Upper Cretaceous radiolaria from the Manín unit: paleoecological and sea-level implications

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The investigated section is formed by red-bed sediments, which cropping out near Praznov village (Middle Váh Valley). Radialarian microfauna from this locality has been discovered for the first time in the Santonian-Campanian formations of the Western Carpathians.

Radiolarians assemblage from the middle part of the Praznov section corresponds to stratigraphic interval from the Coniacian? to the Upper Santonian. Spumellaria predominate in the number of species as well as in quantity.

Association from higher parts is characteristic for the stratigraphic interval from the Santonian to the Upper Campanian. According to zonation by Hollis & Kimura (2001) both associations belong to the *Dictyomitra kozlovae* Zone.

Quantitative ratio reveals the predominance of spumellaria over nassellaria, their quantitative ratio changes. Diversification of both groups is almost the same. On the basis of O´Dogherty & Guex (2002), which studied the rate and model of radiolarian evolution during the Cretaceous, these authors specified several successive phases during this period, which could correspond to the sea-level lowstand phases.

The samples from the Praznov locality were relatively rich in the representatives of the family *Pseudoaulophacidae*, which according to Vishnevskaya & Basov (2007) disappeared at the Santonian/Campanian boundary. Therefore, the samples studied are surely represent assemblages from below the boundary of the Santonian/Campanian, representing only lower part of the zone *Dictyomitra kozlovae* (Dk1), which correspond to the Santonian. The S/N ratio provides evidence for deterioration of environmental conditions, which reflected the previous significant biotic event during Santonian – Campanian.

On the basis of foraminiferal associations, stratigraphic interval of the Praznov section has been established from the Cenomanian to the Upper Campanian. The Middle Turonian part is determined by the species *Praeglobotruncana oraviensis trigona* (Scheibnerová). The species of *Falsomarginotruncana renzi* (Gandolfi), *Marginotruncana terfayaensis* (Lehman), *Marginotruncana pseudolinneiana* Pessagno, *Marginotruncana coronata* (Bolli) and *Contusotruncana cornicata* Salaj represents the Coniacian to the Santonian association the Praznov section. The youngest part of this section belongs to the Upper Campanian, as is evidenced by the index taxon of *Globotruncana arca* (Cushman) and *Globotruncana ventricosa* (White).

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Experimental and theoretical studies of the relaxation of electrically induced (with direct current) polarization signals in porous media

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Polarization properties of porous solids (rocks) depend on both the nature of the rocks and of the filler (pore fluid). Therefore, the polarization parameters can give valuable information about the nature of the rocks. One possible approach to study these parameters is

to study transient's formation or elimination of the electric field in the medium. We discuss some experimental results on the relaxation polarization (of the electric field) in a sample porous body due to an external electrical field, as well as its adequate mathematical modeling. As a sample porous medium we consider purified sand in a viniduril (polyvinyl chloride) box which was filled with the aqueous solution of a salt or a mixture of water and oil. Experiments were conducted for solutions of different concentrations and different proportions of water and oil. A constant potential difference was applied to a sample which caused a constant electric current in the sample. The carbon and the high-quality stainless steel were used for the electrodes. The values of the potential difference and current were carefully controlled. We have measured the dynamics of the potential difference between some internal sample points using the multimeter with the RS-232 interface. These measurements have been automatically transferred to the computer for processing. The experiments were conducted for different initial values of the external voltage from 20 V to 400 V, with the voltage increased by 10 V steps. The voltage was stabilized. The time of application of the low constant voltage causing no noticeable heating is 15 min. For larger voltages the heating can become significant, and the time of application of the voltage was reduced to 2-3 min.

Experimental studies have shown that the filler significantly influences the nature and the speed of the relaxation of the electric field. The smallest relaxation times and initial polarizations and the largest speeds were observed for the distilled water, while the largest initial values of the polarization were observed for samples filled with the electrolyte solution. Our results also show that the largest times for the voltage drop are obtained for a mixture of water and oil used as filler with the relaxation curves highly depending on the concentration of oil.

We emphasize that such complex structures are characterized by very different polarization mechamisms, from electronic to electroosmotic with very different characteristic relaxation times (from 10^{-13} s to minutes). By using macroscopic experimental technique we actually measure the average value of the electric potential. Therefore, in order to properly describe the polarization relaxation one needs to know the relationship between the macroscopic electrical characteristics of the medium and its components (phases). In view of this, we consider the relaxation time spectrum characteristic for the materials in question. We calculated the effective electrophysical characteristics of a porous medium and emmulsion by using well known equations. Our calculations show that for the solution of salt one can achieve a good agrement between the experiment and theoretical predictions even only two relaxation times are taken into account. The influence of the interrelationships between the electrical and mechanical fields on the polarization relaxation processes is also discussed.

Sustainable aggregates resource management: approach within South East Europe

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Earth scientists, geologists, are involved not only in fundamental research projects, but also in applied projects. Most applied projects are multidisciplinary and have as their goal the solution of different open and ongoing challenges that society faces. An important set of these projects deals with the provision of an adequate and secure supply of raw materials. Within such projects many questions are addressed by geologists, who are able to utilize their geological knowledge to collect relevant data, analyze those data and to compile it into comprehensive information that provides a solid base for sound decision making. Geologists can best perform these tasks when they are aware of the need for information, the potential contribution of geology and other disciplines, and prevailing societal paradigm of sustainable development.