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PALYNOLOGICAL STUDY OF SOME GENERA OF BRASSICACEAE (*SAMERARIA, SAVIGNYA, TAUSCHERIA, TETRACME, TORULARIA, TURRITIS*) FROM PAKISTAN

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ABSTRACT

Pollen morophology of 10 species belonging 5 genera of the family Brassicaceae from Pakistan has been examined by light microscope. Pollen grains are usually radially symmetrical, sub-prolate to prolate or oblate-spheroidal, tricolpate rarely 4-6 colpate. Sexine thinner and thicker than nexine. Tectum reticulate with more or less than nexine. Tectum reticulate with more or less regular pattern.

Key Words: Palynological study of some genera of Brassicaceae from Pakistan.

INTRODUCTION

Brassicaceae is a cosmopolitan family of about 350 genera and 3000 species occurring mainly in north temperate zone particularly in the Mediterranean region (Mabberly, 1987). In Pakistan 92 genera and 250 species have been reported (Jafri, 1973). Oil is extracted from the seed, of *Brassica* species. Many crucifers are cultivated as ornamental like Aubrita (Aubrietia). Chiguriaena (1973) examined the pollen morphology of the family Brassicaceae in relation to taxonomy. Javed and Naqshi (1976) also utilized pollen data in the classification of the family Brassicaceae.

Pollen morphology of the family Brassicaceae has been examined by Erdtman (1952), Sharma and Nair (1973), Carter *et al*. (1975), Moore and Webb (1978). The most comprehensive studies of Brassicaceae pollen is that of Rollins and Banerjee (1979). Khan (2003, 2004) studied the pollen of the genus *Arabidopsis* and *Alyssum* belong to the family Brassicaceae from Pakistan. The present investigation is based on the pollen morphology of 10 taxa representing 6 genera of the family Brassicaceae viz., *Sameraria, Savignya, Tauscheria, Tetracme, Torularia, Turritis* by light microscope.

MATERIALS AND METHOD

Pollen samples were obtained from Karachi University Herbarium (KUH) or collected from the field. The list of voucher specimen is deposited in (KUH). The pollen grains were prepared for light microscope by the standard methods described by Erdtman (1952). For the light microscopy, the pollen grains were mounted in glycerine jelly and observations were made with a Nikon type microscope, under oil immersion using 15–20 reading from each specimen. Pollen diameter, polar axis, apocolpium, mesocolpium and exine thickness were measured.

The terminology used is in accordance with Erdtman (1952), Kremp (1965), Faegri and Iversen (1964) and Walker and Doyle (1975).

General pollen characters of the genera

Pollen grains usually radially symmetrical, isopolar, sub-prolate, prolate to spheroidal rarely oblate, tricolpate, sexine thinner or thicker than nexine. Tectum fine reticulate.

Sameraria Desv. (Fig. 1A-B)

Pollen grains, isopolar, prolate, small size, polar axis 19(21)22 µm, equatorial diameter 13(18)19 µm, mesocolpia 13.2 µm in diameter, apocolpia 2.2 µm in diameter.

3–colpate, colpi 14x2.2 µm long, exine 1.1–4.4 µm thick, tenuimarginate, tectum reticulate sexine much thicker than nexine.

Species included: *Sameraria armena* (L.) Desv.

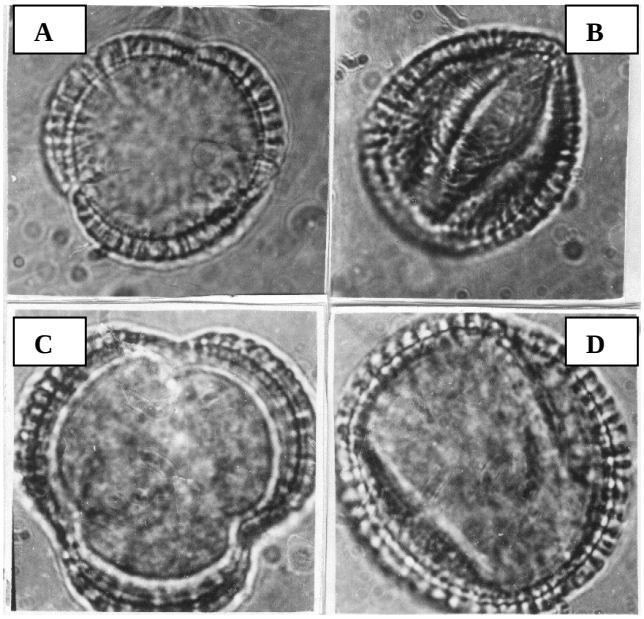

Fig.1 A-D. Light micrograph of pollen grain, Sameraria Armena, A. polar view, B. equatorial view; Savignya parviflora, C. Polar view, D. equalorial view.

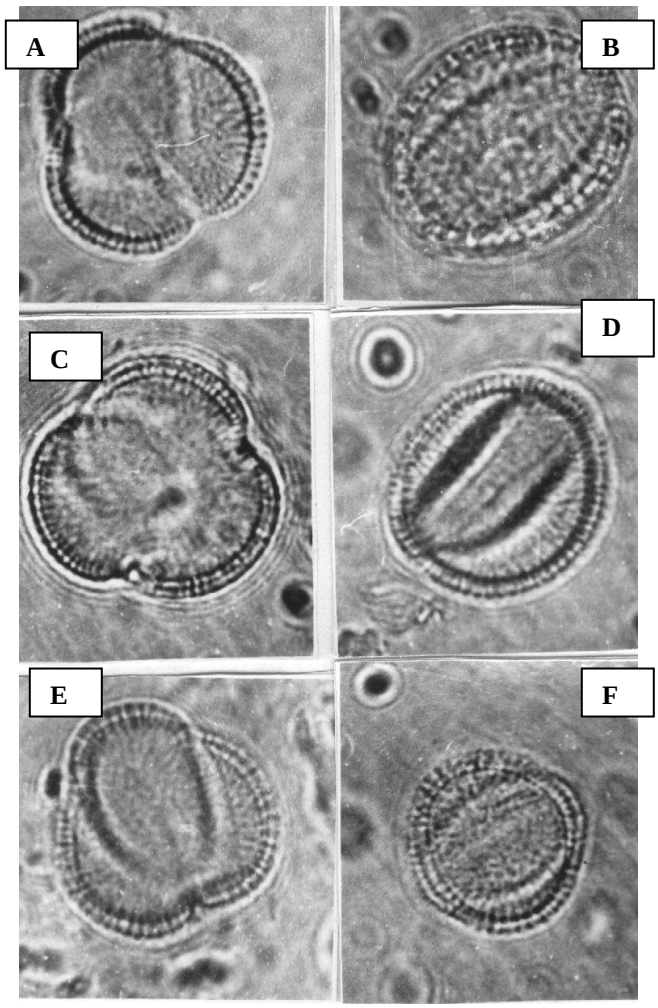

Fig.2 A-F. Light micrograph of pollen grains: *Tetracme contorta*, A. polar view, B. equatorial view; *T. pamirica*, C. polar view, D. equatorial view; *T. stocksii*, E.polar view, F. equatorial view.

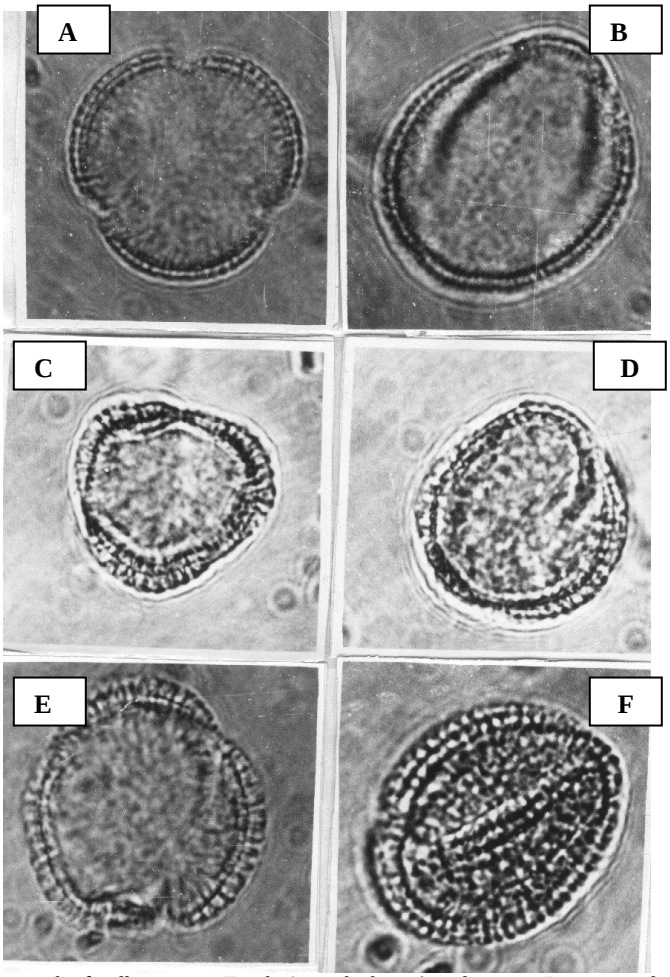

Fig. 3 A-F. Light micrograph of pollen grains: *Torularia aculeolata*, A. polar view, B. equatorial view; *T. humilis*, C. polar view, D. equatorial view; *T. torulosa*, E. polar view, F. equatorial view.

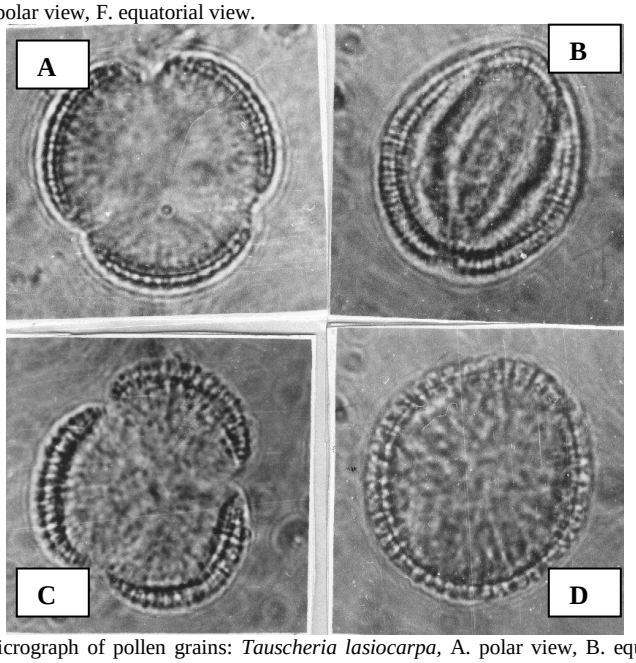

Fig. 4 A-D. Light micrograph of pollen grains: *Tauscheria lasiocarpa*, A. polar view, B. equatorial view; *Turritis glabra*, C. polar view, D. equatorial view.

***Savignya* DC. (Fig. 1C-D)**

Pollen grains, isopolar, subprolate, inter-subangular, polar axis, 25(28)38 µm, equtorial diameter 22(26) 28 µm, mesocolpia 24.2 µm, apocolpia absent.

Colpi 3-colpate, 23.2 µm long, exine 2.2–5.5 µm thick heterobrochate, tectum reticulate.

Species included: *Savignya parviflora* (Del.) Webb.

***Tetracme* Bunge. (Fig. 2 A-F)**

Pollen grains usually radially symmetrical isopolar, subprolate to prolate tri-colpate, Inter Sub-isopolar, sexine much thicker than nexine, exine 2.2–4.4 µm thick, Tenuemargimate. Hetrobrochate.

Species included: *T. contorta* Boiss., *T. pamirica*, *T. stocksii* Boiss.

Key to the species

1. + Pollen grains prolate ..…… *T. contorta*
   - Pollen grains subprolate to prolate ...…… 2

2. + Colpi 16.5 x 2.2 µm long ……..……...…….. *T. pamirica*
   - Colpi 22 x 2.2 µm long ……..……. *T. stocksii*

***Torularia* (Coss.) Schulz. (Fig. 3A-F)**

Pollen grains usually radially symmetrical, isopolar, sub-prolate to prolate, tric-colpate. Sexine much thicker than nexine. Tectum fine reticulate.

Species included: *T. humilis* (C.A. Mey) Schulz. *T. torulosa* (Desf) Schulz. *T. aculeolata* (Boiss) Schulz.

Key to the species

1. + Pollen grains prolate ……..…… *T. humilis*
   - Pollen grains subprolate ……. 2

2. + Colpi 18.7 x 2.2 µm long apocolpia 7.7 µm in diameter ……..…….. *T. torulosa*
   - Colpi 11 x 1.1 µm long, apocolpia 4.4 µm in diameter ……..……. *T. aculeolata*

***Tauscheria* Fisch. & Mey (Fig. 4A-B)**

Pollen grains isopolar, subprolate, inter-subangular small size. Polar axis 22(23)24 µm equatorial diameter 17(18)20 µm, mesocolpia 20 µm in diameter, equatorial diameter, appcolpia absent due to long colpi, 3–colpate, colpi 16.5 x 2.2 µm long, exine 1.1–3.3 µm thick, semitectate, tectum reticulate,

Species included: *Taucheria lasiocarpa* Fisch. ex. DC.

***Turritis glabra* (Fig. 4C-D)**

Pollen grains, inter subangular, subprolate, small size, polar axis 18(22)25 µm, equatorial 16(17)20 µm, mesocolpia 13.2 µm in diameter, apocolpia 2.2 µm in diameter. 3–colpate, colpi 16.5x2.2 µm long, exine 1.1–4.4 µm, tectum reticulate, sexine much thicker than nexine.

Species included: *Turritis glabra* Linn.

Comments

Pollen grains are generally 3-colpate with reticulate tectum. Pollen grains do not show much variation in number and position of aperture. The shape also varies from prolate to subprolate. Pollen characters of 6 genera

shows a great deal of over lapping and integradation in their morphological feature. Tricolpate pollens are most frequent occasionally 4-6 colpate to colporate in the family Brassicaceae. Appel and Al-Shehbez (2002) observed tricolpate. Khalik (2002) also reported tricolpate pollen grains. Erdtman (1952) observed 3-4 colpate pollen grains. However in this family tricolpate, pollen grains are common (Perveen *et al*., 2004)

In the present study symmetry aperture type, and particularly shape class and exine thickness are significant pollen characters. On the basis of pollen shape two distinct pollen group are recognized. In group-I, 3 species viz., *Torularia humilis, Tetracme contorta, Sameraria armena* are included which have prolate pollens, whereas as in the group-II remaining species viz., *T. torulosa, T. acululata, Turrits glabra, Tetracme contorta, T. pamirica, T. stocksii, Tauscheria lasiocarpa, Savignya* are included which have subprolate shape pollen. These species are further divided on the basis of colpi length, mesocolpia and exine thickness (see key to the species).

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