

## Experiment No. 5

### 1.0 TITLE :

To study Morphological and Microscopical characteristics of Cinnamon Bark.

### 2.0 PRIOR CONCEPTS :

Section cutting technique, staining, mounting and observation of transverse section of Cinnamon Bark seed.

### 3.0 NEW CONCEPTS :

#### Proposition 1 : Morphological characters

It includes organoleptic characters and extra features.

#### Proposition 2 : Microscopical characters

It includes observation of important tissue components of transverse section of Cinnamon bark.

#### Proposition 3 : Adulterants

It is debasement of genuine crude drugs, which proved harmful.

### 4.0 LEARNING OBJECTIVES :

#### Intellectual Skill :

1. Ability to interpret the tissue components.

#### Motor Skill :

1. Ability to prepare thin transverse section of cinnamon bark.
2. To handle and observe instrument and crude drug correctly.
3. Labeling different component of cell.

### 5.0 REQUIREMENTS :

#### Apparatus :

Microscope, watch glass, camel hair brush, glass slides, cover slips, beaker, dropper, filter paper, forceps, test tubes, test tube holder, tripod stand, wire gauze, dissecting needle, sharp razor, etc.

#### Chemicals :

Phloroglucinol, Conc. HCl, Iodine solution, Glycerin, Ruthenium Red solution, etc.

#### Crude Drug :

Cinnamon Bark.

### 6.0 DIAGRAM :



Fig. 5.1 Cinnamon Bark and Plant

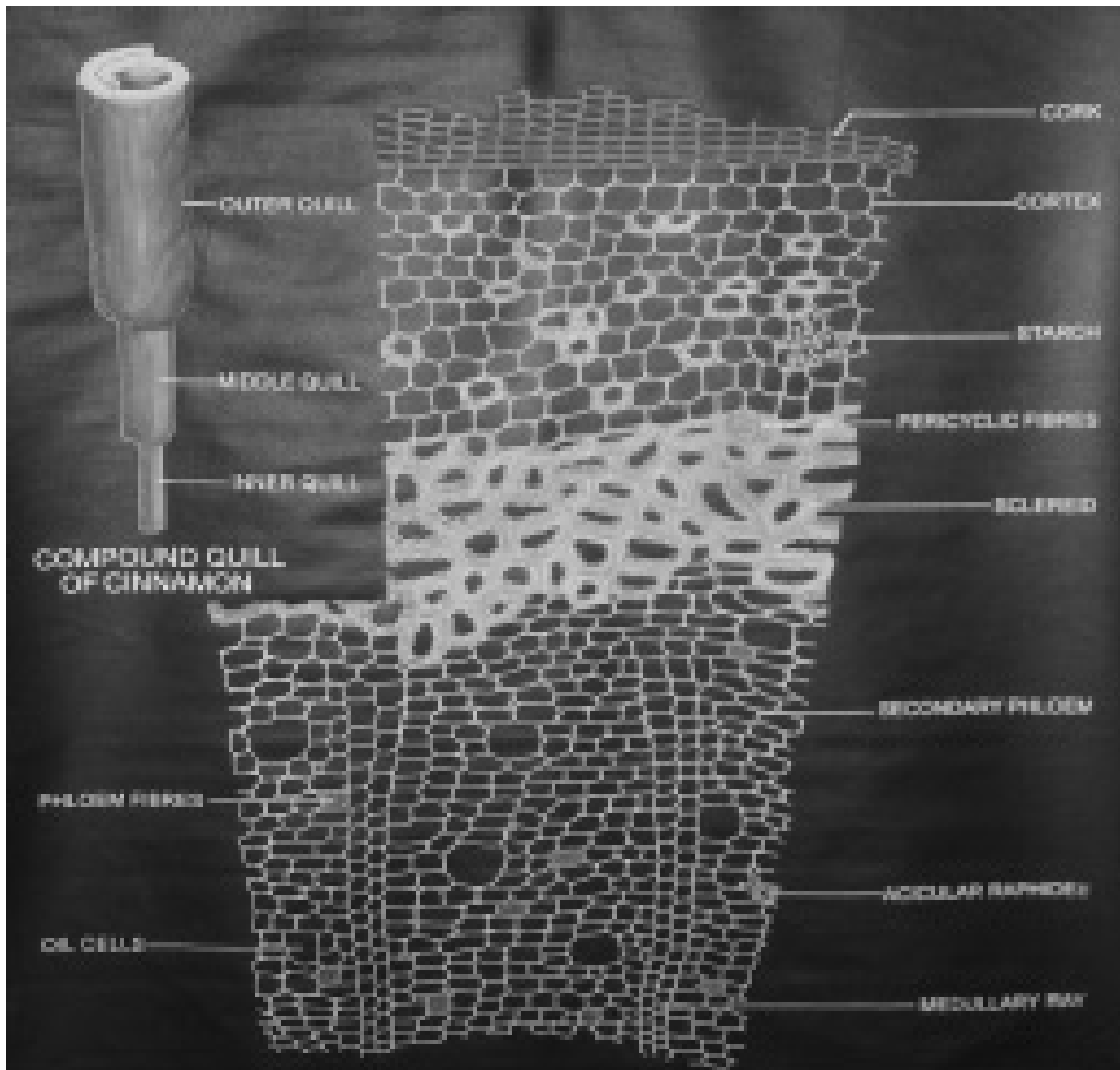


Fig. 5.2 Cinnamon Bark  
(Refer colour diagrams given in Appendix-V)

## 7.0 STEPWISE PROCEDURE :

### 7.1 Synonyms :

English : Cinnamon Bark  
Hindi : Kalmi - Dalchini

### 7.2 Biological source :

It consist of dried inner bark of the shoots of coppiced trees of *Cinnamomum zeylanicum* Nees. It contains not less than 1.0% v/w of volatile oil, belonging to family Lauraceae.

### 7.3 Macroscopy :

#### Organoleptic characters :

**Colour :** Outer surface, dull yellowish-brown; Inner surface darker in colour  
**Odour :** Fragrant, **Taste :** Warm, sweet and aromatic  
**Extra features :** Bark is free of cork, single or double, closely packed compound quills.  
**Fracture :** Splintery.

### 7.4 Microscopy :

#### 1. PERICYCLE (stone cell layers) :

Produce the light coloured wavy, longitudinal lines on the outside of the bark.

**Pericyclic fibres** : Small groups of about 6 to 15 pericyclic fibres (lignified) occur at intervals.

**Sclerides** : 3 to 4 layers of pitted sclerides, thickened lignified walls, isodiametric, slightly elongated tangentially (U-shaped thickening ), with starch grains.

## 2. SECONDARY PHLOEM :

Parenchymatous: few cells contains acicular calcium oxalate crystals and starch grains (diameter upto 10  $\mu$ ).

**Medullary rays** : Biseriate, narrow at inner sight, wider in the scleride band side, contains starch, acicular raphides.

**Pholem fibres** : single, isolated, circular, lignified with stratification, being above 12 to 22 to 35  $\mu$  wide and 200 to 500 to 600  $\mu$  long

**Mucilage cells** : can be identified after staining with Ruthenium red (shows pink / red colour).

**Oil cells** : big, isolated.

Cork and cortex are absent.

### 7.5 Chemical constituents :

Volatile oil (0.5 to 1%), cinnamic aldehyde (55 to 65%), eugenol (4 to 10%), terpenes, mucilage, starch, calcium oxalate, tannins.

### 7.6 Uses :

- |                     |                        |
|---------------------|------------------------|
| 1. Carminative,     | 2. Flavouring agent,   |
| 3. Mild astringent, | 4. Powerful germicide. |

### 7.7 Allied drugs :

- |                                     |                             |
|-------------------------------------|-----------------------------|
| 1. Cassia bark or Chinese Cinnamon, | 2. Wild or Jungle Cinnamon, |
| 3. Java Cinnamon,                   | 4. Saigon Cinnamon,         |
| 5. Oliver bark.                     |                             |

### 7.8 Marketed preparation :

1. Cinnamon is an ingredient of Compound cardamom tincture I.P.

### 7.9 Procedure

1. Clean the platform and issue the apparatus.
2. Issue the sample of crude drug.
3. Preparation of sample for sectioning.
  - Boiling of the sample.
  - Section cutting.
  - Transfer the section in to Watch glass in to Watch glass containing water.
 (If crude drug is too hard, or in any case where subject teacher may feel then the preparation of sample for sectioning is done before one hour or a day of the practical or may be varied in certain cases)
4. Staining Process.
  - Take a clean watch glass and add the staining solution to it.
  - With the help of brush, transfer the section taken from watch glass containing water to stain solution and keep for 2 - 3 minutes.
  - Transfer it to watch glass containing plane water, so that excess stain is washed away. This section is ready for mounting.
5. Mounting Process.
  - Transfer the section to be mounted on the glass slide with the help of brush.
  - Add 1 - 2 drops of water on the section with the dropper.
  - Place the clean cover slip over the section with the help of a forceps and needle.
  - With the help of blotting paper, wipe out excess of water present outside the cover slip. The slide is ready for observation.
6. Observation.
  - Select a place in the laboratory for microscope, where sufficient light is available. Set the microscope in such a way that the C-Arm towards to you and the objective and mirror facing the light.
  - Open the diaphragm completely with the help of the sub stage mirror. Adjust the position so that the field of view is sufficiently illuminated.

- Place the slide prepared on the stage of the microscope at the centre, with the section placed exactly in line with the stage window lying above the condenser.
- Fix the slide between the clips. Now the slide can be moved forward, backward or sideways above the stage with the help of two screws provided on the mechanical stage.
- Take observations.

### 7.10 Staining:

Subject teacher shall ask student to draw diagrams of staining in the space provided below.

1. T.S. + Phoroglucinol + Conc. HCl (1:1)  
Pink colour Lignified cells: Pericyclic fibres, stone cells, cork cells.
2. T.S. + Iodine  
Blue colour  
Starch
3. T.S. + Acetic acid  
Insoluble  
Calcium oxalate crystals
4. T.S. + Dil. HCl  
Soluble  
Calcium oxalate crystals

## 8.0 OBSERVATIONS :

### 8.1 Observation Table for Macroscopy

Sr. No.	Test	Observation
1.	Colour	
2.	Odour	
3.	Taste	
4.	Fracture	
5.	Extra features	

### 8.2 Observation Table for Staining :

Sr. No.	Test	Observation	Inferences
1.			
2.			
3.			

## 9.0 CONCLUSION :

The given crude drug is found to be ..... (Cinnamon bark)

**10.0 QUESTIONS :**

**Write answers to Q....Q....Q....Q.... (Questions to be allotted by the subject teacher. Subject teacher shall also add few more relevant questions)**

1. Give biological source of Cinnamon bark.
2. Draw neat labeled macroscopical diagram of Cinnamon bark.
3. Which microscopic character is detected by Ruthenium Red in case of Cinnamon bark?
4. Write two crude drugs, which contain eugenol as main active chemical constituent.
5. Mention four allied drugs of Cinnamon bark.
6. Give the process of chemical test by which tannins are detected from Cinnamon bark.
7. Write three regional names of Cinnamon bark other than title.
8. Which volatile oil constituents are present in Cinnamon bark?
9. Write four Therapeutic uses of Cinnamon bark.
10. Why is Cinnamon presented in compound quill form? Give reason.

**(Space for answers)**

**(Space for answers)**