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Autor: Lahham, Jamil N. / Al-Eisawi, Dawud
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Pollen morphology of Jordanian Zygothyllaceae

JAMIL N. LAHHAM
&
DAWUD AL-EISAWI

RÉSUMÉ

LAHHAM, J. N. & D. AL-EISAWI (1986). Morphologie du pollen de la famille des Zygothyllacées de Jordanie. *Candolle* 41: 325-328. En anglais, résumé français.

La morphologie du pollen de 13 espèces de *Zygothyllaceae* de Jordanie a été étudiée. Au moyen du microscope optique, l'étude s'est orientée sur la description et les mensurations de toutes les graines ainsi que sur la valeur taxonomique des caractères du pollen de cette famille.

ABSTRACT

LAHHAM, J. N. & D. AL-EISAWI (1986). Pollen morphology of Jordanian Zygothyllaceae. *Candolle* 41: 325-328. In English, French abstract.

The pollen morphology of 13 plant species of the family *Zygothyllaceae* in Jordan has been studied. The study incorporated light microscopy, description and measurements of whole grains, also the relative taxonomic value of pollen characters in this family was included.

Introduction

The family *Zygothyllaceae* includes shrubs or half-shrubs, rarely trees or herbs, and predominate in arid regions or deserts of all continents.

In Jordan, this family is represented by 6 genera comprising 15 species (EISAWI, 1982; BOULOS & LAHHAM, 1977; BOULOS & al., 1977).

In this study a palynological investigation of the Jordanian species of the above mentioned family was undertaken in order to determine the relevant systematic value of pollen characters in this family. The study incorporated light microscopy, description and measurements of whole grains. The most pertinent previous study of the group is that of ERDTMAN (1952) who examined 36 species from 21 genera, he also provided a full list of the relevant work of earlier workers.

Materials and methods

Pollen grains were obtained from specimens deposited at the herbarium of the University of Jordan. Pollen was prepared by using the acetolysis method of KUMMEL & RAUP (1965). Three slides were made from each sample, and the excess sample was stored in labelled vials. Slides were left on a warming table to cure for 24 hours, then cleaned, and the coverslip ringed with colourless finger nail polish. Twenty pollen grains were measured for each species with the aid of an ocular micrometer. The measurements include the polar length (P), the equatorial length (E) and the pollen grain wall thickness (Table 1). The specimens were viewed with a Leitz Laborlux 11 light microscope and the images were recorded with Polaroid Type 55 P/N 4 × 5 film (Fig. 1). The terminology used in this study is that of ERDTMAN (1952) and FAEGRI & INVERSON (1975).

Species	Diameter in micron P	E	Ratio P/E	Shape	Wall in micron	Aperture	Exine pattern
<i>Fagonia arabia</i> L.	25 (28) 30	(25) 26 30	1.07	subspheroidal	1 µm	3-colporate	tectate, bacculate, perforate, sexine as thick as nexine.
<i>Fagonia bruguieri</i> D. C.	(25) 26 (30)	(22.5) 24 (25)	1.08	subspheroidal	1.5 µm	3-colporate	tectate, bacculate, perforate sexine as thick as nexine.
<i>Fagonia glutinosa</i> Del.	(10) 12 (13)	(10) 12 (13)	1.00	subspheroidal	1 µm	3-colporate	tectate, bacculate, psilate sexine as thick as nexine.
<i>Fagonia mollis</i> Del.	(25) 28 (35)	(20) 25 (28)	1.12	subspheroidal	1.5 µm	3-colporate	tectate, bacculate, perforate sexine as thick as nexine.
<i>Nitraria retusa</i> Aschers.	(30) 36 (38)	(30) 25 (38)	1.44	prolate	3 µm	3-colporate	psilate to perforate, intectate, sexine as thick as nexine.
<i>Peganum harmala</i> L.	(20) 24 (25)	(17) 23 (25)	1.04	subspheroidal	1.5 µm	3-colporate	psilate, sexine as thick as nexine.
<i>Seetzenia orientalis</i> Decne.	(40) 47 (50)	(40) 43 (50)	1.09	subspheroidal	2.5 µm	3-colpate	tectate, perforate, sexine thicker than nexine.
<i>Tribulus longipetalous</i> Viv.	(55) 60 (65)	(50) 55 (65)	1.09	subspheroidal	4 µm	polyforate	bacculate with spherical heads, rugulate, muri beaded sexine thicker than nexine.
<i>Tribulus terrestris</i> L.	(48) 57 (63)	(44) 53 (60)	1.07	subspheroidal	4 µm	polyforate	bacculate with spherical heads rugulate, islands $10 \times 10 \mu\text{m}$
<i>Zygophyllum album</i> L. f.	(12.5) 15 (16)	(10) 12 (12.5)	1.25	subspheroidal	1 µm	3-colporoidate	psilate, intectate, no baccula sexine as thick as thick as nexine.
<i>Zygophyllum dumosum</i> Boiss.	(10) 13 (15)	(10) 12 (14)	1.08	subspheroidal	1 µm	3-colporoidate	psilate, intectate, no baccula sexine as thick as nexine.
<i>Zygophyllum fabago</i> L.	(17.5) 20 (22.5)	(15) 17 (20)	1.17	subspheroidal	1 µm	3-colporoidate	psilate, intectate, sexine as thick as nexine.
<i>Zygophyllum simplex</i> L.	(12.5) 13 (15)	(10) 12 (12.5)	1.08	subspheroidal	1 µm	3-colporoidate	psilate, intectate, sexine as thick as nexine.

Tableau 1. — Pollen grain description and dimensions

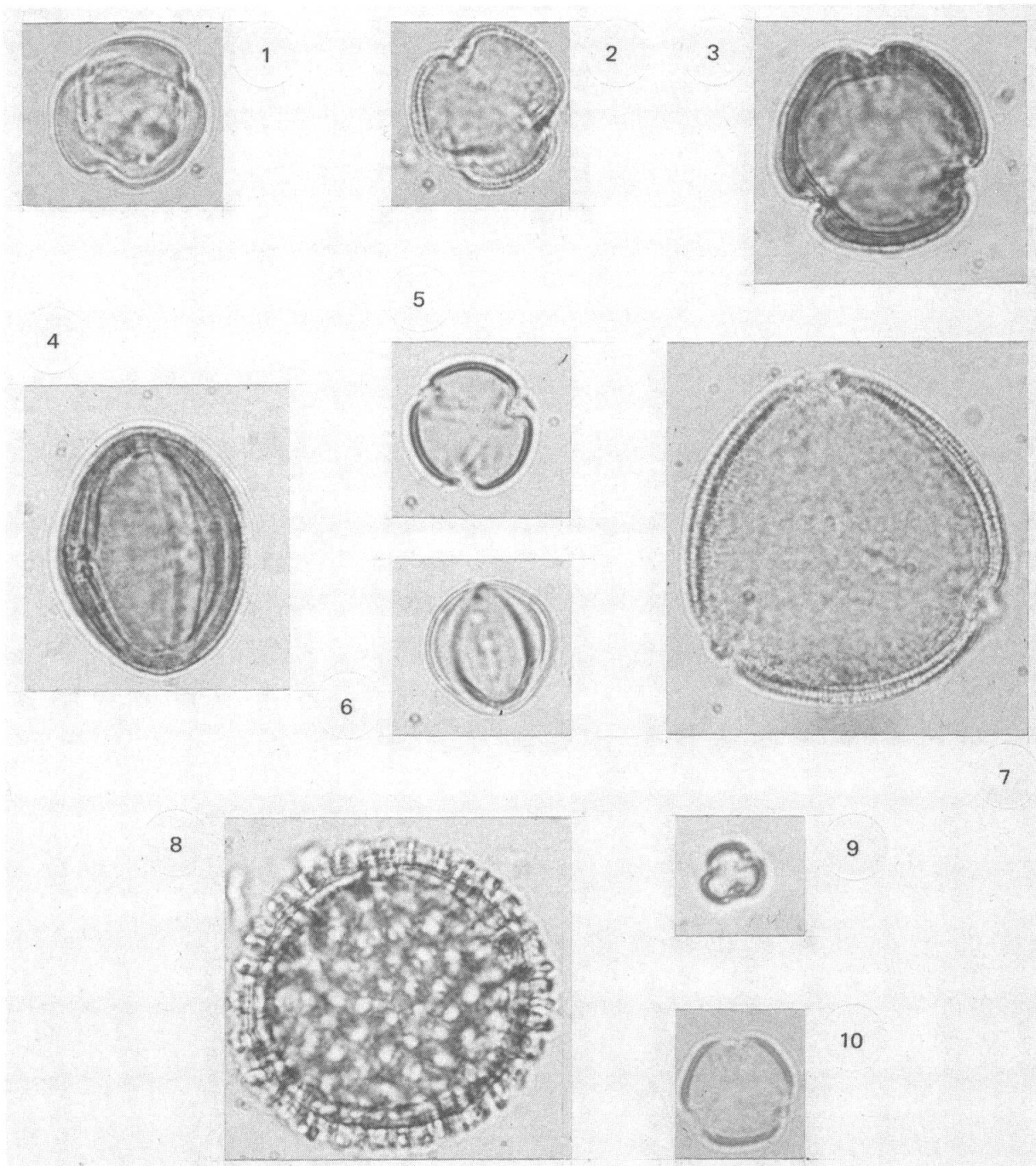


Fig. 1. — Pollen, light microscopic photographs (all photographs are 900 x).
1, *Fagonia arabica* L. **2**, *F. bruguieri* DC. **3**, *Nitraria retusa* Ascherson (Polar view). **4**, *N. retusa* Ascherson (Equatorial view). **5**, *Peganum harmala* L. (Polar view). **6**, *P. harmala* L. (Equatorial view). **7**, *Seetzenia orientalis* Decne. **8**, *Tribulus longipetalous* Viv. **9**, *Zygophyllum dumosum* Boiss. **10**, *Z. simplex* L.

Results

This study reveals that this family is eurypalynous, more or less heterogenous. The pollen grains in this family may be 3-colpate, 3-colporate, 3-colporoidate, polyforate, subspheroidal or prolate. Variations also may be observed in the pollen grains size (12-65 μm), wall thickness (ranging between 1-4 μ), the relative thickness of the sexine to the nexine layer and also in the structure and sculpturing of the exine.

It is very clear that the genus *Tribulus* has very distinct pollen grains among the studied group (polyforate) which justifies its classification in a special tribe (tribuleae) in the family *Zygophyllaceae*. The genera *Zygophyllum*, *Fagonia*, *Nitraria* and *Peganum* (classified in the tribe *Zygophylleae*) are pollen morphologically similar while the genus *Seetzenia* with its trizonocolpate pollen grains is more or less isolated.

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