

New Findings of the Middle Miocene Biostratigraphy of the Planina Syncline (Eastern Slovenia, Central Paratethys)

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The Badenian and partially Sarmatian biostratigraphy of the Planina Syncline (Eastern Slovenia, Central Paratethys) was investigated by using benthic and planktonic foraminiferal taxonomy. The Planina Syncline is located in Kozjansko, in the middle part of Eastern Slovenia. Palaeogeographically, it belongs to the south-western margin of the Pannonian Basin.

The Badenian beds sit discordantly on the Upper Egerian sand in the Planina Syncline. They consist of basal conglomerate, coarse-grained calcarenite or rarely of *Lithothamnium*-limestone. This is followed upwards by massive calcarenite, alternating calcarenite and marly calcarenite, and uppermost by marl. According to previous studies, the stratigraphic boundary between Badenian and Sarmatian was set at the base of Sarmatian conglomerate, which follows marl.

In my research, six sections have been sampled. All of them start with basal Badenian strata and are mostly completed with Sarmatian conglomerate. 159 samples were taken and 128 genera and 192 species or subspecies were identified. Due to their distribution six Badenian zones are defined; Lower Badenian Lower and Upper Lagenidae Zones, Middle Badenian *Pseudotriplasia robusta* and *Uvigerina* cf. *pygmaea* Zones, and Upper Badenian *Bolivina dilatata* and *Virgulinitella pertusa* Zones. All zones apart from the last one are rich in foraminifers, full marine environmental indicators are frequent. Contrary, late Upper Badenian Zone is recognized as having reduced total foraminiferal diversity and much reduced planktonic foraminiferal abundance. Overlying strata belonging to Sarmatian *Anomalinoidea dividens* and *Elphidium hauerinum* Zones are typically brackish. The boundary between Badenian and Sarmatian was adjusted in three sections towards older strata of marl, below the Sarmatian conglomerate.

In no section all six zones are proven but it is presumable that the missing zones are present under unsampled grassy areas, which are frequent and extensive in all sections. If this is so, then there is a continuous sedimentary record from the beginning of Badenian to the Upper Badenian, and possibly into the Lower Sarmatian. The assumption of continuous sedimentation across the Badenian/Sarmatian boundary could be supported by the presence of the impoverished late Badenian *Virgulinitella pertusa* Zone, which was assigned in the easternmost section as well as by the displacement of

the boundary into lithological more uniform marl. In previous studies, the uppermost Badenian beds were considered to be eroded or not deposited, so the boundary between Badenian and Sarmatian is believed to be discordant in the whole area of Slovenia.

To prove my hypothesis regarding the sedimentary continuity of the studied area additional fieldwork is required. Studying microfaunal and lithological changes from the Late Badenian to the Early Sarmatian is only possible by determining the precisely position of the Badenian/Sarmatian boundary within the syncline, and vice versa. Even though the continuity is not proven, the geological transition between both stages in the Planina Syncline appears to be less dramatic than was previously thought.

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