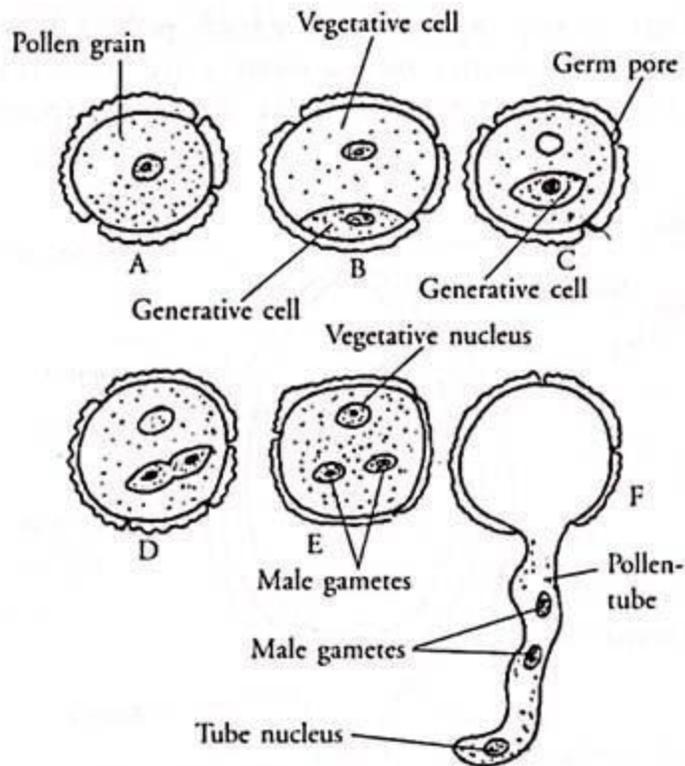


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Paper: IVth  
Topic: Microgametogenesis  
Lecture no. 18

### **MICROGAMETOGENESIS:**

Microgametogenesis is a process by which progressive development of the unicellular microspores takes place where they get developed to mature microgametophytes containing gametes. The development phase of microspores takes place with the onset of expansion of microspore. In this phase, a single large vacuole is produced within the microspore cell. The formation of the vacuole results in the movement of the nucleus of the microspore to an eccentric position. The displacement of the nucleus occurs against the wall of the microspore cell. At this position within the cell, the nucleus undergoes mitosis.

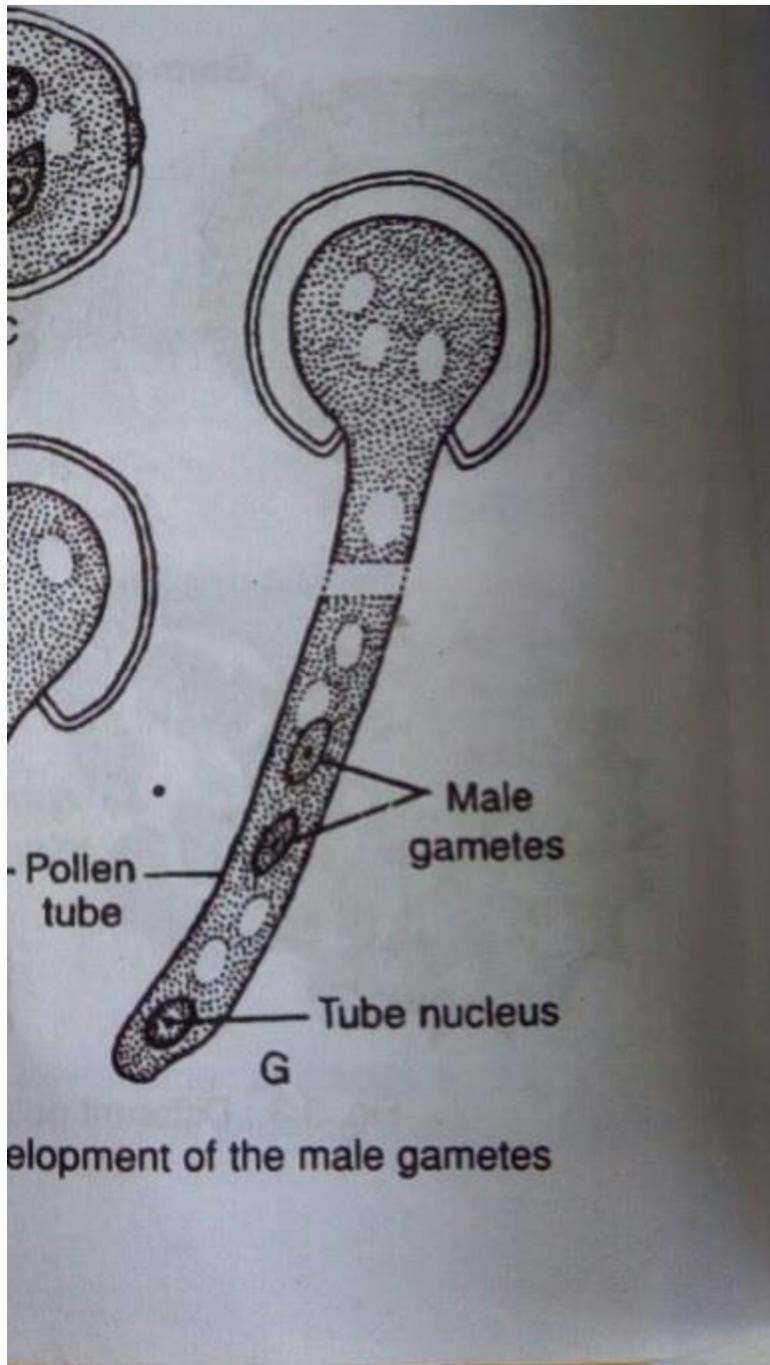
Microspore .i.e, the pollen grain is the first cell of the male gametophyte, which posses one haploid nucleus. During early stages of development, it remains within the microsporangium i.e, its germination starts within the microsporangium.



**Fig. 12** Development of male gametophyte.

The nucleus of the pollen grain undergoes unequal division and forms a large vegetative or tube cell and a small generative cell. Initially, the generative cell remains lying at one corner of the spore wall. Later it gets detached and gets suspended in the cytoplasm of the vegetative cell (forms a 2 celled stage consisting of vegetative cell and generative cell). Later on the generative cell divides and give rise to two cells that are the male gametes (forms 3 celled stage consisting of two male gametes and the vegetative cell)

The process of microgametogenesis ends here and later fertilisation occurs.



The division of the generative cell may either take place in the pollen grain or in the newly formed pollen tube)

The nucleus of the vegetative cell is known as the tube nucleus. The tube nucleus remains within the spore or enters inside the advancing pollen tube. Sooner or later the tube nucleus gets degenerated completely as it does not have any important function.

**Similarities between Microsporogenesis and Microgametogenesis:**

- Both Microsporogenesis and Microgametogenesis processes take place inside the angiosperm flower.
- Both Microsporogenesis and Microgametogenesis involve haploid cell formation.
- During microsporogenesis and megasporogenesis, spores that give rise to gametophytes are produced.

**Difference between Microsporogenesis and Microgametogenesis:**

<b>Microsporogenesis vs Microgametogenesis</b>	
Microsporogenesis is the process of formation of pollen grains (microspores) from the sporogenous tissue.	Microgametogenesis is the process of formation of male gametes from the generative cell nucleus that is present inside the pollen grain through mitosis.
<b>Location of Development</b>	
Microsporangium is the place where microsporogenesis occurs.	Megasporangium is the place where microgametogenesis occurs.
<b>Function</b>	
Production of pollens is the outcome of microsporogenesis.	Production of male gametes is the outcome of microgametogenesis.

## **Summary – Microsporogenesis vs Microgametogenesis**

Microsporogenesis is a process of formation of pollen grains (microspores) from the sporogenous tissue. As a general fact, during this process, a microgametophyte develops inside a pollen grain. This development takes place in a three-celled stage. Microgametogenesis is a process by which progressive development of the unicellular microspores takes place where they get developed to mature microgametophytes which contain gametes. Two types of mitotic divisions take place; pollen mitosis I and pollen mitosis II. The results of the pollen mitosis I are two unequal cells, a small generative cell, and a large vegetative cell. The results of pollen mitosis II are the formation of two sperm cells. This is the difference between microsporogenesis and microgametogenesis.

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