

## POLLEN MORPHOLOGICAL STUDIES IN CERTAIN MEMBERS OF FAMILY POACEAE FROM JAIPUR, RAJASTHAN

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Present paper deals with the pollen morphology of 61 species (53 wild, 8 cultivated) belonging to 42 genera of family poaceae from Jaipur district. In all species pollen grains are spheroidal, monoporate with psilate ornamentation. Aperture as a rule slightly protruding and crassimarginate, thus the poaceae is a stenopalynous family. Size of the pollen and pore ranges from  $12 \times 12\mu$  to  $115 \times 115\mu$  and 2 to  $8\mu$  respectively. *Zea mays* L. has the largest pollen ( $115 \times 115\mu$ ) while *Arundo donax* L. has the smallest one ( $12 \times 12\mu$ ).

**Keywords :** Monoporate; Poaceae; Psilate; Stenopalynous.

### Introduction

Jaipur is situated in the western part of India, between  $75-77^\circ$  E longitudes &  $26-28^\circ$  latitudes in the northern eastern part of Rajasthan. The city has comparatively dry climatic conditions. The morphological studies on pollen of grasses have been done by several workers<sup>1-4</sup>. However, pollen morphology of poaceae from Jaipur has not been studied earlier, except the only record of few poaceae species<sup>5</sup>.

### Material and Method

The pollen sample were collected in two consecutive years 1992-94 from the number of localities. Total 61 sps were collected, out of which 26 sps were from sandy plains, 14 from marshy places, 12 from hills, 8 from fields and one from fresh water aquatic habitat.

Herbarium sheets were prepared and numbered. The anthers were fixed in F.A.A. The slides from fresh material (unacetolysed) as well as from acetolysed grain were prepared. The grains were acetolysed by Erdtman technique<sup>6</sup>.

### Observations

The pollen grains in relation to their size, shape, exine thickness, ornamentation and number of apertures and size of pore were studied. Average values were calculated on the basis of at least 10 observations. The observations recorded in Table 1.

### Occurrence and Phenology

In the flora of Jaipur, poaceae tops the list

of Angiospermic families. It comprises 1/6 plant sps of the total flora of Jaipur<sup>7</sup>.

After the rains entire hills are covered with *Melanocenchris jacquemontii*, *Oropetium thomaeum*, *Tripogon roxburghianus*, *Dichanthium annulatum*, *Tragus biflorus* etc. Common grasses of plains are *Aristida* sp, *Cenchrus* sp. *Cynodon dactylon*, *Dactyloctenium* sp., *Eragrostis* sp., *Saccharum benghalensis*. *Arundo donax*, *Echinochloa* sp., *Imperata cylindrica*, *Paspalidium* sp. grows commonly on marshy places. *Mygroryza aristata* is free floating hydrophyte.

Out of 61 sps collected 50 sps flower during rainy season. Flowering period of some, like *Cenchrus setigerus*, *Paspalidium geminatum*, noted to be winter season. *Cynodon dactylon* found to flower all around the year.

### Discussion

Pollen grains of grasses are spheroidal, monoporate with psilate ornamentation, sexine as thick as nexine. Thickness of sexine was about  $\pm 1.5\mu$  in all the sps. Aperture as a rule slightly protruding and crassimarginate among all the sps. While in *Zea mays* Linn. it is observed to have collar. Size of the pollen ranges from  $12 \times 12\mu$  to  $115 \times 115\mu$  and pore size is from  $2\mu$  to  $8\mu$  in diameter.

*Zea mays* has the largest pollen grain ( $115 \times 115\mu$ ) and pore ( $8\mu$ ) in diameter. *Arundo donax* Linn. has the smallest pollen

**Table 1.** List of poaceae members from Jaipur showing important palynological characters, habit and flowering period.

Sr. No.	NAME OF PLANT	W/C	POLLEN SIZE (in $\mu$ )	PORE SIZE (in $\mu$ )	NO. OF PORE	ORNA-MEN-TATION	HAB-IT	FLOWER-ING PERIOD
1	2	3	4	5	6	7	8	9
1.	<i>Acrachne racemosa</i> (Heyne) ohwi	W	38 x 38	3	1	Psilate	P	Aug.-Sept.
2.	<i>Apluda mutica</i> Linn.	W	41 x 41 to 46 x 46	5	1	Psilate	P	Aug.-Sept.
3.	<i>Aristida adscensionis</i> Linn. Var. <i>adscensionis</i> Bor	W	42 x 42	4	1	Psilate	P	Aug.-Sept.
4.	<i>Arundo donax</i> Linn.	W	12 x 12	2	1	Psilate	M	Aug.-Sept.
5.	<i>Avena sativa</i> Linn.	C	69 x 69	5	1	Psilate	F	Jan-March
6.	<i>Bothriochloa pertusa</i> (Linn.) A. Camus	W	38 x 38	2.5	1	Psilate	H	Aug.-Oct.
7.	<i>Brachiaria ramosa</i> (Linn.) Stapf	W	54 x 54	4	1	Psilate	H	Aug.-Sept.
8.	<i>Brachiaria reptans</i> (Linn.) Gardener et Hubb.	W	46 x 46	4	1	Psilate	P	Aug.-Oct.
9.	<i>Cenchrus biflorus</i> Roxb.	W	50 x 50	4	1	Psilate	P	July-Oct.
10.	<i>Cenchrus ciliaris</i> Linn.	W	47 x 47	4	1	Psilate	P	Aug.-Oct.
11.	<i>Cenchrus pennisetiformis</i> Hochst. et Steud. ex Steud.	W	39 x 39	4	1	Psilate	H	Aug.-Oct.
12.	<i>Cenchrus setigerus</i> Vahl	W	47 x 47	5	1	Psilate	P	Oct.-Feb.
13.	<i>Chloris dolichostachya</i> Lagas	W	38 x 38	4	1	Psilate	H	Aug.-Oct.
14.	<i>Chloris virgata</i> Sw.	W	34 x 34	3.5	1	Psilate	P	July-Oct.
15.	<i>Cynodon dactylon</i> (Linn.) Pers.	W	31 x 31	4	1	Psilate	P	All round in the year
16.	<i>Dactyloctenium aegyptium</i> (Linn.) P. Beauv.	W	46 x 46	4	1	Psilate	P	Aug.-Oct.
17.	<i>Dactyloctenium indicum</i> Boiss.	W	34 x 34	3	1	Psilate	P	Aug.-Sept.
18.	<i>Davidrocalamus strictus</i> Nees.	C	50 x 50	5	1	Psilate	P	Feb.-April
19.	<i>Demostachya bipinnata</i> (Linn.) Stapf	W	35 x 35	4	1	Psilate	P	Aug.-Oct.
20.	<i>Dichanthium annulatum</i> (Forsk.) Stapf	W	38 x 38	3	1	Psilate	H	Aug.-Oct.
21.	<i>Digitaria adscendens</i> (HBK) Henr	W	46 x 46	4	1	Psilate	P	Aug.-Oct.
22.	<i>Digitaria ciliaris</i> (Retz.) Keol	W	46 x 46	4.5	1	Psilate	P	Aug.-Oct.
23.	<i>Echinochloa colonum</i> (Linn.) Link	W	45 x 45	4	1	Psilate	M	Aug.-Oct.
24.	<i>Echinochloa stagnina</i> (Retz.) P. Beauv.	W	54 x 54	5	1	Psilate	M	Aug.-Oct.
25.	<i>Eleusine compressa</i> (Forsk.) Asch. et. Schweinf. ex. C. Christensen	W	35 x 35	4	1	Psilate	M	Sept.-Oct.
26.	<i>Eragrostiella bifaria</i> (Vahl) Bor	W	30 x 30	3	1	Psilate	H	Aug.-Oct.
27.	<i>Eragrostis ciliaris</i> (Linn.) R. Br.	W	32 x 32	3	1	Psilate	P	Aug.-Sept.
28.	<i>Eragrostis tenella</i> (Linn.) P. Beauv. ex R. et S.	W	38 x 38	4	1	Psilate	P	Aug.-Oct.
29.	<i>Eragrostis tenuifolia</i> Hochst. et. Steud.	W	40 x 40	4	1	Psilate	P	Aug.-Oct.
30.	<i>Hordeum vulgare</i> Linn.	C	68 x 68	6	1	Psilate	F	Jan.-Feb.

Sr. No.	NAME OF PLANT	W/C	POLLEN SIZE (in $\mu$ )	PORE SIZE (in $\mu$ )	NO. OF PORE	ORNAMEN-TATION	HAB-IT	FLOWER-ING PERIOD
1	2	3	4	5	6	7	8	9
31.	<i>Hygroryza aristata</i> (Retz.) Nees ex Wt. Am. In Edinb.	W	38 x 38	3	1	Psilate	M	Oct.-Dec.
32.	<i>Imperata cylindrica</i> (Linn.) P. Beauv.	W	31 x 31	4	1	Psilate	M	Aug.-Oct.
33.	<i>Melanocenchris jacquemontii</i> Jaub. et Spach	W	30 x 30	4	1	Psilate	H	Aug.-Oct.
34.	<i>Oropetium thomaeum</i> (Linn. f) Trin.	W	31 x 31	4	1	Psilate	H	Sept.-Oct.
35.	<i>Oryza sativa</i> Linn.	C	64 x 64	6	1	Psilate	F	Dec.-Feb.
36.	<i>Panicum auritum</i> Presl ex Nees	W	48 x 48	4	1	Psilate	P	Aug.-Sept.
37.	<i>Panicum notatum</i> Retz.	W	50 x 50	4	1	Psilate	P	Aug.-Sept.
38.	<i>Panicum paludosum</i> Roxb.	W	42 x 42	4	1	Psilate	M	Aug.-Oct.
39.	<i>Paspalidium flavidum</i> (Retz.) A. Camus	W	46 x 46	4	1	Psilate	M	Aug.-Oct.
40.	<i>Paspalidium geminatum</i> (Forsk.) Stapf	W	42 x 42	4	1	Psilate	M	Nov.-Dec.
41.	<i>Paspalidium punctatum</i> (Burm.) A. Camus	W	36 x 36	2.5	1	Psilate	M	Sept.-Nov.
42.	<i>Paspalum scrobiculatum</i> Linn.	W	44 x 44	5	1	Psilate	M	Aug.-Nov.
43.	<i>Pennisetum typhoides</i> (burm.) Stapf & Hubbard	C	46 x 46	4	1	Psilate	F	July-Sept.
44.	<i>Perotis indica</i> (Linn.) O. Ktze.	W	38 x 38	4	1	Psilate	H	Aug.-Oct.
45.	<i>Phalaris minor</i> Retz. Var. <i>nepalensis</i> (Trin.) Bor	W	52 x 52	3	1	Psilate	P	Aug.-Oct.
46.	<i>Poa annua</i> Linn.	W	31 x 31	4	1	Psilate	P	Jan.-March
47.	<i>Polypogon monspeliensis</i> (Linn.) Desf.	W	38 x 38	4	1	Psilate	P	March-April
48.	<i>Saccharum bengalense</i> Retz.	W	46 x 46	4	1	Psilate	P	Aug.-Dec.
49.	<i>Saccharum spontaneum</i> Linn.	W	57 x 57	5	1	Psilate	P	Sept.-Oct.
50.	<i>Setaria glauca</i> (Linn.) P. Beauv.	W	42 x 42	5	1	Psilate	M	Aug.-Oct.
51.	<i>Setaria tomentosa</i> (Roxb.) Kunth.	W	50 x 50	4	1	Psilate	M	Aug.-Oct.
52.	<i>Setaria verticillata</i> (Linn.) P. Beauv.	W	38 x 38	4	1	Psilate	M	Aug.-Oct.
53.	<i>Sorghum halepense</i> (Linn.) Pers.	W	68 x 68	6	1	Psilate	F	Oct.-Feb.
54.	<i>Sorghum vulgare</i> Linn	C	54 x 54	4	1	Psilate	F	Sept.-Oct.
55.	<i>Sporobolus diander</i> (Retz.) P. Beauv.	W	32 x 32	4	1	Psilate	H	Aug.-Oct.
56.	<i>Sporobolus marginatus</i> Hochst. ex. A. Rich.	W	46 x 46	5	1	Psilate	M	Sept.-Oct.
57.	<i>Tragus Biflorus</i> (Roxb.) Schult.	W	31 x 31	4	1	Psilate	H	July-Aug.
58.	<i>Tripogon roxburghianus</i> (Steud.) Bhide	W	42 x 42	5	1	Psilate	H	Aug.-Oct.
59.	<i>Triticum vulgare</i> vill.	C	75 x 75	6	1	Psilate	F	Sept.-Oct.
60.	<i>Vetiveria Zizanoides</i> (Linn.) Nash	W	37 x 37	4	1	Psilate	M	Aug.-Oct.
61.	<i>Zea mays</i> Linn.	C	115 x 115	8	1	Psilate	F	July.-Sept.

(W-Wild, C-Cultivated, H-Hill, P-Plain, M-Marshy).

with  $2\mu$  pore diameter and pollen grain was  $12 \times 12\mu$ . This variation was not of much taxonomic significance. It could be of interest if studied within a species.

In case of Triticale pollen grains have 0-7 aperture<sup>8</sup>. No poaceae pollen studied so far from Jaipur has more than one aperture, nor they have reticulate or tegulate stratification, all were smooth with no stratification.

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