Borealis

the newsletter of the

Alaska Native Plant Society

PO Box 141613, Anchorage, Alaska December 2006

Join us at our Next Meetings!

Monday, December 4, 7:30 p.m.

(Campbell Creek Science Center)

"Alpine Vegetation And Introduced Caribou on the Kenai Peninsula"

Speaker: Carlos Paez

December Plant Family Study

***Andreaeidae*: Lantern Mosses**

Presenter: Glenn Brown

Mini Botany Presenter: Al Batten

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Monday, January 8, 7:30 p.m.

(Campbell Creek Science Center)

Speaker: TBA

January Plant Family

***Sphagnidae*: Peat Mosses**

Presenter: Joyce Weaver-Johnson

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For latest information on ANPS events, check our website at:

http:// AkNPS.org

News From The Lab

One Flower's Response To Pounding Rain

For the first time, biologists have shown that flowers pinch shut during thunderstorms to shield reproductive parts from pounding rain.

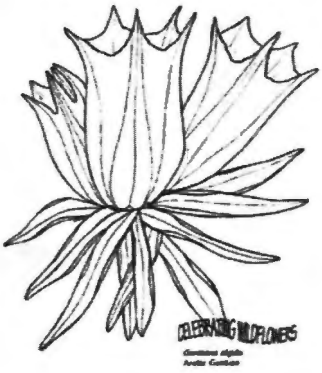
Lab experiments in the 1930's showed that alpine flowers of the narrow leaved gentian, *Gentiana algida*, close when temperatures drop. This gentian can be found in the Alaska range, trailing out into the Aleutians and north along the western coast of Alaska to the Arctic Circle.

Working at three locations in the Rocky Mountains, researchers from the University of Wyoming found that the flowers also constrict as a storm builds, They restrict at the rate of 10% per minute as the storm develops and when the dissipates the blooms reopen.

The researchers mimicked storm conditions in the lab by blowing ice-chilled air over the gentian blooms. The blooms responded by closing up. The blooms reopened when the researchers warmed them.

Then cruelly, the researchers tucked waxed-paper cones inside the blooms so that the blooms couldn't close and subjected them to the same conditions. Blooms that couldn't close for several weeks produced less than a third as many seeds as unfettered flowers. The continuously open flowers also lost up to half of their pollen....possibly the reason which drove the evolution of storm shutting flowers.

Source: Science News, Vol. 160



Andreaeidae: The Lantern Mosses

This group was named to honor J.G.R. Andreae, a German apothecary in the 18th century. Andreaeidae are sometimes also referred to as the granite mosses because they are commonly found on granite rock faces in mountainous and arctic regions, hence Alaska is home to many of them. *Andreaea*, a genus comprised of about 100 species, is the single representative of Andreaeidae found in North America with the exception of *Andreaeobryum*, which has been found in Canada and Alaska. *Andreaea rupestris* Hedw. and *Andreaea rothii* Web. & Mohr are the two most commonly identified representative species found in North America. The range of *A. rupestris* Hedw. in North America is Canada and Alaska south to North Carolina, Colorado and Oregon. *A. rothii* is less widespread commonly occurring in eastern North America.

Andreaea and *Andreobryum* are quite similar and we'll treat them as one group. The lantern mosses are quite small in stature, rarely exceeding 2 cm in height and usually much smaller. They form distinctive tight black or reddish black tufts on bare exposed rock. Most of these mosses prefer siliceous (acidic) rock, giving rise to a second common name for the group "the granite mosses". Any blackish moss which forms tufts on rock surfaces rather than rock crevices is likely to belong to this group.

The leafy plant, the **gametophyte**, is short in stature with dark incurved leaves.

These leaves lack a costae—the moss equivalent of a mid-vein--and are characterized by very thick walled papillose cells giving rise to a bumpy surface. This moss character can be best seen with a hand lens. If the surface of the leaf has a dull, mat finish, its cells are papillose. If it is shiny and reflects light, most likely the cell walls are smooth.

Unlike most other mosses, the **sporophytes** of Andreaea lack a peristome (teeth), instead the capsule splits longitudinally along the sides in 4 places to release the spores. A mature capsule looks much like a miniature Chinese lantern, hence the name "lantern moss".

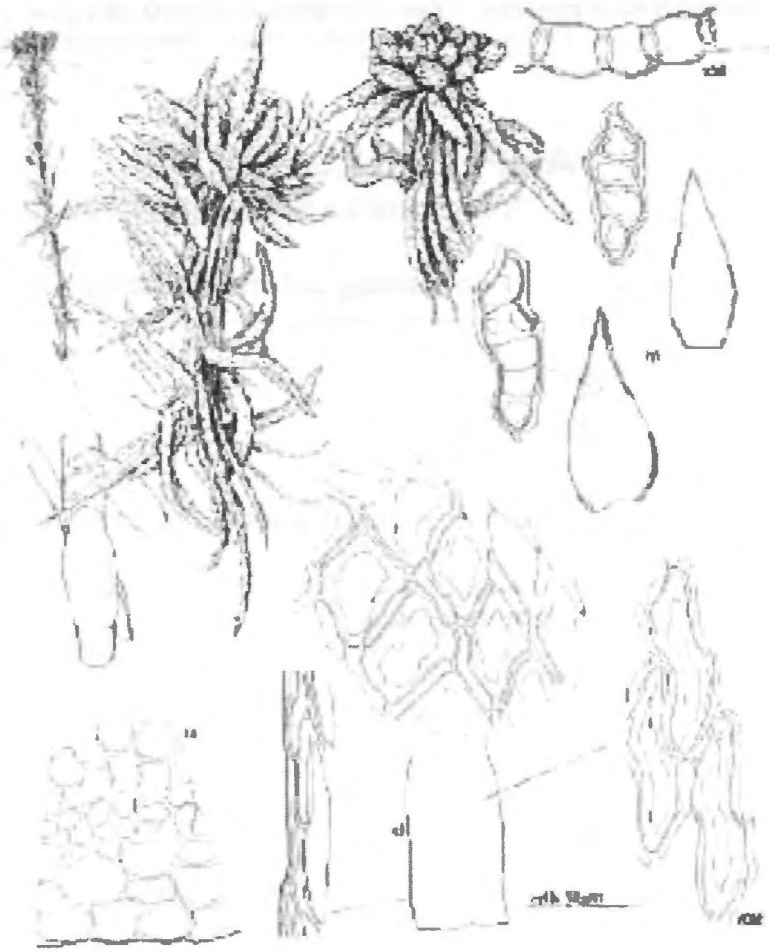
Sphagnidae: The Peat Mosses

The genus *Sphagnum* comes from a Greek word originally applied to a plant of unknown identity. Although there is only one genus in this order, which is considered the most primitive of the mosses, the group now has 150 identifiable species although twice that many have been described. *Sphagnum* is distributed around the world and reaches its greatest abundance in the cooler temperate portion of the northern hemisphere where it dominates wetland vegetation.

Familiar common names for the Genus are bog moss, turf or peat moss. These plants are aquatic or semiaquatic and grow in dense masses in swamps, ponds or lake margins. Certain acids are liberated during growth and cause the water to become acidic (ranging from a pH of 3.7 to 4.8). This creates conditions unfavorable to Fungi and Bacteria. Thus the decay of dead tissue is greatly retarded and makes for favorable bog conditions. *Sphagnum spp.* are ecologically important species in bogs around the world. The hyaline cells of peat mosses are able to hold large quantities of water. This holding capacity is important in retaining moisture in bogs and controlling runoff. The ion exchange capability of *Sphagnum* is important in maintaining the acidic conditions common to bogs.

Sphagnum is unique among mosses in both gametophyte and sporophyte structure. I'll begin with the gametophyte. The growth form of the gametophyte is different from other mosses in that branches form a dense head—capitulum—at the top of the stem. As the plant grows, these branches spread out along the stem, giving rise to a top heavy plant. To keep its balance, *Sphagnum* always grows in tight mats, each stem depending upon neighbor stems for support.

The gametophyte has an amazing structural adaptation which allows them to absorb up to 30 times their dry weight in water. If you were to look at a leaf under a microscope you would see mosaic of very large clear cells—the hyaline cells--surrounded by thread like green cells. The hyaline cells are important for water absorption, the tiny green cells are for photosynthesis. About 98% of the leaf is comprised of hyaline cells, leaving only 1-2% for photosynthesis
In addition to moisture holding qualities, peat moss contributes acid to its surroundings. It does this by making a trade. It takes things like calcium and magnesium out of the water and replaces them with hydrogen ions. As hydrogen ions increase, the pH goes down increasing the acidity.



The sporophyte also has some unique characters. The capsule is spherical and like the lantern mosses, lacks a peristome. Unlike the lantern mosses the peat mosses form a distinct lid (operculum). Inside the capsule after the spores are formed, gasses begin to build up. As the capsule begins to dry, pressure is exerted on the shrinking capsule and ultimately the operculum is blown off—rather explosively releasing the spores. Supposedly the explosion is audible, but I've never heard it.

ALASKA NATIVE PLANT SOCIETY 2006-2007 Seed Exchange

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.

NOTE to Donors: The plea for seeds for the exchange did not get into the last newsletter, but if you have gathered seeds that you'd like to donate, please do. We will offer them at meetings and upcoming mail shows.

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. For mail orders, include an additional $0.50 for 1 -5 packages, or $1.00 for 6 or more. Make checks payable to: Alaska Native Plant Society. Send order to: Alaska Native Plant Society, PO Box 141613, Anchorage, AK. 99514

Seed Germination Information

Use a sterile mix for best results. Fine seed should be sprinkled on the surface. Cover large seeds with soil. Keep mixture moist by covering with plastic. For best results water from the bottom of a tray or spray with a fine mister.

If your only seed starting experience has been with easily germinated vegetables or annual flowers, more patience is going to be required when it comes to growing perennials from seed successfully. Some types germinate within days, others take several weeks, and a large number of perennials require what is called **stratification** -- basically, simulating the conditions that exist outside over the winter. These types of seed are sometimes described as "cold germinators". The usual trick is to place the seed with some moist, sterilized commercial seeding mix inside a plastic bag, then storing it in a refrigerator for a period of time to break down the natural chemical germination inhibitors within the seed. A typical period of time is about three to four months. Then the seed is sowed as usual and started indoors under lights. Another approach is to sow the seed in late fall in pots, then leave it outside in a protected (but unheated) coldframe for the winter.

ANPS SEED EXCHANGE ORDER FORM

Orders will be filled in the order that they are received

Order by plant number appearing before the name

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The price is $0.50 per packet. For mail orders, add $0.50 for 1 -5 packets, or $1.00 for 6 or more.

PLEASE NOTE: Seeds marked with a * are in limited supply, so if you are ordering them, list an alternative in case they are no longer available.

Name_____ Number of packets ___ @$.50 = $____

Address_____ Mailing cost ($.50 for 1-5 or $1.00 for 6 or more) = $____

City_____State_____Zip___ Total Enclosed = $____

Make checks payable to: Alaska Native Plant Society
Send order to: Alaska Native Plant Society, PO Box 141613, Anchorage, AK. 99514

2006-2007 Seed List

	Scientific Name	Common Name	Height	Flower Color	Comments
1.	*Aconitum delphinifolium*	Monkshood	2-4 ft.	Dark blue	Damp; stratify 2-4 months; may take 2 years to germinate
2.	*Aconitum maximum*	Aleutian Monkshood	5-7 ft	Medium blue – large flowers	Stratify 2-4 months; may take 2 years to germinate
3.	*Allium schoenopasum*	Chives	10-12 in	Lavender	Easy
4.	*Androsace chamaejasme*	Rock Jasmine	2-3 in.	White	Difficult to grow
5	*Anemone multifida*	Cut-leaf Anemone	6-10 in.	Cream and pink	Stratify
6.	*Antennaria dioica*	Pink Pussytoes	5-6 in.	Pink	Stratify
7.	*Aquilega formosa*	Western Columbine	15-20 in.	Red and yellow	Easy
8.	*Arnica latifolia*	Meadow Arnica	10-14 in.	Yellow	Easy
9.	*Bupleurum triradiatum*	Thoroughwax	8-18 in	Yellow	Germination method unknow
10.	*Campanula rotundifolia*	Common Harebell	10-16 in	Lavender	Easy
11.	*Carex mertensii*	Mertens Sedge			Stratify
12.	*Delphinium glaucum*	Larkspur	4-5 ft	Dark blue	Damp; stratify
13.	*Dodecatheon pulchellum*	Shooting Star	12-15 in.	Magenta	Cold and damp; stratify; may take 2 yrs to germinate
14.	*Draba incerta*	Whitlow grass	4-6 in.	Yellow	Easy; no stratification
15.	*Fritillaria camschatcensis*	Chocolate Lily	12-16 in.	Brown	Damp/cold; stratify. Will probably take 2 yrs to germinate
16.	*Galium boreale*	Northern Bedstraw	14-16 in	White	easy
17.	*Gentiana propinqua*	Four-parted Gentian	6-10 in.	Pink	Easy; sow in place; annual
18.	*Geranium erianthum*	Wild geranium	15-18 in	White form	Easy
19.	*Iris setosa*	Wild iris – wild collected	16-18 in.	Purple	Soak seeds or stratify; slow to germinate but highly successful.
20.	*Iris setosa*	Wild iris – garden collected			
21.	*Loiseleuria procumbens*	Alpine azalea	1 in.	Pink	Easy; very slow growing
22.	*Mertensia paniculata*	Bluebells	14-16 in	Blue	Stratify; easy
23.	*Mimulus guttatus*	Monkeyflower	12-15 in.	Yellow	Easy; no stratification. blooms the 1st year; reseeds. Not aggressive if you don't plant it near water
24.	*Myosotis alpestris*	Forget-me-not	8-12 in.	Blue	Easy
25.	*Papaver alboroseum*	Pale pink poppy	2-3 in.	Light pink with yellow center	Easy; no stratification; may flower the first year; reseeds. Gravelly soil.
26.	*Papaver alboroseum*	White poppy	2-3 in.	White	Easy; no stratification; may flower the first year; reseeds. Gravelly soil.
27.	*Papaver lapponicum*	Arctic Poppy	3-5 in.	Light yellow	Easy; no stratification; may flower the first year; reseeds. Gravelly soil.
28.	*Papaver sp.*	Unnamed poppy	3 in.	Orange	Easy – from Becharof Lake
29.	*Polemonium acutiflorum*	Tall Jacob's Ladder	20-30 in.	Lavender/blue	Easy; no stratification.

30.	*Potentilla vunflora*	One-flowered cinquefoil	3-4 in	Yellow	Easy
31.	*Rhododendron camtschaticm ssp.glandulosum*	Kamchatka rhododendron	2-3 in.	Large pink flowers	Stratification. Slow growing
32.	*Saxifraga bronchialis*	Yellow spotted saxifrage	5-6 in.	Light yellow	Easy; no stratification. Tiny seeds – don't cover.
33.	*Saxifraga tricuspidata*	Prickly saxifrage	3-4 in	Cream	Easy
34.	*Swertia perennis*	Star gentian	10-14 in	Purple	Stratification recommended
35.	*Tellima grandiflora*	Fringed Cups	15-18 in.	Green	Easy - stratification helpful. Great shade plant.
36	*Tofieldia sp*	Tofieldia	3-4 in.	White	Germination unknown
NON-NATIVE SEEDS					
40.	*Saxifraga manchuriensis*		8-12 in.	White	Easy but stratification helpful Semi-shade. Original seeds from Siberia.

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MOSS VOCABULARY

Mosses and other bryophytes were first studied centuries ago when nobody understood plant life cycles and when communication among researchers was haphazard. As a result, the meaning of some of the many terms and phrases that have been coined or borrowed over the years to describe them are confusing, overlapping, or even contradictory. The original meanings of some have changed, too, either as a particular "school" came to dominate bryology or as or scientific understanding improved and even today the meanings of some terms are hotly disputed. An excellent, full color illustrated glossary of terms used to describe mosses, liverworts and hornworts is "*Mosses and Other Bryophytes – An Illustrated Glossary*" by Bill and Nancy Malcolm, Micro-Optics Press, 2000.

antheridium (plural **antheridia**)	the male reproductive organ of mosses and liverworts
archegonium (plural **archegonia**)	the female repoductive organ of mosses and liverworts
buds	small shoots on the protonema that develop into gametophytes
calyptra	a membranous or hair cap or hood that forms from the wall of the archegonium and protects the embryonic sporophyte; it is formed after fertilization of the egg and is ripped off as the seta elongates.
capsule	the spore producing structure in mosses. The spores are haploid.
costa (plural **costae**)	in mosses and some liverworts, the thickened midrib or nerve of a leaf; the leaves of some mosses have a single or double costa or none at all
diploid	said of a cell which contains 2 complete sets of chromosomes in the nuclei of its cells
foot	the structure that connects the seta of a sporophyte to the parent gametophyte
gametes	male and female reproductive cells
gametophyte	the haploid leafy plant composed of stems and leaves
gemma (plural **gemmae**)	specialized piece of tissue that can develop into new moss or liverwort gametophytes through the process of vegetative propagation
haploid	said of a cell which contains only one complete set of chromosomes in the nuclei of its cells
moss "leaf"	leaf "blade" is usually only one cell thick
operculum	the structure under the calyptra that covers the opening of a spore capsule
peristome	teeth at the opening of the capsule; help in spore dispersal
protonema	the thread-like structure that develops from a moss spore
rhizoids	root-like threads that anchor a moss or liverwort to the substance on which it grows
seta	the stalk that connects a spore capsule to the parent gametophyte
sporophyte	the diploid phase of a moss, consisting of a capsule, stalk and foot
vaginula	the collar-like fragment of archegonium tissue left behind when the calyptra is falls off usually just before spores are disperse

MYSTERY PLANT

This small (2-3 inches) plant can be found in wet alpine locations throughout most of Alaska and is a circumboreal plant in arctic alpine areas. The tiny 3-5 lobed leaves are on long slightly hairy petioles. The small 5-petalled flowers are usually white, but occasionally reddish to purple. Three to five flowers are in loose racemes at the ends of the thin stems. These plants could easily be missed if not in bloom and are rarely seen in large patches.

Mystery Plant Answer

Alpine Brook Saxifrage
Saxifraga rivularis
Saxifragacea Family

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

To. **Jeff Hayes**, November guest speaker for his talk on how the NPS is dealing with some invasive plants.

To **Marilyn Barker** for her introduction to the moss families.

YOU MAKE IT HAPPEN!

"Summer is A'Commin' In" ...Eventually!

Start thinking about summer and what field trips you'd like to share with the group. Where would you like to go? Field Trip planning forms will be provided in the next newsletter, but if you want to get going already, contact Anjanette Steer at anj@ak.net

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

Paid Thru 2006

Membership is on a calendar-year basis - it is time to renew!

ANNUAL MEMBERSHIP APPLICATION/RENEWAL

The Alaska Native Plant Society was organized in 1982 by 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)_____E-Mail: _____

Membership is on a calendar year basis.