

**HYDROGEOCHEMISTRY OF CAVES DRIP WATER
AT SELECTED CAVES IN PENINSULAR MALAYSIA**

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**DISSERTATION SUBMITTED IN
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ABSTRACTS

This preliminary study represents the study on hydrogeochemical of caves drip water throughout Peninsular Malaysia. All samples were analysed for pH, Total Dissolved Solid (TDS), Dissolved Oxygen (DO), Conductivity, cation and anion. Despite local hydrological and geological differences among sampling sites, the monitoring revealed significant synchronous intersite variations that related to rainfall variation and control the volume of water input. The constant hydraulic pressure is expected in karst system as a result of moist condition of tropical region and rainfall throughout the year. Drip sites were classified into to two classifications which are seepages flow and seasonal flow. A simplified conceptual model that show the physical and hydrogeochemical evolution of karst system is proposed. In generally, drip water consists of Ca, Mg and HCO₃ as dominant elements. The source rock deduction analyses strongly suggest that the hydrogeochemical properties of drip water are originated from carbonate weathering. $SI_{calcite}$ determined that drip water is saturated with calcite. The water rock interaction process involves in the karst system are dissolution, dilution, ionic exchange and prior calcite precipitation that lead to saturated $SI_{calcite}$ index. Each of drip possesses a unique hydrogeochemistry characteristic, must be significant related to the host rock properties, flow path characteristic, fracture system behavior and volume of water input.

ABSTRAK

Kajian ini merupakan kajian awal mengenai hidrogeokimia titisan air gua di Semenanjung Malaysia. Analisis yang dijalankan adalah pH, Total Dissolved Solid (TDS), Dissolved Oxygen (DO), Konduktiviti, kation and anion. Kajian pemantauan di kawasan yang berbeza cirian geologi dan hidrologinya, menunjukkan bahawa jumlah taburan hujan dan jumlah air yang menyusup ke dalam system karst adalah berkadar langsung. Jumlah taburan hujan dan keadaan lembap sepanjang tahun di kawasan beriklim khatulistiwa menyebabkan tekan hidraulik adalah tetap. Dua kumpulan air titisan ditentukan iaitu aliran tirsan dan aliran bermusim. Model konsep menunjukkan ringkasan evolusi perubahan fizikal dan hidrogeokimia. Secara keseluruhannya, Ca, Mg dan HCO₃ merupakan ion dominan dalam kandungan titisan air. Hasil analisis penentuan sumber batuan mendapati kesemua parameter hidrogeokimia adalah asalan dari proses perluluhawaan karbonat. $SI_{calcite}$ mendapati titisan air gua adalah kalsit tepu. Proses interaksi batuan dan air yang berlaku di sistem karst adalah pelarutan, pencairan, pertukaran ionic dan pegenapan kalsit utama. Setiap titisan air menunjukkan sifat-sifat hidrogeokimia yang unik disebabkan oleh cirian batuan, perjalanan aliran, keadaan sistem retakan dan jumlah air yang menyusup.

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