

FAMILIES OF PROTEROZOIC OILS IN EURASIA

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There has been considered physical and chemical properties, isotopic and HC compositions of Upper Proterozoic oils from the Siberian, East European, and Arabian platforms. Special attention is paid to the study of saturated aliphatic and cycloaliphatic HC-biomarkers with gas-and-liquid chromatography and gas chromatography-mass-spectrometry methods. It has been determined that Pre-Cambrian oils with their many properties being similar to Phanerozoic oils possess, in the mean time, their specific features.

The presence of the same HC-biomarkers in Pre-Cambrian oils (normal alkanes, isoprenane, monomethylalkanes, steranes, hopanes, cheilantanes, etc.), which typify younger Phanerozoic oils as well, prove the biochemical integrity of bio-lipid complex of the living matter to have been extant throughout all the history of Earth, beginning from the time of origin of life. Anyway, despite the composition of living matter being bio-chemically unified through all the geological history, lipid complexes of the living matter had never been persistent in parts.

All the studied Pre-Cambrian oils were abnormally rich in light carbon isotope ^{12}C ($\delta^{13}\text{C}$ varies from -37 up to -29 ‰). In terms of the content composition of aliphatic and cycloaliphatic HC-biomarkers oils are suggested to be classified into two major families. The first family comprises oils from some basins of Siberian and East European platforms. There are no 12- and 13- monomethylalkanes in them, steranes St_{27} and St_{29} are contained in approximately equal amounts, tricyclanes dominate among terpanes, and monotonous decrease is identifiable in Hh_{31} - Hh_{32} hopanes' concentrations in parallel with the molecular mass growing. By their basic characteristics, oils from this family are similar to Phanerozoic marine oils derived from lipids of procaryotes and protista eucaryotes.

The second family includes oils widely abundant in East Siberia (Baykit and Nepo-Batuoba anteclines), in Oman, and some other oils from East European platform. The presence of 12- and 13- monomethylalkanes, and high concentrations of tricyclanes are inherent to them; Hh_{35} - Hh_{34} homohopanes tend to predominate, generally, while ethylcholestanes predominate dramatically among steranes. Analogs of oils from this family are not known to be found among the Phanerozoic marine oils.

So, it can be presumed that in Late Proterozoic there existed two types of marine ecological niches. In one of them prokaryotes proved to have been identical to Phanerozoic by their lipid complexes composition, whereas in other group there lived organisms with the lipid content composition different from Phanerozoic one, which influenced the compositions of oils derived from them.