

THE PLANT PRESS



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Newsletter of the Friends of the Herbarium

Summer, 1999

Sewanee Botanical Research Update

I thought I'd take this opportunity to provide an update on some of the research projects that students have been involved with in my lab—many of which have been reported on in past issues of *The Plant Press*.

Sarah McCarthy '99 and I have completed a 3-year investigation of overcup oak regeneration dynamics in Sinking Pond on the Arnold Air Force Base. In this seasonally flooded karst (cavernous limestone) depression, we found that light availability and flooding severity interact to control the recruitment of overcup oak trees into the canopy. This oak population is currently experiencing a decline in regeneration that may be linked to recent increases in the duration of flooding. Sarah and I presented this research as a poster at the Botanical Society of America annual meeting last year, and our paper entitled "Population dynamics of overcup oak in a seasonally flooded karst depression" has recently been accepted for publication in the *Journal of the Torrey Botanical Society*. Sarah will be starting as a PhD student in the Department of Ecology and Evolutionary Biology at Rice University this fall. The intriguing results from Sarah's study have led to an invitation for us to submit a grant proposal this summer to the Department of Defense that would fund an expansion of this research over the next three years. We look forward to Sarah returning to continue her collaboration on this project.

Kevin Hiers '95, Sarah McCarthy '99 and I were joined by Dr. George Ramseur, Mary Priestley and Yolande Gottfried from the Herbarium along with several Biology interns this past summer in a re-inventory of permanent forest plots established in a

1978 TVA study in Franklin State Forest by Dr. Ramseur. Our evidence suggests that several oak and hickory species may be on the decline in our forests. This twenty-year trend could be a reflection of fire suppression on the Plateau in the latter part of this century. We also found sobering evidence of dogwood mortality which confirmed results from a study that Kevin and I published two years ago in the journal, *Conservation Biology*. Kevin recently completed his MS in Ecology at the University of Georgia and is currently employed as a scientist with the Tall Timbers Research Station in Florida. He will be coming back to Sewanee this summer to help finish the manuscript from this forest change research.

Alexandra MacKinlay '98 will also be returning to Sewanee this summer to help re-sample the chestnut oak demography plots that she, Steven Howell '97 and I established in 1995. We will be joined in this effort by summer interns Linda House '01 and Kyle Warren '02. This long-term project follows the fates of over a thousand seedlings and saplings in plots on the Sewanee Domain, allowing us to gain insight into the process by which juveniles are recruited into the forest canopy. Alex won the Botanical Society of America's Young Botanist award last year for her Honors research on weevil predation in chestnut oak populations. She has just finished her first year as a grad student at the Duke School of the Environment.

The Herbarium is sharing space this summer with the student internship program of the Cumberland Center for Conservation and Sustainable Development (CCCSD), funded by a grant from the

Associated Colleges of the South. Six student interns and five Sewanee faculty members are involved: Drs. Gottfried (Economics), Haskell (Biology), Brockett (Political Science), Peters (Philosophy) and myself. The CCCSD has taken off this year as an exciting focal point for interdisciplinary faculty-student research at Sewanee. The Center has established a computerized geographical information (GIS) system. This GIS facility has played a critical role in a collaborative research project involving Drs. Brockett and Gottfried and me and our students on the effectiveness of the Tennessee Greenbelt Law in conserving biological diversity in southeastern Tennessee. We have found that the Greenbelt Law is largely ineffective in conserving forest biodiversity, and students this summer are researching ways in which the law could be amended to correct this problem. We are also collaborating with a remote sensing firm out of Chattanooga in a study analyzing the rate and extent of forest conversion in Grundy County that has occurred over the last 15 years. It is widely believed that there has been a recent acceleration of hardwood conversion to planted pine on the Plateau with the arrival of chip mill facilities in the area. Through the analysis of USDA aerial photographs, students will be gathering data to test this assertion and to explore the socio-economic implications associated with the findings.

—Jon Evans
Herbarium Director

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Woman of Letters

Hooray! Our newsletter is being read—and by knowledgeable people. Several caught a mistake in an article in the Winter, 1999, *Plant Press*, in which we erroneously stated that *Euonymus atropurpurea* Jacq. is an invasive exotic in the state of Tennessee. Not so! The culprit, which goes by the same common name, “burning bush,” is *Euonymus alata* (Thunb.) Sieb. Our apologies—but keep those letters coming! —MPP

Drawings This Page

Diamorpha smallii Britton (Elf Orpine), after Radford.

Life on a Sandstone Outcrop

The Piney Point area of the University Domain hosts some of the most fascinating plant associations around. The rock outcrops, where the Sewanee conglomerate sandstone is exposed, are as close to desert habitat as we have on the Cumberland Plateau, and many of the plants that inhabit them employ the same survival strategies as do the plants of the desert.

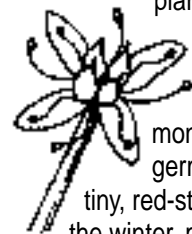
Rock outcrops are populated by unusual flora. These are the xerophytes, plants that are adapted for environments where moisture is scarce. On approaching an outcrop, the observer will notice the dominant white and chestnut oaks (*Quercus alba* L. and *Q. prinus* L.) of the surrounding forest giving way to blackjack and post oaks (*Q. marilandica* Munchh. and *Q. stellata* Wangenh.), along with shortleaf and Virginia pines (*Pinus echinata* P. Mill. and *P. virginiana* P. Mill). *Vaccinium* species—blackberry and farkleberry—are in evidence.

Rock mosses (*Grimmia*) and lichens (*Parmelia*) fleck the bare rock surface here and there. In some places, the rock weathers to produce slight depressions where eroded sand collects and holds moisture. Here, vegetation “islands” form, encircled by

Polytrichum (hairy-capped) moss.

Within these mossy rings, soil builds up and flowering plants are able to get a toe-hold.

“Live quick and die” may sound like a strange survival strategy, but it is effectively employed by annual plants. Elf orpine (*Diamorpha smallii* Britton), a winter annual, completes its life cycle during the cooler months of the year. The seeds germinate in the fall, and the



tiny, red-stemmed plants live through the winter, photosynthesizing on warmer days. By springtime, they are about three inches tall. They flower, producing a striking display of minute white flowers on red and green stalks, in and around ephemeral pools on the flat outcrops. Blooming along with them is Appalachian

stitchwort (*Arenaria patula* Michx.), a taller, mat-forming perennial whose many small white flowers are held at the tips of delicate branches. Both of these species go to seed quickly after flowering, so that when the rock face is hot enough to fry an egg, the embryo plants are well-protected within the seed.

Water retention is the name of the game for other rock dwellers. Our one eastern cactus, prickly pear (*Opuntia humifusa* (Raf.) Raf.) can often be found on these sandstone outcrops. Like *Diamorpha*, the prickly pears are succulents: their thick, fleshy stems (and *Diamorpha*'s leaves) are adapted for storing water. Along the edges of the outcrop, peat moss (*Sphagnum*), with incredible water-retention capabilities, often forms moist mats that harbor a variety of plants, including the beautiful spring-blooming bluets (*Houstonia caerulea* L.) and sometimes pink lady's slipper (*Cypripedium acaule* Ait.). Pick up a clump of *Sphagnum*—you can almost always squeeze at least a bit of water out of it.

In the summer, the color scheme is lavender and gold. A visitor to these outcrops is greeted by blazing star (*Liatris*) and its relatives the goldenrods (*Solidago*). They are in the aster family, many of whose members bloom during the summer and fall. Note the hairy or waxy leaf surfaces of these plants, both adaptations for water retention.

Surprisingly, some xerophytes do not mind desiccation. *Grimmia* and *Polytrichum* mosses and *Cladonia* lichen (sometimes called reindeer moss) are good examples. On a hot summer day, they can appear absolutely dead. Come back after a rain, though, and these “malingerers” will seem to have miraculously resurrected!

You are invited to come explore the sandstone outcrop habitat with us. The Sewanee Herbarium plans a walk to Piney Point, led by George Ramseur, on Thursday, July 8, at 2:00 P.M. Meet at the University gates on Highway 41-A on the eastern end of campus (the Shakerag Hollow trailhead). The walk will be three miles, easy.

—Mary Priestley
Herbarium Curator

Summer Calendar of Events

Summer Tree Identification

Thurs., July 1 • 4:00 PM
Mary Priestley, leader

Learn to use the *Summer Key to Tennessee Trees*, by Shanks and Sharp, to identify some trees of the plateau. Meet at the Memorial Cross. One mile, easy.

Piney Point

Thurs., July 8 • 2:00 PM
George Ramseur, leader

Explore the unique flora of the sandstone outcrops and enjoy the wonderful view from Piney Point. Meet at the University gates on Highway 41-A on the eastern end of campus (the Shakerag Hollow trailhead). Three miles, easy.

Aquatic Plants

Thurs., July 15 • 4:00 PM
Yolande Gottfried, leader

Investigate the abundant and varied flora in and around the lakes of the Domain. Location TBA in the *Sewanee Mountain Messenger*.



Kalmia latifolia L. (Mountain Laurel)



Tradescantia subaspera Ker-Gawl (Spiderwort)

Biodiversity on the Mountain

We are pleased to announce that two new informative pamphlets for the *Biodiversity on the Mountain* series, which is published by the Sewanee Herbarium, are in the works. Sylvester Tan, a student in the college, has completed early drafts of "Medicinal Plants of the American Indians and Early European Settlers" and "Edible Plants of Sewanee." Both pamphlets will be available later this summer.

Biodiversity on the Mountain pamphlets are free and may be picked up at the Bishop's Common and in the hallways of the Biology Department here on campus. Let us know if you would like copies of any of the following mailed to you:

- Medicinal Plants of the American Indians and Early European Settlers
- Edible Plants of Sewanee
- Common Birds of Sewanee
- Amphibians of Sewanee
- Ferns of Sewanee
- Trees of Sewanee
- Nuts and Acorns of Sewanee's Forest

Membership Application/Renewal

The Friends of the Sewanee Herbarium support the work of the Herbarium: education, research, and conservation. A \$10.00 annual contribution would be very much appreciated. The date of your most recent contribution is printed on your address label.

Name: _____

Address: _____

City, State, Zip: _____

Amount Enclosed: \$10.00 Other: \$ _____

Please make check payable to The University of the South. Gifts are fully tax deductible. Send to:

Sewanee Herbarium
c/o Mary Priestley
735 University Avenue
Sewanee, TN 37383

Others who might like to receive *The Plant Press*: _____

Internet Resources

Here is a quick listing of some webpages that we have found to be of botanical interest.

Atlas of the Vascular Plants of Tennessee

<<http://www.bio.utk.edu/botany/herbarium/vascular/atlas.html>>

This site, produced by the Center for Field Biology at Austin Peay State University and the University of Tennessee, provides a vascular plant checklist and distribution maps, by county, for all of the plants collected in the state.

Internet Directory for Botany

<<http://www.helsinki.fi/kmus/botmenu.html>>

This site has links to many, many other sites.

Tennessee Exotic Pest Plant Council

<<http://www.webriver.com/tn-eppc/index.htm>>

In addition to listing the invasive exotic plants in the state, this site lists native plants for landscaping and their particular requirements for best growth.

American Fern Society

<<http://www.visuallink.net/fern/>>

This web page is designed to expand on the exchange of information about ferns between amateurs and professionals around the world.

Texas A&M University's Taxonomy of Flowering Plants course

<<http://www.csdl.tamu.edu/FLORA/ftp/tfphone1.html>>

To brush up on botany, check out these course materials.

U.S. National Database of Plants

<<http://plants.usda.gov/plantproj/plants/index.html>>

Just what it says!

Vegetative Angiosperm Characters

<<http://csdl.tamu.edu/FLORA/ftp/lab/vegchar.htm>>

For a nice glossary of terms related to plant form, with their definitions, cut straight to this Texas A&M lab.



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