

Abstract

The karst aquifers are formed by highly permeable conduits that allow very fast and concentrated flow. They can transport contaminants and endanger drinking water sources. Due to the large abundance of karstified carbonate rocks, it is necessary to prevent possible contamination. Tracer tests are used to determine the catchment and hydrodynamic parameters. These are constantly evolving to better simulate the transport of both dissolved and particulate substances and to minimize the risk of contamination. At present, particulate and colloidal tracers, such as DNA, are being developed to better simulate the movement of pathogenic bacteria. This bachelor thesis deals with this development. In the practical part, a tracer tests were carried out in the Bohemian Cretaceous Basin in the karst of the Jizera Formation, which utilized the obtained knowledge. There was injected NaCl and LiCl into a sinkhole in the settlement Borek and then conductivity was monitored and samples were taken at several places in the Vazovec stream, the spring of Bezednice and the springs near river Jizera. The tracer tests refuted the initial assumption that the water from the sinkhole flows directly into the Vazovec stream under the sinkhole and show one of the few found polyfurcations in the Czech Republic. Furthermore, it is confirm the idea that it is the best developed karst in Bohemia. A series of three tracer tests carried out in spring 2017 found a connection a sinkhole with both the Vazovec stream and the Bezednice spring and a spring in the Jizera valley. Flow velocities are affected by the current flow rate. It ranges from 644 m / day, which is the speed of the third peak from the spring near Jizera (H) in the third tracer test to 7447 m / day in the Vazovec stream (D) at the first tracer test.