

OIL DERIVED FROM FLUID-ESCAPE STRUCTURES IN NORTH-EASTERN PART OF THE BLACK SEA

Dmitry NADEZHKIN¹, Enver ABLYA¹, Michael IVANOV¹ and Gerhard BORHMANN²

¹Moscow State University, Department of Petroleum Geology, Vorobjevy Gory, Moscow, 119992, RUSSIA

²GEOMAR, Wischhofstrasse 1-3, Kiel 24148, Germany

Oil and gas fields are known and well studied onshore the Black Sea. Recently petroleum systems of the Black Sea region are in the focus of numerous studies.

During TTR cruises in the Black Sea three areas: I - Sorokin Trough (Kazakov mud volcano); II – Russian continental margin, Tuapse Trough (Petroleum Mound); III - Georgian margin, Ochamchiri High (Colkhети Seep, Pechory and Iberia Mounds) were investigated. (fig.1). Samples (rock clasts from area I; oils and rock clasts from area II; oils from area III) were collected for analysis in laboratory. Additionally, oil sample from onshore Supsa oil field (Georgia, area III) related to Maikopian Formation was analysed to define a relationship of oils collected offshore to known of mounds to eastern Black Sea petroleum system.



Figure 1. Map of the eastern Black Sea with sample stations:

I - Sorokin Trough (Kazakov mud volcano);
 II – Russian continental margin, Tuapse Trough (Petroleum Mound);
 III - Georgian margin, Ochamchiri High (Colkhети Seep, Pechory and Iberia Mounds)

Saturate and aromatic fractions of oils and bitumens were investigated by gas chromatography, gas chromatography-mass spectrometry (GC, GC-MS) with detailed biomarker evaluations.

Studied samples with mixed type of initial organic matter shows three main distributions of biomarkers (differences in tricyclic terpanes, tetracyclic terpanes and hopanes), which distinctive for studied areas. Bitumens from rock clasts of Kazakov mud volcano is immature, where as oils and bitumens collected from other areas show early maturity based on alkanes distribution and middle-early maturity based on aromatics.

Specific distributions of tetracyclic terpanes (unusual homologous based on mass spectrum) in the samples for the areas II, III was defined. Amount of tetracyclic terpane homologous in the samples are different for area II and area III (fig. 2).

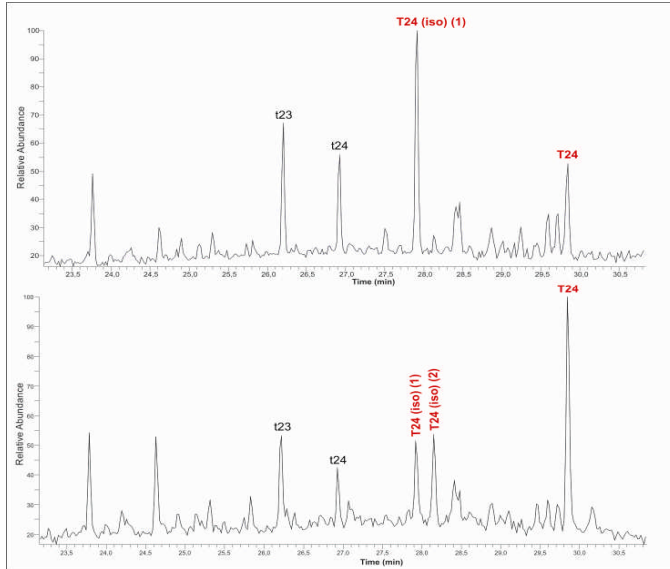


Figure 2. Differences in distribution of tetracyclic terpanes (homologous - red) in oils from area III (upper) and oils and bitumens from area II (lower).

Similar distribution of biomarkers is recorded for oil from Supsa oil field and for oils from Georgian continental margin (area III). Analogously, distribution of biomarkers in oils and bitumens from Maikopian rock clasts of the Tuapse Trough are similar (area II).

In this region are believing that Maikopian rocks (Upper Palaeogene-Lower Neogene) is main source formation. Differences between biomarker distributions for two areas (II, III) can suggest different paleodepositional environments and biota in Maikopian time.