



Saxifragales

Small group of families that include witch hazel, bishop's cap, currants, peonies, and jade-plants.

Paeonia

Sedum

Saxifragales

Small group of families that include witch hazel, bishop's cap, currants, peonies, and jade-plants.

They can be generally identified with their **two or more separate or semi-fused carpels.**

Paeonia

Sedum

Hamamelidaceae - witch hazel family

A medium sized family of trees and shrubs in subtropical and temperate areas but only 1 species in Wisconsin - witch hazel found in rich deciduous woods. A very distinctive shrub with asymmetrical crenate leaves and late-blooming flowers.

Hamamelis virginiana
Witch hazel

Hamamelidaceae - witch hazel family

Simple, alternate leaves on flattened branches; these leaves usually with palmate venation or at least pronounced basal veins



Witch hazel yields an astringent and soothing lotion for cuts and bruises; water diviners favor witch hazel for their dowzers (the divining rod to find water underground)

Hamamelis virginiana
Witch hazel

Hamamelidaceae - witch hazel family

The flowers are perfect, 4 merous (the family can be five merous), and **insect pollinated in the fall** (images from Sept)

CA 4-5 CO 4-5 A 4-5 $\bar{G}(2)$

Petals are ribbon-like

4 stamens opposite the sepals, but 4 small staminodia are opposite the petals



Hamamelis virginiana
Witch hazel

Hamamelidaceae - witch hazel family

CA 4-5 CO 4-5 A 4-5 $\bar{G}(2)$



Hamamelis virginiana
Witch hazel

Previous year's fruit

Ovary is generally inferior or half-inferior with the tops somewhat separated

The two locules each have one or more ovules

Fruit woody, dehiscent at top

Crassulaceae - stonecrop family



Sedum acre - Gold-moss stonecrop, Yellow sedum


Succulent herbs or small shrubs most common in arid temperate or warm temperate regions of the world.

Common as potted plants or in rock-gardens

CAM (crassulacean acid metabolism) type of photosynthesis

All Wisconsin species are introduced, although yellow sedum is spreading in sandy soils

Crassulaceae - stonecrop family



CA 5 CO 5 A 10 Q 5

Flowers typically 5 merous with stamens 2X number of sepals (3,4, or 6 merous species occur)

Carpels are essentially separate and produce follicles when mature

Nectary scales usually evident at base of each carpel

Sedum acre - Gold-moss stonecrop, Yellow sedum

Saxifragaceae - saxifrage family



The family comprises about 30 genera and nearly 700 species; cosmopolitan in distribution. Saxifragaceae is now being broken up into unrelated families.

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Major distinctive vegetative feature is the usual set of **basal leaves** which are often gland-tipped along the edges.

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Major distinctive vegetative feature is the usual set of **basal leaves** which are often gland-tipped along the edges.

Most prefer wet woods, swampy conditions, or drippy cliffs as in the driftless region.



Saxifraga in swampy woods *Sullivantia* under dripping cliffs

Saxifragaceae - saxifrage family




CA.5 CO.5 A.5or10 G.(2)

5 merous flowers usually on leafless stems

Saxifraga pensylvanica - swamp saxifrage

Saxifragaceae - saxifrage family




CA.5 CO.5 A.5or10 G.(2)

5 merous flowers usually on leafless stems

Superior pistil is made of 2 carpels, usually separated, at least from the middle up; perigynous **hypanthium** often present


Fruit 2 follicles or 1 splitting capsule




2 styles

Saxifraga pensylvanica - swamp saxifrage


Saxifragaceae - saxifrage family







Note cup-like hypanthium

Mitella diphylla
Bishop's-cap
or miterwort
[with 2 stem leaves]





Mitella nuda
Small Bishop's-cap



Saxifragaceae - saxifrage family



Tiarella cordifolia
Foamflower
Endangered boreal sp.









Heuchera richardsonii
prairie alumroot

Saxifragaceae - saxifrage family





P. glauca ↑ ↓ *P. palustris* [threatened]

P. parviflora [endangered]



Parnassia - grass of parnassus - has now been moved to its own family, unrelated to Saxifragaceae. Note the **staminodia**.

Saxifragaceae - saxifrage family



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Calciphiles (adapted to high calcium areas like fens, limestone pavement- e.g. Door Co.)




Grossulariaceae - currant family

One genus, 150 species of shrubs from the north temperate regions and Andes
 Characterized by lobed leaves, raceme inflorescences, and fleshy fruits (currants and gooseberries)

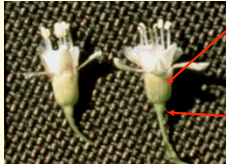
Ribes americanum - American black currant

Grossulariaceae - currant family

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CA 5 CO 5 A 5 G (2)

Flowers 5 merous with sepals large and petals smaller
 Gynoecium inferior of 2 fused carpels




well developed **hypanthium**

ovary




Grossulariaceae - currant family

Currants identified by long racemes of many flowers



Ribes americanum
American black currant



Ribes triste - swamp currant

Grossulariaceae - currant family

Gooseberries identified by paired flowers; stems often spiny



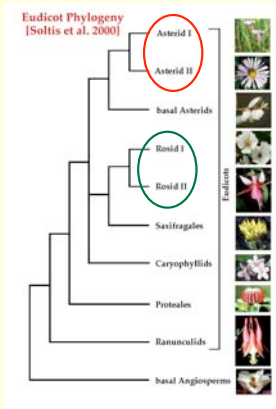
Ribes missouriense
Missouri gooseberry




Ribes cynosbati - prickly gooseberry, dogberry

Rosids


Rosids are one of the two large groups of dicots; the other group are the **Asterids**



Rosids:
Separate petals






Asterids:
Fused petals



Rosaceae - rose family

Rosaceae is a large family of nearly 100 genera and almost 3000 species distributed worldwide but most common in the north temperate regions - important fruit family

Comprise herbs, shrubs, or trees and with simple, pinnately compound or palmately compound leaves

Stipules well developed in compound leaves

Rosaceae - rose family

CA 5 CO 5 A ∞ G [variable!]

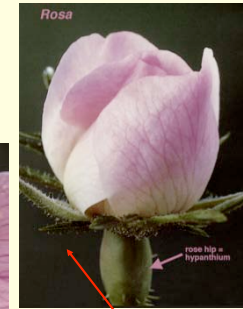
Flowers are showy, 5 merous, with numerous stamens
 Gynoecium is variable and used to define subfamilies



Rosaceae - rose family

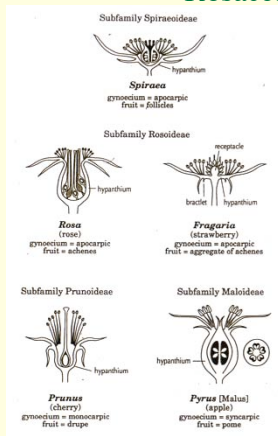
CA 5 CO 5 A ∞ G [variable!]

Flowers are showy, 5 merous, with numerous stamens
 Gynoecium is variable and used to define subfamilies



Hypanthium is present to some degree in all these forms
 Bracts on calyx (epicalyx) often present

Rosaceae - rose family

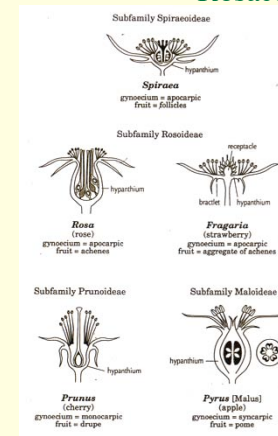


The gynoecium is variable as we will see and has been used to define 4 subfamilies


1. Spiraeoideae
2. Rosoideae
3. Prunoideae
4. Pomoideae or Maloideae

Gynoecium variability encompasses size of receptacle, position of ovary, size of hypanthium, and the resulting fruit types:

Rosaceae - rose family



Rosaceae - Spiraeoideae subfamily



CA 5 CO 5 A ∞ G 2-8

apocarpic, superior pistils
short hypanthium
follicle fruits






Subfamily Spiraeoideae



Spiraea
gynoecium = apocarpic
fruit = follicles

Physocarpus opulifolius - ninebark

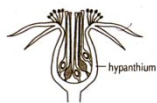
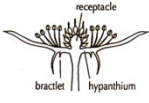
Rosaceae - Spiraeoideae subfamily

Spiraea alba - meadow-sweet

Spiraea tomentosa - hardhack

Rosaceae - Rosoideae subfamily


CA 5 CO 5 A ∞ G ∞

Herbs mostly with compound leaves

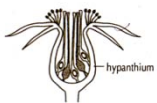
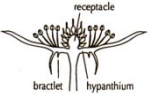
Plants with **stolons** (running stems above ground) or running rhizomes

Rosa
(rose)
gynoecium = apocarpic
fruit = achenes

Fragaria
(strawberry)
gynoecium = apocarpic
fruit = aggregate of achenes



Rosaceae - Rosoideae subfamily

CA 5 CO 5 A ∞ G ∞

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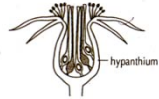
Flowers apocarpic with many carpels

Hypanthium well-developed or **receptacle elongated**

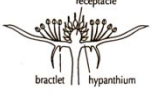
One-seeded **achenes**



Rosaceae - **Rosoideae** subfamily




Rosa
(rose)
gynoecium = apocarpic
fruit = achenes




Fragaria
(strawberry)
gynoecium = apocarpic
fruit = aggregate of achenes

CA5 CO5 A∞ G∞

Achenes often modified into aggregate of achenes (from one flower) as in the strawberry or fleshy drupelets as in raspberry, dewberry



Rubus idaeus - American raspberry



Fragaria sp. - strawberry

Rosaceae - **Rosoideae** subfamily





Fragaria virginiana - wild strawberry



Geum triflorum - prairie smoke

Rosaceae - **Rosoideae** subfamily







Agrimonia gryposepala - common agrimony, harvest lice

2 achenes, but hypanthium disperses as a unit with "velcro"-like barbs from top of hypanthium

Rosaceae - **Rosoideae** subfamily




Potentilla simplex
Common cinquefoil




Argentina argentea
[*Potentilla argentea*]
silverweed


Rosaceae - **Rosoideae** subfamily



Rubus parviflorus
thimbleberry



Rubus hispidus
swamp dewberry



Rubus allegheniensis
blackberry

Rosaceae - **Rosoideae** subfamily



Rosa rugosa
Beach rose



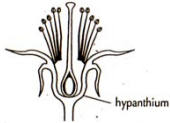
Rosa multiflora
Multiflora rose
Invasive weed




Rosa palustris
Swamp rose

Rosaceae - **Prunoideae** subfamily

Subfamily Prunoideae



Prunus
(cherry)
gynoecium = monocarpic
fruit = drupe




CA 5 CO 5 A ∞ G 1

Shrubs and trees with simple leaves, often with glands along petiole (cherries, plums, peaches)

Gynoecium superior with **one carpel** = **monocarpic**

Fruit a **drupe** = fleshy, with one bony seed



Rosaceae - **Prunoideae** subfamily



Prunus serotina
wild black cherry



Prunus virginiana
choke cherry



Rosaceae - **Prunoideae** subfamily



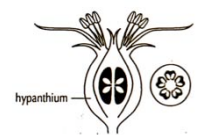
Prunus pumila - sand cherry

Rosaceae - **Prunoideae** subfamily

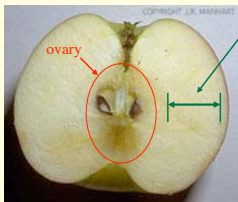


Prunus americana
Wild plum

Rosaceae - **Pomoideae/Maloideae** subfamily



Pyrus [Malus]
(apple)
gynoecium = syncarpic
fruit = pome



CA 5 CO 5 A ∞ Ḡ (3-5)

Shrubs or trees with showy 5 merous flowers

Gynoecium inferior of 3 to 5 fused carpels

Hypanthium thickens in fruit to form **pome** fruit



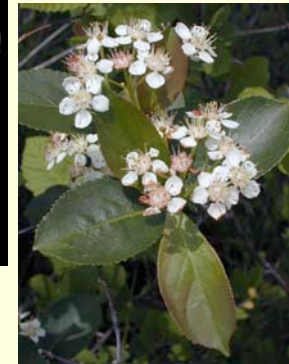
Malus pumila or *Pyrus malus* - apple

Rosaceae - **Pomoideae/Maloideae** subfamily



Pyrus communis
Pear (introduced)

Aronia melanocarpa
black chokeberry



Rosaceae - **Pomoideae/Maloideae** subfamily


Amelanchier laevis
Serviceberry, Juneberry



The image block for *Amelanchier laevis* contains three photographs. The top-left photo shows a cluster of small, round, red berries hanging from a branch with green leaves. The top-right photo shows a branch with several small, white, five-petaled flowers. The bottom photo shows a cross-section of a red fruit, revealing several small, brown, oval seeds inside, with a few more seeds scattered on a green leaf below.

Rosaceae - **Pomoideae/Maloideae** subfamily

Crataegus crus-galli - cockspur hawthorn



The image block for *Crataegus* species contains two photographs. The left photo shows a close-up of a tree trunk with several sharp, thin thorns protruding from the bark. The right photo shows a single, bright red, round fruit hanging from a branch with green, serrated leaves.

Crataegus mollis - downy hawthorn