

Determination of Stomatal Number and Stomatal Index

Practical 08 | Pharmacognosy and Phytochemistry I

Aim

To determine Stomatal Number and Stomatal Index, and interpret the recorded observations.

Principle

- Stomatal number is a count per area; stomatal index expresses stomata as a fraction of stomata plus ordinary epidermal cells in the same field.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.

Materials and Apparatus

- Prepared epidermal mounts and calibrated field-area record.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Calibrate the area represented by a microscope field.
2. Observe the assigned prepared epidermal mounts and use one consistent edge-counting convention.
3. Count stomata and ordinary epidermal cells in the same defined fields.
4. Repeat over the assigned representative fields.
5. Calculate stomata per area and the stomatal index separately.
6. Report the leaf surface, field area and counting convention.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Field area	_____
Stomata S	_____
Epidermal cells E	_____
Repeated fields	_____

Calculations and Interpretation

- Stomatal number = stomata counted/area examined.
- Stomatal index = $S/(S + E) \times 100$; define the counting convention consistently.

Worked Illustration

Illustration: 20 stomata and 80 ordinary epidermal cells in the same field give a stomatal index of $20/(20 + 80) \times 100 = 20.0\%$.

The values in this illustration are for calculation practice.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

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