

Placer gold prospecting around the Tertiary occurrences in the Republic of Macedonia

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Exploration of gold as a mineral resource in Macedonia has a long history. There are more than 30 occurrences, but now gold is obtained only from the Buchim mine (Bogoevski, K., 1998). This paper presents the chemical characteristics of gold which was researched by schlych prospecting in several localities related to the Tertiary magmatism.- Borovic, Borov Dol, Plavica and Alshar. The localities selected belong to two major geotectonic units - the Vardar zone (ore deposits Borov Dol, Alshar and ore occurrence Borovic) and the Serbo-Macedonian massif (Plavica ore deposit). The Tertiary magmatism of calc-alkaline type is most important for ore-forming processes in the region. The host rocks of the localities are mostly presented by volcanic sediments and volcanic and subvolcanic facies of latite, quartzlatite, andesite, basalt and their pyroclastics (ignimbrites, tuffs and breccias)

Ore mineralization, in general, has been represented by copper sulphide minerals except in the Alshar deposit, where the main ore mineral is arsenic and antimony. In the Borov Dol deposit are dominated chalcopyrite (Stefanova et al, 2004^b), while in the Plavica deposit beside the chalcopyrite, enargite is of essential significance. In the Borovic occurrence, pyrite is more common sulphide mineral than chalcopyrite.

Gold paining sampling on the territory of the Borov Dol deposit and Plavica and Borovic occurrences shows the presence of placer gold. On the Alshar deposit area, gold was not established by this method. The sampled gold aggregates – 64 from the Borovic occurrence, 44 from the Plavica occurrence and 37 from the Borov Dol deposit were studied for chemical composition and morphology.

The performed investigation reveals that the gold in the all localities are of high-grade type. The most high-grade gold is found in the Borovic followed by the Plavica and the Borov Dol.

The analyzed 11 gold grains from the Borovic occurrence were characterized with very high degree of fineness ranging between 977 and 999. The other admixtures in the gold are copper and iron.

The placer gold from the Borov Dol deposit territory (there were analysed 13 grains) belongs to a group of high grain gold (900-950) that in this deposit ranges from 834 to 981.

The gold of the Plavica is with fineness of 842-994 from analysed 13 grains (Stefanova et al, 2007).

The size of the gold ranges from 150 µm to 1 mm in the Borov Dol, from 50 to 200 µm in the Plavica and from 30 to 150 µm in the Borovic. The gold occurs as elongated, globular, scaly, isometric, randomly shaped and dendritic grains. The gold of isometric morphology prevails in the Borov Dol. In the Plavica along the isometric morphology of the gold, elongated and dendritic forms are commonly encountered too. Isometric, randomly shaped gold grains prevail in the Borovic occurrence. It should be noted that in the all three localities, the most typical morphology of the gold grains is isometric or randomly shaped one – a characteristic that indicates that the gold studied had not suffered significant deformation.

References:

- Bogoevski, K., 1998: Gold in Macedonia-geology, metalogenic, features, ore occurrences, gold ore deposits and their evaluation. Special Issue No. 7, 249 p.
- Stefanova, V., R. Nedialkov, R. Moritz. 2004^b. Magmatism of the Borov Dol occurrence. – In: *Proceedings of Annual Scientific Conference of Bulgarian Geological Society "Geology-2004"*, 75-76.
- Stefanova, V., V. Kovachev, V. Mladenov, Tz. Stanimirova. 2007: Eluvial-alluvial gold from gold-copper occurrence Borov Dol (R. Macedonia). Part II: Mineralogy of gold and stream sediments. *Review of the Bulgarian Geological Society*, 68, 1-3, pp. 77-91.