



Lecture 8

Theme:

Pollination. Fertilization. Morphology of fruits and seeds and their importance for plant identification.

GENERATIVE ORGANS

lat. «generare» – capable of producing or originating

- Flower(Flos)
- Fruit (Fructus)
- Seed (Semen)



Pollination and fertilization

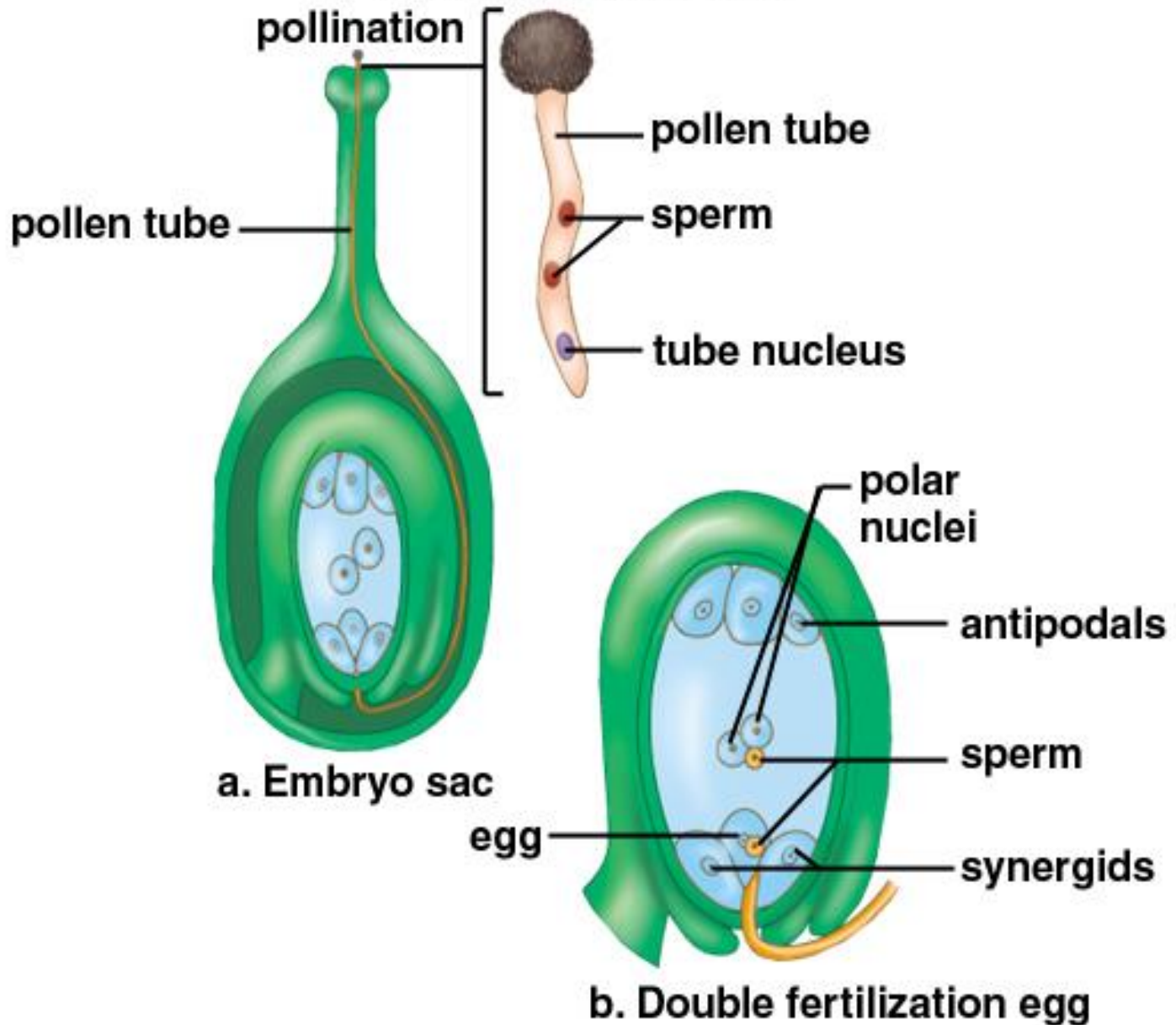
■ After the ripening of the pollen, the anthers burst, and the pollen falls on the stigma of the pistil. This process is called pollination. There are two methods of pollination: self-pollination and cross-pollination. Self-pollination can be carried out only in bisexual flowers. Cross-pollination in the course of evolution turned out to be more progressive. In cross-pollination, offspring can combine the hereditary properties of both parents, which is important for adapting to different living conditions.

■ According to the method of transport, pollen is distinguished: anemophily (wind), hydrophily (water), entomophily (insects), ornithophily (birds), myrmecophily (ants), etc.

One of the pollen cells, caught on the stigma of the pistil, stretches through the pouch of the exina into a long pollen tube, sometimes reaching several centimeters. In it, due to the division of the generative cell, two sperm are formed. The pollen tube grows through the spongy tissue of the stigma and column in the direction of the pestle's ovary, enters the ovule, penetrates into it and bursts, releasing the sperm. One of the sperm combines with the egg, forming a zygote, the second- with the central cell of the embryo sac. This is the double fertilization, which is characteristic only for angiosperms. The discovery of double fertilization belongs to the Russian Academician S.Q. Navashina(1898).

After double fertilization, when the flower fades, an embryo is formed from the zygote: the endosperm - from the fertilized central cell , and fruit- from the walls of the ovary

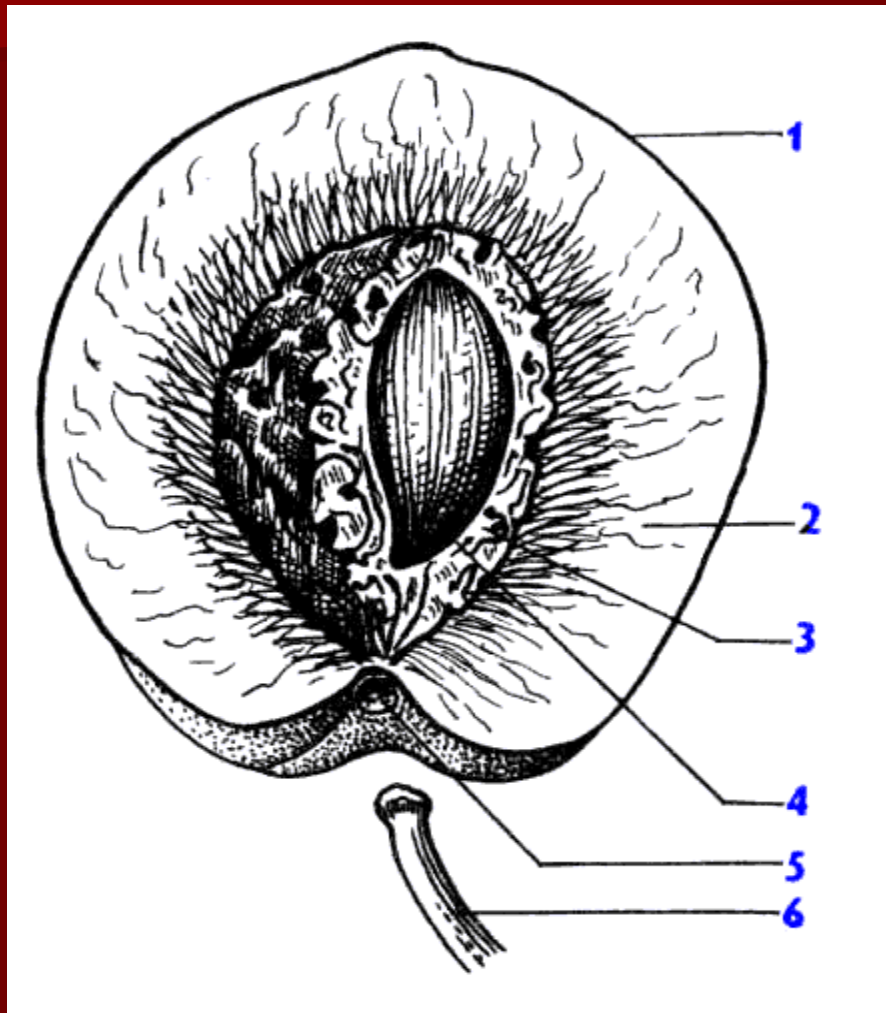
Fertilization





S.Q. Navashin

Schematic structure of the fruit of peach(*prunus*) *Persica vulgaris*

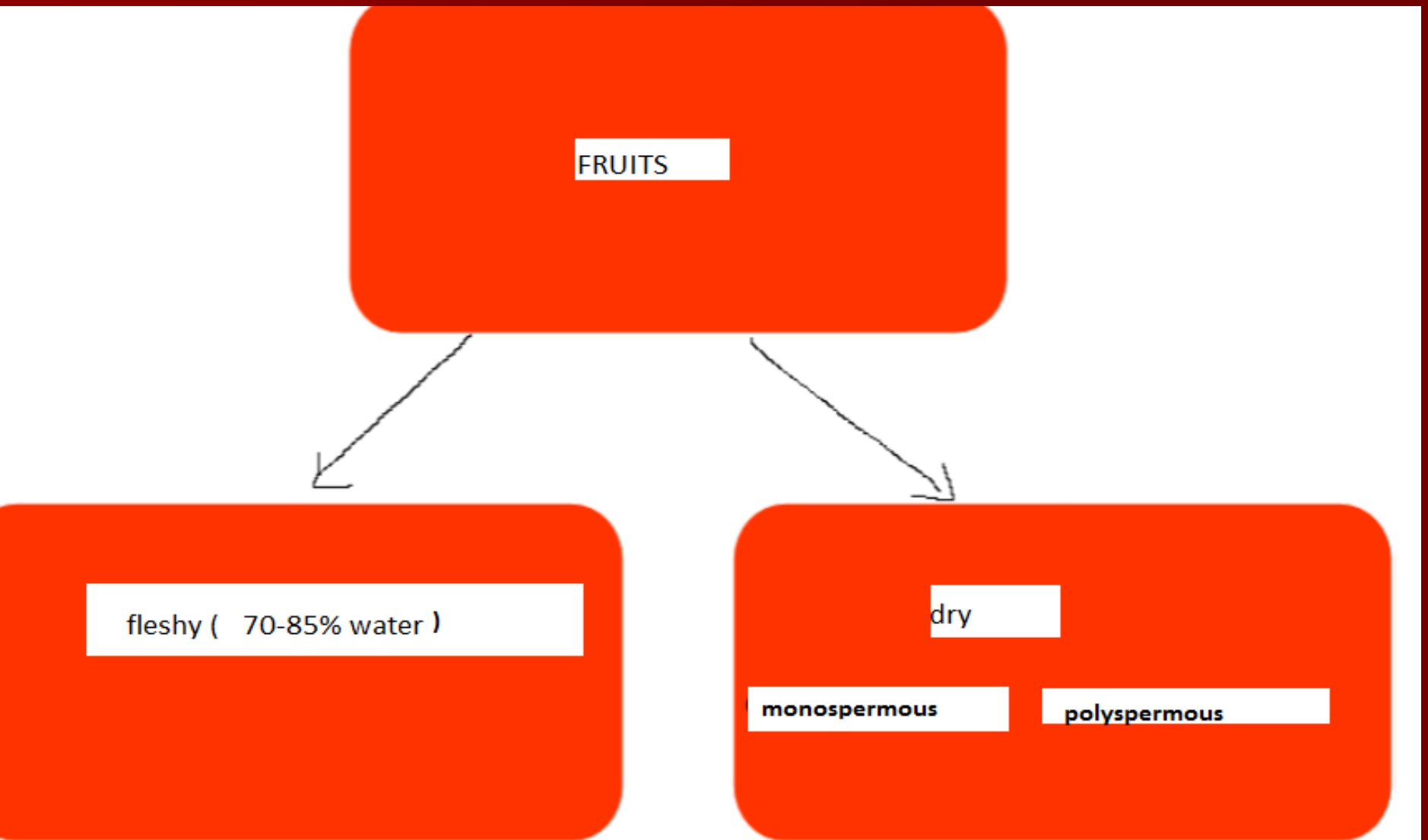


- 1-3 - pericarp
- (1 - exocarp,
- 2 - mesocarp,
- 3 - endocarp,
- 4 - a seed,
- 5 - traces of the
- peduncle,
- 6 - peduncle.

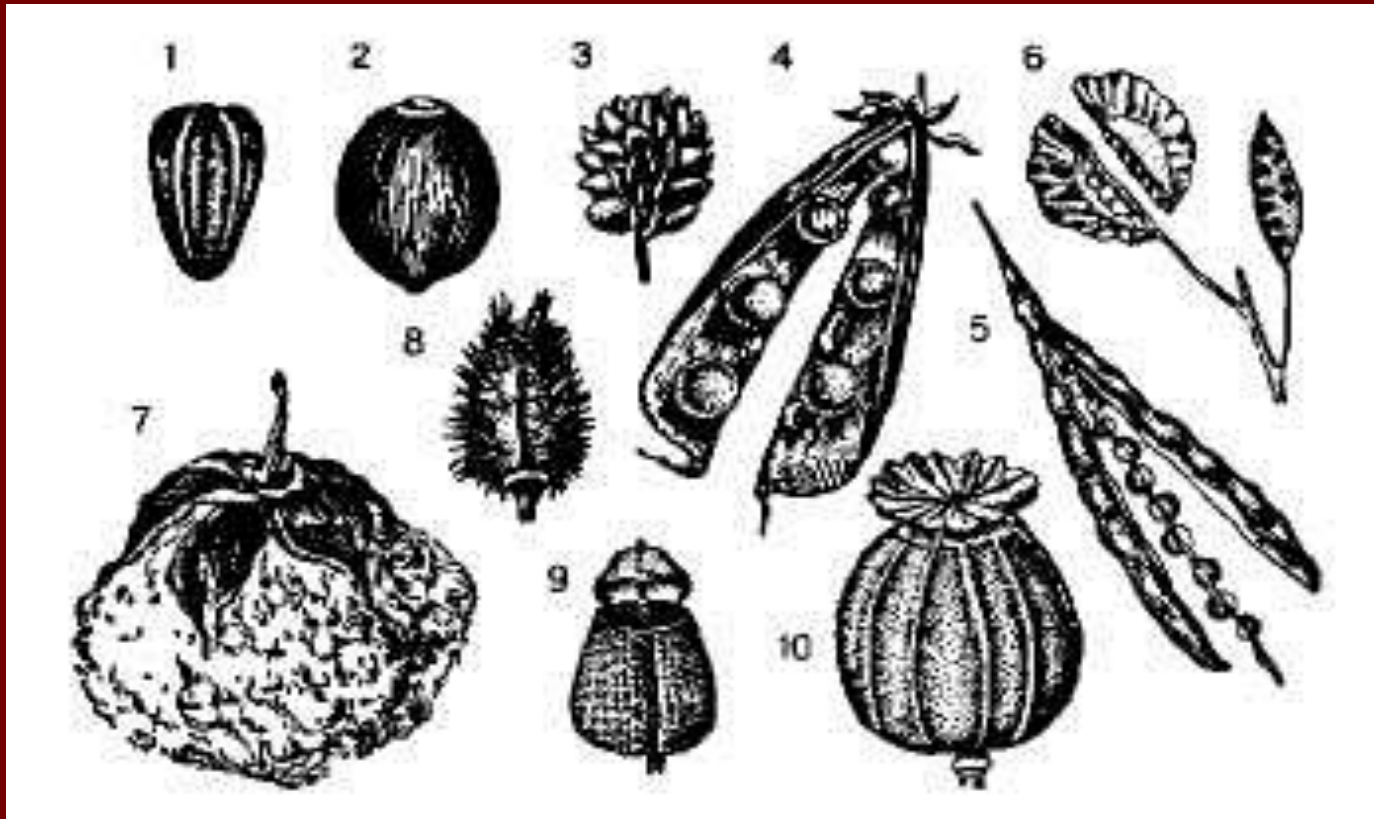
The fruit is formed after fertilization, which occurs inside the ovule.

The fruit protects the seed from drying out, cold, and other unfavorable conditions. The fruits consist mainly of two parts: the seed and the pericarp .. The seed is formed from the ovule, and the pericarp from the outer part of the ovary wall.

CLASSIFICATION OF FRUITS

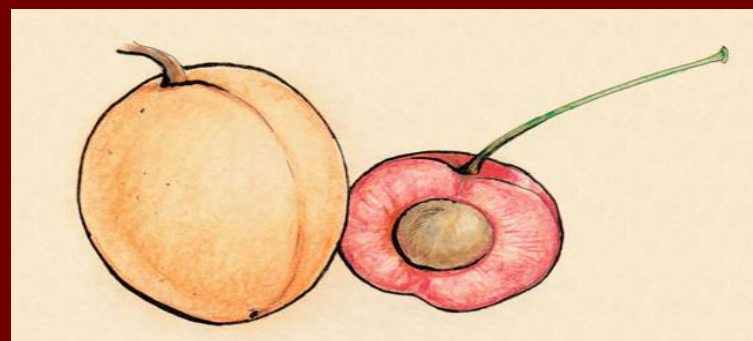


Dry fruits: 1-achene; 2-nut: 3 - polythalamous nut; 4 - bean; 5 - a pod; 6 - a silicula; 7,8,9,10 - a capsule.

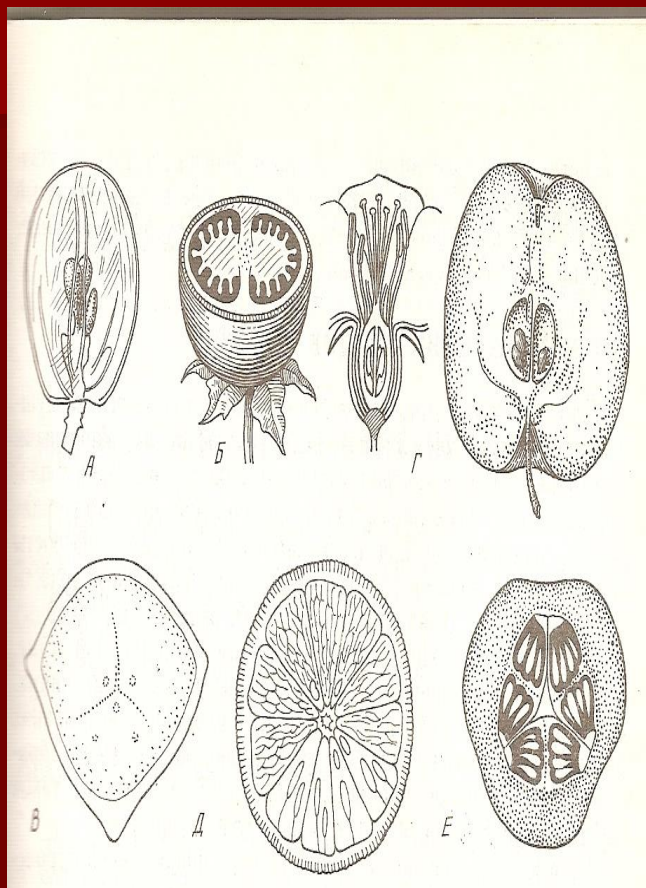


Сочные плоды

■ КОСТЯНКА



соплодие



А – Б – ягода (А – виноград, Б – картофель, В – банан), Г – плод-яблоко.

Д – гесперидий, Е – тыква (огурец).

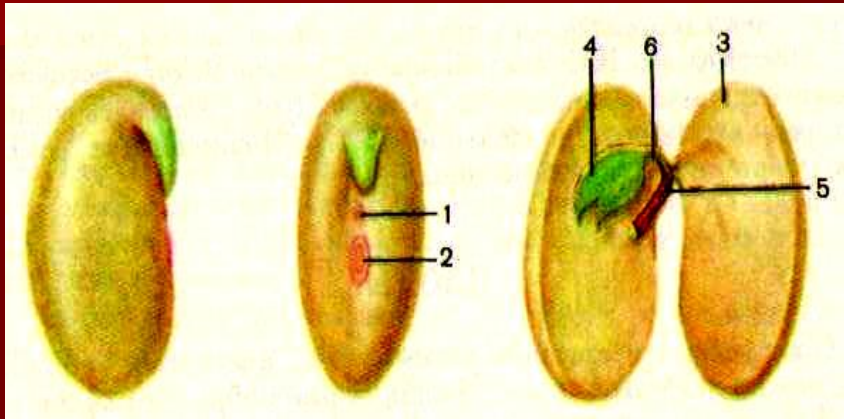
THE STRUCTURE OF SEEDS

The seed is the final stage of sexual reproduction of higher plants and represents a fertilized and mutated ovule . With a large variety of seeds, they all have a similar structure. They consist of seminal hull(spermoderm), nutritional storage tissue (endosperm and perisperm) and embryo.

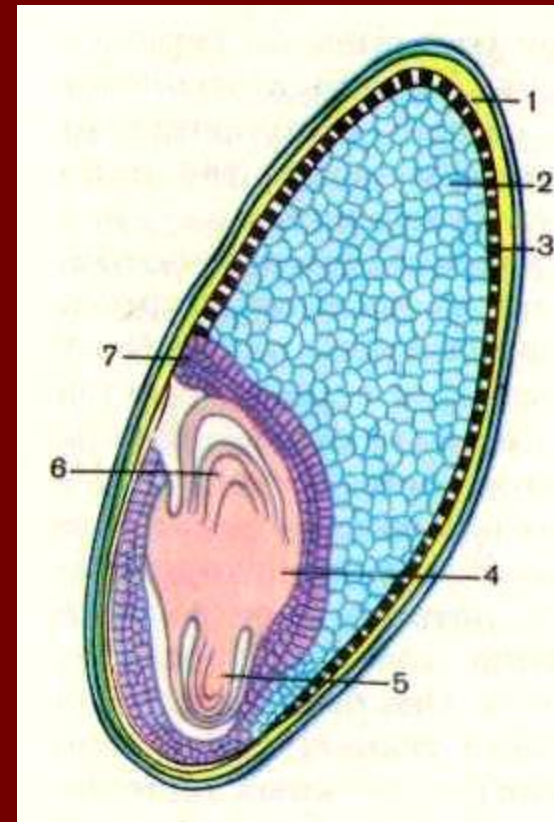
Depending of the nutrients location inside of the seed, they are divided into the following types:

- 1) seeds with endosperm;
- 2) seeds with perisperm;
- 3) seeds with endosperm and perisperm;
- 4) seeds without endosperm and without perisperm;

Structure of seeds of dicotyledonous and monocotyledonous plants



1 - pericarp, fused with hull, 2-endosperm,
3-aleuronic layer, 4 embryos, 5- root, 6-
bud, 7- guard



Thank you for attention !

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