

MICROPALAEONTOLOGY NOTEBOOK

Protobatioladinium elatmaensis sp. nov., a dinoflagellate cyst from the Bathonian of RussiaJAMES B. RIDING¹ & VERA I. ILYINA²¹British Geological Survey, Keyworth, Nottingham NG12 5GG, UK.²United Institute of Geology, Geophysics and Mineralogy, Siberian Branch of the Russian Academy of Sciences, Universitetsky Prospekt 3, Novosibirsk 90, 630090 Russia.

ABSTRACT - *Protobatioladinium elatmaensis* sp. nov. is a distinctive Lower-Middle Bathonian dinoflagellate cyst present, often abundantly, throughout the Russian Platform. The species appears to be a reliable stratigraphical marker and is the oldest representative of the genus *J. Micropalaeontol.* 15(2): 00, October 1996.

INTRODUCTION

During the course of an investigation of the Jurassic palynology of the Russian Platform, numerous specimens of a previously undescribed form of the dinoflagellate cyst genus *Protobatioladinium* Nøhr-Hansen 1986 were encountered from Lower and Middle Bathonian sediments. This distinctive morphotype, described herein as *Protobatioladinium elatmaensis* sp. nov., appears to be a reliable biostratigraphical index.

SYSTEMATIC PALAEONTOLOGY

Division **Dinoflagellata** (Bütschli 1885) Fensome *et al.* 1993Class **Dinophyceae** Pascher 1914Order **Gonyaulacales** Taylor 1980Family **Pareodiniaceae** Gocht 1957Genus ***Protobatioladinium*** Nøhr-Hansen 1986*Protobatioladinium elatmaensis* sp. nov.

(Fig. 1a-d)

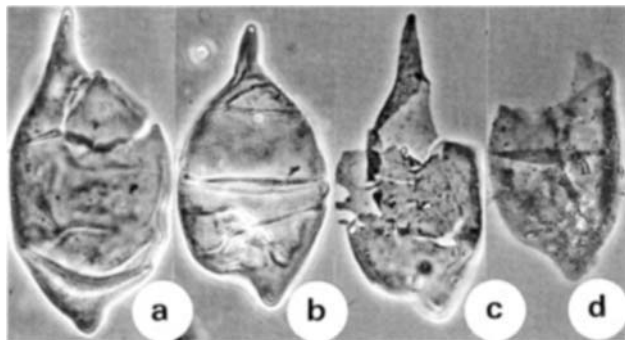


Fig. 1a-d. *Protobatioladinium elatmaensis* sp. nov. All photomicrographs taken using phase contrast, magnification $\times 500$. Specimens from the Lower-Middle Bathonian of Borehole 132, near Elatma, Russian Platform (Fig. 2). (a) Sample VII 3592, 75.50 m depth. The holotype, specimen MPK 10134 in left lateral view. Note the partial archaeopyle formation, the two anterior intercalary paraplates have detached from the loisthocyst. Note also the absence of significant dorso-ventral flattening and the equatorial expansion or 'shoulder' in the posterior intercalary region. (b) Sample VII 3592, 75.50 m depth. A topotype, specimen MPK 10129 in dorsal view. Note the relatively small antapical horn, offset to the right. (c) Sample VII 3592, 75.50 m depth. A topotype, specimen MPK 10133 in dorsal view. Note the disruption of the anterior intercalary paraplate series due to archaeopyle formation and the antapical horn, offset to the right. (d) Sample VII 3953, 74.00 m depth. A paratype, specimen MPK 10138 in dorsal view. Note the complete archaeopyle formation involving the loss of two anterior intercalary and the apical paraplates. All specimens housed in the palynological collections of the British Geological Survey, Keyworth, Nottingham, UK.

Derivation of name. From the town of Elatma, central Russia, from which region the type material was found (Fig. 2).

Diagnosis. Proximate, acavate, longitudinally elongate dinoflagellate cysts, small to intermediate in size (of Stover & Evitt, 1978). The ambitus is ovoidal with a large apical horn and a smaller antapical horn or protrusion. The horns and protrusions are hollow, evenly distally tapering and have simple, rounded extremities. Normally the antapical horn/protrusion is offset ventrally. The cyst is not significantly dorso-ventrally flattened and the equatorial portion of the hypocyst may form a distinctive shoulder in oblique views. The epicyst and hypocyst are similar in height and the presumed paracingular area is normally the broadest part of the cyst. Autophragm thin, smooth to occasionally microgranulate. Archaeopyle combination, type (tA) + (2l). The two opercular pieces comprise Kofoidian paraplates 1a plus 2a and the entire apical paraplate series. Both portions of the operculum are potentially free, however the apical paraplates frequently remain attached or partially attached to the loisthocyst. The archaeopyle is the only indicator of parababulation; the paracingulum and parasulcus are not indicated.

Holotype. Figure 1a - specimen MPK 10134. Sample VII 3592, a Lower-Middle Bathonian siltstone (bed 21), taken from core at 75.50 m in Borehole 132, near Elatma in the River Oka Basin, central Russia (Fig. 2). Housed in the palynological collections of the British Geological Survey, Keyworth, Nottingham, UK.

Dimensions. Based on measurements of 30 specimens, the average maximum (entire) cyst height is $69.6 \mu\text{m}$; this parameter varies from $64.0 \mu\text{m}$ to $82.1 \mu\text{m}$. The maximum cyst width varies from $32.7 \mu\text{m}$ to $41.4 \mu\text{m}$; the average is $36.0 \mu\text{m}$. The height and width respectively of the holotype are $79.2 \mu\text{m}$ and $39.0 \mu\text{m}$.

Stratigraphical and geographical distribution. *Protobatioladinium elatmaensis* sp. nov. is present, frequently abundantly, in the Lower and Middle Bathonian of the Moscow Syncline, the Voronezh Anticline and the Timan-Pechora Basin, Russia (Ilyina, 1991).

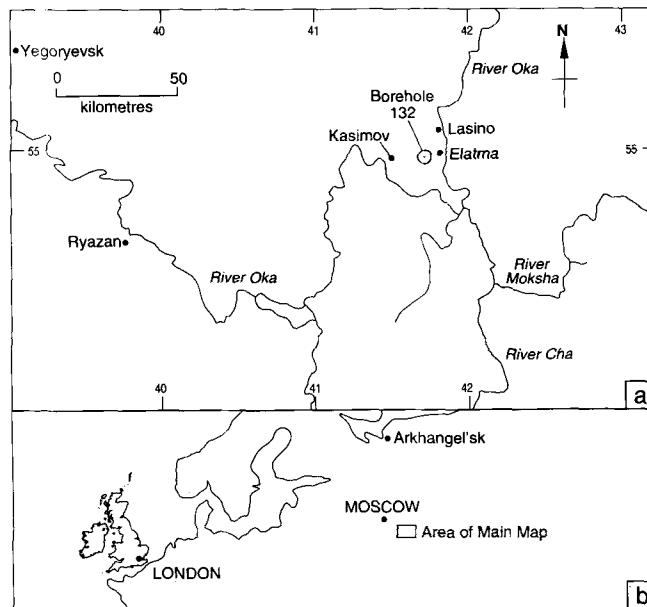


Fig. 2a, b. (a) Sketch map of the Elatma area, Russian Platform, illustrating the location of Borehole 132; (b) location of the area depicted in (a).

Comparison. *Protobatioladinium elatmaensis* sp. nov. differs from the genotype, *Protobatioladinium westhursiensis* Nøhr-Hansen 1986 in having a shorter and distally tapering apical horn which is not constricted and has a broad base and a single antapical horn/protrusion. *Protobatioladinium imbatodense* (Vozzhennikova 1967) Lentini & Vozzhennikova 1990 is relatively large, has a densely granulate/verrucate autophragm and two prominent, short antapical lobes. *Protobatioladinium lunare* Monteil 1992 is relatively large, has short, broad horns, is punctate and has a type (tA) + 2l archaeopyle. The relatively small *Protobatioladinium rossicum* (Iosifova 1992) Iosifova 1996 possesses a small apical horn and two small antapical horns, has typically granulate autophragm and is possibly cornuacate.

Remarks. In the Russian Platform, the Lower and Middle Bathonian dinoflagellate cyst associations are of low species diversity. It is normally associated with rare *Ctenidodinium sellwoodii* (Sarjeant 1975) Stover & Evitt 1978. However, in the Voronezh Anticline western Russia, *Protobatioladinium elatmaensis* sp. nov. is relatively rare and *Ctenidodinium sellwoodii* dominates the dinoflagellate cyst assemblages (Ilyina, 1991). The common presence of *Protobatioladinium elatmaensis* sp. nov. in the Lower-Middle Bathonian of Russia and its absence from northwest Europe is typical of the highly provincial marine palynofloras of the Bathonian Stage (Riding *et al.*, 1985). *Protobatioladinium elatmaensis* sp. nov. is by far the oldest representative of the genus. The other four validly described species are confined to the Upper Jurassic-lowestmost Cretaceous interval (Kimmeridgian, Volgian/Tithonian and Ryazanian).

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