APOMIXIS AND POLYEMBRYONY

Apomixis:

- To produce seeds without fertilization. e.g. Asteraceae and grasses.
- Apomixis is a form of asexual reproduction that mimics sexual reproduction.
- There are several ways of development of apomictic seeds-Diplospory, Apospory, Adventive embryony.
- In some species, the diploid egg cell is formed without reduction division and develops into the embryo without fertilization. This process is called as diplospory / recurrent agamospermy / recurrent apomixis.
- Apomictic embryos are genetically similar and are called as clones.
  Importance of apomixis -
- Hybrid seeds increase productivity and have better character but they show inbreeding depression so hybrid seeds are produced every year and are costly.
- If these hybrids are made into apomicts, there is no segregation of characters in the hybrid progeny. Then the farmers can keep on using the hybrid seeds to raise new crop year after year and he does not have to buy hybrid seeds every year.
- Because of the importance of apomixis in hybrid seed industry, active research is going on in many laboratories around the world to understand the genetics of apomixis and to transfer apomictic genes into hybrid varieties.

Polyembryony:

Development of more than one embryo in the seed had been termed as polyembryony. It was first observed by Leeuwenhoek (1719) in Citrus seeds.

Types of polyembryony:

On the basis of origin, the following four types of polyembryony have been recognized in Angiosperms-

(a) Formation of more than one embryo sac within the same ovule. Eg: Casuarina montana.
(b) More than one pollen tube entering an ovule and fertilizing synergid or an antipodal cell Eg: Ulmus, Sagittaria.
(c) Cleavage Polyembryony, which develops due to Cleavage or splitting of one embryo into two or more embryos Eg: Orchids, Nymphaea, Nicotiana.
(d) Adventive Polyembryony, in which sporophytic cell of the ovule (Diploid nucellar or integument cells) proliferate to form embryos. Eg: Citrus, Opuntia and Mangifera.

- In Balanophora, an adventitive embryo can develop from endosperm.
- Polyembryony is called true if extra embryos develop from the same embryo sac and false if they are formed from two different embryosac, it is rare in angiosperms.