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Impact of sandy soil physico-chemical properties towards urban lakes eutrophication and inorganic pollutant status

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Abstract

A variety of soil types in Malaysia have contributed to the difference of soil properties dissolved in the water and the concern of soil problem in Malaysia involves laterite, sandy, acid sulphate and organic soil. There are several physical properties have been used to evaluate the water sample and consist of pH, dissolved oxygen, total suspended solids, chemical oxygen demand, biological oxygen demand and ammoniacal nitrogen (NH₃-N). For heavy metals, 10 elements had been selected based on Malaysia Environmental Quality Report for further evaluation that consists of (Al, Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd and Pb). Physico-chemical properties for water were measured in situ and in the laboratory and further analysis was prepared by using inductively coupled plasma mass spectrometry and analysis of variance (ANOVA) for heavy metals assessment equally for soil and water. The result obtained showed the average of water quality index for sandy soil in the urban lake was in class IV the status of water mostly was polluted as the amount of the high value in BOD (81.62 mg/L), COD (23.53 mg/L) and NH₃-N (0.44 mg/L). The level of TSS was low (27.18 mg/L) as sandy soil particle less influence for soil movement into the water. As for the result of heavy metals, the composition varied in water but several elements exceeded the natural level such as Al (0.07 mg/L), Cr (0.3 mg/L), Ni (0.11 mg/L), Cu (0.02 mg/L) and Pb (1.43 mg/L) as responding to the character of porosity in sandy soil. Meanwhile, two significant elements were found in sandy soil which was Al (157.95 mg/kg) and Fe (156.17 mg/kg) and become a significant signature indicator.

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