



Koma Kulshan

Chapter WNPS

Newsletter

Inside this issue

p1 Plant Blog
p1 President's Corner
p1-2 2015 Study Weekend
p2 Trip Report
p2-3 Research Roundup
p3 Programs
p3 Field Trips

Find Koma Kulshan Online

Website: www.wnpskoma.org
Facebook: WNPSKomaKulshan

Botany Blog

<http://www.howplantswork.com>

How Plants Work is a product of Bellingham resident Richard Stout, who previously taught and performed botanical research at Williams College and Montana State University.

In his words: "The goal of this blog is to explore the inner workings of plants, on which we all depend for our existence.

"In this blog, I'll primarily focus on sharing new information about plant function (a.k.a., plant physiology).

"I prefer to approach this subject mainly from the perspective of the life of a typical flowering plant (angiosperm): seed germination, plant development, how plants make a living from day-to-day, and, finally, flowering and plant death.

"Along the way, I'll feature topics of current relevance, such as the effects of increasing atmospheric CO2 on plants, the use of plants to clean the environment (phytoremediation), and the extraction of biofuels from plants.

"Ultimately, it's all about how plants work."

Fall (October, November, December) 2015

President's Corner

by Barry Wendling

Give yourselves a well-deserved pat on the back. Despite the rain, or maybe in spite of the rain, the Study Weekend was a success. It was a pleasure planning and working with such motivated people to showcase what we have to offer. Believe it or not, a number of our guests had never seen the splendor of Heather Meadows before and everyone I spoke with had good things to say about the experience. We were also able to support the participation of three students this year through our Study Weekend Scholarship program.

Moving forward, fall means it is time to elect next year's officers. Any member is welcome to run for one of the four positions; president, vice-president, secretary, and treasurer. There are no term limits so feel free to run for re-election. I have thoroughly enjoyed serving, but after being chapter president for close to eight years I think it is time for me to give someone else a turn as at the helm. It will be exciting to see where a new voice will take us. Elections will be held at the October meeting. If you are interested in throwing your name in the hat, let me know before or at the meeting. Or don't show up and we'll assume you would like to be elected.

Study Weekend Wrap-up (cont'd p2)

By Ellen Kuhlmann

Our chapter hosted the 2015 WNPS Study Weekend on August 14th to 16th, our headquarters was the Heather Meadows area on Mt. Baker. We had 114 persons attending, most of whom stayed at The Firs Mt. Baker Chalet. Meals and evening programs were held at the Heather Meadows Ski Lodge, just up the road from The Firs. Sleeping quarters were snug in the Chalet, but the lounge was spacious, with multiple leather couches and a gas fireplace. Both evenings found the lounge well-populated with WNPS members relaxing after the evening program, some chatting, some reading, all enjoying the music provided by a band of musical members led by Joe Arnett.

The weekend opened Friday with lightening, thunder, and a lot of rain; people with Friday afternoon fieldtrips got soaked. Study Weekenders rallied with beverages and food at the evening social and dinner. Barry acted as emcee for the weekend, warming up the crowd with an introduction to the area, followed by Jim Davis talking about meadow-pollinator interactions, and then David Giblin gave an update on the progress of the Hitchcock revision.

Saturday was drizzly, cool, and visibility was poor, but everyone sallied forth and explored the subalpine and alpine environments. Saturday evening we were treated to a very engaging presentation by Andy MacKinnon on the relationships between fungi, trees, and herbaceous plants. Also we held a raffle to benefit our student scholarship program.



Ellen Kuhlmann on the Bagley Lakes Trail during Study Weekend. Photo by Tricia Otto.

Koma Kulshan Chapter WNPS Newsletter

Study Weekend Wrap-Up (cont'd)

Sunday the clouds lifted revealing the majestic outline of Mt. Shuksan, and everyone turned their faces towards the sun. After breakfast, Mark Turner took the official group photo, and then the Sunday trips dispersed to their various destinations.

The tally of study weekend income and expenses is still being finalized. The raffle raised \$275.00, thanks so much to everyone who donated raffle items or bought tickets.

Many thanks to the Study Weekend Planning Group, especially Barry Wendling for handling all issues involving the venues, Katrina Poppe who handled registration, and Allan Richardson who organized the field trips and leaders. Twenty people led one or more field trips, several helped with registration, set-up, or otherwise gave of their time and talents. We couldn't have done this without every one of you.

The 2016 Study Weekend will be hosted by the Wenatchee Valley and Central Washington chapters. We look forward to next year.

South Twin Sisters Sortie

Report by trip leaders Allan Richardson and Abe Lloyd

On August 23, eight of us returned for further exploration in the southeast corner of the Twin Sisters Range, and it was not the rough bush-whack that we had last year. After a quarter mile off the trail through silver fir and western hemlock forest with little brush, we reached the two headwater streams of the South Fork Nooksack River, and were in a totally new botanical world of mostly alpine plants at 2500 feet.

The conifers were now yellow cedar, subalpine fir, mountain hemlock, western white pine, shore pine, and common juniper. On the gravel bar in front of us were mats of blooming moss campion (*Silene acaulis*), featured as an alpine zone plant on the September page of the WNPS calendar! Other botanically interesting plants were *Vaccinium caespitosum*, *Phyllodoce glanduliflora*, *Sibbaldia procumbens*, *Minuartia rubella* (Syn. *Arenaria r.*), and *Minuartia obtusiloba* (Syn. *Arenaria o.*). We also observed an abundance of Northwest sandbar willow (*Salix sessilifolia*), a rare plant in Washington State, not previously recorded for Whatcom County.

After a long break to take in our new surroundings, we headed up the larger headwater stream coming from the west. Because of low water we were able to travel on the gravel bars with several crossings on rocks and logs or by wading. At the highest point we reached there was a rocky mountain-side forest almost entirely of shore pine with mats of juniper.

At the end of our explorations we followed the South Fork downstream where we saw an intensely colored Viola in bloom on a gravel bar. This area deserves return visits, although the stream crossings could be difficult in a normal year.

Plant Research Roundup (cont'd p3)

Adapted from press releases from the Botanical Society of America and the University of Wisconsin-Madison.

A Better Look at Evolution. By analyzing the similarities and differences between DNA sequences of different organisms, biologists can infer relatedness between them. But what if the DNA of the species is so similar that you can't tease the relationships apart? "In these groups, the boundaries between species are often quite blurry, making it difficult to accurately infer relationships," says Ryan Folk, lead author of a study in a recent issue of *Applications in Plant Sciences*.

One solution is to look at regions that evolve faster than others. Protein-coding genes evolve at a relatively slow rate, but introns - the non-coding part of genes - evolve at a much higher rate. Folk and colleagues at The Ohio State University and University of Memphis developed a technique to capture the rapidly evolving intronic regions of the genome to increase our knowledge of evolution in difficult plant groups.

"Previous studies utilizing similar techniques have focused primarily on slowly evolving regions, such as exons, due to concerns with capture success," explains Folk. "The problem with this is wasted DNA sequencing effort. The data are perfectly good, but with a much slower mutation rate it's necessary to increase the amount of data you target to obtain an equivalent amount of evidence for evolutionary relationships among species."

The method uses specialized probes to concentrate sequencing efforts on introns. The researchers tested the method on a recent, rapid radiation of plants in the *Heuchera* group, comparing over 270 DNA markers. Introns had a fourfold increase in mutation rate compared to exons, which allowed the team to confidently resolve evolutionary relationships between very closely related taxa, something previously not possible in this group. "Although often difficult to answer, questions relating to species complexes are sometimes the most interesting because they represent the recent or ongoing formation of new species. We are optimistic that our new method for targeting intronic regions will provide scientists with a valuable tool to answer questions in these difficult groups," says Folk.

Orchid Roots. Most orchids live on trees, often in remote, tropical mountains. Their flowers can be strange -- one even flowers underground, and many species deceive their pollinators. The 25,000 or so orchid species outnumber mammals, reptiles and birds combined.

Previously, botanists have proposed more than a half dozen explanations for this diversity. Now, research from the University of Wisconsin-

Fall (October, November, December) 2015

Chapter Meetings

Meetings begin at 7pm in the Sustainable Living Center education room at the ReStore (2309 Meridian St.). The entrance is off the back alley and the SLC is upstairs. For more information, call Vikki Jackson at (360) 319-6988.

October 21st: To Be Determined

November 18th: A Rare Care Affair

Over 350 species of native plants in Washington State are considered rare and imperiled. Washington Rare Plant Care and Conservation (Rare Care) works with federal and state agencies to learn about these species, document their populations, and restore their populations. Wendy Gobble will introduce some of these rare plant species and their habitats, discuss why they are imperiled, and highlight efforts undertaken by Washington Rare Plant Care and Conservation to conserve these plants. Wendy Gobble is the program manager of Rare Care and has been studying and learning about Washington State's diverse flora for over 15 years.

December 16th: Holiday Party

6:00-pm - 9:00 pm

4682 Wynn Road

Please join us at our annual winter potluck to enjoy a feast of wonderful food and sharing stories about the year. Mark Turner has offered his studio again for the potluck. Dinner will begin around 6:30 pm and we will finish off with a slideshow of highlights of the year. Bring a dish and a drink to share (names A-M bring entrees, and N-Z bring a side or dessert). For those with photos to share, bring along a USB drive with up to 10 digital images.

Field Trips

October 10, Saturday, 8 AM to 5 PM: Hannegan Pass Trail

Join us for an autumn visit to the mountains. There may not be any flowers, but we can study the fruits and seeds, and consider what food is available for wildlife. The trail starts at 3100 feet, and is 4 miles and 2000' elevation gain to the pass. We will hike as far as the snow level and the weather allow. Be sure to bring rain gear and a lunch. Meet at the southeast corner of Sunset Square parking lot out from the Safeway at 8:00 AM to form carpools. To sign up contact Jim Davis at 360-296-5159 by phone or by email at jimdavispcp@comcast.net.

October 24, Saturday, 8 AM to 4 PM: Whatcom Land Trust Catalyst—Riverstead property

For the morning we will join a Make a Difference Day work party planting native trees and controlling invasive plants "deep in the heart of WLT's 311-acre Catalyst—Riverstead property on the South Fork Nooksack River near Acme." After a lunch break, Eric Carraba, WLT stewardship director, and volunteer John Bremer will lead us on an exploration of the property, directing us to areas of botanical interest. During this tour we will also be starting a plant list as part of a more complete botanical survey. Wear sturdy boots and clothes suitable for a work party, bring rain gear and a lunch. Meet at the southeast corner of Sunset Square parking lot out from the Safeway at 8:00 AM to form carpools. Contact Allan Richardson at 733-5477 or boghill@earthlink.net to confirm. If you are driving directly to the site, here are the directions: Travel east on Mt. Baker Highway (SR 542) to Highway 9 (SR9). Head south to Acme and turn left onto Rothenbuhler Road. Travel ¼ mile and turn right at gate, then travel on a gravel road and park by the WLT signs. From there you will need to be prepared to walk a half mile back into the restoration site.

Plant Research Roundup (cont'd)

Madison, published in *Proceedings of the Royal Society B*, corroborates many of these explanations, but finds no evidence for other logical suggestions, such as deceitful pollination. "It was surprising that many classic characteristics of orchids -- the tiny, dust-like seeds, the role of fungi in triggering germination, the fused male-female flower parts that define the orchid flower -- did not trigger the acceleration in species formation," says Thomas Givnish, a professor of botany and first author of the study.

The scientists sequenced genes in chloroplasts, where plants transform solar energy into sugar. By tying their molecular family to fossils of known ages, Givnish and his colleagues created a branching structure showing how many million years ago each major group of orchids appeared. Then, based on the numbers of species known in each of these groups today, the researchers calculated the rate of species diversification in each and tested the many putative causes of the explosion in orchid species. They found that the factors that most greatly accelerated the formation of new species were life in extensive mountain ranges; the presence of epiphytism (life in the trees); pollination by orchid bees, moths, or butterflies; and origin of pollinia (packages of hundreds to thousands of pollen grains dispersed as a unit).

The study suggests that, initially, orchids speciated no more rapidly than their closest relatives, and at a slow rate relative to flowering plants as a whole. Then there were three waves of accelerated speciation beginning 60, 40 and 33 million years ago. Pollinia apparently sparked the first acceleration in speciation, Givnish says. The origin of epiphytism -- and the invasion in tropical mountains with a constant swirl of clouds and rain -- sparked the second, greater acceleration. The invasion of the Andes as they were being uplifted triggered the third and greatest acceleration.

Many proposed explanations for orchid diversity failed the new test. Not even deceitful pollination (present in about one-third of all orchid species) was linked to accelerated speciation, Givnish says. "Orchids, almost alone among flowering plants, have a large number of species that lure pollinators by mimicking a mate, or a nesting site or food resources -- 'lies all for the sake of love' -- but such deceit seems to have played no role in accelerating the formation of new orchid species."

Koma Kulshan Board

Elected Officers

President
Barry Wendling: (360) 671-8403
Barry.Wendling@wwu.edu
Vice President
Abe Lloyd: (360) 303-1339
arcadianabe@yahoo.com
Secretary
Katrina Poppe: (360) 303-7806
katrinalee_98@yahoo.com
Newsletter Editor
Jim Kling: (360) 671-1156
jkling@gmail.com
Treasurer
Angela Nelson: (360) 303-5628
stormnw@comcast.net

Committees

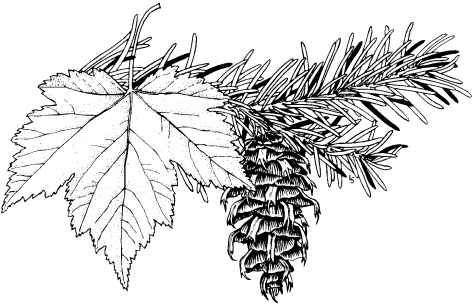
Program Chairs
Katrina Poppe: (360) 303-7806
Vikki Jackson: (360) 319-6988
Field Trip Chair
Allan Richardson: (360) 733-5477
Backyard Habitat Liaison
Molly Porter: (360) 714-0781
Greenhouse Chair
Jim Lyons: (360) 733-2480
State Board Representatives
Mark Turner (at large)
(360) 671-6851

Koma Kulshan Chapter WNPS Newsletter

If you would like to join WNPS

Please return the membership application form to:
Washington Native Plant Society
6310 NE 74th St., Suite 215E
Seattle, WA 98115

Please make checks payable to WNPS
(outside US add \$5 to dues)



Name:_____		Mebership Category:
Address:_____		\$20 Budget (Senior/Student)
City, State, Postal Code:_____		\$35 Individual
Phone:_____		\$45 Family
Email:_____		\$65 Club/Institution
Koma Kulshan Chapter Total Enclosed:_____		\$50 WNPS Friend
		\$100 WNPS Special Friend
		\$500 WNPS Best Friend
		\$1000 WNPS Sustaining Member

The Koma Kulshan chapter of WNPS is dedicated to the preservation and study of native plants and vegetation of Washington State and the education of the public to the values of native flora and its habitat.

WNPS -- Koma Kulshan Chapter
Newsletter Editor
1610 Grant St.
Bellingham, WA 98225