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# Diploma in Pharmacy 1<sup>st</sup> Year

## Pharmacognosy

### Experiment

To perform the gross anatomical study (transverse section) of Clove.

#### Aim:

To perform the gross anatomical study (transverse section) of Clove.

#### Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Kaur Navjit , “Practical Manual of Pharmacognosy” Published by Nirali Prakashan , Pg.No 93 - 97

#### Biological Source :

Clove is made up of the dried flower buds of *Eugenia caryophyllus* Thumb which belongs to a Myrtaceae family.

#### Materials and Apparatus Required

Clove, sharp razor, brush, dropper, needles, watch glass, microscopic slides, cover-slips, safranin, water, glycerine and compound microscope.

#### Theory

The unopened pink coloured buds of cloves are found in evergreen clove trees Same as the other spices, they are available throughout the year Cloves are known to provide a warm, sweet and aromatic taste.

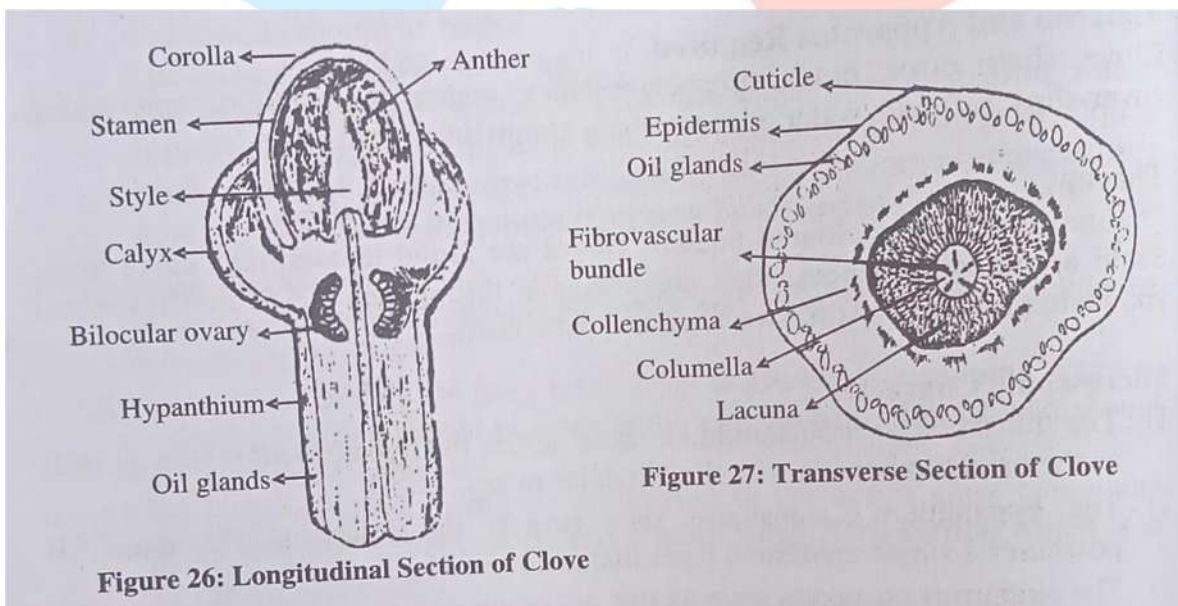
## Morphological Characters

- 1) The transverse section should be taken across the hypanthium region as well as the brief top portion with the bilocular ovary.
- 2) The hypanthium's transverse slice reveals the following characters. It possesses a single epidermal layer that is covered by a thick cuticle.
- 3) The epidermis possesses stomata that are ranunculaceous.
- 4) There are three distinct regions in the cortex: the peripheral region, which has two to three layers of schizolysigenous oil glands embedded in parenchymatous cells, the central region, which has two to three layers of schizolysigenous oil glands embedded in parenchymatous cells, and the central region, which has two to three layers of
- 5) There are a few layers of bicollateral vascular bundle in the middle layer. It has loosely arranged aerenchyma cells in the inner section.
- 6) A thick-walled parenchyma with a ring of bicollateral vascular bundles and numerous sphaeraphides can be found in the centre cylinder. The T.S. through the ovary region reveals the presence of an ovary with several ovules.
- 7) The epidermis of clove has a thick cuticle covering and is composed of a large anomocytic stomata and straight walled cells.
- 8) Schizolysigenous and ovoid-shaped oil glands are present in almost all portions of the drug. The isolated phloem fibres are rarely found in the spongy tissue.
- 9) Calcium oxalate crystals with small number of stone cells are also found in clove. Starch grains are absent

The following properties of clove are shown in a transverse section via the hypanthium

- 1) It has epidermis with stomata and a thick cuticle.

- 2) Schizolysigenous oil glands are included in collenchymatous parenchyma.
- 3) It is the clusters of calcium oxalate in the parenchyma.
- 4) A ring of around 15 bilateral vascular bundles is embedded in a zone of relatively thick walled cells.
- 5) A lignified pericyclic fibre encircles the meristele.
- 6) Xylem of five to six lignified vessels.
- 7) Aerenchyma or parenchyma with air gaps or lacuna.
- 8) Central columella: Thin-walled parenchymatous cells with calcium oxalate cluster crystals and 20-25 tiny vascular bundles



The following characteristics can be seen in a transverse section across the ovary region:

- 1) It has ovary, as well as the ovarian wall.
- 2) Parenchymatous dessep
- 3) Ovules with placentation in the axile
- 4) There is no starch, calcium oxalate prisms, or stone cells.

## Procedure

- 1) 2-3cm long pieces of seed should be taken.
- 2) The seed should be placed between thumb and first finger of left hand.
- 3) The razor should be held in the right hand with the edge of the blade facing inward and handled at right angle to it.
- 4) The top portion of the seed should be dipped in water.
- 5) Then the seed should be cut in transverse sections as soon as possible in a watch glass containing water.
- 6) The thinnest part of the seed should be selected with the help of a delicate brush.
- 7) Thin section of the seed should be transferred into clean watch glass with water
- 8) Few drops of safranin stain should be applied in the watch glass with water.
- 9) The seed should be left for 3-5 minutes.
- 10) Stain should be removed and cleaned with water if required.
- 11) The thinnest part should be placed in the center of the slide.
- 12) A drop of glycerine should be applied over the seed.
- 13) The seed should be covered with a coverslip with the help of needle
- 14) The seed should be observed under a compound microscope after staining and mounting

## Result :

The Gross anatomical study of Clove was performed and determined.

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