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STOMATA'S FUNCTION IN PLANTS AND ECOSYSTEM

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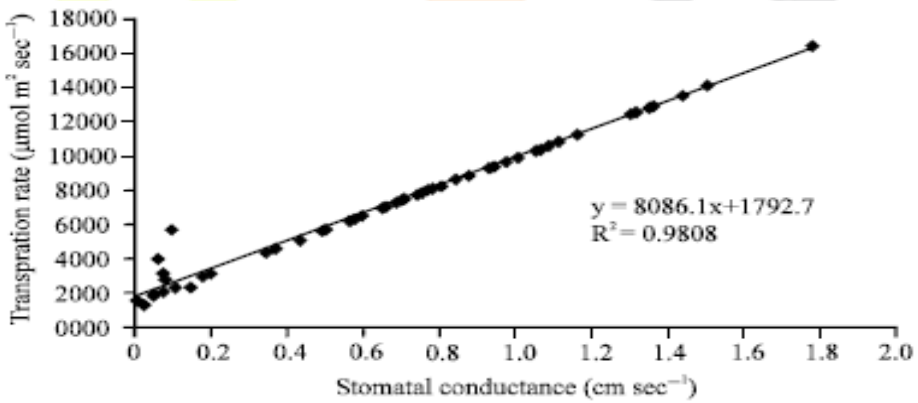
Abstract : This paper briefs you with the structure and functions of stomata in plants and our ecosystem as stomata being the central determinant of plant photosynthesis, transpirational cooling and ecological adaptability have a huge impact on global water and carbon cycles.

INTRODUCTION

Stomata are microscopic pores found in the epidermal layer of the leaves, stem and other organs, that controls the rate of gaseous exchange in plants. The pores are bordered by a pair of specialised parenchyma cells known as "Guard Cells" that regulate the size of stomatal opening. The number of stomata present per unit area of a leaf, their size and distribution pattern vary substantially among species or genotypes within a species. The main function of stomata in plants is to regulate carbon dioxide uptake and water loss that directly influence the CO2 assimilation and transpiration rates.

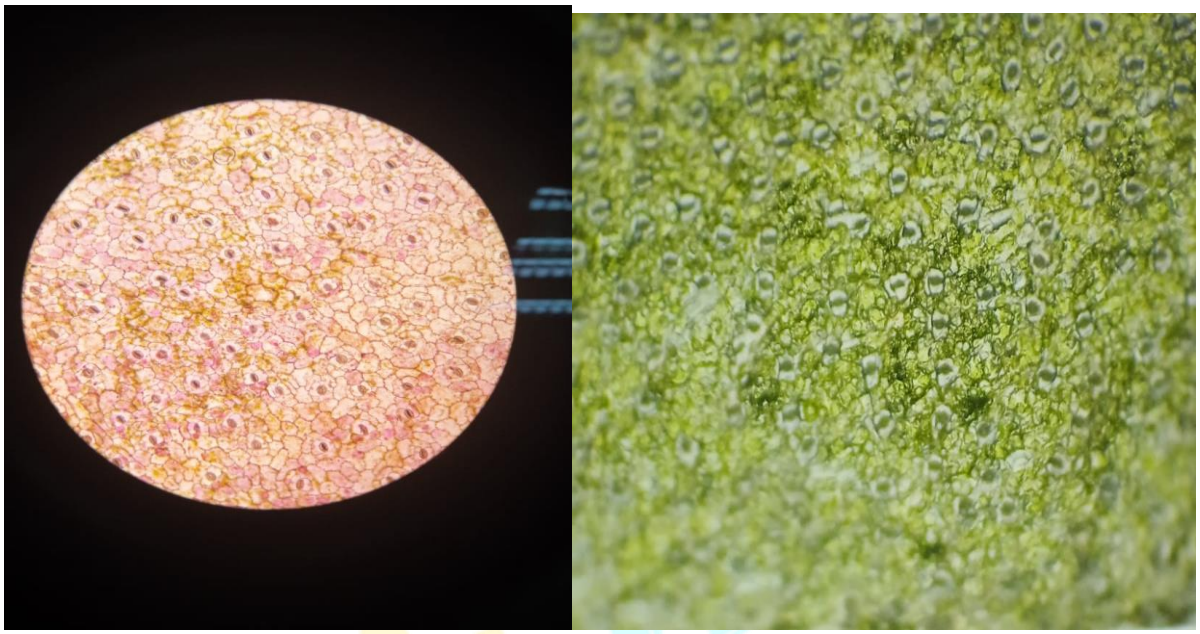


stomatal morphology, conductance and transpiration of musa sp. cv. rastali in relation to magnesium, boron and silicon availability

The above graph depicts the relation between transpiration and stomatal conductance. The more the density of stomata, the more CO2 can be taken up and the more water can be released. The balance between these two prosses depends on stomatal responses to internal and external stimuli and the synchrony of stomatal behaviour relative to mesophyll demands for CO2.

Types of Stomata:

Stomata can be broadly divided into two types on the bases of the shape of their guard cells. The first type is that having bean shaped guard cells possessed by the dicot plants and the second type is that having dumbbell shaped guard cells found in monocot plants . The guard cells regulate the opening and closing of stomatal pore due to turgor changes. Upon the incoming of water inside the guard cells, they swell up due to which the stomatal pore opens up. When the guard cells lose water, they become flaccid and straight and thus close the stomatal aperture.



microscopic images of (a) safranin stained leaf epidermal layer, (b) without safranin.

Stomatal pores can close to such an extent that they can even prevent microbial entry thus protecting the plants from pathogen infection.

Conclusion:

Stomata are important not only for plants but they are very essential for the survival of the animals as well because the oxygen gas which is the most primary requirement for our survival produced by the plants is released in the atmosphere by these microscopic pores. Not only that but the water released by plants during transpiration plays a major role in maintaining the hydraulic cycle of our ecosystem as well as it provides the suction required for the transportation of food and water in plants. Hence stomata are very essential for plants as well as animals and many other species present on this earth.

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