

Ministry education and Science of Republic of Kazakhstan
Karaganda State University named after academician
Ye.A. Buketov

Biological and geographical faculty

Botany Department

Course – Botany

Specialty - 5B011300 – «Biology»

Lecture № 22

Division Ranunculales and Polygonales

(1 hour)

Lecturer: candidate of biological science, associated
professor

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Plan of lecture:

- 1 Family Ranunculaceae and Berberidaceae.
- 2 Family Papaveraceae.
- 3 Family Caryophyllaceae.
- 4 Family Polygonaceae.
- 5 Family Fagaceae.
- 6 Family Betulaceae.

Main literatures:

- 1 Еленевский А.Г., Соловьев М.П., Тихомиров В.Н. Ботаника: систематика высших, или наземных, растений. 2 изд. - М.: Academia, 2001. - 429 с.
- 2 Нестерова С.Г. Лабораторный практикум по систематике растений. - Алматы: Қазақ ун-ті, 2011. - 220 с.
- 3 Родман А.С. Ботаника. – М.: Колос, 2001. - 328 с.

Additional literatures:

- 1 Билич Г.Л., Крыжановский В.А. Биология. Т. 2: Ботаника. - М.: Оникс 21 век, 2002. - 543 с.
- 2 Ишмуратова М.Ю. Систематика и интродукция растений (курс лекций). - Караганда: РИО Болашак-Баспа, 2015. - 100 с.
- 3 Тусупбекова Г.Т. Основы естествознания. Ч. 1. Ботаника. – Астана: Фолиант, 2013. – 321 с.

Family *Berberidaceae*

Family includes 14 genera and about 650 species.

Spreading – continental zone and sub-tropical climate.

Life forms – grassy plants, bushes and small trees.

Flowering formula - $*C_3+3 C_3+3 A_3+3 G_1$

Fruit – berry

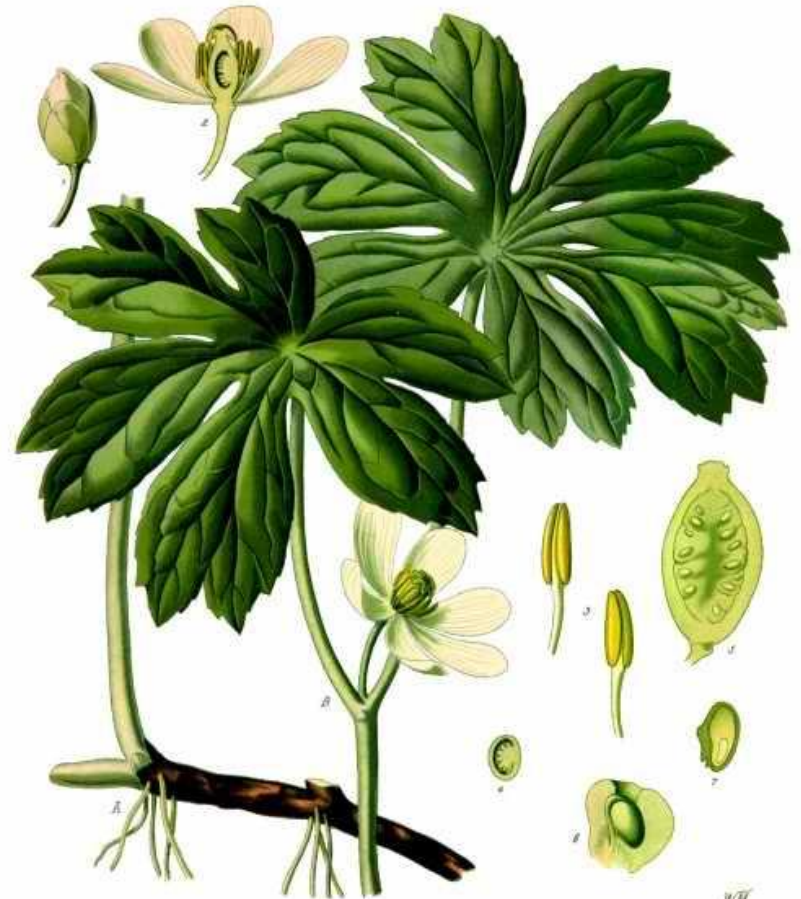
Pollination – by insects

The important genera – *Mahonia*, *Podophyllum*, and *Berberis*.

Practical uses: decorative, medical, for food.



Berberis vulgaris



Podophyllum peltatum L.
Image processed by Thomas Schoepke
www.plant-pictures.de

Podophyllum peltatum

Family Ranunculaceae

Family includes 66 genera and more than 2000 species.

Spreading – regions with continental climate, humid territories

Life forms – perennial grassy plants, lianas, annual plants, biennial plants, rare – semi-shrubs.

Flowering formula *Ca²⁻⁶ Co 5 A[∞] G 1-∞; ↑Ca²⁻⁶
Co 5 A[∞] G 1-∞

Pollination – by insects, by wind

The important genera - *Aconitum*, *Adonis*, *Anemone*, *Caltha*, *Delphinium*, *Ranunculus*, *Thalictrum*, *Pulsatilla*.

Practical value: decorative, medical, poison.



Adonis vernalis



Aconitum boreale



Caltha

Family – *Papaveraceae*

Family consists from 26 genera and includes more than 250 species. All grassy species have latex juice inside stalk and fruits.

Spreading – Eurasia and Southern America

Life forms: grassy plants, rare – bushes and small trees.

Flowering formula - $*Ca(2-3) Co 4 A6 G (2)$

Pollination – by insects and wind

The important genera - *Papaver*, *Chelidonium*, *Macleaya*.

Practical uses: medical, food and decorative.



Papaver
oreades



Chelidonium
majalis



Papaver
somnifera

Family *Caryophyllaceae*

Family is big, includes 80 genera and more than 2000 species.

Spreading – all world, mostly – in continental climate.

Life forms – annual and perennial grassy plants.

Inflorescence – dichasia

Flowering formula - * Ca(5) Co5 A 4-10 G (2-5)

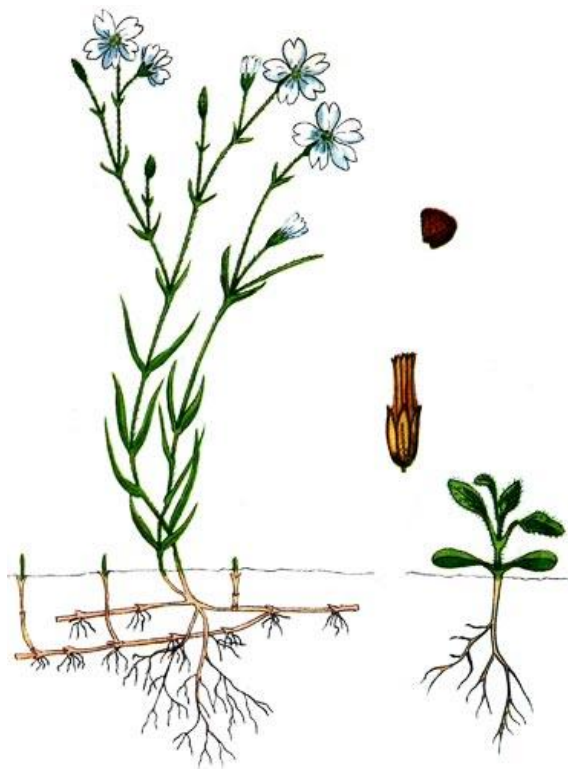
Pollination – by insects, rare – auto pollination.

The important genera - *Dianthus*, *Cerastium*,
Melandrium, *Saponaria*, *Silene*, *Stellaria*.

Practical uses: in medicine, in cosmetic and perfumery, technical (as soap and foam), as decorative plants.



A



Б



В

Saponaria officinalis (A), Stellaria media (Б), Melandrium alba (B)

Family *Polygonaceae*

Quite large family, include 30-35 genera and about 1000 species.

Spreading – all world, mostly – in continental climate.

Life forms – annual and perennial grassy plants, rare – bushes, lianas and trees.

Flowering formula - *P₃ A₃₋₉ G (2-3)

Pollination – by insects

Important genera - *Rumex*, *Polygonum*, *Rheum*, *Fagopyrum*, *Atraphaxis*.

Practical uses – as food, fodder, mellow, technical and medical plants.



A



Б



B

Fagopyrum (A), Polygonum aviculare (Б) and Rumex confertus (B)

Family *Fagaceae*

Family consists from 8 genera and 950 species.

Spreading – continental, tropic and sub-tropic zones.

Life forms – trees, rare - bushes.

Flowering formula:

*P₄₋₇ A₄₋₁₅ ; *P₄₋₇ G(3-6)

Pollination – by wind.

Important genera - *Quercus*, *Fagus*, *Castanea*.

Practical uses: as food, fodder, technical, decorative and medical plants.



A



Б



B

Quercus robur (A), Castanacea (Б) and Fagus europaeus (B)

Family *Betulaceae*

Family includes 6 genera and about 200 species.
Spreading – not-tropical zone of Eurasia and
Southern America.

Life forms – trees and bushes.

Flowering formula:

*P₂₋₄ A_{2-∞} ;

*P₂₋₄ G(2)

Pollination – by wind.

Important genera - *Alnus*, *Corylus*, *Betula*.

Practical uses: medical, technical, food.



A



Б



В

Betula pendula (A), Alnus incana (Б),
Corylus avellana (B)

Control questions:

- 1 Note the typical signs of Polygonaceae family.
- 2 Note the typical signs of Betulaceae family.
- 3 Note the typical signs of Papaveraceae family.
- 4 Which useful properties has Papaveraceae family?
- 5 How do we use species from Fagaceae family?

Test questions:

Individuals from Fagaceae family:

- A) Quercus robur
- B) Castanacea
- C) Fagus europaeus
- D) Betula pendula
- E) Alnus glutinosa
- F) Corylus avellana
- G) Polygonum aviculare
- H) Rumex confertus

Individuals from Polygonaceae family:

- A) Quercus robur
- B) Castanacea
- C) Fagus europaeus
- D) Betula pendula
- E) Alnus glutinosa
- F) Corylus avellana
- G) Polygonum aviculare
- H) Rumex confertus