

GROUNDWATER AGRESSIVITY WITHIN BRIBIN UNDERGROUND RIVER, GUNUNG SEWU

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Karst groundwater agressivity, which is here meant as the ability of water to dissolve limestone plays a significant role to sustain the discharge of Bribin River. This article describes the spatial karst groundwater agressivity of Bribin underground river along flowpath. The boundary of analysis used in this research is the tentative catchment area of Bribin River starting from Pentung River (swallow hole) as an inlet and Bribin Cave as the end point (outlet).

39 caves within the catchment were mapped, and 8 underground river were sampled and analyzed in laboratory to achieve the chemical composition of groundwater including cation (Ca^{2+} , Mg^{2+} , Na^+ , K^+) and anion (Cl^- , SO_4^{2-} , HCO_3^-). Afterwards, the result of laboratory is used to identify the chemical type of karst groundwater. Groundwater agressivity is subsequently classified by using chemical agressivity diagram in the system of $\text{pH} - \text{T}^\circ\text{C} - \text{CaCO}_3$ in order to account the ΔpH and ΔTAC . Finally, using the value of ΔpH and ΔTAC , the rate of karst groundwater agressivity may be defined. In addition, to define the stage of dissolution process along flowpath, analysis of Saturation Indices (SI) with respect to calcite (CaCO_3) is also to be applied.

The result indicates that there is a tendency of the decreasing rate of groundwater agressivity along flowpath. The inlet (Pentung River) characterized by high groundwater agressivity, and then there is a moderate decreasing trend of groundwater agressivity downstream. Finally, the rate of agressivity in the end point (Bribin Cave) confirms the low agressivity stage occurs. Furthermore, the analysis of SI values shows that the dominant hydrogeochemical processes is calcite dissolution, even though this values is very close to equilibrium at Bribin Cave. Meanwhile, interesting phenomena present in Sodong Cave, where the sample is classified as aggressive water with the SI value of -0.43 inevitable that leakage of Bribin River may occur in the future.

Keywords : karst groundwater, agressivity, saturation indices

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