Magmatism and Mineral Occurrences of the Eastern Greater Caucasus, Georgian Segment

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The eastern part of the Greater Caucasus orogen, Georgian segment, is underlain mainly with highly deformed Lower-Middle Jurassic shales, sandstones and volcaniclastic rocks, associated with numerous intrusive bodies. All these rocks contain a variety of mineral deposit types and surrounding zones of hydrothermal alteration.

Conducted researches showed important new information on the evolution of the region. Three main stages of magmatic activity are now clearly identified. The oldest magmatism in Early Jurassic was related to extensional tectonism, and resulted in rhyolitic, through dacitic and andesitic, to basaltic rocks; Additional extensional processes in Bajocian were characterized by intrusion of a gabbro/diorite dike system into late Early-early Middle Jurassic sedimentary formations; and the third magmatic event was associated with Middle Jurassic folding and uplift, during which multiphase diorite plutons were emplaced [1].

Our metallogenic study carried out in the research area has shown that a wide range of mineral occurrences, largely in terms of composition and style, is represented. Most are just locally exposed and the potential for important resources remaining to be discovered at shallower depths is high, particularly under the cover of sedimentary formations and where altered zones are exposed at the surface. According to a number of parameters, these occurances are hydrothermal in origin and are likely genetically linked to productive magmatic centers [2].

Related intense hydrothermal activity was responsible for principal polymetallic mineralization, with more than 100 recognized outcrops. A detailed study of 11 of these ore occurrences has indicated anomalous concentrations of gold, thorium, yttrium, cobalt, cadmium, and bismuth. In addition, several new and potentially significant ore mineral occurrences were discovered, including Gelia and Lechuri.

[1] Okrostsvaridze et al.(2016) *J. Eisodes* (in print).
[2] Ridley (2013) Cambridge Un. Pr. 398 p.