



## **New insights from the structural context and magmatism along the Southern Eurasian Margin: Jurassic-Cretaceous evolution of the Somkheto-Karabagh Mountain Belt, Lesser Caucasus, Armenia and Georgia**

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

(1) Department of Earth Sciences, University of Geneva, Rue des Maraîchers 13, 1205 Geneva, Switzerland (marc.haessig@unige.ch), (2) Institute of Earth Sciences, University of Lausanne, 1015 Lausanne, Switzerland, (3) M. Nodia Institute of Geophysics, I. Javakhishvili Tbilisi State University, Georgia, (4) Institute of Geological Sciences, National Academy of Sciences of Armenia, 24a Baghramian Avenue, Yerevan 375019, Armenia, (5) Al. Jalenidze Institute of Geology, I. Javakhishvili Tbilisi State University, Georgia

Along the Tethyan belt, the Somkheto-Karabagh arc marks the southern Eurasian margin prior to closing of the Northern Neotethys. New insight concerning its structural evolution is related to the magmatic activity related to the ore deposits of two major mining districts. Investigations of the Bolnisi district in Georgia and the Alaverdi district in Armenia along a N-S section across the arc have revealed structures indicative of successive compressional and extensional phases throughout Mesozoic times. The mineralogy, major and trace element geochemistry and isotopic characteristics of the host rocks showcase varying sources, formation environment and conditions.

The Lesser Caucasus is characterised by the Somkheto-Karabagh Mountain Belt. Bordering it to the South, ophiolites mark the limit between Eurasia and the Gondwanian derived South Armenian Block on which they have been thrust. This belt consists of a volcanic arc formed along the Southern Eurasian margin during closure of the Tethyan oceanic domains. Arc construction lasted from at least the Mesozoic to the very beginning of Cenozoic times due to successive North-dipping Palaeotethys and Northern Neotethys subduction until collision between the Eurasian and the South Armenian Blocks. Formation of the Somkheto-Karabagh can be assigned to two stages: (1) Mesozoic arc construction and evolution along the Eurasian margin, and (2) Cenozoic magmatism and collisional to post-collisional tectonics controlled by inherited structures from Late Cretaceous-Paleogene accretion along the Eurasian margin.

In Armenia, the Alaverdi district contains N- to S-oriented strike-slips and inverse faulting support general compression perpendicular to the arc during Middle Jurassic times. Normal faulting associated to the emplacement of intrusions within the Callovian detrital deposits are compatible with exhumation. This is further argued by evidence of gravitational gliding, yet ductile shears within coherent stratification could also indicate N-S extension during latest Middle Jurassic times. The Alaverdi district consists of stratabound polymetallic deposits hosted by Middle Jurassic volcanic rocks, and the Teghout porphyry Cu deposit, postdating the emplacement of a local tonalite reported as Late Jurassic.

In Georgia, new observations have identified a transgressive contact of Late on Early Cretaceous rock sequences. In addition, angular unconformities between successive stages of the Late Cretaceous have been recognised evidenced by variations of dip direction and/or angle. Locally, small grabens and cross stratification within the Late Cretaceous argue for an extensional context in a delta/costal marine setting at that time. The Bolnisi district consists essentially of epithermal systems, and possibly one transitional system, interpreted in earlier studies as VMS-porphyry-epithermal, emplaced within Late Cretaceous formations. These are the last metallogenic events associated with subduction of the northern branch of the Neotethys before accretion of the South Armenian block with the Eurasian margin during the latest Cretaceous (Early Maastrichtian, ~73-71 Ma).