

Topic: Microgametogenesis

B.Sc. Botany Sub. II

Group: B

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Microgametogenesis (Development of Male Gametophyte):

- Microspore i.e., the pollen grain, is the first cell of the male gametophyte, which contains only one haploid nucleus.
- During early stage of development, it remains within the microsporangium.
- The cell undergoes unequal division and forms a small generative cell and a large vegetative or tube cell.
- Initially the generative cell remains lying at one corner of the spore wall.
- Within short time, it gets detached and becomes ellipsoid or fusiform in shape and remains suspended in the cytoplasm of the vegetative cell (2-celled stage i.e., vegetative cell and generative cell).
- Later on, the generative cell divides and gives rise to two ellipsoidal or

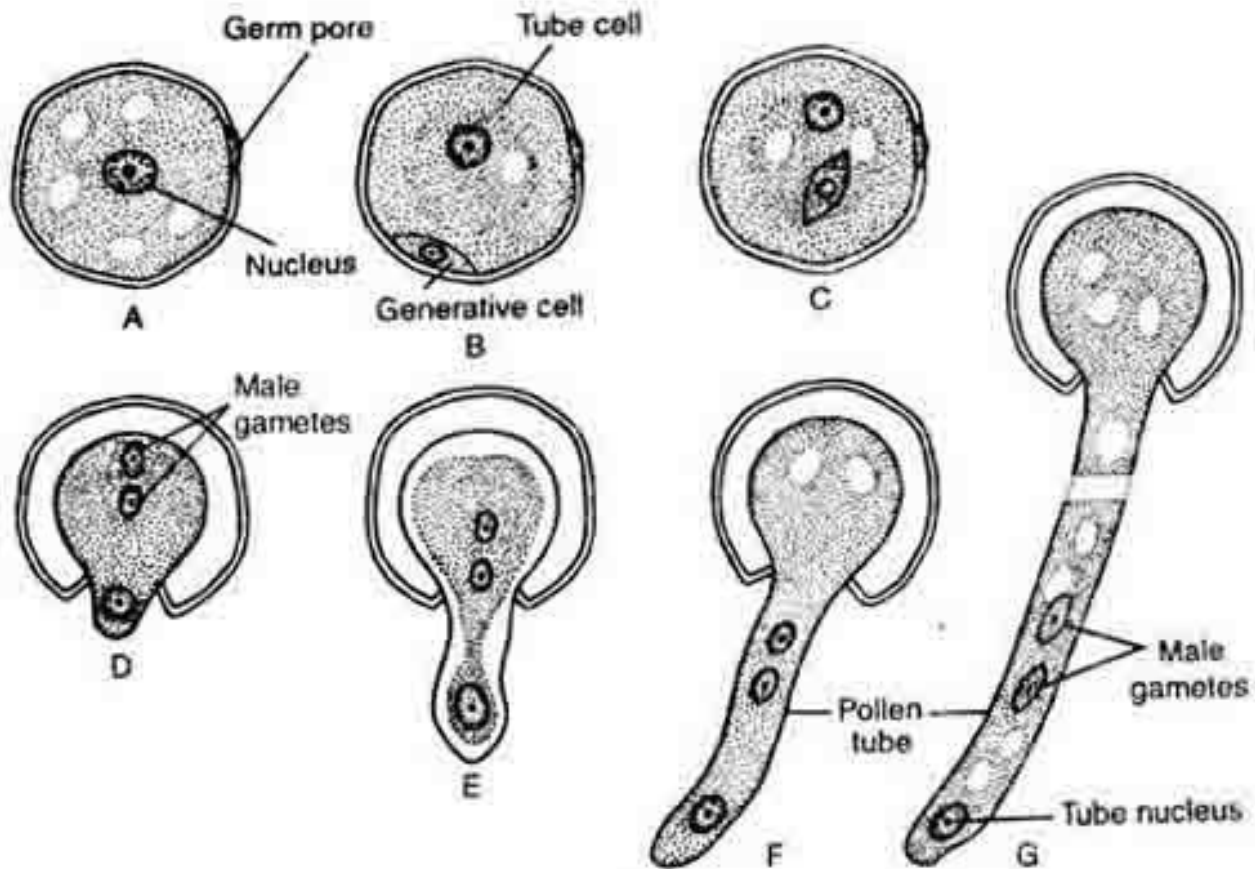



Fig. : A-G. Germination of the pollen grain and development of the male gametes

lenticular or spherical cells - the male gametes (3-celled stage i.e., vegetative cell and two male gametes).

- The second division i.e., the division of generative cell, may take place either in the pollen grain or in the pollen tube which develops through germ pore after pollination.
- The nucleus of the vegetative cell is commonly known as tube nucleus.
- It usually shows sign of degeneration with the maturation of generative cell.
- Finally the tube nucleus remains within spore or may enter the pollen tube. Sooner or later it may be degenerated completely.

Significance of tube nucleus:

Earlier workers thought that the tube nucleus had great significance in the direction of growth of the pollen tube, as it is usually present just behind the



growing point within the pollen tube.

However, recent workers differ with the above opinion and consider it as a purely non-functional vestigial structure, based on the following facts-

- In branched pollen tube, the tube nucleus remains in one tube, but all the tubes grow normally.
- It does not always occupy the position behind the growing point within the pollen tube, but in many cases it lies behind the male gametes.
- In some cases, the growing pollen tube does not have any tube nucleus as it degenerates prior to the development of pollen tube.