

Fiddlehead Forum

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Editors: Joan Nester-Hudson and David Schwartz

Vancouver Fern Foray 2008

by Melanie A. Link-Pérez

The Fern Foray for Botany 2008 in Vancouver, British Columbia, took place on Saturday, July 26. Thirty fern enthusiasts joined trip coordinators Chris Sears, Mike Barker, and Steve Joya (Frank Lomar could not attend) for an all day field trip to visit three sites in the North Vancouver and West Vancouver regions. The group departed from the University of British Columbia in a touring bus under clear, sunny skies that promised a day perfectly suited to botanizing in comfort.

The first stop of the foray was the Lower Seymour Conservation Reserve (LSCR) in North Vancouver, approximately a thirty-minute drive from campus, the last part of which afforded many scenic views of mountains covered in coniferous forests. The LSCR is a 5,668-hectare coastal forest that is part of the Seymour Watershed. Within the LSCR is a network of over 25 kilometers of hiking trails. Along the Old Growth Trail and Spruce Loop trail (between 200-220 m elevation) the group observed eleven fern species.

We entered the trails at the top of a gentle slope and were greeted with a mixed deciduous/coniferous forest with trees draped in epiphytes, their lower branches arching down over boulders that were cloaked in bryophytes and ferns. Immediately we encountered our first ferns of the trip (if we don't take into account the ubiquitous roadside Bracken Fern, *Pteridium aquilinum*): the Sword Fern (*Polystichum munitum*), the Lady Fern (*Athyrium filix-femina* ssp. *cyclosorum*, Fig. 2), and the Deer Fern (*Blechnum spicant*, Fig. 1). All three of these species were frequent along the trail, with *B. spicant* appearing particularly stunning with the erect fertile leaves set



Figure 1. Deer Fern- *Blechnum spicant*

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The Editors of FIDDLEHEAD FORUM welcome contributions from members and friends, including miscellaneous notes, and reviews of books on ferns. Articles may be submitted electronically on disk (PC compatible) or typed (using a simple font like Helvetica in a minimum of a 12pt font.)

Regular membership in the American Fern Society is on a calendar-year basis and includes access to field trips and the spore exchange. Regular members receive *Fiddlehead Forum*, but not the American Fern Journal, for \$12 (+\$3 expedited delivery fee, except U.S.A., Canada, and Mexico) Individuals interested in regular or journal membership should contact the membership secretary.

AFS HOME PAGE

<http://www.amerfernsoc.org>

amongst the surrounding sterile leaves, which were so shiny that their dark, blue-green color appeared almost iridescent.

The trail quickly led down to a wetland area with a boardwalk and observation deck from which we could admire the landscape while keeping our boots dry. The water was so pristine and still that it is difficult to discern the junction between skunk cabbages and their reflections in photographs taken of them. The alder trees and the rampant Salmonberry (*Rubus spectabilis*) distracted some of us from ferns momentarily—but only until we caught sight of the *A. filix-femina* growing along the boardwalk. The fronds of the Lady Fern in that location were so tall that several participants were enticed to climb down from the boardwalk to serve as



Figure 2. Carol Kelloff with lady Fern - *Athyrium filix-femina* ssp. *cyclosorum*

human scale bars; numerous fronds overtopped these intrepid volunteers. Further along, the trail skirted the Seymour River floodplain and took us through a strand of old growth forest. There were many Sitka Spruces (*Picea sitchensis*), the oldest of which is more than 500 years old with a diameter of more than nine feet. Hemlocks (*Tsuga spp.*) and Douglas Firs (*Pseudotsuga menziesii*) also towered over us as we made our way along the trails that we shared with mountain bikers, who were occasionally curious about the large groups of people peering at the undersides of fern fronds with hand lenses. Other notable seed-plants included Western Red Cedar (*Thuja plicata*), Vine Maple (*Acer circinatum*), and the spiny Devil's Club (*Oplopanax horridus*).

The Licorice Fern (*Polypodium glycyrrhiza*) was a treat for many of us to see, but one fern enthusiast (who shall remain unnamed to protect the guilty) decided to see if it would also be a treat to eat, since the stems

are said to be very sweet and licorice-flavored. This unnamed individual sampled a small portion of the rhizome (in a responsible fashion), but reported disappointment on not detecting the sought-after flavor. Another star among the ferns sighted at LSCR was Anderson's Holly Fern (*Polystichum andersonii*). This allotetraploid (formed from the diploid parents *P. munitum* and *P. kwakiutlii*) has the distinction of bearing bulblets on the distal portion of its rachis; these vegetative propagules were the subject of much admiration from the foray participants.

The small, low-growing Oak Fern (*Gymnocarpium dryopteris*, Fig. 3) was also a stand-out of the day because its light green triangular lamina—held horizontally above the forest floor—made it seem almost out of place among the larger, more robust-looking, dark-green ferns of the understory. Other ferns checked off our list at the LSCR were the Spiny Wood Fern (*Dryopteris expansa*), Braun's Holly Fern (*Polystichum braunii*), Narrow Beech Fern (*Phegopteris connectilis*), and Mountain Fern (*Thelypteris quelpaertensis*).



Figure 3. Oak Fern - *Gymnocarpium dryopteris*

The LSCR was an excellent starting location for our fern foray, and we were reluctant to leave at the appointed time—and truth be told, many of us couldn't leave at the set time because we had become quite turned around within the network of trails. Apparently, a significant number of us (possibly, half or more) were so engrossed in the ferns and other plants that we had failed to notice all the turns we had made along the trails. Numerous splinter groups came together and then parted again looking

for the elusive trail back to the bus. The various “lost groups” eventually aggregated at the Seymour Dam Construction Site and Fish Hatchery (where resourceful participants consulted a large, wooden kiosk bearing a trail map), and cheerfully discussed the morning's adventures until scouts ascertained the best exit strategy. When the scouts returned, we learned that we were so close to the bus that it was almost embarrassing.



Figure 4. When all else fails, Marcus Lehnert, Eddie Watkins and Hee Song consult the trail map.

With the group all together again, we traveled to our second stop of the day, Mount Seymour Provincial Park. Along the way, we stopped briefly at a grocery store to supplement our box lunches or make up for shortages (botanizing can work up such an appetite!). To make up for lost time, we enjoyed lunch on the bus or trailside.

Mount Seymour Provincial Park, established in 1936, is a semi-wilderness area covering 3,508 hectares, with the lower elevations (below 1000 m) dominated by old-growth Douglas Fir and Western Red Cedar, and the higher elevations comprised mainly of Pacific Silver Fir (*Abies amabilis*), Yellow Cedar (*Chamaecyparis nootkatensis*) and Mountain Hemlock (*Tsuga mertensiana*). We spent most of our time exploring the trails and the chairlift right-of-way north of Parking Lot 4. At this site, we observed a total of 18 ferns and lycophytes, including 6 species that were present at the LSCR (*Pteridium aquilinum*, *Blechnum spicant*, *Athyrium filix-femina*, *Dryopteris expansa*, *Gymnocarpium dryopteris*, and *Polystichum munitum*).

An impressive sight for some participants was the dense and expansive carpet of Common Horsetail (*Equisetum arvense*); the occasional dandelion inflorescence popping out from this lush colony of horsetails made it look like some whimsical chimera of fern and composite. The showstopper, however, was the assemblage of *Botrychium* species found in the chairlift right-of-way: Leather Grapefern (*B. multifidum*), Western Moonwort (*B. hesperium*), and Northwestern Moonwort (*B. pinnatum*). In some spots, the *Botrychium* was abundant enough that we had to carefully select where to place our next step so as not to crush the diminutive fronds. These ferns elicited so



Figure 5. Foray on Mount Seymour chairlift right-of-way.



Figure 6. Don Farrar and David Barrington discussing *Botrychium* on Mount Seymour.

much excitement that at the end of the first hour, the bulk of fern participants had not advanced more than a few hundred meters from our starting point, and many enthusiasts had dusty knees from kneeling down to observe and photograph the botrychia more closely.

Eventually, participants made their way further up the slope and added three lycophytes to the Mount Seymour list: Stiff Clubmoss (*Lycopodium annotinum*), Common Clubmoss (*L. clavatum*), and Sitka Clubmoss (*Diphasiastrum sitchense*). Ferns included the Fragile Fern (*Cystopteris fragilis*), Holly Fern (*Polystichum lonchitis*), Irregular Polypody (*Polypodium amorphum*), Western Maidenhair (*Adiantum aleuticum*), and Parsley Fern (*Cryptogramma acrostichoides*). Despite the amazing views

and abundance of interesting ferns, however, even the most staunch fern-lovers were ultimately driven back down the slope and onto the bus by the swarms of black flies that were increasingly emboldened in their attacks on the eyes, nostrils, and ears of foray participants.

The third and final stop for the field trip was Larson Bay in West Vancouver. After a leisurely walk through a neighborhood of spectacular homes with oceanfront views, participants reached the cobble beach and the bayside trails beyond. This site added one more lycophyte to our checklist of the day, Wallace's Spikemoss (*Selaginella wallacei*), and three more ferns: Giant Horsetail (*Equisetum telmateia*), Maidenhair Spleenwort (*Asplenium trichomanes* ssp. *trichomanes*), and Goldenback Fern (*Pentagramma triangularis*). A dead shark on the beach provided a non-botanical highlight for the less squeamish among us.



Figure 7. *Polystichum munitum sori*.

We returned to the UBC campus at the end of the afternoon with 27 ferns and lycophytes crossed off our checklists and with the satisfaction of a day well spent. The four field trip coordinators planned a great foray. The day was filled with amazing ferns, great scenery, and enjoyable interactions with friends both newly-made and of long-standing.

Encyclopedia of Garden Ferns by Sue Olsen Wins a 2008 CBHL Literature Award

Encyclopedia of Garden Ferns by Sue Olsen (Timber Press, Portland, OR, 2007) has won a 2008 Annual Literature Award from The Council on Botanical and Horticultural Libraries.

Encyclopedia of Garden Ferns won CBHL's award in the general interest category. This internationally comprehensive book includes the history, taxonomy, cultivation and propagation instructions for almost 1,000 ferns. It includes 700 color photographs of ferns. (ISBN 9780881928198, 144 pages, hardcover)

Order out of Chaos: Linnean Plant Names and Their Types by Charlie Jarvis (Linnean Society of London in association with the Natural Museum, London, 2007) won an award in the technical category.

The CBHL Literature Awards honor both the author and the publisher of works that make a significant contribution to the literature of botany and horticulture. The awards were announced June 4 in Grand Rapids, Michigan, during CBHL's annual meeting.

Congratulations!

HETEROSPORY IN A NUTSHELL

The micro- and the megaspore,
each has a special chore:
a gametophyte must grow inside
(where photosynthesis is denied).

(The male gametophyte:
is much smaller, if I'm right,
than the female gametophyte.
It produces sperm cells by the score;
that's all it does – nothing more.

(The female gametophyte:
traps the sperm cells in a lake
(not so very hard to take).
Thus the female does her part,
soon the zygote gets its start.

When the gametophytes have matured
(heterozygosity is fully assured),
the embryo forms in just two days.
So endospory really pays!

JARGON

(Jargon in botany
is better than not-any.
But heterozygosity
is a monstrosity.)

--- *Guenther K. Machol*

NOTES:

Of the world's 9000 or more fern species, about one percent have evolved to produce two kinds of spores, and are termed heterosporous. These ferns reproduce in a way that is strikingly different from that of homosporous ferns.

HETEROSPORY: with respect to the clover fern family Marsileaceae (*Marsilea*, *Regnellidium* and *Pilularia*). The floating fern family Salviniaceae (*Salvinia*, *Azolla*) is also heterosporous, but differs in some details.

MUCH SMALLER: Unlike the megaspore, the microspore doesn't need to store food for the future embryo. (Moran 2005)

SPERM LAKE: the liquid interior region of the gelatinous envelope that forms around a megaspore when it is hydrated. (Gifford and Foster 1989)

HETEROZYGOSITY: "the state of being heterozygous, i.e., having the two alleles at corresponding loci on homologous chromosomes different for one or more loci." (Merriam-Webster Collegiate Dictionary, 11th)

TWO DAYS: "Young embryos were observed as early as 2 d[ays] after the time of spore release." Schneider and Pryer 2002)

ENDOSPORY: "Reproduction by this process is rapid because it is not necessary to grow a whole photosynthetic thallus, as in the homosporous cycle." (Wagner and Smith 1993)

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- E. Gifford and Foster, A.S. *Morphology and Evolution of Vascular Plants*. 1989. W.H. Freeman and Co., New York.
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- H. Schneider and Pryer, K.M. 2002. Structure and Function of Spores in the Aquatic Heterosporous Fern Family Marsileaceae. *Int. J. Plant Sci.* 163(4): 485-505
- W. Wagner, Jr. and Smith, A.R. 1993. "Pteridophytes" in *Flora of North America, v.2*. Oxford Univ. Press Oxford. Available at <http://hua.huh.harvard.edu/FNA/Volume/V01/Chapter12.shtml>

Pteridophyte Key Prototypes

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Ferns and fern allies comprise approximately 3% (31 Families, 97 Genera, 555 Species) of the North American continental vascular flora.¹⁻² Although pteridophyte keys exist for the continent north of Mexico, keys for a specific state, province, or territory are often lacking. Now, Gerber and Merel Black (webmaster, Freckmann Herbarium, University of Wisconsin (UW)-Stevens Point) have produced online pteridophyte keys for Wisconsin using the Flora of North America (FNA)² as a source document.

The Wisconsin pteridophyte keys³ were developed by first cross-checking species listed in the FNA² with specimens in the Freckmann⁴ and Wisconsin State Herbarium⁵. FNA pteridophyte keys were reworked specifically to include only Wisconsin species. Permission to use the FNA keys was granted by the Executive Committee of the FNA. Species in the Wisconsin keys were linked to herbarium specimen information and Wisconsin distribution maps³⁻⁵. FNA distribution maps are copyrighted and were not linked. A printable PDF version³ of each key was produced for use in the field.

Using this method, additional pteridophyte keys could potentially be developed for other North American states, provinces, and territories. A compilation of these keys housed on the American Fern Society website would provide ready access to regional keys for use by professionals, students, and the general public.

References:

- ¹ Wagner & Smith.1993. Ch. 12. Pteridophytes. Flora of North America (FNA), vol 1
- ² FNA, vol 2 online at http://www.efloras.org/volume_page.aspx?volume_id=1002&flora_id=1
- ³ Pteridophyte keys, Botanical Club of Wisconsin online at <http://wisplants.uwsp.edu/BCW/Keys.html>
- ⁴ Freckmann Herbarium, UW-Stevens Point online at <http://wisplants.uwsp.edu/>
- ⁵ Wisflora, Wisconsin State Herbarium, UW-Madison online at <http://www.botany.wisc.edu/wisflora/>

Summer Fern Course in Maine

The Humboldt Field Research Institute, located near Stueben, Maine, will offer a fern course, *Taxonomy and Biology of Ferns and Lycophytes*, from 17-21 August 2009. The course will be taught by Robbin Moran, Curator of Ferns at the New York Botanical Garden. It will emphasize the identification, phylogeny, and ecology of local ferns and lycophytes. Lectures will be in the morning and field trips in the afternoon. For more information, visit the following web site: <http://www.eaglehill.us> You can also contact the Station Director, Joerg-Henner Lotze, Humboldt Field Research Institute, PO Box 9, 59 Eagle Hill Road, Steuben, ME 04680-0009 USA Phone: 207-546-2821, FAX: 207-546-3042; office@eaglehill.us

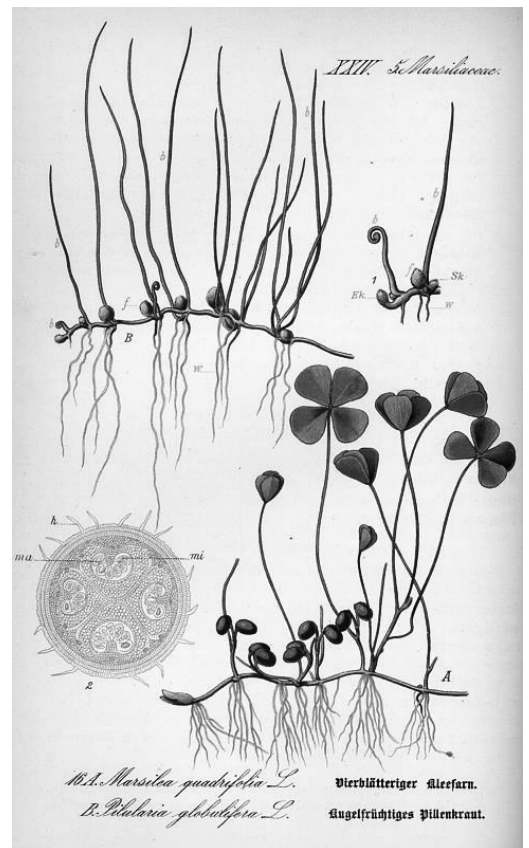
Fern Botanical Art – Historical Plates

Anyone interested in historical drawings of ferns will likely enjoy the high-resolution, color scans of plates from Thomé, “Flora of Germany, Austria and Switzerland”, (1885-1905). Among the 572 color drawings are 16 color drawings of ferns, many with fine detail, including *Adiantum*, *Asplenium*, *Athyrium*, *Blechnum*, *Botrychium*, *Ceterach*, *Cheilanthes*, *Cryptogramma*, *Cystopteris*, *Marsilea*, *Matteuccia*, *Pilularia*, *Woodsia*, *Polystichum* and *Phegopteris*. The images were scanned at 300 (and 100) dpi by Dr. Kurt Stueber (www.biolib.de) of the Max Planck Institute for Plant Breeding Research, Cologne, Germany; they are available at [http://caliban.mpiz-koeln.mpg.de/~stueber/thome/Alphabetical list.html](http://caliban.mpiz-koeln.mpg.de/~stueber/thome/Alphabetical%20list.html). (Illustration: *Marsilea* and *Pilularia*)

— Guenther K. Machol

We would like to thank all American Fern Society members for their contributions to the Fiddlehead Forum in 2008 and send out a request for members to submit articles for 2009 inclusion in the Fiddlehead Forum. Happy New Year to all!

Joan Nester-Hudson and David Schwartz



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