Angiosperms division
Magnoliophyta или Angiospermae

Subclass Ranunculidae - RANUNCULIDAE

Plan

General description of the subclass Ranunculidae

Order Buttercups - Ranunculales

Family Lunoceraceae - *Menispermáceae*

Family Barberry - *Berberidaceae*

Family Buttercups - *Ranunculaceae*

Order Poppies - Papaverales

Family Poppies - *Papaveraceae*

Family Fumitorys - *Fumariaceae*

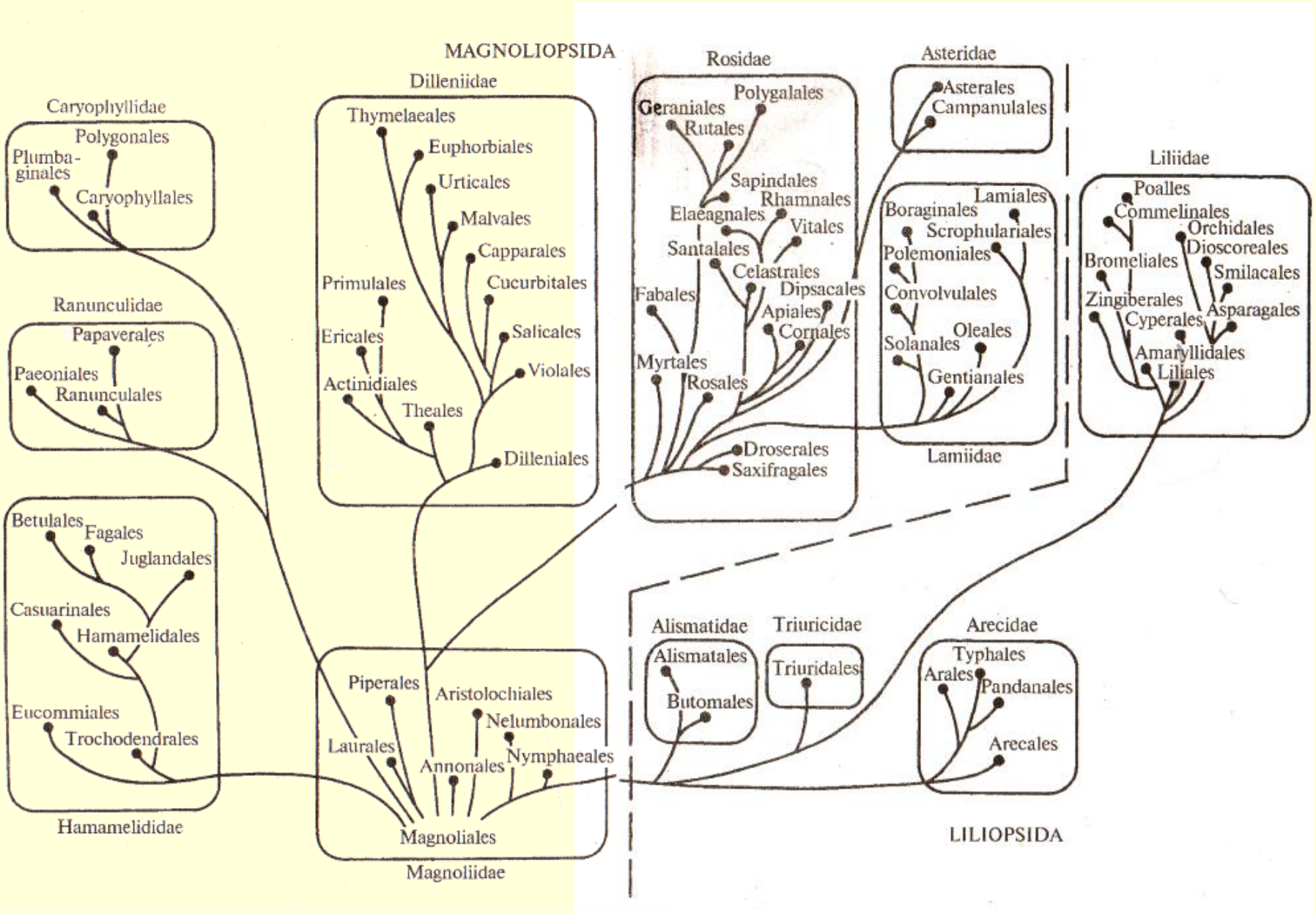
Order Peony - Paeoniales

Family Peony - *Paeoniaceae*

The subclass Ranunculidae includes

3 (4) orders,
13 families,
200 genera,
about 4000 species.

In all likelihood, the Ranunculidae are descended from Magnolidae, most likely from ancestors like the modern Illiciales, and are generally more specialized than the Magnolidae.


MAGNOLIOPSIDA
Caryophyllidae
Polygonales
Plumba-
ginales
Caryophyllales
Ranunculidae
Papaverales
Paeoniales
Ranunculales
Betulales
Fagales
Juglandales
Casuarinales
Hamamelidales
Eucommiales
Trochodendrales
Hamamelididae
Dilleniidae
Thymelaeales
Euphorbiales
Urticales
Malvales
Capparales
Primulales
Cucurbitales
Salicales
Ericales
Violales
Actinidiales
Theales
Dilleniales
Rosidae
Polygalales
Geraniales
Rutales
Sapindales
Rhamnales
Elaeagnales
Vitales
Santalales
Celastrales
Dipsacales
Fabales
Apiales
Cornales
Myrtales
Rosales
Droserales
Saxifragales
Asteridae
Asterales
Campanulales
Lamiales
Boraginales
Scrophulariales
Polemoniales
Convolvulales
Oleales
Solanales
Gentianales
Lamiidae
Liliidae
Poales
Commelinales
Orchidales
Dioscoreales
Bromeliales
Smilacales
Zingiberales
Asparagales
Cyperales
Amaryllidales
Liliales
Piperales
Aristolochiales
Nelumbonales
Laurales
Annonales
Nymphaeales
Magnoliales
Magnoliidae
Alismatidae
Alismatales
Butomales
Triuricidae
Triuridales
Arecidae
Typhales
Arales
Pandanales
Arecales
LILIOPSIDA

Features of the subclass

1. The mature pollen is 2-celled, 3-bearded, or derived types.
2. Predominantly herbaceous plants
3. No vascularless, vessels usually with simple perforation
4. Stomata without subsidiary cells (ranunculoid type)
5. Secretory cells in parenchyma usually absent, accept only in family Menispermáceae
6. Flowers bisexual and very rare unisexual, often spiral or spirocyclic.
7. Stamens and carpels of specialized type
8. Seeds with a small embryo and abundant endosperm

Order - Ranunculales
Family *Menispermáceae*

Menispermum dahuricum

Plants are dioecious. The foliage is alternate.

Leaves of Menispermáceae are simple, mostly entire, almost always without stipules.

Leaf petioles are usually long.

The leaf and stem parenchyma of many Menispermáceae contains secretory cells or canals filled with bitter juice.

Veins are palmate, less often pinnate.

Flower small, actinomorphic, usually in axillary racemes, corymbs or panicles, cyclic or very rarely spirocyclic (with spiral calyx), mostly 3-membered, very often with two circles of sepals, petals and stamens.

Petals are 6 (sometimes absent), usually smaller than sepals;

Stamens have 6-24 loose or fused stamens with 2-4 anthers;

Pistillate flowers usually have 3 pistils, each with one ovule.

Fruits of the representatives of Menispermaceae are etaerio of drupelets or etaerio of achenes. The seeds have a wrinkled hard endosperm; the embryo is curved, with flat or convex cotyledons.

♂ *$Ca_{3+3}Co_{3+3}A_{\infty}G_0$

♀*$Ca_{3+3}Co_{3+3}A_{\infty}G_0$

Menispermum dahuricum

Family of *Berberidaceae*

Berberis vulgaris

Representanives of Berberidaceae family are shrubs or small trees, less often - perennial grasses.

The leaves are simple or compound.

Inflorescens are simple or compound racemes, less often flower in solitary.

Fower usually small, actinomorphic, cyclic, bisexual.

The perianth is differentiated into sepals and petals.

The petals with nectaries in the lower part.

Stamens are 4-9, less frequently 12-18, free.

The gynoecium consists of a single carpel.

The carpel has an expanded apex stigma, which is al-most sessile on a short style.

Ovules are more often numerous.

In most genera the fruit is fleshy, berry-like.

Podophýllum peltátum

Mahonia aquifolium

Berberis vulgaris

On long shoots they often have 3 to 5 segmented, sometimes simple prickles up to 2 cm long, in the axils of which there are shortened shoots with tufts of normal leaves.

The calyx consists of two circles of colored sepals, with three sepals in each. The corolla consists of two circles of petals with three petals each. This makes the flower seem terry. The petals have two large, fleshy, bright orange nectaries at the base.

$$*Ca_{3+3}Co_{3+3}A_{3+3}\underline{G}_{1}$$

Family - *Ranunculaceae*

Most members of the family Ranunculaceae are annual herbs and perennial herbs, overwintering in the form of tubers and rhizomes, but there are also lianas and shrubs.

Leaves are simple, very rarely compound, with no stipules. Leaves often dissected, divided, deep-lobed, less often entire, alternate or opposite.

Vessel segments with simple perforation.

Flowers are bisexual or unisexual, more often actinomorphic, less often zygomorphic. Stamens are numerous. Stamens of various types. Anthers and filaments are well separated. Apocarpic gynoecium consisting of numerous carpels; less frequently, the number of carpels is 5, 3, or 1.

Seeds have a small embryo, rarely without endosperm.

Batrachium trichophyllum

Adonis aestivalis

Most representatives are inhabitants of temperate climates. Some are found in tropical countries. There are both inhabitants of water bodies *Batrachium trichophyllum* and arid places *Adonis aestivalis*

Floral with simle perianth is usually have only a calyx (*Clematis*, *Pulsatila*, *Anemona*). The calyx usually has a bright corolla-like color - white, pink, blue, blue.

$$*Ca_5Co_{8–12}A_{\infty}\underline{G_{\infty}}$$

Petals of *Ranunculaceae* are staminate origin.

Plants with acyclic flowers

Trollius europea

$$* P_{\infty} A_{\infty} \underline{G_{\infty}}$$

Trollius asiaticus

$$*Ca_5Co_5A_{\infty}\underline{G_{\infty}}$$

Representatives of this family with acyclic flowers may also have double perianth; in addition, in some species petals or their parts may be changed into nectaries, inflorescence may be elongated (*Myosurus minima*).

Plants with spirocyclic flowers

Anemone hepatica

$$*Ca_5Co_{8-12}A_{\infty}G_{\underline{\infty}}$$

Ceratocephala falcata $*Ca_5Co_5A_{\infty}G_{\underline{\infty}}$

Ficaria verna $*Ca_3Co_{8–12}A_\infty G_{\underline{\infty}}$

Adonis wolgensis $*Ca_5Co_{8–12}A_\infty G_{\underline{\infty}}$

Caltha palustris $*Ca_5Co_5A_\infty G_{\underline{\infty}}$

Plants with cyclic flowers

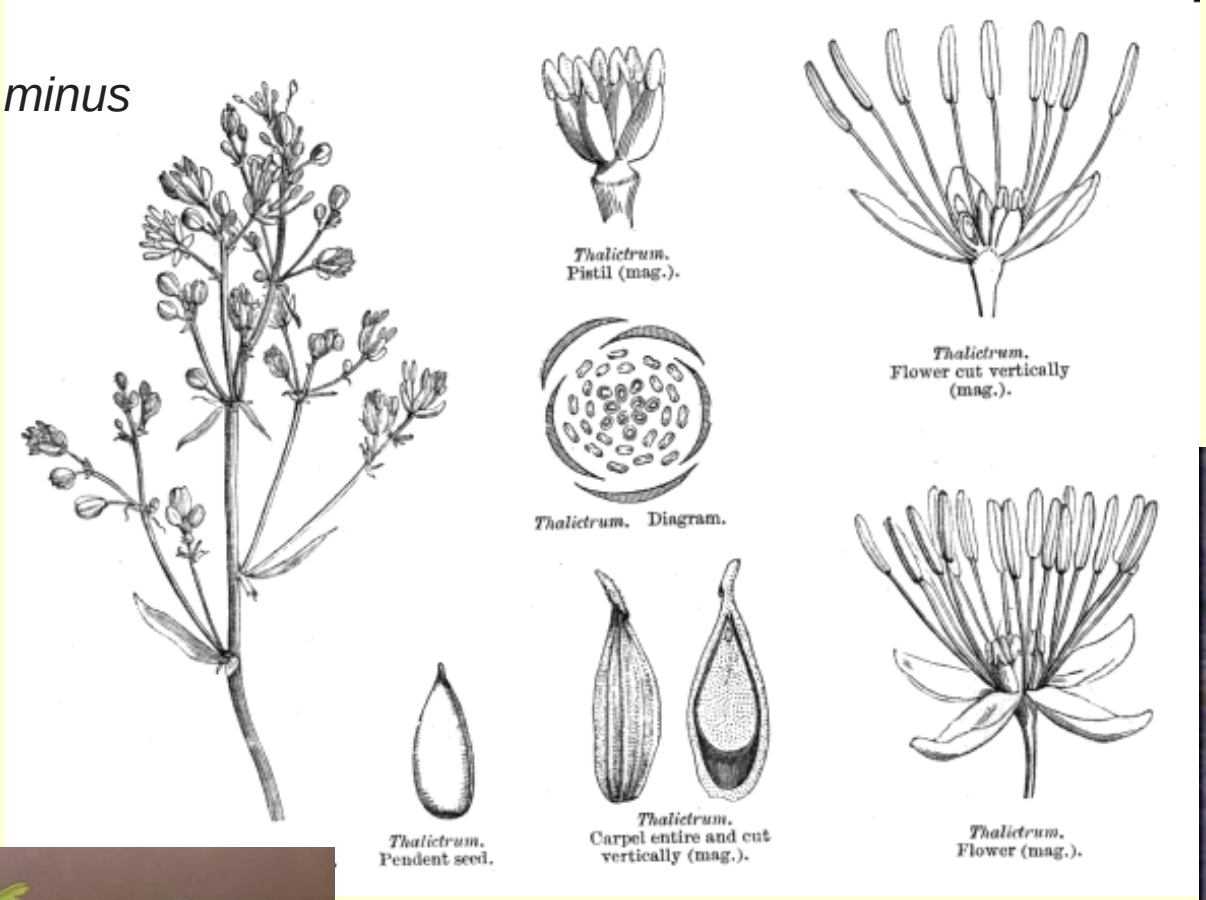
Aqulegia hybridum

$$* Ca_5 Co_5 A_\infty G_{\underline{\infty}}$$

Anemone nemorosa

Anemone rarnunculoides

Thalictrum minus

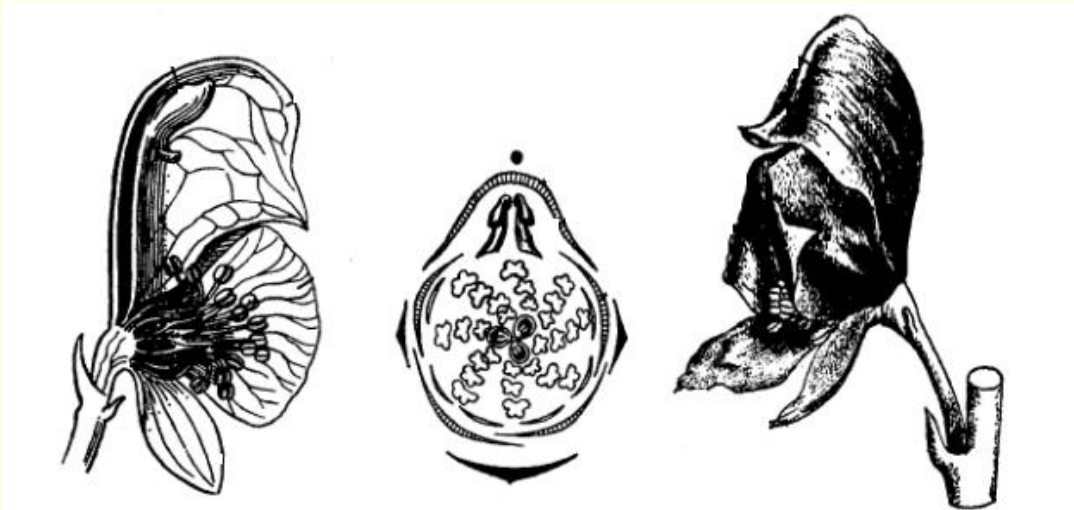


Plants with zygomorphyc flowers

Aconitum napellus $\uparrow Ca_5 Co_{2\,nectaries} A_\infty G_{\underline{3}}$

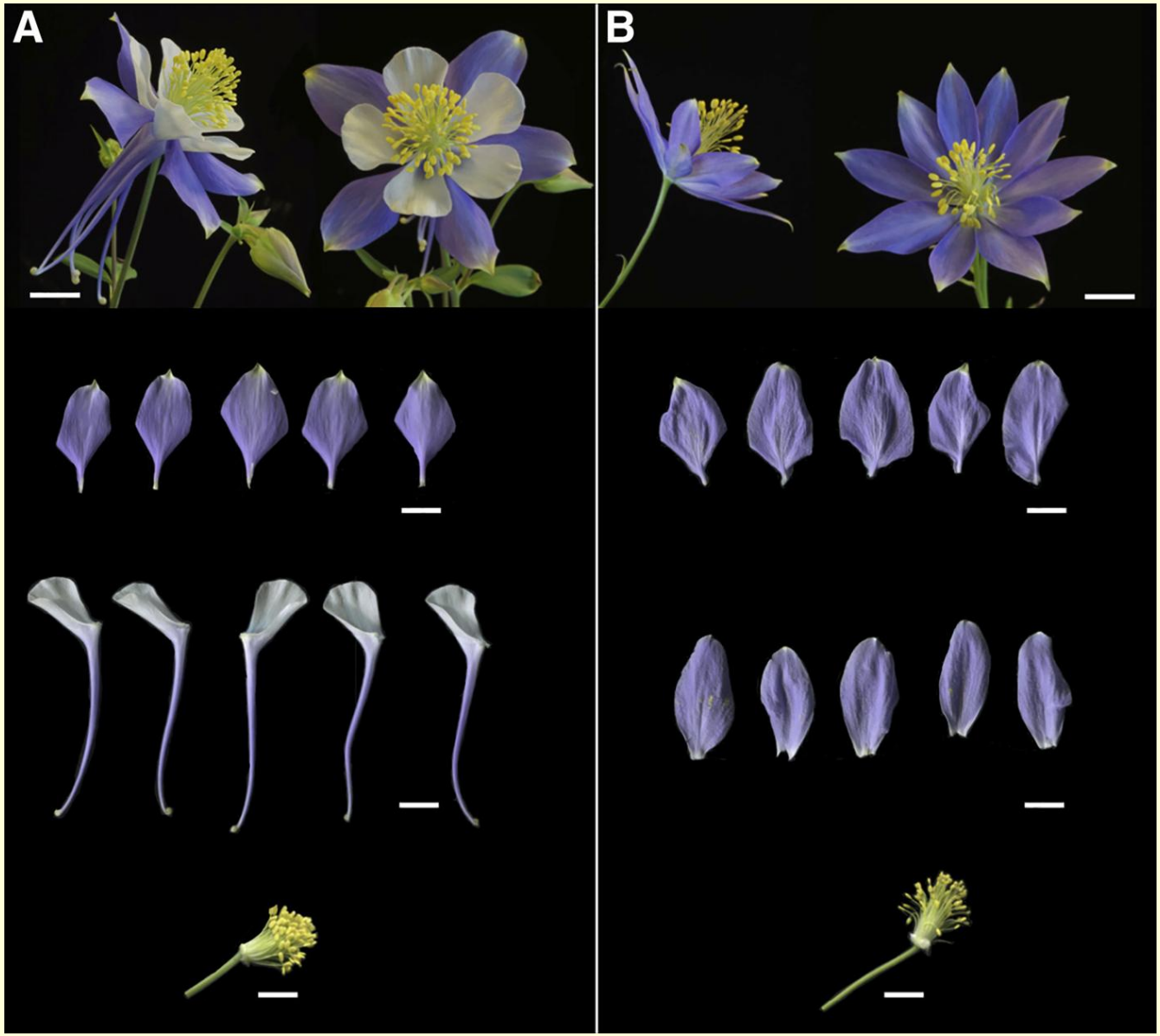
Delphinium elatum $\uparrow Ca_5 Co_{(3)} A_\infty G_{\underline{3–5}}$

Aconítum soongáricum



Consolida regalis

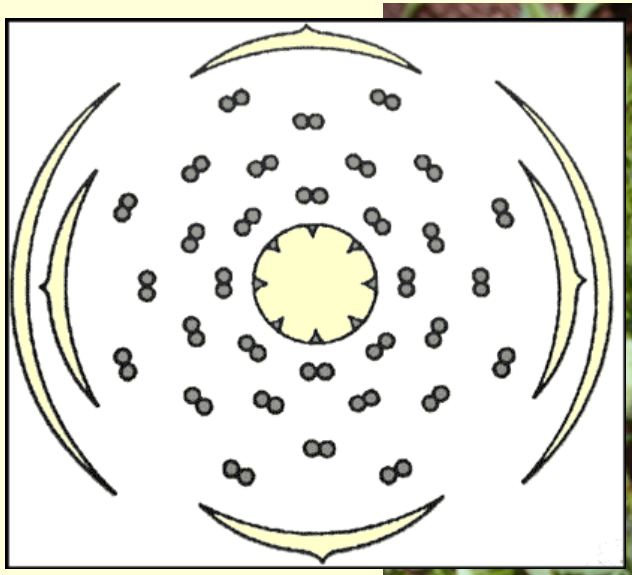
Delphínium punicéum



Nectaries formed from petals or their parts are generally characteristic of buttercups. They can be observed even in the most primitive representatives (*Myosurus minima*). The most specialized representatives (*Aquilegia, Delphinium*) have nectaries represented by spurs - long, tube-shaped outgrowths containing nectar.

Fruits of *Ranunculaceae* are mainly apocarpic: etaerio of folicle, etaerio of achenes, rare single folicle.

The order Papaverales
The family Papaveraceae



Papaver rhoeas

$$*Ca_2Co_{2+2}A_{\infty}G_{\underline{(\infty)}}$$

They are perennial and annual herbs, seldom shrubs or small trees.

Leaves are alternate, rarely opposite or whorled, without stipules.

Flowers are 2-3-membered, bisexual, actinomorphic or zygomorphic. Sepals are usually 2 (less frequently 3 or 4), and fall off.

The petals are more often 4 or 6, in two circles.

Stamens are numerous, free or united in bunches.

The gynoecium is syncarpous; the ovary is usually upper, with numerous ovules.

Seeds are small, with a fleshy, oily endosperm.

All Papaverales have non-membered laticifers, which are filled with glutinous juice containing alkaloids.

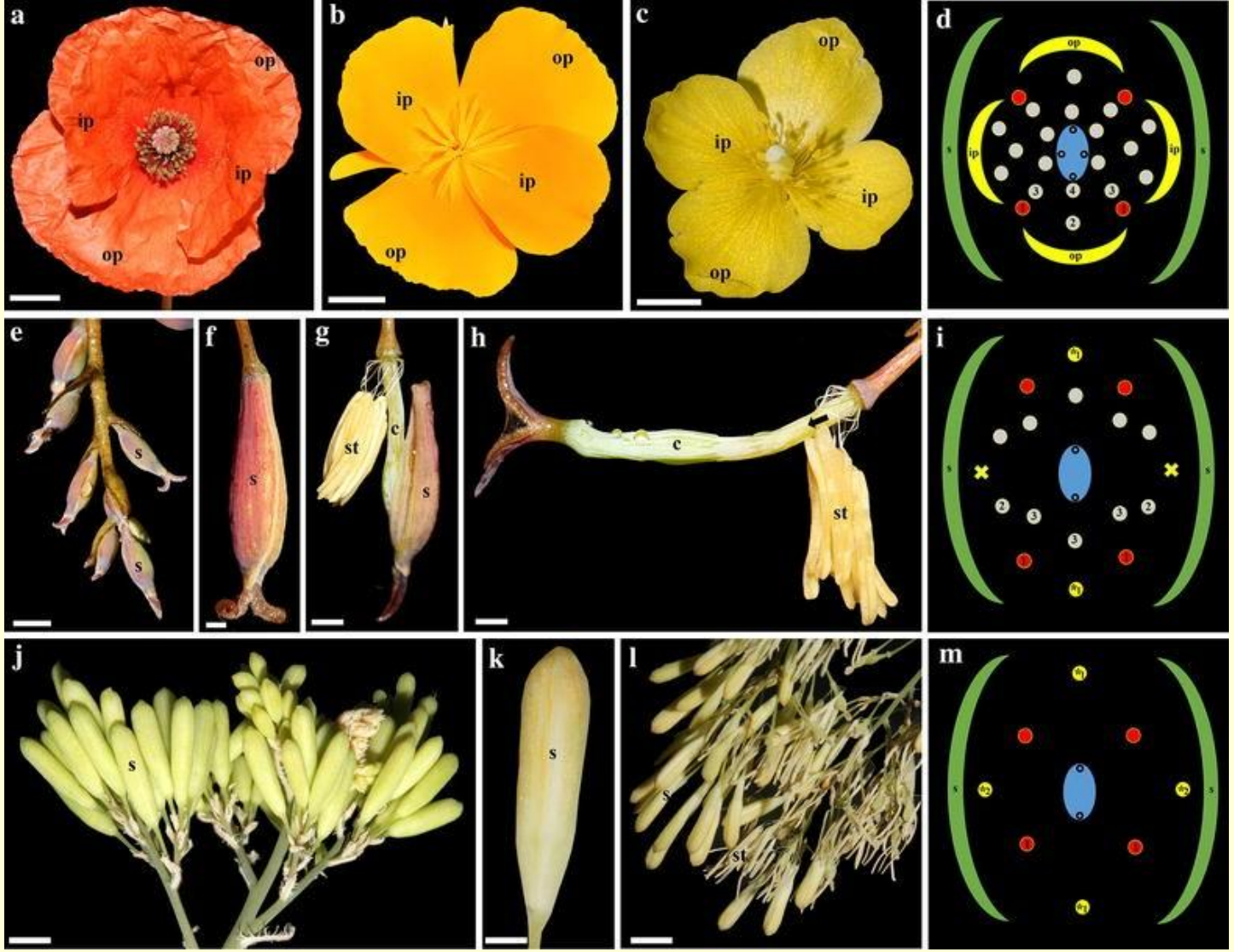
The order Papaverales includes three families: Papaveraceae, Fumaraceae and Hypecoeae, all of which differ in the number of stamens. These families are often considered subfamilies of the Papaveraceae family.

Bocconia frutescens

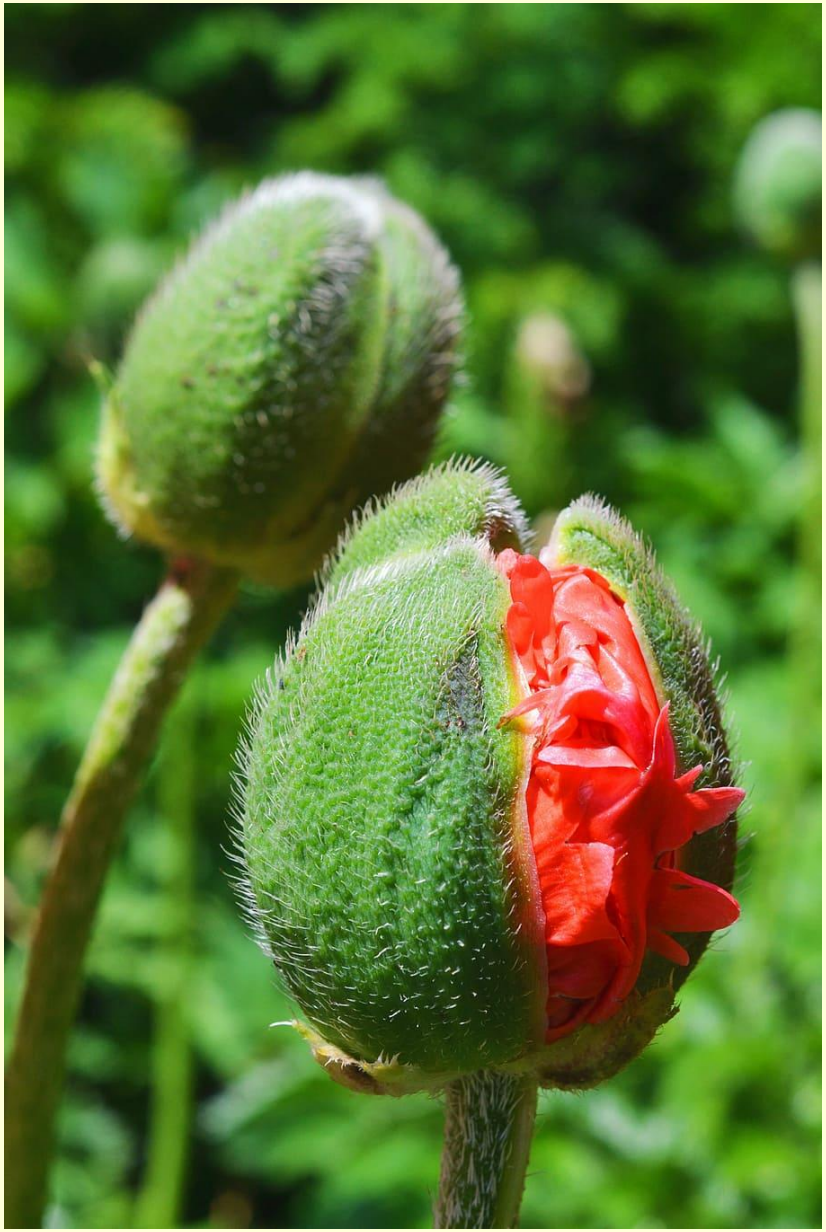
Macleaya cordata

In the tropics, the genera *Bocconia* and *Macleaya* are found as shrubs or small trees.

The exceptions are the flowers of *Bocconia* and *Macleaya*, without petals.



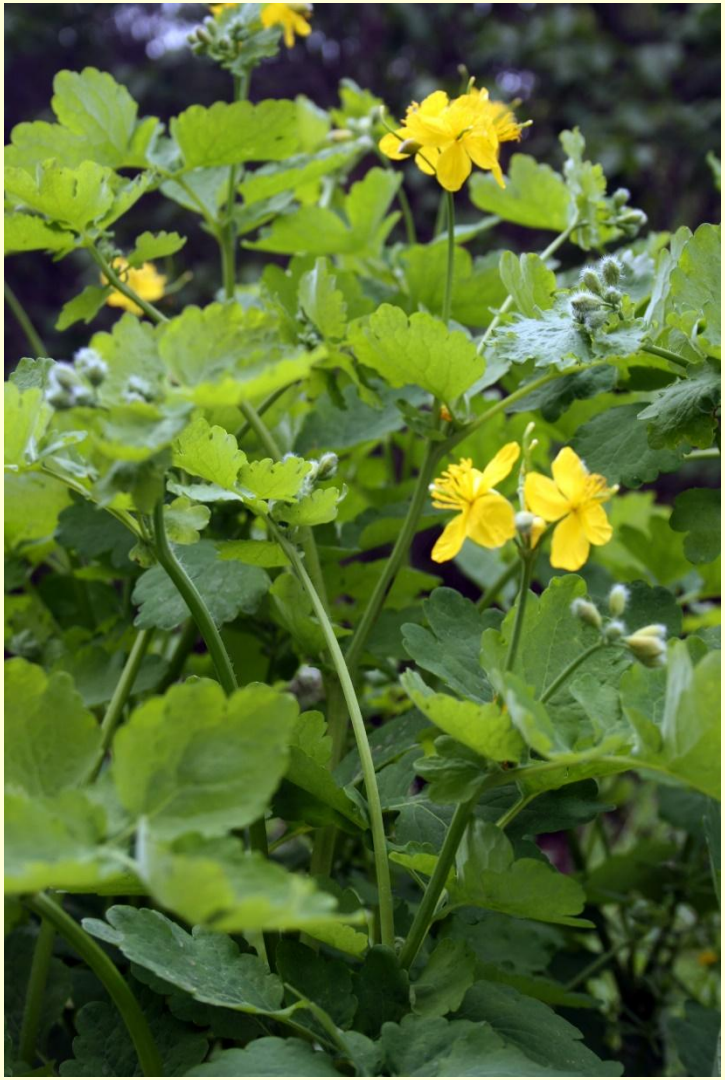
Floral diversity in Papaveraceae. Petal-bearing flowers in *Papaver rhoeas* (**a**), *Eschscholzia californica* (**b**) and *Stylophorum diphyllum* (**c**). **d** *S. diphyllum* floral diagram. **e**–**m** Petal-less flowers. **e**–**h** *Bocconia frutescens*, preanthetic and anthetic flowers. **i** *B. frutescens* floral diagram. **j**–**l** *Macleaya cordata*, preanthetic and anthetic flowers. **m** *M. cordata* floral diagram. *Arrow* gynophore; *c* carpel, *ip* inner petal, *op* outer petal, *s* sepal, *st* stamen, * homeotic stamen; 1, first set of 4 true stamens on the first whorl in *red* indicate that these are the first stamens formed and that they occupy the same positions in both petalous and apetalous species serving as reference for the positioning of all other stamens; 2, second set of true stamens of the first whorl; 3, true stamens of the second whorl. 4. True stamens of the third whorl.



Sepals have 2-3 and tend to fall off as the flower unfurls. The calyx is often a closed receptacle, which contains crumpled, tortuously arranged petals of a bud Papaver

$$*Ca_2Co_{2+2}A_{\infty}G_{\underline{(\infty)}}$$

The petals are 4 (5, 6-12), arranged in two circles.
Stamens are numerous, loose. The gynoecium is syncapous.
The ovary is upper.



Chelidonium majus

$$*Ca_2Co_{2+2}A_{\infty}G_{(\underline{2})}$$

Petals of Chelidonium of the inner circle are somewhat smaller than those of the outer one.

Capcule of Poppi (*Papaver*)

Capcule of Chelidonium

Fruit capsule.

Family Fumariaceae

Fumaria officinalis

Lamprocapnos spectabilis

Corydalis solida

$$\uparrow Ca_2Co_{(3)+(3)}A_{\infty}\underline{G_{(2)}}$$

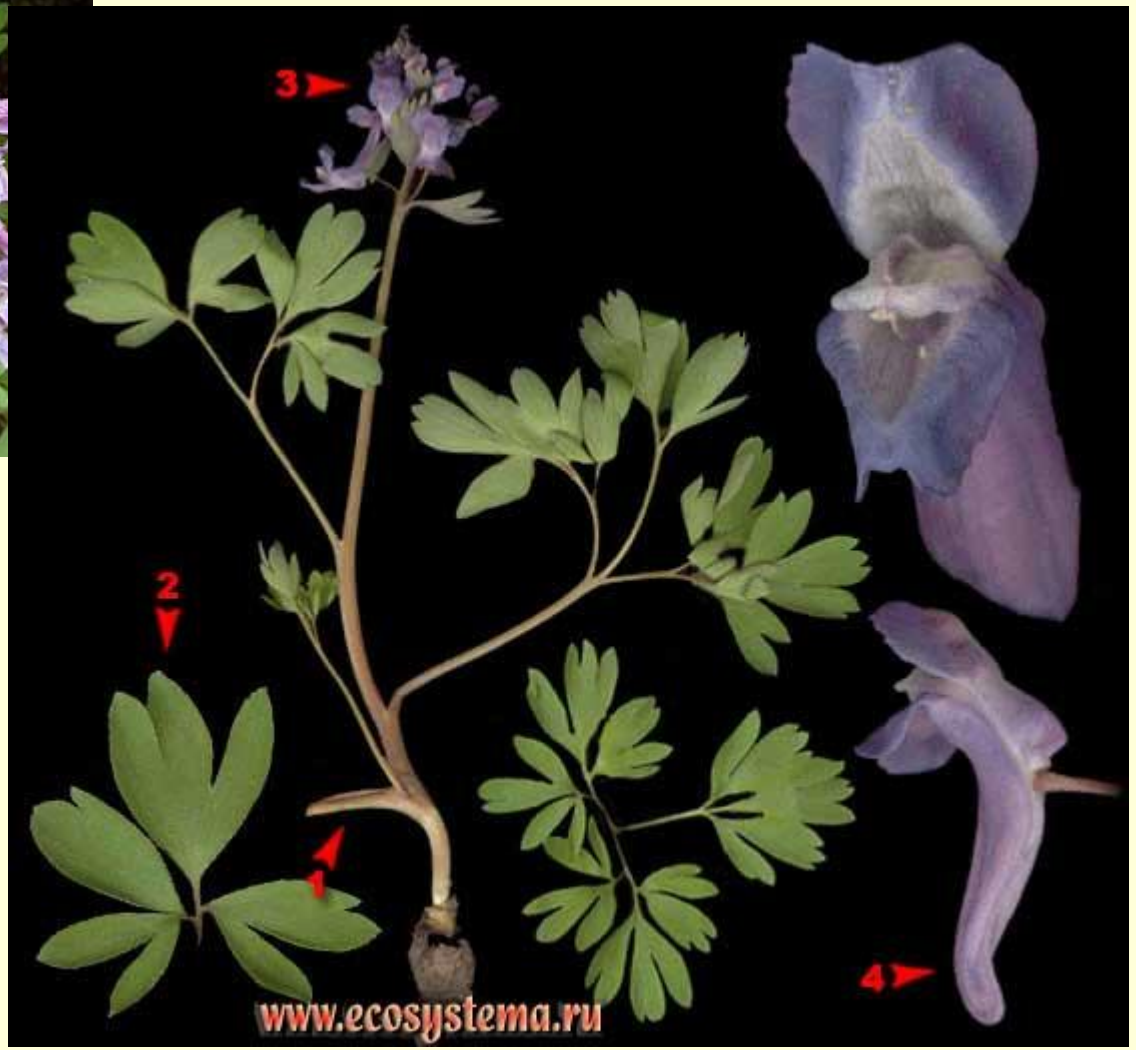
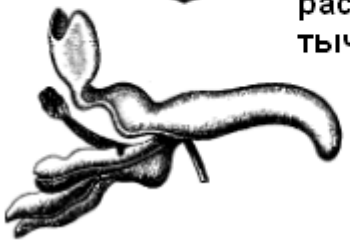


диаграмма и вид цветка сбоку Corydalis cava, звездочка - положение расщепившейся тычинки



Order Paeoniales
Family Paeoniaceae

Paeonia tenuifolia

$$*Ca_5Co_{5–10}A_{\infty}\underline{G_3}$$