Seasonal Variations of Air-Trichomes at Bodh-Gaya

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(Accepted, February, 1988)

Plant trichomes, occur in the ambient atmosphere of university campus, Bodh-Gaya. Altogether 33 morphotypes of air-trichomes belonging to different genera and families constituting ground taxa of the locality were recorded. Of these, unicellular trichomes comparable to those of grasses were commonly observed throughout the year. The maximum types were recorded during summer months followed by winter and rainy seasons, respectively. Temperature, relative humidity and rainfall

Key Words - Allergen Air, Genera Grasses Trichomes Seasonality

Persistent occurrence of plant trichomes in the air along with other aerobiota has been recorded at Bodh-Gaya centre. An elaborated investigation of the qualitative and quantitative analysis of airtrichomes was made under changing weather conditions and the results are reported.

MATERIALS & METHODS The trichomes of ground taxa were studied by making temporary slides of the epidermal peels of their hairy aerial parts. Camera lucida sketches of trichomes served as reference slides for the identification of trichomes trapped from

The isolation of air-trichomes was made by gravity slide exposure technique (Anonymous, 1980-1982). An aeroscope was installed at 4m height in the open terrace of the departmental building. Three glycerine jelly (gelatine 100g: glycerine 100 mL: phenol 1 mL: Safronin 1 mL) coated slides were exposed twice a week at 2 PM and allowed to remain for 24h. Such exposed slides were mounted with molten glycerine jelly and covered with 22 x 60 mm cover glass. A drop of formaline was added before mounting for better fixation of the cover glass. Qualitative estimation was done by preparing camera lucida sketches of trichomes along with fungal spores, pollen grains and miscellaneous biota trapped from the air. However, only trichomes were identified by comparing their camera lucida sketches with those obtained from the reference slides and available literature (Metcalfe, 1956; Metcalfe & Chalk, 1965). Simultaneously quantitative analysis was made by recording the number of trichomes per cm_2 of the exposed slides.

RESULTS & DISCUSSIONS Qualitatively 33 morphotypes of trichomes were observed. Of which unicellular, non.septate trichomes comparable to those of grasses were dominant (Fig.1-33). The number of trichomes was maximum (1.909) during summer months while their minimum number (0.227) was recorded during rainy season (Table 1).

Observation revealed that the quality as well as quantity of trichomes showed marked seasonality. Qualitatively morphotypes maxima were recorded during April, May and June which sharply decreased during the rainy months of July, August and September. A similar trend was observed in quantitative variation. During summer months trichomes were dried as a consequence of of dry air and high temperature making them lighter in weight and easily disseminable into the ambient atmosphere as a result of trembling of plant surfaces at various stages of growth and development. The decrease in the number of trichomes during rainy season might be due to continuous rainfall. Gregory (1973) pointed out that rain scrubbing is the ideal method of deposition for particulates.

Release of copious amount of trichomes specially during harvest in summer and winter as well as their perpetual dissemination in the air from



Fig 1-33. 1. Small, unicellular trichome with granular cytoplasmic content and a small hyaline basal cell (Psidium guava). 2. Multiseriate, pointed trichome (Ammania basifera). 3. Unicellular, non-septate trichome with pointed tip and broader base without ornamentation; cytoplasmic content fills 3/4 portion of the lumen (Brassica compestris). 4. Pointed, unbranched. unicellular trichome with serrate margin and a small hyaline basal cell which is connected with the main trichome through a dark coloured connective (Amaranthus viridis). 5. Bi-celled, unbranched, microhair with swelling at the node and a pointed upper end (Tridex procumbens). 6. Simple, unbranched hair with elongated lumen densely filled with granular cytoplasm (Quisqualis indica). 7. Simple, unbranched, micro-or macro-hair with empty lumen, pointed apex and flattened base without any ornamentation (Baugainvellia spectabilis). 8. Unbranched, elongated, filamentous hair with small basal cell containing granular cytoplasm (Zyzyphus zuzula). 9. Simple, unicellular trichome with circular bases and pointed obliterated granular cytoplasmic column (Crotolaria juncea). 10. Multiseptate, multicellular hair with clongated pointed apical cell other basal cells form ladder like structure (Polygala spp.) 11. Simple, non-septate hair having somewhat swollen basal cell with cytoplasmic content (Eragrotis triceps). 12. Simple, unbranched micro- or macrohair without cytoplasm in the lumen. Pointed at tip and show trilobular basal swelling (Cajanus cajan). 13.-Pointed, unbranched, unicellular trichome with swollen base and granular cytoplasm in lumen (Cynodon dactylon) 14. Multiseptate macro-hair with cells without cytoplasm in the lumen (Lantana camara). 15. Multiseptate, multicellular trichome with apical gland having 3 tranversed septa (Cicer arietinum). 16. Multicellular, multiseptate trichome with trilobular gland at the tip (Martynia diandra). 17. Multicellular, multiseptate trichome with biseriate arrangement in the lower cells while upper cells are uniseriate (Parthenium hysterophorus). 18. Unicellular, unbranched pointed trichome with empty lumen (Cassia fistula) 19. Sickle shaped, curved, bicelled trichome oval protuberance without cytoplasm emerging from the basal cell which also contains cytoplasm in the lumen (Panicum spp.) 20. Simple, nonseptate without cytoplasmic content in the lumen and contains thick walled spherical cell at the base (Oryza 21. Unicellular, non-septate trichome with sativa). pointed tip and flattened base, cytoplasmic content forms an obliterated column (Raphanus sativus). 22.-Unicellular, non-septate hair with obliterated lumen, pointed at the tip (Triticum vulgare). 23. Simple, unicellular, elongated pointed hair with single spherical prominant basal cell and empty lumen (Zea maize) 24. Peltate two-armed trichome (Chrysenthemum sp.) 25, 26. Multiseriate and multiseptate structures (stalk of

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glandular hair of Jatropha and Crozophora) 27. Simple, unicellular with small hyaline basal cell, cytoplasmic content of the trichome are partitioned into 5 small and one big chambers (Casuarina sp.) 28. Simple, unicellular without cytoplasm in the lumen (Grasses) 29. Simple, non-septate hair with granular cytoplasmic content at the base in the form of a spherical cell (Eragrotis tri-

cepes) 30. Unicellular, non-septate macro-hair with obliteratred lumen (Benincasa hiapida). 31. Stellate trichome with seven arm and ten glands in the centre (Solanum melongena) 32. Simple, unicellular in a group of three trichomes (Mucuna spp.) 33. Stellateh hair with seven arms and glands in the centre (Solanum melongena).

Table 1	Variation	of	Total	Morpheter							
				From photypes/Avera	ige Numbe	er/Per C	m 2	of Air - Trichomes	Tranned	0.0	4 1 1 1
				Exposed Slide	s (Pooled	Data d	of y	(ears)		OH	ine

Trichome Morphotype	S	0	N	D	T	E						
Ammania basifera(L)		And should be a state of the		D	3	Г	M	A	М	J	1	A
Amaranthus viridis(S)			_	_				+	+			
Baugainvellia spectabilis		+	+		-	+	·+-	_	+	+		
Benincasa hispida(S)	_	Anar a	-	+				_				_
Brassica compestris(L)		-	_		_				+		_	
Cajanus cajan(F)			_	+		+		+	+	+	_	
Cassia fistula(L)	-		+-	_	_		_	_	+		_	Transfer of
Casuarina sps.(S)			_		+	+	+	+	+	+	_	_
Chrysanthemum sps. (L)	-+-	-	1			_		+		-		_
Cicer aietinum(F)			T		+	+	-+-		+	_	_	_
*Crotolaria juncea (L)	Manual La		-		-+-			_	+			-
Cynodon dactylon (L)	and service of the se	-	1			+	+	+	+		_	_
Eragrotis tricepes (L)		B11111	-+-			+		Sector Las	+	+	-	
Eragrotis tricepes (S)			_		_	_	den ch	_	+	_		-
*Euphorbia herta (S)		+	10-10-10-10-10-10-10-10-10-10-10-10-10-1		+	-	-	+		+	_	
Grass (L)	+	+	+	-+-	+	+	-	+	+	+-	+	+
Hibiscus esculentus (L)		111 IN			_	-				4-	+	+
*Lantana camara (S)	-+-	+-	+	+	+	-+-	+-	+	-	-	-	_
Martynia diandra (F)	promiter	provide-		+	_	_	-	+		+	+	+
*Mucuna sps (F)			_					+	+			
Oryza sativa (S)		_		+			+	+		+		
Panicum sps. (L)		+		+		_	1000		+	+		
*Parthenium hysterophorus	+	+		+	+-	+	+	+	+	+		Terrary (
Polygala sps. (L)				10° 1					-}			wrap;
Psidium guava (L)	-	+	-	+		2-12-00	+-		#1.1.1.1	+	water	
Ouisqualis indica (L)	+	+	+	+	+	+	+	+	+	+	+	+
Raphanus sativus (L)				+-			+					
*Solanum melongena (L)	+		+				-+-	+	+		-1014	
Solanum melongena (S)	+	+			_	augusti-	2-3 V	-	+			10.01/0
*Stalk of glandular hair												
of Jatropha & Crozophora		+				-	_					-
*Tridex procumbens (L)			+	-+-	+	+	+	+	+	-#-		+
Triticum vulgara (L)		-	_	_			+	-+-	1.114	6462-	0.014	
Zyzyphus zuzuba (L)		#1071	and the second			+	1.128					-1
Number of trichomes/cm 2 of exposed slide.	.61	.99	1.0	1.5	.98	.99	1.2	1.7	1.9	1.5	.45	.36
Total Morphotypes	9	11	11	12	11	12	15	10	Ú.	10	2	-

L=Leaf trichome

S = Stem trichome

F=Fruit trichome

*=Suspected Allergenic trichomes

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other sources could also be examined for detecting the presence of some specific chemicals causing irritation to animals including human being. Each type of trichome is supposed to contain some amount of chemical substance which may be allergenic (Kanchan & Jayachandra 1980 a, b) or non-allergenic in nature.

Acknowledgements We thank the Head, Department of Botany, Magadh University for providing facilities and to Prof. D.P. Sinha, Department of Zoology, Magadh University for statistical analysis of the data. A.S. is grateful to Magadh University for financial assistance.

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