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The Structure and Geochemistry of the Kila-Kupra Mud Volcano (Georgia)

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Introduction

Georgia is the one of the countries where such geological formations as mud volcanoes are widespread (Fig. 1). Within Georgia their core distribution area encompasses the Lori plateau and the Gombori Range (Kakheti region). Minor occurrences are observed in the Triali range northern flank foothills near the village Kavitskhhev (Ebralidze et al., 1975).

Mathodology

The Kila-Kupra fold complicated by the exposures of three mud volcanoes (Kila-Kupra East, Central and West) is disposed in the central part of the Iori plateau (Fig. 1; Fig. 2). Aiming the investigation of the mentioned mud volcanoes genesis water and oil samples for geochemistry studies were collected from the gryphon. The samples have been shipped to the Engry & Geoscience Institute at the University of Utah and are currently being under processing. Aside from geochemical studies in order of better understanding of the Kila-Kupra mud volcanoes structure provided by the "Frontera Eastern Georgia" company 2D seismic data have been treated using IHS Kingdom software (Fig. 3).

Results

As a result of the seismic data processing (Fig. 3) has been detected, that Kila-Kupra mud volcanoes are related to the complicated by faults dome part of the same name asymmetric anticline structure. Apparently, the Middle Sarmatian sediments are the source of these volcanoes. Up to date, based on the paleontological and petrographic studies of the mud volcanoes breccias samples Upper Sarmatian sediments have been regarded as the source of Kila-Kupra volcanoes (Ebralidze et al., 1975; Buleishvili, 1960). However, the presence of Porosononion subgranosum (Egger) and Nonion bogdanowiczi Voloshinova in the foraminifera complexes introduced in the mentioned publications indicates the existence of the older than Upper Sarmatian sediments material (apparently Middle Sarmatian) in the mud volcanoes breccias as well (Gruzinskaya et al., 1986; Koiava et al., 2008; Shatilova et al., 2009).

Fig. 1. Physical-Geographical map of Georgia with locations of mud volcanoes (modified after Marvashvili 1970, simplified)

1 - Kavitskhhev; 2 - Bakana; 3 - Tbilisiskhevi; 4 - Akhtala; 5 - Lalbe; 6 - Pkhoveli; 7 - Western Kila-Kupra; 8 - Central Kila-Kupra; 9 - Eastern Kila-Kupra; 10 - Navtis-Chebi; 11 - Baida; 12 - Aladjigi; 13 - Polpoi-Tepe; 14 - Northern Tuluki-Tepe; 15 - Southern Tuili-Tepe.

Fig. 2. Kila-Kupra mud volcanoes

1 - Western Kila-Kupra; 2 - Central Kila-Kupra; 3. Eastern Kila-Kupra

Fig. 3. A - Geological map of the Kila-Kupra area with the location of mud volcanoes and seismic lines; B - Interpretation of Seismic line A-A; C - Interpretation of Seismic line B-B.

Conclusions

On the basis of conducted studies and available data has been defined, that Kila-Kupra mud volcanoes are related to the complicated by faults dome part of the same name asymmetric anticline structure. The assumption about the link of these mud volcanoes source to the Middle Sarmatian sediments has been made.

References


