

## **Radioactive mineral springs in Orlica-Sněžník Dome**

### **Abstract**

Radiohydrogeochemical research focused on radioactive waters was carried out in parts of the Orlica-Sněžník Dome (North-East part of the Czech Republic), build by orthogneisses.

Radioactivity of more than 350 springs was measured, activity of dissolved radon  $^{222}\text{Rn}$  higher than 1000 Bq/L was found in 57 springs, 20 springs fulfil the criteria for mineral waters due to activity of dissolved radon ( $^{222}\text{Rn} > 1500$  Bq/L). The highest activity (5175 Bq/L) was found in an overflowing well in the area of Králíky - Dolní Hedeč. Some of the previously suspected of being „radioactive“ springs were discredited, the observed activity of radon is significantly lower than the criteria for radioactive mineral water.

The majority of radioactive mineral springs were found in the area of Stříbrnice, Dolní Hedeč, Mladkov, in the valley of Mlýnský potok and others.

Spatial distributions of radioactive mineral springs are very irregular, springs are connected to tectonically fractured zones.

Suitability of gama-ray intensity measurements in springbed sediments was proved as a sensitive and easily operable method for the indication of high radon activities in spring water. If the values are correctly obtained by emanometrical measurement of radon activity was proved by control sampling and measurements performed by T. Przylibski (Technical University, Warszawa, Poland).

No correlation between high activity of dissolved radon and other macrochemical, microchemical and radiochemical components of spring waters was found. All the sampled waters are cold, very low-mineralised, with slightly acid or neutral reaction. The only significant component is dissolved radon  $^{222}\text{Rn}$ .

Some of radioactive mineral springs (Čtrnáctka, Marie, Jakub's springs near Stříbrnice, Šalamoun and Karolína in Mladkov) were recently adjusted for drinking and inhalation therapy.

Perspective for further research and balneological exploitation may be the springs in Dolní Hedeč area - overflowing well KSS-1 - 5175 Bq/L, other radioactive mineral springs and rare radioactive peloids deposit. Another perspective area is the radioactive spring Marie near Stříbrnice, flowing out from very wide-ranging emanometrical anomaly produced presumably by deemanation of very strong radioactive source.