Native Azalea Study Group

Like other members of our Azalea Chapter of the American Rhododendron Society, I have enjoyed learning about native azaleas. I have encouraged field trips to see specific species and for many years have observed two large and interesting multi-species populations in Cherokee County and Lumpkin County, Georgia. For several years, I have been studying the azalea and rhododendron literature in depth to learn more about these native species, their identification, and their history.

Alabama Azalea

Some good azalea references exist, and each has its strengths and weaknesses (see for examples, Alfred Rehder,[1] Clement Bowers,[2] Frederick Lee,[3] John Street,[4] Fred Galle,[5] Kathleen Kron,[6] and Clarence Towe[7]).

I have been and am still greatly impressed with Henry Skinner's 25,000 mile trek in 1951 in search of native azaleas.[8] I have longed for a modern Skinner expedition. He saw hundreds of thousands of plants that summer, crisscrossing and traveling up and down the eastern United States from Texas to Massachusetts, and such a study was more valuable than years and years of analyzing old, dry herbarium samples. Unfortunately, the limits at that time in our knowledge of azalea polyplody and its hybridization implications coupled with Skinner's preconceived notions of species and hybridization led him to explain too much as mere hybridization (e.g. pink-tubed *Rhododendron austrinum*, *R. colemanii*, pink *R. atlanticum*). Skinner's massive study was a strictly bloom-time study, which did not allow for analysis of winter bud characteristics. Another major problem with Skinner's study is his lack of documented results. His unpublished raw trip notes and a list of about 500 plants he sent back to Morris Arboretum are available at the University of Virginia and are, since 2005, available online.[9] As far as I know, Skinner published the one article on his search and only three other summary articles on native azalea species,[10] none of which goes into much detail about what he observed and learned on his epic journey. The detailed analyses may be in Skinner's 1952 PhD dissertation, which I have not seen.[11] To identify these apparent shortcomings in Skinner's study is not to imply that there is no value to his articles. They contain much useful native azalea information.

Piedmont Azalea

Henry Skinner conducted his search from March to August 1951. A new native azalea study would not necessarily have to be a single multi-month effort. It is the thorough study part that is important.

Native Azalea Study Group

A few months ago, when asked for suggestions to invigorate and improve our chapter, Reds Broadhead suggested we establish a native azalea study group. Wow! I received that suggestion with warm enthusiasm and have given it some serious thought.

Many possibilities exist as to how we could establish a native azalea study group and how the group would study these species. Should it be a group only within our ARS chapter? How aggressive should our research be?

Below I have put down some of my thoughts as a starting point for discussion. One will soon see that I am thinking large, creating a serious group whose projects will outlive us all. But such a vision does not mean we start out large with complex, time-consuming, and expensive projects. We first get our feet wet and learn where and how we can best contribute to the knowledge of native azaleas. Yet, early on we should lay out a framework and establish research goals that can not only guide us but suggest to others what study issues exist within this challenging group of plants.

Premises

Oconee Azalea with 'Midnight Flare' blossom for comparison

We could start with premises. I feel the following are appropriate.

! Native azaleas are most attractive. Bartram calls the Flame Azalea *(R. calendulaceum*) "the most gay and brilliant flowering shrub yet known." Frederick Pursh calls the Smooth Azalea *(R. arborescens*) "the finest ornamental shrub I know," and says the Flame Azalea is "without exception the handsomest shrub in North America."

Ralph Waldo Emerson praised the Rhodora *(R. canadense*):

> If the sages ask thee why
> This charm is wasted on the earth and sky,
> Tell them, dear, if eyes were made for seeing,
> Then Beauty is its own excuse for being.

William R. Van Dersal says,

> ... rhododendrons, azaleas, and Kalmia–the Mountain Laurel–must come first among American shrubs. No list of the 'ten best' came from any part of the country where these plants occur without at least one and usually several species being listed.

Native Azalea Study Group

Frederick P. Lee in speaking of both deciduous and evergreen azaleas says,

> The infinite charms of variety and beauty belong to the azalea. From all the plants of the past, there have evolved few flowering shrubs offering more facets of loveliness and, wisely selected, greater adaptability to diverse climatic conditions than the azaleas. This is no inconsiderable claim when we realize the tiny niche that the seventy or so species occupy in the evolution of the greater number, perhaps 225 thousand of present-day species of other flowering plants. Yet this is a justifiable claim.

! Native azaleas are underappreciated in America. They are more popular, and have been for hundreds of years, in Great Britain where they are not native.

! Some major gardens and arboretums for financial or other reasons have lost scholarly interest in native azaleas.

! Native azaleas are biologically linked and placed within the *Rhododendron* genus, a large and variable group, containing deciduous, evergreen, and in between plants; found from arctic regions to the tropics; from sea level up to 19,000 feet; from small ground covers to trees 80 feet tall; with leaves from a quarter of an inch to 3 feet in length; and containing two biologically incompatible groups, those with scales on the leaves (lepidotes) and those without scales (elepidotes).

Flame Azalea

! The concept of species is a subjective one, not an exact science. Groups of plants do not always have distinct boundaries. When are two similar groups of plants different enough to be two different species? There will always be disagreements among botanists and horticulturists over what should be and not be a species of native azalea.

! Native azaleas are particularly difficult to categorize. Species characteristics overlap, and thus many species are ill defined. Contradictory descriptions exist in published literature. Given a chance, many species readily hybridize with other species.

! Some subspecies distinctions are horticulturally valuable. Lumping such variations for purely botanical nomenclature reasons into a single species without being explicitly identified as a variety or form makes horticultural efforts difficult. Important characteristics of sub groups are merged and blurred within the wide variability of the overall species and often lost sight of by horticulturists and nurserymen following the

merged classifications, no longer referenced as distinct botanical varieties or forms.

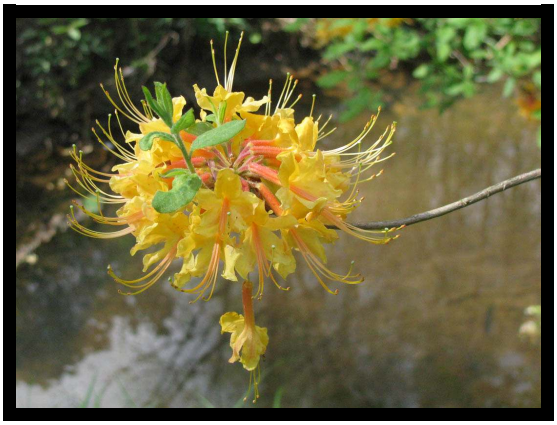
! Field research is invaluable. A limited number of herbarium specimens cannot replace seeing and systematically analyzing thousands of plants in the wild, observing the typical and the range of variation.

! With dried herbarium specimens, which have been the major tool of taxonomists in classifying plants, morphological analysis is limited. Many herbarium specimens have been misidentified.

! Modern digital photography can provide high quality morphological evidence.

! Modern taxonomic methods including chemical and DNA analyses can increase our understanding of these plants and aid in classification.

! The study group should be more in depth than just to see the pretty flowers.



Florida Pinxter Azalea

! We should learn from other study groups, not reinvent the wheel, nor make the same mistakes.

Natural Hybrid (triploid)

! The primary emphasis of the study group should be on species and natural hybrids.

! The group should collect and analyze plant material with an open mind as to what species a plant specimen belongs to.

! Mysteries will always remain. The study of native azaleas will never be complete.

! Study results must be documented and available.

Organization

There are some organizational issues we ought to address early on.

What is the mission of the group?

Should it be within the auspices of our chapter?

Natural Hybrid (triploid)

What should be the scope of membership? Should it extend outside our chapter where quite a few experts can be found?

Should we have dues? There will certainly be some group expenses.

What officers, committees, and project teams do we need?

How will we communicate and share information? Communication includes consideration of meetings/conferences, discussion forum, blog, FaceBook, web site, etc.

Will the study scope include literature research, questionnaires & interviews, lab studies, horticultural experiments, as well as field research?

We need to think about how we disseminate our plans and results from our research.

In the longer term, we need to consider incorporation, 501 (c) 3 status, and grants for research projects.

Possible Research Areas

One of the early tasks should be to identify candidate research areas and specific projects. Annually the list could be amended and re-prioritized for the upcoming year. Possible research areas include

Identification

This area could involve multiple projects of literature research, winter bud analysis, leaf analysis, chemical studies, DNA studies, fragrance, flowering sequences, color within species, etc. An identification guide could be one product.

Swamp Azalea ‘Pink Mist’

Distribution

The current state of distribution knowledge is fraught with probable misinformation. Studies could improve our natural distribution knowledge.

Habitats

More precise data can be collected on where native azaleas prefer to reside. Detailed site studies similar to Dr. Charles Horn's work at Newberry College would be useful.[12]

Natural Hybridization

Biologists and horticulturists differ as to how much natural interbreeding occurs. Hybridization studies could identify hybrid swarms and help determine how prevalent hybridization is and what are factors encouraging and discouraging natural hybridization.

Ploidy

Recent research into gene structure of native azalea species has greatly changed our understanding of species and potential hybridization. More understanding in how tetraploids and triploids exist in a world of predominantly diploid species is needed.

Plumleaf Azalea

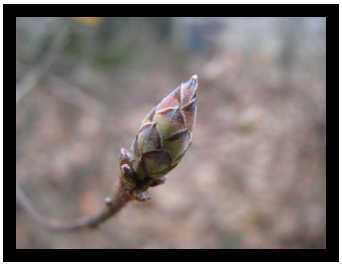
Preserving Gene Pool of Outstanding Clones

Research could identify and document outstanding clones from the average mass and establish of means of dissemination to ensure their long-term survival.

Other important research areas may exist. Hundreds of projects could be identified. Some

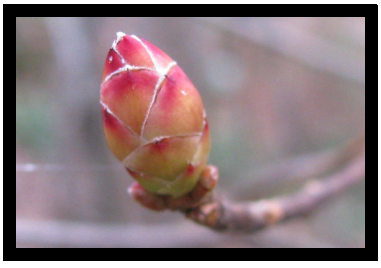
projects may involve more than one research area. Because of the potentially large number of projects, periodic prioritization will be necessary; however, a thorough list of potential candidates is valuable for future consideration by our group and other researchers. To begin suggestions, a few possible projects are listed below. Many more than these few examples can be identified. Some are described as questions to be addressed. Many would be multi-year projects. Scope, goals, and detailed objectives should be established for each project.

1. Analyze the *canescens–periclymenoides–prinophyllum* complex.
2. Analyze the large *viscosum* complex.
3. Should the pink tetraploid of the Florida panhandle be a new species?
4. Is winter bud analysis useful in identification?
5. Can *calendulaceum* be pink?
6. What affects flower color shifts and color changes as corollas mature?
7. How conflicting are published species identifications and keys? What is incorrect?
8. Develop a complete identification, description, and comparison guide, written in as simple terms as possible.
9. What is the correct distribution of the various species?
10. Were there ever native *calendulaceum* in New York?
11. What is the southern range of *vaseyi*?
12. What is the range of *flammeum*?
13. What is the evidence of native azaleas in the outlying states of Texas, Oklahoma, Missouri, Illinois, Kentucky, and Ohio?
14. Are *prunifolium* in other canyons near Providence Canyon?
15. What are the geographical limits in performance (e.g., hardiness, heat tolerance) for each species?
16. Where are species sympatric (i.e., where do species overlap in geographic distribution)?
17. What are the specific differences and similarities in habitat among the species and varieties? This can be broken into multiple species-by-species projects.
18. How can one tell a hybrid from a species? Can hybridization be measured?
19. How prevalent are natural hybrids?
20. Investigate natural *calendulaceum* hybrids.
21. Can a native azalea diploid x tetraploid cross produce diploid offspring? triploid offspring? tetraploid offspring?
22. What is the source of the large number of Breedlove triploids?
23. Why is *occidentale* difficult to grow in the east?
24. What varieties and forms below species level are worth noting and propagating?
25. Identify outstanding native azalea clones that should be preserved.



Hammocksweet bud

Piedmont Azalea bud



Pinxterbloom bud

Discussion Needed

So, now discussion is needed. I need to know who is interested in such a study group and whether you think any of the ideas mentioned above are off base. You cannot hurt my feelings with constructive criticism. Just don't insult my mother. Please contact me at candrews@mindspring.com

References

1. Rehder, Alfred. (1921). The azaleas of North America. in *A monograph of azaleas: Rhododendron subgenus anthodendron*, by Ernest Henry Wilson and Alfred Rehder, publication of the Arnold Arboretum, No. 9, 107-196. Cambridge, MA: The University Press. (reprinted 1977 Sakonett, RI: Theophrastus Publishers). This monograph is in two parts. Wilson wrote on azaleas of the Old World, and Rehder on North American azaleas. Written for botanists and those educated in plants, this technical treatise was the most detailed analysis of North American azaleas at the time.

2. Bowers, Clement Gray. (1936). *Rhododendrons and azaleas: Their origins, cultivation and development.* New York: MacMillan Company, 549 pp. (second edition 1960, 525 pp). Contains an early exposition of native azaleas from a rhododendron expert, but one who has a strong bias toward the northeastern United States where hardiness is number one priority. No significant changes in descriptions of native species in second edition.

3. Lee, Frederic P. (1958). *The azalea book*. Princeton, NJ: D. Van Nostrand Company, 324 pp. (second edition 1965, 435 pp). Based on the smaller American Horticulture Society's 1952 *The Azalea Handbook*, 148 pp. Thorough treatment of both deciduous (which was contributed in part by Henry Skinner) and evergreen azaleas. No significant changes in descriptions of native species in second edition.

4. Street, Frederick. (1959). *Azaleas*. London: Cassel & Company, 278 pp. First book published in Great Britain dedicated to the subject of azaleas. Street provides many interesting details of the history of American azaleas brought to Europe, almost none on identification of the various species.

5. Galle, Fred C. (1987). *Azaleas* (revised ed.). Portland, OR: Timber Press (1995 printing), 519 pp. (original edition 1985, 486 pp). Much of Lee's text is in Galle's book, but updated, and Galle adds much information on cultivars, clones, and hybridization. Galle's revised edition corrects typographical errors, but also contains added material.

6. Kron, Kathleen A. (1993). A revision of *rhododendron* section *pentanthera*. in *Edinburgh Journal of Botany*, 50(3): 249-365. Based on her PhD thesis, this highly technical treatise gives Kron's analysis of the primary group of deciduous azaleas and her opinion of which are species and which should be considered under other species as part of their variability.

7. Towe, L. Clarence. (2004). *American azaleas*. Portland, OR: Timber Press. 146 pp. This delightful little book records Towe's extensive experience in searching for, collecting, propagating, and growing azaleas. From his experience, he give suggestions on how to improve azaleas through hybridization. Towe discusses the species, including the recently declared *R. eastmanii*, but not with detailed descriptions or histories. Towe's wisdom includes this valuable proverb on hybrids and species identification: "if it looks like a duck, it is probably mostly duck."

8. Skinner, Henry T. (1955). In search of native azaleas. in *Morris Arboretum Bulletin* 6(1): 3-10; 6(2): 15-22. A description of his six-months journey in 1951.

9. McDonald, Sandra. (2005). "In Search of Native Azaleas: Henry Skinner's 1951 Southern Collecting Trip." <http://etext.lib.virginia.edu/collections/projects/rhodo/skinner/> . Once on the web page, click on the Browse button to access Skinner's trip records, trip routes notes, collection list, and the 1955 *Morris Arboretum Bulletin* article.

10. (1) Skinner, Henry T. (1959). An evaluation of our eastern wild azaleas. in *Morris Arboretum Bulletin* 22: 80-81, 106; (2) Skinner, Henry T. (1961). Classification of the native American azaleas. in *Proceedings International Rhododendron Conference.* May 11-14, Portland, OR, 81-86, American Rhododendron Society; (3) Skinner, Henry T. (1979). America's native azaleas. in *Handbook on rhododendrons and their relatives.* Manual #66, 30-35. Brooklyn Botanic Garden.

11. Skinner, Henry T. (1952). Character patterns in the early flowering azaleas of the southern United States. PhD dissertation, University of Pennsylvania.

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12. Horn, Charles N. (2003). Distribution and ecological preference of *rhododendron eastmanii* Kron & Creel (May-white Azalea) in South Carolina. *Castanea* 70(1): 1-12. Describes the 23 sites identified as of 2003.