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POLLEN FLORA OF PAKISTAN - IX. PAEONIACEAE

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Abstract

Pollen morphology of the family Paeoniaceae from Pakistan has been examined by light and scanning electron microscope. Pollen grains are generally radially symmetrical, isopolar, prolate-spheroidal, 3-zonocolporate, colpi long. Exinum tegillate striate.

Introduction

Paeoniaceae, a small monogeneric family comprising of 33 species is distributed in Asia, Europe and temperate North America (Willis, 1973; Mabberley, 1987). The family was first recognized by Rudolphi (1830), but Bentham & Hooker (1876) included *Paeonia* in the family Ranunculaceae. However, the genus *Paeonia* differs from other members of Ranunculaceae by a number of morphological and anatomical characters, such as mode of anthers dehiscence, presence of fleshy disc, arillate seed, scalariform xylem etc. Cronquist (1981) placed the family Paeoniaceae under the order Dilleniales alongwith Dilleniaceae whereas Thorne (1983), Takhtajan (1969) and Dahlgren (1989) considered the family Paeoniaceae as a distinct monotypic order Paeoniales.

Pollen morphology of the family Paeoniaceae has been examined by Faegri & Iversen (1964) Armbruster & Jacobs (1934-1935), Nair (1965), Wang (1960), Roland (1968), Vishnu - Mittre (1963) and Walker & Doyle (1975). Zhgenti (1969) described pollen morphology of few species of the genus *Paeonia*.

In Pakistan, the family is represented by a single species, *Paeonia emodi* Wall. ex Royle (Nasir 1978). The present report describes the pollen morphology of *Paeonia emodi* from Pakistan using light and scanning electron microscope.

Materials and Methods

Pollen samples were obtained from the Karachi University Herbarium (KUH). The pollen grains were processed by the standard acetolysis method described by Erdtman (1952). The measurements were based on 15-20 readings from each specimen. Polar axis (P), equatorial diameter (E), colpi length, apocolpium, mesocolpium and exine thickness were measured under light microscope.

The terminology used is according to Erdtman (1952), Kremp (1965), Faegri & Iversen (1964) and Walker & Doyle (1975).

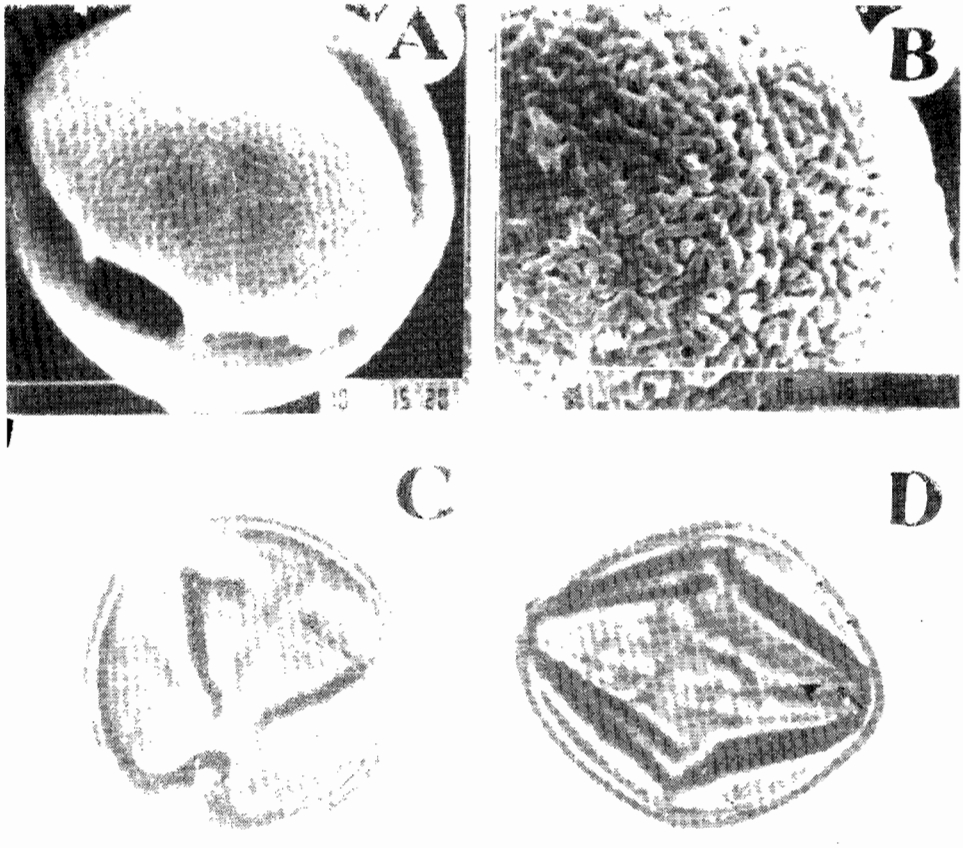

Fig. 1. Pollen grains of *Paeonia emodi* Wall. ex Royle under light and scanning electron microscopes (SEM). A & B = Light micrographs: A, Equatorial view; B, Polar view. C & D = Scanning electron micrographs: C, Equatorial view; D, Polar view.
Scale bars = 10 μm.

Pollen morphological characters of *Paeoniaceae*

Pollen grains generally radially symmetrical, isopolar, prolate - spheroidal, 3 - zonocolporate, equatorial view elliptic, polar view ± triangular, colpi long, sexine thicker than nexine, tectum rugulate - striate.

Description of pollen type

Paeonia emodi Type (Fig. 1 A - D).
Pollen class: 3 - zonocolporate, zonoporate.
P/E ratio: Subprolate.

Shape: prolate -spheroidal.
Apertures: Ectoapertures - colpus, long, not sunken ends acute Endoaperture - circular, distinct, ora la-longate.
Exine: Sexine thicker than nexine.
Ornamentation: Tectum rugulate - striate.
Outline: ± triangular in polar view, elliptic in equatorial view.
Measurements: Polar length (P) 28.71 (33.61 ± 0.74) 39.41 um, equatorial diameter (E) 23.31 (31.95 ± 0.17) 35.9 um, colpus 28.73 (30.31 ± 0.03) 35.9 um long. Mesocolpium 21.5 (24.1 ± 0.84) 35.9 um. Apocolpium 1.07 (2.25 ± 0.18) 3.50 um. Exine 1.77 (1.79 ± 0.08) 2.87 um thick.
Species included: *Paeonia emodi* Wall. ex Royle
Comment

Pollen grains of *Paeonia emodi* type is characterized by having prolate - spheroidal, tricolporate pollen with rugulate - striate tectum. The pollen grains of closely related family i.e., Ranunculaceae are different from *Paeonia* (Erdtman, 1952) as in the family Ranunculaceae porate or colpate pollen with spinulose - scabrate tectum are found The present findings support the placement of family in a separate monotypic order Paeoniales by Takhtajan (1968); Thorne (1983) and Dahlgren (1989).
Specimens examined: *Paeonia emodi* Pakistan: Hazara, Nasir 10871 (KUH); Murree, S.I. Ali 640 (KUH); Near Forest Rest House, Y.Nasir & W. Merjer s.n. (KUH).

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