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POLLEN MORPHOLOGY OF *CUCURBITA MOSCHATA* DUCHESNE, *CUCURBITA PEPO* L. (FAMILY CUCURBITACEAE)

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ABSTRACT:

Pollen characteristics of*Cucurbitamoschata*Duchesneand *Cucurbitapepo*L were documented in this paper. SEM analysis of acetolysed pollen grains indicated that in both the species the exine surface pattern were spinate and inter spinal region were granulose. In both the species possess large grains and indicated the primitive status.

KEY WORD: *Cucurbita moschata Duchesne, CucurbitapepoL, Pollen, Exine.*

INTRODUCTION:

Pollen is a tiny haploid functional unit represents the sole medium through which the entire male genetic attributes are transmitted to the generation; thereby ensure the perpetuation of species and the functional aspects of pollen has received greater attention in areas like pollen physiology, pollen biology, pollen allergy, biochemistry, genetic engineering, radiobiology, molecular mechanism and in plant breeding (Wodehouse, 1935., Rudrarmuniyappa, 1995).

Cucurbitaceae are usually hairy climbers with simple or branched lateral tendrils, yellow or whitish unisexual flowers, inferior ovary with parietal

placentation and numerous relatively large seeds. Cucurbitaceae are most diverse in tropical and subtropical regions with hotspots in Southeast Asia, West Africa, Madagascar, and Mexico (Schaefer and Renner, 2011). They are of Asian origin and probably originated in the Late Cretaceous, some 60 million years ago (Schaefer *et al*., 2009).

According to Erdtman (1952), Marticorena (1963), Jeffrey (1990), Aloyshina (1966) and Shridhar and Singh (1990), the pollen of Cucurbitaceae is eurypalynous, with considerable differences in grain shape, ornamentation pattern and position of apertures between the individual genera.

MATERIAL AND METHODS:

Pollen grains of*Cucurbita moschata* Duchesnewere collected from Kanjirapally, Kerala and *Cucurbitapepo*L. from Chengalam,Kerala during December, 2013. Pollen sample were collected from fresh plant material into small vials containing 70% ethyl alcohol. They were fixed and stored for further investigation in room temperature.

Pollen size was measured using micrometer. Pollen was assigned into different shapes by calculating P/E ratio proposed by Erdtman, (1952). Pollen preparations were made by acetolysis proposed by Erdtman (1952). The palynological characters were analysed by Nair's terminology (Nair, 1964). Acetolysed pollen was observed under KYOWA GENTER, BIOLUX-CXT-11, 70562, trinocular research microscope. For SEM studies the acetolysed pollen grains were sputter-coated with platinum in a JSM-6390 Autofine Coater, and SEM micrographs taken using JEOL/EO instrument.

RESULTS AND DISCUSSION:

Cucurbita moschata Duchesne,(Fig.1) and *Cucurbita pepo* L.(Fig.2) are trailing herbs, Tendrils 3-fid, Leaves simple, leaves palmately lobed, number of lobes five, leaf base cordate, margin serrate, flower yellow, conspicuous, solitary, Petals entire.

The shape of the pollen in *Cucurbita moschata* and *Cucurbita pepo* are spheroidal. Grain size range of *C.moschata* is (133-146.3×133-146.3µm), mean= (138.76×138.76µm) with a standard deviation (6.7×6.7µm). In *C. pepo* grain size range (110-137.5×110-137.5µm),mean = (131.08×131.08µm) with a standard deviation = (11.83×11.83µm) (Table.1 and Fig.3 and 4).Both are belongs to the pollen size category of 'very large pollen' (100-200µ).Pollen size generally considered as a tertiary character in phylogenetic studies. Pollen size was found to be useful in cytopalynological studies (Nair and Ravikumar, 1984). It is emphasized that the value of pollen size in taxonomy, varied difference in plants are reflected in pollen grains at times (Erdtman, 1952), larger size of pollen grain considered to be a primitive character (Nair, 1965).

The exine ornamentation was found to be 'spinate and granulose' in both the species. The pattern of pollen wall sculpturing is species specific, and pointed out to be determined by the sporophyte. Surface ornamentation of exine is considered to be a significant morphological character helping a great deal in the categorization of various genera and species as a supplementary factor in eurypalynous families (Nair and Sharma, 1965). The exine ornamentation types fall into two broad categories, the depression type which were advanced, and the projection or excrescence types which were comparatively primitive. With respect to ornamentation the pollen of *C. moschata* and *Cucurbita pepo*shares an advanced feature

CONCLUSION:

Pollen grain of *C. moschata* are found to be 10-12 pororate, exine is of projection type 'spinate and granulose' and the shape of the pollen is spheroidal. Pollen grains of *C. pepo* are found to be 10-12 pororate, exine is of projection type 'spinulate and granulose' and the shape of the pollen is spheroidal. Pollen size indicates that both are scheduled under 'very large pollen' category. With respect to the pollen characteristics *C. moschata* and *C. pepo* shares primitive features.

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S. No.	Name	P Mean ± Sd	E Mean ± Sd	P/E	Shape	Morphology
1	*Cucurbita moschata* Duchesne	138.76±6.70	138.46±6.70	1	Spheroidal	10-12 zonopororate, spinate, inter spinal region granulose.
2	*Cucurbita pepo* L.	131.08±11.83	131.08±11.83	1	Spheroidal	10-12 zonopororate, spinulate, inter spinal region granulose.

Fig.1.*Cucurbita moschata*Duchesne

Fig.2.*Cucurbita pepo*L.

Fig.3.SEM of pollen grain of *Cucurbitamoschata*Duchesne.

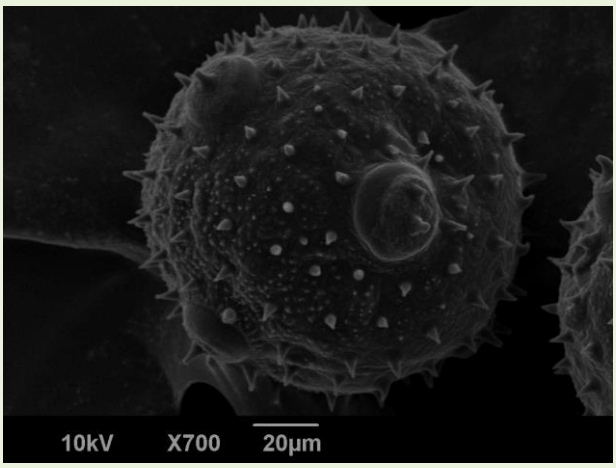

Fig.4.SEM of pollen grain of *Cucurbitapepo*L.