

STUDY ON POLLEN MORPHOLOGY OF GENUS *ZIZIPHUS*

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Pollen morphology of seven cultivated varieties and four wild forms belonging to the genus *Ziziphus* was studied using the acetolysis technique. The pollen grains were similar in aperture. They were 3-colporate having either psilate or faintly reticulate exine ornamentation. Further the pollens were prolate, subprolate or prolate spheroidal in shape. The thickness of the exine ranged between 1.18 to 1.72 μ . Differences were observed in the size of the pollen grain and it was maximum in Desi- (29.52 x 27.48 μ) and minimum in Kathaphal (19.32 x 18.42 μ). Thus, the genus almost showed homogeneity in the morphology of the pollen grain except the size of pollen grain.

Keywords : Ber, Pollen morphology; *Ziziphus*.

Introduction

Pollen morphology has been shown to be of great use in cultivar taxonomy of horticultural plants. Pollen morphology and surface topography have been widely accepted to identify plants of divergent and closely related taxa¹. The earliest reported work on pollen grains of *Ziziphus* was by Wodehouse². Subsequently, Erdtman³ reported that Rhamnaceae was a stenopalynous family having pollen grain usually tricolporate with plainly reticulate exine. Nair⁴ reported that pollen grain of *Ziziphus jujuba* Lam. were with psilate exine and circular endocolpium. Rao and Shukla⁵ found that different species of *Ziziphus* could be differentiated based on size, shape and pore structure of the pollen grains. Varietal differences in shape and size of the pollen grains were also reported by Singh and Mishra⁶, Nehra *et al.*⁷ and Hegde and Sharma⁸. An attempt has been made to differentiate the cultivated varieties and wild forms of *Ziziphus* on the basis of pollen morphology.

Materials and Method

The polleniferous material used for pollen morphological studies was collected from selected cultivars and species of ber (Table 1) located at the Horticultural orchard of CCS Haryana Agricultural University, Hisar during the year 1999-2000 and 2000-2001. The flowers were collected directly from field in vials containing 70 percent ethanol between 6.30 to 7.30 AM in the peak month

of flowering i.e. September for Jharber and October for other cultivars/forms. The pollen preparation was made by the acetolysis as described by Nair⁹. The terminology adopted for the description of pollen morphology was also the same as that used by Nair⁹.

Results and Discussion

The *Ziziphus* species and cultivars investigated exhibit little diversity in shape, size and exine characteristics and complete uniformity in aperture characteristics (Table 1 & Plate 1). It is clear from the table that the pollen grains were similar in aperture. The pollen grains were 3-colporate. The shape of the pollen grains was subprolate in all the cultivated cultivars except Illaichi, where it was prolate. But in the case of all the four wild forms, the shape was prolate spheroidal.

The size of the pollen grains varied in different wild and cultivated species of ber. Two varieties could be identified on the basis of the size of pollen grain. The size of pollen grain ranged between 19.32 x 18.42 μ to 29.52 x 27.48 μ of different varieties/forms. The exine ornamentation was faintly reticulate in all the cultivated varieties except Illaichi and Kathaphal where it was psilate type resembling to wild forms. So it can be said that the genus showed homogeneity in the morphology of pollen grain and variations were observed in size of pollen. Moti *et al.*¹⁰ did not observe any differences in the morphology of pollen of

Table 1. Pollen morphology in various cultivars/forms of *Ziziphus* spp.

Name of cultivars/ forms/species	Aperture	Shape	Size (μ)		P/E ratio	Exine thickness (μ)	Exine ornamentation
			Polar	Equatorial			
Cultivated cultivars							
<i>Ziziphus mauritina</i>							
Umran	3-Colporate	Subprolate	26.80	25.67	1.04	1.61	Faintly reticulate
Illaiichi	3-Colporate	Prolate	21.14	19.93	1.06	1.27	Psilate
Kathaphal	3-Colporate	Subprolate	19.32	18.42	1.05	1.18	Psilate
Gola Gurgaon No. 3	3-Colporate	Subprolate	23.02	20.83	1.11	1.36	Faintly reticulate
Bahadurgarhia Gola	3-Colporate	Subprolate	27.25	24.68	1.10	1.47	Faintly reticulate
Dandan Gola	3-Colporate	Subprolate	24.53	22.12	1.11	1.40	Faintly reticulate
Kakrola Gola	3-Colporate	Subprolate	21.82	19.63	1.11	1.37	Faintly reticulate
Wild forms							
<i>Ziziphus</i> spp.							
Desi-1	3-Colporate	Prolate spheroidal	29.52	27.48	1.07	1.71	Psilate
Desi-2	3-Colporate	Prolate spheroidal	29.14	28.20	1.04	1.72	Psilate
Desi-3	3-Colporate	Prolate spheroidal	29.44	26.35	1.12	1.68	Psilate
<i>Ziziphus nummularia</i>							
Jharber	3-Colporate	Prolate spheroidal	27.62	25.92	1.06	1.40	Psilate

P/E-Polar/ Equatorial

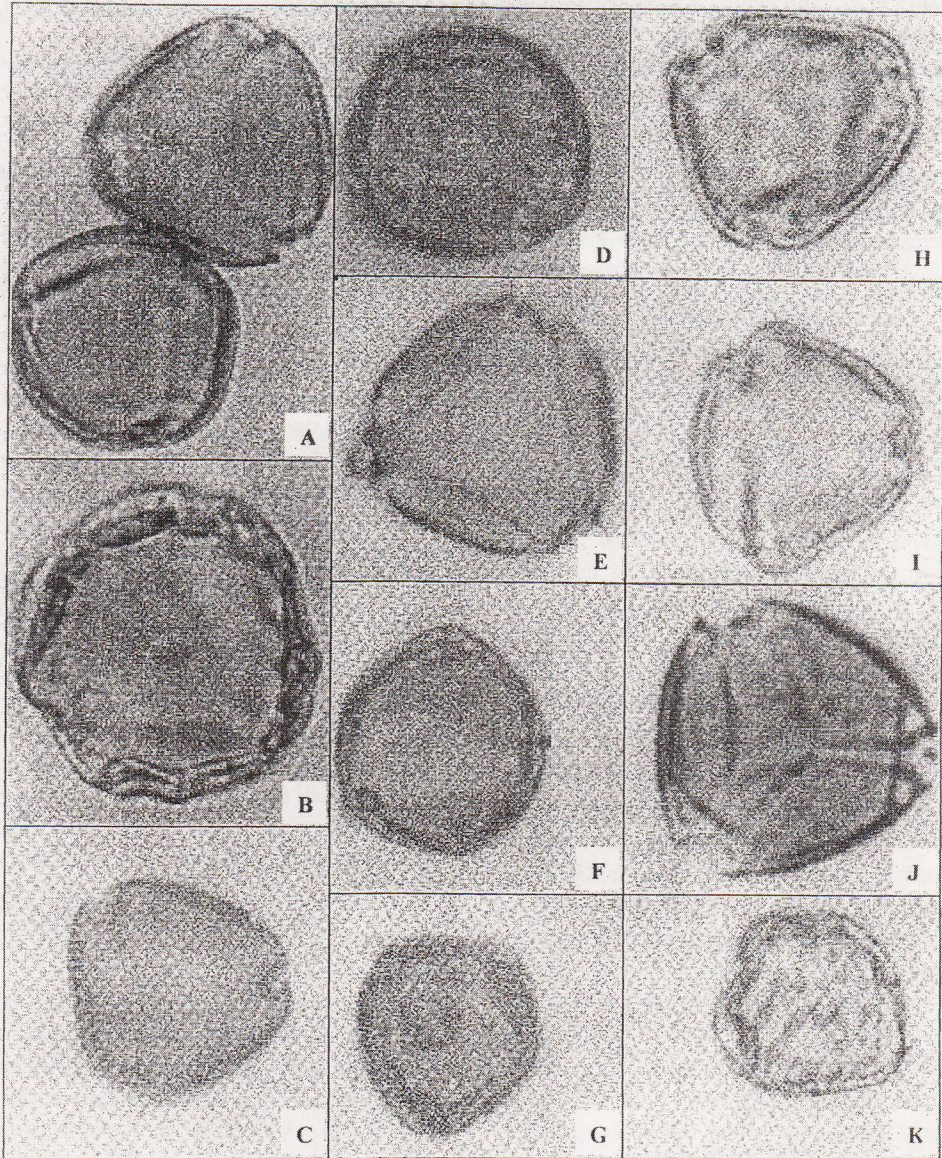


Fig. 1. Pollen grains of various cultivars and forms of *Ziziphus* spp.
A. Umran; B. Illaichi; C. Kathaphal; D. Gola Gurgaon No. 3; E. Bahadurgarhia;
F. Dandan Gola; G. Kakrola Gola, H. Desi-1; I. Desi-2; J. Desi-3, K. Jharber.

101 mango varieties but differences were found in the size of pollen grains. The reports of pollen morphology of guava by Nair *et al.*¹¹, Moti and Singh¹² in grapes, and Nehra *et al.*⁷ and Hegde and Sharma⁸ in ber also revealed that the general characters were the same in all the cultivars and the differences were restricted to the size of pollen grain only.

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