

Benthic foraminiferal fauna as a tool to indicate the Toarcian Oceanic Anoxic Event in homogeneous Ammonitico Rosso series of Bakonycsérnye (Transdanubian Hungary)

Gábor Zsiborás (1) and Ágnes Görög (2)

(1) Eötvös Loránd University, Department of Palaeontology, Budapest, Hungary (zsgabedavies@gmail.com), (2) Eötvös Loránd University, Department of Palaeontology, Budapest, Hungary (gorog@ludens.elte.hu)

In the last decades, since the Toarcian Oceanic Anoxic Event (T-OAE, ~182 Ma) recognized, several studies were dealing with the effect of it on the foraminiferal faunas from black shales and marls of the epicontinental region. Only a few works were made from the Tethyan oceanic basin region (Monaco et al., 1994; Nini et al., 1995; Pettinelli et al., 1997) characterized by occurrence of black shales between the “Lower *Posidonia* Shale” and the Ammonitico Rosso. However, the black shale is absent in some Tethyan sections substituted by red or grey marls. Only Reolid et al. (2015) focused on foraminifera from this kind of successions, from the Betic Cordillera, where the T-OAE was not detected. From the section of Tűzkövesárok of Bakonycsérnye, Transdanubian Central Range, Hungary, Monostori in Galácz et al. (2008) based on the Bairdididae dominated ostracod fauna indicated suboxic environment at the Pliensbachian/Toarcian boundary. Thus the aim of our study was to give paleoecological interpretation of the foraminiferal fauna of this 2 m thick Ammonitico Rosso sequence.

Foraminifers were extracted from six red nodular, slightly argillaceous limestone (Tűzkövesárok Limestone) samples from the Pliensbachian part (Emaciatum Zone) and one sample from the Toarcian part (Tenuicostatum Zone) which begins with a hardground and following by red marl (Kisgerecse Marl).

The washing residues of the lower four samples contain foraminifers, sponge spicules, radiolarians and echinodermata parts (crinoids and holothurians). The upper two Pliensbachian samples include more foraminifers, however, other groups are absent. The Toarcian sample contains crinoids and less foraminifers (30%).

Overall 68 taxa were identified, 54 on species, 14 on generic level. The most of the specimens have calcitic tests, in the Pliensbachian, agglutinated forms are 7-24% of the fauna, however, they are absent in the Toarcian. Upwards to the Pliensbachian/Toarcian boundary, the diversity of the fauna rapidly increased. Above the boundary, the number of species decreased to the 40% of the Pliensbachian maximum diversity.

Sorting the specimens by morphological features is a tool for the paleoecological evaluation. In the Pliensbachian assemblages, the biconvex groups (*Lenticulina*) are dominant, however, elongated (*Nodosaria* and *Eoguttulina*) and flattened (*Planularia*) groups are dominant in the Toarcian. This morphological changing indicates the decreasing of seawater oxygen level and current energy in the lowermost Toarcian. It does not show anoxia but can be suboxia caused by abrupt deepening. The previous results of the ostracod studies indicated the same events.

The Pliensbachian/Toarcian boundary section of Tűzkövesárok includes a similar foraminiferal fauna to other Tethyan successions Spoleto and Umbria-Marche Apennines (Central Italy), Ionian Basin (Greece); and epicontinental sequences e. g., Lusitanian Basin (Portugal) which all have black shale layers in the Early Toarcian. In contrast, the Betic section with very similar lithology to Bakonycsérnye provided a totally different fauna with dominance of agglutinated forms and without significant diversity changes at the boundary.

The studied boundary section is the first Ammonitico Rosso sequence which foraminiferal fauna indicated the environmental changes caused by the T-OAE in the deep basin of the Tethyan Realm.

The Research was supported by the Hantken Foundation.