

Degradation of carbofuran and diazinon in some selected soils in Sri Lanka

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Ground water resources in Sri Lanka are derived largely from direct rainfall seepage and recharge from surface water bodies. Pesticides availability and persistence in soils are directly related with ground water contamination. Hence the knowledge of degradation of pesticides in soils is essential for contamination management.

Therefore, a study on degradation and dissipation of C^{14} ring labelled two popular pesticides, carbofuran and diazinon, in four soil series under three great soil groups of Sri Lanka were carried out.

Three soil groups: Red Yellow Podzolic (Nuwara Eliya series), Alluvials (Pugoda series) and Regosols (Kalpitiya and Negombo series) were selected. Surface soils of the selected soil types were incubated at 70% of maximum water holding capacity and $28^{\circ}C$ under 13 hours light and 11 hours dark conditions. Soil samples weighing 10g each were added with $0.05\mu Ci$ of ring labelled carbofuran and diazinon. Liberated CO_2 from samples was collected to an alkaline solution and analyzed for $^{14}CO_2$ using Liquid Scintillation Counter after days 0, 1, 3, 5, 7, 14, 28, 56, and 90.

Degradation percentage of carbofuran is low in all soil groups but a comparatively higher degradation rate was shown in Kalpitiya regosols than in others. After 20 days, degradation percentage in Kalpitiya was 12.5% and Pugoda series was 7.5% but in other two soils it was below 7.5%. After 40 days, it was over 20% in Kalpitiya and in other three soils below 15%. After 90 days over 60% of degradation was shown in Kalpitiya soils but in other soils it was below 50%. After 90 days, Nuwara Eliya series showed less than 10% degradation.

Diazinon exhibited a faster degradation than carbofuran. At 14 days of incubation 25% degradation was shown in Kalpitiya and Nuwara Eliya series but in Pugoda and Negombo series it was below 20%. After 40 days it was 80% in Kalpitiya soils and was 60% in Nuwara Eliya series. Even after 90 days, only 25% was degraded in Negombo and Pugoda series.

The results showed that the degradation rate of carbofuran is much slower than diazinon and hence the risk due to leaching of carbofuran is higher than diazinon. Low soil temperature resulted from high elevation and high organic matter in Nuwara Eliya soil may have some attribution for persistency of carbofuran.

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