

Diversity of Wisconsin Rosids

... elms, mulberries, legumes ...

we will be seeing, in the next few lectures, many of the woody plants (trees/shrubs) present at your sites

Rhamnaceae - buckthorn family

A large family of trees and shrubs in the tropics and temperate areas. In Wisconsin we have 2 genera (*Rhamnus* and *Ceanothus*) and 6 species. Several are some of our most invasive shrubs in the forest sites you will study.



Many of our species are armed with thorns

Leaves are simple and alternate or opposite often with **arcuate** venation (arcing along the edge)



Rhamnus cathartica - European or common buckthorn [invasive] common 401 final exam shrub!

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Inner bark is bright green

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CA 4,5 CO 4,5 A 4,5 G (3)



Flowers 4 or 5 merous (4 merous shown in common buckthorn)

Stamens opposite the petals - unusual in flowering plants!

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Stamens opposite the petals - unusual in flowering plants!

Fruits one-seeded drupes

Shrubs often confused with cherries and hollies

Rhamnus cathartica - European or common buckthorn [invasive] common 401 final exam shrub!

Rhamnaceae - buckthorn family



Frangula alnus (= *Rhamnus frangula*)
Glossy buckthorn [invasive]



Rhamnus alnifolia
alder leaf buckthorn [native]

Rhamnaceae - buckthorn family



Ceanothus americanus
New Jersey tea

Elaeagnaceae - Russian olive family



Elaeagnus angustifolia - Russian olive

Russian olive family are small trees and shrubs easily recognized by silvery or reddish glandular hairs covering bottom leaves and/or stems

Russian and autumn olive are invasive trees with alternate leaves



Elaeagnus umbellata - autumn olive



Elaeagnaceae - Russian olive family



Shepherdia argentea - silver buffalo-berry (western N. Am. Species but planted)



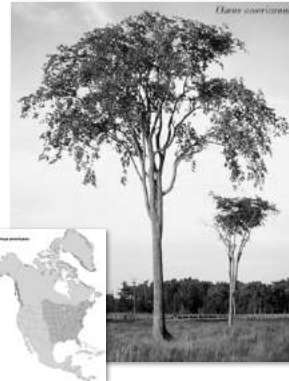
Shepherdia canadensis - buffalo-berry

Buffalo-berries are North American species with opposite leaves



Ulmaceae - elm family

A north temperate family of trees best known for the American elm with its distinctive vase shaped growth form. Dutch Elm disease, caused by the fungus *Ophiostoma ulmi*, is gradually destroying these magnificent trees. Dutch Elm disease was first discovered in this country in 1930.



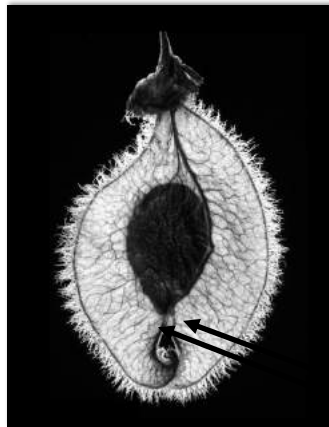
Leaves are **distichously** arranged - 2 ranks in one plane - and pinnately veined

Leaf bases are strongly asymmetric



Ulmus americana - American elm

Ulmaceae - elm family



Flowers are bisexual but reduced and wind pollinated; they appear before the leaves

Pistil is made of two fused carpels but only one seed matures; fruit is a **samara** - a winged achene is this case



Note 2 styles on samara

Ulmus americana - American elm

Ulmaceae - elm family



Ulmus rubra - red or slippery elm

Red elm leaves are more sand papery in texture, less asymmetric at base; inner bark is reddish



common 401 final exam treelet!

Ulmaceae - elm family



Red elm leaves are more sand papery in texture, less asymmetric at base; inner bark is reddish

Samaras are larger than the American elm and without fringe of hairs along edge

Ulmus rubra - red or slippery elm



common 401 final exam treelet!

Ulmaceae - elm family



Rock elm has corky bark – otherwise leaves looks like a smoother American elm



Ulmus thomasii – rock or cork elm

Cannabaceae - marijuana family

A small family in the Great Lakes of 3 genera and 4 species of trees, herbs and vines. Plants palmi-pinnate (*Celtis*), palmately lobed (*Humulus*) or compound (*Cannabis*). Often distinctively aromatic plants. Flowers unisexual.



Cannabis sativa
Hemp, marijuana



Celtis occidentalis
Hackberry



Humulus lupulus
American hops

Cannabaceae - marijuana family

Celtis is a group of small trees previously placed in Ulmaceae or Celtidaceae. Hackberries have unisexual flowers. Leaves are strongly **palmi-pinnate** - with 3 main veins at base.



Note distinctive warty bark




Celtis occidentalis
- hackberry




Fruit is a one-seeded drupe, not a berry!


(C) 2002, Gary Ewless

Cannabaceae - marijuana family




Female inflorescence
Seeds 1-seeded

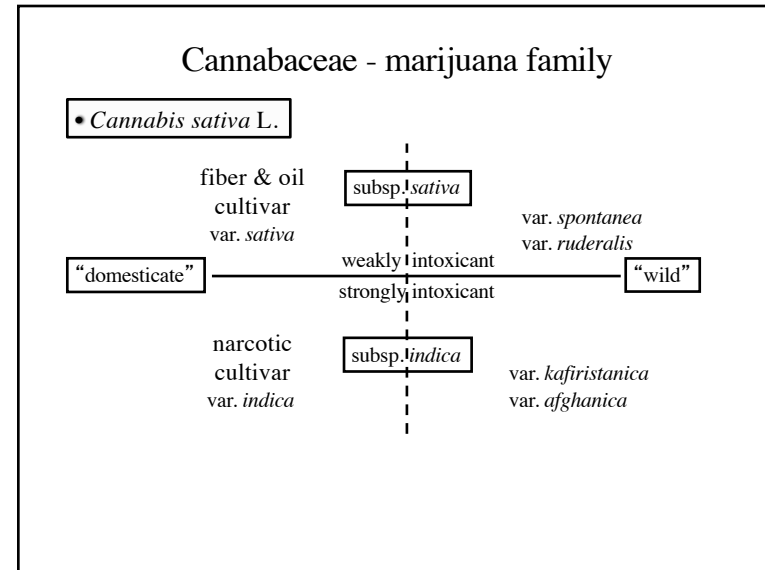





Cannabis sativa
Hemp, marijuana




Male inflorescence



Cannabaceae - marijuana family





Hemp farm outside Ripon




THE FAIRWATER HEMP COMPANY
FAIRWATER, WISCONSIN

Industrial hemp – part of Wisconsin agricultural past






Cannabaceae - marijuana family




Humulus lupulus
American hops



WISCONSIN HOP EXCHANGE GROWERS

Under cultivation; notice the hop female inflorescences which is source of beer flavoring - lupulin



Cannabaceae - marijuana family



Humulus lupulus
American hops

Under cultivation; notice the hop female inflorescences which is source of beer flavoring - lupulin



Humulus japonicus
Japanese hops [escaped]



Urticaceae - nettle family

Largely a tropical family of herbs and shrubs. In Wisconsin we have 5 genera and 6 species - all of them herbs and generally restricted to woodlands.



Leaves have the palmipinnate venation; either alternate or opposite

Urtica dioica - stinging nettle

Urticaceae - nettle family

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Urtica dioica - stinging nettle

Some species, like stinging nettle, are a source of irritants found in specialized hair-like cells on stems and leaves

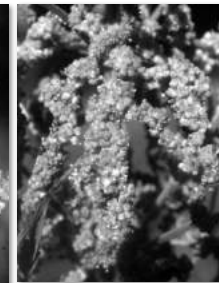
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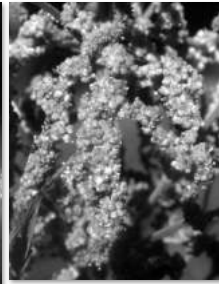
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Flowers are reduced and unisexual, in congested inflorescences, and mostly wind-pollinated

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Stamens have a peculiar elastic spring-like mechanism that flings pollen further out from the plant

Urtica dioica - stinging nettle

Urticaceae - nettle family

Leaves are palmi-pinnate as in other related families of the Rosales. Genera in Wisconsin can be separated by leaf arrangement, presence of stinging hairs, and inflorescence features.



Urtica dioica - stinging nettle
[opposite leaves, stinging]



Laportea canadensis - wood nettle
[alternate leaves, stinging]

Urticaceae - nettle family



Boehmeria cylindrica
False nettle



Parietaria pensylvanica
pellitory



Pilea pumila
clearweed

Moraceae - mulberry family



A large and important family of tropical trees (figs, breadfruit). Two genera (*Morus* and *Maclura*) with 3 species occur in Wisconsin, although only 1 is native.

Well developed latex system occurs in the family and thus is easy to recognize by usually milky sap when leaves or stems are cut.

Leaves are alternate, strongly palmi-pinnately veined.

Morus alba - white mulberry (introduced, source of food for silk worms in the Orient) - has characteristic variable lobing of leaves.



Morus alba - white mulberry

Moraceae - mulberry family



Flowers reduced, unisexual, no petals
 Single seeded fruits (fleshy achenes or drupelets) from many flowers coalesce to form one fleshy, **multiple fruit** [e.g., mulberry, fig, breadfruit]



Morus alba - white mulberry [left - female ; right - male]

Moraceae - mulberry family



Red mulberry is our one native species, and is quite rare and is a riparian edge specialist



Morus rubra - red mulberry

Moraceae - mulberry family

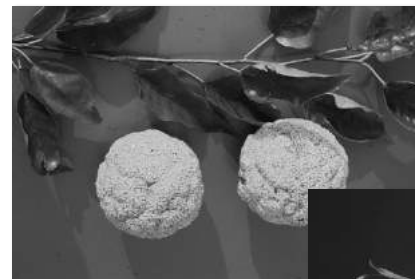


Note the multiple fruit - derived from an entire inflorescence, not from just one flower



Morus rubra - red mulberry

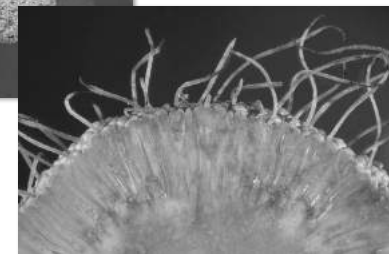
Moraceae - mulberry family



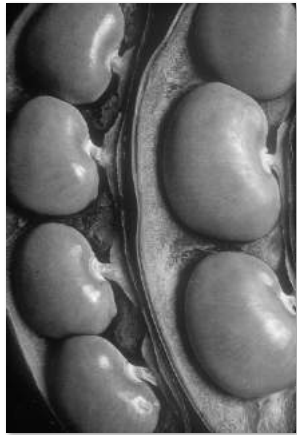
Osage orange is not native but often seen escaped; note the large grapefruit sized multiple fruit

Maclura pomifera - osage orange

Cross section of multiple fruit showing individual one-seeded fruitlets



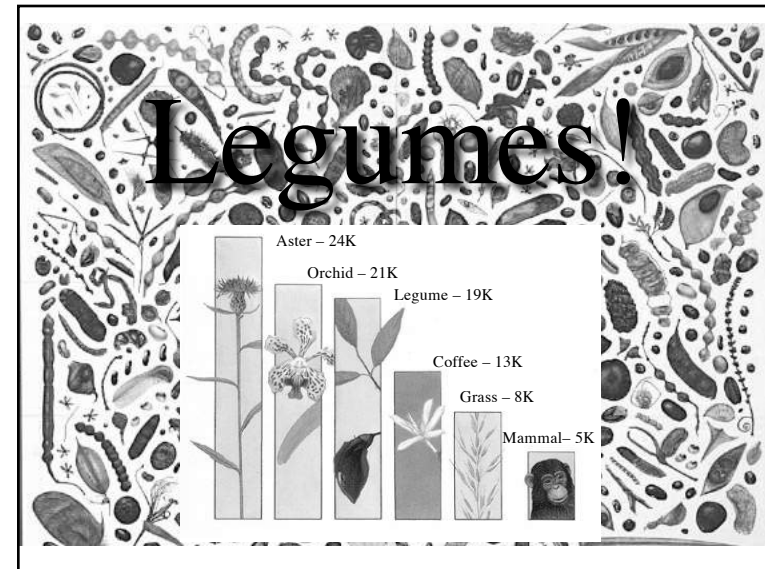
Fabaceae



Produce specialized follicles - **legumes** - that open along two lines of dehiscence



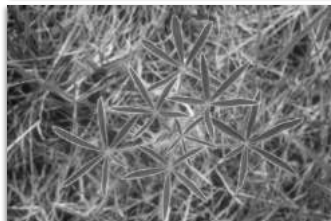
Allowed to call family **Leguminosae**



Fabaceae

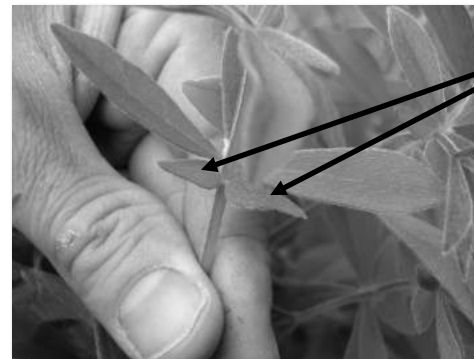


Most of the legumes are compound leaved - pinnately, palmately, trifoliolate - a few are simple leaved



Fabaceae

Most of the legumes are compound leaved - pinnately, palmately, trifoliolate - a few are simple leaved



Stipules are generally well-developed

“caesalpinoid” legumes

CA5 CO5 A10 G1

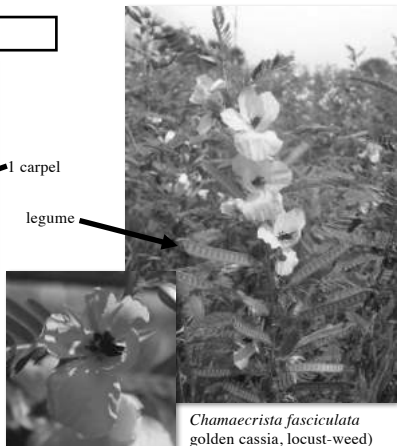


1 carpel

legume

Flowers 5 merous with 10 stamens; topmost petal = banner sits in front of the 2 lateral or wing petals

Gynoecium **monocarpic** and forms the legume



Chamaecrista fasciculata
golden cassia, locust-weed)

“caesalpinoid” legumes



Senna marilandica - southern wild senna



Senna hebecarpa- wild senna

“caesalpinoid” legumes



Cercis canadensis - eastern redbud
NOT native



“caesalpinoid” legumes

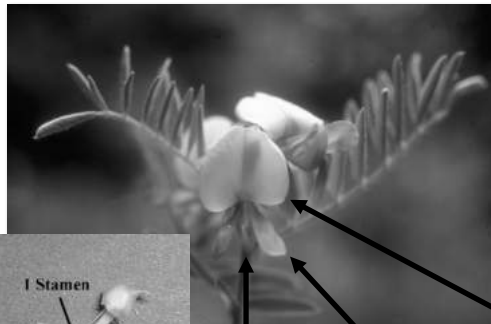


Gleditsia triacanthos - honey locust



“faboid” legumes

CA (5) CO 3+(2) A (9)+1 G 1



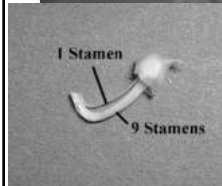
80 species in Wisconsin; many with root nodules for N₂ fixation

Calyx often fused

Banner petal behind **lateral** petals

Bottom **keel** petals often fused

Stamens **diadelphous** = 9 fused + 1 separate



2 keel petals 2 lateral petals

banner petal

“faboid” legumes



Baptisia leucophaea (= *B. bracteata*) - creamy wild indigo



Apios americana - groundnut

“faboid” legumes



Securigera (Coronilla) varia - crown vetch



Desmodium canadense - ticktrefoil

“faboid” legumes



Lathyrus japonicus - beach pea



Lupinus perennis - lupine

“faboid” legumes



Robinia pseudo-acacia - black locust

invasive
common 401 final exam tree!

“faboid” legumes



Melilotus alba
White sweet clover



Vicia villosa
Hairy vetch

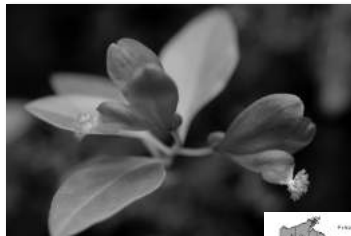


Medicago sativa
alfalfa



Trifolium pratense
Red clover

Polygalaceae - milkwort family



Polygala paucifolia
gaywings, flowering wintergreen

Early flowering plant of northern hardwood pine forests



Polygala sanguinea
purple milkwort

A small family of herbs with flowers reminiscent of legumes; their closest relatives; milky latex in plant



Polygalaceae - milkwort family



Polygala polygama - bitter milkwort

Species characteristic of sandy soils; note the **cleistogamous** flowers = closed and selfing vs. **chasmogamous** = open and outcrossed

