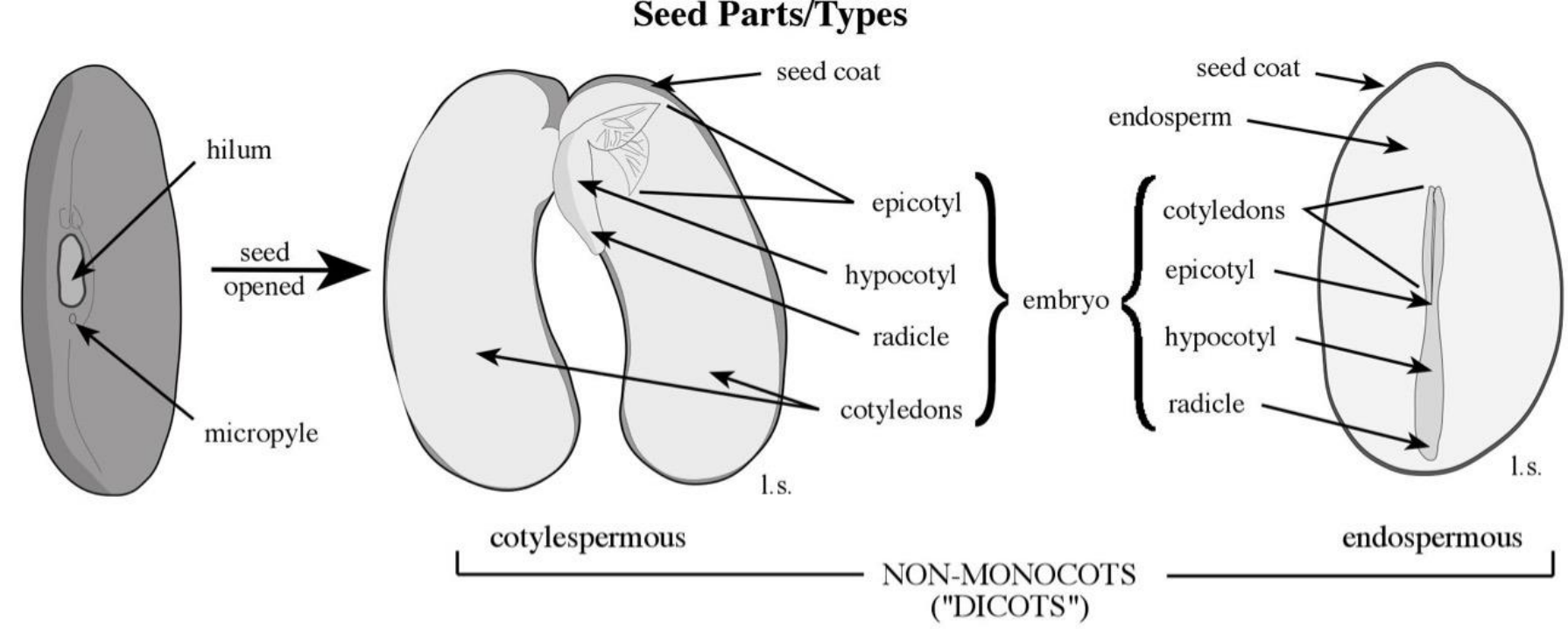
# 2019-2020
# PLANT MORPHOLOGY LAB.

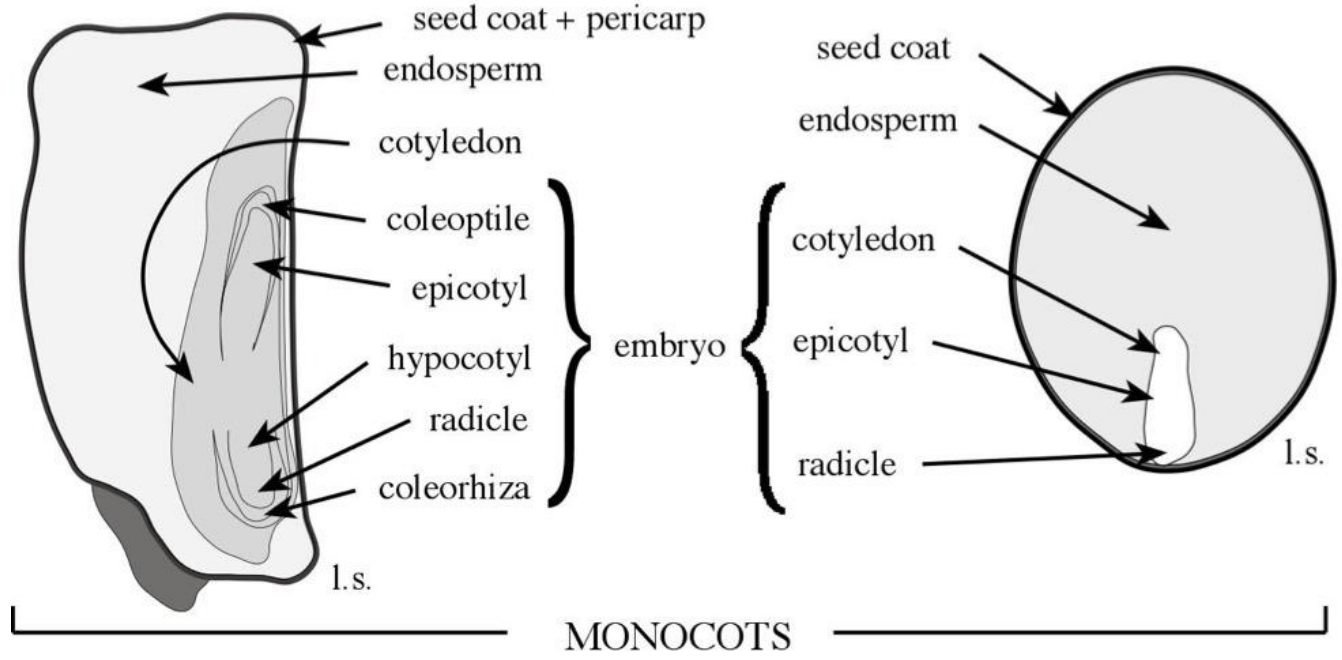
**Dr. Aydan ACAR ŞAHİN**

**14th week**

# SEED

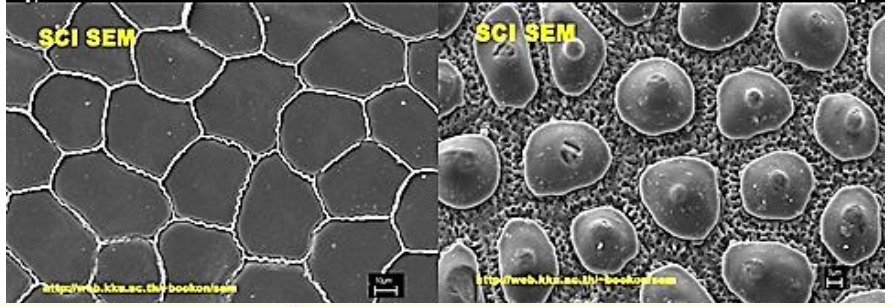


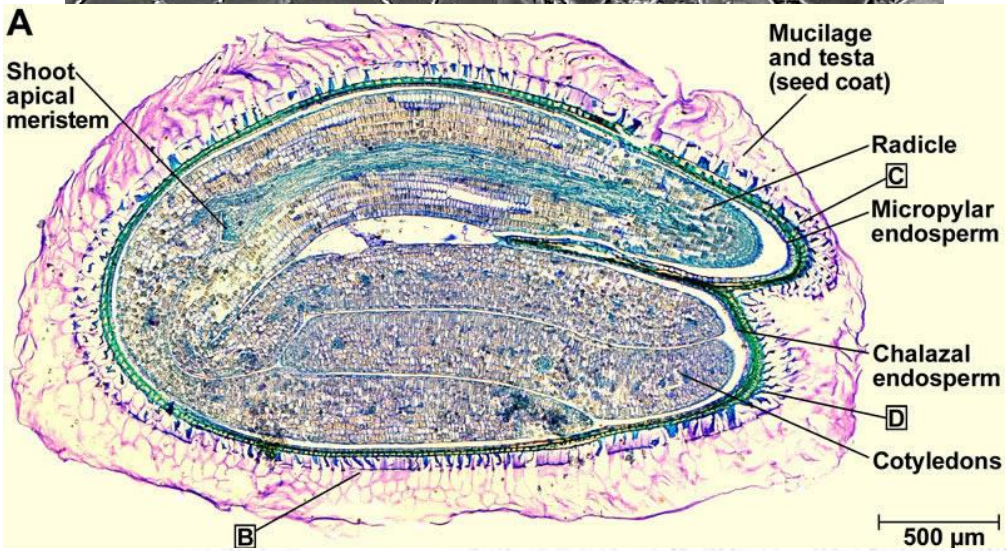

A typical seed contains a **seed coat, cotyledons, endosperm, and a single embryo**




**hilum-** scar of attachment of funiculus
**cotylespermous –** nutritive tissue in cotyledons (e.g., beans, peas)
**endospermous –** nutritive tissue in endosperm
**perispermous –** nutritive tissue in nucellus

- **(i) Testa:** It is the outer layer of seed coat. It is thick, hard and brittle. The external surface appears smooth, shinning and mottled brown in colour.
- **(ii) Tegmen:** It is the inner layer of seed coat that appears dull and papery. Now it is called as perisperm or persistent nucellus.
- **(iii) Caruncle:** It is a white spongy bilobed outgrowth present near the narrow end of the seed. If partially covers the hilum (dark scar) and completely covers the micropyle (small pore). Caruncle absorbs water which percolates through the micropyle into the seed.
- **(iv) Raphae:** It is a shallow ridge present on the testa of flat surface of the seed. The distinct bifurcation of raphae represents chalaza.
- **(v) Endosperm:** It is a white oily food storage tissue that is present inner to the perisperm. From this layer castor oil of commerce is extracted.
- **(vi) Embryo:** Embryo lies in the centre of endosperm. It consists of a radicle, a plumule and two lateral cotyledons, all of which are present on a short embryo axis. The cotyledons are thin, semi-transparent and oval in outline. They have palmate venation. The middle costa or rib is more prominent and bears a few lateral veins.



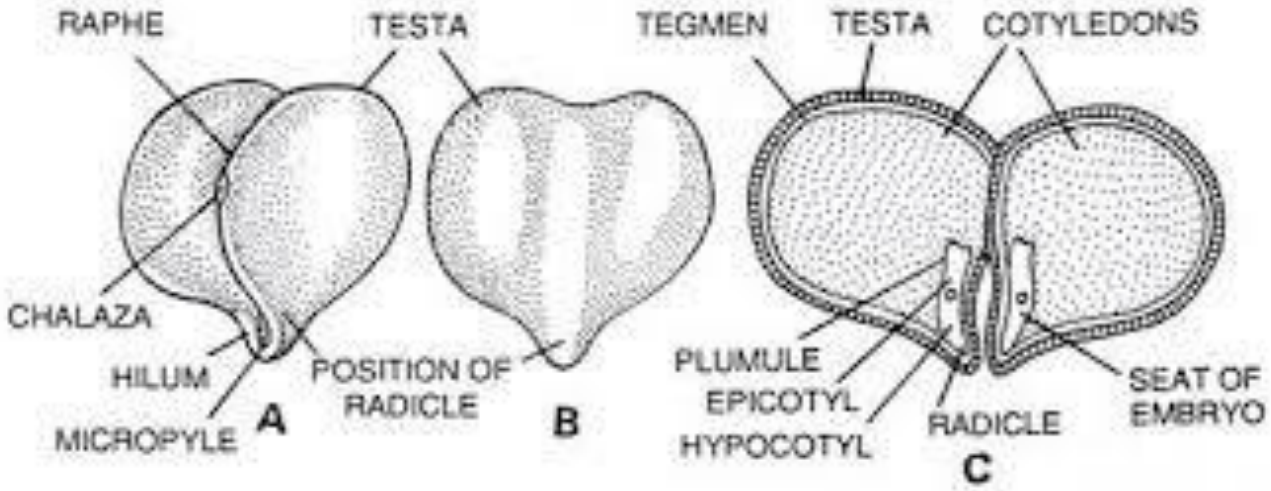
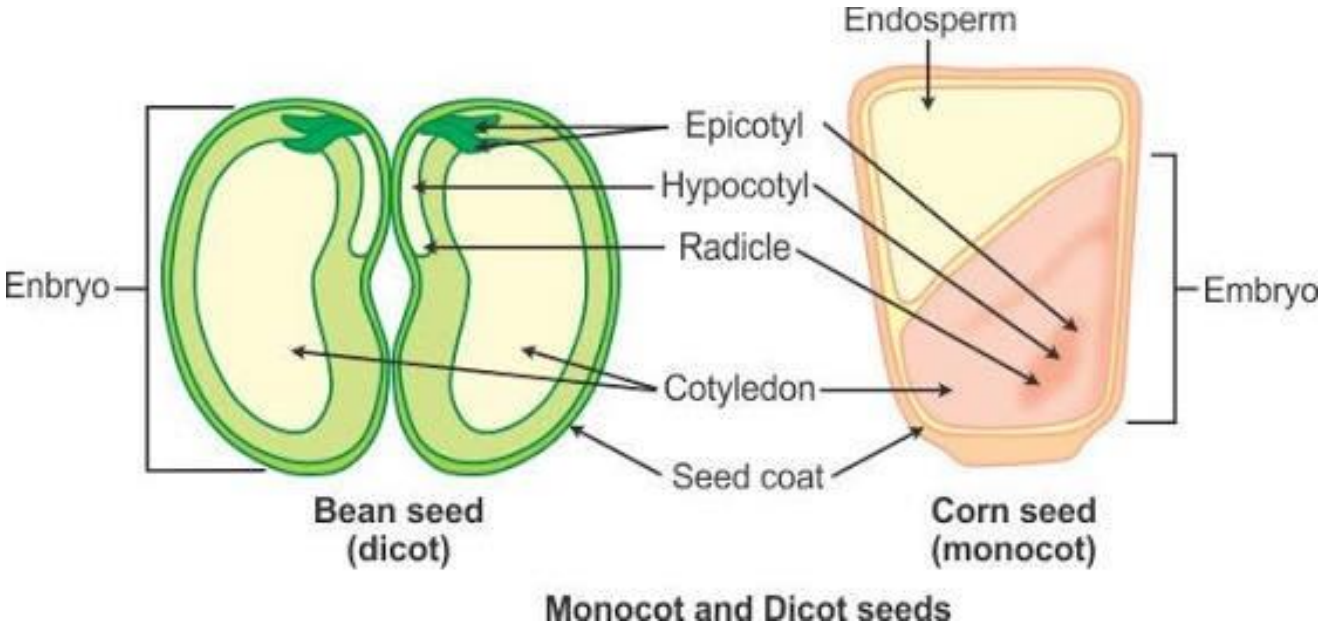




Fig. 34.73. Structure of gram seed. A, complete seed showing various parts; B, seed as seen after removing the testa; C, L.S. of seed.

The two cotyledons in the dicot seed also have vascular connections to the embryo.
In **endospermic dicots**, the food reserves are stored in the endosperm. During germination, the two cotyledons therefore act as absorptive organs to take up the enzymatically released food reserves, much like in monocots (monocots, by definition, also have endospermic seeds). Tobacco (*Nicotiana tabaccum*), tomato (*Solanum lycopersicum*), and pepper (*Capsicum annuum*) are examples of endospermic dicots.
In **non-endospermic dicots**, the triploid endosperm develops normally following double fertilization, but the endosperm food reserves are quickly remobilized and moved into the developing cotyledon for storage. The two halves of a peanut seed (*Arachis hypogaea*) and the split peas (*Pisum sativum*) of split pea soup are individual cotyledons loaded with food reserves.



Monocot and Dicot seeds

# How Seeds Travel

## by the wind

milkweed

dandelion

maple

## by animals

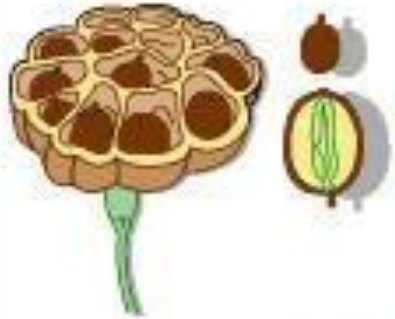
beggar-ticks

sandbur

blackberry

## by water

lotus



cattail

coconut

## by bursting

violet

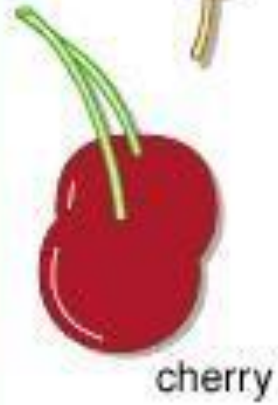
jewelweed

witch hazel

## by humans

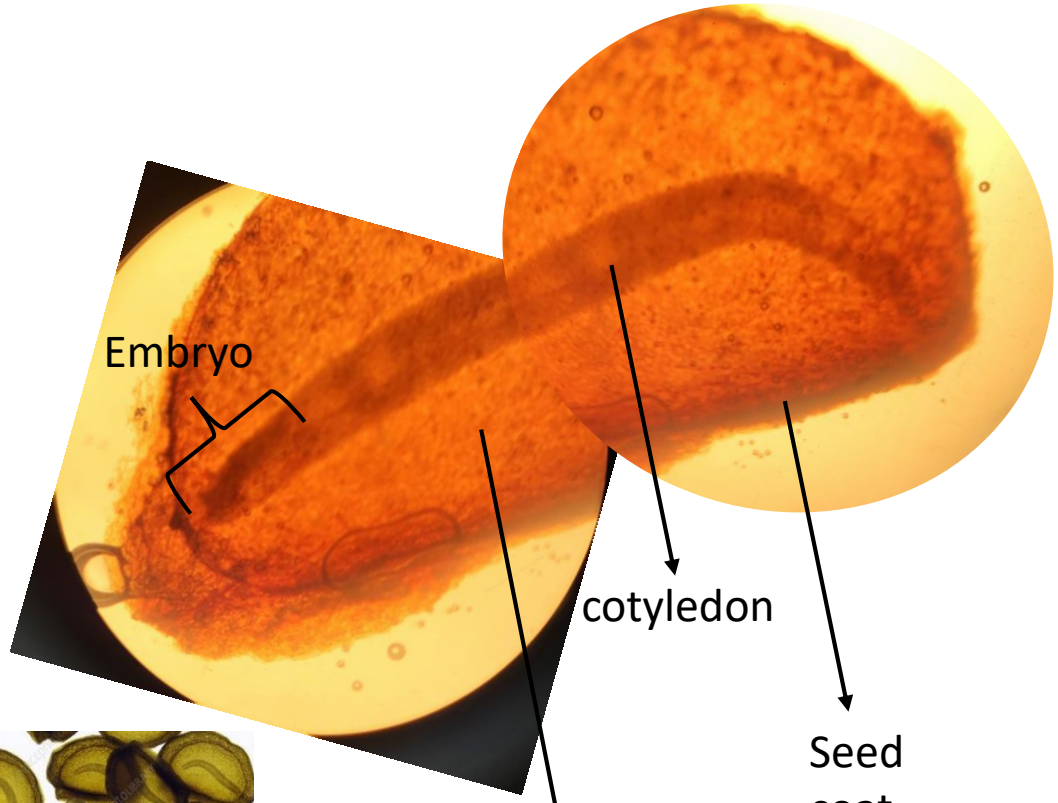
bean

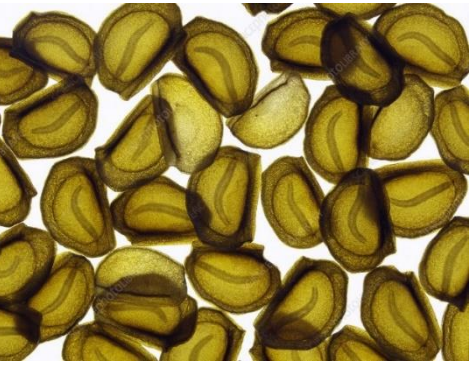
wheat



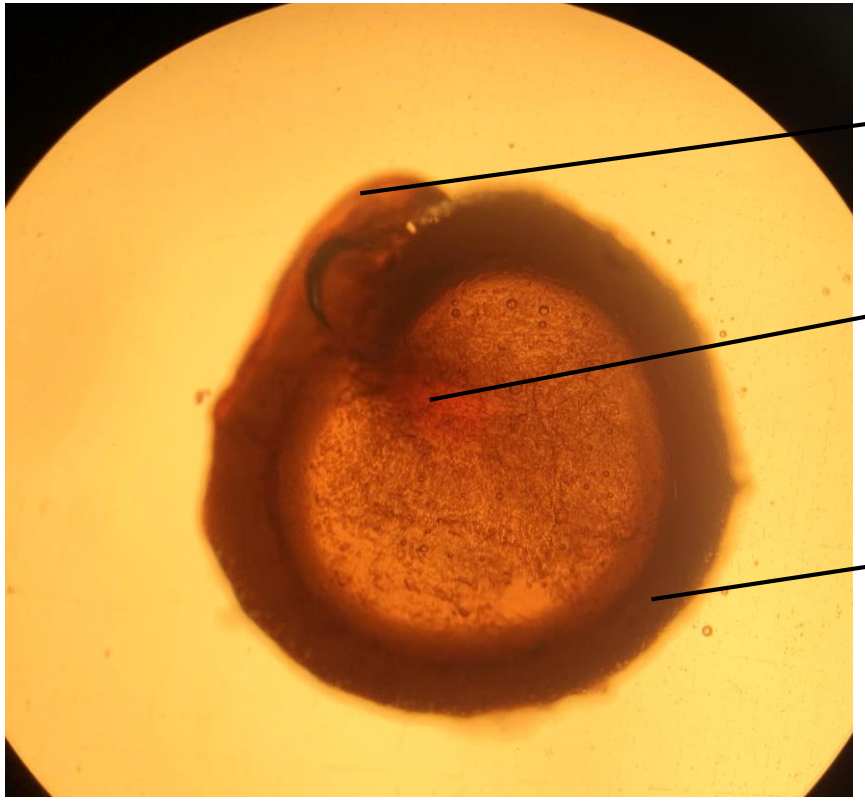
cherry

# Örnekler:Lilium tohumu (M)_Atriplex tohumu (D)



Monocot




Dicot

# Apple Seed Anatomy