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Topic: Microsporogenesis
Lecture no. 17

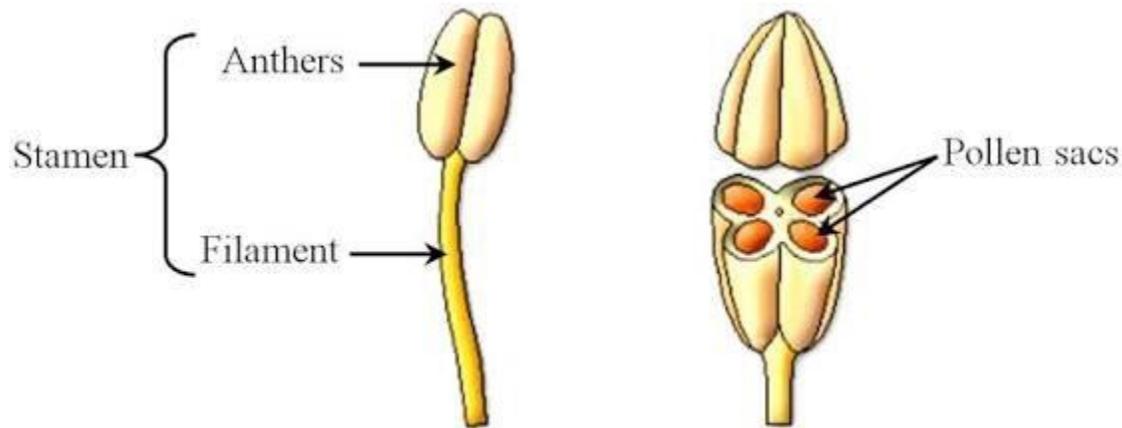
Topic: Microsporogenesis and Microgametogenesis:

The reproductive unit of angiosperms is the flower. A flower consists of two reproductive units; androecium and gynoecium. Androecium is the male reproductive unit whilst the gynoecium is the female reproductive unit. The androecium contains anther and filament and the gynoecium contains stigma, style, and ovary. Microsporogenesis and microgametogenesis take place in the anther of the androecium. Microsporogenesis is the process of formation of pollen grains (microspores) from sporogenous tissue and microgametogenesis is the process of formation of male gametes from the generative cell nucleus that is present inside the pollen grain through mitosis.

MICROSPOROGENESIS:

Microsporogenesis is a process that takes place during plant reproduction. As a general fact, during this process, a microgametophyte develops inside a pollen grain. This development takes place in a three-celled stage. With regards to flowering plants; angiosperms, the microsporogenesis process takes place with the involvement of a microspore mother cell. The microspore mother cell is present in

the anther of the flower, which is one of the two segments of the androecium (male reproductive unit of the angiosperm flower). Or, in simplest word, the development of pollen grains (microspores) within the anther is termed as microsporogenesis.



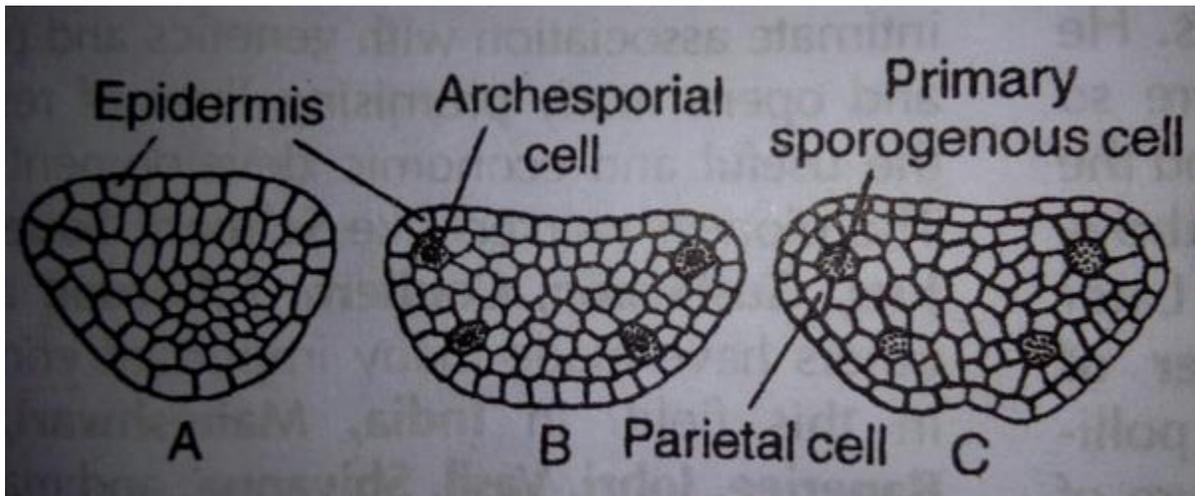
Structure of stamen

Each typical anther consists of two lobes and each lobes contains two pollen sacs (microsporangia) . There are present innumerable fine powdery or granular mass of cells known as pollen grains (microspores) within each pollen sac.

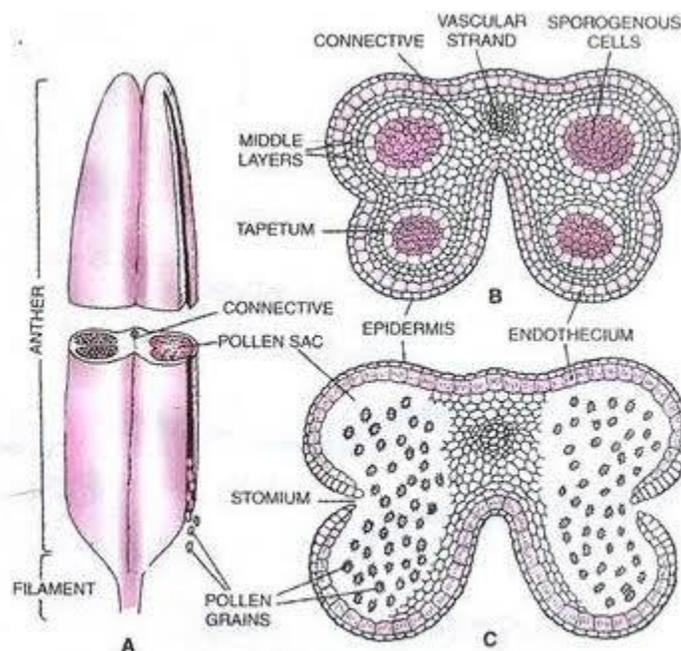
Development:

Young anthers are made up of homogeneous mass of meristematic cells without intercellular space. With further maturation the anther becomes four lobed. The outer layer of the anther is the epidermis. The inner cells of the anther start

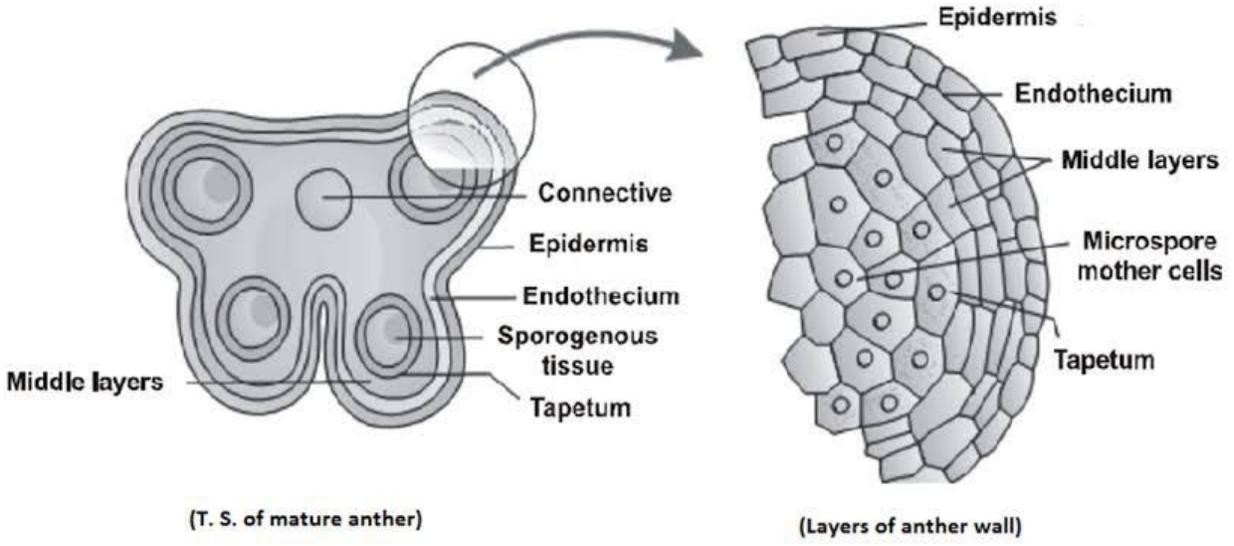
developing.



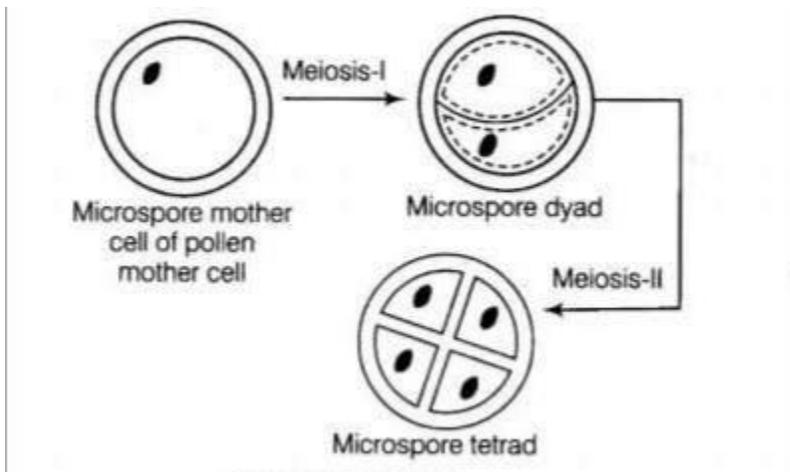
In each lobe at each corner some cells become differentiated from the others by their dense protoplasm and are termed as 'archesporial cells'. Each archesporial cell then divides mitotically and forms primary parietal cell and an inner primary sporogenous cell. The primary parietal cell divides both periclinally and anticlinally to form the microsporangial wall (antheridial wall) consisting of outer layer called exothecium, middle layer called endothecium and the innermost layer called the tapetum (nutritive layer).



Structure of Anther. A, longitudinally dehiscent anther cut transversely to show pollen sacs and connective. B, T.S. young anther; C, T.S. anther at the time of dehiscence (common or longitudinal type).



The primary sporogenous cell either directly function as spore mother cells or divides mitotically into a number of cells which function as spore mother cells. All the primary sporogenous cells functioning as spore mother cells cells {diploid($2n$) in nature} and undergoes meiotic division and give rise to four haploid (n) microspores all arranged tetrahedrally.



Each pollen grain (microspore) has two walls:

- Outer exine (consisting of two regions- outer sexine and inner nexine) .
- Inner intine.

