

# The UBC Herbarium

## Visitor Guidelines

### The Collections

The UBC Herbarium houses over half a million plant specimens from around the world with a focus on plants of British Columbia. This collection is critical to the identification, monitoring, and conservation of plant biodiversity in British Columbia, and is an important resource for education and scientific research.

The herbarium includes five major collections: macroscopic algae (mostly seaweeds), bryophytes (mosses, liverworts and hornworts), fungi, lichens, and vascular plants (flowering plants, conifers, ferns, and their relatives).

In addition to the world's largest collection of BC plants, our internationally recognized bryophyte collection is the largest in Canada. We also have important collections of Pacific algae and fungi, Hawaiian plants, tropical prayer plants (Marantaceae), and cyanolichens.

#### **Algae**

The UBC Phycological Collection has in excess of 89,000 specimens with the majority of these from the northeast Pacific, including about 3,800 accessions of coralline algae. This collection focuses on the diverse seaweed flora of the northeast Pacific from Oregon to Alaska.

Type specimens: 152

Current filing system: specimens are filed by phylum, then alphabetically by genus, then colour-coded by geographic region.

#### **Bryophytes**

With more than 240,000 specimens, the Bryophyte Collection at UBC is the largest and most comprehensive in Canada, and one of the largest in the world. The major representation is from British Columbia and adjacent United States: Alaska, Washington, Oregon, California and also Arizona. The collection also includes strong representation from the Atlantic Provinces of Canada. In addition to North American specimens, we house collections that are worldwide in scope.

Type specimens: 268

Current filing system: specimens are filed alphabetically by family, genus, then by geographic region (see folder color code in binder).

#### **Fungi and relatives**

The Fungal Collection is home to the largest research collection of macrofungi of British Columbia (23,000 accessions). The collection of Agaricales (mushrooms) has expanded rapidly in the recent years. The herbarium also has extensive holdings from the order Tremellales due to Dr. R.J. Bandoni's interest and research in the group.

Type specimens: 20

Current filing system: specimens are filed by kingdom, starting with Protozoa, Chromista, Fungi. In Protozoa and Chromista, specimens are filed alphabetically by phylum, class and genus. Fungi are ordered by phylum (Basidiomycota and Ascomycota). Within phylum, specimens are filed alphabetically by class and genus. Please see collection manager for a list of taxa.

#### **Lichens**

With more than 43,000 lichens specimens catalogued to date, the UBC Herbarium houses one of the largest collections in western North America. We have a very solid macrolichen collection, with a strong focus on cyanolichens, especially the genus *Peltigera*. Prominent collectors include: George Otto, with 2,500 accessions; Willa Noble 2,200; Teuvo Ahti 450; Irwin Brodo 700; Trevor Goward 15,000. Of the

entire Lichen Collection, 66% are from B.C., 12% are from the rest of Canada and the other 12% are from smaller collections from around the world.

Type specimens: 50

Current filing system: specimens are filed alphabetically by genus.

### Vascular Plants

(Include Ferns & Fern Allies, Gymnosperms, and Angiosperms)

The UBC Herbarium has the world's largest collection of British Columbia vascular plants and is worldwide in scope. Of the 240,000 vascular plant specimens, about 45% are from British Columbia, 22% are from the rest of Canada. The Northwest Territories and Yukon are especially well represented.

Specimens from the United States make up about 16% of the Collection, with 9% from the five Pacific Coast states (California, Hawaii, Oregon, Washington, and Alaska) and 7% from the rest of the United States. Hawaiian plants are especially well represented. About 17% of the collection is from the rest of the world, with the largest numbers from Great Britain, Finland, China, Australia, Denmark, Japan, South Africa, Taiwan, Russia, Greenland, and Sweden.

Type specimens: 136

Current filing system: specimens are filed taxonomically by family based on Angiosperm Phylogeny Group III system and other resources. Within a family, specimens are filed alphabetically by genus, then colour-coded by geographic region. Please ask for assistance to locate a family.

### To Locate Specimens

The five collections: Algae, Bryophytes, Fungi, Lichens, and Vascular Plants, are located in cabinets in the public realms of the Beaty Biodiversity Museum, as shown on the map below. The filing system in each collection varies (see information about each collection above). Type specimens of all collections are stored in the Herbarium office (Room 018).

Please note that our collections are not all updated to current taxonomic treatments. Specimens may be stored under synonyms or based on previous treatments. If specimens cannot be located using the currently accepted name, please look under synonyms or ask for assistance.

### General Practice

Herbarium specimens are fragile and some are over 100 years old. Please help us to preserve this valuable collection for future generations by following these guidelines, and asking for assistance if you are unsure about how to handle specimens.

#### Specimen handling

- ❖ Specimens, including loans, are not to be removed from the herbarium.
- ❖ Remove the entire folder from the cabinet and use the sliding cabinet shelves or one of the work benches in Room 005 to examine the specimens and inform a staff member when the specimens are retrieved from a cabinet.
- ❖ Handle specimens gently and never turn them over as this can cause permanent damage
- ❖ Destructive sampling is strictly prohibited unless special permission is granted by a Collections Manager or Curator.
- ❖ If the specimen is loose or becoming unglued, inform a staff member so it can be repaired.
- ❖ Do not leave specimens unprotected on the working table when you finish. Inform a staff member or ask for instruction.
- ❖ Return cabinet and room keys before you leave.

#### Pest and safety control

- ❖ Inform a staff member if you are bringing in any fresh plant material, personal collection, or other material that might include pests.

- ❖ Avoid bringing in plant material with excess soil. If necessary, these can be frozen so they can be safely examined without introducing pests to the collections.
- ❖ Some of our older collections have been chemically treated to deter insect infestation. Specimens should be handled with care. Gloves are available on request.

#### Specimen filling

- ❖ Please ask for guidance before filing any specimens back to the cabinets
- In general, specimens that have been out of the cabinets for more than 24 hours should be frozen before re-filing back in the cabinet.

#### Destructive Sampling

Destructive sampling is strictly prohibited unless special permission is granted by a Collections Manager or Curator. Destructive sampling includes but is not limited to leaf sampling for DNA extraction, sampling of pollen, spores and/or any parts of the specimen.

Research annotation is required for destructive sampling. Annotations should be attached but not glued. Please see Annotation section for more instruction.

#### Annotation

Archival-grade paper slips of Determinavit, Confirmavit and Research Annotation slips are available in the Herbarium. Annotations must be written or printed on archival paper (100% cotton paper). All the information on the slips should be either printed or legibly written in archival pen. Annotations should be attached by paper clips or by other means but should NOT be glued.

If possible, all specimens studied should be annotated. For destructive sampling, a Research Annotation is required. Please ask for assistance when you need to make a large number of annotations.

#### Determinavit and Confirmavit Annotations

Should include: Accession number of the specimen, determination, signature and date. Additional notes, references, institution/organization, can also be included.

#### Research Annotation

Should include: Accession number, material removed, the nature of the study (leaf material sampled for DNA, pollen samples taken etc.), GenBank number (if available) the researcher's name, and date. Additional notes and institution/organization can also be included.

Preferably, a researcher can draw an outline or arrow (on the specimen sheet in pencil) to indicate where the sample was taken with researcher's name and date.

If identification of the specimen has been made, a separate Determinavit or Confirmavit Annotation slip should be attached.

#### Update Annotations in the Database

Depending on workload, annotations can take from a few weeks to a few months to be updated in our database.

### **Database Access**

The algae, lichen, and fungal collections have all been fully entered into the database; bryophyte and vascular plant collections are >60% complete. Digital records of label information and available images from all five collections are shared through searchable online databases, available at [www.biodiversity.ubc.ca/museum/herbarium/](http://www.biodiversity.ubc.ca/museum/herbarium/)

The online searchable databases contain the main information about the specimen (Accession No., Taxon info, Collection location and date, Geo-reference, Collector and Collector's No., Notes, Previous identifications/Annotations, and image of the specimen if available).

Our in-house databases are more comprehensive and include additional information, such as loan history, additional notes and etc. Such information is available upon request.

The records in the databases are updated on an ongoing basis to meet new standards, add more specimens, and update specimen information. The information may not be complete (e.g. annotations may not be entered). Some of the information about the specimen shown in the record may not be on the original label (e.g. geolocation etc.). The taxon names match those on the specimens; these are not updated unless the specimens are annotated. Synonym search is required for a comprehensive list of specimens (in database and in cabinets).

Our databased records are also partially or fully shared with:

- ❖ Canadensys: <http://data.canadensys.net/explorer/search> (vascular plants only; search results are downloadable; images included)
- ❖ Consortium of Pacific Northwest Herbaria Database: <http://www.pnwherbaria.org/> (vascular plants only)
- ❖ Global Biodiversity Information Facility (GBIF): <http://data.gbif.org> (vascular plants only)
- ❖ JSTOR Plant Science: <http://plants.jstor.org/> (types of all collections only, images included)
- ❖ E-flora BC: <http://www.geog.ubc.ca/biodiversity/eflora/>

## Specimen Images

We house an image bank of specimens from all collections. Specimens are either imaged by scanner (600 dpi resolution) or by camera (300 dpi resolution). High resolution images are not available online but can be requested.

The digitization of the collections has been funded by operational funds, supplemented with grants from various organizations and by donations.

In addition, some of the images are done by our herbarium volunteers. Currently, we have images available for about 21,000 specimens; more than 95% are vascular plants.

Some of the major imaging projects we've done over the last few years:

- Digitization of the type specimens of all five collections (by scanner, 600 dpi)
- Digitization of Yukon Vascular Plants (by camera, 300 dpi)
- Digitization of Dr. Gerald Straley's historical collection (by camera, 300 dpi)
- Digitization of historical B.C. collections of John Davidson (by scanner, 600 dpi)
- Digitization of historical B.C. collections of John Davidson's correspondents (by scanner, 600 dpi)

### Loans

To request loans from the UBC Herbarium, please contact the Collections Manager and Curator.

### Dissecting and Compound Microscopes

#### Dissecting Microscopes

We have a few dissecting scopes in the Research Room (Room 005). If you are a first-time visitor, please ask for guidance before use.

There is a dissecting scope connected to a camera in the main office (Room 018). Formal training is required to use this dissecting scope. Please contact the Collections Manager to make arrangements for training.

### Compound Microscopes

There are two microscopes in the main office, each connected to a camera. Formal training is required to use this dissecting scope. Please contact the Collections Manager to make arrangements for training.

Microscopes with cameras are in high demand and available only by appointment. Appointments should be made at least 2 weeks in advance (allow more time when training is involved).

We do NOT store images taken for the user's own use. Please make a copy of your work before you leave.

#### Other Resources

Our reference library has many old, rare, and specialty books, and a range of floras and field guides. A list of book titles is available upon request.

Herbarium supplies, including plant presses, cardboards, herbarium mounting paper and folders, are available for sale.

#### Specimen Donation

Please contact the Collections Manager and Curator if you want to donate specimens to the UBC Herbarium.

## **The UBC Herbarium**

**Beaty Biodiversity Museum and Department of Botany,  
University of British Columbia**

