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Dept. of Botany

class : 12th

Unit : 1 (Sexual Reproduction)

Chapter : Development of seed and Fruit

Topic : Embryo formation or Embryogeny

Lecture No. - 12

Date : 20/07/2020

Embryo formation:

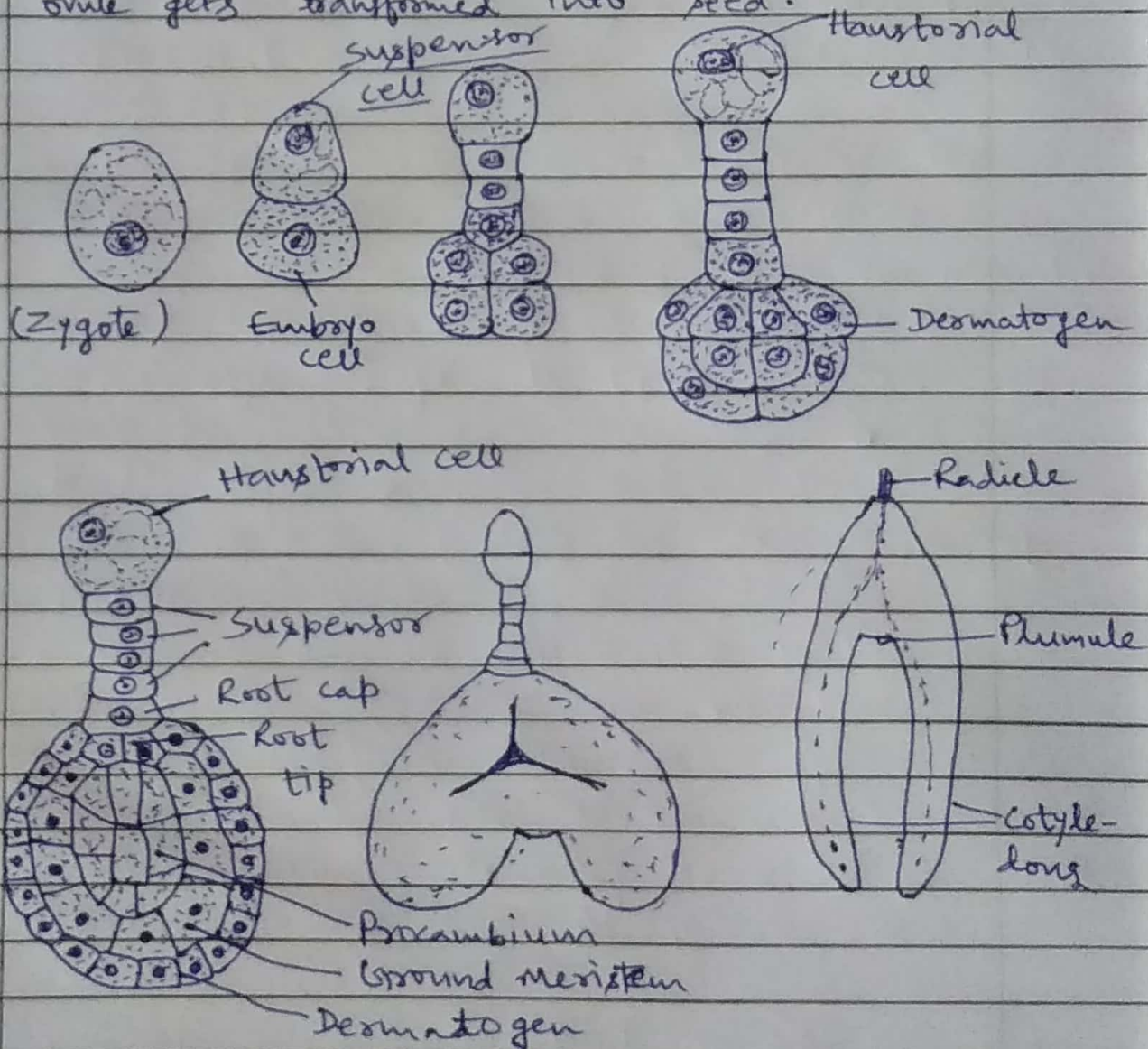
After fertilization, the zygote or oospore develops into embryo. All the changes that occur during the development of embryo from a zygote or oospore is known as embryogeny.

- In a typical dicot, the zygote elongates and then divides by a transverse wall into two unequal cells.
- The larger basal cell is called suspensor cell.
- The other towards the antipodal end is termed as terminal cell or embryo cell.
- The suspensor cell divides transversely a few times to produce a filamentous suspensor of 6-10 cells.
- The suspensor helps in pushing the embryo in the endosperm.
- The first cell of the suspensor towards the micropylar end becomes swollen and functions as a haustorium.
- The haustorium has wall ingrowths similar to transfer cells.

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- The last cell of the suspensor at the end adjacent to the embryo is known as hypophysis.
- Hypophysis later gives rise to the radicle.
- The embryo cell undergoes two vertical divisions and one transverse division to form eight cells arranged in two tiers - epibasal (terminal) and hypobasal (near the suspensor).
- The epibasal cells eventually form the two cotyledons and the plumule.
- Only one cotyledon is produced in monocots.
- The hypobasal cells produce the hypocotyl except its tip.
- The eight embryonic cells or octants divide periclinally to produce an outer layer of protoderm or dermatogen.
- The inner cells differentiate further into procambium and ground meristem.
- Protoderm forms epidermis, procambium gives rise to stele or vascular strand and ground meristem produces cortex and pith.
- Initially the embryo is globular and undifferentiated.
- Early embryo with radial symmetry is called proembryo. It is transformed into embryo with the development of radicle, plumule and cotyledon.
- Two cotyledons differentiate from the sides with a faint plumule in the centre.

- At this time, the embryo becomes heart-shaped.
- The rate of growth of the cotyledons is very high so that they elongate tremendously while the plumule remains as a small mound of undifferentiated tissue.
- Subsequently the embryo undergoes rest as the ovule gets transformed into seed.



(Fig: Stages in the development of a dicot embryo)