

Geology of the Greater Caucasus Kakheti and Tusheti segments and evaluation of their ore occurrences prospects

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The Greater Caucasus Phanerozoic orogenic belt is the northernmost part of the Caucasus, which is accreted to the south margin of the Eurasian continent. Kakheti and Tusheti segments form the extreme eastern part of this belt within Georgia. Tectonic and magmatic activity caused intensive hydrothermal mineralization of the volcanogenic-sedimentary rocks of this segments and led to the formation of more than 100 historically recognized ore occurrences (Akimidze et al., 1986).

A detailed study of 11 of the more significant of these occurrences has indicated anomalous concentrations of base metals as well as gold, thorium, yttrium, cobalt, cadmium, and bismuth. In addition, several new and potentially significant mineral occurrences were discovered, including two designated here as Gelia and Lechuri.

According to our metallogenic research it can be seen that numerous mineral occurrences in the Kakheti and Tusheti segments formed from similar magmatic-hydrothermal fluids, but under different temperature regimes (Okrostsvardidze et al., 2016). There is no doubt that Artana, Iodvani, Chelti, and other similar mineral occurrences are small-scale when compared to many developed world-class metal deposits. However, the Stori and Tebulo districts have potential to develop large-scale resources, as supported by the extensive development of quartz-sericite-chlorite-pyrite and albite-epidote-chlorite-pyrite alteration zones that typically are characteristic of porphyry deposits. The Lechuri mineral occurrence, which was discovered during this research, is of great interest. The mineralization shows important similarities to the Filizchay pyrite-polymetallic deposit in Azerbaijan based on geology, mineralogy, and geochemistry (Mustafaev et al., 2006).

This present research has noted for the first time the presence of gold mineralization in the region. It should be highlighted that the Tebulo district, where gold anomalies were determined in massive polymetallic bodies, is associated with strongly silicified zones, which is an important result of our research. In conclusion, we note that it is necessary to undertake more detailed metallogenic research in the Tusheti and Kakheti segments in the future, because important mineral deposits, such as those in neighboring Azerbaijan and Dagestan, may be present.

References

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