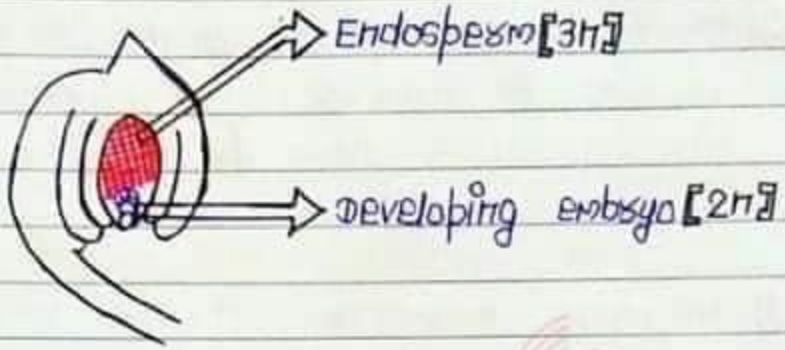

SPECIAL POINTS :=

(i). Endosperm is absent in some of Angiosperms.

eg:= T Trapaceae , O Orchidaceae , P Podostemaceae

TOP ⇨ TRICK FOR REMEMBER.

(ii). The "endosperm" in "Betelnut"/"Arecanut [Arecaceae]" and "Ammonaceae family" is rough surfaced. It is known as "ruminate endosperm".

(iii). ** In "tomato" and "Maize" endosperm is mosaic like, it is known as "Mosaic endosperm".

(iv). *** The "drinking portion" [coconut water] is "nuclear endosperm" and "edible or white portion" is "cellular endosperm".

⇨ Some plants have "diploid endosperm" instead of Triploid.
eg:= Oenothera

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** [v] In cereals peripheral layer of endosperm are rich in protein is known as "Aleurone layer [3n]".

[vi] Starchy endosperm is found in some plants.

eg:= Rice, Wheat, Maize

Q. In Coconut types of endosperm is ?

[i] Nuclear
[ii] Cellular
[iii] Both
[iv] None of the above

NOTE ⇨ If both are not given then the answer will be Nuclear.

Q. Megaspore cell have chromosome number 12 then what will be chromosome number in Aleurone layer ?

Sol:= n = 12 [Given]

∵ Aleurone layer have 3n ploidy, so no. of chromosome = 3×n
= 3×12
= 36 Ans.

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**

[vii]. Effect of pollens inside embryosac on endosperm is known as "Xenia".

eg: Maize

**

[viii]. Effect of pollens outside the embryosac on seed coat is known as "Metaxenia".

eg: Date palm

***

- NON ENDOSPERMIC / EX-ALBUMINOUS SEED ⇨ Endosperm is completely utilised by developing embryo.

  eg: Gram,
  Ground nut,
  Pea,
  Beans.

***

- ENDOSPERMIC / ALBUMINOUS SEED ⇨ When endosperm is not completely utilised by developing embryo.

  eg: Wheat,
  Rice,
  Coconut,
  Maize,
  Barley,
  Castor, Sunflower

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DEVELOPMENT OF EMBRYO IN DICOT

- Development of "embryo" in "capsella" was discovered by "Hanstein".

- Embryo develops at the micropylar end of the embryo sac where the zygote is situated.

  Mostly zygote divides only after certain amount of endosperm is formed. This is an adaptation to provide assured nutrition to developing embryo.

- "1st division" of oospore is "transverse", results two cells are formed. The one cell lies towards "micropyle" is called "basal cell"/"suspensor cell".

  The other cell lies towards "chalaza" is called "apical"/"terminal cell"/"embryonal cell".

- The basal cell and embryonal cell divide simultaneously.

  The embryonal cell divides by mitotic divisions to gives rise to the proembryo and subsequently to the "globular", "heart shaped" and "mature embryo".

- The suspensor cell divides by mitotic divisions to forms a "6-10 celled" long filament like structure which is termed as suspensor.

- The main function of suspensor is to push the developing embryo into food laden endosperm to provide nutrition.

- The micropylar cell of the suspensor swell up. This cell of suspensor is known as "haustorial cell".

- In "capsella" due to curved position of body of ovule embryo becomes curved. This curved position of the embryo is called "Torpedo".

  ⇩

  Mature embryo

- An axis is present between plumule and radicle is called "embryonal axis".

  It is also called "Tigellum".

  ⇩

  Main embryonal axis.

- Both the cotyledons are present at lateral position of embryonal axis and plumule is formed in terminal position in dicotyledon embryo.

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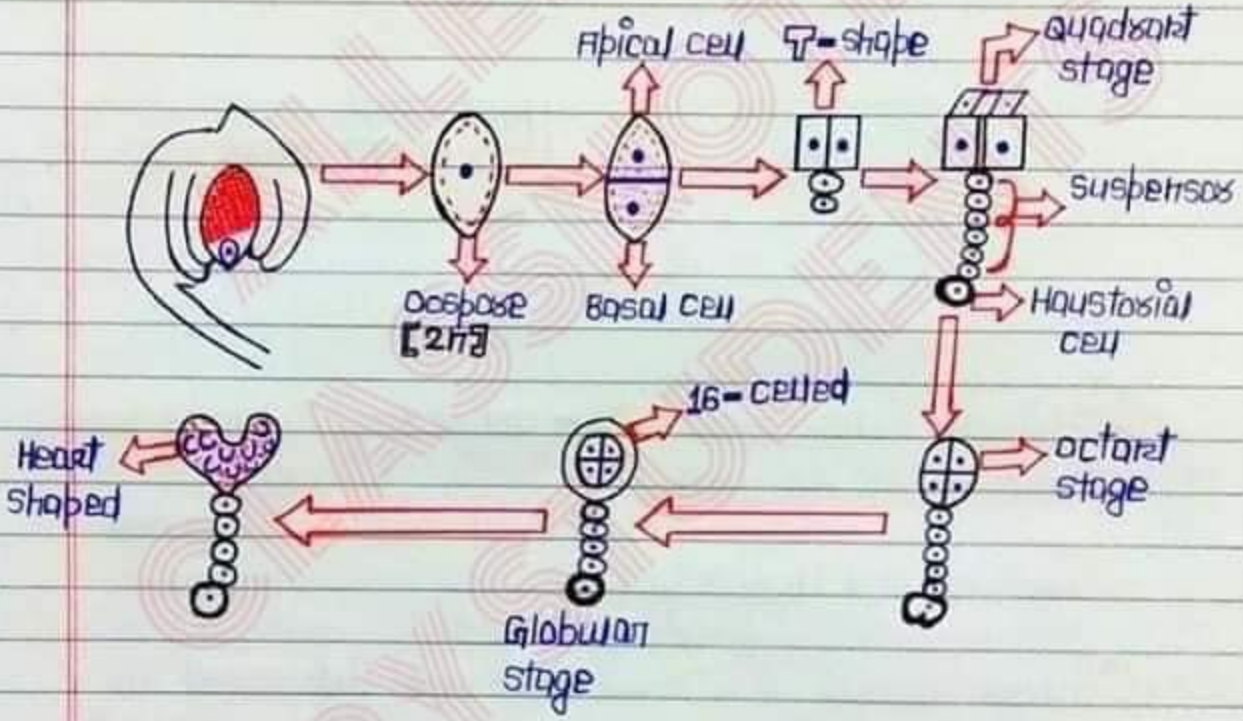
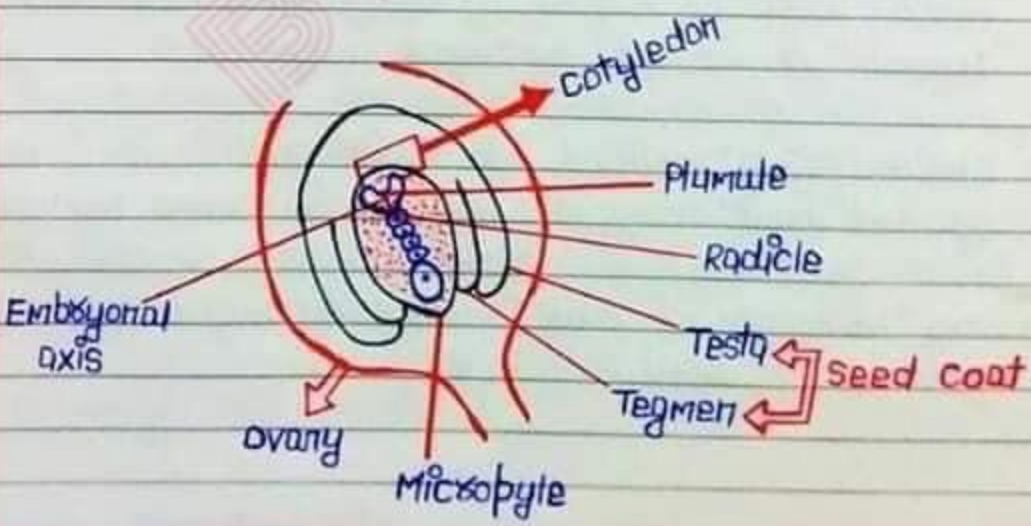
☞** This type of development of embryo is known as Crucifer type or onagrad type.

It is the most common type of embryo development in Dicots.

☞** Crucifer type of embryo development is found in capsella.





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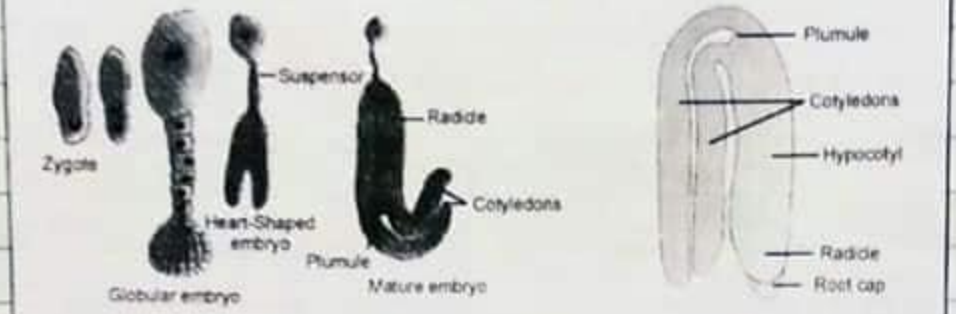

THE DEVELOPMENT OF EMBRYO IN A DICOT (*Capsella*)

↳ NCERT [FIGURE]

- "Epibasal cells" formed "2- cotyledons", "epicotyl" and "plumule" of the embryo.
  "Hypobasal cells" are formed "radicle" and "hypocotyl".

- After fertilization "ovule" converts into "seed" in which "testa" is formed by "outer integument" and "tegmen" is formed by "inner integument".

- Entire "ovary" modified into "fruit". This fruit is formed by fertilized ovary so that it is called true fruit.

- Only "Micropyle of ovule" remains unchanged and also present in seed.

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2* In some of Angiosperms, fruit is formed from ovary without fertilization which is known as "parthenocarpic fruit".

2* In some fruits parthenocarpy is useless [if edible part is endosperm or seed].

eg:= Pomegranate

DEVELOPMENT OF EMBRYO IN MONOCOT

The early development of dicot and Monocot embryos are similar upto, globular stage.

The Oospore divides transversely to form a Suspensor cell towards Micropylar end and embryonal cell towards chalazal end.

** The embryonal cell divides transversely into a terminal and a middle cell.

The terminal cell divides repeatedly to form a globular embryo which form a massive cotyledon and plumule.

The Middle cell gives rise to hypocotyl and radicle.

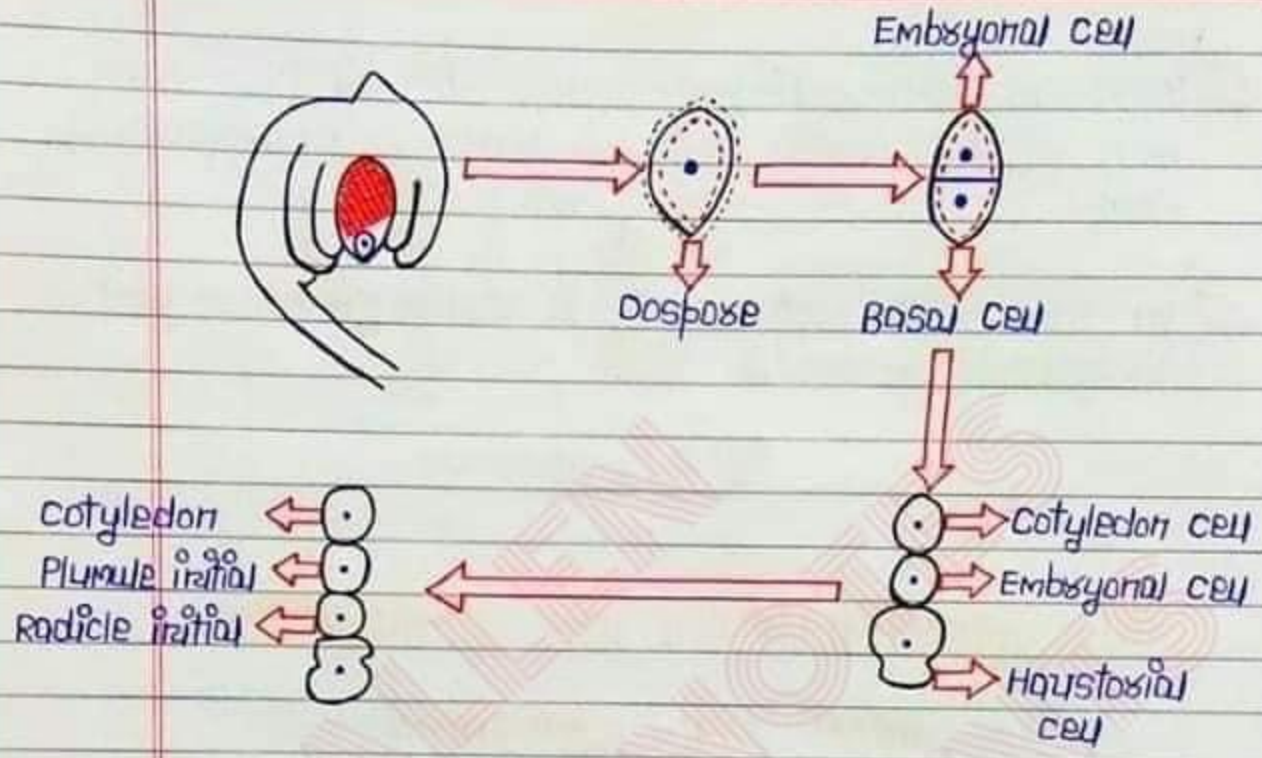

FIG:= DEVELOPMENT OF EMBRYO IN MONCOTS

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- In the "grass family" the cotyledon is called "scutellum" [shield shaped] that is situated towards "one side" [lateral] of the "embryonal axis".

At the lower end of it, the embryonal axis has the radical and root cap enclosed in an undifferentiated sheath called "coleorrhiza".

The portion of the embryonal axis above the level of attachment of scutellum is the epicotyl.