

## **INTRODUCTION**

A Potometer is an apparatus used to measure the rate of water loss from a plant (transpiration). The rate of transpiration is determined by measuring the drop in water level in a graduated tube over a period of time. The drop in water level is caused by the plant absorbing water to replace an equal volume of water lost due to transpiration.

This Potometer has only one glass part - the capillary tube. All other parts are plastic. The potometer is fitted with a 3-way stopcock.

## **SETTING UP THE POTOMETER**

1. Fill a sink or a basin with water.
2. Remove the plunger of the syringe mounted on the apparatus and immerse the entire apparatus in the basin, allowing the water to enter the apparatus. With the apparatus still submerged, re-insert the plunger, moving it in and out to remove any air bubbles trapped in the tube.
3. Take a leafy plant cutting of around 15-20 cm. long with a stem diameter of around 5mm. Immediately plunge the cut end of the stem in the sink of water and remove the bottom 2-3 cm. of the stem with sharp scissors. Leave the cutting in the sink.
4. Keeping the apparatus immersed, and the arrows of the stopcock pointing in all three directions i.e. pointing towards the rubber tube, the capillary and the syringe, gently insert the cutting of the leafy stem into the soft rubber tube and sea it by tying a string or by using plasticine.
5. With the apparatus still in water carefully push the plunger in to the 2ml mark.
6. Now remove the entire apparatus from the sink carefully, ensuring that the cutting does not get dislodged from the rubber tube.
7. Adjust the plunger of the syringe as necessary to bring the water level in the capillary tube to the zero mark on the scale. Turn the stopcock by 180°, thus isolating the syringe. This will ensure that the plant can only draw water from the capillary.
8. Take your first set of readings in one the conditions suggested below. After taking readings subject the potometer to a different condition, but first turn the stopcock in a manner that isolates the plant but keeps the syringe and the capillary connected. Now push the plunger slowly to raise the water level in the capillary once again to the zero mark. Then, before taking further readings turn the stopcock yet again, this time to isolate the syringe thus once again ensuring that the plant draws water only from the capillary.

### EXPERIMENT

Listed below are a number of situations where you can take observations with your potometer.

- 1) In the open laboratory
- 2) Under a strong light source
- 3) In a dark cupboard
- 4) In a warm incubator
- 5) In windy conditions on upper surfaces of leaves
- 6) In windy conditions on lower surfaces of leaves
- 7) Enclosed in a polythene bag.

Remember to change just one environment factor at a time. Also, allow the plant cutting some time to get used to the new environment (at least 2-3 minutes) prior to taking readings.

### RESULTS

These can be tabulated as follows :-

Situation	Environmental condition being altered	Movement in water level after 5 minutes