

The fused nucleus resultant on fertilization is the diploid zygote. Its nucleus divides twice to form four nuclei which migrate at the chalazal end of an enlarged zygote. The four nuclei now divide simultaneously forming two tiers of four nuclei each. The cell walls are laid down across the four basal nuclei and this way four small cells have been produced at the lower end of the oospore. Both the tiers in the subsequent division form a sixteen-celled proembryo having four tiers of four cells each, they are from below upwards as ① the embryonal gives rise to embryo proper; ② the suspensor tier - cells of which elongate immensely forming the suspensor or the primary suspensor which pushes the embryonal tier down into the ♀ gametophyte. ③ rosette tier - which is sometimes meristematic ④ the uppermost tier - is open at top and is active for nutrition.

The cells of the embryonal tier divide further into proximal secondary suspensor (Sporne, 1965). All the four secondary suspensors or embryonal tubes split apart from one another, each bearing an embryonal tier at its tip. This splitting event results in forming the cleavage polyembryony with the elongation.

In some sps the phenomenon of rose the polyembryony has also been noticed. In this case, four additional embryos develop from the rosette cells.

Of the several embryos produced per ovule, which is now called a seed,



one survives which all the rest being demerited. The embryonal tier on further segmentations forms a multicotyledonary embryo.

### Structure of embryo:-

The mature embryo consists of a shoot axis with the radicle towards the micropylar end and a small plumule opposite to radicle. The plumule is surrounded by a number of tiny cotyledons which are green within the seed (Willis 1966). The lower part of the axis is the hypocotyl. The coiled and withered suspensor may be attached at the upper end. This embryo is the new sporophyte.

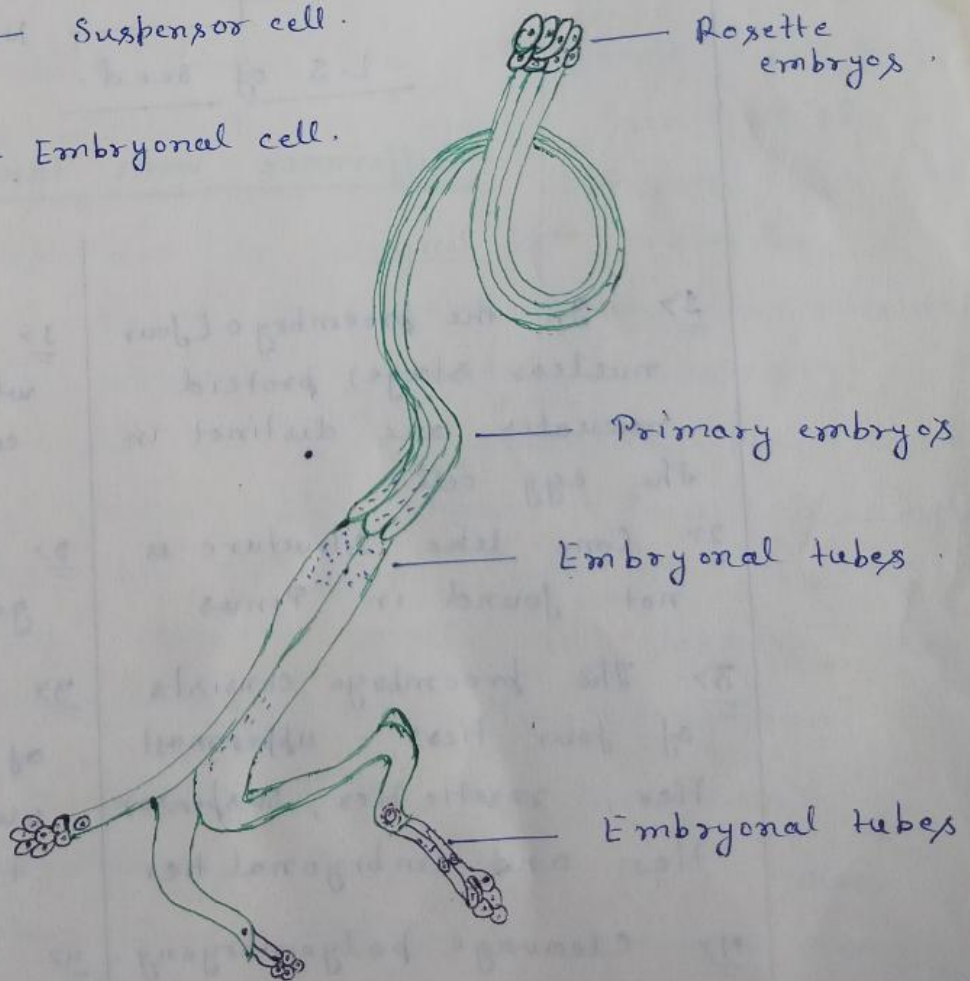
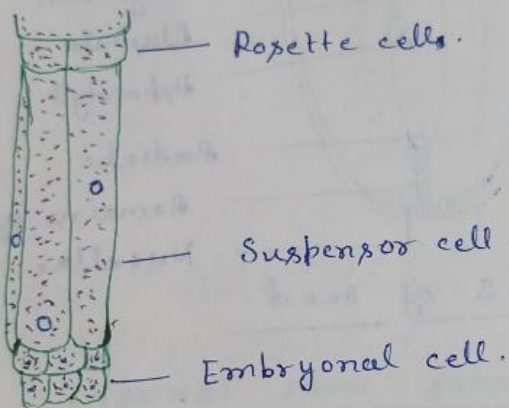
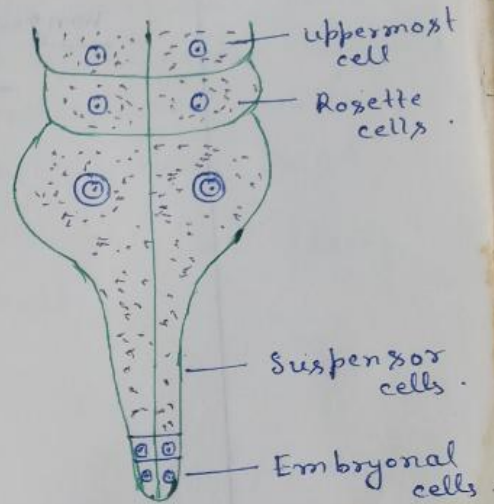
The Seed:- The seed consists of the following structure —

1. Embryo :- It contains a straight mature embryo.
2. Endosperm :- It is laden with reserve food. The embryo embedded in it absorbs its nutrition from it. Towards the pointed end of the endosperm is the nucellar cap which represents the remains of the nucellus.
3. Perisperm :- It is also present in the form of a thin membranous reddish brown pearly structure at the micropylar end in a remnant of the nucellar tissues.
4. Seed Coat :- The integument of the ovule becomes the seed coat or testa. The testa is hard and stony as it develops from the middle stony layer of the integument and the inner soft layer forms a thin brown membranous covering called the tegmen.

5. Wing:- The seed has a thin membranous wing which is derived from the surface of ovuliferous scale. The wing helps in the dispersal of the seed.

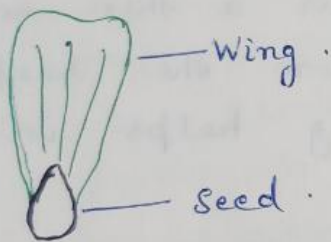


Division of nucleus

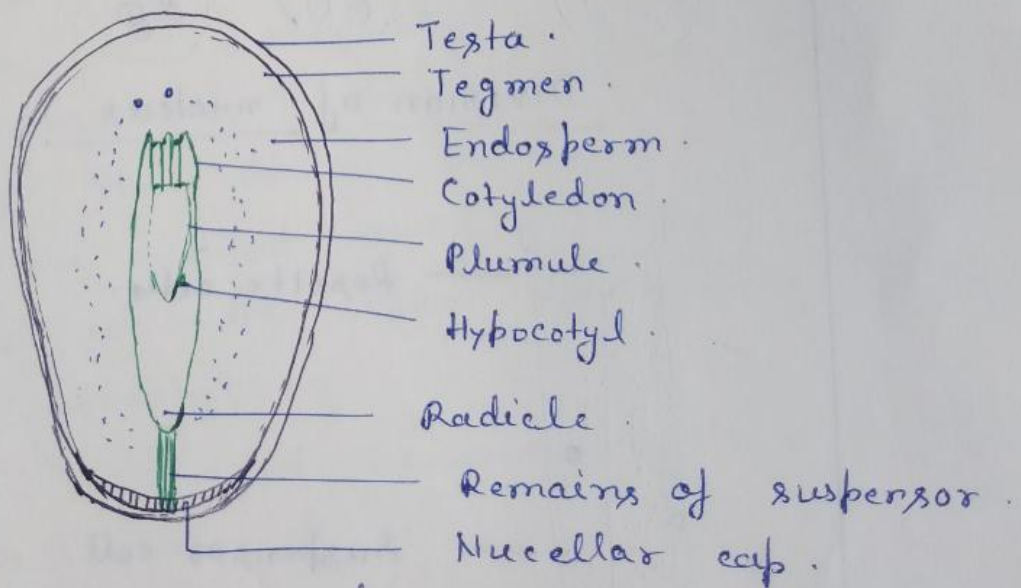
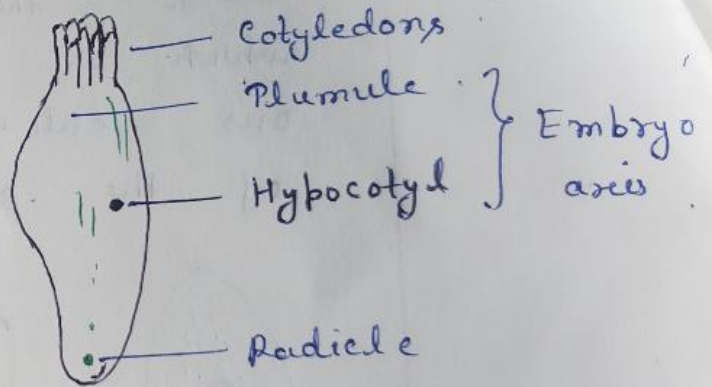


Embryo of Pinus





winged seed of Pinus.



L.S. of seed.

Difference with Taxus.