



The Eastern Pontides and Somkheto-Karabagh Arcs: Jurassic-Early Cretaceous and Late Cretaceous-Cenozoic magmatism in relation to the Eastern Black Sea Basin

Marc Hässig (1), Robert Moritz (1), Alexey Ulyanov (2), Massimo Chiaradia (1), Nino Popkhadze (3), Ghazar Galoyan (4), and Onise Enukidze (5)

(1) Université de Genève, Département des Sciences de la Terre, Geneva, Switzerland (marc.haessig@unige.ch), (2) Institute of Earth Sciences, University of Lausanne, Lausanne, Switzerland, (3) Al. Jalenidze Institute of Geology, I. Javakhishvili Tbilisi State University, Tbilisi Georgia, (4) Institute of Geological Sciences, National Academy of Sciences of Armenia, Yerevan, Armenia, (5) M. Nodia Institute of Geophysics, I. Javakhishvili Tbilisi State University, Tbilisi, Georgia

From the Jurassic to the Eocene, the Eastern Pontides-Lesser Caucasus region recorded subduction, obduction, micro-plate accretion, as well as final Eurasia-Arabia collision and closure of Neotethys oceans. It is accepted that both the Eastern Pontides' and the Lesser Caucasus' geology results from subduction of the Neotethyan realm towards the North below the South Eurasian Margin. This is attested by the consecutive Izmir-Ankara-Erzincan and Amasia-Sevan-Akera Suture Zones running along northern Turkey to Armenian, Eastern Azerbaijan and north-eastern most Iran. Yet, despite these geographic and structural analogies a comparison of the magmatic rocks outcropping throughout this portion of the Northern Neotethyan Belt exhibits geochronologic disparities differentiating the Eastern Pontides from the Lesser Caucasus. It appears that the Lesser Caucasus preserves Jurassic to Early Cretaceous and Late Cretaceous to Eocene ages while the Eastern Pontides preserve mainly Late Cretaceous and Eocene ages.

New radiometric datings and geochemical characterisations of magmatic rocks along with structural observations of the Alaverdi and Bolnisi Districts of the north-eastern most Lesser Caucasus complement the magmatic history of this portion of the Alpine orogeny. Subduction related calc-alkaline magmatism in the Alaverdi District is dated Late Jurassic (158-146 Ma) and for the Bolnisi District it is dated Campanian (85-81 Ma) and Eocene (53-52 Ma). The continuation of Late Cretaceous and Eocene magmatism along the Eastern Pontides to the Lesser Caucasus is identified in the Bolnisi District. Data pertaining to the Alaverdi district only supplement Jurassic to Early Cretaceous ages to the Lesser Caucasus region, reinforcing interrogations concerning the limited occurrence of Jurassic arc magmatism in the Eastern Pontides and in turn a common subduction history with the Lesser Caucasus Region at that time.

We propose a model in which back- to intra-arc basin opening displaces older portions of a magmatic arc away from the active SSZ, farther north. The evolution of these regions throughout the Mesozoic and Cenozoic features the emplacement of subduction and collision related magmatic rocks along the entire Southern Eurasian Margin all the while marginal basins open. This model is supported by the presence of Jurassic subduction related magmatic rocks in the Sochi Region (western Greater Caucasus, south of the Main Caucasus Thrust) across the Eastern Black Sea from the Eastern Pontides. In this framework, the current position and structure of the Sochi Region of the Greater Caucasus, the Lesser Caucasus and the Eastern Pontides result from opening of the Eastern Black Sea Basin and Transcaucasian Basin Basins in a back- to intra-arc setting, suggesting asymmetric counter clockwise slab roll-back. The Jurassic to Early Cretaceous portion of the arc runs from the Sochi region south-east to the Alaverdi district continuing as the Somkheto-Karabagh Arc of the Lesser Caucasus, cut by the Transcaucasian Basin. The Late Cretaceous to Eocene portion of the arc stretches from the Eastern Pontides continuing to the Bolnisi district, emplaced within the southern margin of the Transcaucasian Basin, and extends into the Somkheto-Karabagh Arc of the Lesser Caucasus.