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## **Au-Ag±W mineralization related to the collisional granitoids of the composite Lutzkan magmatic complex, Bulgaria**

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The Lutzkan magmatic complex in Western Bulgaria hosts the first gold deposit in Bulgaria - "Zlata" (means "gold"). It crops out as bigger plutons (Lutzkan and Ruy) and few small bodies S and NW from the town of Trun and about 50 km W of the Bulgarian capital Sofia. The rocks of the magmatic complex intrude amphibolite facies metamorphic rocks with presumed Precambrian age and Lower Palaeozoic low-metamorphic carbonaceous metasediments and basic metavolcanics. They are covered by Permian sediments and overlain and intruded by Paleogenic volcanics and dykes.

The rock types of Lutzkan pluton range from gabbros and diorites to leucocratic aplite-granites where the granites and granodiorites being the most widespread variety. The Ruy pluton and its vein rocks are mainly granitic in composition. Geochemical studies and U-Pb zircon/titanite conventional and LA-ICP-MS dating of the plutons revealed that the gabbro-diorites of the Lutzkan pluton belong to the basement unit. They are Cambrian in age ( $537 \pm 1.6$  Ma) with mantle-dominated island-arc geochemical characteristics (Ta-Nb negative anomaly;  $\epsilon_{\text{Hf-zircon}}$  values between +8.9 and +12.4). The granitoids of Lutzkan and Ruy pluton are dated at  $334.1 \pm 1.2$  Ma. They show distinct geochemical characteristics typical for most Paleozoic collisional granites of the European Variscides: negligible or absent Ta-Nb anomaly; enrichment in K, U, Rb, Ba, Cs, Sr, Th;  $\epsilon_{\text{Hf-zircon}}$  values between +3 and -10. The geochemical characteristics and zircon inheritance imply melting of lower-middle crustal materials with mixed crust-mantle origin. Two sampled vein rocks of the Ruy pluton show some striking geochemical characteristics and are dated as Eocene in age.

The characteristics of the Au-Ag±W mineralization at Zlata deposit are evident for a link with the differentiated Carboniferous granitoids. The intrusion of basic magma (dykes of gabbroic to diorite composition) into the granitoids might lead to magmatic volatile saturation and potentially trigger the formation of the magmatic-hydrothermal ore.