

Diversity of Wisconsin Rosids

... violets, willows, spurges ...

Violaceae - violet family

A tropical to temperate family of 800 species in about 20 genera. They comprise herbs (ours) to vines and trees. Over 200 are violets (*Viola*). Wisconsin has around 28 species of *Viola* and 1 member of *Hybanthus*.



Viola tricolor - pansy, jonny-jump-up

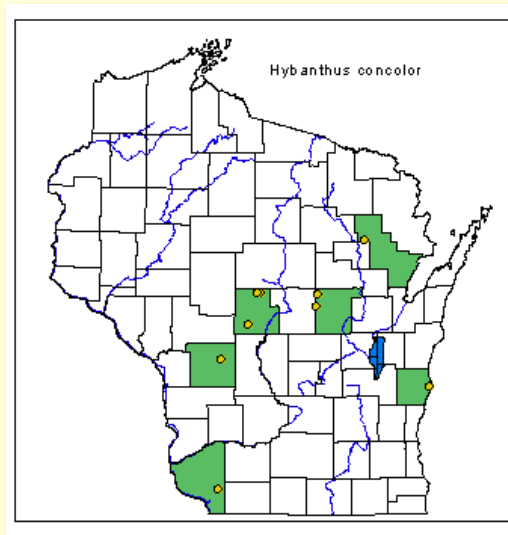


Viola affinis - sand violet

Violaceae - violet family



Hybanthus concolor - green violet
Special concern, almost extirpated



Violaceae - violet family



Violets herbaceous – basal or stemmed leaved
Leaves often heart shaped and palmately veined or lobed, and sometimes palmately compound.

Stipules are well developed.



Violaceae - violet family



CA 5 COZ 5 A 5 G (3)



- Flowers insect pollinated, with nectar guides, and strongly zygomorphic
- Perianth 5 merous
- Lower petal spurred, 2 lower stamens have spurs going back into the petal spur
- 5 stamens form extensions of connective around style
- Pistil 3 carpellate with parietal placentation

Violaceae - violet family



Pistil forms 3 parting capsule in **chasmogamous** flowers (open flowers) from out-crossing



Cleistogamous, or closed flowers, form small capsules via self-pollination (note the **parietal** placentation in upper capsule)

Violaceae - violet family



V. pedata
Bird' s-foot violet



V. pedatifida
Prairie violet



early spring, open area violets

Violaceae - violet family



V. pubescens - downy yellow violet

A stemmed yellow violet



V. canadensis - Canada white violet

A stemmed white violet

early spring, woodland violets

Violaceae - violet family

V. sororia – wood violet
Wisconsin state flower!

One of many stemless purple violets — these often hybridize making them particularly difficult to key out



V. macloskeyi
Wild white violet
A small white flowered violet

Hypericaceae - St. John's-wort family

A small family of temperate herbs or small shrubs of 9 genera and 560 species (= Clusiaceae or Guttiferae). In Wisconsin we have 2 genera (*Hypericum* and *Triadenum*) and 14 species. Some are invasive.



All of our species are opposite leaved

Many of the species have leaves that are **punctate** - with quite visible clear to black dots, these sometimes seen on petals as well

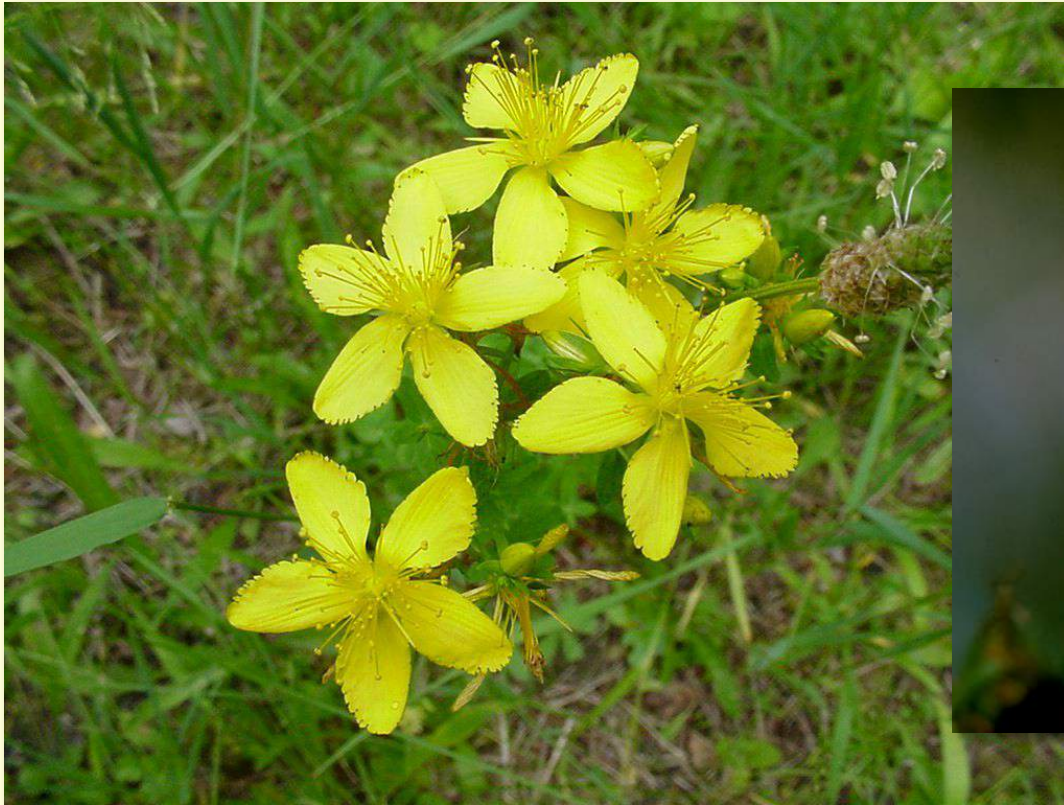
Hypericum punctatum - St. John's-wort

Hypericaceae - St. John's-wort family

CA 5 CO 5 A ∞ G (3-5)

Flowers yellow (*Hypericum*) or pink (*Triadenum*)

Stamens many, often grouped at base



Hypericum perforatum - Klamath weed [ecologically invasive]

Note the perforations along edge of yellow petals

Hypericaceae - St. John's-wort family

CA 5 CO 5 A ∞ G (3-5)

Pistil made up of 3 to 5 fused carpels with axile or parietal placentation

Fruit a capsule



Hypericum ascyron
great St. John's wort

Hypericaceae - St. John's-wort family

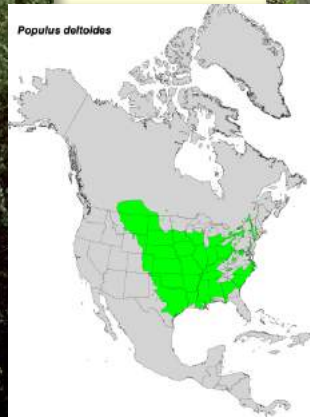


Triadenum virginicum
marsh St. John's wort

Wetland species with pinkish petals
and fewer stamens

Salicaceae - willow family

A woody family of about 55 genera and over 1000 species – most willows. In Wisconsin we have 2 genera (*Populus*, *Salix*) and 6 species. All have simple, alternate leaves.



Populus deltoides - American cottonwood



Salicaceae - willow family

A woody family of about 55 genera and over 1000 species – most willows. In Wisconsin we have 2 genera (*Populus*, *Salix*) and 6 species. All have simple, alternate leaves.



Salix babylonica - weeping willow



Salix fragilis - crack willow

Salicaceae - willow family



Populus deltoides
American cottonwood



Populus - poplars, cottonwood, aspens

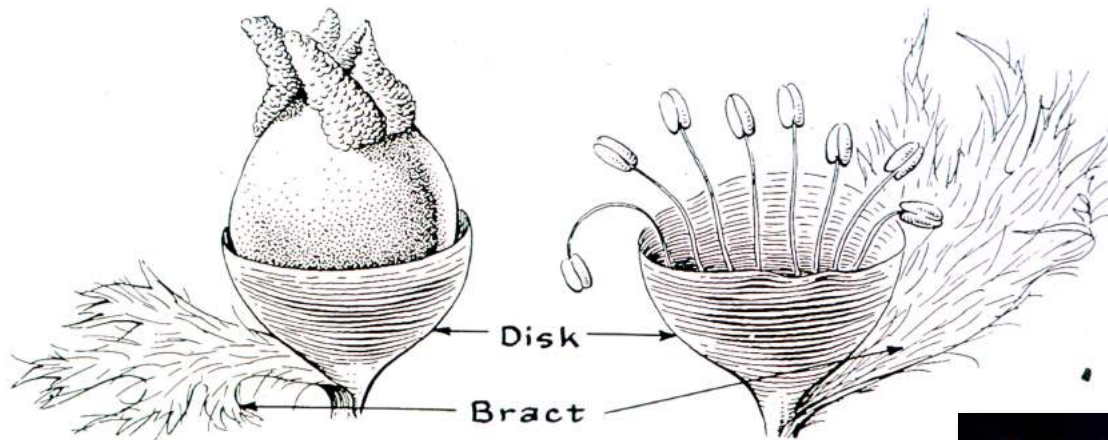
Trees **dioecious** = male and female trees, sometimes clonal

Male and female flowers reduced and in **catkins** or **aments** - **wind pollinated!**

Male flowers are reduced to essentially stamens

Female flowers reduced to only a 2-3 carpellate pistil, with large feathery styles

Salicaceae - willow family



134 *Populus*, (left) female flower, (right) male flower.

The flowers possess a **disk**, which is probably reduced sepals

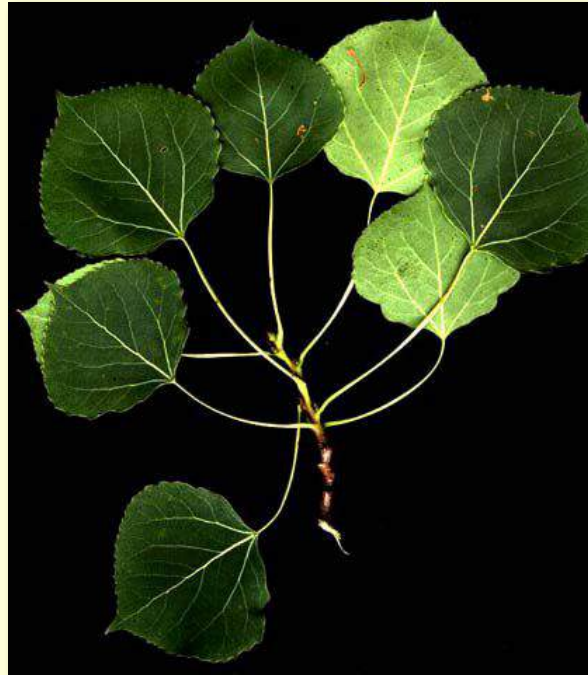
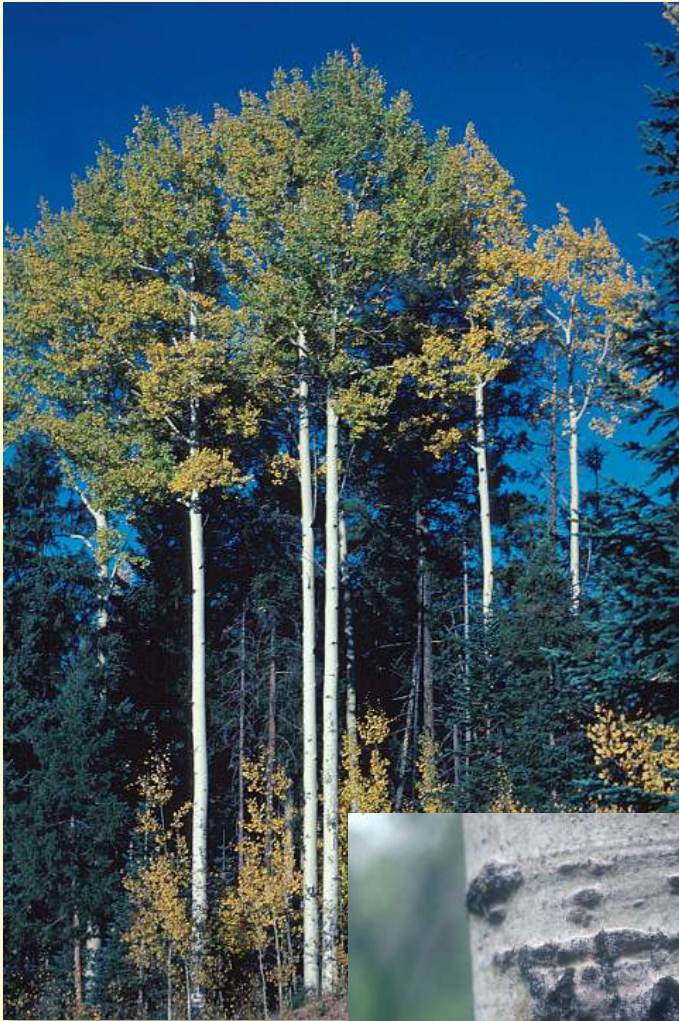
Each flower is subtended by a **bract** = modified leaf

Fruit is a capsule which release the seeds with a **coma** attached (cottony hairs; how cottonwood gets its name)

Wind dispersed seeds as well!



Salicaceae - willow family



P. tremuloides
trembling aspen



P. grandidentata
bigtooth aspen



These aspens are clonal from root sprouts, fast growing, light wooded, and important for pulp in the paper industry

Bark is light grey; leaves have flattened petioles

Salicaceae - willow family



Populus balsamifera
Balsam poplar, balm-of-gilead



Populus alba
White poplar
Introduced from Europe

Salicaceae - willow family



Salix - willows

Dioecious as in *Populus*

But, both wind and insect pollinated!

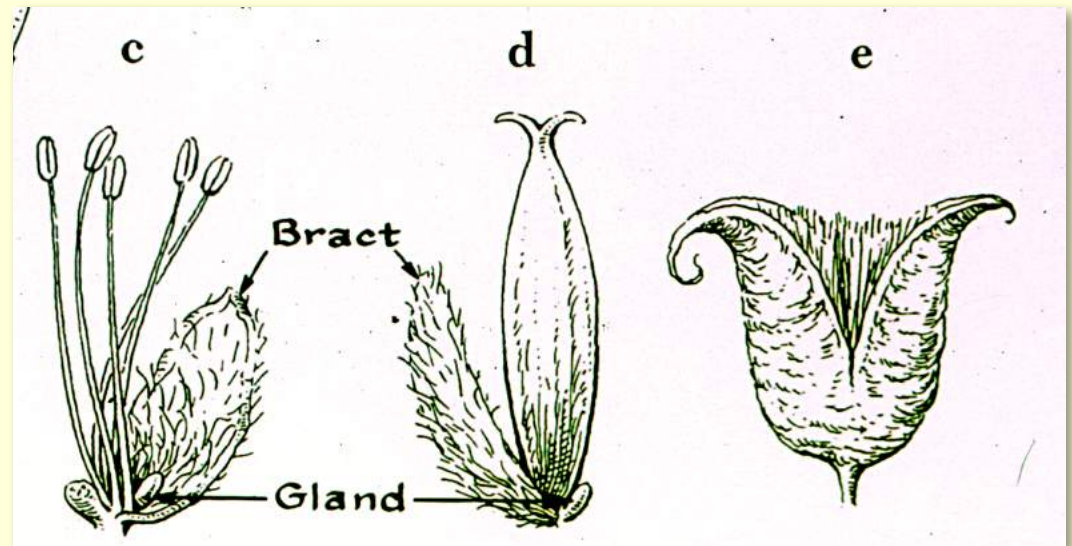


Salicaceae - willow family



Unlike *Populus*, the willow flowers have no disk, but instead a **gland** for nectar production and insect pollination in addition to wind pollination

Like *Populus*, the willow flowers have bracts; and the fruit is a capsule with cottony seeds



Salix, (a) twig with catkin, (b) floral diagrams of male and female flowers, (c) male flower, (d) female flower, (e) capsule.

Salicaceae - willow family

Salix - willows



Many species are “precocious” -
flower before leaves flush in spring

Salix discolor - pussy willow



Salicaceae - willow family



Salix pedicellaris - bog willow



Salix humilis - prairie willow
Note capsule and cottony seeds

Euphorbiaceae - spurge family



A large cosmopolitan family of trees, shrubs, and herbs

Latex bearing and filled with nasty chemicals (source of rubber, castor oil, tapioca, poinsettia).

Leaves alternate, simple (often palmately lobed) or palmately compound.

CA 5	CO 0	A ∞	G 0
CA 5	CO 0	A 0	<u>G</u> (3)

Family has unisexual flowers, 5 sepals, no petals, numerous stamens, 3 fused carpels, and capsules

Ricinus - castor oil bean

Euphorbiaceae - spurge family



Acalypha rhomboidea – copper leaf, mercury (native)

A Wisconsin example of this typical type of male and female unisexual flower arrangement



Euphorbiaceae - spurge family

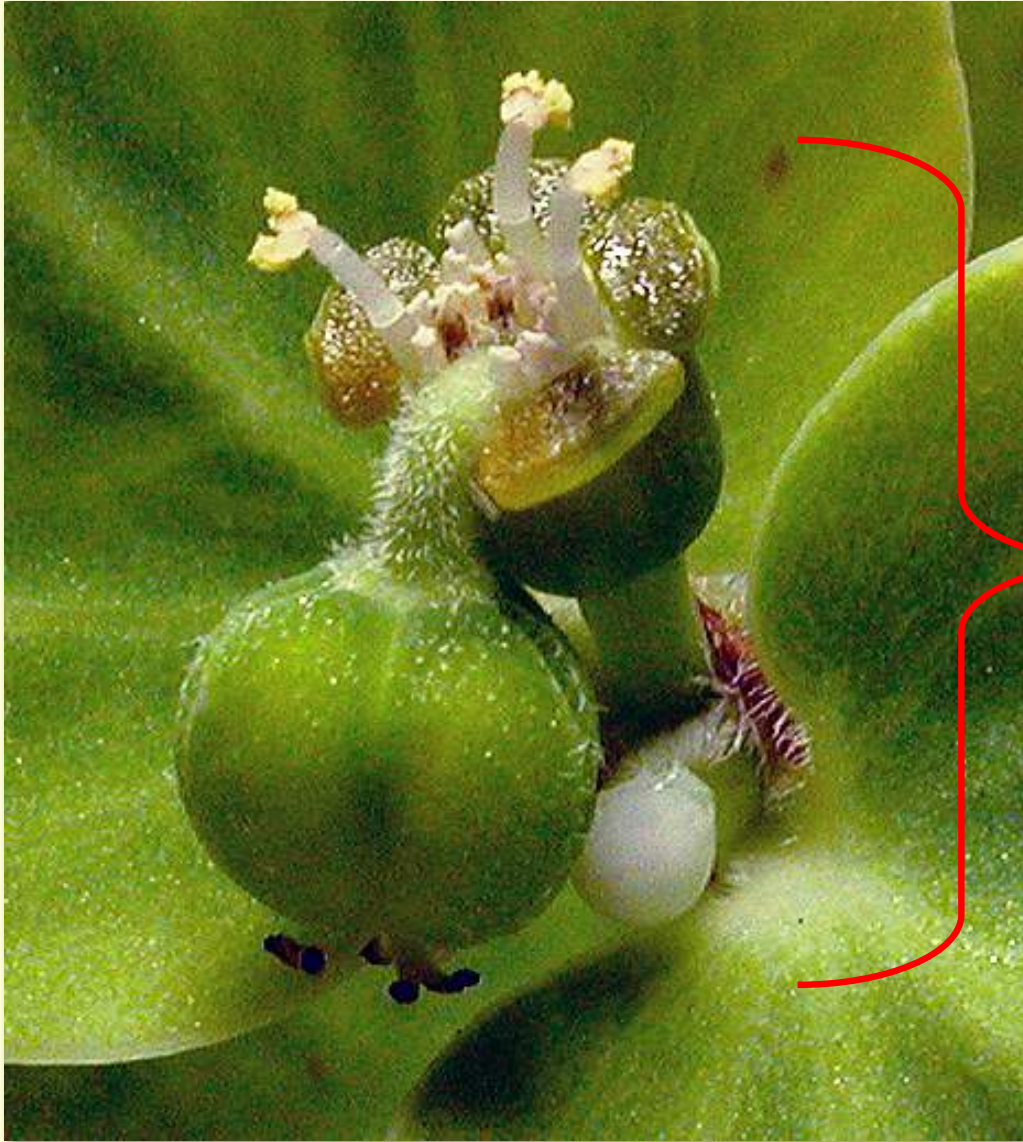


Croton glandulosus – sand croton
(naturalized)

A Wisconsin example of this typical
type of male and female unisexual
flower arrangement



Euphorbiaceae - spurge family



A quite different arrangement of unisexual flowers is seen in many of our spurges of the genera *Euphorbia* and *Chamaesyce*.

Flower or inflorescence?

Euphorbiaceae - spurge family



Euphorbia corollata - flowering spurge (native)

Shown here are 3 cyathia; the whole unit here is one **cyathium**

The “flower” of our **flowering spurge** is actually a highly modified inflorescence = **cyathium**



Euphorbiaceae - spurge family

Cyathium is composed of:

glands

appendages of glands

many 1-stamened male flowers (no perianth)

one 3-carpellate female flower (no perianth)



Euphorbiaceae - spurge family



Euphorbia virgata
(*E. esula*) - leafy spurge

One of several species
labelled “obnoxious
weed” by state law

Clonal growth, out-competes range plants as it
spreads westward, and avoided by cattle and
other animals



Euphorbiaceae - spurge family



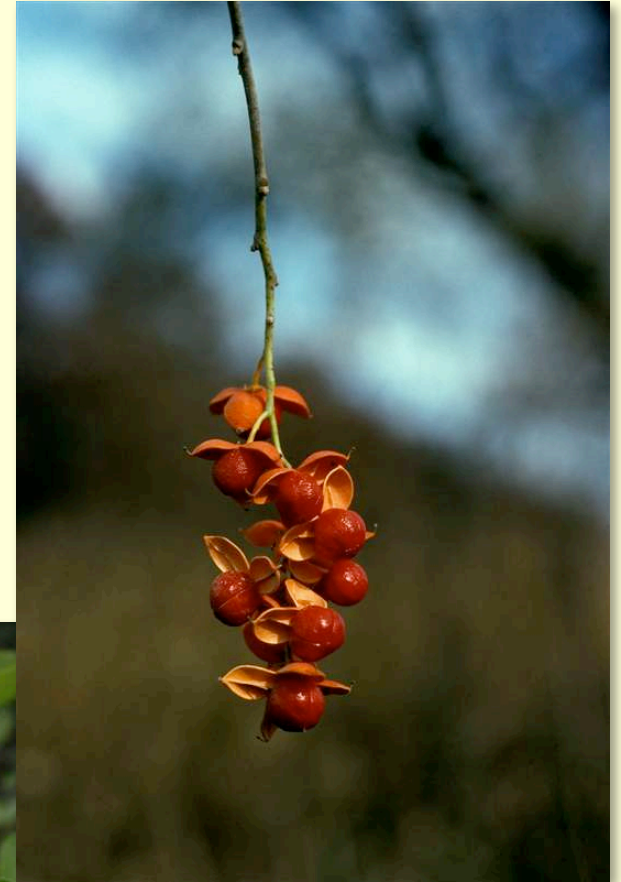
Euphorbia polygonifolia
(*Chamaesyce p.*) - seaside spurge



One of several species that are restricted to the Great Lakes coasts with wider disjunct distributions along the Atlantic marine coasts (also includes beach pea, sea rocket)

Celastraceae – bittersweet family

An important tropical family of vines. We have vines, shrubs, and herbs.



Celastrus scandens –
American bittersweet



Celastraceae – bittersweet family

An important tropical family of vines. We have vines, shrubs, and herbs.



Celastrus orbiculatus –
Oriental bittersweet
invasive



Celastraceae – bittersweet family

An important tropical family of vines. We have vines, shrubs, and herbs.



Euonymus atropurpurea –
Eastern wahoo, burning-bush



Celastraceae – bittersweet family



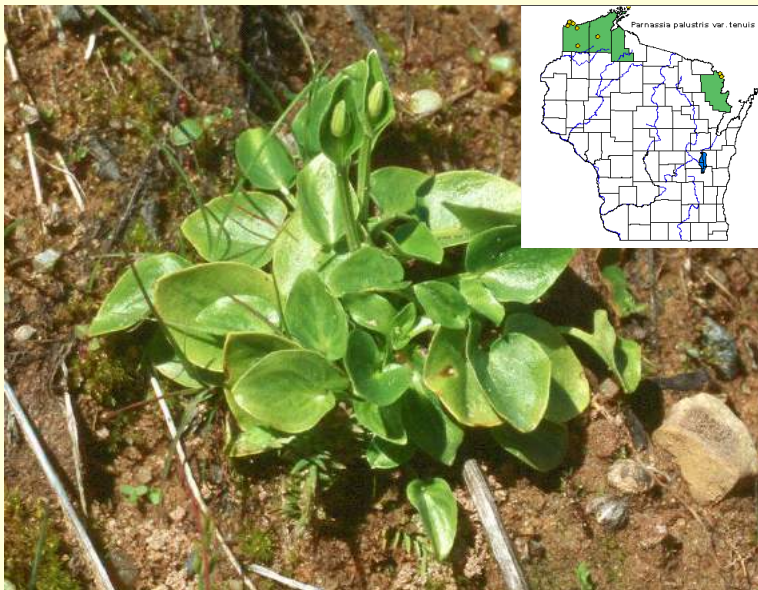
P. glauca



P. palustris [threatened]



P. parviflora [endangered]



Cucurbitaceae - melon family

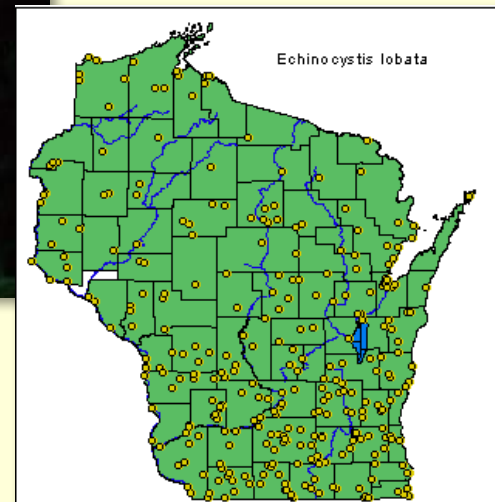
A tropical, subtropical, and temperate family of vines. Most noted for important fruits such as gourds, melons, cucumbers.



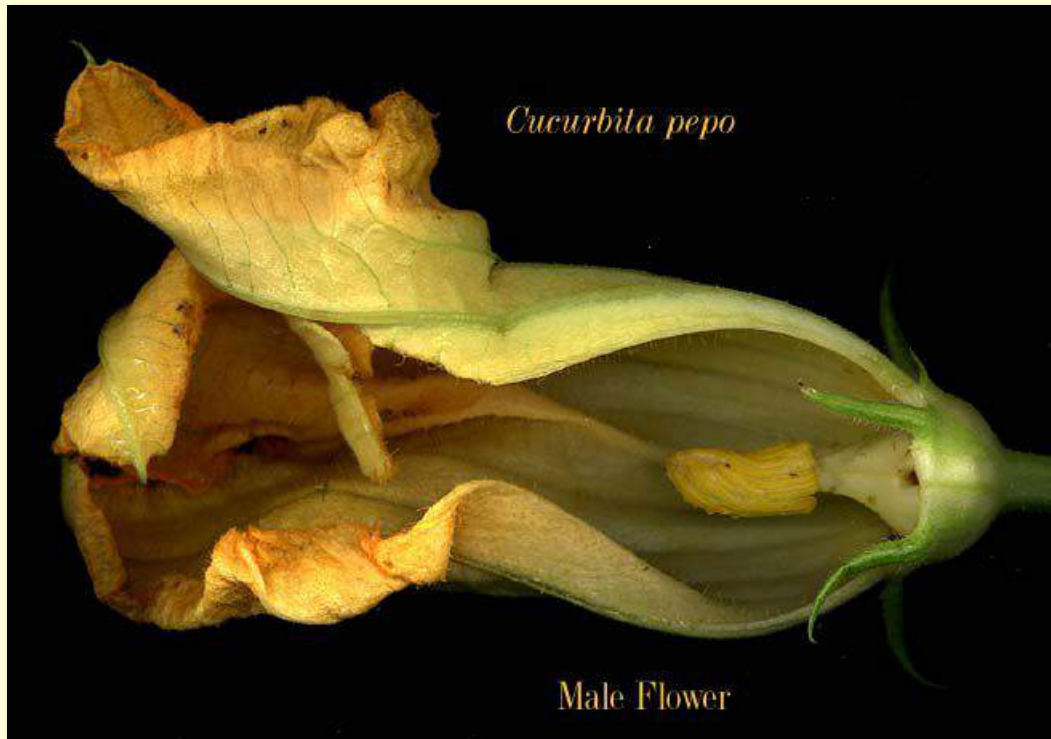
Alternate, simple leaves which are typically palmately lobed and veined.

Tendrils are modified inflorescences.

Echinocystis lobata - wild cucumber

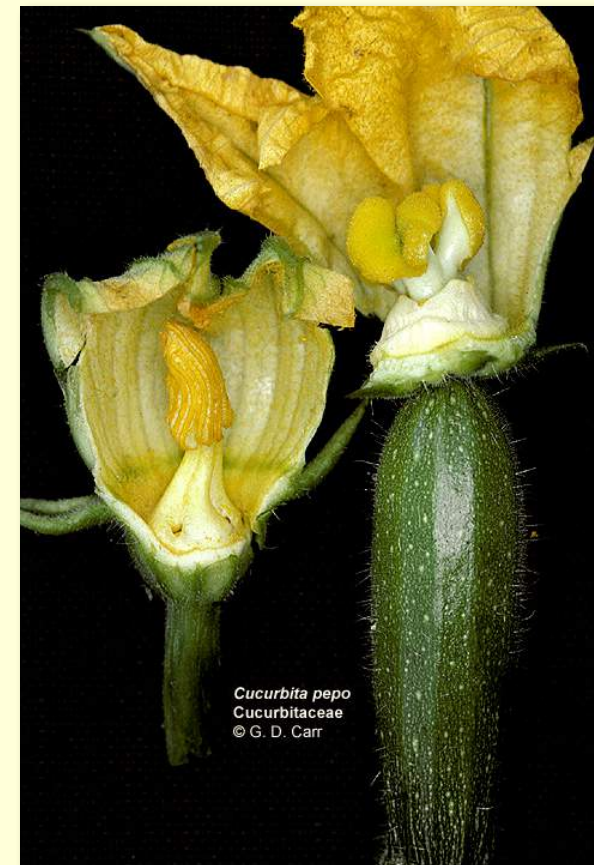


Cucurbitaceae - melon family



Flowers unisexual and plants monoecious

Sepals and petals are both fused; stamens are weird, female flower is epigynous



Male flower left

Female flower right

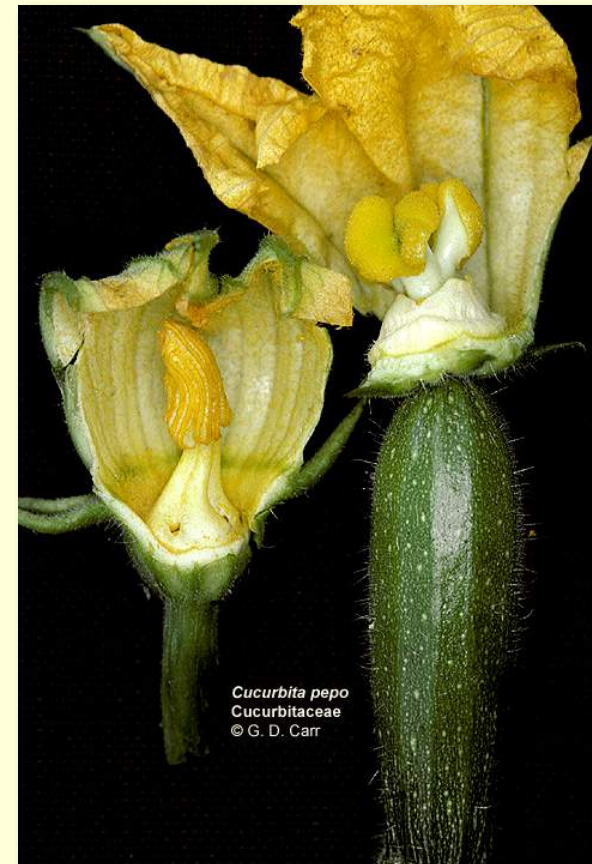
Cucurbitaceae - melon family



Fruit is a berry with leathery rind = **pepo** (pumpkin)

Flowers unisexual and plants monoecious

Sepals and petals are both fused; stamens are weird, female flower is epigynous



Cucurbitaceae - melon family



Echinocystis lobata
wild cucumber



Note the many small male flowers and few female flowers going into fruit and spiny pepo

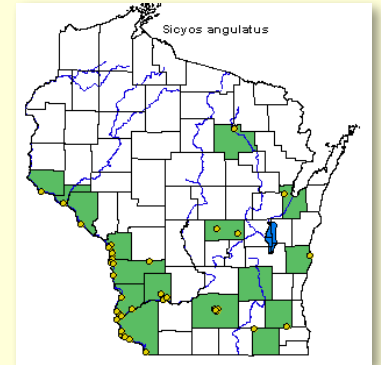


Early spring seedlings are common with 2 large cotyledons

Cucurbitaceae - melon family



Sicyos angulata - bur cucumber



Small “burred” cucumber or pickle-like fruits can be seen on bottom right



Vitaceae - grape family

Vines in the tropics and temperate areas. In Wisconsin we have 2 genera and 6 species. Includes one of the most celebrated of all plants *Vitis vinifera* -wine grape.

Flowers are small and usually clustered in more showy inflorescences. Fruits berries with several seeds.



Parthenocissus tricuspidata - Boston ivy



Vitis - grape

Vitaceae - grape family



Vitis - grape

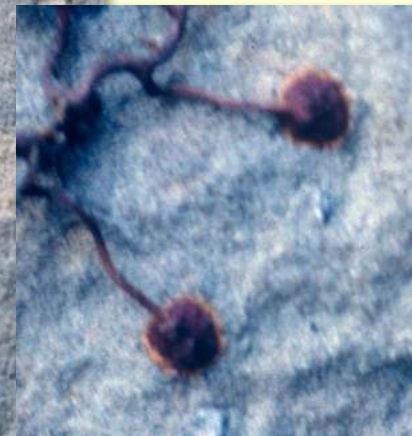


Parthenocissus - Boston ivy

Leaves simple in *Vitis* (grapes) and usually compound in *Parthenocissus* (woodbines, Boston ivy); venation and lobing usually strongly palmate



Plants climb by **tendrils** = modified branches or inflorescences; others climb by **holdfasts**; these often negatively phototropic



Vitaceae - grape family



Parthenocissus quinquefolia - Virginia creeper, woodbine

Vitaceae - grape family

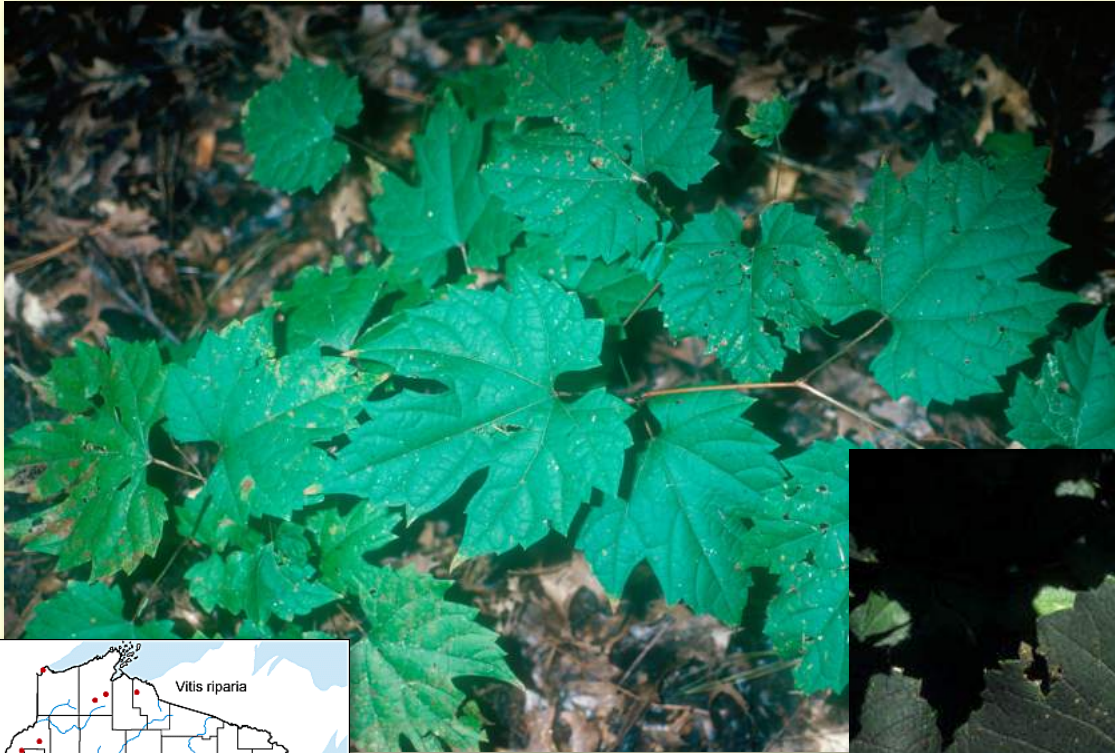


Parthenocissus quinquefolia
Virginia creeper, woodbine

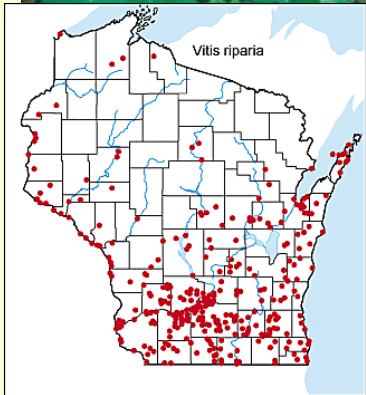
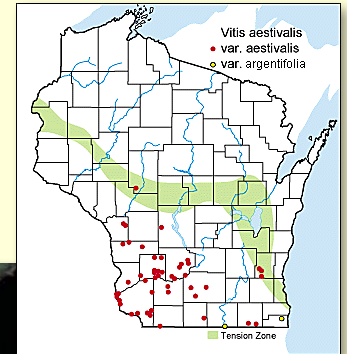


Parthenocissus inserta
grape woodbine

Vitaceae - grape family



Vitis riparia (+ *V. vulpina*)
River, frost grape



Vitis aestivalis
Summer grape

