

2019-2020
PLANT MORPHOLOGY LAB.

Dr. Aydan ACAR ŞAHİN
13th week

Fruit

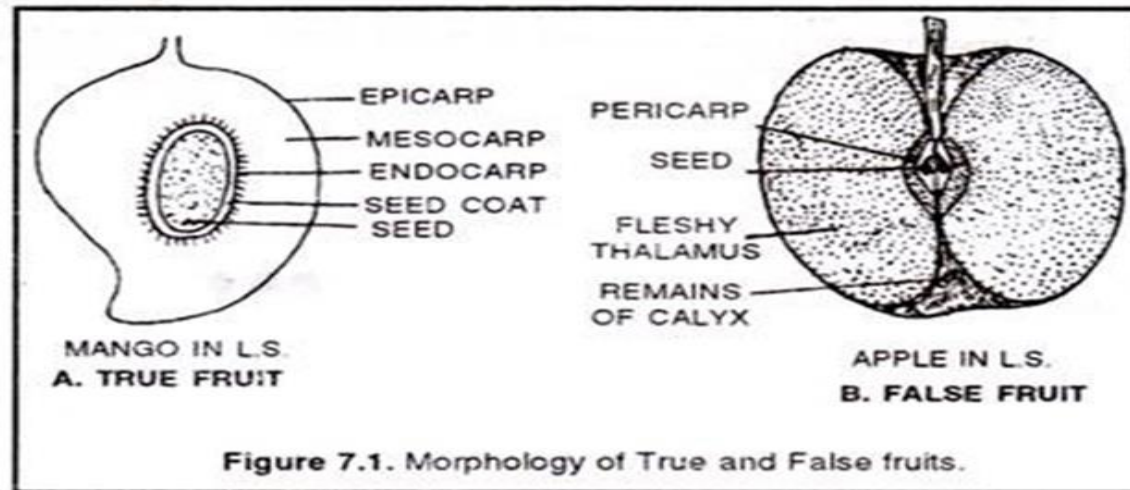
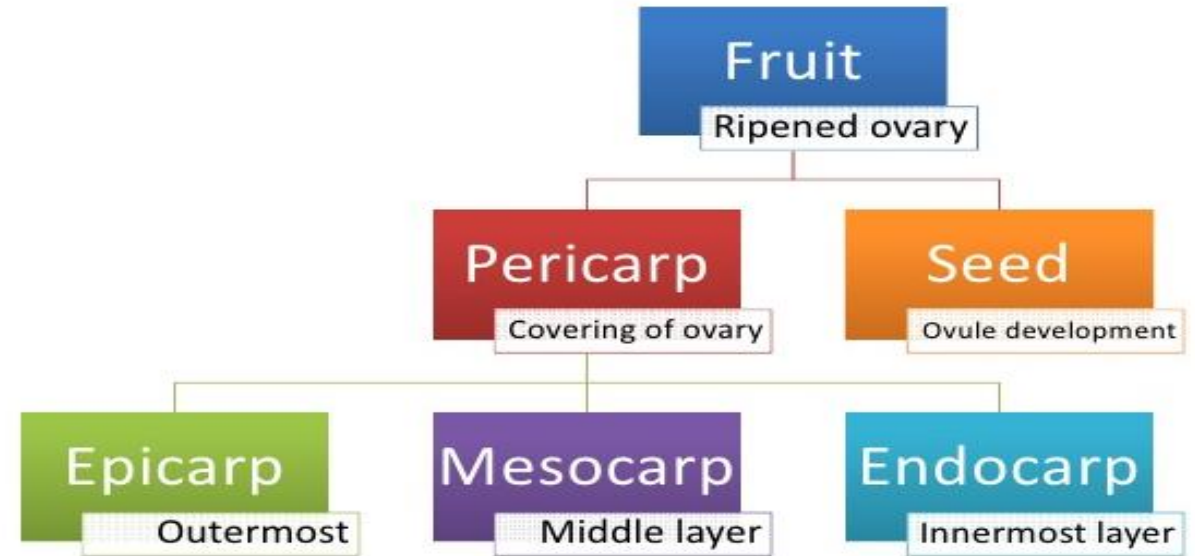
What is a fruit?

A mature or ripened ovary formed after fertilization is called fruit.

Ovary wall – **Pericarp**

Ovule- **seed**

Parts of Fruits



Botanically, a fruit develops from a ripe ovary or any floral parts on the basis of floral parts they develop, fruits may be true or false.

(i) True Fruits:

- **A true fruit or eucarp is a mature or ripened ovary, developed after fertilization**, e.g., Mango, Maize, Grape etc.

(ii) False Fruits:

- A false fruit or pseudo-carp is derived from the floral parts other than ovary, e.g., peduncle in cashew-nut, thalamus in apple, pear, gourd and cucumber; fused perianth in mulberry and calyx in Dillenia (Or. Ou). Jack fruit and pine apple are also false fruits as they develop from the entire inflorescence. False fruits are also called spurious or accessory fruits.

iii) Parthenocarpic fruits:

- These are seedless fruits that are formed without fertilization, e.g., Banana. Now a day many seedless grapes, oranges and water melones are being developed by horticulturists. Pomology is a branch of horticulture that deals with the study of fruits and their cultivation.

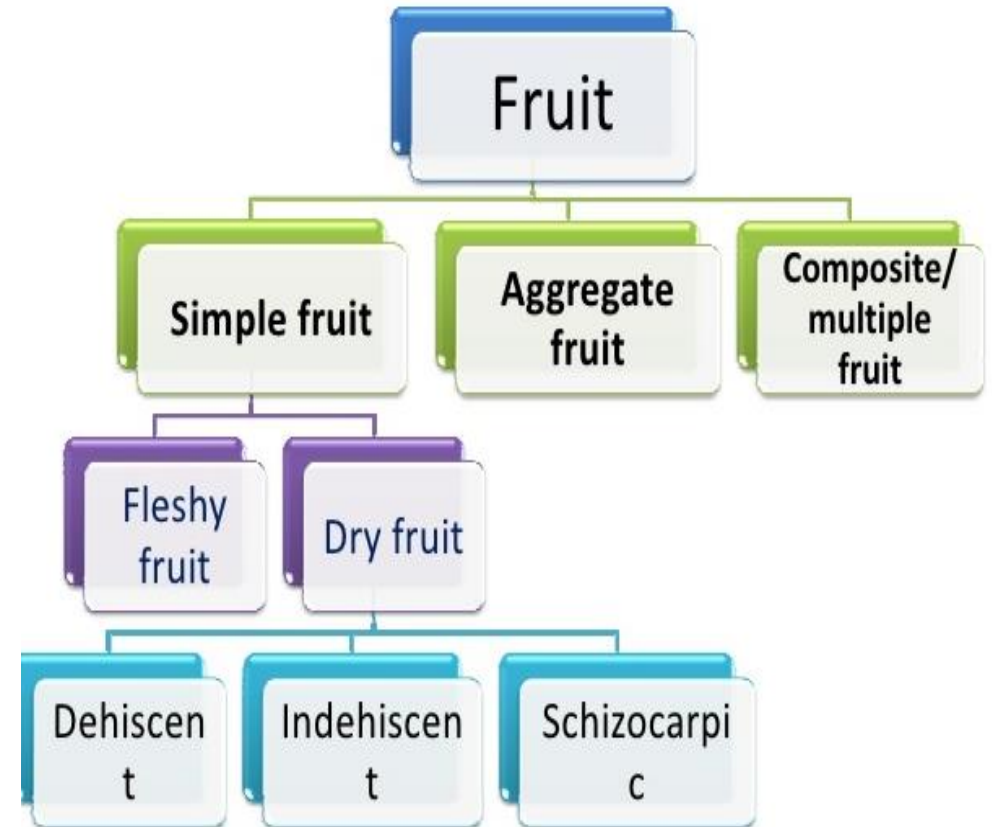
Morphology of a Typical Fruit:

- A fruit consists of pericarp and seeds. Seeds are fertilized and ripened ovules. The pericarp develops from the ovary wall and may be dry or fleshy. When fleshy, pericarp is differentiated into outer epicarp, middle mesocarp and inner endocarp.

- **Types of Fruits:**

On the basis of the above mentioned features, fruits are usually classified into three main groups:

- 1) **Simple,**
- 2) **Aggregate and**
- 3) **Composite or Multiple fruits.**



DRY FRUITS

- ***Dry fruits*** - generally grey, brown, or another dull color, with a very thin and dry ovary wall, so that the food is largely confined to the seeds. These may be further subdivided based on the number of seeds and whether the fruit remains closed at maturity (**indehiscent**) or opens naturally (**dehiscent**).



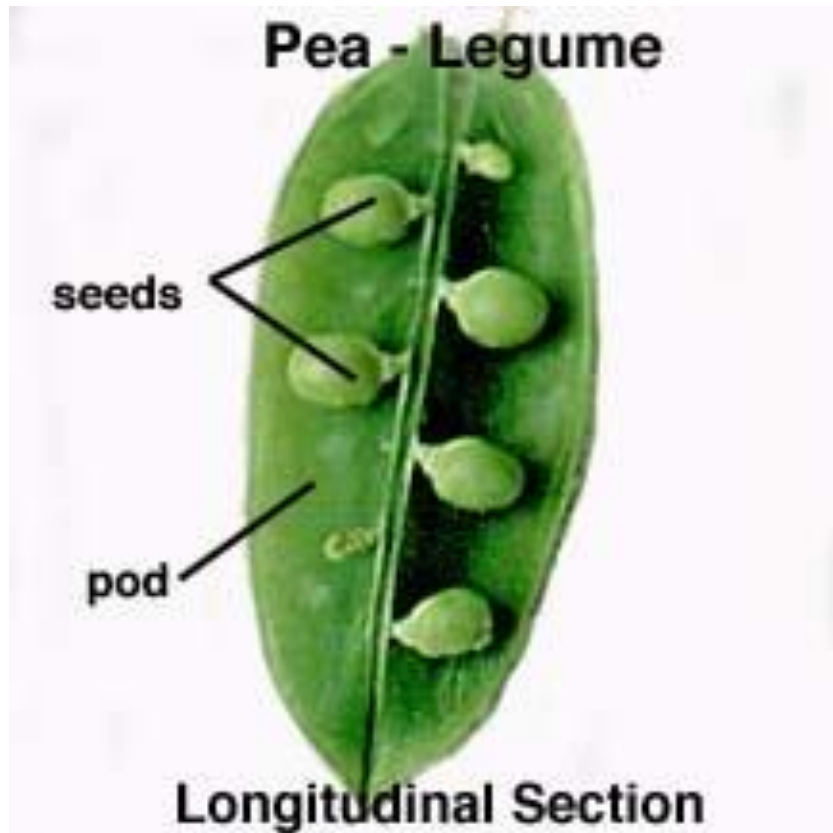
a. DRY DEHISCENT FRUITS

1- Follicle: A Follicle is a dry dehiscent fruit which splits on one side only. It may contain one or many seeds.



2- Legume:

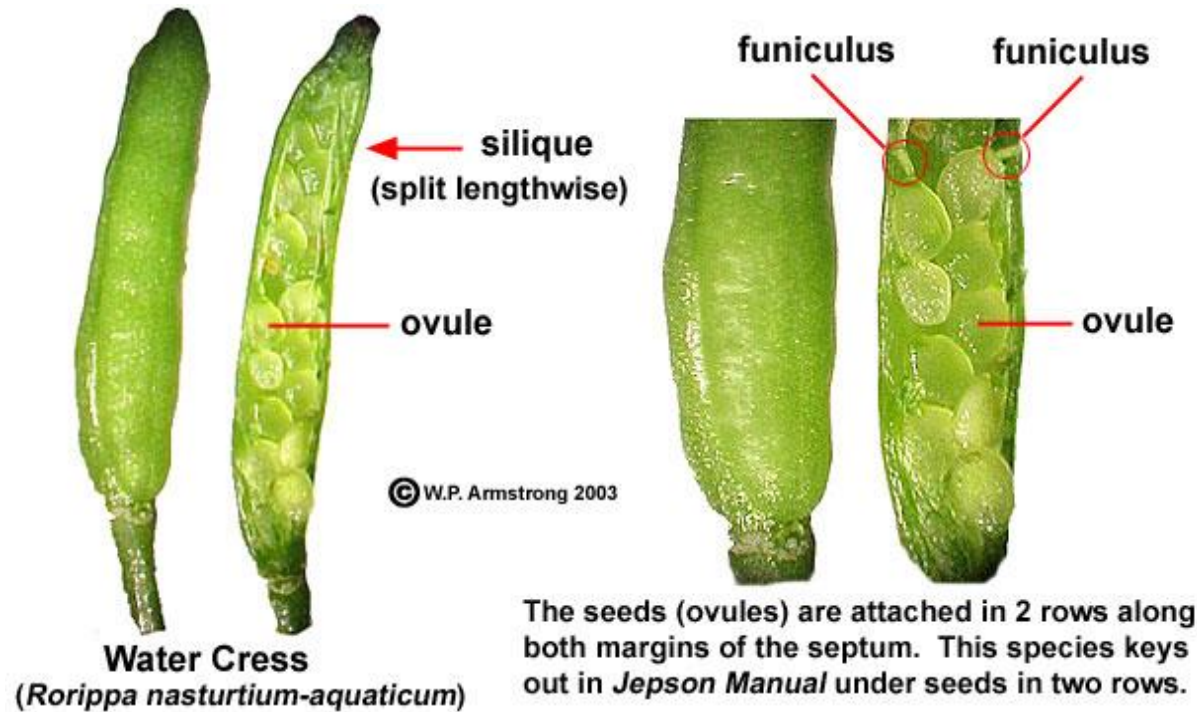
A Legume is a dry dehiscent pod that splits on two sides.



3- Silique:

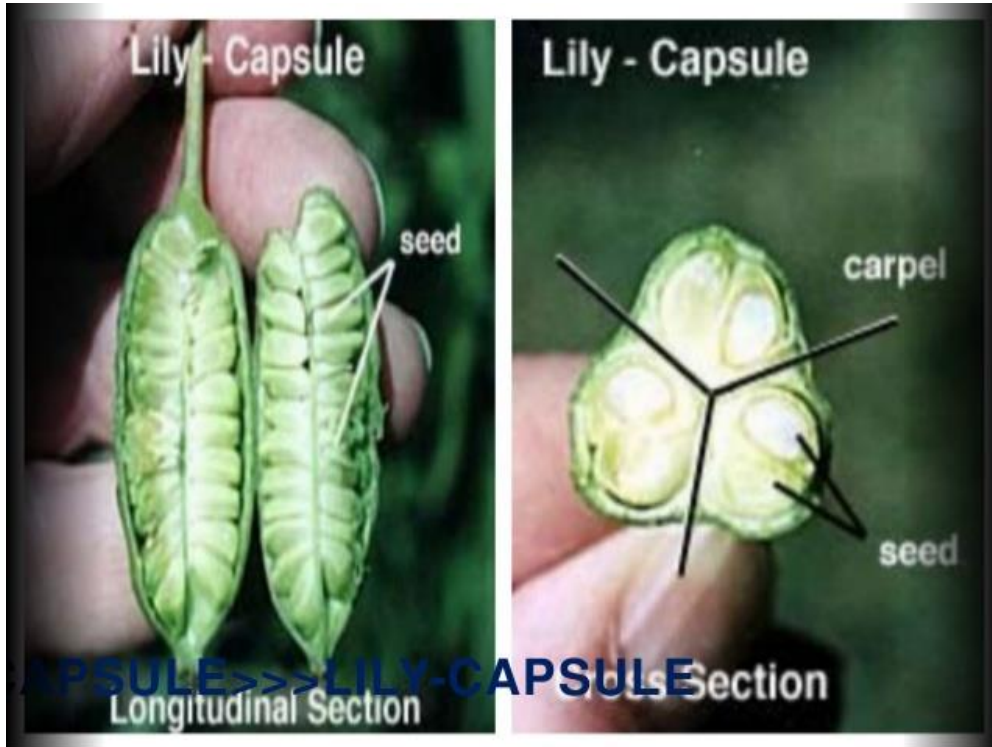
A Silique is a dry dehiscent fruit.

It is long and thin, splits down the two long sides, and has a papery membrane (the septum) between the two halves.



4- Capsule:

A Capsule is the most common fruit type. A Capsule is a dry fruit which splits open to release the seeds.



Kapsül meyveler



a



b



c



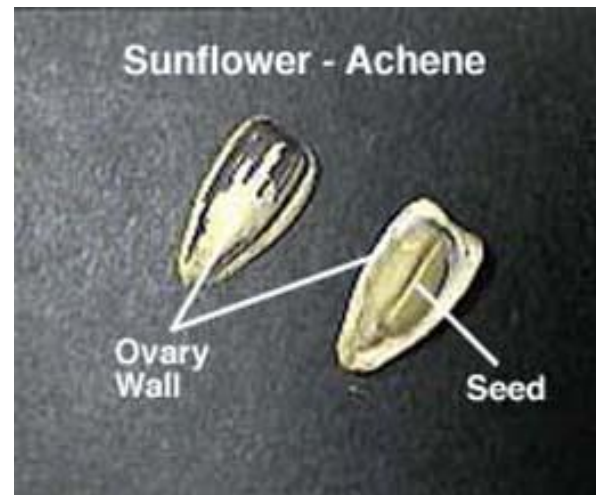
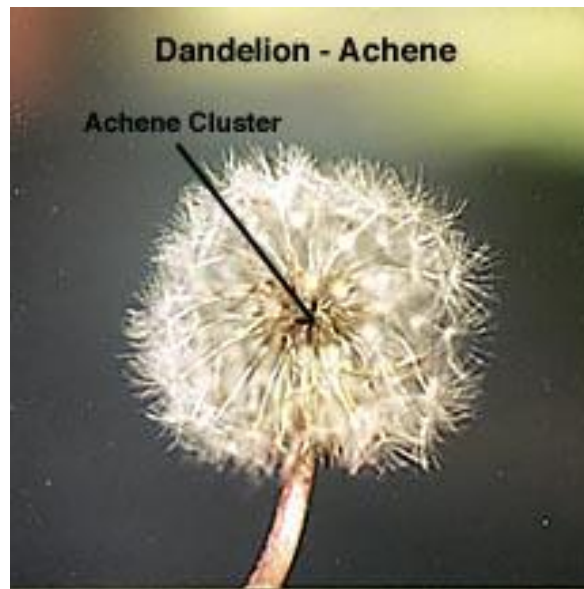
d

Şekil 5.38. a. Binbirdelikotu (*Hypericum* L.)'nda septisit kapsül, b. Pamuk (*Gossypium* L.)'ta lokulusid kapsül, c. Haşhaş (*Papaver somniferum* L.)'ta delikli (porisit) kapsül ve d. Banotu (*Hyoscyamus* L.)'nda kapaklı (piksidium) kapsül meyveler.

b. DRY INDEHISCENT FRUITS

- **1- Achene**

An Achene is a single-seeded dry indehiscent fruit in which the seedcoat is not part of the fruit coat.



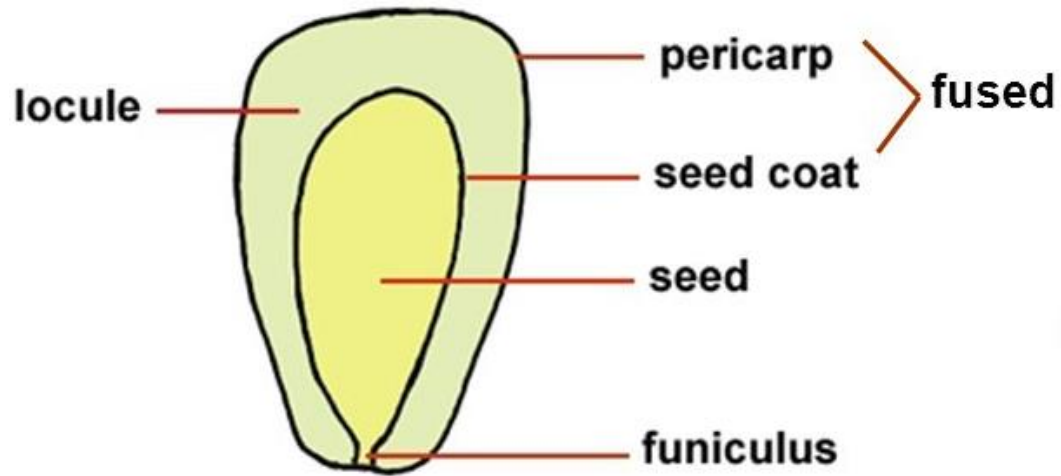
- **2- Nut**

A Nut is a large single hardened achene.



3-Caryopsis

A Caryopsis is a simple dry indehiscent fruit, like an achene, but with the seedcoat fused with the fruit coat.



- **4-Samara**

A Samara is an independent dry indehiscent fruit which has part of the fruit wall extended to form a wing



FLESHY FRUITS

- **Fleshy fruits** are **fruits** which a part or all of the pericarp is **fleshy** at maturity.
- Fleshy fruits have a juicy layer of tissue in the pericarp, seen in fruits such as oranges, tomatoes and grapes.

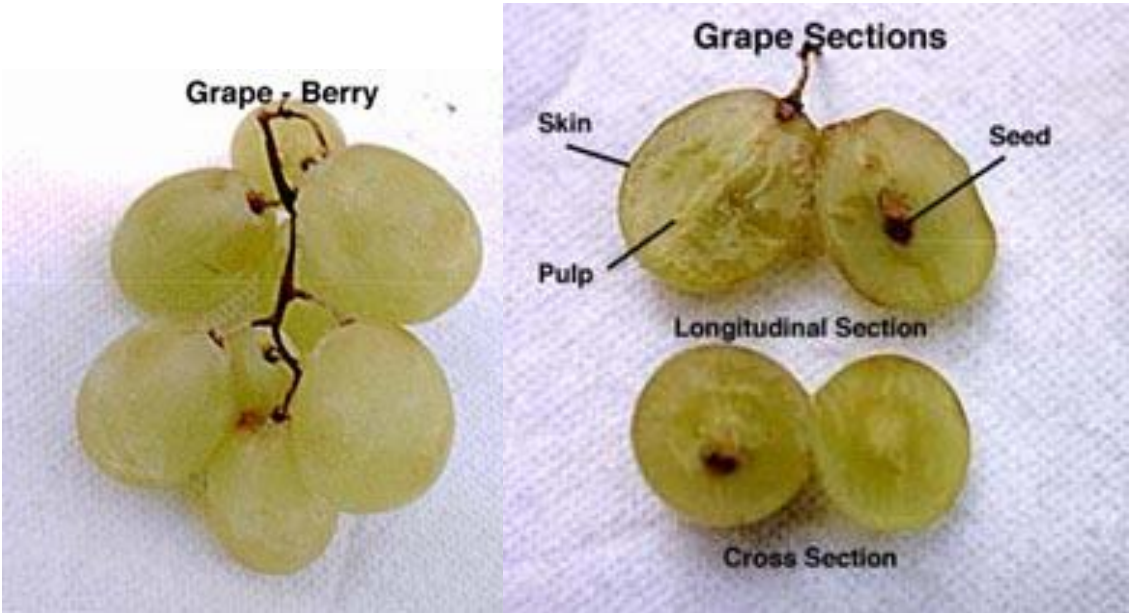
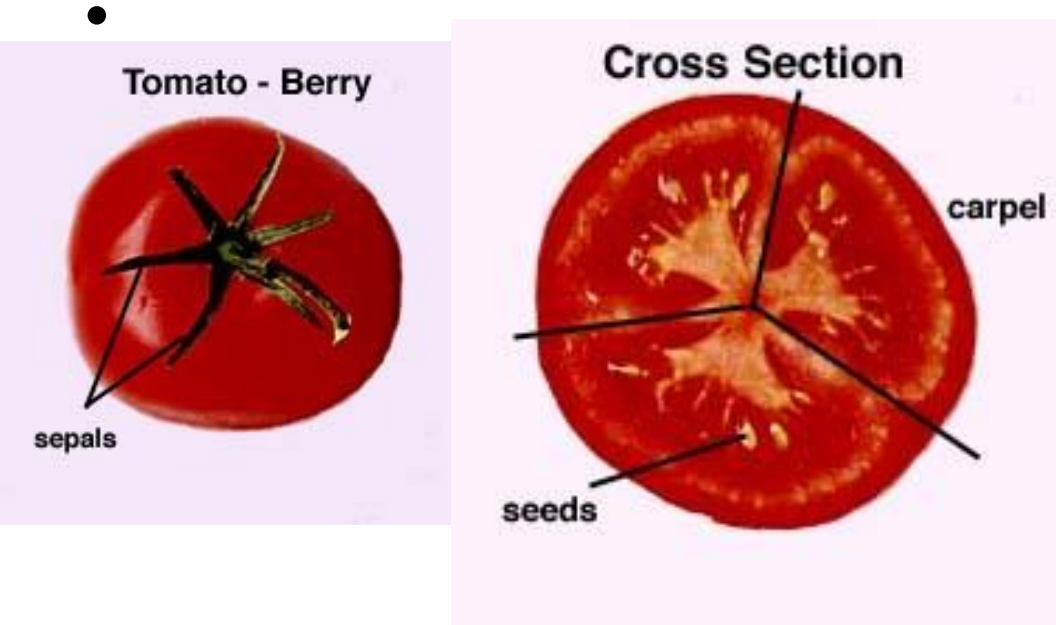


A) Fleshy simple fruits:

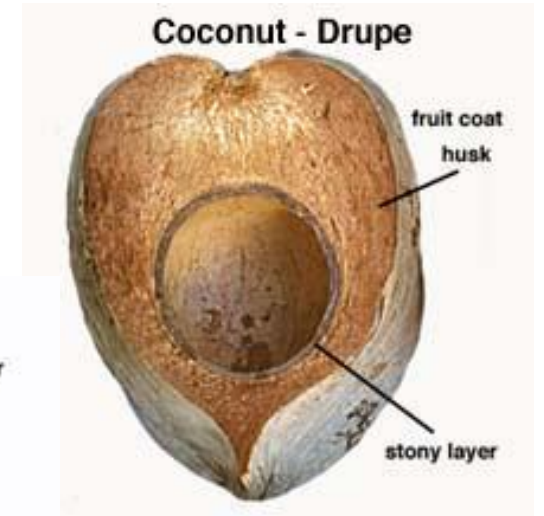
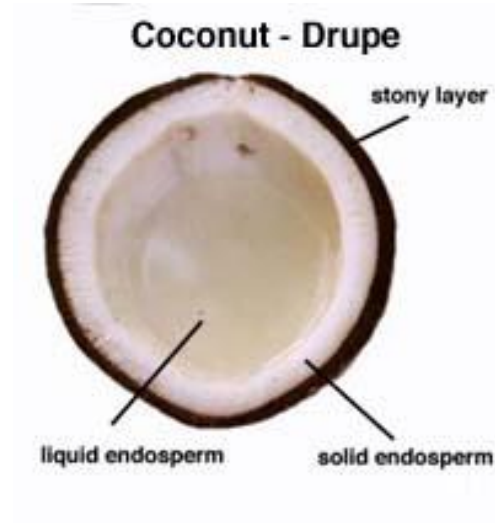
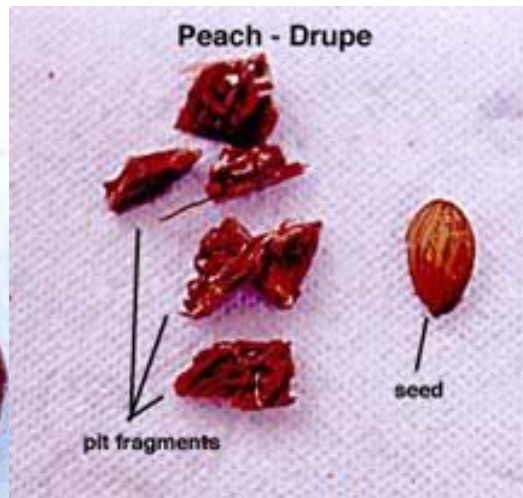
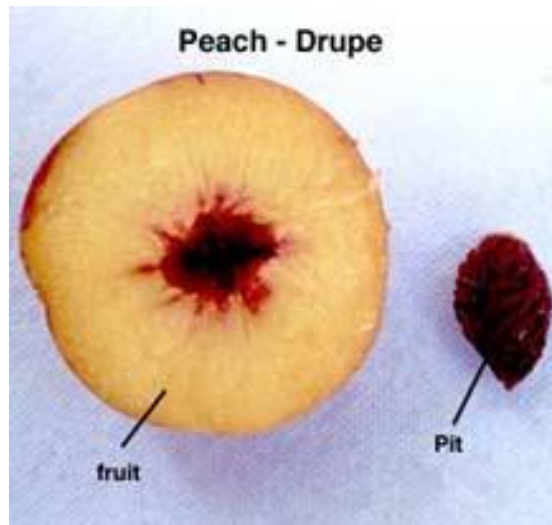
- A **simple** fruit always develops from a single ovary containing one or more carpels and may or may not include additional modified accessory floral (perianth) structures.
- In addition, a simple fruit is either **fleshy** or **dry**. Fleshy fruits include the **berry, drupe, pome, pepo, and hesperidium**.



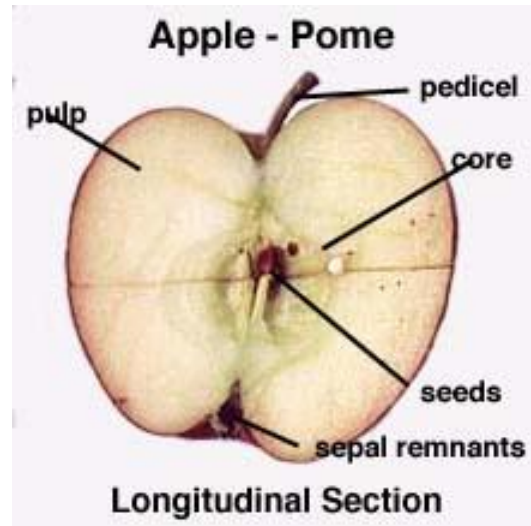
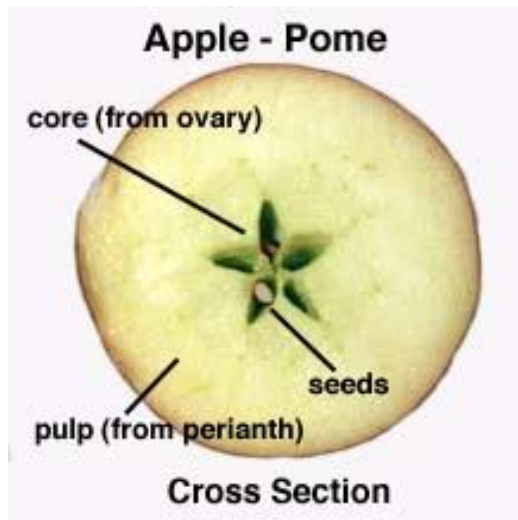
1. Berries : one or more carpels developed within a thin covering, very fleshy within, with the seeds embedded in the common flesh of a single ovary



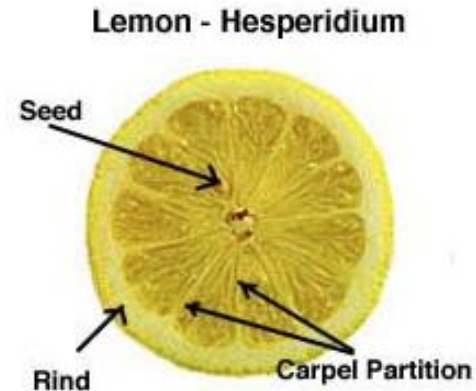
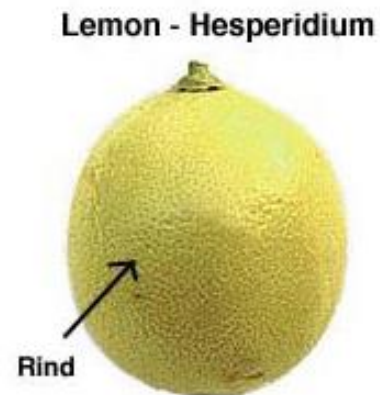
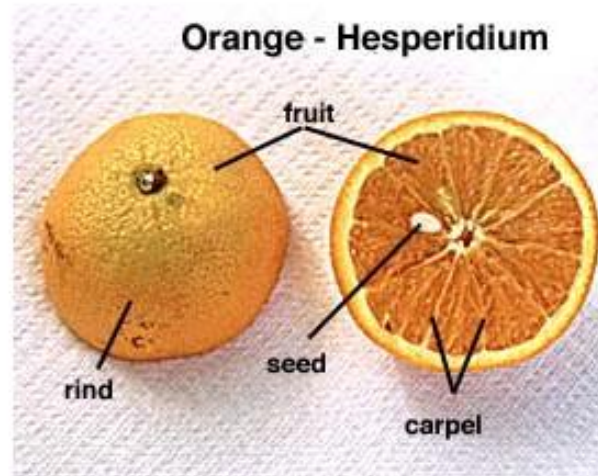
2.Drupes: "stone fruit", a simple fruit produced from a single carpel, usually one-seeded, with an outer fleshy layer of tissue called the **pericarp** and an inner, heavy stony layer called the **endocarp** .



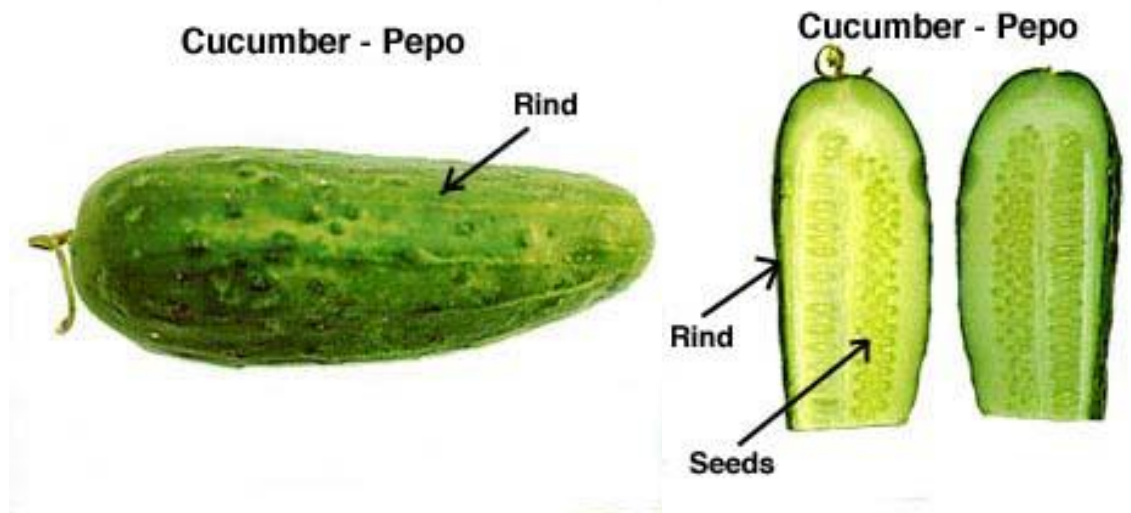
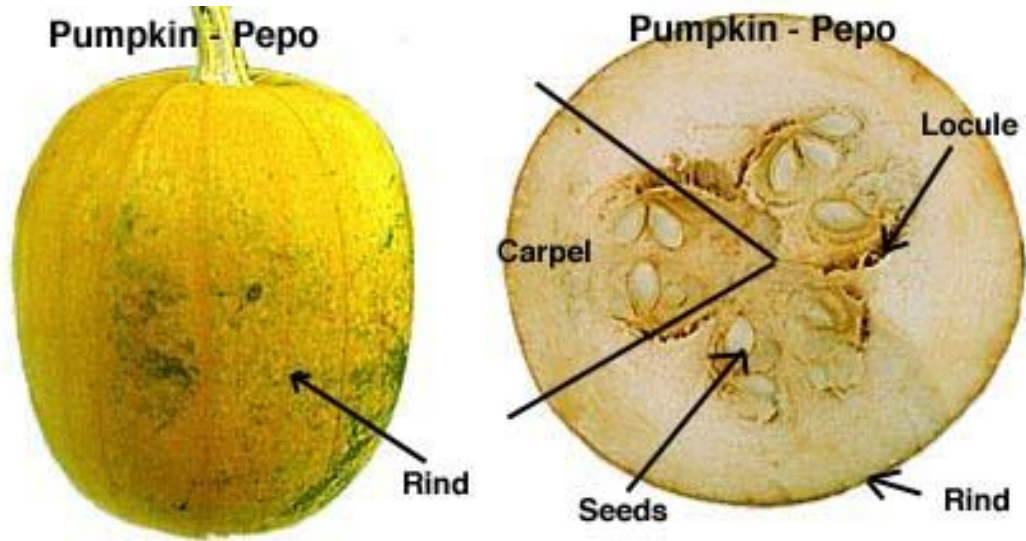
3.Pomes: A pome has many seeds with fleshy tissue surrounding the pericarp that is sweet and juicy.



4. Hesperidium: These type of fruits are always covered with a leathery rind and the partitions separating their carpels are tough and fibrous.

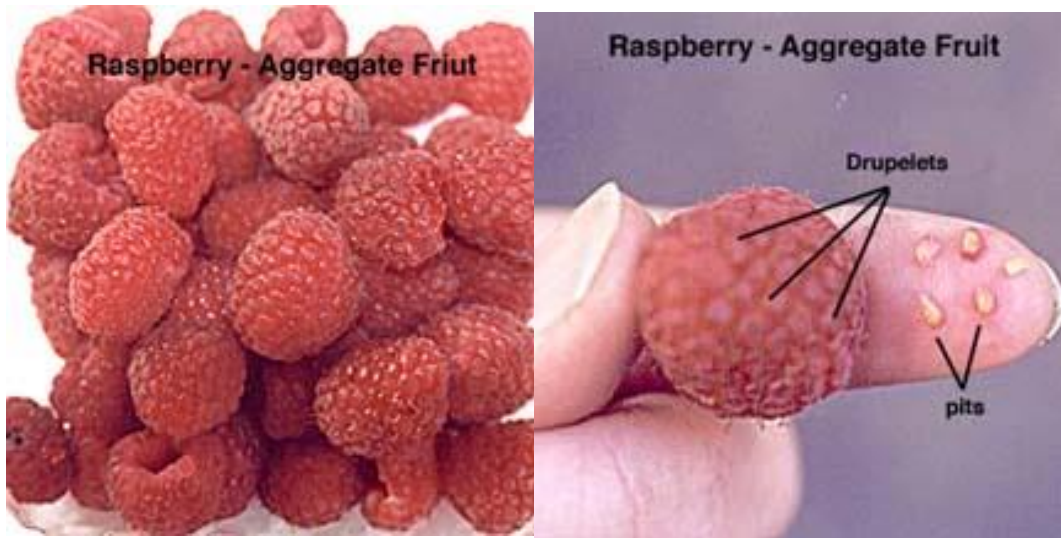


5. Pepo: It is covered by a rind that is hard and thick. Below the rind, the rest of the ovary wall is soft and fleshy.

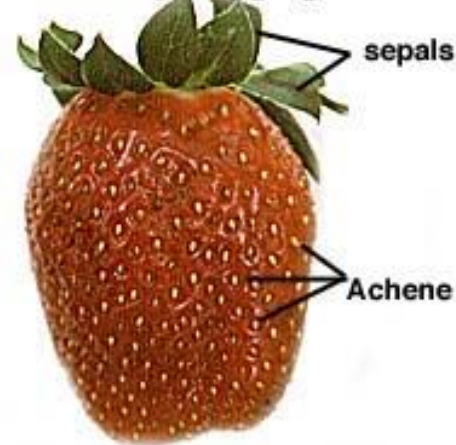


B) Aggregate Fruits

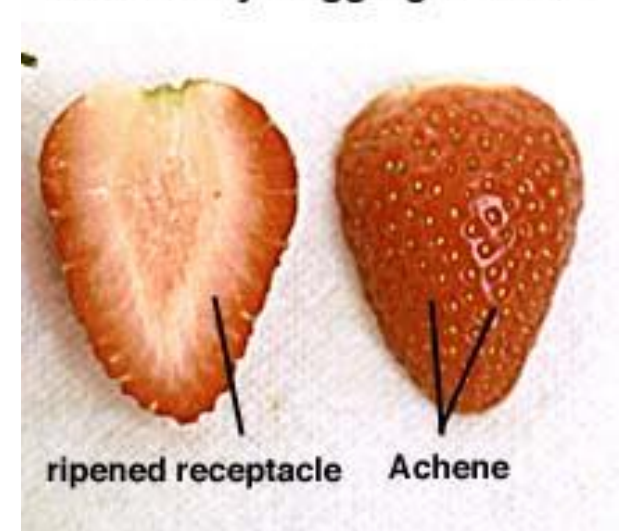
- An aggregate fruit results from the joining together of several ovaries of the same flower.
- This process starts with a flower that contains several carpels with an equal number of ovaries.
- Each ovary contains a single ovule that develops into a seed following fertilization.
- As the ovaries develop and increase in size they become attached together.



Strawberry - Aggregate Fruit



Strawberry - Aggregate Fruit



C) Multiple Fruits

- Multiple fruits, develop from a cluster of flowers.
- Individual fruits of the multiple cluster develop from one ovary and some accessory parts of the flower.

