

STUDIES ON THE POLLEN MORPHOLOGY OF THE GENUS *ALYSSUM* (BRASSICACEAE) FROM PAKISTAN

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Abstract

Pollen morphology of 7 species of the genus *Alyssum* belonging to the family Brassicaceae have been examined by light microscope. Pollen grains are usually isopolar; tricolpate with reticulate tectum. It is a stenopalynous genus. However, the species of this genus show little variation in shape, size colpi length and exine pattern. Hence the palynological characters are significant at specific level.

Introduction

Of about 100 species of the genus *Alyssum* mostly found in the Mediterranean region, Central Europe, Central and Western Asia, only 10 species are recorded from Pakistan (Jafri, 1973). Morphologically pollen grains are 3-colpate and colpate, inter-subangular sub-prolate, isopolar, small to medium size, colpi variable in length very long to very short. The aim of the present investigation was to provide a detailed account of pollen morphology of the genus *Alyssum* from Pakistan.

Material and Method

The palynological investigation are based on herbarium material obtained from the Karachi University Herbarium (KUH). The pollen slides were prepared by the method of acetolysis as suggested by Erdtman (1952). Measurement of about 10 grains for each species were taken and photomicrograph made on Kodak x 16-DIN roll under oil immersion. The terminology used for pollen description has been followed as suggested by Erdtman (1952) and Fagri & Iversen (1964).

Results

Pollen character of the genus *Alyssum*

Pollen class: Colpate.

P/E ratio: Prolate-sphaeroidal to prolate.

Size: Small to medium.

Aperture: Colpate and colpate aperture colpi variation in length very long to very short, narrow, colpi membrane reticulate, ends acute.

Exine: Sexine more or less as thick as nexine.

Outline: Inter-subangular, circular to oval.

Measurement: Polar axis 19-40 μ m, equatorial diameter 19-24 μ m, exine 1.3-3.3 μ m. Colpi ranges from 10.5x1.1 – 23.1x2.2 μ m long, mesocolpia 13.1 – 20 μ m in diameter, apocolpia 3.3 – 5.5 μ m.

Details of *Alyssum* species examined has been summarized in Table 1.

Table 1. Summary of the pollen morphological data of the genus *Alyssum*.
(Fig. 1-7)

Species	P (μm)	E (μm)	Shape	Size	No. of Apr.	Equatorial outline	Apocolpium	Mesocolpium (μm)	Length of colpi (μm)	Exine thickness (μm)
<i>A. dasycarpum</i>	22(28)32	17(21)22	Is-Pr	Rs	3	Ov	4.4	16.5	23.1x2.2	1.1 - 3.3
<i>A. desertorum</i>	24(25)29	18(21)23	Is-Sc-Sp	Small	3	Ovl	5.5	17.5	10.5x1.1	3.3
<i>A. lanceolatum</i>	21(23)24	17(19)20	Is-Ps	Small	3	Ovl	Absent	15.4	18.5x2.2	3.3
<i>A. linifolium</i>	21(22)24	19(21)22	Is-Ps	Small	3	Ovl	Absent	20.0	16.5x1.1	3.3
<i>A. marginatum</i>	26(27)27	19(19)20	Is-Ps	Rs	3	Ovl	3.3	13.2	22x1.1	3.3
<i>A. szowitzianum</i>	25(27)31	21(24)28	Is-Ps	Small	3- Prolate	Ovl	4.4	19	22x3.3	1.1 - 2.2
<i>A. turkestanicum</i>	19.8(30)41	14(23.1)30.1	Is-Pr	Medium	3	Ovl	4.4	12.1	16.5x1.1	1.1 - 2.2
						Ovl				

Key to:- Abbreviation P= Polar axis, E= Equatorial axis, Is= Inter subangular, Sp= Subprolate, Ps= Prolate spheroidal, Ovl= Oval, Apr.= Aperture

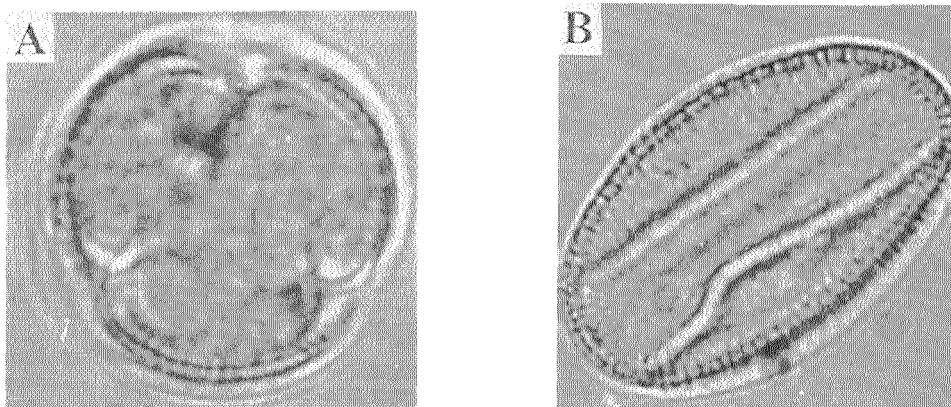


Fig. 1. Light micrographs of pollen grain of *Alyssum turkestanicum*
 A. Polar view (Reticulate tectum), B. Equatorial view (Colpi)

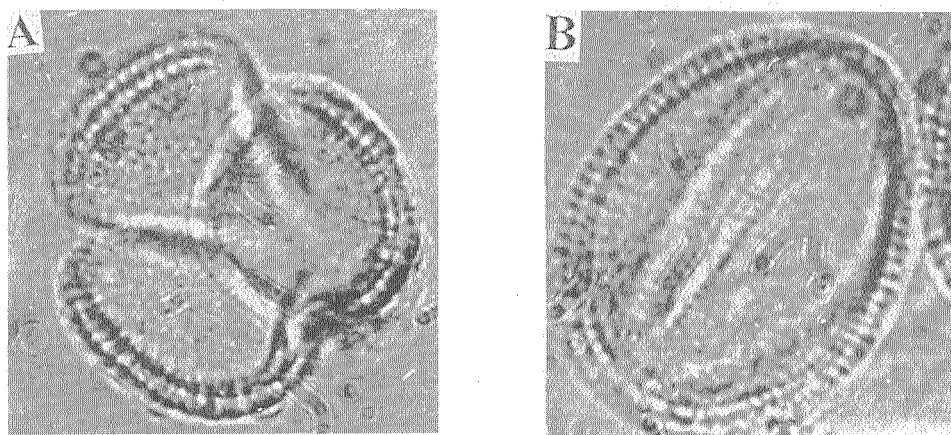


Fig. 2. Light micrographs of pollen grain of *Alyssum linifolium*
 A. Polar view, B. Equatorial view

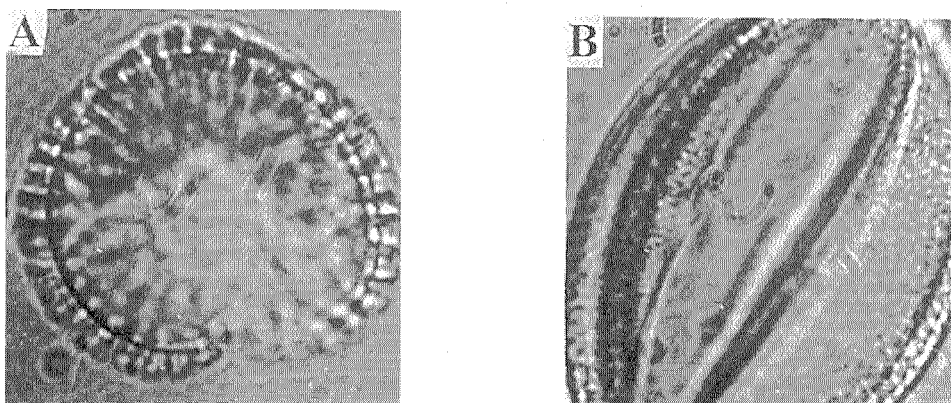


Fig. 3. Light micrographs of pollen grain of *Alyssum szowitsianum*
 A. Polar view, B. Equatorial view

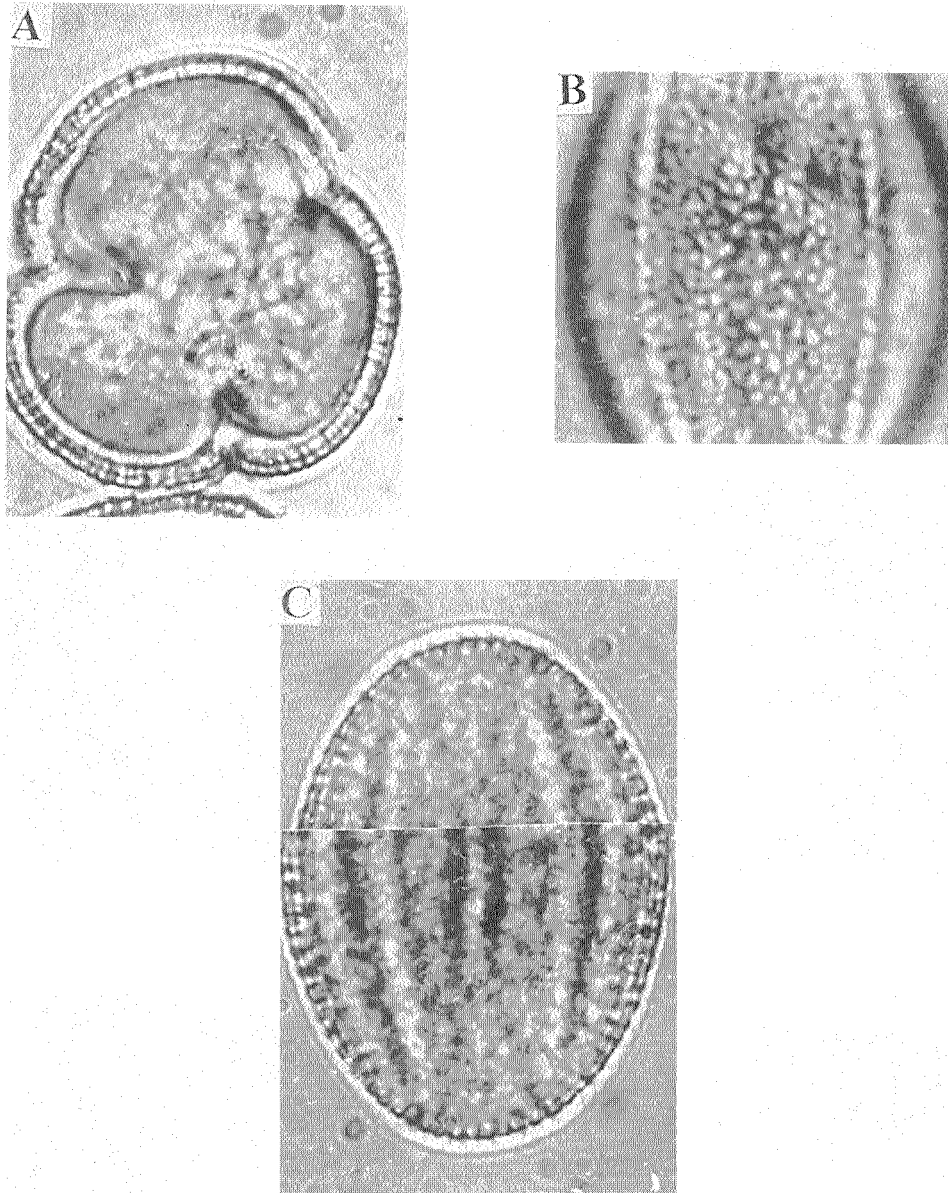


Fig. 4. Light micrographs of pollen grain of *Alyssum lanceolatum*
A. Polar view, B. Equatorial view (Reticulate surface), C. Equatorial view (Colpi)

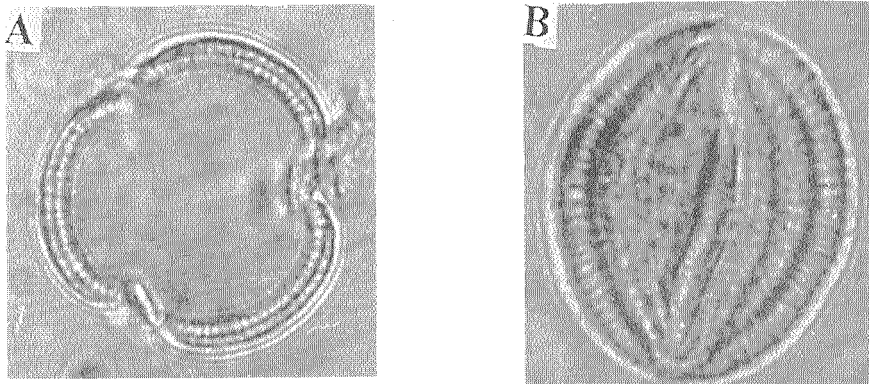


Fig. 5. Light micrographs of pollen grain of *Alyssum desertorum*
A. Polar view, B. Equatorial view

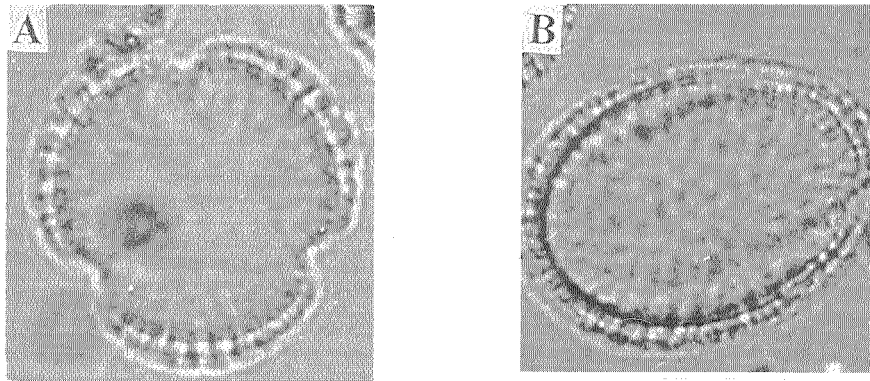


Fig. 6. Light micrographs of pollen grain of *Alyssum dasycarpum*
A. Polar view, B. Equatorial view

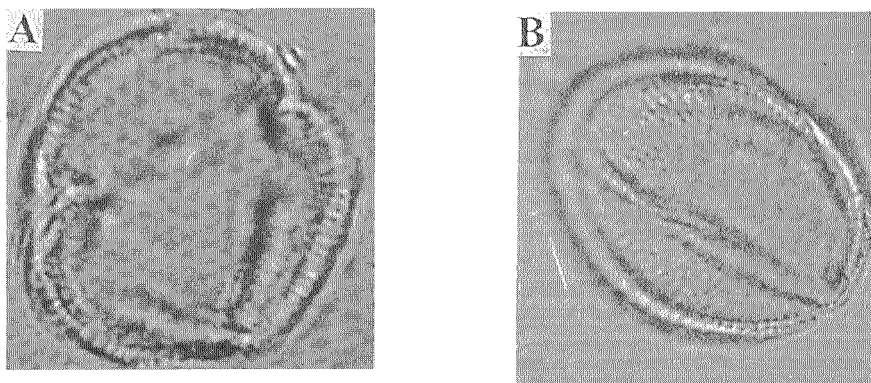


Fig. 7. Light micrographs of pollen grain of *Alyssum marginatum*
A. Polar view, B. Equatorial view

Key to the species based on the pollen morphology

(Fig. 1-7)

- 1 + Pollen grain prolate-sphaeroidal 3
 - Pollen grain prolate 2
- 2 + Mesocolpium 16.5 μm *A. dasycarpum*
 Mesocolpium 12.1 μm *A. turkestanicum*
- 3 + Colpi 10.5 μm long, *A. desertorum*
 - Colpi 16-22 μm long 4
- 4 + Polar length of pollen grain 25-31 μm 6
 - Polar length of pollen grain 21-24 μm 5
- 5 + Mesocolpium 15.5 μm *A. lanceolatum*
 - Mesocolpium 20 μm *A. linifolium*
- 6 + Exine 3.3 μm thick *A. marginatum*
 - Exine 1.1 - 2.2 μm *A. szowitsianum*

Comments

The genus *Alyssum* is characterized by tricolpate pollen with reticulate tectum. It is stenopalynous genus. Seven species viz., *Alyssum dasycarpum*, *A. desertorum*, *A. lanceolatum*, *A. linifolium*, *A. marginatum*, *A. szowitsianum* and *A. turkestanicum* have been examined. Palynology is significantly helpful at specific level. These species are divided into two groups i.e., prolate and prolate spheroidal.

In group I, two species viz., *Alyssum dasycarpum* and *A. turkestanicum* are included which have prolate pollen whereas in the group II remaining species viz., *A. szowitsianum*, *A. linifolium*, *A. lanceolatum*, *A. desertorum* and *A. marginatum* are included which have prolate spheroidal shape pollen. These species are further divided on the basis of colpi length, mesocolpia and exine thickness etc., (see key to the species).

Acknowledgement

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