Petrology of the Sakeni Intrusive and Sakeni Goldfield Genesis (Greater Caucasus, Georgia)

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The Greater Caucasus is Phanerozoic collisional orogen, formed along the southern margin of the Eurasian continent and extends for more than 1200 km between the Black and Caspian Seas. The Sakeni diorite-quartz diorite-adamellite intrusive (77 km^2) is located in the Southern part of of the Pre-Alpine basement complex, in the Svaneti region. It is a metaluminious mantle-crust I-type body, which was emplaced ca. 315±5 Ma (Rb-Sr age) [1]. Along the Alibek thrust (SW-NW, <50-60^0) the Middle-Upper Paleozoic granite-migmatite complex (HT-LP) is thrust onto the Sakeni intrusive.

As a result of our work in the region a new gold district was discovered along the Alibeg thrust zone, which we have named the Sakeni goldfield [2]. Presently, four gold-bearing occurrences are located in the Sakeni goldfield: Kakrinachkuri, Hokrila, Memuli, and Achapara. They are localized along the northern margin of the Sakeni intrusion and controlled by the Alibeg thrust fault. The mineralized zones are formed in the brecciated and greizenized rocks of of the thrust zone (thickness 400-600 m) and include veins, pods, and stockworks. Gold occurs with quartz-scheelite, quartz-pyrite-arsenopyrite, and quartz-stibnite assemblages. The highest gold concentrations (15-20 g/t) are with the pyrite - arsenopyrite association and lowest - in the quartz-stibinite (0.5-1.2 g/t). On a tentative estimation Sakeni goldfield should contain 60-65 tons of gold [2].

A simplified genetic model of the Sakeni goldfield is as follows: syn-orogenic thermal events activated a fluid system that mobilized metals from the Sakeni intrusive. Fluid was focused along the Alibeg thrust zone, and mineralization was localized along structural barriers within the thrust itself. We assume that goldfield represents a post-magmatic, gold-quartz-low sulfide hydrothermal event, which is characteristic of many orogenic gold systems [3].

[1] Okrostsvaridze, 2007. Intellect, Tbilisi, 223 p. [2] Okrostsvaridze, Bluashvili 2009. *Bul. Georg. Acad. Sc.*,v.**1**. pp. 127-131 [3] Goldfarb *at al* 2005. *Economic Geology*, 100th Anniversary Volume, p. 407-450