



RESEARCH ARTICLE

STUDIES ON THE STOMATAL FREQUENCY OF TWO MEDICINALLY IMPORTANT MEMBERS OF FAMILY COMMELINACEAE

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Abstract

Tradescantia pallida (Rose) D.R.Hunt and *Tradescantia spathacea* Sw. belongs to the family Commelinaceae. The plants of *Tradescantia* were collected from campus of University Department of Botany Ranchi University Ranchi. In present investigation the shape, size and type of stomata was observed. Maximum number of stomata was observed i.e. 21.71 ± 2.1 , on the basal surface of Adaxial portion of leaf of *Tradescantia pallida* (Rose) D.R.Hunt and there is no stomata was found on the abaxial surface of *Tradescantia spathacea* Sw.

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Introduction:-

Tradescantia pallida (Rose) D.R.Hunt and *Tradescantia spathacea* Sw. belongs to the family Commelinaceae. The family is commonly known as Day flower family or Spiderwort wort family. The family comprises 37 genera and 600 species. Members of this family are widely distributed in the Tropical and sub tropical region in the world (Saravanakumar.K,2013). Members of this family are cultivated from April to November.(Eiichi IDAKA et.al 1987).Plants has many medicinal properties. It is use to treat venereal disease, cancer and Cardiovascular disease.

The present investigation, on *Tradescantia* species was carried out to determine the shape, size, and frequency of stomata.

Material and Methods:-

The plant material were collected from Campus of University Department of Botany R.U. Jharkhand .Fresh leaves were taken for cuticular studies. They were peeled of with the help of sharp razor. After peeling of, slides were prepared by the staining with safranin and mounted with glycerin. Under microscope shape and size (length and width) of stomata were observed and measured with the help of ocular and stage micrometer. For calculation of Stomatal index 10 reading were recorded for Abaxial surfaces of leaves in Apex, middle and base portion.

Stomatal Index:- The stomatal index was calculated with the help of following formula

S.I= no. of stomata per unit area / no of stomata + no of epidermal cell $\times 100$

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Results:-

Photosynthesis and water transport in plant facilitate by specialized epidermal cells of leaves known as stomata. The type of stomata is Tetracytic. In *Tradescantia pallida* Rose D.R ,Hunt. maximum stomatal index was found. 21.71 ± 2.1 at Basal portion of adaxial surface, but in *Tradescantia spathacea* Sw. it was observed $14.14 \pm 1.03 \mu$ in middle portion of adaxial surface. Stomata's are absent in abaxial surface of *Tradescantia spathacea* Sw i.e., hypostomatic nature was found. Length of stomata was highest i.e., 89.2 ± 1.50 at the apex portion of abaxial surface of *Tradescantia pallida* Rose D.R.,Hunt and lowest at the basal portion of adaxial surface i.e. 56.8 ± 0.94 .

Discussion:-

The leaf had Tetracytic type of stomata. The hypostomatic nature of stomata found on the *Tradescantia spathacea* Sw. that means stomata's are present only in the adaxial surface, and amphistomatic (in both the surface) nature was found on *Tradescantia pallida* (Rose) D.R.

Conclusion:-

On the basis of present investigation it may be concluded that Tetracytic type of stomata was present in both the species of *Tradescantia*. In both the species *Tradescantia pallida*(Rose)D.R,Hunt. was amphistomatic in nature and *Tradescantia spathacea* Sw. was hypostomatic. However, there were differences observed in Stomatal index, length and width of stomata.

Table 1:- Stomatal index data related to Length, Width and area of Stomata in (μ) of adaxial and Abaxial surface of *Tradescantia pallida* (Rose) D.R,Hunt and *Tradescantia spathacea* sw.

Surfa ces	Species	Apex			Middle			Base		
Adaxi al		S.I	Length (μ)	Width(μ)	S.I	Length (μ)	Width(μ)	S.I	Length (μ)	Width(μ)
	<i>Tradescantia pallida</i> (Rose)D. R,Hunt	20.38 ± 1.29	74.4 ± 3.97	36.8 ± 4.36	17.33 ± 2.79	58 ± 0.63	36 ± 0.80	21.71 ± 2.11	56.8 ± 0.94	33.2 ± 0.58
	<i>Tradescantia spathacea</i>	7.89 ± 0.77	49.2 ± 0.58	34.8 ± 0.98	14.14 ± 1.03	42.4 ± 0.62	30 ± 0.63	9.32 ± 1.22	50 ± 2.13	34 ± 1.02
Abaxi al	<i>Tradescantia pallida</i> (Rose)D. R,Hunt	18.64 ± 1.85	89.2 ± 1.50	42.8 ± 0.98	16.20 ± 1.47	76.8 ± 2.02	45.2 ± 1.13	12.01 ± 1.31	78 ± 2.90	44 ± 1.05
	<i>Tradescantia spathacea</i>	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL



Fig 1:-



Fig 2:-



Fig 3:-

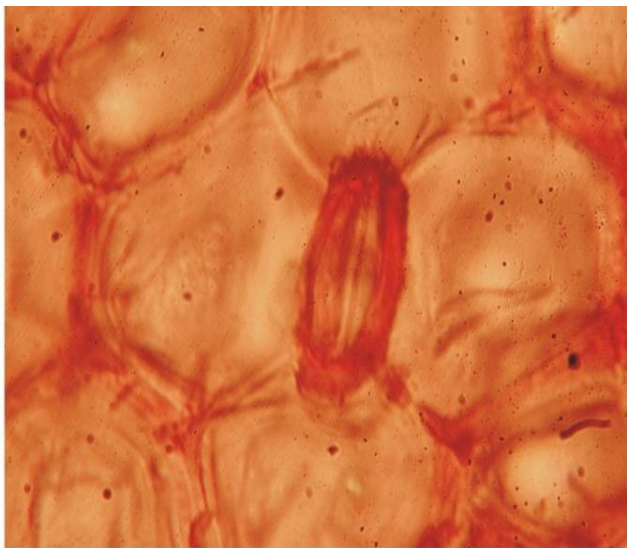


Fig 4:-

Photograph of *Tradescantia spathacea* Sw.(Fig1),Microphotograph of Stomata of *Tradescantia spathacea* Sw.(Fig2).
Photograph of *Tradescantia pallida* (Rose).D.R,Hunt (Fig1),Microphotograph of Stomata of *Tradescantia pallida* (Rose).D.R,Hunt.(Fig4)

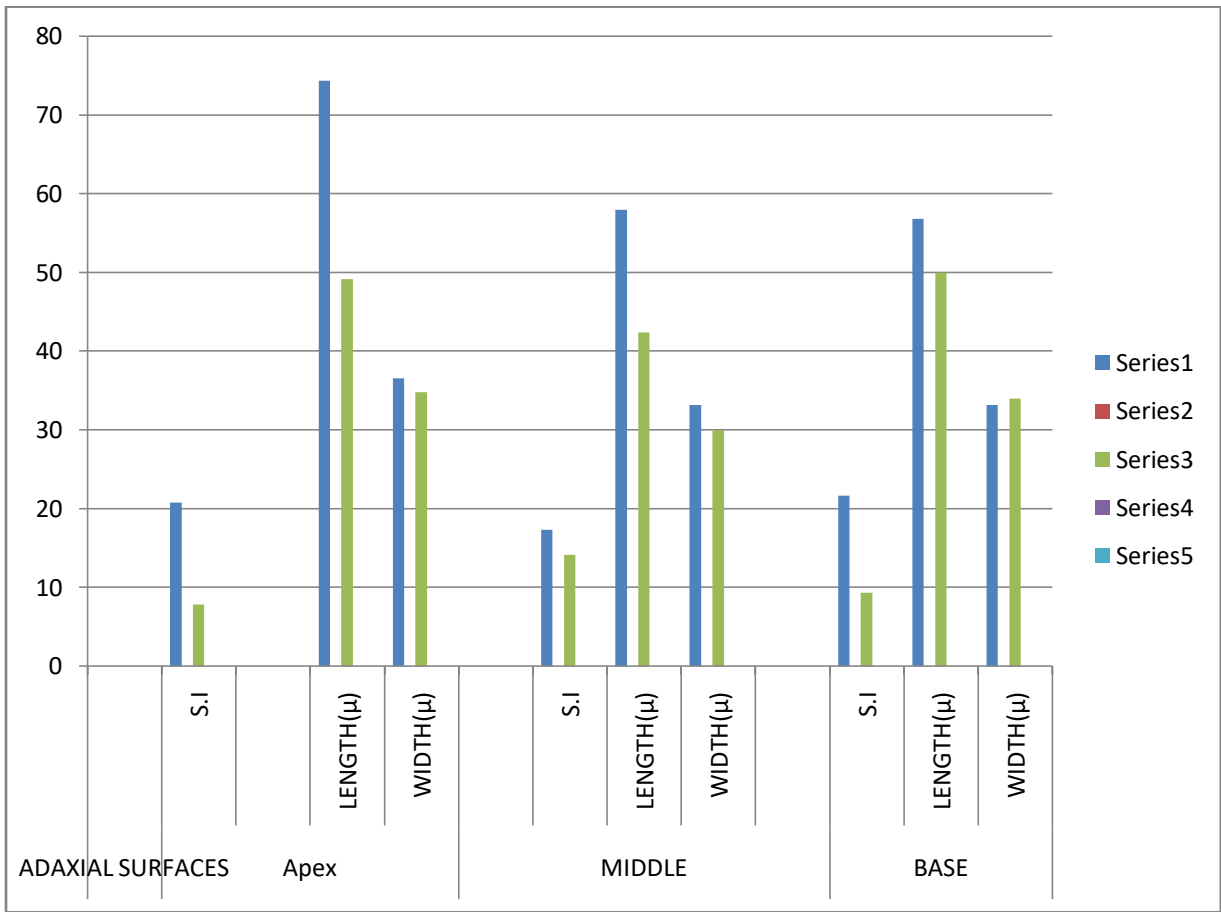


Fig 5:- Column graph showing comparative stomatal index (S.I),Length and width of stomata in Adaxial surface of the *Tradescantia pallida*(Rose).D.R,Hunt and *Tradescantia spathacea* Sw.

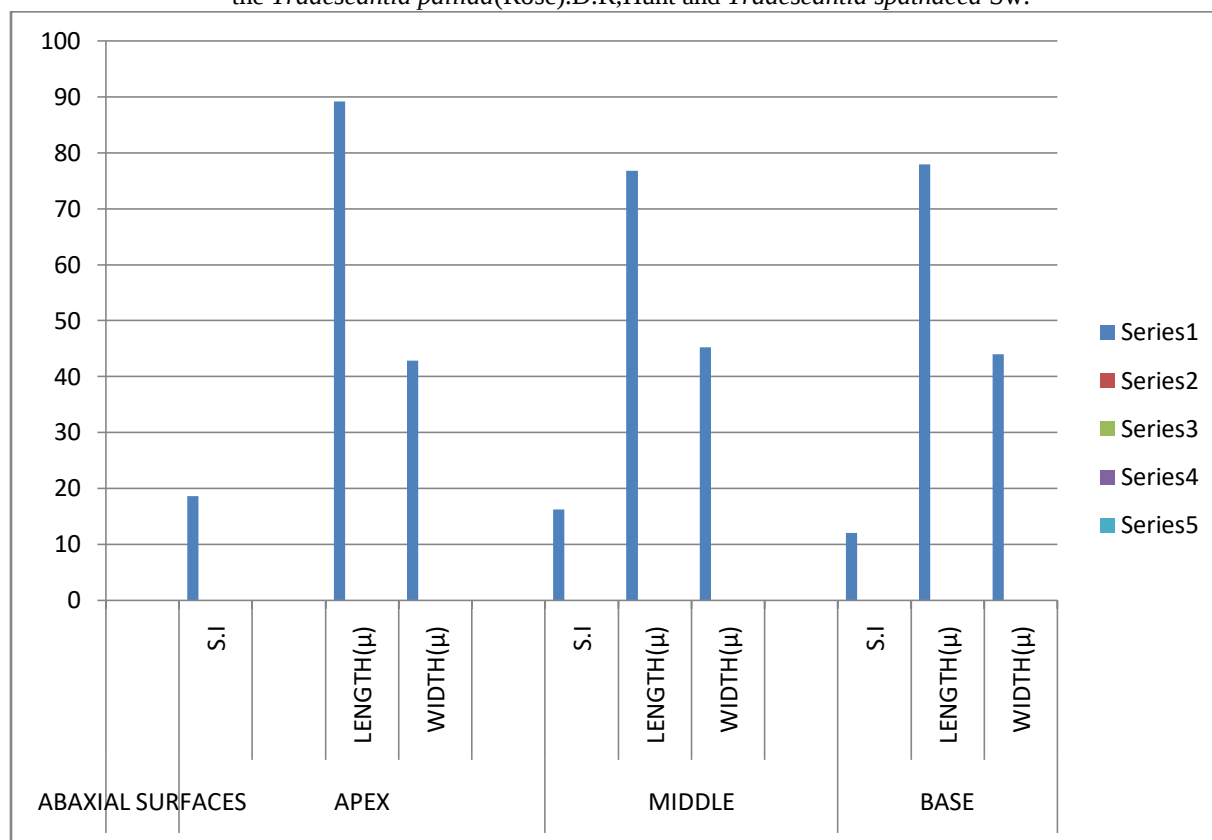


Fig6:- Column graph showing comparative stomatal index (S.I),Length and width of stomata in Abaxial surface of the *Tradescantia pallida*(Rose).D.R,Hunt. and *Tradescantia spathacea* Sw.

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