JOURNAL

American Rhododendron Society

Vol. 68 Number 2 Spring 2014

American Rhododendron Society
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ARS On-line Journals: http://scholar.lib.vt.edu/ejournals/JARS/
ARS Archives: http://www.lib.virginia.edu/small/

Society's Purpose

To encourage interest in and to disseminate knowledge about rhododendrons and azaleas. To provide a medium through which all persons interested in rhododendrons and azaleas may communicate and cooperate with others through education, meetings, publications, scientific studies, research, conservation and other similar activities.

Membership Benefits

- Chapter affiliation with scheduled meetings
- *Journal American Rhododendron Society* published quarterly
- Annual convention and regional conferences
- Seed exchange
- Listing of registration of names and descriptions of new rhododendron hybrids published in the Journal

To Join the Society

Membership categories:
(January 1 – December 31)

Student (include proof if over 18)	$10.00
Regular	$40.00
Commercial	$90.00
Sustaining	$75.00
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You can join the ARS through your local ARS chapter (check the website www.rhododendron.org for chapter contact info) or by sending a check or money order directly to the Executive Director of the American Rhododendron Society at the above address. Checks must be in US funds. Make checks payable to the "American Rhododendron Society." Membership includes one year (4 issues) of the *Journal American Rhododendron Society* and affiliation with the chapter of your choice.**To receive the winter issue of the Journal, renewals must be postmarked no later than Dec. 1.**



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'Amiblue' by Bill Stipe.

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Plant Name Registration: http://www.rhododendron.org/plantregistry.htm

Rhododendron & Azalea News: http://www.rhododendron.org/news/newsindex.htm

From the President

Bruce Feller
Old Field,
New York

As I write this column for publication in the Spring issue of *JARS*, I'm aware that I will be competing for your attention against the many compelling distractions that this season brings. That having been said, I would like to provide some further perspective on the subject of expense and income streams mentioned in my last column—specifically, concerning the Endowment Fund (EF).

Traditionally associated with funding the Society's Grant Program, a portion of Endowment Fund earnings has also been applied more recently to supplement other income streams in an effort to "balance the budget." These withdrawals are carefully considered by your representatives (District Directors) and other Board members within the "metes and bounds" of relevant Society By-Laws and Policy. The context in which those decisions are made is the subject of the text appearing below. Written by Gordon Wylie, Past President and Gold Medal honoree, it provides perspective on the challenges and complexities of managing Society finances.

"The Society's primary source of revenue is necessarily member dues. Other sources, such as book sales, have provided modest funds. Contributions to the General Fund have been mostly unpredictable and widely varying from time to time. The ARS On-Line Store, now including book sales with other items, will perhaps result in some additional but likely not large amount of income. Individual Chapters, on the other hand, regularly and successfully raise substantial funds through means not available to the Society. These include plant sales to members and the general public and sponsoring regional Conferences or annual Conventions.

The "dance" between setting dues and budgeting (and, more importantly, paying) ARS operating costs presents a dilemma. The Board, understandably, has been unwilling to adjust dues every year. Increases are thus often playing "catch up" and, whatever the reasons, raised dues have resulted in significant loss in membership numbers. I recognize there are other issues in attracting and keeping members, but dues have a proven negative relationship. Effectively continuing the ARS mission as we have become privileged to achieve requires a viable organization over a wide geographical area, one that is unique among rhododendron centric groups. In other words, we need members in sufficient quantity to meet the day-to-day needs of functioning individual Chapters here in the US, in Canada, and overseas.

Several different Board Policies (POB) in Sections 4, 9 and 12 address the Endowment Fund. None, as I read them, precludes use of fund income to pay day-to-day Society expenses. Moreover, POB 12.1 says about the Endowment Fund "... to further the purposes of the Society, as stated in Article 1..." (By-Laws), and Article 1, Sec. B ambitiously and broadly states "... encouragement of the culture of rhododendrons ... ." Surely there's nothing wrong with using some of the EF income to meet our core purpose by maintaining an economically healthy association of Chapters spread over a wide area of the world.

From the Editor

Glen Jamieson
Parksville, BC
Canada

As many of you may have noticed in the recent *JARS* Winter issue, the Board gave us approval to initiate some changes in *JARS* in our efforts to make it both more attractive and readable. There are more colour pages, with a slight reduction in total number of pages to keep costs down, and we have added a "Digital *JARS*" column to help members access ARS websites a little easier. Comments from members received to date have been supportive, with all expressing that they like the changes made. Sonja and I are continuing to investigate how *JARS* might be improved, both in look and in content, as we continue to try to make *JARS* as relevant and as interesting for members as possible. I thus thank again all those ARS members that submit articles to me, many of which are unsolicited, as we rely on these unpaid submissions to fill each *JARS* issue.

The other big changes that have occurred over the past few months have been in the weather experienced by all of us! On the North American west coast, we started out with an exceptionally dry winter, with significant rains only beginning to come in mid-February. Temperatures, although not as high as last year, have also been relatively mild, which has been bad news for those looking forward to snow sports. Recent rains in BC at least have since refilled reservoirs, just in time as the real gardening challenge in many northwest areas is our regular summer and fall drought.

In contrast, central and eastern North America have experienced bitter cold, ice storms and heavy snow, exceptional in both their severity and duration. How this has affected gardens may be unclear, as covering snow can protect low plants from severe cold and desiccation, but for vegetation above the snow level, freezing and subsequent desiccation can be deadly. Even worse is ice accumulation on plants, which can break branches. Rhododendrons, being evergreen, are particularly vulnerable to ice and heavy snow damage because of their leave's large surface area, so I can only hope that any damage that occurs will not have killed prize plants, even if they have been impacted negatively.

Weather extremes have not just been confined to North America though, and I've watched on the news the battering the UK has received due to record heavy rainfalls and strong winds. This has no doubt affected many gardens there too, and with many of the biggest gardens being on the milder, western parts of the UK, weather impacts may be serious. Canadian news broadcasts do not describe the weather in northern Europe, but I would guess that many of the storms passing over the UK also affected that region as well. Again I can only hope that damage to members' gardens there will be not too serious.

As a scientist, the question at the back of my mind is to what degree is this extreme weather the result of climate change, and will such pattern increasingly characterize the future! I guess only time will tell!

SPRING 2014 VOLUME 68 NUMBER 2
Journal American Rhododendron Society (ISSN 0745-7839). Published quarterly (Jan. 15, April 15, July 15, Oct. 15) by the American Rhododendron Society, P.O. Box 525, Niagara Falls, NY 14304-0525 USA. Membership in the Society includes a subscription to the *Journal American Rhododendron Society*. Annual membership dues are $40.00 per year. International Standard Serial Number of Journal ARS 0745-7839. Periodicals postage paid at Niagara Falls, NY and at additional mailing offices.

Bill Stipe — A Lifetime of Creativity

'Creamcicle'.

Emily Weissman
Seattle, Washington

Photos by Bill Stipe

[Editors note: This article is the second one (see *JARS* 67(3), p. 135-137) that stemmed from a trial project the ARS did last summer with a summer intern, who was anonymously funded. The project's intent was to provide "oral histories" of prominent member hybridizers, growers, and nursery owners while we still have these folks with us. We started in the Washington state area near Seattle simply because that's where this intern was living.]

There are some who are content to merely live life as it is. To glide through endlessly, simply being. But for others there is an innate drive to create, to build, and to construct. Of those, there are some we revere as great artists, Picassos and Rembrandts, who spend their life in fame for great works. And there are those who quietly hold the task of keeping the world moving forward, one silent but significant project at a time.

Wilbert Stipe, or "Bill" as he assures me I may call him, is the perfect example of an

'Karen Gervais'.

innovator. From his first horticultural experiments on his parent's farm to his increasing talent as a nurseryman and hybridizer, his life has been a constant source of creativity and exploration.

Growing up on a wheat farm, Stipe had ample time to experience the both the practical and mysterious side of the plant world. "A lot of the time I was the truck driver" he tells me, "… and I would notice that every once in a while there was a stalk of wheat that was about this much higher than all the rest of them…So I started collecting those. And when I grew those, they all grew tall." Stipe's first experience with genetics was later to stem into an avid interest and skill for hybridizing, but his initial experiments weren't extremely successful. "We had some fruit trees, so I learned about grafting then…I even tried grafting prunes on apples," he tells me with a laugh "…and that didn't work." Around this same time, his father gave Stipe a small plot of land to grow whatever he liked on. "I'm the thirteenth child in the family and there was always four or five sisters at home, and they all had their own gardens and I had my own garden, and I started growing vegetables. My dad always encouraged me and gave me a piece of land…and I lived there."

Stipe continued living on the farm after his marriage to his wife Mary at the age of nineteen. After five years, however, his keen mind led him to a new frontier of exploration—electronics. "Television hadn't come to eastern Washington yet," he begins, "and I was one of the first in the area who knew anything [about TV]…I probably had the first television there." After building his own business, Stipe TV, from the ground up, he found that running any enterprise in the farming community was far from easy. "Famers want to pay their bills once a year—after the harvest—and if the

harvest is bad you don't get paid at all. There's still some farmers over there that owe me money," he jokes.

Stipe's love of electronics and enterprising spirit led him to receive an excellent offer of employment from Boeing, at that time a burgeoning company in need of many electronic technicians. While working there, Stipe also attended the University of Washington, which eventually steered him into the field of electrical engineering. After a few years employed at Boeing, Stipe and his family were relocated to Fort Walton Beach, Florida. There he spent time on an Air Force base testing missiles.

While his day job centered mostly on technological innovation, the world of horticulture was never far from Stipe's mind. "While I was there [Florida], I rented a place and started planting things…I got some books and learned about bananas, and what to fertilize and what not. My postman came by one day and said, 'That's the first time I've seen a banana tree in Fort Walton Beach!' I even put one in a pot and brought it home [to Washington]," but it didn't live here."

From Florida, Stipe spent time in the military, and then moved back to Washington, this time to the western area. It was there, in the heart of rhododendron country, his fascination with the brilliant blooms began. "I'd never seen rhododendrons in eastern Washington! They don't grow there. It's too cold and too hot. So when I moved to Seattle, I saw all these rhododendrons growing about and I had to learn something about them, so I joined the rhododendron society and the next thing you know, I was planting rhododendrons everywhere."

'Moonlite Champagne'.

'Patty Ann'.

Mentored by big names in the field, Stipe soon became involved in much more than plant growing and society meetings. In fact, under the encouragement and direction of Warren Berg, he found himself nearly seven thousand miles (13,000 km) around the world, hiking and seed collecting through treacherous terrain in the mountainous regions of China. "We went into places where there wasn't any road…" Stipe tells me, his description a far cry from the comfort of his beautifully crafted Whidbey Island home. "We would go hike another five or ten miles (9-18 km), sometimes up in really rugged territory…we even had to go up on a glacier." The team was comprised of international hybridizers, some local guides, and a few army men carrying rifles with bayonets attached. "I don't know if they were trying to protect us, or protect the Chinese," Stipe jested.

For a trip of thirty days, each man carried only a pack containing basic supplies like a compass, iodine for water purification, and bags to collect plant samples. While Stipe recalled that one friend, Peter Cox, carried a little foldable microscope, he himself chose something a little more creative. "Before I left, I went to my doctor to have a physical…" and I said, "Doc, what should I take along as survival food in case I need it?" And he says, "Take nuts." "And so I took a big bag of cashew nuts and a big package of M&Ms. You can survive a long time on that!" he said.

Stipe also carried supplies for gathering samples, collecting mostly just the pepper-like rhododendron seeds due to a ban on exporting whole plants. Despite having a permit to transport seeds out of the country, he came up with an ingenious plan to

'Leslie Bell'.

avoid the stringent regulations. "Some people who brought stuff out had been caught by Chinese and had some terrible times…" he told me, "so what'd we do? We mailed them." Later, as I asked Stipe if he had kept the infamous envelopes, he quickly had me chuckling as he explained why they didn't arrive in the best of shape. "One of the problems that I had was the Chinese stamps didn't have sticky on the back of them. Now I don't know what their idea was: I guess they wanted you to buy glue. So I got some jam and smeared on the back of the stamp. And I'm not sure they all showed up here, because that wasn't the *best* way to secure stamps to the envelopes. But some of them did, anyhow."

His trek through China was incredible, although enormously taxing. Stipe took me on a walk through his garden and pointed out the massive and hardy rhododendrons that he has cultivated from the trip's seeds. "We saw plants that were a hundred feet [30 m] tall," he tells me, "rhododendrons that had trunks on them…" The rhodies in Stipe's yard, while not quite this big, are equally impressive in vigor and variety. As we strolled through the acres, I asked Stipe about how he became more involved as a grower. "I joined the American Rhododendron Society shortly after I moved to Seattle," he began, "I knew about Mrs. Meerkerk… she and her husband owned the property here…and he had 51 acres [20.6 ha] out here on Whidbey Island." The land, bequeathed after the Meerkerk's death to the Seattle Rhododendron Society, was finally dedicated as a hybridizers test garden. As plant samples from all around the world began arriving, the team including Stipe worked hard to clear and cultivate the land. "We got quite a few: from Germany, Scotland, and quite a few from the US. So we'd plant three of each variety. And the idea was to test them to see how they'd do on Whidbey Island…

'Two Thumbs Up'.

Every summer we would ask members to come up and evaluate these hybrids and rate them… Once a year, I would put that data all together and publish it. And the results would show up in the Journal of the American Rhododendron Society."

Stipe stayed at the forefront of Meerkerk garden creation until he finally became the manager. In this position he labored many hours to ensure that more than just hybridizers would enjoy the beauty of Meerkerk. "I worked to open the garden to the public. Before then there was no way to have people come in and enjoy the garden." While manager, Stipe kept areas in constant change, moving plants and landscaping entirely new sections to keep guests coming back again and again. Innovative as always, he described to me how he had enlarged the garden substantially. "Even over at Meerkerk, I started clearing land that had never been cleared before because I always wanted to plant a new garden."

Rhododendrons were a continuing passion for Stipe as he evolved from his station at Meerkerk to begin clearing and planting his own fifteen acre (6 ha) jungle. As he did this, a simultaneous project arose in the form of a beautiful two-story house, built from the ground up. Beginning in 2000, Stipe and his wife moved into a small apartment on the property, and began construction that took over four years. There was obvious and legitimate pride in his voice as Stipe spoke to me about his now entirely completed home. "This is probably my best accomplishment. I designed this house from scratch, built it and lived in it, and I can't find anything wrong with it." Stipe's garden posed, and still poses, another enormous challenge with acres of land to cultivate and upkeep. His natural innovative spirit has come to his aid many times in problem solving on the property. In one case, he designed and developed a brand new tractor attachment in order to carefully remove plants from the ground and move them about.

This same creativity, focused now on genetics, has allowed Stipe to become one of the best known hybridizers in the Northwest. "I'm most proud of my 'Amiblue' (see cover photo)," he tells me. "I've propagated, and I sell a lot of them. As a matter of fact, I just got word from a friend down in Oklahoma… And he said, "Bill, it's grown for five years!" And Oklahoma gets terribly hot in the summer and cold in the winter, and he said, "I lose a lot of plants every year that I try, but 'Amiblue' is still alive."

Stipe's network of friends through the society reaches beyond the United States too, something he is very appreciative of. "I've loved meeting people from all over the world in the Society. I guess I could count a thousand friends…at least. And getting together at the conventions, we share friends' stories and memories and achievements…I belong to a lot of different organizations, but the Rhododendron Society is probably the friendliest."

Stipe's natural inclination to create has had to come with a healthy dose of patience. In describing the lengthy process of making crosses, I can see his keen interest in willing to wait the years it takes to gain success. "So it takes you four or five years," he says about certain hybrids, "but I'll do that every year, so every year I've got new ones. And I anticipate what they're going to look like. And that keeps me interested."

Sitting in the glowing warmth of his timbered home, the view of his gorgeous multi-acre garden out the window, I ask Stipe from where his inspiration to create beauty develops. "Well, I think it's a very interesting thing…" he tells me, instantly serious. "I mean, just the very fact that you can take a seed, which looks so insignificant, and contain all of the elements of a fantastic plant…It's hard to classify. My passion is growing things. Let's put it that way."

Emily Weissman has a BA in Communications from Seattle Pacific University, and just recently received her Master's in Communications Management from the University of Southern California. Emily is the daughter of Bob and Diane Weissman; Bob is the ARS webmaster and chair of the Digital Publications and Electronic Media Committee. Bill Stipe is a member of the Whidbey Island Chapter.

Figure 1. *Pieris phillyreifolia* flowers and leaves.

For Your Rhododendron and Azalea Beds: The "Vine Wicky" Unvined

Ron Miller,
Pensacola, Florida

[Editor's note: This article, although not about a rhododendron, is about another closely related plant genus, *Pieris*, that is a common companion of rhodos and that has similar cultural needs as rhododendrons and azaleas. Until I read this article, I did not realize that *Pieris* species, like rhodos, also have a disjunct spatial distribution, with most *Pieris* species (four) from southeast Asia, two from eastern North America and one from western Cuba. This article is about one of the lesser known American species, which the author suggests because of its uniqueness should perhaps be more commonly grown with rhodos in gardens.]

The things that your liable/ To read in that flora,/ They ain't necessarily so.

The first thing to say about *Pieris phillyreifolia* is that it makes a great ground cover for spaces around azaleas and rhododendrons. It is a charming ~8 in (~20 cm) woody shrub with glossy, recurved, coriaceous, evergreen foliage and surprisingly large blueberry-style white flowers that open in late winter or early spring (Figure 1). The upright new growth, appearing at several times of year including fall, is strikingly orange-red. The next thing to note is that its common name, "vine wicky," is just plain stupid. The third is that this runty charmer is relatively unknown to horticulturists beyond a small strip along the immediate Gulf Coast, where it has gained some popularity at native plant sales. Though indigenous to Zones 8 to 10, this pieris will tolerate much cooler climes.

I vividly recall when my fellow azalea fancier John Thornton reported, after attending yet another of his endless series of azalea or rhododendron klatsches, that he had casually chatted with a member of a pieris society and was astounded, first, that there *was* a pieris society and, next, that this knowledgeable chap was apparently unfamiliar with a second, southern, and quite remarkable North American member of the mostly Asiatic genus. Almost five decades before, I had stumbled upon this plant when it was blessed with its own genus, *Ampelothamnus.* It lost a certain *je ne sais quoi* in the mundane rebranding. However, the species name "phillyreifolia" remains a joy, unless of course you have to spell it.

Anyone who knows *Pieris floribunda* from our southeastern mountains or the commonly cultivated *japonica*, *taiwanensis*, or *ryukyuensis* will expect any pieris to be an elegant medium-sized shrub. If you live in the warmer parts of this country, you may even have been warned that *Pieris floribunda* is really, really tetchy about coming down out of the clouds and has a fatal attraction for *Phytophthora*. If so, you will be disappointed to read that our southern species, which might hold much promise for warm-weather gardeners, is an oddity of oddities, an ericaceous vine so specialized that it subsists by going up the bark of a single swamp tree, *Taxodium ascendens*, the pond cypress. A few authorities include *Chamaecyparis thyoides*, Atlantic white cedar, as an alternative for the cypress. Of late the qualifier "or shrub" is occasionally appended as an unelaborated afterthought. Thus Alan Weekly in his "Flora of the Southern and Mid-Atlantic States":

> This southeastern species has the remarkable habit of often growing as a creeping vine under the bark of *Taxodium ascendens*, the branches exserted through the cypress bark, sometimes ascending into the upper canopy with the main stem never visible except at the very base of the tree; it also sometimes grows as a low shrub. (Nov. 2012, http://www.herbarium.unc.edu/flora.htm, p. 822)

Better, though still misleading. This species is a dryland terrestrial shrub, in

Figure 2. *Pieris phillyreifolia* on forest floor also sprouting from loblolly pine trunk.

places quite common, that occasionally ascends several species of tree not by draping and climbing but by thrusting its long, ordinarily horizontal rhizomes upward within available loose bark. Its presence on swamp trees is a secondary effect of windblown seed dispersal. The species is so drought resistant that it can hang on as an epiphyte rooted in particulate organic material on the buttress or in the fork of a tree. This little gem is fascinating as an example of (a) a horticulturally neglected native plant, (b) a sun and fire and sand dominated ecosystem, and (c) botanical information gone astray without adequate fieldwork.

The accepted moniker for this plant, "vine wicky," illustrates perfectly how a rumor, no matter how misguided, tends to propagate itself from publication to echoing publication until the repetition loops around to confirm itself as general knowledge, much as Parson Weems's fabrication about the young George Washington and the cherry tree long ago became true by common law. Much published botanical lore is

Figure 3. Common witch hazel as a rhizomatous groundcover.

urban legend. There is no doubt that *Pieris phillyreifolia* under atypical circumstances can run up the flaky trunks and limbs of those particular tree species, but never in a manner one would associate with a vine, and not always just those trees. See the pine trunk in Figure 2, noting the way the tiny shrubs on the ground merge seamlessly into the shrubs emerging from the bark. Yep, that is a loblolly pine, *Pinus taeda*.

The pieris rhizomes are so aggressive that, while burrowing horizontally across the forest floor, they occasionally meet some piece of penetrable upright material and make a 90° vertical turn. What does a pieris care whether its matrix is the peaty surface layer of duff or the bark of one of those conifers or a rotting stump or even a live oak or a *Cyrilla* with a corky, mossy base? The runners ignore gravity within any loose tree sheathing that can substitute for its accustomed organic mat on the soil below. They would probably run up within an old shag rug if one was draped and buried to interrupt their paths. If this pieris is a vine, a New York City subway is a trolly.

Many plants growing in open areas of our region have very similar growth habits, from *Seranoa* (saw palmetto) to *Licania* (gopher apple) to the low, spring-blooming form of *R. viscosum* to *Kalmia hirsuta.* These pineland perennials stay quite low, spreading asexually to form interconnected monoclonal colonies while pushing up vegetative and reproductive parts at intervals. Even our oaks often take on this ground cover form. To my east, *R. minus* var. *chapmanii* survives in its harsh environment with the same asexual strategy, only in its case by layering. All these species limit water loss by the sizes or the shapes or the surfaces of their leaves. They differ from the pieris in that most colonize more open woods. Some also prefer the semi-dry upper edges of seepage slopes; all refrain from going arboreal. Low, colonial, woody perennials seem as characteristic of the southern pine belt as the herbaceous ground covers are of the mixed

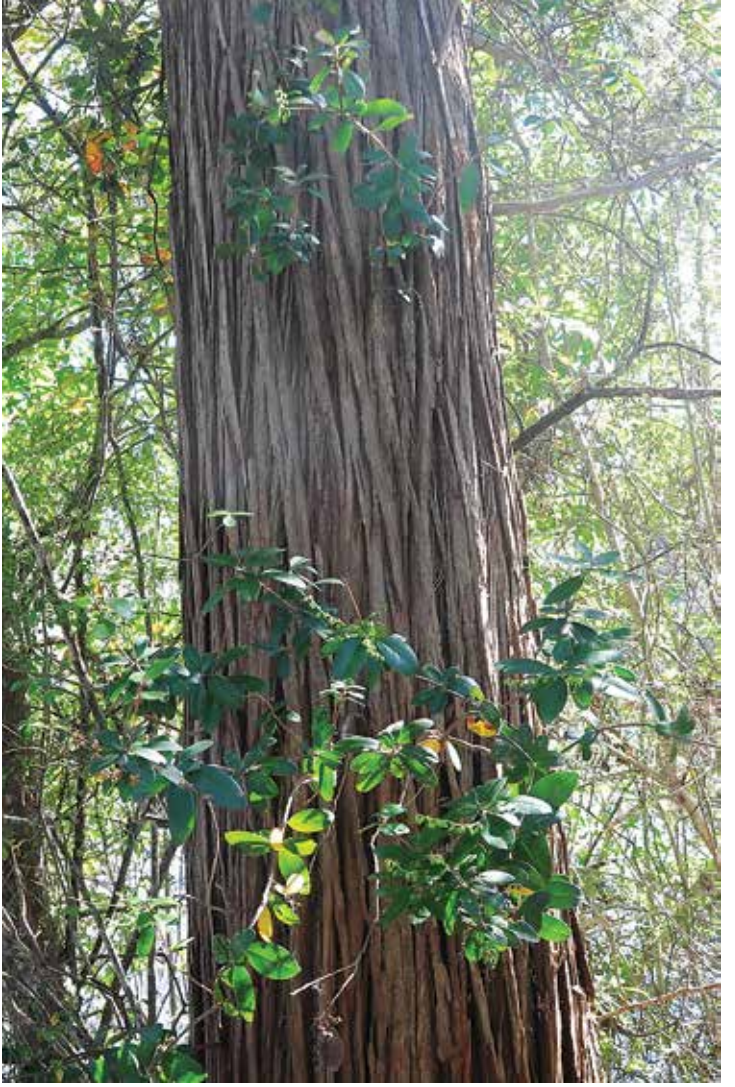


Figure 4. *Pieris phillyreifolia* running under Atlantic white cedar bark.

mesophytic Appalachian forest.

It is fascinating that southern plants from so many different families have all hit upon the same basic survival plan. Even *Hamamelis virginiana,* the common witch hazel, can become a low colonial shrub near the Gulf of Mexico (Figure 3), especially where subject to burning; and a treeless expanse of sandy river bank can at times be carpeted by an extensive ~5 in (~13 cm) high tangle of interwoven *R. austrinum* plantlets that leave nary a patch of soil uncovered. According to botanical keys, neither the witch hazel nor the azalea is rhizomatous. Wanna bet?

The under-bark rhizomes of the pieris initiate leafy shrubs that are the equivalent of the far more numerous shrubs blanketing the ground. If the host tree is vigorous—most

Figure 5. *Pieris phillyreifolia* patch in a highly xeric setting among sand live oak and saw palmetto.

are not—the in-bark runners will in due time become submerged in the cambium layer itself and yet keep probing onward and upward at their tips like some parasitic subcutaneous worm (Figure 4). Rarely, the runners will ascend 20-30 ft (6-9 m) under the bark without deriving any apparent liquid or nutritional sustenance beyond that obtained from their roots below. Perhaps they gain additional water or food through their leaves like the epiphytic *Epidendrum* orchids living on nearby *Magnolia grandiflora*. Quite a stunt, though what the pieris likes most of all are fallen, rotting pine logs, which they will blanket with garlands of green leaves and, in season, flowers. The latter continue from January until early March.

What does this species gain from these arboreal antics? Probably greater dispersal of wind-blown seed from on high, plus increased pollination. Note (a) that the greatest masses of flowers occur in dense bunches of shrubs in trees and (b) that the seed set is much better up high than on the ground, probably because the pollinators going from tree to tree visit several different clones. Below, a bee can spend an entire shift in one giant monoclonal expanse of these self-sterile plants. The terrestrial colonies bear seed mostly on their edges.

One thing cannot be stressed too much: the vast majority of plants are not arboreal. If I had to guess, 99.8% of the biomass in my local region resides in the mats across the floor of the pine-oak forest, much of it sequestered underground (see Figures 5 and 6). The colonies—I have seen some hundreds of yards/meters long and over 15 yd/m wide—are never far from streams or bodies of water, perhaps because the mild slopes offer a hint of seepage that keeps the roots a bit less dry than they would be in the sandy upslopes dominated by *Pinus clausa, Crataegus lacrimata,* and other truly

Figure 6. Patch of *Pieris phillyreifolia* in bloom, circles on Cladonia (red) and Ceratiola (blue).

hard core xerophytes. Perhaps increased humidity from open water is also a factor. The pieris can be found scattered along high sandy benches lining brown water streams, always perched well above the flood line, and in far greater numbers on duff-covered slopes along with *Quercus geminata, Seranoa repens, Pinus taeda*, *Vaccinium arboreum, Osmanthus americana*, etc.

A close look at Figure 6 will reveal that the pieris is nonetheless so well adapted to dry conditions that it can flourish and bloom beside *Cladonia* sp. (deer moss lichen: red circle) and *Ceratiola ericoides* (Florida beach rosemary: blue). These two are surefire indicators of radically dry and sterile conditions. In some delightful settings within shady ravines on Eglin Air Force Base in Florida, colonies enjoying a bit more protection and moisture provide a thick green carpeting for scattered *Stewartia malacodendron, Halesia diptera,* and *Magnolia macrophylla* var. *ashei*; but these carpets always stop above the edge of the seepage zone where bog evergreens and thickets of *R. viscosum* var.

serrulatum take over.

I never dreamed that the pieris could also be a pyrophyte before I clambered up one blackened and ashy stream bank where the pieris was lustily overtopping burned brush stumps and re-emergent rhizomatous fire-lovers like *Vaccinium darrowii*, *Gaylussacia dumosa, Pteridium aquilinum,* and *Morella pumila*. Light green pieris runners were even pushing rapidly up the charred and fire-loosened bark of pine trees. At that moment, an epiphany: the pieris is simply one more of the low shrubs of similar habit adapted to fire climax woodlands. These plants are primarily underground organisms that have expendable vegetative and reproductive shoots that pop up quickly like toadstools in a lawn from their unburned food-storage runners below the ground. The competitive imperative after one of the fires is to obey the maxim attributed to the Confederate raider Nathan B. Forrest: "git thar fustest with the mostest." At that, *Pieris phillyreifolia* does quite well, though in our open wiregrass pinelands, nothing out-"gits" rhizomatous gallberry holly, *Ilex glabra,* which without frequent fires will take over any moist, acid landscape. Our pieris prudently stays instead under the drought-resistant evergreen oaks, which are themselves subject to occasional but fewer fires, and leaves the water edges to the local toughs.

The range of the plant follows the sandy evergreen belt from coastal South Carolina to coastal Mississippi, seldom going far inland. Occasional plants will attach themselves to *Taxodium* in interior acid swamps and hold out in small patches nearby if there is sand around. This little evergreen seems most common in the Yellow River drainage in Eglin Air Force Base, just east of Pensacola, though I have encountered huge patches further to my east, near brown water lakes in the Choctawhatchee River delta, and to the west, where plants line sandy streams in southern Alabama. The pieris is never found along alluvial rivers or where soils are heavy or circumneutral. The frequency and behavior on the Atlantic coastal plain are unknown to me first hand. Surely they are similar.

Some of our local nurserymen maintain that there is both a dryland and a wetland form, maybe even two varieties. They seem to confuse edaphic variations with genetic differences. There are simply too many terrestrial patches that can provide ample seed for wetland tree sites, and those sites, though readily dampened, are not really wet at all but are elevated above the water on the raised buttresses of trees. Every gardener knows that leaf shape and size can vary considerably with a slight change in watering. Differences beyond ordinary for native plants have eluded me.

I know of a few desultory attempts to cross this pieris with the cultivated species—each time, it seems, with casual methods and uncertain results. Some capsules were set, though so far it is hard to tell whether hybridization took place. A pieris seedling looks like a pieris seedling. If these plants are compatible with the Asiatic plants that belong to a quite different section of the genus, perhaps low growing, heat-tolerant foundation plants with the larger flower racemes of *Pieris ryukyuensis* might someday

become available.

So how on earth did so blatant a shrub get stuck with the name "vine wicky"? Quite probably, it was first observed in South Carolina peeking out from the bark of a pond cypress. In that setting, the pieris makes a fine show whether in or out of bloom. Along the rivers in my region, not far from sprawling terrestrial mother lodes, old, punky, broken riverside white cedars provide elevated pockets that serve as beds for windblown seed (Figure 7). Seeds can also germinate upon buttresses of *Taxodium* holding patches of moss or decaying wood above the wet. When the pieris seedlings start growing as epiphytes, they have no inclination to descend and spread out into the adjacent bog but can push up under the loose bark of the trees to make quite a spectacular display. Once a visitor spots an amazing lily of the valley bouquet decorating a tree in the dingy last days of winter, he will inevitably look upward for the plant again in similar circumstances, perhaps even while standing ankle deep in the midst of an unnoticed terrestrial colony. Such is the dominance of preconception over perception.

Last year, after brooding on the conflict between my own field experience and received wisdom, I contacted researchers in Tallahassee, Florida, east of the Apalachicola River, who were doing work with insects that exploit the pieris. "Where do you find your plants?" asked I. "In swamps, on pond cypress trees." At that moment I could not help but recall the cry of 18th century poet Christopher Smart, confined to an asylum for praying aloud on the streets: "I said they were mad, and they said I was mad, and

Figure 7. Old Atlantic white cedar snag with epiphytic *Pieris phillyreifolia*.

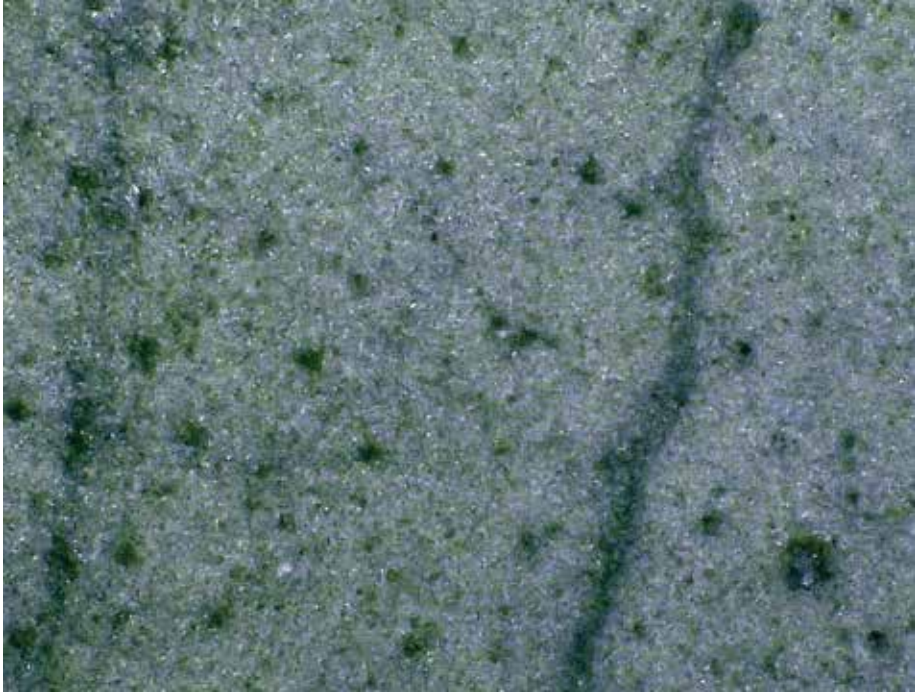


Figure 8. Underside of a *Pieris phillyreifolia* leaf with stomata.

damn them, they outvoted me." In a moment of self-doubt, I emailed a respected field botanist in that same region; and he assured me, much to my relief, that the plant is primarily a colonial shrub over in his area, too, though probably not nearly so frequent as to his west nor in such extensive colonies. Since the colonies themselves are never mentioned in print, they are effectively invisible for all except those who are either uncommonly curious or uncommonly idle. The reader may decide to which group the writer belongs. If you have never viewed the amazing video "The Invisible Gorilla" (http://www.theinvisiblegorilla.com/gorilla_experiment.html), do so; and it will let you know everything that you need to know about the blinkers that we all wear in the field.

The ability to survive in sandy dry areas and even as an epiphyte gives this plant a great horticultural boost. Is there any plant this side of Arizona better able to handle water stress? Not only are the leaves thick and recurved to reduce transpiration, the plant also resembles a lepidote rhododendron, with thousands of tiny stomata under the leaves to control water loss (Figure 8). Like most highly rhizomatous woody plants, *Pieris phillyreifolia* roots readily. Once things get a bit cooler after September, I can stick cuttings into the sandy soil of my Florida azalea beds and have them root in high percentages without anything other than an occasional watering along with the lawn. They bloom the second year after rooting, the first year if the cuttings are budded. They seem quite chipper under the acid conditions demanded by azaleas and rhodies and quickly spread across the bed. Some plants that are rhizomatous in the wild are shy

about sending out runners in cultivation. Not so this pieris. If potted, in no time it will sprout from the drain hole and send feelers to the lip.

The plants seem able to take winters at least up to Philadelphia, maybe far into Zone 6 with some protection. A few leaves or pine needles over them during the depth of winter would surely help to prevent sun scorch. Testing further north seems warranted. Interior New England might be pushing it. My studies suggest that most of the ornamental plants from the Gulf Coast travel north quite well because they are in origin migrants that wandered south during the glacial maxima and have just hung around enjoying our milder winters and lower taxes, while their more energetic, ambitious neighbors marched dutifully back north again. My local azaleas seem to grow better in Zone 7 in northeast Tennessee than they do at home, and our new Gulf diploid fothergilla does better in the Carolina mountains than in my own yard. Why not the coastal pieris? It would be interesting to hear how well it performs on the West Coast without hot Eastern summers.

Most of all, the plants demand sharp drainage, either in coarse sand or in loose organic material such as chipped pine bark. If not full-time epiphytes, they are epiphyte wannabes. Do not overfeed or overwater. These plants flourish on and sometimes in a pure silica medium with absolutely no ion adsorption capacity to hold nutrients. Heavy clay without soil modification is probably a loser. Long-lived and happy in containers, the pieris makes a compact evergreen bush that blooms profusely quite early, maybe indoors around Easter in the North. I have sent seed capsules to Appalachian Native Plants (www.appalachiannativeplants.com) hoping that J and Lindy can work their usual ericaceous magic on the tiny seeds and produce seedlings for distribution.

This species is beautiful and unusual and maybe even cute. Try a dab of Dixie in your beds. I often try rhododendrons and azaleas from up your way. And kill almost every last one of them.

Ron Miller is a retired English teacher, a geriatric plant hunter, and a repentant rhododendron grower in Pensacola, Florida. Not that he has anything against horticulture. Some of his best friends are horticulturists. Photos by the author except for Figures 3 and 5, by Rick Lewandowski, a boon field companion and photographer and a prolific source of taxonomic information who, I have long suspected, is himself a horticulturist.

Asian Rhododendrons Find a Home Away from Home

'Taurus' in the Master Gardeners Display Garden in Skagit County, Washington. Photo by the author.

Western Regional Conference, Everett, WA, Sept. 26-28, 2014
Sponsored by District 2: Komo Kulshan, Pilchuck, Seattle, Cascade, Whidbey Island Chapters

Sonja Nelson
Mount Vernon,
Washington

Rhododendrons are the super-stars among shrubs in the gardens of District 2 where the ARS Western Regional Conference will be held in September 2014. No wonder! Their flowers are sublime, their foliage is eye-catching and their stature is commanding. They have taken their place in District 2 gardens, as they have throughout the Northwest, as if they "belong" here as much as our native plants. But, as most of us know, most of them originated in faraway lands, especially Asia. Once the early plant explorers discovered the extraordinary beauty of Asian rhododendrons, Western gardeners clamored for seed and, lo and behold, the Northwest proved to be a congenial new home for them. (District 2 extends from the Canadian border in the

'Starbright Champagne', a cross by Frank Fujioka. Photo by the author.

north to several miles to the south of Seattle.)

To fully appreciate the influence of the Asian rhododendrons in the Northwest, we need only look at the list of Rhododendron of the Year Awards for the Northwest. The 2014 winning elepidote was 'Fire Rim'. Look back in its parentage and you will find the rhododendron species *dichroanthum, fortunei, souliei, wardii, decorum* and *griffithianum.* All Asian species. The winning lepidote was 'Ginny Gee' whose parentage goes back to *R. keiskei*, a native of Japan, and to *R. racemosum*, a native of China. (The 2014 winning deciduous azalea was 'Homebush' whose parentage is unknown.) The 2014 winning evergreen azalea was 'Komo Kulshan', a selection of the species *R. kiusianum*, a native of Japan.

If we look at some other very popular rhododendrons in the Northwest we see the trail also goes back to Asian species. The spectacular 'Taurus' is an eye-catcher with its bright, red-flowered trusses. One of its parents is the species *R. strigillosum* hailing from Sichuan and Yunnan provinces in China. The wonderful "yaks" (*R. degronianum* ssp. *yakushimanum*) with their decorative indumentum on their foliage and their tidy, rounded forms are commonly grown in District 2 and is a useful parent for many hybrids. This species is native to Japan. Coming from India, Nepal and Bhutan is the species *R. griffithianum,* which is a parent to the popular 'The Honourable Jean Marie de Montague'. Once the Asian species were introduced to the West, gardeners in the Northwest soon found that many of them were highly suitable for their climate and extended the range of parents for new hybrids. Gardeners and hybridizers no longer needed to rely on the old "Ironclads," which were parented by very cold-hardy species from Europe, the Caucasus mountains and the eastern North America—species *R. catawbiense* and *R. maximum.* District 2 is thus a prime location for trying out the new Asian species and their hybrids from the start.

That the Northwest climate is hospitable for the Asian species is an ironic statement,

'Winter Song', a cross by Jim Barlup. Photo by Jim Barlup.

to say the least. Although temperatures are generally comparable, the geography is dissimilar; Asian rhododendrons tend to be mountain dwellers, while their new homes in District 2 are at the base of the North Cascade mountains bordering Puget Sound. More dissimilar are the seasonal rainfalls. In Asia, the heavy rainfall comes in the summer, and in the Northwest it comes in the winter. However, with supplemental watering in the dry months of July, August and September, the rhododendrons adjust.

Steve Hootman, Executive Director and Curator of the Rhododendron Species Botanical Garden (RSBG), gives his explanation on how the rhododendrons adjust to these disparities. In the Fall 2013 issues of the garden's newsletter, he writes that Puget Sound has a mitigating effect by bringing fog to the lowlands and preventing heat from building up. In addition, he believes that the dry growing season with low humidity and cool evening temperatures prevent many of the diseases and insect problems that can befall other regions. He also writes that the low soil fertility, at least at the RSBG, helps keep diseases and insects at bay.

ARS members from outside the Northwest who attend the Western Regional Conference may want to learn about the rhododendrons native to the Pacific Northwest in particular. Most local members are less enthusiastic about using natives in their gardens than they are about the trnasplants from Asia. Yes, we have some, but they are not among the super-stars of most gardens. Locals may thrill at the sight of the native *R. macrophyllum* growing along the highway on Whidbey Island and may even stop to snap a photo but are not about to fill their gardens with this lack-luster plant. Hikers in the Cascades may take delight in the cheery yellow flowers of *R. albiflorum,* but if they try it in their gardens they find it is a grouchy grower. As for *R. groenlandicum* from subsection *Ledum*, known as Labrador tea, well, landscape architect Clive Justice calls it "horticulturally challenged." Yes, we like to see these rhododendrons in the wild, but we do not depend on them as we do the Asians as we build our gardens.

'Sandra Ann Stipe', a cross by Bill Stipe. Photo by Bill Stipe.

Because District 2 welcomed the Asian rhododendron immigrants as soon as they arrived, the region inevitably became a hybridizing milieu. One of the first hybridizers was Halfdan Lem from Seattle who developed the Walloper group using various hybrids with the Asian parental species *R. griffithianum* and *R. arboreum.* (These hybrids also had the hardier *catawbiense* from eastern US as a parent that lent some cold hardiness.) One of the results of Lem's hybridizing is the esteemed 'Lem's Monarch'. Ever since Lem, the hybridizing bug has stayed alive in District 2. Today three notable hybridizers are producing new rhododendrons that are exciting gardeners at home and further afield. (These are not the only hybridizers in the District but are listed here as examples of the general fervor in the area.)

Frank Fujioka of Whidbey Island is known throughout the rhododendron world for his hybrids. He was, in fact, inspired by Lem. Perhaps his most well known is the stunning gold-flowered 'Seaview Sunset'. Another favorite is 'Starbright Champagne', and a newer beauty is 'Louisa Whittrock'. Jim Barlup of Bellevue is a prolific hybridizer. In the Winter 2014 issue of the ARS journal are the registered names of seven of his crosses. From the start he has tried to introduce some cold hardiness into his crosses to make them suitable for East Coast gardens. Also from Whidbey Island is Bill Stipe. An article on his hybridizing appears in this issue. His 'Amiblue' is on the cover.

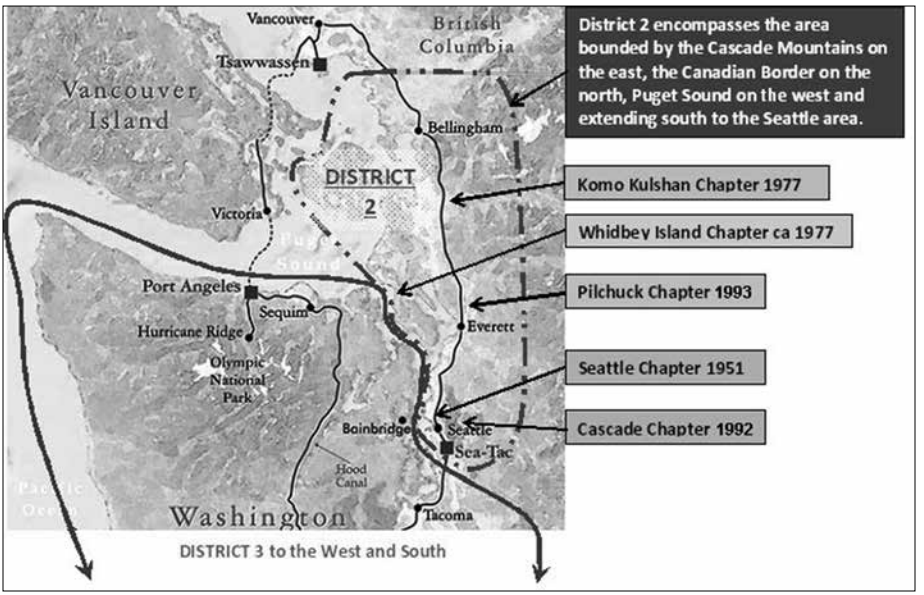
If you attend the Western Regional Conference this year, you can immerse yourself in the rich pool of rhododendron knowledge gained over many years by members of this District and adjacent Districts and take home new ideas for your own garden.

Sonja Nelson is a member of the Komo Kulshan Chapter and Assistant Editor of JARS.

ARS District 2: Host of 2014 Western Regional Conference

Richard Fairfield
Snohomish,
Washington

District 2 of the ARS encompasses the Northwest mainland corner of Washington State, from the Seattle area to the Canadian border and from the Cascade Mountains to Puget Sound, including the islands. The Olympic Peninsula, which is west of Puget Sound, is part of District 3, which extends down the coast and along the I-5 corridor towards Oregon (Clark 2012). There are four *Rhododendron* species native to our district, *R. albiflorum* (Cascade azalea), a deciduous plant which grows on moist mountain slopes and is rarely seen in bloom due to the late melting of the snowpack (see Kendall 2012); *R. groenlandicum* (Labrador tea), which inhabits swamps and bogs along the coast; *R. columbianum* (western Labrador tea), which tends to prefer a little



Map showing boundaries of ARS District 2.

elevation; and of course, the Washington state flower, *R. macrophyllum*, the showiest of the four species.

Gardens in District 2 experience winter climates ranging from the warmth of the Puget Sound shore zone 8a (8b most years) to the chill of the inland river valleys and mountains, zone 7b and even 7a. Of course, all of this often goes out the window due to the region's wide range of microclimates. The topology of the western slopes of the Cascade Mountains, which influences wind patterns and cold air drainage; tall trees that protect from winds but which also provide shade from the frost-melting sun; and the occasional influx of Fraser River canyon winter outflows from central British Columbia can all alter the actual growing conditions in any given garden. Dropping snow and limbs from large trees can sometimes provide unintentional pruning of rhododendron plants under them, but these trees can also have a significant influence in the summer too. They can protect plants from the heat of the northern sun but this may also limit the sunlight needed for the maximum formation of flower buds. Summer temperatures rarely get over 90° F (32° C) for more than a day or two at a time (once or twice each summer) and temperatures of 100° F (38° C) or more are almost unheard of. Still, summer rain is scarce and watering of a rhododendron garden (especially one with young plants) is often necessary.

District 2 is comprised of five chapters (see figure) with about 180 members in total, though, unfortunately, like in many other chapters, not all members are still active. From north to south in the district, the Komo Kulshan Chapter spans from the Canadian border to Mt Vernon and has 16 members; Whidbey Island Chapter has 40 members; Pilchuck Chapter takes in all of Snohomish county and has 30 members; Seattle Chapter has 58 members; and Cascade Chapter, on the east side of Lake Washington, has 35 members. While membership and participation has been declining in recent years, the active members in all of the chapters are enthusiastic about the educational, social and exploration activities offered. All chapters continue to hold monthly meetings, truss shows, plant sales, garden tours and other excursions. Because of the relative close proximity of the district's chapters to one another, associate membership in multiple chapters is fairly common (which has helped to keep at least one chapter afloat) and several chapters share activities.

District 2 hosted the ARS annual convention in both 1999 and 2009 and the fall regional in 2002. District 2 is again proud to host the Fall Western Reginal Conference on September 26-28, 2014. The theme for the conference is "Falling into Rhododendrons." The conference will be held at the Holiday Inn in Everett Washington, the same venue as with the 2009 convention. The semi-annual board of directors meeting will be held on the Friday with the conference kick-off night with a talk on the "History of Jim Barlup Hybrids." Saturday will feature morning and afternoon educational seminars, and the hybridizer's roundtable, by popular demand, will also be held on Saturday. The day will conclude with a banquet and keynote

speaker. Sunday will see the conference wrap-up and the Executive Director's forum. Being in the fall, and not in the rhododendron blooming season, open gardens and garden tours have yet to be determined (see formal conference announcements in the coming months).

The ARS itself got its start in Portland Oregon in 1945, and interest in other areas soon made it necessary to establish other chapters around which future membership would be formed. Interest in the ARS spread quickly north into Washington State and in December 1951, the founding members of the Seattle Rhododendron Society signed their by-laws and one of the founding members, Elsie Watson, went to Portland to sign up with the ARS. District 2 was thus established 63 years ago. At one point, membership was as high as 400 but Washington ARS members were spread out all over the central Puget Sound counties, including on some of the islands. In 1975, there was interest in starting a Rhododendron Club in Skagit County, about 65 miles (100 km) to the north of Seattle, and in 1978, the Komo Kulshan Chapter (the Native American name for Mt. Baker, the 10,775 foot (3284 m) volcano, which on a clear day, is visible from both most of District 2 and southwestern British Columbia (BC)) was formed, although it was initially placed in District 1 (BC) as they were closer to the Vancouver area than to Seattle. However, due to national pride and border crossing challenges, the chapter later petitioned the ARS to be placed in District 2 with the Seattle Chapter, and this was granted in 1988. Membership peaked at about 65 with many members living in Snohomish County 30 miles (about 50 km) to the south. Two species clones of *Rhododendron* bear the chapter's name: *R. kiusianum* 'Komo Kulshan' and *R. pseudochrysanthum* 'Komo Kulshan'.

In the meantime, interest (and/or pressure) was mounting for the wide-spread Seattle chapter to break up into more geographical entities. Seattle chapter members who lived on Whidbey Island determined that there was enough interest for a chapter on the island, so with the help of Lloyde Newcomb, the Whidbey Island Chapter was formed sometime between 1977 and 1978. Since that time, 18 members in that chapter have been honored with the Bronze Medal and at least two of the founding members are still active. The chapter is honored to count both Frank Fujioka and Bill Stipe as members.

In 1980, the Seattle chapter incorporated to be able to assume ownership of Meerkerk Garden on Whidbey Island from Ann Meerkerk's estate. Meerkerk, begun in 1961 and located near the center of Whidbey Island, is a 10 acre (4 ha) display garden surrounded by 45 acres (18 ha) of forest preserve and walking trails. Seattle eventually dissolved their ownership to allow Meerkerk to become its own non-profit garden and it is now more closely aligned with the Whidbey Island chapter.

Again, there was a push for the Seattle Chapter to relinquish some of its members so they could meet closer to their homes, this time in Bellevue, just across Lake Washington from downtown Seattle. There was concern that this move would hurt the Seattle club but those involved pushed forward anyway and in 1992, the Cascade

Chapter was formed.

Finally, in 1993, the Pilchuck Chapter was established in Marysville by a splitting of the Komo Kulshan Chapter, but unfortunately, Komo Kulshan itself has never really recovered its membership base from this split. Pilchuck also attracted those Seattle Chapter members living north of Seattle, closer to Everett. In summary, District 2 has many active ARS members, and because of its close proximity to both Districts 1 (BC) and 3 (western WA), is part of a vibrant Northwestern rhododendron community.

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Richard Fairfield is the District 2 Director and a member of the Pilchuck chapter.

Are Idioblasts Related to Drought Resistance in Rhododendron section *Schistanthe*?

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Erik Nilsen
Photos by Erik Nilsen.

Layman Summary

Leaves of Rhododendron species in section *Schistanthe* have abnormally large cells called idioblasts on the upper leaf surfaces just below the epidermis. The significance of idioblasts to tropical *Rhododendron* leaves is a point of speculation. We did a project to measure the amount of idioblast cells in the leaves of 17 different species. In addition, we studied the significance of the idioblast cells to water relation traits of the leaves. The total leaf volume occupied by idioblast cells was from 4% to 22% among the different species. We observed that succulent leaves had lower numbers and volumes of idioblasts compared with thin non-succulent leaves. In relatively thin leaves, idioblast cells can make a significant contribution to water storage, while in thick leaves idioblast expression is less important for leaf water balance. In addition, the more succulent leaves had higher maximum water loss rates than did thin leaves with large idioblasts. We propose that idioblast cells in *Rhododendron* leaves are an adaptation to water stress because they provide a buffer against short-term changes in leaf water content for epiphytic species with relatively thin leaves.

Leaves of all members of *Rhododendron* section *Schistanthe* (Craven et al. 2010), also known as vireyas (Argent 2006), contain idioblasts (Nilsen and Scheckler 2003). Idioblasts are not known from leaves of any other section of the genus *Rhododendron*.

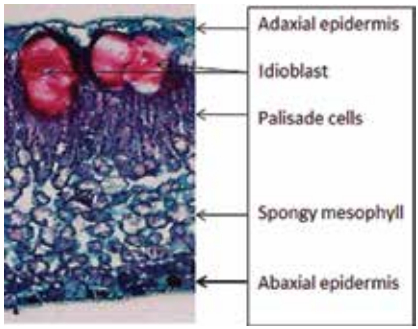

Fig. 1. Image of leaf cross-section from *R. zoelleri* 'Decimus' stained with Safranin O and fast green. Major leaf cell types are identified.

This uniquely derived trait helps define the group (Argent 2006, Craven et al. 2010). Idioblasts are large cells with unknown function within a matrix of smaller cells. The idioblast cells in *Schistanthe* are roughly elliptical in shape and contain a large central vacuole (Fig. 1). The central vacuole can contain oil droplets, mucilage, or be subsectioned by intra-vacuolar membranes (Nilsen and Scheckler 2003), but the vast majority of the material in the idioblast central vacuole is water. *Schistanthe* have these idioblasts located throughout the adaxial (top) sides of their leaves, although some idioblasts are found on the abaxial (bottom) epidermis particularly associated with scale bases. Adaxial idioblast cells in *Schistanthe* leaves are either located just below the epidermis or in the epidermal layer. Idioblasts are found in organs of other epiphytes and some non-epiphytic plants as well. For example, some orchid and bromeliad species have idioblast cells in their roots or leaves (Ely et al. 2007, da Silva and Scatena 2011). Idioblast cells in leaves of some non-epiphytic taxa are also well described, particularly in the *Fabaceae* and *Scrophulariaceae* (Lersten and Curtis 1995, 2001).

The structure of idioblast cells in *Schistanthe* leaves has been documented, and their functions may involve leaf or plant water-relations, protection from ultraviolet radiation, leaf-temperature moderation or defense against herbivores (Nilsen and Scheckler 2003). Among these possibilities, the effects of leaf idioblast cells on water-relations may have importance to plant distribution and species habitat preference.

Species of *Schistanthe* are commonly epiphytic, particularly in cloud forest regions (G. Argent personal communication). In contrast, an epiphytic growth habit is rare or absent in other groups of *Rhododendron* (Argent 2006). An epiphyte obtains water (derived from precipitation, stem flow, or fog drip) from a thin layer of organic matter on the branch. The amount of water in that organic matter is often small and typically has a short storage time compared with water in the soil. Thus, epiphytes in a cloud forest may periodically experience significant water limitation due to random or seasonal fluctuations. For this reason, several large groups of epiphytes (e.g., orchids and bromeliads) have specialized metabolism (CAM photosynthesis) and water-conservation structural traits such as succulent leaves or water tanks (Reyes-Garcia et al. 2012). It is logical to assume that epiphytic *Rhododendron* would follow suit.

We propose that idioblast cells, because they contain a large amount of water, increase a leaf's water-holding capacity (succulence), thereby serving as a buffer against water loss from palisade cells (Fig. 1). We hypothesize that the effects of idioblast cells on leaf

water-relations would increase as the total volume of idioblasts in the leaf increases. Thus, leaves with a large total volume of idioblast cells would be able to move water from idioblasts to replace the water lost from adjacent palisade cells during transpiration. The palisade cells, which perform most leaf photosynthesis, would thus be able to retain a higher relative water content during the day because of nearby idioblast cells.

To help understand this hypothesized relationship, consider two buckets of water. One bucket contains 40 l and the other contains four l. If you remove an equivalent amount of water from each bucket (e.g., 200 ml), then the bucket that started with 40 l of water would retain a higher proportion of its initial water (99.5 %) than would the bucket that started with four l (95 %). Based on this analogy, leaves with high idioblast expression (total area of idioblast per area of leaf section) should be able to maintain a more stable water content during the day when transpiration is occurring in comparison with leaves with low idioblast expression. Also, leaves with greater idioblast expression might have greater water loss (transpiration) because of their higher water content per leaf area.

Leaf water content is regulated by two processes: 1) hydraulic conductance of water from roots to leaves (transport stream), and 2) water loss from leaves to the air (transpiration). This is similar to a bathtub. If the tap flow of water (hydraulic conductance) is high and the drain (transpiration) is closed, then the tub (leaf water content) fills. On the other hand, if the drain is open and the tap flow is slow then the tub drains. Therefore, if transpiration is higher than hydraulic conductivity, then leaf water content will decrease. A decrease in leaf water content leads to a water deficit and a lower water potential. Decreases in leaf water potential induce stomatal closure (stomata are the small holes on the lower leaf surface through which gasses flow in and out of the leaf) and indicate that the plant is under drought stress.

Leaf water potential is the energy state of the water in the leaf, and it is measured in negative potential energy units (-MPa). The physiological activity of water and its movement from cell to cell, from root to leaf or from leaf to atmosphere are all dependent upon leaf water potential. Water will only move from a higher (more positive) to a lower (more negative) water potential. The lower (more negative) the water potential of a leaf, the greater the drought stress the leaf tissue is experiencing. Therefore, it would be advantageous for plant leaves to be able to lose even a relatively large amount of water without changing leaf water potential too much. The ratio of leaf water loss to changes in leaf water potential is defined as leaf capacitance. High leaf capacitance means that a leaf can lose a relatively large amount of water without significant change in leaf water potential.

During conditions of low hydraulic conductivity of water (drought for example), there are two possible ways to maintain constant leaf water content. One is to reduce transpiration by closing stomata. This response will cause a reduction in photosynthesis (which is regulated by stomatal conductance). Alternatively, the leaf could provide some

additional water from its own resources (e.g., the idioblast cells) into the transpiration stream. Having an alternative water source could enable both constant leaf water content and open stomata during periods of low hydraulic conductance (drought). Such an alternative water source in a leaf is known as a leaf capacitor (Blackman and Brodribb 2011). Leaves with large capacitors are able to maintain constant high leaf water content even during drought. In such leaves, it takes a large change in relative water content to make any change in leaf water potential. If idioblasts serve as leaf capacitors, we predict that, as expression of idioblast cells increases, leaf capacitance should also increase.

To test these ideas, we decided to identify a group of *Schistanthe* species that differed in idioblast expression in their leaves. We then tested three questions: 1) Is leaf capacitance significantly associated with idioblast expression? 2) Does stomatal pore index increase with idioblast expression? 3) Do plants that have particularly high or low idioblast expression live in different habitats? Addressing these three questions is a first step to understanding the functional significance of idioblasts to leaf water-relations and habitat preference in tropical *Rhododendron* species.

Species Used in this Study

In this study, we used accessions representing 17 species of *Rhododendron* section *Schistanthe*. All accessions were obtained from the Pacific Island Nursery in Kea'au, Hawaii. These accessions were cloned from plant material originally supplied by various sources, including the Rhododendron Species Foundation and Botanical Garden (Federal Way, Washington, USA), The Royal Botanical Garden (Edinburgh, Scotland) and private collectors. There were between three to seven plants tested for each accession, 62 plants in all. Each was given an individual number, potted in coconut bark, fertilized every two weeks, and watered daily. Daytime temperature in the greenhouse ranged from 25 - 30° C through the year. Native habitat information for each species represented by an accession was obtained from published species descriptions (Argent 2006).

Leaf Sample Preparation

Three leaves were collected from each plant. Mature leaves, from the current growing season, on outer canopy branches were selected in order to ensure similarity of developmental stage among species. At the midsection of each sampled leaf, five rectangular pieces (2 mm wide) were excised that extended from the leaf margin to the midvein. These pieces were immediately preserved in a fixative (FAA: 10% formalin, 5% acetic acid, 50% ethanol and 35% water). After complete fixation the samples were dehydrated through an alcohol gradient, followed by a xylene gradient and impregnated with paraffin oil before embedding in paraffin blocks. Sections (12 micron thickness) were adhered to microscope slides and stained with safranin-O and

fast green. This technique was selected to highlight the presence of secondary cell walls, fibers, chloroplasts, and nuclei with safranin O, and primary cell-wall structure with fast green (Ruzin 1999). We made five slides from each of three leaves from each plant, resulting in 15 slides for each plant.

Measuring Idioblast Expression

Anatomical traits were measured for each microscope slide. Two photomicrographs were captured from each slide by using a digital camera (Olympus model DP-10) mounted on a bright field microscope (Olympus model BX50) from each slide. We selected the most complete and clear image of the two taken from each slide for analysis. Measurements of all leaf-section images (15 per plant) were made by using the image analysis program SCION image (Scion Corporation, Frederick, Maryland). Leaf thickness, the number of idioblast cells on both the adaxial and abaxial sides of each image, and the length and width of each idioblast in the leaf image were measured. Cell volume of each idioblast was calculated by using the geometric formula for an oblate spheroid ($4/3\ \pi^2 b$), where a = major semiaxis and b= minor semiaxis (Selby 1972). We determined the average size and total area of idioblast cells in each section. Idioblast expression was calculated as the total area of idioblast cells divided by the total area of the leaf image times 100. Therefore, idioblast expression is the % of the leaf section occupied by idioblast cells.

Measuring Leaf Water-relations Traits

We utilized moisture-release curves to determine leaf water-relations characteristics. A moisture-release curve is the relationship between leaf water potential and leaf relative water content. Each leaf (at least three from each plant) was saturated to full water content by immersing the petiole in water and leaving the leaf in a closed chamber for at least two hours. Following full leaf water saturation, we immediately measured leaf area, weighed the leaf and determined leaf water potential with a Scholander pressure chamber (Plant Moisture Systems Instrument Co., Albany Oregon, model 1000). Following the initial measurement, we left the leaf on the bench top (air temp = 25° C; relative humidity = 40 %) to dry out. During the drying process, we repetitively measured relative leaf water content and leaf water potential at ten points or more as the leaf lost about 30% of its total water content. At the end of the moisture-release curve we determined leaf dry weight. Leaf succulence was calculated as the total water content per leaf area (g water/ m^2) at full leaf saturation. Leaf capacitance (C_{leaf}), was determined as the amount of water loss that occurs for any given water potential change before the turgor loss point. We standardized leaf capacitance against leaf size as done in previous research (Brodribb and Holbrook 2003).

We estimated the maximum leaf conductance for each plant by measuring the stomatal pore index (SPI) (Sack et al. 2003), which accounts for both stomatal density and stomatal pore size (SPI = density x pore size^2). With standard imaging

techniques (Nilsen and Webb 2007), we determined the number and size of stomata on the abaxial surface of five replicates of three leaves (n=15) from each plant. None of our leaves had stomata on their adaxial leaf surface. Thus, all the plants we studied were hypostomatous. The only known amphistomatous species (stomata on both leaf surfaces) of *Rhododendron* is *R. saxifragoides* (Nilsen 2011).

Is Leaf Capacitance Significantly Aassociated with Idioblast Expression?

We addressed this question by regressing mean leaf capacitance (C_{leaf}) against mean idioblast expression (as the independent variable) for all sampled accessions. Idioblast expression varied from 4.1% in a single plant of *R. macgregorieae* to 21.6% in a single plant of *R. bryophilum.* Mean idioblast expression on an accession basis varied from 5.2% for *R. goodenoughii* to 19.9% for *R. bryophilum*.

Leaf capacitance (C_{leaf}) per plant varied from 621 mmol m^{-2} MPa^{-1} in a single plant of *R. multicolor* to 3166 mmol m^{-2} MPa^{-1} in a single plant of *R. crassifolium*. On an accession basis, the lowest average C_{leaf} was 634 mmol m^{-2} MPa^{-1} for *R. kochii*, and the highest C_{leaf} was 2172 mmol m^{-2} MPa^{-1} for *R. crassifolium*. These C_{leaf} values resemble those reported by Blackman and Brodribb (2011) for diverse temperate and tropical plants. In brief, idioblast expression and C_{leaf} both varied by five-fold among plants and three to four-fold among accessions.

There was no significant relationship between leaf capacitance and idioblast expression among sampled accessions (Figure 2A). However, there was considerable variation in C_{leaf} at low idioblast expression. If one putative outlier (*R. bryophillum*) is removed from the data set, then there seems to be a constraint toward lower C_{leaf} at higher levels of leaf idioblast expression. There was a positive, significant regression (R^2= 0.42; p = .004) between C_{leaf} and leaf succulence (Fig. 2B). The discrepancy between these two relationships is explained by leaf thickness in relation to idioblast expression. Relatively thin leaves that have high idioblast expression (e.g. *R. bryophillum* – 4.0 mm thick and 20% idioblast expression) have high succulence because of their idioblasts. In contrast, species with thick leaves and low idioblast expression (e.g. *R. crassifolium*- 6.25 mm thick and 5.4% idioblast expression), have high leaf succulence due to leaf thickness.

We predicted that high idioblast expression would increase the total volume of water stored in the leaf. This is true for species with relatively thin leaves. However, as leaf thickness increases, idioblast expression has a lower influence on leaf succulence. Thus, leaves that are very succulent (due to thickness or to idioblasts) could lose more water volume before relative water content decreases in comparison with leaves that have low succulence (see our bucket analogy earlier in this article). In summary, C_{leaf} was associated with leaf succulence rather than with idioblast expression alone, suggesting that idioblast expression is most important for buffering water potential in species with relatively thin leaves.

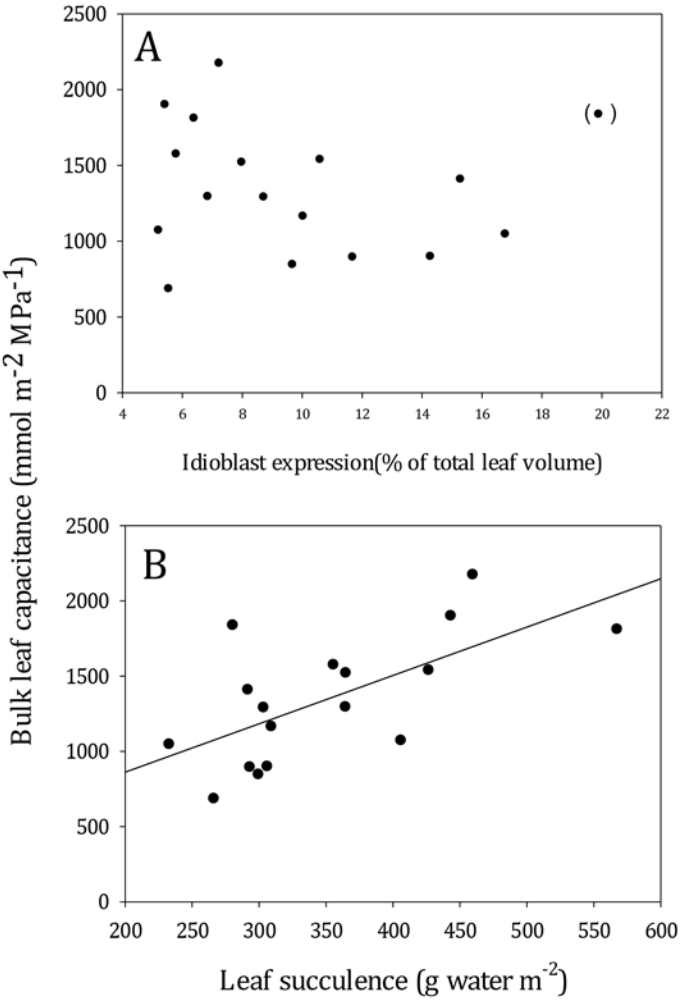

Fig. 2. The relationships between leaf capacitance and leaf anatomical traits for 17 accessions of *Rhododendron* species in section *Schistanthe* are shown. A) A plot of leaf capacitance against idioblast expression. The point in parentheses refers to the accession representing *R. bryophilum*. B) A plot of leaf capacitance against leaf succulence. Solid line in Panel B refers to the linear regression results (R2= 0.43).

Does Stomatal Pore Index Increase as Idioblast Expression Increases?

The highest stomatal density (number of stomata per mm^2 of leaf surface) was 547 mm^2 for a plant of *R. macgregoriae*, and the lowest stomatal density was 202 mm^2 for a plant of *R. crassifolium*. The longest stomatal pores (0.046 mm) were found on a plant

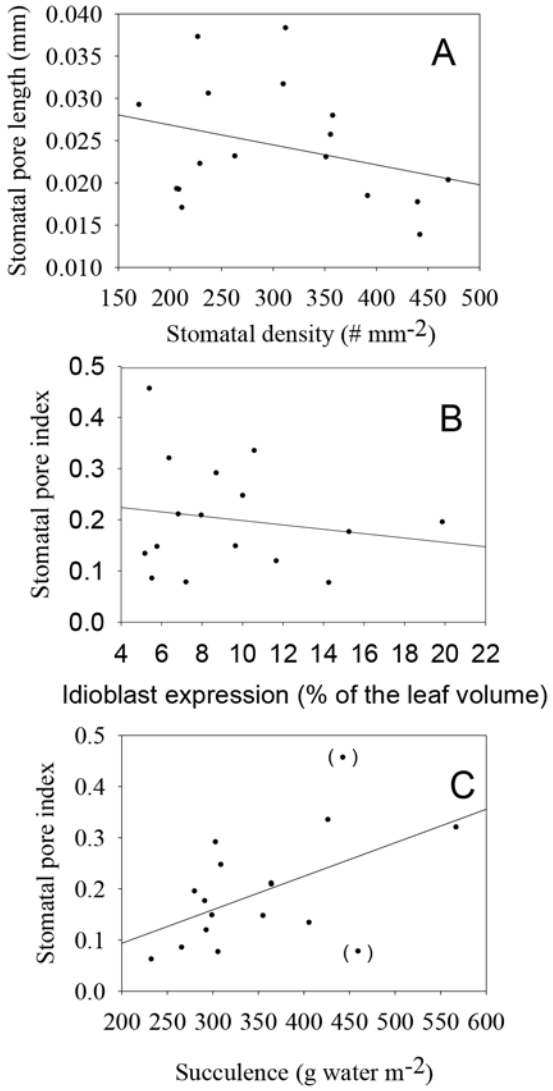

Fig. 3. The relationships between stomatal traits and leaf anatomical traits for 17 accessions of *Rhododendron* species in section *Schistanthe* are shown. A) A plot of the relationship between stomatal pore length and stomatal density (R^2 = 0.099). B) A plot of the relationship between stomatal pore index (= stomatal density × (pore length)^2) and leaf idioblast expression (R^2 = .028). C) A plot of the relationship between stomatal pore index and leaf succulence (R^2 = 0.20). Points in parentheses represent values for *R. jasminifrorum* (top) and *R. crassifolium* (bottom).

of *R. jasminiflorum* and the shortest stomatal pores (0.014 mm) were found on single plants of *R. kochii* and *R. macgregoriae*. We anticipated a negative relationship between stomatal density and stomatal pore length. The accession with the largest average stomatal pore size (0.037 mm) was *R. jasminiflorum*, but the accession with the lowest average stomatal density (170.7 mm^{-2}) was of a different species (*R. celebicum*). There was a non-significant negative relationship (R^2 = 0.098; p = 0.220) between mean stomatal pore length and mean stomatal density among all accession (Fig. 3A).

Among our accessions, the largest average stomatal pore index (SPI) was 0.334 for *R. jasminiflorum* and the smallest was 0.076 for *R. crassifolium*. Plants that have small SPI have low maximum stomatal conductance. Therefore, based on SPI, *R. crassifolium* had the lowest potential stomatal conductance and *R. jasminiflorum* had the highest, suggesting that *R, crassifolium* conserves water more effectively than does *R. jasminiflorum*.

Stomatal pore index (SPI) tended to decrease as idioblast expression increased for the accessions we studied (Fig. 3B), but this regression has weak support (R^2 = 0.03; p = 0.536). As with our other parameters, SPI was highly variable at low idioblast expression, but SPI was constrained to low values at high idioblast expression. Similar to our observations with capacitance, SPI was significantly associated (R^2 = 0.270; p = 0.033) with succulence rather than with idioblast expression. As leaf succulence increased, SPI increased (Figure 3C). There were two putative outliers to this last relationship (*R. jasminiflorum* and *R. crassifolium*). If these two species are removed from the analysis, there is a strongly significant relationship (R^2 = 0.41; p = 0.010) between succulence and SPI. Therefore, increasing succulence (by increasing leaf thickness or leaf idioblast expression) is associated with a higher maximum stomatal conductance (as indicated by the higher SPI).

Do Plants that have Particularly High or Low Idioblast Expression Live in Different Habitats?

Our anatomical and water-relations measurements suggest that succulence of *Schistanthe* leaves is related to leaf capacitance and SPI. If these relationships are important to plant fitness during drought, we would expect to find plants with more succulent leaves in microhabitats that are prone to water limitation. To find the relationships among leaf anatomical traits, leaf water-relations traits and habitat quality, we collected habitat information from species descriptions provided by Argent (2006). We were unable to find clear relationships between habitat characteristics and leaf or water-relations traits when all accession means were included in the analysis. Therefore, we decided to look at the habitat quality for the four accessions (*R. bryophilum, R. celebicum, R. javanicum, R. verticillatum*) with the highest average idioblast expression (average of 15.3%) and for the four accessions (*R. goodenoughii, R. kochii, R. macgregoriae, R. orbiculatum*) with the lowest average idioblast expression (average of 5.5%). There

Table 1. Habitat and plant growth form characteristics of four accessions of *Rhododendron* species in section *Schistanthe* with the highest or lowest idioblast expression among 17 tested accessions. I-Exp = idioblast expression; Suc = succulence; EL = elevation; Lat = latitude.

Accession	I-Exp	Suc	Height	Dominant Growth	Habitat preference form	Min EL	Max EL	Mean EL	Min Lat	Max Lat	Mean Lat
	%	g/m2	m								
bryophyllum	19.9	280	2	epiphytic	Tall (mature) forest	1065	1830	1447.5	-11.6	-2.6	-6.6
celebicum	15.3	291	1.5	epiphyte	Mossy forest	1800	2600	2200	-7.4	4.7	-1.4
javanicum	14.3	306	5	epiphyte	Primary and secondary forest	800	2550	1675	-8.9	21.1	15
radians ssp. *verticillatum*	10.1	309	3	epiphytic	Mossy forest	700	1500	1100	-7.4	4.7	-1.4
Average	**14.9**	**296.5**	**2.88**	**epiphytic**		**1091**	**2120**	**1605.6**	**-8.8**	**6.97**	**1.4**
goodenoughii	5.2	406	4	Terrestrial	Ridges and open shrub	1400 grassland	2300	1850	-11.6	-2.6	-6.6
kochii	5.5	266	10	Terrestrial tree	Mossy forest on ridges	1000	2300	1650	4.6	21.1	12.85
macgregoreae	5.8	356	15	Terrestrial tree	Shrublands, mossy forest, dry sunny locations	500	3000	1750	-11.6	0	-5.8
orbiculatum	5.4	443	4	Terrestrial shrub	Terrestrial on cliffs and rock outcrops	800	1800	1300	0.8	7.4	4.1
Average	**5.48**	**367.8**	**8.25**	**Terrestrial**		**925**	**2350**	**1637.5**	**-4.45**	**6.48**	**1.14**

was no consistent difference in elevation or latitude characteristics between the ranges for the two groups (Table 1). However, the species with high leaf idioblast expression were small shrubs and predominantly epiphytic. In contrast, those with low idioblast expression were large shrubs or trees and were predominantly terrestrial. Our sample size of accessions was relatively small, so this hypothesis should be considered preliminary and needs further testing. Yet, our results make good ecological sense.

Epiphytic habitats are characterized by small rooting zones comprised primarily of organic matter held on tree branches. This type of growth medium is likely to become wet during rain events, but quickly dry afterward. Therefore, epiphytic plants that are able to maintain relatively constant tissue-water content during rapidly changing root-medium-water content should have a selective advantage. We propose that idioblasts on the adaxial side of leaves can buffer changes in leaf-tissue-water content in habitats with rapidly changing water content. This relationship is particularly true for relatively thin leaves. Locating the idioblasts on the adaxial side of the leaf is important for maintaining gas exchange into the leaf because most gases diffuse through stomata on the abaxial leaf surface into the mesophyll region.

Images of four species in *Schistanthe* that have idioblasts

R. bryophyllum.

R. orbiculatum.

R. robinsonii.

R. zoelleri.

Summary

Leaves of *Rhododendron* species in section *Schistanthe* have idioblast cells on their adaxial leaf surfaces. The total leaf volume occupied by idioblast cells (expression) varies from 4% to 22% among plants. There is a negative relationship between leaf idioblast expression and leaf capacitance. However, there is a significant positive relationship between leaf succulence and leaf capacitance. In relatively thin leaves, idioblast cells can make a significant contribution to capacitance, while in thick leaves idioblast expression is less important for leaf capacitance. In addition, the more succulent leaves have higher maximum leaf conductance. Idioblast cells provide a buffer against short-term changes in leaf water potential for epiphytic species with relatively thin leaves. We propose that there is a selective advantage for having high idioblast expression in epiphytic *Rhododendron* species.

Acknowledgements

The authors thank Diseya Iobote for collecting data early in this project. This research was supported by funds from the American Rhododendron Society Research Committee, the Virginia Tech MAOP program, and the Department of Biological Sciences at Virginia Tech.

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Society News

Awards

COWICHAN CHAPTER
Bronze Medal: Leslie Drew

From the very beginnings of the Cowichan Rhododendron Society over twenty-five years ago, you were there to guide us. Your knowledge of the inner workings of a Chapter of District 1 of the American Rhododendron Society was invaluable. You guided us through the constitution and our purpose. You were a witness to our application signatures for certification of incorporation under the Society Act. You made us aware of the centre of our Chapter, the American Rhododendron Society, and how we fit. You always took the opportunity to promote the genus *Rhododendron*. Garden tours in your garden, built by you and your husband Frank, were opportunities to learn from you and to enjoy your garden. Our newsletter has been enhanced by your wonderful articles and editing. Slide shows and talks that you gave taught us about the cultivation and care of our rhododendrons. You have inspired us, and made our Chapter a strong member of District 1 of the America Rhododendron Society. The Chapter is pleased to present to Leslie Drew our highest award, the Bronze Medal

DE ANZA CHAPTER
Bronze Medal: Christy Hartsell

Christy is our Vireya expert, always bringing us new information about the culture, and sharing with us his beautiful plants and blossoms. As well, Christy has served as our Vice President for the last two years. He also buys and organizes plants for our plant sale, having done this for at least the last five years. He has more than earned our affection and the Bronze Medal.

Bronze Medal: Alma Fletcher

Alma Fletcher is our loyal and energetic membership chairman. She has served as President and Vice President in charge of speakers, but her real talent lies in being our "welcome person" at meetings and encouraging her friends to join. Alma also serves as a special sales person because she always takes plants to people that can't make it to our sales. We are delighted to award this medal to such a deserving friend of De Anza and ours.

NANAIMO CHAPTER
Bronze Medal: June Bouchard

June has served on the Nanaimo Rhododendron Society executive as secretary for many years. In addition, she has always been actively involved in the activities and events of the club including: our raffle table, bus trips, and annual Christmas auction, as well as plant and truss shows. She played an integral role in the planning for our very successful first open garden tour fundraiser. The Western Regional Conference of 2012 was a success largely because of June's dedication to detail and hard work in the design of our website and in her numerous registration duties. She has graciously

Awards continued

opened her home and garden many times for meetings, tours, and chapter wind-up parties providing a happy and generous venue for these events. Her time, energy, commitment, and passion have been exemplary.

Bronze Medal: Sandra Dorman

The Nanaimo Rhododendron Society wishes to acknowledge the many con-tributions made for its well-being by Sandra Dorman. A long-term member of the Society, she has served as a Vice-President and Director. She has chaired the social committee for many years and has spent hours preparing coffee, and tea and organizing snacks at each meeting. She has organized various social functions, including the welcome back social in September, the Christmas social and for a number of years, coffee and snacks at our annual truss show and plant sale. As coordinator of the social committee for the Fall Western Regional Conference of the ARS in September, 2012, Sandra organized every meal for the over 250 delegates for three days.

Sandra has generously hosted many meetings and opened her garden for club events. Sandra is also noted for her cheerful notes and cards when members have been unwell. Her positive attitude and helping hands have enriched the Nanaimo Chapter tremendously.

Bronze Medal: Gerry Moore

It is with great pleasure that the Nanaimo Rhododendron Society awards Gerry Moore the Bronze Medal for outstanding service to our society. Gerry has been an important contributor and supporter of our club since joining. He has supported our club through active participation in committees and events including our annual truss show, plant sale, garden tours and Christmas auction. He put in many hours serving as treasurer for 3 years. Gerry was also an important member of our 2012 Western Regional ARS conference committee. As treasurer, his ideas, attention to detail, planning and budget forecasting were outstanding and a key contribution to the success of the conference. Gerry and Linda have graciously hosted many meetings and enthusiastically opened their garden to club members.

SEATTLE CHAPTER

Bronze Medal: Katherine Thompson

The Seattle Rhododendron Society was pleased to present a Bronze Medal to Katherine Thompson at the Holiday Banquet December 8, 2013. Katherine has been a very active member from the beginning of her membership. She grows mostly smaller rhododendrons on her city lot in West Seattle. She was raised around all sizes of plants and enjoys them all. The annual May Truss Show would not function so well with out her expertise as Head Clerk. She has from the beginning organized the awards lists and kept us all in order.

Her certificate reads: Katherine Thompson, The Seattle Rhododendron Society recognizes the outstanding service you have given this ARS chapter. In your seventeen

Awards continued

years as a member you have been newsletter editor twice, served as secretary and been an involved board member for many years. You contribute to every event including planning ARS conventions for District 2, decorating and planning for our Holiday Banquet,bringing delicious food and smiles for all. At our spring Truss Shows you participate in set up and take down and especially as a very competent Head Clerk. In that position you are relied upon as the person knowing who, what and when awards are given. You are always willing and able to serve in any capacity to further the success of the SRS and the world of rhododendrons.

The Seattle Rhododendron Society takes great pleasure in awarding you the Bronze Medal, its highest honor. Presented by the President, Dec. 8, 2013.

In Memoriam

Mike Bale

Mike Bale (1941–2014) has been a Fraser South chapter member since 1989.

A passionate believer in the value of garden tours to entertain and educate fellow enthusiasts, he immediately made organizing open gardens and garden tours his goals when he first became a FSRS Director in 1993.

About the same time, Mike and his wife Patti began to develop their iconic garden, Lu Zhu ("Dewdrop" in Chinese), located on the lower slopes of a mountain just west of Agassiz.

For more than 20 years Mike planted many thousands of rhododendrons there, many grown from seed or cuttings, others purchased. He also added at least as many companion plants to the landscape. Mike loved the garden, and hosted garden tours for our club, other ARS clubs, and other garden organisations touring internationally, including the Royal Horticultural Society.

Mike was the driving force behind the hosting of the ARS 2006 Fall Conference in Harrison Hot Springs, BC., and without Mike's vision and creativity it would never have been the great success it was. Renowned for his generosity, Mike regularly donated flats filled with rhododendrons grown from seed or cuttings to the raffle tables of both the Fraser South and Vancouver Chapters.

Mike was an enthusiastic supporter of the Rhododendron Species Foundation and was also responsible for the instigation and organisation of the Species Study Days held there from 2002 through 2009. These series of spring meetings, under the tutelage of the RSF's Steve Hootman, were an invaluable education in rhododendrons: where they came from, how they grew, what they looked like, and most confusing of all, the complex relationships and taxonomy of the various groupings.

Mike Bale was warm, generous, funny, hard-working, interesting, and a great supporter of all things rhododendron, and was recognized for the enormous contributions he made by receiving Bronze Medals from both the Fraser South and Vancouver chapters.

Brenda Macdonald

In Memoriam continued

Gordon E. Jones

Gordon E. Jones passed away in Oneonta, NY, on December 16th, 2013, he was 92.

Gordon lived a full and amazing life, touching so many along the way. He grew up in upstate, New York in Jefferson County and attended Cornell University studying ornamental horticulture. After graduation he served in the U.S. Army with the 17th Airborne Division, also acting as the aide to General Joseph V. Phelps. Upon leaving the Army with the rank of Captain, he joined Robson Seed Company and was in charge of flower seed research and seed trials.

In 1957, after interviewing for the job by the urging of a colleague, he became the Director of Planting Fields Arboretum in Oyster Bay, NY. Gordon loved Planting Fields and was greatly influential in building the large rhododendron, holly, magnolia and conifer collections there. He adored the vast collection of camellias in the Camellia Greenhouse and the tropical plants in the Main Greenhouse. In the early 1960s, he, along with the arboretum staff, designed and built the five acre Synoptic Garden, which is still the largest and most unique of its kind in the U.S. It is a diverse collection of trees, shrubs, perennials and bulbs that are arranged alphabetically by botanical name and is still used regularly by students, professionals and homeowners. In 1993, when Gordon retired from Planting Fields, the garden was officially named the Gordon E. Jones Synoptic Garden. In his honor, the hybrid rhododendron 'Gordon Jones' was introduced, a tribute that he was very proud of. This special rhododendron is still available in the trade today. There is no doubt that Gordon Jones played a major role in developing Planting Fields into a world-class arboretum. His spirit and ideals are alive and well at the arboretum.

In addition to trees and shrubs, Gordon had a real passion for growing vegetables and would work in his vegetable garden everyday, sowing seed, cultivating the soil and harvesting his crops. With great pride, he would bring fresh fruits and vegetables to the dinner table.

He played important leadership roles in numerous plant societies and horticultural organizations including The Holly Society of America, the American Rhododendron Society, the American Association of Botanical Gardens and Arboreta and the New York Hortus Club and received numerous horticultural awards including the Gold Medal Award from the American Rhododendron Society and the Gold Medal of Horticulture Award from the NY State Nurseryman's Association, The Long Island Nursery and Landscape Association's Man of the Year and was given an honorary lifetime membership by the New York Hortus Club.

Gordon was a kind and gentle soul and had the unique ability to motivate people to work towards a common goal. The friendships Gordon forged and the people he influenced are far reaching. There is no doubt that all of us who worked with him are better people having known Gordon and having been touched by his love and friendship.

In lieu of flowers, the family suggests that donations be made to the Planting Fields Foundation to support the development of the new sensory garden (www.plantingfields.org), a fitting tribute to a man who loved nature and plants.

In Memoriam continued

Bill Moyles

Bill Moyles (1930-2013), of Oakland, California passed away on December 16th in his home at the age of 83. A long-time member of the ARS and California Chapter, Bill was a Gold Medal recipient in 2005, having previously received the Bronze Medal in 1997.

Born in Portland, Oregon and raised in Tacoma, Washington, he served in the U.S. Navy during the Korean War, where he was based in Pearl Harbor and was deployed on a fuel supply ship off Korea. He took advantage of the GI bill, and graduated from the University of California at Berkeley with a Masters in Psychology and Statistics. His work career continued at U.C. as a statistical research associate until his retirement.

Always interested in gardening, and excited to learn about the rhododendron plant explorers of the late 19th-early 20th century, Bill and his wife Lois acquired a nearly one acre (0.4 ha) lot in the lower Oakland hills in 1971. He was a very enthusiastic gardener with a talent for design. His garden always seemed immaculate, and was perhaps influenced by gardens in the United Kingdom, with discrete planting beds artfully arranged among gently winding grassy paths leading downhill from the house.

For many years Bill found vireyas especially exciting. He carried on an extensive international correspondence within the relatively small world of these tropical rhododendron enthusiasts. An expert in propagation, he eventually came to organize the vireya seed exchange within the ARS. Many new species and hybrids were introduced and distributed through the exchange, which received seed from all over the world. Bill was careful to test the viability of the seed he received, and wrote articles on growing these often-tricky rhododendrons from seed for the ARS Journal. One of Bill's favorite species to work with was *R. saxifragoides*, a ground cover plant that can't be grown well in the U.S. but that makes wonderful and varied hybrids.

Bill's most notable local accomplishment was to conceive, obtain funding, lobby the city government, build and then maintain a vireya display garden in a lathe house at Lake Merritt in Oakland. In 2007 after 12 years, he turned over this responsibility to others. It remains a beautiful and now mature planting of species and hybrids, from the dwarf *R. ericoides* to the larger and more showy hybrids, some of which are now over 12 feet (3.7 m) tall.

Bill was also instrumental in working with the Hawaii Chapter of the ARS in setting up their display gardens, supplying seed and plants, and inspiring them to grow vireyas in what may be the only totally secure outdoor area for these plants in the U.S.

But Bill wasn't only interested in vireyas, as he loved to grow "regular" temperate rhododendrons and alpine plants as well. He especially enjoyed trying (and often succeeding) with species which "can't be grown" in the San Francisco Bay area like *R. lepidotum*. He was an active hybridizer, and his creations include 'Cappuchino', 'Fleurette Evans', 'Noyo Dream', 'Taos', and 'Winter Lights', all great compact plants for California gardens.

Bill's influence will persist, and he will be missed in the Bay Area, in Hawaii and well beyond. He was able to do what he loved for many years. Who can ask for more?

Don Selcer

In Memoriam continued

Gareth Shearman

Gareth Shearman, after a lengthy battle with cancer, died October 14, 2013. A month before his passing, he received a Bronze Medal award for his many years of service to the Victoria Rhododendron Society (VRS). When he was leaving the club meeting with his new Bronze Medal, he had his hands full and was asked if he wanted someone to carry the medal. "No way!" was his response. In addition to setting up and maintaining the VRS website and membership records, he participated in the propagation group, hosted many of the executive meetings, and shared in the rewarding work of putting on truss and sales shows and conventions. He was also an active member of the Victoria Orchid Society, University of Victoria Finnerty Garden Friends, and the Vancouver Island Rock and Alpine Garden Society. Gareth loved both science and nature and the idea that communities would be stronger with access to both. He will be missed by the members of the Victoria Rhododendron Society and many others.

Sharon M Joseph

Rhododendron Calendar

2014	Scottish Chapter & German Rhododendron Society Tour of Gardens, Parks, Arboretums and Nurseries of Germany, May 12-19
2014	ARS Annual Convention, Cleveland, OH, May 16 -18, Board Meeting
2014	ARS Western Regional Conference, District 2, Everett, WA, Sept. 26-28, Board Meeting
2014	New Zealand Rhododendron Association International Conference, Dunedin, NZ, Oct 20-25
2015	ARS Annual Convention, 70th Anniversary, Sidney, BC, May 6-10, Board Meeting
2016	ARS/ASA Annual Convention, Williamsburg, VA, April 20-24, Board Meeting

Society News

Individual Donations 1/1/2013 through 12/31/2013

Donations to the General Fund

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Wheeler, Steven F.
Whitcomb, Jean
Wieland, Aileen Wieland
Willis, Lloyd L. & Margaret
Wilson, James D.
Wilson, Therese N.
Winding, Susan & John
Wood, Jonathan D.
Wuthe, Hanns-Herbert
Yee, Carol M.
Zickuhr, Norman & Maria

Individual In Memoriam Donations to the General Fund

Keim, Cathy, in memory of Betts Layman
McDonald, Kenneth Jr., in memory of Celia Dollarhide
Reed, Kathrine & Wallace, in memory of Mary Bluhm
Sinibaldi, Maria, in memory of Jerry Sowa
Tomford, Heli, in memory of Russ DeBurlo
Wheeler, Steven F., in memory of Betts Layman
Wylie, Gordon & Linda, in memory of Dr. D. Williams

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Sweeney, Helen
Wylie, Gordon & Linda

Society News

Individual In Memoriam Donations to the Endowment Fund

Haffenreffer, Dr. Mary, in memory of C. Dollarhide, Soroptimi
Kukrika, Miodrag, in memory of Ewa Maria Kukrika
McDonald, Kenneth, in memory of Fritz Morsink
Read, Rosemary, in memory of Richard Levin

Chapter/District/Special Donations 8/11/2013 – 2/12/2014

Donor	Amount	Source
Endowment Fund		
Greater Philadelphia Chapter	$400.00	Chapter donation
Valley Forge Chapter	$1,138.00	Chapter donation
Middle Atlantic Chapter	$100.00	In memory of Mavis Haywood
Bob & Eileen Ward	$100.00	In membory of Anne Sather
Fred & Ann Whitney	$4,500.00	Special donation
General Fund		
Komo Kulshan Chapter	$1,000.00	Chapter donation
RSC Atlantic Region	$300.00	Chapter, regional conference

Society News

Chapter Shows

Early shows were reported in the winter issue. No admission charge unless noted.

CASCADE – Spring Show and Sale; 9 a.m. to 5 p.m., Sat., May 17, and 10 a.m. to 4 p.m., Sun., May 18; Wilburton Schools Service Center, 12241 Main St., Bellevue, WA. Don Smart

FRASER SOUTH - Our annual and critically acclaimed Beer Bottle Truss Show will be at our regular meeting on Wed., May 21; doors open at 7 p.m. with the meeting starting at 7:30 p.m.; Langley United Church, 5673-200 Street, Langley, BC. Ample off-street parking is available. Visitors are most welcome to join us for this fun event.

GREATER PHILADELPHIS AND VALLEY FORGE – Combined Chapter Cut-Flower Competition; deadline for entries 8:45 a.m. sharp, Sat., May 10; Morris Arboretum, 100 E. Northwestern Ave., Philadelphia, Pa.; brochure and catalogue of previous entries will be posted at www.GPChapterARS.org. Requests for entry tags and brochures and all other inquiries: Michael Martin Mills, show chairman. Show is concurrent with Chapter-Arboretum plant sale. Competition open to all.

MASON-DIXON – Chapter Show and Sale; 9 a.m. to 4 p.m., Sat., May10; Carroll County Agricultural Center in Westminster, Maryland; rhododendrons and azaleas on display and for sale.

NEW YORK – Flower Show; 1 to 3 p.m., Sat., May 24; Planting Fields Arboretum, Oyster Bay, NY; no fee for Show, but there is an admission fee to the Arboretum for Non-Members; Bruce Feller.

NOYO – Chapter Show; 9 a.m. to 5 p.m., Sat., May 10 and Sun., May 11; Mendocino Coast Botanical Gardens, 18220 North Highway 1, Ft. Bragg, CA. Hundreds of gorgeous flowers on display, celebrity judging, people's choice awards, raffles, and opportunities to purchase plants on site. This year's juried show is expected to be the largest in California, with over 1,000 entries filling the big, white tent with a cascade of color. Attendance is expected to top 1,000 people from throughout California and beyond.

PORTLAND – Mother's Day Show and Plant Sale; entries of trusses for the Show will be accepted at the Cool House from between 6-9 p.m. Friday night, May 9, or between 7-9 a.m., Saturday, May 10; the Show opens to the public at noon on Saturday, after judging. It reopens at 9:00 a.m. on Sunday, May 11, and closes at 5:00 p.m. both days; Crystal Springs Rhododendron Garden at S.E. 28th, north of Woodstock Blvd. in Portland, Oregon; the Show is inside the Garden and the Plant Sale is in the adjoining parking lot; the huge rhododendron and companion plant sale will be open 9:00 a.m. to 5:00 p.m. both days and is open to the public; admission to the Plant Sale is free and admission to the Garden and Show is $4. Kathy Van Veen

SIUSLAW – May Rhododendron Festival Flower Show and Plant Sale; Rhododendron Leaf Display; Elementary School Students Rhododendron Art Show; 1 to 5 p.m., Sat., May 17, and 10 a.m. to 5 p.m., Sun., May 18; Florence Events Center, 715 Quince, Florence, OR. Plant Sales, open to the public, are outside the south wall of the Events Center on Sat. and Sun. from 10 a.m. to 5 p.m. The public is welcome to bring flower trusses on Sat., 7 to 9 a.m to be judged by rhododendron experts. The truss must come from a plant that the owner has grown for at least 6 months. Ribbons, trophies and raffle prizes will be awarded. It's a great time to ask questions about rhododendrons. Larry Jensen

A Third Botanical Variety in *Rhododendron minus*

Donald H. Voss
Vienna, Virginia

According to many botanists, the species *Rhododendron minus* includes all of the endemic lepidote rhododendrons of the southeastern United States. According to others, the total population of the lepidotes comprises three species: *R. minus, R. carolinianum,* and *R. chapmanii.* Underlying these treatments are taxonomic decisions based on the authors' differing analyses of variation within and between regional populations. Upon discovery of a plant new to science, it is usually not possible to undertake a comprehensive determination of its habitat, range, and variation. Indeed, the classification and naming of the southeastern lepidote rhododendrons was often based on limited observation of a small part of the range of the wild population, on a few herbarium specimens, or on a few plants in cultivation. Today there is general recognition of three major forms of the southeastern lepidote rhododendron, each associated with a geographic region. These regions are coastal plain and piedmont areas ("lower-elevation"), high mountain areas ("montane"), and the sandy pine barrens of West Florida. The taxonomic rank at which the populations of those regions should be recognized and whether the montane plants merit separate treatment remain controversial.

The lepidote rhododendrons in each of these regions exhibit characteristics unique to the region as well as characteristics similar to those found in the other regions. The succession of names that have been published reflects the expansion in knowledge concerning differences between these populations. A trip through time highlights key characters that influenced authors to create and name new taxa, offering perspective on the choice between a one-species and a three-species taxonomic model for the southeastern lepidote rhododendrons.

Chronology

The recorded history of the lepidote rhododendrons of the southeastern United States began in 1792 when the Natural History Society of Paris published the name and diagnosis for *R. minus,* discovered by French botanist Michaux during his journey

of plant exploration along the Savannah River. The diagnosis, which noted the smaller, elliptical, petiolate leaves with somewhat rusty-red vestiture, served to distinguish the plant from the native elepidote rhododendrons; the locality was "the banks of the Savannah River" (Michaux 1792). Later, in his *Flora*, Michaux (1803) expanded the description of habitat to include the higher mountains of Carolina. Meanwhile in England, Andrews (1798) had more fully described the lepidote rhododendron from plants grown from seed that originated in "back settlements of Carolina" and named it *R. punctatum.* This name was widely accepted in the United States as the name for the southeastern lepidote rhododendrons throughout the 1800s.

The variability and range of the species was first recorded formally in 1815. Ker Gawler (in an account accompanying an illustration in Edwards' *Botanical Register*) described plants from the "mountains of Carolina" as having larger corollas that become pale rose without spotting. He designated these plants *R. punctatum ß* (Ker Gawler 1815). Based on Ker Gawler's *ß*, G. Don (1834) named the montane plants *R. punctatum* var. *majus,* noting "leaves and flowers larger." Referring to Ker Gawler's *R. punctatum ß,* Rehder (1912) commented that "this form, however, seems to have been subsequently lost to cultivation, as it is never mentioned again in horticultural or botanical literature." The naming of this variety automatically created the name *R. punctatum* var. *punctatum* (an "autonym") for the rest of the species.

The next expansion of the recognized range of the lepidote rhododendron occurred with the publication in Chapman's *Flora* of a "variety" in *R. punctatum* for plants growing in the sandy pine barrens of West Florida (Chapman 1860). Once again, reference to a variety was published with no varietal epithet. One was supplied when Alphonso Wood (1870), noting the small oval-obovate obtuse leaves and minute sepals, named *R. punctatum* var. *chapmanii.* Asa Gray decided that specific rank was appropriate for the Florida plants and published *R. chapmanii*, referring to Chapman's *Flora,* not to Wood's variety (Gray 1876). His diagnosis noted the great similarity with *R. punctatum*, but pointed to the rigidly erect branches, thicker leaves, precocious flowering, ovate corolla lobes, and shorter tube, stamens, and style of the Florida plants. In a move that had little acceptance or consequence, O. Kuntze (1891) swept dozens of *Rhododendron* taxa into the genus *Azalea,* including "*R. punctatum* Andr. 1799 (non *A. punctata* Lour. 1790) = *R. minus* Mchx. = *A. minor."*

Soon, a white-flowered variant in the montane population of the lepidote rhododendron drew attention. Kelsey (1895), a nurseryman in the mountains of North Carolina, included *R. punctatum* var. *album* in his trade list. No description accompanied the name; consequently the name was not validly published and did not exist botanically. Rehder (1902) validly published *R. punctatum* var. *album* with the brief diagnosis "Fls. white" in his contribution to Bailey's *Cyclopedia.*

The danger of making taxonomic and nomenclatural decisions on the basis of inadequate information is illustrated by another 1902 botanical event. Small (then

Curator of Museums at the New York Botanical Garden) referred to a "single specimen of a *Rhododendron* related to the Alleghenian [sic] *R. punctatum*" that had been in the Columbia University herbarium for nearly three-quarters of a century (Small 1902). Small had not seen a similar specimen until he received a specimen collected by a Mr. Cuthbert along the Savannah River near Augusta. Small noted that its corolla tube was longer than the lobes, whereas "in the case of *R. punctatum* the lobes of the corolla are longer than the tube"—apparently basing this assertion on the single montane specimen at Columbia University. He proceeded to name the Cuthbert plant *R. cuthbertii* and stated its habitat to be "on river banks, middle and eastern Georgia"; i.e., in the lower-elevation habitat of *R. punctatum* var. *punctatum*. Small (1903) repeated the error in his *Flora,* placing *R. punctatum* (corolla tube "broadly funnelform") on the mountain slopes and *R. cuthbertii* ("narrowly funnelform") in the woods of central Georgia. Small's treatment did, however, call attention to the differences between the montane and the lower-elevation plants.

Noting Small's error, Rehder (1912) published *R. carolinianum* with a long, detailed description of the montane plants. He had observed differences between two plants growing at the Arnold Arboretum (one from Kelsey's nursery in the mountains of North Carolina and the other "from the South"). Study of herbarium specimens from the lower-elevation and montane populations confirmed his evaluation of the cultivated specimens. Rehder stated that "*R. minus* is chiefly distinguished from *R. carolinianum* by the longer cylindric corolla-tube which is longer than the lobes." He also noted the corolla color range to be pale rosy purple or rarely whitish, with or without spots or only slightly spotted.

At this point, the three major populations of the lepidote rhododendron had been recognized as species: *R. minus* Michx. (lower-elevation), *R. carolinianum* Rehder (montane), and *R. chapmanii* A. Gray (West Florida). Two additional species names, *R. punctatum* Andrews and *R. cuthbertii* Small, were in fact synonyms of *R. minus*. It is plausible that Andrews, a botanical artist in England during the 1790s' political turmoil and war with France, may have been unaware of Michaux's earlier discovery and naming of the plant as *R. minus.* Small's naming of *R. cuthbertii*, a plant already named *R. minus* and *R. punctatum,* is best forgotten. Four varieties in *R. punctatum* had been created by the end of 1902: *R. punctatum* var.*majus*, *R. punctatum* var. *punctatum*, *R. punctatum* var. *chapmanii*, and *R. punctatum* var. *album.* Thus, although botanical tradition and, after 1867, botanical rules, dictated acceptance of the earlier *R. minus*, the southeastern lepidotes continued to be widely known as *R. punctatum* by botanists and horticulturists alike.

Interest in the "white" form of the montane lepidote rhododendron led Ashe (1921) to publish *R. carolinianum* var. *margarettae*. In selecting the varietal epithet, he was apparently not aware of or did not accept Rehder's 1902 *R. punctatum* var. *album*. Ashe stated that the corolla of var. *margarettae* was pure white and its habitat was rocky

woods and cliffs near streams at elevations of 1500 - 4000 feet along the Blue Ridge in North Carolina. He noted that the rose-purple form is confined to elevations above 4000 feet. Publication of this variety also created the autonym *R. carolinianum* var. *carolinianum.* Ashe then decided that, because of its habitat and distinct distribution, the white lepidotes should be recognized as a species, and he published *R. margarettae* (Ashe, 1922)—another name that has received little acceptance. A year later, Rehder published the new combination *R. carolinianum* var. *album* for the white-flowered population, citing his 1902 *R. punctatum* var. *album* in the synonymy (Rehder 1923).

In 1926, Rehder studied specimens of the lepidote rhododendron from the foothills of southwestern North Carolina. He noted differences from *R. carolinianum*: higher stature; looser habit; narrower, longer leaves; and somewhat smaller corollas—characteristics intermediate between those of the montane and lower-elevation plants. Rehder named these plants *R. carolinianum* var. *foliatum,* stating that "it occurs at altitudes from 3000 to 4500 ft. and is probably more common than the type [i.e., *R. carolinianum*] which seems restricted to altitudes above 4000 feet" (Rehder, 1926).

Duncan and Pullen (1962) studied the relation of corolla-tube and corolla-lobe lengths in the lower-elevation and in the montane plants as well as differences in leaf and floral characters, plant habit, and the timing of vegetative and floral growth. They concluded that, because of overlapping characters and intergrading forms, the various populations of the southeastern lepidote rhododendron are closely related and should be placed in *R. minus.* They published *R. minus* var. *chapmanii* for the Florida lepidote and included in *R. minus* var. *minus* the plants long known as *R. minus, R. punctatum, R. cuthbertii,* and *R. carolinianum* (Duncan & Pullen, 1962). A small map in their article showed four areas associated with the principal variants in the species:

1. The Great Smoky Mountains, straddling the North Carolina-Tennessee border, and along an axis from northeast of Linville, NC, southwest through Asheville.
2. A smaller area from slightly north of the North Carolina – South Carolina border near Tryon, NC, westward and dipping slightly into the northwest corner of South Carolina.
3. A broad band west of a line from a point on the North Carolina – South Carolina border southwest of Fayetteville, NC, southwestward through the northwestern half of South Carolina, northern Georgia, and east-central Alabama.
4. Northern Florida and the Florida panhandle.

In the 1980s, a study partially funded by the ARS Research Foundation examined not only the usual vegetative and reproductive morphology of the plants in *R. minus* but also the micromorphology of pollen, seeds, and leaves (Gensel 1988). It also examined their variability throughout their native range and in garden experiments at Raleigh, North Carolina. The 1988 article was a brief summary of the research and included partially analyzed data. When referring to *R. carolinianum* and *R. minus* together, Gensel used the term "*R. minus* complex."

Gensel agreed that leaf morphology is not diagnostic within the *R. minus* complex, but is diagnostic for *R. chapmanii.* He noted a difference between sun and shade leaves in *R. chapmanii*: "the sun leaves are bullate . . . have revolute margins, and are borne at a narrow angle to the stem." In contrast, "the shade leaves are bullulate (a lesser degree of bullate) . . . flat . . .and borne at a greater angle to the stem." Gensel stated that both *R. chapmanii* and plants from the most southern populations of the *R. minus* complex produce long shoot growth when nutrients and water are adequate. He added that the shorter shoots and compact habit of the *R. minus* complex at higher elevations "is the result of selection pressure by exposure and is genetically fixed. Plants in the woods close to exposed habitats are usually taller." He noted further that *R. carolinianum* var. *album,* from the lower part of the elevation range of *R. carolinianum*, "attains the tall habit of *R. minus."*

Rehder's observations of corolla size and form in connection with the naming of *R. foliatum* were implicitly confirmed by Gensel's findings that "Carolina rhododendron has a shorter corolla length than *R. minus,* but there appear to be intermediates in the foothills near areas of sympatry. Chapman's rhododendron is only weakly separated from some populations of more southern *R. minus,* which as a group appear to have longer, differently proportioned tubes than *R. minus* in the more northern foothills." Gensel concluded that differences in corolla color were not taxonomically significant.

Weakley (2012) stated in his *Flora* that "*R. carolinianum* is phenologically separated from *R. minus* . . . Morphological distinctions between the two taxa are subtle and inconsistent." He accepted a three-species classification: *R minus, R. carolinianum,* and *R, chapmanii.*

Observations of *Cognoscenti*

Some fieldmen who have visited the various populations of *R. minus* believe that the differences in plant characteristics, habitats, and times of flowering deserve taxonomic recognition. For example, Ron Miller presented a detailed discussion of *R. minus*, informed by his extensive observations in the field, in the *Journal of the American Rhododendron Society* (Miller 2013). Based on the variant characteristics of the plants in Duncan and Pullen's areas 1, 2, and 3, Miller suggested recognition of two or three species: one for the low-elevation plants of areas 3 and 4, one for the montane plants of areas 1 and 2, and possibly one for an unclassified, unnamed plant from high elevations in the Great Smoky Mountains. This unnamed plant has campanulate to funnel-form corollas that are darker, more purplish, and more uniform than the other southeastern lepidotes. It is smaller in stature and has leaves smaller and more pointed than any others in var. *minus.* Referred to informally as "smokianum" by Miller, it was first observed as a possible new taxon by S. D. Coleman, who suggested but did not publish the epithet *gilreathi[i]* in 1965.

Don Hyatt (pers. comm.) distinguished three forms of the montane lepidote in

Duncan and Pullen's area 1: (a) early-blooming *R. carolinianum* at 4000 – 5000 ft. elevations from south of Ashville northeastwards along the southern border of area 1; colors range from white to blush pink, many with strong yellow spotting; (b) near Linville and Grandfather Mountain, colors range from blush to pink with no spotting; and (c) in upper elevations from Newfoundland Gap to Mt. LeConte in the Great Smoky Mountains, small populations of the unnamed smaller, more purple lepidote.. These observations are in general agreement with those in Ron Miller's article.

Taxonomic and Nomenclatural Considerations

Today the disagreement among authorities concerning classification of the southeastern lepidote rhododendrons is much the same as that a century earlier. The appropriate rank for recognition of the lower-elevation, montane, and Florida plants remains controversial as does the matter of separate recognition for the montane population. In addition, some observers believe that separate status is desirable for the montane white-flowered plants. Botanists now seek classifications that reflect evolutionary relationships, but these call for molecular studies. Without data from such studies, taxonomic decisions are based largely on correlation of morphological characteristics. The grouping of similar plants into taxa (e.g., species and varieties) that can be recognized worldwide offers benefits not only to plant science but also to ecology, commerce, and other interests. For these benefits to be realized, unique scientific names must be provided for the taxa (nomenclatural decisions).

The matter of white flowers in *R. minus* is problematic and is best set aside. Many flowers that are observed as being white are in fact chromatic at very low levels of chroma. For example, when naming *R. carolinianum* var. *margarettae*, Ashe stated that the flowers were "pure white." Yet, both Miller and Hyatt, the latter an accomplished water-color artist, reported seeing undertones of pink in some white-flowered plants of the Pisgah population. Botanists widely consider flower color to have little diagnostic value in taxonomic placement. One plant-taxonomy textbook (Stuessy 1990) emphasizes the need for caution: ". . . single characters can lead to completely erroneous artificial classifications of low predictive value."

The preponderance of botanical opinion—at least since 1962—has been that all of the southeastern lepidote rhododendrons are members of *Rhododendron minus.* The Florida lepidotes are widely accepted as *R. minus* var. *chapmanii*. In the Edinburgh revision (Cullen 1980), *R. minus* included two varieties, namely var. *minus* and var. *chapmanii* (as *champanii*). In the new *Flora of North America*, the authors accepted *R. minus* with the varieties *minus* and *chapmanii* (Judd and Kron 2009). Sharply diverging from this treatment, Weakley (2012), in the electronic draft of his *Flora of the Southern and Mid-Atlantic States,* recognized three species, *R. minus, R. carolinianum,* and *R. chapmanii.*

In view of the differences between the populations of the areas outlined by Duncan

and Pullen, some observers feel that a more discriminating classification is justified. For example, based largely on his observations in the field, Ron Miller suggested taxa that more closely reflect differences he has observed between the populations of *R. minus* (sensu lato):

R. minus
- var. *minus* (less *carolinianum*)
- var. *chapmanii*

R. carolinianum
- var. "Linville"
- var. "Pisgah"

R. [to be described; possibly to be named *gilreathii*]

Until such time as appropriate molecular data are available, the similarities between the populations of the southeastern lepidotes, which have been named *R. minus* Michx., *R. chapmanii* A. Gray, and *R. carolinianum* Rehder, support their treatment as a single species; namely, *R. minus* with the lower-elevation, montane, and Florida plants designated as varieties. For the species, the name *R. minus* Michx. has priority. *R. minus* Michx. var. *chapmanii* (Alph. Wood) W.H. Duncan & Pullen is available for the Florida variety. To accommodate recognition of the montane plants as a variety, *R. minus* var. *minus*, which Duncan and Pullen defined as including both the lower-elevation and montane plants, must be restated.

The following classification recognizes the principal morphological variants in *R. minus*, removing the montane plants from *R. minus* var. *minus* and providing a varietal epithet for them:

R. minus Michx**.**

var. *minus*

R. punctatum Andrews, 1798
R. punctatum var. *punctatum*
Azalea minor (Michx.) Kuntze, 1891
R. cuthbertii Small, 1902

var. *majus* (G. Don) D.H. Voss, **comb. nov.** ≡ *R. punctatum* var. *majus* G. Don, *General History of the Dichlamydeous Plants* 3: 844 (1834).

R. punctatum var. ß Ker Gawl.,1815
R. punctatum var. *majus* G. Don, 1834
R. punctatum var. *album* Kelsey nom. nud., 1895
R. punctatum var. *album* Rehder, 1902
R. carolinianum Rehder, 1912
R. carolinianum var. *margarettae*

Ashe, 1921
R. carolinianum var. *carolinianum*
R. margarettae Ashe, 1922
R. carolinianum var. *album* (Rehder) Rehder, 1923
R. carolinianum var. *foliatum* Rehder, 1926

var. *chapmanii* (Alph. Wood) W.H. Duncan & Pullen
R. punctatum "variety" Chapman, 1860
R. punctatum var. *chapmanii* Alph. Wood, 1870
R. chapmanii A. Gray, 1876
Azalea chapmanii (Alph. Wood) Kuntze, 1891

If recognition of a population based on corolla color or another minor feature is warranted, it should be named as a forma under the appropriate variety.

Postscript for the Curious

Why was "var. *majus*" chosen for the montane plants instead of the more familiar and attractive "var. *carolinianum*"? The priority rules of the ICN require the use of "the final epithet of the earliest legitimate name of the taxon in the same rank"(McNeill et al. 2012). Ker Gawler first recognized the montane plants as "var. *ß*" in 1815, and in 1834 G. Don published "var. *majus,*" the first varietal epithet for them, citing "Ker. bot. reg. 37." The name *Rhododendron* is neuter in gender, so why do *minus* and *majus* not have the usual Latin neuter ending *–um*? They are comparative adjectives with the masculine and feminine forms *minor* (smaller) and *major* (larger); their neuter forms are *minus* and *majus*, respectively.

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Acknowledgements

The author is deeply indebted to Dr. Joseph H. Kirkbride, Jr., ,U.S. National Arboretum, for guidance through complexities of the nomenclatural code (ICN), for his generosity in reading successive drafts of this article, and for suggesting emendations. Thanks are also due Ron Miller, Don Hyatt, and Bill Miller who read drafts. Ron Miller's comments were particularly valuable.

Don Voss is a member of the Potomac Valley ARS Society and a frequent contributor to JARS.

Rhododendron multicolor MIQ: the spectacular red flowered form rediscovered

(Modified with permission from Pam Hayward, editor for Rhododendrons Camellias and Magnolia*s 2012, 117-118)*

Wiguna Rahman, George Argent, Tony Conlon and Nicky Sharp.

Rhododendron multicolor MIQ. was first described in 1860 from a collection attributed by Professor Sleumer to the Dutch horticulturist and botanist Johannes Teysmann (No. 778) from Mt. Singalang on the west coast of Sumatra, Indonesia. The type specimen in Utrecht (The Netherlands) is without date or collector but is most likely to have been collected between 16 February and 5 March 1856, according to Teysmann's collecting itineraries (Steenis 1950). The flowers were described on the label as "*coroll alb & sulphur*" and confirm the pale yellow flowers of the plants seen in cultivation since the 1960s (Argent 2006). What has frustrated vireya enthusiasts has been the lack of any sign of the red form grown at Veitch's 'Royal Exotic Nursery' on the Kings Road, Chelsea, London, from a collection of Charles Curtis. This red form received a First Class Certificate of merit from the Royal Horticultural Society on Nov 13. 1883. It was one of only six vireya species used by Veitch's nursery to produce the many hundreds of '*javanico-jasminiflorum*' hybrids towards the end of the 19th century and which caused such a sensation when exhibited in Victorian Britain.

The present plant was collected by Agus Suhatman (now Head of Ex-situ conservation Division of Cibodas Botanic Garden) on an expedition in September 2006 to Bengkulu, South West Sumatra, on the summit of Mt. Kaba (1490 m; 4888 ft). It was found on an open area of rocky hills dominated by *Melastoma malabathricum* L. It is now grown in the Cibodas Botanic Garden, Java, in front of the guest house. Here it is in a very exposed position that probably accounts for the deep red colouration of the foliage, but it is growing strongly and showed signs (in February 2011) of continuous flowering, as reported by James Veitch, with flower buds, open flowers and fruit capsules in various states of maturation all on the same plant. It is quite possible that this recent collection is from the same or a very similar locality to that where Curtis collected his specimens. Bengkulu (then Bencoolen) was very accessible in Curtis's time but he never published his precise itineraries to protect his finds from competitors, although he is known to have visited Sumatra on his early 1880–82 expedition on behalf of the Veitch nurseries (Steenis 1950).

Cibodas Botanic Garden is located on the northern slope of Mount Gede-Pangrango in Western Java at 1300–1425 m (4265-4675 ft). Annual rainfall is up to 3380 mm (133 in) per year. Although *R. multicolor* is a Sumatran plant, in the Cibodas garden it shares the native pollinator *Bombus rupifes* Lep. with the native *R. javanicum* (Blume)

Benn. and about 76% of open flowers develop into mature fruit.

Acknowledgements

With thanks to Dr. Mustaid Siregar and Dr. Didik Widyatmoko, directors of the Bogor and Cibodas Botanic gardens respectively, who gave permission and support for the visit to Indonesia by the British authors. Financial support for this visit was given by The Royal Botanic Garden Edinburgh, The Royal Horticultural Society's Bursaries Committee, The Eve Bennett Trust and Kew Guild Awards. Thanks also to Graham Hardy for his willing and helpful library research.

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Developing Heat Tolerant Rhododendron Hybrids with Disease and Insect Resistance using *R. hyperythrum*: Part II

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Introduction

In Part 1 (Southerland 2013), I described my experiences raising *Rhododendron hyperythrum* and the hybrids I have developed with it in my hot and humid area of the Piedmont in the state of North Carolina in the American South. In that paper, I detailed not only the species and its hybrids value as landscape plants and their increasing value to those seeking heat tolerance in addition to disease and insect resistance. Having these attributes is important for rhododendron enthusiasts, hybridizers and the casual gardener, as there are presently limited selections available for the more extreme climate areas, as plants there are more susceptible to the problems and diseases such as *Phytophthora* and stem dieback. With most climate experts predicting increasing temperature extremes in the future, this species and its hybrids are likely to be particularly desirable.

In this paper I discuss my hybridizing program in greater length and detail what I have learned and what changes or breeding directions I am presently moving in.

Selecting Parents for Adaption to Hot Environments

Anything that induces stress on the plant must be considered in the selection of parents. In addition to air temperature, sun exposure, length of photoperiod, growing season, moisture and soil temperature are also important. When looking at prospective parents, the phrase describing a plant as "needs good drainage" is practically synonymous with being phytophthora susceptible! It is always better to try to suit the plant to the site conditions than to try to suit the site conditions to the plant. When possible, I have tried to cross other rhododendrons with *R. hyperythrum* as both seed and pollen parent. Reintroducing *R. hyperythrum* into a breeding program as a parent is a good idea, as it

maintains a high nuclear genetic capacity to tolerate heat and resist phytophthora.

R. decorum is another species that processes many good qualities that should complement those of *R. hyperythrum* when used as a parent. The species has vigor and withstands exposure (Cox 2010). It is not fussy with cultural environmental conditions and will tolerate both relatively dry soil and a range of soil pH (Cox 2010). Its hybrids also in general both grow and bud better with good sun exposure (Cox 2010). Given these conditions *R. decorum* generally blooms as a young plant and frequently passes this trait on to its progeny (offspring). This is an important characteristic in hybridizing as it allows the hybridizer to move rapidly from one generation to another toward breeding goals. The greatest negative to using *R. decorum* as a parent is that many forms are only rated as cold hardy to 0° F (-18° C) (Cox 2010). However, *R. hyperythrum* is rated as cold hardy up to -15° F (-26° C) and should add hardiness to its offspring, particularly if used as a seed parent.

('Vulcan' × *R. hyperythrum*) × yellow *R. decorum* yellow form.

'The Honourable Jean Marie de Montegue' × *R. hyperythrum,* selection #1 (Cross #16-2000).

Dr. John Thornton (1989, 1990) reported that in his Franklinton, Louisiana, garden both *R. decorum* and *R. fortunei* do well despite the considerable heat. However, he further added that *R. fortunei* hybrids do not do well and the only satisfactory *R. decorum* hybrid is 'Caroline'. Dr. Krebs (pers. comm.) confirmed that unfortunately neither species had been tested in his phytophthora resistance experiments. I would not expect a great decrease in heat tolerance if either *R. decorum* or *R. fortunei*

(or many of their hybrids) were crossed onto *R. hyperythrum*.

As noted in Part 1 (Southerland 2013), *R. hyperythrum* and its hybrids have many virtues as a landscape plants for warm climates and confer these qualities to their hybrid progeny. However, there are some problems with using it as a parent, particularly with progeny flower color. The first is that typically *R. hyperythrum* flowers start pink in the bud and then fade quickly to white, usually with purple speckling in the dorsal lobe. This fading is frequently passed on to the offspring in primary crosses, but not always. In my opinion, this fading is not as dominant or pronounced as that observed when using *R. degronianum* ssp. *yakushimanum* as a parent; most hybridizers that used *R. degronianum* ssp. *yakushimanum* in primary crosses have experienced this dramatic fading of flower color. Even when the flowers of *R. hyperythrum* fade in color, the colors are clearer and less "muddy" than those of the yakushimanum hybrids that I have grown. Many hybridizers may generalize this fading as common to species of the *Pontica* subsection, although the *R. hyperythrum* affinity to the Ponticum Series has been questioned (Fang et al. 1998). The negative experience of using *R. degronianum* ssp. *yakushimanum* as a parent may have kept many hybridizers from using *R. hyperythrum,* even though it has much else to offer as a parent. More than once I was discouraged or even criticized for using it as a parent.

'The Honourable Jean Marie de Montegue' × *R. hyperythrum,* selection #2 (Cross #16 - 2000).

'The Honourable Jean Marie de Montegue' × *R. hyperythrum,* (Cross #16 - 2000). SS1-09.

The second problem is related to the first in that there are not many available hybrid crosses with *R. hyperythrum* to use in a breeding program. I obtained forms

of *R. hyperythrum* and many of *R. hyperythrum* hybrids from Drs. Means and Thornton for the foundation of my hybridizing program. With these plants and using pollen I obtained from the RSF, I have made crosses with commercial hybrids to produce all desired colors. In the beginning, my hybridizing was simply to obtain red and purple flowers. Parent plants with these colors I could obtain commercially with ease and most that I have used have a reputation of some degree of heat tolerance. Later, other flower colors such as yellow and the "tropical colors" were quickly added to my goals, and this presented its own problems.

('Vulcan' × *R. hyperythrum)* × 'Sedonna, (Cross 5-2005-1).

'Cee Cee' ('Vulcan' × *R. hyperythrum*), (Cross #19 - 1997).

At the start of my breeding program, I used *R. hyperythrum* mainly as a pollen parent. This was because I thought that the seed parent would transmit flower color more reliably, as in general, most hybridizers believe that the seed parent is more dominant in transmitting plant qualities. I have since rethought the value of this strategy, and suggest that using *R. hyperythrum* as a seed parent may have several advantages for both plant traits and physiological characteristics.

My first crosses using forms of *R. hyperythrum* and its hybrids both as a pollen parent and as a seed parent yielded better flower color than expected. For example, *R. hyperythrum* (ARS 233-92) × 'Peter Faulk' resulted in a good light red flower, which faded to rose pink but not to white. I have not only considered the deepness or the saturation of flower color when selecting the perspective parent, but I have also considered to what degree the parent could confer this to its resulting hybrids. Plants with a reputation of

Mike Stillwell with [('Cadis' × 'Autumn Gold') × 'Snow Shimmer'], cross by Mike's father Marshall Stillwell.

producing good offspring, even though in the first generation I might not achieve the desired flower color, were also utilized. 'The Honourable Jean Marie de Montague' and 'Janet Blair' are examples of hybrids with reputations for being good parents, even without taking resulting flower color in consideration. Many of the best red flowered hybrids such as 'Taurus', 'Grace Seabrook' and 'Markeeta's Prize' have 'The Honourable Jean Marie de Montague' as a parent. 'The Honourable Jean Marie de Montague' is also in the parentage of large numbers of the better west coast yellow flowered hybrids, and its offspring frequently also have large flowers. This hybrid's cold hardiness is rated as only -5° F (-21° C), but the cold tolerance of its hybrids in crossings with *R. hyperythrum* would likely be increased. The results of my crosses with 'The Honourable Jean Marie

de Montague' × *R. hyperythrum* are among my favorite plants. The flowers are typically large and the truss full, flower color ranged from near white to almost red with many bicolors, and most have flowers with a prominent dorsal blotch. Plant growth habit ranged from dense to somewhat open, with some "true" dwarfs, the smallest of which measured 2.5 ft (0.76 m) wide and less than 1.0 ft (0.30 m) tall after 12 years, while some sister seedlings grew to 6 ft (1.83 m) high by 6 ft wide (1.83 m) in the same time period. The leaves were generally large and thick and are held two to four years.

'Janet Blair' × *R. hyperythrum,* selection #4 (Cross #84 - 1999).

'Janet Blair' also was used in some primary crosses with *R. hyperythrum* because it is not only a "good doer" in many different climates, but it is "friendly" to the expression of yellow flower color. It is also rated cold hardy to -15° F (-26 °C) so its offspring with *R. hyperythrum* should have good cold tolerance.

'Janet Blair' × *R. hyperythrum* yellow eye, selection #3 (Cross #84 - 1999).

I have made the cross 'Vulcan' × *R. hyperthrum* for red flowers several times with good results. 'Vulcan' is 'Mars' × *R. griersonianum*. The flowers of the cross 'Vulcan' × *R. hyperythrum* vary in color from clear bright pink to various shades of bright red all held in a tight truss. 'Vulcan' with its half *R. griersonianum* parentage also appears to impart *R. griersonianum*'s brightness and color intensity to the flower color of its offspring. 'Vulcan' blooms as a young plant and can pass this early blooming on to its progeny. *R. griersonianum* as a parent also has been useful in imparting its brightness and color intensity to produce not only red, but purple and yellow flowers.

The red species *R. haematodes* and *R. griersonianum* have helped intensify yellow in hybrids containing them, such as 'Fabia, 'Mary Belle', 'May Day' (Knights 2003). Therefore, using these species can be helpful in the pursuit of yellow as well as red flowers.

Over time, the most outstanding and earliest blooming plants of my primary crosses with *R. hyperythrum* became the "workhorses" of my hybridizing program. I then "bridged" from my primarily reliance on the Means and Thornton hybrids to the use of my own hybrids in moving forward on my goals. Two selections of these in particular are presently being used extensively. The first is 'Vulcan' × *R. hyperythrum*, named 'CeeCee', which has bright red flowers, a good habit and beautiful shiny veined leaves that are held for three years. The second is 'Janet Blair' × *R. hyperythrum* ARS 223-92) (selection #1). This is a large flowered bicolor with white, pink and a large dorsal purple blotch, and has a good habit with stout thick stems and large dark green recurved leaves of heavy substance held for up to three years. 'Janet Blair' in the hands of east and west coast hybridizers has proven to be valuable in transmitting yellow flower color to its offspring.

Parent selection in the pursuit of obtaining yellow and similar flower colors has been challenging, as species in these colors and their hybrids are particularly intolerant of warm climates. Whether

('Janet Blair' × *R. hyperythrum*), selection #1 (Cross #84 - 1999).

R. hyperythrum × 'Peter Faulk' (2).

developed on the east or west coast, almost all yellow hybrids are highly susceptible to the root rot pathogen phytophthora. In my experience root rot seems to be particularly an issue of hybrids with *R. wardii* in their parentage. In producing *R. hyperythrum* hybrids that have flowers in cream, yellow and tropical colors, I have had only a few of these hybrids survive long enough to collect pollen and seed. Since there are not many hybrids for breeding with *R. hyperythrum* in these colors that will survive, I have had to largely rely on help from other hybridizers. I have sent pollen from my forms of *R. hyperythrum* and its hybrids to individuals, and they crossed this pollen onto their plants and then sent me the resulting seed. This way, I have made progress in producing hybrids with cream and light yellow flowers and some tropical colored flowers. Some of these tropical colored flowers are similar to 'Percy Wiseman', and some have pronounced calyxes.

A "eureka" moment occurred in 2010 when I had a plant bloom that had true yellow flowers of good depth. The cross was 'Hong Kong' × *R. hyperythrum;* 'Hong Kong' ('Catalgla' × 'Crest') is a David Leach hybrid that has primrose yellow flowers and is hardy to -20° F (-29° C) (Greer 1996). This hybrid was grown from seed that I had obtained through the seed exchange (ARS 2001 #30), and it took ten years to produce one flower truss. The importance of this was huge in that it demonstrated that you can get a good yellow flower color from a primary cross with *R. hyperythrum* as a pollen parent. The good yellow color produced by this cross and the appearance of some lighter yellow flowered colors from some of my other *R. hyperythrum* crosses recently lead me to believe that there should be darker yellows in the garden yet to bloom. Obtaining a true yellow flower with 50% *hyperythrum* in the cross has encouraged me to make more primary crosses with *R. hyperythrum* instead of using *R. hyperythrum* hybrids, as I have previously done.

Another "eureka" moment came when two sister seedlings of yellow *R. decorum* × *R. hyperythrum* bloomed in less than three years from seed. One of the seedlings had light cream flowers and the other white. Both had large flowers and up to eleven in the truss, and were fertile as seed and pollen parents! This was significant for several reasons. First, I now had plants with yellow genes that could potentially greatly reduce the time to blooming from seed. I might thus be able to move more quickly through subsequent generations towards my goals. Second, these plants are being used as both seed and pollen parents and I have a number of crosses growing now. More sister seedlings of this cross have since bloomed, but unfortunately all had white flowers, but all were fertile as both seed and pollen parents. In contrast, many of my other *R. hyperythrum* hybrids as well as those of Drs. Means and Thornton have been pollen sterile and could only be used as seed parents.

In the last several years, another new direction in my quest for tropical and yellow flowers has been the increased use of hybrids containing *R. dichroanthum* and its subspecies. Several *R. dichroanthum* hybrids with 'Autumn Gold' in the parentage have

demonstrated a degree of heat tolerance and have thus been used as parents. These hybrids were developed by local hybridizers Delbert Brim, Marshall Stillwell and Wyatt Lefever. Many of these also have a "yellow form" of *R decorum* in them, as well as 'Janet Blair.' I am presently making use of these hybrids in my breeding program. As noted by Knights (2003a,b), *R. dichroanthum* frequently can pass on its degree of flower color saturation to its hybrid offspring. My use of *R. dichroanthum* hybrids is gradually replacing my use of *R. wardii* hybrids in my effort to produce yellow flowers as I believe this pairing offers more advantages.

The initial blooming of my crosses has persuaded me that careful selection of the parents used can be as important as or even more important than which parent is the seed parent. The fading that can occur when using *R. hyperythrum* as a primary parent can be a problem, but I now believe that it is not an absolute certainly even when using *R. hyperythrum* as a seed parent! The disease resistance and other benefits of having 50 % *R. hyperythrum* in the parentage have already been discussed, and I now feel that the advantages of using *R. hyperythrum* as a seed parent outweigh the negatives because this passes on chloroplasts, mitochondria and other organelles. These intracellular structures are inherited only from the ovum of the seed parent. The chloroplast controls photosynthesis and the mitochondria is involved in the plants' respiration. Both of these structures and their enzyme systems would have been selected for and evolved for optimum heat tolerance. The value of their inclusion by using *R. hyperythrum* as a seed parent would seem obvious.Using *R. hyperythrum* as a seed parent also confers ease of cultivation at all stages of growing the resulting offspring.

Once again I would like to thank the Research Foundation of the American Rhododendron Society and Committee members for helping to fund my hybridizing efforts through ARS grant #132.

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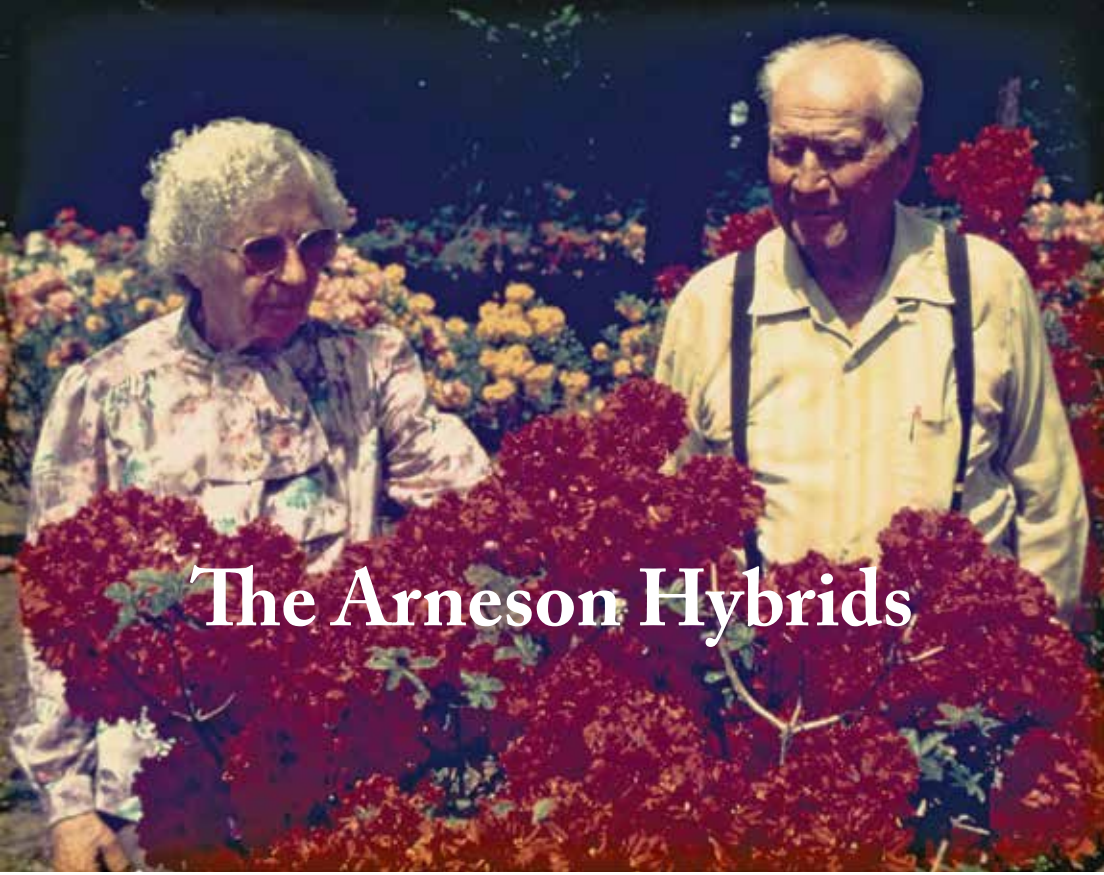


The Arneson Hybrids

Azalea fields, Arneson Nursery. Robertha and Ivan next to one of their red hybrids, circa the 1980s.

Tadeusz Dauksza
Orland Park, Illinois

The rural heritage of land in the Midwest USA, the breadbasket of United States, has small agricultural communities with strong ties to a large number of Norwegians who immigrated in the 19th and 20th centuries. Between 1825 and 1925, more than 800,000 Norwegians left for North America, representing about a third of Norway's population, with the majority immigrating to the USA and a lesser number to Canada. To a great extent, early emigration from Norway was out of religious persecution, especially for Quakers, but this was compounded by crop failures, as Norwegian agricultural resources were unable to keep up with population growth. The United States Homestead Act promised fertile, flat land, and thus the early settlements were first in Illinois and then westward into Wisconsin, Minnesota, the Dakotas and finally into the Oregon Territory, the northwestern corner of the USA.

One of those Immigrants was Edward John Arneson, who first went to Wisconsin but then moved to a new settlement called Westbrook, Minnesota, where he married

'Arneson Gem'.

Lena Peterson (Olena Pederson) and started a family. But this story is about Edward John Arneson's grandson, Ivan Leonard Arneson, and his wife Robertha Burrell.

Ivan Leonard Arneson and Robertha Burrell

Ivan was born on Feb 7, 1910, in Westbrook, Cottonwood County, MN. Life was harsh in that southwestern part of Minnesota, with grasshopper infestations, prairie fires, cold blustery winters, a lack of trees for fuel source (most of the trees had been cut for the railroads that went West thru Minnesota), and so in 1913 Ivan's dad packed up the family's belongings and they all headed west to Canby in the Clackamas area of Oregon.

Ivan's early childhood was spent around the Willamete River Valley, and his passion was fishing during breaks from school in the Willamette River, which was within walking distance from the Arneson residence. After finishing high school and while attending a teachers college in Monmouth, OR, Ivan met Robertha Burrell. Graduating in 1935, Robertha taught school in a two-room country school in Astoria on the beautiful Oregon coast. Ivan received his teaching certificate from the Oregon Normal School in Monmouth and taught seventh–grade students for nine years not too far from his hometown of Canby. Ivan and Robertha were married on June 3, 1938, and started

'Arneson Gem'.

'Arneson Ruby'.

a family and a long journey together over the next 67 years. While growing up, Ivan worked for farmers and nurserymen in the Canby area. In 1937, his fishing partner who also was a nurseryman planned to retire and since Ivan was free during the summer months from his teaching, he approached his friend with the idea of growing fruit trees. His friend offered to help Ivan get started and turned over to Ivan some of his customers. Thus, the Arneson nursery began with 10,000 prune (plum) trees.

The Arneson Nursery, and the Azalea Fields

Ivan continued teaching until 1946 while he got the nursery established with other fruit trees, fruit tree rootstock, shade and flowering trees, and shrubs including rhododendrons. In 1950, the Arneson's bought a 24-acre (9.7 ha) farm just before you enter Canby on route 99 E, later adding four and half acres (1.8 ha).

Deciduous azaleas entered the Arneson's story in 1950 when the first Mollis azalea liners were procured. *Rhododendron molle*, previously *Azalea mollis*, is from China and Japan. In Japan, many hybrids of *R. molle* ssp. *japonicum* are found, which are called the Mollis azaleas. Some are selected forms of *R. molle* ssp. *japonicum* and others are hybrids with *R. molle* ssp. *molle*. In 1922, Lionel de Rothschild of Exbury, Southampton, UK, obtained many seedlings of Mollis azaleas and bred what

became known as the Exbury azaleas. To further confuse, *R.* × *kosterianum* is often used for this collective group. Each year Ivan and Robertha bought more and more azaleas with bright colors and good flowers from different local sources, such as from Wade Robbins, who had the best ones at that time. Ivan picked out the best in Robbins' field for his stock plants, especially several good reds that he then planted in his azalea fields.

'Arneson Gem'.

In 1949, John Henny one of the founding fathers of the American Rhododendron Society, attended a Rhododendron Conference in England and was impressed with the Exbury azaleas there. Upon returning to Brooks, OR, Henny imported some of those Exbury's. Attending a slide program presentation of those Exbury's, the Arneson's were smitten and in the mid-fifties, Ivan and Robertha began an extensive collection of named Exbury and Mollis azaleas (and some seedlings) obtained from a number of sources. Wade Robbins and John Henny were the major plant suppliers, but they also acquired plants from other growers in Oregon, notably E.J Kraus, Corvallis, a retired professor at Oregon State University, and P.H. "Jock" Brydon, Salem, an importer of English azaleas who also attended that Rhododendron Conference in England. The Arneson hybridization program thus began in 1959.

'Arneson Pink'.

'Arneson Frilly Lemon'.

'Arneson Red Sunset'.

Hybridizing for Superior and Unique Azaleas.

Ivan and Robertha began evaluating flowers in each set of seedlings they had purchased, and labeled and saved the best. This meant saving only between one to five plants from a cross, although in one cross they saved 15. They then crossed these best plants with good named azaleas or sometimes crossed two named azaleas. The Arneson garden began with their collection of named azaleas and all of the best seedlings they had saved to watch for further crossings. They made many crosses, and as they came to bloom they carefully evaluated them to determine which ones were the best, this enabled them to choose the best from each generation. Simultaneously, Ivan and Robertha's knowledge of growing fruit trees such as apples, quinces, cherries, and pears resulted in them being invited to contribute to the Oregon's Nurserymen's Association, along with belonging to the International Propagator's Society.

By the 1980s, Ivan and Robertha were making about 100 crosses a year, and selling up to 20,000 plants a year. This large quantity of crosses improved their production of better seedlings. One of the Arneson's goals was to develop bright, clear-colored flowers or intense colors, especially of reds. Producing a good red flower was not the only interest, though, and using some Mollis seed from 'C.B.van Nes' × 'Koster's Brilliant Red', obtained from retired OSU professor E.J. Kraus, they produced plants with various shades of red, except for one with variegated flowers that had a red bud opening to a red-edged flower with a yellow center. Ivan and Robertha crossed

this variegated plant with several reds resulting in more plants with variegated flowers. They then planted some open pollinated seed from the original variegated plant. All the seedlings were pinkish, except one that was orange-red, opening to orange to yellow-orange. The local Orchard Mason Bees did an admirable job, because this plant was good enough to be named 'Arneson Gem'.

Another interest of the Arnesons was to produce petaloid doubles with larger flower. Every time they found a good flower that was partly double, they saved it to use in hybridizing for a larger-flowered double (corolla 3-4" (7.6 -10.2 cm) in width).

With the advent of tissue culture technology, the Arneson's have been able to see many of their hybrids become commercially available. They began working with Bruce Briggs in the early 1980s and now most, if not all, of their registered hybrids are available in the trade.

Listed below are the registered Arneson hybrids that Ivan and Robertha brought to beautify our gardens: 'Arneson Baby Doll', 'Arneson Cameo', 'Arneson Fairy Jewel', 'Arneson Flame', 'Arneson Frilly Orange' 'Arneson Gem', 'Arneson Golden Solitaire', 'Arneson Little Gem', 'Arneson Medallion', 'Arneson Pink', 'Arneson Ruby', 'Arneson Ruby Princess', 'Big Punkin', 'Canby', 'Cascade Pink', 'Fluffy', 'Frilly Lemon', 'Molalla Red', 'Mount Rainier', 'Nifty Fifty', 'Orange Splendor', 'Raspberry Delight', 'Red Sunset' (syn = 'Arneson Red'), 'Robbins Flame', ' Rose Ruffles', 'Soft Echo' and 'Twinkie'.

Most of those listed Arneson hybrids azaleas can be purchased /mail-ordered from Greer Gardens in Eugene, Oregon, www.greergardens.com.

For those visiting the Portland or Canby area, please do stop and visit the Arneson Garden located at 249 S. Sequoia Parkway, Canby, which is now a horticultural park, offering picnicking, a woodland walking trail, benches to rest, and most of all, a view of a special azalea garden. The legacy continues!

Many thanks to all providers of photo's and to Sheldon Hatheway, son-in-law of Ivan and Robertha Arneson.

Tadeusz Dauksza is a member of the Lake Michigan Chapter, ASA, and the Ann Arbor Chapter, ARS.

O. Howard Hinsdale Garden, Spring 2014:

Open Garden Days & Other News

The growing vitality of the community-based "Friends" group supporting this historic collection of rhododendrons, camellias and magnolias is reflected in their commitment to provide manpower for three public open days this year. The scheduled Saturday dates are April 26, May 10 and May 24. The open hours will begin at 10 a.m. and continue to 2 p.m. Ample parking will be available at the Elk Viewing Area Kiosk about a mile west of the garden, and free transportation will be provided from there to the main garden.

Attend on one or more of these dates to both enjoy the garden and/or provide expertise about the rhodies and their companions while visiting with folks attracted by the blooming spectacle—a rewarding means, by the way, of carrying out the ARS mission of promoting interest and knowledge of rhododendrons, all while in the midst of a beautiful array of those very plants.

2014 marks the beginning of the second decade in reclaiming the Hinsdale Garden. In addition to the annual chore of removing rough grass and weed growth, the Northwest Youth Corps will clear a way for permanent paths this year. The routes for these have been marked with ARS member assistance, and they will be completed over a weed barrier topped with relatively coarse wood chips. Other investments this year by the Bureau of Land Management (BLM, a division of the U. S. Department of the Interior and the garden's owner since purchase from the Hinsdale family after O. Howard Hinsdale's death) will include tree pruning work following up that done several years ago, and installation of an attractive arched wooden pedestrian bridge between the main and east garden segments.

The Friends group is exploring the possibility of securing a water supply from the City of Reedsport for a robust irrigation system throughout the garden. Planning and other BLM agency/volunteer work continues for identified long range goals of restoration and perpetual maintenance of the O. Howard Hinsdale Garden, which is well on its way to becoming a permanent feature in the Deans Creek area of the officially designated "Scenic Highway 38".

Gordon Wylie

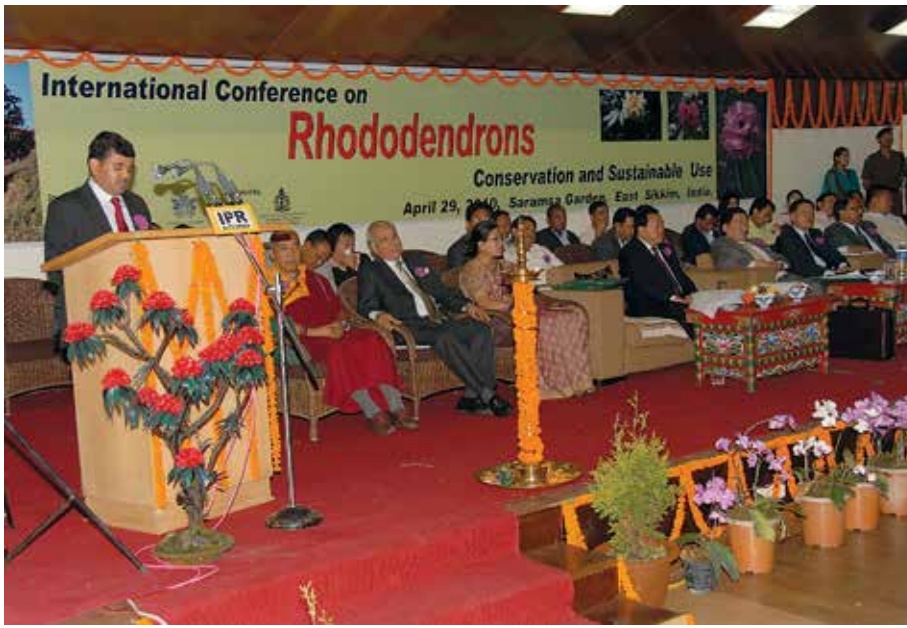
Showcasing Sikkim Rhododendrons:

The International Rhododendron Festival 2010 Experience

Dechen Lachungpa
Sichey Busty,
Gangtok,
Sikkim, India

Introduction

The State of Sikkim is rich in species of *Rhododendron*, having 38 species, and the highest concentration in North Sikkim is at the Singba Rhododendron Sanctuary, which covers 43 km^2 (16.6 mile^2). This sanctuary's northern boundary is Yumthang



Minister Forests Bhim Dungyal inaugural address in the Conference. K.C. Pradhan, President JD Hooker Chapter, ARS.

Inauguration of the Festival by the Governor of Sikkim at Singba Rhododendron Sanctuary. Forest Chief Sonam Lachungpa (with green jacket & cap); Speaker K.T.Gyatsen; Governor of West Bengal, Mr. M.K. Narayanan (then acting Governor of Sikkim); Mrs. Narayanan; and Bhim Dungyal (Forest Minister).

Valley, famous for its scenic beauty, wild flowers and hot springs. The southern boundary is Yakchey-la, to the east is the high and rugged Chuba Sagochen Mountain Range and to the west is Chomzomei Tso, extending up to Lava Pass. The Government of Sikkim has made considerable effort in its conservation of biodiversity, and over 30% of the geographical area of Sikkim is included in a protected area network. This network includes the Khanchendzonga Biosphere Reserve and seven Wildlife Sanctuaries. Sikkim is probably the only state in India to designate sanctuaries specifically for rhododendrons, the Singhba Rhododendron Sanctuary in Yumthang Valley in North Sikkim and the Bharsey Rhododendron Sanctuary in West Sikkim along the Nepal Frontier.

Rhododendrons in the Sikkim Himalayas were first brought to the attention of the world by Sir J.D. Hooker (Hooker 1853), who described several of the species of rhododendrons found in Sikkim. His work was revised 140 years later by Sonam Lachungpa and U.C. Pradhan (2011). The two authors conducted a survey of species recorded by Hooker, and further discovered *Rhododendron* × *sikkimens*e with its blood red flowers endemic to the Yumthang Valley in North Sikkim beside a cultivar of *R. dalhousiae* ssp. *dalhousiae* (sometimes referred to in Sikkim as ssp. *tashii*, named after Tse Ten Tashi, a great rhododendron enthusiast well known in the ARS fraternity as

TTT). *R. leptocarpum* was reported to be in the Yumthang Valley by a Swedish botanist attending the International Rhododendron Festival (IRF).

Joseph Dalton Hooker

Sir J.D.Hooker was a friend of Charles Darwin and the son of William Hooker, the director of Kew Gardens. Hooker made two trips to Sikkim, the first trip from Darjeeling into southwest Sikkim in 1848. The second trip, which was more important and significant, was to the northern part of Sikkim in May 1849. He reached Chungthang and then went towards Lachen but could not advance up the Zemu. There he collected eight to ten rhododendron species that were in full bloom. He then travelled higher up the Lachen towards Thangu and encamped at 3886 m (12750 ft) and later, higher up towards Kongra- La at 4784 m (15,700 ft) at the boundary between Sikkim and Tibet. By the end of July he was on his way back to Chungthang, from where he proceeded onwards towards Lachung to Yumthang and the Donkia Pass. In early October he returned back to Yumthang to meet his friend Dr. Campbell, the Superintendent of Darjeeling and the Political Agent to Sikkim. Campbell and Hooker paid a visit to the Rajas residence at Tumloong in early November and afterwards made an excursion to Chola Pass. At Chumanako the two were arrested and roughly treated, most probably on the orders of the Dewan and not the Maharaja. They were kept prisoner at Tumloong and brought to near Darjeeling before being

Rhododendrons in full bloom during month of May.

R. ciliatum.

released. The detention period lasted 47 days, from November 7 to December 23, and all responsible for the arrests were punished. Keshab Pradhan (2008) mentioned that Hooker's (1849-51) publication of *The Rhododendrons of the Sikkim Himalayas* was one of his greatest contributions, as it generated worldwide interest in this genus and led to further hybridization and production of superior cultivars. However, while it is true Sikkim came into the limelight due to rhododendrons, this was at a cost! Sikkim lost a large tract of land extending right to the plains of India at that time, as the country got greatly reduced in size as punishment for the persecution of Campbell and Hooker.

Some Interesting Observations of the Explorers of Rhododendrons in Sikkim

Sir J.D. Hooker (1954) in his appendix on the "Physical Geography of Sikkim" explained why the drier regions of Upper Sikkim have a lesser variety of rhododendrons and other plants in comparison to the Singalelah Range, which has an abundance of rhodendrons but lacks in other species of herbaceous plants. He explained the phenomenon as:

> The banks of rivers between 8000 and 14000 feet are generally covered with Rhododendrons sometimes to the exclusion of other wooded vegetation, especially near the snowy mountains, a

cool temperature and great humidity being the most favourable conditions for the luxuriant growth of the genus.

Such conditions prevail throughout the Singalelah Range due to its proximity to Kinchinjinga, accounting for the overwhelming abundance of rhododendrons there. This may also be accepted as the probable reason for the comparative absence of herbaceous plants, most of which would be challenged to exist against such formidable competitors.
George A. Gammie (1894) wrote:

> *Rhododendron nivale*, a humble soil-embracing plant inhabiting the desolate slopes of Donkia and Kinchinjhow between 17,000 ft to 18,000 ft, bears the honour of being the most woody plant in the Himalayas.

R. glaucophyllum, R. campylocarpum and *R. cinnabarinum* against the peak of Yumthang, Photo. Dr. Namgyal.

For miles and miles, a traveller there would trudge along sheep paths through impenetrable thickets of rhododendrons. Their flowers are of varied colours but none are blue. They are devoid of perfume with the exceptions of *R. anthopogon, R. setosum* and *R. nivale.* These three plants when bruised or trodden upon exhale an overpowering scent from the superficial glands with which they are crusted, aggravating headaches suffered by everyone at high elevations. The discomfort is intensified in bright weather as the warmth engendered by the sun causes the vapour to rise in greater volume. Many loads of their twigs are collected and taken to the Buddhist temples of Sikkim where they are burned as incense. They are also much in service in camps as they burn readily when lighted, a consideration of extreme importance in a country where the wetness of ordinary wood

R. cinnabarinum ssp. *cinnabarinum.*

R. cinnabarinum.

causes delay in obtaining brisk fires.

Yak are grazed in this valley up to 5182 m (17,000 ft), and cattle range up to 3962 m (13,000 ft). These animals possess sufficient instinct to avoid eating the poisonous aconites [monkshoods], which grow only to the height of the accompanying low herbage. Goats and Tibetan ponies from the information I gathered have the same instincts, while sheep, strange to say, must be muzzled or driven quickly through areas infested with these plants.

One of the rhododendrons is equally poisonous to animals—*R. cinnabarinum.* Honey, which is collected in the spring but at no other time of the year, is said to be rendered deleterious by the admixture of nectar from this species' flowers. However Sonam Lachungpa (pers. comm.) differs on this point, saying that the petals of the flower after removal of its reproductive parts (androecium and gynoecium) can be eaten, but taste sour.

Some of Sonam Lachungpa's (pers. comm.) first hand experiences with a few other rhododendron species are:

> In the spring, Rock Bees [*Apis dorsata*] collect nectar from rhododendrons and from many poisonous plants like Aconites, and this honey is highly poisonous. To test the presence of poison, the honey is applied to a wound; if the cut burns then the honey is not safe for consumption. If this poisoned honey is consumed, then it affects the nervous system and there is no control over voluntary muscle movement in humans. However, this honey in the villages of Lachung is boiled and made into tiny candies which are then eaten in small amounts, as it is believed this provides energy. This poisoned honey is also given to sick horses and animals in a limited quantity.

R. aeruginosum has bluish leaves and when the sun shines bright, the entire area can look bluish, which can cause nausea.

Rhododendrons help in the conservation of rare plants such as *Cypripedium himalaicum, C. elegens, C. tibeticum, Picorrhiza kurro* (Kutki) *and Nadostachys jatamasi.* Dwarf rhododendrons provide protection against adverse climatic conditions, and there can be a huge plant biomass under rhododendrons which enriches the soil and helps in moisture conservation. This is the reason for the presence of a large biodiversity around rhododendrons.

During the IRF 2010, Lachungpa noted:

> I have come across yet another beautiful dark pink variety of rhododendron in the Singba Sanctuary—another yet to be studied and named species or variety. Surely there is a lot of natural hybridization going on that warrants further study.

R. aeruginosum with yaks grazing on primula meadow at back in Yumthang Festival area. Photo by Dr. Namgyal.

Sir J.D.Hooker revealed the world of Sikkim rhododendrons, but it is the enthusiasm and love for nature by our very own foresters who now advance the variety of Sikkim rhododendrons more forcibly. We can proudly say that many rhododendron hybrids found in both Europe and the USA havebeen derived from the native rhododendrons of Sikkim. However we face the danger of losing this precious wealth because of both biotic and abiotic factors. Sonam Lachungpa admits that some of the best rhododendrons (recorded at the mid-1800s at the time of writing of *Rhododendrons of the Sikkim Himalayas*) that could have been preserved no longer exist, as these trees have since been buried by an avalanche.

International Rhododendron Festival 2010

It was decided in 2009 as part of the International Tourism year to have an International Rhododendron Festival both to promote tourism and to showcase to the world the rich diversity of rhododendrons in Sikkim. Planning for the festival took two long years, as since Sikkim was about to hold one of the biggest events, it was a matter

R. thompsonii.

of pride for the State. International experts and guests from ten countries were invited for the event, and all their flags were hoisted at Singba, Yumthang, Thamo Chi and at the Ranipool Saramsa Gardens. Incidentally, most of the invitees were from Scandinavian countries as it was Finnish and Swedish missionaries who first ventured into the highlands of Sikkim in the eighteenth century. They brought a sea of change to Sikkim, from introducing apples to teaching women weavers of tweeds, floor rugs, blankets, ladies capes, etc., all using vegetable dyes sourced from the nearby forests. As part of the festival, an international rhododendron conference was also held in the Saramsa Gardens. Small construction works had to be completed, such as making trekking trails, cafeteria huts, wooden bridges and resting sheds. Transportation and hotels for guests had to be arranged. Bird watching, angling, nature camping, and mountain biking activities were planned, and infrastructure considerations such as power supply and garbage disposal had to be taken care of. Capacity building in the local populace was also a factor that had to be addressed. The effort required excellent co-ordination within the Forest Department as well as between other line departments and Travel Agent Associations, NGO's, etc. Improving the National Highway leading to North Sikkim was another big challenge, which required the help of the Border Road Organisation to ensure that there was always a free flow of traffic.

The commencement date was set for April 25, 2010. Though many rhododendron stalwarts were of the opinion that the date was too early to best observe rhododendron flowering, a miracle happened! The climate on 2010 was apparently so congenial that the entire Yumthang Valley was ablaze with the colours of rhododendrons, at a date previously unknown in the memories of local people.

The Chief Guest of the festival, His Excellency, the Governor of West Bengal, Mr. M.K. Narayanan (then acting Governor of Sikkim), arrived by helicopter from Calcutta. The festival began with the offering of traditional prayers for good luck at the "Chuba Lakhar Sacred Grove"; "Chuba" means land between two rivers. It is a patch of virgin forest comprised of coniferous *Picea smithiana* (spruce), *Tsuga dumosa* (hemlock), and junipers growing on rocky patches. Here a local deity/Guardian by the name of Cho Chuba is worshipped. Legend has it that on a full moon's light on Buddhist auspicious nights, Cho Chuba's horses can be heard galloping, along with the sounds of radong [traditional Tibetan horn] and gyaling [a double reed traditional Tibetan woodwind instrument] being played from adjoining hills. For the people of Lachung, this grove is revered and worshipped twice a year, once on the first day of

Losar [lunar-based Tibetan New Year] and six months after. The puja [a special kind of ritual] is first done by a Pao [shaman] and then by monks. Because of its significance, no person cuts trees or hunts in and around that area and if any person does so, it is feared that bad luck will descend over the entire village. When K.C. Pradhan, the J.D. Hooker Chapter President, was invited to oversee the arrangement, he strongly advocated that the function should start only after paying homage to the deity and seeking his blessings, as he meticulously did while undertaking any forestry operation in the area during his long tenure as Forest Chief.

R. setosum.

After offering prayers in the early hours of April 25, 2010, a formal inauguration of the year-long festival was done by the cutting of a ribbon at the Shingba Sanctuary Gate (photo on p. 99). An inaugural function was then held inside the Sanctuary where two books were released: *The Handbook on Sikkim Rhododendrons* by K.C. Pradhan and *The Medicinal Plants of Sikkim* by Tika Sharma. The Governor then started the mountain bike expedition along the Rhodo Trail. The group then proceeded towards Yumthang Valley for the opening of the newly constructed cafeteria by the Tourism Department, passing small cafes which had been constructed along the road for local villagers to sell food items and products. The old Yumthang Forest Rest house had been converted into a forest museum, and a handicraft show which had been organised by the Directorate of Handicrafts was also inaugurated. Along the river the Sikkim Anglers Association (for which K.C. Pradhan is the President and the highly reputed physicist Dr. Namgyal (he was a school student guide in 1974 on the ARS Sikkim Rhododendron Expedition) is General Secretary) had organised "Angling for High Altitude Trout (Rainbow Trout)," a catch-and-release event. The Travel Agents Association of Sikkim had also organised a display of trekking tents and ski equipment. Finally, in the evening the Governor along with international representatives walked two kilometres along the rhododendron trekking trail. By dusk, all were gathered at the Lachung Thamo-che school compound to witness a Cultural Show. The festival continued for 10-15 more days, and dignitaries were taken on a trip to Lachen to see the rhodos in bloom.

The success of the festival celebration in Lachung would not have been possible without the support of the local people of Lachung, the Lachung Dzumsa, TAAS, the Government of Sikkim, the Hotel Association of North Sikkim and Gangtok, NGO's and lastly, the dedicated officers of the Forest Department.

On April 29, 2010, the international conference "Rhododendrons: Conser-vation and Sustainable Use" (Mainra et al. 2010) was held at the Saramsa Gardens (photo

on p. 81). The Chief Guest of the event was the Honourable Chief Minister of Sikkim, Shri Pawan Chamling.

R. wightii.

Inpact of the IRF 2010

The organisation of the International Rhododendron Festival has had a big impact on the livelihood of the people of Sikkim. North Sikkim is remote and agriculture is not very sustainable. It has definitely bought about awareness amongst the residents of North Sikkim that the rich forest should be conserved to attract tourists, and there is now a positive change in their attitude towards conservation. Every person who attended the festival or was a part of it, people who had never seen a rhododendron or at least never thought to take interest in them, are now aware of this rich wealth of Sikkim. Sonam Lachungpa, co-author of the book on Sikkim Himalayan rhododendrons, reminisces that while surveying rhododendrons for their book, the only "hotel" that existed was the two-room Lachung Bungalow where they did most of their work. Today, there are over 100 homestays, and local people now view rhododendrons as a valuable resource that attracts tourists from around the world.

Tourism is already a major source of income in Sikkim. Such show case and advertisement at a global level is definitely producing a positive impact on the tourism industry. The closing ceremony of the year-long festival was held in April 2011 at the Bharsey Rhododendron Sanctuary, established by K.C. Pradhan back in 1969 after his return to Sikkim from Yale University in the USA.

Climate change has become a major issue worldwide, and the festival date serves as an initial record of the flowering pattern of rhododendrons. The conference served as a global platform for Sikkim to witness and learn from the experts invited from other countries on conservation and management issues for rhododendrons in general.

Outcomes of the IRF 2010 Conference: Conservation and Sustainable Use

The conference was a huge success with representatives both from India and abroad working on rhododendron propagation and research. It was a gathering of people who had worked for years on rhododendrons that were eager to share their experiences and knowledge for the benefit of everyone. Several topics on rhododendron conservation and management-related issues were deliberated upon. Some of the advice, experiences and ideas on better management and conservation by the experts are highlighted below:

A. For ex-situ conservation, all propagation methods need to be improved. The experiences of mass propagation in Western countries should be considered. If possible, seed propagation should be preferred to maintain genetic diversity. Plantings in different provinces/elevations of a species at one place could be the basis for phenological

comparisons over time. Ensure that desirable ecotypes and rare and threatened endemic species are a part of focus on ex-situ conservation. Also, species of socio-economic importance can be considered for mass cultivation, eg., the growing rhodos for incense production.

B. Create awareness [of the importance of rhododendrons] for people at a grassroot level, especially people living in the fringes of the forest and who depend heavily on the forest resources.

C. Develop arboreta of different rhodo species.

D. Eco-tourism should be encouraged in selected areas but only in a regulated manner.

E. Protection of rhodo habitat as a whole, and not concentrating solely on a particular species alone. Our efforts on conservation have to be squarely on protecting the habitat. In formulating policies to better protect and manage, sound scientific research is essential.

F. To encourage and support research activities in identifying natural areas of rhododendron species occurrences, and to monitor the statuses of individual species in their respective ecosystems and the identification of relevant abiotic and biotic threats. Long term phenological monitoring of select ecotypes, and observing rhodos in the context of climate change needs to be initiated.

G. To develop a large database with regular up-dating and a website that is highly informative, e.g., the website "Hirsutum," developed by Herman van Rhee, a member of the Dutch Rhododendron Society, is highly informative and successful at a global level. Requesting the transfer of materials for biodiversity research to other countries should be considered with the aim of ensuring continued survival of species elsewhere.

H. Provision of alternate forms of livelihood, reduction in dependence on forest resources and provision of alternate energy sources for fuel, etc.

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Dechen Lachungpa is the newsletter editor of the JD Hooker Chapter.

When is a Rhododendron Not a Rhododendron?

Glen Jamieson
Parksville, BC,
Canada

A recent *New Scientist* issue (P16, 1 Dec 2012) summarized an article that stated that the Singapore rhododendron is the first flowering plant that has been shown to recruit ants to chase poor pollinators away. Carpenter bees (*Xylocopa*) are better pollinators than the smaller solitary bee *Nomia* for this plant, and weaver ants that frequented the flowers were shown to chase away or ambush *Nomia*. The larger carpenter bees were not troubled by the ants. It was subsequently shown that the flowers actively attracted weaver ants, although how remains a mystery. This is a new kind of plant-ant interaction, with the plant manipulating the behavior of the ants to ward off more inefficient pollinators.

What also interested me though, was the reference to "Singapore rhododendron,"as I was not familiar with this plant. At first I thought it might be a vireya, but investigation revealed that while it is called a "rhododendron," it is not one, and is not even in the family *Ericaceae*. The plant is in fact *Melastoma malabathricum,* belongs to the Melastoma family *Melastomaceae,* and is alternatively known as the Straits Rhododendron, Indian Rhododendron, Malabar Melastone, and by its Malay name Sendudok.

It occurs naturally in southeast Asia—in China, Japan, Burma, Cambodia, Laos, India, Malaysia, Nepal, the Philippines, Thailand and Vietnam. It is usually found between 100 and 2,800 m (328 to 9186 ft) elevation on grasslands and sparse forests. It has also been reported to grow wild in Indian Ocean islands, Taiwan, Australia and many islands in the South Pacific Ocean. It has been declared a noxious weed in the United States (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?23928).

It is a showy plant that seems to be perpetually in flower, even in exposed areas where nutrients and water are lacking. It usually grows to about 1 m (3.2 ft), has reddish stems and each leaf is long and narrow and is pointed at both ends with three distinct ribs. The ribs on the leaf's underside have fine bristles. The attractive flowers are up to 7 cm (2.8 in) in diameter and are produced in a cluster at the tip of each shoot. Each flower has five petals and the most common flower colour is deep mauve, although there is

Melastoma malabathricum. Photo by the author on Mt. Kinabalu.

also a white-flowered cultivar. The flowers are interesting as they have two types of stamens—the anthers of five outer stamens, arranged in an outer ring, are larger, curved and violet in colour while the remaining five are located in an inner ring and are straight and yellow in colour. The flowers last only one day, opening after sunrise and closing the same day, with the petals falling off a few days later.

The Singapore rhododendron attracts many native birds including the yellow-vented bulbul (*Pycnonotus goiavier*), flowerpeckers (family *Dicaeidae*), doves and pigeons that consume the ripe fruits and help to disperse its seeds. Squirrels and monkeys are also fond of the fruits. The plant is also the host for caterpillars of butterflies such as the Common Sailor (*Neptis hylas*) and the Grey Count (*Tanaecia lepidea*).

When ripe, berries of *M. malabathricum* break open irregularly to reveal a soft, dark purple, sweet but rather astringent-tasting pulp and numerous orange seeds. The seeds are tasteless and can be eaten but will stain the tongue black. In fact, the name "melastoma" is Greek for "black mouth," a name appreciated by generations of children who have eaten the berries.

Melastoma malabathricum is a recognized herb and in some locations, its leaves,

shoots and roots are prepared in various ways and are used to treat stomach aches and diarrhea. Its roots and leaves are applied to lesions and wounds to help with healing and in the treatment of hemorrhoids. The young leaves can be eaten raw or cooked and taste sour, and the pulp around the seeds can also be eaten. The seeds are used to produce a black dye and the roots a pink dye. In some places, the leaves are fed to silkworms.

Although the plant is sometimes considered a weed because it can rapidly colonise wastelands with seeds that are dispersed by birds, this does help prevent soil erosion on disturbed land. It also accumulates aluminum ions from the ground where it is grown (http://www.ncbi.nlm.nih.gov/pubmed/19704812), and may be used to help remove aluminum from soils with a relatively high concentration.

For garden use, Singapore rhododendron is a full sun plant and is not generally fussy about soil type. It can be grown in areas with clay but it does better in soil that is fertile and friable. Its roots should be consistently kept moist and plants should not be allowed to dry out between watering, making it suitable as a marginal plant for bogs and water gardens. Although it is a plant adapted to nutrient-poor conditions, it will benefit from a regular dose of a general fertilizer to promote both healthy growth and a profusion of flowers.

Plants can be pruned to shape them and because of its self-seeding habit, shrubs in bloom should have their spent flowers removed promptly (dead-heading) to limit fruit and subsequent seed production and disperal.

Acknowledgements: The above has been modified from http://mybotanicalspace.blogspot.ca/2010/08/melastoma-malabathricum-singapore.html, *http://en.wikipedia.org/wiki/Singapore_Rhododendron* and http://www.naturia.per.sg/buloh/plants/melastoma.htm

2014 *JARS* Photo Contest

The Contest is open only to ARS members in good standing as of the contest closing date. Judges and their immediate family (spouse, parents, siblings, and children) and household members are not eligible. By participating in the Contest, each entrant fully and unconditionally agrees to and accepts these Official Rules and the decisions of the Judges, which are final and binding in all matters related to the Contest. There are no prizes except bragging rights, and the Editor of *JARS* has the right to publish runner up and winning entries.

All photos submitted must have been taken between January 1, 2014, to July 31, 2014. Entries must be received by midnight PST, July 31, 2014. All entries should prominently feature either rhododendrons, azaleas and/or vireyas in the composition. Competition categories: 1) Flower, truss or spray; 2) Plant in bloom; 3) Landscape or plants in the wild or in gardens; 4) Foliage; 5) People, Insects, or Animals; and 6) Other, for creative or artistic effects of any kind that involves these plants. This could involve the use of software products like PhotoShop.

Photo Guidelines: 1) The Photo must be in .jpg, .jpeg, or .gif; 2) Images submitted should be sent by email and be of modest size, about 1024 to 1280 pixels in length and 480 to 768 in width, which would correspond to a dpi of at least 300 for a 3 x 5 in (7.6 x 12.7 cm) photo; 3) Cropping of digital images and minor adjustments to exposure and color balance is permitted for entries in all categories. Advanced image editing features available in software products like Photoshop should not be used except for entries in category six; 4) The Photo caption and/or description must not exceed 200 characters in length. Provision of some details about the camera and settings for each entry is also required, and for submissions in category 6, include a brief explanation of how the image was created; **5) The Photo cannot have been submitted previously in an ARS contest (chapter contest submissions are acceptable);** and 6) The number of entries by any individual per category is restricted to two.

Note: Photo guideline 5 (in bold) has been modified.

Newly Registered Rhododendron Cultivar Names

Michael Martin Mills
North American Registrar of
Plant Names
Philadelphia, Pennsylvania

The following rhododendron and azalea names were approved and added to the International Rhododendron Register before Feb. 4, 2014, by the Royal Horticultural Society, which serves as the International Cultivar Registration Authority for the genus *Rhododendron*. (Information on the registration process follows the descriptions of cultivars.)

Key
(a) – deciduous or evergreen azalea
(r) – elepidote or lepidote rhododendron
(v) – vireya rhododendron

(z) – azaleodendron
X – primary cross
(s) – seed parent of cross, if known
x – cross of an unnamed parent
* – not registered
H – hybridized by
G – grown to first flower by
R – raised by
S – selected by
N – named by
I – introduced commercially by
REG – registered by
Royal Horticultural Society color numbers in parentheses, unless another system is noted

(r) 'Arctic Dreams'
Elepidote rhododendron: 'Horizon Lakeside' (s) X 'Arctic Gold'. H (1997), G (2003), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 20/ball truss, broad funnel, 2 inches (51mm) long x 3.5 inches (89mm) wide with 5

'Arctic Dreams'. Photo by Jim Barlup.

frilly lobes. Bud: strong red (53C). Inside: brilliant yellow (9C) shading to a band of pale yellow green (4D) at margins, narrower on lower lobes; strong red (53B) blotch at base of upper lobe changing to strong red (53C) spots in center of upper lobe. Outside: brilliant yellow (9C) shading to pale yellow green (4D). Truss 6 x 6 inches (152 x152mm). Lvs 5.5 x 2.1 inches (140 x 54mm), elliptic, rounded base, broadly acute apex, downcurved margins, moderate olive green (147A) above, glossy. Shrub 4 feet (1.2m) high x 5.5 feet (1.7m) wide in 10 years, intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C). Flowering midseason (May in Seattle).

(r) 'Coral Dancer'

Elepidote rhododendron: 'Coral Blossom' (s) X 'Casanova'. H (1998), G (2004), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 16/dome truss, open funnel, 2 inches (51mm) long x 2.75 inches (70mm) wide with 5 wavy lobes.

'Coral Dancer'. Photo by Jim Barlup.

Bud: moderate red (47A). Inside: light yellowish pink (27A) shading to a deep pink (52C) 0.4-inch (10mm) band at edges of all lobes; deep red (53A) 0.4-inch (10mm) nectar pouches at base of all lobes; moderate reddish orange (35B) spotting on upper lobe, starting 0.75 inch (19mm) from base and extending 0.9 inch (22mm). Outside: light yellowish pink (27A) shading to a deep pink (52C) 0.25-inch (6mm) band at edges of all lobes. Calyx: 0.9 inch (22mm), light yellowish pink (27A) shading to a deep pink (52C) at the margin. Truss 5 inches (127mm) high x 6 inches (152mm) wide. Lvs 5 x 2.25 inches (127 x 57mm), elliptic, rounded base, broadly acute apex, flat margins, moderate olive green (147A) above, matte. Shrub 2 feet (0.6m) high x 3.5 feet (1.1m) wide in 7 years, intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C). Flowering midseason (May in Seattle).

(r) 'Mary Ann Gelsthorpe'

Elepidote rhododendron: parentage unknown. H (c. 1970), G (1970s): John C. Cowles, Stowe, MA. N (2013): Cyndy Fish, Milton, MA. REG (2014): Heritage Museums and Gardens, Sandwich, MA. Flrs 7/ball truss, funnel, 2 inches (51mm) long x 2.5 inches (64mm) wide with 5 wavy lobes. Inside of flower: light purplish pink (65B) with strong yellow green (145A) speckled throat extending 1 inch

'Mary Ann Gelsthorpe' . Photo by D & J Delano.

(25mm) from base. Outside: pale purplish pink (56B). Calyx: 0.1 inch (3mm), strong yellow green (144B). Truss 5.5 inches (140mm) high x 4.5 inches (114mm) wide. Lvs 4.5 x 2 inches (114 x 51mm), oblong, rounded base, obtuse apex, downcurved margins, moderate olive green (146A) above, matte. Shrub 12 feet (3.6m) high x 10 feet (3m) wide in 40 years; intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C), bud hardy to 5°F (-15°C). Flowering midseason (May on Cape Cod). Etymology of name: Named for Mary Ann Gelsthorpe of Sandwich, MA, mother of Cyndy Fish, a major supporter of Heritage Museums and Gardens. Synonym: Heritage 581-67.

(r) 'Morrie's Song'

Elepidote rhododendron: 'Violet Mist' (s) X 'Black Adder'. H (2003), G (2009), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 11/ball truss, saucer, 2.25 inches (57mm) long x 3.5 inches (89mm) wide with 5 frilly lobes. Bud: deep purplish red (71A). Inside: yellowish white (155D) extending 1 inch (25mm) from base (1.5 inch [38mm] on upper lobe), then blending through light purple (77D) to strong purple (77B) at margins; strong yellow green (144C) 1.5-inch (38mm) spotted flare on upper lobe. Outside: light purple (77D) blending to strong purple (77B) at margins, with light reddish

'Morrie's Song'. Photo by Jim Barlup.

brown (177B) rib veins. Truss 5.5 x 5.5 inches (140 x140mm). Lvs 5 x 2.1 inches (127 x 54mm), elliptic, rounded base, broadly acute apex, wavy margins, moderate olive green (147A) above, semiglossy. Shrub 4 x 4 feet (1.2 x1.2m) in 10 years; intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C). Flowering midseason (May in Seattle). Etymology of name: Named for a friend of the hybridizer who lives in Victoria, BC.

(r) 'Night Wind'

'Night Wind'. Photo by Jim Barlup.

Elepidote rhododendron: 'Jonathan Shaw' (s) X 'Black Adder'. H (2003), G (2008), N (2012), REG (2014): Jim Barlup, Bellevue, WA. Flrs 15/ball truss, saucer, 1.75 inches (44mm) long x 3 inches (76mm) wide with 5 wavy lobes. Bud: strong purplish red (59A). Inside and outside: moderate purplish red (58A) blending to deep purplish red (61A) at margins of upper lobes, with deep-grayish reddish brown (200A) 1-inch (25mm) flare on inside of upper lobe. Truss 5 x 5 inches (127 x 127mm). Lvs 5.5 x 2 inches (140 x 51mm), elliptic, rounded base, broadly acute apex, upcurved margins, moderate olive green (147A) above, matte. Shrub 3.7 feet (1.1m) high x 3 feet (0.9m) wide in 10 years; intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C). Flowering midseason (May in Seattle).

(r) 'Only Yours'

'Only Yours'. Photo by Jim Barlup.

Elepidote rhododendron: 'Terra' (s) X 'Winter Spice'. H (2003), G (2008), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 16/dome truss, funnel, 2.5 inches (64mm) long x 2.75 inches (70mm) wide with 5 frilly lobes. Bud: strong purplish red (58C). Inside and outside: yellowish white (155D) blending to pale purplish pink (65C) at margins, more pronounced on upper lobes; on inside upper lobe, dark red (59A) flare, beginning at base, extending 1 inch (25mm), changing to spotting for 0.4 inch (10mm). Calyx: 1 inch (25mm), yellowish white (155D) with dark red (59A) flare. Truss 5 inches (127mm) high x 6 inches (152mm) wide. Lvs 5 x 1.9 inches (127 x 48mm), elliptic, rounded base, broadly acute apex, flat margins, moderate olive green (147A) above, matte. Shrub 2.5 feet (0.8m) high x 3 feet (0.9m) wide in 10 years; intermediate habit, leaves held 2 years. Plant hardy to 5°F (-15°C). Flowering midseason (May in Seattle).

(r) 'Roy Blackmore'

Elepidote rhododendron: 'Maverick' (s) X 'Orchid Bouquet'. H (2006), G (2012), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 19/conical truss, open funnel, 2.5 inches (64mm) long x 3.75 inches (95mm) wide with 5 wavy lobes. Bud: strong purplish

red (61B). Inside: pale yellow (11D) blending through light purplish pink (73C) to strong purplish pink (73B) at edges; moderate red (184B) flare extending 1.5 inch (38mm) from base; strong purplish red (60B) nectar pouch at base of each lobe. Outside: blending from very pale purple (73D) through light purplish pink (73C) to strong purplish pink (73B) at edges. Calyx: 1 inch (25mm), pale yellow (11D) with moderate red (184B) flare. Truss 6 inches (152mm) high x 7 inches (178mm) wide. Lvs 5.5 x 2 inches (140 x 51mm), elliptic, rounded base, broadly acute apex, flat margins, moderate olive green (147A) above, matte. Shrub 3.3 x 3.3 feet (1 x 1m) in 7 years; intermediate habit, leaves held 2 years. Plant hardy to 5°F (-15°C). Flowering midseason (May in Seattle). Etymology of name: Named for rhododendron collector Roy Blackmore of Victoria, BC.

'Roy Blackmore'. Photo by Jim Barlup.

(r) 'Sky Dancer'

Elepidote rhododendron: 'Capistrano' (s) X 'Nelda Peach'. H (2000), N (2013), REG (2014): Jim Barlup, Bellevue, WA; G (2007) John Winberg, Fall City, WA. Flrs 17/ball truss, broad funnel, 1.9 inches (48mm) long x 3 inches (76mm) wide with 5 wavy lobes. Bud: pale greenish yellow (2D). Inside: yellowish white (155D) with pale yellow

(8D) at base, superimposed on upper lobe by deep red (185A) flare extending 0.4 inch (10mm) from base then changing to spots for 1.2 inch (22mm). Outside: yellowish white (155D) with pale yellow (8D) at base. Truss 5.5 x 5.5 inches (140 x 140mm). Lvs 5.5 x 2 inches (140 x 51mm), elliptic, rounded base, broadly acute apex, downcurved margins, moderate olive green (147A) above, matte. Shrub 3 feet (0.9m) high x 3.3 feet (1m) wide in 7 years; intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C). Flowering midseason (May in Seattle).

'Sky Dancer'. Photo by Jim Barlup.

(r) 'Teri Lee'

Elepidote rhododendron: 'Maverick' (s) X 'Orchid Bouquet'. H (2006), G (2012), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 25/conical truss, broad funnel, 2.25 inches (57mm) long x 3.5 inches (89mm) wide with 5 wavy lobes. Bud: strong purplish pink (68B). Inside: pale purplish pink (65D) blending through light purplish pink (65B) to moderate purplish pink (65A) at margins, with a touch of pale yellow (8D) on upper lobe; deep red (60A) flare extending 1.5 inch (38mm) from base on upper lobe and part of adjacent lobes; deep red (60A) nectar pouch at base of each lobe. Outside: pale purplish pink (65D) blending through light purplish pink (65B) to moderate purplish pink (65A) at margins with moderate purplish pink (65A) rib veins for the length of the corolla. Calyx: 0.75 inch (19mm), deep red (60A) at base extending 0.25 inch (6mm), then deep purplish pink (65D) to tip. Truss 7

'Teri Lee'. Photo by Jim Barlup.

x 7 inches (178 x 178mm). Lvs 5.5 x 2 inches (140 x 51mm), elliptic, rounded base, broadly acute apex, wavy margins, moderate olive green (147A) above, matte. Shrub 3.5 feet (1.1m) high x 3 feet (0.9m) wide in 7 years; intermediate habit, leaves held 2 years. Plant hardy to 5°F (-15°C). Flowering midseason (May in Seattle). Etymology of name: named for Teri Lee of Preston, WA, a friend of the hybridizer.

(r) 'The Rowland'

'The Rowland'. Photo by D & J Delano.

Elepidote rhododendron: Parentage unknown. H (c. 1970), G (1970s): John C. Cowles, Stowe, MA; N (2013): Lynda Rowland, MA; REG (2014): Heritage Museums and Gardens, Sandwich, MA. Flrs 10/ball truss, open funnel, 2.1 inches (54mm) long x 3 inches (76mm) wide with 7 wavy lobes. Inside of flower: strong purplish pink (73B) with 0.5-inch (13mm) deep red (53A) ray beginning at base of upper lobe. Prominent upcurving pistil with deep red (60A) stigma. Outside: strong purplish pink (63C). Truss 4.75 inches (121mm) high x 5.5 inches (140mm) wide. Lvs 4.25 x 1.5 inches (108 x 38mm), lanceolate, rounded base, acute apex, upcurved margins, moderate olive green (137A) above, matte. Shrub 7 feet (2.1m) high x 6.5 feet (2m) wide in 40 years; intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C), bud hardy to 5°F (-15°C). Flowering midseason (May on Cape Cod). Etymology of name: named for the family of George and Barbara Rowland of Wellesley, MA, supporters of Heritage Museums and Gardens. Synonym: Heritage 36-94.

(r) 'Watt Family'

'Watt Family'. Photo by D & J Delano.

Elepidote rhododendron: parentage unknown. H (c. 1970), G (1970s): John C. Cowles, Stowe, MA; N (2013): Karen King-Watt, Falmouth, MA; REG (2014): Heritage Museums and Gardens, Sandwich, MA. Flrs 7/ball truss, open funnel, 1.5 inches (38mm) long x 2.5 inches (64mm) wide with 5 wavy lobes. Bud: deep purplish pink (70C). Inside: pale purplish pink (56C), with small strong greenish yellow (153C) throat at

base, prominent 1.5-inch (38mm) pistil. Outside: deep purplish pink (73A). Truss 6 inches (152mm) high x 4 inches (102mm) wide. Lvs 3.5 x 1.75 inches (89 x 44mm), elliptic, rounded base, broadly acute apex, flat margins, moderate olive green (137A above), matte. Shrub 15 x 15 feet (4.6 x 4.6m) in 40 years; intermediate habit, leaves held 2 years, floriferous. Plant hardy to 0°F (-18°C), bud hardy to 5°F (-15°C). Flowering midseason (May on Cape Cod). Etymology of name: named for the family of Brooks Watt and Karen King-Watt of Falmouth, MA, supporters of Heritage Museums and Gardens. Synonym: Heritage 82-70.

(r) 'Your Move'

'Your Move'. Photo by Jim Barlup.

Elepidote rhododendron: 'Independence Day' (s) X 'Snow Candle'. H (1999), G (2005), N (2013), REG (2014): Jim Barlup, Bellevue, WA. Flrs 19/ball truss, broad funnel, 2 inches (51mm) long x 3 inches (76mm) wide with 5 wavy lobes. Bud: strong purplish pink (55B). Inside: light purplish pink (65B) with margins of pale purplish pink (65D); strong purplish red (60B) flare extending 1.5 inch (38mm) from base on upper lobe. Outside: light purplish pink (65B) with margins of pale purplish pink (65D). Truss 5.5 inches (140mm) high x 6 inches (152mm) wide. Lvs 6.25 x 2.5 inches (159 x 63mm), elliptic, rounded base, broadly acute apex, flat margins, dark yellowish green (139A) above, matte. Shrub 3 feet (0.9m) high x 3.7 feet (1.1m) wide in 8 years; intermediate habit, leaves held 2 years. Plant hardy to 0°F (-18°C). Flowering midseason (late April in Seattle).

References

Names conform to the rules and recommendations of the *International Code of Nomenclature for Cultivated Plants, Eighth Edition* (2009). Color names are from *A Contribution Toward Standardization of Color Names in Horticulture*, R.D. Huse and K. L. Kelly; D. H. Voss, editor (ARS, 1984).

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Errata

In *JARS* 68, P.12, the category 1 winner was *R. himantodes*, not *R. haematodes; P. 16, R. lutem should be R. luteum; P.* 37, the original article referred to *Rhododendron* sect. *Vireya.* It should have been pointed out that this name has since been changed to sect. *Schistanthe* Schltr; and on P. 40, "hamberlain" should read "Chamberlain".

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Jeb Justice
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VICTORIA
Janet Renouf
Peter Vaartnou
Geoffrey Voss
WILLIAM BARTRAM
Sally McGuire
Holly Parrott

In Memoriam

Bale, Michael S.
Glein, Robert
Moyles, E. William
Van Loon, M.R.

Correction: In the Winter 2014 issue of the journal, Roger Dunlap was listed in the In Memoriam notes. We apologize for this unfortunate error. Roger is alive and well.