AtlanticRhodo

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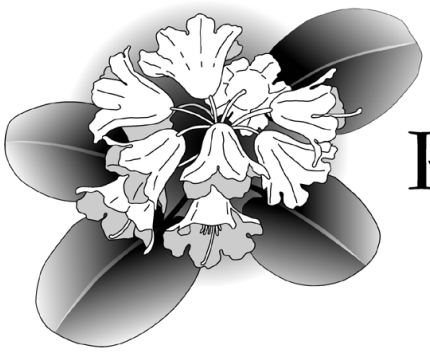

Atlantic Rhododendron & Horticultural Society

Our Mission

ARHS supports and promotes the development and exchange of expertise and material relating to the practice of creating and maintaining year-round garden landscapes featuring rhododendrons and other plants.

Inside this Issue

Photos in articles are by the authors, unless otherwise identified.

Membership

Atlantic Rhododendron & Horticultural Society.

The current membership period is September 1, 2020 to August 31, 2021. The membership fee is $20.00 if paid between September 1, 2020 and November 30, 2020, and $30.00 after Nov. 30, 2020. A membership form is included with this issue. For benefits and to download a membership form see ARHS website **www.atlanticrhodo.org**

American Rhododendron Society: ARHS is a chapter in District 12 of the American Rhododendron Society.
Combined ARHS and ARS membership cost is $74.00 Canadian. A membership form is included in this issue. For benefits and to download a membership form see **www.atlanticrhodo.org**

Cheques, made payable to Atlantic Rhododendron & Horticultural Society, should be sent to **Rebecca Lancaster, 22 Walton Dr. Halifax, NS B3N 1E4**

AtlanticRhodo is the Newsletter of the Atlantic Rhododendron & Horticultural Society. We welcome your comments, suggestions, articles, photos and other material for publication. Send all material to the editor.

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Editor: *John Brett*
7 Halls Rd.
Halifax,NS, B3P1P4
902-999-3292
jbrett@eastlink.ca

Cover Photo: *R. carolinianum*, like many rhodos, contributes to autumn colour in the garden . [Photo Sterling Levy]

Calendar of Events

The Nova Scotia Museum auditorium is not open this fall/winter season due to Covid 19 restrictions. We plan to hold meetings and deliver our programs via the Zoom platform until we are again able to meet in person.

Sept. 12 Saturday – **A Halifax Garden Tour**, 1:00pm – 4:30pm. Ruth Jackson, Hallie Watson, and Jay Wesley: These three notable Halifax gardeners invite us into their beautiful and very different gardens.

Oct. 6 Zoom Presentation: **The Autumn Garden** by Dennis Crouse. A look at planting and garden design, with an emphasis on the fall landscape. Dennis demonstrates how he uses the native surroundings to create beautiful effects in his own garden.

Oct. 17 **Celebrating the Kentville Rhododendron Interpretive Panels**: A field trip to celebrate the recent completion and installation of the panels. Trip cancelled due to the difficulty of complying with Covid 19 restrictions.

Nov. 3 **Annual General Meeting** by Zoom. 7:30pm, followed by a Zoom presentation at 8:00pm, **Bogs and Barrens of Nova Scotia,** by David Patriquin. David will highlight some great places to see native plant habitats, as well as offering a tour of his garden, with advice on growing ericaceous plants.

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Dec. 1 Zoom meeting: **Christmas party** and presentation of members' photos. A maximum of 6 photos per member should be sent no less two days in advance of the meeting to Rebecca Lancaster (arhsmembership@gmail.com), as she will assemble them for the zoom meeting.

2021

Jan. 5 Zoom meeting: **The Dunedin Botanical Garden of New Zealand** by Todd Boland.
We'll take a break from winter and join Todd for a visit to this very impressive collection, featuring a vast range of Rhododendrons, a spectacular rock garden, South African and native New Zealand gardens, and more. There will be stunning photographs at the peak time for Rhododendron bloom. Todd Boland is Chief Horticulturalist at the MUN Botanical Garden. He is also a founding member of the Newfoundland Wildflower Society and current chair of the Newfoundland Rock Garden Society.

Feb 2 Zoom meeting or in-person presentation at the Nova Scotia Museum auditorium, if available. Local speaker. Topic to be determined.

Thank you for avoiding the use of perfumes and scented products when you come to ARHS events.

Welcome

A very warm welcome to our new members who have joined ARHS since May

Emily Black	**Halifax**
Lynn Kelley-Cooper	**Halifax**
Todd Corey	
Andria Davidge	**Halifax**
Pamela and Doug MacLean	**Bedford**
Bill Murray	**Oakfield**
Matthew Stormes	**Halifax**
Daryl Watson	**Alberta**

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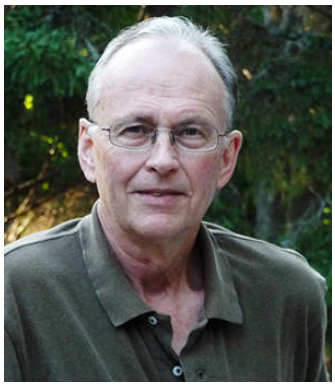
Are your dues paid up to date? *Our records show that some members are not. If you are a local ARHS member please consider renewing as a dual member of both the ARHS and ARS (American Rhododendron Society). This gives access to the ARS Journal, a full colour magazine published quarterly, as well as access to the ARS seed exchange, ARS conventions, and other benefits. Please see page 2 for information on payment methods. And our website:* http://atlanticrhodo.org/about-us/membership-info/ *A membership form is included in this Newsletter.*

THE PRESIDENT'S COLUMN

by John Brett



Since not everyone can be present at our November 3rd Annual General Meeting I will devote this column to an abbreviated summary of the past year's activities.

Restrictions related to Covid 19 have certainly had an effect . But to me, it is surprising how much we have accomplished in spite of the impediments. The credit for this goes to our extraordinary volunteers, who have figured out not just adequate but in some cases outstanding alternatives to the usual ways we operate. I am truly grateful for their creativity and their determination. And though I have said it before, I will say it again: It is our volunteers that make the ARHS truly remarkable. Here are three examples.

1. Though Covid 19 closed the Nova Scotia Museum and caused the cancellation of our programming last spring, we still managed to put on our members' spring plant sale. In addition to all the usual work, this required developing social distancing protocols and recruiting extra volunteers to help with order processing, payments and pickups. And from everything I know the day was a great success. Lynn Rotin led this effort, backed up by Sandy Dumaresq and Rebecca Lancaster.

2. The ARS 2021 Convention planning committee has continued with its work, using zoom meetings, emails and phone calls to shape what will be the first-ever hybrid ARS convention, which will include both virtual and in-person events. You can read more about this in Jim Sharpe's convention update, to be found in this issue. Our convention co-chairs are Jim Sharpe and Rebecca Lancaster, again backed up by a cadre of dedicated volunteers.

3. With our visiting speakers unable to enter the province, we had to reconstruct our fall program. To replace our September meeting, and on relatively short notice, our programmers organised a fall tour of three remarkable Halifax gardens. For October we presented our first ever zoom presentation with Dennis Crouse, complete with PowerPoint images and text. Thank you Dennis for being our trial speaker and testing out this new technology. A special thanks also to Lynn Rotin, to programmers Jim Sharpe and Bob Howard, and to Rebecca Lancaster for getting us up and running on the Zoom platform.

Overseeing all of our activities (as well as volunteering for many of them) is the Board of Directors. We met three times this past year, in person, and had to cancel just one meeting scheduled for early April. Yet we accomplished a lot, thanks to phone and email communications. For long time members, one notable milestone was the retiring of the RSC (Rhododendron Society of Canada) name. This was agreed to between the ARS Niagara chapter and the ARHS (sadly, the third chapter in district 12, the Toronto chapter, is no longer active). The RSC name has not been used by us in a long time so this change has no effect on our imprimatur. We will continue to be, as before, the Atlantic Rhododendron and Horticultural Society, also known as the American Rhododendron Society, District 12, Atlantic chapter.

Currently we have 93 paid-up members of which 9 are new, and 24 are joint ARS/ARHS members. This is down considerably from the 168 members we counted last year, and we believe this is a consequence of the Covid 19 scare, since monthly in-person meetings have been cancelled and attendance at our public events is limited. So these opportunities to renew have not been there. If you are not paid-up I urge you to do so now. A membership form is included in this newsletter.

Looking ahead, I see great opportunities for the ARHS. We have always been a significant presence on the garden scene in Atlantic Canada, the role we play in our various communities going well beyond the improvements we make in our own gardens. Hosting the ARS 2021 Convention in Wolfville, this June, will further strengthen our connections with fellow rhodo enthusiasts across the continent and beyond. Among the long term challenges we face, perhaps the greatest is - as it is for many garden societies - the recruiting of a new, younger generation of aspiring ornamental gardeners and plants-people. To meet this challenge we need more and better information about how to make our offerings attractive to this cohort. Our future depends on it.

This will be the last of my President's columns. After four years as president I will be stepping down as of our November 3 AGM, though I will continue as a member at large on the board, and with my other ARHS responsibilities. It's been a great learning experience for me (my previous administrative experience being virtually non-existent) and a privilege to represent what I firmly believe is the most important amateur horticultural society in Atlantic Canada. I have had great support from my fellow board members and from the other volunteers who head up our committees. To all of them, I am deeply grateful. As a parting thought let me paraphrase my rhodo-mentor, the late Dick Steele, who often said that better gardens make for better communities and better citizens. This thought is well worth keeping in mind when we consider our larger purpose as a society, and what we aspire to accomplish in the future. ¤

ARS 2021 Spring Convention Update

by Jim Sharpe, ARS Convention Co-Chair

View across the valley to Cape Blomidon,NS. [Photo John Brett]

This coming June we will be hosting **Rhododendrons Down East**, aka the **American Rhododendron Society 2021 Spring Convention**, right here in Nova Scotia. This is the biggest North American event in a Rhodo-lover's world, and this is the first time it has ever been hosted in Atlantic Canada. It is also the first convention to combine live and virtual events, a necessity brought on by Covid 19 travel restrictions. So the members of our convention planning committee are truly pioneers, and they are working extra hard on this complex undertaking to assure its success.

What an exciting opportunity for all of us to come together with fellow plant enthusiasts from across the continent, Europe and beyond, to immerse ourselves in all things Rhododendron. We will be offering all presentations, garden tours and networking opportunities on-line to anyone who can access the internet! For those of us who can travel in-person to the Old Orchard Inn in Wolfville there will be live presentations, garden tours and a plant sale featuring rare and unusual rhodos and companion plants propagated especially for the event.

Our convention presentations will focus on rhododendron culture in Atlantic Canada and around the North Atlantic Rim. Among our notable convention presenters are: Ken Cox, from Glendoick Nursery in Scotland; Joe Bruso, a New England rhodo breeder from Massachusetts; and Todd Boland from Newfoundland's Memorial University Botanical Garden. The Convention will open with an "Introduction to Mi'kma'ki" by Gerald Gloade, Mi'kmaw naturalist, educator and story-teller, who will illuminate a traditional Mi'kmaw perspective on the natural history of Atlantic Canada. Garden tours, both virtual and in-person, will include the Kentville Research Centre, The Harriet Irving Botanical Gardens at Acadia University, the Annapolis Valley Historic Gardens, the Peggy's Cove barrens, as well as many great private gardens.

Networking opportunities will include the Breeder's Roundtable, where participants gather to hear about and to discuss the latest trends in rhodo breeding; the ARS Next Generation Project, a Niagara chapter initiative aimed at encouraging a younger demographic to get involved with rhododendrons and the ARS; and social events featuring farm produce, seafood, beer, cider and wine from our local producers.

To make of all of this happen we must have volunteers to help with promotion, sponsorship and with all the various kinds of hospitality services that will assure a great experience for our in-person attendees. And if you have experience planning virtual meetings and conferences, we need you! So if you think you can help, even if you're not sure how, please get in touch with me, Jim Sharpe, email: sharpe@ns.sympatico.ca , or with our volunteer coordinator, Lynn Rotin, email: lynnrotin@gmail.com.

Thanks to all the members of the ARS 2021 Planning Committee: John Brett for the plant sale, Rebecca Lancaster as co-chair for the Convention, and Sheila Stevenson, Jamie Ellison and Bob Howard for garden tours.

We expect to have the Convention website and registration available soon, and we'll let you know when we do. ¤

The Garden at Shamper's Bluff

by Freeman Patterson, Shamper's Bluff, Kingston, New Brunswick

(*Editor's note: Departing from our usual format, Freeman's essay is followed by a photo album of his beautiful garden images, made even more valuable by his informative captions. All photos are by the author.*)

To help you understand the evolution of my rhododendron and azalea garden, I want to provide some context.

First, nearly everybody in ARHS knows that I had two liver transplants in January 2000. As I was in an induced coma for six weeks I had to learn how to do everything all over again, beginning with holding my neck and head straight and then gradually how to walk. My full recovery took about three years.

Second, when I was finally eased out of the coma my transplant surgeon told me that I had had less than one per cent chance of surviving the second operation – that I'd won Lotto 649 five weeks in a row. Knowing this was life-altering in many ways, not least of which was gaining a sense of liberation, a freedom to create and do things that really matter to me. High on that list was, finally, to have a truly happy childhood. One thing I'd always dreamed of as a child, but was denied, was the opportunity to create a huge, beautiful flower garden, one that was integrated in a loose sort of way with native plants of all sorts, a place where I could be fully and joyfully present. With the almost daily dedication of a hardworking neighbour and friend, Joanne Nutter, I slowly began to garden again, something I'd done to some degree all my life, and we gardened together five days a week for the next fifteen years.

So, in the spring of 2004 in an area of open woods near my house I planted three rhododendrons and in another patch in 2007 three Northern Lights azaleas. Those tiny beginnings had expanded by 2020 to occupy three acres of woodland "rooms," containing approximately 1500 rhodos and azaleas (more than 150 varieties of the first and about 50 of the second). All the hard work of cutting down, stacking, and burning dead trees and tangles of bushes, digging, planting, mulching, watering, and the resulting beauty have contributed enormously to my excellent physical and emotional health and fitness.

When Joanne finally retired five years ago her place was taken on a part-time basis by Joel MacPherson, a tall guy in his early 40s, who can pick up and carry 300 pounds as easily as most of us can carry an apple. Joel has a background in forestry and horticulture and knows all about chain saws, tree-climbing equipment, etc. and exudes a really aesthetic imagination. His wife Tanya often works in the garden too.

During the last 10 years other people have also been especially helpful: ARHS member Harold Popma of Sackville, N.B. (for his expertise and gifts of young plants from time to time,) Jack Looye (from whom I acquired a range of hybrid rhododendrons unavailable in local nurseries,) and Dick Steele (more accurately his nephew Michael, who for several years was the caretaker of Tyng Hill, a Steele family property just three km. from me; Michael gave me permission to move to my garden about 100 azaleas of varying ages that Dick was cold-testing here in NB). Michael died a couple of years ago and the property has been neglected since, but by then Joanne and I had moved every azalea and transplanted every layered rhododendron branch that I could find in the encroaching forest. And I've had the generous support of Jeannie and Rob Northrup of nearby Hampton, who supply me with all the horse-manure compost I need. Finally, deepest thanks to Dr. Don Craig, who invited me to his garden at peak bloom in 2008 and encouraged me until his death.

Because the several parts of the garden vary in physical orientation and wind protection, I am working in plant hardiness zones from 4b to 6a, with 5a and 5b being the most common. The coldest areas are among the sunniest, so I've planted there mostly hardy azaleas (many now 8 to 9 feet tall) and a few very hardy rhodos, such as Ingrid Mehlquist, Ken Janeck, several Finnish cultivars, and two or three of the iron-clad Catawbiense varieties. My one Teddy Bear (6a) is burgeoning in a 5b area and, like most rhodos, it seems hardier once established. My five or six Capistranos and five White Blue Peters, both favourites, are thriving in all zones except 4b, as are numerous other cultivars.

The rhodos and azaleas share space with several species of native ferns, including large stands of the beautiful hay-scented fern *(Dennstaedtia puntilobula),* clumps of lady ferns *(Athyrium filix-femina*) and the three "biggies" – the interrupted *(Claytosmunda claytoniana),* the cinnamon *(Osmundastruam cinnamomeum)* , and the edible ostrich ferns (*Matteuccia struthlopteris.)* There are also swaths of wild blueberries *(Vaccinium angustifolium)* and even more extensive sweeps of bunchberries *(Cornus canadensis),* also the native azalea *(Rhododendron canadense),* marsh marigolds *(Caltha palustris)* in a couple of boggy spots, jacks-in-the-pulpit *(Arisaema triphyllum),* fireweed *(Epilobium angustifolium),* and many, many more native plants. Providing both shade and enormous aesthetic presence are numerous white birch and white cedar, the

most common trees, but also several species of maple, aspen, bilberry *(Amelanchier spp.)*, spruce, and balsam fir. I've also planted a few non-native species, my favourite being the Himalayan blue poppy *(Mecanopsis betanicifolia).*

In the winter I have to guard against two natural predators – deer (who love the flowers buds of the rhodos) and ruffed grouse (who dine on flower buds of azaleas). Because I'm relatively isolated the local deer herd is not habituated to the presence of human activity, so I turn on three radios in the garden at night (always choosing a music station and both English and French CBC; in New Brunswick the deer are bilingual). During the daytime two dogs are quite effective at "putting the boots" to deer, but I also have a winter maze of ropes with aluminum pie plates that bang in the slightest breeze. The only effective grouse repellent I've found is strips of brilliantly reflective mylar tape clothes-pinned to ropes and branches in the areas where azaleas are concentrated. However, I also make sure that no grouse nest in the garden, thus developing a sense of propriety.

Two years ago I finally woke up to the fact that, having the acid soil that rhododendrons love, I could safely use only the mulch that nature provides me. After all, it's been helping to keep the soil acid here for a very long time. So I started raking up rotting deciduous leaves and throwing them into shaded heaps along with all sorts of dead grasses and non-woody plants removed from hither and yon. I can use the mix by the following spring, as sufficient rotting has occurred even without turning the piles. Other times I go ferreting for sphagnum moss in a huge nearby bog. These mulches of organic native materials beat the cost of buying and trucking commercial mulch and my plants are just as happy!

Also I made one smart move near the beginning that I continue to practise. Often Joanne and I "opened up" or cleared a new area in the winter and the place was still full of stumps and roots in spring, when I was very anxious to plant. As it was virtually impossible to dig up the soil because of the network of roots, I had to set the plants on top of the ground and build around them. On every occasion possible I'd set a plant against a stump, preferably in the lee of a prevailing wind, knowing that as the root rotted it would suck up and retain moisture that watered the plant. Occasionally I was able to plant a rhododendron in a stump and never had to put mulch around it. A lovely Janet Blair will testify to that. This year when I created another rhododendron room of 70 widely-spaced plants and a new open bed of 25 azaleas, I kept these and other lessons gained from experience very much in mind.

During the summer of 2019 the garden received regular good rainfall and the resulting root development paid off with fabulous spring growth of both rhodos and azaleas in 2020. This summer, however, has been the driest by far since I began keeping precipitation records 14 years ago and I've been hand watering every plant five years old or younger every fourth day and all the other plants, except the most mature, about once a week. They all are looking good and have an extremely heavy flower bud set for 2021. Now, I'll just have to see what winter brings.

Finally, I'd like to say that I'm not a hybridizer. Although I minored in botany at Acadia (several centuries ago), I'm more interested in the aesthetics of gardening than the science. Although I deeply appreciate the huge variety of cultivars that hybridizers, especially Jack Looye, but also Harold Popma and Sandy Burnett, have created and provided me, I regard my challenge and my privilege to be the continuing endeavour of creating a magnificent garden and, if possible, making certain that the beauty will survive me.

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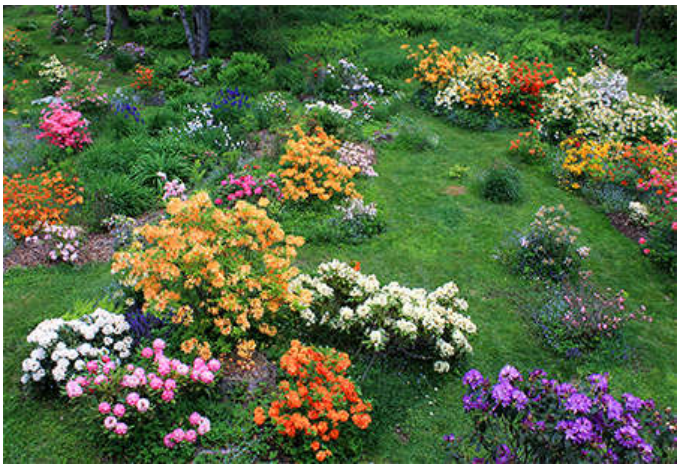
The two images below show an area of my garden under construction in 2012. The first shows an area of dying forest that was cleared in the winter and is being planted in the spring. Because of a heavy network of underlying roots I sat the rhododendrons on the ground surface and built up the soil-mix around each one. The tree stumps were left deliberately high to use as seats and to provide wind shelter for young plants and, as they rotted, to retain moisture the plants could use. The second photo is of an adjacent area planted with azaleas.

The next two photos show approximately the same adjacent areas in 2019. Together they represent about 15-20% of the total garden. All the plants appear shortened due to the aerial perspective.



Three years ago I moved a fairly large, scraggily *R.* 'Pink Roseum' from a place with insufficient light to a new location next to the rotting remains of an old birch. It began to thrive rapidly and next year set many flower buds. Birch rots quickly and makes superb compost. This rhodo just becomes happier and happier.

The native azalea, *Rhododendron canadense*, established itself on several decaying humps of ancient cinnamon ferns in the huge woodland bog near one edge of my garden, so I concluded that if it could succeed there, so could any of the Northern Lights azalea hybrids. This is *R.* 'Rosy Lights'.

A young *R.* 'Minas Grand Pré' grows in the shelter of a huge decaying spruce.

As I pass by trusses of *R.* 'Hong Kong', I can peer through the woods to another room of ferns and rhododendrons.

Three years ago my birthday present to myself was this small second story balcony on the back of my barn. Great for viewing part of my garden with a morning coffee or an evening glass of wine.

My four *R.* 'White Blue Peter' are hardy, reliable bloomers. This cultivar came from Jack Looye and is not to be confused with either *R.* 'Blue Peter' or *R.* 'White Peter' (a Gus Mehlquist hybrid).

The flowering of the abundant *Cornus canadensis* coincides with the peak of the rhododendron and azalea bloom. The first (left) of the two pictures below shows some trusses of a large *R.* 'Catawbiense Album' and the second shows *R.* 'Blue Peter' in bloom.

The lepidote, *R.* 'Olga', with the native *R. canadense* in late May or early June.

The yellow *R.* 'Capistrano' blooms prodigiously from an early age. I have five scattered throughout the garden.

R. 'Pieter Tigerstedt' (large white bush), *R.* 'Skookum' (bright red, central), *R.'* Besse Howells' (soft red, foreground), *R.* 'Haaga' (pink, upper left), *R.* 'Florence Parks' (rich purple, right).

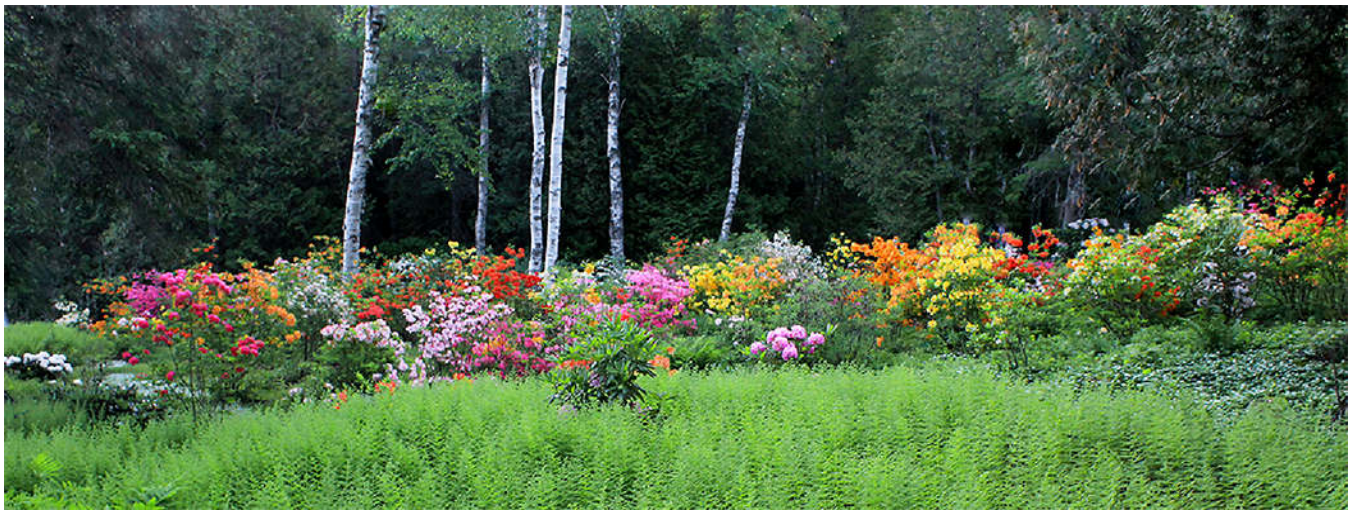
R. 'Boule de Neige' (foreground), *R.* 'Besse Howells' and *R.* 'Haaga' (above left), and azaleas, with my barn in the mist.

R. 'Walter Ostrom', another reliable bloomer.

R. 'Ingrid Mehlquist' is a low-growing, super hardy, floriferous rhododendron. The red buds open to rich pink, then fade gradually to white over nearly a month in bloom. I have at least ten.

R. 'Eruption' is always a "show stopper" ! I have two and am layering branches of one.

The brilliant orange azalea is a Dick Steele hybrid, the large red rhodo is *R.* 'Nova Zembla', and the large lavender rhodo is actually a *R.* 'Pink Roseum' or *R.* 'English Roseum' (colour rendition changed by light from a blue, blue sky.)



This is part of my largest azalea area. Many of these plants are 8-9 feet (2 metres or more) tall and thrive in this 4b zone, where winter north-west winds often blow fiercely. Rhodos such as *R.* 'Ingrid Mehlquist', *R.* 'Crete', *R.* 'Ken Janeck', and all the Finnish cultivars, except *R.* 'Hellikki', do well here too.

Small *R.* 'Henry's Red' rhodo (foreground), azaleas, and forget-me-nots *(My*osotis sp.).

The native azalea, *Rhododendron canadense*, is abundant in open fields below my house, where many summers you can pick wild blueberries (*Vaccinium angustifolium)* to your heart's content.

Himalayan blue poppy (*Mecanopsis betanicifolia)* grows a metre tall in deep, rich loam among azaleas.

A 2019 picture of one of the many paths that lead through the garden. The grass eventually took hold naturally with no seeding whatever. Ostrich ferns are in left foreground.

This year’s fall colour rivals the impact of spring bloom

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Growing Rhododendron Species Seed from Russia

by Michael Heim

(*Editor's note: Atlantic Rhodo thanks the author and the Journal of the American Rhododendron Society for kind permission to reprint this article. Photos are by Elena Polonskaya unless noted otherwise. Michael Heim is a professor of natural sciences at the Lac Courte Oreilles Ojibwe College, and is a member of the ARS Midwest Chapter.)*

Growing landscape of *R. redowskianum.*

Growing landscape of *R. fragrans.*

It was with a bit of trepidation that I ordered rhododendron seed online from Russia. In my experience, ordering seed internationally has been hit or miss. For instance, about fifteen years ago I sent for wild-collected seed from a company in Magadan in the Russian Far East. I live in northern Wisconsin about an hour's drive from Lake Superior, so obtaining super cold-hardy rhododendrons is obviously enticing. Imagine my disappointment when only two seedlings germinated; two other packets failed to germinate at all.

Recently when I discovered Prof-Seeds in Perm, Russia (near the Ural Mountains), the allure of super hardy rhodies with unusual horticultural merit that were shown on their website was irresistible. Though I had misgivings, based on my previous experience, I need not have worried. Prof-Seeds turned out to be very efficient and knowledgeable, with excellent customer service. The seeds arrived carefully packaged, with detailed germination instructions for each of the species, and the location where each was collected in the wild. What more could a rhodyholic ask for? Well, good germination would be nice. As you can see in the photo, to my delight, all three species germinated profusely!

So which three species did I order? *R. fragrans* (previously known as *R. adamsii,*) *R. redowskianum,* and *R. aureum* var. *hypopitys.* Here's a bit of information about each of them.

R. fragrans is found on open south-facing slopes in the subalpine zone of Siberia.

R. redowskianum forms mats on firm scree in the alpine tundra. Its flowers are truly spectacular! Native from southeastern Siberia to Sakhalin and North Korea, it is cold-hardy to at least -47° F (-44° C). This species requires a free-draining sunny site. Summers may be too hot for it even here in northern Wisconsin, although my tiny seedlings have shown no duress at 90° F (32° C). One of the nice things about getting a lot of seedlings is that variation may favor some with greater heat tolerance.

R. aureum* var. *hypopitys grows to 3.5 ft. (1 m) tall, so it's basically a robust variety of *R. aureum.* Native to eastern Russia around the shores of the Amur and Tuta Rivers in Sichote-Alinj, it is found growing in spruce/fir, rarely in larch woods. It is reportedly not in cultivation in the U.S.

It will be exciting to plant these seedlings out next spring to evaluate how they perform in various sites here in the north woods. The coldest temperature that I've experienced here is -45° F (-43° C). All three species should shrug this off with ease.

For others interested in obtaining Russian seed from Prof-Seeds, contact Elena Polonskaya, Svobody Street 102-3, Kirov, Kirov region, Russian Federation, 610002, email: issumbossy@yandex.ru. Elena is also the director of the Vyatka Ericaceae Arboretum (RF, Kirov region).

Author's Note: The tray of *R. fragrans* in the center of the seedlings photo contained an earthworm that had hitchhiked in with forest soil that I use. Evidence of its workings shows as a dark patch at the far end of the middle tray. I have since carefully flipped the tray over and liberated the stowaway, with no injury to the tough little seedlings. ¤

R. redowskianum showing foliage and flowers.

R. fragrans showing the shrub in the wild.

R. fragrans flower.

R. redowskianum flower.

R. fragrans – pink form.

R, aureum var. *hypopitys* showing the shrub in the wild.

R. aureum var. *hypopitys* flowers.

Trays of Russian seedlings germinated. [Photo by the author].

Plant communities growing in the same habitat as *R. aureum* var. *hypopitys*.

Spring-flowering Gentians and a Few Others

by Bob Howard

(*Editor's note: All photos are by the author except that of Gentiana acaulis which is courtesy of: xulescu_g, https://commons.wikimedia.org/wiki/File:Gentiana_acaulis_(34693824681).jpg#metadata*)

Gentiana X macaulayi 'Kingfisher'.

Gentiana veitchiorum

I want to encourage you to try to grow some gentians. The vivid pure blues and the romance of the high mountains are reasons enough. There are many different kinds, but I will focus on some that I grow: the spring-flowering gentians, *Gentiana acaulis, G. angustifolia* and *G. verna* 'Pyrenees'. For summer I'll highlight *G.* 'True Blue', and for later in the season the reliable *G. septemfida* var. *lagodechiana* as well as the willow gentian, *G. asclepaedia*. And then, for the fall, I'll tell you about my unrequited love affair with *G. sino-ornata*, and give a mention to *Gentiana X macaulayi* 'Kingfisher'.

Let's start with the spring-flowering gentians. There are two groups, the *acaulis* group and the *verna* group. Both are widely distributed but are generally associated with the Alps. In the *acaulis* group there is a species called *G. acaulis* (the trumpet gentian). I use the plural, 'trumpet gentians', for all the species in this group. I also grow *G. angustifolia* from this group. I cannot tell these two apart without the labels, though specialists do see differences and grant each species status. Of the plants I am describing in this article, I recommend in first place the trumpet gentian, *G. acaulis*, as having the best combination of reliability and beauty.

The trumpet gentians are easy to grow in my experience. I have an area of the rock garden with fairly rich but quickly draining soil, about two feet deep, made of 1/3 peat moss/leaf mold, 1/3 loam, and 1/3 sharp granitic gravel. Underneath that, I put a layer of well-rotted cow manure in some areas. and more sharp gravel underneath the whole area. This rock

Gentiana angustifolia

Gentian acaulis

Gentiana septemfida var. *lagodechiana*

garden wraps around a slope, north facing at one end graduating to western facing at the other, so there is some bright shade area and some direct sun area. I've tried the trumpet gentians in bright but softer north light and in the hotter western sun. They perform the same for me in these different light conditions. I water about once a week in hot, dry months. The general rule is that gentians should always have moisture at the root and bright light; think of mountain skies with glacial water melting nearby.

The *verna* group (sometimes called the spring gentians) is represented by *G. verna* 'Pyrenees' in my garden. This is a fabulous plant, flowering with little stars that radiate bright sky-blue light. Tiny, it seems more delicate, so I've had mine just in a north-facing spot, out of direct sun. I say "had" because after five years of increasing in size gradually and flowering regularly, I lost it last year. I don't know why. It just disappeared. I planted a new one which has done well this year and seems ready for the winter. I got it from Wrightman's Alpine Nursery in St. Andrew's, NB. They have a long list of gentians. Other mail order nurseries that list some gentians are Free Spirit Nursery and Fraser's Thimble Farm, both in BC.

For the summer, an upright perennial you might try is *Gentiana* 'True Blue', an easy-to-grow, reliable flowerer. It grows about 24"-30" (60cm-76cm) tall and 18"(45cm) or more wide, flowers for a long time from around late July to early September, and is deep blue, at least according to the name. However, like most plants with a "true blue" label it is really somewhat purplish. Also flowering from late summer into September is *G. septemfida* var. *lagodechiana*, sometimes called the summer gentian. I have this growing in three different spots, in a rock wall, in the rock garden, and in regular garden soil, all in bright sun. About 6" tall and spreading a bit wider, this also requires no special attention and flowers reliably.

Another gentian for late summer and flowering into the fall is the willow gentian, *G. asclepiadea*. I give it my second-best recommendation (after *G. acaulis*). It's a good edge-of-the-woods plant. I think it's a great companion for rhododendrons, hydrangeas and Japanese maples. Woodsy, moist soil that is high in humus, good drainage, and bright light are the recipe for success. I grew some from seed of *G. asclepiadea 'Knightshayes'* and got mostly purpley blue flowers, with some reddish purple, and one white flowering plant. If you want just a couple of good blue plants, buy a named form or choose the plant when it is in flower.

Now we turn to the unrequited love story. The fall gentians are famous for their heart-breaking clear blues. A large number of species are known as the autumn flowering gentians from China. I had good luck the first year I grew *G. sino-ornata*, also known as the Chinese autumn-flowering gentian. (The overlap in common names can be confusing.) Given my initial happiness, I bought and planted more. The following year my cherished plant had over a dozen three-inch long corollas opening a lovely, perfect, sky blue. I went to bed dreaming sweet dreams. The next morning, I went out to admire it and found all the flowers browned out. This has happened to me many times, in fact, even again this year.

John Weagle told me that these plants are just not adapted to our climate. It's too cool and wet for the flowers. Stubbornly, I've persisted by laying glass panes on raised stone runners over them to shed rain. However, being a weatherman in Nova Scotia and predicting when it will rain is a thankless ambition. I've included some pictures of the Chinese fall-flowering gentians so that you can see why I am smitten and desirous of a better relationship with them.

From my experience, the autumn blooming hybrid, *Gentiana X macaulayi* 'Kingfisher', is a bit more tolerant of our moist fall air than *G. sino-ornata*. Next year may require cloches, perhaps melting ice nearby for soil moisture, and, if that fails, constructing a miniature alpine house with gentle fans to keep the air fresh, "buoyant", and crisp. I cannot really recommend these plants. Yet. ¤

Gentiana sino-ornata

"Hard" Pruning of Old Wood on Rhododendrons to Control Size and Improve Habit

by Don Pothier

Editor's note: The beautiful grounds surrounding Don and Barbara Pothier's home in Tusket, Nova Scotia, tell you there must be a master-pruner in the neighborhood. And that turns out to be Don, himself, who has expertly shaped his trees and shrubs into simple yet beautiful forms. Many of us are fearful of pruning rhododendrons back hard. In this article Don shows us that it can be done, and with great success.)

The Don and Barbara Pothier house and grounds at Tusket, Nova Scotia.

I first heard about "hard" pruning rhododendrons from an elderly gentleman from Yarmouth, Nova Scotia. Several years ago, he dropped by the house to ask me how I pruned my "overgrown" rhodos. I told him my rhodos hadn't yet reached that stage. He proceeded to tell me that he had heard of this severe pruning method but was scared to try, afraid to kill them, and besides, he really didn't know where to start or what to cut. I told him I would try some hard pruning on a *Rhododendron* 'Nova Zembla' of mine and see what happened.

I did some on-line research and, as with most shrub pruning, the recommendation was to prune as soon as the flowering is finished. I only use a good quality, heavy duty set of pruning cutters. These make a nice clean cut, thus avoiding harsh saw blade marks with rough edges that do not heal over as quickly and cleanly.

As for how much of the old wood to cut off, there is no set rule, but I did not want to have to do it again in a few years. You can see from the photos that I only left approximately 2 feet or so of the original trunks above the ground. I tried, however, to create somewhat of a "rounded form" with the remaining stems, to give some shape to the new growth as it starts to fill in again.

I highly recommend pruning be done as soon as possible after the bloom is over. This is critical. For me, it always seems to be some time after Father's Day - late June or so – for rhododendrons. As soon as the bloom ends, the new growth starts, and what you want to do is send all that vital energy into the formation of tiny new buds which will break out of the old wood. If you wait too long, most of the vital energy will bypass the old wood and go into producing the usual new leaf growth on any existing foliage.

It takes approximately three weeks or so before you'll notice any new buds. But suddenly - almost like magic! - you will notice them, very tiny, appearing all over the old trunks. Once the buds appear, it's truly amazing to see how quickly they grow.

Rhododendron 'Nova Zembla' before hard pruning.

The same *R.* 'Nova Zembla' about a month after pruning, with new growth showing.

After 3 months *R* 'Nova Zembla' showing vigorous new growth.

I started using this method on my Nova Zembla, and have repeated the process four times, always with success. I should point out that even during last summer's severe drought, I never watered it, even after a severe pruning.

This summer, for the first time, I also did my *R.* 'Super Nova Zembla' and it's coming along nicely. I also decided to prune back my *R.* 'Janet Blair', a personal favorite of mine, as it was also getting too large for its location. I cut the old woody trunks back a bit shorter than the two Nova Zembla varieties. Much to my surprise, all the new growth came up directly from the base of the trunks, at ground level, almost as if I had planted a new bush. I've watched it all summer, and although the new growth appears to be somewhat slower, it is coming along very nicely, though without a show of new growth farther up the remainder of the old trunks.

I can't say that I have any secret formula for success. But I do believe the most important thing is that severe pruning should be done very soon after the bloom is ended, to encourage buds to form on the old wood. Whether or not this technique will work on every kind of rhododendron, I can't say. However, if a plant has outgrown its location or has become leggy, open, and unattractive, why not give it a try? If hard pruning does work, the rejuvenated rhodo, with its still intact large root mat, should grow more quickly than a young plant fresh out of a pot, so pretty soon your old rhododendron will be new again. After all, nothing ventured, nothing gained. ¤

R. 'Super Nova Zembla' (left) and *R.* 'Janet Blair' (right) before hard pruning.

The *R.* 'Janet Blair' 3 months after pruning.

R. 'Super Nova Zembla' 3 months after pruning

What's in a Name? The Challenge of Identifying North American Azalea Species.

by Charles Andrews

(Editor's note: Atlantic Rhodo thanks the author and the Journal of the American Rhododendron Society for kind permission to reprint this fascinating and revelatory article. It challenges us on several different levels, perhaps most significantly by questioning commonly held assumptions about what the term "species" really means when it is applied to plants in the genus Rhododendron. All photos by the author.)

Introduction

The native North American azaleas are a very complex a group of plants. In this article I will consider how confused we have been about them, what we are just now learning, and what we need to do in the near future to improve our understanding.

R. canescens thicket in Lumpkin County, Georgia.

Azaleas

North American azaleas–native azaleas or "wild honeysuckle"– are part of the dynamic duo of evergreen and deciduous azaleas. We all know azaleas come in two basic flavors: evergreen and deciduous, though not everyone knows the two are not, botanically, very closely related. They are both called azaleas today only because Carl Linnaeus put both types in the genus he named *Azalea*. It is almost impossible to force a cross between plants of the two types. The rare seedling is almost never vigorous or healthy. Deciduous azaleas are more closely related to the large-leaved elepidote rhododendrons than they are to evergreen azaleas (http://users.wfu.edu/kronka/kakbek/rhododendrons.html). Evergreen azalea species are solely Asian, while deciduous azaleas are found in Asia, Eastern Europe, and North America. Of the deciduous kind, the lion's share is found in North America, with 17 species as currently identified.

Stepchildren

All azaleas are now classified in the large genus, *Rhododendron*, and some consider azaleas the unglamorous stepchildren of rhododendrons. More than one botanical author has written of "true rhododendrons" and then of azaleas, as if azaleas were not true rhododendrons. Arguably, the large *Rhododendron* genus of around 1000 species could conceivably be divided into multiple genera, as several botanists have suggested, such as *Ledum*, *Tsusiophyllum*, *Rhododendron*, *Azalea*, *Menziesia*, *Azaleastrum* (Cox 1948), *Hymenanthes*, and *Therorhodion* (Copeland 1943). But as of now, azaleas are just as much a *Rhododendron* as *Rhododendron maximum* or *R. lapponicum*.

Leonard Frisbie, founder of the Pacific Rhododendron Society, who eventually did so much to bring attention to *R. occidentale* (common name: the Western Azalea), began his interest in rhododendrons with a personal bias against deciduous azaleas. Introducing a 1949 article "Series Azalea: Subseries Luteum," Frisbie (1949) begins with an apology:

> "In writing about the deciduous rhododendrons, which many consider to be a poor country cousin to the more spectacular evergreen sorts, I would like to have it understood that I am not trying to place them on par with the other series. With me they very definitely run third place behind the quality evergreen species and hybrids. But they do have a place in our gardens."

Frisbie was not alone in considering our North American deciduous rhododendrons third-class citizens. I am one, however, who thinks they are magnificent. The wild plants are not gaudy or flamboyant. They do not look like they are on steroids. They have a natural beauty. The flower trusses are in perfect balance with the size of their leaves. The plants blend well in a natural setting with both evergreen and deciduous plants. Our native azaleas offer strong and varied fragrances unparalleled in other *Rhododendron* species. They come in many colors, including many vibrant shades of orange and yellow. Proper selection will give bloom periods from early spring until fall. And native azaleas are generally less troublesome than their large-leaved counterparts.

What's not to like? Oh, they are deciduous? Well, let's then rid our gardens of hydrangeas, dogwoods, cherries, witch hazels, winterberries, forsythia, lilacs and, of course, roses.

A Complex Group of Plants

Our native azaleas are a very complex group of plants that is not well understood. The problem begins with the term, 'species'. We say, "I have this species," or "I have that species," as if we are talking hard facts. The truth is, botanists cannot agree on what a species is. There is no exact definition. Genus and species are man-made concepts - an attempt to classify plants and animals by their perceived similarities and differences. The terms are not exact, provable entities like 1+1=2, or the second law of thermodynamics, or chemical elements such as iron, gold, and helium. Yet we use the terms so

casually we accept them as hard facts, though much of botany, including the taxonomy, is soft science akin to economics, political science, and social studies.

Plants, especially our native azaleas, but also *Vaccinium, Crataegus, Solidago, Rubus, Hamamelis,* and parts of *Quercus,* do not always fit neatly into the pigeonholes described in the books and identification keys. I believe our American azaleas may be misclassified. It is not clear how many species we really have or should have. Is it the current 17 or should it be more? Perhaps it should be fewer, say 3 to 5, with more subspecies, varieties, and forma.

What is clear is that there are contradictions and inconsistencies in the current list and difficulties in assigning many of our wild plants to one of the taxa. Our native azaleas have highly variable morphological characteristics that overlap the man-made species descriptions. Where does one species end and another begin?

Earl Sommerville has said most native azaleas are hybrids, and from the viewpoint of gene exchange he is possibly correct. The idea of an evolutionary tree where this species evolved from that species may be all wrong. Our native azaleas for the most part are a promiscuous bunch. Given half a chance, they will exchange spit with almost any other native azalea. The heritage of our azaleas does not look like a branched tree; it looks more like a spider web of cross pollination back and forth, back and forth, over millennia.

We normally think of a hybrid as H = A x B. A major problem with native azaleas in the wild is that species A and species B have to be somewhere within pollination range to have such a hybrid. Often, they are not. This suggests that these so-called hybrids are as stable as the so-called species. Perhaps we have species and hybrids all wrong. Both are part of an overlapping continuum. Speciation is as much a function of our language as of an evolutionary process.

I would argue that the real dynamic entity that uses its gene pool to adapt for survival is at a higher level than the current 17 species, *R. vaseyi* and *R. canadense* excepted. It is more at the subgenus *Pentanthera* level. Perhaps it is the group that is evolving and not the declared individual species. To avoid confusion, however, we'll refer to the current 17 species.

Table 1.
17 North American Species

R. alabamense	*R. canadense*	*R. flammeum*	*R. vaseyi*
R. arborescens	*R. canescens*	*R. occidentale*	*R. viscosum*
R. atlanticum coastal azalea	*R. colemanii* Red Hills azalea	*R. periclymenoides* pinxterbloom azalea	
R. austrinum Florida azalea	*R. cumberlandense* Cumberland azalea	*R. prinophyllum* roseshell azalea	
R. calendulaceum flame azalea	*R. eastmanii* May white azalea	*R. prunifolium* plumleaf azalea	

We assume, based on pre-Darwinian ideas, that species come before hybrids, but is this true? It seems to me species equilibrate out of the cobwebs of hybrids. We have the real world, and we have herbaria. The real world – the plant populations of the mountains, balds, woodlands, plateaus, and plains of North America – does not match well with the current 17 species as described. Nevertheless, we need to know what they are.

I like to think of some of them in groups:

I put *R. canadense, R. vaseyi,* and *R. occidentale* each in a separate group of one. *R. canadense* and R. *vaseyi* are so different from everything else, and *R. occidentale* is the only azalea on the West Coast.

The group of early pinks is comprised of *R. canescens, R. periclymenoides,* and *R. prinophyllum.*

The early whites are *R. alabamense, R. atlanticum,* and *R. eastmanii*.

I also place *R. colemanii* and *R. austrinum* each in a group of one. *R. colemanii* is the latest named species, a tetraploid. *R. austrinum* is often yellow or orange, but it is quite different from other orange azaleas. Arguably, I could consider *R. colemanii* and *R. austrinum* combined into a single group.

My orange group is made up of *R. flammeum, R. calendulaceum, R. cumberlandense,* and *R. prunifolium.*

North America has the lion's share of deciduous azaleas. There is only one in Eastern Europe and a small handful in Asia. In North America, one is west of the Rocky Mountains, *R. occidentale,* all the rest reside from eastern Texas and eastern

Oklahoma to New England and southeastern Canada. In the main, you will find these 16 eastern species in and around the Appalachian Mountains. They do trail down into the foothills and plateaus and to both the Atlantic and Gulf Coastal Plains. The disjunct populations of *R. prinophyllum* in Arkansas and Missouri suggest the distribution of this species may once have been much larger. The sweet spot is the Southern Appalachians of North Carolina, Tennessee, and especially Georgia. With its geographic diversity of mountain, piedmont, and coastal plain regions, Georgia has 12 indigenous species, more than any other state.

The primary reason for this distribution is acid soil and moisture. Rain tends to encourage the growth of organic matter and leach away basic salts. Areas of high rainfall thus tend to have more organic soil and more acidic soils. Areas of low rainfall tend to have little to no organic matter in the soil and significantly higher concentration of alkaline salts. If one looks at a pH map of North America and a rainfall map of the same area one will find the two are quite similar. While pH and rainfall are both a continuum and not an either/or situation, one finds in general that the distribution of native azaleas stops when the pH get too high and/or annual average rainfall becomes too low. Most native azaleas want constantly moist, not wet soils.

I might point out that *R. occidentale* does grow in slightly acid to basic serpentine soils. Note three facts related to this: (1) Many *R. occidentale* do grow in acid, non-serpentine soils, (2) the serpentine soils are high in magnesium and iron and low in calcium, which may help alleviate the problem azaleas have with higher pH soil, and (3) the *R. occidentale* found in the serpentine areas do have some morphological differences from *R. occidentale* in other locations.

Problems with the Current Species

Kron's DNA studies (<http://users.wfu.edu/kronka/kakbek/rhododendrons.html> and associated links, accessed June 3, 2018.) show that deciduous azaleas may be more closely related to the elepidote rhododendron subgroup than to evergreen azaleas. Further, Kron found deciduous azaleas *R. molle* (Chinese azalea) and *R. arborescens* (sweet azalea) to relate closer to lepidote rhododendron *R. edgeworthii* and other lepidotes than to the evergreen azaleas.

We do not have space to go over all the problems with the current species, but we can identify a few. The main problem is inconsistency and arbitrariness in species assignment. Consider the *R. viscosum* complex. In her PhD dissertation, Kathleen Kron (1987) moved *R. oblongifolium* and *R. serrulatum* into *R. viscosum* without even assigning them a variety status. She also removed variety status from *R. viscosum* var. *aemulans* and *R. viscosum* var. *montanum*. Yet Kron kept *R. canescens*, *R. periclymenoides*, and *R. prinophyllum* as separate, distinct species (Kron 1987, 1993).

R. viscosum var. *aemulans* is an early blooming plant, in flower generally from March to April. It is very low and stoloniferous, forming extensive colonies similar to *R. atlanticum*, and it has fuzzy, ovoid flower buds. Var. *aemulans* is a unique plant found in the Gulf Coastal Plain and west into southeast Texas on the edge of sandy drainages in the transition between dry and wet areas.

R. viscosum var. *serrulatum* is a late summer and fall blooming plant, flowering in July to October. It is tall, non-stoloniferous, and has smooth lanceolate buds. Var. *serrulatum* is commonly found in the Florida Panhandle and adjoining states on sandy river banks and hummocks in swamps, and on the Gulf Coast with its roots in heavy concentrations of salt. A common factor with these two distinctly different plants seems to be the narrow, white flower tube. These two types, along with others, are currently considered one species.

R. canescens and *R. periclymenoides* are both early blooming, pink to white azaleas. *R. canescens* is the most common azalea in the Southeast and *R. periclymenoides* dominates from North Carolina northward, though the two species do overlap in distribution. Their colors are similar, with *R. periclymenoides* occasionally producing shades of lavender. Often stated as a distinctive feature are the glandular hairs on the tube of *R. canescens*, but *R. periclymenoides* also has a glandular tube form. *R. canescens* is said to produce somewhat taller, more upright plants. These two types, along with others, are currently considered separate species.

If *R. viscosum* is one species despite its many variations, why not *R. canescens* and *R. periclymenoides*? Further, why are the similar *R. cumberlandense* and *R. flammeum* separate? Or *R. cumberlandense* and *R. prunifolium*? Why cannot *R. calendulaceum* and *R. cumberlandense* be a ploidal series of a single species like the wandflower, *Galax urceolata*, and the American elm, *Ulmus americana*? Where is a thorough DNA research project when you need it?

Natural Hybrids/Introgression

Another complication in classifying and identifying a particular native azalea is natural hybridization. Of the 17 declared American species, most will cross with the other species, given the opportunity. *R. canadense* and *R. vaseyi* are the exceptions. This means identification keys are of limited value to identify what species a wild azalea may be. We look at a plant, but we have not been introduced to its parents or grandparents.

Clement Gray Bowers, who in 1936 wrote "Rhododendrons and Azaleas", the first detailed book on the subject of rhododendrons by an American author, points out that some botanists considered *R. prinophyllum* to be a variety of *R. periclymenoides* and that transitional forms between the two of nearly all degrees have been found. He used the names *R. nudiflorum* and *R. roseum*, which have since been declared illegitimate (Bowers 1936).

R. periclymenoides also hybridizes readily with *R. canescens*. Can anyone tell with certainty if a pink azalea species in this large overlap area belongs to one species or the other? Henry Skinner (1955) in his 1951 epic 25,000-mile journey "In Search of Native Azaleas" found on the southern end of the Cumberland Plateau below Sewanee, Tennessee, what he called:

> a confused complex reminiscent of *R. canescens, nudiflorum, alabamense*–all thoroughly mixed together and varying in flower color from pure white to lavender, pale pink with pale tubes, and pink with deep red tubes, many of the plants being highly stoloniferous.

R. periclymenoides

On a brief swing through Arkansas, Skinner found *R. oblongifolium* - now included in *R. viscosum* - growing side by side with *R. roseum* (now *R. prinophyllum*) and found evidence of hybridization between the two. Skinner thought *R. flammeum*, the 'Oconee azalea' of central Georgia, was "a rather confused species" that "has been on too familiar terms with the aggressive *R. canescens*." With the Oconee azalea, which he called by the old name *R. speciosum*, he found intermediates in characteristics and habitat between *R. alabamense* and *R. canescens*. On Spruce Knob Mountain in West Virginia, Skinner found *R. calendulaceum*, *R. nudiflorum*, and *R. roseum* all growing and blooming together. There, Skinner assumed triple matings were occurring:

> bizarre in the extreme – short and tall bushes bearing large or small flowers in every color from coral pink through salmons to rich lavender, pale yellow or pure white. The last was large flowered and otherwise identical with the Flame Azalea.

In some other instances, Skinner's assumptions of hybridization were incorrect. For example, *R. colemanii* is not a *R. alabamense* hybrid (Zhou *et. al.* 2008). Skinner also climbed up to Gregory Bald and saw the well-known swarm of hybrids there.

Plantsman David Leach was primarily an evergreen rhododendron expert, but because they were in the genus, he did investigate native azaleas. He provided conclusive evidence that *R. furbishii*, called a species by Walter Lemmon, was instead a hybrid and not a species. He proved this by crossing *R. arborescens* with *R. cumberlandense* and producing identical results. He also crossed *R. furbishii* with *R. furbishii* and produced some *R. cumberlandense* and some *R. arborescens*-looking plants (Leach 1959).

In June 1958, Leach was invited to Hendersonville, North Carolina, to tour rhododendron and azalea populations. For Leach the visit was an epiphany (Leach 1958):

> The overwhelming impression of the azaleas is their massive diversity, far surpassing anything that the botanists have led us to expect. The North Carolina azaleas are a vast, amorphous population shifting endlessly in a dynamic evolutionary phase in which crosses in the wild and great masses of natural hybrids are commonplace. A revelation awaits any student of the genus….
>
> The travelling enthusiast might just as well leave his botanical keys at home. They are useless in any attempts to identify species in countless hybrid swarms which are encountered at every hand….
>
> They are a geneticist's dream, but they are a taxonomist's nightmare...

Leach went on to say the evidence is indisputable that azaleas are in flux, and that species in typical form are often the exception in "…vast seas of Azaleas undergoing introgressive hybridization." He recognized that our wild populations often refuse to fit into the classifications we call species. Instead they are intergrading hybrids constituting uninterrupted progressions of variations linking them to their ancestry. Leach thought the so-called hybrids did not have a genetic disadvantage. In some sites he saw them thriving more than their progenitors. I believe Leach's observations are astute and still hold true.

Kathleen Kron was aware of all of the above and more when she wrote her 1987 PhD dissertation on revisions in *Rhododendron* section *Pentanthera*. Kron recognized that natural hybrids and hybrid swarms occur. However, she dismissed widespread natural hybridization, arguing that only occasionally do actual habitat and flowering time overlap (Kron 1987, 1993). In the 25 years since Kron rejected Skinner's and Leach's field observations of widespread natural hybridization, more and more observers have had a chance to study azaleas in their natural habitats. There is absolutely no doubt Kron was incorrect in her conclusion. Consider the following evidence:

We have found on many occasions “running arbs” in the Southern Appalachians, as did Henry Skinner. “Running arbs” are hybrids between R. arborescens and R. viscosum var. montanum. They have flowers and smooth stems as does arborescens but are stoloniferous. They form runners and spread out into colonies.

Clarence Towe can show many examples of *R. periclymenoides* crossing with *R. calendulaceum*, the flame azalea, in South Carolina.

John and Sally Perkins can show probable examples in Audra State Park, West Virginia of *R. prinophyllum* or *R. periclymenoides* crossing with the flame azalea, *R. calendulaceum*. These *R. calendulaceum* crosses are strongly suggested by the hybrids being triploids, crosses of the diploid with the tetraploid. These crosses have been verified by ploidy testing.

In the Florida Panhandle, Ron Miller can show tall *R. canescens* crossing with the low-growing and spreading *R. viscosum* var. *aemulans*, yielding a low, pink, colonizing plant.

On Mt. Cheaha in Alabama, one can find *R. cumberlandense* in large numbers. Blooming earlier is *R. canescens* and later is *R. arborescens*, yet sometimes the bloom times overlap. The obvious hybrids are outstanding.

On Hurricane Creek in Lumpkin County, Georgia, where thousands of *R. canescens*, *R. calendulaceum*, and *R. arborescens* reside, dozens of triploids plants have been confirmed through ploidy testing. These plants often grow within a few feet of each other.

Even some of the tetraploid plants seem to have long-term introgression with the diploids. How otherwise does one get a large-flowered strong pink tetraploid azalea with an orange blotch?

Already mentioned is *R. flammeum*, the Oconee azalea. This azalea is often found with *R. canescens* and its intermediates. In Fulton County, Georgia, near the old Roswell Mill, *R. canescens*, *R. calendulaceum*, *R. flammeum*, and hybrids are all growing together.

A location in Cherokee County, Georgia, has produced large numbers of ploidy-tested triploids.

More and more natural crosses of the named species are being discovered. There is no doubt that, given the chance, most of our natives will cross and have done so for many, many years. The only way to make sense of all these puzzling observations is DNA testing and more ploidy testing.

Misinformation

Much misinformation on our native azaleas exists in the literature, and has since the beginning. Let me give just a few examples:

The Name ‘Azalea’

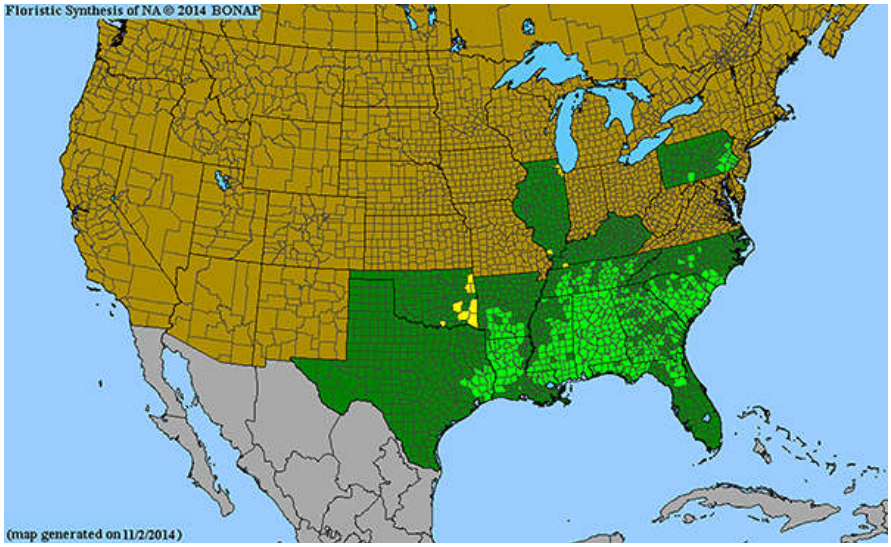
Linnaeus first coined the term *Azalea* as a new species back in 1735 because he thought his new species required an arid habitat (Linnaeus 1735, 1737). The word derives from the ancient Greek *“azaleos”*, which means dry. (Wiktionary, 3/22/2018)

Linnaeus found these plants high in the treeless Lapland Alps in what he said were sandy, rocky, dry places. Since half of the ground was still covered in snow in July with water running in rivulets through the snow, how he determined it was arid is unclear (Linné 1811). With his limited exposure to azaleas, Linnaeus did not realize that almost every azalea prefers constantly moist soil (though not wet soil).

Rose Colored *R. arborescens*

Frederick Pursh (1814) introduced *R. arborescens*, perhaps our best white deciduous azalea, as a new species and stated he had seen it in the wild and in Bartram’s garden outside Philadelphia. He described the species as having rose-colored flowers. This incorrect flower color description was repeated by other botanical authors for almost 100 years, including the well-respected John Torrey, Asa Gray, John Claudius Loudon, and Alphonso Wood. Do you think these authors had actually seen a living plant in bloom? It is not a rare species. Both André Michaux and François André Michaux, had earlier described the fragrant white azalea that each found beside mountain streams, but neither gave it a botanical name (A. Michaux 1889, A.F. Michaux 1904).

R. arborescens.



R. canescens distribution map showing significant portion of the biomass in the piedmont and erroneous distribution in Pennsylvania. Dark green indicates species present in the states or province. Lime green indicates species present in the county. Yellow indicates species present and rare in the county.

R. canescens, the Mountain Azalea

Pursh (1814) introduced another point of confusion when he took Michaux's southeastern *R. canescens* and applied it to high elevation plants in the Blue Mountains of Pennsylvania. This confusion lasted for over 100 years. Pursh (1814) apparently was not aware of the new species *Azalea rosea* named by Loiseleur-Deslongchamps in 1812. Loiseleur's species is now named *R. prinophyllum*. It is generally not heat tolerant and resides mostly in northern climes or high elevations from western Virginia northeastward. There are disjunct populations in Arkansas and southeastern Missouri. It is because of this confusion between *R. prinophyllum* and *R. canescens* that you sometimes see *R. canescens* called the mountain azalea.

Species Maps

Species distribution maps often contain errors in both directions, omissions and false positives. You will find, for example, *R. calendulaceum* throughout Alabama and *R. arborescens* on the Alabama coast. These errors occur because, with little or no verification, the mappers rely on previous published flora and herbarium specimens. *R. calendulaceum* is often reported in the state of New York, but no one can or has pointed to indigenous plants there. *R. calendulaceum* is rare even in Pennsylvania, the most northern distribution of the species. This repeated piece of misinformation originated from a 1749 Latin description of a yellow azalea on a property on the Hudson River. No one else has been able to offer evidence of *R. calendulaceum* growing as far north as New York. Was a yellow azalea dug elsewhere and brought to the Coldenham estate in New York? (Colden 1749)

R. canescens, Not in the Piedmont

Clement Bowers, mentioned previously, was a horticulturist from New York. In his 1936 book and 1960 revision as well as in letters for the 1952 "The Azalea Handbook" and Frederick Lee's 1958 "The Azalea Book," Bowers argued that *R. canescens* should not be called by the common name, 'Piedmont azalea'. Bowers (1960) asserted time and again, in total error I have to say, that *R. canescens* is limited to the coastal plain from South Carolina southward and westward. This New Yorker did not have much field experience in the Southeast. If he had, he would have known a very large portion of the biomass of *R. canescens* resides in Georgia, Alabama, and Tennessee *above* the coastal plain. I am glad to see that the most used common name today for *R. canescens* is the Piedmont azalea, which is the most common azalea in the Southeast Piedmont from Texas to North Carolina. To call this species the 'Florida pinxter', as Bowers suggested, is quite misleading. Many if not most of the pink azaleas in Florida are pink tetraploids, probably a color form of *R. austrinum*.

When a Hybrid is Not a Hybrid

While the possibility of natural hybrids makes species identification difficult to impossible, it is also true that we have misidentified plants as hybrids when they are just species showing off their variability. Two examples will suffice. Polly Hill introduced the Choptank Hybrids. The original plants came from between Dover, Delaware, and the headwaters of the Choptank River. She transplanted them in her garden in Wilmington, Delaware, and collected and propagated open pollinated seeds. She showed a particularly attractive form with some pink in the flowers to Henry Skinner, and he thought they were hybrids of *R. atlanticum* crossed with *R. periclymenoides*. We now know that *R. atlanticum* is a tetraploid, *R. periclymenoides* is a diploid, and the offspring are almost always triploid. Recent tests to date have shown Choptank Hybrids to be tetraploids, and we have more field experience to know pink is not uncommon in *R. atlanticum*.

Flower truss, *R. canescens*, Lumpkin County, Georgia.

Buds of R. *viscosum* and R. *calendulaceum*.

'Snowbird', a cultivar at the Biltmore Estate was said to be a *R. atlanticum* × *R. canescens* cross, yet tests show it to be tetraploid, like *R. atlanticum*. Pink does not automatically mean hybridization with *R. periclymenoides*, or with *R. canescens* in the southern portion of the coastal plain.

In southern Alabama and into Georgia there are azaleas that were called *R. alabamense* or *R. alabamense* hybrids. John Thornton, Ron Miller, and others doubted this and, finally, with enough field work and lab research, discovered a new tetraploid species, *R. colemanii*. However, there are still *R. alabamense* labels today at Callaway Gardens in front of *R. colemanii* plants.

Will the Real Tetraploids Please Stand?

Ploidy has to do with the number of sets of chromosomes a plant or animal has. You have two sets. Plants can have two, three, four, five, six, or more. *Rhododendron* chromosomes are so small they can only be seen with an electron microscope. Even then they are extremely difficult to visually count accurately. The first studies made mistakes. *R. calendulaceum* and *R. canadense* were declared tetraploids, meaning they had twice the normal number of chromosomes. *R. atlanticum* and *R. austrinum* were said to be diploid. With advanced technology we now know *R. atlanticum*, *R. austrinum*, *R. colemanii*, and *R. calendulaceum* are tetraploid. *R. canadense* is diploid.

All Flower Buds are Chestnut Brown

Kron's revision of *Pentanthera* contains interesting statements on azalea flower buds. This caught my eye because I view the characteristics of flower buds as one way to help distinguish species, one from the other. Some are lanceolate; some are quite ovoid. *R. vaseyi* flower buds are globose and look like musket balls. Some have pubescence. Some have cilia along the bud scales, and in some cases the cilia are glandular. Some have dark bands along the top of the bud scales.

I find a variety of colors, fairly consistent to the species. Yet, in every case, Kron (1993) described the flower buds as "chestnut brown." The only place I have consistently seen chestnut brown native azalea flower buds is on herbarium sheets of dried specimens.

Can't tell *R. austrinum* from *R. canescens*

More examples of misinformation exist. We shall end, however, with this well-worn belief. How often have you heard it said that when not in bloom, it is almost impossible to distinguish *R. austrinum* from *R. canescens*? In fact, it is simple and easy. New growth on *R. austrinum* is always glandular. New growth on *R. canescens* is almost always eglandular. I will explain the "almost" part later.

For Now, We See Through a Glass Darkly: Unanswered Questions

We now move from problems related to misinformation to problems related to ignorance: that is, the things we don't know or don't understand about this complex group of plants. In addition to the puzzlement and uncertainty surrounding how to best identify and group our native azalea species, we have many other unanswered questions.

How did *R. atlanticum* Hide so Long?

Of historic interest is *R. atlanticum*. It grows on the Coastal Plain from southern New Jersey down to Georgia. This is an early blooming, low-growing, highly colonizing, fire-adapting plant that can cover an acre or more with its runners. It had to have been stepped on by thousands of settlers and soldiers from Jamestown, Charlestown, and many settlements up the coast and along the King's Highway. Yet, it was not recognized as a species until 1917, probably being confused with the later-blooming *R. viscosum*.

Why Does *R. occidentale* Fail to Survive on the East Coast?

The only native azalea on the West Coast is *R. occidentale*. Though the typical form is a white flower with a yellow blotch, there are very attractive multi-colored forms. We have never been able to successfully grow this species in the east. The reason remains elusive. Climate? In the west it grows on the

Buds of *R. periclymenoides* and *R. canescens.*

coast and in the high Sierras at Donner Pass. In the east we fail north and south. What special conditions might it need that we can't supply? Great Britain seems to succeed with this species.

Pink tetraploid type from north Georgia mountains

Where are *R. austrinum* and *R. atlanticum* Triploid Hybrids?

We know *R. calendulaceum*, *R. austrinum*, and *R. atlanticum* are tetraploid, and when they pollinate a diploid azalea the result is almost always a triploid. Many natural triploid hybrids, with *R. calendulaceum* as a parent, have been found. Yet almost no triploids have been found in areas where *R. austrinum* and *R. atlanticum* grow. Is this because of a difference in the tetraploids? Or is it because we have yet to recognize a possible natural hybrid and sent a sample for testing?

Yellow River vs. Escambia River Habitats for *R. austrinum*

In the lower section of the Yellow River in Florida, the tetraploids are all pink. Going up-river, a transition eventually occurs with a mixed area of pink, white, and yellow. Farther upriver, only yellow *R. austrinum* are found. The Escambia River is not far away, but the situation is quite different. Here, *R. austrinum* occurs in mixed colors all along the river: yellow, pink, white, and multicolored. Changes in soil acidity do not seem to explain this difference.

Is *R. canadense* Really an Azalea (or is it even a *Rhododendron*)?

We have always known the delightful Rhodora, popularized in the poem by Ralph Waldo Emerson, was unique. Alarm bells went off at the 2013 joint ASA/ARS convention in Asheville when Jason Lattier *et al.* (2013), one of Dr. Tom Ranney's graduate students, presented results showing that *R. canadense* appears to have a base chromosome number of 12, not the uniform base number of 13. The sampling covered multiple locations across the geographic distribution. If this holds true, it begs the question: Should *R. canadense* be considered an azalea? Is it even a *Rhododendron*?

Should *R. vaseyi* be Considered one of our Azaleas?

R. vaseyi is another plant that we know is different. In the 2005 revision of *Rhododendron*, Loretta Goetsch *et al.* (2005) moved *R. vaseyi* out of *Pentanthera*. In their analysis *R. vaseyi* was more closely related to plants formerly in *Menziesia* than our other American azaleas. If true, this places some doubt on calling *R. vaseyi* an azalea.

How does Color Relate to Species?

When is a blotch a sign of hybridization or introgression? Is the pink tetraploid in north Georgia, *R. calendulaceum*? Is the pink tetraploid in the Florida Panhandle, *R. austrinum*?

Recent Research and Discoveries

While we still see through a glass darkly, in fact, we are learning more every day.

New Species

R. eastmanii was declared a new species in 1999. For years it was said to be a disjunct group of *R. alabamense*. The aforementioned *R. colemanii* (Red Hills azalea) sat quietly in the Red Hills section of Alabama until someone finally realized *R. alabamense* grows in different habitats. The Red Hills azalea became a new species in 2008.

Pink Tetraploids = *R. austrinum*?

In Florida, John Kunkel Small, Henry Skinner, and all others have assumed any Deep South pink azalea was *R. canescens*. Detailed field examination recently has revealed them to be wrong. Ron Miller discovered pink tetraploids that in every other aspect are identical to *R. austrinum*.

Can1 and Can2, Two Types of Southern Pink Diploids

Even more recently, as Ron Miller explores the rivers, fields, and woods with an eagle eye, he has discovered that there are two types of southern pink diploids. We call these Can1 and Can2.

Can1: This is the typical *R. canescens*. It has pink to white flowers with glandular hairs on the flower tubes and often twisted, revolute petals. New growth is eglandular, distinct from *R. austrinum*.

Can 2: Then in eastern Texas, Ron discovered pink azaleas with glandular new growth. To his surprise, ploidy tests showed these plants to be diploid. Looking much like *R. canescens*, these Can2 plants reside in a moister habitat, tend to have broader petals, and are quite stoloniferous. Can2 plants are predominant to the west, in eastern Texas and northern Louisiana. They occur only rarely eastward where Can1 dominates. Should Can2 be considered a new species?

Ploidy Research

Recent ploidy research has opened our eyes to a better understanding of possible species and hybrid relationships. It was the research of Jeff Jones (2007), another of Dr. Tom Ranney's graduate students, that revealed *R. atlanticum, R. austrinum* and *R. calendulaceum* are tetraploids with twice the usual number of chromosomes. Soon, the aforementioned *R. colemanii* was added to the list.

John and Sally Perkins joined a team at the University of Coimbra in Portugal in an ongoing multi-year study of *Rhododendron* ploidy. By testing hundreds of cultivars and wild plants, and by the Perkinses making crosses with parents of known ploidy, they have come up with some general ploidy rules. Here are a few of the Perkins's derived observational rules: *

diploid × diploid = usually diploid,
tetraploid × tetraploid = usually tetraploid,
diploid × tetraploid = usually sterile triploid,
tetraploid × diploid = usually failure,
fertile triploids can occur but are rare,
triploids can produce diploids, triploids, tetraploids, pentaploids, and
in diploid × tetraploid F1's, offspring tend to look more like the tetraploid parent.
(* seed parent × pollen parent)

New Research and Methods Needed

We need more field research, more study of azalea populations *in situ*. Too much previous research was based on herbarium specimens that do not and cannot accurately represent entire populations of live plants. We also need a modern replacement for herbarium specimens as the primary source of data. Using dried specimens was advanced technology in the 16th century. They show only a snapshot or two in the annual cycle of the plant. Much is lost in the dried evidence. A specimen may not represent the typical population or the peak bloom and thus may be misleading. With such scant evidence, the plant may be misidentified by the author and those who examine it. I am not suggesting we eliminate herbarium specimens, but supplement them with 21st century multimedia technology such as macro-lens and microscopic images, and with powerful databases that allow us to more effectively store, organize, correlate and retrieve all the known information on North American azaleas.

We need much more ploidy testing, especially on wild plants, to better understand what is happening between tetraploids and diploids. We need to find more fertile triploids and analyze the populations around them to better understand how these triploids naturally occurred. We need to find further evidence of downward introgression and upward introgression from tetraploid to diploid and vice versa.

We need more hybridization research. Systematic hybridization by humans can help us better understand what has been and is going on in nature, Finally, and perhaps most importantly, we need extensive DNA research on our native azaleas. Such studies will require careful controls to assure large quantities of samples, known provenance of the samples, known character differences among and within populations, and geographically diverse populations. It is my hope that from these studies we can learn how related, genetically, our 17 species really are. Our ARS Research Foundation and ASA Research Fund can help support such efforts.

Conclusion

Our native azaleas of North America are indeed a very complex group of plants. There are many gaps in our current understanding. There is still much to learn about them.

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This article is based on a keynote presentation given by Charles Andrews at the Azalea Society of America convention, April 7, 2018, and modified from articles originally published in "The Azalean," Summer 2018 and Fall 2018.

R. vaseyi "White Find" [Photo Sterling Levy]

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Photo Album - A "seasonal review", starting with earliest spring bloom and ending with vibrant fall foliage. [Photos by Sterling Levy].

Hamemalis "Jalena"

Eranthis hyemalis

Lewisia tweedyi

Eryngium giganteum

Gentiana paradoxa

Gentiana asclepiadea

Chrysanthemun xrubellum "Clara Curtis"

Acer palmatum