



FRIENDS

OF THE UNIVERSITY
OF MONTANA

HERBARIUM

Spring 2006

Flora of Montana On-line

by Peter Lesica

The Montana Flora On-line Project is underway. In September I began specimen determinations and nomenclature updating. At the same time Zia Maumenee began customizing the Specify database program for our use. Specify is a large and complex database program developed at the University of Kansas for museums of all kinds. Tarn Ream, the graduate student supervisor, began entering data and helping Zia debug the software in October.

Then in November, Elizabeth Crone started hiring student data enterers, and we were underway. Things went slowly at first because everyone was still learning, but now Zia and Tarn have a good handle on the system, and there are ten students working. As of spring break, nearly 2,500 specimens had been entered. Zia has now turned her attention to building the website, designing it to be friendly to interested lay people as well as professional botanists. The Project intends to hire a teacher to review the website for user-friendliness. Right now queries of the 2500 specimens (mainly ferns and fern allies) can be accomplished, but only from a university computer. Zia hopes that the database will be available to the World Wide Web by the end of summer.

The benefits of the project are already becoming apparent. Thus far I have examined every Montana specimen in the first ten cabinets (there are 75 total) to make sure that the determinations are correct. The first five volumes of the new *Flora of North America* have been invaluable. In the process I have found no fewer than eight species previously unreported for the state, most of which were hiding behind misidentifications. Four of these are introduced from Eurasia: *Papaver croceum*, *Amaranthus tuberculatus*, *Silene chalcidonica* and *Gypsophila scorzonnerifolia*. The other four, *Delphinium glaucum*, *Betula pumila*, *Abronia elliptica* and *Chenopodium dessicatum* are native. It's gratifying to know that I collected four of these and humbling to admit that I originally misidentified them.

I had an opportunity to try out the database recently. As I was going through the Montana fern collections, I noticed a familiar name. C. N. (Chuck) Miller is a retired professor of Botany. He taught paleobotany and plant anatomy when I came here in the 1980's, and he is an internationally known expert on fossil pines. I was interested in the fact that back in the mid-60's he had been collecting ferns. I learned that two of his Ph.D. advisors at the University of Michigan had been Warren Wagner (see 2001 FOH newsletter) and John Mickel, two big-name pteridologists. I queried the database for all Chuck's

(Continued on page 4)



Papaver croceum, newly reported for the state; previously identified as *Papaver rhoeas*.

FRIENDS

of the University
of Montana

HERBARIUM



**BIOLOGICAL SCIENCES
UNIVERSITY OF
MONTANA
MISSOULA, MT 59812**

*THE MISSION OF THE
FRIENDS IS TO SECURE
SUPPORT FOR AND TO
ENRICH THE
COLLECTIONS AND
OPERATIONS OF
THE UM HERBARIUM*

BOARD OF DIRECTORS

Drake Barton
Tara Carolin
Marilyn Marler
Scott Mincemoyer
Steve Shelly, president
David Dyer, ex officio

The *Friends* Newsletter
is edited by
Peter Lesica and David Dyer

Layout by
Drake Barton and Kathy Lloyd

Activities

The Clark Fork Chapter of the Montana Native Plant Society held three meetings in the herbarium in 2005. Peter Stickney presented the stemless Primulaceae, James Riser taught a session on milkweeds, and Peter Lesica gave a class on Montana buckwheats.

Notes from the Board

Like the wardrobe door into Narnia, the herbarium door is like a door into another time and place; only here it is always summer, and you can find almost any plant you can think of in bloom or at least in some form of vegetative state. In my career as an -ologist for National Parks such as Canyonlands, Arches, and now Glacier, and before that as a student of botany, I have had a fair amount of experience with herbariums over the years, and writing this editorial leads me to think about a few of the many reasons I've learned to appreciate an herbarium.

Early in my career the single-cabinet herbarium for the southeast Utah parks was located right in my office and small enough I could browse through all the specimens prior to field season each year. I remember how excited I was to identify the mustard, spectacle-pod (*Dithyrea wislizenii*), the first time I saw it in the field, because I recognized it from having seen the herbarium mount. During those years, I sometimes visited the Brigham Young University herbarium and at least once made photocopies of several species not represented in the parks' herbarium, so I could develop a search image for some less common plants.

In my work I have often found wilted plants with question marks on sticky notes on my desk, but in this electronic age, more and more often I am asked to identify plants in digital photographs or even faxes. Digital photographs don't often key well (who knows how hairy that corolla is?), but sometimes a comparison with herbarium mounts can help narrow down possibilities. Then after struggling through a field key with a wilted specimen of a plant without all the required parts present and finally coming to a tentative conclusion, no photograph, line drawing, or description can boost confidence in my decision like taking my sample over to a herbarium and comparing it to a verified specimen (either that or it provides sure evidence I took a wrong turn somewhere in the key). Associated data found on the label are almost equally as valuable. I can envision the plant in its field setting by reading about habitat, soil or substrate type, elevation, associated species, and collection date. From labels I not only learn about the plant, but I learn about the history of botanical exploration in the park.

I also get data requests such as an inquiry about Jones' columbine (*Aquilegia jonesii*) record details, or occurrences of pink corydalis (*Corydalis sempervirens*) prior to post-2000 fires. For these types of questions, I've been fortunate in the park service to have an electronic database that provides all herbarium label data for specimens in the park herbarium. I can look up information in the database at my desk without having to disturb herbarium specimens at all (many date back more than 50 years and a few surpass 90-120 years!). I am very excited about the prospect of gaining access to data for many MONTU specimens as well, thanks to the Montana Flora On-line Project. While I don't frequently get to the MONTU herbarium in person, I expect to make regular use of the electronic database once it is on-line. It may not be as fun as stepping into the world of the herbarium, but it is efficient and saves wear and tear on the herbarium.

An herbarium may be as valuable to the botanist as a wrench is to the mechanic, but more than that, sometimes it is just good to know even though it is the middle of January and my favorite plants lie dormant under the snow, I can step into another season and habitat in the herbarium and get a good botanical fix. Likewise, find your favorite herbarium and have fun botanizing!

Tara Carolin

MONTU People

...Eugene E. Addor

Hay fever can be pretty unpleasant for those who suffer from it. However, hay fever isn't all bad, at least as far as the UM Herbarium is concerned, because it led to one of the earliest systematic plant collections for the Missoula Valley. It all started nearly 90 years ago when William Scheppegrell reported to public health officials that hay fever was common in parts of the Northern Rocky Mountains, including Missoula. Several researchers developed classifications based on dominant vegetation and geography that allowed some ability to predict hay fever seasons, but it wasn't until the mid-50's that the definitive work was done by a forestry student turned botanist at the University of Montana.

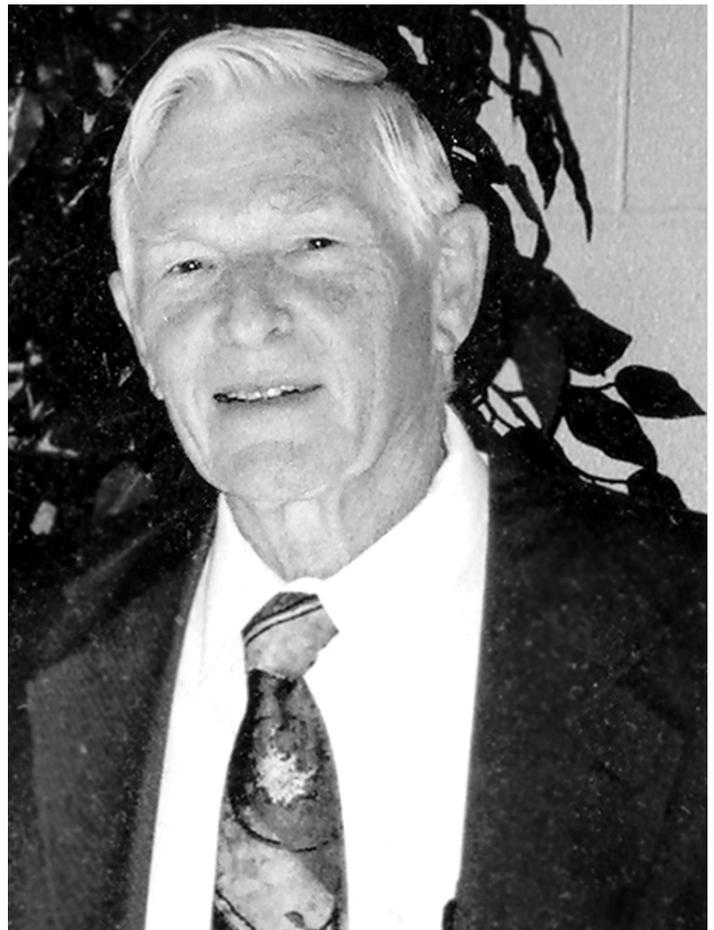
Eugene Addor came to Missoula from Ukiah, California in 1950. Although Gene came from a family of mechanics, he seems to have gotten his start in plant science from the five summers he spent working for Mendocino National Forest in northern California. He graduated high school in 1947 and then attended Santa Rosa Junior College for two years to get a stronger background in math and science. By this time he had decided to be a forester, so he got catalogues from all the Pacific Northwest universities with good forestry schools, including the University of Washington, University of Idaho, and University of Montana. His last summer on the Mendocino he consulted the Forest Supervisor who recommended UM (it was called Montana State University at the time) because he had gone there. However, Gene recalls that it was the picture of the girl on the cover of the UM catalogue that made him decide to come to Missoula.

Gene spent two years as a forestry undergrad before being drafted into the army in 1952. He worked summers on the Nine Mile Ranger District. He married his wife Marian in 1951, and in the 1952 he took LeRoy Harvey's spring flora class. Learning how to identify plants sowed the seeds of his interest in botany. The Army sent him to Yuma, Arizona where he was assigned to driving around the Sonoran Desert and setting up portable weather stations. He bought

a copy of Edmund Jaeger's classic, *Desert Wildflowers* and Kearney and Peebles' *Arizona Flora* and learned the flora with a particular interest in the spring ephemerals. He returned to being a forestry undergrad at UM in 1954, but he added a minor in botany. In the summers he assisted Forest Service research on white pine genetics and blister rust out of Sandpoint, Idaho, and he graduated with a degree in forestry in 1956.

LeRoy Harvey was Gene's advisor when he started his Botany M.S. in 1956, and he helped Gene obtain funding from the Stella Duncan Memorial Fund for a study on the wind-pollinated (anemophilous) plants of the Missoula Valley. The goal of the study was to compile a list of all the wind-pollinated plants and document when they flowered to help public health officials predict hayfever "seasons" and how conditions might be improved or at least kept from becoming worse. To this end Gene spent two summers doing field work in the

(Continued on page 5)



Eugene Addor made many hundreds of plant collections currently housed in the UM Herbarium.



MONT NEWS BRIEFS

New Acquisitions

Missoula Forest Service Herbarium: 152 sheets from MT, ID
 Drake Barton: 6 sheets from MT
 Loren Bahls: 500 diatom slides from Pacific Northwest
 Peter Lesica: 190 sheets from MT
 Colin Henderson and Jodee Smith: 50 sheets from MT
 Susan Rinehart: 100 moss specimens from MT

Exchange Acquisitions

New York Botanical Gardens: 133 sheets from ID, UT, NV,
 CA, OR
 Snake River Plains Herbarium: 43 sheets from ID

Loans for Research

Ron Kelley, Eastern Oregon University: 20 sheets of *Cryptantha
 sobolifera* for treatment in Jepson Manual and Flora of Oregon.

Donna Barns, Utah Valley State College: 8 sheets of *Navarretia*
 for Flora of North America treatment.

Alan Prather, Michigan State University: 67 sheets of *Monarda*
 for Flora of North America treatment.

James Locklear, University of Nebraska: 22 sheets of *Phlox
 caespitosa* for a systematics study.

Dale Kruse and Rick Hammer, Texas A & M University: 2
 sheets of *Panicum thermale* for a systematics study.

David Barrington, University of Vermont: isotype of *Carex
 plectocarpa* for a systematics study.

Publications Based on MONTU Specimens

Kimball, S. F. and P. Lesica. 2005. Wildflowers of Glacier Na-
 tional Park and surrounding area. Trillium Press, Kalispell,
 Montana.

Lesica, P. 2005. The resurrection of *Erigeron parryi*
 (Asteraceae). *Brittonia* 57: 47-54.

Lesica, P. 2006. Rare plants are common where you find them.
American Journal of Botany 93(3): 454-459.

Morales, E.A., L.L. Bahls, and W.R. Cody. 2005. Morphologi-
 cal studies of *Distrionella incognita* (Reichardt) Williams
 (BACILLARIOPHYCEAE) from North America with com-
 ments on the taxonomy of *Distrionella* Williams. *Diatom Re-
 search* 20(1):115-135.

Thompson, D. M. 2005. Systematics of *Mimulus* subgenus
Schizoplacus (Scrophulariaceae). *Systematic Botany Mono-
 graphs* 75: 1-213.

The UM Herbarium received 21 requests for information in 2004, including requests for label data from the following genera:

Pyrrcoma, *Eriogonum*, *Triteleia* Juanita Ladyman, JNJ Asso-
 ciates, Colorado

Anagalis Anita Cholewa, Bell Museum of Natural History,
 Minnesota

Trillium Susan Farmer, University of Tennessee

Bromus tectorum Erin Bard, Montana State University

Hedera Tara Ramsey, University of Washington

Helianthus Tom Gulya, USDA, North Dakota

Pinus flexilis Douglas Goldman, Harvard Herbarium, Massa-
 chusetts

Lomatium Rick McNeill, University of Idaho

Gratiola ebracteata Dwayne Estes, University of Tennessee

Thesium University of Calgary

Rhamnus cathartica Illinois Natural History Survey

...Flora on-line (Continued from page 1)

Montana collections. There are 24 of them, most
 from Rattlesnake, Rock, Bass, and Lolo Creeks near
 Missoula, and MacDonald Pass above Helena.
 They were all made in 1966 and 1967. I imagine
 these were the first years Chuck was in Missoula.
 I'll have to ask him sometime, but right now I
 probably know more about Chuck's collections
 than he can remember.

It's good to remember that the Friends of the
 UM Herbarium played an important role in ob-
 taining the National Science Foundation grant
 that made this project possible. The fact that
 there is a large group of private citizens inter-
 ested enough in the UM Herbarium to contrib-
 ute more than a dozen new cabinets was one
 of several reasons that compelled NSF to
 choose MONTU for funding. Good job, Friends!

2006 FRIENDS OF THE UM HERBARIUM ANNUAL MEETING

The Annual Meeting of the Friends of the UM Herbarium will be held Saturday, November 11 from 10:00 a.m. to 2:00 p.m. The meeting will be held in Rm. 202 of the Natural Sciences (Botany) Building on the UM Campus. This is the annual meeting of the Board of Directors and is open to the membership.

...Gene (Continued from page 3)

Missoula area. During the summer of 1957 Gene gathered extensive data on flowering phenology from which he compiled horizontal bar charts depicting quantitative pollen shedding by species over the course of the growing season. He made many hundreds of plant collections currently housed in the UM Herbarium. The majority, but not all, of these are of wind-pollinated plants, including native, naturalized, and cultivated species. At the same time Gene was field testing a preliminary draft of William Booth's *Flora of Montana* which would eventually be published in 1959. At least one of Gene's collections, *Amaranthus tuberculatus*, is the only collection known from Montana.

Although he could have undertaken a Ph.D. program under Booth, Gene chose to take a job laying out timber sales for the Siuslaw National Forest on the coast of Oregon, but he didn't care much for clearcut logging of old growth so he went to construction. A year later he started a Ph.D. program at the University of Oregon but stayed only two years because of the heavy class and teaching load. In 1962 Gene and his wife moved across the country to Mississippi where he became a research botanist for the Army Corps of Engineers. He first worked on environmental effects to military equipment and then on aquatic weed control. Gene retired in 1980 and shortly thereafter married his second wife Pat and moved to Alabama. He has a strong interest in antique cars and trucks, volunteers at a wildlife rehabilitation center, and travels overseas to participate in construction projects with his church group. He hasn't lost his interest in botany either; he's a member of the Southeastern Exotic and Invasive Plant Society, the Desert Botanical Garden, and the Alabama Wildflower Society, and he has a reputation in his AWF chapter for being able to identify unknowns. Up north, we have him to thank for many of MONTU's collections from when Missoula was just a little town.

Peter Lesica

Thanks to new members of the Friends!

Your continued interest and support is what makes us effective. Thanks, and welcome to these members, new since the last newsletter.

Eugene Addor
Wease Bollman
David Carr
Don Charles
Leslie V.S. Millar
Susan Rinehart-Richtmyer

Don't Forget to Pay Your Dues!

If you haven't already done so, send in your membership renewal. You won't want to miss a single issue of the newsletter or miss out on what is happening at the herbarium. There is a membership form on page 8. Gift memberships are also available and are a great idea for friends.

Visitors to the University of Montana Herbarium in 2005

General Public and Private Consultants

John Pierce, Karen Layman, Leslie V.S. Millar, Clark Fork School, James Riser, Drake Barton

UM Researchers and Students

James Habeck, Becky Douglas, Marilyn Marler, J. Derleth, Giles Thelen, Kim Williams, Mark Behan, Karlek Janislampi, Jennifer Gremer, Kelly Chadwick

Out-of-town Academic Researchers

Ron Hartman (University of Wyoming), Loren Bahls (Hannaea), Alan Prather (Michigan State University), Sarah Brustkern, K. Marlow (Washington State University), Matt Lavin (Montana State University), Alfonso Delgado (UNAM, Mexico), Pamela Kittelson (Gustavus Adolphus College)

Federal, State, Tribal, NGO Biologists

Tina Laidlaw (Environmental Protection Agency), Dave Hanna (The Nature Conservancy), Melanie Rohrmeier, Lauren Priestman, Peter Stickney, Darlene Lavelle, Sacha Pealer (U.S. Forest Service), Scott Mincemoyer, Kathy Lloyd, Steve Cooper (Montana Natural Heritage Program), Vicki Bradley, Barbara Hellier (USDA-ARS)

Meet MONTU's Student Employees

The herbarium has two experienced and talented work-study students this year. Melisa Beveridge has been with us for one year and is a double major at U.M. She is pursuing degrees in biology, with a natural history emphasis, and in art. She has already combined her two interests by doing over 90 botanical illustrations for a Boone and Crockett book. Also, we asked Melisa if she would be interested in putting together an exhibit about our herbarium in the biology building display case. Not only did she quickly put together a fine exhibit featuring the variety of materials collected by the herbarium, but she did all the original artwork for the exhibit as well! Melisa is currently applying to the prestigious University of California Santa Cruz program in scientific illustration. Her goal is to pursue freelance scientific illustration, particularly of plants, as a career.

Amanda Roberson started at the herbarium last December, and she comes to us with a wealth of experience in U.M.'s Division of Biological Sciences. She has worked with Marilyn Marler's restoration program, with Bitterroot Restoration, and as an undergraduate researcher in several faculty labs. Her background is especially strong in plant and microbial ecology. In order to spend some time out of the lab, Amanda accepted a field position last summer at the University of Alaska's Institute of Arctic Biology. She traveled on wilderness rivers near Fairbanks collecting roots (and some great stories!) for a research project. Amanda would like to continue her studies of plant and microbial ecology in graduate school.

Hopefully she'll stay at U.M. and continue with our herbarium! Please say "Hi" to our work-study students in the herbarium!

Dave Dyer



MONTU's talented student employees. At right is Melisa Beveridge with the herbarium exhibit and above is Amanda Roberson working in the herbarium.



MONTU Home to Rare Diatoms

The spectacular mountains extending north along the Continental Divide from Rogers Pass to Glacier National Park and beyond into Canada are sometimes called North America's Alps. Indeed, a group of peaks in the Bob Marshall Wilderness is known as the Flathead Alps. Like their European counterparts, the mountains of the Canadian Rockies ecoregion¹ are high and wet, with a history of alpine glaciation. Now there is another feature linking the North American Alps with the European Alps; they are both home to a rare diatom genus and species.

Diatoms are one-celled, photosynthetic, and largely aquatic organisms with cell walls composed of silica. They are found in nearly all-aquatic habitats. Diatoms are classified according to their general symmetry, growth habit, number and position of chloroplasts, structure of the silicon cell wall, and other features. Diatoms are found in nearly all aquatic habitats. There are about 900 validly published genera and an estimated 200,000 species worldwide. Of these, only about 20,000 species have been described in the scientific literature and about 400 new species are described each year. Approximately 1,500 of the described species that occur in the Pacific Northwest are represented in the Montana Diatom Collection (MDC) at MONTU.

Led by Dr. Eduardo Morales at the Academy of Natural Sciences in Philadelphia, a team of diatomists recently documented North America's only known populations of *Distrionella incognita*². Previously, this species had been reported only from Upper Bavaria and the Northern Tyrol. In North America, it is found in streams draining the Canadian Rockies Ecoregion, on all sides of the Continental Divide. West of the Divide, *D. incognita* has been found in the Kootenai River, Flathead River, and Blackfoot River basins. North and east of the Divide, populations have been recorded in the Belly River,

and in Birch Creek, Dupuyer Creek, and the Sun River along the Rocky Mountain Front. The genus *Distrionella* includes only a few other species and all of them are found in cold, mountainous areas.

The Montana Diatom Collection at MONTU is the only public repository of *Distrionella incognita* in North America. Besides *D. incognita*, the MDC contains many other diatom taxa of limited distribution, many undescribed species, and several Northwest endemics. The Montana Diatom Collection is a plant collection in miniature. Associations of diatoms from natural habitats are randomly strewn on cover glasses and mounted on microscope slides in resins of high refractive index.

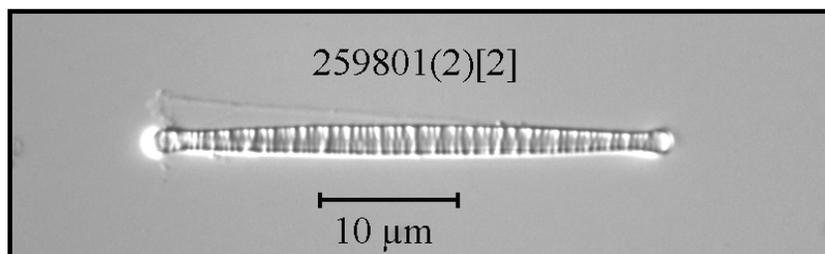
One prepared microscope slide in the MDC may contain as many as 120 species and 100,000 individual diatoms—more than the total number of vascular plant specimens at MONTU. The MDC at MONTU now numbers 2,600 slides, which occupy only one shelf of an antique oak bookcase. Another 7,500 slides of the MDC currently reside in Helena and will be transferred to MONTU at a later date.

Cataloging diatom biodiversity in North America is in its infancy. Many regions remain unexplored, many habitats remain unsampled, and many unknown taxa remain undescribed. The Montana Diatom Collection at MONTU will be is an important resource in this ongoing effort.

Loren Bahls

¹ Woods, A.J., J.M. Omernik, J.A. Nesser, J. Sheldon, and S.H. Azevedo. 1999. Ecoregions of Montana (color poster with map). U.S. Geological Survey, Reston, Virginia.

² Morales, E.A., L.L. Bahls, and W.R. Cody. 2005. Morphological studies of *Distrionella incognita* (Reichardt) Williams (BACILLARIOPHYCEAE) from North America with comments on the taxonomy of *Distrionella* Williams. *Diatom Research* 20(1):115-135.



Distrionella incognita, a rare diatom deposited in North America only at MONTU.

YES! *I want to help protect the irreplaceable collections and enhance the facilities of the University of Montana Herbarium*

- | | | |
|--------------------------|----------------------------|----------------|
| <input type="checkbox"/> | REGULAR MEMBER | \$15 |
| <input type="checkbox"/> | SUSTAINING MEMBER | \$25 |
| <input type="checkbox"/> | CONTRIBUTING MEMBER | \$50 |
| <input type="checkbox"/> | ORGANIZATION | \$50 |
| <input type="checkbox"/> | LIFE MEMBERSHIP | \$300 |
| <input type="checkbox"/> | SPECIAL GIFT | \$_____ |
| <input type="checkbox"/> | HONORARIUM FUND | \$_____ |



Dues are for a period of **two** years. All contributions to the Friends are tax deductible to the full extent provided by law. All checks should be made payable to UM Foundation/Friends of the UM Herbarium.

Send checks to:

Herbarium
Division of Biological Sciences
The University of Montana
Missoula, MT 59812



FRIENDS
of the
University of Montana
HERBARIUM
Biological Sciences
University of Montana
Missoula, MT 59812