



NATIVE PLANT STUDY GROUP

PARASITIC PLANTS OF BC With Excursions Elsewhere

written by Kristen Harrison

Parasitism can be a beautiful and/or romantic thing. Take for example, Indian paintbrush (*Castilleja* spp. from the Orobanchaceae family). It is known for its splendidly-coloured leafy bracts but is partially parasitic on the roots of grasses and forbs. The Orobanchaceae is just one of about fifteen families of flowering plants in which parasitism has evolved.

About three-quarters of all parasitic species are mistletoes (at least 2,000 species around the world!), belonging to the Viscaceae and Loranthaceae plant families. In our November meeting we had the great pleasure of listening to Job Kuijt speak about parasitic plants. Job is an adjunct professor of biology at the University of Victoria and has been studying parasitic plants for over fifty years and is considered the world expert on mistletoes of North, South and Central America. Over the course of his career, Kuijt has discovered and described about 250 new mistletoe species and published approximately 150 scientific papers on the topic.

Parasitism in plants is a relationship in which one organism uses the nutrients and water of another plant, the host. Parasitic plants fall under two general categories: Holoparasites and Hemiparasites (semiparasites).

Holoparasites are organisms which have lost all chlorophyll and draw all materials, including water, organic and inorganic particles, from their hosts and are thus completely dependent on them. A local native holoparasite would be Vancouver ground cone (*Boschniakia hookeri*), which is parasitic on Salal (*Gaultheria shallon*) and other members of the Heather family (Ericaceae) such as Kinnickinnick (*Arctostaphylos uva-ursi*). A hemiparasite is a plant that can live either as a parasite or on its own. They are known as green parasitic plants because they have photosynthetic leaves. Examples are the Mistletoes (*Arceuthobium* spp) and Louseworts (*Pedicularis* spp). Hemiparasitic plants draw water and organic particles, but not inorganic particles, from their hosts.

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To draw nutrients and water from the host plant, parasitic plants use specialized structures called haustoria. These are bell shaped structures that clamp onto the host. Once clamped, haustoria form a cavity and then attach to the xylem of the host where water and inorganic materials are being carried from the roots to other parts of the plant. Upon entering the living tissue of the host they draw material from the xylem.

By now the Christmas kissing mistletoes are in the compost but we still have native mistletoes in British Columbia. They are parasitic on a wide range of our native conifers (*Abies*, *Juniperus*, *Larix*, *Picea*, *Pinus*, *Tsuga*). On the coast it is most commonly found on Western Hemlock (*Tsuga heterophylla*) but is often overlooked because it grows high up in the host tree. In Victoria mistletoe infections can be found on Lodgepole pines (*Pinus contorta*) at higher elevations like Finlayson Point.

Some mistletoes produce galls on the host species; growths of woody tissue around the infection. Galls often remain on the branches after the mistletoe has disappeared. Mistletoes on cone-bearing trees often cause the terminal branches to become very compact and bushy like a broom and the condition is commonly called witch's broom. These infections can cause significant reductions in the growth of the conifer hosts.

If you're interested in learning more about parasitic plants see "Parasitic Flowering Plants" Published by Brill, The Netherlands 2008 by Dr. Heide-Jørgensen, a student of Dr. Kuijts'.

Van. Island Holoparasites and Hemiparasites

Holoparasites:

Boschniakia hookeri (ground cone), in association with *Gaultheria shallon* (salal), one plant can produce 300,000+ seeds. Amazing when you consider how rarely you find this plant. I've only found it once on Camas Hill.

Orobanche uniflora (naked broomrape) is found using a variety of plants, esp *Sedum spathulifolium*



OROBANCHE CALIFORNICA

(stonecrop) and *Lomatium utriculatum* (springold) *O. californica* (California broomrape) is found with *Gringelia integrifolia* (gumweed)

O. pinorum (pine broomrape) is very rare and grows in association with *Holodiscus discolor* (oceanspray) near Eagle Heights

O. fasciculatum (clustered broomrape) grows in association with *Artemisia* sp. (mugworts, sagesworts and wormwood).

Cuscuta salina (salt marsh dodder) grows into plants of the Chenopodiaceae (goosefoot) and Asteraceae (aster-sunflower) families. You can see a good display at Esquimalt Lagoon spit.

Hemiparasites:

Castilleja family (paintbrushes and owl-clovers) including *Castilleja* spp, *Orthocarpus* spp and *Triphysaria* spp
Pedicularis spp (louseworts)

The Native Plant Study Group meets on the third Thursday of the month from Sept through May except Dec at 7 pm at the MacLaurin Building, UVic. Please join us. Membership fees are \$15.00 annually or a \$2.00 charge for drop-in. Check Room Schedule for new meeting locations.

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EVENTS AND OUTINGS

CRD Parks: www.crd.bc.ca/parks

South Vancouver Island Mycological Society:
www.svims.ca

Vancouver Island Rock and Alpine Society:
www.virags.ca

Swan Lake & Christmas Hill Nature Sanctuary:
www.swanlake.bc.ca

Victoria Natural History Society:
www.vicnhs.bc.ca

Native Plant Society of BC: www.npsbc.org

For all outdoor events, wear appropriate clothing and footwear, bring a light snack and water. Most organizations request that you leave your dogs at home.

Tues Jan 20 VNHS Botany Night Rare Plants of Salt Spring Island: Research and New Discoveries. Robin Annschild, on the Endangered Yellow Montane Violet and a recently discovered new population of Scouler's catchfly. Swan Lake Nature House, 7:30 p.m. Admission free, everyone welcome. Bring your friends.

Sat Jan 24. CRD Parks 10-noon High Ridge Hike at Francis King Meet at nature Centre off Munn Rd



OROBANCHE PINORUM

Sat Jan 31. CRD Parks 1-2:30 Marvellous Matheson. Hike around Matheson Lake. Meet at parking lot at end of Matheson Lake Rd

Sun Feb 1. CRD Parks 1-2:30 Witty's Lagoon. Learn about local First Nations' culture. Meet at nature centre off Metchosin Rd.

Sun Feb 15. CRD Parks 1-2:30 Lone Tree Hill Hike. Meet at Parking lot off Millstream Rd (small lot).

Sat Feb 21. CRD Parks 1-2:30 East Sooke Park. Learn about local First Nations' Coastal Culture. Meet at Alyard farm Parking lot off Beecher Bay Rd off East Sooke Rd.

Sat Feb 21. Seedy Saturday
Hosted by the James Bay Market Society, Victoria Conference Centre 10 am -4 pm, 720 Douglas Street, \$7 under 12 free. Info: 250.385.0485.
Keynote presentations by Frank Morton (Wild Garden Seeds) and Thomas Hobbs (Southlands Nursery)

April 18 and 19
Swan Lake-Christmas Hill Nature Sanctuary
Native plant sale and gardening workshops.
Come to buy or learn or volunteer to help out.

For UVic events:

UVic parking policy--pay parking is in effect 24 hours a day. You must purchase a \$2 parking permit for the evening.

The NPSG gratefully acknowledges the support of the RNS program at UVic in securing the use of the rooms and facilities.

Please visit our lovely website: www.npsg.ca
Designed and maintained by NPSG co-chair Valerie Elliott, co-owner of design company iD2 (id2.ca). Thanks Valerie and Stephan for the superb work and generous commitment!

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VOLUNTEER OPPORTUNITIES

The Anti-ivy League of Cadboro Bay is fighting an ongoing battle. Contact Agnes at 721-0634 or thelynns at shaw.ca for more info.

Hospital Rock: Contact Agnes as above

Beacon Hill Park Ivy Pull, Saturdays (except long weekends), 9 am-Noon southeast woods near Cook and Dallas. Bring gardening gloves. No dogs. Call Cornelia, 920-3556 or kacy at islandnet.com .

Oak Bay Native Plant Garden meet every Fri. morning from 9-11, weather permitting. Corner of Beach Drive and Margate Avenue. Guided walks in spring.

Brighton Avenue Walkway Restoration. Work each Sun. 9:30 - 11:30. Meet at Hampshire and Brighton, 2 blocks south of Oak Bay Ave.

Swan Lake-Christmas Hill Nature Sanctuary is looking for volunteers to help with the gardens and restoration. Contact June at grounds at swanlake.bc.ca

Garry Oak Restoration Project

If you would like to volunteer with restoration of these Saanich parks, please contact Jen Eastman at ferns1 at telus.net All times are 9:30-11:30 am. on Saturdays. Gloves and equipment provided as well as juice and snacks.

- Jan 17 at Chatterton Hill Park
- Jan 24 at Feltham
- Feb 7 at Camas Park
- Mar 7 at Chatterton Hill
- April 4 at Wetherby

The Haliburton Wetland Restoration Team is looking for native shrubs to use in hedgerows at the farm. Contact Kristen at 598-6546 or kristenh at uvic.ca

NPSG SPEAKER SCHEDULE

Unless otherwise noted all meetings are held in room D 116 MacLaurin Building, UVic at 7 pm. Please note February change.

February 19

Room 110 Harry Hickman Building
Native Plant Gardening Is For The Birds
Darren and Claudia Copley, president and editor respectively of the Victoria Natural History Society, are masters at attracting birds to their home. Join us to learn how to garden so that your yard will become a haven for birds. aka Birdbrain 101!

March 19

Planning for Butterflies in Gardening and Restoration
James Miskelly completed his Masters degree at UVic, researching two rare species of butterflies. Butterfly populations of many species are diminishing on Southern Vancouver Island; providing butterfly habitat while creating gardens or in restoration work is important to their continued existence. Some of them are so beautiful, they are almost like flying flowers.

April 16

"Swan Lake Nature Sanctuary: A Refresher Course in Conservation Imagination"
Rare species, native plant gardens and the changes that have occurred and are occurring at this destination nature sanctuary. June Pretzer joined the Nature Sanctuary staff in April, 2008. June, a graduate of the Restoration of Natural Systems program at UVic., has a real passion for restoring and preserving the ecosystem within the Nature Sanctuary. She's looking for volunteers, if you are interested, see contact info under volunteer opportunities.

May 21

Member's Night Presentations
Moralea Milne and Camas Hill
Pat Johnston and Native Plant Gardening

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There are No Longer Saprophytes on Southern Vancouver Island!

It used to be thought that saprophytes lived on dead organic matter but were not parasitic. However, recent discoveries have revealed that no vascular plants can break down decaying organic material directly, only fungi have that capability. These former saprophytes, now named myco-heterotrophs, form a parasitic relationship with fungi wherein they receive carbon from the mycorrhizal associations between fungi, plants (often coniferous trees) and themselves.

In the case of Indian pipe (*Monotropa uniflora*), the fungal host, short-stemmed russula (*Russula brevipes*), obtains and shares nutrients with conifers; the roots of Indian pipe then take energy (carbon) away from the fungus but give nothing back in return.

They have been labeled mycorrhizal cheaters. Indian pipe is considered a full myco-heterotroph, while some some gentians and photosynthetic orchids are partial myco-heterotrophs,

Pinedrops (*Pterospora andromedea*) grow in association with fungi in the Rhizopogon genus, potato-like mushrooms that grow underground, much like a tuber. They in turn usually have a mycorrhizal connection with shore pines and other conifers.

Candystick (*Allotropia virgata*) is a photographer's delight, with it's brazenly cloaked red and white stems, it is found only in association with members of the Matsutake or pine mushroom family.



MONOTROPA UNIFLORA



HEMITOMES CONGESTUM

Former Saprophytes:

Cephalanthera austinae (phantom orchid)

Allotropia virgata (candystick)

Hemitomes congestum (gnome-plant)

Monotropa uniflora (Indian pipe)

Corallorhiza maculata (spotted coralroot)

C. striata (striped coralroot)

Hypopitys monotropa (pinesap)

Pterospora andromedea (pinedrops)

Reference:

<http://en.wikipedia.org/wiki/Myco-heterotrophs>

Did you know that there are over 1,000 species of mushrooms that form mycorrhizal associations with Douglas-firs?

Oregon white truffle (*Tuber gibbosum*), shrimp russula (*Russula xerampelina*) and chanterelles (*Cantharellus* sp) are choice edible mycorrhizal mushrooms found in association with Douglas-firs.

From Mushrooms demystified by David Arora

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NATIVE PLANT STUDY GROUP
(Sub-group of the Victoria Horticultural Society)

NOTES

The NATIVE PLANT STUDY GROUP is a non-political group dedicated to learning about B.C. native plants, as wild populations and in garden settings, and to supporting conservation of native plants and their habitats. The group is guided by a volunteer steering committee. Members are encouraged to volunteer for this committee. Participation in outside events, by the group, or by individual members using the NPSG name, is dependent on approval of the steering committee or, where indicated, by the at-large membership. Activities requiring funding must receive approval by the general membership.

Co-Chair: Valerie Elliott
Co-Chair: Nathalie Dechaine
Speakers: Moralea Milne
Treasurer: Joan Varley
Newsletter: Moralea Milne
Plant Rescue: Todd Doherty
Field Trips: Jean Forrest
Pat Johnston
Membership: Agnes Lynn
Publicity: Valerie Elliott
Room Set-up: Pat & Wayne Robertson
Plant Raffle: Heather Pass
List-serve: Linda Beare & John Olafson
Refreshments: Pat McMahon
VHS Liaison: Heather Pass

Native Plant Study Group members are required to become members of the Victoria Horticultural Society. Fees are \$25.00/yr and help pay for insurance to cover field trips. Send \$ to Box 5081 Stn. B, Victoria, V8R 6N3

The NPSG Newsletter is produced by Moralea Milne

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