Acta Palaeobot. Suppl. 2: 67–71, 1999 — Proceedings 5th EPPC

IN SITU SPORES OF SOME FRASNIAN FOSSIL PLANTS FROM THE NORTHERN TIMAN (RUSSIA)

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ABSTRACT. Rich collection of Devonian fossil plants with well preserved sporangia containing mega- and microspores collected by Snigirevsky in 1993 have been studied by Tschibrikova and Olly. A number of Devonian formal species of dispersed pollen and spores have been distingushed. Recorded complexes demonstrate the most important evolutional trends of land vegetation. Plant megafossils with sporangia containing spores inside occur not so often. Such fossils are known to be very important for the understanding of reproductive biology of the plants (Jansonius & McGregor 1996).

KEY WORDS: Devonian, mega- and microspores in situ

INTRODUCTION

Many fossil plants with well-preserved sporangia containing mega- and microspores inside have been collected by Snigirevsky in 1993 from Upper Devonian (Frasnian) deposits of Northem Timan. In situ spores have been studied by Tschibrikova and Olly. All the specimens of macrofossils are stored in the collection a (No. LP-21) of the Department of Palaeontology, Institute of the Earth Crust, St. Petersburg State University.

RESULTS

The first plant is *Zosterophyllum timanianum* (Petrosjan) S. Snig. comb. nov. It had frequently dichotomically divided stem (Pl. 1, fig. 1) with terminal groups of sporangia (Pl. 1, fig. 2). Each sporangium was spirally attached to the stem by a short stick. *Z. timanianum* is heterosporous. Sporangia contains many micro- (Pl. 1, fig. 4) and single megaspores. The first one are close to *Stenozonotriletes formosus* Naum. and *S. recognitus* Naum. Megaspores (Pl. 1, fig. 3) have no analogues between *sporae dispersae*.

The second heterosporous plant – *Dimeripteris gracilis* Schmalh. 1894 with two- or three-time divided branches, each of them finished by small single sporangium (Pl. 1, fig. 5). Microspores (Pl. 1, figs 7, 8) containing into resembles *Leiotriletes microrugosus* Naum. (with smooth exine) and *Cyclogranisporites* Pot. et Kr. (with rough exine). Megaspores (Pl. 1, fig. 6) are relatively small and look like *Stenozonotriletes rugosus* Nekr., *S. extensus* var. *major* Naum. and *S. laevigatus* Naum. It should be noted that megaspores of *D. gracilis* are very close to the microspores of *Zosterophyllum timanianum* in morphology and size (cf. figs 6 and 4 on the plate 1).

Third plant – aff. *Carpolithes compactus* Dawson 1871 – contain single megaspores remind of Eifelian *Punctatisporites* (?) *tortuosus* (Tschibr.) but are twice larger (Pl. 1, fig. 9).

Sporangia of *Cephalopteris mirabilis* Nathorst (1902) 1910 (Pl. 2, fig.1) contain tetrads of spores (Pl. 1, fig. 10) which are not desintegrated. Tetrads are covered by spiny capsules (Pl. 2, figs 2, 3, 5) and contains probably microspores with similar spines on its surface (Pl. 2, fig. 4).

Our study of *in situ* pollen and spores of North-Timanian Frasnian plants is just started. New investigations should yield a new data for identification of some spore mother plants.

REFERENCE

JANSONIUS J. & McGREGOR D.C. (eds.). 1996. Palynology: principles and applications. American Association of Stratigraphic Palynologists Foundation, Vol. 1.

PLATES

Plate 1

1–4. *Zosterophyllum timanianum* (Petrosjan) S. Snigirevsky comb. nov.
1 – Dichotomously divided stem of plant with terminally placed groups of sporangia, LP 21/2, × 1;
2 – Strobilus of plant, LP-21/3; × 1;
3 – Megaspore, LP-21/3-1, × 370;
4 – Microspore, LP-21/3-2, × 600

5–8. *Dimeripteris gracilis* Schmalhausen 1894
5 – Congestion of small branches with sporangia. LP-21/4, × 1;
6 – Megaspore, LP-21/4-1, × 600;
7, 8 – Microspores, LP-21/4-2, × 600

9. Aff. *Carpolithes compactus* Dawson 1871. Megaspore, LP-21/5, × 130

10. Cephalopteris mirabilis Nathorst (1902) 1910. Spores tetrade covered by spiny capsule, LP-21/6-1, × 550

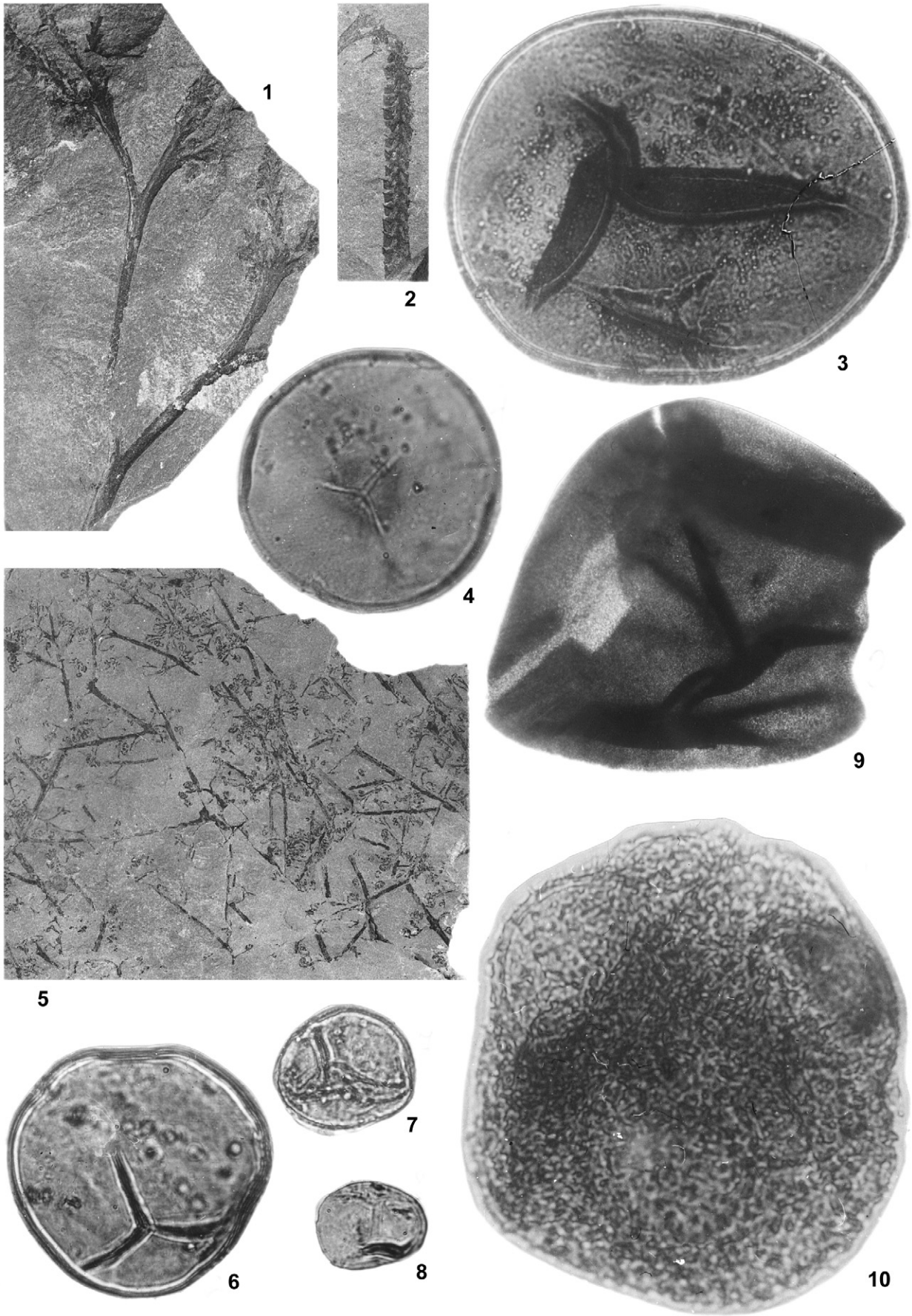
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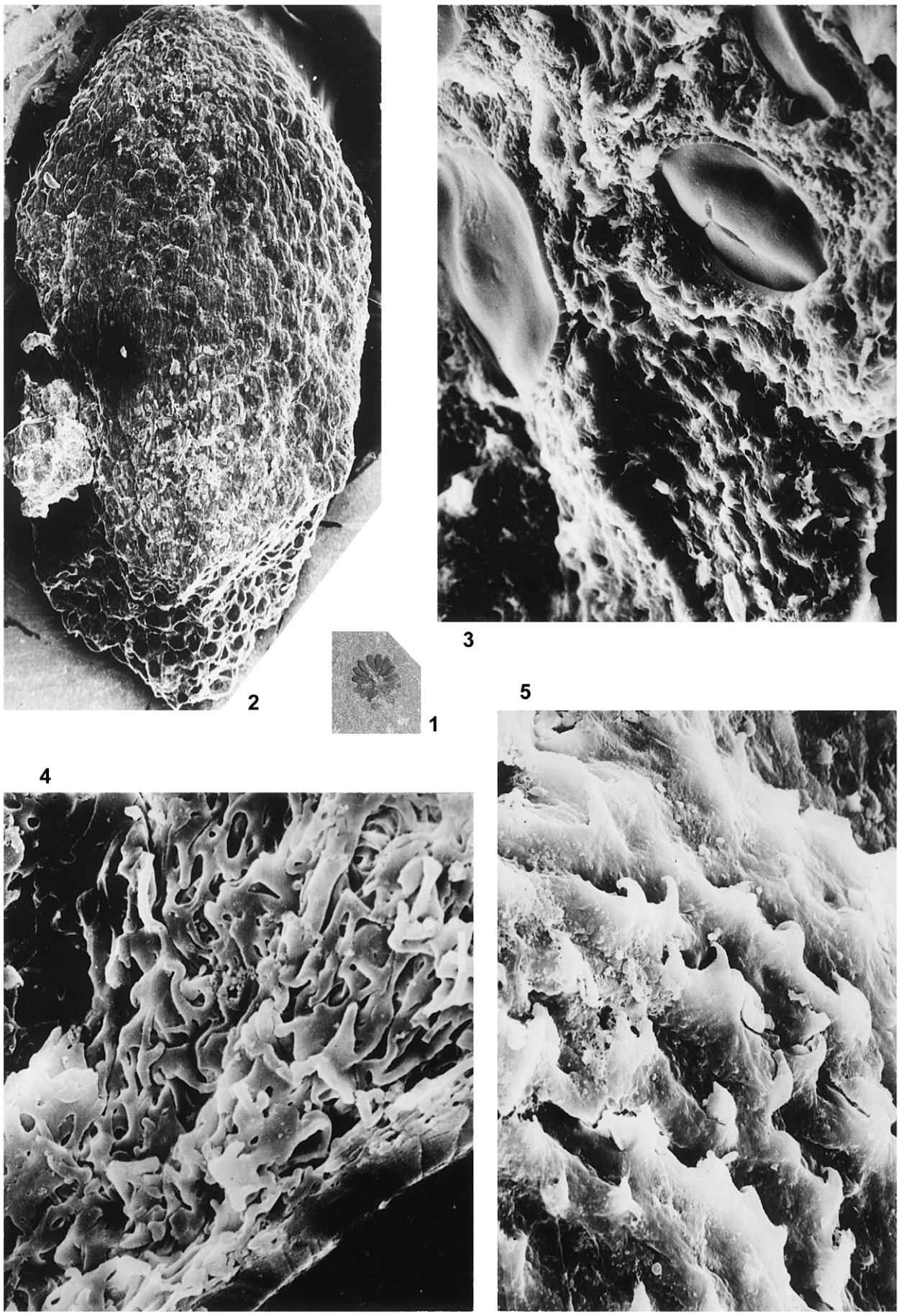
Plate 2

1–5. *Cephalopteris mirabilis* Nathorst (1902) 1910
1 – Group of sporangia, LP-21/6, × 1;
2 – Single sporangium with many tetrads, LP-21/6-2, (SEM) × 36;
3 – Surface of tetrade with destructed capsule and with spore under it, LP-21/6-3, (SEM) × 720;
4 – Spiny surface of microspore (?), LP-21/6-4, (SEM) × 6000;
5 – Spiny surface of tetrade capsule, LP-21/6-3, × 2000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