

Lab 3

Dwarf shrubs

Biology 331 - Systematic Botany

Diagnostic characters of plant families for which sight recognition is expected
(except Cyperaceae, Poaceae and Juncaceae)

Disclaimer: This information was compiled as a lab study guide to aid in sight recognition of vascular plant families. Despite my best efforts, this guide may contain mistakes or omissions. Please, use this guide as a study aid only. -Amy Breen

Apiaceae (Umbelliferae) - The Carrot or Parsley Family

1. Leaves compound
2. Petioles sheathing
3. Internodes hollow
4. Inflorescence an umbel or compound umbel
5. Ovary inferior and 2-carpellate
6. Perianth often only a single whorl
7. Fruit a schizocarp

Asteraceae (Compositae) - The Sunflower Family

1. Florets (flowers) arranged in heads
2. Heads are subtended by a series of involucral bracts
3. Calyx is never green, it is either modified into a pappus or absent
4. Pappus of bristles, hairs or scales
5. Stamens are epipetalous and anthers are co-nate while filaments are distinct
6. Ovary inferior and 2-carpellate
7. Fruit an achene


Betulaceae - The Birch Family

1. Woody trees and shrubs
2. Leaves alternate and serrate
3. Plants monoecious (separate male and female inflorescences)
4. Inflorescence a catkin
5. Flowers apetalous
6. Fruit a samara (if ovary superior) or nut (if ovary inferior)

List of key Arctic plant family characteristics: *Summarized by Amy Breen for BIOL 331*

Covers 33 Families common in Alaska, except for graminoid families, Poaceae (grasses), Cyperaceae (sedges), Juncaceae (rushes).

Good reference for general plant identification terms:

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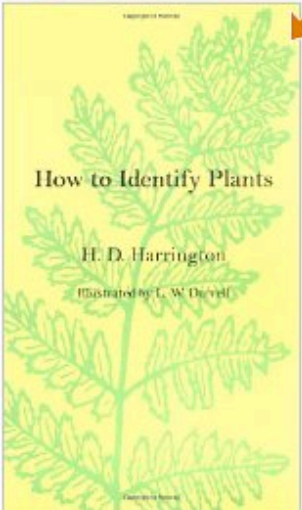
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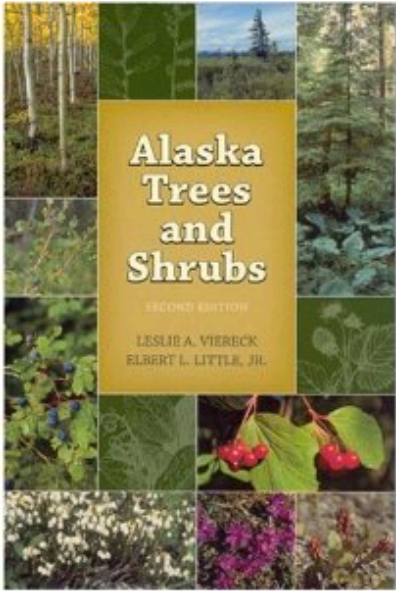
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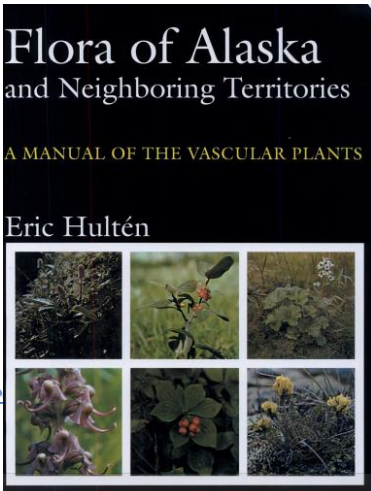
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Good references for entire Alaska and Yukon Territory floras:




Flora of Alaska and Neighboring Territories
A MANUAL OF THE VASCULAR PLANTS
Eric Hultén


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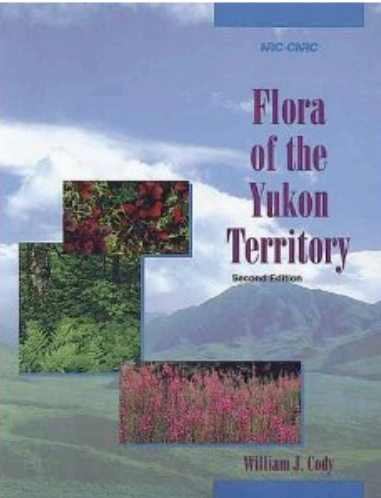


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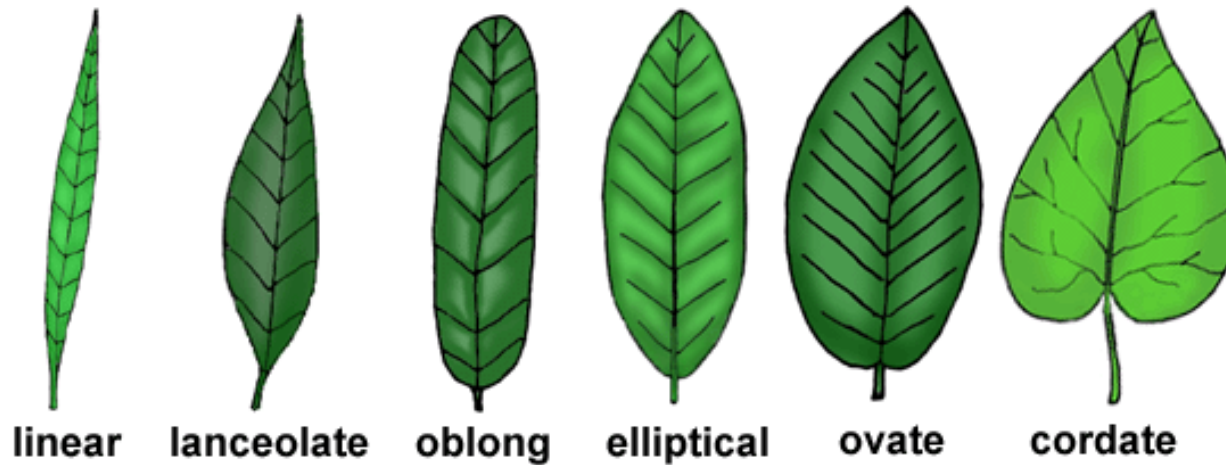


Flora of the Yukon Territory
Second Edition
William J. Cody

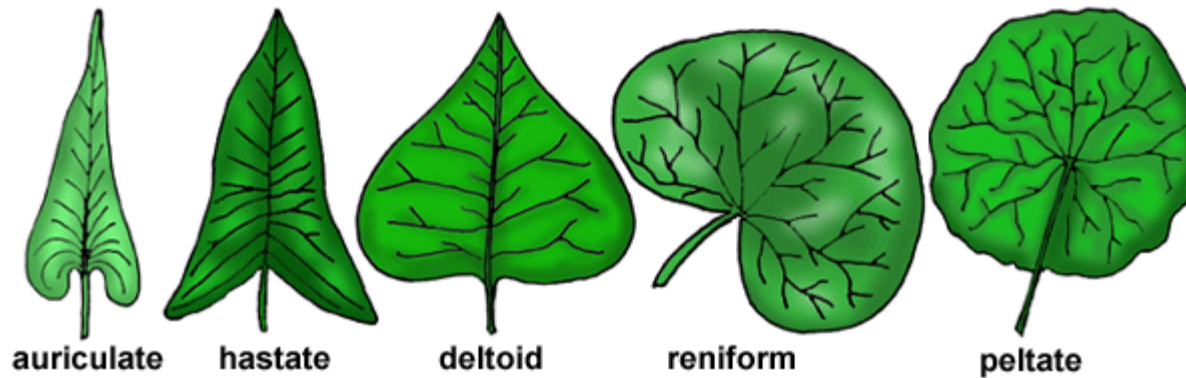
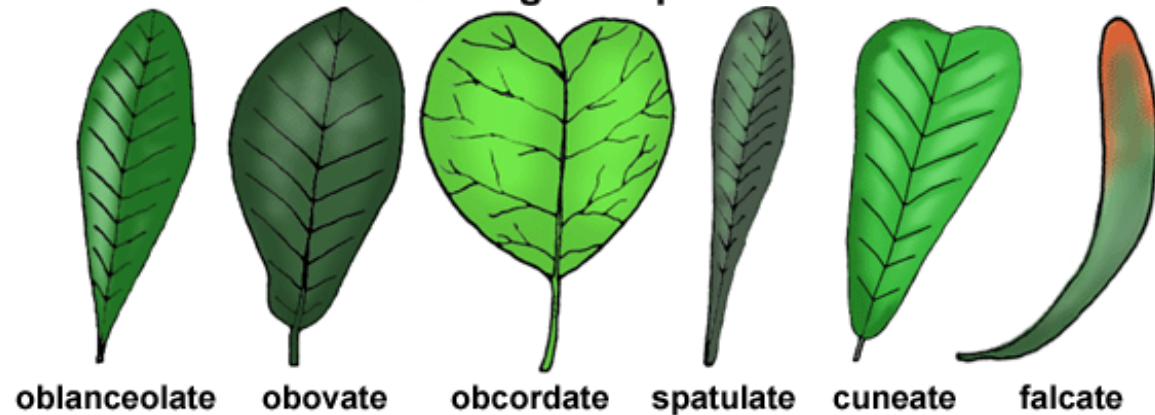
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General leaf shapes

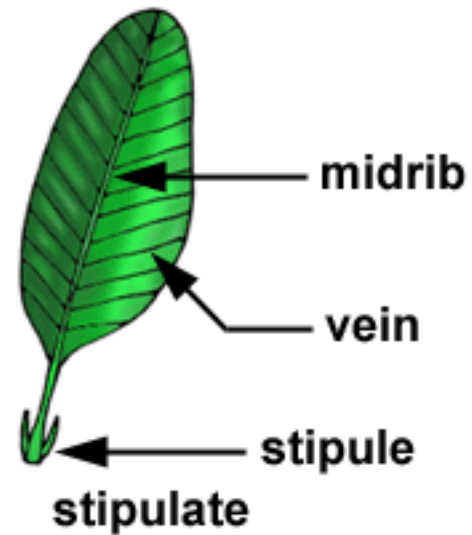
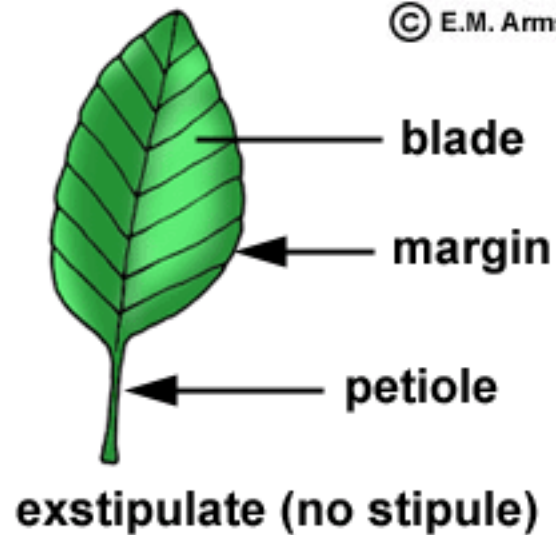


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Courtesy: Wayne's Word. Textbook of Natural History. <http://waynesword.palomar.edu/term1f2.htm>

Simple leaf: one blade

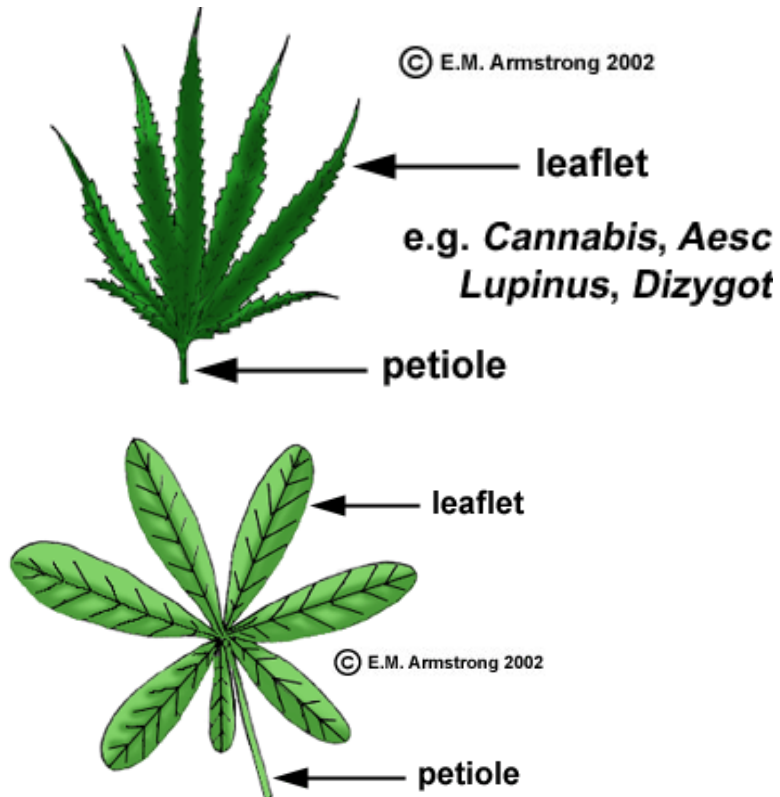
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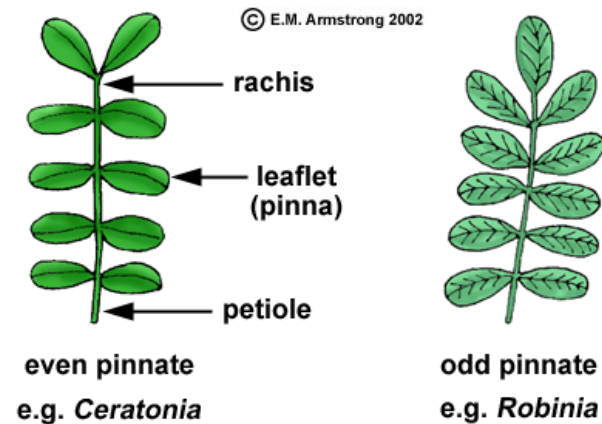
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Compound leaf: divided into leaflets

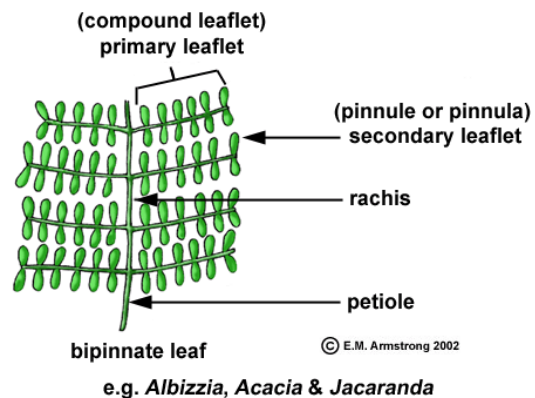
Palmately compound:



Pinnately compound:



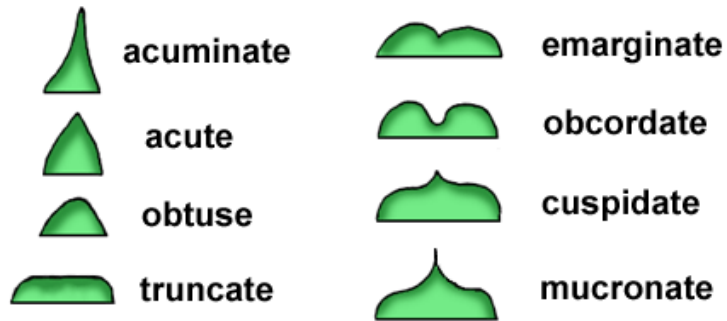
Twice pinnately compound:



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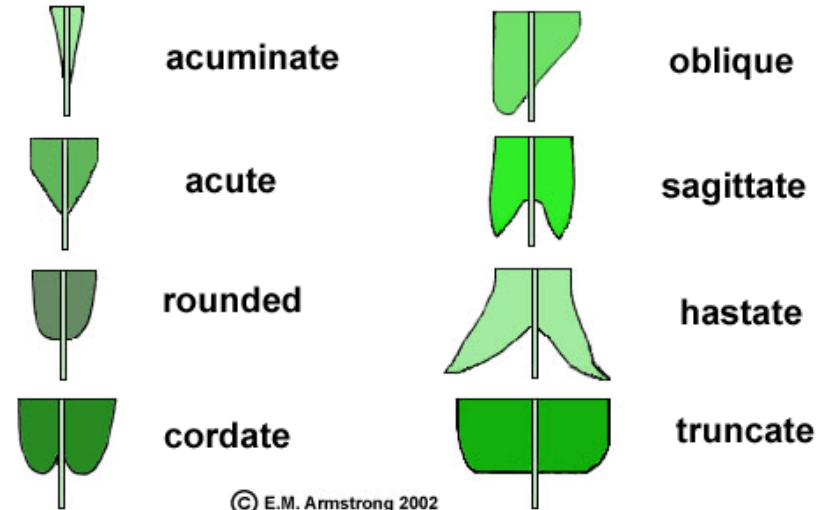
Leaf apices, bases, and margins:

Apices:



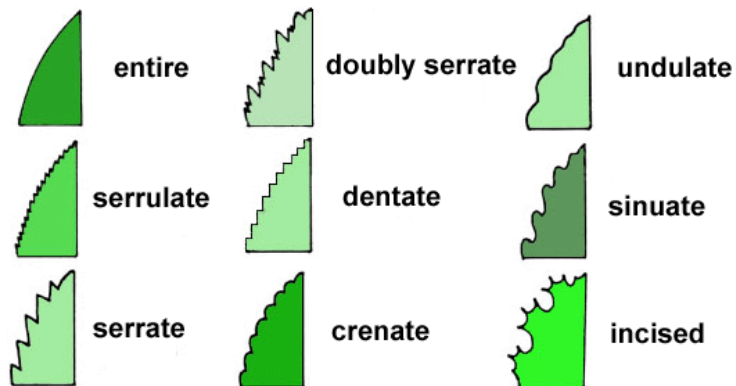
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Bases:

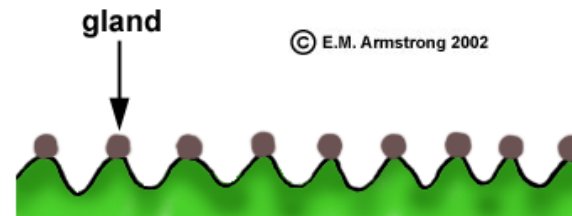


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Margins:



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glandular denticulate leaf margin
e.g. *Ceanothus tomentosus* ssp. *olivaceus*

Courtesy: Wayne's Word. Textbook of Natural History. <http://waynesword.palomar.edu/term1f2.htm>

Leaf and stem surfaces:

Glaucous: Covered with a whitish powder or waxy coating.

Farinose: Covered with a meal-like powder or minute particles.

Scurfy: Covered with small scalelike particles.

Viscid (Viscous): Covered with sticky or resinous secretion.

Punctate: Dotted with minute pits or translucent dots.

Papillate (Papillose): Bearing minute, pimplelike protuberances.

Tuberculate: Bearing tubercles or warty protuberances.

Verrucose: About the same as tuberculate

Rugose: Wrinkled--typical leaves of the mint family (Lamiaceae)

Glabrous: Without hairs of any kind.

Pubescent: With a hairy surface--there are many kinds of hairiness:

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Types of hairiness or fuzziness:

- Arachnoid:** Cobwebby--soft, entangled hairs.
- Barbellate:** Hairs with barbs down the sides.
- Bearded:** Long, stiff hairs.
- Bristly:** Stiff hairs.
- Canescent:** Dense grayish-white hairs.
- Ciliate:** Hairs along leaf margin forming a fringe.
- Floccose:** Tufts of soft, woolly hairs.
- Glandular:** Hairs with enlarged gland at tip.
- Hirsute:** Stiff hairs, rough to the touch.
- Hispid:** Stiff (rigid), bristly hairs--may penetrate skin.
- Hoary:** Covered with short fine hairs (white down).
- Lanate:** Woolly or cottony hairs.
- Pilose:** Sparse, soft and straight hairs.
- Puberulent:** Minutely pubescent (diminutive of pubescent).
- Scabrous:** Rough to the touch due to short, stiff hairs.
- Sericeous:** Appressed, fine and straight hairs (silky).
- Stellate:** Star-shaped hairs (common in Malvaceae).
- Strigose:** Sharp, straight, appressed hairs.
- Tomentose:** Densely matted, soft white wool (tomentum).
- Villous:** Long and soft hairs (shaggy)--not matted.
- Woolly:** Long, soft entangled hairs (similar to tomentose).

Erect Dwarf Shrubs

15-40 cm tall

Betulaceae	<i>Betula nana</i>	dwarf birch
Cornaceae	<i>Cornus canadensis</i>	bunchberry
Cupressaceae	<i>Juniperus communis</i>	common juniper
Ericaceae	<i>Cassiope tetragona</i>	white arctic mountain heather
	<i>Ledum palustre</i> ssp. <i>groenlandicum</i>	Labrador tea
	<i>Ledum palustre</i> ssp. <i>decumbens</i>	marsh Labrador tea
	<i>Rhododendron lapponicum</i>	Lapland rosebay bearberry
	<i>Vaccinium vitis-idaea</i>	lingonberry
	<i>Vaccinium uliginosum</i>	bog blueberry
(Empetraceae)	<i>Empetrum nigrum</i>	crowberry
Rosaceae	<i>Rubus chamaemorus</i>	cloudberry

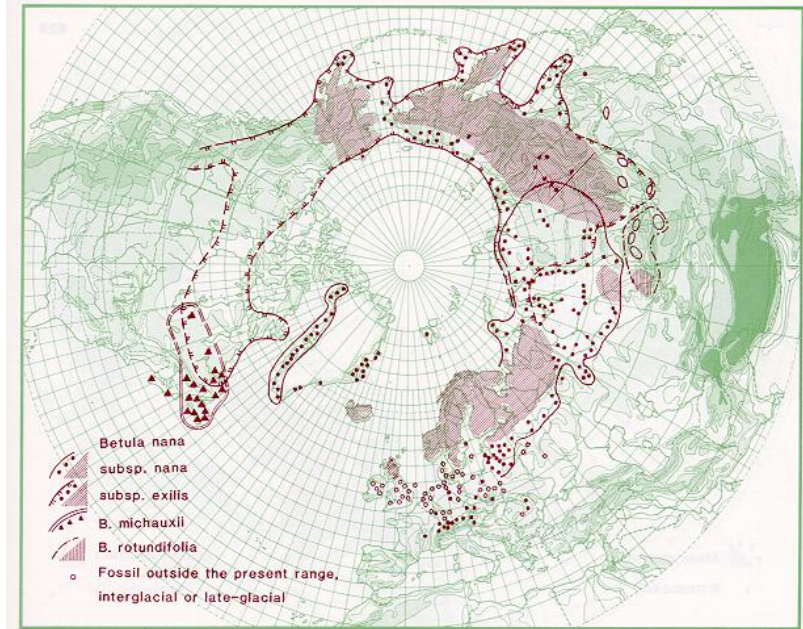
Betula nana

Family: Betulaceae

Common name: Dwarf Birch



- **Dwarf shrub**, often less than 0.5 m tall.
- **Leaves:** Small (3-12 mm long, often wider than long, often straight, or notched at base,).
- (Contrast with *B. glandulosa* which often a low shrub (50-150 cm), with larger leaves, 10-20 mm long, wedge-shaped (cuneate) base.



<http://linnaeus.nrm.se/flora/di/betula/betul/betunan.html>



Family characteristics for Betulaceae:

Summarized by Amy Breen for BIOL 331

Betulaceae - The Birch Family

- Woody trees and shrubs
- Leaves alternate and serrate
- Plants monoecious (separate male and female inflorescences on same plant)
- Inflorescence a catkin
- Flowers apetalous (without petals)
- Fruit a **samara** winged achene as in *Betula* (ovary superior) or nut as in *Alnus* (ovary inferior).



Betula glandulosa leaves.

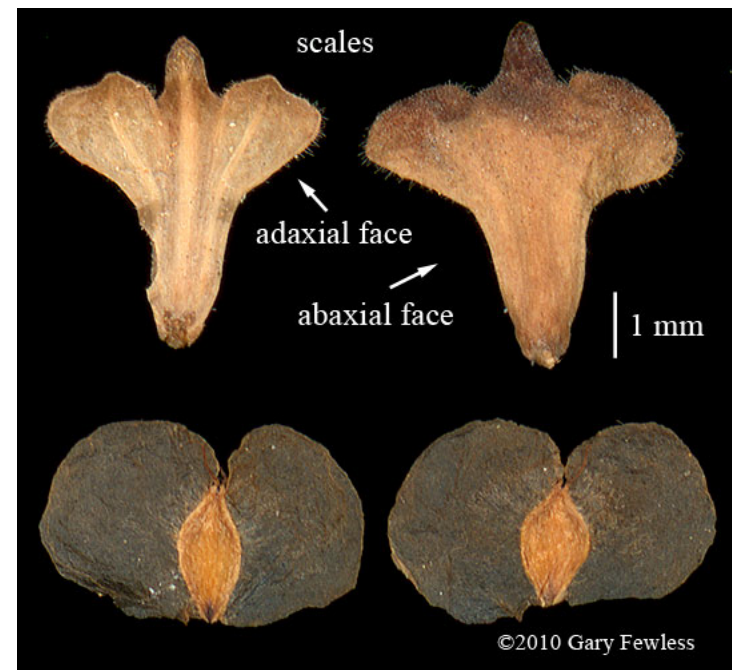
http://www.buyshrubszone.com/si/betula/betula_glandulosa.html



Betula glandulosa catkin.

<http://mamabluefoot.wordpress.com/tag/california-wildflowers/>

Samara: A type of dry fruit where one seed is surrounded by papery tissue that helps carry the seed away from the tree as the wind blows. The fruit does not split open, which means that it is indehiscent. They are often found in large groups on the tree.



Scales, and samara of *Betula papyrifera*.

http://www.uwgb.edu/biodiversity/herbarium/trees/betpap_seed01gf500.jpg

Family: Cornaceae

Common name: Bunchberry

Cornus canadensis



<http://depts.washington.edu/wrccrf/gallery/WRCCRFflora.html>



Cornus canadensis
Cornaceae
© G. D. Carr



<http://www.oberlin.edu/newsinfo/05may/expflower.html>

- **Subshrub** 10-20 cm tall.
- **Leaves:** Opposite, in whorl of 2 larger leaves (below) and 4 smaller leaves (above) subtending the inflorescence.
- **Inflorescence:** Compound terminal **cyme**, with 4 showy white bracts. Actual flowers in central cyme are small
- **Release of pollen:** 4 petals restrain 4 stamens, which explode (0.4 milliseconds) when trigger on petal touched.
- **Fruit:** Cluster of red edible **drupes** (5 mm dia.) (fleshy, 1-seeded fruit)
- **Habitat:** Cool, moist, coniferous forest floors.



© 2004 Janet Novak

Juniperus communis

Family: Cupressaceae

Common name: Common Juniper



http://en.wikipedia.org/wiki/Juniperus_communis

- Low-growing evergreen needle-leaf shrub or small tree, often creeping, many subspecies.
- **Leaves:** needle-like, awl-shaped, sharp pointed.
- **Flowers:** Inconspicuous. Doecious.
- **Fruits:** Seed cones are blue berry-like, which are favorite food for many species of birds, and key ingredient in numerous alcoholic beverages (e.g., gin, beer; Borovicka (Slovak), sahti (Finnish); gin is old French word for “Juniper”.
- Widest range of any woody plant (Low Arctic to 30°N, worldwide). Grows on warm sunny slopes of subzone E.



<http://www.terebess.hu/tiszaorveny/>

Family characteristics for Ericaceae

Flowers

Ericaceae - The Heath Family

- Plants usually woody shrubs or small trees. Numerous dwarf shrubs in the Arctic and boreal forest. Highly variable (presently 21 genera. Pyrolaceae, Empetraceae are now placed in the Ericaceae based on genetic evidence).
- Leaves:** **coriaceous** (with a thick or leathery texture).
- Flowers:** Highly variable. Petals sometimes fused to form **urceolate** (cylindrical or ovoid, hollow, **campanulate** (bell-shaped) or **zygomorphic** (irregular), flowers. Many are showy (e.g., *Rhododendron*, *Azalea*).
- Fruit:** a capsule (as in *Cassiope tetragona*) or berry. Many common berries such blueberry (*Vaccinium uliginosum*), lingonberry (*V. vitis-idaea*), bog cranberry (*Oxycoccus microcarpus*), bearberries (*Arctous rubra*), crowberries (*Empetrum nigrum*).
- Many species are typical of acidic, infertile “heaths”.



Arctostaphylos uva-ursi,
R.W. Smith, <http://www.michiganflora.net/image.aspx?img=9595&id=1208>



Chamaedaphne calycullata,
R.W. Smith, <http://www.michiganflora.net/image.aspx?img=10266&id=1210>

Fruits



Cassiope tetragona capsule.

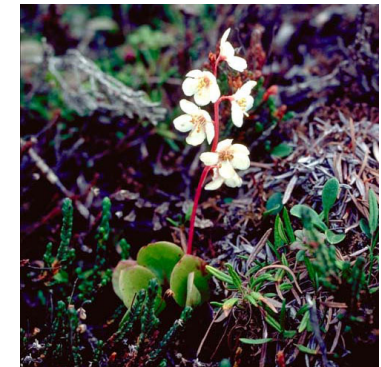
<http://www.superstock.com/stock-photography/Cassiope+Tetragona>



Vaccinium vitis-idaea, berry,
http://www.bizearch.com/trade/Lingonberry_Fruit_Powder_7169_44410.htm



Rhododendron lapponicum,
Roger Johansen, http://nhm2.uio.no/botanisk/nbf/plantefoto/Rhododendron_lapponicum.htm



Pyrola grandiflora, J.M. Gillett
18690, <http://nature.ca/aaflora/data/www/pypygr.htm>.

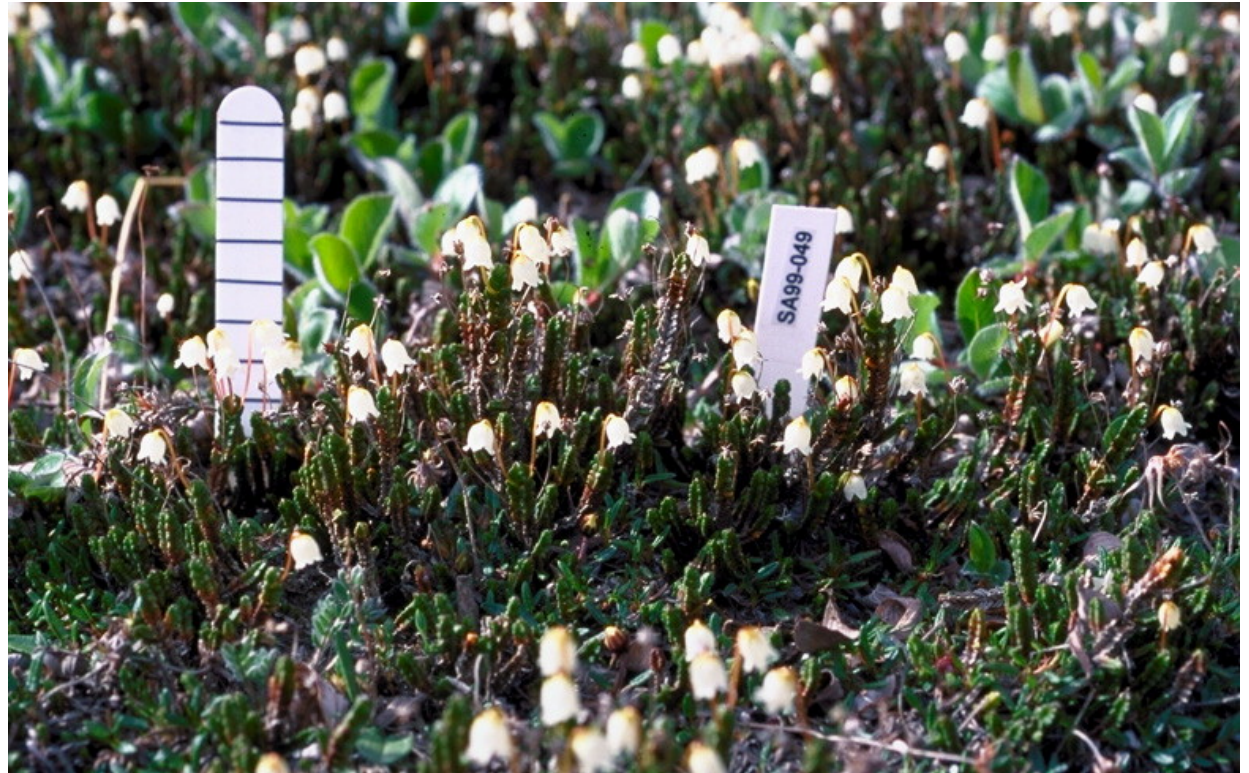
Family: Ericaceae

Common name: Four-Angled Cassiope

Cassiope tetragona



Flowers and capsules.



Typical plant. Banks Island. Scale bar in cm. Susan Aiken 99-049. CAN., <http://nature.ca/aaflora/data/www/er.htm>

- **Hemi-prostrate evergreen dwarf shrub to about 20 cm.**
- **Leaves: Opposite, in 4 rows.** Small (3-5 mm), lance-shaped. Stems covered with leaves. Old leaves persistent on stem.
- **Flowers: White**, nodding on slender stalks, **bell-shaped**.
- **Fruit:** Erect **capsule**, 3 mm long.
- **Habitat:** Protected habitats, often dominant plant in well-drained **snowbeds**.

Family: Ericaceae

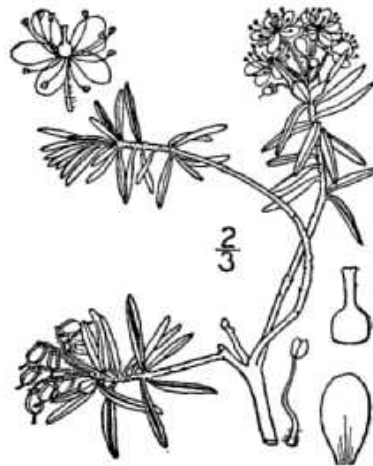
Common name: Narrow-
leaf Labrador Tea

Ledum palustre ssp. *decumbens*



<http://www.mujweb.cz/WWW/dendrologie/WWWstr/seznam%20herbare.htm>

Narrow leaves.



Britton, N.L., and A. Brown. 1913.
*Illustrated flora of the northern
states and Canada*. Vol. 2: 677.
Courtesy of
[Kentucky Native Plant Society](http://www.kentucky-native-plant-society.org/).

(usually 10 stamens)



http://www.mun.ca/biology/delta/arcticf/_ca/wwwer.htm

Erect dwarf evergreen shrubs to 30-60 cm tall.

Stems: Young twigs hairy, light brown. Older twigs gray.

Leaves: Linear, 8-15 cm long, **narrow** (1-5-3 mm wide), evergreen, edges rolled inward, upper side shiny dark green, lower side with reddish-brown wooly hairs. linear, needle-like, shiny, with groove on lower surface, 3-6 mm long.

Flowers: Numerous in clusters at tip of branches. Each flower is about 12 mm broad, white, 5 spreading petals. Fragrant abundant flowers early summer.

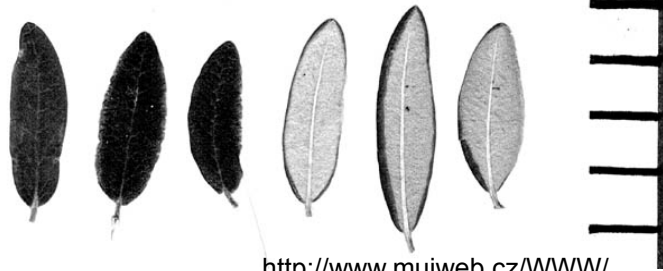
Fruits: Capsule (3-6 mm). **Pedicels (flower stalks) often abruptly bent downward just below the fruit.**

Habitat: Common shrub in nearly all acidic bogs and tundras.

Family: Ericaceae

Common name:

Labrador Tea



<http://www.mujweb.cz/WWW/dendrologie/WWWstr/seznam%20herbare.htm>

- Much wider leaves and larger than in ssp. *decumbens*.
- Flower stalks not abruptly bent downward.

Britton, N.L., and A. Brown.
1913. *Illustrated flora of the northern states and Canada*.
Vol. 2: 677. Courtesy of
[Kentucky Native Plant Society](http://www.kentuckynativeplantsociety.org/).



(usually 8 stamens)



<http://www.rook.org/earl/bwca/nature/shrubs/ledu>

Erect dwarf to low evergreen shrubs to 100 cm tall.

Stems: Young twigs hairy, light brown. Older twigs gray.

Leaves: Narrowly oblong, 25-50cm long, **wider than ssp. *decumbens***. (5-12 mm wide). Otherwise similar to ssp. *decumbens*.

Flowers: Numerous in clusters at tip of branches. Each flower is about 12 mm broad, white, 5 spreading petals.

Fruits: Capsule (3-6 mm). **Pedicels not abruptly bent downward just below the flower.**

Habitat: Common shrub in black- and white-spruce forests, and in wetlands. Abundant after fires and near treeline.

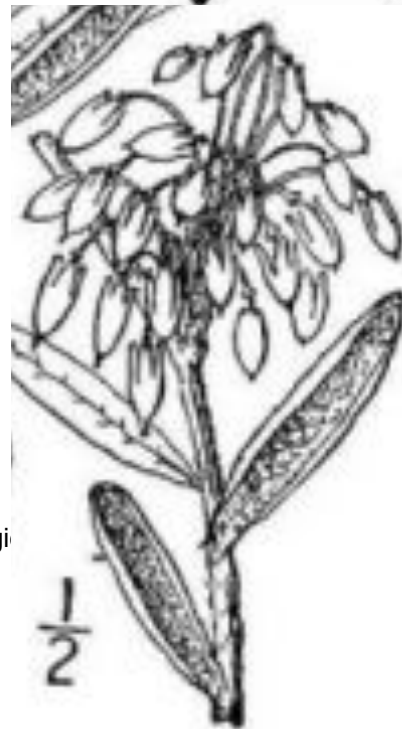
Comparison of ssp. *decumbens* and ssp. *groenlandicum* leaves and flower stalks (pedicels) in fruit



<http://www.mujweb.cz/WWW/dendrologie/WWWstr/seznam%20herbare.htm>



<http://www.mujweb.cz/WWW/dendrologie/WWWstr/seznam%20herbare.htm>



- Much wider leaves and larger than in ssp. *decumbens*.
- Flower stalks not abruptly bent downward.

Family: Ericaceae

Common name:
Lapland Rosebay

Rhododendron lapponicum



Erect dwarf evergreen shrubs to 40 cm tall.

Stems: Much branched.

Leaves: Oval 5-15 mm long, blunt at apex, leathery, crowded at end of twigs, both surfaces with greenish to brown resin dots. , 8-15 cm long, **narrow** (1-5-3 mm wide), evergreen, edges rolled inward, upper side shiny dark green,

Flowers: 1 to several in terminal clusters. Petals showy spreading. Corolla about 20 mm across and slightly irregular, petals pinkish to deep purple. Pedicels scurfy.

Fruits: Dry capsule (5-6 mm).

Habitat: Grows abundantly in some moist nonacidic tundras.

Family: Ericaceae

Common name: Blueberry

Vaccinium uliginosum



http://www.flowerremedies.com/fr/p_229.html



Vaccinium uliginosum
Foto: Jan Wesenberg



http://www.atlas-roslin.pl/gatunki/Vaccinium_uliginosum.htm

- **Deciduous dwarf shrub to about 40 cm.**
- **Stems:** Much branched shrub.
- **Leaves:** **Obovate** (oval but wider toward the tip) to elliptic, 1-2 cm.
- **Flowers:** **Pink**, nodding on slender stalks, **urn-shaped**.
- **Fruit:** Blue berry (5-10 mm) ripening late July to August..
- **Habitat:** Very common shrub of tundra and open forest, often especially common in recently burned areas.

Family: Ericaceae

Common name: Lingonberry,
Low Bush Cranberry

Vaccinium vitis-idaea



Berries from previous summer.
<http://www.emannorth.ca/ic/ds010/results.cfm>



Plant and berries. Jonas Bergsten.

http://en.wikipedia.org/wiki/File:Vaccinium_vitis-idaea_20060824_003.jpg

- **Low evergreen (summer green) erect dwarf, shrub 5-15 cm tall.**
- **Stems:** Slender, trailing, rooting at nodes.
- **Leaves:** Oval, thick, dark green above, light green beneath and spotted with short stiff brown hairs, edges slightly rolled under, 1-2 cm long.
- **Flowers:** 1-several grouped at end of short stalks, pink, bell-shaped. nodding on slender stalks, **urn-shaped**.
- **Fruit:** Bright red sour berry (6-8 mm) ripening in August. Persisting on stem through the winter.
- **Habitat:** Very common dwarf shrub of acidic tundras and forest floors, often especially common in recently burned areas..

Family: Ericaceae (Empetraceae)
Common name: Crowberry



Prostrate evergreen shrubs to 15 cm tall.

Stems: Creeping heath plant forming dense mats with horizontal much-branched stems.

Leaves: **Evergreen**, crowded, 4 in whorl, linear, needle-like, shiny, with groove on lower surface, 3-6 mm long.

Flowers: Inconspicuous, (5-10 mm), purplish, with stamens much longer than petals. Doecious.

Fruits: **red drupe**, drier than *Arctous* with insipid taste.

Habitat: Drier sites in boreal forests, usually under aspen. Occurs in some warmer microsites in the tundra, but is not common.

Empetrum nigrum



Flowers with long stamens.



Fruits.

Family: Rosaceae

Common name: Cloudberry



[http://
www.alaskaherbtea.com/
Foraging/cloudberry.htm](http://www.alaskaherbtea.com/Foraging/cloudberry.htm)



- **Low decicuous erect dwarf, shrub 5-20 cm tall.**
- **Stems:** From creeping root stalks.
- **Leaves:** 2-3 with slender petioles (1-2.5 cm long). Rounded leaf blades, 2.5-5 cm across, with 3-5 rounded lobes and finely toothed border.
- **Flower:** One per shoot, white, large (1.2-2.5 cm diam.).
- **Fruit:** Aggregate, drupes (1.2-2.5 diam.) composed of 6-18 drupelets (6-8 mm), pink to salmon colored ripening in late August to September. Highly edible.
- **Habitat:** Wet, open, acidic bogs, through out Alaska.

Prostrate Dwarf Shrubs

< 15 cm tall

Caprifoliaceae	<i>Linnaea borealis</i>	twin flower
Diapensiaceae	<i>Diapensia lapponica</i>	pincushion plant
Ericaceae	<i>Arctostaphylos alpina</i>	alpine bearberry
	<i>Arctostaphylos rubra</i>	red fruit bearberry
	<i>Arctostaphylos uva-ursi.</i>	kinnikinnik,
		largeflowered wintergreen
(Pyrolaceae)	<i>Pyrola grandiflora</i>	sidebells wintergreen
	<i>Pyrola secunda</i>	entireleaf mountain-avens
Rosaceae	<i>Dryas integrifolia</i>	eightpetal mountain-avens
	<i>Dryas octopetala</i>	arctic willow
Salicaceae	<i>Salix arctica</i>	skeletonleaf willow
	<i>Salix phlebophylla</i>	netleaf willow
	<i>Salix reticulata.</i>	least willow
	<i>Salix rotundifolia</i>	

Family: Caprifoliaceae
(Linnaeaceae)

Common name: Twinflower

Linnaea borealis



<http://crawford.tardigrade.net/journal/album7309.html>



<http://www.bi.ku.dk/tavler/thumb.asp?ID=259>

Creeping broadleaf evergreen shrublet, 10-15 cm tall.

Leaves: Round, opposite; persisting for two years.

Stems: Creeping or trailing, with numerous short aerial stems rising from the stolon. With time, stolons may become shallowly buried beneath litter and duff layers; aerial stems become woody with age but rarely exceed 1/8" in diameter.

Roots: Shallow, fibrous network, within and slightly below the duff layer. Root crown positioned at or just beneath the duff or soil surface.

Flowers: Pink, bell-like, in pairs; very fragrant. Flowers last about 7 days.

Fruit: Small, dry, one-seeded capsule, maturing approximately 36 days after flowering.

Habitat: Common in well-drained white spruce forests, less common on tundra in Subzone E.

Family: Diapensiaceae

Common name:
Diapensia



Habitat: Fellfield, Jouko Lehmuskallio, <http://www.luontoportti.com/suomi/en/kukkakasvit/diapensia>

Diapensia lapponica



Cushion-form evergreen shrub, 2.5-7.5 cm tall.

Leaves: Evergreen, densely overlapping rosettes of leaves, narrowly oblong ovate, 3-10 mm long, rounded at apex.

Stems: Slender concealed by leaves.

Flowers: Single, erect, large for size of plant. 5 persistent, greenish yellow sepals. Bell-shaped corolla with 5 white, spreading rounded lobes.

Fruit: Erect, egg-shaped capsule about 6 mm, 3 celled with several seeds.

Habitat: Dry acidic tundra sites.



Carl Magnus Lindeman (1956-1928)
<http://runeberg.org/nordflor/pics/158.jpg>

Family: Ericaceae

Common name: Alpine Bearberry

Arctous alpina



Prostrate deciduous shrubs 6-10 cm tall.

Stems: Prostrate and creeping.

Leaves: Forming clusters of leaves at tips of stems. Leaf blades obovate to oblanceolate, 4-15 mm long, base attenuate-cuneate, decurrent onto petiole, surfaces rugose (thick compared to *A. rubra*); old leaves persistent on twigs and skeletonized (**abundant persistent old leaves at base of stems is diagnostic against *A. rubra***).

Inflorescences: 2-4 flowered; bracts ovate, membranous. **Pedicels** 0.1-0.6 mm.

Flowers: Few clustered at end of sepals pale green or yellow; corolla yellow, whitish, or green (pale yellowish green) urn shaped, 3 lobes recurved, greenish, rounded.

Fruits: **black-purple drupe**, 6-9 mm diam.

Habitat: Dry acidic fellfields. Forms extensive red mats in the fall in alpine areas, and dry tundra in the Arctic. Eaten by bears and ptarmigan.



Ripe fruit black

Family: Ericaceae

Common name: Red-fruit Bearberry

Arctous rubra



(Left: *Arctous alpina*. Right: *Arctous rubra*. Note: longer trailing stems of *A. rubra*, and more erect form *A. alpina*.

Images: UA Herbarium, Arctos,
http://web.corral.tacc.utexas.edu/UAF/2008_11_11/ipegs/H1241961.jpg.
http://web.corral.tacc.utexas.edu/UAF/2008_10_29/ipegs/H1241778.jpg.

Prostrate deciduous shrubs 3-15 cm tall.

Stems: More trailing than *A. alpina*.

Leaves: Similar to *A. alpina*, except thinner, **dropping from plant in first winter**. Turning red in fall.

Inflorescences: 2-4 flowered; bracts ovate, membranous. **Flowers:** Similar to *A. alpina*.

Fruits: red drupe, with insipid taste.

Habitat: Dry fellfields. More common in moist, nonacidic tundra and forests compared to *A. alpina*.

Family: Ericaceae

Common name:

Kinnikinnik, Bearberry

Arctostaphylos uva-ursi



Prostrate evergreen shrubs 3-10 cm tall.

Stems: Creeping with shedding bark along surface of soil, rooting along the stem.

Leaves: **Evergreen**, leathery, obovate, prominently (reticulate) net-veined.

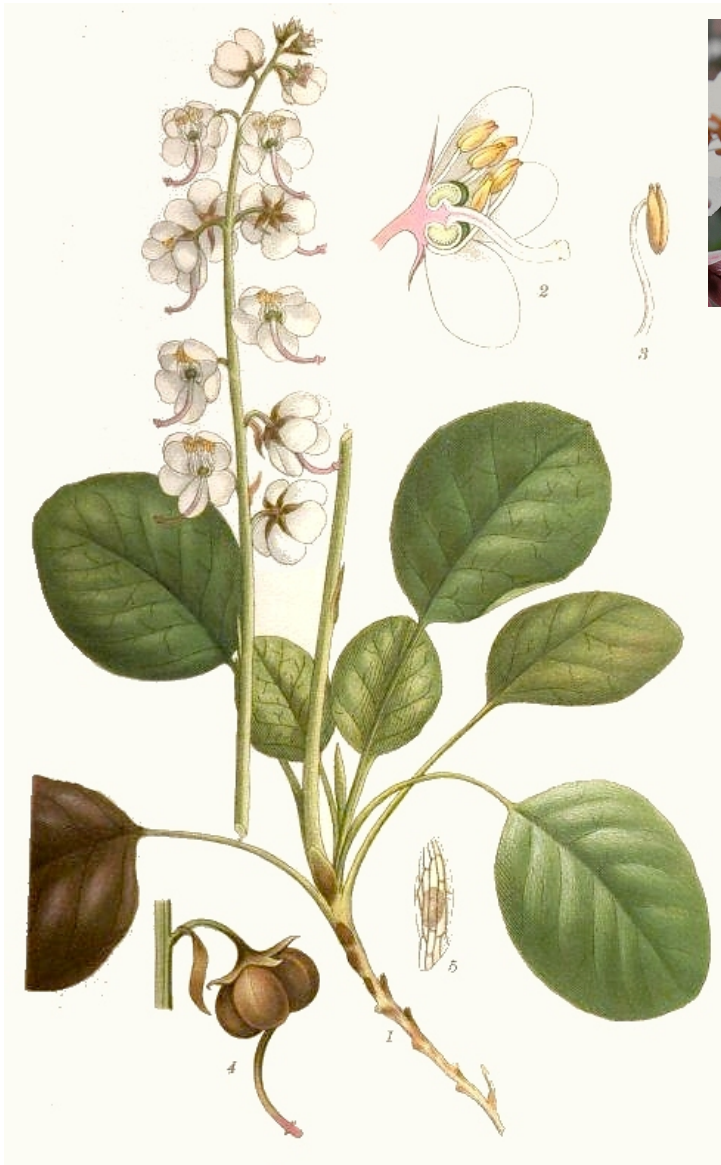
Flowers: 1-several in raceme at end of twigs, nodding corollas. Urn-shaped, white to pink.

Fruits: **red drupe**, drier than *Arctous* with insipid taste.

Habitat: Drier sites in boreal forests, usually under aspen. Is not common in most tundra areas, but occurs in some warmer microsites.

Family: Ericaceae (Pyrolaceae)
Common name: Wintergreen

Pyrola grandiflora



Flowers.



Developing fruiting capsule with protruding style.



<http://www.digitalnaturalhistory.com/images/PyrolaGrandifloraMaybe1NorthArmSaglekBayLabradorJuly102009Hannie.jpg>

Perennial herb or sub-shrub:

Stems: 7-24 cm tall, with 1 or more scarious bracts.

Leaves: simple **evergreen**, basal,, leathery, lustrous, **rounded**, entire margin.

Inflorescence: **Raceme** with 4-11 flowers, not one-sided (as in *P. secunda*).

Flowers: Large, 5 sepals and petals, calyx lobes oblong, , petals creamy white or pinkish, style long and curved (resembles elephant trunk),

Fruits: Brown dry orbicular capsule with 5 lobes, with many small seeds.

Habitat: Common in moist nonacidic tundra, and open boreal woodlands.

Family: Pyrolaceae

Common name: One-sided wintergreen

Pyrola secunda (= *Orthilia secunda*)



http://commons.wikimedia.org/wiki/File:Pyrola_secunda_Atlas_Alpenflora.jpg



<http://www.nawwal.org/~mrgoff/photojournal/2004/winspr/02-28wintergreen3.html>



Connecticut Botanical Society: <http://www.ct-botanical-society.org/galleries/orthiliasecu.html>

Perennial herb:

Stems: 7-24 cm tall, **leafy** on lower half of stem (compared to basal in *P. grandiflora* and *P. asariflora*).

Leaves: scattered on lower half of stem, up to 4 cm long, oblong-ovate, acute tip, **crenulate-serrate margins**, somewhat leathery (less so than *P. grandiflora*).

Inflorescence: **One-sided raceme of small whitish green flowers.**

Flowers: Style long, but shorter and straighter than in *P. grandiflora*.

Fruits: Capsule, similar to *P. grandiflora*.

Habitat: Boreal forests and shrublands. Subspecies *secunda* has smaller leaves and extends into the tundra.

Family: Rosaceae

Common name: Entire-
Leaf Mountain Avens



Inflorescence with mature plumose seeds.



[http://www.civilization.ca/cmc/
plaza/plaza08_1eng.html](http://www.civilization.ca/cmc/plaza/plaza08_1eng.html)

Dryas integrifolia



http://www.lattaphoto.com/Image_Galleries/Special%20Places/Willmore/blue_grouse_pass.htm

Evergreen (summer-green) prostrate dwarf shrub, forming extensive mats.

Stems: Prostrate, woody, often with abundant masses of dead grayish leaves.

Leaves: leathery, simple (1-2.5 cm long), narrow, (0.3-1 cm wide), **entire-margined (compared to crenulate or wavy margin of *D. octopetala*)**, glabrous dark green above; densely hairy, whitish beneath.

Flowers: Single on erect hairy stalks, 8-10 spreading white petals, central yellow mass of stamens of pistils.

Fruits: Many small achenes, with persistent long hairstyles forming whitish feathery twisted plumes (2-3 cm long,

Habitat: Dry and moist nonacidic tundra and moist nonacidic sites in wetlands.

Family: Rosaceae

Common name: White Mountain Avens

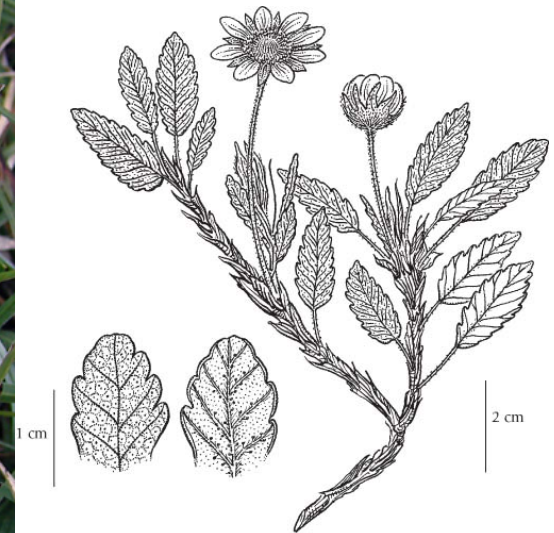
Dryas octopetala



http://www.boga.ruhr-uni-bochum.de/html/Dryas_octopetala_Foto2.html



http://www.ukwildflowers.com/Web_pages/dryas_octopetala_mountain_



Dryas octopetala ssp. *hookeriana*

Similar to *D. integrifolia* in most respects except leaves, which are wavy toothed instead of straight margined, and with prominent incised veins on upper surface, and glands and scales on midvein of lower surface.

SALICACEAE Willow Family
Order Salicales

Trees and shrubs, predominantly of north temperate areas. Tree and tall shrub species are significant elements in riparian habitats for both succession after natural disturbance and for wildlife habitat and forage. In alpine and arctic habitats, dwarf shrub species are very common.

Simple, stipulate (bearing stipules) leaves alternately arranged on woody stems. Flowers are minute, unisexual, reduced, and arranged in catkins which often emerge before the leaves (our pussy willows!). Flowers consist of either a superior pistil (1-2 carpels), or of 2 or more stamens, and each reduced flower is subtended by a single, small, ciliate and/or pubescent bract. In *Salix* there are one or two nectary glands at the base of each flower which produce nectar and scent to attract insects, facilitating pollination. *Salix* also has a single bud scale; often diagnostic for winter twig identification. *Populus* has no nectaries, has several bud scales, and the buds often exude balsam, a fragrant, sticky substance that is a harbinger for spring in interior Alaska. Capsules open to release numerous tiny seeds having a tuft of hairs for wind dispersal. All species are dioecious, having staminate and pistillate catkins borne on separate plants.

Uses include lumber, ornamentals, revegetation, and medicinal (balsam and salicylic acid). *Salix* is a taxonomically difficult group, having both known and suspected hybridization, and displaying extreme morphological variation in response to habitat, disturbance, and browsing. Collecting pistillate catkins and recording plant height greatly facilitates identification later.

New terms: aments, bracts, precocious.

Salix (willows), *Populus* (cottonwood and aspen).



Prostrate willows

Salicaceae - The Willow Family

- Woody trees and shrubs
- Leaves alternate and simple
- Plants dioecious (separate male and female plants)
- Inflorescence a catkin
- Flowers apetalous
- Fruit a capsule with comose (bears a tuft of long white hairs on seeds)

Family: Salicaceae

Common name: Arctic Willow

Salix arctica



Male catkins with red anthers,

<http://www.alaska-in-pictures.com/salix-arctica-5823-pictures.htm>



Female catkins with capsules.

Dirk Schories: <http://www.guiamarina.com>



Typical prostrate growth form.

<http://www.jan-mayen.no/flora/janmayenflora.htm>



Jón Baldur Hlíðberg 2002.
Gautavík 14, 112 Reykjavík
<http://www.fauna.is/picture2e.asp?ID=1104>

Stems: Prostrate, creeping reddish, and much branched, rooting at the nodes. Frequently forming dense mats Less than 10 cm tall. Extremely variable in growth form and size and shape of the leaves.

Leaves: 2-7.5 cm long, with fairly long petioles (about 1/3 length of leaf) mature leaves **ovate to obovate**, entire margin, upper surface often shiny green usually without hairs, lower surface and margins often with sparse long villous pubescence.

Catkins: Relatively large (to 10 cm) on erect peduncles.

Capsules: Broad with scattered hairs, reddish to pale brown, ripening mid-Aug.

Habitat: Wide range of habitats. Dry to moist, even wet, mineral-rich meadows and tundra.

Family: Salicaceae

Common name: Skeletonleaf Willow

Salix phlebophylla



Female capsules,
M.K. Raynolds,

http://www.arcticatlas.org/photos/pltspecies/spp_enlargement.php?queryID=saph&fileName=Salph13.jpg

Green and persistent dead
leaves. M.K. Raynolds, http://www.arcticatlas.org/photos/pltspecies/spp_enlargement.php?queryID=saph&fileName=Salph14.jpg



Male catkins in flower.

Josef Geml

http://www.arcticatlas.org/photos/pltspecies/spp_enlargement.phpqueryID=saph&fileName=Salix_phlebophylla.j

Prostrate dwarf shrub: Densely matted with thick central tap root.

Leaves: Small (8-20 mm long), **oblanceolate to obovate**, usually glabrous, with entire margin and prominent veins on both sides.

- Persistent for at least 3 yrs, “skeletonized” lvs covering the basal part.

Habitat: Dry acidic substrates.

Family: Salicaceae

Common name: Nettleleaf Willow

Salix reticulata



Prostrate dwarf shrub: Creeping shrub.

Leaves: Nearly round to oval, to 4 cm long. Thick and leathery. **Prominently reticulate (net veined)** on both surfaces. Margins entire. Lower surface whitish (glaucous). usually glabrous, with entire margin and prominent veins on both sides.

Habitat: Dry to moist nonacidic tundra and meadows, found in wetlands (fens) on hummocks.

Family: Salicaceae

Common name: Least Willow

Salix rotundifolia



Emerging leaves and catkins.

Christine Donovan.

<http://tea.armadaproject.org/donovan/6.28.2001.html>



Female catkins with capsules.

Phyllis Weyand

<http://tea.armadaproject.org/donovan/6.28.2001.html>

Prostrate dwarf shrub: Creeping shrub, arising from taproot

Stems: branchlets bearing 2-3 leaves.

Leaves: Mainly orbicular (round) to elliptic, **small (to 5-14 mm long, 4-9 mm wide)**. Margins entire.

Catkins: Borne on branchlets, Usually few flowered and not long.

Capsules: Often reddish, small, glabrous or sparsely pubescent (4-7 mm)

Habitat: Highly variable, dry to moist tundra and meadows, characteristic species in deep nonacidic snowbeds.