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A comparison of the gold fineness in the Romanian gold deposits

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Romania is well known as a gold producing country, at least since the XIXth century. The main gold producers were the mines in the Metaliferi Mts. (the celebrated *Golden Quadrilateral*) such as Barza, Rosia Montana, Bucium etc. The gold deposits in the area belong to the hydrothermal vein type and porphyry copper-gold type, related to a huge andesitic volcanism during the Miocene. There are also base metal – gold deposits of hydrothermal type, especially in the Northern part of Romania (Baia Mare area), where the gold was mainly a by-product. Nevertheless, some other types of gold deposits contributed a lot to the gold production of Romania, such as some shear zone related deposits in the South Carpathians (e.g. Valea lui Stan) as well as alluvial concentrations (e.g. Pianu Valley, in the same area of South Carpathians). This gold production spanning at least two centuries provided the National Bank of Romania a reserve of over 100 t gold.

The alluvial deposits and occurrences of gold in Romania are quite widespread in the South Carpathians (especially in the eastern part). They are related to the primary sources in the metamorphic rocks, i.e. shear zone related ores, some amphibolites, ultrabasites, etc. and contain besides gold many heavy minerals such as magnetite, ilmenite, rutile, zircon, etc. As a rule, the gold fineness is generally high as it is the gold fineness of the shear zone related ores. This results either by removing of silver during gold residence in alluvia or by removing the impurities in general due to the pressure within the shear zones hosting the deposits.

The gold fineness of the Transylvanian hydrothermal ores is highly variable, i.e. it varies between 700 and 900 ‰, as already shown by Maclaren [1] and Haiduc [2]. More recently such data were provided by Udubasa et al. [3], Popa et al. [4], Cristea-Stan et al. [5] and others.

The recently identified and investigated gold grains in the area between Olt and Dambovitza valleys show a high fineness of gold confirming thus the general rule observed elsewhere, the Carpathians included. The fineness of the gold grains from the Arges river alluvia is of about 980 - 990 ‰; only once the analysis gave 92 % Au and 7.2 % Ag, i.e. a fineness of 927.4 ‰. The other elements identified by X-ray fluorescence are Cu (0.03 %), Fe (0.6 - 1.1 %) and Pb (0.1 - 0.2 %). The spread of the gold content values is greater in the Topolog river alluvia being in the range of 93.0 - 97.3 % Au and one grain with 79.2 % Au and 19.9 % Ag (fineness of 799.2 ‰). The other elements show the same concentration as in the Arges area. An interesting result gave a sample from the Topolog valley, with 93.7 % Au, 3 % Ag and 2.6 % Pb, as well as significant Sb content as revealed by the micro-PIXE elemental maps and point spectrum. The association of gold grains with rutile is also significant pointing out the possible source: shear zones with gold, rutile, kyanite and quartz, as shown by Udubasa et al. [6] in the Sebes Mts. (westwards of this area).

References:

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