

**THE STUDY OF NATURAL ATTENUATION OF
AGRICULTURAL CHEMICALS BY CLAY.**

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by

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Abstract

Sri Lankan modern agriculture uses enormous quantities of organic and inorganic agricultural chemicals for their cultivations. Currently glyphosate is one of the most applied organic herbicide in Sri Lanka with increasing importance. The Studies on dynamic of these agrochemicals in soils are very complicated which helped to reduce the concentration of the chemical contaminants in the environment. This is known as natural attenuation. The adsorption, downward movement and the degradation are the most important attenuation process that used to achieve the objective of this research, the attenuation capacity of selected agricultural chemical by clay.

Known concentration of 360 g L^{-1} glyphosate leachate was passed through laboratory clay mixed soil and washed quartz sand columns. The batch adsorption experiment was conducted by equilibrating soil samples with increasing concentrations of glyphosate concentration of the supernatant solution. The column leachate and the batch experiment glyphosate analyzed were done by a UV-Spectrophotometer at 435 nm. Initial and the final measured soil Nitrogen content of column and the observed soil chemical and physical properties were used to get the conclusion on soil selected from Badulla.

The leaching concentration of glyphosate from soil columns was decreased with increasing volume eluted and the leaching percentage of glyphosate was 60%. The glyphosate concentration remained in soil was 40%. Furthermore the adsorption experiment showed that the rate of glyphosate adsorption in Badulla soil sample was higher than 1 and the adsorption data was fitted well to Langmuir isotherm which assumes that a maximum adsorption occurs when all adsorption sites are occupied and indicating that the amount adsorbed increases linearly with increasing glyphosate concentrations. The nitrogen content (N content) of soil had been increased after glyphosate application to soil columns due to biodegradation of glyphosate.

The results indicated that the Adsorption and biodegradation of glyphosate were important processes in determining the attenuation of glyphosate in soil. Badulla soil has a significant rate of natural attenuation capacity.

Key words: Agricultural chemical, Natural attenuation, Glyphosate, Clay