

Systematic Botany. Lecture 22–23

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Outline

Leguminosae, or Fabaceae—legume family



General features of Leguminosae

Leguminosae, or Fabaceae—legume family

- ▶ Up to 17,000 species, third largest angiosperm family after Compositae (aster family) and Orchidaceae
- ▶ Widely distributed throughout the world but preferably in tropics
- ▶ Three subfamilies (Caesalpinioideae, Mimosoideae, Papilionoideae) often treated as separate families

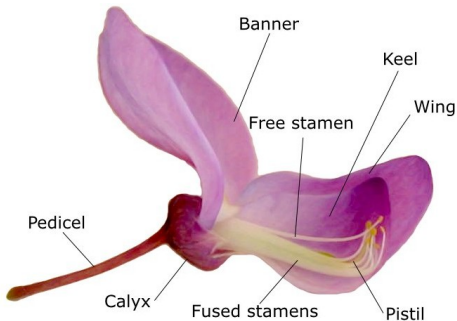
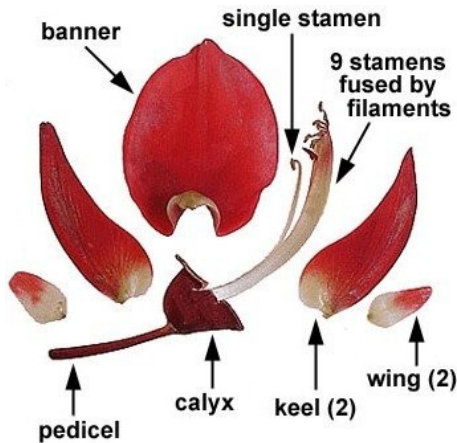


Morphology of Leguminosae

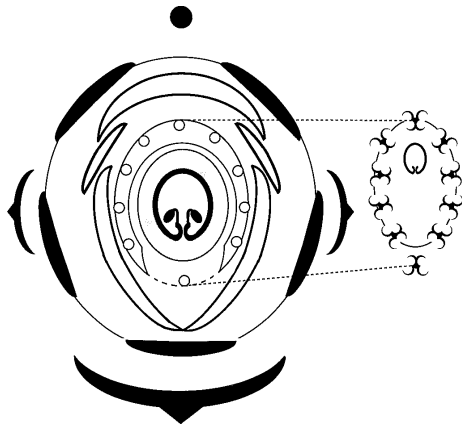
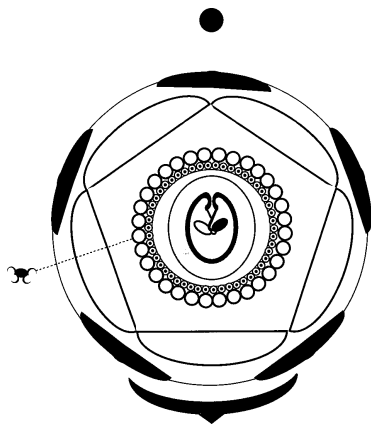
- ▶ Have root nodules with nitrogen-fixing bacteria
- ▶ Leaves alternate, pinnately compound (once or twice), with stipules
- ▶ Sepals 5, united; petals 5, in Papilionoideae they are free, unequal and have special names (banner, keel and wing), in Mimosoideae they fuse and form tube
- ▶ Stamens often 10 with 9 fused and one free stamen; in Mimosoideae, stamens are numerous
- ▶ Single pistil with single carpel
- ▶ Fruit is a legume: dehiscent with one camera
- ▶ Mature seeds without endosperm



Flower of Papilionoideae



Leguminosae flower: Mimosoideae and Papilionoideae



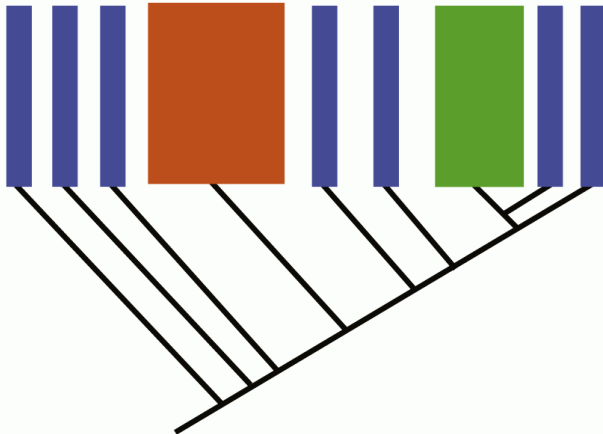
$*K_{(5)}C_{(5)}A_{5-\infty}G_{\underline{1}}$ or $\uparrow K_{(5)}C_{1,2,2}A_{1,[4+5]}G_{\underline{1}}$

The Leguminosae

Caesalpinioideae
(2,250 species)

Papilionoideae
(13,800 species)

Mimosoideae
(3,270 species)



Leguminosae classification

- ▶ Three subfamilies: Caesalpinioideae, Mimosoideae and the biggest is Papilionoideae (Faboideae)
- ▶ Caesalpinioideae:
 - ▶ *Gleditsia*—gleditsia
 - ▶ *Bauhinia*—orchid tree
 - ▶ *Cercis*—redbud
 - ▶ *Delonix*—royal poinciana
- ▶ Mimosoideae:
 - ▶ *Desmanthus*—prairie mimosa
 - ▶ *Prosopis*—mesquite
 - ▶ *Acacia*—acacia
 - ▶ *Mimosa*—sensitive plant, mimosa



Delonix regia in flower



Unusual legume—*Harleyodendron unifolium*



Phyllodes of Australian *Acacia glaucoptera*



Desmanthus illinoensis



Mimosa pudica before touch



Mimosa pudica after touch



Representatives of Papilionoideae (Faboideae)

- ▶ Swartzioids (*Swartzia*: highly unusual, but only in tropics)
- ▶ Genistioids
 - ▶ *Lupinus*—lupinus
- ▶ Dalbergioids
 - ▶ *Amorpha*—false indigo
 - ▶ *Petalostemon*, or *Dalea*—prairie-clover
 - ▶ *Arachis*—peanut
 - ▶ *Desmodium*—tick-trefoil
- ▶ Millettoids
 - ▶ *Apios*—ground nut
 - ▶ *Phaseolus*—beans
 - ▶ *Glycine*—soybeans
 - ▶ *Psoralea*—breadroot



Swarzia sp.



Representatives of Papilionoideae (Faboideae) (contd.)

- ▶ Robinioids
 - ▶ *Lotus*—trefoil
 - ▶ *Robinia*—locust
- ▶ IRLC (“inverted repeat-lacking”) group
 - ▶ *Caragana*—Siberian peashrub
 - ▶ *Astragalus*—milkvetch
 - ▶ *Oxytropis*—loco-weed
 - ▶ *Trifolium*—clover
 - ▶ *Vicia*, *Lathyrus*—vetch
 - ▶ *Medicago*—alfalfa
 - ▶ *Melilotus*—sweet clover
 - ▶ *Pisum*—pea



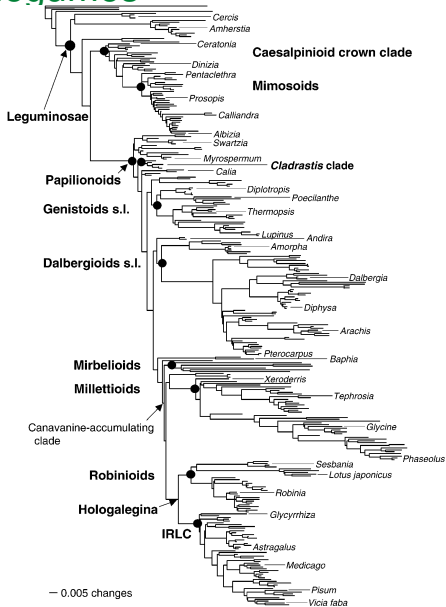
Glycine max, soybean



Arachis hypogaea, peanut



Phylogeny of legumes



For Further Reading



A. Shipunov.

Systematic Botany [Electronic resource].

2011—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_448



Van Bruggen, Th.

The vascular plants of South Dakota.

1996. 3rd ed.

University of South Dakota, Vermillion, SD.

