A HIGHLY RADIOACTIVE SYENITE FROM THE MOLDANUBIAN ZONE (WESTERN MORAVIA)

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Two small bodies of syenite cropping out in the Oslava valley northwest of the city of Náměšť nad Oslavou (western Moravia) are interpreted as being highly differentiated granitoids of the Třebíč massif (Rastenberg type). The syenite intrudes Moldanubian biotite-bearing migmatites of the Gföhl unit. Both bodies are separated from the Třebíč massif by a zone with amphibole-biotite gneisses and biotite-bearing migmatites, several hundred metres thick (Weiss, 1974; Hájek & Luna, 1972).

The syenite is characterized by high contents of potassium (10–11 % of K_2O), aluminium (17–18 % Al_2O_3), and variable content of iron (0.5–5.5 % FeO as total iron). Magnesium (0.1–0.6 MgO) and calcium (1–1.7 % CaO) are low. SiO_2 fluctuates between 60 and 65 %. The modal composition reflects the chemical composition of the rock with high K-feldspar (86–90 %), amphibole (3–10 %), and low quartz (2–9 %) contents. Based on these data, the rocks can be classified as alkali-feldspar quartz syenite and alkali-feldspar syenite. Zircon, titanite and biotite are the accessory phases. As the mineralogical characteristics show, the rocks are not homogenous. The modal proportions of quartz and amphibole show a negative correlation. The coarse-grained syenite grades into fine-grained leucocratic syenite aplite in the centre of the body.

We measured the concentrations of U, Th, and K using a portable gammaspectrometer GS–256 (Breiter & Gnojek, 1996). The uranium concentrations show large variation (8–40 ppm) but thorium varies less (43–98 ppm). Such values are higher compared with those from the Třebíč massif. Our preliminary results from the Třebíč massif indicate that the concentrations of uranium fluctuated around 22 ppm (20–27 ppm). The thorium (44–57 ppm) as well as potassium (6.3–6.8 % K) concentrations do not show large variations either. The fine-grained leucocratic aplite displays very high contents of Th (352–961 ppm), U (140–370 ppm), and K (about 14 %).

The similar Th/U ratio (syenite 1.9–6.5, Třebíč massif 2.0–2.6, aplite 2.2–2.8) seems to support the hypothesis of Hájek & Luna (1972) suggesting the common origin of the syenite and granitoids of the Třebíč massif.