

### Important Definitions

The process of **loss of water** in the form of water vapour from the leaves and other aerial parts of plant is called Transpiration.

Ganong's Potometer is a device which measures the rate of **water intake** by a plant.

**Stomatal Transpiration** is a type of transpiration which occurs from the leaves through stomata

**Cuticular Transpiration** is a type of transpiration which occurs directly from the surface of the leaves and stems

**Lenticular Transpiration** is a type of transpiration which occurs from the lenticels which are the minute openings on the surface of the old woody stems

Special **pore-bearing structures** present on the margins of leaf to allow **exudation** are called **Hydathodes**

**Guttation** is the loss of water as *droplets* along the margin of leaves through hydathodes

**Bleeding** is the *direct flowing* out of plant sap from any cut surfaces in case of injury.

### Adaptations To Reduce Excessive Transpiration

**Sunken Stomata**- The stomata may be sunken or covered by hairs. Eg: Nerium

**Fewer Stomata**- No. of stomata may be reduced

**Narrow Leaves**- Leaves may become narrower to reduce surface area. Eg: Nerium

**Reduced Exposed Surfaces**- Leaves may get wavy, rolled or folded to reduce exposed surface.

**Loss of Leaves**- Leaves may be dropped or absent or changed into spines. Eg: Cacti

**Thick Cuticle**- Leaves may be covered by thick cuticle. Eg: Banyan & most evergreen trees.

### Ganong's Potometer

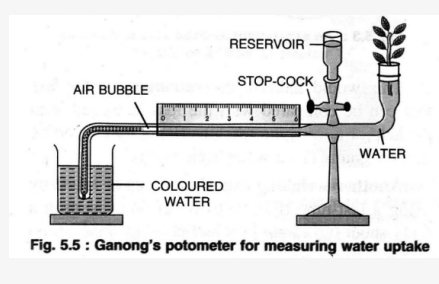
Precautions in use of Potometer:

1. The potometer should be made completely water-tight
2. The twig should be cut obliquely so that it allows larger surface for water intake and avoid suction of air bubble into the twig under water which will stop the absorption of water into the xylem

Limitations in the use of Potometer:

1. Introduction of air bubble is not very easy
2. Twig may not remain fully alive for a long time
3. Any changes in the outside air temperature may affect the position of air bubble in the capillary tube.

### Ganong's Potometer



### Significance Of Transpiration

- Cooling Effect** Evaporation causes cooling. Hence, transpiration helps plants in hot sunny days to cool.
- Suction Force** Provides Transpiration Pull which is responsible for the upward movement of water in tall plants
- Distribution of Water & Mineral Salts** Since leaves are present at the tips of all branches, transpiration helps to draw water or minerals towards them and thus helps in their distribution throughout the plant's body.

### Factors Affecting Transpiration

- Intensity Of Sunlight** Since during the day, stomata are open to facilitate inward diffusion of CO<sub>2</sub> for photosynthesis & are closed at night. Therefore more transpiration occurs during the day
- Temperature** Increase of temperature allows more water to evaporate. Higher the temperature, more is the transpiration.

### Factors Affecting Transpiration (cont)

**Velocity of Wind** Transpiration increases with the velocity of wind. The faster the wind blows, more is the transpiration from the surface of leaves.

**Humidity** Transpiration is reduced if the air outside is humid since high humidity in the air reduces the rate of outward diffusion of the internal water vapour across stomata, thereby reducing the rate of transpiration.

**Carbon Dioxide** Increase in CO<sub>2</sub> level over normal 0.03% causes stomatal closure, resulting in decrease of transpiration

**Atmospheric Pressure** Rate of Transpiration increases with the decrease in atmospheric pressure.

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By **seremin** (seremin)  
[cheatography.com/seremin/](https://cheatography.com/seremin/)

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