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Earl Core Student Award Report

Influence of tree age, size, location, and competition on compression wood formation in *Pinus strobus* L. following severe ice storm damage in southwestern Virginia

By Benjamin A. Hook

On February 10 – 11, 1994, a severe ice storm struck the Appalachian Mountains, causing widespread damage to forests (Lafon, Graybeal et al. 1999; Mou and Warrillow 2000). Damage to individual trees varied depending on their geographical position and pre-storm condition (Millward and Kraft 2004; Rhoades and Stipes 2007). Ice deposition injured trees both directly through branch breakage and indirectly by bending them down from an upright canopy position. Bent gymnosperm stems formed compression wood, a type of reaction wood (a gravitropic growth response to displacement by an external force), on the underside of the stem to return to an upright position. While a natural component of many living trees, it is denser than normal wood and causes extreme warping and cracking when dried, and is considered a defect in wood products (Timell 1986). A project was partially funded by the Sustained Engineered Materials Institute (SEMI) at Virginia Tech to (1) evaluate the influence of tree age, size, location, and competition on the percentage of compression wood in eastern white pine (*Pinus strobus* L.) following severe ice storm damage, and (2) examine cellular features of *P. strobus* compression wood and normal wood tracheids before and after the ice storm across a tree diameter gradient.

Additional financial assistance from the Southern Appalachian Botanical Society in 2009 allowed travel to and from the study plot for collection of *P. strobus* samples and other field data. The funds also allowed the purchase of an external hard drive for storage of high-resolution (2400 pixels/in) scans of *P. strobus* cross-sections, along with glass slides and cover slips for microscopic sample preparation.

The study area was located in the Ridge and Valley physiographic province of southwestern Virginia, and spanned a southwest aspect, an intermittent stream, and a northeast aspect of Price's Mountain. *Pinus strobus* trees within the plot were destructively sampled and disk samples taken. Cross-sections were necessary for analysis of compression wood surface area; tree cores would not have shown the full picture. After sanding with increasingly finer grit sandpaper to reveal the wood cells, I scanned the samples and used image analysis software to quantify the percentage of compression wood within individual growth rings. This allowed comparison of annual trends in compression wood formation across a gradient of tree diameters and locations. In addition, microscopic images of wood cells were collected using a transmitted light microscope in combination with a digital camera for analysis of tracheid structure.

Fewer *P. strobus* trees were present on the southwest aspect than the northeast, their germination was likely hindered by the warmer and drier conditions on the exposed aspect. Only two trees on the southwest aspect were old enough to have experienced the 1994 ice storm, and formed only minor compression wood in that year. By contrast, a large cohort germinated on the protected northeast aspect in the late 1960s. Age was location-independent within this stand, but tree diameter was dependant on slope position; large stems were located in valleys (abundant water and nutrient availability), and small-diameter stems on slopes and ridgetops. There was a significant negative correlation between tree diameter and compression wood formation; smaller-diameter stems were more likely to bend rather than break under the weight of the ice. Large-diameter stems showed a different response; a reduction in ring width in 1994, suggesting that the large trees experienced canopy damage. Many large trees had a forked branching pattern in the upper canopy. Cross-dating revealed that the forking pattern originated during the 1993/1994 dormant season. Compression wood formed on the downhill side of stems supporting the idea that, on slopes, you should always core a tree perpendicular to the slope rather than on the downhill or uphill side to avoid compression wood or opposite wood.

This high-resolution digital scan of a 9 cm diameter *Pinus strobus* cross-section showing severe compression wood formation after the February 1994 ice storm until time of felling. Compression wood forms on the downhill side of a tree, while opposite wood forms on the uphill side.

Microscopic examination of pre- and post-storm xylem revealed that in small-diameter stems, the ice storm induced cellular features associated with compression wood; highly lignified circular tracheids with thick secondary cell walls and intercellular spaces (Timell 1986). Large-diameter trees formed normal wood tracheids after the storm; box-shaped or hexagonal tracheids with thinner cell walls and no intercellular spaces. Trees with severe compression wood created many more cells on the compression wood side than opposite wood cells; in extreme cases, the opposite wood

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From the Editor's Desk

This extra large issue is the single issue for Volume 18 of *Chinquapin* is my last as splitting time between Georgia and Alaska makes meeting my duties difficult.

I want to personally thank my intrepid team of wonderful writers that has made this a joy:

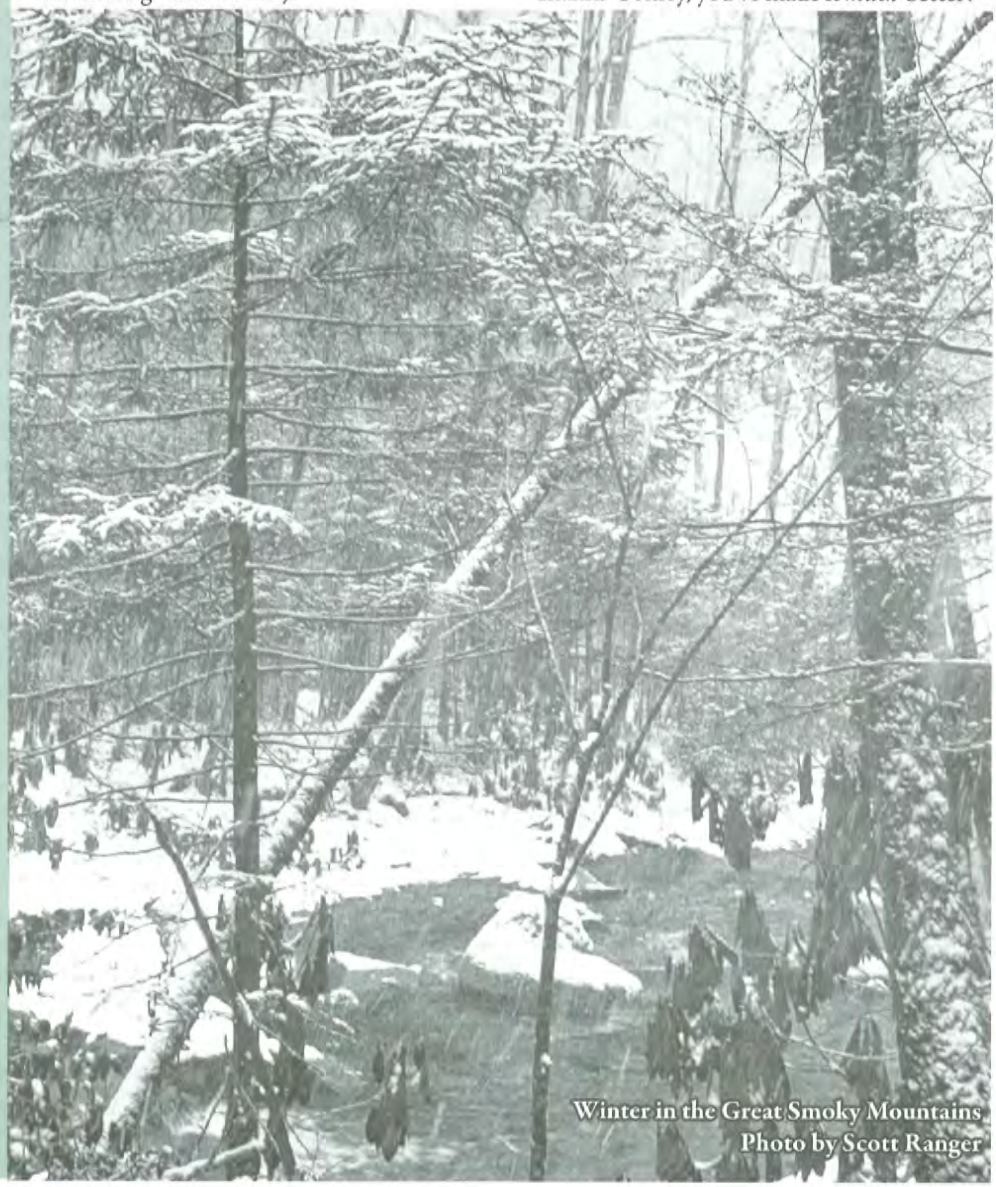
Alan Weakley amazes me every time I read his work and use his geographically expansive—and seemingly continually expanding—flora. His insights are keen and provocative yet very readable and engaging.

Linda Chafin, whom I've known for almost three decades, is one of the finest field botanists I know and this shows well in all her wonderful treatments of rare plants (plus she always gets them to me nearly press ready in an InDesign document!).

George Ellison has a grace to his writing making it a delight to read and the breadth of his knowledge of the natural history and natural historians of the southern Appalachian mountains surely is without peer and is always in my mind while writing my book.

Dan Pittillo is, well, he's the "man of the mountains". His intimate study of the southern Appalachians—living in the midst of them—remained on these pages after his retirement as editor with the fun "mystery plants". He cast a long shadow on my role with *Chinquapin* and I truly respect and thank him for the giant shoulders I rode upon four years ago.

Conley McMullen, whom I've dubbed "Eagle Eye" has been my best proofreader and colleague in the production of *Chinquapin*. Thanks Conley, you've made it *much* better!



Winter in the Great Smoky Mountains
Photo by Scott Ranger

Botanical Excursions

by George Ellison

Donald Culross Peattie: The Road of a Naturalist in the Mountains of Western North Carolina

Naturalist Donald Culross Peattie (1898-1964) was born in Chicago, Illinois. His father, Robert Burns Peattie, was a journalist in Chicago, Omaha and New York for fifty years. His mother, Elia Wilkinson Peattie—a writer and literary critic for the *Chicago Tribune*—was a major influence on her son's life and work.

About 1899, Elia first journeyed to Tryon NC seeking a mild winter climate for her son Donald Culross, whose health was delicate in his boyhood. In spite of frequent and prolonged visits thereafter...the Peattie family did not settle in Tryon permanently until after World War I.

In his autobiography *The Road of a Naturalist* (1941) Peattie recalled his first extended visit to the North Carolina mountains in 1906 as a time when he "saw the world of people fall away, grow small, grow hazy blue, forgotten. In seven months upon that isolated summit of the Appalachians I began to discover a world older and greater. It is the world now of my established habitation, my working days and holidays, and it lies open to all men, in valleys as on mountains, by any road you choose to enter." Peattie isn't implying that the Tryon area became his permanent "habitation"—but he does credit early experiences there as being instrumental in his subsequent decision to devote himself to the natural world—the "road" that "lies open to all men."

Sketch of Peattie by Rodney Ramsey, done for George Ellison's article

In 1918, Peattie moved with his parents to New York City. An encounter at the Bronx Botanical Garden with botanist John Hendley Barnhart quickened his interest in nature; so much so, that he entered Harvard, where he majored in the natural sciences and graduated with honors in 1922.

Carol Ann McCormick, assistant herbarium curator at the University of North Carolina at Chapel Hill, has examined the collection dates and site locations for the 140 species Peattie deposited at the UNC herbarium. These indicate that he visited with his parents in Tryon in 1921 from April through September, and during April in 1922, 1923, and 1926. McCormick noted that, "There is a hiatus in his North Carolina specimens, coinciding with his living abroad. His collecting and visits to North Carolina resumed by 1936 (October and December) and 1937 (April and May)." It is possible but not likely that Peattie visited his parents without doing some plant collecting. From 1927 to 1937, he published a checklist of the "Trillium Species in North and South Carolina" and seven checklists of the "Flora of the Tryon Region" in the *Journal of the Elisha Mitchell Scientific Society* that totaled 269 printed pages.

In 1923, Peattie married the novelist Louise Redfield and, shortly thereafter, initiated his career as a freelance writer. Like many American writers of that era, the Peatties moved to Europe in order to write fiction, eventually settling in the south of France. Little of what either of them wrote during that period was of consequence. By the time their money ran out in 1933, they were ready to return to the United States.

The most significant writing Peattie produced in France was a little booklet titled *A Natural History of Pearson's Falls and Some of Its Human Associations,* which helped his mother's garden club protect a natural area in Western North Carolina. As related in the autobiography, Peattie's mother had, in 1932, written him "from Tryon in Carolina that the glen I loved there, with tall trees and a waterfall in it, was to be sold for its lumber, and what had I to say for that? So I sat down, in our Riviera villa, and wrote about everything that grew there ...and the falls itself, that leaps forever with a pulsation like living. This report my mother's friends took to the richest man in town, and he bought the glen for them."

Located in the Pacolet River valley in southwest Polk County, North Carolina, between Saluda and Tryon, the 268-acre Pearson's Falls Glen presently attracts upwards of 15,000 visitors a year. The waterfall is a 90-foot stair-step cascade. It is situated in a thermocline where cold

northern winds overlap warm southern breezes to create a temperate zone that houses a diverse flora of over 200 woody and herbaceous species, many of them rare.

Back home in America, the Peatties settled in rural Illinois, where Donald wrote his first bestseller, *An Almanac for Moderns* (1935), a collection of daily meditations on nature that attracted national attention and critical praise. In 1937, he published *Green Laurels: The Lives and Achievements of the Great Naturalists*, an inspired series of profiles of men who studied the natural history of the earth, beginning with Aristotle and concluding with Jean-Henri Fabre. As indicated by herbarium specimens on deposit at UNC-CH, the Peatties revisited the mountains of North Carolina in the late 1930s. They settled permanently in Santa Barbara, California, in 1937. Between that time and his death in 1964, he published over forty books. Two are related to his experiences in the southern mountains.

In *The Road of a Naturalist*, Peattie has a section devoted to his childhood years in Tryon and another that provides a montage of recollections from his adult years of exploration throughout Western North Carolina from 1921 to 1937. The narrative structure of the book as a whole occurs as a series of flashbacks that can be confusing. Critics sometimes faulted him for a prose style "that could verge on the florid as he strove to communicate his enthusiasm for the natural world." But when reread with patience, *The Road of Naturalist* emerges as one of the more dynamic natural history books written by an American in the twentieth century.

Even though Peattie's *A Natural History of Trees of Eastern and Central America* wasn't published until 1950, his descriptions of countless species are based on firsthand observations made throughout Western North Carolina. Among those tree books that combine factual botanical information with lore and vivid description, it has perhaps never been equaled.

These selections from Peattie's publications that contain natural history descriptions of Western North Carolina indicate the range of prose styles he employed.

A Natural History of Pearson's Falls

Pearson's Falls Watercolor by Elizabeth Ellison

Many millions of years ago a smile began to crease the face of the continent that was to be called America, and the Blue Ridge was raised from the sea and the plains. This wrinkle was made of granite, the very bed-rock of the earth when first it fell, a spattered drop, from the sun's cauldron...

Today, in the heart of those old mountains, you may find your heritage of beauty and wonder, the finished product of millions of years of life. As in a cathedral nave where one may admire the art of centuries, so one goes reverently up the glen called Pearson's Falls, where scenes from the story of life on earth are painted upon the carven walls and green windows...

Here, for thousands of years, the white sprite, the fall, has been in being, delicious, setting in motion a perpetual breeze which makes the maidenhair and the foam-flower to tremble ceaselessly upon their stalks, keeping a fleck of brown from forever swirling about the pool below...

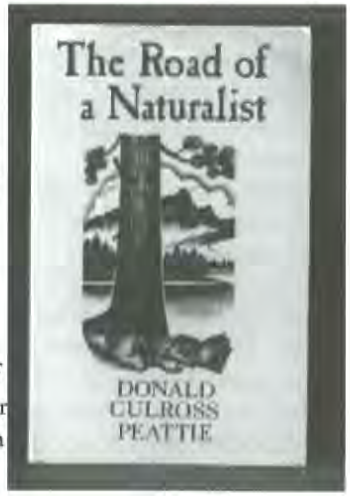
Miss Margaret Morley, author of that charming animal story, "Little Mitchell," the delightful travel book, "The Carolina Mountains," several safe and tasteful studies of sex and love-life in nature, was the first to discover the walking-fern at Pearson's Falls...

Only to remember the [song] of a warbler I once heard for a whole spring at Pearson's Falls is to see the magic charm of the whole Glen, the swaying of the maidenhair, the passage of white clouds through blue sky high over beech and hemlock, to hear the laughter of the brook, the drumming of fine spray on the great rhombic leaves of Trillium and scent the rich odor of the fecund loam.

This was a mocking and ventriloquistic song. I found when I tried to follow it into the trees behind me, it had then flown over me and was calling again. This taunting experience went on for years. Finally, I actually saw the bird dipping and teetering and bobbing curtseys, and in an instant I recognized the white line that passes around the head through the eyes, and the speckling of the breast. And as he took wing he gave the call which I had been hearing all these years. The identity of the bird was at last complete. It was the Louisiana Water Thrush.

The Water Thrush inhabits not only water-bottom land forests, but is also found on hillside and mountain streams, wherever the woods are more open below. Always, however, he requires water, and his food is secured form the shores of streams, or mud banks of pools. Even when at ease the bird seems controlled by a sense of restlessness, and not only when walking but when perching, constantly teeters its body ... Certainly this bird is the very spirit of the Falls and the high wood around them.

The Road of a Naturalist



It was [my mother] who would reach into the grimy midwinter misery of my city life, and pluck me out of it, and take me to that far-off country where winter was no more than long frost crystals making forests under the red mud... In our cottage, where the fat-pine kindled her fire, my mother's typewriter went clickety-clack. I came in out of the beginning of spring, bringing her pine-saps, a fistful. I had found them under leaves, and they smelled of carnations, inside their dead brown husks, and were cold as fungi to my fingers.

Another year (I think it was my eighth), I had the luck to catch the measles, and got earlier into my chosen life, for the longest stay there... In seven months upon that isolated summit of the Appalachians I began to discover a world older and greater. It is the world now of my established habitation, my working days and holidays, and it lies open to all men, in valleys as on mountains by any road you choose to enter it.

Each day, up on that mountain-top, I saw nobody, and each day again there was no one to see. I was lonely, and complained of it, and knew at last that I did not care. For I had a book that to me was as alive as an animal; it slipped with an alert silence over sands where glinted what was gold or only fool's gold; either was as bright. Red tritons nimbly got away again out of my hand. The turtles let me hold them, but they went inside themselves and so got way too, after all. Squatting with my chin between my knees, I built dams in the brook until my hands were cold as the running water; I built stone cities on the ledgy shore.

The brook said nothing about where it was going, but when I followed it I heard the shouting and the singing even before I got there and beheld the foamy plunge of the great fall down the mountain-side. That most eternal movement, wind of a waterfall, stirred the glistening laurel leaves all down the sheer steep even on a still day, and I had a sense of hallelujah and rejoicing as far back into the woods as I could hear the cataract...

And now I knew the mayflower and trillium by name, and the Carolina wren and the cardinal, all the singing birds except the one who sang alone in the rain, lifting his voice and letting it fall in a long silver whistle...

From what I called my sunrise rock I could see morning, and the reaches of Rutherford County. And sometimes I could catch the labor of a train down there when it struck high country, and the wail of its whistle as it plowed its lonely course through blue distance. At night I slept, resting between the mountain's shoulders, waking only if the men were out after 'coon or possum; far away I heard the yells, the shots, the dogs baying, and I imagined the light of the torches licking up the pine trunks and how they caught the treed thing's eyes in a sudden furious glitter...

The day was late in winter; I was turning over the sheets in the herbarium; the specimen I lifted next from out its neat manila folder looked back at me familiarly. I had seen this plant before, long, long ago with the eyes of love and only a child's understanding...

Therefore the label bore the name of the mountain where I had heard the thrush when I was eight, and watched dawn and sunset from the rocks. The word was like a secret between myself and nature. Deeply it had lain buried with that other life closed years ago, which now opened suddenly beyond this flower. There the white fall plunged and the mountain-tops rolled misty blue away, and all at once I could remember how this trillium smelled, a dark honey perfume. I lifted the specimen closer; the flower rose serene out of its three great rhombic leaves, solitary and symmetrical; under my hand lens it spoke to me in the tongue I was beginning to understand.

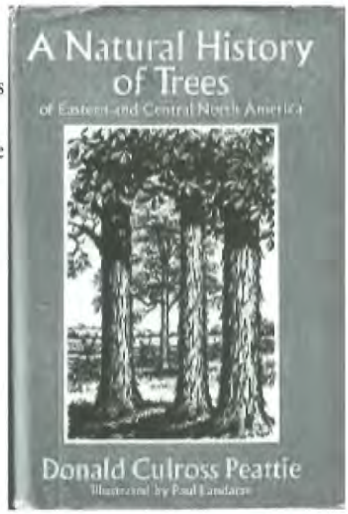
I took my specimen in to Doctor Barnhart. I said—most casually remarking it—the place name which was passport to me. Doctor Barnhart reached for his atlas, and turned to the page that mapped the Carolinas. Historian of botany that he is, he began to trace out the routes of the collectors who had gone that way... Somebody, Doctor Barnhart remarked, closing the atlas, ought to get down in that country again. He might find Michaux's mysterious magnolia. Or even his shortia, the flower lost for a century...

These fragments joining through a hundred years are in the great tradition of science. I felt its glory, and that I was following it, when I started south not after shortia alone but for my remembered trillium and any and all good things that might fall to me as a collector. For now I had a vasculum to sling across my shoulder, and two plant presses, each a double lattice of stout ashwood with straps to bind it. I had stocked up, too, on the specimen driers that go in a plant press—extra thick blotting paper, cut like herbaria sheets to the same standard size, of a highly bibulous stock. One of my two suitcases was crammed with nothing but these. At Biltmore I changed trains and when, arrived in Tryon, I threw up the suitcase lid to get my driers out, I found instead a stranger's clothes tenderly wrapping a revolver and two quarts of snake-bite whisky. My dismay must have been slight compared to that of the Southern gentleman who reached for his liquor and found the thirstiest blotting paper that the Cambridge Botanical Supply Company could offer.

Margaret Morley lent me driers. She was leaving the field forever, and she gave me her microscope, all her scientific library, and her blessing. She it was who told me where to find the walking fern, and the seven kinds of trillium... After tramping sixty miles, sleeping on the ground by my campfire or in the cabins of mountaineers, my fingers, too, touched [shortia] at last. There on Horsepasture Creek, in the Blue Ridge near Toxaway, I gathered a few plants to colonize nearer home. In that wild place, the loam-bound roots in my two hands, I felt at the center of things. I had simply walked off that map which shows New York City as the axis of America...

This I know now; then I was simply happy, along with Nature every day and all day long. No one knew in what glen or on what ridge I wandered; no one was there to watch me as I changed identity, tramping and climbing and sleeping noons or nights whenever I fell weary.

A Natural History of Trees



Sooner or later he who rides or climbs in the southern Appalachians finds himself on some wind-swept, sun-bitten rocky ledge where a grove of the strange Bur Pine suddenly surrounds him. [This species is now usually referred to as Table Mountain Pine (*Pinus pungens*).] It may reach 60 feet up there in the Great Smokies, with stout vigorous branches that sweep to the ground, in trees growing in the open, while the upper branches curve upward toward its rather flattened top. Its big cones encircle the twigs in dense clusters, each knob of the one armed with a horrendous hooked prickle, as if to guard the harsh fruit through to its slow maturity. For the cones cling on the tree until ripe, yet ripeness may not come for twenty years. And the tree allows no one without an axe to bear off these mace-like trophies; elastic though the branches are, they are unbreakable by human muscle.

This intransigent Pine has no business future, nor will it—slow-growing, stingy of shade, without one concession to grace—ever find a role in horticulture. Its place is high on mountain ridges, where it looks down on the soaring buzzards, where the wildcat lives and the rattler suns his coils.

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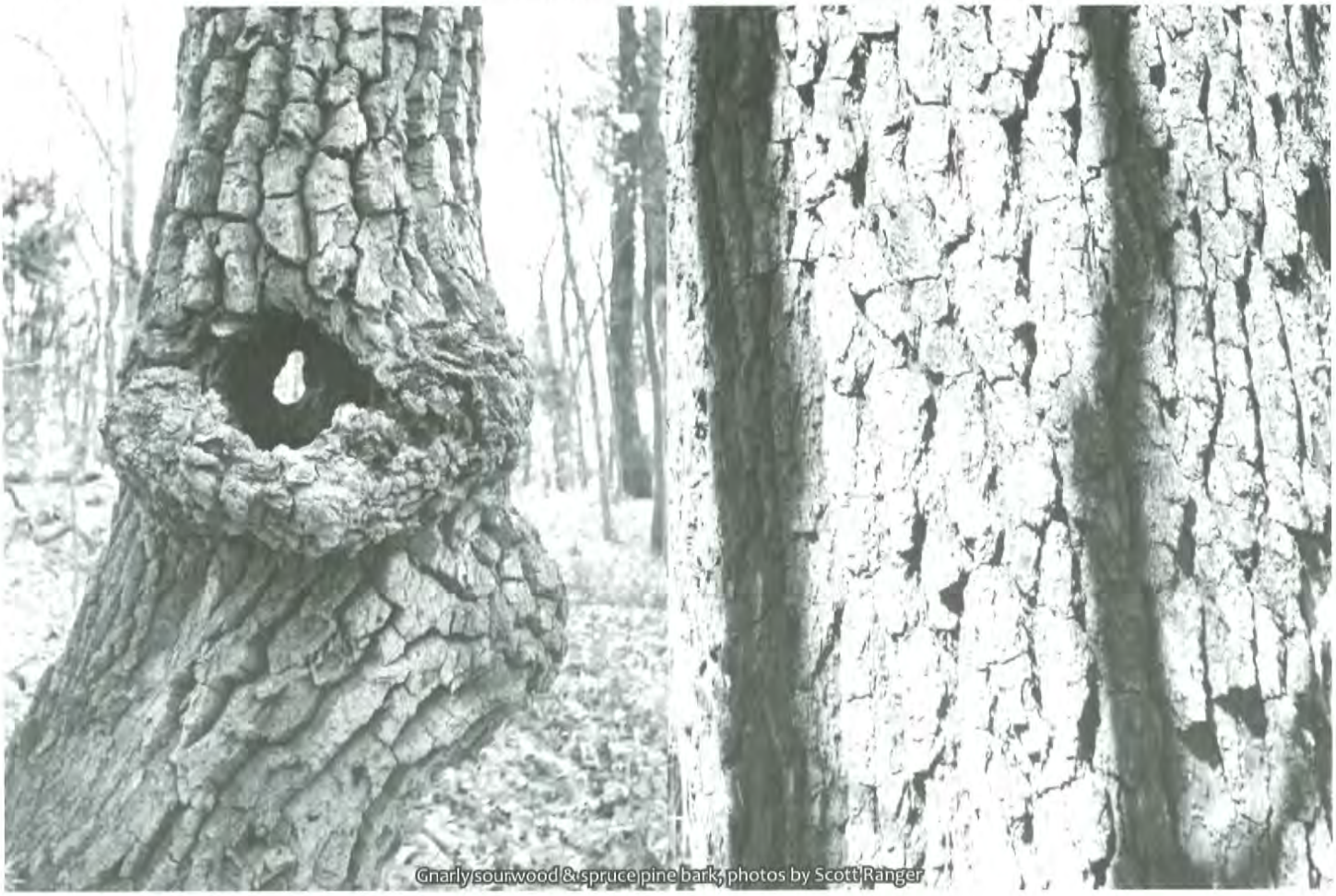

Gnarly sourwood & spruce pine bark, photos by Scott Ranger

Rare Plants

by Linda Chafin

Disturbances in the Field: *Agastache scrophulariifolia* disappearing from floodplains and bottomlands

The short-term visuals of natural disturbances – the blackened forest floor of a recently burned woodland, tree trunks twisted and jumbled by a tornado, salt-cooked needles of coastal pines after a hurricane – can be more than a little hard to take for those us who find refuge in natural areas from the visual assault of suburban sprawl and rural "development." But what we term beautiful changes as we watch and learn from the natural world: the value of natural disturbances to proper ecological functioning is now well known and easily observed in landscapes that reap the benefits of increased productivity and species diversity.

One important natural disturbance that is now missing from most of our landscapes, and one which is unlikely to be restored on a meaningful scale anytime soon, is flooding. In the U.S., only 2 percent of rivers remain in their free-flowing condition; many are dammed several times. The value of flooding in maintaining ecosystem productivity and in promoting microhabitat and species diversity is well documented, but dams, enthusiastically built throughout most of the 20th century, will be a long time in coming down — if ever.

Many once common plant species are now threatened by the loss of free-flowing rivers and their beneficial impacts on associated levees, floodplains, and bottomlands. Without floods to deposit nutrients, sort sediments, disperse seeds, create canopy gaps, and scour the floodplain forest floor of flood-intolerant species, native species diversity in floodplains and bottomlands has waned.

One victim of floodplain loss is purple giant hyssop (*Agastache scrophulariifolia*). This species occupies a variety of habitats in the eastern U.S., including mesic, deciduous forests of both uplands and floodplains. Once widespread, it is now extirpated or is ranked as critically imperiled, imperiled, or rare in 14 states, due in part to loss of its floodplain habitat. Damming rivers has delivered a double whammy to purple giant hyssop by removing the natural disturbance of floods and by making bottomlands and floodplains safe for farming and development.

Purple giant hyssop grows along the upper edges of floodplains of high-gradient rivers and streams as well as on associated rich slopes, in piedmont and montane oak-hickory forests and forest edges, usually in moist, sandy, well drained soils rich in calcium and magnesium. It has low tolerance for competition and its seeds require sunlight to germinate, both traits that indicate dependence on frequent disturbance for long-term survival.

Purple giant hyssop is a perennial herb up to 6 feet tall, often forming large clumps. The stems are erect, purple-tinged, and four-sided, with hairs only on the angles. The leaves are up to 5 inches long with 2-inch long petioles; they are opposite, oval or heart-shaped, with a rounded base, pointed tip, and toothed edges. Its leaves have a strong anise-like odor when crushed. Leaf rosettes emerge around the bases of last year's stems as early as March.

The flower spikes are up to 6 inches long, erect at the tips of stems, and tightly packed with purple, pink, or whitish flowers and small, pinkish bracts. The flowers are two-lipped, with a slightly ragged lower lip and stamens extending well beyond the lips. The calyx is white, pink, or purplish, with five narrowly pointed lobes that are more or less the same size. A variety of insects, including bees, flies, and butterflies, and possibly hummingbirds pollinate the flowers.

Purple giant hyssop flowers in late summer and fall, and the fruiting stems with their seeds last through the winter. The persistence of the infructescence until the time of late winter and spring floods, which disperse the seeds, may be another adaptation to life in disturbance-prone floodplains.

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calyx with 5 pointed, equal-sized lobes

(Folk)Taxonomic Advisory!

by Alan Weakley

Plant "common names"—how common are they?

I should admit right here in the first sentence that I have a conflicted relationship with plant common names—I am fascinated by the linguistics and folk history of them, I appreciate some of their utilities in education and communication, and I find them variously frustrating. Let me try to explain why...

What IS a "common name?"

Well, surely that is easy! But let us first detour briefly to review what names are and what they are for. Names of any kind are a fundamental aspect of human thought, and serve as object labels or tags that enable us to communicate about the objects. Much has been written in taxonomic and nomenclatural textbooks about the characteristics that tend to make names most useful—uniqueness, unambiguity, constancy over space and time, transcendence of national/language borders. These characteristics are often used as a rationale for the superiority of scientific (Latin) names over common names, but perhaps the characteristics cited are actually a biased subset of those that might be given, and some might pull in the other direction: ease of pronunciation, actual (or potential) widespread use across society, facilitation of knowledge about the natural world... If I say "broomsage" to any of my cousins, they know exactly what I mean, but I could talk about *Andropogon virginicus* until I was blue in the face and get nowhere, so "broomsage" has at least some advantages.

Adam naming the animals in the Garden of Eden. Italian Renaissance tapestry in the Florence Museum, in the Public Domain

So, common names. The adjective "common", according to Dictionary.com, means:

1. belonging equally to, or shared alike by, two or more or all in question: common property; "common interests."
2. pertaining or belonging equally to an entire community, nation, or culture; public: a common language or history; "a common water-supply system."
3. joint; united: "a common defense."
4. widespread; general; ordinary: "common knowledge."
5. of frequent occurrence; usual; familiar: "a common event; a common mistake."
6. hackneyed; trite.
7. of mediocre or inferior quality; mean; low: "a rough-textured suit of the most common fabric."
8. coarse; vulgar: "common manners."
9. lacking rank, station, distinction, etc.; unexceptional; ordinary: "a common soldier; common people; the common man; a common thief."

So which meaning of "common" applies to the common names of plants and animals? Those of us concerned with science education, knowledge of the public about our natural heritage, and support for conservation, might hope that #1, 2, or 3 apply, but I don't think these are the meanings intended. Even #4 and 5 could be good, that common names are "widespread, general, ordinary, usual, familiar," but I don't think that is either the true meaning or, alas, accurate. I grew up in a family in which knowledge of plants, birds, forests, and fields was indeed ordinary and usual, and it has been a long, slow realization that only a very small percentage of people in eastern North America have any idea of what a white oak is, probably the single most widespread and dominant tree in the region.

The actual usage of "common" in "common names" is most closely related to #8, "coarse, vulgar," in the sense of everyday, unrefined, of the "common man," and not in the more usual modern usage of crude, rude, and socially unacceptable. It relates to an old use of "the vulgar tongue" to mean English or some other "common" language, meaning one actually spoken by the populace, rather than Latin. As an example, the word "vulgar" is used ten times in the Epistle Dedicatory of the King James Bible, extolling the then very controversial idea that the "common man" should be able to read the Bible in their own, "vulgar" language rather than having it read to them in Latin and interpreted to them by priests:

"Indeede without translation into the vulgar tongue, the unlearned are but like children at Jacobs well (which was deepe) without a bucket or some thing to draw with: or as that person mentioned by Esau, to whom when a sealed booke was delivered, with this motion, Reade this, I pray thee, hee was faine to make this answere, I cannot, for it is sealed."

It says a lot about the evolution of society and culture that "vulgar" once meant simply "common, of the masses, not Latin" and that (in this internet era) direct access to information (not hierarchically conveyed by an educated elite of priests and doctors) was regarded as dangerous. But this is not the place for further explorations of those ideas...

As an aside, "vulgar" does appear frequently in our plant scientific (Latin) names as *vulgaris*, meaning common or familiar; epithets that in our flora almost always refer to introduced European species which were common and familiar in the 17th and 18th century northern European landscape.

An alternative term sometimes used for "common" names is "vernacular" names. This is a more precise and probably better term, meaning (from Merriam-Webster.com):

1.a. using a language or dialect native to a region or country rather than a literary, cultured, or foreign language; b.) of, relating to, or being a nonstandard language or dialect of a place, region, or country; c.) of, relating to, or being the normal spoken form of a language.
2. applied to a plant or animal in the common native speech as distinguished from the Latin nomenclature of scientific classification <the vernacular name>

It also has an interesting historical basis, deriving from "verna," a slave born in the master's house (as opposed to one imported from elsewhere. Which brings us back to the evolution of society and culture...

So, where do our English vernacular names come from, and what is their use?

Vernacular (English) names in use in 2010 have come to us in many different ways, and this is where things get complicated relative to the "commonness" and purposes of vernacular names.

British vernacular names

Many of the vernacular names we use are indeed English, as in "from England." Some of these English names were in the plant knowledge base of British settlers, and they applied (or in some cases, misapplied) them to similar North American species as a folk taxonomy. Many of these names are at the generic level: oaks, pines, ashes, and maples of eastern North America were obviously similar to their Old World cousins, "of a kind," and settlers applied these names. In some cases, they misapplied them, as in taking the name of a common British maple, sycamore, and using it for *Platanus occidentalis*, which more logically might have been called by British settlers "American plane tree" ("sycamore" itself is a misapplication of the name of a north African fig species with lobed leaves that was grown in the Middle East; see *What is a "sycamore"? ... and other uncommon common names*; http://www.herbarium.unc.edu/7-8-04.pdf).

Individual species names probably developed more gradually, though many seem to have become well-established quite early. Guthrie's Geography (1820), in a characteristic passage writing of the Piedmont and Coastal Plain of North Carolina, states:

"The lower parts of the state affords abundance of valuable pitch pine on the barrens, as well the long leared as the short leared, the former of which abounds in the south-eastern parts of the state. Both form a valuable part of the exports. In the swamps abounds cypress and the Bay tree; the former yielding valuable shingles. In other, and especially in the upper parts, the forest yields oaks of various kinds, such as the white, black, red, post, Spanish, Turkey, and chesnut oak, and the Black Jack; further, hickory, chesnut, short leafed pine, walnut, cherry, mulberry, locust, sycamore, poplar, or tulip tree, maple, elm, beech, birch, sassafras, plum, persimons, sourwood, haw, holly, chinquepin, sumack, and other trees and brushwood. Of wild fruits there are, hickory-nuts, chesnuts, walnuts, wild cherries, mulberries, persimons, plums, grapes, chinquepin, whortleberries, blackberries, deuberries, strawberries, on uncultivated fields, and cranberries, on the mountain-bogs."

These common names are familiar to us almost 200 years later and seem to have mostly the same meanings (though I wonder if the "Bay trees" in the swamps that yielded good shingles might be *Nyssa*). *Liriodendron tulipifera* already had the alternate common names of poplar and tulip tree. I'm not sure what to think of Spanish oak, which most books nowadays would associate with *Quercus falcata*, but I have run into it in surveys in the high mountains of the Southern Blue Ridge, apparently referring to either *Quercus coccinea* or the mountain form of *Quercus rubra*. Whortleberry for Vaccinium (blueberry or huckleberry, see below) is a Britishism in modern usage.

American vernacular names

Other common names came from American sources, either by the adoption of native American names, or by the indigenous development of names from folk usage in North America. Among native American-derived names, hickory (*Carya*), sassafras (*Sassafras*), chinquapin (*Castanea pumila*), and yonkapin (*Nelumbo lutea*) come quickly to mind and it seems notable that these are all North American plants with no close cognates in northern Europe. Some American vernacular names, including some cited in Small's (1933) *Manual of the Southeastern Flora*, are colorful, bawdy, or socially inappropriate in various ways (these latter are certainly interesting from the standpoint of folk taxonomy and cultural history, but aren't acceptable in modern standard usage).

Some of the most interesting sets of truly vernacular common names are ones derived by corruption from more familiar words. "Broomsage" for "broomsedge" is common across rural eastern North America, and created by substitution of the more familiar word "sage" for the unfamiliar one "sedge;" put "broomsage" in your favorite search engine, and you will get many hits, such as http://www.flickr.com/photos/kenb/4263722395/. Another example is "sparrowgrass" for *Asparagus*. Wikipedia (http://en.wikipedia.org/wiki/Asparagus) states:

The English word "asparagus" derives from classical Latin, but the plant was once known in English as *sperage*, from the Medieval Latin *sparagus*. This term itself derives from the Greek *aspharagos* or *asparagos*, and the Greek term originates from the Persian *asparag*, meaning "sprout" or "shoot". Asparagus was also corrupted in some places to "sparrow grass"; indeed, the Oxford English Dictionary quotes John Walker as having written in 1791 that "Sparrow-grass is so general that asparagus has an air of stiffness and pedantry".

But, one of my favorite examples of this demonstrates that this process is still occurring. My friend and colleague Milo Pyne was recently conducting field work in Tennessee and was directed to a glade by some local men who said "yes, you need to go up there behind them 'colonial trees.' " Somewhat puzzled, Milo proceeded as directed and found that the glade was behind a grove of Paulownias (*Paulownia tomentosa*)!

Truly vernacular or folk names are often in conflict with "standard" common names. For instance, the books will tell you that "huckleberry" is the common name for *Gaylussacia* and "blueberry" is the common name for *Vaccinium*. But in "common" usage by people who pick them rather than identify them using botanical manuals, one or the other name is used in ways that have nothing to do with the two genera (and given recent molecular phylogenetic analyses of the taxonomy of these plants, maybe this is a case of "folk taxonomy" being prescient of the truth!).

The folk taxonomy of conifers in the southeastern United States is another interesting and tangled story of common usage ignoring the books. The town of Spruce Pine, NC is apparently named for *Tsuga canadensis*. Spruce Pinnacle in Buncombe County, NC is crowned with old *Tsuga caroliniana*. *Picea rubens* and *Abies fraseri* are called "He Balsam" and "She Balsam" (considered the male and female of a single species), Tamarack Post Office in Watauga County, NC and Tamarack Ridge in Highland County, VA are named for the abundance of *Picea rubens*! The generally used common name for *Juniperus* is "cedar," and *Chamaecyparis* is called "juniper."

Fancy British names

Some common names come from being constructed or made up in learned circles in Europe, and then carried back to North America via "book larnin'." An excellent example of this is Venus's Fly-trap for *Dionaea muscipula*, a fanciful name made up in British drawing rooms in the late 18th century (the Latin name actually makes use of a different goddess and a different prey: Diana's mousetrap). William Bartram apparently recorded a native American name for it, Anglicized as "tippitiwitchet," and a few decades ago I collected (thanks to the late Reverend Tucker Littleton) a "true common name" for it in Onslow County, North Carolina, used for at least a century by local families: "meadow clams."

Recently constructed English names

Historically, until just a few decades ago, most plants didn't have common names. Floras through the 20th century tended to list common names for most genera, and a rather small minority of species (other than trees, ferns, orchids, or economically important species). For instance, Radford, Ahles, & Bell (1968) have no common names for species of *Carex* or *Rhynchospora*; the attitude, I believe, was that only a Serious Scientist would want or need to call a *Carex* or *Rhynchospora* species anything at all, and if he or she were a Serious Scientist, Latin would do just fine, as the only communicant about a *Carex* or *Rhynchospora* species would be another Serious Scientist.

But more recently, many common names have been created, with the explicit goal of having a common name for all plants in a state or smaller area, for all plants listed as rare or legally endangered or threatened, or for every plant species. Kartesz & Thieret (1991) published a short paper on guidelines for the creation, spelling, and usage of common names, in an effort to create some level of standardization of spelling, hyphenation, and philosophy behind these "new common names." The implicit goal behind these efforts is that common names help popularize plants and rare species, and only if there is an English common name for a plant will it be appreciated by a broader public.

A few of these efforts to create common names have been unfortunate. The Carolinas endemic *Lysimachia asperulifolia* was one of those obscure plants known only to a few botanists and conservationists content to call it by its Latin name, until it became a candidate for listing under the United States Endangered Species Act. At that time, a common name was created for it, and as often happens it was a "common name by translation." Whoever created the name looked at the epithet "*asperulifolia*" and decided it meant "rough-leaved" or "roughleaf," from "*asper*" = rough and "*folia*" = "leaf," and hence came up with the "common name" of Roughleaf Loosestrife. Alas, the name is doubly inappropriate. The actual meaning of the epithet is "with leaves of *Asperula odorata* [the plant in the Rubiaceae known as Woodruff in English and Waldmeister in German, and now usually included within *Galium* as *Galium odoratum*]," alluding to the whorled leaves of both plants. And, the leaves of *Lysimachia asperulifolia* are absolutely and slickly smooth, lacking the slightest hint of roughness or even hairiness. So, the accepted common name for *Lysimachia asperulifolia* is wrong, etymologically and descriptively, but I suppose we are stuck with it unless a campaign is mounted to replace it with some more appropriate name, such as Pocosin Loosestrife or Carolina Loosestrife.

An additional problem with some "translated common names" is that the feature described by the specific epithet is often some detailed feature of a small part of the plant. So, the name Plumed Beak Sedge for *Rhynchospora plumosa* seems to imply that there is something plume-like about the plant ("plumed" being an adjective referring to the beak sedge itself), but what is plumed or featherlike are the minute perianth bristles at the base of the achene.

Other "translated common names" may be accurate, but so unhelpful as to be misleading, such as Southern Sedge for *Carex austrina*. The epithet means southern, the plant grows in the southern United States, but many other sedges would have an equal or better claim to the name.

The example of birds

In the professional and amateur world interested in birds, there has long been a push for the idea of standardized common names. The International Ornithologists's Union (IOU or IOC) promotes the idea, and maintains a list of standardized common names. The following states the philosophy behind standardized common names for birds (and by extension, for other organisms) (Wordbirdnames.org: http://www.worldbirdnames.org/tp-why.html):

Why standardize names? The nonscientific names of birds differ for the same species on different continents and vary annoyingly from list to list. On a world wide basis, different species may have the same name.

Nearly twenty years ago, the leadership of the IOC saw the need for better standardized vernacular names. First came French names (Devillers and Ouellet 1993), then Spanish names (Bernis 1995). English names were especially challenging. They took more than fifteen years to compile.

We believe that an improved system of standardized English names will lead to success in ornithology and the conservation of birds worldwide. Names based on logical rules and consensus should aid clear and crisp communica-

tion among global stakeholders. The stakeholders include government officials, publishers, and philanthropists, many of whom are not comfortable with or literate in scientific names.

Global birders also desire improved standardization and greater simplicity of English names. So do conservation biologists and the editors of the books on birds. All such stakeholders need to communicate clearly without using hyphens in four different ways and without trying to reconcile the treatment of different names in authoritative works.

Thus on behalf of the IOC we encourage the use of these standardized names. We truly believe that the list of names recommended here has important strengths, and, if used widely, will promote consistency, authority and better conservation.

Of course, even those who agree that standardized common names are a good idea may find themselves fighting mad when it is their favorite common names that are ruled "non-standard!"

How common are common names; how common should they be?

So, I'd like to close this ramble through plant common names by posing some questions; I hope that *Chinquapin* readers will send in their opinions!

1. Do you use plant common names?
2. What is the degree of tension between standard or created common names and folk names?
3. Should common names be capitalized, or not?
4. To what degree should they be standardized?
5. Do common names have a role in popularizing plants, botany, biodiversity, and conservation?
6. Should plant common names be more common (in the sense of more often used)?
7. Should plant common names be more common (in the sense of used by the common person)?

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Send responses to weakley@bio.unc.edu

Response by Scott Ranger

I am well into writing a book *Notes on the Natural History of the Juneau Area, Alaska: Observations of an Eclectic Naturalist.* In it are liberal doses of names of many kinds and he are some of my thoughts on names from it:

Names carry great power. In the Judeo-Christian world naming things rests in the deep past of creation. The name of the first man in the Bible, known as Adam in English, comes from the ancient Hebrew אדם. This seems to be a play on words for the name of the man is extremely close to the ruddy color of hair or skin and the ground or earth that the creation story tells us he was made from. His name is then inextricably entwined with his very being. Names become real and strong. Then "...Adam gave names to all cattle, and to the fowl of the air, and to every beast of the field..." (Genesis 2:20 KJV, in the public domain). To call something by a name included the very essence of that thing, be it an animal or a person. Once two or three learn a thing, a name naturally develops as a kind of shorthand that encapsulates their understanding of it that they agree on and mutually understand. This allows communication.

I've thought much about the questions Alan asks and give some of my answers in this statement about how I'm handling common names:

As common names are not proper names, they are not capitalized except for birds, where the American Birding Association (ABA) and American Ornithological Union (AUO) usage calls for their capitalization. I believe "common" names must be exactly that. By that I mean they must be in the common vernacular of the local area. I despise names created for English usage by simply transliterating the Latin scientific name and I try hard not to use them unless they fit my understanding of the word common. Even where fitting into the common vernacular, I despise the use of "false" when appended to any organism as each deserves its own name and nothing in nature is "false". I include them only because they occur often in the popular and scientific press, but attempt to include another, less pejorative, appellation.

So to more fully answer:

1. Yes. I'm primarily an interpretive naturalist dealing with the public and must be constantly aware of their needs and wants.
2. Extreme. The administrative demand that each scientific name have a corresponding English name in lists has created horrific names as Alan has illustrated, lacking in any creativity or local meaning.
3. No. Unless they include a proper noun, they are not proper nouns.
4. No. Standardization defies all definitions of common, vernacular or colloquial and destroys the richness of their time and place.
5. Absolutely! I do this every day I work as a naturalist guide.

6&7. Things become vulgar—common—*on their own.* Those that become commonly used do so as a result of being common. Visit any garden center and you'll find many "scientific" names being used to sell the plants and many have them have entered the vernacular. Wildflower books probably propagate common names more than anything else, for better or worse. Let nature take its course and enjoy the wonder of all the local names like "weasel snout".

Mystery Plants

by Dan Pittillo

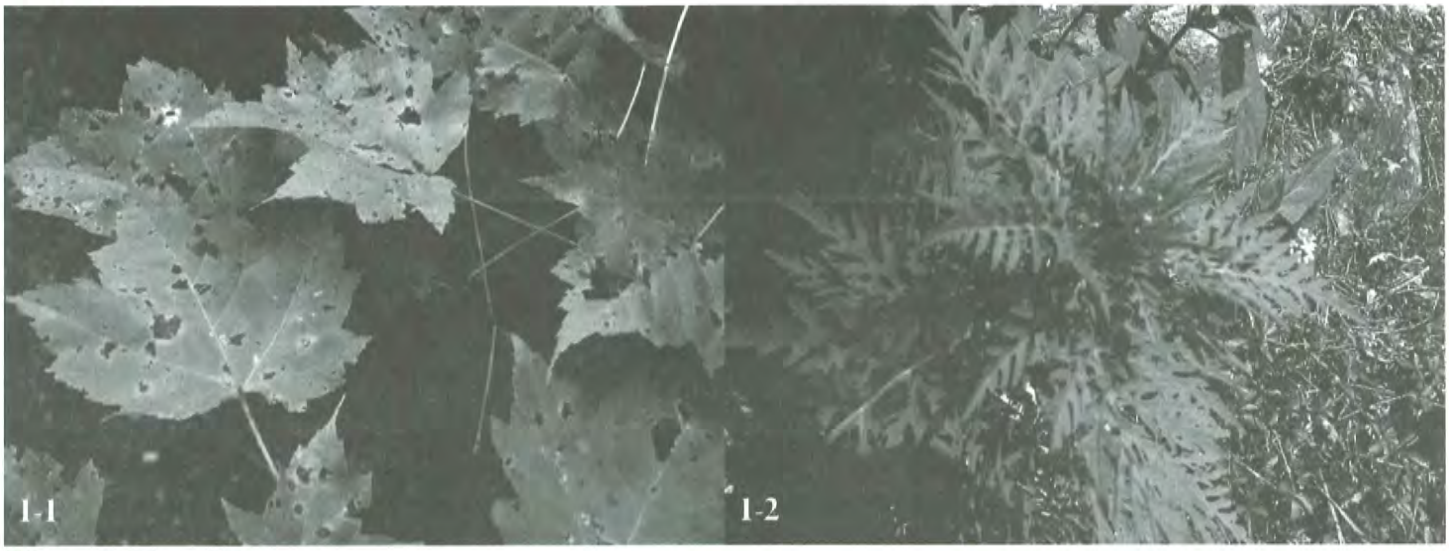
This is the tenth year of the "Mystery Plant" challenge we've offered. Many good botanists are out there and there were several that took the challenge with amazing insight and knowledge. I've had a ball responding to members with their responses and greatly appreciate everyone that responded.

This time you have an ability to get all answered correctly because these have been the subjects during the past decade. If you kept the newsletters, you might thumb through to match pictures (caution: some photos are not same printed). See what you can do with these and we will have to put you in the "hall of fame" for the mystery solvers. There are five pairs of photos, each numbered with it's pair to help you match your name to the right image. All photos are by Dan.

Send your answers to Dan Pittillo, dpittillo@gmail.com or by mail, 675 Cane Creek Road, Sylva, NC 28779.

The 2009 vol. 17(3) *Chinquapin* for the last mystery pair was *Acer rubrum* and *Viburnum acerifolium*. The largest number yet to enter the contest includes these thirteen: Richard Flagar, Mark Johns, Cam Maclachlin, Rick Norskov, Philip K. Parsons, Mark Pistang, Chris Reid, Franz Seischab, Chris Senfeild, Scott Slankard, Allen Sweetser, David Taylor and Richard Ware. All but one of the entries had correctly identified these two twigs, but the highest score for the year Allen Sweetser. Congratulations to all that got the rather difficult pairs in 2009!

Pair 1



Pair 2

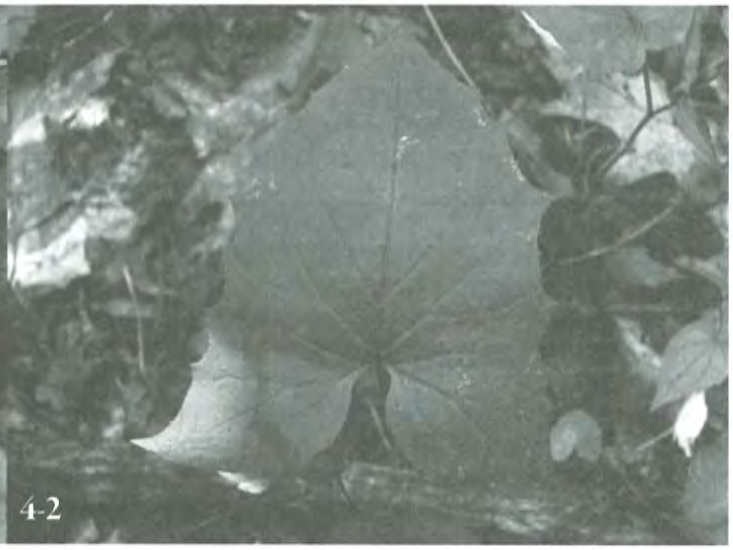
Pair 3


3-1


3-2

Pair 4


4-1


4-2

Pair 5


5-1


5-2

Illustrating Dan Pittillo's long experience in the mountains is his photo pair ***"Pines atop Little Green Mountain"***. The left photo is from 1970 and the right from 1998. Dan notes: "it ... gives a perspective of more than three decades of plant change in the photo pair I made in Panthertown Valley in the south end of Jackson County. The 1970 photo shows [a] table mountain pine to the far left but in the very center of that photograph is a small white pine seedling. In the 1998 photo the white pine is over 25 feet tall and the table mountain pine is in the far left edge, hardly changed for the intervening decades."

SABS Student Awards!

From Council Member Wendy Zomlefer:

The Southern Appalachian Botanical Society is pleased to announce two awards for students: the SABS Outstanding Student Poster Award and the SABS Outstanding Student Contributed Paper Award. These will be presented for the first time at the Association of Southeastern Biologists meeting in Huntsville, AL, in April 2011. SABS convenes as one of the affiliate organizations at this meeting. The posters and talks will be assessed by anonymous judges. Each award includes an honorarium of $150.00, and the winners will be announced at the ASB banquet.

Qualifications: A nominee must be a current undergraduate or graduate student in good standing and must be a current member of SABS. A student will nominate his/her poster or oral presentation when registering for the ASB meeting and submitting the abstract. The instructions for nomination are on the ASB Website, www.sebiologists.org/.

Presented paper (oral presentation):

written communication (abstract)
oral communication (presentation)
technical approach (fieldwork, lab techniques, and statistical analyses)
significance of research
knowledge of area (response to audience questions)

Posters:

written communication (abstract)
organization of information and graphics on poster
oral communication – interaction with poster visitors, response to visitor questions
technical approach (fieldwork, lab techniques, and statistical analyses)
significance of research

Earl Core Student Award Recipients for 2009

TIANITA DUKE (Austin Peay State University)—Taxonomy, ecology, and distribution of unusual populations of *Lysimachia hybrida* (Myrsinaceae) from Tennessee and Alabama

SARAH GALLIHER (Elon University)—Determining the effects of beech mortality due to beech bark disease on spring ephemerals in Great Smoky Mountains National Park

BENJAMIN HOOK (Virginia Tech)—Influence of age, diameter, and location on compression wood formation in *Pinus strobus* L. following ice storm damage (feature article for this issue).

Halictidae nomla

Diversity of Bee species (Superfamily Apoidea) on rock outcrop environments

by Theresa Sosby

Biology 480 Senior Research, Western Carolina University

In keeping with *Chinquapin's* highlighting of outstanding student work and as a plug for students to apply for the SABS student awards, here are excerpts from a very recent study that should be of interest to all.

In nature, bees are the most common and arguably the most important pollinators. The diversity of plant species, including endemic and narrowly distributed species, on high elevation rock outcrop communities of the southern Appalachians, raises the question of whether there is matching diversity of bee species. It is also valuable to know whether bees are general or specific pollinators for these plants. An inventory of seven outcrops between June and July revealed five of nine North American families in the rock outcrop communities: Halictidae, Apidae, Andrenidae, Megachilidae, and Colletidae. The number of pollen types obtained from the bodies of 14 individuals averaged 3.07 types per individual. As fewer pollen types would be expected on the body if bees were acting as specific pollinators, I conclude the bee species sampled are generalist pollinators in high elevation rock outcrop ecosystems

Abstract

In Western North Carolina rock outcrop environments have a wide variety of flowering plants. With over 16,000 species of bee in the world, it is important to know which are present in these environments. This study examines the diversity of bee species present, and whether these bees are pollinating one species of plant versus many. Over the course of two months, sixty-one separate individuals were examined and properly identified. From this data it was found that five out of the nine bee families are present in these environments that are present in North America. Any bee specimens with pollen baskets that were visibly full were rinsed with 65% ethanol onto a slide. Compared to the slides of pure pollen from the flower specimens, the bees had an average of 3.07 different types of pollen on them. Based on the size of the flowering communities this conclusively states that bees are acting as general pollinators in these rock outcrop environments.

Introduction

Bees, within the Order Hymentoptera and the Superfamily Apoidea are the largest, the most common and arguably the most important pollinator. With over 16,000 species world wide, bees are an important divergence of pollinating insects, originating in early to mid-Cretaceous, roughly in synchrony with the flowering plants (Danforth et al. 2006). Bees and flowering plants have a commonly known symbiotic relationship, while bees gain nutrients and food for larvae from the pollen; the plants also get pollinated (Bolton and Gauld 1988). Out of seven total bee families, it is possible distinguish between them by subtle differences in wing veins and by the fine structure of the mouthparts and other microscopic characteristics. However, the bees in each family have other interesting descriptive features, including their size, nesting and foraging behaviors, and easier to see body features such as body hair, abdomen segment coloration, the length of the tongue, and the form of the pollen-carrying structure. (Bolton and Gauld 1988).

Rock outcrop communities represent a very small fraction of land surface area in the Southeastern United States, roughly 12,000 acres total. However they contain a large number of native plant species and unique community types. These abundant plant species provide plenty of opportunities for pollinators. These environments are located on the top or sides of mountains and are communities of plants growing on the bare rock face. Because of the diversity of plants on rock outcrop environments I believe it is important to know what bee species are present. This study will examine the number of bee species present on flowering plants in rock outcrop environments during the months of June and July. It is also valuable to know whether bees are general versus specific pollinators for these plants. This study will also examine whether bees are pollinating one specific species of plant versus many different species.

Apis mellifera

Bombus sandersoni

Study area

Continued from front page
side contained only a few cells per year after the 1994 ice storm .

I am currently working on a multiple regression model which aims to predict the amount of compression wood in living trees based on their size, location, and past climate data. Results of this model will give foresters more information to help them manage our forests for increased efficiency in harvesting, wildlife habitat and recreation.

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Conley McMullen and Charles Horn examining the flowers of a witch hazel on Sunset Rock in Higlands, North Carolina in 2008

Southern Appalachian Botanical Society
Scott Ranger, Newsletter Editor
1963 Ferry Dr
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