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 № 8

Fruits and their classification. Spreading of fruits and seeds

(1 hour)

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

Plan of lecture:

1 Fruit and seed. Functions of fruits and seeds.
2 Morphology of fruits. Types of fruits.
3 Spreading of fruits and seeds. Practical uses.

Basic literatures:

1 Бавтуто Г.А. Практикум по анатомии и морфологии растений. – Минск: Новое знание, 2002. – 185 с.

2 Родман А.С. Ботаника. – М.: Колос, 2001. - 328 с.

Additional literatures:

1 Ишмуратова М.Ю. Ботаника. Учебно-методическое пособие. - Караганда: РИО Болашак-Баспа, 2015. - 331 с.

2 Тусупбекова Г.Т. Основы естествознания. Ч. 1. Ботаника. – Астана: Фолиант, 2013. – 321 с.

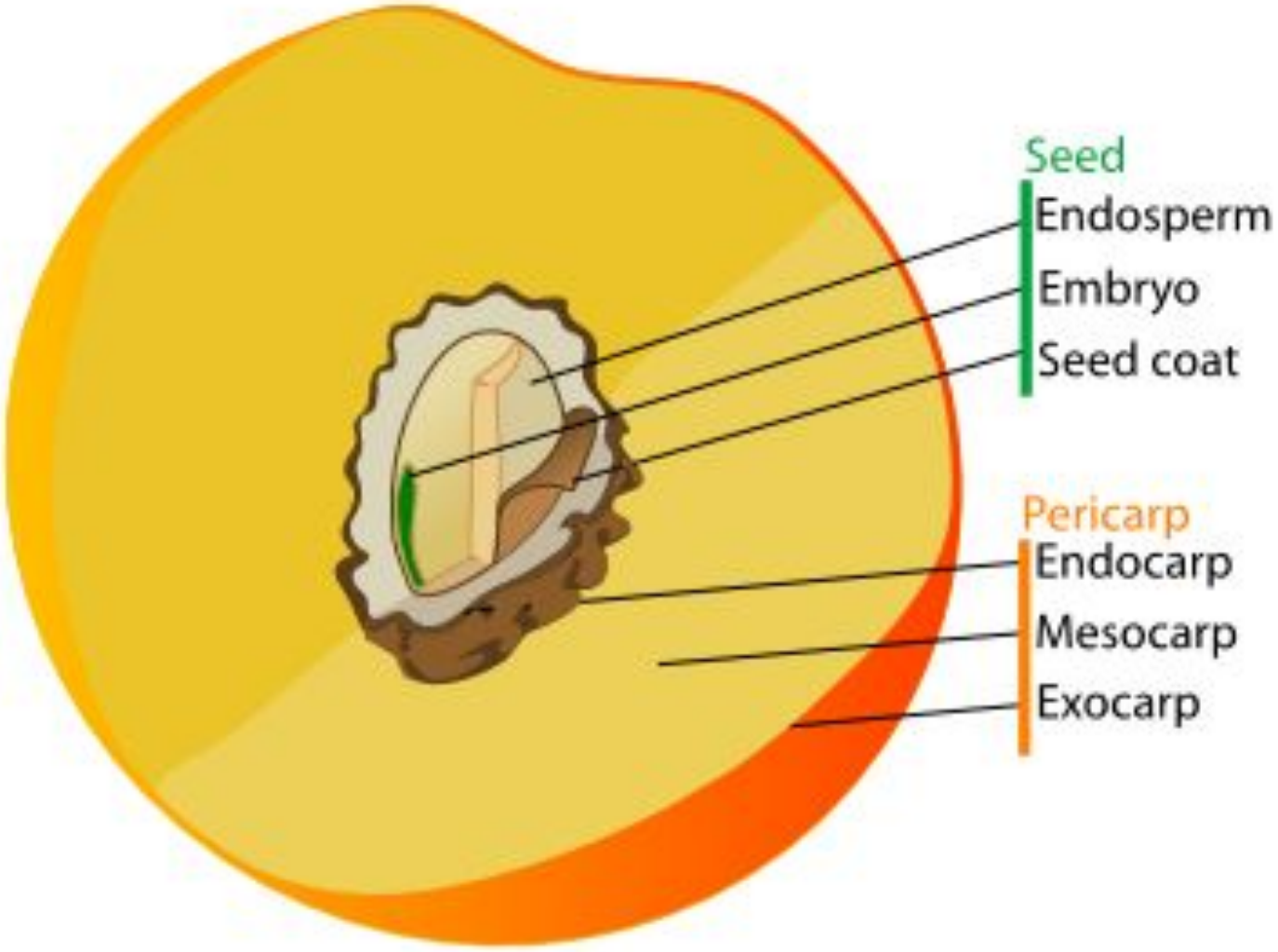
3 Байтулин И.О. Основы ризологии. - Алматы: Гылым, 2001. – 210 с.

A **fruit** is defined as ripened ovary, flower, or whole inflorescence. The origins of the fruit coat and the pericarp which is comprised of the exocarp, mesocarp, and endocarp, are mostly from the wall of the pistil.

Fruits can be simple, multiple, or compound. Simple fruits come from a single pistil (like cherry, Prunus). Multiple fruits are formed from many pistils of the same flower (strawberry, Fragaria). A compound fruit (infructescense) would be a pineapple (Ananas) or fig (Ficus) which comes from multiple flowers (inflorescence).

Fruits can be dry or fleshy. An example of dry fruit is a nut like peanut (Arachis) or walnut (Juglans). Examples of fleshy fruits include apples (Malus) or oranges (Citrus). (like papaya, Carica) will not open and will be dispersal units (diaspores) themselves. Schizocarp fruits (like in spurge, Euphorbia or maple, Acer) are in between: they do not open but break into several parts, and each of them contains seed inside. In addition, simple fruits could be monomerous (1-seeded) like nut or achene (sunflower, Helianthus), or bear multiple seeds (like follicle in tulip, Tulipa).

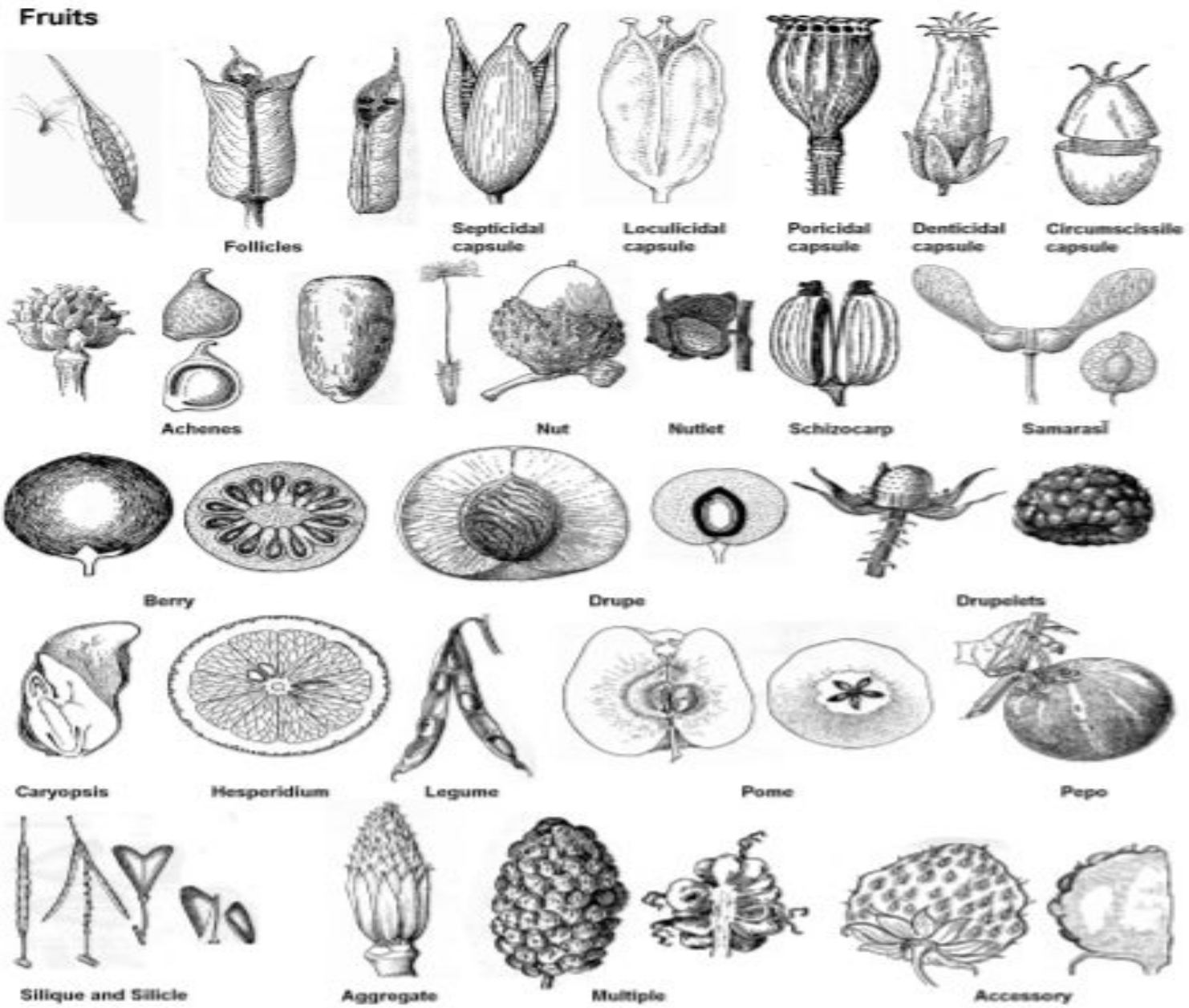
Structure of fruits



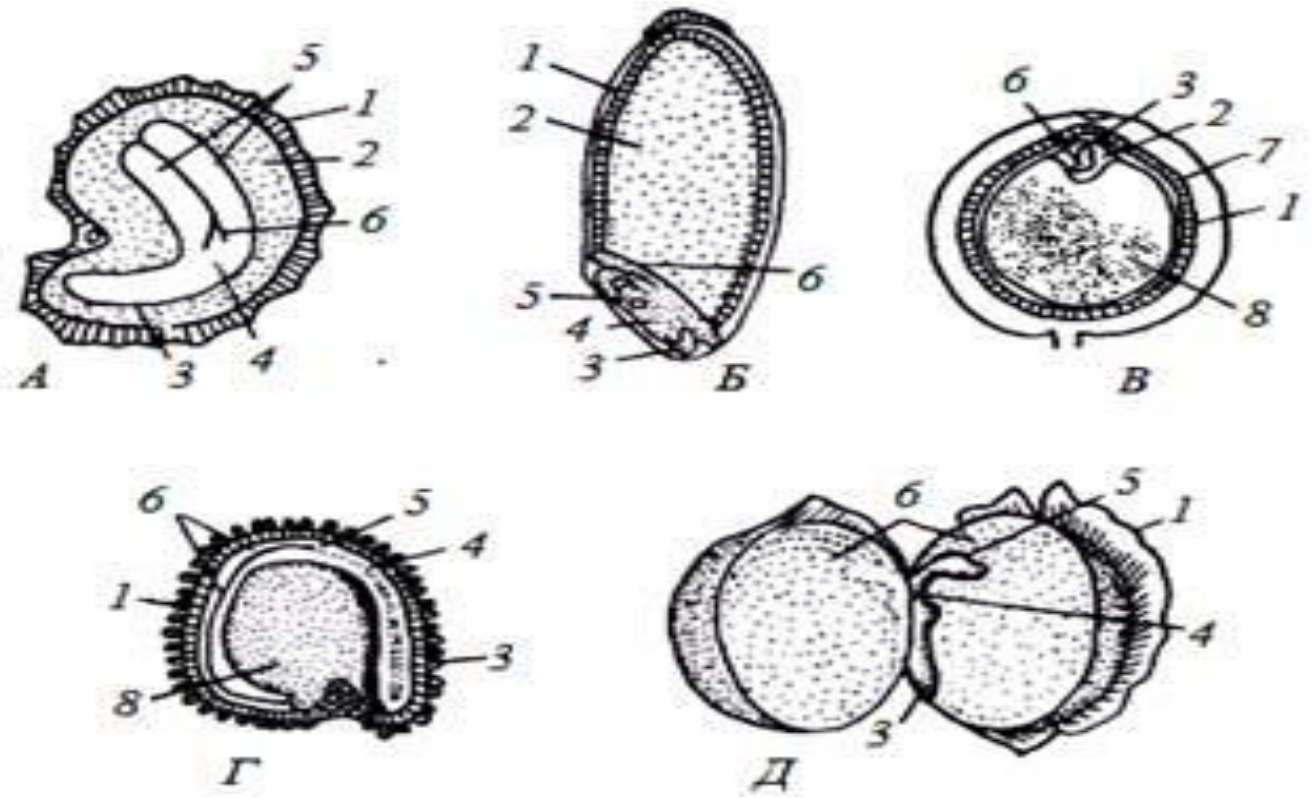
Types of fruits

Type	Consistency	Opening	Example(s)
Simple	Fleshy	Indehiscent	Drupe, Berry, Hesperidium, Pome
Simple	Dry	Dehiscent	Legume (pod), Capsule, Silique
Simple	Dry	Schizocarpic	Regma, Samara, Shizocarp
Simple	Dry	Indehiscent	Caryopsis (grain), Nut (incl. acorn), Achene
Multiple	Fleshy	Indehiscent	Multiple drupe
Multiple	Dry	Dehiscent	Follicle
Multiple	Dry	Indehiscent	Multiple nut
Compound	Fleshy	Indehiscent	Compound berry
Compound	Dry	Indehiscent	Compound nut

Classification of fruits

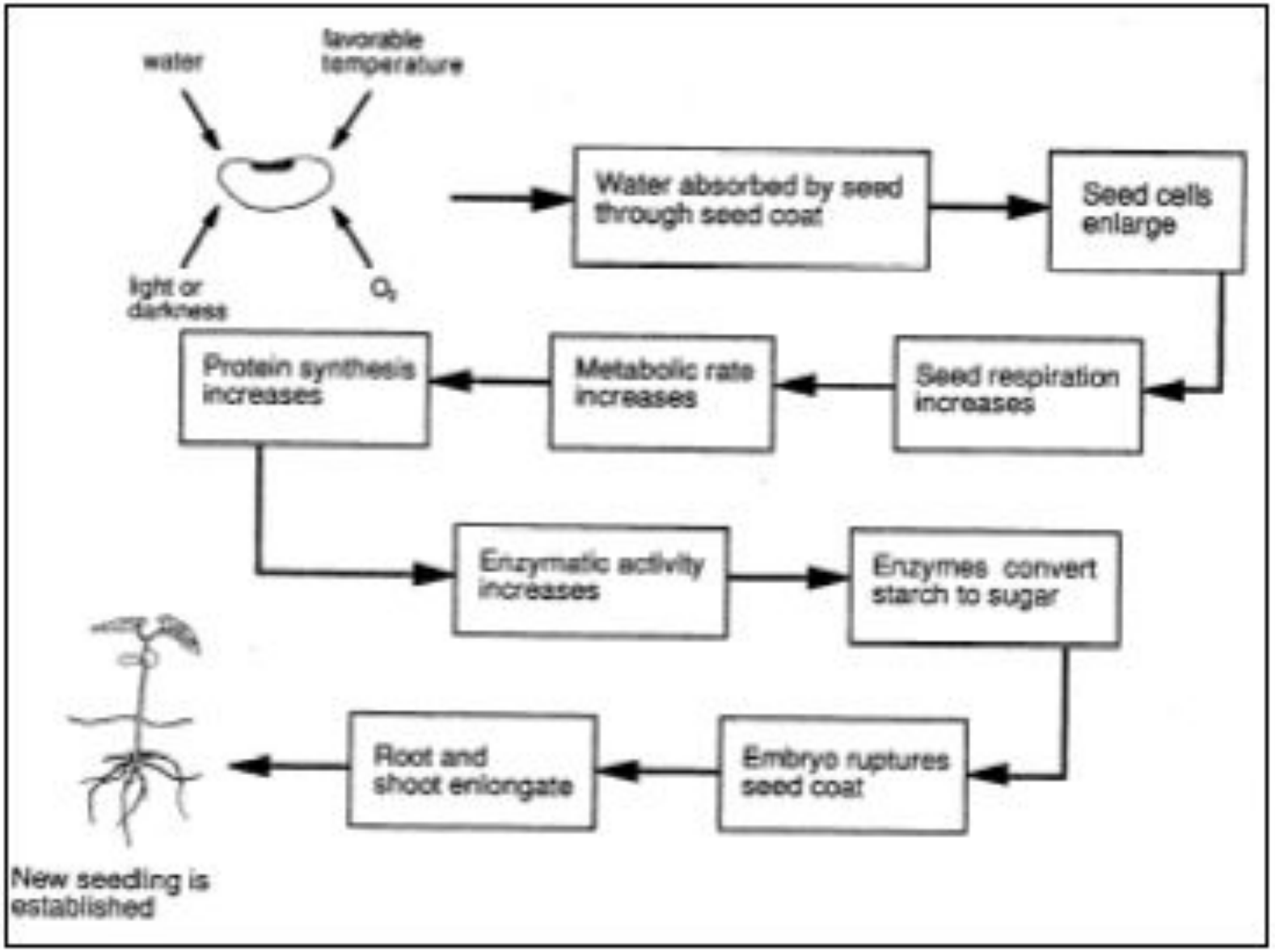


Types of seeds

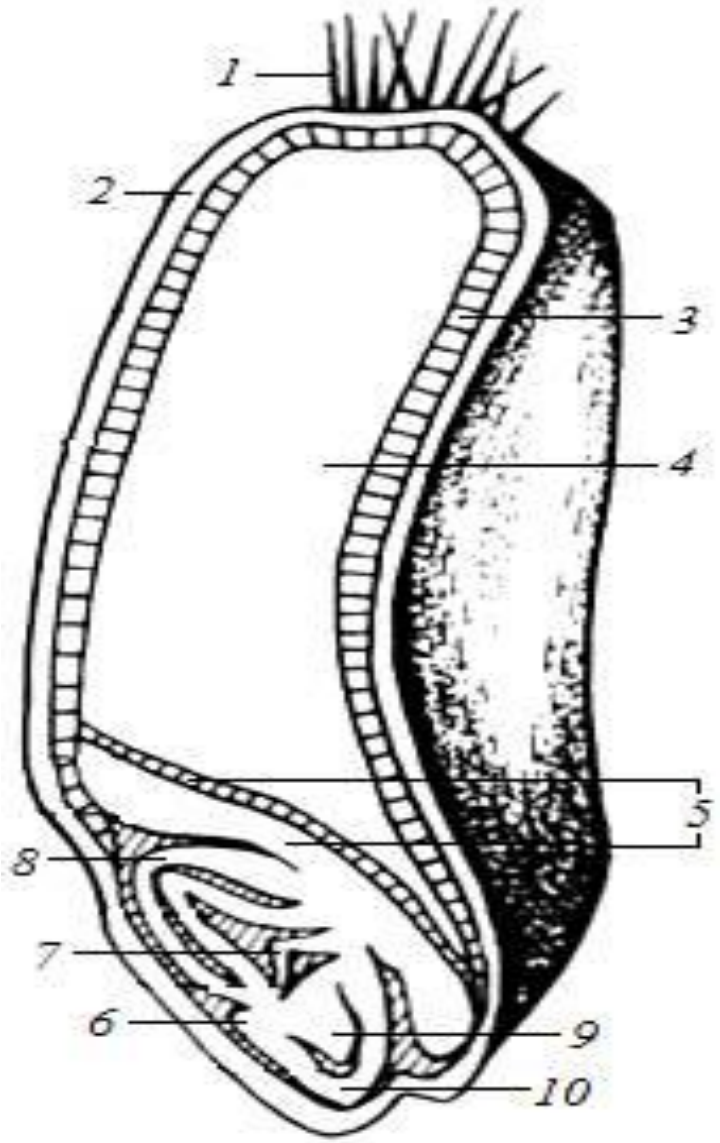


А – seeds with endosperm which around embryo (papaver); *Б* – seeds with endosperm, which is located near by embryo (wheat); *В* – seeds with small endosperm and big perisperm (pepper); *Г* – seeds with perisperm (Agrostemma); *Д* – seeds with nutrition compound inside cotyledons (bean); *1* – seed cover; *2* – endosperm; *3* – embryo root; *4* – embryo stalk; *5* – embryo bud; *6* – cotyledons; *7* – endocarp; *8* – prisperm

Development of fruits

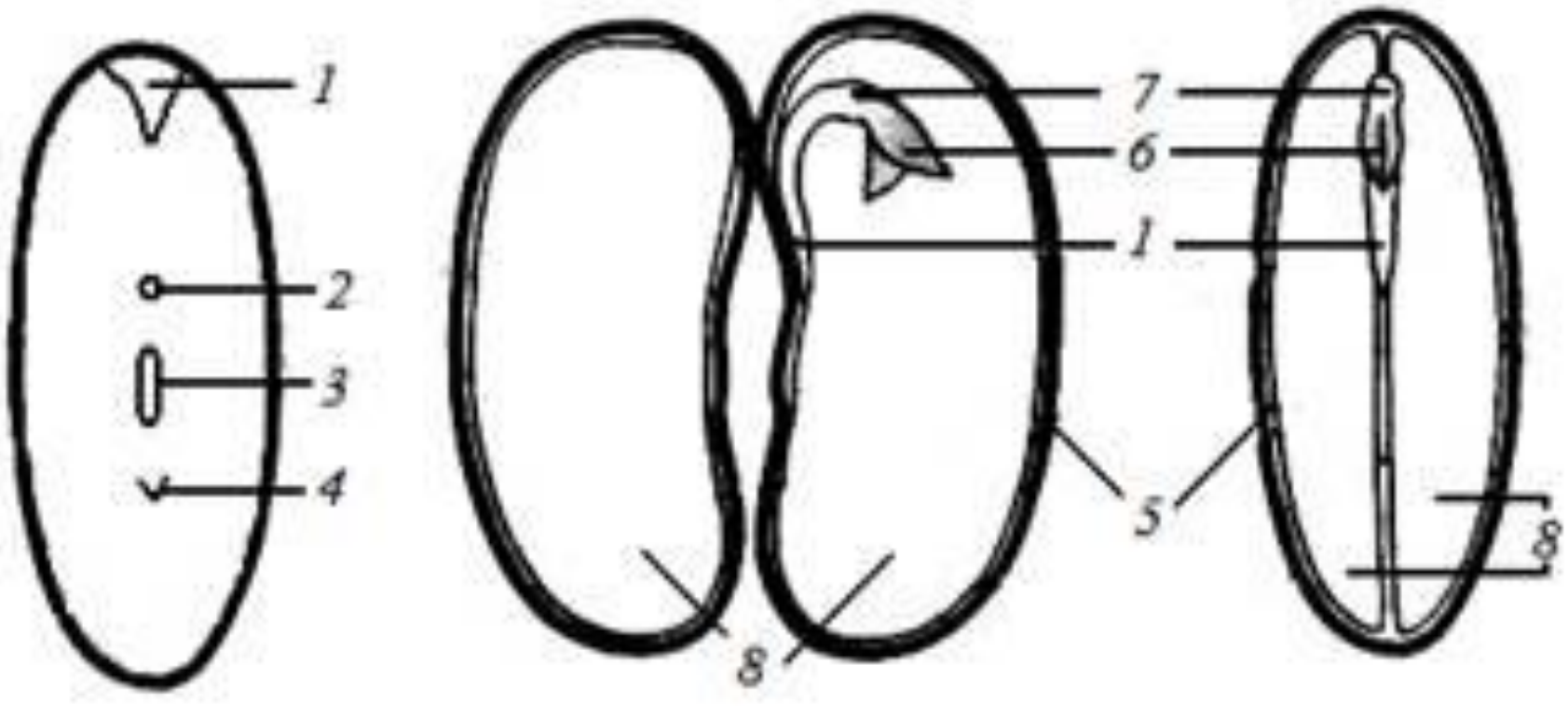


Structure of fruits of wheat



1 – trachoma; *2* – seed coat; *3* – aileron cover; *4* – storage starch (*3*–*4* – endosperm); *5* – corymb; *6* – epiblast; *7* – embryo bud with leaves; *8* – coleoptiles; *9* – embryo root; *10* – coleorhizae

Structure of seed of bean



1 – embryo root; *2* – micro pile; *3* – chillum; *4* – seed raphe; *5* – seed coat; *6* – embryo bud; *7* – embryo stalk; *8* – cotyledons

There are two basic types of spreading of seed. The first way is realized without using of external agents; the second way – by using different external factors: wind, water, animals and human.
The first way is caled autochoria (from Greek «autos» - self, «choreo» - spreading, going), second method - allochoria (from Greek word «allos» - another). So, these plants are called autochores and allochores.

There are four main methods of allochoria. They are: anemochoria (from Greek word «anemos» – wind), zoochoria («zoon» – animal), hydrochoria («hydro» – water) and antropochoria («antropos» – human). The most wide group of plants with anemochria. So, units of spreading, seeds or whole fruits are spreaded by wind.

Control questions:

1 How scientists make a scheme of parts of flowers and fruits?

2 Which signs belong higher plants to leading positions in world?

3 How do produce simple and compound fruits?

4 Note the differences between seeds of monocotyledonous and dicotyledonous plants.

5 Make a classification of fruits and seeds.

6 Prepare the scheme of seed of bean and wheat.

7 Why did zoochoria appear after anemochoria?

Test questions:

Compound fruits has:
A) sycamine
B) broad tree
C) apple tree
Д) ananas
E) cherry
F) banana

Type of spreading of seeds and fruits by using of insects:
A) antropochoria
B) zoochoria
C) hydrochoria
Д) entomochoria
E) anemochoria