



The late alpine structure of the Greater Caucasus as an element of the Peri-Arabian collisional area

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During the Paleogene-Early Miocene, a marginal sea inheriting the Cretaceous back-arc basin existed in the area of modern Greater Caucasus. In the Middle Eocene, that sea, a part of the Para-Tethys basin, started closing as evidenced by formation of synsedimentary nappes and olistostromes. Onset of collision is also confirmed by the chemistry of the Eocene volcanics. However, overall compression of the Greater Caucasus did not begin until Early Miocene when the Arabian plate detached from Africa and started moving northward. The Late Alpine orogenic phases in the Caucasus coincided with that of rifting and spreading in the Aden-Red Sea rift system. The earliest one was the Styrian orogeny of Early Miocene that correlated with initial stage of opening of the rifts and was manifested in the west of the Greater Caucasus (i.e., right in front of the Arabian plate northern tip) where the Main Caucasian thrust and conjugate asymmetrical megaanticline of the Central Caucasus formed. At the same time, right-lateral strike-slip faults of the north-west to about E-W strike developed. Together with the North Anatolian strike-slip fault that emerged at the same time, they probably accommodate dextral transpression caused by counterclockwise rotation of the Arabian plate. The Middle Miocene tectonic pause was expressed both in the rift system and in the Caucasus. Tectonic movements restarted in the end of the Sarmatian age (Late Miocene) simultaneously with the northward propagation of the Levantine fault and some changes in direction of the Arabian plate movement. The main folding in the Greater Caucasus, of the Attic and Rhodanian phases, extended over the whole orogen especially to the east. Pressure applied by the moving Arabian indenter was directed predominantly towards the Alborz region, from where strike-slips of different sense of lateral movements extended symmetrically: NW-SE right-lateral faults in the Caucasus and NE-SW left-lateral faults in the East Alborz and West Kopetdagh. An

about S-E directed extension between Caucasian and Kopetdaghian blocks was compensated by formation of the South Caspian meridional graben. Finally, the youngest Valachian orogeny of the Eopleistocene manifested itself to greater extent just around the South Caspian graben where a lateral escape of crustal volumes from the Caucasian and Kopetdaghian syntaxes was directed to. So, the collisional structure of the Caucasus formed in compliance with kinematics of the Arabian plate movement. Far-field effects of pressure caused by north-directed movement of the Arabian plate are manifested in neotectonic structural pattern in the platform area north of Caucasus. The research was granted by the President of Russian Federation, the Project No. ÍØ-7559.2006.5.