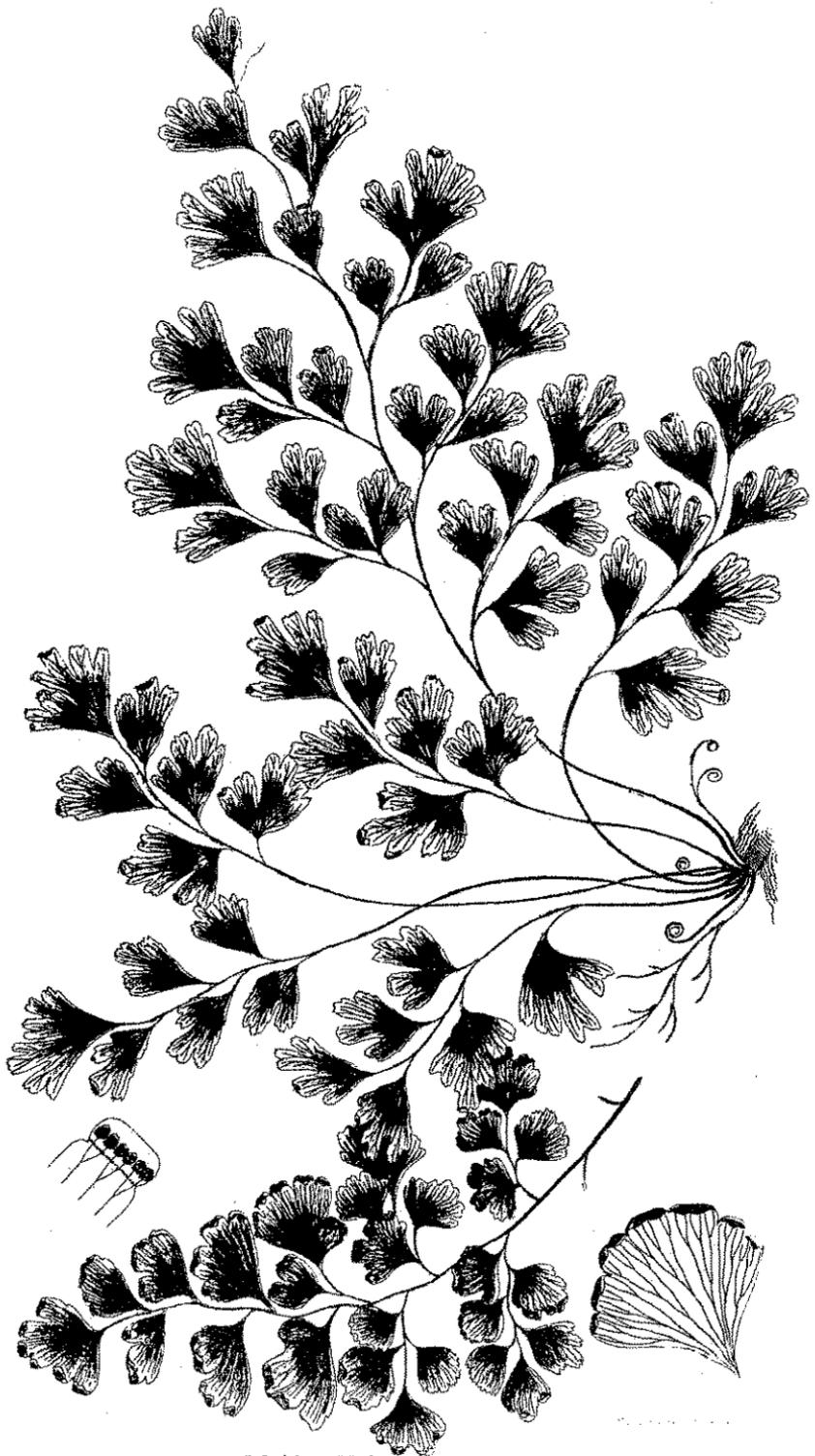
GROWING PITCHER PLANTS FROM SEED

Pitcher plants are easy to grow from seed. Apply these instructions to the attached package of mixed *Sarracenia* seeds, and soon you will have dozens of your own pitcher plant seedlings.

1. Keep this package of seeds in a screw-top jar in refrigerator until ready to sow. Best time to sow is in mid- to late March.
2. Sow seeds in a 3'' or 4'' plastic pot filled with damp (not wet!) medium composed of $\frac{1}{2}$ peatmoss and $\frac{1}{2}$ coarse vermiculite or perlite.
3. Lightly press seeds into medium. Do not cover.
4. Put entire pot in a plastic bag. Seal plastic bag and place pot in refrigerator for 40 days.
5. Check pot periodically to guard against drying out or molding of seeds.
6. After 40 days in refrigerator, remove pot from plastic bag and put pot in a shallow tray of water. Locate pot and tray of water in a sunny location. Never allow medium to dry out.
7. Expect germination in 30-45 days after removing from refrigerator.
8. Keep seedlings in same pot for at least the entire first year.

Pitcher plant seeds, like many other fall-maturing native plant seeds, require this period of cold, moist, treatment (stratification) to break their dormancy, develop the embryo and assure uniform generation. In effect, this treatment simulates winter conditions, but with much more control and convenience and much less damage to seeds. Good Growing!





Maiden Hair
Adiantum capillus-veneris

GARDEN FERNS

by Roger Boyles

There are many native and exotic ferns suitable for our North Carolina gardens. Ferns thrive in a variety of garden settings, from the deep shade woodland forest gardens to more open areas of the herb garden.

The list that I am presenting here is of those ferns **HARDY** in our state not only for the winter cold but perhaps more importantly for our hot summers. All of these ferns have lived in temperatures down to 4 degrees F., and a high of 106 degrees F. I should mention that the low temperatures were for only two days, but the high temperatures lasted a few weeks.

During the summer high temperatures, make sure that watering is kept up and ferns shaded as much as possible to reduce stress. Mulching during the winter months also helps reduce stress.

Be careful not to cover the fern crowns. Covering them may hold too much moisture which may lead to crown rot. Always remove mulch from around your ferns by hand in the spring, you will be able to feel for the new fronds, which will help reduce the potential for damaging the emerging fronds by rakes or other hand tools.

This is not a complete listing of hardy ferns, only the ones that I have grown:

NORTH AMERICAN HARDY FERNS

BOTANICAL NAME	COMMON NAME	HT. ('')	LIGHT (foot-candle)	MOISTURE	pH
<i>Adiantum capillus-veneris</i>	Southern maidenhair	24	200-300	MOIST	B
<i>Adiantum venustum</i>	Evergreen maidenhair	32	200-300	MOIST	
<i>Asplenium ebnoides</i>	Scott's spleenwort	20	150-200	MOIST	B
<i>Asplenium pinnatifidum</i>	Lobed spleenwort	6	150-200	MOIST	A
<i>Asplenium platyneuron</i>	Ebony spleenwort	20	150-200	MOIST	B
<i>Asplenium scolopendrium</i>	Hart's-tongue Fern	16	200-300	MOIST	B
<i>Athyrium pycnocarpum</i>	American Glade fern	48	399-400	MOIST	B
<i>Athyrium filix-femina</i>	Lady fern	30	200-600	MOIST-WET	
<i>Blechnum spicant</i>	Deer fern	28	150-200	MOIST	
<i>Cystopteris fragilis</i>	Brittle Bladder Fern	14	150-200	MOIST-WET	B
<i>Cystopteris tennesseensis</i>	Tennessee bladder fern		150-200	MOIST-WET	B
<i>Dryopteris dilatata</i>	Broad buckler fern	60	150-200	MOIST	
<i>Dryopteris goldiana</i>	Giant Wood Fern	48	600+	MOIST	
<i>Dryopteris marginalis</i>	Marginal shield fern	20	150-200	MOIST	
<i>Dryopteris spinulosa</i>	Spinulose shield form	24	150-200	MOIST	
<i>Lycopodium lucidulum</i>	Shining Clubmoss	8	300-400	MOIST	
<i>Marsilea quadrifolia</i>	Water Clover	6	600+	AQUATIC	
<i>Pellaea brachytera</i>	Sierra cliff brake	8	300-400	MOIST-DRY	
<i>Pellaea wrightiana</i>	Wright's cliff brake	12	400-600	MOIST-DRY	B
<i>Polystichum acrostichoides</i>	Christmas fern	36	150-200	MOIST	
<i>Polystichum andersonii</i>	Anderson's holly fern	40	300-400	MOIST	
<i>Polystichum braunii</i>	Braun's holly fern	40	300-400	MOIST	
<i>Polystichum munifidum</i>	Sword fern	40	150-200	MOIST	
<i>Thelypteris normalis (Kunthii)</i>	Southern Woodfern	30	300-400	MOIST	
<i>Woodsia obtusa</i>	Blunt-lobed woodsia	18	300-400	MOIST-WET	

EXOTIC HARDY FERNS

BOTANICAL NAME	COMMON NAME	HT. (")	LIGHT (foot-candle)	MOISTURE pH
<i>Arachniodes simplicior</i>	Variegated Shield Fern	32	300-400	MOIST
<i>Athyrium japonicum</i>	Japanese Lady Fern	24	300-400	MOIST-WET
<i>Athyrium octophorum</i>		28	150-200	MOIST
<i>Athyrium nipponicum</i> 'pictum'	Japanese painted fern	20	600+	MOIST-WET
<i>Blechnum penna-marina</i>	Alpine water fern	12	300-400	MOIST
<i>Blechnum spicant</i>	Deer fern	28	150-200	MOIST
<i>Cyrtomium fortunei</i>		16	300-400	MOIST-DRY A
<i>Dryopteris affinis</i>	Scaly male fern	60	150-200	MOIST
<i>Dryopteris affinis</i> 'Cristata'	Crested scaly male fern	60	150-200	MOIST
<i>Dryopteris atrata</i>	Shaggy shield fern	16	300-400	MOIST-DRY
<i>Dryopteris dilatata</i>				
'Lepidota cristata'	Broad Buckler fern	15	150-200	MOIST-DRY
<i>Dryopteris erythrasora</i>	Autumn Fern	18	150-200	MOIST
<i>Dryopteris filix-mas</i>				
'Linearis Polydactyla'		36	150-200	MOIST
<i>Dryopteris filix-mas</i>				
'Undulata Robusta'	Robust Undulate Male Fern	36	150-200	MOIST
<i>Dryopteris uniformis</i> 'cristata'		8	300-400	MOIST
<i>Polystichum polyblepharum</i>	Japanese tassel fern	48	400-600	MOIST-DRY
<i>Polystichum setiferum</i>	Soft shield fern	36	300-400	MOIST-DRY
<i>Polystichum tsus-simensense</i>	Tsusima holly fern	20	300-400	MOIST-DRY

MEASURING LIGHT WITH A PHOTOGRAPHIC LIGHT METER

$$\text{Foot-candles} = \frac{20 (f^*f)}{T*S}$$

Foot-candles	f Stop	Shutter speed (sec)	Film speed (ASA)
17	1.2	1/60	100
31	1.6	1/60	100
48	2	1/60	100
94	2.8	1/60	100
192	4	1/60	100
376	5.6	1/60	100
768	8	1/60	100
1452	11	1/60	100
3072	16	1/60	100
12288	32	1/60	100
27	1.2	1/60	64
28	1.6	1/60	64
75	2	1/60	64
147	2.8	1/60	64

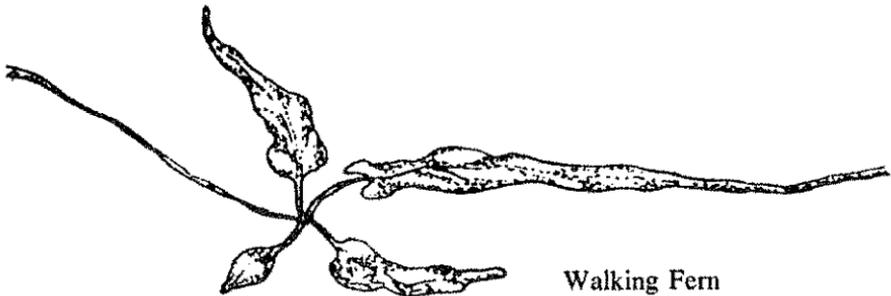
Foot-candles	f Stop	Shutter speed (sec)	Film Speed (ASA)
300	4	1/60	64
588	5.6	1/60	64
1200	8	1/60	64
2269	11	1/60	64
4800	16	1/60	64
19200	32	1/60	64

LOW LIGHT	150-200	foot-candles	HIGH-MEDIUM	400-600	foot-candles
LOW-MEDIUM	200-300	foot-candles	HIGH	600+	foot-candles
MEDIUM	300-400	foot-candles	LOW-HIGH	200-600	foot-candles

BIBLIOGRAPHY

Fern Finder by Anne C. Hallowell & Barbara G. Hallowell; *The Fern Guide* by Edgar T. Wherry; *A Field Guide to the Ferns* by Boughton Cobb; *Ferns* by Reginald Kay; *The Fern Dictionary* by Wilbur W. Olson; *The Gardeners Fern Book* by Gordon Foster; *How to Know the Ferns and Fern Allies* by John Mickel; *The Economic Use and Associated Folklore of Ferns and Fern Allies* by Lenora Wile May; *A Field Manual of the Ferns & Fern Allies of the United States and Canada* by David B. Lellinger; *Encyclopedia of Ferns* by David L. Jones; *Fern Growers Manual* by Barbara Joe Hoshizaki.

Roger Boyles is owner of a Fern Nursery which produces all of its plant stock from spores. He is an excellent gardener and grower. He started his gardening hobby with orchids. Meanwhile, he took courses on ferns and worked as a volunteer at the NY Botanical Garden with its eminent curator, John Mickel. The more subtle attraction of the fern world finally claimed him and he left the corporate world where he had worked as a design engineer to move to NC and establish the fern nursery called TakeRoot. The fern program at the NC Botanical Garden has profited from his expert help as a volunteer these past two years and he has developed his unique nursery which is sure to take much stress off the natural fern populations all over the country. TakeRoot has a catalog list. You may send for it at 4 Blake Drive, Pittsboro, NC 27312 or call 919-967-9515.



Walking Fern

POISONS IN THE WOODS

by Villa Zala

North Carolina is blessed with its wild flowers, blooming in succession from the Outer Banks to the Smokies. Most of them are harmless, bless them, but many are not. About seventy-nine or eighty, by approximate count, contain allergens, toxins, or even mixtures of chemical elements, which a sensible plant-lover had better be aware of. Such plants are called *toxic*, or *potentially harmful to humans*. It's the moral equivalent of *handle with care*.

Some plants are poisonous only in the bulb, others in the flower, others in the sap, leaf or berry. The medical profession has classified plant poisons into three major groups: systemic poisons, the kind that might possibly kill you if you eat them, the dermatitis plants which may give you a rash or an itch, and the allergenics are those that provoke sniffles, sinusitis or asthma.

Poison hemlock grows all over the state, and so does water hemlock. The Cherokee soaked their corn kernels in a hemlock bath before planting, to discourage field mice from eating them. Otherwise it seems to have no use that we could care for. The Greeks employed it to execute undesirable citizens like Socrates, and again the Cherokee taught that if you chewed the roots of water hemlock for four consecutive days, you could "become sterile forever." Possibly motionless as well. Hemlock is a prime example of "systemic" poisons.

The superstars of the dermatitic group are, of course, the big three: poison ivy, poison oak, poison sumac. Most people are acquainted with these, but I was for a long time confused as to which of the two sumacs was the non-poisonous one. Then I noticed that one had "toothed" edges to its leaves, and the other had smooth edges. The smooth one was the poisonous sumac—resulting in the very simple reminder, "Watch out for the smoothie!" It works every time.

A lot of oleander grows in this state, a lovely shrub with pencil-thin branches. The latter have caused some worry at the Poison Centers because boy scouts and campers think those branches look like skewers—ready-made skewers on which to toast hot dogs. The oleander's poison, which is similar to digitalis, gets into the hot dogs and soon the Poison Center has another client. The oleander's blossoms are so attractive that I brought a tub of it inside to winter over in my living-room. One luckless day I decided to prune it back a little—without gloves. The burns on my hands and lower arms reminded me for a couple of weeks to practice what I preach. Keep protected. Oleander, it appears, is both systemic and dermatitic.

Datura stramonium, known in North Carolina as jimson weed, is a hallucinogenic with dangerous powers. One "volunteered" in my tiny garden last summer, shot up to twelve feet and opened great white parachutes for flowers. A little intimidating when you know what can happen to people who fall "under the influence." A sensation of flying is one of the milder symptoms, but the experience is more often what is called "a bad trip." It should never be grown where small children might be tempted by its pods.

My own fascination with poison plants began some ten years ago when Mercer Hubbard, founder of the herb garden at Totten Center, Chapel Hill, decided the Botanical garden ought to show poison plants. The Botanical garden, under the auspices of the University of N.C., is primarily a teaching garden, and we need-



Oleander
Nerium oleander

ed to teach about poisons that grow. Since no one seemed eager to take on this project I found myself "drafted," and have been grateful ever since.

Since I knew little about poison plants to begin with, I soon found myself hunting for informative books. There were not very many. James W. Hardin had broken ground in 1973 with *Stock-Poisoning Plants of North Carolina*, but of course that dealt primarily with grazing animals, and plants that are poisonous to animals are not necessarily so to people. Still, it was a start. This work was followed up quickly by Hardin and Arena's *Human Poisoning from Native and*

Cultivated Plants, a work that was a giant step forward. Anyone seriously wanting to know about poisonous plants in this state should make its acquaintance.

A more inclusive book, that covers the entire country, is Walter Conrad Muenscher's *Poisonous Plants of the United States* published in 1975. Another authority from Cornell, John M. Kingsbury, has given us *Deadly Harvest*, the most enjoyable of all books on the subject. It is not just a textbook, it is a "reading" book to be picked up and experienced over and over. However, and alas, it is out of print. One copy is available at the Chapel Hill Public Library (and please be sure to return it!). Also, a paperback edition was put out in 1965 by Holt, Rinehart and Winston, and with fabulous luck you might stumble on a copy in a second-hand bookshop.

The titles described so far are reference books, to be used indoors. However, once you start out into the field to explore poisons on foot, your best friend is a manual. Bird-lovers have Roger Tory Peterson. Poison plant-lovers also have their on-the-spot guides. The "authoritative" guide we use at the poison garden is the AMA handbook, issued in 1985. It is beautifully illustrated and covers the entire United States (see listing below). The Charles Kingsley Levy handbook is helpful with mushrooms.

My first choice, after the AMA number, would be Lucia Woodward. This most useful of the manuals to carry into the field comes to us, rather incredibly, from England. Two years ago I went on one of Ken Moore's pilgrimages to view English



Poison Ivy
Rhus toxicodendron

Am. L. Witt. b. 11a

gardens, and it was in the bookshop at Kew Gardens that I spotted the title, *Poisonous Plants a colour field guide*, Compiled by a Lucia Woodward, it described itself as a "quick reference work" and that its aim was to identify the poisonous plants of Europe and North America. This was a big mouthful for a small concise publication of 192 pages. Its aim, however, was achieved by an inspired use of symbols and keys presented in a variable box in the lower half of the page, while the upper half offers an excellent color picture of the species described. There is no searching around—and as a final gesture of goodwill, the binding is of a heavy plastic that will survive a touch of rain. (It rains a lot in England).

Villa Zala has been a NC Botanical Garden volunteer from the time she moved to Chapel Hill. When the library was started at the Totten Center she is the librarian who set it up and was in charge of it until an illness forced her retirement. Upon recovery she became involved again as the designer, creator, and director of the Poisons Garden, one of the newer additions to the Herb Garden all of which is in charge of Mercer Hubbard.

GUIDES FOR POISON PLANTS

AMA Handbook of Poisonous and Injurious Plants. Dr. Kenneth F. Lampe and Mary Ann McCann. Created for doctors by the American Medical Association, \$24.95. 432 pp., plastic-covered, 437 colored illustrations. First choice. (Bookstores) 1985.

Poisonous Plants, a colour field guide. Lucia Woodward. 144 colored illustrations. The manual most recommended for easy use in the field. Published in England; distributed in the U.S. by Hippocrene Books, Inc., 171 Madison Ave., N.Y. \$12.95. Order by mail or phone (212-685-4371) 1985 Highly recommended. Includes North American plants.

A Field Guide to Poisonous Plants and Mushrooms of North America. Charles Kingsley Levy and Richard B. Primack, Boston University, 1984. 178 pp., 32 color plates, pen-and-ink drawings. Emphasis on hallucinogens and mushrooms. Paperback, \$9.95.

Following is a chart of North Carolina wild flowers compiled by Linda Stier, also a volunteer at the poison garden, Totten Center. Even the Coker Library at UNC admits it does not have a check-list of the poison plants to be found in North Carolina. We therefore submit this rather proudly, on the grounds that it may well be a first.

—Villa Zala

NATIVE PLANTS OF NORTH CAROLINA WITH TOXIC PROPERTIES

by *Linda Stier*

NAME	COMMON NAME	PART POISONOUS	HOW I-ingestion C-contact	COMMENT
<i>Aconitum vacinatum</i>	Monkshood	total plant, esp. leaves, roots	I	
<i>Actaea pachypoda</i>	Baneberry	berries, roots	C,I	juice irritant
<i>Aesculus</i> spp.	Red Buckeye, Buckeye	nuts, twigs	I	
<i>Allium</i> spp.	Nodding, Wild Onion	bulbs, bulblets, flowers, stems	I	
<i>Amianthium muscaetoxicum</i>	Fly-Poison	total plant, esp. bulb	I	
<i>Anemone quinquefolia</i>	Thimbleweed	total plant	C,I	
<i>Arisaema</i> spp.	Green Dragon, Jack-in-the-Pulpit	total plant	I	raw corm of jack-in-the-pulpit very pungent, but edible when boiled
<i>Asclepias</i> spp.	Milkweed, butterfly Weed, Swamp Milkweed, Variegated Milkweed	sap	C,I	common milkweed (<i>A. syriaca</i>) has edible young stems; Butterfly Weed (<i>A. tuberosa</i>) most poisonous species
<i>Baptisia australis</i>	False Indigo	total plant	I	
<i>Caltha palustris</i>	Marsh Marigold	total mature plant	I	prior to flowering plant may be boiled and eaten as greens
<i>Calycanthus floridus</i>	Sweet Shrub	seeds	I	
<i>Campsis radicans</i>	Trumpet Creeper	leaves, flowers	I	
<i>Cassia fasciculata</i>	Partridge Pea	total plant, esp. raw seeds	I	roasted seed used very sparingly as coffee substitute
<i>Caulophyllum thalictroides</i>	Blue Cohosh	berries, roots	I	
<i>Chelidonium majus</i>	Celandine, Rock Poppy	total plant	I	
<i>Cicuta maculatum</i>	Water Hemlock	total plant, esp. roots	I	
<i>Clematis</i> spp.	Leather Flower Virgins Bower	total plant	C,I	
<i>Cnidioscolus stimulosus</i>	Stinging Nettle	stinging hairs on leaves, stems	C	
<i>Conium maculatum</i>	Poison Hemlock	total plant, esp. root, seeds	I	
<i>Convallaria montana</i>	Lily of the Valley	total plant, inc. water in which flowers have been kept	I	
<i>Datura stramonium</i>	Jimsonweed	total plant, esp. seeds, dry leaves	I	
<i>Daucus carota</i>	Queen Ann's Lace	total plant	C	photosensitization

NAME	COMMON NAME	PART POISONOUS	HOW I-ingestion C-contact	COMMENT
Delphinium tricornae	Larkspur	total plant, esp. lvs, roots, seeds	C,I	sap may cause numbness, pricking
Dicentra spp.	Bleeding Heart Dutchman's Breeches, Squirrel Corn	total plant		
Echium vulgare	Blueweed	total plant	I	chronic consumption of plant in herbal teas causes liver disease
Euonymus americanus	Strawberry Bush	fruit	I	
Eupatorium rugosum	White Snakeroot	total plant	I	toxic via cow's milk
Euphorbia, spp.	Poinsettia, Carolina Ipecac, Flowering Spurge	sap	C,I	toxicity of poinsettia is questionable
Gelsemium sempervirens	Yellow Jessamine	flowers	I	
Hydrangea aborescens	Wild Hydrangea	flower	I	
Hymenocallis occidentalis	Spider Lily	bulbs	I	
Hypericum spp.	St. Johns Wort, Hypericum	total plant	C	photosensitization
Ilex, spp.	Amer. Holly, Mtn. Holly	fruit	I	leaves are nontoxic & in many species brewed for caffeine content
Ipomoea spp.	Morning Glory	seeds	I	
Iris, spp.	Dwarf Iris, Crested Dwarf Iris	rootstock	I	
Kalmia, spp	Mtn. Laurel, Sheep Laurel	leaves, nectar (in honey)	I	
Leucothoe spp.	Leucothoe	leaves, nectar (in honey)	I	
Lobelia spp.	Fetter-Bush, Cardinal Flower, Lobelia, Great Lobelia	total plant	I	plant extracts, leaves in form of tea or tobacco toxic
Lonicera, spp.	Coral Honey-suckle, Honey-suckle, Lonicera	berries	I	
Lyonia lucida	Lyonia, Fetter-Bush	leaves, nectar (in honey)	I	
Malus angustifolia	Crab Apple	seeds	I	
Parthenocissus quinquefolia	Virginia Creeper	berries	I	
Physalis angulata	Ground Cherry	unripe berries	I	
Phytolacca americana	Poke	mature leaves, roots, seeds, unripe berries	I	young sprouts, stems eaten after boiling & discard cook water, mature berries relatively non-toxic, roots mistaken for parsnip, horseradish
Podophyllum peltatum	Mayapple	total plant except fruit	I	fruit may cause slight upset
Prunus serotina	Wild Cherry	kernel in pit	I	

NAME	COMMON NAME	PART POISONOUS	HOW I-ingestion C-contact	COMMENT
Ranunculus hispidus	Buttercup	sap	C,I	
Robinia spp.	Black Locust, Bristly Locust	bark, leaves, seeds	I synthesis	interferes with protein
Rhododendron spp.	Rose Bay, Purple Laurel, Pinkshell Azalea, Flame Azalea	leaves, nectar (in honey)	I	
Rhus spp.	Poison Oak, Poison Ivy, Poison Sumac	total plant	C	plant toxic live or dead, also smoke burning
Sambucus spp.	Elderberry, Red- Berry Elder	total plant except ripe fruit	I	ripe fruit harmless when cooked; limited amts. raw, flowers probably nontoxic
Sanguinaria canadensis	Bloodroot	total plant	C,I	sap potent irritant similar to Chelidonium majus
Solanum carolinense	Horse Nettle	leaves, stems, green fruit	C,I	spines on leaves, stems irritant
Symplocus foetidus	Skunk Cabbage	leaves	I	
Vaccinium corymbosum	Blueberry	leaves	I	
Veratrum viride	False Hellebore	total plant	I	
Zephranthes atamasco	Atamasco Lily	bulb	I	
Zigadenus leimanthoides	Poison Camas	total plant, incl. flowers	I	

REFERENCES

- Lampe, K.F.; McCann M.A., *AMA Handbook of Poisonous and Injurious Plants*
 Levy, C.K., Primack, R.B., *A Field Guide to Poisonous Plants and Mushrooms of North America*
 Justice, W.S., Bell, C.R., *Wild Flowers of North Carolina*
 Radford, A.E., Ahles, H.E., Bell, C.R., *Manual of the Vascular Flora of the Carolinas*

Linda Stier has worked as a Botanical Garden volunteer since her move to the Triangle. She served for a short time as an interim curator of the Herb Garden. This list was compiled by her when she was taking a course on Poisons of Domestic Animals at NCSU. Linda now serves as assistant to Villa Zala in the Poisons Garden and she is a member of the planning board for the Botanical Garden.

TIPS FOR SUCCESSFUL SEED COLLECTING

by Janie Bryan

Seed collecting can be an easy process or a very difficult and frustrating one depending on the species. Herbaceous plants often change very dramatically between flowering and fruiting. It is sometimes very difficult to find a plant after the flowers have faded. To deal with this type of problem, careful observations and locations need to be recorded. Tagging the plant is also helpful, assuming the tag remains on the plant.

Once you have decided to collect seeds and the location is recorded, the challenge begins. With some plants, such as columbine (*Aquilegia canadensis*) and bloodroot (*Sanguinaria canadensis*), the seeds mature in a matter of weeks. Seeds of other species, such as jack-in-the-pulpit (*Arisaema triphyllum*) and skunk cabbage (*Symplocarpus foetidus*), mature very slowly over the summer and are not ready to be collected until the fall.

There are a few general rules to follow in determining when a seed is mature and ready for collection. Look for indications in the fruiting structures. Generally, they will expand in size and turn from a lighter to a darker color as the seeds mature. This is true of the seeds as well. However, as with every rule there are exceptions. Once again, jack-in-the-pulpit (*Arisaema triphyllum*) is a good example. The berries are bright green in June and ripen to a dark red in late summer, but the seeds remain white when mature.

Successful seed collecting requires patience and frequent observation. The rate of ripening is different with every species. Some seeds are dispersed very quickly which makes them difficult to collect, while other seeds persist long after they have matured and may be collected over a long period of time. Allow seeds to develop fully before collecting. Keeping records of seed collection dates will help in establishing your own calendar to which you may refer in coming years.

Once the seeds have been collected, they need to be cleaned as soon as possible. Seeds with fleshy outer covering are easier to clean immediately after collecting. Dry seeds are best left to air by shaking into a paperbag. Other capsules may have to be crushed to remove the seeds. If further cleaning is desired, tea strainers or fine wire mesh are useful in separating the seeds from the trash.

The seeds are now ready to be sown or stored for future use. Seeds that are being stored should be kept in the refrigerator in an airtight container.

Janie Bryan is assistant to the curator of the seed collection and distribution program at the NC Botanical Garden.



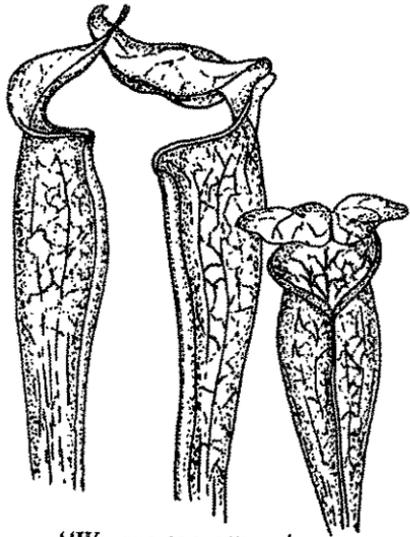
Jack-in-the-Pulpit
Arisaema triphyllum

NOTE FROM NATIONAL RESOURCES DEFENSE COUNCIL

Received from Julie Moore

1) The good news: Two herb industry associations have adopted a resolution discouraging the collection and sale of wild-collected ladyslippers "orchids" (*Cypripedium* spp.) for medicinals and encouraging commercial propagation. The resolution, sponsored by Steven Foster of Arkansas, was adopted by the International Herb Growers and Marketers Association and the American Herb Products Association in June and July. In accordance with the resolutions, Nature's Way, a health food company based in Utah, announced in October that it would stop purchasing ladyslippers. President Ken Murdock encouraged other companies to take the same step.

2) The bad news is a growing trade in cut pitchers from pitcher plants for the cut flower trade. The following information comes from Dr. Thomas Gibson: Conservationists are now facing a new and urgent problem, comparable in magnitude to the ginseng trade: the flower-like traps of the carnivorous plant, *Sarracenia leucopylla*, are being harvested from wild populations for the international and national florist markets. Currently, more than 4 million traps are taken each year from the bogs in the southeastern United States, principally in Alabama, Mississippi, and Florida. This trade may reach 20-30 million in the next few years. The impact on the unique bog community is potentially disastrous, including the possible extinction of large numbers of rare, threatened, or endangered animal and plant species. To curtail these developments, Dr. Gibson is organizing a boycott of the pitchers by the florist trade. For further information, or to offer to help distribute information on this trade, contact me or Dr. Gibson, Department of Botany, University of Wisconsin, Madison, Wisconsin 53706.



*"We are too attractive
for our own good."*

Julie Moore
508 Elm St.
Raleigh, NC 27604

The North Carolina Wild Flower Preservation Society was formed in 1951 by a group appreciative of the flowers, shrubs, and trees throughout the State. The Society primarily is interested in native plants and in problems related to their propagation (seeds, cuttings, cell, tissue, or organ culture), nutrition, distribution, environmental requirements, diversity, ecology, and conservation.

The Society operates through officers, a board of directors, and committees. Members are urged to participate in the working of the Society.

Spring and fall meetings are held at botanically interesting and significant locations across the State. The meetings feature field trips and walks led by botanists and horticulturists knowledgeable about the area. Members also exchange seeds and plants. Other field trips and excursions are organized on a local basis throughout the year.

A newsletter is issued twice a year with articles and illustrations by professional and amateur contributors. The Newsletter editor solicits and accepts material from members as well as from other writers familiar with the flora of the State.

The Society has a scholarship fund to support undergraduate and graduate students working on native plants. The research may be field oriented or carried out in experimental plots or in a laboratory. A library or herbarium study may be appropriate. At the conclusion of the project, a summary report is to be submitted and, if appropriate, may be printed in the Newsletter. The recipients also are invited to make a report on their projects at one of the fall or spring meetings. The Scholarship Fund is supported by member donations and by other gifts. Students can request their research directors to apply to the Society for scholarships.

MEMBERSHIP APPLICATION

Individual Annual Dues: \$ 7.50
 Family Annual Dues: 10.00
 Sustaining Annual Dues: 25.00
 Lifetime Membership: \$150.00

*Please send this and all address
 corrections to;
 North Carolina Wild Flower
 Preservation Society, Inc.
 Mrs. S.M. Cozart, Treasurer
 900 West Nash Street
 Wilson, NC 27893*

Scholarship Fund Donation: _____

Name _____

Address _____

City _____

State _____ Zip _____

New Renewal



1989 NORTH CAROLINA WILDFLOWER OF THE YEAR

The North Carolina Botanical Garden and the Garden Club of North Carolina, Inc. are co-sponsoring the North Carolina Wildflower of the Year Project for the eighth consecutive year. The project's aim is to actively promote through the state and region an attractive North Carolina wildflower. Sundrops, *Oenothera fruticosa*, has been selected as the North Carolina Wildflower of the Year for 1989. Members of more than 580 garden clubs and other enthusiastic gardeners throughout North Carolina will be promoting this fine native perennial for cultivation in home gardens and landscapes in 1989. Garden centers and nurseries are encouraged to participate by propagating sundrops for sale. By demonstrating that sundrops, along with many other North Carolina wildflowers, are easy to propagate, we can establish an effective alternative to the commercial digging of our native plants from natural areas.

For more information on sundrops and for additional sundrops seed for special projects, please send your request with a *self-addressed, legal size, stamped envelope* to: Dept. WF

1989 North Carolina Wildflower of the Year
North Carolina Botanical Garden
The University of North Carolina at Chapel Hill
Box 3375, Totten Center
Chapel Hill, NC 27599-3375
(Phone 919-962-0522)



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