



Integrated stratigraphy of the Middle-Upper Miocene transition in the Central Paratethys (Transylvanian Basin, Romania)

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In the Middle-Upper Miocene boundary interval of the Paratethys, the restricted marine water circulation is expressed by the occurrence of the brackish biota as a response to the isolation from the open sea. This isolation is the third and final one of the Paratethys from the Tethys, following the Early Oligocene first isolation and a second one, Early Miocene in age (Rusu, 1988; Rögl, 1999; Piller et al., 2007).

One of the sections displaying a continuous transition between the Sarmatian and Pannonian is Oarba de Mureş, located in the central part of Transylvanian basin, Romania. There, the combined results of magnetostratigraphy and radiometric dating indicate that the Sarmatian-Pannonian boundary is situated at 11.3 ± 0.1 Ma (Vasiliev et al., 2010), postdating the Serravallian-Tortonian boundary (at 11.608 Ma). Furthermore, the isolation of the Pannonian basin was dated in Serbia by Ter Borgh et al. (2013) at 11.63 ± 0.04 Ma. This age was found also in the Vienna basin, predating the isolation of the Transylvanian basin by 0.33 Ma (Ter Borgh et al., 2013).

The Sarmatian s.str. deposits of Oarba de Mureş section are characterized by ostracod taxa *Hemicytheria*, *Leptocythere*, *Callistocythere*, *Cyprideis* and *Loxoconcha*, as well as *Ammonia*, *Porossonion*, *Elphidium*, *Articulina*, *Bolivina*, *Streptochilus* and *Tenuitellinata* foraminiferal genera. The overlying Pannonian deposits contain ostracods of a low salinity paleoenvironment. There is a sharp biotic change at the Sarmatian-Pannonian boundary between the marine and fresh-brackish microfauna. In the investigated marine Sarmatian deposits, nannofossil assemblages containing *Discoaster kugleri*, index species of the NN7 calcareous nannofossil zone, were identified. Monospecific nannofossil assemblages with *Braarudosphaera bigelowii*, indicating a lowering salinity, were found within the Sarmatian-Pannonian boundary interval. Upwards in the studied succession, within the uppermost Sarmatian and Pannonian deposits, the calcareous nannofossil assemblages contain only reworked taxa, from Cretaceous and Tertiary sediments. In the studied Transylvanian section, the LO of *D. kugleri* is placed in the uppermost Sarmatian deposits, slightly below the occurrence of monospecific assemblages with *B. bigelowii* and above the volcanoclastic layer dated at 11.62 Ma by Vasiliev et al. (2010). This finding is a line of evidence that the Serravallian-Tortonian boundary is placed, in the Central Paratethys, towards the top of the Sarmatian, being in agreement with the absolute age determined by Vasiliev et al. (2010).

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