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Dept. of Botany

class: 12th

Unit: 1 (Sexual Reproduction)

chapter: Fertilization in flowering plant.

Topic: Fertilization

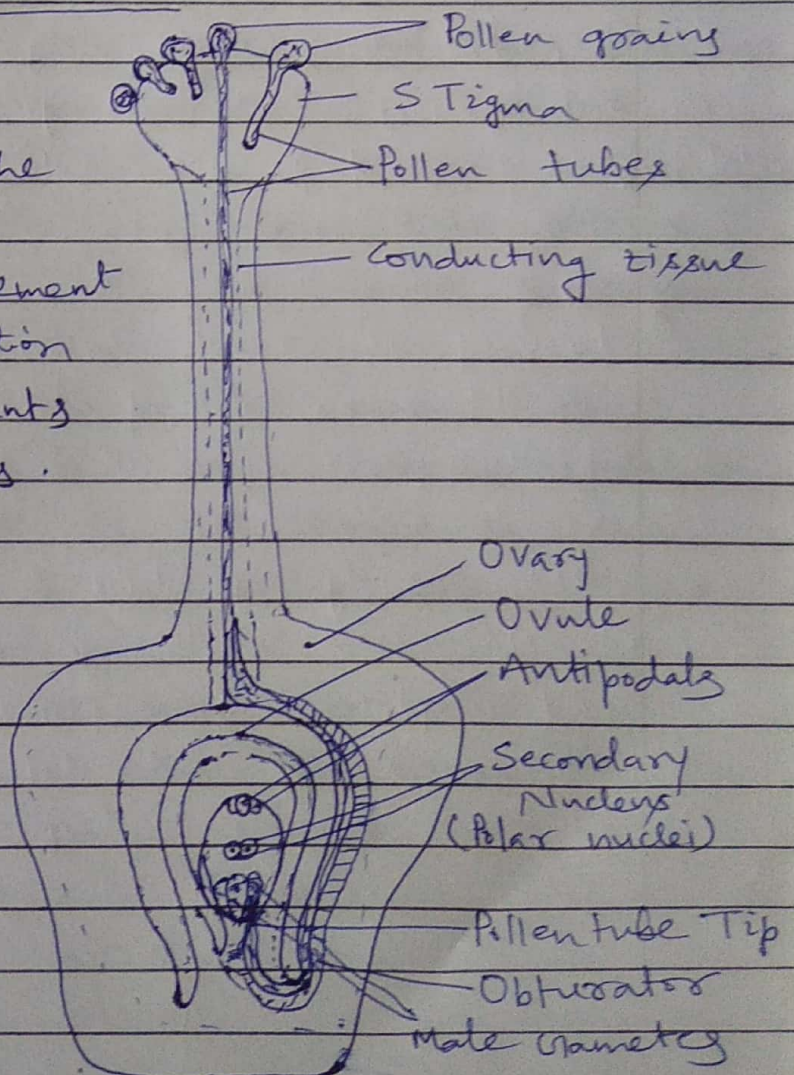
Lecture No. - 06

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Fertilization in Flowering Plants:

The fusion of male and female gametes is called fertilization.

Diagram showing here describes the structural and functional arrangement during fertilization in flowering plants or angiosperms.



(Fig: Fertilization in a flowering plant or (Angiosperm))

In flowering and seed plants (Angiosperms), the male gametes are brought to the egg containing female gametophyte by a pollen tube and the phenomenon is called siphonogamy.

A large number of pollen grains come to germinate over the stigma.

A pollen grain does not pass down the stigma. Only its pollen tube does so. The pollen tube eats its way through the solid part of the stigma and style by secreting pectinases and hydrolytic enzymes.

Formation of Pollen tube:

Initial growth of the pollen tube takes place on expenditure of food present in the pollen grain.

For further growth, the pollen tube obtains its nourishment from the interior of stigma and style.

The contents of the pollen grains shift into pollen tube with the tube or vegetative nucleus moving to its tip followed by the two gametes and passes inside the ovary through the style.

Style may be hollow or solid.

Hollow style has a canal lined by special large cells. Solid style has a special tissue of pectinised thick walls known as transmitting or conducting tissue.

The pollen tube travels along the lining of canal in hollow style drawing nourishment

from its living cells.

In solid style, the pollen tube grows through transmitting tissue by separating their cells through secretion of pectinases.

- In the ovary, the growth of the pollen tube is directed by another tissue called Obturator.

- The pollen tube enters the ovule, either through its micropyle (porogamy; Lily), chalaza (chalazogamy; Casuarina) or the sides after piercing through the integuments (Mesogamy; Cucurbita).

After entering the ovule, the pollen tube is attracted towards the micropylar end of the embryo sac.

The attractants are secreted by synergids.

The pollen tube pierces one of the two synergids and bursts open into it.

Out of the two male gametes, one fuses with the egg or oosphere to perform generative fertilization, also called Syngamy or hove fertilization.

It gives rise to a diploid zygote or oospore. Soon after, the vacuole and plasmodesmal connections of the egg degenerate. It now becomes ready to produce the embryo.

(Continued in next lecture)