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Kelseya

Newsletter of the Montana Native Plant Society



Kelseya uniflora
ill. by Bonnie Heidel

Confessions from a Huckleberry Enthusiast

By Mel Waggy, MNPS Lifetime Member

Having spent years working as a botanist in the Pacific Northwest, I always fancied myself knowledgeable on the genus *Vaccinium,* commonly referred to in Montana as the huckleberry. However, after visiting two tropical regions — Hawaii and Florida — I began to wonder just how much I really knew about my beloved shrub. While touring botanical sites in those states, I encountered several native *Vaccinium* species. Until then I had assumed that members of this genus were confined to temperate regions in the northern latitudes, so I figured it was high time to learn more before I ate one more delectable berry!



Vaccinium caespitosum Michx.

Vaccinium, a member of the highly heterogeneous *Ericacea* family, is thought to have originated in the mid-tertiary period (about 30 million years ago). Botanical attributes shared by most genera in this family include alternate leaves, urn-shaped flowers and fleshy fruit. Berries may be red, blue, purple or black, and most are edible. Vaccinium species vary in height from a few inches to almost 30 feet tall.

Although the genus *Vaccinium* has undergone extensive taxonomic research, it remains under investigation. All members of this genus belong to the blueberry tribe *(Vaccinieae)*, a large morphologically diverse group (>1000 species) that are widespread, primarily in the tropics. While there may be as many as 35 genera in the blueberry tribe, *Vaccinium* is the only genus that occurs in the temperate and tropical zones of both Eurasia and the Western Hemisphere. Results from cladistic analyses suggest that *Vaccinium* is a polyphyletic genus, meaning some species are more closely related than others.

Available resources indicate there are between 400 and 500 species of *Vaccinium*, and that about two-thirds of those species (~266 to 333) occur in Malaysia, 70 in southeast Asia, 19 in Japan, five in Africa, six in Europe, 25 in South America, and 26-31 in North America. Historically, this genus has been divided into as many as 22 sections worldwide (~10 in North America). Sections are typically separated based on morphological traits and there is little hybridization between sections. According to PLANTS Database, *Vaccinium* is native throughout North America, excepting North Dakota and Nebraska. It is also native to Hawaii. The state containing the most species of *Vaccinium* is Virginia, with 15.

The recently published "Flora of Montana" indicates there are seven species of *Vaccinium* in Montana: *V. caespitosum, V. globulare, V. myrtillus, V. membranaceum, V. scoparia* (grouped into the Section *Myrtillus*), *V. occidentale* (section *Vaccinium*), and *V. myrtilloides* (Section *Pyxothamnus*). More commonly, *V. globulare* has been grouped under *V. membranaceum* and will be referred to as such for the remainder of this essay. In Montana, *Vaccinium* can be found throughout the western mountainous regions as well as a few south-central counties of the state. All are relatively widespread with the exception of *V. myrtilloides*, commonly known as velvetleaf huckleberry. This species is listed by the Montana Natural Heritage Program as a Species of Concern due to its sparse distribution in Montana and potential threats to its habitat. However, velvetleaf huckleberry is common throughout other parts of North America and in some areas is harvested or cultivated.

continued on page 10

Illustration contributed by: Missouri Botanical Garden, St. Louis, U.S.A. Curtis's Botanical Magazine, vol. 62 [ser. 2, vol. 9]: t. 3429 (1835) [n.a.]

Chapter Events

Calypso Chapter

October, day and time TBA. "Restoration of Native Plant Species to Butte Hill." Presented by Robert Pal of Montana Tech. Info: Catherine at 498-6198, nativeplants@montana.com.

Sunday, December 6, 11:00 am.-2:00 pm. Christmas Brunch. Come to the new home of Kriss and Rick Douglass for holiday cheer and to discuss plans for 2016. Bring a dish to share and your field trip ideas! Info: Kriss at 490-0281.

Clark Fork Chapter

Thursday, October 8, 7:00 pm. "The Macrofungi of Montana: An Introduction to Mushrooms and Lichens of the Big Sky." Everyone wants to know more about our local mushrooms. Join Tim Wheeler and Bitterroot members for this presentation at the Lee Metcalf National Wildlife Refuge headquarters, Stevensville **(note different time and place).**

Sunday October 11, 9:00 am. "Mushroom and Lichen Foray in Lolo Creek Canyon." Join Tim Wheeler on this outing to search for interesting examples of fungi and lichen. We'll drive along Hwy 12, stopping at several locations between Traveller's Rest and Lolo Pass. Meet at Traveller's Rest State Park (just west of the town of Lolo on Hwy 12).

Thursday November 12, 7:00 pm. Come to this double-header to get a glimpse of our botanical past and how our vegetation has changed. Chris Carlson of Missoula Department of Parks and Recreation will present "Vegetation Change in Missoula-Area Grasslands, 1958-2014" and John Pierce will talk about "Post Lake Missoula Vegetation, a Group Effort." Rm L09, Gallagher Business Bldg., UM Campus **(note new time).**

Thursday December 10, 6:30 pm. Our annual Christmas Potluck takes place in the Del Brown Room, Turner Hall, UM Campus. With luck, parking will be available west of the Gallagher Bldg., in lots or on the streets off of Arthur and Connell. Bring plates, utensils and a dish to share. Alcoholic beverages are okay! Don't forget to bring a few of your favorite slides or digital pictures from the summer. Info: Peter at 728-8740 or Kelly at 258-5439.

Monday January 11, 7:30 pm. "Eastern Montana's Grasslands and Grassland Birds, Conservation in a Changing Landscape." Marisa Lipsey discusses how plants and birds have changed on the Northern Great Plains. This is a joint meeting with Montana Audubon. Rm 123, Gallagher Business Bldg., UM Campus **(note different day and place).**

Eastern At-Large

Info: Jennifer Lyman at 656-7869, jenclyman@gmail.com.

Flathead Chapter

Wednesday, October 21, 5:30 pm. Potluck Dinner. We'll share adventures from the summer and start planning events for 2016. No formal program, just time for getting to know other members and catching up. Bring dishes, utensils and some food to share. North Valley Community Hall, 235 Nucleus Ave., Columbia Falls.

Wednesday, November 18, 7:00 pm. Program TBA. Come early for a 5:30 pm meeting to discuss Chapter business and activities. Program to follow; sack dinners welcome. North Valley Community Hall, 235 Nucleus Ave., Columbia Falls.

December, Date TBA, 5:30 pm. Annual Christmas Party. We'll begin with socializing and refreshments, to be followed by a potluck supper. Info: mnps.flathead@gmail.com. North Valley Community Hall, 235 Nucleus Ave., Columbia Falls.

Kelsey Chapter

Saturday, December 5, 6:00 pm. Holiday Potluck. Join us for dinner and show-and-tell at the home of Bob and Toni Person. Bring a dish to share, your own table service and, of course, a plant-related item to show the group. 223 S. Rodney, Helena. Info: Bob at 443-4678.

Maka Flora Chapter

Info: Libby Knotts at 774-3778.

Valley of Flowers Chapter

Tuesday, October 13, 7:00 pm. "Horticultural Research on Montana Natives." Charissa Bujak, recent MSU Plant Science and Plant Pathology graduate, received USDA funding to research cost-effective production of Montana native plants. Come hear tips that may help you decide on what container type and fertilizer rate to use. She will share information about the current commercial production of Montana native plants. Rm 108, MSU Plant Bioscience Building, Bozeman. Info: Linda Iverson at 930-1682, <lilandscape@mtintouch.net>.

Thursday, October 15, 3:00-5:00 pm. "Pollinator Garden Fall Cleanup." The popular Pollinator Garden maintained by the Valley of Flowers Chapter grew and bloomed exuberantly this year, so we'll need some serious elbow grease to ready it for winter. Bring gardening gloves and hand pruners or a rake. The garden is on Bozeman's Linear Trail, between Garfield and Mason Ave., just north of the Langohr Community Gardens. Info: Linda Iverson at 930-1682, <lilandscape@mtintouch.net>.

Thursday, November 12, 7:00 pm. "Herbarium Wonders." What plants are strange/wonderful/out-of-place in Montana and documented by specimens in the MSU Herbarium? Join Elizabeth Bergstrom for

an evening of story-telling about some of the special items in the collection. Rm 108, MSU Plant Bioscience Building, Bozeman. Info: Elizabeth Bergstrom at 581-6571, <dodecatheon16@gmail.com>.
(Note different day.)

Tuesday, December 8. Holiday Potluck. Join Valley of Flowers friends at the Lucky Dog Lodge on the Gallatin River, Four Corners. Bring food or drinks. Carpool from the southeast corner of the Gallatin Valley Mall (behind the pet store) at 5:45 pm, or from Bozeman Community Thrift Store parking lot, Four Corners, at 6:00 pm. Info: Jeff Copeland at 539-6029, <jouzelcopeland@gmail.com>.

Tuesday, January 12, 7:00 pm. "Horticultural Research: Montana Native Plants in the Domestic Landscape." Tracy Dougher, head of MSU's Department of Agricultural Education, received an MNPS Small Grant several years ago to conduct field research on an array of native plants as potential cultivars. That work blossomed into an entire research program. Come hear what she's done, and how the findings might be useful in planting new native landscapes. Rm 108, MSU Plant Bioscience Building, Bozeman. Info: Gretchen Rupp at 586-8363, <beesgrmt@gmail.com>.

Western At-Large

Info: Jon Reny at 334-0459, jreny@kvis.net.

Chapter News



Searching for "belly plants" and more at Lost Trail Wildlife Refuge. *Photo by Jon Reny.*

Summer Field Trip Highlights

Submitted by Jon Reny, Western At-Large Chapter

On a warm, sunny day in early June, 14 plant enthusiasts from western Montana met for an outing on the Lost Trail National Wildlife Refuge. Peter Lesica, who recently has completed a botanical survey of the refuge, and Beverly Skinner, a refuge biologist, led us to a variety of habitats, where we tallied 66 plant species in bloom. You know it's going to be a great day when elk are spotted right from the refuge headquarters.

We began by walking through a flat area that was marshy this time last year; this year, everything was much drier. We still were able to view the uncommon California *Hesperochiron* and the great camas (always a treat). Any slight mound or depression (microsite) offered a change in species community. As we moved toward an aspen grove, the species changed even more. We ate lunch in the shade of Ponderosa pines and then went to view Peter's "belly plants" (so-named because you need to get on your belly to fully appreciate them). Even though it was drier than expected, we found a number of these tiny species. My favorite was oldstem *Idahoa (Idahoa scapigera)*. It wasn't in flower, but the seed pod of this little guy is unique. If you aren't careful, you might mistake if for the capsule of a moss. We also found Silene's Catchfly — a species the Montana Natural Heritage Program ranks as "at risk because of very limited and/or declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state." I'd only seen this plant once before in my 25-plus years of botanizing in western Montana. We finished the day with a short excursion to a rock outcrop located just above Dahl Lake. Beverly took us to a petroglyph site that you would easily pass by if you didn't know it was there.



Eastern At-Large Chapter August field trip to the Pryor Mountains, with members of the Montana Wilderness Association and the Pryors Coalition. Plants seen included *Leptodactylon pungens, Astragalus hyalinus, Hymenopappus filifolis,* all growing together in the Chugwater soils on the south side of the mountains. The group also went to Bear Canyon, where they found *Penstemon radicosus, Townsendia species, Stenotus acaulis* and *Tetraneuris torreyana*, among other species. *Photo by Jennifer Lyman.*

Chapter News

MSU Installs New Pollinator Garden

Submitted by Gretchen Rupp, VoF Chapter

On a hot July morning, 30 volunteers assembled at the MSU Horticultural Farm west of the Bozeman campus to plant a new garden. The MSU Pollinator Garden will be a research and outreach facility with the ultimate purpose of bolstering populations of native pollinators and honeybees. The new garden boasts a number of beds of bee-friendly habitat and forage plants — mostly natives — plus a pavilion, an equipment shed and eight honey bee colonies.

The garden project is spearheaded by Michelle Flenniken, an assistant professor at MSU in the Department of Plant Sciences and Plant Pathology who is studying host-parasite interactions in bees, and involves several MSU departments. MNPS members have been essential in getting the garden idea off the ground, as well as in formulating possible research questions, designing the garden, selecting plants and doing the actual planting. The project received a $1,500 MNPS Small Grant award earlier this year for the acquisition of plant material.

For more information on the extensive research on bees and bee habitat being carried out at MSU and UM, see the spring edition of MSU's *Mountains & Minds* periodical. Visitors are welcome at the MSU Pollinator Garden. Access to the Horticultural Farm and the garden is from West Garfield St., via West 19th Ave., Bozeman.



New plants go in at MSU Pollinator Garden this summer.
Photo by Gretchen Rupp.

WELCOME NEW MEMBERS

The Montana Native Plant Society welcomes the following new members:

Calypso Chapter
Pam Barbour

Clark Fork Chapter
Jordan Meyer-Morey, Lauren Sullivan, Ryan Synder, Jo Bernofsky, Lila Fishman, Suzanne S. Abdoulfadl, Leta Brown, Juan DeSanta Anna, David Ronninger, Cynthia Unrau, Prairie Wolfe and Diana Costello

Flathead Chapter
Karen Lauer, Sharon Racicot, Matthews Bradley, Kathy Ross and Idell Wetdemeyer

Kelsey Chapter
Trinity Pierce, Constance Fiske, JJ Prill, David & Kristin Sewak and Bonnie Warren

Valley of Flowers Chapter
Jeanne Knox, Rebekah Vanwieren and Paloma Defuntes

Western-At-Large
Elizabeth Caton

Mark Your Calendars

The Montana Native Plant Society (MNPS) is pleased to announce the 2016 Small Grant competition for projects or studies that 1) stimulate research, conservation and educational activities that help foster an appreciation of Montana's native plants and plant communities; and 2) promote native plant conservation through better understanding of Montana's native flora and vegetation and the factors affecting their survival. Project or study proposals must pertain to native plants of Montana.

The competition is open to residents of Montana and to all MNPS members. The deadline is January 31, 2016. Check the MNPS website (www.mtnativeplants.org/Small_Grants_Program) or the next issue of *Kelseya* for more information and submission guidelines, or contact bkuropat@centurytel.net.

WANTED

Graphic Artist for Logo Design

The Montana Native Plant Society has issued a Request for Proposal (RFP) to all interested graphic designers to develop a logo for the state-wide organization and a branding/style guide for printed materials other than *Kelseya*. To view the RFP and apply, please go to the MNPS website (mtnativeplants.org) or contact Kathy Settevendemie (kathy@blackfootnativeplants.org) for more information. Deadline for applications is October 10.

SAVE THE DATE

February 9, 2016

MNPS Plant Conservation Conference

Using Genetics In Plant Conservation

University Center, Missoula

Tour of the Cedars

Adapted from an article by Mark Schiltz, Western Montana Manager, Montana Land Reliance

This summer, the Montana Land Reliance, a land conservation organization, teamed up with the Montana Native Plant Society on a new kind of outreach event. The gathering took place June 13 on Andie "Rose" MacDowell's MLR conservation easement property in the Ninemile Valley. Rose has developed a walking trail that extends for more than a mile under a thick canopy of western red cedar, and participants — including MNPS members and Rose's friends and neighbors from the Ninemile — could wander along riparian wetlands adjacent to Bird Creek.

Surrounded by the Lolo National Forest and bordered by the Confederated Salish and Kootenai Tribal reservation, the narrow Ninemile Valley boasts a diverse variety of ecosystems and represents one of the most unique landscapes in Montana.

More than 45 people spent the day strolling beside Bird Creek, combing the lush vegetation in search of orchids and other native plants. At the end of the day, MNPS members developed a list of 128 different plant species, from the delicate fairy slipper orchid *(Calypso bulbosa v. occidentalis)* to towering ponderosa pines *(Pinus ponderosa)*. The spectrum of native plants documented on the MacDowell property demonstrates how conservation easements help protect some of Montana's most precious native plant habitat.

MLR would like to thank both MNPS members for sharing their extensive knowledge of Montana's amazingly diverse flora, and Rose MacDowell for hosting the event with such charm and generous hospitality. Given the success of this event, MLR looks forward to teaming up with MNPS and other MLR conservation easement landowners for more great plant tours in the future!



The June 13 hike in the Ninemile, hosted by MNPS and The Montana Land Reliance, had over 40 participants of all ages. *Photo by Cissy Klein*

Native Plants Matter

The Calypso Chapter will host the 2016 MNPS Annual Meeting in conjunction with the American Penstemon Society, June 24-26, at Fairmont Hot Springs Resort. Discounted room rates available (use group ID 14384, password 37003400); make your reservations soon! Fairmont is a fun family venue and we are offering a great selection of hikes and activities for kids. Watch for details in upcoming issues of Kelseya and online at www.mtnativeplants.org.

President's Platform

The 28th Annual Meeting of the Montana Native Plant Society was held at the Loon Lake 4H Camp, near Bigfork in the Swan Valley. More than 100 people participated in workshops, meetings, field trips and socializing. It is inspiring to work with such dedicated people as the members of the Flathead Chapter, who worked so hard to pull off such a great meeting.



Numerous field trips reflected the richness of the area's wetlands in the meeting's theme "For Peat's Sake... Befriend the Fens!" Botanizing occurred in fens, preserves, near creeks and on ridge trails. There was even an aquatic botany exploration of the camp's lake! Sundews, orchids, sedges and numerous riparian plants were among the many species identified.

During the business portion of the meeting, our Secretary, Patrick Plantenberg, presented election results in his own inimitable style. I was re-elected as President for another term. Incumbent Co-Treasurer, Jenny Tollefson of the Clark Fork Chapter, was re-elected for a third term, with Flathead Chapter member Shannon Kimball as the other half of the team. And incumbent Jon Reny ran again for Western Representative-at-Large and won. The Maka Flora Chapter won the prestigious "Chapter with the Highest Percentage of Voters Award."

Aside from a chance for MNPS members to meet friends from around the state, the Annual Meeting is an opportunity for committees to meet face-to-face to plan for the upcoming year. If you would like to participate in a committee but were unable to attend the annual meeting, please let me know and I'll get you connected! We'd love to have your input.

Speaking of field trips, MNPS hosted 35 field trips throughout Montana this summer -- many thanks to trip leaders and organizers who made them possible!

— Kathy Settevendemie

News from the MNPS Annual Meeting

MNPS Awards

Outstanding Service Award: Rachel Potter

Submitted by Tara Carolin, Flathead Chapter

Rachel Potter can aptly be described as the heart of the Flathead Chapter: not often in the spotlight, but a source of energy and hard work that keeps the Chapter pumping. From generating ideas for program speakers, to connecting us with other conservation organizations and community issues, Rachel can be relied upon to work tirelessly to support the mission of MNPS.

Rachel was part of the Chapter's founding in 1988. She served as secretary for its first two years, as publicity chair from 2004-2014, and currently serves as vice-president. She has played a leading role in many Chapter projects, including developing a native plant demonstration garden at the Discovery Square in Columbia Falls, and in creating and updating our native plant landscaping packet, to name just a few.

Rachel frequently bridges the work of MNPS with other community and conservation organizations, such as the Flathead Roundtable, Montana Wilderness Association, North Fork Preservation Association, Flathead Coalition and others. She keeps us connected with community events such as Arbor Day, Earth Day and Wilderness celebrations. She works actively on issues that help protect habitat for native plants, such as the North Fork Watershed Protection Act, Rocky Mountain Front Heritage Act, and on supporting sustainable energy policies. Rachel and her husband, Jack, also have volunteered for many years at the spring work weekend for The Nature Conservancy's Pine Butte Ranch.

In 2010, Rachel Potter researched early botanical explorers of Glacier National Park and collaborated with Peter Lesica to develop a presentation titled "Botanical Expeditions in Glacier National Park, 1909 and 1910." In the presentation, which has been delivered several times around the state, she traces the trips made by Morton Elrod, Glacier Park's first naturalist, and botanist Marcus Jones, using their written accounts, historic and modern photos and, of course, lots of wildflower pictures.

In summary, we're not sure where the MNPS Flathead Chapter would be without Rachel. It would probably exist, but it would not be nearly as active or productive without her infectious enthusiasm and diligent hard work. As one member described her, "I just think of her as the energy and ideas behind most of what our Chapter accomplishes." Whenever someone is needed to assist with a task, Rachel is more often than not, the one who steps up. She also has a gift for motivating others to get enthused about a project and see it through to completion.

Along with the award certificate, Rachel was presented with a glass pitcher etched with glacier lilies and twinflowers, created by Debby Schaefer. We would like to say thank you, Rachel, for all you have done on behalf of the Montana Native Plant Society, and all you continue to do. All of your dedication and energy has made a difference for native plants in our region.



Tara presents Rachel Potter with her award.
Photo by Betty Kuropat



Gary and Mary Sloan with larch tree planted in their honor at the Whitefish Library.
Photo courtesy of the Whitefish Pilot.

Special Achievement Award: Mary and Gary Sloan

Submitted by Terry Divoky, Flathead Chapter

[See also the online article by Heidi Desch, Whitefish Pilot*, posted 7/28/2015 — Ed.]*

Born and raised in Montana, Mary grew up in Superior; Gary in Troy. He, the handsome, English teacher, moved to Whitefish for the elk hunting; she, the athletic and willowy, Home Economics teacher was after good skiing. Their partnership was formed in the 1960s.

A deep interest in native plants and their stories underlies the projects Mary and Gary work on, from leading field trips to volunteering for numerous organizations. Mary was the first person I knew who grew native plants from seed, and she planted natives around her property to promote biodiversity for birds and wildlife. I'd never seen anything like her gardens, self-gathered seed collection, and Gary-built garden shed. Mary shared seeds with me and from that moment on she was my inspiration for growing natives.

It is impossible to create a complete list of Mary and Gary's accomplishments. They are humble people and the list is extensive, but here goes:

Mary, a member of MNPS since 1989, was Chapter Secretary before serving as President, 1996-2000.

Mary and Gary established an herbarium for the Whitefish Community Library with more than 100 Montana native plants that they pressed, described and displayed in a specially-designed, Gary-built wooden case. Mary continues to fashion a "Native Plant of the Month" display at the library.

The Sloan's started the Plant ID Station for the Flathead Forestry Expo in early 1990s. This annual, week-long event offers hands-on exposure to the role forests play in our everyday lives. Last year, more than 1,000 fifth grade students and about 800 adults and families attended.

Excellent plant photographers, Mary and Gary created a picture file with hundreds of digitized slides cataloged according to species name and family, and designed rotating displays for a tri-fold board they built to help illustrate the MNPS goals. Together with Maria Mantis and Dee Blank, the Sloan's mounted photos of native plants into wooden frames to display at various businesses and organizations around the Flathead.

The Sloan's also engaged in scientific research. Mary volunteered with Peter Stickney to measure plant succession plots on Miller Creek Demonstration Forest. They worked with the Tally Lake Ranger District on a fire history study, and they designed and implemented a 15-year photo record of post-fire plant succession after the 1995 Little Wolf Fire.

continued on page 9

For Peat's Sake…Befriend (and Remember) the Fens!

Submitted by Betty Kuropat, Flathead Chapter

Autumn is coming, but memories of the 2015 MNPS Annual Meeting still bring a smile and a sense of warmth. The Flathead Chapter hosted this year's gathering, June 26-28, at Loon Lake 4H Camp. We were so glad to have the lake for boating, swimming, gazing at, and listening to loon calls. Temperatures were in the high 90s and peaked at more than 100 degrees for the field trips on Saturday.

Friday afternoon, Tris Hoffman, weed specialist with the Flathead National Forest, provided a well-attended workshop on weed identification, ecology and management. People were patient and accommodating as they arrived, registered, found their parking and lodging spots, shopped for books, shirts and other merchandise, and perused the silent auction. Following dinner, Maria Mantas hosted a fun social at her nearby house.



Field trips are always the main event at the Annual Meeting. On Saturday, there were six trips to fens and other wetlands in the Swan and Flathead Valleys, three strenuous peak-bagging hikes — or at least to higher and somewhat cooler elevations — a visit to a long-term forest stewardship project on Swan River State Forest, and an aquatic vegetation field trip in Loon Lake using canoes and snorkels. The kids had a fun day with Bob and Heidi learning about plants around the camp and swimming. After breakfast and goodbyes on Sunday, folks headed off for more field trips to Swan Valley fens or the Glacier National Park Native Plant Nursery.





The Flathead Chapter committee would like to thank everyone who helped us pull off a great Annual Meeting, particularly the field trip leaders, Maria for the Friday night party, the folks who donated to the silent auction, Pattie the shirt printer, Ferndale Community Center and St. Patrick's Episcopal Church for parking space, the shuttle drivers, and the crew at Loon Lake 4H Camp! You made it a memorable weekend!



Top: **Searching for aquatic plants in Loon Lake.**
Photo by Betty Kuropat.

Middle: **Porcupine Fen field trip with Maria Mantas.**
Photo by Dee Blank.

Bottom: **In search of orchids, Jeff Copeland finds a wet spot.**
Photo by Jill Davies.

Left: ***Lysimachia thyrsiflora,* Ambrose Fen.**
Photo by Dee Blank.



Many populations of shooting star *(Dodecatheon conjugens)* include albino plants.

Whites in the Minority

Story and photos by Peter Lesica, Clark Fork Chapter

Seems like almost every year someone I know will excitedly tell me that they saw a white shooting star or a white lupine. Of course I'm too jaded to get as excited as they are, but the occurrence of albino flowers does raise some interesting questions. Why is it that albino morphs usually occur in blue- or pink- or red-flowered species, but rarely occur in yellow-flowered plants? And why is it that for some species the white-flowered forms are always rare, but in other cases they can become quite common or even dominant? The answer to the first question is pretty straightforward but not so for the second one.

The blue, red, pink or purple color of flowers is the result of pigments called anthocyanins, which are manufactured by plants from flavonoids. When one of the genes that contributes to the production of these anthocyanins becomes mutated, the flowers are white instead of colored. Sometimes the occurrence of white-flowered forms relates to pollination. In this case, white- or blue/red-colored flowers dominate in different populations. For example, Rocky Mountain columbine *(Aquilegia coerulea)* is commonly blue in the central Rocky Mountains, where it is most often visited by bumblebees. However, white-flowered forms, like those found in Montana, are thought to be pollinated more by hawk moths, which are attracted to the lighter-colored flowers. Mathew Streisfeld and collaborators studied the red and whitish forms of orange monkeyflower *(Mimulus aurantiacus)* in California. They found that a single gene was responsible for the difference in flower color, and that the two forms had different pollinators. They suggest that the two forms are on their way to becoming two different species because interbreeding is unlikely when different insects are attracted to the different forms.

Pollinator preference is not always the explanation when different flower colors are both common. Sandblossoms *(Linanthus parryae)* is an annual of the Mojave Desert with blue and white color forms. Some locations have a preponderance of white-flowered plants, but just a little ways away the blue-flowered form predominates. Doug Schemske and Paulette Bierzychudek examined one such site and found strong evidence that different plant communities with different soils supported different color forms in spite of the fact that they were in close spatial proximity. They were unable to pinpoint the exact mechanism, but it must have been some trait(s) that was connected to flower color rather than the flower color itself.

Missoula phlox *(Phlox kelseyi var. missoulensis)* occurs on the hills immediately north of Missoula. Plants with deep blue or white or intermediate flowers occur together. It was assumed that flower color affected pollination, but Lisa Campbell, a graduate student at the University of Montana, spent many hours observing all the different color forms and found that the same insects in equal numbers visited all the forms, and there was no difference in seed set. In this case it appears that flower color has little bearing on survival or reproductive success, just like eye color in humans.

White and colored flowers may both be common in some species, but more often than not albino forms are rare throughout a plant's range. So what's with that? People often assume that albinos are rare because they lose their pollinators. For example, a common species of larkspur *(Delphinium nelsonii)* is ordinarily blue, but rare white-flowered plants occur near Rocky Mountain Biological Lab in Colorado. Experiments conducted by NickWaser and Mary Price showed that white-flowered plants produced very few seeds because the primary pollinators, hummingbirds and bumblebees, discriminated against them.

However, pollination is often not involved in albino rarity because anthocyanins do more than just color the flowers. They occur throughout plant tissue and have been shown to protect the leaves and stems from damage by too much solar radiation. Anthocyanins and especially their flavonoid precursors also help protect plants against diseases and insect pests. So anthocyanins and the genetic machinery that make them have a number of functions besides just coloring the flowers and helping attract pollinators, although this is probably what is most noticeable to us. This situation, when a single gene or gene complex influences more than one trait, is called pleiotropy, and it is the overarching reason that albino plants are rare in most populations, although the details vary among species.



Drummond's phlox *(Phlox drummondii)* is a pink- or red-flowered species endemic to Texas with rare white-flowered forms occurring sporadically. Donald Levin and his collaborators found that albino plants were visited as often by their insect pollinators as were their pink- or red-flowered neighbors. However, white-flowered plants produced fewer flowers and had much lower survivorship, and the researchers found that the loss of the gene that produced pink or red flowers also made the plants less able to cope with dry conditions that can be common in Texas.

Northern wallflower *(Parrya nudicaulis)* is a mustard that is common in Alaska. The flowers are usually purple. White-flowered plants do occur, but they are more common in the southern part of the state and virtually non-existent in the north. Researchers found that the same biochemical pathway that produces the purple pigment also enhances cold tolerance. For this reason white-flowered plants can persist in the warmer parts of the state (if any parts can be said to be warm), but do not occur where it is colder.

John Warren and Sally Mackenzie studied five species of British plants that have both bluish and whitish color forms. They found that blue-flowered plants performed better under drought-induced stressful conditions. They surmised that the flavonoids and anthocyanins, which are anti-oxidants and were lower in white-flowered plants, helped the blue-flowered plants overcome stress.

It's a complex world out there. That little albino flower you found could be suffering from lack of pollination or cold or drought or some disease. Perhaps you should take your little white buddy to the natural food store nearest you and get her some anti-oxidants. She'll thank you for it.

Further reading

Dick, C. A., J. Buenrostro, T. Butler, M. L. Carlson, D. J. Kliebenstein and J. B. Whittall. 2011. Arctic mustard flower color polymorphism controlled by petal-specific downregulation at the threshold of the anthocyanin biosynthetic pathway. PLoS One e18230.

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continued from page 7

Their spirit of contribution and volunteerism extents far beyond MNPS. Early in his Forest Service career, Gary was instrumental in preserving one of the last remaining stands of ancient cedars in the Kootenai National Forest, establishing the Ross Creek Cedars Scenic Area. Both were active in the Flathead Forestry Project, which was instrumental in getting a law passed that authorized National Forests and the BLM to implement stewardship contracting and collaboration in their planning process for timber sales. As a result, the Sloan's were awarded the Danny On Conservation Award from the Flathead National Forest for their significant contribution to resource conservation.

MNPS is proud to claim the Sloan's as friends and members, and the Special Achievement award is but a small token of our appreciation.



Above left: Rare albino Lewis monkeyflower.

Right: A completely albino population of lupine *(Lupinus argenteus)* near Hot Springs, MT.

continued from page 1

Many common names are used to describe *Vaccinium*. Blueberry is used throughout North America, particularly in the east. The blueberry you typically see at local markets is likely a domesticated version of either highbush *(V. corymbosum)* or lowbush *(V. angustifolium)* blueberries; both species are native to eastern North America. You may occasionally see "wild" blueberries at the market; these are likely lowbush blueberries, but occasionally may be velvetleaf huckleberry. Cranberry is used to describe several species of *Vaccinium* that are native to the coastal regions of the continent (Pacific and Atlantic) and some inland regions in the east. One species native to the east, *V. macrocarpon*, has been domesticated for 100 years and is used in popular products such cranberry sauce, juice and dried cranberries. Lingonberry *(V. vitis-idaea)*, native to boreal and arctic tundra regions of the world, is often used to make jams and other treats, primarily in Scandinavia. Other, less known common names for *Vaccinium* include bilberry, partridgeberry (Newfoundland), whortelberry (Great Britain), sparkleberry and farkleberry (Texas), Ōhelo (Hawaii), and cowberry (Sweden).



Vaccinium membranaceum.

In Montana and other northwestern parts of North America many *Vaccinium* species are commonly referred to as huckleberries. Several sources indicate that the common name huckleberry may have originated when colonists misidentified the berry as the European blueberry, "hurtleberry." Over time the word was Americanized and became "huckleberry." Beware, however; not all huckleberries are Vacciniums. If you travel to eastern states, "huckleberry" refers to the genus *Galylussacia*, another member of the *Ericacia* family with tasty berries. Additionally, while you're perusing next spring's garden seed catalogue you may come across the "garden huckleberry," but don't be deceived. Although sources says this plant produces an edible dark purple berry, it is a member of the nightshade family *(Solanum melanocerasum)*.

Most common names reflect the morphological traits that define the various taxonomic sections. The calyx, corolla and especially stamen morphology are often emphasized in the delineation of this genus, although characters of the fruit, seed and vegetative parts are also considered important. In Montana, *V. membranaceum*, commonly referred to as thin-leaf or big huckleberry, is the species most commonly eaten and harvested for commercial purpose. I have often wondered what makes thin-leaf huckleberry different from the eastern blueberry or cranberry. Outside of the obvious color and taste differences, cranberries have four chambers inside the fruit, while eastern blueberries and thin-leaf huckleberries have 5 (and sometimes may appear to be 10-celled). The difference between thin-leaf huckleberries and the eastern blueberries is not so clear, but one reference indicated that huckleberries produce a single flower in leaf axils on twigs of the current year's growth, while blueberries develop clusters of berries on year-old stems and produce greater yields.

Even after all this research, I still have unanswered questions about huckleberries, such as:

- If they can put a man on the moon, why can't we domesticate the thin-leaf huckleberry?
- How are Huckleberry Finn and Huckleberry Hound related to *Vaccinium*?
- In a taste test between huckleberry jam and jams made from other Vacciniums, which would be favored?

Okay, I couldn't help myself. I actually conducted a taste test using jams made from huckleberry, wild blueberry, lingonberry and Ōhelo berry. Although by no means scientific, and sampling numbers were embarrassingly low, taste tests revealed an equal preference for wild blueberry and huckleberry — but most participants thought they all tasted good. Ōhelo berry was the third favorite jam and had a unique taste unlike any *Vaccinium* I've ever eaten. Lingonberry came in last (but was my second favorite) and has a cranberry taste.

On a final note: many ecologically minded huckleberry consumers are worried how large-scale huckleberry harvesting and sales may be impacting the ecosystem. Available publications indicate that commercial harvesting of huckleberries has been steadily increasing since the early 1990s. There appears to be concern about the impacts this harvest is having on wildlife, particularly grizzly bears. Unfortunately there is not enough space in this essay to adequately address this issue. For more information on this subject refer to "A Social History of Wild Huckleberry Harvesting in the Pacific Northwest" (Richards, R.T. and Alexanddar, S.J. 2006. A Social History of Wild Huckleberry Harvesting in the Pacific Northwest. Gen. Tech. Report PNW-GTR-657). A free PDF version of this publication can be found on the web at http://www.fs.fed.us/pnw/pubs/pnw_gtr657.pdf.

Mel Waggy is a retired botanist who spent 15 years working in Montana, Oregon and Washington. A former member of the Flathead and Clark Fork Chapters, she is now the sole member of the unofficial West Virginia Chapter, where she busies herself with learning about the thousands of native plants in that part of the world.

Illustration contributed by: Smithsonian Institute, Washington, U.S.A. Walcott, Mary Vaux, North American wild flowers, vol. 1: t. 7 (1925-1927)

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