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 № 24

Characteristic of families Rosaceae, Fabaceae, Linaceae, typical species and practical uses

(1 hour)

Lecturer: candidate of biological science, associated professor Ishmuratova Margarita Yulaevna

Plan of lecture:

1 Family Rosaceae.
2 Family Fabaceae.
3 Family Linaceae.
4 Practical uses of species.

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 *Rosaceae*

Large family, includes more then 100 gena and more then 3000 species.

Spreading – all world, mostly – continental and sub-tropical zones of Eurasia and Southern America. Family separated into 4 sub-families.

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

Flowering formula - *Ca(4) Co4-5 A∞ G1-∞

Pollination – by insects

Important gena – Malus, Pyrus, Potentilla, Rosa, Cotomeaster, Amygdalus, Armeniaca, Prunus, Spiraea, Sanguisorba, Sorbus and etc.

Practical uses – food, meadow, technical, medical, decorative plants.

Sanguisorba officinalis

Fragaria vesca

Systematic position

Class: Dicotyledonae

Sub-class: Polypetalae

Series: Calyciflorae

Order: Rosales

Family: Fabaceae

General characters

Distribution

Fabaceae includes about 482 genera and more than 7,200 species. The members are cosmopolitan in distribution but abundant in tropical and subtropical regions. In India, this family is represented by about 100 genera and 754 species.

Habit

The members of this family exhibit different habits. Prostrate herb eg. *Indigofera enneaphylla* (Seppu nerunji), erect herb (eg. *Crotalaria verrucosa*), twiner eg. *Clitoria ternatea* (Sangupoo), tendril climber eg. *Pisum sativum* (Pea plant), shrub eg. *Cajanus cajan* and trees eg. *Pongamia glabra*. *Aeschynomene aspera* (Pith plant) is a hydrophyte and commonly called pith plant.

Inflorescence

Usually a raceme eg. *Crotalaria verrucosa* (Kilukiluppai) or a panicle (eg. *Dalbergia latifolia*) or axillary solitary (eg. *Clitoria ternatea*).

Flower

Bracteate, pedicellate, bracteolate, complete, bisexual, pentamerous, dichlamydeous, zygomorphic and hypogynous.

Fruit

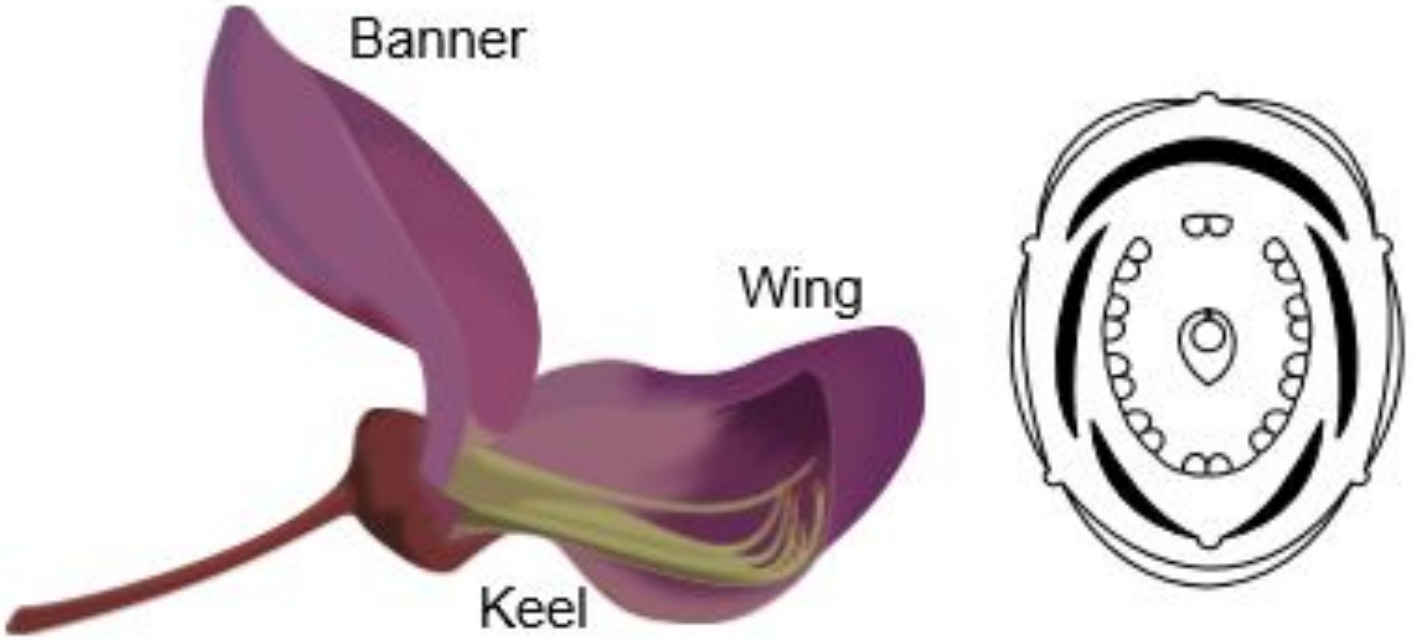
Typically a legume. In *Arachis hypogea*, the fruits develop underground. After fertilization, the stipe of the ovary becomes meristematic and grows down into the soil. Thus the ovary gets buried into the soil and develops into fruit.

Seed

Non-endospermous and kidney shaped.

Floral formula

Br., Brl., %, ⚥, $K_{(5)}$, C_5, $A_{(9)+1}$, $\underline{G}_1$



Leguminosae. Flowers of Papilionoideae subfamily.

Economic importance

1. Pulses The seeds of Cajanus cajan (red gram), Vigna mungo (black gram), Vigna radiata (green gram), Vigna ungiculata (horse gram) and Cicer arietinum (chick pea) are rich in proteins and used as pulses.
2. Vegetables The tender fruits of Lablab purpureus (field bean) and leaves of Sesbania grandiflora (agathi) are used as vegetables and greens.
3. Oil plants Oil extracted from the seeds of Arachis hypogea (ground nut) is used for cooking. Seeds are edible. Pongam oil obtained from the seeds of Pongamia pinnata (pongam) has medicinal value and is used in the preparation of soap.
4. Timber plants Timber is obtained from Dalbergia latifolia (rose wood) and Pterocarpus santalinus (red sandal wood) is used for making furniture, cabinet articles and other building materials.
5. Fibre plants Fibres obtained from Crotalaria juncea (sunhemp) and Sesbania aegyptiaca (sesban) are used for making ropes.
6. Dye plants The important blue dye, indigo obtained from Indigofera tinctoria (Avuri) is used in the colouring of printing ink and paints. Blue dye is also obtained from the flowers and seeds of Clitoria ternatea.
7. Ornamental plants Butea frondosa (flame of the forest), Clitoria ternatea, Lathyrus odoratus (sweet pea) and Lupinus hirsutus are grown as ornamental plants.

Bean

Arachis hypogaea L.
Image processed by Thomas Schoepke
www.plant-pictures.de

Arachis

Melilotus

Family *Linaceae*

Small family, include 6 gena and about 250 species.
Spreading – all world, mostly – continental and sub-tropical zone.
Life forms – grassy plants, rare – semi-shrubs and bushes.
Flowering formula - *Ca5 Co5 A 5-10 G (5)
Pollination – by insects
Important genus – Linum.
Practical uses: technical (for production fabric), food and medical.

Linum perenne

Control questions:

1 Write the systematic position of Fabaceae.
2 What is papilionaceous corolla?
3 What is vexillum?
4 Describe the gynoecium of Clitoria ternatea.
5 What is pulvinus?
6 Write any two binomials of dye plant of Fabaceae.

Test questions:

I. *Choose and write the correct options.*

1. *Pongamia glabra* is a
   a. herb b. shrub
   c. tree d. climber
2. *Aeschynomene aspera* is a
   a. xerophyte b. hydrophyte
   c. mesophyte d. lithophyte
3. The binomial of groundnut plant is
   a. Arachis hypogea *b. Pongamia glabra*
   c. Dalbergia latifolia *d. Vigna mungo*
4. The fruit of the members of Fabaceae is
   a. berry b. drupe
   c. legume d. caryopsis.
5. The type of placentation seen in the members of Fabaceae is
   a. axile b. basal
   c. parietal d. marginal