

Borealis

the newsletter of the



PO Box 141613, Anchorage, Alaska

April/May 2009

Join us at our Next Meetings!

Monday, April 6, 7:30 p.m.

(Campbell Creek Science Center)

Speaker: Dr. Lilian Alessa
UAA Biology Dept

Topic: "The Fabulous Freezing Fucus:
How a Seaweed Teaches Us About
Adapting to Climate Change"

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

(Campbell Creek Science Center)

Speaker: Annie Neavldine

Topic: "Taking effective pictures
of flowers"

Annie will share some hints and tips from
her experience photographing plants and
flowers."



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

[http:// AkNPS.org](http://AkNPS.org)

Fungi To The Rescue

The Alaska Botanical Garden's 2009 Spring Garden Conference on April 4 features Keynote pioneering mycologist Paul Stamets. Paul will be talking on Friday evening at the Lousaac Library about "Solutions from Nature: How Mushrooms Can Help save the World". He will also be featured along with many Alaskan gardening experts at the Saturday conference at UAA. For more information on the Conference contact Alaska Botanical Garden: www.alaskabg.org.

Paul Stamets has been a dedicated mycologist for over thirty years. Over this time, he has discovered and coauthored four new species of mushrooms, and pioneered countless techniques in the field of edible and medicinal mushroom cultivation. He received the 1998 "Bioneers Award" from The Collective Heritage Institute, and the 1999 "Founder of a New Northwest Award" from the Pacific Rim Association of Resource Conservation and Development Councils. In 2008, Paul received the National Geographic Adventure Magazine's Green-Novator and the Argosy Foundation's E-chievement Awards. He was also named one of Utne Reader's "50 Visionaries Who Are Changing Your World" in their November-December 2008 issue.

He has written six books on mushroom cultivation, use and identification; his books *Growing Gourmet and Medicinal Mushrooms* and *The Mushroom Cultivator* (coauthor) have long been hailed as the definitive texts of mushroom cultivation. Other works by Paul Stamets include *Psilocybe Mushrooms and Their Allies* (out of print), *Psilocybin Mushrooms of the World*, *MycoMedicinals®: an Informational Treatise on Mushrooms*, and many articles and scholarly papers. His newest book is *Mycelium Running: How Mushrooms Can Help Save The World*. This book is a 21st-century manual for healing the earth and creating sustainable forests through mushroom cultivation, featuring mycelian solutions to water pollution, toxic spills, and other ecological challenges.

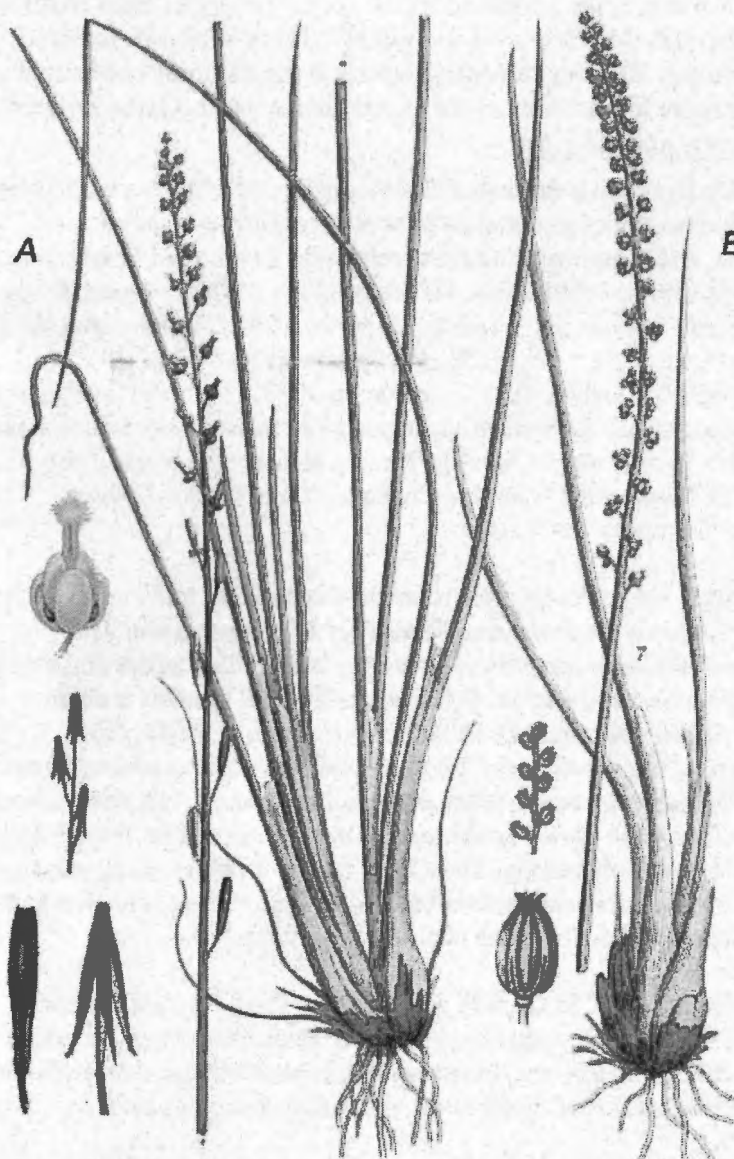
Paul sees the ancient Old Growth forests of the Pacific Northwest as a resource of incalculable value, especially in terms of its fungal genome. A dedicated hiker and explorer, his passion is to preserve, protect, and clone as many ancestral strains of mushrooms as possible from this pristine woodlands.

Don't miss this visionary talk and the full day of gardening related seminars by Alaska experts – April 3 and April 4, 2009!

Juncaginaceae –The Arrow Grass Family

The Arrow-grass family consists of 2-3 genera and 20 species. They are found in cold and temperate regions of both hemispheres. Here in Alaska the family is represented by one genus, *Triglochin* with 2 species—*T. maritimum* and *T. palustre*. The family is closely related to Scheuchzeriaceae (last month's family) and Potamogetonaceae, the pond weed family. Many botanists combine the Schueuchzeriaceae and Juncaginaceae. The arrow-grasses differ from the Scheuzeriaceae by having united carpels and from the Potamogetonaceae by habit: they are terrestrial, not aquatic plants.

All members of the family are herbaceous with sheathing basal simple leaves. They rightly earn their common name of arrow-grasses as a field of arrow-grass appears as a field of grass, the flowering stalks, when present, appear as arrows out of the substrate. The Alaska members are rhizomatous with 2 ranked leaves. They have inflorescence is a terminal spikate raceme. The flowers have 6 perianth segments in two whorls of three; there are 6 stamens and either 3 or 6 carpels (3 in *T. palustre* and 6 in *T. maritimum*).



A. *Triglochin maritimum*

B. *Troglochin palustre*

The two species differ in habitat as well. *T. maritimum* (Sea Arrow Grass) is most commonly found in saline meadows and tidal flats whereas *T. palustre* (Marsh Arrow Grass) is more likely to be found along freshwater drainages, such as pond margins and riverbanks. However, both are known from all types of wetland areas.

The coastal salt marsh flats in southcentral Alaska are characterized of huge nearly pure stands of *T. maritimum*. These stands are use as forage for Canada geese. On Fox River flats (at the head of Kachemak Bay), there is competition between grazing cattle and geese for the resource. The leaves are fleshy and semi-cylindrical like those of Marsh Arrowgrass, but they are not furrowed above at the base (though may have slightly raised edges). The flowers are also similar but the fruits are very different, being no more than twice as long as broad in *T. maritimum* but many times longer than broad in *T. palustre*. The plant is tufted with stout "fans" of leaves at base. The flowers start off red and soon become white, then fall to leave the green carpels which eventually become brown fruits.

Petals/sepals of *T. palustre* are 6, all similar, green and purple. The showy parts of the flower are the long white stigmas. In general it is a more delicate plant than Sea Arrowgrass, with the flowers or fruits less densely packed around the stem.

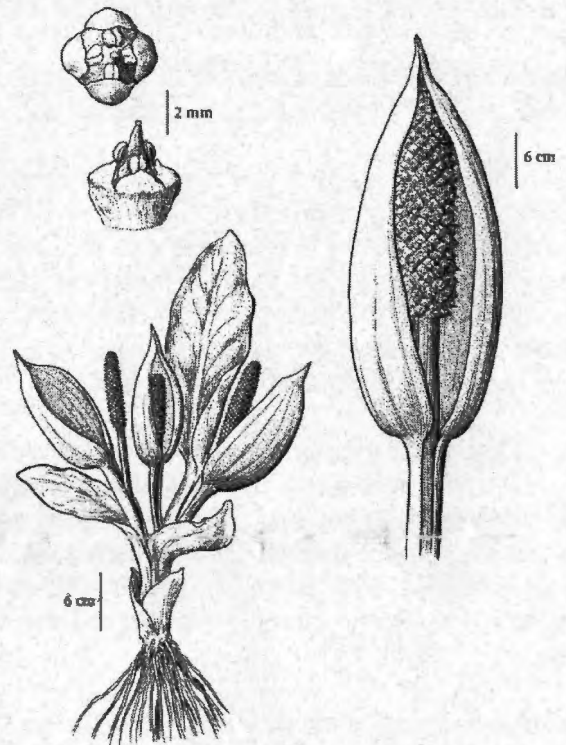
Mystery Plant Answer
Primula incana
 Primula/Primulaceae Family

Araceae—The Arum family

Araceae is a highly diverse and important economical family—Its members include *Philodendron*, *Monstera*, *Caladium*, *Aglaonema* (Chinese evergreen) *Zantedeschia* (calla lily), *Dieffenbachia* (dumbcane)—all houseplants, as well as the garden “jack-in-the-pulpit”, *Arisaema* and taro, *Colocasia*. The family is large, containing about 110 genera and 2000-2500 species. The greatest family diversity is in the tropics and subtropics, hence all the house plants! But it does include 3 Alaska genera: *Lysichiton*, *Acorus* and *Calla*. It should be noted that *Acorus* is often separated from the other aroids and placed in a separate family.

Aroids are mostly perennial herbs, many have a fleshy rhizome. The main characteristic which identifies the group is the large, often petaloid spathe (which is actually a bract!) that subtends a massive spadix. A spadix is a fleshy spike with reduced flowers. The flowers usually show a reduced perianth and may be perfect or imperfect. The fruit is a berry.

Yellow skunk-cabbage (*Lysichiton americanum*) is a fresh, succulent and unforgettable addition to the wetland. It has a skunk-like odor that attracts insects, and it grows to more than 3 feet in height, with a bright yellow spathe, flower spike (spadix), and oval, green leaves that reach about 75 cm wide. Its appearance has also earned it the name of swamp lantern. The leaves and root are edible by humans; particular processing methods eliminate the slightly bitter, acrid taste. Bears and deer also eat it. Skunk cabbage was rarely used as a food for native people, but was used as “Indian wax paper” for lining berry baskets, berry drying racks and steaming pits.

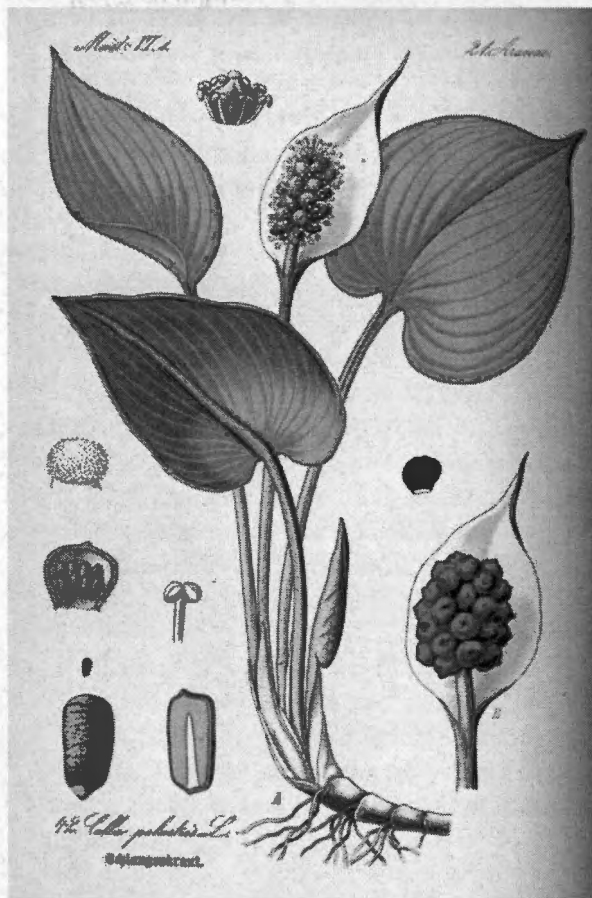


Lysichiton americanum

Calla palustris is native to cool temperate regions of the Northern Hemisphere, in central, eastern and northern Europe, northern Asia and northern North America (Alaska, Canada, northeastern contiguous United States).

It is a rhizomatous herbaceous perennial plant growing in bogs and ponds. The leaves are rounded to heart-shaped, 6–12 cm long on a 10–20 cm petiole, and 4–12 cm broad. The greenish-yellow inflorescence is produced on a spadix about 4–6 cm long, enclosed in a white spathe. The fruit is a cluster of red berries, each berry containing several seeds.

The plant is very poisonous when fresh due to its high oxalic acid content, but the rhizome, like that of other arums, is edible after drying, grinding, leaching and boiling.



FROM WHAT WE'VE LEARNED

ANPS monthly meetings are always fun and educational! Have you been missing out? This month you are in luck, because our Secretary Beryl Wardlaw has been willing to provide us with a review of some recent topics covered. While her reviews are great, she can only provide the "tip of the iceberg" – to savor the whole experience you'll have to show up on that first Monday of the month!

February 2, 2009 – "What is Happening To Our Alders?" Lori Trummer

When Lori Trummer got a call in 2003 from Michael Shepherd asking if she knew what was causing local alders to die off, it started an interesting example of scientific sleuthing. Lori has worked with the Forest Service for 20 years. Currently her job is plant pathologist but she is about to retire to her creekside property in Gustavus.

Alaska has four kinds of alder, three in South Central and Interior - *Alnus incana subspecies tenuifolia*, *Alnus viridis subsp. Crispa*, *Alnus viridis subsp. Sinuata*, and one in Southeast Alaska: *Alnus rubra*.

The reason for concern is that alder are keystone species in early succession for stabilization and nitrogen fixation. This shrub is generally so prolific it is known as the "Boreal weed". Its roots grow clusters of nodules containing the Frankia bacterium, which live in symbiosis with the alder. The alder provides nutrients while the bacterium is able to change nitrogen from the air to a form the plants can use. Even after the alder has gone the soil may retain the nitrogen for up to two centuries. It is a great irony that plants are limited to obtaining nitrogen from soil while surrounded by an abundance in the air. They need the bacteria they host to make usable compounds for them and the subsequent plant species in the area need the nitrogen it brings to the soil.

The range of the thinleaf alder (*Alnus incana tenuifolia*) throughout the western US and Canada includes South Central and Interior Alaska along the Alaska Range and in the Kenai peninsula. The species has smooth bark and lobed leaves and grows along water courses. This alder is clearly affected by the blight. So far *A. rubra* is not much infected. *Alnus Crispa* is also a host to the disease. There are infestations of *Alnus sinuata* in Katmai. How bad is it? Forest Service monitoring plots in Kenai (2004, '05 and '06) Matsu ('05 and '06) and the Interior ('06) show forty percent of the plants are dead, another 31% experience some dieback, and about a third remains healthy. The Fairbanks location hasn't seen the peak yet.

What does the infection look like? After leafout the foliage withers by early summer. The bark becomes pitted by the pathogen with the potential for girdling the stem. The alder has some ability to isolate the infection but tends to lose the battle. The roots do not resprout.

Three main factors interact to promote plant disease: the nature of the pathogen, the susceptibility of the host and the environmental conditions. Lori and her colleagues tried to discover what was attacking the plant. More than twelve native canker pathogens fell under consideration. The fungus *Valsa melanodiscus* appears to be a major culprit. To check if any root rot is involved Lori and her crew dug around the roots of several plants but found very few instances of root rot. European colleagues suspected that *Phytophthora*, a root rot which kills alder in Europe, is affecting the Alaskan species but Lori's group concluded this was not the main problem. Any root disease appears to be a secondary infection. In the sick plant the crucial Frankia bacteria are dying. They did encounter some severe insect defoliations that may have indirectly stressed the alders, such as sawfly. They concluded from their studies that the dieback and mortality was unrelated to distance to streams or roads or soil drainage in any of the areas monitored. 2003 and the two subsequent summers were drier than usual. This may have been the stress that weakened the alders and initiated the infection.

Where the alder have died back the *Calamagrostis* grass, which was already there, takes the opportunity to spread. What is the history of sites where the alder is threatened? There is evidence it has happened before, and it is not uncommon to see some dieback, but this is a massive infestation. Like many species in this time of global warming the alder are moving "up the hill", to higher elevations, where the alders show better recovery rates. Several organizations are working on aspects of the problem. The Alaska Bird Observatory is comparing the impact of healthy versus diseased alder sites on bird communities. Field work and university studies shed light on the problem. Lori thinks the alder is a plastic species and may rebound. Let's hope so. Thank you Lori for sharing a fascinating investigation.

March 1, 2009 “Drawing and Painting Wildflowers Throughout the West” Speaker: Linda Vorobik

It is obvious that Linda Vorobik loves flowers. Her presentation for the Alaska Native Plant Society featured many strikingly beautiful examples. Frequently we'd hear oohs and ahs from the audience as the next slide of photos or artwork appeared on the screen. I'm afraid a verbal description doesn't do it justice. If you would like to see examples of her illustrations, visit her website:

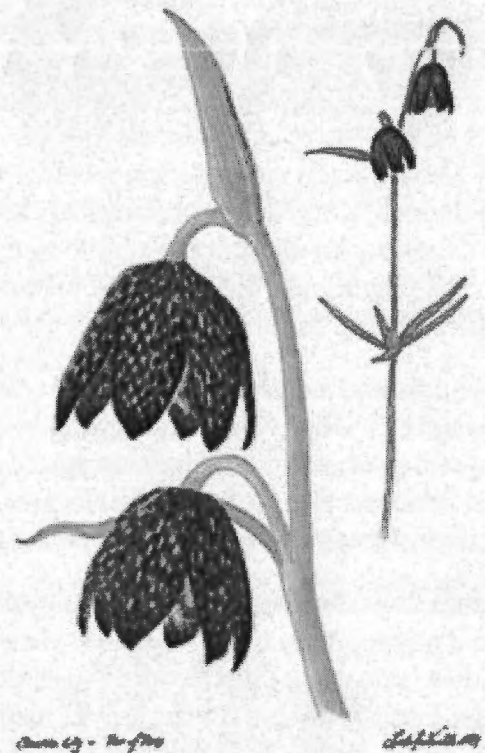
In botanical illustration, art serves science because drawings can show details of a plant that may not be as clear in a photograph. Linda is able to examine a herbarium specimen and draw from it so that the illustration looks like a living plant. In this kind of art aesthetic choices promote clarity by the way the picture is arranged on the page, frequently showing not only the whole plant against the white background but also close-ups of selected details. Linda outlined some of her techniques, such as watercolor washes for layering color, progressing from light to dark like on the translucent onion bulb layers she suggests practicing with, and opaque white for highlights. She also showed how to practice mixing colors with the tedious but very beneficial exercise of painting a chart of squares. The people I talked to who took her workshop each said they enjoyed it and got a lot out of it, whether or not they were already adept at drawing and painting.

Linda teaches university courses in biology, illustration and ecology, and her botanical illustrations are published in several flora. She also sells her artwork, and when someone asked if she misses the paintings she sells, her reply was no, that just makes space to do another piece. Linda travels throughout the Western states, giving workshops and drawing and painting the plants of the different habitats she visits, which range from the lushly wooded coastal regions interspersed with farmland to drier areas on the eastern side of the mountains, where sagebrush or desert prevails. Each has many interesting and beautiful species.

Some of the photos showed the desert in full bloom, as happens only once a century. Every winter after rain the flowers come out, but 2005 was unusual and spectacular. In March Linda goes south to California and works her way northward. She showed us some Indian Paintbrush flowers (*Castilleja* species) and challenged us to guess the pollinator from the structure. It is the hummingbird that reaches in with its long beak to gather nectar. We have several local paintbrush species in Alaska, many of them yellow.

West of the Sierras you find open hill country with meadows with scattered oak trees that harbor mistletoe in their branches. Linda calls it a “rainbow of flowers” when this region is in bloom. Milkweeds are a genus not native to Alaska, so when Linda showed us their flowers, with their male parts highly ornamented to attract insects, I was unfamiliar with them. The slides featured so many interesting species I can't mention them all, but one of my favorite local flowers is the chocolate lily. Linda showed us several kinds with different coloration and patterns. Check out her website for a nice illustration of *Fritillaria affinis* in yellow. Ours is *Fritillaria camschatcensis* in a dark purplish brown. A less than delicious fragrance, however.

Are you looking forward to Spring? I thought of spring when Linda Vorobik showed us *Calypso bulbosa*, a lovely pink and white orchid that pops up on the forest floor just before leafout. It is still all white outside but winter is on its way out. It was nice that Linda came up here in the off season and shared all this color and cheer. I appreciate her technical and scientific expertise but above all I enjoyed her lively and friendly enthusiasm. Thank you very much Linda!



***Fritillaria affinis* - Chocolate Lily**
Illustrator: Linda Vorobik

Pollen Season Arrives, Blame The Trees

By Ned Rozell

With your next breath of spring air, you'll pull dozens of invaders through your nose. These intruders may make your nose drip and your eyes red and watery.

The airborne invaders are grains of tree pollen, specks so small that it would take eight of them to cover the period at the end of this sentence. The air is rich with pollen because spring is the mating season for trees.

The first step in a tree's reproductive dance is to release sperm, safely held in the center of a pollen grain. Trees release an incredible amount of pollen to improve the odds of finding a female flower. One birch catkin (the cluster of tiny flowers that looks like a caterpillar) can release millions of pollen grains.

Birch is the worst of the Alaska pollen types for allergy sufferers, said the late Jim Anderson, former biosciences librarian for the University of Alaska Fairbanks. In addition to being a collector of neckties, teddy bears, typewriters, and other things, Anderson had a passion for pollen. He studied it for years with an air-sniffing instrument mounted on top of a building. Looking at years of data, he found a few trends in the way trees and other plants release pollen.

Anderson found that birch trees begin releasing pollen about two days before leaves emerge from buds, and the concentration of birch pollen is greatest about three days after the leaves come out. He measured more than 4,500 grains of birch pollen per cubic meter on the highest pollen days.



Birch Pollen

Allergy sufferers are hit hardest by birch pollen because it contains irritating proteins. Each grain of pollen consists of a center containing the male genetic material, surrounded by a protective wall called the exine (which was the word on Anderson's vanity license plate). When pollen comes in contact with moisture, such as that on the nose's mucous membranes or the lining of the eyelid, protein molecules from the exine leach into a person's tissues. An allergic person's immune system produces antibodies against the protein molecules. Antibodies then trigger the release of histamines and other potent substances, leading to the cold-like symptoms familiar to allergy sufferers.

Anderson discovered that watching the weather could help him predict the day trees release pollen. By taking the average of the daily high and low temperatures and subtracting 32 degrees Fahrenheit, he came up with a number called degree-days. By looking at past years' pollen outbreaks and comparing them with temperature records, he found that, in the Fairbanks area, poplar and aspen release pollen first. Next come birch, alder, spruce and grasses, all at specific numbers of degree-days.

Though the dates of pollen release from year to year vary with the warmth of spring, Anderson said he was able to keep a running tally of degree-days. He knew, for example, that when the number approaches 232, birch trees are ready to release pollen. He also found that birch trees tend to release pollen in greater amounts every other year. He didn't know the reason for the biennial cycle, but thought it had to do with the biological makeup of birches.

Luckily for those with allergies, pollen season doesn't last very long. According to pollen calendars Anderson has made for Fairbanks and Anchorage, birch trees typically shed large amounts of pollen May 10th through the 20th.

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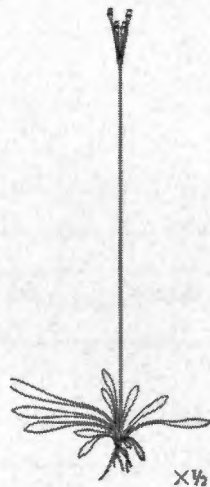
MYSTERY PLANT



This perennial is only found in Eastern Central Alaska, Yukon Territory, and a few other scattered areas in northern Canada.

The basal leaves are linear, lanceolate and can be up to 2 inches long, the underside being farinose (covered with a white mealy substance) as is the calyx and peduncle (stem of the inflorescence).

The inflorescence is in the form of an umbel and can have 3 to several small pinkish lavender flowers. The petals are joined together for half of their length and then salviform. These plants can be found growing in wet areas and meadows.



Upcoming Botanical Events

Alaska Native Plants - May 6-27

BIOL A075 Local Flora 1 CR (Pass/Fail) Wed
Morning section 8:30- 12:15, Evening section 6:00-9:45 Wednesdays. Most classes will be out of doors.

Join Marilyn Barker in a study of wild flowers and plants in the surrounding locale with emphasis on use and identification. May include preparation of pressed plant specimens and field trips. Contact: UAA to register for this spring semester class.

Saturday, May 2

Co-sponsored by the AMGA, the Alaska Botanical Garden will host a lecture on, by well-known garden writer Tracy DiSabato-Aust. Author of *The Well-Tended Perennial Garden*, DiSabato-Aust will speak on *The Well-Designed Mixed Garden: Building Borders with Trees, Shrubs, Perennials, Annuals & Bulbs*. Tickets are \$15 for ABG members, \$20 for non-members.

This lecture will take place at the Alaska Wild Berry Theatre, 5225 Juneau St.

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Newsletter ("**Borealis**")
Editor Ginny Moore

FAX:

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Thank You!

To our guest speakers, Lori Trummer and Linda Vorobik
and

To our member volunteers who have provided Plant Family and Mini Botany information at every meeting!

To Susan Klein, our new webmaster,
and
Andy Anderson-Smith, who developed the site!

It is our Membership that keeps us going!

Wanted

The Alaska Native Plant Society is looking for a projector and laptop computer to use for our monthly meetings. If you have a used one in working condition that you'd be willing to sell or donate, contact Mel at

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, please 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

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