

Silicified microbiota from the Bohemian Late Proterozoic

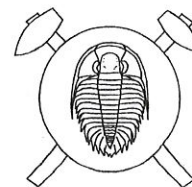
Silicifikované mikrofosílie českého mladšího proterozoika (Czech summary)

(4 text-figs., 6 plates)

MILADA VAVRDOVÁ

Geologický ústav Akademie věd ČR, Rozvojová 135, 165 00 Praha 6

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Rich and diverse benthic microbiota has been detected in dark silicites of Precambrian age (Kralupy–Zbraslav Group, Teplá–Barrandian Proterozoic).

The evaluation of in situ preserved cyanobacterial colonies allows to characterize supratidal, intertidal and subtidal fossil sedimentary environment. Bacterial degradation, permineralization by iron sulphides and early diagenetic silicification were the main factors controlling the preservation of organosedimentary structures and textures such as low-relief bioherms, firm algal mats, fenestral fabrics, bird-eye structures, dessication cracks, plastic deformations and other phenomena.

A Gunflint type of microbiota (*Huroniospora psilata* – *Gunflintia minuta*) has been ascertained in the Nížbor anticline. Benthic associations from lydites and siliceous shales from the north of Prague (Kralupy environment) and in the SE part of the basin (Blovce area) resemble in some aspects analogical finds from the Arctic Canada (Dismal Lake Group, Belcher Island Group). Silicified graywackes and stromatolitic iron-rich cherts from the Stříbro – Plasy Belt and Svojšíň Belt (*Siphonophycus* – *Podolina angulata* palaeocommunities) may be well compared with the supratidal facies of the Draken Conglomerate Formation.

Introduction

The present investigation is primarily concerned with the palaeoecological assessment of the fossil communities of microorganisms ascertained in the Kralupy–Zbraslav Group, a lower unit of the Bohemian Late Proterozoic. Organic remains were studied mainly in thin sections, less extensively as palynological residua obtained by acid maceration (HF, HCl) and in SEM observation of silicite fragments.

Preliminary results of the study were reported in the paper by Vavrdová and Mrázek (1991) in which a short outline of previous paleontological investigations is given. More detailed information is summarized by Konzalová (1988).

A special attention has been given to stromatolitic textures, ascertained in the SE part of the Teplá–Barrandian region (Blovce area) by Pouba in 1973. Subsequent micropaleontological investigations (Pačtová and Pouba 1975) confirmed the presence of silicified microbiota, namely bacterio–algal mats indicating shallow environment.

The Kralupy–Zbraslav Group, assigned to a combined petrotectonic association of rocks on the convergent boundary between oceanic and continental plates by Cháb (1979), represents a volcano–sedimentary complex with predominance of graywackes, siltstones and basaltoid volcanics. Black shales rich in pyrite and frequent lensoid bodies of dark cherts occur in belts

of mainly NE–SW orientation (text-fig. 1). Twenty localities were investigated in the present study, as well as extensive comparative material from cherty horizons which occur in the sequences of the Early Paleozoic (Silurian, Early Devonian) and younger age.

The material studied is stored in the Collections of Geological institute, Czech Academy of Sciences, Prague, No. MP 2001–2030. Detail localization of samples is presented in Vavrdová and Mrázek (1991).

Preservation of microfossils

Different modes of preservation of microfossils has been noted during the study, which may contribute to the reconstruction of fossil environment and diagenetic processes in silicites.

Patchy accumulations of microfossils in thin sections usually reveal relatively quick changes in the preferential modes of preservation: primary biopolymeric envelopes are relatively rarely preserved (pl.I, fig.1). More common are ferrous oxides or sulphides forming outer sheaths, or layers of finely disseminated limonite. Unicells are frequently ruptured by subsequent formation of quartz crystals, distorted by framboidal pyrite and gradually disintegrated into amorphous organic dust.

Repeated alternations of horizons with Fe sulphides and oxidized layers with limonitized