A review of age constraints of epithermal precious and base metal deposits of the Tertiary Eastern Rhodopes: coincidence with late Eocene-early Oligocene tectonic plate reorganization along the Tethys

Moritz R.[1], Márton I.[1], Ortelli M.[1], Marchev P.[2], Voudouris P.[3], Bonev N.[4], Spikings R.[1] and Cosca M.[5]

[1]Section des Sciences de la Terre et de l'Environnement, University of Geneva, Rue des Maraîchers 13, 1205 Geneva, Switzerland, robert.moritz@unige.ch, istvan.marton@unige.ch, melissa.ortelli@unige.ch, richard.spikings@unige.ch

[2]Geological Institute of the Bulgarian Academy of Sciences, Acad. G. Bonchev Street, 1113 Sofia, Bulgaria, pmarchev@geology.bas.bg

[3]Department of Mineralogy-Petrology, University of Athens, GR-15784 Athens, Greece, voudouris@geol.uoa.gr

[4]Department of Geology and Paleontology, Sofia University St Kliment Ohridski, 15 Tzar Osvoboditel Bd., 1504 Sofia Bulgaria, niki@gea.uni-sofia.bg

[5] U.S. Geological Survey, Denver Federal centre, MS 963, Denver, CO 80225, U.S.A. mcosca@usgs.gov

The Tertiary Eastern Rhodopes are a major ore province within the Tethyan metallogenic belt. $^{40}Ar/^{39}Ar$ age data obtained in the past ten years are overviewed and discussed. It allows us to address some of the open questions and shed some new light on the sequence of ore-forming, magmatic and tectonic processes throughout the Eastern Rhodopes. Small to moderately sized ore deposits and prospects in the Rhodope Massif are hosted by high-grade metamorphic, continental sedimentary and igneous rocks. Sedimentary rock-hosted gold epithermal prospects are the earliest hydrothermal systems, hosted by Maastrichtian-Paleocene clastic rocks. Their $^{40}Ar/^{39}Ar$ ages vary between 37.55 ± 0.44 Ma and 34.71 ± 0.16 Ma, with the waning hydrothermal activity overlapping with the start of the oldest volcanism in the Eastern Rhodopes yielding $^{40}Ar/^{39}Ar$ ages ranging between 34.62 ± 0.46 Ma and 32.97 ± 0.23 Ma. Within a very short time between 32.13 ± 0.20 and 31.2 ± 0.4, Pb-Zn-dominated and Cu-Au-dominated epithermal prospects, respectively in the northern and the southern parts, were formed, and coincide with rhyolitic dikes emplaced at about 31.5 Ma. The Late Eocene-Early Oligocene post-orogenic magmatic and ore-forming evolution of the Eastern Rhodopes coincides with the time of collision at about 30-35 Ma of the African and Eurasian plates in the Caucasus and the Rif-Betic belts, when a dominantly subduction-dominated tectonic regime changed to a collision-dominated system, and the northward motion of the African plate slowed down, accompanied by an increasing southward slab retreat velocity in the Aegean Sea.

Remnant mineral assemblages in the garnet porphyroblasts from the Rebra Group micaschist used for establish metamorphic PT path (Rodna Mountains, East Carpathians)

Mosonyi E. and Forray F.L.

Babes-Bolyai University, Department of Geology, M. Kogalniceanu 1, 400080 Cluj-Napoca, Romania, emilia.mosonyi@ubbcluj.ro

The Rebra Group terrane from the Rodna Mountains is part of the Rodna Variscan nappe which was remobilized during Alpine cycle (Austrian phase). Its rocks are polymetamorphic and polydeformed, which mainly consist of: micaschist and gneisses (with garnet, ± kyanite, ± fibrolite), marbles (± tremolite, ± fucshit, ± diopside), amfibolites (± garnet, ± epidot), pegmatites (± garnet, ± turmaline) and Nichitas granitoid. The rocks are S and L-S tectonits with 3 main foliations, the last (S3) being of crenulation type due to retrogression and S1 was transposed after S2 by isoclinal folding. The penetrative lineations are trending NW-SE. The metamorphic peak was attained under amphibolite facies (medium pressure), and corresponds to the staurolite – almandine and kyanite – almandine – muscovite