College of Science Al-Mustanseiriyah University Dep.: Biology

Academic year: 2014-2015 Subject: Plant taxonomy Class: Third Grade

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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, bladdery or inflated, one-seeded, dry fruit, utricles 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.

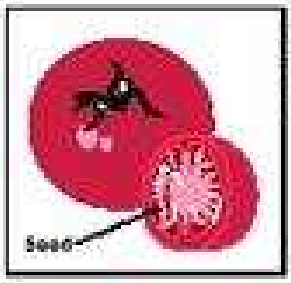
12- Scizocarp: is a dry, dehiscent fruit type derived from a two or more loculed compound ovary in which the locules separate at maturity.

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 cucurbtaceae.



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

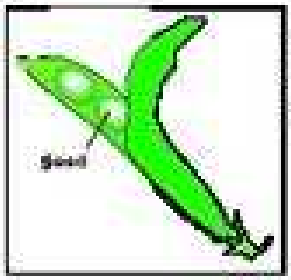
Tomato (*Lycopersicon lycopersicum*)

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

Peach (*Prunus persica*)

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

Milkweed (*Asclepias syriaca*)



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.

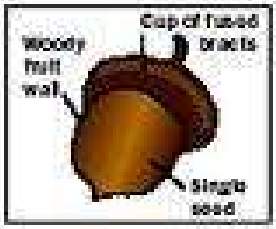
Iris (*Iris* sp.)

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

Wheat (*Triticum* sp.)

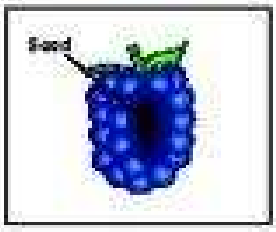
Achene-
A simple, dry fruit in which the fruit wall is separate from the seed coat.

Sunflower (*Helianthus annuus*)



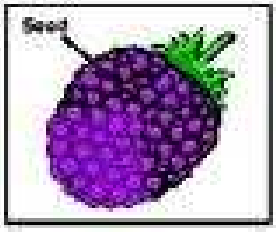
Nut-
A simple, dry fruit that has a stony wall, is usually large, and does not split open at maturity.

Oak (*Quercus* sp.)



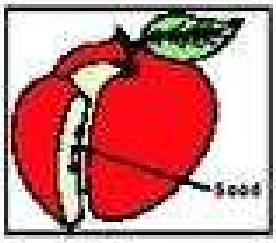
Aggregate fruit-
A fruit that develops from a single flower with several to many pistils (i.e., carpels are not fused into a single pistil).

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:-

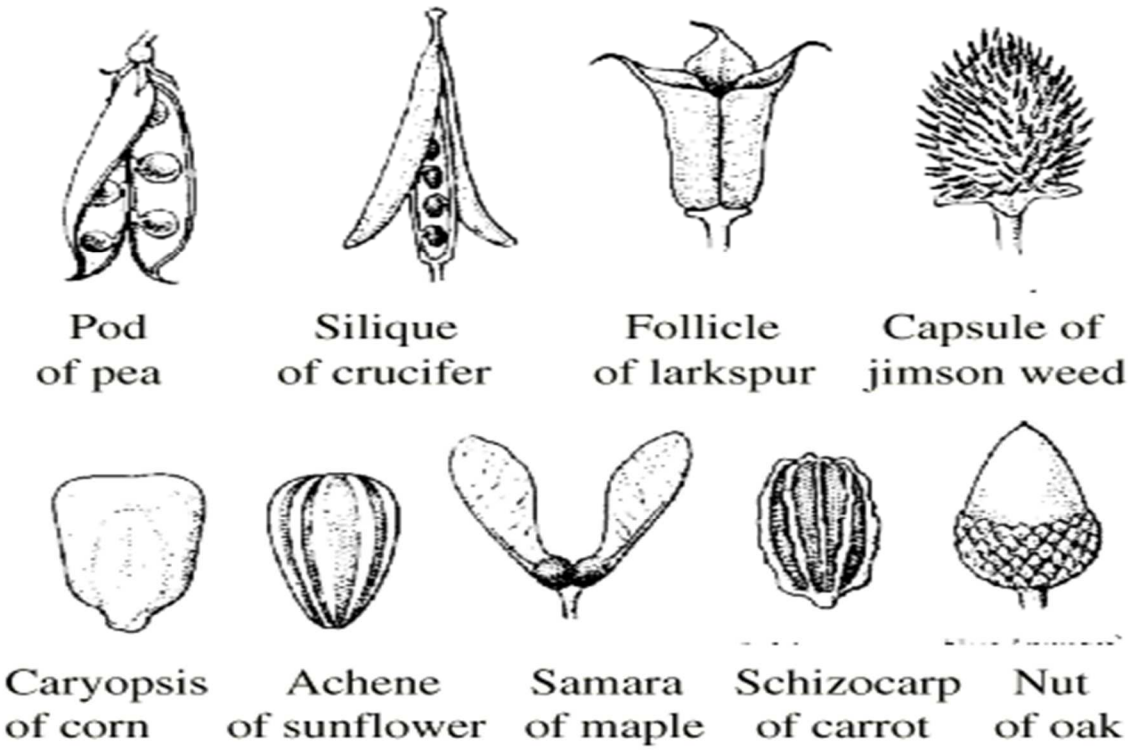
A/ Achenecetum: is an aggregate fruit of achenes. A common example is Fragaria(strawberry), in which the achenes are on the surface of accessory tissue, an enlarged, fleshy receptacle.

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 ssed 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.