Fall 2012

"This is not a hand lens. It's a florascope!"

Florascope

The Newsletter of the A. C. Moore Herbarium
University of South Carolina

Botanical News of SC

There is plenty of botanical news all over the world, and we'd like to share some of the local news with you. We are particularly interested in knowing of some newsworthy or otherwise remarkable plant collections that have been made in South Carolina. We have brought up this theme in previous issues of the Florascope, and will be doing so in the future. Why is this important? There are plenty of reasons.

Red Jute, *Corchorus orinocensis* (and in Spanish, "Espadilla"), is an herbaceous plant that botanists

Corchorus orinocensus

place in the linden family (Tiliaceae), this family known mostly for its woody members, including linden ("basswood") trees. (The family placement is somewhat controversial…as red jute and its close relatives otherwise are considered members of the hibiscus family, Malvaceae.) Various species of *Corchorus* are used widely, from Asia to the northern Africa, as an important source of structural fiber; other species produce edible foliage which is commonly used as a cooked vegetable. Red jute is not particularly important economically, and is apparently native to Latin America, from Peru to northern Mexico. It has been reported in the past from the southwestern USA (Arizona, Texas) and more recently from Florida and Alabama.

This species was found in September, 2012 in Aiken County by Celeste Ray. The plants seen were growing along a walking path right at the Savannah River, along the Greeneway. Celeste alerted members of the SC Native Plant Society, and the news eventually got to us. We are glad it did! Celeste was able to provide us with a specimen of this plant, which has been entered and database within our main collection. *Corchorus orinocensis* is now officially established as occurring in South Carolina.

Continued Page 2

Web Site Upgrades and Online Collections

You probably didn't notice, but the A. C. Moore Herbarium web site was moved to a new server last December. Though little has changed on our homepage and much of the navigation remains the same, you might notice that when you type in www.herbarium.org, the address will change to herbarium.biol.sc.edu.

For roughly the first 10 years of service the herbarium's web site was hosted by Dr. Tim Mousseau (a colleague in the Department of Biological Sciences here at USC), and we thank him for his kindness and generosity. Tim's server was named 'cricket' and you might find some old links out there that still point to our old web site on that machine… they'd look something like cricket.biol.sc.edu/acmoore. If you find any of those links out there please let us

Continued Page 2

Continued from Page 1

SC Botanical News

Whether it is present in other areas of our state, or if it will persist, remains to be determined.

Sometimes, finding a new species for the state is just an effect of filling in a gap. *Ranunculus platensis* is a good example. (See photo on page 5.) This species was located, in great abundance, on March 24, by John Nelson, who happened to be browsing around at Lake Ashwood in Lee County. "Prairie buttercup", as it is called. (Why? It's not a prairie plant. It's native to South America. One more example of a "bad" common name, we think.) The leaves are palmately lobed, and finely hairy. The flowers are quite small, as buttercups go, but quite handsome. The petals are golden yellow, and of course, there are plenty of stamens. Each one of the carpels—which are free from each other—is equipped with a number of tiny little knobs on its two flat faces, and each little knob is surmounted by a prominent, though tiny, hook-like projection.

In North America, it is a species found mostly near the Gulf Coast, from Texas to Alabama, and there are reports of it now from Georgia and North Carolina. South Carolina has represented a distributional gap, without any reported collections. Of course, that has changed and maps of its distribution will need to be updated to include the Palmetto State. Logic suggests that such a species is probably found in more than one county in our state. It is likely that continued botanizing in the coastal plain counties in the near future will turn up additional populations. But, who knows where the next population of this little traveler will show up? Maybe in the upcountry?

And now for a grass! In this case, a grass that was collected but not identified until a couple of years later. This situation happens quite often. You might wonder why a botanist would ever bother to collect a plant that he/she didn't know already, or was unable to immediately tag with a name. The reason is obvious. There are so many different plant species out there, and so many new ones potentially showing up unexpectedly, that it behooves a botanist to make specimens of plants that are unknown, at least at that time. Once the specimen is pressed, dried, and filed away (sometimes in an "unknown" folder), it will be available for a more knowledgeable taxonomist to examine at some point in the future. (Hopefully not too long!) Such is the case with a curious witch-grass, obviously a *Dichanthelium*, taken from Lexington County in the spring of 2009 by John Nelson, in the company of indefatigable nature-lover, Hunter Desportes. A specimen of the Mystery Grass was made for the herbarium, and was eventually sent to UNC for its study by Richard LeBlond, an expert on the witch-grasses .

LeBlond rather excitedly let us know that the Lexington County specimen is in fact a dead-ringer for the rare "Golden witch-grass". This plant was described in 1903, under the name *Panicum chrysopsidifolium* and by 1910, was known only from 3 places in Florida and 1 place in Louisiana (as well as a couple of places in Cuba and Puerto Rico). Since then, it had been located in a number of localities from Delaware to Texas, on the coastal plain, and is now known with certainty from South Carolina. If the unknown grass had NOT been collected in 2009, who knows how long before its presence in SC would have been established? We really appreciate Richard's willingness to look at our specimens and provide determinations and corrections. Truly, botanists are a group of scientists that depend on the expertise of their colleagues. (By the way, Richard, being the witch-grass guru, has concluded that this plant is really not a species of *Panicum*, but does in fact belong to the genus *Dichanthelium*.)

Staff admiring the new A. C. Moore Herbarium tee-shirts. Of course, women work in a *her*barium!

Continued from Page 1

Herbarium Web Improvements

know so that we can update them (send an email to brownh@biol.sc.edu).

We also owe a great deal of thanks to the Biology Department's Network Manager, John Alam. John's efforts to provide us with a dedicated web server have been a blessing to say the least. The new server allows for expanded capabilities, and better, faster service to visitors like you. Capitalizing on the robust features of this new machine, we are now offering a completely redesigned online collections search interface called 'Flora Caroliniana'.

Flora Caroliniana runs on National Science Foundation supported open source code called Symbiota. The site is accessible via the herbarium's homepage or at herbarium.biol.sc.edu/floracaroliniana. In addition to serving specimen information for the A. C. Moore Herbarium, the site also supports searches of the Clemson Herbarium collections database (and may at some point include other SC Herbaria as well). We are continuously working to enhance the visitor's experience and will be adding dynamic keys, digital images, and new flora projects with species checklists. If you are interested in creating your own species checklist (of your backyard or favorite natural area), you might consider creating an account and taking advantage of the taxonomic picklist to add new plant names to your list.

Numbers and Setting New Goals

It seems obvious that a collections manager would be interested in somewhat obscure facts about the collections that he or she manages, but as with any bit of collections-related trivia, the initial inquiry becomes a 'tar baby' with one question leading to another. Such is the case when we inventoried how many distinct species were represented from each South Carolina county in the main collection here at the A. C. Moore Herbarium. What seemed like a simple question quickly resulted in more questions regarding why the results appeared the way they did and what this information was telling us about our herbarium, its history, its ongoing efforts to study and document the flora of South Carolina, and the impact that this and other collections in the state may have on our understanding of biological diversity and species' distributions. Wow, that's a lot to glean from a simple question.

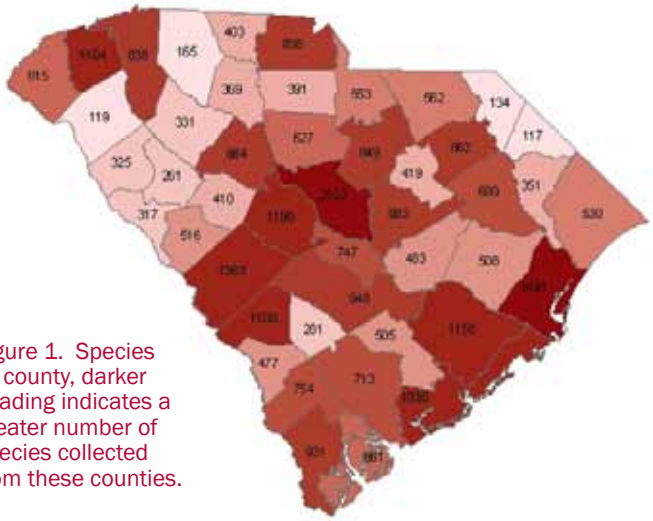

Figure 1. Species by county, darker shading indicates a greater number of species collected from these counties.

"How many distinct plant species are represented from each county in South Carolina at the A. C. Moore Herbarium?" To answer this question, we conducted a series of queries in our collections database. These numbers were then plugged into a GIS application to give us a neat color shaded map that provided a graphic display of 'hot spots' (counties with a higher number of species in the collection) and 'gaps' (counties with fewer species in the collection). But what was this telling us? At first glance, (fig. 1) one could easily assume that Richland County was the most botanically diverse county in South Carolina, followed closely by Georgetown and Pickens.

However, the overall shading in the state makes little sense and every good botanist knows that plants don't care about political boundaries. For instance, if the shading were taken at face value, why would Pickens County have over 1,000 species and neighboring Anderson County only have about 100? Clearly this was not a good indicator of botanical diversity. Perhaps, the numbers were less related to diversity and more so to botanical survey work and collecting activities. So we asked another question, "How many total specimens are represented from each county in South Carolina at the A. C. Moore Herbarium?" We then generated a very similar map, (fig. 2) with very similar shading, and slightly higher numbers. (The numbers are higher because in some cases we have multiple collections of the same species from the same county.)

Now we could see that there was a positive correlation between the number of species from a particular county and the total number of specimens collected from that county. So the apparent diversity in Richland County was partially attributable to the sheer number of collections. Why so many collections from Richland County? Well, because that's our 'backyard' of course. Make no mistake, staff of the A. C. Moore Herbarium are well aware that Richland County is perhaps a bit overrepresented in the collection, however it's difficult to avoid collecting something new on your way to work or just during a walk around the block. Clearly, proximity to the A. C. Moore Herbarium can account in some measure for the number of species and specimens we have from Richland County. Yet there are other counties that seem to have higher numbers of species and specimens. So what about the top ten counties with the highest number of specimens and greatest number of distinct species represented in the collection? Well those differ a little.

In both cases, (fig. 3 and fig. 4, next page) we see eight of the 'usual suspects' but there are more distinct species from Jasper and Orangeburg Counties and more specimens from Darlington and York Counties. What is going on here? The answer isn't easy to explain and probably involves a variety of factors. Most botanical inventories are conducted on large tracts of public land which require baseline biotic inventories prior to the formulation and implementation of land management strategies. Considering the placement of National Forest Lands in South Carolina, the large numbers of collections from Pickens and Berkeley Counties might correlate nicely with the presence of

Continued Page 4

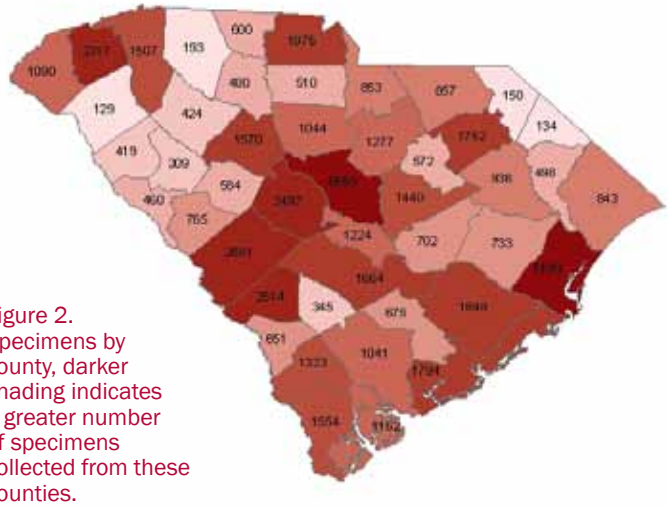

Figure 2. Specimens by county, darker shading indicates a greater number of specimens collected from these counties.

Continued from Page 3

Statistics and Goals

the Sumter and Francis Marion National Forests respectively. Following this reasoning though, why would Aiken County be so heavily studied? Well, in the 1950's, Dr. Wade T. Batson (former curator) conducted a multi-year botanical inventory of the Savannah River Site and amassed numerous collections from this area. However, large tracts of public land aren't necessarily known from Darlington or Georgetown County. Thus the same reasoning seems less likely to hold true. In fact, these latter two counties are probably so well represented in the collections of the A. C. Moore Herbarium because of the accessioning of other collections. That is to say the collections from herbaria without the means for active curation were given to USC and became part of our herbarium. In 1986, the Coker College Herbarium was donated to USC and in the late 1990's we accessioned the collections from the Brookgreen Gardens Herbarium. These two collections both contained many specimens from their respective surrounding areas. This phenomenon sounds familiar...a greater number of species and collections are found near a herbarium. This trend may also carry over to exchange programs as well. An exchange program involves two herbariums trading duplicate specimens, a means of not putting all our eggs in one basket. If we consider the other herbaria in South Carolina with which we actively exchange specimens this further explains why at least Pickens County is so well represented. Clemson and USC have developed a long-term exchagne program which is ongoing.

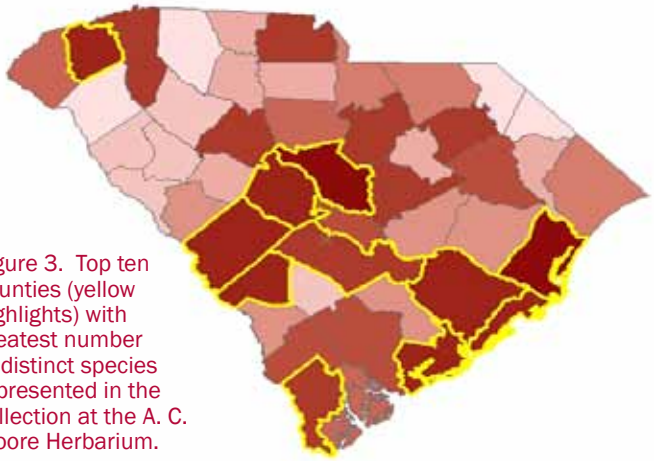

Figure 3. Top ten counties (yellow highlights) with greatest number of distinct species represented in the collection at the A. C. Moore Herbarium.

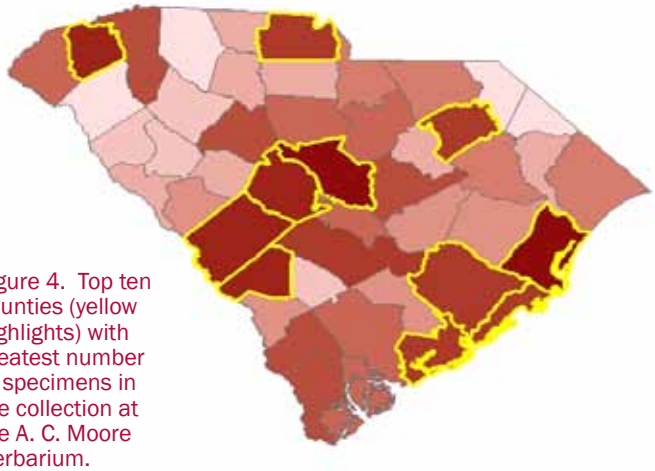

Figure 4. Top ten counties (yellow highlights) with greatest number of specimens in the collection at the A. C. Moore Herbarium.

While the A. C. Moore Herbarium focuses on the flora of South Carolina and the southeastern United States, we have many cooperative exchange programs with other herbaria. In fact we also exchange specimens with herbaria from around the world which makes your local herbarium a resource for global botanical information. So whether you've just heard the saying or if your car is sporting one of our fancy bumper stickers that says, "Support Your Local HERBARIUM", keep in mind that your local herbarium might be closer than you think. Herbaria in South Carolina dot the state in the counties of Pickens, Greenville, Spartanburg, Aiken, Newberry, York, Richland, Florence, Colleton, Charleston, and Horry (to learn more see www.sc-herbaria.org).

Now that we've trudged through all of the number crunching, we've set some new goals. As evidenced from this brief investigation the botanical elements of some counties are severely underrepresented in our collection. Our goal is to ensure that at least every county in South Carolina is represented by at least 1,000 specimens!

Happy 100th, Dr. B !!!

Plantman might be our botanical Superhero, but our HUMAN botanical hero is surely Dr. Wade T. Batson, shown here celebrating his 100th birthday on May 5, 2012. What a cake (strawberries!), and what a party! Over 300 people took part—his family, friends, neighbors, and of course many of his past students—all gathered at his boyhood home in Marietta SC for a fantastic day of reminiscing, well-wishing, and of course, an incredible dinner. Dr. B has given so much to so many, and we are forever grateful to him for his ability to impart his love for the natural world and for those around him to all of us. Best wishes for many more, Dr. B!

Aleurites fordii

Centrosema virginianum

Lonicera fragrantissima

Recent Plant Identifications

A. C. Moore Herbarium provides plant identifications as a **free** public service. It is one way the College of Arts and Sciences at USC reaches out to the citizens of the state.

As of the end of September 2012, we recorded 336 separate plant identifications. Lots of times, people want to know what the MOST mysterious plant for the year seems to be. This year, the most-often-sent-in plants include 3 species of Glory–bower (the genus *Clerodendrum*), leather flower (*Clematis*), butterfly-pea (*Centrosema virginianum* and *Clitoria mariana*), Autumn-olive (*Eleagnus umbellata*), Breath-of-Spring (*Lonicera fragrantissima*), and Princess tree (*Paulownia tomentosa*). There were three questions concerning both "Clearweed" (*Pilea pumila*), Tung-oil (*Aleurties fordii*)...and the top mysterious plant was "Downy elephant's foot" (*Elephantopus tomentosus*) with five different requests.

There are different ways in which we accomplish these identifications. Increasingly, we receive images of plants as snapshots through the mail and as electronic images (most often jpeg files) sent to us via email. Usually this works just fine, and we can identify the plant from the photo.

People mail us a piece of the plant in question. If you want to send us a mystery plant for identification, put enough of it to identify inside a baggy with a slightly damp paper towel inside. Close the baggy up, and then poke one or two little holes in the baggy. It shouldn't dry out nor rot. This technique works quite well. It's always nice to have examples of the stem and leaves, and of course the flowers and/or fruits or seeds that would make an identification possible.

A third way to get us your plant is by bringing it to us. If we know you are coming, we'll make a special effort to meet you, or perhaps run down to the back door of our building to meet you on the sidewalk, if you can't come all the way up. (Or can't find a place to park!)

If you send us a specimen, or bring one by, that also gives us the option of pressing and drying the plant, and turning it into a permanent specimen for our main collection. This has been particularly useful as a way for us to get additional interesting agricultural and "yard" weeds, sometimes allowing us to add additional "dots on the map", in terms of county distribution. Plus, we've acquired some excellent specimens of unusual houseplants that people have brought to us.

We look forward to helping you out identifying puzzling plants that you might have. It's one of the things we do!

Clerodendrum indicum

Ranunculus platensis

Paulownia tomentosa

We Love Visitors!

If you have ever been to the A. C. Moore Herbarium, you know that it's crowded…even when nobody's here. We have less than 1500 square feet for all of the collection, work spaces, table tops, and corridors. Neverthe-

Dr. John E. Fairey, III

Dr. Zack Murrell

less, we are thrilled to have visitors! This past year we have continued our tradition of having scheduled visits by various groups and researchers, as well as by impromptu drop-ins!

We were thrilled to have Dr. John E. Fairey III visit the Herbarium in September. Professor Fairey, who is from Rowesville SC, started out his college career as a biology major here at USC, and was a student of both John M. Herr, Jr. and Wade T. Batson. After graduating, he went to graduate school at West Virginia University to study the very interesting sedge genus *Scleria*, under the direction of Earl L. Core. After leaving Morgantown, John came back to South Carolina (1968) as a professor at Clemson, where he served as the curator of the Herbarium, and proceeded to develop a long list of graduate students. John retired in 1996, but is still active in studying *Scleria*. We were extremely pleased to have him up here, if even for one short afternoon. Perhaps there is some way that we could make him more of a permanent fixture!

Professor Charles N. Horn of Newberry College visited us for several days during the summer, further investigating our native members of the genus *Rhododendron*. Dr. Horn, the curator of the Newberry College Herbarium, is a local expert on wild azaleas (among several other plant groups), and has been instrumental in studying the distribution of the recently described "May-white azalea", *Rhododendron eastmanii.*

Dr. Zack Murrell, a professor at Appalachian State University, is working with several students on a species level study of the dwarf flowered heartleaf (*Hexastylis nani-flora*), collaborating with the South Carolina Heritage Trust Program, the North Carolina Natural Heritage Program and the NC Department of Transportation. The dwarf flowered heartleaf grows in the Piedmont of North and South Carolina, one of the fastest growing areas in the Southeast. Because many of the sites where the plant once grew are now developed into towns and suburban areas, it is considered a Threatened Species in accordance with the Endangered Species Act. Zack and his crew are seeking new populations of the plant and are looking at ways to differentiate this species from possible hybrids. Studying leaf and flower shapes, habitat and molecular data called microsatellites helps understand the species and its relatives. Herbarium collections are one of the first steps in establishing a known range for this plant, as well as developing a concept of morphological variation among and between its populations. This information will establish protocols to protect this plant in the future.

Extension Agents Tour the A.C. Moore Herbarium

Last July the Annual Meeting and Professional Improvement Conference (AM/PIC) of the National Association of County Agricultural Agents (NACAA) was held in Charleston. This was the first time in its 96 year history that this professional association of Extension Agents has met in South Carolina.

Extension Agents are educators who perform outreach work in agriculture, horticulture, forestry and natural resources, 4-H youth development, community development, and related disciplines, thereby improving their state's agricultural and rural economies. The Extension Service is available to all citizens and provides numerous services from home gardening advice to financial planning for farmers. Each state's Extension Service is hosted by its Land-Grant University. SC has two such Universities, Clemson and SC State, both of which support SC's

County agricultural agents pictured on the steps of Longstreet Theatre, across the street from the Herbarium in the Coker Life Sciences Building at USC-Columbia.

Extension Service by staffing offices in all 46 counties. South Carolina's agents were proud to host 1,300 colleagues from other states for 6 days of professional development, tours, and camaraderie.

As part of the AM/PIC planning committee, I had the great pleasure of organizing and guiding pre-conference tour for horticulture agents on July 13 and 14. The 27 participants on this two day tour represented 15 states, including Utah, Arizona and Hawaii. The majority of these visitors had never before been to S.C. We toured some of South Carolina's most beautiful horticulture attractions, spending the first day in Columbia and the second in Charleston.

One of the highlights of our trip was a visit to the A.C. Moore Herbarium. Dr. John Nelson, Herbarium Curator, led an enlightening discussion about the purpose of herbaria and how they benefit Extension Agents and the general public through plant identification services and botanical collections. He demonstrated plant collecting and preserving techniques, displayed some of the herbarium's most interesting specimens, and made an impassioned plea for everyone to "support your local herbarium". Afterwards, Dr. Nelson provided a walking tour of USC's campus, featuring the historic Horseshoe. He shared campus history and pointed out unique trees and other plants along the way, including an ancient crape myrtle and several massive oaks.

The agents had a fantastic time, thoroughly informed by Dr. Nelson's wit and insight. They were amazed by S.C.'s botanical diversity and natural history, and several expressed to me that they gained new appreciation for herbaria. Finally, on behalf of NACAA and the pre-conference tour, I would like to thank Dr. Nelson and the Herbarium staff for surrendering most of an afternoon to tour and entertain our group. It's not something that they will soon forget. And as for me… this Clemson grad is a big fan of the USC Herbarium! *Vivat Linnaeus*!

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The Pitcher-esque Environs of Cataract Bogs

South Carolina's upstate geological landscape is rich in granite. Occasionally, large granitic domes, at which bare rock reaches the soil's surface, create a hostile environment for plants by providing little opportunity for them to take root. These expansive openings in the forest canopy, which are largely devoid of herbaceous vegetation as well, often provide visitors with a sense of awe as they take in the rolling vistas below as a sort of natural scenic overlook. Many of you are probably familiar with 40 Acre Rock Heritage Preserve in Kershaw County. Located near the eastern edge of South Carolina's Piedmont Ecoregion, the 'not-quite-40-acre' rock certainly harbors some interesting and extremely rare plant species; however, there is an entirely different suite of rare plants that can be found on granitic domes in the Upstate.

Two adjacent Heritage Preserves in Greenville County are known for a series of granitic domes. Being closer to the Blue Ridge Ecoregion, these rock faces are on a slightly steeper incline than their cousins to the East. Also, there is a constant, gentle trickle of water flowing in thin sheets over the rock surface that supports some rare, and potentially deadly, plant species. The health risks primarily affect insects, but curious humans may be easily injured as well. Along the water's descent, small pockets of vegetative debris accumulate and form thick, mucky peat deposits. The soggy soil is nutrient-deprived and not deep enough to support woody vegetation, so small herbaceous perennials thrive in the open sun. Because they are associated with waterfalls, or cataracts, these sites are often referred to as 'Cataract Bogs'. The appearance of these hanging gardens as they cling to steep, slick slopes is quite breath-taking, but difficult for humans to observe up close. Not even the best footwear can provide sufficient traction to prevent a sudden slip and fall over the algae-coated rock surfaces, and many an avid botanist has suffered some serious scrapes and bruises (some have been hospitalized) in an attempt to observe a rare plant species, one which deals a deadly fate to unsuspecting insects.

Fully-extended leaves of *Sarracenia jonesii*.

Mountain Sweet Pitcher Plants (*Sarracenia jonesii* Wherry) are known only from a handful of counties in North and South Carolina. They are, as one might expect, quite well adapted for catching and digesting insects which

Cataract bogs, despite their treacherous footing, are habitat for a wide diversity of plant and animal species.

Memorial Gifts

a message from John M. Herr, Jr.

Certainly donors give money to organizations and causes they truly respect and for which they are strongly motivated to support, knowing that their support makes a positive difference. On occasion, donations are given in memory of a loved-one or friend knowing that they would be pleased by the donor's thoughtfulness.

For many organizations, memorial donations are accorded a brief mention in an annual report, and then seldom if ever brought to anyone's attention.

Not so for memorial gifts to the W. T. Batson Endowment for the A. C. Moore Herbarium. A donation of $50 or more offered in memory of someone is marked by the addition of a special label to a herbarium sheet on which is recorded the name of the person remembered and the name of the donor. The herbarium sheet selected bears a plant specimen favored by the donor or was in some way special to the person remembered. Not hidden in some obscure report, this label will be seen by many people over the years whose attention is drawn to the plant represented by that herbarium specimen. Remember, what is written on an herbarium specimen is far more durable than what is chiseled onto a tombstone.

Continued from previous page

Cataract Bogs

provide the plants with additional nutrients not found in the nitrogen-deprived soils they inhabit. Due to their limited distribution, threats to habitat integrity and the potential for illegal collection, *S. jonesii* is listed by the US Fish and Wildlife Service as Federally Endangered. Recent efforts to augment our understanding of this species' distribution in South Carolina lead Heritage Trust Biologists to survey areas likely to support these plants. In consultation with the A. C. Moore Herbarium, which currently holds eight specimens of *S. jonesii*, Heritage Trust staff determined that the recent survey efforts had indeed discovered previously unknown populations. Documenting these populations includes a detailed process of recording locality and habitat information. While it is not often that a botanist would actually collect material from such a rare plant species (this requires special permits and judicious sampling methods where collection is not likely to cause permanent damage to the plant's overall health), it is common practice to collect a few of the associated plant species – especially when field identification is difficult. These specimens will be processed and curated at the A. C. Moore Herbarium where they will serve as vouchers aiding in further development of the survey site's habitat characterization.

A. C. MOORE HERBARIUM
University of South Carolina

Florascope

Volume 7
Issue 1

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