

ACTIVITY 15

INVESTIGATION OF EFFECT OF DIFFERENT CONCENTRATION OF GLUCOSE SOLUTION ON OPENING AND CLOSING OF STOMATA

Requirements:

- (i) Compound microscope
- (ii) Glass slide and cover slip
- (iii) 5% and 0.5% glucose solutions
- (iv) Fresh leaves of Rhodocolour
- (v) Distilled water, razor or blade.

Theory:

Stomata are the small openings in the epidermis of leaves. These stomata contain two bean-shaped cells, guard cells, which contain chlorophyll. These guard cells open stomata during day time due to photosynthesis and close during night. This opening and closing of stomata is a physiological process and can be controlled by the presence or absence of light.

Procedure:

- (i) Take a fresh Rheodicolour leaf, strip off a small piece of lower epidermis, mount on a slide and cover by cover slip.
- (ii) Select a widely open stomata under microscope and add few drops of 5% glucose solution.
- (iii) The water from guard cells moves to the outside due to exosmosis i.e. plasmolysis takes place because 5% glucose has greater concentration than the cell sap.

As a result of this process the stoma is closed.

- (iv) After that 5% glucose solution is changed by 0.5% solution or pure water, which contains less concentration than cell sap.
- (v) The stoma becomes open by absorbing water due to endosmosis. The guard cells become turgid.

Conclusion:

The guard cells of stomata become flaccid (soft) in strong solution due to loss of water by plasmolysis, so stoma is closed and become turgid (strong) due to intake of water in pure water, so stomata is open.