



## Estimation of Fluorescent Dye Amount in Tracer Dye Test

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Karstic groundwater is more influenced by human than the groundwater that disperse in pores. On the other hand karstic groundwater resources, in addition to providing agricultural needs, livestock breeding, drinking and domestic water in most of the months of the year, they also supply drinking water to the wild life at high altitudes. Therefore sustainability and hydrogeological investigation of karstic resources is critical. Tracing techniques are widely used in hydrologic and hydrogeologic studies to determine water storage, flow rate, direction and protection area of groundwater resources.

Karanfil Mountain (2800 m), located in Adana, Turkey, is one of the karstic recharge areas of the natural springs spread around its periphery. During explorations of the caves of Karanfil mountain, a 600 m deep cave was found by the Turkish and Polish cavers. At the bottom of the cave there is an underground river with a flow rate of approximately 0.5 m<sup>3</sup>/s during August 2014. The main spring is located 8 km far from the cave's entrance and its mean flow rate changes between 3.4 m<sup>3</sup>/s and 0.21 m<sup>3</sup>/s in March and September respectively according to a flowrate observation station of Directorate of Water Works of Turkey. As such frequent storms, snowmelt and normal seasonal variations in rainfall have a significant and rapid effect on the volume of this main spring resource.

The objective of our research is to determine and estimate dye amount before its application on the field inspired from the previously literature on the subject. This estimation is intended to provide a preliminary application of a tracer test of a karstic system. In this study dye injection, inlet point will be an underground river located inside the cave and the observation station will be the spring that is approximately 8 km far from the cave entrance. On the other hand there is 600 meter elevation difference between cave entrance and outlet spring. In this test Rodamin-WT will be used as tracer and the appropriate amount of tracers was found according to the flowrate of the spring. The amount of dye is very important for the consistency of the results and the applicability of the tests. For example if the amount of tracer that is estimated is found to be inadequate, any field readings and data could be lost. Most importantly tracer dye is costly and hard to prepare, transport and will follow a torturous path through the cave to the underground river.