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Properties of sandy soil and allelochemical compounds of heath forest in Rantau Abang, Terengganu, Malaysia: Implication for ecological sustainability and biodiversity conservation

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Abstract

Kerangas or heath forests are found on podzolised siliceous sands (spodosols), where gradually decomposing organic matter occurs on the soil's surface. Changes in the extent of podzol development, soil consistency, and poor nutrient contents signify the unique properties of sandy soil in the heath forest at Rantau Abang, Terengganu, Malaysia. Unfortunately, the sandy soil's chemical and physical properties are in critical condition due to human activities such as cutting and burning, impacting the sustainability of this ecosystem and its ground cover of shrubs, sparse grass and sedge. Therefore, it is crucial to study the properties of sandy soils in heath forests before their extinction. This analyzed the physical and chemical attributes of heath forest sandy soils regarding heavy metal toxicity, pH, concentrations of carbon, nitrogen, available phosphorus, cation exchange capacity (CEC), allelochemical compounds, total phenolic content in the soil, soil colour, and soil texture. The solid was found to be nutrient-deprived due to its extreme acidity and toxicity. The results showed that allelochemical matters were higher in plants but not in the soil attributes and the water bodies, along with a highly active response in young plant tissues due to their sources of phenolic content. Remarkably, the overall phenolic content was observed to be considerably high in the semi-mature phase of vegetation. © 2023 by the authors.

Author Keywords

Allelochemical; Heath forest; Heavy metals; Low pH; Nutrient deficiency; Sandy soil; Soil acidity

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