



New insights and questions about the Meso-Cenozoic Tectonic evolution of Eastern Black Sea and Caucasus.

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Since last decade a lot of new field researches (supported by MEBE and DARIUS programmes) were carried out in order to clarify the tectonic evolution of the South Caucasus and Eastern Black Sea regions. A summary of these improvements are as following:

1. Evidence of only one suture zone in the Lesser Caucasus: the Sevan-Akera suture zone as the eastward continuity of the Izmir-Ankara-Erzincan one.
2. Timing and modalities of the Upper Cretaceous obduction process of the Sevan-Akera back-arc basin.
3. Paleolatitude reconstruction of the Taurides-Anatolides-South Armenia microplate (TASAM) since the Late Cretaceous
4. Paleocene to Miocene tectonic evolution of the collision zone between Eurasia and the TASAM.
5. Structures and propagation of the Lesser Caucasus and Greater Caucasus foreland basins from Paleocene to Miocene.
6. Structures of the inverted Paleocene-Eocene Adjara-Trialeti basin of the Eurasian margin and timing of deformations from Lesser Caucasus to Greater Caucasus.
7. New stratigraphic data from the Crimea Mountain which argues for a Lower Cretaceous rifting of the Eastern Black Sea.

According to aforementioned results and previous studies, this widespread zone (from the Eastern Black Sea to the Lesser Caucasus) appears act as a large puzzle of heterogeneous lithospheres (continental, oceanic, arc, back-arc basins) since the Early Cretaceous. This is probably why this area has differently reacted in time and space to the northward collision of the TASAM with Eurasia since the Late Cretaceous and then of Arabian plate since the Oligo-Miocene. It seems that some lithospheres which have cold mantellic behavior (especially the Black Sea) react as rigid blocks, while others with a continental origin, reheated by magmatism, (as the Taurides-Anatolides) were extruded to the west or bended as an orocline (as the Lesser Caucasus, the Pontides). This is why some main questions remain, are not solved and are still debated.

1. The continuity of main structures of the belt to the Est. The obduction front observed in the Lesser Caucasus is not well localized in NW Iran. This question is really a key point in the reconstruction of the obduction and collision processes which occurred in the northern branch of the Neotethys during the Late Cretaceous.
2. The changes in space and time of geodynamic processes responsible for the closure of the northern branch of Neotethys (subductions-obductions-collisions) and how these changes are related to the opening and inversion of back arc basins.
3. What processes are involved in the thickening of the crust, melting and magmatism all along the Caucasus region, and that support the present-day topography? What is the role of a possible fragmentation of the subducted slabs, or delamination of the continental lithosphere in the changes of topography? Is a mantle plume involved (as some geochemical data from Late Mesozoic and Cenozoic magmatic rocks indicate it)? What crust/mantle coupling supports the present day stress and strain field?