

Experiment 4

I. Aim : To study the process of absorption by plant roots.

II. Materials Required:

- i. Freshly removed plants with intact roots
- ii. 4 Test tubes
- iii. Oil
- iv. Safranin Stain
- v. Cork
- vi. Water

III. Procedure:

- i. Take 4 test tubes and mark them as A, B, C and D.
- ii. Next about $\frac{3}{4}$ th of the test tube A, B and C is filled with water but the test tube D receives only a few drops of water.
- iii. The mouth of the test tube A is sealed with a cork to prevent evaporation.
- iv. Three fresh plants are taken with intact roots which are next washed to clean the dirt and soil particles.
- v. Now these plants are placed in the test tubes B, C and D.
- vi. Some oil is added into the test tube B and C to prevent evaporation of the water.
- vii. A few drops of ink is added to the test tube C.
- viii. The water levels are marked in each test tube.
- ix. These test tubes are now kept undisturbed at room temperature for the next 2 days.
- x. After 2 days have passed the condition of the plants are observed and noted down

IV. Observation:

- i. In test tube A there is no change in water level proving that there is no absorption of water.
- ii. The water level drops in the test tube B and C, confirming that the roots absorb water and lose it through the process of transpiration.
- iii. In test tube C the absorption of the water is further confirmed by the coloration of the plant due to the absorption of the red dye along with the water.
- iv. In test tube D as the roots are not in contact with water, the water is not absorbed by the plant resulting in its death.

V. Inference:

A decrease in the water levels inside the test tube and the coloration of the plant in test tube C confirms that water is absorbed by the roots of the plants.

VI. Precautions:

1. Be careful while handling glassware such as test tubes.

OBSERVATION TABLE			
Test Tube	Setup	Level of Water after One Day	Condition of the Purslane Plant
A	Test tube containing only water and fixed with cork	Remains the same	NA
B	Purslane plant roots immersed in test tube containing water and mustard oil	Decreased	Remains healthy
C	Purslane plant roots immersed in test tube containing water, mustard oil and red ink	Decreased	Remains healthy; stems and leaves have turned red
D	Purslane plant roots not immersed in the water in the test tube	Remains the same	Has shrivelled



