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Tectonic evolution of the Black Sea – Caspian Sea region

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Tectonics and geological evolution of the Caucasus, or Black Sea-Caspian Sea region as a whole, are largely determined by its position between the still converging Eurasian and Africa-Arabian lithosphere plates, within the wide zone of a continent-continent collision, shortening and deformations. Problems of Late Proterozoic-Phanerozoic development of this area have been considered and discussed during the past decades in a great number of publications. According to some authors the Black Sea – Caspian Sea region in the Late Proterozoic –Early Paleozoic, Middle-Late Paleozoic, Mesozoic and Early Cenozoic belonged to the now-vanished Tethys Ocean (Prototethys-Paleotethys-Neotethys) and its northern (Eurasian) and southern (Gondwanian/Africa-Arabian) margins. Within this ocean-continent convergence zones there existed a system of island arcs (Main Range zone of the Great Caucasus, Georgian and Artvin-Bolnisi blocks of the Transcaucasus, Eastern Pontides), intraarc rifts (Fore Range zone of the Great Caucasus, Eastern Black Sea – Achara-Trialeti and Talish-South Caspian zones of the Lesser Caucasus), back-arc basins (Southern Slope zone of the Great Caucasus) etc. characteristic of pre-collisional stage (Late Proterozoic-Early Cenozoic) of evolution of the region. During syn-collisional (Oligocene-Middle Miocene) and post-collisional (Late Miocene-Quaternary) stages of the Late Alpine tectonic cycle as a result of continent-continent collision inversion of relief took place: at the place of back-arc basins were formed fold-thrust belts of the Greater and Lesser Caucasus with the Transcaucasian intermontane depression instead of Transcaucasian rigid blocks (microcontinents, island arcs). The normal marine basins were replaced by hemi-closed basins of euxinic type (Paratethys) and later on (Late Miocene) – by continental basins with subaerial conditions of sedimentation.

The complex network of faults determines the divisibility of the region into a number of separate terrains of different orders, varying from one another by their dimensions, genesis and geologic nature. Geological, paleobiogeographical and paleomagnetic data provide evidence that these terrains before being accreted together into a single complicatedly-built fold-and-thrust belts have undergone long-term and substantial horizontal displacement within the oceanic area of Tethys. The boundary zones between these terrains represent belts of maximum geodynamic activity with wide development of processes of tectonogenesis (folding, faulting), volcanism and seismicity.