EXPERIMENT NO. 1

AIM: To prepare a stained temporary mount of a leaf peel to observe stomata.

REQUIREMENTS: A thick spongy leaf (Rheo, Lily, Tradescantia or Bryophyllum), Plain glass slides, coverslip, watch glass, forceps, needles, brush, blade, safranin, filter paper, glycerine, and microscope.

PROCEDURE:

- 1) Take the leaf provided.
- 2) Hold it between the thumb and forefinger.
- 3) Break off the leaf from front to back by putting pressure so that the epidermis comes out from the the lower surface or ventral side of the leaf.
- 4) The epidermal peeling should be taken from the laminar region and not from the midrib region.
- 5) Cut small pieces of the peels and immediately, transfer them to a watch glass containing water.
- 6) Transfer one of the pieces into a Petri dish containing safranin solution and leave it for about a minute. Both over staining and under-staining should be avoided.
- 7) Now transfer the peel on a clean slide with the help of a brush and needle.

8) Cut the portion of the peel to a proper rectangular or square shape of appropriate size (2 to 3 mm) with the help of a blade and a needle.

9) Add a drop of glycerine on the slide over the peel and put the coverslip gently. Care must be taken to avoid the entry of air bubbles and the mounting should be done in the centre of the slide.10) After putting the coverslip, press it a bit with a needle to spread the glycerine over peel properly.

11) Remove the excess of water or stain, if any, from the slide surrounding the peel with the help of a blotting paper.

12) Examine the slide under the microscope.

OBSERVATION:

1. Under Low power of the microscope

a) A single-layer of cells with a distinct and irregular outline is observed. b) Cells are closely packed with no intercellular spaces. c) Large numbers of minute openings called stomata are present2. Under the high power of the Microscope. a) Each aperture or pore represents the stomata.

b) Each stoma is surrounded by kidney-shaped or bean-shaped guard cells. c) The cells surrounding guard cells are known as subsidiary cells.

d) The inner walls of these guard cells are thick and the outer walls are thin and more elastic. e) The special wall structure facilitates the opening and closing of stomata.

f) When the guard cells are fully turgid they open the stoma and when they are flaccid they close the stoma. g) Stomata help in the exchange of gases and transpiration.



Open stomata



INFERENCE:-As seen under low and high power of the microscope, the epidermal cells with minute pores called stomata are observed.

PRECAUTIONS

- 1) Take the peel from a freshly plucked leaf.
- 2) Always hold the slide by its edges to avoid making the slide dirty.
- 3) Put the coverslip gently to avoid the entry of air bubbles.
- 4) Mounting should be done in the centre of the slide.
- 5) Both over-staining and under-staining of the cells should be avoided.
- 6) A clean slide must be used for making the temporary mount.

PRACTICAL BASED QUESTIONS

- 1. Why do you think that stomata are present only on the aerial parts of plants?
- 2. What is the shape of the guard cell in the grass leaf?
- 3. What is the role of cuticle over epidermis?
- 4. How are guard cells different from rest epidermal cells?