

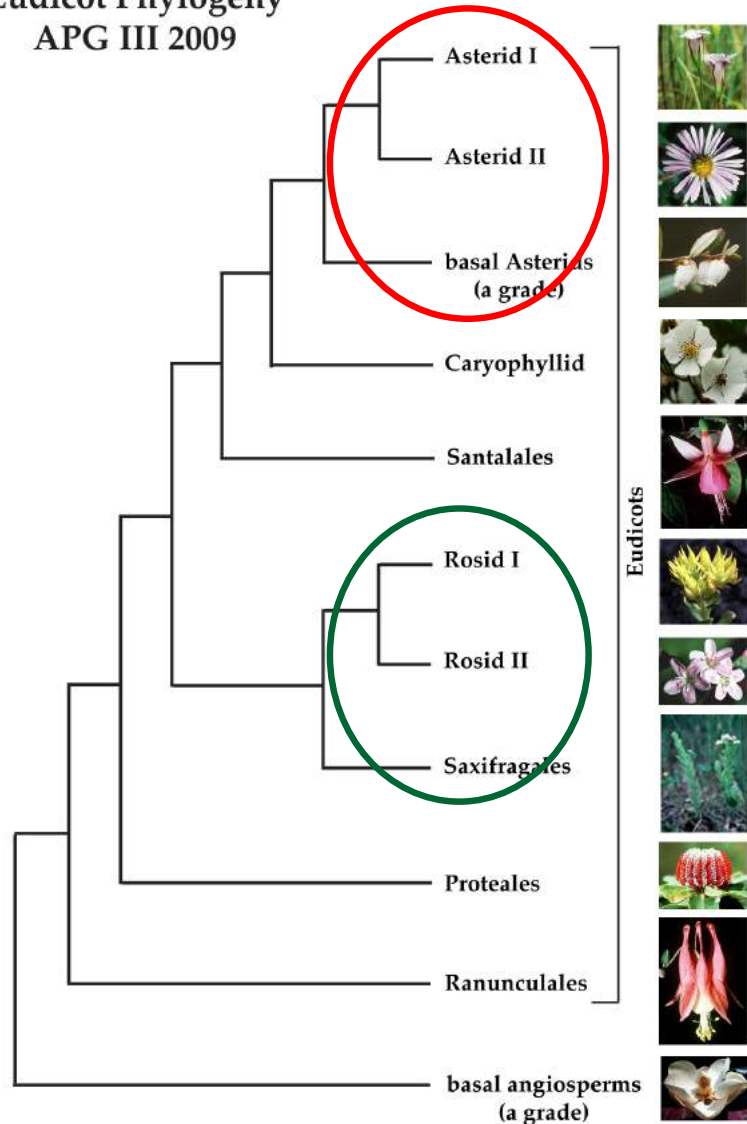
A photograph of a field of flowers, likely dogwoods, with white and pink blossoms on tall stems against a clear blue sky. The text is overlaid on the image.

Diversity of Wisconsin Asterids

. . . dogwoods, blueberries, and
primroses . . .

Asterids

Eudicot Phylogeny
APG III 2009



Asterids: second of the two large groups of eudicots



Rosids:

Separate petals

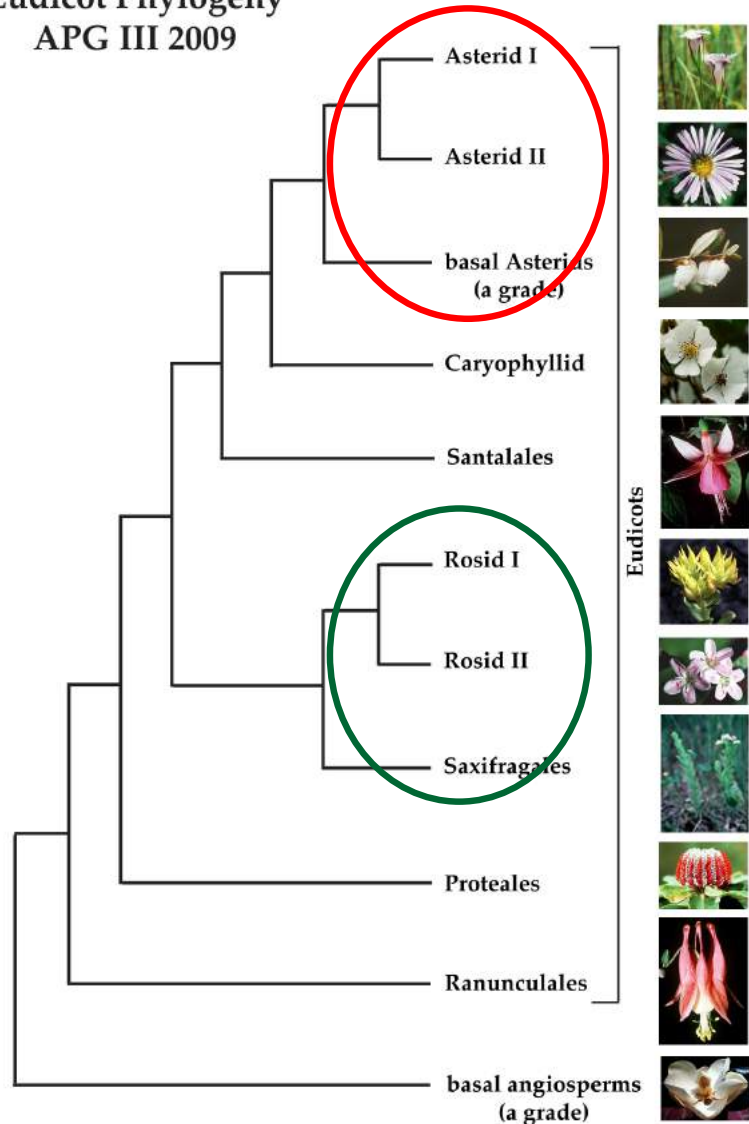
Asterids:

Fused petals



Asterids

Eudicot Phylogeny APG III 2009



- (1) fused petals
- (2) stamens = or less than number of petals
- (3) stamens fused to petals

****Ericaceae - blueberry family**

Worldwide family of subshrubs, shrubs, epiphytes, and small trees. Characteristic of **nutrient poor soils**; in Wisconsin common in bogs, acidic pine dominated forests, or sandy soils.

Ericaceae now includes the totally fungus dependent **mycotrophs** - non chlorophyllous, all food and water from fungi

Symbiotic relationship with **mycorrhizal** relationship, forming **haustoria** - root to fungus connection, permits nutrient uptake by plants, carbon uptake by fungus.



Leatherleaf in bog



Pinesap in pine forest

**Ericaceae - blueberry family



Rhododendron (Ledum)
Labrador tea
Note revolute leaves

evergreen plants, with tough, leathery leaves often **revolute** or inrolled along edge of leaf, with sunken stomata, and bottom of leaves often covered with protective hairs



Chimaphila
shinleaf



Arctostaphylos
bearberry

**Ericaceae - blueberry family

CA (4-5) CO (4-5) A 8-10 \overline{G} (4-5)

corolla tube bell or vase shaped - most of our species are 5 merous

Stamens are 2X the number of petals with **terminal pores** for pollen release - rather than slits - for **buzz pollination** by bees



****Ericaceae - blueberry family**

CA (4-5) CO (4-5) A 8-10 \overline{G} (4-5)

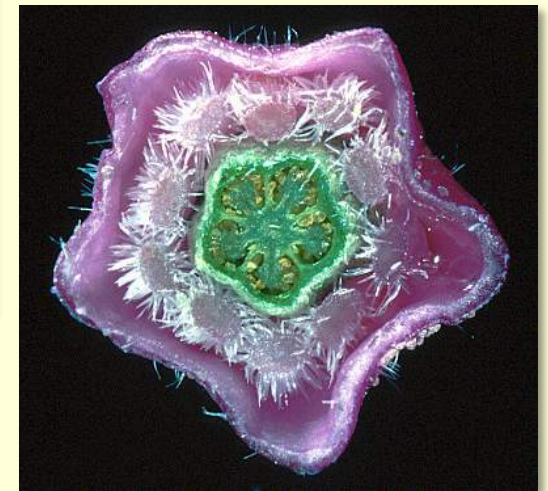


Superior pistil

Inferior pistil

Pistil is superior or inferior

Fruit a berry or capsule and many seeds



**Ericaceae - blueberry family



Bog rosemary has alternate leaves, revolute, and glaucous (white powdery) on the undersides



Andromeda glaucophylla - bog rosemary

**Ericaceae - blueberry family



*Chamaedaphne
calyculata*
leatherleaf

- dominant shrubby member of bogs
- leaves are glandular dotted.
- fruit is a dry berry/capsule.



****Ericaceae - blueberry family**



Kalmia polifolia - pale laurel



*Rhododendron
groenlandicum*
(*Ledum*) Labrador tea



2 bog genera

**Ericaceae - blueberry family



V. macrocarpon
cranberry

Vaccinium myrtilloides
Velvet-leaf blueberry

Blueberries and cranberries are
inferior ovaried and berry fruited

Vaccinium angustifolium
Lowbush blueberry

**Ericaceae - blueberry family



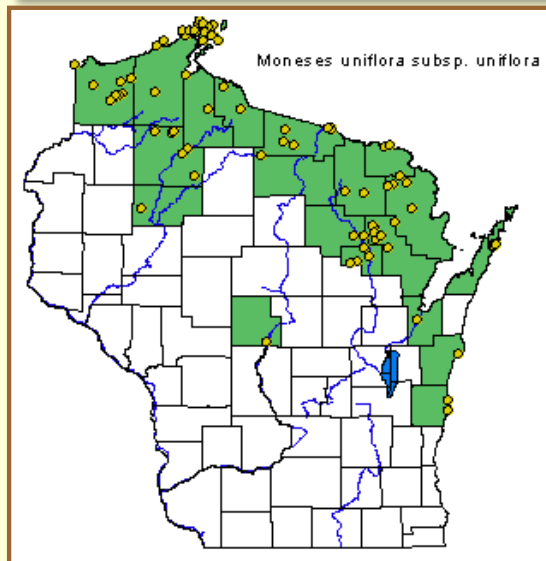
Chimaphila umbellata
pipsissewa



Pyrola rotundifolia
Round-leaved shinleaf

Former Pyrolaceae

**Ericaceae - blueberry family



Moneses uniflora
One-flowered shinleaf

Former Pyrolaceae

****Ericaceae - blueberry family**



Hypopitys monotropa
(*Monotropa hypopithys*)
pinesap



Monotropa uniflora
Indian-pipe



Pterospora andromedea
Giant pinedrops
Endangered

Mycotrophs from the old
family Monotropaceae

*Primulaceae - primrose family

Chiefly north temperate family of herbs; 20 genera and about 1000 species. In Wisconsin we have 5 genera and about 15 species. [Note: Michigan Flora separates into Primulaceae + Myrsinaceae]

CA (5) CO (5) A 5 G (5)

5 merous, stamens attached unto petals, and opposite the petals rather than the sepals



Primula (Dodecatheon) - shooting star



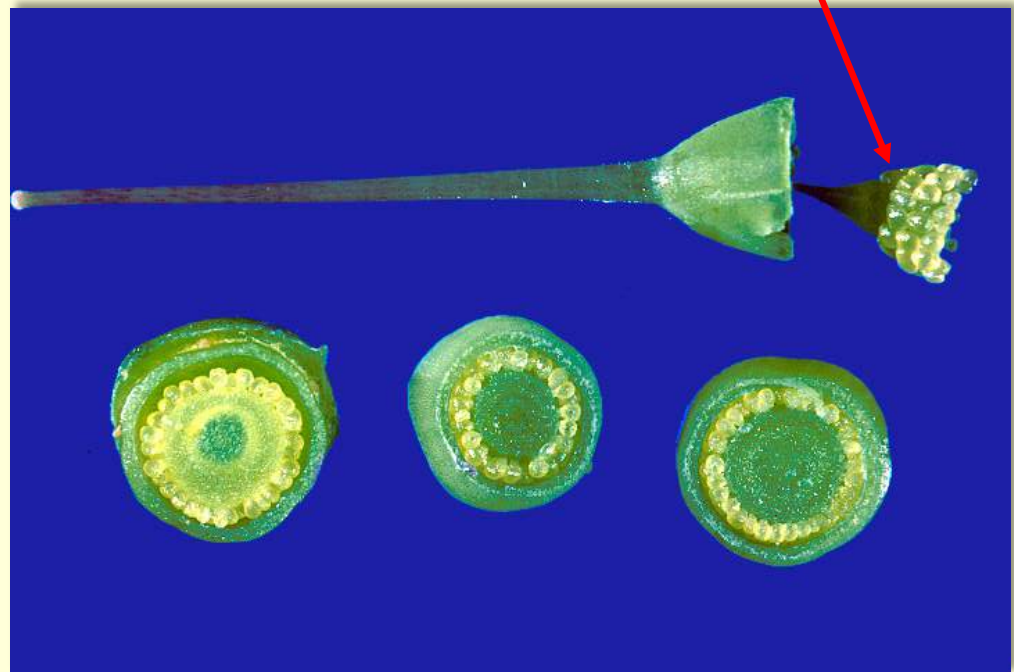
Lysimachia - loosestrife

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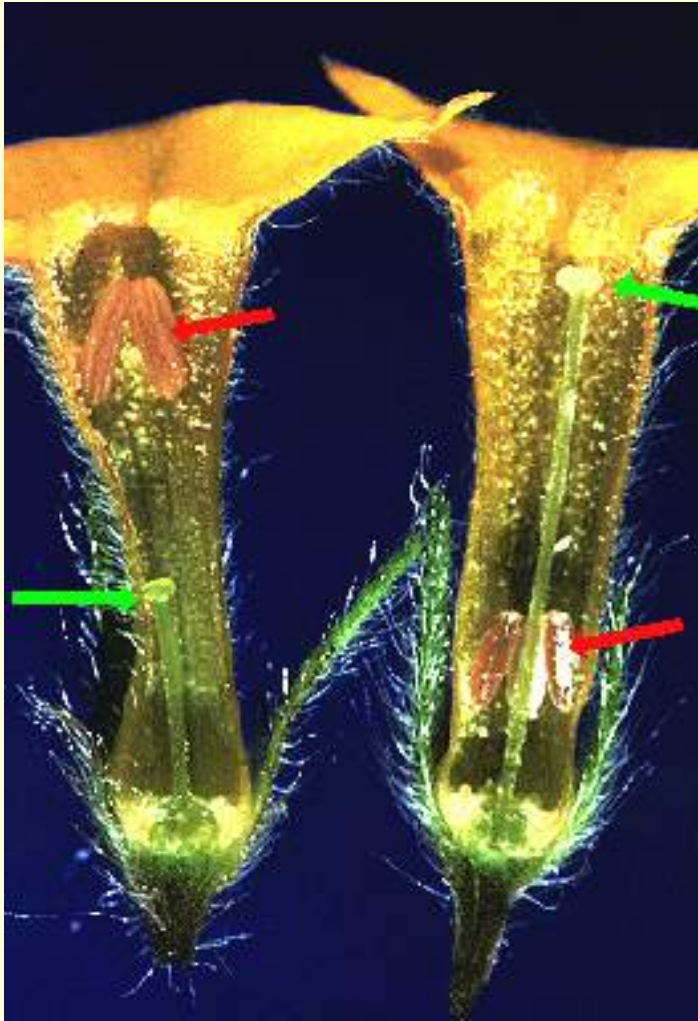
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Pistil is superior, unilocular, with **free-central placentation**, fruit a capsule

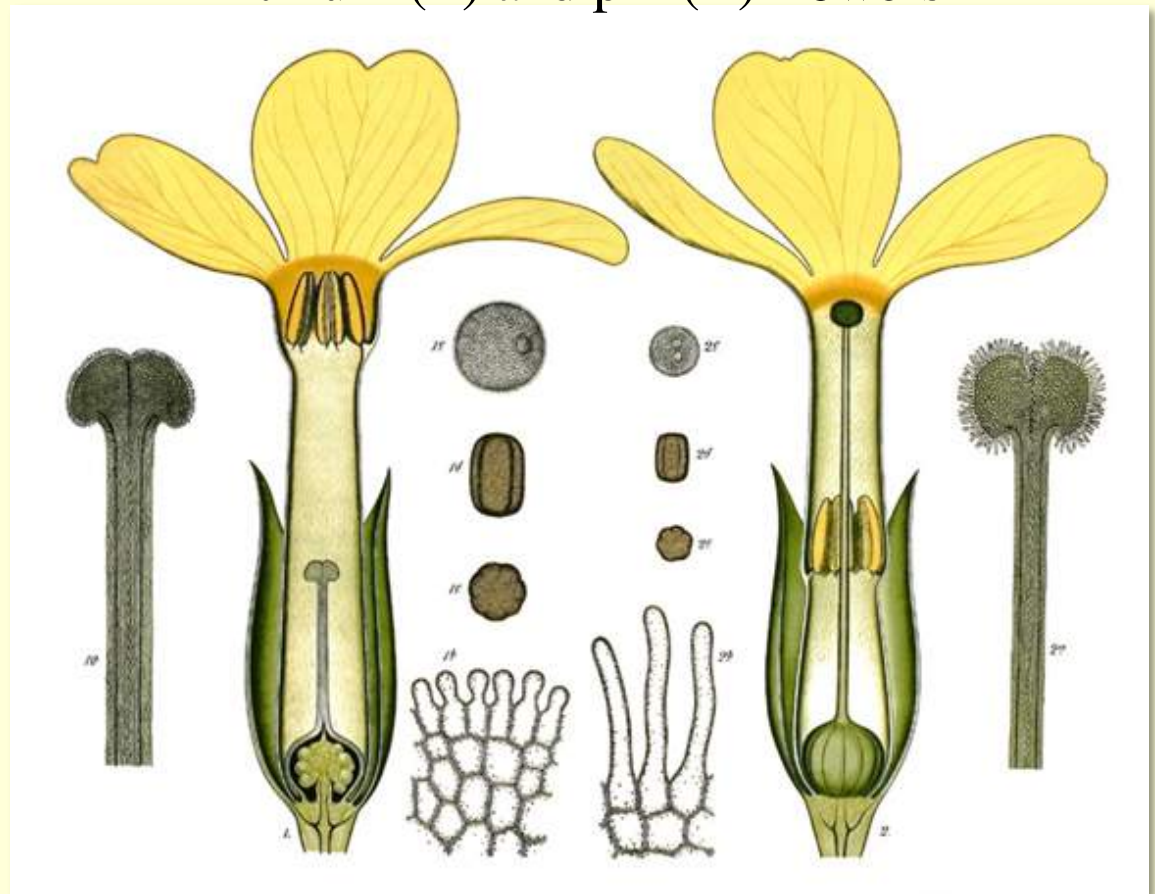


Primula (Dodecatheon) - shooting star

*Primulaceae - primrose family



Pollen and stigmatic differences in thrum (L) and pin (R) flowers



Primula - the classic study organism for heterostyly by Darwin

*Primulaceae - primrose family



Primula meadii
shooting star

Basal leaves



P. amethystinum
Western shooting star



both formerly in *Dodecatheon*

*Primulaceae - primrose family



Lysimachia ciliata
Fringed loosestrife

Opposite leaves

Lysimachia nummularia
Moneywort,
Creeping Charlie



Lysimachia thyrsiflora
Tufted loosestrife,
Swamp candles

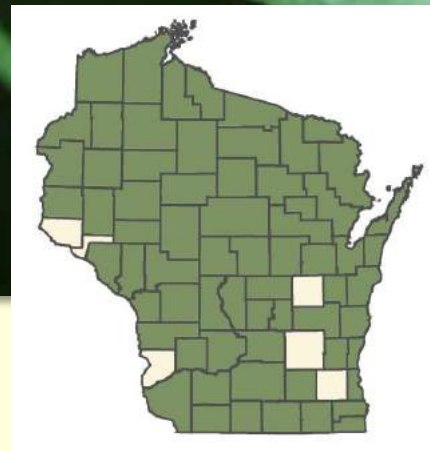
*Primulaceae - primrose family



Trientalis borealis
(*Lysimachia borealis*)
Starflower

Ubiquitous
woodland herb with
whorl of leaves

Flower is unusual
with 7 merous
perianth



Whorled leaves

*Sarraceniaceae - pitcher plant family



Sarracenia purpurea -
pitcher plant

Insectivorous family of 3 genera; 1 species in Wisconsin.

Pitfall trap (pitcher) from modified leaf; luring color, odor, downward projecting hairs, slippery slope, drowning pool, digesting enzymes



*Sarraceniaceae - pitcher plant family



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Pitfall trap (pitcher) from modified leaf; luring color, odor, downward projecting hairs, slippery slope, drowning pool, digesting enzymes



All adaptations to live in nutrient (N) poor habitats; mainly in bogs, but also in fens, lake edges, swales of Great Lakes

*Sarraceniaceae - pitcher plant family

CA 5 CO 5 A ∞ G (5)

5 merous flower; unusual **peltate stigma**; flower structure ensures outcrossing by bees



Sarracenia purpurea - pitcher plant



**Polemoniaceae - phlox family

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

5 merous flowers, corolla tube with 5
stamens fused to inside of tube, often at
different heights; 3 fused carpels and 3
styles



**Polemoniaceae - phlox family



Phlox divaricata - woodland phlox

2 genera in Wisconsin

Phlox has opposite
leaves

**Polemoniaceae - phlox family



Polemonium reptans - Jacob's ladder

Alternate leaved spring flowering plant of woodlands and openings
[great Botany 401 final exam species!]

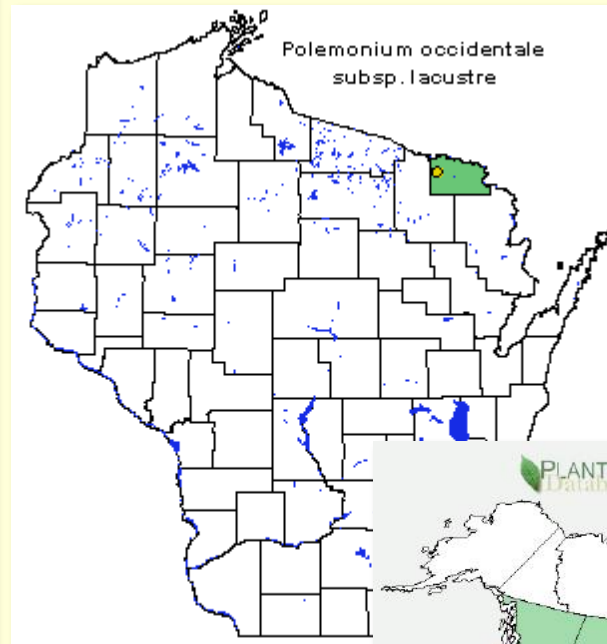


**Polemoniaceae - phlox family



Polemonium occidentale – western polemonium

Endangered species – Western Disjunct



*Balsaminaceae - jewelweed family

Small family of juicy-stemmed herbs with spurred sepals; we have two species

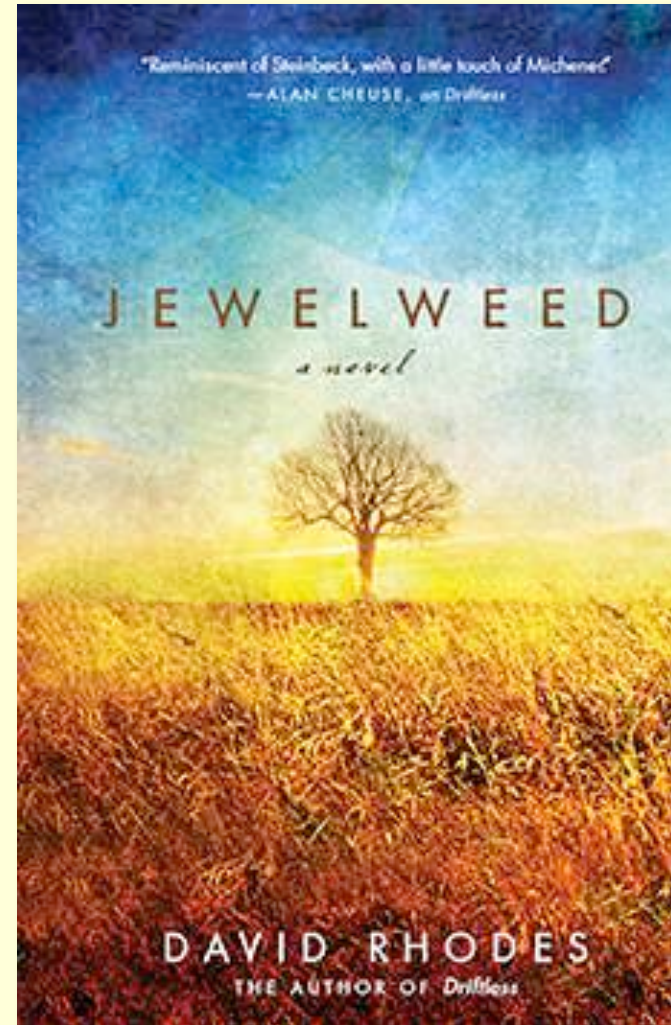


Impatiens capensis - orange jewelweed



Impatiens pallida - yellow jewelweed

*Balsaminaceae - jewelweed family



Jewelweed – iconic plants of the Driftless Region

*Balsaminaceae - jewelweed family



Mature ripe capsule

Fruit is explosive to the touch -
so also called **touch-me-nots**

Capsule sprun open



**Cornaceae - dogwood family



- Opposite (except for one) leaved shrubs or subshrubs
- Arcuate (arching) venation



**Cornaceae - dogwood family



CA 4 CO 4 A 4 \overline{G} (2)

Congested 4-merous flowers often with
4 inflorescence bracts

Fruit a 1-seeded drupe

Cornus foemina var. *racemosa* -
Gray dogwood



Cornus florida – flowering dogwood
(not native)

**Cornaceae - dogwood family



Cornus foemina var.
racemosa - Gray dogwood



Common component
of shrub carr

**Cornaceae - dogwood family



Cornus sericea (= *C. stolonifera*)
Red-osier

Common in wet places, distinctive
with red stems



**Cornaceae - dogwood family

Cornus canadensis - bunch berry

Low to ground circumboreal subshrub, appears to have a whorl of leaves, and has 4 showy bracts below flowers



****Cornaceae - dogwood family**



Eastern North American small tree with 4 conspicuous white bracts

Cornus florida - flowering dogwood

