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PALYNOLOGICAL STUDIES ON SOME VARIETIES OF MORUS SP

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ABSTRACT
Pollen morphological study is a useful tool to study the inter-relationship of plant taxa. Twenty varieties of mulberry coming under different *Morus* sp. belonging to the family Moraceae have been examined by Light microscope. Pollen from different varieties exhibits variation in size, shape, pollen fertility occurs in all pollen grains. Many early records available in cytotaxonomical and cytomorphological studies. Only few reports are there in palynological studies in Moraceae. The present experiment is an attempt to study the pollen morphology of twenty varieties of *Morus* sp. This study is significantly helpful at the species level. The present investigation reveals the qualitative and quantitative micro morphological features of the pollen which can be used to discriminate the ploidy level of *Morus* sp.

KEYWORDS: *Morus* sp. Palynology, Twenty varieties.

INTRODUCTION
The pollen morphological characters are very useful in the classification and identification of many groups of plants (Erdtman, 1952; Nair, 1970). Pollen characteristics form important supplementary evidence in the cytotaxonomical studies. In Twenty varieties of *Morus* sp. , the palynological details such as pollen diameter, exine ornamentation and pollen fertility were carried out. Among twenty varieties, one variety (China white) coming under *Morus alba* L., Sixteen varieties coming under *Morus indica* L. (Table – 1). And two varieties (BC -2-59, Kosen) coming under *Morus multicaulis* Raffin. and one var. (Acc. 339) coming under *Morus serrata* Roxb.

MATERIALS AND MTHODS
Fresh and mature anthers, ready for dehiscence, were used for this study. One percent acetocarmine was used. Morphological details of pollen grains were made on twenty varieties of *Morus* sp. Results were tabulated with a view to see the differences among the taxa as to their size, shape, pattern of exine ornamentation, thickness and other features so as to assess the affinities between the closely related taxa. The percentage of viable pollen was calculated for each taxon.

The pollen grains were stained with 1 % aceto – carmine. The pollen which were morphologically normal and well stained were scored as fertile, while those which were shrunken and unstained pollens were scored as sterile. Pollen fertility was expressed in percentage.

RESULTS AND DISCUSSION
All the varieties of *Morus* studied possess have uniformly spherical pollen grains with size variations. Diploid varieties have smaller pollen grains while triploids have larger pollen grains. The maximum pollen diameter (27.50 um) was observed in *Morus indica* var. TR – 4 while the minimum (16. 50 um) was seen in *M. indica* MS - @ and MR – 1 varieties. The maximum exine thickness (3.00 um) was observed in *M. indica* varieties C – 776, S – 34, S -1635, S – 799, MR – 1 and *Morus multicaulis* Var. Kosen, while the minimum (2.00 um) was in *M. indica* var. S – 146 and *Morus serrata*. Regarding pollen fertility, the maximum (98.50 %) was observed in *M. alba* var. China white, *M. indica* var. MS – 2, S – 1301 and MR – 1 and the minimum in the variety TR – 8 (Table -1, Plate - 1)

The size of the triploid varieties is larger than those of diploids comparatively and the fertility of the pollen grains is very low (71.50 %, 72 % and 73.50 %) in triploid variety and very high (98.50 %) in diploid varieties. Reduced pollen fertility may be attributed to multivalent formation and other meiotic abnormalities which results in loss of chromatin materials (Darlington, 1937; Gottschalk, 1978). Stebbins (1950) pointed out that sterility may be mainly due to genetically controlled factors of unknown origin. According to Muntzing (1951) the fertility in auto as well as allo polyploids is influenced not only by the presence or absence of multivalent but also by other genetic factors. Variation in pollen stainability in the different varieties of mulberry indicate that they vary in genetic status. The sterility in a

way is useful in mulberry since it leads to high yield (Abdullav *et al*., 1964) and nutritive value.

Table 1: Palynological Studies on Different Varieties of Morus.

S. no.	Name of the cultivar	Pollen diameter (µm)	Exine thickness (µm)	Pollen Fertility (%)
1.	*Morus alba* var. China white	18.50	2.50	98.50
2.	*Morus indica* var.MS - 2	16.50	2.25	98.50
3.	*Morus indica* var.S -1	17.70	2.25	94.00
4.	*Morus indica* var.C - 776	25.00	3.00	95.50
5.	*Morus indica* var.S - 1635	26.50	3.00	77.50
6.	*Morus indica* var.S - 34	21.50	3.00	93.50
7.	*Morus indica* var.S - 1301	21.00	2.50	98.50
8.	*Morus indica* var.S - 763	20.50	2.50	97.50
9.	*Morus indica* var.S - 146	19.50	2.00	97.00
10.	*Morus indica* var.S - 799	25.00	3.00	95.00
11.	*Morus indica* var.S - 13	24.00	2.50	74.00
12.	*Morus indica* var. MR - 1	16.50	3.00	98.50
13.	*Morus indica* var. MR - 2	20.50	2.25	98.00
14.	*Morus indica* var. TR - 4	18.50	2.50	73.50
15.	*Morus indica* var. TR - 8	27.00	2.50	71.50
16.	*Morus indica* var. TR - 10	26.50	2.25	72.00
17.	*Morus indica* var.Mysore local male	18.50	2.50	91.50
18.	*Morus multicaulis* var.BC –2- 59	27.52	3.00	92.00
19.	*Morus multicaulis* var.Kosen	20.00	3.00	96.00
20.	*Morus serrata* var. Acc. 339	24.50	2.00	73.50

CONCLUSION

Pollen morphological studies have indicated that the pollen grains were uniformly spherical in shape. Generally, the fertility was very high in diploid varieties while uniformly very low in triploid varieties. The sterile nature of triploid is not a major impediment in mulberry. The pollen grains of the triploid varieties were larger than those of the diploids and the fertility in triploids was very low compared to the diploids.

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