



Mohanlal Sukhadia University, Udaipur
Third Year B.Sc. Botany
Practicals - Group-II

PAPER – II
Plant Physiology and Biochemistry

Exercise 3. Demonstration of phenomenon of plasmolysis using *Rhoeo discolor* leaves

Submitted by

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❑ Demonstration of phenomenon of plasmolysis

➤ Plasmolysis

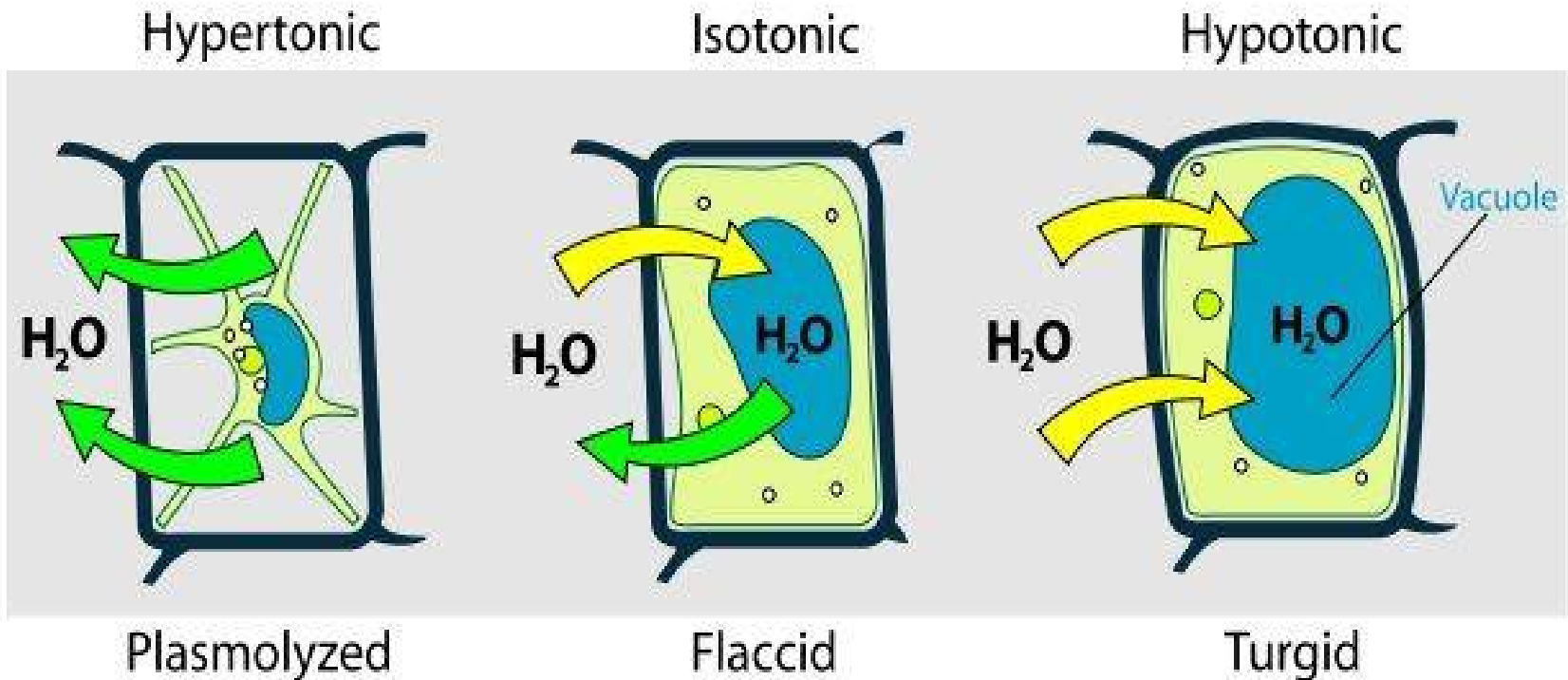
- ✓ Plasmolysis is shrinkage of the protoplasm due to the loss of water from a cell
- ✓ It is a vital phenomenon as it explains the process of osmosis
- ✓ Plasmolysis demonstrates the permeability of the cell wall and the semipermeable nature of the protoplasm
- ✓ It helps to detect whether a particular cell is living or dead as the plasmolysis does not take place in a dead cell.
- ✓ The osmotic pressure of a cell can be determined by the plasmolytic method

➤ Practical Utility of Plasmolysis

- It plays most vital role in the preservation of meat, jellies and other food stuffs, and thereby prevents them from being destroyed by bacteria and fungi. Salting of food stuffs (to be preserved) raises the osmotic pressure of the preservation medium. Bacteria and fungi get plasmolysed and killed due to exosmosis
- Plasmolysis is also involved in killing of weeds in lawns, orchards and agricultural fields by chemical weedicides
- It helps in preventing the growth of plants in the cracks of the walls



- ✓ When a cell is placed into a **Hypertonic solution**, there is a higher concentration of solutes outside the cell, so water flows out of the cell to balance the concentration on both sides of the membrane
- ✓ When a cell is placed into a **Hypotonic solution**, there is a lower solute concentration outside the cell than inside, and water rushes into the cell
- ✓ In an **Isotonic solution**, solute concentrations are the same on both sides, so there is no net gain or loss of water



❑ Requirement

- ✓ *Tradescantia* leaf, water, sugar/salt solution, slides, cover glass, microscope, blade



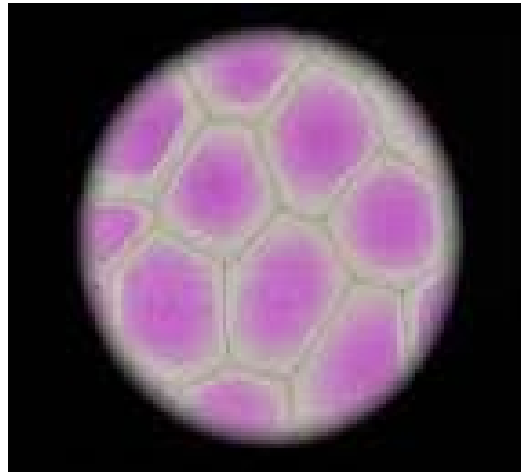
❑ Method

- ✓ 1. From the lower surface of the leaf of *Tradescantia*, peel off small segments of epidermis by a blade
- ✓ 2. Put few peelings on a slide, mount in a drop of water, put a cover glass and study under microscope
- ✓ 3. Mount some of the peelings in the drops of sugar solutions of different concentrations

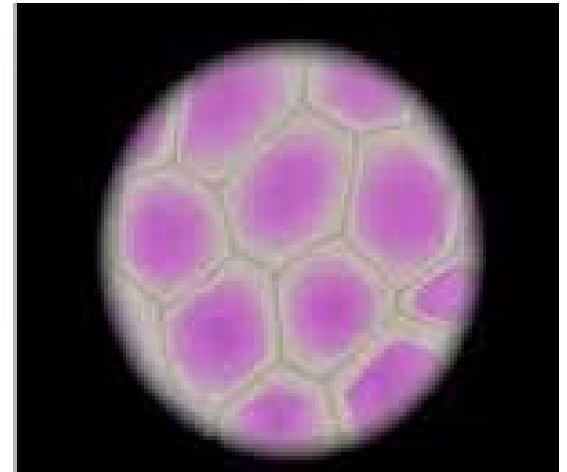
❑ Observations

The peelings placed in the sodium chloride solution(0.1% and 5%) show the concentra in their cell contents

- ✓ More the concentration of sodium chloride solution(5%) more is the contraction and shrinkage of cell contents



NaCl solution(0.1%)



NaCl solution(5%)

Protoplasm ←

