Borealis

the newsletter of the

Alaska Native Plant Society

PO Box 141613, Anchorage, Alaska January 2002

Join us at our November meeting!

Monday, January 7 , 7:30 p.m.
at the Campbell Creek Center
off 68th and Lake Otis

"The Trials &Tribulations of Using Black Cottonwood Dendrochronology To Date The Recession of Exit Glacier"

Speaker: **Joel Cusick**
National Park Service

****

Plant Family Study
Pink (Caryophyllaceae) Family

Presenters
January: Anjanette Steer
February: Connie Kison

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CHECK OUT THIS YEAR'S SEED EXCHANGE!!

See Page 7 inside and bring form to the next meeting, or mail to:

Gary Rasmussen

Anchorage, AK 99503-1917

Keeping In Touch

This is a good time of year to take some time to explore the many resources available that can teach us more about Alaska native plants. There are a number of people and organizations within Alaska and our Pacific Northwestern region that provide educational information.

This newsletter includes excerpts from some of those resources that we thought you should know about. We chose these articles because they are interesting insights into some of our native plants. They will also give you an idea of the diversity of individuals and organizations that we have available to those of us who want to learn more. Next to each article there is also more information on the organization, its activities and how you can contact them, by mail or through the internet.

One in-state resource many of us may not know about is the University of Alaska Fairbanks Museum **Herbarium**. The Herbarium (ALA[1]) contains more than 175,000 specimens of non-vascular and vascular plants and is the only major research herbarium in Alaska. The collection also includes plants from other states, Canada, Greenland, Fennoscandia, Japan, and Russia and provides a basis for teaching and research. On the basis of the collection and their activity, the Herbarium was selected as one of 105 National Resource Collections in the United States by the Advisory Committee for Systematic Resources in Botany, a committee of the American Society of Plant Taxonomists.

Included in this newsletter is a story by ANPS member ***Carolyn Parker***, a Research Associate at the Herbarium. Carolyn's tale of a recent trip to Cape Krusenstern and a new find gives us a view of "research in action"!

"ALA" is the official acronym given to the University of Alaska Museum Herbarium in the list of the world's herbaria published by the International Association for Plant Taxonomy (Holmgren, P. K., N. H. Holmgren, and L. C. Barnett. 1990. *Index Herbariorum Part I: The Herbaria of the World.* New York Botanical Garden, Bronx, NY. 693 pp.

Plant Family Study

Minuartia and *Arenaria*

JANUARY 2001

Presenter: Anjanette Steer

Caryophyllaceae (Pink) Family

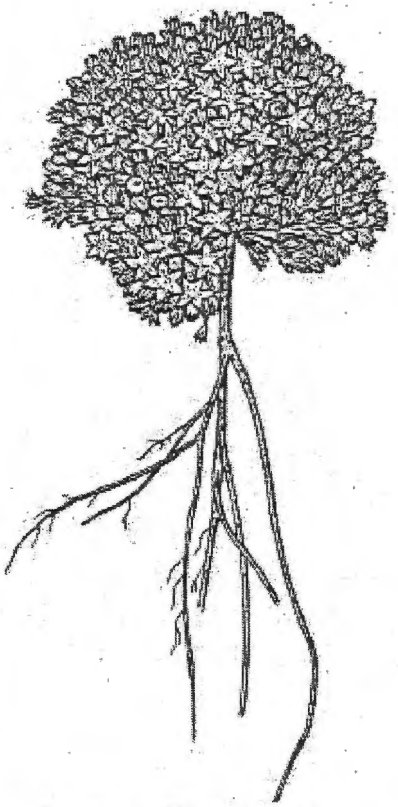
Minuartia macrocarpa

These two genera are closely related and, except for their seed capsule, could easily be confused. *Minuartia* has a 3-parted seed capsule and *Arenaria* a 6-parted seed capsule. There are nine species in Alaska and all except one are found in other locations as well, many in Europe and Asia. *Minuartia yukonensis* has a very limited distribution - Alaska, Western Yukon Territories, and East Asia, just across the Bering Land Bridge.

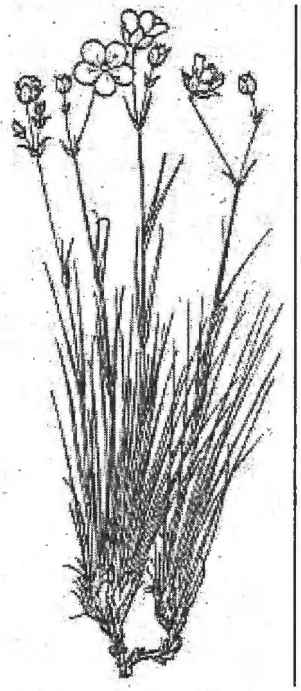
All species have narrow, needle-like leaves and are low mat-forming plants. Most are found in dry gravelly or rocky alpine areas. *M. stricta* and *M. dawsonensis* can be found in moist lowland areas. Most have 5 rounded petals and are white flowered. *M. rubella* ha pinkish petals and *M. Rossii* has purplish sepals. Both are very small flowered species. Distinction between species is often very difficult, relying on flower size, sepal length or number of nerves in the leaves.

The *Arenaria* genus has only 3 species in Alaska and all are very different from each other. *A. longipedunculata* is quite obscure, could easily be confused with minuartias. *A. capillaris* is a tall, grass-like, tufted species with light green leaves. The flowers are white about 5/8 inch and in cymes of 2 or 3 flowers held high above the foliage (total height 4-6 inches. It is found in very dry often sandy areas of interior Alaska, arctic Alaska and Asia.

Arenaria Chamissonis, when out of bloom, looks much like *Silene acaulis* (moss campion). It has very limited distribution – rocky and scree areas of the Alaska Range and mountainous areas of the Seward and Lisburne Peninsula. (N.W. Alaska), and just across the land bridge. The small needle-like leaves are stacked close together and form a dense clump. The tiny flowers are green, lie close to the foliage and look like little stars.



Arenaria Chamissonis

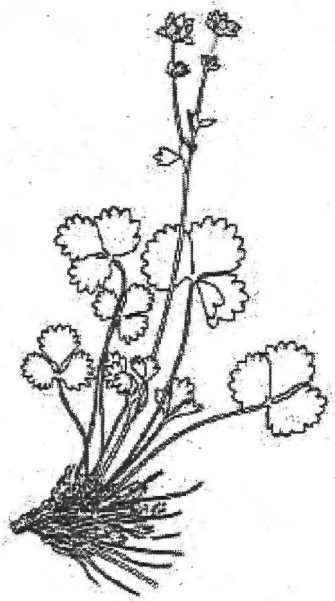


Arenaria capillaris

Exploring Cape Krusenstern - 2001

By Carolyn Parker

The instant our small Cessna touched down in the Kakagrak Hills in late June I knew our visit was perfectly timed. Primroses and poppies graced the limestone ridges; we had arrived at Cape Krusenstern National Monument at full flowering. The UA Museum Herbarium had been contracted to direct a National Park Service vascular plant inventory for all of Alaska's northwestern parklands. As lead botanist, I was responsible for making this happen. Cape Krusenstern's flora was very poorly documented and this was our first destination. The entire Herbarium staff was with me on this first trip: myself, Alan Batten, and Amy Denton...our new curator on her first Alaskan botany trip. The new NPS inventory coordinator for the northwest region, Tom Heinlein, was also experiencing his first Alaskan field trip with us. Camp was perched on a low ridge that overlooked the ice-bound Chukchi Sea. During those first few days we visited alpine, riparian, and coastal habitats collecting an impressive diversity of plants that quickly made our presses bulge. Almost every species of *Primula* known from Alaska seemed to be abundant here. Willow shrubs near camp were draped with qiviut where a herd of muskoxen, now grazing nearby, had stopped to scratch free their winter undercoats. After a few days we were moved by plane down to the beach near Krusenstern Lagoon. A series of ancient beach ridges here had been made famous by archaeologist Louis Giddings, who has described the 6,000+ years of human occupation they record. Today many Iniupiaq families still maintain summer camps along the current beach for subsistence hunting, fishing, and berrying. Our camp beach was ablaze with potentillas, saxifragas, rock jasmine, and forget-me-nots as the lyme grass, umbels, and numerous graminoids that would dominate later had only begun to emerge. And the diversity of birdlife overwhelmed us; terns, jaegers, gulls, and plovers were our constant companions, while the buzz of duck, geese, and crane calls were always in the background. A boat trip up through the lagoon system and long walks along the beaches filled our days; and our new set of presses. July 4th was cool and rainy, so we built a beach fire to staywarm until our return flight to Kotzebue arrived.



Potentilla fragiformis

I knew we had missed most late-blossoming species, so later in the summer I returned to Sheshalik, the gravel spit-lagoon system at the southern tip of Cape Krusenstern NM, to round out our inventory effort. Reidar Elven and Heidi Solstad of the University of Oslo Herbarium,
Norway, were my new crew, and Bob and Carrie Uhl were our local hosts. Bob and Carrie had spent the last 40+ summers at this camp site and their knowledge of the local flora and landscape contributed immensely to our efforts. Bob had been monitoring a local population of *Gentianopsis detonsa* for over 20 years resulting in some interesting insight into the life history of this very poorly known rare plant. He rigged up a trailer behind his 4-wheeler to get us all down the beach to his favorite sites. And the kings appeared in Carrie's net while we were there, sparing us from some canned beef dinners! One late afternoon we grabbed a curious-looking *Potentilla* near camp and hurriedly threw it into the press. As always, the time went by very, very fast.

Back in Fairbanks this fall, there was finally time to look carefully at our piles of collections. That 'odd' *Potentilla* from Sheshalik turned out to be *Potentilla fragiformis*, new to North America, but known from the coasts of Chukotka and Kamchatka, Russia. Knowing there was 1 other *Potentilla* species (*P. hyparctica*) in the region with similar pubescence and leaf morphology (but a very different style shape) I looked through our Herbarium collections cautiously, and indeed, found 3 more specimens of *P. fragiformis*; from Kivalina collected in 1960, from Gambell on St. Lawrence I. in 1970, and from Sheshalik in 1972, the same area we had visited. Each had been misidentified, understandably, and thus 'hidden' within our collections.

I'm reminded once again how much more we can learn about our own Alaskan flora. In this instance, a combination of field work and careful review of our existing, and rapidly growing, collection right here in Fairbanks, has made a small, but significant contribution.

Stellaria

Presenter: Connie Kison

Caryophyllaceae (Pink) Family

There are 16 species belonging to the *Stellaria* genus that are native to Alaska. All except two are found in numerous other localities, as well. *Stellaria ruscifolia* subsp *aleutica* is found only in Alaska, mostly on the Aleutian Chain, but other subspecies of *ruscifolia* are found in extreme eastern Asia. *Stellaria alaskana* is found only in the mountains of Central Alaska and the Yukon Territories.

It is quite easy to recognize the *Stellaria* genus. The small white, five-petalled flowers have notched petals (often appearing as ten). Recognizing which species within the genus is a more complex process that involves noting whether stems or leaves are glabrous or scabrous (smooth or rough); whether the leaves are ciliate in margins (hairs on the edges); whether sepals are scarious margined (translucent on the edges) and longer or shorter than petals, and whether the seed capsule is longer than the sepals - plus its color.

Usually the taller and weaker species grow in damp areas. Species that grow on tundra or scree slopes are short, stiff and upright. Most spread by rhizomes.

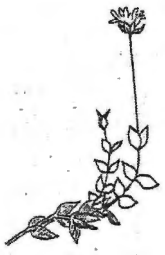
I suspect a chart of characteristics for each species and a key would be very helpful in the field.

Stellaria media is an introduced, weedy plant that is found in gardens and along trails.

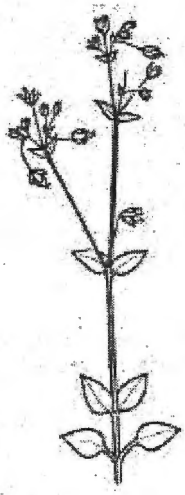
Stellaria sitchana is a common tall species found in moist lowland areas.

Stellaria Edwardsii is a shorter, rigid spacies fond in rocky places in the mountains.

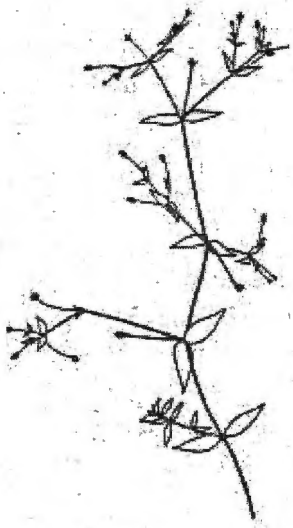
Stellaria alaskana, a very short stiff species with bluish-green leaves that are congested at the base, is found in rocky places in the mountains on scree slopes.



Stellaria ruscifolia

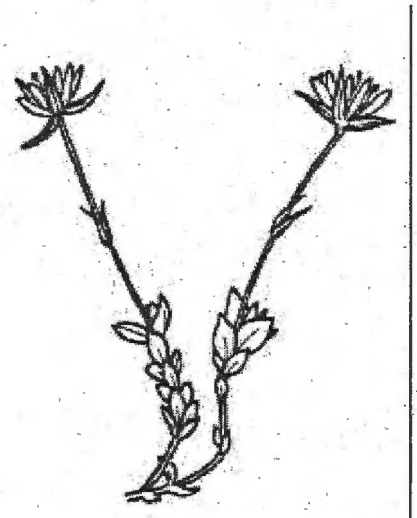


Stellaria media



Stellaria Edwardsii

Stellaria sitchana

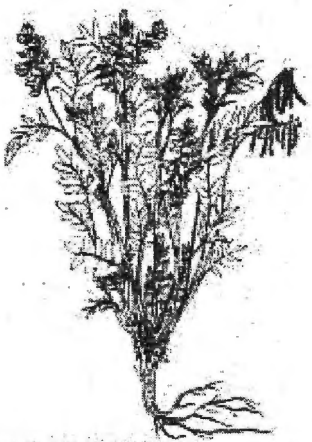


Stellaria alaskana

The Georgeson Botanical Garden Review is published three times yearly. Annual membership dues include a subscription.

Dr. Pat Holloway is manager of the Georgeson Botanical Garden at the University of Alaska in Fairbanks Agricultural and Forestry Experiment Station. GBG researchers study the propagation, cultivation and conservation of native and introduced plant species in the subarctic north. The GBG serves as a repository for all ornamental and edible plant materials hardy in subarctic Alaska and provides definitive horticultural information about subjects ranging from the reproductive biology of the endangered Aleutian shield fern to identifying the patterns of cold acclimation and hardiness of garden primroses. There is much to do, learn, and see at the Garden. We welcome you to our Web site and hope that if your travels take you to Fairbanks, Alaska that you will visit us.

Georgeson Botanical Garden
309 O'Neill Resources Building
University of Alaska Fairbanks
Fairbanks, Alaska 99775
(907) 474-7433
http://www.uaf.edu



Hedysarum Mackenzii, Wild sweet pea (Heller 1953)

A Tale of Two Species

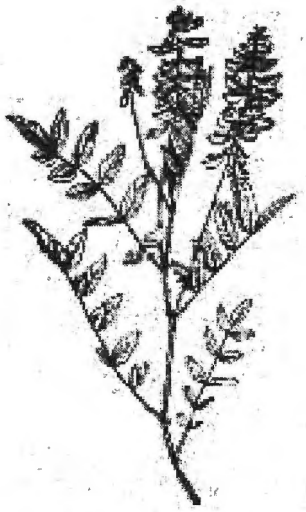
by Dr. Pat Holloway

One of the more interesting and challenging parts of my job is answering the myriad of phone calls I get from all over Alaska and quite a few from the 'lower 48' states asking for all kinds of assistance. "How much reindeer manure can I add to a flat of potting soil in order to grow my bedding plants?" "How can I improve the fruit production in my field of lingonberries?" "How do I germinate wild iris seeds?" "I have a landscape business in Colorado and was awarded a contract to landscape Eielson Air Force Base. Tell me everything you know about hardy landscape plants in the next 10 minutes!" Usually, I can answer the questions thrown at me. Some of them have me scrambling for my favorite reference books or contacting colleagues or local grower with more knowledge than me. Some are the catalysts for very interesting experiments in the botanical garden, and some just leave me speechless.

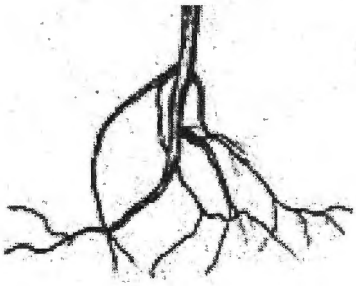
In September, I received a call from a gentleman in Waterloo, Iowa. He had viewed a program on national television about a young man, Christopher McCandless, who hiked into the back woods near Denali Park in 1992 with the intention of living off the land. Tragically, Mr. McCandless died of starvation about four months after starting his adventure. One of his final diary entries was, *"Extremely weak. Fault of potato seed. Much trouble just to stand up. Starving. Great jeopardy."* The national newscasters hinted that the potato seeds might have caused or exacerbated his starvation and prevented him from seeking help. My enterprising Iowa caller thought these seeds might be a dieter's dream come true! He wanted to find out more about these potato seeds so he could package and sell them as appetite suppressants!

Normally, I don't follow up on calls such as this. I tried to convince the Iowan that even strychnine would suppress a person's appetite, but I wouldn't take it no matter how badly I wanted to lose a few pounds! However, his call reminded me of another conversation I had a few years ago with a graduate student in the UAF chemistry department. Edward Treadwell contacted the Botanical Garden to see if we had any collections of *Hedysarum alpinum* and *H. Mackenzii* seeds. The "potato" in Mr. McCandless' diary was the Indian potato, *Hedysarum alpinum*, historically one of the most widely harvested wild plants in Alaska. In fact, the present site of the UAF campus was once called *Troth Yeddha* or wild potato hill by the Athabascan Indians because it was a favorite harvesting place for Indian potato roots. As part of Mr. Treadwell's master's thesis, he wanted to explore the newscaster's claims that the seeds of the edible Indian potato contributed to Mr. McCandless' death. It just so happened that we had an abundance of seeds from both species. Although the roots are definitely edible, the seeds might easily contain a poisonous alkaloid.

The story of the two *Hedysarum* species has one more twist that dates back a century to Arctic Explorer, Sir John Richardson. Members of the Richardson Expedition became ill following a dinner made from roots of *H. Mackenzii*, the wild sweet pea. Every amateur and professional botanist in the Far North has heard of the poisonous nature of this plant, although not one study has ever been conducted to identify the poison. The story of the explorers' illnesses has been passed down, unchallenged, and is repeated in many Alaska references (i.e.Heller 1953, Kari 1991). Since both the edible and poisonous species are found growing



Hedysarum alpinum
Root and Foliage



in the same regions, often right next to each other, it seems odd that there are no accounts of accidental poisoning by native residents or recent immigrants anywhere in Alaska. Treadwell wanted to find out if any of these claims for either species was true.

The two *Hedysarum* species belong to the Legume plant family, some members of which are notorious for causing birth defects and death in livestock. More than 450 poisonous alkaloids have been found in the 18,000 members of the Legume plant family (Treadwell 1996). Mr. Treadwell subjected his seed samples to a diversity of chemical tests to determine if alkaloids were present in seeds of one or both species of *Hedysarum*. He also tested the roots and shoots of both species to identify possible toxic chemicals that might occur in the wild sweet pea but not in the Indian potato.

Treadwell found that neither species of *Hedysarum* contain any alkaloids. He conducted a battery of tests on roots and seeds that all came out negative. He found no difference in chemical composition of roots and seeds of the Indian potato. Therefore, it is not true that the roots are edible, and the seeds are poisonous. Analysis of root extracts from both species showed very little differences between the wild sweet pea and Indian potato, and there was no evidence of a toxic component in wild sweet pea.

Treadwell found nothing in his analysis that would lead to the conclusion that the Indian potato seeds Mr. McCandless ate caused him to become sick or lose his appetite. Mr. McCandless most likely starved to death because he simply could not gather enough calories from wild plants to survive. Students in NRM 101, Natural Resources Conservation and Policy, this semester learned that a person would have to eat more than 25 pounds of willow bushes **each and every day** to maintain enough calories to survive on plants alone. Chances are a bit higher with Indian potato roots; one needs to harvest about four pounds of roots per day to meet minimum calorie requirements. Assuming one could find large fields of Indian potato plants, digging the long, skinny roots is hard work, and harvests measure in the ounces per plant, not pounds. Most indigenous people knew how hard it was to harvest Indian potato roots, so they raided mouse caches or searched river banks for exposed roots. For Mr. McCandless, a handful of Indian potato seeds just wouldn't be enough to survive.

Mr. Treadwell's research also calls into question the long-held belief that wild sweet pea is poisonous. He found no evidence that it differed substantially from the Indian potato in chemical composition. He speculates it was something else in the stew pot that made Richardson's expedition so ill. The early journals describe other components of their diet: lichens, leather, rotten meat, fish entrails, and warble-fly dung. I cannot imagine even suspecting wild sweet pea roots as the culprit with a diet like that!

Poisonous or not, there is no evidence in any ethnobotanical research that wild sweet pea was ever used by indigenous people for food or medicine. Chemistry professor, Tom Clausen, speculates this has to do more with plant morphology than existence of a poison. The wild sweet pea has a smaller, much-branched root system (2 cm diameter) as opposed to a bigger, less branched system in Indian potato (up to 5 cm diameter). It simply might be easier to harvest Indian potato than wild sweet pea. As for my Iowa acquaintance, I had to tell him Indian potato seeds probably would not become the next great organic diet pill. The moral of this story is that no question is too outrageous. I learned quite lot from one man's question!

Alaska Native Plant Society - Seed Sale List - 2002

The Alaska Native Plant Society sells seed of plants native to Alaska, which have been collected by members during the year. Seeds can be purchased at the regular monthly meetings or by mail order. The price is $0.50 per package. Package sizes vary considerably due to the number or amount of seeds collected. Some rare or difficult to collect species may contain few seeds, while some easy to collect species may contain a large number of seeds.

If seeds are to be mailed, include an additional $0.50 for 1 -5 packages,
or $1.00 for 6 or more packages.

Make checks payable to: Alaska Native Plant Society

Send order to: Gary Rasmussen, , Anchorage, AK. 99503-1917.

	Common Name	Botanical Name Ordered	Quantity
1.	Anemone, Cut-leaf (Pink)	*Anemone multifida*	_____
2.	Anemone, Narcissus-flowered	*Anemone narcissiflora*	_____
3.	Aster, Coastal Fleabane	*Erigeron pereqrinus*	_____
4.	Aster, Siberian	*Aster sibiricus*	_____
5.	Cinquefoil	*Potentilla Vilosa*	_____
6.	Columbine, Western	*Aquilegia formosa*	_____
7.	Harebell	*Campanula rotundifolia*	_____
8.	Lily, Chocolate	*Fritillaria camshatcensis*	_____
9.	Lupine, Arctic	*Lupinus arcticus*	_____
10.	Poppy, Alaskan	*Papaver alaskanum*	_____
11.	Poppy, Arctic	*Papaver lapponicum*	_____
12.	Poppy, Icelandic	*Papaver nudicaule*	_____
13.	Poppy, Pink	*Papaver alboroseum*	_____
14.	Saxifrage, Brook	*Saxifraga punctata*	_____
15.	Saxifrage, Prickly	*Saxifraga tricuspidaata*	_____
16.	Shooting Star (ssp. *superbum)*	*Dodecatheon pulchellum*	_____
17.	Whitlow Grass	*Draba incerta*	_____
18.	Deer Cabbage	*Fauria crista-galli*	_____
19.		*Apargidium*	_____

Total number of packages ordered _____X $0.50 each = $_____.____

+ Postage $_____.____

Amount enclosed = $_____.____

Mail order to:

_____, _____, _____, ___, _____

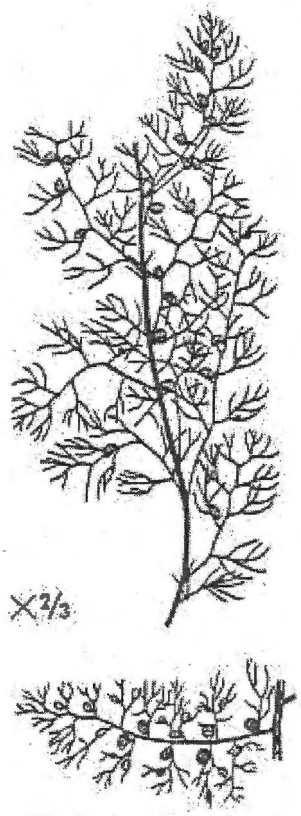
Please print: Name Address City State Zip code

Reprinted from "Kelseya", the newsletter of the Montana Native Plant Society, Spring 2001

Carnivores Turn To Gardening

WWW.ARGS.ORG

By Peter Lesic



Urticularria vulgaris

I often lead field trips to wetlands. One of the high points of these trips is finding a bladderwort (Utricularia spp.). Bladderworts are Montana's most common carnivorous plants. These aquatic plants produce pinhead-sized traps on their leaves that capture small crustaceans or other invertebrates. At least that's been the common knowledge and what I've always told people. However, some recent research is going to make me change my story.

More than one-third of all species of carnivorous plants on earth are bladderworts, and species of Utricularia occur from the tropics into the arctic. Some species of these rootless plants grow in mud or even as epiphytes in rainforest trees, but most, like Montana's three species, are aquatic. They all produce bladder-like traps with doors that open and close. Touching the hairs around the door causes it to open and suck in whatever is just outside. The traps are capable of capturing small animals and absorbing nutrients from them. But there's more to the story; it seems that bladderworts may be more gardeners than carnivores.

Several years ago researchers at the University of Wisconsin made a confusing discovery. They found that *Utricularia macrorhiza* (the same as our most common species, *Utricularia vulgaris*) grown in water with a high density of invertebrates (potential prey) did not respond by producing more traps. However, they did produce more tarps when the water was higher in nutrients. Apparently bladderworts produce traps for a reason other than just capturing prey, a reason related to the fertility of their surroundings.

Recently, Jennifer Richards at Florida International University made some observations that may help explain the Wisconsin findings. Richards examined 1,400 traps from *Utricularia purpuree* in the Everglades. She found that 63% had something in them. Of these only 8% contained dead prey items, but all contained algae, diatoms, or other photosynthetic organisms. I have made the same observations here in Montana. All the old bladders have green stuff in them, but it's devilishly hard to show people a trap with a dead bug in it.

Richards proposes that bladderwort bladders act not so much as traps but as tiny microcosms, absorbing the waste products produced by their photosynthetic and bacterial occupants. This hypothesis may also explain the Wisconsin finding that bladderworts produce more traps in nutrient-rich water but not in prey-rich water. Algae grow better in nutrient-rich water, so a bladderwort's captive algae gardens will be more productive. In addition the bladders may also absorb nutrients directly from the water. This is an unusual strategy to compensate for a lack of nutrient-absorbing roots, but it is not unique.

Certain tropical epiphytes called tank bromeliads obtain nutrients in a similar fashion. These plants live in tree canopies and are unable to absorb nutrients through their roots. Instead, they hold water at the base of their leaves. These miniature "ponds" support all manner of aquatic life including mosquito larvae and even frogs. The bromeliads absorb the waste products form these little ecosystems directly into specialized cells at the base of the leaves.

More research needs to be done to prove that algal waste products are contributing to bladderwort nutrition. Still, it seems likely that bladderworts are really omnivores, obtaining more of what they need from gardening than from carnivory. It's just another case of "whatever works". So it looks like I lost my cool story about bladderwort carnivory. But that's okay because the real story is even more fascinating.

Alaska Science Forum

Further Reading

Knight, S.E. & T. M. Frost. 1991. "Bladder Control in *Utricularia macrorhiza*: Lake-Specific Variation in Plant Investment In Carnivory". Ecology 72:728-734

Richards, J. H. 2001. "Bladder Function in *Utricularia purpuree* (Lentibulariaceae): Is Carnivory Important?" American Journal of Botany 88: 170-176

November 2, 2000
Article #1514

This column is provided as a public service by the Geophysical Institute, University of Alaska Fairbanks, in cooperation with the UAF research community. Ned Rozell is a science writer at the Institute.

Tundra an Early Riser Under North Slope Snow

By Ned Rozell

The plants that make up tundra, the slow-growing mat that covers much of Alaska, would seem the most patient of organisms, but scientists are finding otherwise. Researchers working on Alaska's north slope recently found that tundra plants begin photosynthesis while still covered with snow.

Greg Starr and Steve Oberbauer made the discovery while testing the tundra near Toolik Field Station, an 88,000-acre research sanctuary managed by UAF's Institute of Arctic Biology. Toolik Field Station is just north of the Brooks Range, in the treeless foothills and plains of Alaska's arctic. Starr and Oberbauer are ecologists from Florida who travel north each summer to study at Toolik. I met them in 1997 when I walked into the field station with my dog Jane on our pipeline hike. On a day off from walking, I wrote a science column ("Counting Carbons in a Warmer Diet") about how Starr and Oberbauer were warming tundra with greenhouse plastic and electric coils. They wanted to see how the plants would react to a warmer climate. During their study, Starr and Oberbauer noticed some quirks that led to this year's discovery that some tundra plants are able to convert sunlight to energy while still beneath the snowpack.

First, they noticed some tundra plants emerged from the snowpack in the spring with a reddish brown tint. The rusty color was evidence the plants were producing anthocyanins, pigments that serve as sunblock and protect the plants from overdosing on too much sunlight. "We figured the plants must be getting a blast of light while under the snow or just after the snow melted," said Oberbauer, a professor at Florida International University in Miami.

To find out how much light was penetrating the snowpack, Oberbauer and Starr installed sensors under the snow; they found a good dose of sunlight under as much as 30 centimeters of snow. Starr, who was then working on a Ph.D. at Florida International and is now a postdoctoral fellow at the University of Florida, decided to see if plants were reacting to sun under the snowpack.

With equipment that allowed him to measure changes in carbon dioxide in and around the plants, Starr found that four species of plants-Labrador tea, mountain heather, lowbush cranberry, and cottongrass-were taking up carbon dioxide while buried with snow.

To test the bizarre notion that photosynthesis was happening beneath the snow, Oberbauer and Starr placed one of their gas-exchange chambers-a box covered with clear plastic that allows them to monitor what gases are leaking from the tundra-over tundra that was covered with snow. When they blocked sunlight by covering the box with a black cloth, carbon dioxide readings went up. Oberbauer and Starr also measured carbon dioxide levels at the base of the arctic snowpack and found them much higher at nighttime than during sunny spring days. Another group of scientists working in Barrow found a drop in carbon dioxide levels in springtime just before the snow disappears.

In late spring, the world beneath the snow is a fine place for photosynthesis, Starr said. Melting and refreezing of the surface creates ice lenses that allow sunlight through and allow plant leaves to dry somewhat; the snowpack also traps carbon dioxide and holds it in a perfect place for plants. Starr measured photosynthesis of

Labrador tea, mountain heather, lowbush cranberry, and cottongrass under the snow and found the plants sometimes worked at 20 percent of their summer peak.

This revelation adds a new twist to whether the Arctic acts as a carbon "sink," in which plants take up more carbon dioxide than they release, or a carbon source, in which they add to carbon dioxide in the atmosphere that produces global warming. Starr estimated that the North Slope tundra could be sucking up 15 percent more carbon dioxide than scientists thought.

Myosotis: Journal of the Alaska Native Plant Society

Local Anchorage folks interested in the native flora and educating others to our rich flora founded the Alaska Native Plar Society in 1982. To celebrate twenty successful years of operation, the Board and the Membership have decided to produce a Journal of the Alaska Native Plant Society. The newsletter of the society is Borealis and the logo is a stylized Linnaea borealis. The journal will be called ***Myosotis*** in honor of our state flower.

- Taxonomy of vascular plants, mosses, algae and lichens
- Ecology of native species and plant communities
- Ethnobotany of native plants
- Notes of botanists, scientists, explorers and botanical artists
- Landscape restoration
- Horticulture as it relates to use of native species
- Range extensions

The manuscript should be double-spaced throughout with 1-inch margins on all sides. Pages should be numbered and tables and figures should be numbered consecutively. Articles should follow the general format: abstract, introduction, materials and methods, results, discussion, summary and literature cited.

Two or more members of the society or outside reviewers will review each manuscript received. After review, authors will be notified of the acceptance or rejection of manuscripts.

Authors will have the opportunity to review their articles before publication and are expected to correct any errors.

For publication of the first volume, articles should be submitted no later than January 1, 2003.

Please submit 2 copies of the manuscript. (All articles will be printed in black and white). ***Myosotis*** will be prepared on a PC using MS Word/Excel/Publisher. All manuscripts and inquiries should be sent to:

Editor of ***Myosotis***
Alaska Native Plant Society
PO. Box 141613
Anchorage, Alaska 99514

MYSTERY PLANT

(Hint: You might need to get out your Botanical Glossary for this one!)

This plant is densely caespitose, sometimes forming a low loose cushion or small mat. The base of the plant is covered with persistent marcescent (old-brown) leaves. The new narrow green leaves are ciliate in margins and the upper surface is covered with forked and branched hairs. Pedicels are short, placing the flowers close to the leaves, but extend in fruit. Sepals are connected about half way and the tips are pointed. The five petals are pink and connected at the base. It blooms in early June and can be found growing on stony slopes in interior and eastern Alaska and in Southwestern Yukon Territories.

Answer on Page 11.

ANNUAL MEMBERSHIP APPLICATION/RENEWAL

e Alaska Native Plant Society was organized in 1982 ..y an enthusiastic group of amateur and professional botanists. It is a non-profit educational organization with the goal of uniting all persons interested in the flora of Alaska. Membership is open to any interested individual or organization. If you wish to join us, pleas indicate the category of membership you desire, fill in the form below and mail it with the appropriate remittance to:

Alaska Native Plant Society,
P.O. Box 141613,
Anchorage, AK 99514

STATUS ☐ **New** ☐ **RENEWAL**

CATEGORY

☐	**Full-time Student**	**$ 5**
☐	**Senior Citizen**	**$10**
☐	**Individual**	**$12**
☐	**Family**	**$18**
☐	**Organization**	**$30**

Name _____

Address _____

City: _____ State_____Zip_____

Telephone: (Home)_____(Work)_____

Membership is on a calendar year basis.

ADVANCE WARNING!

The 2002 **Alaska Rare Plant Forum** will hold its annual meeting in Fairbanks in April 11-12, in the Kobuk Conference Room of the BLM-Northern Field Office on Airport Road.

We are sending this announcement early so you can plan ahead to attend! In January we will formally solicit presentations. Please pass this notice on to anyone interested whom we may have missed. As always, the meetings are free, and open to the public.

If you have any questions please contact:

Mary Stensvold, Chairperson
kruzov@yahoo.com

SEEDS FOR SEED EXCHANGE!!

Please bring to the next meeting, or mail to
Gary Rasmussen

Anchorage, AK 99503-1917

MYSTERY PLANT ANSWER

Answer: *Douglasia Gormani*

Primulaceae/Primrose Family

Volunteers Are Needed!

- To present Plant Family information at the monthly meetings: Call Verna at and specify which unit and the month you prefer: *Cerastium* and *Sagina* are the species and March and May are the dates.
- To provide very short mini-botany presentations on any subject at monthly meetings. Call Marilyn Barker,
- Field Trip Coordinator to organize next season's field trips.

ALASKA NATIVE PLANT SOCIETY
State and Anchorage Chapter Officers

President	Frank Pratt
Vice President	Leonard Grau
Secretary	Beth Koltun
Treasurer	Sue Jensen

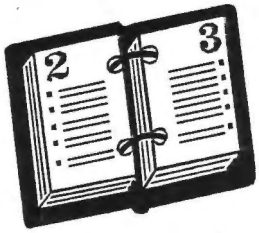
Anchorage Chapter Program Coordinators

Main Program	Susan Klein
Plant Family	Verna Pratt
Mini-Botany	Marilyn Barker
Field Trips	Open

Newsletter ("*Borealis*")

Editor	Ginny Moore
Circulation	Martha Hatch

Borealis is published monthly October through May. Articles may be sent to Ginny Moore, Anchorage, AK 99516. Phone or FAX: , or E-mail: mooretg@alaska.net



UPCOMING PLANT & NATURE EVENTS

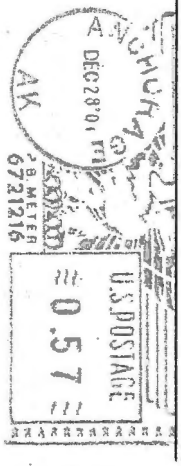
January 7, 7:30 PM **Alaska Native Plant Society** Monthly Meeting *Campbell Creek Science Center*

February 4, 7:30 PM **Alaska Native Plant Society** Monthly Meeting *Campbell Creek Science Center*

January 7, 7:00 PM Mat-Su Master Gardener Association meeting
Speaker: Julie Riley, Extension Horticulture Agent
Topic:"Common Perennials, Unusually Species"
Location: Matanuska Telephone Association Building 480 Commercial Drive, Palmer

January 24, 7:30 PM Herb Study Group:
Location: Cooperative Extension Service conference room
2221 E. Northern Lights (Northern Lights and Lake Otis Parkway behind Medical Park)
Call Julie Riley for more information

Alaska Native Plant Society
P.O. Box 141613
Anchorage, AK 99514



CHECK YOUR LABEL: IT IS TIME TO RENEW!