

BIOGENIC ACCUMULATIONS in ROMANIAN PETROLEUM SYSTEMS

Stoica-Negulescu Elena Rodica

Prospectiuni S A, Romania, rodica_negulescu@hotmail.com,

This paper offers an image of specific elements and prospects of the Romania's Biogenic Petroleum Systems. Taking into account the geographic, stratigraphic and temporal criteria, in correlation with geokemical studies, we defined thermogenic petroleum systems (Carpathian, Pannonian, Moesian.) and the biogenic ones (**Transylvanian, Pericarpathian, Euxinic**).

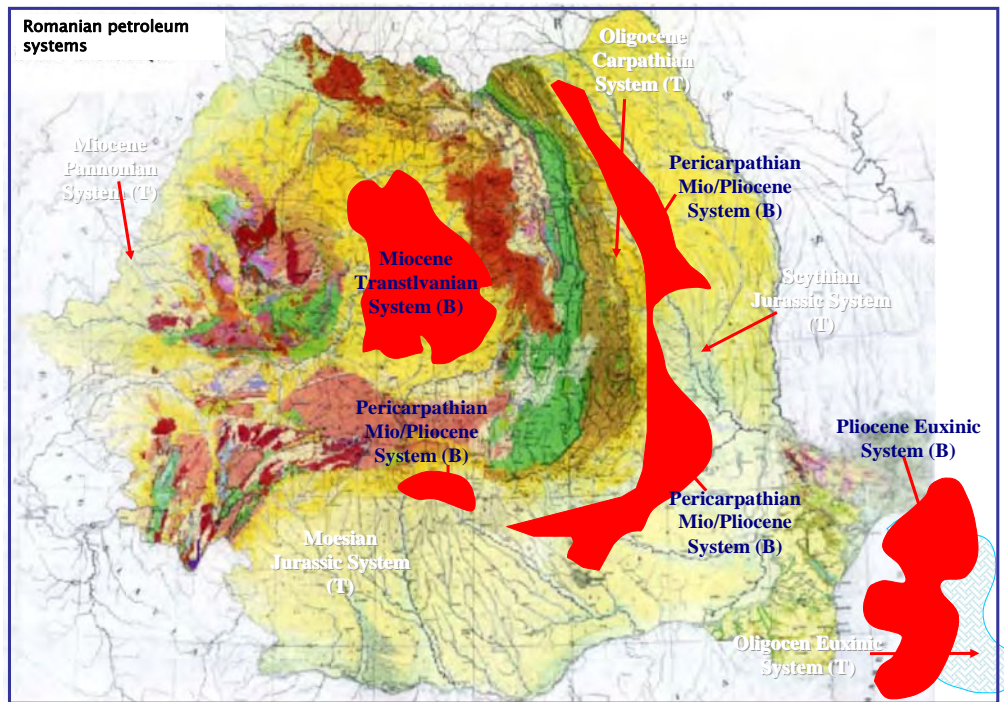


Fig.1 Romanian geological map and the main biogenic petroleum systems (red colour).

The main biogenic petroleum system is located in post-tectonic inter-arc **Transylvanian basin**, in sands and sandstones of Miocene "gaseiferous formation" which includes over 3.000 meters of

Badenian, Sarmatian and Pliocene deposits. The source rocks are Middle/Upper Miocene bituminous shales and marls, in condition of low geothermal gradient.

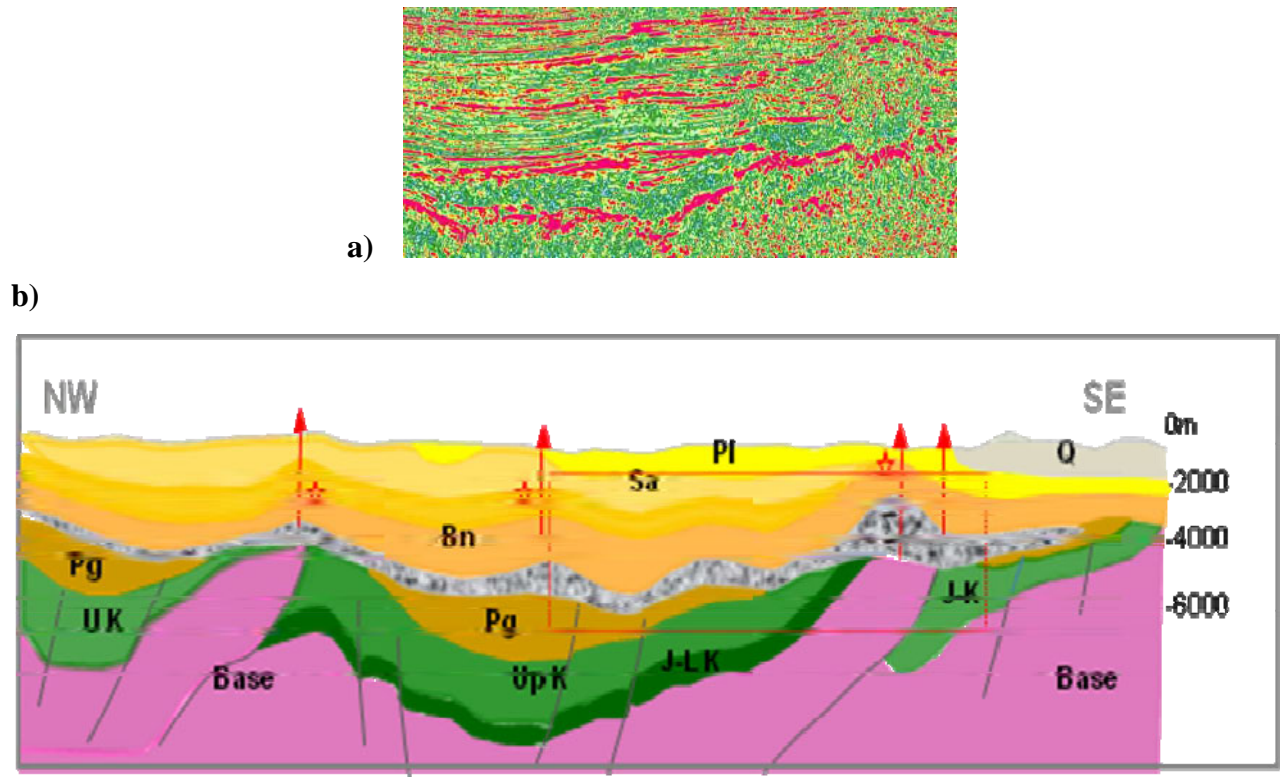
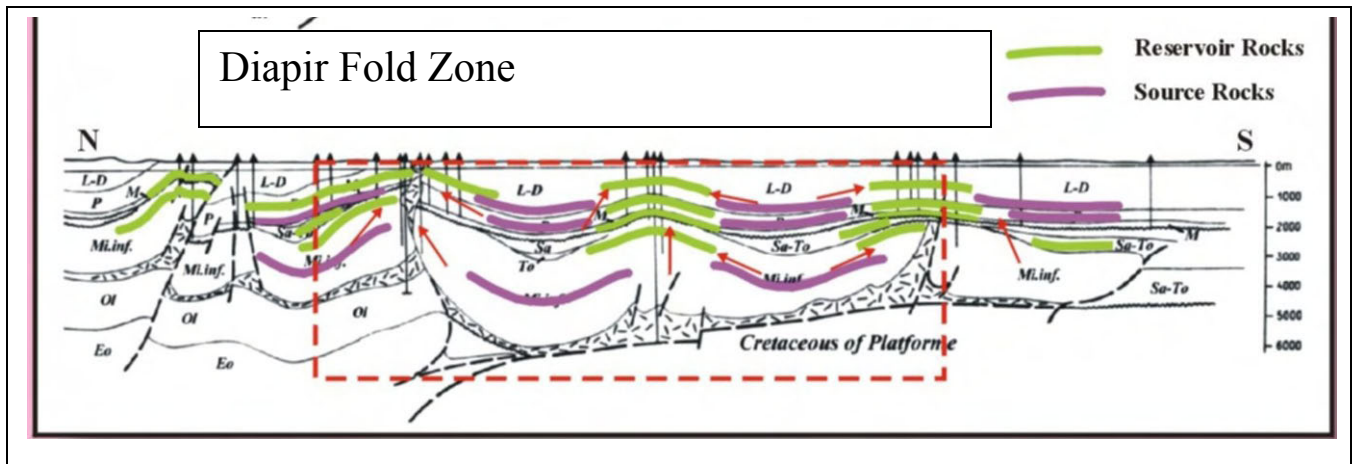


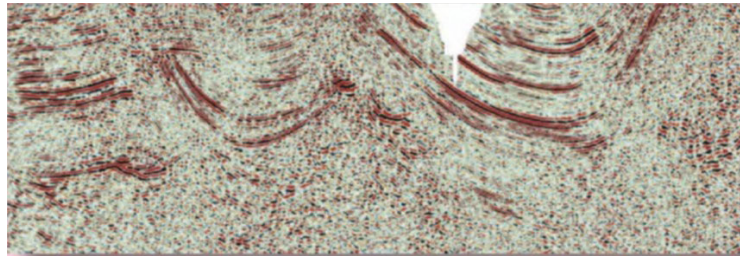
Fig.2 NW-SE seismic line (a) and geological cross-section (b) in **Miocene Transylvanian Petroleum System**.

The traps are structural, stratigraphic or hydrodynamic, the diapiric phenomenon produced by Burdigalian – Badenian salt being the most important element in the structural feature. Transylvanian Depression comprises three distinct zones: the outer monoclinial zone; the diapir folded; the dome and anticline zone. The prospective areas are related to pro-delta deposits of Badenian and Lower Sarmatian in northern and southern part, and to salt tectonic controlled mixed traps, or depositional traps in central-eastern part.

In front of Carpathians is developing the **Pericarpathian Mio/Pliocene** petroleum system that extends in western Moldavian Platform and eastern Moesian Platform. The hemi-pelagic or deltaic pelitic sequences of Middle-Upper Miocene have proved to be potential source rocks (vitrinite reflectance value can be over 0.65%). The sand bodies accumulated during the deltaic construction, particularly when this overlap and alternate with thin pelitic sequences, offer the most favourable conditions for biogenic accumulations.



a)



b)

c)

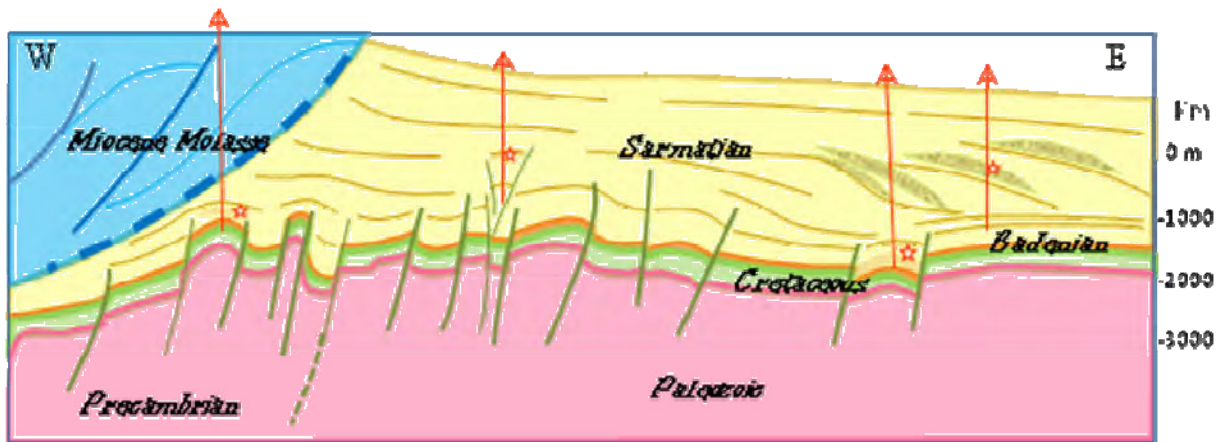


Fig. 3- Geological cross-section and seismic image in **Pericarpathian Petroleum System**: Diapir Fold Zone (a, b), and Moldavian Platform (c).

The Black Sea Continental Shelf presents conditions for biogenic gas accumulation in Upper Pliocene/Pontian sands, argillaceous sands and thin sandstones in slow, large anticlines, or in subtle stratigraphic traps (turbidites, paleoalley). The source rock can be the hemi-pelagic Upper Moicene-Pliocene pelites, in medium geothermal gradient conditions. The accumulations could extend in Nord Dobrogean Promontory and in Moesian Platform.

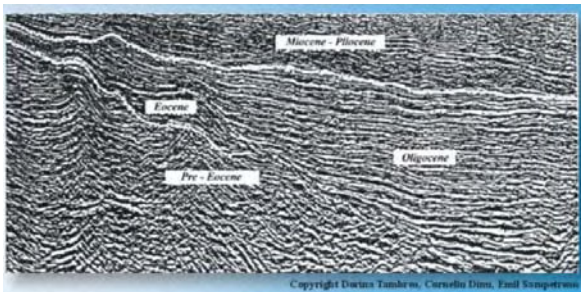
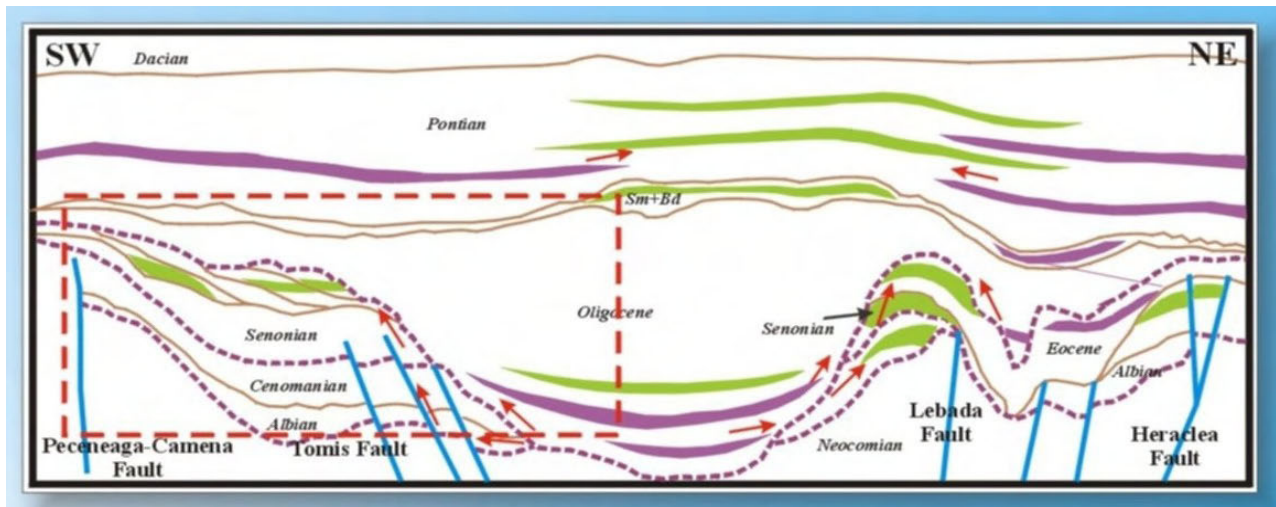


Fig.4 Cross-Section and Seismic line in Pliocene Euxinic Petroleum System.

Romanian sedimentary basins have still areas with hydrocarbon potential. The discovering of the new biogenic fields is related mainly to the detection of subtle traps (diapiric structures, truncations, pinch-out in paleo-deltaic systems, turbidites, channels) in Miocene-Pliocene formations. High resolution seismic, with a strong rock attributes and AVO analyses is necessary.

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