BOREALIS

published monthly
October thru May
by the

MARCH 1990

ALASKA NATIVE PLANT SOCIETY

P.O. BOX 141613, Anchorage, Alaska 99514

MEETING NEWS

The March meeting of the Anchorage Chapter will be on Monday, March 5th at 7:30PM in the Municipal Library Meeting Room in the west end of the Carr's Muldoon Shopping Mall, corner of Muldoon Road and Northern Lights. The library will be closed, so enter by the door at the rear of the building.

BOARD OF DIRECTORS---The board meeting will be at 6:45 PM immediately preceeding the general meeting.

PROGRAM---ANPS member Rob Lipkin will present a discussion on "The Flora and Vegetation of Magadan."

PLANT FAMILY---The family to be discussed is the Diapensiaceae or Diapensia family. ANPS member Ram Srinivasan will lead the discussion. This family is represented in Alaska by one species having tiny, oval, evergreen leaves. It is a sub-shrub of alpine and tundra, having white flowers with 5 sepals, 5 connected petals, stamens and a superior ovary which forms a 3-parted capsule. It is found throughout the State, except the western part of the Aleutian chain and most of Southeastern Alaska.

DUES---1990 membership dues are now due and payable. Dues are $5 student, $10 individual, and $15 family (2 adults). Pay at March meeting or send to the ANPS Post Office Box listed above. Check the mailing label on this newsletter. If it has "90", you are paid up. If it has "89", your does are overdue, and this will be your last newsletter until dues are paid for 1990.

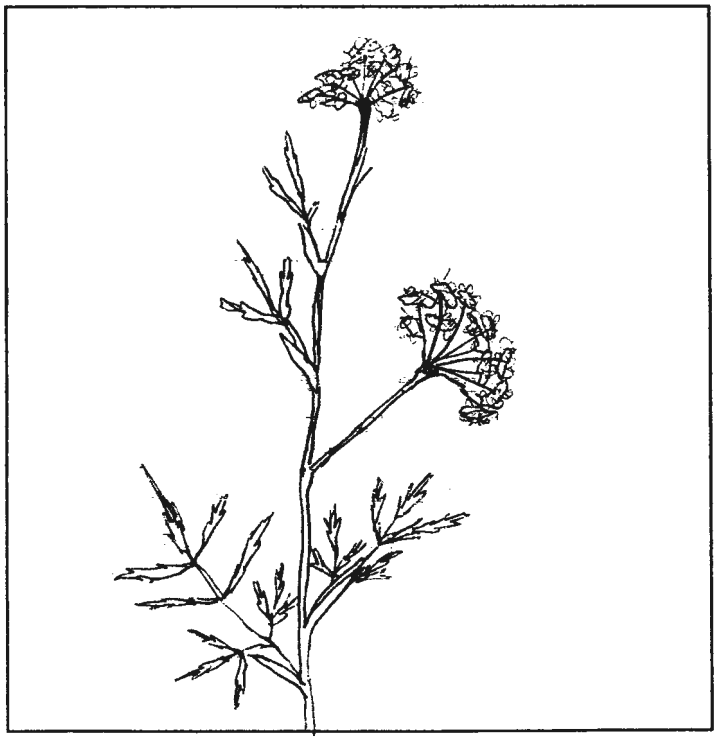
MYSTERY PLANT

The plant is robust and may grow up to one meter (3 feet) tall. It grows from tuberous-thickened and chambered roots. The roots contain cucutoxin, a deadly poison. Thus, the chambered appearance is an excellent characteristic for identification.

Leaves are once or twice pinnately compound and the white to cream or pink flowers are in umbels with 14 to 33 unequal rays. Leaf shape; broad linear to narrow lanceolate. Ovaries are glabrous as are the fruit.

It occurs in marshes, on lake margins or along streams in southwest and central Alaska.

Submitted by Gary Davies



Mystery Plant

ELAEAGNUS COMMUTATA **(Bernh.) Silverberry**---submitted by Gina Delucchi

This plant may also be described as *Elaeagnus argentea* (Pursh.) in older references. Additional common names include wolfberry and wolf willow. (12,18,19).

Elaeagnus commutata is a deciduous shrub ranging from 1 to 3.7 m in height. Its leaves are alternately arranged, elliptic to ovate, and silver-scurfy of both surfaces, though paler beneath. Young twigs are covered with brownish scales, while older branches are grayish-silver. It is thicket-forming and spreads easily through suckering. Silverberry flowers are inconspicuous since they lack petals, but have a noticeably pleasant fragrance. Small clusters of trumpet-shaped, yellowish flowers with 4 pointed lobes develop at leaf axils. *E. commutata* fruits are drupe-like and resemble miniature (12-15 mm) silver olives with a dry, mealy flesh surrounding a striate, elliptic stone. The fruits may remain on the plant throughout the winter. Silverberry's range extends from central Alaska and the Yukon Territories to British Colombia, east to Quebec, and south to Minnesota, South Dakota, Colorado and Utah (3.15,20,27).

In Alaska, *E. commutata* is common on the dry slopes and gravel bars along the major rivers of the Interior. Elsewhere, it may occupy different habitats: in Alberta, this shrub frequently occurs in the understory of aspen parkland communities (18,28).

Elaeagnus commutata belongs to the Elaeagnaceae or Oleaster family which contains 3 genera of trees and shrubs totalling 30-40 individual species. A covering of brown or silver scales on the leaves and young twigs is a characteristic of this family. The genus name *Elaeagnus* is variously translated from Greek meaning "olive" and "chaste tree" or "sacred olive". The other genera in Elaeagnaceae are *Shepherdia* (buffaloberry) and *Hippophae* (sea buckthorn). Silverberry is the only species of *Elaeagnus* that is native to North America though it was not introduced into cultivation until 1813 (6,7,12). The only other member of the Oleaster family that occurs in Alaska is *Shepherdia canadensis*, commonly known as the soapberry or russet buffaloberry (15,27).

More information is available on the uses of introduced *Elaeagnus* species, particularly Russian olive (*E. angustifolia*), but it can be assumed that silverberry can be employed for similar purposes in Alaska. *E. angustifolia* is a tree native to southern Europe and western Asia and is believed to be the wild olive of classical authors (4,12). Russian olive is widely planted (and has become naturalized) in the northwestern U.S. for a variety of conservation purposes such as shelterbelts and windbreaks, stream and slope stabilization and wildlife cover. It is also reputed to be a high-quality honey producer. *E. angustifolia* is well-adapted to dry and/or saline soil conditions and is hardy to -40 degrees C (2,19). Another species, *E. umbellata* (autumn olive) is also recommended by the U.S. Soil Conservation Service for conservation plantings and is more popular as an ornamental as it produces red, persistent fruits (21). Other *Elaeagnus* species grown for ornamental purposes include *E. pungens* (thorny elaeagnus) from which several cultivars have been developed, and *E. multiflora* (cherry elaeagnus). Due to its habit of profuse suckering, *E. commutata* is regarded as too weedy or "untidy" for use as an ornamental despite the fact that its foliage is the most showy (silvery) of the genus (6,14).

Many species of *Elaeagnus* and *Shepherdia* have edible fruits which vary in their palatability to humans. In the Orient, a sherbet is prepared with *E. angustifolia* fruits which are described as mealy but sweet (6). *E. umbellata* "berries" can be used for jelly but are somewhat astringent fresh (although they are consumed fresh in Japan)(21). *Shepherdia argentea*, the silver buffaloberry, has sour red fruits which are valued for preserves. Native Americans collected and dried *S. argentea* fruits for winter use. They were commonly prepared by cooking with buffalo meat (pemmican?) which presumably explains their common name (7,12). *S. canadensis* (soapberry, soopalallie) fruits contain saponin which gives them an extremely bitter taste when fresh, yet they can be shipped with water and sugar into a frothy desert (13,15,22).

E. commutata fruits are edible but the flesh is dry and mealy and most authors' descriptions range from emergency food to unpleasant (13,20,22). Athabaskan Indians in the upper Tanana region traditionally prepared den ma'eh (my spelling) or "winterberry" by frying in moosefat (13,15). The recipe as told to me in Dot Lake was to cook the berries in water and moose or bear grease until the mixture reached the consistency of peanut butter. The mixture apparently darkened during cooking since it looked like "cocoa". I don't know if/how the seeds were removed. This dish was much relished during the Christmas season and at winter feasts (26). The Dena'ina people of upper Cook Inlet prepared deh gega or "on the branch berry" in a similar manner (16).

Another of the "old ways" with silverberry in the upper Tanana was to collect the dried berries in late winter (after the time they were good for eating) to string for use as beads. These "beads" were sometimes dyed with natural agents such as cranberry or blueberry and evidently readily took up colors (26).

One reason for the USDA/SCS promotion of *Elaeagnus* species is that these plants provide food for a variety of wildlife species. The fruits of *E. angustifolia* and *E. umbellata* are important sources of food for songbirds such as grosbeaks, waxwings, and robins. In addition, game birds, small rodents and even deer are known to feed on Russian olive fruits. The wildlife value of *E. commutata* is less well-documented, however ring-necked pheasants, prairie chicken, snowshoe hare and domestic livestock have been observed feeding on the fruit (2,17,25). Silverberry was considered to be a browse species for deer in a USFWS habitat improvement study in South Dakota (5). According to one correspondent in Healy Lake, Alaska, silverberry is regarded as "moose and fox food". Upper Tanana residents also referred to *E. commutata* as "gooseberry" which may imply the use of this shrub by waterfowl (26).

Similar to alder and *Myrica gale* (bayberry), *E. commutata* is a non-leguminous nitrogen-fixing shrub. In fact, all three genera of the Oleaster family form root nodules and have been demonstrated to be cross-inoculating. The nodulating organism is a *Plasmodiophora* fungus, rather than a *Rhizobium* bacteria which infect legume roots (11,18). While the presence of woody plants in range land tends to be detrimental to herbaceous forage production, the presence of silverberry did not decrease forage yield when compared with an adjacent grassland in Alberta. The nitrogen content of herbage and frequency of desirable species was significantly higher where *E. commutata* was dominant (28). Non-nodulated silverberry plants growing in the same pot a nodulated companions were taller than non-nodulated plants grown in sterilized soil. Apparently, the nodulated plants increased the available nitrogen in the surrounding soil (1). This ability to fix nitrogen explains why *E. commutata* is able to colonize poor, rocky or disturbed sites. It is a subject of revegetation studies on oil sands mining spoils in Canada (8).

Silverberry usually bears a seed crop every year. The number of cleaned seeds per pound ranges between 2700 and 4600, averaging 3800. Embryo dormancy is overcome by cold stratification for 10-90 days (19,24). It is believed that the pit contains inhibitory substances which can be removed by repeated cycles of soaking and rinsing with warm water (9). Excision of embryos will result in immediate germination, but is an impractical means of propagating in quantity (10). Excised embryos are highly susceptible to rot, a fact to which I can personally attest. Some researchers found that *E. commutata* seed germination was inhibited by light, but I have observed virtually 100% germination in light following 30 days cold stratification (9,23). Silverberry can be propagated vegetatively from dormant hardwood or semi-hardwood cuttings treated with IBA rooting hormone (8).

REFERENCES:

1. Bailey, SW. 1973. Effects of Nodulation on Growth of Silverberry. Can. Journal Plant Sci. 53:919-920

2. Borell, AE. 1962. Russian-olive for Wildlife and Other Conservation Uses. USDA Leaflet no. 517.

3. Britton, NL and A Brown. 1913. An Illustrated Flora of the Northern US, Canada and British Possessions vol.2. Charles Scribner's Sons, New York.
4. Coffin, MC. 1951. Trees and Shrubs for Landscape Effects. Charles Scribner's Sons, New York.
5. Dietz, DR. 1975. Germination, Survival and Growth of Selected Browse Species in the Black Hills of South Dakota. in Proceedings Symposium and Workshop on Wildland Shrubs. ed. HC Stultz. Provo, UT.
6. Din, MA. 1983. Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics and Culture, Propagation and Uses. 3rd edition. Stipes Publishing Co., Champaign, IL.
7. Flint, HL. 1983. The Country Journal Book of Hardy Trees and Shrubs. Country Journal Publishing, Brattleboro, VT.
8. Fung, MYP. 1984. Vegetative propagation of native shrubs in the Fort McMurray area, Alberta, Canada. The Plant Propagator. 30:7-9.
9. Fung, MYP. 1984. Silverberry seed pre-treatment and germination techniques. Tree PlantersÆ Notes. 35:32-33.
10. Hartmann, HT and DE Kester. 1975. Plant Propagation Principles and Practices. 3rd edition. Prentice-Hall, Inc., Englewood Cliffs, NJ.
11. Hawker, LE and j Fraymouth. 1951. A Re-Investigation of the Root-Nodules of Species of Eleagnus, Hippophae, Alnus, and Myrica, with Special Reference to the Morphology and Life Histories of the Causativ Organisms. J. Gen. Microbiology 5:369-386.
12. Headstrom, R. 1978. The Families of Flowering Plants. AS Barnes and Co., Cranbury, NJ.
13. Heller, CA. 1981. Wild Edible and Poisonous Plants of Alaska. UA CES Publication no. 28, Fairbanks, AK.
14. Hudak, J. 1984. Shrubs in the Landscape. McGraw-Hill Book Col, NY.
15. Hulten, E. 1981. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA.
16. Kari, PR. 1978. Dena'ina K'et'una Tanaina Plantlore. Adult Literacy Laboratory, Anchorage Community College, AK.
17. Martin, AC, Zim, HS and AL Nelson. 1951. American Wildlife and Plants. McGraw-Hill Book Co., NY.
18. Moore, AW. 1964. Note on Non-Leguminous Nitrogen-Fixing Plants in Alberta. Can. Journal of Botany. 42:952-955.
19. Olson, DF. 1974. Seeds of Woody Plants in the United States. Agriculture Handbook no. 450. US Forest Service, USDA.
20. Shaw, RJ. 1974. Plants of Yellowstone and Grand Teton National Parks. Wheelwright Press, Ltd., Salt Lake City, UT.
21. Shoman, JJ, Ashbaugh, BL and CD Tolman. 1966. Wilflife Habitat Improvement. National Audubon Society, NY.
22. Turner, NJ and AF Szcyawinski. 1979. Edible Wild Plants of Canada. vol. 3. National Museum of Canada, Ottawa.
23. Unpublished data. ALR 497 Alaska Native Plant Propagation. Spring 1988. Univ. of AK. Fairbanks
24. US Forest Service. 1948. Woody Plant Seed Manual. USDA Misc. Publication no. 654.
25. Van Dusal, WR. 1938. Native Woody Plants of the US: Their Erosion Control and Wildlife Values. USDA Misc. Pub. no. 303.
26. Various. Personal communication during ARCTIC Workshops held in upper Tanana communities. Summer 1987.
27. Vierick, LA and EL Little. 1972. Alaska Trees and Shrubs. Agriculture Handbook no. 410. US Forest Service, USDA.
28. Whysong, GL and AW Bailey. 1975. Production and Nitrogen Content of Herbage in a Silverberry (E. commutata) Community Compared to Adjacent Grassland and Forest Communities. Can. J. Plant Sci. 55:801-808.

QUIZ ANSWER

Cicuta mackenzieana Raup., Mackenzie Water Hemlock.