FORAMINIFERS AND OSTRACODES BIOSTRATIGRAPHY OF THE BADENIAN-SARMATIAN SEDIMENTS FROM THE VCR-1 CORE, THE KOLUBARA BASIN, SERBIA

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Abstract: According to the reach, forams and ostracodes associations from Vcr-1 core, Badenian and Sarmatian are divided into four biostratigraphic zones: *Ammonia beccarii* Assemblages zone, *Elphidium reginum* Taxon-Range zone, *Elphidium hauerinum* Taxon-Range zone and *Porosononion granosum* Abundance zone. Finding of above mentioned microfossils indicates to the succesive deposition in a shallow, sublittoral environment.

Key words: foraminifers, ostracodes, biostratigraphy, Badenian, Sarmatian, Kolubara basin

The paper describes the microfauna of foraminifers and ostracodes, as well as its significance for the Badenian and Sarmatian biostratigraphy in the core Vcr-1 in the Kolubara Basin (Fig. 1). This is an investigation borehole, drilled in the range of the Project “Stratigraphy of the Neogene of Kolubara Basin”, in order to answer the following question: what underlies the coal-bearing Miocene. Due to technical reasons, the drilling was stopped after entering the Upper Badenian sediments. Nevertheless, abundant collected material enabled biostratigraphic division and correlation with the adjacent boreholes in which the two Miocene stages had been previously found (Mitrovic & Rundic, 1993, 1996; Petrovic & Mitrovic, 1990; Spajic et al.,
A detailed analysis of foraminiferal and ostracod fauna was performed using standard biostratigraphic methods, and biozones were distinguished according to the International Stratigraphic Guide (Salvador, 1994, Murphy & Salvador, 1999).

Fig. 1. Simplified physical setting of the Kolubara basin and location of investigated borehole Vcr-1/77

Badenian sediments were discovered at the depth of 503.40-373.20m (Fig. 2). The Badenian is represented by various lithological members: clays, sandstones, carbonaceous limestones and lithothamnion limestones. Abundant and various foraminifers and ostracodes were determined in almost all sediments. Frequent zone species Ammonia beccari in association with elphidiums (Elphidium crispum, El. flexum, El. rugosum and others) confirmed Upper Badenian – Ammonia beccarii Assemblages zone. Accompanying fauna is very diverse and represented by the following forms: Heterolepa dutemplei, Nonion commune, Cibicides ungerianus, Asterigerinata planorbis, Borelis melo, Quinqueloculina akneriana, Qu. triangularis, Cycloforina contorta, etc. Ostracodes are numerous as well, and they are represented by various forms: Aurila haueri, Pokornyella deformis, Tenedocythere sulcatopunctata and others, but they are mostly treated as accompanying fauna.

Sarmatian sediments were discovered at the depth of 373.20-298.5m (Fig. 2). In the lower part of the borehole, in the interval 373.20-356.40m, the Sarmatian stage begins with sandy clays, while sandy and marly limestones and carbonaceous sandstones with intercalations of sandy clays and sands can be found in the interval 356.40-298.50m. The main characteristic of the microfaunal community is a distinct uniformity, expressed through the presence of smaller number of genera with numerous populations of certain species. Among foraminifers, forms of the Elphidium and Porosonion genera are particularly frequent. These two genera are of the primary importance for biostratigraphy of the Lower Sarmatian. Very clear changes in
the assemblage composition are mostly reflected in the proportional presence of representatives of these two genera, which enabled separation of three biostratigraphic zones in the Lower Sarmatian: *Elphidium reginum* Taxon-Range zone (373.20-356.40m), *Elphidium hauerinum* Taxon-Range zone (356.40-319.40m) and *Porosonion granosum* Abundance zone (319.40-298.50m). Ostracodes are represented by typical brackish association: *Senesia vadaszi*, *Heterocythereis mehesi*, *Cyamocytheridea leptostigma*, *Loxoconcha fragilis*, *L. hastata*, *Xestoleberis glaberescense* and others.

Fig. 2. Lithostratigraphical succession of the core Vcr-1/77

Development of above mentioned fossil forms point to a successive sedimentation in a shallow, near-shore environment - sublittoral (Mihajlovic et al., 1997; 1998).

In a paleoecological sense, two basic types of environment were distinguished: 1) marine environment during the Badenian, with prevailing mostly stenohaline forms. Exceptions are assemblages from the uppermost Badenian levels, significantly poorer in varieties, which indicates the beginning of salinity decrease; 2) reduced marine environment during the Sarmatian, i.e. a brackish biotope with mesohaline living community, connected to the upper levels of the investigated borehole.

References


