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## **Stomatal studies of some ethno-medicinal plants used against bone diseases.**

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**Abstract:** The present paper deals with study of epidermal cell and stomata. The stomata allow gaseous exchange. In leaves they occur either on one surface or on both surface. The determination of stomatal index in the ethno-medicinal plants like *Nyctanthes arbor-tristis* Linn., *Ricinus communis* Linn., *Vitex negundo* Linn. are used against bone diseases.

**Key words:** Stomatal index, Ethnomedicinal plants, Bone disease.

### **INTRODUCTION**

Stomata are minute pores of elliptical shape, surrounded contain chloroplast by two specialized kidney shaped cell called guard cell. Stomata are the suitable avenue for transpiration. The upper epidermis no. of stomata is less then lower epidermis. The number of stomata may varies in different plant species so stomatal studies can also be helpful in identification of plants .These three plants are commonly used by the local people of Ranchi district against arthritis, bone fracture, lumbago, gout, rheumatism and sciatica etc.

The primary and most important function of stomata is gaseous exchange and secondary function is transpiration. After counting the stomata and epidermal cells, the stomatal index is determined by given data. Stomatal index is the percentage of total no. of stomata with total no. of epidermal cells around the stomata in a unit area of leaf it can the calculated by the following

formula.

$$S.I = \frac{S}{E + S} \times 100$$

S.I. = Stomatal index

S = No. of stomata per unit area.

E = No. of epidermal cells in the same area.

### **MATERIALS AND METHODS**

*Nyctanthes arbor-trisis*, *Ricinus communis*, *Vitex negundo* leaves were collected from Namkum, Burdwan compound and Ratu Ranchi in March – Nov 2010. During the sunny day, the epidermis was peeled with the help of blade at both dorsal and ventral surface of leaves, cleaned and were stained with aqueous saffranine and mounted in glycerin , prepare a slide and observed under microscope. Those plant were identified with the help of Botany of Bihar and Orissa Vol-I-VII<sup>1</sup>. Scientific technique were used to prepare herbarium specimens<sup>2</sup>, which are maintained in the university department of Botany , Ranchi University. Ranchi.

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**RESULTS AND DISCUSSION**

**Table 1: Stomatal Index of *Nyctanthes arbor-trisis* L.**

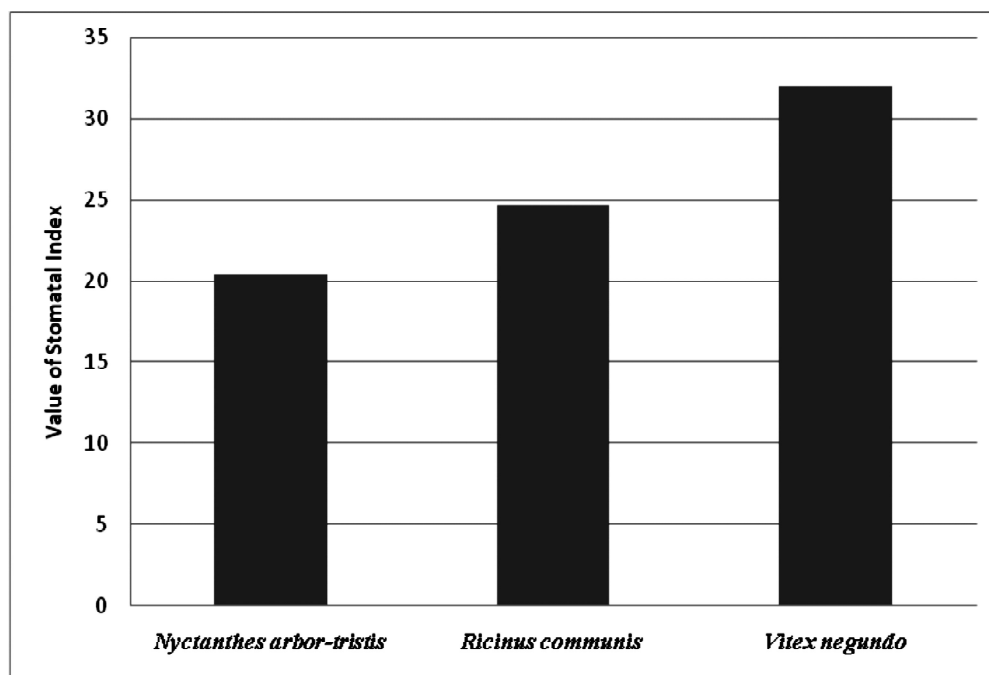
No. of Observation	No. of Stomata per unit area (s)	No. of Epi. Cells(E)	$S.I = \frac{S}{E+S} \times 100$
1	21	75	
2	23	79	
3	22	74	
4	17	80	
5	20	78	<b>S.I. = 20.48</b>
6	18	75	
7	15	78	
8	23	72	
9	17	76	
10	20	74	
<b>Total Average</b>	<b>19.6</b>	<b>76.1</b>	

**Table 2: Stomatal Index of *Ricinus communis* L**

No. of Observation	No. of Stomata per unit area (s)	No. of Epi. Cells(E)	$S.I = \frac{S}{E+S} \times 100$
1	25	75	
2	22	77	
3	27	81	
4	24	76	
5	26	77	<b>S.I. = 24.75</b>
6	23	80	
7	24	75	
8	25	78	
9	28	77	
10	30	76	
<b>Total Average</b>	<b>25.4</b>	<b>77.2</b>	

**Table 3: Stomatal Index of *Vitex negundo* L.**

No. of Observation	No. of Stomata per unit area (s)	No. of Epi. Cells(E)	$S.I = \frac{S}{E+S} \times 100$
1	42	75	
2	35	82	
3	28	80	
4	46	78	
5	38	74	<b>S.I. = 32.04</b>
6	39	85	
7	31	83	
8	43	78	
9	34	80	
10	37	76	
<b>Total Average</b>	<b>37.3</b>	<b>79.1</b>	



Graph 1: Comparative study of Stomatal Index

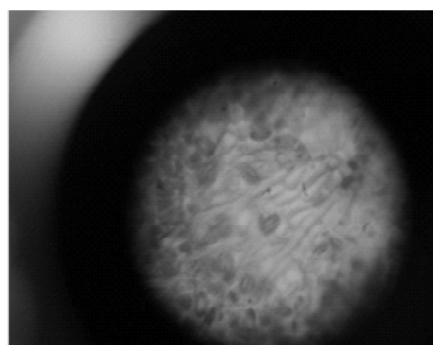


Fig-1: *Ricinus communis* L.

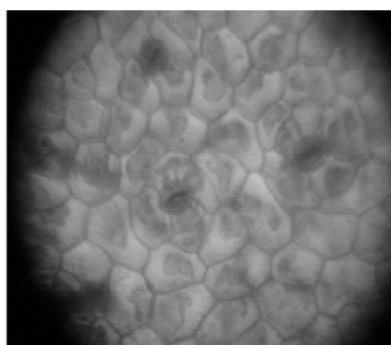


Fig-2 : *Nyctanthes arbor-tristis* L.

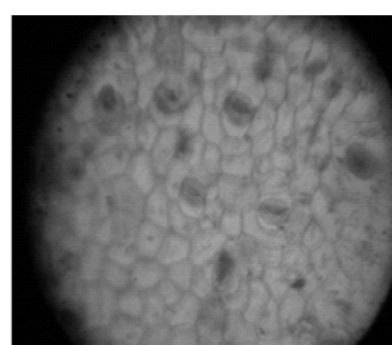


Fig-3: *Vitex negundo* L.

The present paper deals with the types of stomata in these mentioned plants species and there stomatal index. *Nyctanthes arbor- trisis* L., *Ricinus communis* L. and *Vitex negundo* L. types of stomata was anomocytic. Stomatal index are respectively 20.48%, 24.75% and 32.04% in which highest and lowest stomatal index studied in *Nyctanthes arbor- trisis* L. and *Vitex negundo* L. These stomatal study had been done observed in last few years in different part of country and also classification

of stomata is studied<sup>3</sup>. The stomatal studied of some medicinal plants of polygonaceae family was done<sup>4</sup>. The relationship of stomatal density and index was studied in salix cinerae<sup>5</sup>. The stomatal study play an important role in plant classification.

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