The Direct Correlation of the Neogene of the Eastern Paratethys and Tethys

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Abstract

In analyzing the plankton microfossils (foraminifers, nannoplankton), some correlation levers are recognized in the Neogene sediments of the Eastern Paratethys. The concept aspects of the stratigraphy of the Eastern Paratethys are considered. The problems concerning the stage and zonal division, correlation of the Neogene stratigraphic units of different ranks and structural-facial zones are interpreted. Based on the complex methodology (bio-, litho-, magnetostratigraphy), the accuracy of direct correlations of Neogene of the Eastern Paratethys with the International Stratigraphic chart is proved,

General Comments

The resolution of the biostratigraphic method for detailed stratification of the Neogene is presented (Figure 1; contributions by Semenenko, 1987 and Gozhyk, 2006 [Figures 2 and 3]). The detailed analysis of the distribution of microfossils (planktonic foraminifers, nannoplankton, dinocysts) of the Neogene deposits of the Eastern Paratethys allowed us to distinguish 10 associations of ocean plankton (correlation levels), which enabled to us define more exactly the age of the lithostratigraphic units, conduct their correlation within the limits of the Paratethys, and show their interrelation with the International Stratigraphic Scale.

In the lower Miocene two correlation levels are distinguished that allow us to define more accurately the Miocene-Oligocene boundary (1 level) and to place the Illichiv Formation to the Upper Sakaraulian (2 level). The 3rd and 4th levels were selected within the deposits of the Tarchan Formation which confirm its Middle Miocene age and allow their correlation with the Lower Badenian and Lower Langhian. The 5th correlation level is selected within the Konkian deposits which correspond to the Upper Badenian and Lower Serravallian (see Figure 4 for important nannofossils).
The 6th level defines the boundary between the middle and upper Miocene, which is in the middle of the Bessarab Sub-formation, and gives reason to correlate it with the boundary of the Pannonian and Tortonian. The 7th level is distinguished within the Bagerov Formation of the Maeotian.

The 8th level is present in the upper part of the Maeotian and gives a reason to correlate these sediments with the Pannonian stage of the Central Paratethys and the Tortonian and Messinian of the Geological Time scale (2004). The 9th level is distinguished within the sediments of the Azov Formation and gives us a reason to assign the Kimmerian sediments to the Pliocene (see Figure 5 for important nannofossils). The 10th level which is distinguished in the Taman layers (upper part the Middle-Upper Akchagil) of the Eastern Crimea on the Black Sea shelf, corresponds to the Pliocene-Pleistocene boundary.

References


Figure 2. Cover of “Stratigraphic Correlation of the Upper Miocene and the Pliocene of the Eastern Paratethys and Tethys” (Semenenko, 1987).

Figure 3. Cover of “Stratigraphy of Mesozoic and Cenozoic Deposits of the Black Sea Northwestern Shelf” (Gozhyk et al., 2006).
Figure 4. Nannofossils of the 5th and 6th correlation levels.
Figure 5. Sarmatian, 8th level, 9th level, and Pannonian nanofossils.