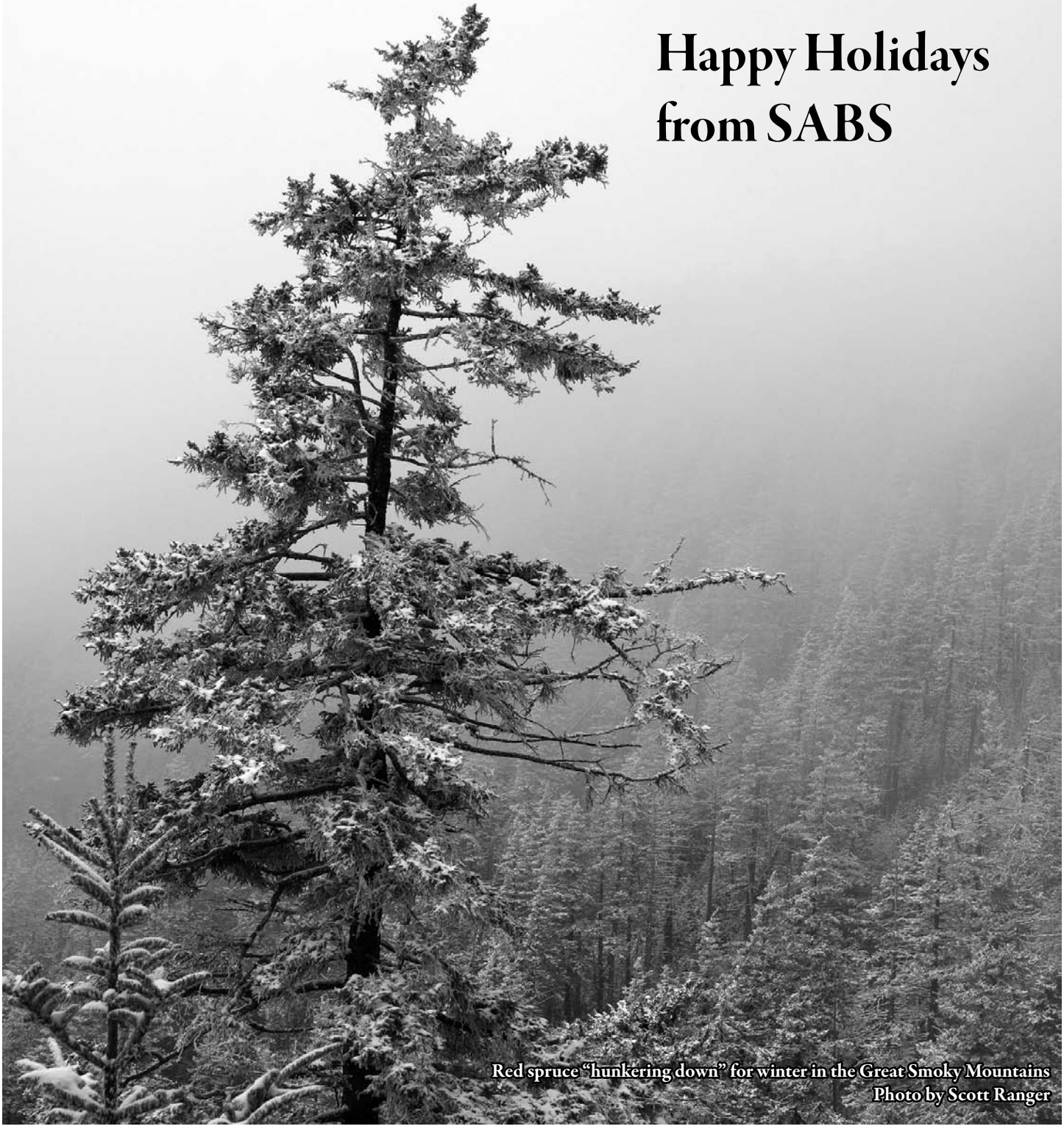
CHINQUAPIN

THE NEWSLETTER OF THE
SOUTHERN APPALACHIAN BOTANICAL SOCIETY

VOLUME 16, NO. 4
WINTER 2008



Happy Holidays from SABS

Red spruce "hunkering down" for winter in the Great Smoky Mountains
Photo by Scott Ranger

Field Notes

by Scott Ranger

Three-birds Orchid Update

With another season of observing this ephemeral orchid at Pickett's Mill Battlefield State Historic Site, I've come up with some observations and questions. The photograph below is illustrative for both. If anyone has any answers, I'd love to hear them.

Observations:

- Even the smallest stems (>2 mm diameter and >3 cm tall) have at least one well-developed flower bud.
- All the flowering and fruiting stems are subhorizontal on my many visits over the flowering period of two weeks.
- The topmost buds are not open or are just barely open showing only a small part of a perianth during the entire flowering period.
- Only the bottom flowers have well-developed and expanding pistils.
- The uppermost pistils are small and with the perianth still showing white at the end of the flowering period.
- Expanding pistils and withering perianth of lower flowers are common before peak flowering.
- Virtually every stem is a part of a small community of stems, almost none are solitary.
- Nearly every clump includes at least one Southern grapefern (*Sceptridium biternatum*) within inches of it.
- Few insects are observed in the area.
- I discern no scent from these flowers.

Questions:

1)Does this species self-pollinate?
The evidence here seems to indicate that yes, it does. What else could explain the development of fruits when the flowers have not yet opened? The only insects are pesky mosquitoes that pay now attention to these flowers. I was not at the site in twilight or nighttime to observe any insects at that time.

2)Do all the flowers even open?
A week after the photograph on the right was taken, the topmost buds were no larger and the perianth was withered. At least on this individual—and many others like it on this site—they never opened.

3)Do weather conditions control flowering?
I made a careful comparison of weather conditions in 2007 (very hot with 14 days > 90°F and 5 >100°F and dry with ~20% of normal rainfall) and 2008 (nearly normal). The same flowering pattern occurred both years. It seems weather, at least in these two years, didn't have an effect on flowering. We counted a total of 460 stems in 2008, up 61.5% from 2007. Weather probably had something to do with this.

4)Is synchronicity overemphasized? I think it is. Most of the literature implies that the flowers, sometime over a wide geographic range, all flower at the same time. I interpret this as over a matter of hours and not days. Clearly the flowers at this single site did not all open at the same time. Some don't seem to open at all! Many species flowers open over a period of days, a common phenology not unique to three birds.

5) What myco-heterotrophy is going on?
On my last day at the site I take Matt Richards of the Atlanta Botanical Garden with me. He plans to do some fungus trapping during the late fruiting period and perhaps will find some answers. Is there a connection with the grapefern?

Botanical Excursions

by George Ellison

Hunkering Down in Winter

It's mid-December 2008 as I write this. This past weekend my wife, Elizabeth, and I spent most of our time in our cabin on the North Carolina side of the Smokies, feeding wood into the two woodstoves in our living and kitchen areas. Out the back windows, we could see birds foraging around the feeders. Through the front windows, across the little creek that flows through our property, rhododendrons drooped their leaves like forlorn sheep, indicating beyond all doubt that the first really cold snap of the winter was upon us.

Animals make it through the cold by generating warmth from food, movement, shelter, or contrived means like fire. Plants, on the other hand, have devised a series of ingenious devices that allow them to survive in potentially lethal conditions.

All plants in upland or northern environments face the double-edged dilemma of low temperature stress and lack of moisture in winter. Most opt to lay low: annuals survive as over-wintering seeds; biennials produce low-growing, first-year plants protected by leaf litter or a blanket of snow; herbaceous perennials die back completely and over-winter as dormant corms or regenerative root stock; and broadleaved deciduous trees, shrubs, and various vines shed their leaves and assume other protective measures. Come spring, these plants really have to hustle to do their thing and produce seed or fruit during the growing season.

Table Mountain Pine

Evergreens have "chosen" the other fork in the evolutionary path. They tough winter out with their foliage intact so as to obtain a head start when the growing season arrives. For this group of plants, photosynthesis can continue longer in the fall and begin earlier in the coming year; indeed, keeping their leaves (or needles) actually helps these plants survive since they can use them in photosynthesis on mild winter days. Come spring, energy that would otherwise be channeled into producing leaves is saved for direct reproductive efforts.

Additional strategies allow evergreens to weather the drying winds and freezing temperatures of winter. Conifers have needlelike leaves that expose less surface to cold drying winds than broader leaves. Their needles, stems, and roots are filled with "botanical antifreeze" in the form of resinous chemicals. Conical shapes minimize buildups of snow or ice.

Other evergreens have developed thick leaves with waxy coats to cut down on evaporation. These tend to be shrubby or ground hugging. In order to avoid having their leaf cells ruptured by frost, water is channeled to spaces between the cells where expansion does less damage. And finally, the sugar content of the cells is increased to lower their freezing points.

Individual evergreen species often have their own distinctive over-wintering devices. Everyone has observed how rhododendron leaves curl and droop in extreme cold. Drooping (a dormant posture also assumed during periods of drought) lessens exposure to wind, while curling temporarily shields and closes off air-circulation pores (stomata) on the undersides of the leaves.

In *Life in the Cold: An Introduction to Winter Ecology* (Hanover NH: University Press of New England, 1987), Peter J. Marchand provides interesting information on this topic. I was especially interested in the tables Marchand presents that provide the freezing ("killing temperature") for various tree species. He makes the point that most species have adapted to the cold by adjusting their freezing tolerance so that it closely matches the minimum temperature at their northern range limit.

For instance, live oak, a southern tree of the Gulf Coast and lower Atlantic coastal plain will tolerate temperatures down to 15 or so degrees Fahrenheit. Eastern redbud, a tree that ranges northward from the southern states to the Great Lakes, dies when subjected to temperatures approaching minus 31 degrees.

Other deciduous trees that range into the higher elevations here in the Smokies like northern red oak and yellow birch withstand temperatures in the minus 35-49 degree range. Red spruce and Fraser fir, trees that grow in our highest elevations above 6,000 feet, could make it in temperatures below minus 80 degrees.

continues on page 8

Taxonomic Advisory!

by Alan Weakley

Small's small species, or there and back again.

As mentioned in earlier columns, John Kunkel Small was a prolific (some would say profligate!) namer of new species in the Southeastern United States flora, from the 1890s to the 1930s. An index of his taxonomic activity is The International Plant Names Index (2008): 5707 records (though there are duplicates and this number includes species elsewhere, genera, etc.). His narrow species concept generated much criticism, and following his three manuals of the Southeastern flora (1903, 1913, 1933), many of the taxa he named were lumped or ignored. To a degree, Small did himself no favors in making the case for his species, since many were named in his Floras, with no possibility for real discussion or detailed statements of diagnostic characters. Thus the later author faced with evaluating whether or not to follow Small in a given taxonomic decision had the choice of

1) digging into the taxonomic situation in some detail,
2) going out on the (possibly weak) limb with Small, or
3) regarding the case for the split as "not made."

Not surprisingly, choice 3 often seemed the most prudent and feasible one.

The re-lumping of many of Small's species is reflected in such works as Radford, Ahles, & Bell's 1968 *Manual of the Vascular Flora of the Carolinas*, which came to be used very widely across the Southeast and was thus taxonomically very influential. State and regional floras have always tended to act as the primary mediators of taxonomic opinion in an area, though that role is perhaps slightly weaker now, with the advent of extensive online resources, such as the USDA Plants (http://plants.usda.gov/) and NatureServe Explorer (http://www.natureserve.org/explorer/). Still, for the great majority of people in an area who are identifying plants, a single state or regional flora will serve as the dominant standard that they follow, even if that standard is increasingly out-of-date. Most users of floras do not have the opportunity to consult the ongoing stream of hundreds of papers published in dozens of journals that constitute the most recent and (usually) most authoritative taxonomic opinions. Thus a decision to recognize (or not) a species in a flora often determines for decades whether it is included in species lists for parks or natural areas, how herbarium specimens are identified and labeled, whether it is treated as a rare species and a "conservation target" and assigned conservation ranks by NatureServe, whether federal and state conservation and land-managing agencies will conduct surveys for it and manage lands for its conservation, and affects data gathered for diversity and community classification analyses.

Put simply, taxonomic usage now has much more than merely scientific application and implications; it affects on-the-ground decisions about what tracts of land will be converted to intensive human uses and which established as conservation areas. Fortunately the long, slow process of more carefully re-evaluating Small's small species is proceeding, with the application of a variety of systematic tools, traditional and modern, and a great many (though certainly not all) have proven worthy of taxonomic recognition. As seen in the examples below, many of these decisions have important implications for our conservation and for our understanding of the evolution and biogeography of the eastern North American flora.

Solidago pulchra (Beautiful Goldenrod; Asteraceae)

In his 1933 Manual, Small named *Solidago pulchra*, a species endemic to wet pine savannas of eastern North Carolina. The species was collected very few times in the next three decades, and Radford, Ahles, & Bell (1968) and Godfrey & Wooten (1981) synonymized it under *S. stricta*. Cronquist's Asteraceae treatment for the now defunct *Vascular Flora of the Southeastern United States* (1980, published almost simultaneously with Godfrey & Wooten's influential Wetland Flora) re-recognized *S. pulchra* and provided detailed key characters and descriptions to distinguish it, *S. stricta*, and *S. gracillima*.

In the 1980s, Natural Heritage Program botanists revisited the handful of sites documented by herbarium collections and found that the species was easily distinguishable from *S. stricta* and *S. gracillima* by many morphological characters, only slightly overlapped in flowering phenology, and often co-occurred with *S. stricta*, all information that confirmed its distinctiveness. Natural Heritage Program field work and Carolina Vegetation Survey vegetation plots revealed that *S. pulchra* was a locally common species in remaining wet pine savannas of southeastern North Carolina, such as the Green Swamp (Brunswick County), Holly Shelter Game Land (Pender County), Camp Lejeune Marine Corps Base (Onslow County), and Croatan National Forest (Carteret County), as well as a rarity in the Sandhills region in seepage bogs and sandhill/pocosin ecotones. The presence of many and large populations in protected and fire-managed lands makes *S. pulchra*'s future relatively secure, despite its status as a very narrowly distributed endemic, to the Cape Fear Arch region of North Carolina and adjacent South Carolina. Along with more famous species, notably *Dionaea muscipula* (Venus's flytrap, meadow clams; Droseraceae), the re-recognition of *Solidago pulchra* is reminder of the biogeo-


Photo by Brenda Wichmann

graphic significance of the Cape Fear Arch region as a major refugium of Coastal Plain taxa through past climate changes (see LeBlond 2001 for additional information).

Gaylussacia orocola (Blue Ridge Huckleberry; Ericaceae)

Another of the many novelties in Small's 1933 Manual was *Lasiococcus orocola*, its distribution and habitat given as "swamps, Blue Ridge, N.C." Camp (1935) recognized it, treating the genus *Lasiococcus* within a broader *Gaylussacia*, and Sleumer (1967) in a worldwide monograph of the genus, also regarded *G. orocola* as a "good species." Radford, Ahles, & Bell (1968) lumped it into *G. dumosa*, without comment, but their description of *G. dumosa* (including *G. orocola*) failed to accommodate many features of *G. orocola*, including its bog habitat and its greater stature (to 11 dm). Sorrie & Weakley (2007) recently re-examined the taxonomy of the *G. dumosa* complex (*Lasiococcus*, in the sense of Small), and concluded that Small, Camp, and Sleumer were right to consider *G. orocola* a distinct evolutionary lineage warranting specific recognition. When acknowledged as a taxon, *G. orocola* becomes one of the rarest and most imperiled of southeastern species, with fewer than a half dozen extant populations, and those in mountain bog sites suffering from hydrologic alteration and encroaching development. Biogeographically, *G. orocola* is another "southern Southern Appalachian bog" montane sibling of Coastal Plain species (*G. bigeloviana* and *G. dumosa*), similar to *Sarracenia jonesii* (and *S. rubra*), *S. purpurea* var. *montana* (and *S. purpurea* var. *venosa*).

Narthecium montanum (Mountain Yellow Asphodel; Nartheciaceae)

The small genus *Narthecium* has a fragmented, relictual distribution, with species scattered in the northern hemisphere. Except for the type species of the genus, *Narthecium ossifragum*, most of the species are narrow endemics which differ from one another morphologically only subtly. Small (1924) named a new species in *Narthecium* (which he treated in the genus *Abama*) for a population discovered in the mountains of North Carolina, disjunct from the Coastal Plain distribution of *N. americanum*. Although later works on the genus, such as Schumacher (1947) and Fernald (1950) (by implication from the distribution given for *N. americanum*), consistently recognized *N. montanum* as distinct from *N. americanum*, the two were lumped without comment by Radford, Ahles, & Bell (1968), and this opinion has been the generally prevailing one in the decades since, ratified most recently by Utech in FNA (2002). Bruce Sorrie and I recently studied the few existing specimens of *N. montanum*, and compared the morphological distinctions between it and *N. americanum* with those between other *Narthecium* species in Eurasia and western North America, and we concur with the opinion of Schumacher (1947), who probably had the best worldwide knowledge of the genus, that *N. montanum* should be recognized (see Weakley 2008 for distinguishing features). Tragically, taxonomic (re-)recognition comes too late for this narrow endemic of Southern Appalachian bogs; following the destruction of the East Flat Rock Bog (Henderson County, N.C., and also a former site of *G. orocola*), its only known site of occurrence, the species is apparently extinct.

References:

Camp, W.H. 1935. Studies in the Ericales. I. The genus *Gaylussacia* in North America north of Mexico. Bull. Torrey Bot. Club 62: 129-132.

Cronquist, A. 1980. Asteraceae, Volume I, Vascular flora of the Southeastern United States. University of North Carolina Press, Chapel Hill, N.C.

LeBlond, R.J. 2001. Endemic plants of the Cape Fear Arch region. Castanea 66: 83-97.

Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the vascular flora of the Carolinas. University of North Carolina Press, Chapel Hill, N.C.

Schumacher, A. 1947. Die Moorlilien (*Narthecium*)-Arten Europas. Archiv für Hydrobiologie 41:112-195.

Semple, J.C., and R.E. Cook. 2006. Pp. 107-166 in: Flora of North America Editorial Committee. Flora of North America north of Mexico. Volume 20, Magnoliophyta: Asteridae, part 6: Asteraceae, part 2. Oxford Univ. Press, New York, NY.

Sleumer, H. 1967. Die Gattung *Gaylussacia* H.B.K. Botanische Jahrbücher Syst. 86: 309-384.

Small, J.K. 1903. Flora of the southeastern United States, being descriptions of the seed-plants, ferns and fern-allies growing naturally in North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, and in Oklahoma and Texas east of the one hundredth meridian. Published by the author, New York, NY.

———. 1913. Flora of the southeastern United States, being descriptions of the seed-plants, ferns and fern-allies growing naturally in North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, and in Oklahoma and Texas east of the one hundredth meridian, second edition. Published by the author, New York, NY. 1394 pp.

———. 1924. A new bog-asphodel from the mountains. Torreya 24: 86-87.

———. 1933. Manual of the southeastern flora, being descriptions of the seed plants growing naturally in Florida, Alabama, Mississippi, eastern Louisiana, Tennessee, North Carolina, South Carolina, and Georgia. University of North Carolina Press, Chapel Hill, N.C.

Sorrie, B.A., and A.S. Weakley. 2007. Notes on the *Gaylussacia dumosa* complex (Ericaceae). J. Bot. Res. Inst. Texas 1: 333-344.

Sorrie, B.A., A.S. Weakley, and G.C. Tucker. [in press, 2009]. *Gaylussacia*. In Flora of North America Editorial Committee. Flora of North America north of Mexico, volume 8. Oxford University Press, New York.

The International Plant Names Index. 2008. Published on the Internet http://www.ipni.org [accessed 16 December 2008]

Utech, F.H.. 2002. *Narthecium*. Pp. 66-67 in: Flora of North America Editorial Committee. Flora of North America north of Mexico. Volume 26, Magnoliophyta: Liliidae: Liliales and Orchidales. Oxford Univ. Press, New York, NY.

Weakley, A.S. 2008. Flora of the Carolinas, Virginia, Georgia, northern Florida, and surrounding areas, working draft of 22 July 2008. University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, NC. [and also available online at http://www.herbarium.unc.edu/flora.htm]

Rare Plants

by Linda Chafin

Wingstems & Crownbeards: Rare *Verbesinas* of the Eastern U.S.

Wingstem and Crownbeard – maybe it's because I'm writing this just before Christmas, but that sounds like the names of a pair of Grimm fairy tale characters or, maybe, a couple of Herbology Professors at Hogwarts School. Picturing tall and rangy for one, short, stout, and hairy for the other...which also works as a sort of general description of the *Verbesinas*.

Sixteen species of *Verbesina* occur in North America, with eight of these occurring naturally in the eastern U.S. and a ninth, *V. encelioides*, invading and naturalizing from the west. All but three of our eastern *Verbesina* species have the eponymous winged stems — leaf tissue is decurrent and conspicuous on the stems between the nodes — and all deserve the common name "crownbeard," which — we think — refers to the fruiting heads, which bristle with flattened, awned achenes radiating at right angles to the involucre and with chaffy pales that persist on the receptacle. Anyone with better insight into the origin of that common name, please call in!

Three of our native eastern *Verbesinas* are common and distributed widely throughout the eastern United States. These are coarse, often weedy, plants that are conspicuous in the Fall in floodplains, roadsides, pastures, and other disturbed areas: *V. virginica*, *V. alternifolia*, and *V. occidentalis*.

Five eastern *Verbesinas* are rare, disjunct, or endemic. *V. helianthoides* is widely distributed and common in the Midwest, but is disjunct to western North Carolina and to central Georgia where it occurs in dry woodlands and prairies over mafic rocks. *V. aristata* is endemic to the pine woodlands of the lower south (Alabama, southwest Georgia, and northern Florida). Narrowly endemic but locally abundant, *V. chapmanii* occurs in mesic flatwoods in six counties in the central portion of the Florida Panhandle, while *V. heterophylla*, another narrow endemic, occurs sparingly in sandhills in eight counties in northeast Florida. *V. walteri* is widely distributed in the south, but is rare and disjunct in most states where it occurs.

The last of this group of rarities, also known as Carolina crownbeard and Walter's crownbeard, is distinctive in the genus for having white flowers in a globose, discoid head – the only other white-flowered member of this genus, *V. virginica*, has radiate heads. Small (1933) classified *V. walteri* as *Ridan paniculata* and placed only one other species in that genus, the modern day *V. alternifolia*, based on their globose receptacles. Small placed the other modern day *Verbesinas* in the genus *Phaeuthusa*, all of which have flat, convex, or slightly conic — but not globose — receptacles. Small recognized only one *Verbesina*, the species we now know as *Eclipta alba*.

Carolina crownbeard's distribution is also distinctive: it is rare in Oklahoma, Arkansas, Alabama, Georgia, North Carolina, and South Carolina, and relatively common in Louisiana and Mississippi; it's also been reported from Texas. In all locations, it occurs in rich, moist hardwood forests, often in calcareous or mafic-derived soils. The best time to look for it is late August and September, when its inflorescences — composed of numerous, round, white heads atop 12 foot stems — are most conspicuous.

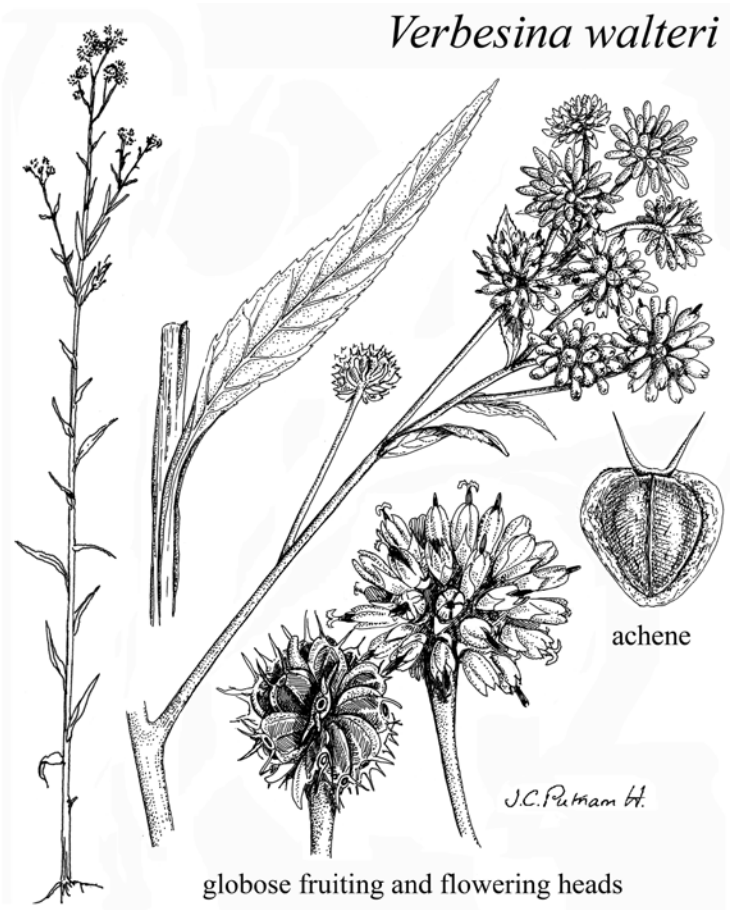
FNA. 2006. Flora of North America. Vol. 21, Magnoliophyta: Asteridae, Part 8: Asteraceae, Part 3. Oxford University Press, New York.

NatureServe. 2008. NatureServe Explorer. NatureServe, Arlington, Virginia. http://www.natureserve.org/explorer

Small, J.K. 1933. Manual of the southeastern flora. 1972 Reprint Edition. Hafner Publishing Company, New York.

Weakley, A.S. 2008. Flora of the Carolinas, Virginia, Georgia, northern Florida, and surrounding areas. University of North Carolina, Chapel Hill. http://www.herbarium.unc.edu/flora.htm.

Photograph by John Pelton, used with permission.

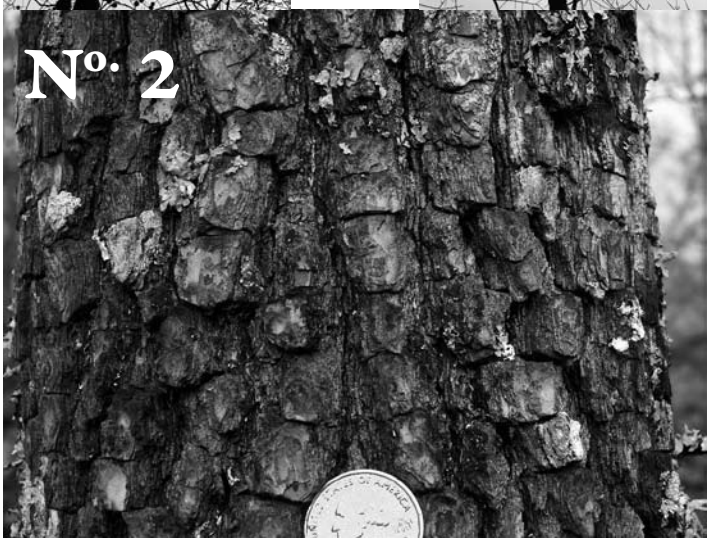


Mystery Plants

by Dan Pittillo

Continuing with our tree pair contest, the next puzzler confuses many folks in winter, for the bark of the two is so similar for older trees. However, more than one character is often sought for recognition of species. In this case, the branching pattern will be helpful. No. 1 is confined to southern New England southward to Florida and westward to Texas, then northward to east Kansas and Indiana. No. 2 is distributed in about the same region, north to Maine and hops over to Mexico as well. See if, with help of these clues, you can identify this pair with the quarter for scale. (Pittillo photos)

Again this year, a book will be offered for the winner of the Mystery Plant contest for 2008. *continues on back page*



Smoky Mtn. English

by Dan Pittillo

This last installment will be a tough nut to crack! Dan had these in two groups, but here they are all placed together. Match the numbered Smoky Mountain name with the lettered scientific name. There are more Smoky Mountain names than scientific names, so some of the latter will have to be used more than once. No hints! And please, don't look up your answers in Dan's source for this fun contest, Montgomery and Hall's *Dictionary of Smoky Mountain English*. Try it on your own!

Send your answers to Dan at dpittillo@gmail.com by February 15, 2008.

For those who don't have the fortitude to compete—try it anyway!—answers will be in *Chinquapin* 17(1) in March.

1. thimbleberry
2. timbleweed
3. tiger lily
4. tinkerbell
5. tiswood
6. tobacco weed
7. toothwort
8. trout lily
9. tulip tree
10. turkey mustard
11. Turk's cap lily
12. turtlehead
13. umbrella leaf
14. umbrella plant
15. umbrella tree
16. velvet plant
17. wahoo
18. wake robin
19. water oak
20. whipporwill shoes
21. white-heads
22. white laurel
23. white sanicle
24. white turtlehead
25. whiteweed
26. wild apricot
27. wild cherry
28. wild honeysuckle
29. wild indigo
30. wintergreen
31. witch hobble
32. witch broom
33. wood shamrock
34. worm grass
35. yellow daisy
36. yellow dock
37. yellow poplar
38. yellow root
39. yellowwood

A. *Gnaphalium obtusifolium*
B. *Erythronium umbilicatum*
C. *Liriodendron tulipifera*
D. *Rosa odoratus*
E. *Chelone glabra*
F. *Lilium superbum*
G. *Anemone virginiana*
H. *Magnolia tripetala*
I. *Verbascum thapsus*
J. *Aquilegia canadensis*
K. *Diphylleia cymosa*
L. *Euonymus americanus*
M. *Lilium tigrinum*
N. *Cypripedium acaule*
O. *Trillium erectum*
P. *Quercus nigra*
Q. *Halesia tetraptera*
R. *Dentaria diphylla*
S. *Actaea pachypoda*
T. *Podophyllum peltatum*
U. *Prunus serotina*
V. *Passiflora incarnata*
W. *Baptisia tinctoria*
X. *Oxalis montana*
Y. *Viburnum lantanoides*
Z. *Rhododendron maximum*
AA. *Rudbeckia hirta*
AB. *Cladrastis kentukea*
AC. *Eupatorium rugosum*
AD. *Rhododendron calendulaceum, R. periclimenoides*
AE. *Chrysanthemum leucanthemum*
AF. *Rumex crispus*
AG. *Xanthorhiza simplicissima*
AH. *Chelone glabra*
AI. *Spigelia marilandica*
AJ. *Gaultheria procumbens*
AK. caused by fungal infection

Hunkering, continued from page 3

Some tree species have adapted especially for the regions in which they find themselves. For instance, sycamores in Mississippi will die in the event of temperatures below minus 4 degrees, while sycamores in Minnesota will tolerate minus 40 degrees. White pine shows a similar range of adaptability.

The lesson in this for Elizabeth and I has been to prepare for the harshest winter weather situation we might reasonably expect to encounter here in the Smokies by cutting our wood early, keeping it good and dry, and hunkering down as quietly as possible by the woodstove while it burns.

www.georgeellison.com
Drawing by Elizabeth Ellison
www.elizabethellisonwatercolors.com

Mystery Plants, continued from page 7

In Chinquapin 16(3) the pair were both dogwoods, which most folks recognized. N°. 1 was *Cornus florida* and N°. 2 was *C. alternifolia*, which some overlooked the leaf arrangement and thought *C. amomum*.

Susan (with Allen) Sweetster continues with both correct and leads for the year so far. Richard Ware got both and Tracy Roof & Greg Schmidt scored one correctly.

Letters to the Editor

Joy van Dervort-Sneed's "Earl Core Student Award Report" on her findings of the associated species for *Asarum contracta* and *A. rhombiformis* piqued my curiosity, not so much with the associated species as with the taxonomy. I wonder, is the implication that the author is suggesting a recombination of *Asarum* and *Hexastylis*? Further, I am also curious about the relationship of *contracta* vs. *rhombiformis* and *arifolia*. In observing what I discern to be *rhombiformis* in the Biltmore Estate along Dinkle Creek, there seems to be variance in the degree of the contraction of the calyx tube depending upon the time observed and vigor of the plants. Some flowers calyx forms tended toward the shape of *arifolia* rather than *rhmbiformis*. I anxiously await the rest of the story for these curious evergreen (and deciduous) winter herbs.

Sincerely, J. Dan Pittillo

I'm promoting a self-published picture book, *A Trailside Guide to Mosses and Liverworts of the Cherokee National Forest* By Paul G. Davison with contributions from Mark J. Pistrang. You can preview the 1st 15 pages at http://www.blurb.com/bookstore/detail/422248

A non-technical guide to 52 common genera of mosses and liverworts found in the southeastern U.S. Seventy-five species are illustrated in 210 full color photographs. Text includes description of habitat, size, and distinguishing characters. The range in magnification in the photographs aims to make this a practical field guide that does not require the observation of microscopic characters. No royalties are made from sales. Sincerely, Paul Davidson

Southern Appalachian Botanical Society
Scott Ranger, Newsletter Editor
1963 Ferry Dr
Marietta, GA 30066-6250

Return Service Requested

presort Std
U.S. Postage
PAID
Permit No. 7
Marietta, GA