

# The Journal of the South Carolina Native Plant Society



Fall 2010

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Greetings, fellow SCNPS members. In the last issue I gave some highlights of the 2010 symposium in the Low Country. **Our 2011 Symposium is planned for Saturday, May 14, 2011 in Rock Hill at the Museum of York County.** Details are still being worked out, but we will have a one-day event, with several speakers in the morning, starting at 10:00, followed by field trips and workshop sessions in the afternoon. Field trips will include the rocky shoals spider lilies site. The York County region is home to some very interesting native plant communities, including remnant piedmont prairies.

The Museum has been a long-term partner with the Piedmont Chapter. Over the last 5 years, the MYCO and the Piedmont Chapter have planned native plant sales, field trips and various programs that focused on native plants and communities, such as the piedmont prairies. The MYCO features a rain garden that was installed at the 2007 Symposium and a Carolina Fence Garden that is maintained by SCNPS members.

So, please save this date on your calendar, and look for regular updates on the SCNPS list-serve and website, and in newsletters.

Jeff Beacham, President



## Boeing Site Plant Rescues

Jean Everett, PhD  
College of Charleston Biology Department

In our Summer issue we learned some of the basics of conducting plant rescues. Now I want to share a wonderful rescue story with you. Charleston was blessed to land the second Boeing Dreamliner manufacturing plant last fall – a real economic boost for our community. For me, the excitement was tempered with dread because I knew that the only inland Charleston County population of southern sugar maple, see photo above (*Acer barbatum*), quite rare on the Coastal Plain, was located on the Boeing site, which is near the Charleston airport. I first discovered this population more than 10 years ago, when I stopped on the roadside to photograph the uncommon Elliott's aster (*Symphyotrichum elliotii*). I turned my head and spotted the maple. I stared with disbelief – this is not an inland species on the outer Coastal Plain. We see it on salt marsh shell mounds. But there it was, and I was so thrilled! It was late fall, and my quick dash into the woods revealed little. This is a habitat that blossoms in the spring.

I tried for many years to gain access to the site in the spring, but was always turned away, and I was never even able to document the maple due to post 9/11 security. I never lost my intense curiosity to know what else might be in there, though, and when the Boeing announcement was made, I was able to contact them, assisted by an interested Post and Courier reporter who later wrote 2 fantastic articles on the rescue project. To my utter delight, Boeing granted access. We had to move quickly, though! Almost from one day to the next, I was given permission to take my plant taxonomy class to the site. We roamed

(See **Boeing**, page 2)

**Boeing**, from page 1

the hundred acres in awe – besides the sugar maple we found the rare basswood (*Tilia americana* var. *heterophylla*) and nutmeg hickory (*Carya myristiciformis*). American beech (*Fagus grandifolia*) was present, but oddly not common. The site was carpeted with crane-fly orchid (*Tipularia discolor*), Christmas fern (*Polystichum acrostichoides*) and wild ginger (*Hexastylis arifolia*). We also found Indian pink (*Spigelia marilandica*, Fig 2.), squawroot (*Conopholis americana*), our native honeysuckle (*Lonicera sempervirens*), striped gentian (*Gentiana villosa*, an odd, green-flowered species), Jack in the pulpit (*Arisaema triphyllum*), witch hazel (*Hamamelis virginiana*), red buckeye (*Aesculus pavia*) and many other species typical of high-calcium habitats.

That was on a Monday. On Thursday, at 6 a.m., I got a delayed email from Boeing to say that I could take a crew of no more than 10, that day only, to rescue as many of these special plants as possible. Ground breaking was Friday. I quickly activated my network, and with the help of Lowcountry member Jeff Jackson, one of his helpers, and a great crew from the College of Charleston, we

worked most of the day to dig up plants. It was perfect transplanting weather – cool and misty all day. We potted up hundreds of plants – not just the rare species, but many other ferns, shrubs and small trees. It was breathtaking, but heartbreaking as well. Just a few days later the site was completely razed.



Figure 2. Indian pink (*Spigelia marilandica*).

The construction of the manufacturing plant requires the relocation of Aviation Avenue, leaving two small strips of land on either side of the new Aviation Avenue undisturbed and in conservation zones. In February, I contacted Boeing again to see if we could survey those protected strips. Jeff and I went out one Friday afternoon, and were once again delighted by what we found. Most of the species found on the now cleared plant site were present, including the maple, and also vast patches of Mayapples (*Podophyllum peltatum* Fig 3.), mottled trillium (*Trillium maculatum*) and atamasco lily (*Zephyranthes atamasco*)! We also found two rare spring orchids, the spring coralroot (*Corallorhiza wisteriana*) and southern twayblade (*Listera australis*). Many species were coming back up in the newly cleared roadbed, and once again Boeing allowed us to rescue

from the disturbed part of the site. With a wonderful crew of Lowcountry members, we rescued hundreds more rare plants.

In both rescue events, the plants were potted up, and then many of them were transplanted that same day to their new homes. Some were held in pots for later transplanting. All the rescuers that had suitable habitat were able to take some plants home, but most plants went to public gardens. The College of Charleston, Charlestowne Landing, and a SCDNR native species garden were all recipients. We still hope to have some plants transplanted to the native species garden at Hampton Park and to the SC Aquarium. The success of the transplants is amazing, considering the rocky, rooty soil and the speed of removals – we were literally yanking orchids out of the ground! It was surreal.

Why was such a wonderful and rare plant community located at this site? It all comes down to soils and geology. The soils in the Coastal Plain develop exclusively from deposited parent materials. The entire Coastal Plain was under sea water for many millions of years, and during this time sediments that eroded off highlands to the north and west were deposited in the marine environments to the east. Marine organisms and chemical precipitates were also deposited. The origins of the sediments, the depositional environment, and sea water chemistry largely controlled the nature of the deposits. Sediments deposited in high-energy coastal environments were primarily coarse textured and low in nutrient content – similar to modern barrier island sands. Sediments deposited in low-energy offshore and estuarine environments were finer textured and their nutrient content reflects the origin of the sediments – highly variable (Figure 4).

Sea level fell before lithification (rock formation) occurred, exposing largely unconsolidated sediments that developed into our modern



Figure 3. Mayapple (*Podophyllum peltatum*) and mottled trillium (*Trillium maculatum*)



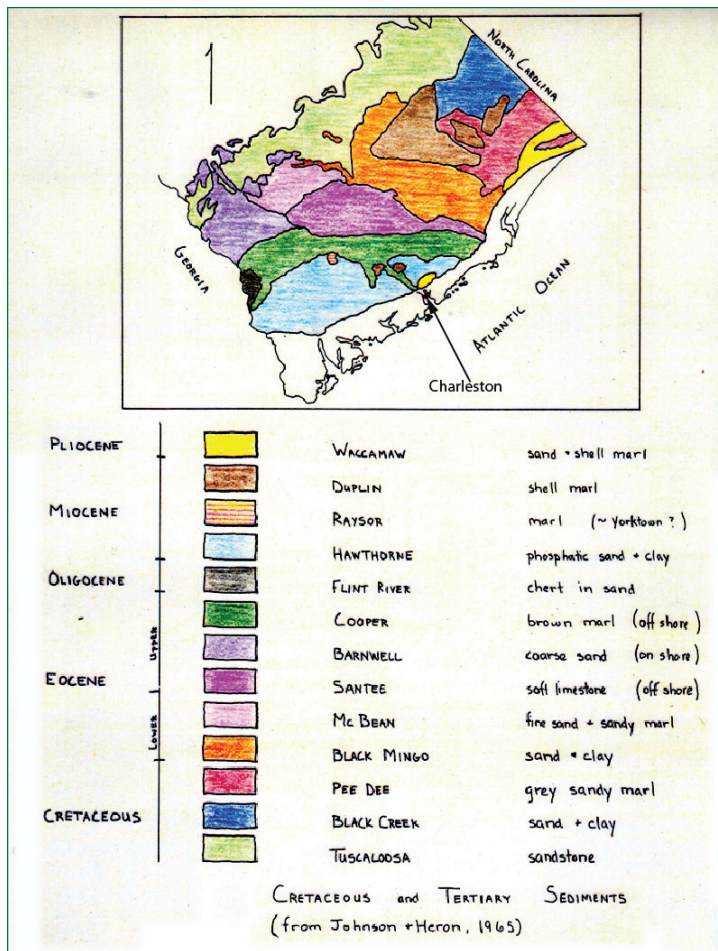


Figure 4. These Cretaceous and Tertiary sediments are largely overlain by Pleistocene terraces that were deposited as sea level dropped. In some cases, however, the underlying sediments affect the surface soils.

soils. Sea level dropped in stages; as climate cooled in pulses, sea level dropped, then stabilized for a time, then dropped again, leaving behind seven orphaned barrier island-estuarine terraces that overlay the older sediments. The modern Outer Coastal Plain (southeast of about Orangeburg) consists of this series of terraces – the leading edge representing the barrier islands of the time, and the terrace to the west representing the estuary of the time. More minor sea level fluctuations resulted in a re-working of sediments in river channels, resulting in a more complex geology along these drainages (Figure 5).

For the most part, the younger terraces completely control the modern soils, but sometimes those older, underlying sediments peek through. This is especially true along drainag-

es, where minor sea level fluctuations had a major impact. The Boeing site is on a narrow peninsula between two major drainages – the Ashley and Cooper Rivers.

This means that the older, underlying sediments are much closer to the surface in the area near the airport than in other parts of the Lowcountry.

The older formation near the airport is well known and described – the Hawthorne Phosphatic Sand and Clay Formation, deposited during the Miocene Epoch, mid-Tertiary Period, about 20-some million years ago (Figure 4). The formation extends down into Florida, and has been mined off and on for over 100 years, starting in the 1870's. The airport area was mined – we can still see some of the trenches. In fact, Charleston was once a major world-wide supplier of



Figure 6. A large nodule of precipitated calcium phosphate from the site



Figure 7. Remnants of historic phosphate mining.

phosphate fertilizer! More information on this fascinating part of our history can be found at <http://nationalregister.sc.gov/SurveyReports/hydrophosphatesindustryLowcountry2SM.pdf>.

The Hawthorne formation overlies the limey Cooper Marl, and the calcium carbonates in the marl interacted with the high phosphate content of the sea water to form calcium phosphates which precipitated into nodules. Phosphorus precipitates readily with a variety of minerals to form what are essentially rocks. Rocks! Almost unheard of in the Lowcountry. These were the mined materials. Apparently they were scooped right out of the mud in some of the early mining efforts! We don't know entirely why sea water had such a high phosphate content at the time, but it was partly because of the



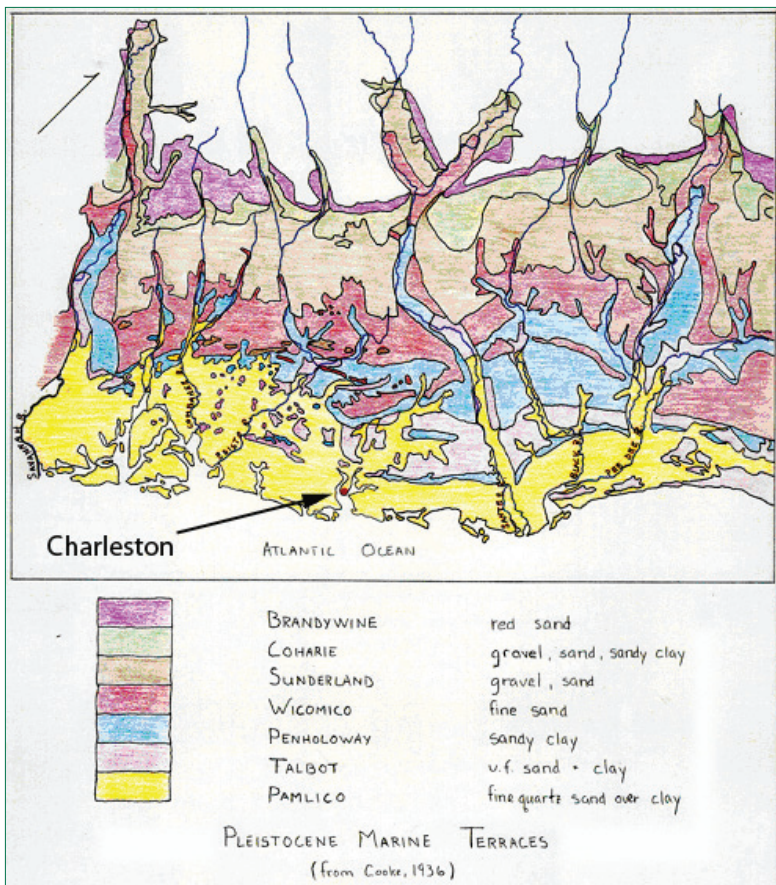


Figure 5. The area near the airport is on the most recently exposed terrace, the Pamlico, shown in yellow. Note the Hawthorne formation, in light blue, and the adjacent (and in some cases underlying) Cooper marl in dark green.



Figure 9. The bulldozed site

large amounts of organic sediments that washed in from the adjacent uplands.

Weathering of these older sediments has resulted in a clayey, high pH soil that is rich in calcium, phosphorous and magnesium – all important plant nutrients. In addition, the clayey soil texture ensures that nutrient cations (positively charged ions) are held in the soil, rather than being leached away as is common in

sandier soils. Clays are mostly negatively charged and thus tend to hold cations in place – including calcium and magnesium (and water, since it's polar). Phosphorous is usually in anionic (negatively charged) form, but the nodules are slow to dissolve and there's so much phosphorus in this formation that it's highly available. This type of soil is rare in the Lowcountry, and thus the adapted plant community is also rare. Most of the



Figure 8. Rescuing plants by boat.

species present are not globally rare, but they are rare in the Lowcountry.

Most of the plant community on the site was destroyed to clear for the manufacturing plant (Figure 9). However, the strips of preserved land on either side of the future Aviation Avenue remain extremely valuable remnants of the community and deserve protection and restoration. There is currently a lot of trash on the site, and a massive infestation of invasive species that are choking out the rare species. These include the native but pestilent poison ivy (*Toxicodendron radicans*) and the non-native invasive species Japanese honeysuckle (*Lonicera japonica*), Chinese privet (*Ligustrum sinense*) and popcorn tree (*Triadica sebifera*). Boeing received an internal conservation award for allowing the rescues, and they have expressed a great deal of interest in preserving and butterfly pea restoring these areas, and other areas on the site. They have started working with The Nature Conservancy, including former Lowcountry Chapter President, Colette DeGarday, on this process. I'd love to see a SCNPS partnership develop to help. We are all hopeful that at least some of this incredibly special plant community will be preserved. Regardless, and even though many plants were sadly destroyed, some of these plants will persist in public and private gardens throughout Charleston, due in large measure to the valiant efforts of volunteers from the SCNPS!

*All photos courtesy of the author.*



# Invasive Plants in Exotic Islands

Diane Coiner

Bahamas, exotic plants; it's what you expect, right? But, invasive exotics are a major problem for this enticing island country. Here some examples seen during an Earth Watch Expedition, "Coastal Ecology of the Bahamas", led by Kathleen Sullivan Sealey in January and March, 2010. This is part of a long-term project gathering baseline data on selected islands about water quality, fish and algae diversity in near-shore waters, and coastal land use-plants. I first participated in 2009 on Long Island. Currently, on the island of Exuma, the project has progressed to mitigation, including planting native plants that help protect the environment.

The verdant tropical vegetation here is predominantly exotic species. The lacy *Casuarina equisetifolia* tree, succulent appearing *Scaevola sericea*, and the weedy legume, *Leucaena leucocephala* are all problems (Fig. 1). The bright red bougainvilleas are planted everywhere in the tropics, but are not villains. *Casuarina* causes major damage, in Florida as well as the Bahamas. Where it grows, nothing grows under it, and it is the first thing to sprout up in a disturbed area. The really bad part of this is that the roots do not hold sand as well as many of the displaced native plants will, so where they grow along beaches, coastal

erosion becomes a problem. Case studies show that where *Casuarina* trees are removed and natives replanted, the protective dunes actually rebuild. Here you see a beach house about to fall in as sand washes away from the *Casuarina* roots surrounding the house (Fig. 2). The owner of this house says, "Those trees have been there since I was a kid"! Indeed they have, as the trees, also known as Australian pine, rapidly spread from Florida where they were planted by the railroad tycoon, Flagler and the Ringlings of circus fame.

Some other obvious problem plants include, fast growing *Scaevola sericea* from the Pacific, widely used by developers in landscaping (Fig. 3). The native *Scaevola plumieri* (Fig 4) is considered threatened. Both species, also known as Ink Berry, have the characteristic fan shaped flower shown. The invasive has noticeably larger leaves and white berries, while the more polite native has black berries.



Figure 1. Invasive exotics; *Casuarina*, *Scaevola*, *Leucaena*



Figure 2. Beach house with *Casuarina* and erosion



Figure 3. Invasive exotic, *Scaevola sericea*



Figure 4. Endangered native, *Scaevola plumieri*

(See *Exotic*, page 12)

# The challenge of plant identification!

Dr. Steven R. Hill

As we all know, or should, having the accurate name for a plant opens up a world of information about it – especially now in the age of the Internet! Plant identification is both an art and a science. It is not limited to ‘professionals’, and so anyone can become an experienced plant identifier. The greatest asset is experience. Certainly a willingness to learn is extremely valuable, and a fanaticism is even better. When I was a kid, I wanted to know the names of everything I saw. That is fanaticism! I still know a lot of animal names as well as plant names, but my experience for decades has been mostly with plants. An interested amateur, with experience, can also name about as many plants as they have seen or been taught, whether they know the technical characters of the plant or not. Those with some education [self-taught or not] should be able to use an identification key in a more technical and complete flora publication to be sure of their identification, even if they have never seen the plant previously.

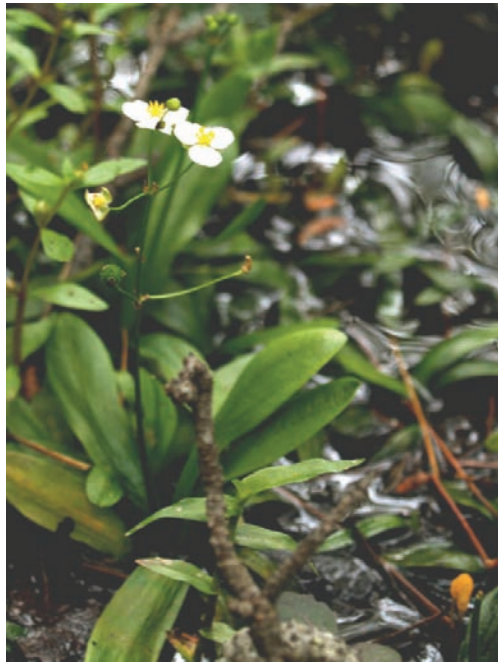
As a teenager and before, I started out with plant picture books. Most people do. There is nothing wrong with this at all. However, the more plants one learns and sees, the more it becomes obvious that there are no complete picture books for the general or cultivated flora. So, you

may or may not be correct in your identification using a picture book. I quickly learned the importance of leaf arrangement on the stem, stipules, compound vs. simple leaves, fruit types, and so on – features needed to identify most unknown plants. Moving into this field of botany in college was a pleasure, and greatly expanded my horizons and expertise.

I have lived in several states, including South Carolina. For over 30 years, in the 8 states where I have lived, it has been part of my job to identify plants, and I enjoy learning a new flora. The more places one travels, the more plants one learns. But that is not all. To really learn plants well, one must grow them, from seed if possible, to learn the different stages of the plant so that one can identify even seedlings and immature vegetative plants and not just those with flowers on them. Of course, having flowers makes it much easier, but I like a challenge. Anyone who gar-

dens learns to recognize which plants are keepers and which are weeds, even at a young stage. So I encourage people to grow plants to learn them. If you don't know what it is, let it grow until it can be recognized. If you have a very small amount of land, you can always replace the plants with others as you learn, to make room, or you can garden with someone else on their land.

Okay – so in October of 2007, Bill Stringer sent me an email and asked me if I would be willing to take over plant identifications for SCNPS online. He knew I had been curator of the Herbarium at Clemson some years back, and he was familiar with my botanical knowledge through SCNPS and elsewhere. I was happy to do so, especially when told that Harry Davis would post results on the web for me. It has been an interesting 3 years or so. Most people have been polite and have sent in great images for me to look at. I can usually identify plants from a good image. Sometimes I must ask the sender to send some more details, or even give him / her a good guess with hints on how to be sure



Bunched Arrowhead *Sagittaria fasciculata*.  
Photo courtesy of Kevin Sargent



Dwarf-flowered heartleaf *Hexastylis naniflora*.  
Photo courtesy of author.





*Trillium oostingii*. Photo courtesy of Bob Griffith

of what it is, usually when it comes into flower. When I can, I include Internet links with more information. One of my favorites was an exchange back in March of 2008 with a couple in the Aiken area that who sent me several nice images of good-sized and interesting-looking trees on their property. I just couldn't ID it. I had several species in mind, and sent the images around to botanist friends in SC, IL, NC and FL, and I also asked the senders for more information. One had been cut and had about 120 rings! The ideas came back, including *Kalmia*, *Symplocos*, and *Cyrilla*, and I considered them. For different reasons, all had their pros and cons. Finally, I asked Billy and Gina B. [who sent it in] to go to see Bob McCartney at Woodlanders, the well-known native plant nursery in Aiken. Bob was certain it was *Cyrilla*, and so it was. But these trees were huge – larger than any *Cyrilla* I had seen in SC. I remembered seeing the same species, *Cyrilla racemiflora*, on the island of Dominica in the West Indies, of all places, that was about 50 ft tall and with a trunk almost 3 ft wide, and so I had no problem deciding accepting the fact that these good-sized trees were the Ti-Ti, as it is called. From that I also concluded

that this nice wetland habitat was special and probably had not been disturbed for quite awhile. The whole ID process was very interesting.

And then there is the school teacher, Laura L., near Spartanburg who was making a nature trail for her school. The images came in, and two of them surprised me – both federally listed species – the bunched arrowhead [federally endangered], and the dwarf-flower

heartleaf [federally threatened]. The site turned out to be extra special with these and other rare plants, and it was exciting to build up a species list with Laura, and to have a new location for these rare plants.

Perhaps the most memorable images came in April of this year from Bob G. who had been hunting near the Wateree River Swamp and found a plant he had not seen before. It was a trillium that I had never seen. I have grown trilliums for years,



Swamp ti ti (*Cyrilla racemosa*) flowers. Photo courtesy of Ted Bodner, Southern Weed Science Society, Bugwood.org

## The Journal of the South Carolina Native Plant Society

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and have a wonderful book on them by Fred & Roberta Chase, and but this plant was totally new to me. I thought it might be a new species and started the ball rolling by contacting fellow southeastern botanists with the images. I soon found out that I was not up to date – that this trillium, *Trillium oostingii*, had been described as a new species only 2 years previously by Dr. Chick Gaddy. I was too late! But it shows that one must keep up with the literature because new species are still out there, and perhaps others will be found in SC!

Being on the Internet, I also receive images from such far-flung places as Australia, Pakistan, and elsewhere. I can sometimes identify these, because they are mostly horticultural plants, but the network of botanists, worldwide, is sometimes tapped for its expertise when I am stumped.

All in all, this has been fun, and I hope that SCNPS members and others will continue to send in nice images of plants for identification and that they will also consult the great Internet site put together as a joint effort by the Society where many of your questions will be answered!

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*Exotic*, from page 3

Finally, here is a native Red Mangrove (Fig 5), whose stilt roots form habitat for young fish and crabs while stabilizing the shore line. But, in the upper left of the picture, another villain is crowding in, cork-tree, *Thespesia populnea*, probably from the Pacific.

The hopeful part of this story of invasive exotic plants is that the natives are getting some help. Red mangroves and other coastal native species are being planted by an Earth Watch team from Alaska (Fig. 6) to stabilize this tidal area in George Town, Exuma. This mitigation work will continue along with data collection when further teams are scheduled in.

Another great part of the job after a mucky morning planting: fish and algae surveys in the wonderful blue Bahamian waters (Fig. 7).



Figure 5. Red mangrove (*Rhizophora mangle*) crowded by cork-tree, *Thespesia populnea*



Figure 6. Building revetment and planting native red mangrove.



Figure 7. Another great part of the job after a mucky morning planting: fish and algae surveys in the wonderful blue Bahamian waters.

## Name Those Native Plants

Can't tell us apart? Look a little closer. We're both late summer blooming leguminous plants along roadsides and forest edges. I'm the one on the left, and I am a very viney plant. My look-alike on the right is not as viney. Our flowers are large and similar in size. We both have bean-like pods, but mine (on the left again) are longer. We have different genus and species names, as well as different common names, but some folks assign the same common name to us both. Some folks describe our flowers as papilionaceous, which might give you a hint as to the common name we share. Sorry to be so mysterious, but a girl can't tell all her secrets!



Photo courtesy of Bill Stringer



Photo courtesy of Dan Tenaglia of [www.missouriplants.com](http://www.missouriplants.com)

The **common name** answer is embedded in the text somewhere in this newsletter.