

# CHINQUAPIN

THE NEWSLETTER OF THE  
SOUTHERN APPALACHIAN BOTANICAL SOCIETY

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SPRING 2014

## EARL CORE STUDENT AWARD REPORT

Geographical history and infraspecific morphological variation of the hemiparasitic wildflower,  
American Cow-Wheat (*Melampyrum lineare*, Orobanchaceae)

by Karoline Oldham

*Melampyrum lineare* (Figure 1) grows in forests spanning the eastern coast of North America and spreads west along the US-Canada border. Its habitat is a familiar one to me, since I grew up just a short drive away from the Shenandoah National Park in Virginia. With the help of funds from the Southern Appalachian Botanical Society's Earl Core Student Award, I devoted weeks of my summer to exploring mountains and roadsides in a wonderful combination of things novel and familiar (Figure 2); as a Master's student fresh out of my first year of graduate school, this was the most extensive field excursion I had yet planned, and although the forests felt familiar, I was new to the process of planning week-long, multi-state trips into the field.

In addition to localities in my home state of Virginia, my fieldwork took me to Delaware, Maryland, Kentucky, Tennessee, Georgia, North Carolina, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine. With the help of my adviser, Dr. Andrea Weeks, I collected 441 individuals from 38 populations. I



Figure 1. *Melampyrum lineare* in flower.

have begun to use these specimens, in combination with loan specimens from 22 herbaria across the range of *Melampyrum lineare*, to conduct a morphological revision of this species' four varieties. This summer, I intend to conduct a population genetic study to test competing phylogeographic hypotheses for *Melampyrum lineare*. Pennell (1935) hypothesized that *M. lineare* found refuge in southern Appalachia during the last Pleistocene glacial maximum approximately 20,000 years ago and subsequently recolonized higher latitudes by following its hosts northward after the glaciers retreated. However, evidence suggests that not all host species of *M. lineare* survived Pleistocene glaciations exclusively in southern Appalachia; *Pinus banksiana* may have survived in refugial populations in the northeastern part of the continent (Godbout et al. 2005, 2010).

Waltari et al. (2007) present yet another alternative; many parasitic species survived Pleistocene glaciations in western North America and spread east as the glaciers receded. In order to test these hypotheses, I will first travel to approximately 20 localities in Ohio, Michigan, Minnesota, Idaho, Montana, and British Columbia to sample the remaining, western portion of this species' distribution. Primers of 33 microsatellite loci developed for *Melampyrum* will be piloted for their utility in assessing the allelic diversity among the North American populations from which I have collected. I will collect microsatellite data from approximately 500 individuals from 50-60 populations.

I will present my progress on the infraspecific revision and the population genetic study of *Melampyrum lineare* at the 2014 meeting of the Virginia Academy of Science in May, and Botany 2014 in July.

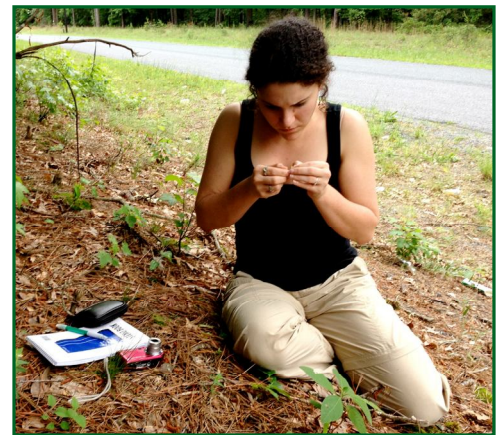


Figure 2. The author studying *Melampyrum lineare*.

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## From The Editor's Desk:

### Joe Pollard, Newsletter Editor

Several times I've used this space to applaud the work done by Dan Pittillo as editor of *Chinquapin* for most of its existence. A popular feature through most of this time has been "Mystery Plants" – a series of challenging contests based on botanical knowledge. Many of us turned to it first when we received our newsletter in the mail (even if we were too timid to actually submit an entry).

Since I took over the editorial duties, Dan has graciously continued "Mystery Plants," but has now asked permission to end the run. However, I think we still need fun and games, so with this issue I'm going to offer a new series. One of the daunting challenges of doing that was having a repository of photographs on which to base the competition, so I was thrilled when my friend Janie Marlow agreed to be my partner in the project. Janie is the creator and webmaster of the website [www.NameThatPlant.net](http://www.NameThatPlant.net), which is a clearinghouse of information and images of native and naturalized plants of the Carolinas and Georgia. And she takes

excellent photographs!

I've decided to change the title of our quiz to "Botanical Brainteasers." In part this is just to avoid charges that I stole Dan's idea! But perhaps it also indicates a subtle change in the nature of the questions. While recognizing species from our Southern Appalachian flora will still be a key part of the game, each brainteaser will also require readers to solve some sort of puzzle. Perhaps it will be based on the classification, nomenclature, or ecology of the plants. Knowing me, there may be some bad puns involved down the road, although this time it's pretty straightforward.

In addition, I hope you'll also check out the article co-authored by Janie Marlowe and John Nelson, with troubling news about an invasive species recently recognized in our area. We also have a fascinating report by a student who was supported by an Earl Core award from SABS (more of those to come in future issues). Regular contributors Lytton Musselman and George Ellison have provided stimulating articles as well. Thanks to all of you for filling these pages with interesting food for thought.

Enjoy the spring, everyone!

## SABS Welcomes Our New Members

- Kadrin Anderson
- John Atwood
- Harvey E. Ballard, Jr.
- Douglas Bright
- Lia Campbell
- Meghan L. Cooper
- Maureen Donohue
- Kristen Emery
- Jason Paul Joines
- Francesca Lauterman
- Catherine Luckenbaugh
- Rachel McAlister
- Landon McKinney
- Margaret Ann Polchow
- Peter Schafran
- Kylie Stackis
- Brooke Stallings
- Ryan R. Unks
- Thomas J. Whitmore

## Results of the last series of Mystery Plants

by Dan Pittillo

In the last issue, Mystery Plants nos. 1 and 5 were both hemlock (*Tsuga canadensis*), no. 2 was buckeye (*Aesculus flava*), and no. 3 was yellowwood (*Cladrastis kentukea*). All of those are native to the Southern Appalachians, of course. No. 4 is a species of *Quercus*, but not a local one – it was photographed in Costa Rica!

The winner of last year's challenging "Mystery Plants" competition is the very promising young man, Rudi Boekschoten. Rudi is now in 8th grade, and would potentially be an excellent researcher should he pursue a career in botany, any other science, or any of the visual arts or scientific imaging. He will receive a copy of Kristin Johannsen's *Ginseng Dreams, the Secret World of America's Most Valuable Plant*, which was donated by Judy Dumke, the winner of the previous contest in 2011-12. Congratulations Rudi!

## *Cassytha filiformis*: Dodder Laurel or Devil's Gut

By Lytton John Musselman, Old Dominion University

Botanists visiting southern Florida for the first time often note what appears to be extensive populations of dodder (*Cuscuta*, Convolvulaceae) along the interstate, along railroad tracks, as well as in natural areas, especially sand ridge communities (Fig. 1).

But this botanical equivalent of parasitic spaghetti is not dodder, not in the same family nor even the same clade as dodder. Instead, it is a relative of sassafras, laurel, and avocado, all members of the Lauraceae, the Laurel family. I am not comfortable with the "common" names of this parasite, *Cassytha filiformis*, though dodder laurel is the most descriptive because it looks like dodder and is in the laurel family. The origin of Devil's gut is unclear—is it because



Figure 1. Habit of *Cassytha filiformis* on a woody host.

of the tangled mass of stems figuring an imagined demonic gut? What not call it angel spaghetti instead?

These two genera, *Cassytha* and *Cuscuta*, present one of the most remarkable examples of parallel evolution in the angiosperms. Both are parasitic vines, totally dependent upon their host attachments for survival despite a modicum of chlorophyll. Both have a broad host range (some dodders do exhibit host preferences). Both have indurate seeds requiring scarification to germinate. Both lack normal roots. They both exhibit nastic movements, a kind of back



Figure 2. Stem tip of *C. filiformis* showing hairs.

and forth movement of the stems, and thigmotropism, the phenomenon of responding to an upright stem by twining about it. Thigmotropism is an obvious advantage for a parasitic vine looking for a host.

*Cassytha* is entirely tropical and subtropical; *Cuscuta* species are widespread in temperate and tropical regions. In the United States, *C. filiformis* occurs only in Florida, Texas, and Hawaii. Like other Lauraceae, *Cassytha* has anthers opening by flaps and a one-seeded drupe, in contrast to the larger flowers of *Cuscuta* with its anthers opening by slits and a fruit that is a capsule with three or four seeds. Lastly, dodder laurel is perennial while our *Cuscuta* species are annuals.

*Cassytha filiformis* is a mostly benign

parasite though it can, on occasion, cover fruit trees like mangoes and cause death of branches, rarely killing an entire tree. On the other hand, several *Cuscuta* species are serious pests of numerous agricultural crops.

Because of the striking homoplasy it is not surprising that *Cassytha* and *Cuscuta* are confused. I always enjoy looking in the indeterminate (specimens that cannot be identified)



Figure 3. Flowers of *C. filiformis*. Each flower is only a few mm across.

folders in the Convolvulaceae cabinets in large herbaria because invariably there will be *Cassytha*. It is possible to distinguish between the two parasitic vines by examining even a fragment of a stem. *Cassytha* has hairs (Fig. 2), whereas every *Cuscuta* I have examined is totally psilate—bald as a billiard ball.

There is only one *Cassytha* species in North America, *C. filiformis*. The greatest diversity of the genus is in Australia where about five species occur. However, *C. filiformis* is pan-tropical. I have collected it in Florida, Burkina Faso, Senegal, Namibia, and Brunei Darussalam.

In Florida, it flowers and fruits mainly during winter months but can flower and fruit at other times. The flowers are whitish-green, only a few mm across (Fig. 3).

Little is known about flower biology, I assume from their size that autogamy is likely. These develop into drupes with white flesh often with black dots. There are reports that the fruits are eaten by birds. Seeds are black and very hard (Fig. 4). I have germinated them, after scarification, by placing seeds on glass fiber filter paper in petri plates. *Cassytha filiformis* can be grown in a greenhouse but is more difficult to establish on host plants than *Cuscuta* species.

So the next time you are in balmy South Florida and assume what you see is the typical yellow mass of dodder stems smothering roadside plants—take a closer look.



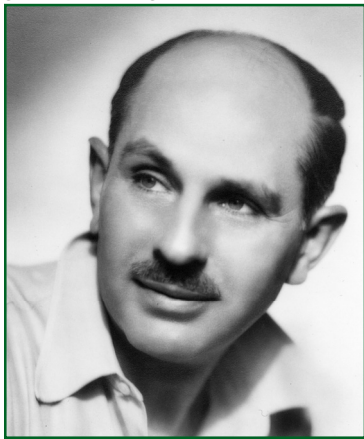
Figure 4. Seeds of *C. filiformis*. Technically, these are fruits because the white fleshy layer covering the fruit is derived from the calyx.

## BOTANICAL EXCURSIONS

**Donald Culross Peattie Redux**

By George Ellison

As you know from previous Botanical Excursions columns I am a big fan of Donald Culross Peattie and Edwin Way Teale. They were, in my opinion, the two major American nature writers of the twentieth century. By major nature writers I mean in regard to their body of work (each published numerous books on various topics during long productive careers); their popularity with the general reading public on a national level; and the consistent quality of their work.



Donald Culross Peattie

I have been collecting and reading Peattie and Teale since the late 1960s. Given the opportunity, I included both in a two-volume collection titled High Vistas: An Anthology of Nature Writing from Western North Carolina & the Great Smoky Mountains (2009 and 2011) published by the History Press in Charleston SC. And I have written profiles of both for this newsletter and other publications.

Teale passed through the Smokies region in the 1950s, when he was writing North With Spring (1951). But the Peattie family lived at Tryon NC about 30 miles south of Asheville for many years. I can't think offhand of another writer-naturalist of his rank so closely associated with the region. The only other who might be a rival in this regard would be Arthur Stupka, the longtime naturalist in Great Smoky Mountains National Park. Synchronistically, both Stupka and Peattie contributed chapters to The Great Smokies and the Blue Ridge (1943), which was edited by Roderick Peattie, Donald's brother, who was a geologist.

Teale's star has never dimmed. He won a Pulitzer Prize in 1966 for the quartet of seasonal travel books that included North With Spring and his books have remained in print. But after becoming a widely recognized almost cult-like figure during the first half of the twentieth century, Peattie's books have, for the most part, been out of print and his name recognition (except by other nature writers) all but nil.

That situation is, hopefully, about to be remedied. In January 2014 the Trinity University Press in San Antonio TX reissued nine of his books "to reintroduce the forgotten mid-20th-century naturalist and author, who was once a household name during his prime." The titles are indicative of their content: Cargoes and Harvests (1926), socioeconomic histories of tea, tobacco, potatoes, etc.; An Almanac for Moderns (1935), a series of year round daily meditations and observations; Green Laurels: The Lives and Achievements of the Great Naturalists (1936); A Book of Hours (1937), a series of meditations and observations; A Gathering of

Birds (1939), an anthology; Flowering Earth (1939); The Road of a Naturalist (1941), autobiography; Diversions of the Field (1952), animal, hunting, and fishing stories; and A Natural History of North American Trees. The last title is a conflation of two books published in the 1950's that were, respectively, devoted to eastern and western trees. It was edited by Frances Tenebaum, with an excellent biographical note by Mark Peattie, the author's son, and a critical introduction by Verlyn Klinkenborg.

"We feel that his was an important voice that vanished too soon," noted Burgin Streetman, marketing manager of Trinity University Press. "The first printing for A Natural History of North American Trees will be 4,000 copies. Print runs for the remaining eight titles vary, with all being published simultaneously in e-book format as well as print, and Flowering Earth being published solely as an e-book. The project was inspired after multiple Trinity University Press authors touted Peattie as a point of reference or an example of personal inspiration. We decided to make a commitment of the type that university presses can: to facilitate a complete rediscovery of an important thought leader who had been forgotten, but whose voice stands the test of time and should find a new audience today ... We have no doubt that new generations of fans will discover this man who belongs among the ranks of Audubon, Thoreau, and many others. The project has been implemented with the full support of David Peattie, the author's grandson, who is a book publisher in Berkeley CA."

Donald Culross Peattie (1898-1964) was born in Chicago, Illinois. In his autobiography The Road of a Naturalist, 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." Tryon didn't become his permanent "habitation"—but he spent many years there while growing up and as a young man. 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." 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)." From 1927 to 1937, he published a checklist of the "Trillium Species in North and South Carolina" and seven checklists of the "Flora of

Donald Culross Peattie continued on Page 7

# The Early Plant Gets the Habitat

by Jane K. Marlow and John B. Nelson

It has been said that very early spring flora are rarely well documented. If a plant also happens to be new to our flora and to have invasive tendencies, this could be a formula for disaster.

*Ficaria verna* (formerly known as *Ranunculus ficaria* and colloquially called Fig Buttercup or Lesser Celandine) is such a plant. A perennial native to Europe and northern



The leaves of *Ficaria verna* ssp. *verna* can be up to 4 x 4 cm. Note the tubers. (These plants were found in the Reedy River floodplain in Greenville County, SC.

Africa that has been used horticulturally in North America for over a century, it only recently has begun to aggressively naturalize outside the garden — thus, although it is on a number of invasive plant lists, it is relatively unknown to many southeastern botanists. Its biology is especially worrying.

It emerges quite early, even as early as



Each axillary bulbil can vegetatively produce a new plant.

December, before most natives. Once established, it creates extensive mats of vegetation too dense for natives to penetrate. By late May or early June, it will have vanished completely — the only indication that it was ever there may be bare soil, or bare soil scattered with small bulbils.

These bulbils are one of *Ficaria's* multiple reproductive mechanisms. Two of the five subspecies can produce axillary bulbils capable of reproducing the plant vegetatively. All subspecies have numerous underground tubers (any one of which can produce a new plant when separated from the parent plant), and seeds are said to be viable in four of the five subspecies.

Fig Buttercup thrives in mesic environments and is typically (but not always) found adjacent to rivers, streams, lakes and ponds, or in wetlands. Some of the native plants said to be at risk of displacement are *Dicentra* (Squirrel Corn and Dutchman's Breeches), *Erythronium* (Trout Lily), *Claytonia* (Spring-beauty), *Mertensia virginica* (Virginia Bluebells), *Cardamine/Dentaria* (Toothworts), *Sanguinaria canadensis* (Bloodroot) and *Trillium*.

Flowers consist of 3(-4) sepals and 7-12 (typically 8) yellow petals (some may have more). A population in full bloom resembles a green carpet with yellow polka dots. Plants consist of a basal rosette; the shiny, dark green leaves are petiolate, cordate and succulent. In the plants we have seen, the netted venation on leaf undersides was so prominent as to look almost reptilian — a character that helped spotters to distinguish isolated vegetative clumps of *Ficaria* from the vaguely similar basal leaves of *Ranunculus abortivus* (Kidney-leaved Buttercup).

Marsh Marigold (*Caltha palustris*) is often confused with Fig Buttercup. *C. palustris* is native to wetlands in the eastern US, rare in some parts of its range; its roots do not produce tubers; it will never form extensive continuous mats of vegetation; and its flowers are comprised of 5-9 yellow sepals (no petals). It is not known to exhibit invasive tendencies (reports to the contrary are likely based on mis-identification).

*F. verna* has been found in every state east of the Mississippi River except Vermont, Florida and Mississippi. It is

considered invasive in at least ten states and banned in two. It's difficult to know how much it has naturalized in the Southeast, but our suspicions are that it is much more



*Fig Buttercup's* flowers are yellow with a slightly darker center, typically with 8 petals. Remember that color photographs are available at <http://sabs.appstate.edu/chinquapin-issues>.

widespread than available range maps indicate. In early spring, we urge each of you to engage others in scouting the banks and floodplains of waterways in your area, especially those flowing through urban centers.

If you find *Ficaria*, document the site, both by sending specimens to regional herbaria and by posting your findings on EDDmaps.org (Early Detection and Distribution Mapping System). Without current range data, it is difficult to gauge the extent of the threat facing southeastern riparian zones.



Subspecies *ficariiformis* and *verna* are capable of producing axillary bulbils (arrows).

Jane K. Marlow lives in Travelers Rest, SC, and is webmaster of Name That Plant ([www.NameThatPlant.net](http://www.NameThatPlant.net).) John B. Nelson is Chief Curator of the A.C. Moore Herbarium at the University of South Carolina, Columbia.

Additional pictures and references on p. 8.

# Botanical Brainteasers

By Joe Pollard and Janie Marlow

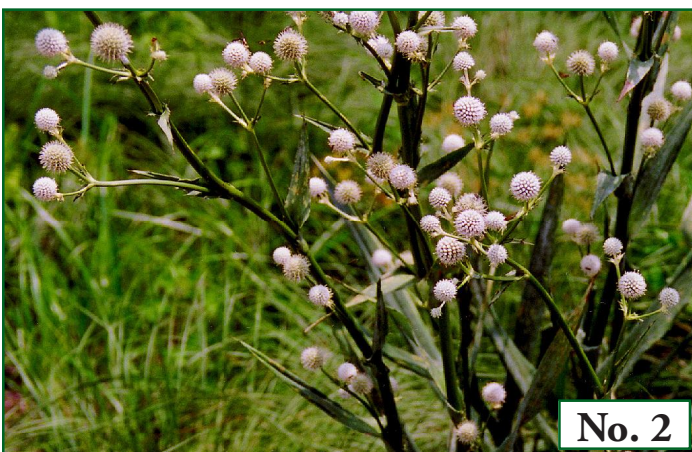
This issue of Chinquapin launches a new series of puzzles which will hopefully be entertaining and challenging, in the tradition of the “Mystery Plants” feature that Dan Pittillo has contributed for so long. For more back-story about the new feature and how it may differ from what has gone before, please read “From the Editor’s Desk” on page 2.

For starters here’s a fairly easy one – hopefully not too easy! Five plants are pictured below. All are native to the Southern Appalachian region. One of them doesn’t really belong with the other four. Which is the odd one out, and why?

Winners will be determined on a point system. Most of the points will be based on correctly answering the quiz question (which is the odd one out?), and providing a good explanation of your answer. Additional points will be given for correct identification of each of the five species. We’ll keep this going through all four issues of Volume 22, and the person with the highest point total at that point will receive a prize of the recently-published Woody Plants of Kentucky and Tennessee by Ronald Jones and Eugene Wofford.

Remember that color images can be seen at <http://sabs.appstate.edu/chinquapin-issues>. We’ll try to get them posted online by about the same time that you get your printed copy.

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Please address all correspondence regarding Botanical Brainteasers to [joe\\_pollard@att.net](mailto:joe_pollard@att.net). (That’s an underscore character between first and last names.) If you need to use snail-mail, my address is on page 2.



Donald Culross Peattie continued from Page 4

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



Peattie, his wife, and oldest son

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.

The Peatties settled permanently in Santa Barbara, California, in 1937. During his lifetime 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 a Naturalist emerges as one of the more dynamic natural history books written by an

American in any 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 never been equaled. These two selections from Peattie's publications that contain natural history descriptions of Western North Carolina indicate the range of prose styles he employed.

### The Road of a Naturalist

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...

### 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 cone 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.

Photographs courtesy of David Peattie, Berkeley, CA ([www.bookmatters.com](http://www.bookmatters.com))

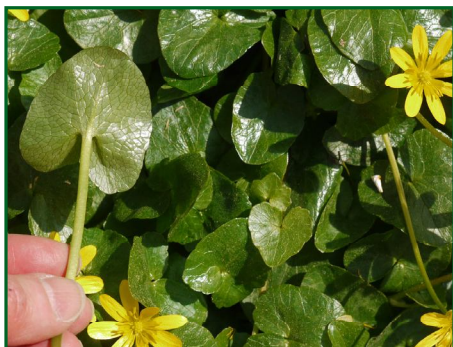
George Ellison is based in Bryson City, NC ([www.georgeellison.com](http://www.georgeellison.com))

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## Have You Seen This Invasive Plant?



*The shiny, dark green leaves are petiolate, cordate and succulent.*



*The leaves of *Ficaria verna* ssp. *ficariiformis* can be up to 7 x 7 cm; those of ssp. *chrysocephala* can be up to 8 x 9 cm. All subspecies produce underground tubers which, if broken off, can produce new plants. (These plants were found in the scour zone of an urban creek in York County, SC.)*

**Read about it on page 5.**

### References and Further Reading

- Axtell, A.F., A. DiTommaso, and A.R. Post. 2010. Lesser Celandine (*Ranunculus ficaria*): A Threat to Woodland Habitats in the Northern United States and Southern Canada. *Invasive Plant Science and Management* 2010 3:190-196.
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