Paleooceanography of Oligocene-Early Miocene sedimentation of the southern regions of Ukraine

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Deposits of Oligocene-Early Miocene age (Maykop series) belong to one of the most prospective complexes of the Southern oil-and gas-bearing province of Ukraine. Their commercial oil-bearing is confirmed at Strilkova, Beysugska, Morska, Kazantypska prospects of the Azov Sea. Within the Kerch Peninsula, the fields at Fontanivska, Pivnichnosyvashska, Povorotna, Prydorozhna, Vladyslavivska, Slusarivska (Denega *et al.*, 1998) and other prospects are related to these deposits. Within the Plain Crimea the Dzhankoyske gas field is being developed. Discoveries of gas fields at Golitsynska, Pavdennogolitsynska, Shmidtova and other prospects of the north-western Black Sea shelf, as well as at Subotina prospect (Fore-Kerch Black Sea shelf) confirmed the substantial perspectives of the Maykop deposits within the whole region.

In this relation, the great importance of this study is the characterisation of the features of the Maykop sedimentogenesis, which will be the base for determination of the peculiarities of the sandy-siltstone layers spreading, forecast of the reservoir rocks and sealing horizons occurrence, assessment of perspectives of the separate prospects.

Oligocene-Early Miocene deposits are widely spread within the southern regions of Ukraine and are lacking in local areas in Dobrougea, Mountainous Crimea, in the domes of Central Crimean and Middle Azovian mega-elevation, western and eastern areas of the Northern Black Sea region. The completeness of the succession and its thickness vary significantly. The most complete succession with a maximum thickness over 4000 m has been penetrated within the Kerch Peninsula. The deposits of similar thickness of 1600-4000 m are observed within the offshore north-western and Fore-Kerch Black Sea shelves. A significant reduction of the succession completeness and thickness (up to 300-400 m) is observed within the Northern Black Sea region and the Plain Crimea, which is related to the reduction of thickness of separate horizons as well as to their pinching-out or more late erosion.

Maykop deposits are usually unconformably resting on the carbonate rocks of Eocene age and in turn are unconformably covered by the terrigenous Miocene rocks.

Stratigraphic division of the Maykop Series is rather problematic because of the similar lithological composition of the sequence, lack of the regional markers, poor paleontological remains and is made usually by electrometric data.

The base of the lithological structure of the Oligocene-Early Miocene sequence is made up of clayey rocks, which differ by aleuritic-psammitic or carbonate material. In upper, middle and lower horizons of the sequence the streaks of siltstones and sandstones are traced, whose role increases while approaching to the denudation areas. In this respect, in Maykop sequences of the axial zones of North-Crimea and Indolo-Kubanian depression the clayey lithotypes are predominant, while at southern slope of the Ukrainian monocline and north-eastern closure of the Mountainous Crimea the aleuritic-psammitic rocks are dominating. Between these zones the content of aleuritic-psammitic material depends exclusively on the activity of temporary streams. The streaks of carbonate (marl, limestone) and silica (opoka, spongolite) rocks are also revealed in the sequence, more seldom the horizons of glauconite, siderite-bearing, ferrous-manganese rocks are traced, which are more typical for the northern parts of the region.

As for oil and gas prospecting the clastic sequences are the most important ones, the geological-paleooceanographic investigations were directed to the determination of peculiarities of their sedimentogenesis. As a result, a range of schemes have been constructed, which show the sedimentary environments for five aleuritic-psammitic lithological complexes.

Taking into account the global paleooceanographic situation in Oligocene (Zonenshine *et al.*, 1987), as well as the results of our investigations, we can conclude, that the sea transgression to the Black Sea – Azov region was moving in north-eastern direction from the East- and West Black Sea troughs through the straits in Kilian-Kalamitian-Crimean-Caucasian zone of elevations to the axian zones of Karkinite-North Crimean and Indolo-Kubanian depressions with a consequent advance into the Plain Crimea, Western and Eastern Black Sea region. Two basins with different dynamics and depositional environments are distinguished rather clearly: internal (Odessa, Kerch) and exernal Black Sea, which were separated by the Kilian- Kalamitian-Crimean-Caucasian range of submarine-surface elevations.

In the external part, it is open for the oceanic water, thus the deep-water conditions were predominant in the Black Sea sedimentary basin. The depocenters of sedimentation were spread within the East- and West Black Sea troughs and the clayey, more seldom aleuritic-clayey muds deposited there.

In the internal part, in the Odessa and Kerch Basins, the near shore-marine and alluvial-deltaic sedimentary environments prevailed. Terrigenous sedimentation dominated there (aleuritic-clayey muds, sands, aleurites). Detritic material was derived by a range of river systems (Pre-Dnister, Pre-Dnipro, Pre-Molochna, Pre-Don). The latter supplied generally insignificant volumes of clastic material, which in our opinion was caused by the peneplainized type of denudation areas. However, they had a rather essential influence of the way of clastic material distribution, forming psammitic-aleuritic node bodies of facial zones: ''river bed'', ''river mouth bar'', ''fan'', ''along shore bar', though they are insignificant in area and thickness.

In the areas of the maximum subsidence (Mykhailivska, Nyzhniogirska, Shubynska, Bagerovska depression) the aleuritic-clay and clayey mud of the outer shelf were formed.

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Zonenshine, L. P., Dercoure, J., Kazmin, V. G. (1987): Evolution of Tethys, History of Tethys ocean, 104-115.