



## A STUDY ON STOMATAL TYPES OF PLANT IN BIODIVERSITY PARK OF ST. STEPHEN'S COLLEGE

**Dr. Praveen Dhar T.**

Assistant Professor, Department of Botany, St. Stephen's College, Pathanapuram, Kollam

Kerala, India.

### ABSTRACT

*The form and shape of the stomata and its associated epidermal cells, stomatal frequency, type of epidermal trichomes and pattern of distribution, are important sources of taxonomical consideration. The objective of the present study is to find out the stomatal features of plant species available in biodiversity park. The study, it was found that the leaves of all the species studied were different types of stomata and the stomata were unevenly scattered and oriented in different directions in the epidermal tissue.*

**Key words:** Stomatal types, Stomatal indices, Stomatal frequency

### INTRODUCTION

Stomata are considered as homologous structures. The last two decades witnessed an unprecedented interest in stomata structure and development and greater use to such data in assessing taxonomic relationship and evolution hands than any other characters of the leaf (Wilkinson, 1979). The wall thickening and ornamentation of the guard cells and the shape, size, distribution and orientation of the stomata are characters that are of taxonomic value. Vancotthem (1973) pointed out that "the morphological and ontogenetic stomata type provides us with not only a diagnostic character but also a very valuable taxonomic and perhaps even a phylogenetic clue". The form and shape of the stomata and its associated epidermal cells, stomatal frequency, type of epidermal trichomes and pattern of distribution, are important sources of taxonomical consideration.

The main objective of the present study is to find out the stomatal features of plant species available in biodiversity park of our college.

## **MATERIALS AND METHODS**

For the present investigation 16 plants were selected. For stomata analysis, epidermal peels were taken mechanically using a razor blade. They were first washed in distilled water and stained in 1% aqueous safranin. Again washed in distilled water, mounted in 50% glycerine and sealed with paraffin wax. The stomata were observed by using compound microscope. Photomicrographs were taken for all the observations. Jetner –Biolux research microscope was used for micro photographing.

In the present study stomatal frequency and stomatal indices were also calculated. The formula for calculating Stomatal frequency and indices are given below :

$$\text{Stomatal Frequency (S.F.)} = \frac{S}{E} \times 100$$

$$\text{Stomatal Index (S.I.)} = \frac{S}{E + S} \times 100$$

Where ‘S’ is the number of stomata per unit area and ‘E’ is the number of epidermal cells other than the stomata in the same unit area.

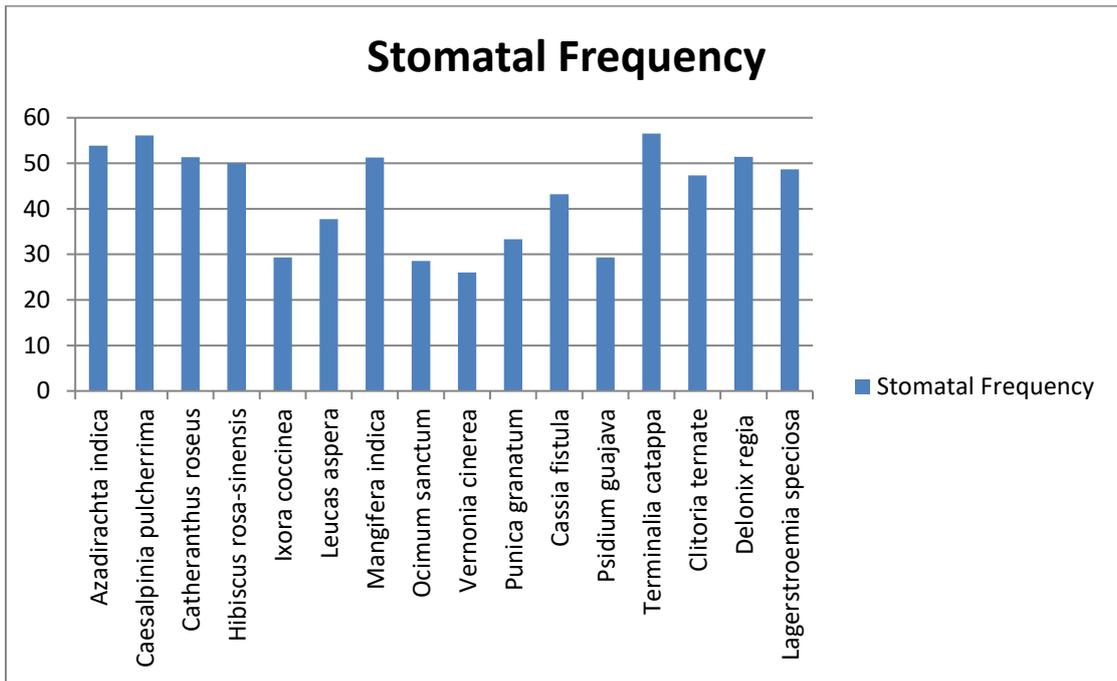
## **OBSERVATION**

The present study was conducted in Biodiversity park of St. Stephen’s College. For the present investigation newly introduced plants were selected. Morphological features and stomatal features like type of stomata and stomatal indices were calculated. The observations revealed from the present study is given below :

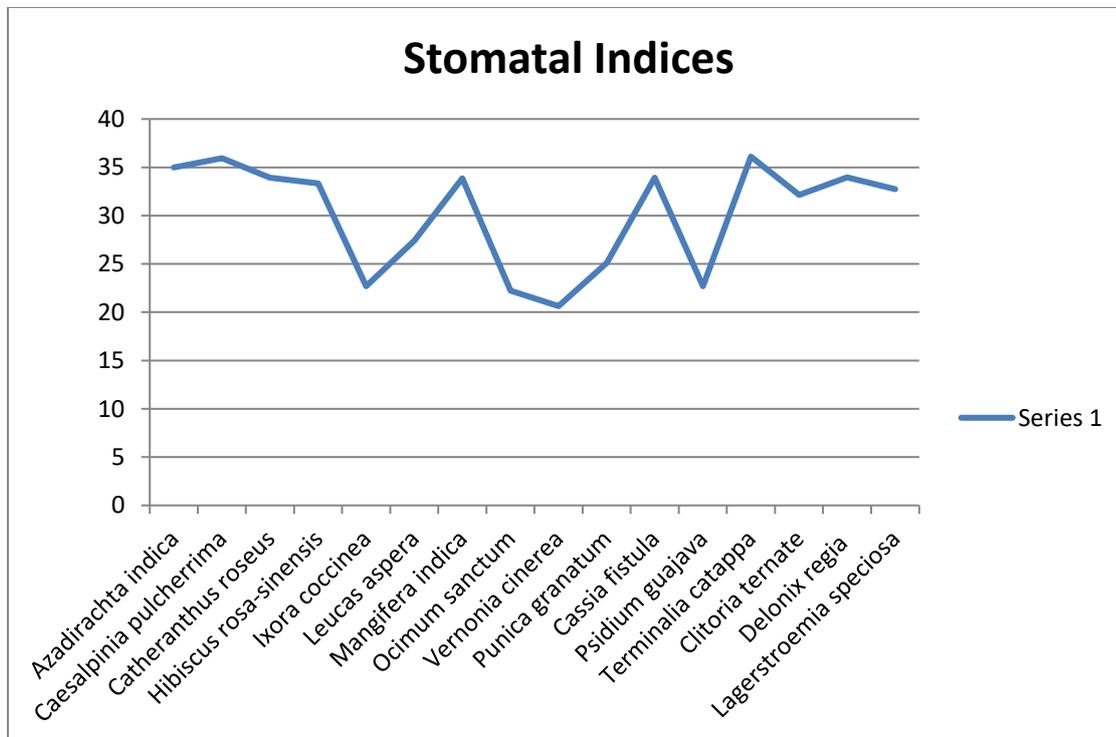
**Table: - 1 Stomatal features of species of the present study**

Sl. No	Botanical name	Stomata type	Stomata Frequency	Stomata Indices
1	<i>Azadirachta indica</i>	Paracytic	53.84	35
2	<i>Caesalpinia pulcherrima</i>	Anisocytic	56.09	35.93
3	<i>Catheranthus roseus</i>	Paracytic	51.35	33.92
4	<i>Hibiscus rosa-sinensis</i>	Paracytic	50	33.33
5	<i>Ixora coccinea</i>	Diacytic	29.33	22.68
6	<i>Leucas aspera</i>	Diacytic	37.77	27.41
7	<i>Mangifera indica</i>	Paracytic	51.25	33.87
8	<i>Ocimum sanctum</i>	Diacytic	28.57	22.22
9	<i>Vernonia cinerea</i>	Paracytic	26	20.63
10	<i>Punica granatum</i>	Paracytic	33.33	25.09
11	<i>Cassia fistula</i>	Anisocytic	43.24	33.92
12	<i>Psidium guajava</i>	Paracytic	29.33	22.68
13	<i>Terminalia catappa</i>	Paracytic	56.52	36.11
14	<i>Clitoria ternate</i>	Anisocytic	47.36	32.14
15	<i>Delonix regia</i>	Anisocytic	51.42	33.96
16	<i>Lagerstroemia speciosa</i>	Paracytic	48.71	32.75

**Graph :1 Showing stomatal frequency species of the present study**



**Graph :1 Showing stomatal indices species of the present study**



## DISCUSSION

During the present investigation type and number of stomata, stomata frequency, stomata indices of leaf epidermis were observed. In the present investigation, it was found that the leaves of all the species studied were different types of stomata and the stomata were unevenly scattered and oriented in different directions in the epidermal tissue. Stomatal type and frequency also show diversity from plant to plant but plants belongs to same species show same types of stomata. Diversity of stomata on the same surface in the Convolvulaceae have already been reported by Tognini (1987), Pant and Banerji (1965), Shah (1967). On the basis of stomatal study, it is suggested that epidermal characters such as stomatal types, nature of the epidermal cell, average size of stomata and guard cells can be of definite value in supplementing the conclusion based on external morphology.

## REFERENCES

- **Banerji, M.L. and Das, S. 1972.** Minor venation pattern in the Indian *Acers*, Advance in plant morphology. Y.S. Murty et al. (eds). *Sarita Prakashan, Meerut*. 51-57.
- **Shah, G.L. 1967.** Stomatal development in *Convolvulus arvensis* Linn. Proc. Indian Acad. Sci. Soc. B. 66. 241-242.
- **Tognini, F. 1897.** Contribuzione allo studio della oryunoence comparete degli stomi. Atti I<sup>st</sup> Bot. Univ. Lab Orittogan, *Pavia*, 4: 1-42.
- **Vancotthem, W. R. J. 1973.** Stomata types and systematic. *Bot. J. Linn. Soc.* 67. suppl. I: 59-71
- **Wilkinson, H.P. 1979.** The plant surface (mainly leaf), anatomy of Dicotyledens. Metcalfe, C.R. and L. Chalk (eds) 2<sup>nd</sup> edition Clarendon Press, Oxford , 97-165.