

## GUIDE TO THE COLLECTION AND PREPARATION OF YOUR VASCULAR PLANT COLLECTION

### ASSIGNMENT

You are required to hand in a plant collection of 25 specimens using the techniques as outlined in this handout. The collection is to include 25 different species of native flowering plants. **Your collection must include representatives of 20 families, including at least one sedge, one grass, and one rush. Weeds will not count towards the required number of species in your collection.** Your collection, unmounted, between newspapers, should be completed by the end of September. You will be shown how to mount your specimens and labels on standard herbarium sheets. Your final collection will be handed in as professionally mounted and labeled specimens. Append a collection list, giving the specimen number, (1-25) scientific name & authority, common name, family, and the volume/page number on which the specimen is described in the *Illustrated Flora of BC*.

### CONSERVATION ISSUES

In today's world of endangered species, plant collecting is a valuable but potentially dangerous activity. Scientifically, specimens may be collected for a herbarium where plants are appropriately stored and catalogued. Herbaria have great scientific value both as records of plant occurrences and as reference for identification. The collection you are making, however, has purpose as an educational tool. I believe the educational value of a collection is considerable, but caution must be used in order that rampant collection does not endanger any plant population. In England, collection by amateurs, together with loss of habitat has caused the extinction or near extinction of a number of plants, especially orchids. It is now illegal to pick or collect any plant in Britain without the consent of the landowner.

#### Some rules to start

- (1) **Do not collect in parks or ecological reserves.** It is illegal unless you have a permit (I have permits for Wells Gray Provincial Park and Lac Du Bois—but I need to be with you if you are collecting there).
- (2) Do not collect on private land unless you have the permission of the land owner.
- (3) Collection is possible on Crown land—however, make sure you only collect specimens from well established populations. A good rule of thumb is the 20 rule. If the population is over 20 individuals, you may collect one specimen.

#### For any collection, the following areas need to be considered:

1. Collecting Equipment & Supplies
2. Field Notes
3. Collecting
4. Pressing and Drying
5. Mounting & Storage

## 1. COLLECTING EQUIPMENT & SUPPLIES

You will need the following equipment and supplies on your collecting trips:

- \* collecting bag, preferably of sturdy canvas
- \* assorted collecting bags - large black garbage bags, 8x12" plastic bags
- \* hand trowel or other digging tool - brightly coloured as they tend to get left behind!
- \* hand lens
- \* contour map, altimeter or GPS unit
- \* weatherproof field notebook (Rite-in-the-Rain paper), mechanical lead pencil
- \* Plant Press ( I have a few of these to lend out each summer or you can build your own see <http://www.uen.org/utahlink/pond/buildpress.htm>)
  - press ends & straps
  - alternating: cardboard - felt - newspaper - felt - cardboard
  - extra newspapers

## 2. FIELD NOTES

Field notes are very important to the future use of plant specimens for identification and research. Each collector should assign a collection number starting from number 1 and running consecutively for all collections made. Some prefer to identify the year in their collection number, for example, 97-1, 97-2 etc. Most collectors keep two sets of records, (1) a field notebook, and (2) a permanent collection record book. The field notebook may be substituted by writing notes on the sheets of paper holding the specimen in the press. Most prefer to keep as much data as possible in their waterproof field notebook. Remember, you can never have too many field notes. The permanent record book will contain all the information in the field notes plus the correct name for the specimen following identification or verification at a later date. There are a number of specific pieces of information that should be gathered for each specimen when it is collected. They are:

- 1) **Geographical locality** of the collection, including the latitude and longitude where possible.  
e.g., 5.5 mi N of Valemount, B. C. 51°13'N 113°45'W
- 2) **Habitat** where the specimen was collected, including the elevation, soil and vegetation types.  
e.g., grass-sedge margin of alkaline slough, 500m elevation
- 3) **Biogeoclimatic Zone** in which the plant was collected.
- 4) **Description** of plant including any outstanding morphological characteristics, such as growth form - tree, shrub or herb, and flower colour.  
e.g., herbaceous shrub, sticky, flowers bright lemon yellow
- 5) **Abundance**, indicating whether rare, occasional or common.  
e.g., locally common
- 6) **Date** collection was made.  
e.g., 1991 June 14
- 7) **Collector(s)**  
e.g., J. J. Smith
- 8) **Collection Number**  
e.g., 87 or 97-87
- 9) **Identified** by (if identified by someone other than the collector)  
e.g., C. Veer, 1994 August 1

HERBARIUM OF THE UNIVERSITY  
COLLEGE OF THE CARIBOO

PLANTS OF WELLS GRAY PARK

*Lycopodium annotinum* L.

Stiff Clubmoss

Family Lycopodiaceae

1.2 Km. N. of Shadow Lake

Shadow Lake Bog

Sphagnum Bog

660 m 51 45' N 120 01' W LB, ICH

07/11/94

Collected by Connie Veer with Dave Williams

Identified by Connie Veer

Verified by Trevor Goward

Collection number: 94-86

Sample Herbarium Label

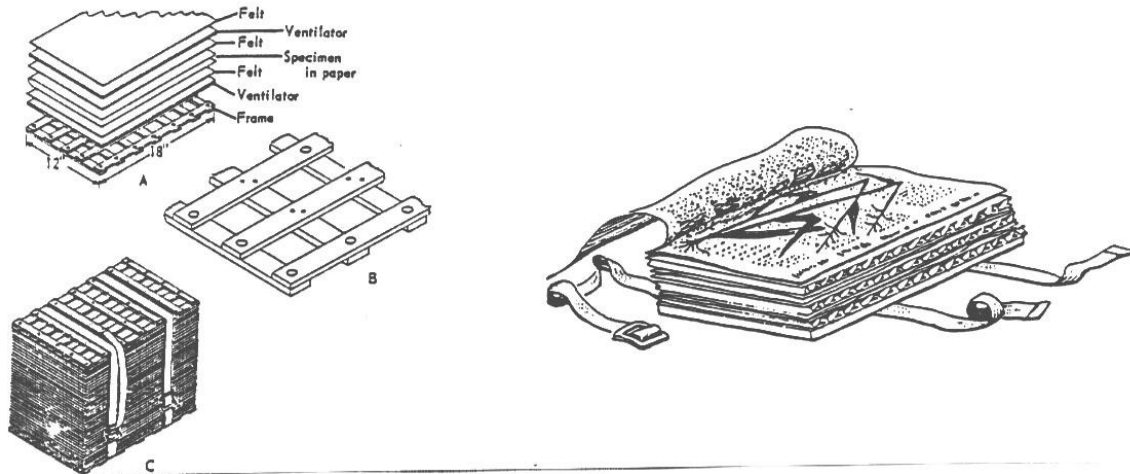
3. COLLECTING

- 1) Always collect plants in flower or fruit. This is sometimes difficult for trees, but an effort should be made to collect the flowers or fruit. Collect specimens which are representative of the population and avoid the tendency of collecting only those which fit on a standard herbarium sheet, 11 1/2" x 16 1/2". With some specimens, such as *Oplapanax* (Devil's Club), you will have to use a number of separate sheets.
- 2) Always collect a few extra flowers and fruits as you will often need to dissect out a pressed flower after first 'relaxing' it in hot water. Extra flowers are often placed in small packets and attached to the finished herbarium sheet.
- 3) Collect herbaceous plants with their roots or bulbs. Remove all excess soil. If a stream is handy wash off the roots - this is a must for all specimens collected in wet areas. In many bulbous plants, the bulbs are the most diagnostic part of the plant for identification to species. Sometimes it will be necessary to split large roots or bulbs so that they will dry satisfactorily. Notes should be made at the time of collection about the texture of bulb coverings.
- 4) Collections of trees or shrubs should have a sample of the bark taken from the trunk and dried with the specimen. It is important to make additional notes about the height, form and the diameter of the trunk at breast height (DBH) of trees and shrubs when the collection is made.
- 5) Place **each** collected specimen into a small plastic bag, usually 12" X 18" (bread bags or freezer bags work well) and blow air into each bag, tying it off. Add each 'ballooned' specimen to a large black plastic garbage bag.

- 6) Keep your specimens as cool as possible. On hot days take a large cooler with you and cover the specimen bags with newspaper and ice thus ensuring that your specimens do not freeze. If you can't press your specimens right away keep them overnight in the refrigerator or cooler. Note that the sooner your specimens get pressed the better will be your final product.

#### 4. PRESSING AND DRYING

- 1) Press you plants as soon as possible, although it sometimes helps to leave them in the plastic bags to wilt a little. Partial wilting sometimes makes the specimens easier to arrange on the newsprint sheets.
- 2) Plants should be folded (if necessary) or some of the parts removed in particularly large specimens in order that the specimen will fit into a rectangular area 11 1/2" x 16 1/2" inches (the size of a herbarium sheet). Thick roots and twigs will need to be cut lengthwise to decrease their bulk in the press.
- 3) Lay your plant out between the folded piece of newsprint so that it will 'look nice' on the finished herbarium sheet, noting that you need to allow room for the label in the bottom right hand corner. Ensure that at least one leaf is pressed lower side uppermost as the keys will often refer to the nature of the trichomes (hairs) on both the upper and lower surfaces.
- 4) Place your specimen folded in the newsprint between a cardboard sandwich in your plant press. If available place a blotter under, and over each folded piece of newsprint. Thus you should have multiple sets of: cardboard / blotter / newsprint / specimen / newsprint / blotter / cardboard. **Be certain** to put your collection number on the sheet otherwise you may lose track of the specimen when it is taken out of the press.
- 5) Place your end frames on each side of the cardboard sandwiches and apply all the pressure you can when cinching up the two straps or ropes. **Recinch** every 24 hours (approx.) If your furnace is on place the press over a vent so that the air can circulate up through the cardboard ventilators.
- 6) Be sure your plants are dry before removing them from the plant press. Usually 24 to 48 hours are required to dry plants when the press is placed in the hot summer sun or over artificial heat (**low temperature only**).
- 7) Store dried specimens where they will remain dry and not absorb moisture.



### The Plant Press

#### 5) USING KEYS

To identify a plant you could examine it carefully, read descriptions of all known plants, and see which one it matches most closely. There is a quicker way. You can key it out (identify it using a botanical key). A key is a series of paired choices concerning characteristics of the plant. Each choice is called a lead, and by choosing the lead that fits your plant, you will be directed to another set of leads. Eventually one of the choices leads to the name of the plant.

In lab, you will be mainly using the keys in Hitchcock and Cronquist, "Flora of the Pacific Northwest". Most of the keys in this book are good and accurate, but are somewhat difficult to use at first because they use lots of abbreviations and unnecessary terminology. Most of the abbreviations are pretty obvious, but if you don't know what one means, a list of them is near the front of each book. The keys in this book are unusual and good because the features mentioned are nearly all illustrated next to the lead. Be sure to note that the NUMBER of the ILLUSTRATION refers to the NUMBER of the LEAD of the KEY, not to the numbers just in front of the species names.

#### SUGGESTIONS FOR USING KEYS

1. Always read ALL of EACH of the choices. Even though the first one seems to fit, the next one may fit even better.
2. DO NOT GUESS on meanings of terms (look them up, then remember them) or measurements (use your ruler). You will find the well illustrated, *Plant Identification Terminology: An Illustrated Glossary* an excellent reference
3. Look at several specimens or parts of your plant. All organisms exhibit some variation, so look at several to get some idea of the average or normal. Some people have the uncanny ability to get the one freak in millions of normal specimens.
4. WHEN THE CHOICE IS NOT CLEAR, or you do not have sufficient

information or parts available to make the choice, try both leads, arrive at 2 possible identifications, and compare descriptions of the 2 final possibilities to make the final choice. Often, as you proceed further in the key, none of the leads will fit and it will be apparent that you should have made the other choice earlier.

5. IF NEITHER CHOICE SEEMS TO FIT, you probably made a mistake earlier. Retrace your steps.
6. ALWAYS, after arriving at an identification from a key, check a description and illustration of the species to see if it fits your specimen. Even better, check a correctly identified specimen in a herbarium to see if it is the same as your plant. (This could be more difficult than it sounds, a high percentage of specimens in herbaria are misidentified.) In lab, you can find complete descriptions and larger illustrations in the 5-volumes "Vascular Plants of the Pacific Northwest" by Hitchcock *et al.* Up to date descriptions and synonymies can be found in the recently published *Illustrated Flora of British Columbia*. Copies are available to use in lab.

## 6) POTENTIAL REFERENCES TO IDENTIFY YOUR PLANTS

### FIELD GUIDES FOR SOUTHERN INTERIOR BC

Parish, R., R. Coupe and D. Lloyd. 1996. *Plants of Southern Interior British Columbia*. Edmonton: Lone Pine Publishing.

### B.C. MUSEUM GUIDES

- Brayshaw, T.C. 1976. *Catkin Bearing Plants of British Columbia*. Occasional Paper No. 18. Victoria: Royal British Columbia Museum.
- Brayshaw, T.C. 2000. Pondweeds, Bur-reeds and their Relatives of British Columbia. Victoria: Royal British Columbia Museum.
- Schofield, W.B. 1992. *Some Common Mosses of British Columbia*. Second Edition. Victoria: Royal British Columbia Museum.
- Szczawinski, A.F. and G.A. Hardy. *Guide to Common Edible Plants of British Columbia*. Victoria: Royal British Columbia Museum.
- Turner, N.J. 1995. *Food Plants of Coastal First Peoples*. Victoria: Royal British Columbia Museum.
- Turner, N.J. 1997. *Food Plants of Interior First Peoples*. Victoria: Royal British Columbia Museum.
- Turner, N.J. 1979. *Plants in British Columbia Indian Technology*. Victoria: Royal British Columbia Museum.
- Turner, N.J. et al. 1990. *Thompson Ethnobotany: Knowledge and Usage of Plants by the Thompson Indians of British Columbia*. Victoria: Royal British Columbia Museum.

### BOOKS & GUIDES

- Arora, D. 1986. *Mushrooms Demystified*. Second Edition. Berkeley: Ten Speed Press.
- Arora, D. 1991. *All That the Rain Promises, and More*. Berkeley: Ten Speed Press.
- Brayshaw, T.C. 1996. *Trees and Shrubs of British Columbia*. Vancouver: UBC Press and Royal British Columbia Museum.
- Brown, L. 1979. *Grasses: An Identification Guide*. New York: Houghton Mifflin Company.

- Cody, W.J. and D.M. Britton. 1989. *Ferns and Fern Allies of Canada*. Ottawa: Minister of Supply and Services Canada.
- Farrar, J.L. 1995. *Trees in Canada*. Markam: Fitzhenry & Whiteside Limited and the Canadian Forest Service, Natural Resources Canada, Ottawa.
- Flowers, S. 1973. *Mosses: Utah and the West*. Provo: Brigham Young University Press.
- Goward, T. and C. Hickson. 1995. *Nature Wells Gray*. Second Edition. Lone Pine Publishing and The Friends of Wells Gray Park.
- Guard, B.J. 1995. *Wetland Plants of Oregon & Washington*. Edmonton: Lone Pine Publishing.
- Harris, J.G. and M.W. Harris. 2000. Second Edition. *Plant Identification Terminology*. Spring Lake: Spring Lake Publishing.
- Johnson, D. et al. 1995. *Plants of the Western Boreal Forest & Aspen Parkland*. Edmonton: Lone Pine Publishing.
- Kershaw, L., A. MacKinnon and J. Pojar. 1998. *Plants of the Rocky Mountains*. Edmonton: Lone Pine Publishing.
- Kershaw, L. 2000. *Edible & Medicinal Plants of the Rockies*. Edmonton: Lone Pine Publishing.
- Klinka, K., V.J. Krajina, A. Ceska and A.M. Scagel. 1989. *Indicator Plants of Coastal British Columbia*. Vancouver: University of British Columbia Press.
- Lawton, E. 1971. *Moss Flora of the Pacific Northwest*. Nichinan: The Hattori Botanical Laboratory.
- Lloyd, D. et al. 1990. *A Guide to Site Identification and Interpretation for the Kamloops Forest Region*. Victoria: Ministry of Forests, Research Branch.
- Lyons, C.P. and W. Merilees. 1995. *Trees, Shrubs & Flowers to Know in British Columbia & Washington*. Edmonton: Lone Pine Publishing.
- MacKinnon, A., Pojar, J. and R. Coupe. 1999. Second Edition. *Plants of Northern British Columbia*. Edmonton: Lone Pine Publishing.
- Malcolm, B. and N. Malcolm. 2000. *Mosses and Other Bryophytes: An Illustrated Glossary*. Nelson, New Zealand: Micro-Optics Press.
- Meidinger, D. 1988. *Recommended Vernacular Names for Common Plants of British Columbia*. Victoria: Ministry of Forests.
- Meidinger, D. and J. Pojar, editors. 1991. *Ecosystems of British Columbia*. Victoria: BC Ministry of Forests.
- Moerman, D.E. 1998. *Native American Ethnobotany*. Portland: Timber Press.
- Moore, M. 1993. *Medicinal Plants of the Pacific West*. Santa Fe: Red Crane Books.
- Neave, R. 1995. *Exploring Wells Gray Park*. Fourth Edition. Kamloops: The Friends of Wells Gray Park.
- Parish, R., R. Coupe and D. Lloyd. 1996. *Plants of Southern Interior British Columbia*. Victoria: BC Ministry of Forests and Edmonton: Lone Pine Publishing.
- Pojar, J. and A. MacKinnon. 1994. *Plants of Coastal British Columbia*. Victoria: BC Ministry of Forests and Edmonton: Lone Pine Publishing.
- Savile, D.B.O. 1962. *Collection and Care of Botanical Specimens*. Ottawa: Canada Department of Agriculture.
- Schofield, J.J. 1989. *Discovering Wild Plants: Alaska, Western Canada, The Northwest*. Seattle: Alaska Northwest Books.
- Stubbendieck, J. et al. 1997. *North American Range Plants*. Fifth Edition. Lincoln: University of Nebraska Press.
- Vitt, D.H., J.E. Marsh and R.B. Bovey. 1988. *Mosses, Lichens & Ferns of Northwest North America*. Edmonton: Lone Pine Publishing.
- Walters D.R. & D.J. Keil. 1996. Fourth Edition. *Vascular Plant Taxonomy*. Dubuque: Kendall/Hunt Publishing Company.

Whitson, T.D., Editor 2000. Ninth Edition. *Weeds of the West*. Newark: The Western Society of Weed Science

## IDENTIFICATION OF BRITISH COLUMBIA VASCULAR PLANTS

**Floras of local regions or surrounding areas, all useful for British Columbia or some part of it. Technical, with few illustrations unless indicated otherwise.**

Abrams, L. 1923-1960. *Illustrated Flora of the Pacific States*. Volumes 1-4. Stanford University Press, Stanford, Calif. Different volumes published in different years. (completely illustrated)

Anderson, J. P. 1959. *Flora of Alaska*. Iowa State University Press, Ames, Iowa. Covers much of our northern flora and high elevation plants from farther south.

Calder, J. A. and R. L. Taylor. 1968. *Flora of the Queen Charlotte Islands*. Part 1. Systematics of the Vascular Plants. Queen's Printer, Ottawa.

Davis, R. J. 1952. *Flora of Idaho*. Wm. C. Brown Co., Dubuque, Iowa.

Douglas, G.W., G.B. Straley and D. Meidinger. 1990-1994. *The Vascular Plants of British Columbia*. Special Report Series 1-4. Victoria: British Columbia Ministry of Forests Research Branch.

Douglas, G., G. Straley, and D. Meidinger. 1998. *Rare Native Vascular Plants of British Columbia*. Victoria: British Columbia Conservation Data Centre.

Douglas, G, D. Meidinger and J. Pojar, Editors. 1998-2002. *Illustrated Flora of British Columbia: Volume 1-8*. Victoria: Ministry of Environment, Lands and Parks and Ministry of Forests.

**This is the most up-to-date taxonomic treatment of our flora.**

Gilkey, H. 1961. 2nd edition. *Handbook of Northwest Flowering Plants*. Binford and Mort, Portland, Oregon.

Hitchcock, C. L., A. Cronquist, M. Ownbey, and J. W. Thompson. 1955-1969. *Vascular Plants of the Pacific Northwest*. Volumes 1-5. University of Washington Press, Seattle.

Hitchcock, C. L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle & London.

Hulten, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, Calif.

Meidinger, Del. 1988. *Recommended Vernacular Names for Common Plants of British Columbia*. B.C. Ministry of Forests, Victoria, B.C.

**This is an attempt by the MoF to standardize common names throughout B.C.**

Morin, N. Convening Editor. 1997. *Flora of North America North of Mexico*. New York: Oxford University Press.

**This definitive treatment of our North American flora will ultimately extend to 30 volumes**

Moss, E. H. 1959. *Flora of Alberta*. Toronto: University of Toronto Press.

Peck, M. E. 1941. *A Manual of the Higher Plants of Oregon*. Binford & Mort, Portland, Oregon.

Scoggan, H. J. 1978-1979. *The Flora of Canada*. Volumes 1-4. National Museums of Canada. Ottawa.

St. John, H. 1963. *The Flora of Southeastern Washington and of Adjacent Idaho*. 3rd ed. Outdoor Pictures, Escondido, California.

Szczawinski, A. F., and A. S. Harrison. 1973. *Flora of the Saanich Peninsula*. B.C. Provincial Museum, Victoria, B.C.

Welsh, S.L. 1974. *Anderson's Flora of Alaska and Adjacent Parts of Canada*. Brigham Young University Press, Provo, Utah. (completely illustrated)

**Books useful for special groups.**

- Brayshaw, T. C. 1976. *Catkin Bearing Plants of British Columbia*. B. C. Provincial Museum Occasional Paper Series, No. 18. Queen's Printer, Victoria.
- Farrar, J.L. 1995. *Trees in Canada*. Markam: Fitzhenry & Whiteside Limited and the Canadian Forest Service, Natural Resources Canada, Ottawa.
- Hurd, E.G., S. Goodrich and N.L Shaw. 1994. *Field Guide to Intermountain Rushes*. Ogden: Intermountain Research Station.
- Looman, J. 1982. *Prairie Grasses Identified and Described by Vegetative Characters*. Ottawa: Minister of Supply and Services Canada.
- Roberts, A. 1983. *A Field Guide to the Sedges of the Cariboo Forest Region, British Columbia*. Victoria: Ministry of Forests.
- Taylor, T. M. C. 1970. *Pacific Northwest Ferns and Their Allies*. Toronto, University of Toronto Press

**A checklist without keys or illustrations, but with a contemporary synonymy.**

- Douglas, G.W. et al editors. 1994. *Vascular Plants in B.C.* Parts 1-4. Crown Publications Inc. Victoria, B.C.
- Taylor, R. L., and B. MacBryde. 1977. *Vascular Plants of British Columbia: A Descriptive Resource Inventory*. Technical Bulletin, UBC Botanical Garden, UBC Press, Vancouver. 778 pp.