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Structural characteristics of Paleogene deposits, in central Romanian Black Sea offshore

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The Romanian Black Sea offshore is located in the extension of the two main onshore structural units: the North Dobrogea Folded Belt and the Moesian Platform separated by the Peceneaga-Camena Fault. The southern part of the North Dobrogea are overlain by the Upper Albian to Campanian sediments of the Babadag Basin opened towards offshore into Histria Depression, filled with Paleogene deposits.
The study area comprises the Paleogene Histria Depression. Beginning with the Paleocene, a discrete phase of strike-slip deformation induced by Peceneaga – Camena fault rejuvenation. Paleocene deposits are mising and Eocene deposits are primarily determined by the tectonic setting. During the Oligocene, the sea level rise again, sediments covering the entire Black Sea shelf.
Tectonic processes that control the stratigraphy and the geometry of the Paleogene sub-basins include mainly the extensional and compresional movements creating and modifing the space accomodation (Dinu et al., 2005). According with Ţambrea et al. (2002) and Ionescu (2002), erosion of the proximally uplifted areas and transport into basins increases the sediment load within basin resulting in increase of thicknesses and compaction. A third variable that significantly controls the stratigraphy is eustatic sea level falls and rises that cause progradation and retreat of facies boundary. Any change of these factors resulted in creation and destruction of the accommodation space and formed discordances, which are expressed by toplap, downlap and erosion of beds delimiting the Eocene sequences and by onlap and erosion of beds delimiting the Oligocene sequences.
The intergrated analysis of the seismic lines and core data permitted to define the regional geological evolution: after the Paleocene regional uplift and subaerial erosion of the Cretaceous shelf – upper slope systems, locally siliciclastic influx was derived by fluviatile – deltaic systems during the Lower - Middle Eocene. The tectonic movements propagated in a southwest – northeast trend generating local distinct sub-basins separated by tectonic highs that acted as local source areas. The sub-basins present different dimensions: 4 – 38 km length, 4 – 16 km width and 204 – 1576 m thickness.
The main sub-basin located in Iris-Venus area is deep, rhombic shaped, delimitated by normal faults, and may be connected with the strike-slip deformation component of Peceneaga – Camena Fault. The next sub-basin, located on West Lebada area may be considered a cross- fault extensional zone. In the following sub-basin East Lebada- Minerva area, normal faults generated a tectonic corridor characterized by high subsidence rate and local submarine/subaerial intraslope topographic highs. The last sub-basin localised in Histria area is a ponded one and captured highly organic matter - rich muddy carbonate turbidites.
In all sub-basins, there is a progression from structure control to sediment control deposition. There are carbonate-siliciclastic turbidite wedges and gullies fill (West Lebada), autochthonous carbonate wedges (Iris-Venus, East Lebada–Minerva), and muddy carbonate turbidites (Histria).
On the seismic lines, all the Eocene sequences are defined by high continuity and high amplitude facies. Both sub-basins Venus-Lotus and Lebada East are characterised by two types of the seismic sequences. In the base is develop an oblique tangential facies which change to an oblique sigmoidal facies shwoing a basinal energy lowering. The toplap and downlap terminations delineate Eocene and Oligocene erosional and Eocene and Cretaceous depositional unconformities. The second sequence is characterised in the base by parallel high amplitude reflections which became in the upper part almost a mute seismic facies corresponding to a lithologically homogeneous sequence. There is a difference between two sub-basins related to the influx of sedimentary material direction: in the Venus-Lotus sub-basin the sedimentary influx is from SW to NE while in the Lebada East sub-basin is almost from N to S.

Keywords: Eocene Hstria Depression, Iris-Venus area, West Lebada area, East Lebada – Minerva area.
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