

Diploma in Pharmacy 1st Year

Pharmacognosy Practical

To perform the gross anatomical study (transverse section) of Cinchona

Aim:

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

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Kaur Navjit , “Practical Manual of Pharmacognosy” Published by Nirali Prakashan , Pg.No 75 - 79

Biological Source :

Cinchona is the dried bark of the stem or root of Cinchona calisaya Wedd., Cinchona ledgeriana Moens., Cinchona officinalis Linn., and Cinchona saccirubra Pavon, or hybrids of the first two species with the last two species, all of which belong to the Rubiaceae family.

Materials and Apparatus Required

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

Theory

Cinchona officinalis is a small shrub or tree with rugose bark and hairy branchlets. Stipules are glabrous and lanceolate or oblong, acute or obtuse. Cinchona is used to numb pain, destroy germs, and act as an astringent in eye treatments, Cinchona extract is also used topically for haemorrhoids, ulcers, hair growth stimulation, and varicose vein management.

Morphological Characters

1) Periderm:

- i) **Cork:** Cork is made up of several layers of thin-walled, flat, polygonal cells with a reddish brown substance. It is permeated with the substance suberin
- ii) **Phellogen:** It consists of 2 to 3 layers of thin walled cells with no cellular substance
- iii) **Phelloderm:** It consists of 6 to 8 layers of thin-walled rectangular cells with no cellular substance.

2) Cortex:

- i. It consists of several layers of thin-walled tangentially elongated cells, 2 to 6 inches long, containing reddish brown materials Calcium oxalate crystals, crystals of narrosphenoldal.
- ii. It contains starch grains of 6 to 10 mm in diameter.
- iii. There are no sclereids whereas cavities (secretion canals) are present.

3) Secondary Phloem:

- i. **Sieve Tubes:** The compact cells are around 200cm long and 15 to 20cm wide, with narrow companion cells and the sieve tubes are compressed and collapsed in most cases.
- ii. **Fibres:** It consists of numerous, large, fusiform, lignified phloem fibres with striated walls and prominent tubular or funnel-shaped pits, usually isolated in clusters of two to three fibres.
- iii. **Phloem Parenchyma:** It consists of thin, dark reddish brown walls with calcium oxalate micro-prisms.
- iv. **Medullary Rays:** One to three senate cells that are radially elongated and contain starch granules. They extend up to the cortex cells.

Procedure

- 1) The area where practical is to be performed should be cleaned and the apparatus should be provided.
- 2) The sample of crude drugs should be provided.
- 3) The sample should be prepared for sectioning.
 - i) The sample should be boiled
 - ii) The section should be cut down.
 - iii) The section should be transferred into the watch glass containing water. If the crude drug is too difficult, or in any circumstance where the subject teacher feels it is necessary, the sample for sectioning is prepared one hour or a day before the practical, or may be altered in some cases.)

4) Staining Process:

- i. A clean watch glass should be taken and staining solution should be added to it.
- ii. The section which has been taken from watch glass containing water to stain the solution should be transferred with the help of brush and should be kept for 2-3 minutes.
- iii. Then the solution should be transferred to the watch glass containing plane water so that excess stain is washed away. This section which is to be mounted is ready.

5) Mounting Process:

- i. The section which is to be mounted on the glass slide should be transferred with the help of brush.
- ii. 1-2 drops of water should be added on the section with the help of stopper.
- iii. The clean cover slip should be placed over the section with the help of forceps and needle.
- iv. Excess water present outside the coverslip should be removed with the help of blotting paper. The slide is now ready to be examined.

6) Observation:

- i. Choose a location in the laboratory for the microscope that has enough light. The microscope should be arranged so that the C-Arm is facing towards the viewer and the objective and mirror are towards the light
- ii. The diaphragm should be opened completely using sub-stage mirror. The position should be adjusted so that the entire field of view is well illuminated.
- iii. The prepared slide should be placed on the stage of the microscope's centre with the section aligned with the stage window above the condenser.
- iv. The slide should be fixed between the clips. With the use of two screws on the mechanical stage, the slide can now be moved forward, backward, or sideways above the stage. The observation should be noted

Result :

The gross anatomical study of Cinchona was performed and determined.