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Transverse Section and Powder Microscopy of Clove Flower Bud

Experiment 7 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To examine a transverse section and powder of unopened clove flower bud and record diagnostic features.

Principle

Authentication combines the arrangement of tissues in a section with diagnostic fragments in powder. Syzygium aromaticum belongs to Myrtaceae. Material age, organ and processing can change the appearance; the complete pattern is more useful than one isolated cell.

Section Features

- Hypanthium with epidermis, prominent oil cavities and vascular tissues.
- Associated floral structures in the appropriate part of the bud; section level changes the appearance.
- Sclereids and calcium-oxalate clusters where visible.

Powder Features

- Oil-cavity tissue fragments and sclereids.
- Pollen grains from the flower bud.
- Calcium-oxalate clusters and vascular fragments.

Requirements

- Authenticated unopened clove flower bud, labelled comparison slides and the prescribed microscope.
- Fresh razor used with a holder, slides, coverslips, water/glycerol mountant and instructor-prepared stains.

Procedure

1. Prepare a section

Use the instructor's safe cutting method to obtain a thin transverse section through the assigned organ. Transfer to water and select an intact section.

2. Mount

Mount in the assigned water/glycerol medium without folds or air bubbles. If staining is required, use the prepared reagent and prescribed rinse.

3. Low-power map

Observe the outline and tissue arrangement at low power. Draw the complete section with orientation and a clear title.

4. Diagnostic structures

Move to higher power to label the structures listed below. Record objective magnification; use stage calibration for any dimensions.

5. Powder study

Mount a small amount of powder without a dense opaque layer. Scan several fields and draw at least three characteristic fragments.

6. Compare and conclude

Compare the section and powder with authenticated slides. A stalk-only or exhausted material lacks the complete authentic bud pattern. Record what was actually visible rather than copying every expected feature.

Observations and Record

Record	Entry
Botanical name / family / part	Syzygium aromaticum / Myrtaceae / unopened clove flower bud
Section, objective and stain	_____
Three powder fragments and magnification	_____
Diagnostic agreement / limitations	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Magnification alone does not give a fragment length. If calibration is 4 µm per eyepiece division and a fragment spans 12 divisions, its length is 48 µm.

Result

State whether the observed section and powder support the stated botanical material, naming the features seen and any unresolved difference.

Precautions

- Use authenticated, labelled teaching material and instructor-prepared reagents. Wear the protection specified for the chemical method.
- Compare with a known control and record actual observations. A single colour, precipitate or odour description cannot authenticate a crude drug.
- Do not taste botanical material or directly inhale vapours; dispose of solvents and staining reagents in their assigned waste containers.
- Use teacher-prepared staining/clearing reagents. Do not make chloral-hydrate or corrosive staining mixtures independently.

Viva Questions and Answers

1. Why study both section and powder?

The section preserves tissue arrangement, while powder reveals fragments retained after grinding.

2. Why examine several fields?

A single field may miss a diagnostic feature or overrepresent a contaminant.

3. How should an uncertain feature be recorded?

Describe it as uncertain and request comparison; do not force an identification.

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