The New Data on the Paleotemperature of Pliocene Basins within South Caspian Depression

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The paleotemperature of the Pliocene basins of South Caspian trough have not been studied well. Meantime, the results of the paleotemperature analysis of Pliocene basins may widely be used for the assessment of oil and gas potential within Pliocene deposits of the South Caspian depression and its surroundings, the paleogeographic reconstruction and the recent issue of global warming as well. The paleotemperature studies for Early Pliocene basin have been conducted on the basis of sedimentological criticizing, rare plant fossils, paleotemperature investigations on palinology in Late Pliocene basins in terms of Ca/Mg ratio and heavy oxygen content in the shells of mollusk. Besides additional information, we obtained the organic matter content in clays with paleofloristic and palinological studies.

As a result of analysis conducted, we found out that the Early Pliocene basin within this South Caspian trough has arid zone character. Consequently, the degree aridization of climate increases from West to East. In fact, the western part of South Caspian has semi-desert climate character. We assumed that the air temperature on land during summer season is between 40 and 42 °C, and the T° of sea water in the shallow parts of basin is heated to 30-32 °C. The air temperature on the eastern part, especially within the western Turkmen trough, during summer is heated to 50 °C. The T° of marine water within Turkmen border of the basin reaches up to 35-40 °C. Thus, the Early Pliocene basin on eastern Turkmen border is characterized as a typical arid desert climate. From this point, we have determined the type of sedimentation as arid-lithogenesis. The paleotemperature studies in the Late Pliocene basin indicate that its climate can sharply be distinguished from the Early Pliocene basin. T° of shallow water basin during summer is 13-14 °C based on the data obtained from Ca/Mg ratio in shales and the isotopic analysis. If this temperature represents approximately the land, then we can assume that the T° on land oriented temperature is around 20-25°C. This result is provided with the coniferous plant fossils, and again we can assume that the climate of the Late Pliocene basin of South Caspian trough is correlated with the climate of actual Baltic Sea. The type of deposition of the Late Pliocene basin belongs to the type of humid-lithogenesis.

Key words: *Paleotemperature, palinology, paleofloristic study, Caspian basin.*