

Vivekanand College, Kolhapur

(Empowered Autonomous)

Department of Botany

Study of Anther

(Structure & dehiscence)

By

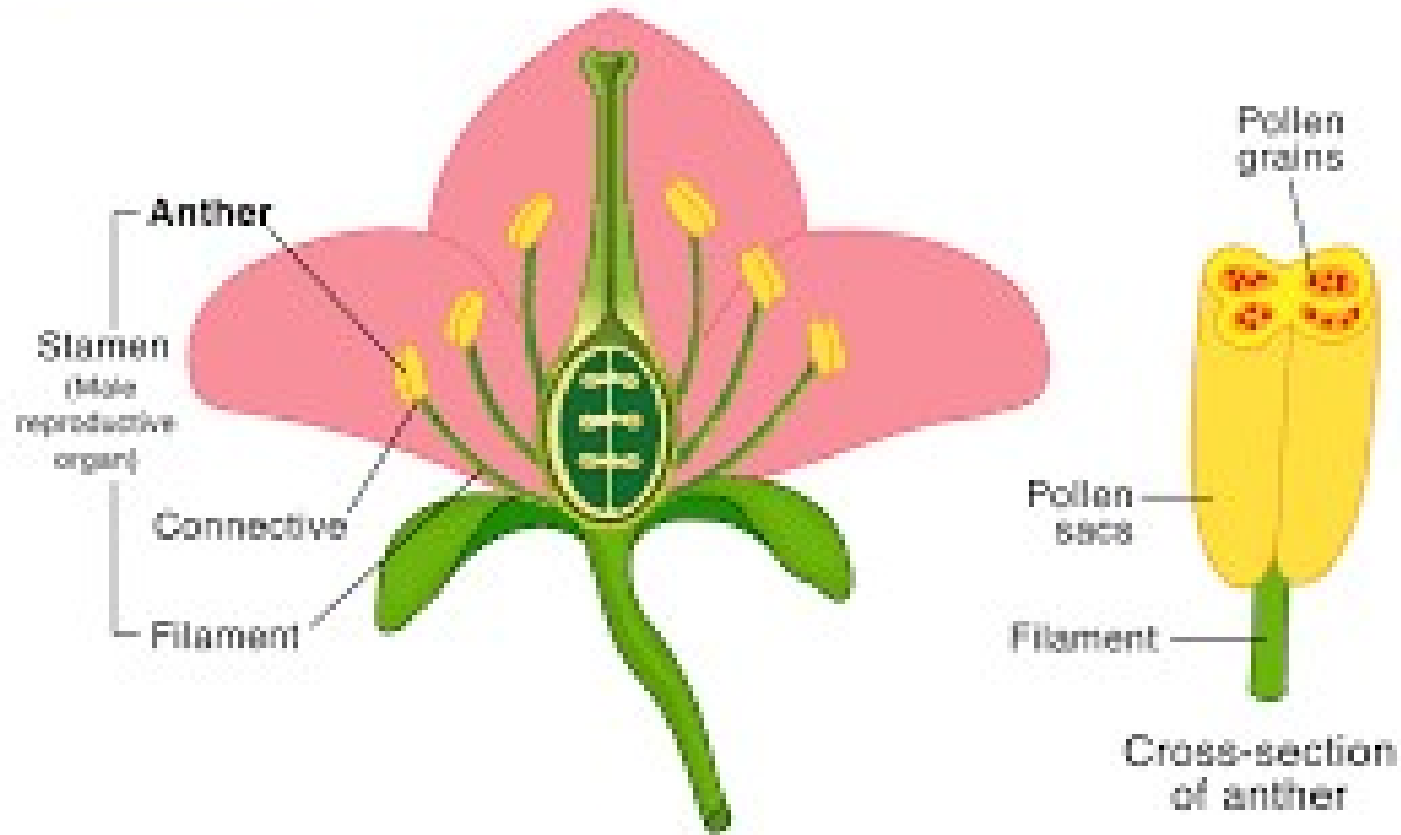
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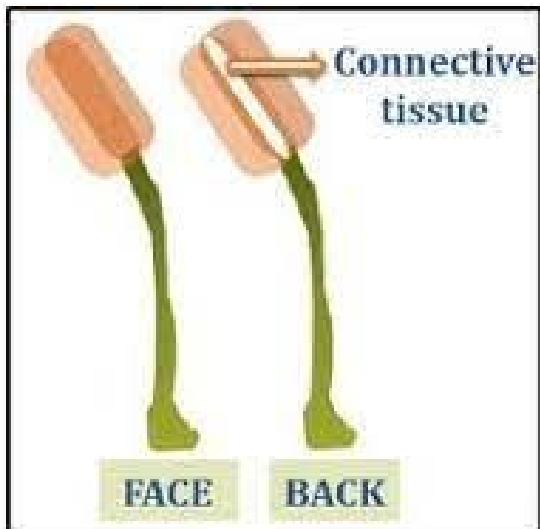
Structure of anther

- The male reproductive part of a flower is called the **stamen**.
- Stamen is composed of a long tube, called filament and it has a pollen producing structure at the end. This oval shaped structure is called the **anther**.
- Each anther is generally borne at the tip of a long slender stalk known as filament.
- The anther is a two-lobed structure or **bilobed**.
- Anther is crucial in the reproduction of flowering plants, as it produces male gametes called pollen.

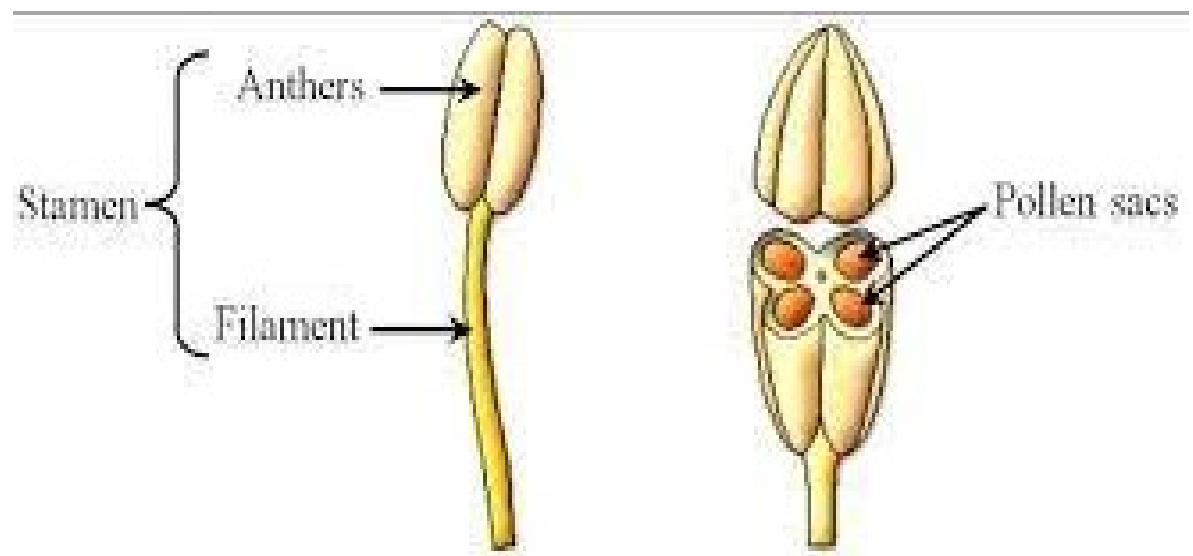
Anther

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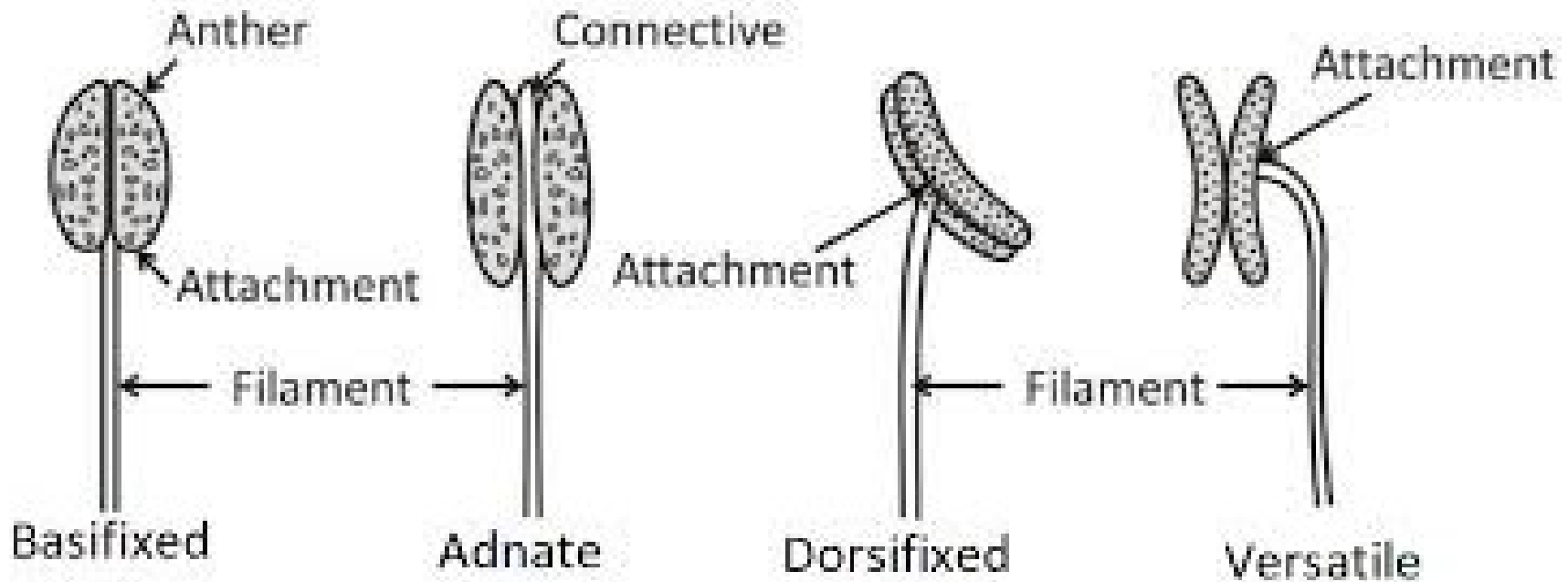


EXTERNAL VIEW OF ANHER



Structure of stamen

❖ Types of anthers: (Based on attachment of filament)



Anther attached at its base to apex of the filament.
e.g. *Sesbania*

When an anther is attached to the whole length of its filament.
e.g. Water Lily

Anther attached dorsally and medially to the apex of the filament.
e.g. *Passiflora*

Anther whose attachment is near its middle. This enables them to swing freely.
e.g. Grasses

Anthesis: It refers to the process during which the anthers dangle out from the spikelet of the growing flower. The process of dehiscence occurs during the stage of anthesis when a flower attains maturity.

Dehiscence: On maturation, the anther burst out by discharging pollen grains. Thus, pollen release from an anther is a process that refers to the 'Dehiscence'.

❖ Dehiscence of anther:

- The splitting of the plant structures in order to release its content is called dehiscence.
- The point where the anther breaks is called the line of dehiscence.
- Anther dehiscence is the final function of the anther that causes the release of pollen grains.
- This process is co-ordinated precisely with pollen differentiation, floral development and flower opening.
- The **endothecium** is responsible for anther dehiscence to disperse pollen when they are mature.
- Tapetum nourishes the developing pollens. The three outer walls provide protection and help in dehiscence of anther to release pollen grains.

❖ **Steps of dehiscence of anther:**

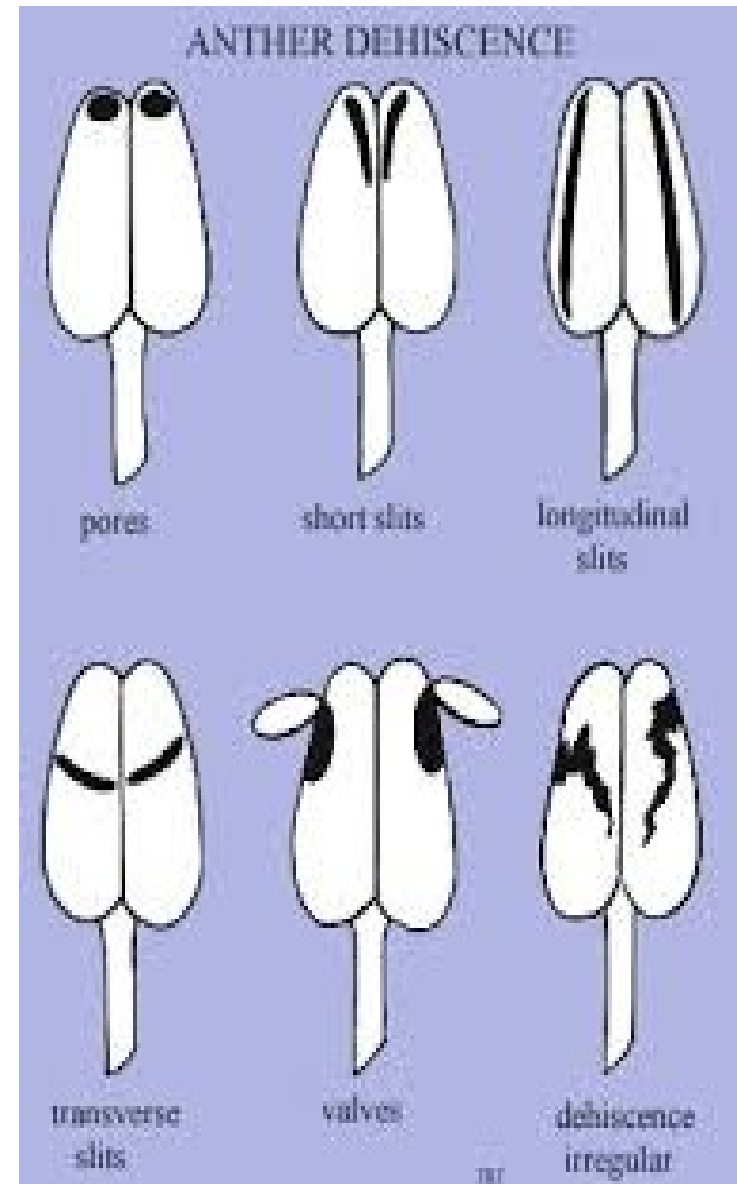
It consists of following steps:

- 1) Expansion of the epidermis and endothecium cells.
- 2) Enzymatic opening of the septum between two locules.
- 3) Mechanical rupture of the tapetum.

- The anther wall comprises four layers: Epidermis, Endothecium, Middle layers and Tapetum. Out of these layers, it is the **Endothecium** which helps in anther dehiscence.
- The cells of endothecium are radially elongated and develop fibrous thickenings which arise from inner tangential walls, at maturity.
- These fibrous thickening are made up of alpha cellulose and traces of lignin. The outer tangential walls remain thin.
- Endothecium has hygroscopic nature. The inner tangential walls are unable to stretch as the anther matures because of fibrous thickenings but the outer walls are thin and they can expand as the anther matures.
- Due to this uneven and differential expansion of outer and inner tangential walls and hygroscopic nature of endothelial cells, the endothecium helps in anther dehiscence at maturity.

During the process of dehiscence, anther undergoes dehydration, pollen loses water and the strip between pollen sacs disintegrate resulting in the release of pollen grains. Based on the direction of dehiscence, anther releases pollen grains in different ways.

The most common, and ancestral, anther dehiscence type is **longitudinal**, dehiscing along a suture parallel to the long axis of the thecae.



❑ **Poricidal dehiscence:** In this type, pollen releases from the apical or distal region. e.g. Potato, Brinjal

❑ **Longitudinal dehiscence:** The pollen releases laterally or longitudinally, neither towards nor away from the axis. e.g. *Datura*

❑ **Transverse dehiscence:** The pollen releases away from the centre of the unilocular anther. e.g. Members of family Malvaceae.

❑ **Valvular dehiscence:** In this type, pollens release through valves or trap doors. E. g. *Barberries, Laurus* etc.