

5. Study of V. S. of anatropus ovule through a permanent slide/ relevant chart.

Ovule (megasporangium) is enclosed in the ovary. There may be one or many ovules in an ovary.

Aim study of anatropous ovule and functions of its various parts.

- The ovule in which micropyle, chalaza and funicle are not in one straight line and integuments run parallel to funicle is called as **anatropus ovule**. It is also called as inverted ovule and is the most common type of ovule, in angiosperms.
- The ovule shows two main parts as: - body and funicle.
- The body shows two integuments originating from base of ovule reaching up to the tip of ovule. The tip shows a small cleft, left by two integuments called as micropyle.
- The integuments enclose a mass of fertile, parenchymatous, diploid cells called nucellus. There is only one fertile cell located more or less in the centre of nucellus but towards micropylar end of ovule this is called **megaspore mother cell**. It finally develops into only one female gametophyte (embryo sac).
- In monosporic embryo sac, the female gametophyte. It is 8-nucleated and 7-celled structure.
- Female gametophyte consists of egg apparatus, 2-polar nuclei and 3-antipodal cells.
- The egg apparatus is located closer to the micropylar end of embryo sac. It consists of central haploid **egg cell** and 2 supporting laterally placed **haploid synergids**.
- In mature female gametophyte, the 2 polar nuclei fuse to form the **diploid secondary nucleus** (definitive nucleus).

Fig

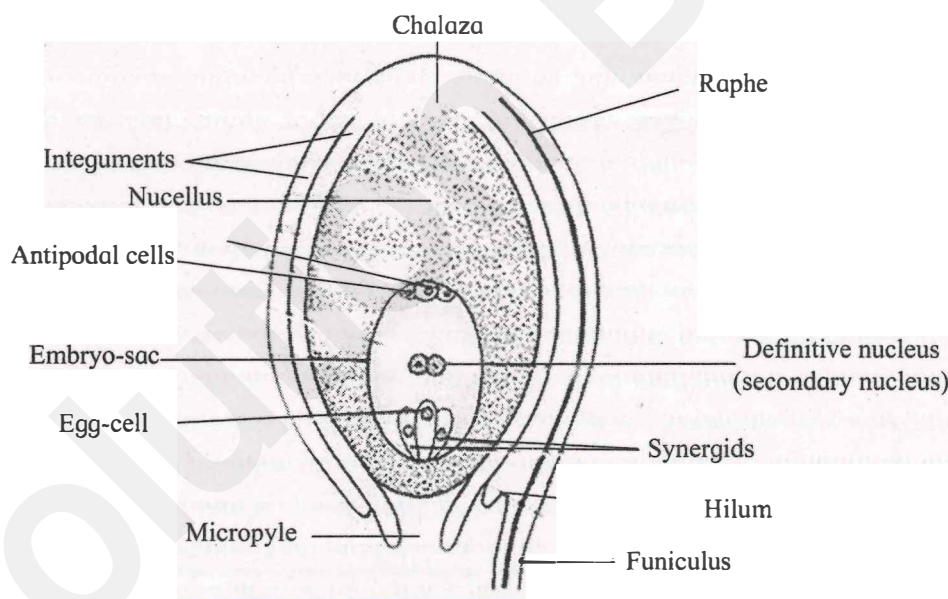


Fig. V. S. of anatropus ovule

- Sketch figure

Comment on the special feature of anatropous ovule and embryo sac :

Anatropous ovule-

1. The most common form of ovules is anatropous ovule, which occurs in more than 80% of angiospermic families.
2. The ovule body is turned 180° and micropyle comes close to the funiculus. Chalaza and micropyle lie in the straight line but hilum is at 90° to the micropyle. The micropyle, then, is close to funiculus.
3. There is also a ridge in the ovule, as the ovule body is fused on one with the funiculus.

Embryo sac

The embryo sac or female gametophyte is an oval structure present in the ovule of flowering plants. An embryo sac is said to form when the haploid megaspore nucleus divides. It possesses two haploid nuclei and six haploid cells which do not have cell walls.

Questions

1. What is ovule?

A structure in seed plants that consists of the embryo sac surrounded by the nucellus and one or two integuments and that develops into a seed after it is fertilized.

2. Enlist the functions of micropyle prior to fertilization and after fertilization in the ovule of angiosperms.

Micropyle plays a significant part in the germination of the seed.

To start with, the pollen tube reaches the ovule to deposit the sperm for fertilization from the micropylar end.

Secondly at the time of germination of the seed the micropyle assists in the function of water absorption and finally the roots emerge through the micropyle during seeds germination.

3. What is the double fertilization ?

Double fertilisation: It is the process of fusion of one male gamete with the egg nucleus and another male gamete with the polar nuclei or secondary nucleus is called double fertilisation.

4. Give functions of :

a. Integuments

The integuments develop into the seed coat when the ovule matures after fertilization

b. Nucellus

It houses the embryo sac as well as nutritive tissue

c. Funicle

It contains a strand of conducting tissue leading from the placenta into the chalaza.

d. Synergid cells

play an essential role in pollen tube guidance and function.

e. Antipodal cells

Antipodal cells are present at the chalazal end. Antipodals are nutritive in function; it nourishes the embryo sac. Substances produced by the antipodals helps in the growth and development of the endosperm.

5. Distinguish between female and male gametophytes in angiosperms.

MALE GAMETOPHYTE VERSUS FEMALE GAMETOPHYTE	
MALE GAMETOPHYTE	FEMALE GAMETOPHYTE
Life stage of heterosporous plants which produces male gametes	Life stage of heterosporous plants which produces female gametes
Derived from the microspore or pollen grain	Derived from the megaspore
Originates inside the microsporangium	Originates inside the megasporangium
Has three cells; all the cells are functional	Has eight cells; only two cells are functional
Has two phases of growth	Has a single phase of growth
Leaves the microsporangium	Remains inside the megasporangium
Disintegrates after fertilization	Produces new structures after fertilization
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