

The place of the Bolnisi ore district, Georgia in the Tethyan-Eurasian metallogenic belt and peculiarities of its mineralization

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The Tethyan-Eurasian metallogenic belt (TEMB) consists of the Apuseni-Banat-Timok-Srednegorie (ABTS) belt on the west and the Pontide-Lesser Caucasus (PLC) belt on the east. Both of them belong to the same geodynamic setting and are mainly linked to Late Cretaceous calc-alkaline volcanic activity. During Late Cretaceous, the Tethyan ocean closed and volcanic activity and mineralization were related to the last stage of subduction and to slab destruction as well. The various character and slab transformation along TEMB is the differences in the mineralization and character of volcanism in the western and eastern belts and within each of them.

Thus in the western belt, in the Bulgarian Panagyurishte and Serbian Timok regions, gold-copper high-sulfidation epithermal (Chelopech, Elshitsa, Radka, Krassen, Coka Marin, Lipa), and porphyry-copper (Medet, Elatsite, Assarel, Petelevo, Tsar Assen, Vlaikov Vruh, Madjanpek, Bor) were formed. In the eastern belt, there are Kuroko-type deposits at Madenkoy (Chaeli) and Lahanos (East Pontides), Turkey, as well as one epithermal copper-polymetallic deposit (Murgul), gold-bearing low sulfidation deposits at Cerattepe, Mastra (Gumushane) and one porphyry-copper deposit at Guzeliayla, Turkey.

In the Bolnisi district, Georgia, which belongs to the PLC, the gold-copper epithermal deposits consist of two levels: the lower gold-copper porphyry and upper gold-bearing quartz-barite veins. The Bolnisi ore district consists of two clusters with deposits and occurrences of similar styles of mineralization. Such a similar alternation of ores is known at the Turtei deposit, Sardinia, Italy, where gold-bearing quartz vein mineralization was developed above the epithermal copper-base metal ores.

The character of volcanic activity and mineralization was different along the Tethyan-Eurasian metallogenic belt, and varied within the limits of Late Cretaceous. The volcanic-hosted porphyry-copper mineralization the Timok and Panagyurishte regions is andesitic, whereas in the Bolnisi ore district the volcanism linked to mineralization is rhyolitic-dacitic. In the Panagyurishte region, the north to south younging of magmatism is accompanied by a change in chemical and isotopic characteristics (Von Quadt et al, 2005). In the Bolnisi ore district, the same situation occurs, however here the younging of magmatism and mineralization is observed from the south to the north and is characterized by a concomitant increase of the mantle source during volcanism. It may be explained by slab detachment during subduction. (Gugushvili; et al. 2002).

The gold bearing quartz-chalcedony and low temperature quartz-barite mineralization must be linked to acid magmatism. The reason of poor gold content in Timok region (Bor and Madjanpek) as well as in Kuroko type Pontide deposits (Madenkay and Lahanos) need farther investigations.