

## Lecture: 6

**\*\*\*Fruits:**

Fruits are the mature ovaries or pistils of flowering plants plus any associated accessory parts.

**\*\*Accessory parts:** are organs attached to a fruit but not derived directly from the ovary, including the bracts, axes, receptacle.

**\*\*Pericarp:** is the fruit wall, derived from the mature ovary, sometimes pericarp divided into layers: **1-** endocarp

**2-** mesocarp

**3-** exocarp

**\*\*\*Fruit types:** are based first on fruit developed :

- 1- Simple fruit: derived from a single pistil of one flower.
- 2- Aggregate fruit: derived from multiple pistil of a single flowers, thus having an apocarpous gynoecium.
- 3- Multiple fruit: derived from many coalescent flowers.

**\*\*\*Simple fruits:**

- 1- Achene:** is a one-seeded, dry, indehiscent fruit with seed attached to the pericarp at one point only as in sunflower.
- 2- Grain (or caryopsis):** is a one-seeded, dry, indehiscent fruit with the seed coat adnate to pericarp wall as in poaceae family.(like wheat).
- 3- Nut:** is a one seeded, dry, indehiscent fruit with a hard pericarp.
- 4- Samara:** is a winged, dry, usually indehiscent fruit as in *Acer*.

**5- Urticle:** is a small, bladderly or inflated, one-seeded, dry fruit, utricle are essentially achenes in which the pericarp is significantly larger than the mature seed as in *Atriplex* (salt bush).

**6- Capsules:** are generally dry, dehiscent fruits derived from compound ovaries, several types of capsule can be recognized based on the type or location of dehiscence:-

**A/ Loculicidal capsules:** have longitudinal lines of dehiscence radially aligned with the locules or between the placenta if septa are absent it splits into valves.

**B/ Septicidal capsules:** have longitudinal lines of dehiscence radially aligned with the ovary septa( or with placenta if septa are absent). Its splits into valves.

**\*\*Valves:** apportion of the pericarp wall that splits off, but does not enclose the seed, valves may remain attached to the fruit or may fall off.

**C/ Circumscissile capsules:** (also called a pyxis) has a transvers (as opposed to longitudinal) line of dehiscence, typically forming a terminal lid as in *Plantago*.

**D/ Septifragal or valvular capsules:** is one in which the valves break off from the septa, as in *Lpomoea* (morning glory).

**E/ Poricidal capsules:** have dehiscence occurring by means of pores as in *Papaver*.

**7- Follicle:** is a dry, dehiscent fruit derived from one carpel that splits along one suture, such as in unit fruit of *Magnolia*.

**8- Legume:** is a dry, dehiscent fruit derived from one carpel that splits along two longitudinal sutures as in fabaceae.

**11- Silicles and siliques:** are dry, dehiscent fruits derived from a two carpeled ovary that dehisces along two sutures but that has an outer rim.

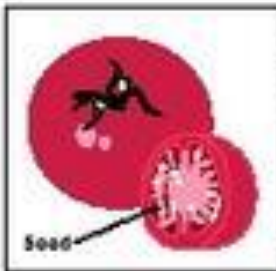
**12- Scizocarp:** is a dry, dehiscent fruit type derived from a two or more loculed compound ovary in which the locules separate at maturity.

**13- Berry:** is the unspecialized term for a fruit with asucculent pericarp as in *Vitis* (grape).

**14- Drupe :** is a fruit with a hard, stony endocarp and a fleshy mesocarp, as in *Prunus*.

**15- Hesperidium:** is a septate fleshy fruit with a thick – skinned, leathery outer pericarp wall and fleshy modified trichomes (juice sacs) arising from the inner walls, as in *Citrus*(orange, lemon, etc.).

**16- Pepo:** is a non –septate fleshy fruit with parietal placentation and leathery exocarp derived from an inferior ovary, as in cucurbitaceae.



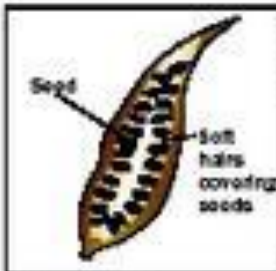
**Berry-**  
A simple, fleshy fruit in which the fruit wall is soft throughout.

Tomato (*Lycopersicon lycopersicum*)



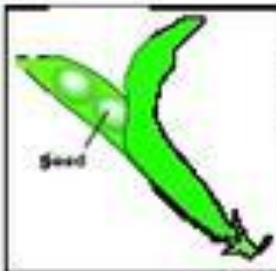
**Drupe-**  
A simple, fleshy fruit in which the inner wall of the fruit is hard and stony (the pit).

Peach (*Prunus pensile*)



**Follicle-**  
A simple, dry fruit that splits open along one suture to release its seeds.

Milkweed (*Asclepias speciosa*)



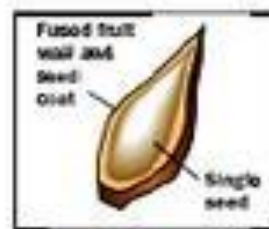
**Legume-**  
A simple, dry fruit that splits open along two sutures to release its seeds.

Green bean (*Phaseolus vulgaris*)



**Capsule-**  
A simple, dry fruit that splits open along three or more sutures or pores to release its seeds.

Pea (*Pisum sp.*)



**Grain-**  
A simple, dry fruit in which the fruit wall is fused to the seed coat.

Wheat (*Triticum sp.*)



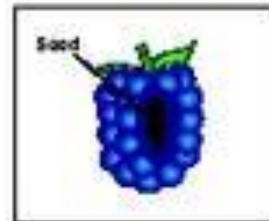
**Achene-**  
A simple, dry fruit in which the fruit wall is separate from the seed coat.

Sunflower (*Helianthus annuus*)



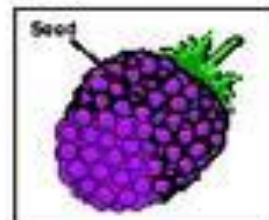
**Nut-**  
A simple, dry fruit that has a stony wall, is usually large, and does not split open at maturity.

Oak (*Quercus sp.*)



**Aggregate fruit-**  
A fruit that develops from a single flower with several to many pistils (i.e., carpels are not fused into a single pistil).

Blackberry (*Rubus sp.*)



**Multiple fruit-**  
A fruit that develops from the ovaries of a group of flowers.

Mulberry (*Morus sp.*)



**Accessory fruit-**  
A fruit composed primarily of tissue (such as the receptacle) other than ovary tissue.

Apple (*Malus sylvestris*)

**\*\*\*Aggregate fruits:** is one derived from two or more pistils (ovaries) of one flower:-

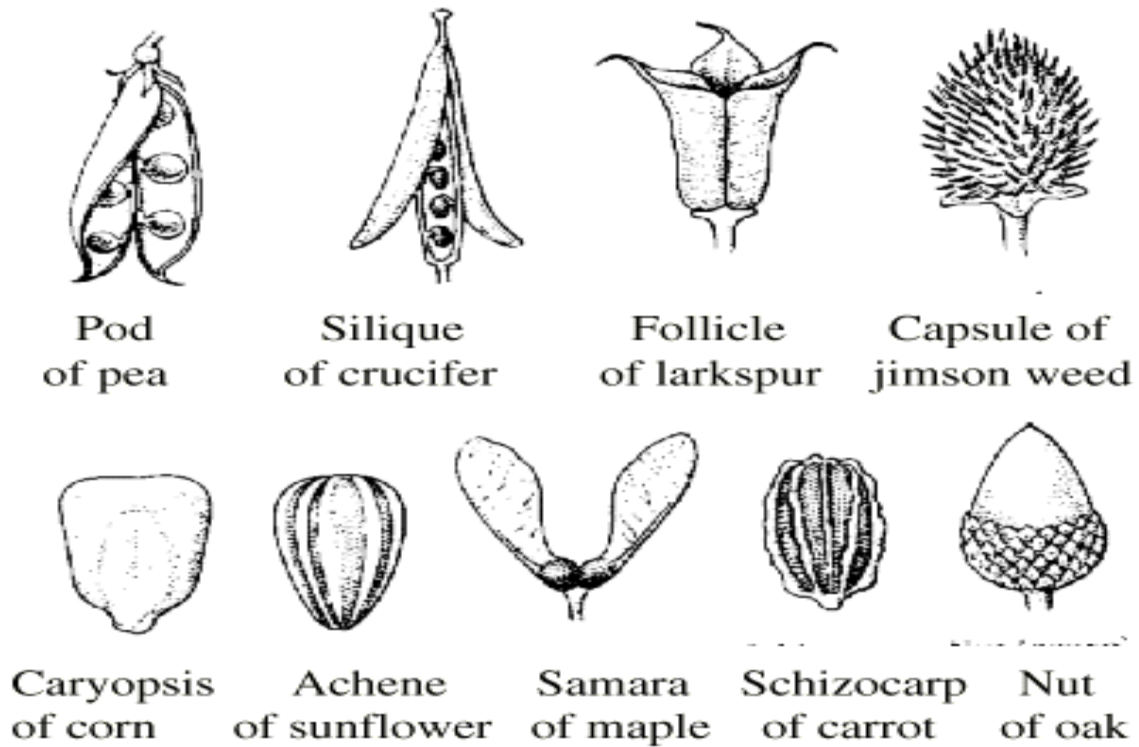
**A/ Achenecetum:** is an aggregate fruit of achenes. A common example is *Fragaria* (strawberry), in which the achenes are on the surface of accessory tissue, an enlarged, fleshy receptacle.

**B/ Drupecetum:** is an aggregate fruit is an aggregate fruit of follicles as in *Magnolia*.

**C/ Syncarp:** is an aggregate fruit, typically of berries, in which the fruits fuse together, as in *Annona* (note that syncarps may form at the floral stage or later during fruit development, if the latter, the fruit is sometimes called a **pseudosyncarp**).

**\*\*\*\*\*Multiple fruits:** is one derived from two or more flowers that coalesce. Types of multiple fruits:-

- 1- Sorosis: is a multiple fruit in which the unit fruits are fleshy berries and are laterally fused along a central axis as in *Ananas* (pineapple).
- 2- Syconium: is a multiple fruit in which the unit fruits are small achenes covering the surface of a fleshy, inverted composed receptacle (derived from a hypanthodium) as in *Ficus*.



### \*\*\*\*Seeds:

Aspects of seed morphology can be important systematic characters used in plant classification and identification. Parts of seed is:

- 1- **Seed coat:** the outer protective covering of seed derived from the integument. Seed coat consist of two fused layers: **a/ testa**  
**b/ tegmen**

**\*\*sarcotesta:** a seed coat that is fleshy at maturity .

- 2- **Hilum :** the scar of attachment of the funiculus on the seed coat.

- 3- **Raphe:** a ridge on the seed coat formed from an adnate funiculus.

**\*\*Embryo:** is the immature sporophyte, it consist of:
















**A/ Epicotyl :** the immature shoot.

**B/ Radical:** the immature root.

**C/ Hypocotyl:** the transition region between the root and epicotyl.

**D/ Cotyledon:** the first leaf/leaves of the embryo, often functioning in storage of food reserves.

**How Seeds Travel**

by the wind	by animals	by water	by bursting	by humans
 milkweed	 beggar-ticks	 lotus	 violet	 bean
 dandelion	 sandbur	 cattail	 jewelweed	 wheat
 maple	 blackberry	 coconut	 witch hazel	 cherry

© 2006 Encyclopædia Britannica, Inc.