

Archiving the Flora of the Pacific Northwest in the Western Washington University Herbarium

by *Eric DeChaine, Curator, and Fred Rhoades, Curator of Fungi, Western Washington University Herbarium*

Herbarium Name: Western Washington University Herbarium
Location: Western Washington University, Dept. of Biology, room 239, 516 High St., Bellingham, WA 98225
Date founded: 1996
Tag ID: WWB
Number of collections: 4 (vascular plants, non-vascular plants, algae, fungi)
Size of collection: over 26,000 specimens
Open to the public: hours vary, but usually 10-4 on weekdays
Website: <http://myweb.facstaff.wwu.edu/dechaie/herbarium.html>
Volunteers needed: yes, specimen mounting and databasing
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The mission of the Western Washington University Herbarium (WWB) is to archive and make accessible correctly identified botanical specimens, with an emphasis on those inhabiting the Pacific Northwest. Because a large part of our aim is to share this repository of botanical information, we have an open door policy with scientists, students, and the greater community. Indeed, we are visited by teachers, taxonomists, ecologists, conservation biologists, environmental consultants, ethnobotanists, and amateurs for identification of plants and fungi and information on their morphological variation, distribution, and ecology. As such, the herbarium is an excellent resource for anyone interested in botany and mycology of the Pacific Northwest.

While the main focus of WWB is vascular plants of the Pacific Northwest, the collection also includes non-vascular plants, algae, and fungi from around the region and beyond. Of particular interest is our specialty collection of plants from the North Cascades. With more than 26,000 specimens, the herbarium contains a rich assortment of botanical information. In addition, WWB serves as a portal to other national and international herbaria through specimen loans and exchanges. By being part of the network of herbaria (the Index Herbariorum), we can readily access the wealth of morphological, ecological, geographical, and even genetic data available that is housed in plant collections around the world. Not only do we have preserved specimens, but also a

small reference library on plant systematics and the flora of the region.

The geographic focus of the collection is largely delimited by the Vancouverian Province of the Rocky Mountain Floristic Region. The Region is comprised of two provinces that basically span the western (Vancouverian) and eastern (Rocky Mountain) mountain ranges. The herbarium lies near the geographic center of the Vancouverian Province, which extends from the southern tip of the Cascades, just south of the Oregon-California border, northwards through the Cascades along the coast, and into Alaska. This region is marked by wide changes in elevation across a topographically complex landscape, with some ranges (i.e., the Olympics) isolated from the main cordillera. This heterogeneous terrain offers a diversity of environments that have no doubt promoted the great species diversity and high degree of endemism witnessed across the region.

In systematics, it goes without saying that the process of speciation begins well before distinct species arise. It is the same with the origination of the WWB Herbarium. The following history has been gleaned from anecdotal notes and correspondences found tucked away in the herbarium, and through conversations with those involved with the collections in the early years of the department (with special thanks to Jerry Flora and Rich Fonda). No clear chronology was kept as the herbarium grew, and as such, many of the details have been lost through the years. The herbarium began as a simple teaching collection, built up by faculty members interested in botany, such as Ruth Platt and Leona Sundquist, who pressed, mounted, and preserved plant specimens at what was then known as Western Washington College of Education. During the early stages of the collection, Sundquist served as the Science Department chair, becoming the first chair of the Biology Department that was founded in 1961. At that time, the department was located in Haggard Hall, but there was no official herbarium, per se. In the mid-1950's Jim Martin became the first skilled taxonomist to be involved with the collections. But, it wasn't until Ron Taylor was hired in 1964

that the collections really started to grow. Taylor built up the collections on his own, by trading specimens with other herbaria, and through sampling of specimens from student collections in the Systematic Botany course. In 1977, the college was renamed Western Washington University and it was about that time that the herbarium-proper originated. Taylor continued to augment the collections through 1992 when he retired. David Morgan replaced Taylor and served as the curator from 1993-2005. In the fall of 1996, the Biology Department moved from Haggard Hall into the new Biology Building, which had a room dedicated to the

WWB herbarium with new storage cabinets, desk-space, and dissecting microscopes. Following Morgan's departure in 2005, Barry Wendling, an aspiring graduate student and keen botanist, volunteered as the interim collections manager. And, with Wendling as his graduate student, Eric DeChaine took on the role of herbarium curator in 2006.

The WWB Fungal Herbarium at WWU consists of 5101 specimens, including slime molds (Myxomycota), lichen-forming fungi (Ascomycota and Basidiomycota) and free-living fungi (Ascomycota, Basidiomycota and a few Deuteromycota). This collection was begun by mycologist Richard Haard in the late 1960s and curation has continued by mycologist Fred M. Rhoades from 1977 to the present time. The collection is mainly a teaching collection and includes mostly locally common representatives added to the collection by students over the years. Also included are fungi and lichens from Oregon from the early collections of Fred M. Rhoades, lichens deposited by Bruce Ryan from his Masters Thesis ecological study at Washington Park, Anacortes, WA, and lichens and fungi deposited from studies by Fred M. Rhoades at the Sulfur Creek lava flow (Mt. Baker), Olympic National Park, Lopez Island, and elsewhere in northwest Washington. There is also a nicely packaged collection of Myxomycota from a private collector in California and few exsiccata from other lichenologists. An additional historical note: an early member of the science faculty of the Washington State Normal School at Bellingham (progenitor of WWU) was A. W. C. T. Herre, an early Pacific Northwest lichenologist. He collected here in the 1910 to 1920 time frame and several northwest species are named after professor Herre. However, as far as we know, he left none of his collections at the College—they were all donated to herbaria in California where he originally came from and retired to.

The WWB Bryological Herbarium at WWU consists of 2638 specimens. It was begun in the 1950s by former WWU botanist, Jim Martin and added to over the years by his students, WWU mammologist Clyde Senger, and students of mycologist Fred M. Rhoades who taught Bryophytes back in the 1980s. The collection is mainly a teaching collection and includes mostly locally common representatives. A nice collection of specimens, some from a 1925 class at Friday Harbor taught by bryologist Lois Clark, was donated by Doris Mullen.

In the herbarium, we are currently funded through the National Science Foundation to research how climate change during the Quaternary (~ the last 2 million years) impacted the diversity and distribution of arctic and alpine plants in western North America. The wildflowers that color the

tundra landscape hold clues to the secret of how arctic and alpine species have responded to climate change in the past. During the Ice-Ages, the climate oscillated between cold glacial and warm interglacial periods and habitats shifted accordingly—forcing populations to either persist in refugia, migrate to areas of more suitable habitat, adapt to the changing environment, or go extinct locally. How the plants responded can be inferred from the variation that they harbor within their genomes. By understanding how species were influenced in the past, we can better predict how they may respond to future climate change.

To investigate the consequences of the Quaternary on tundra plant diversity, we are collaborating with Dr. Charles Davis at the Harvard University Herbaria to investigate the systematics of several genera across a broad spectrum of angiosperm families in the northwest. Species include members of the Cyperaceae, Juncaceae, Poaceae, Liliaceae, Polygonaceae, Saxifragaceae, Crassulaceae, Fabaceae, Rosaceae, Lentibulariaceae, Campanulaceae, and Asteraceae. For our research, we are collecting plants from the field, pressing and mounting them for accession in the herbarium, sequencing their DNA, and testing biogeographic and speciation hypotheses. For more information about this research, please visit <http://myweb.facstaff.wwu.edu/dechaie/>. During our collecting expeditions to remote arctic and alpine sites, we not only pick, press, and preserve individuals of the target species of interest, but also voucher specimens of all species we encounter in order to augment the distribution and morphological data available to the botanical community in general. As one might imagine, the number of tundra plants in the WWB collection is growing rapidly! As with any systematic project, this work necessitates examining numerous specimens, not only from nature, but also those curated in other herbaria. Thus, we have many specimens on loan from other herbaria (e.g., the University of Alaska Herbarium in the Museum of the North (ALA), the Harvard University Herbaria (HUH), and the University of British Columbia Herbarium (UBC) to name a few).

In addition to increasing the number of specimens, we are in various stages of databasing our collections. Our goal is to have every specimen in the database, including accession numbers, collection information, and high-resolution images of the specimens so that the geographic, ecological, and morphological data archived within WWB available to all botanists via the internet. Through the involvement of students and other volunteers, we hope to complete this project in the near future.

Contact Eric DeChaine at (360) 650-6575, eric.dechaie@wwu.edu and Fred Rhoades at fred.rhoades@wwu.edu

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Douglasia

c/o Washington Native Plant Society
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Seattle, WA 98115

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BLAINE, WA

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Balsamorhiza rosea

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