# TP 03 : stomata

Underneath each leaf, in the epidermal tissue, there are small openings called stomata. Surrounding each stomata are guard cells that regulate the opening and closing of the stomata. The stomata allow carbon dioxide into the leaf for photosynthesis and release excess oxygen into the atmosphere as byproduct of photosynthesis. Water is also lost from the plant through the stomata, so the size and number of stomata vary according to the environment and other adaptations of the plant. In this experiment, the student will collect leaf specimen to observe and compare their stomata.

Transpiration is the evaporative loss of water through the aerial parts of the plants especially through the leaves. In all green plants transpiration occurs mostly through the stomata of the leaves. In dicot plants leaves will have more stomata on the lower surface than the upper surface. So more transpiration occurs through the lower surface of the leaves of this plant. Stomatal pores get widely opened when the leaf get exposed to bright sunlight. To avoid excessive loss of water through transpiration dicot leaves possess more stomata on the lower surface as this surface is not much exposed to sunlight.

**Aim of the experiment**

- **Experiment 1 :** Observed of stomata.
- **Experiment 2 :** To prove more transpiration occurs from the lower (ventral) surface of a dicot leaf than upper (dorsal) surface. (OR) To prove unequal transpiration from the two surfaces of a dorsiventral leaf.

**Materials:**

Leaves - Clear nail polish -Transparent tape –Microscope -Microscope slides - Microscope cover slip - strips of dry cobalt chloride paper.

- **Procedure for experiment 1 :**

- Collect leaves.

- On the bottom of each leaf, paint a 1 inch square section of clear nail polish. Allow to dry.

- Place clear tape over each section of nail polish and carefully remove from the leaf. This will give you an impression of the epidermis of the leaf. Fix the tape to a microscope slide and label with the plant species.

- With the microscope on the lowest setting, focus your slide to see the stomata. Once you have a good view, switch to the next magnification. Look at the stomata from each magnification available. Determine at which magnification the stomata are the most easily viewed. Write this setting down to use with each slide.

- Draw the stomata and describe their general shape and size. In a single field of view, count the number of stomata. Switch the field of view and count again.

❖ **Procedure for the experiment 2 :**

- A well watered dicot plant has to be selected for this experiment. Now two strips of filter paper are soaked in 2% solution of cobalt chloride and are perfectly dried under sunlight. Cobalt chloride paper will be blue in color when it is dry and become pink when it absorbs moisture. Due to this characteristic feature it acts as a chemical indicator in this experiment. One strip of this dry blue cobalt chloride paper is kept on either surface of a healthy dorsiventral leaf and are covered by glass slides with the help of clips. Now the whole experimental setup is kept under bright sunlight. Observe closely the changes which occur in cobalt chloride papers placed on both the surfaces.
- Experiment to show more transpiration occurs from lower surface of a dicot leaf than upper.