

**DEGRADATION OF CHLORPYRIFOS IN *SPINACIA*
OLERACEA (SPINACH) AND SOIL**

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ABSTRACT

DEGRADATION OF CHLORPYRIFOS IN *SPINACIA OLERACEA* (SPINACH) AND SOIL

Chlorpyrifos is an organophosphorus insecticide that widely used in agricultural pest control. The chlorpyrifos analysis method of residue and degradation in *Spinacia oleracea* (spinach) and soil were studied. The soil samples have been analysed for four physical-chemical parameter which are particle size analysis, pH, percentage moisture and total organic carbon content. Those of the physical-chemical parameter are important in degradation behaviour of pesticide in soil. The soil consists of 19.54% coarse sand, 65.58% fine sand, 14.77% clay and silt. The pH of soil was 4.95 with 4.06 g kg⁻¹ organic carbon and 15.55% moisture content. Residues of chlorpyrifos were extracted from spinach and soil with acetone/water, purify with liquid/liquid partition and column chromatography, concentrate to small volume and analysed by UV-Vis detection. Absorbance of chlorpyrifos in methanol was positively proportional to its concentration at 229 nm respectively. The degradation of chlorpyrifos formulation in spinach and soil was determined. The results showed that chlorpyrifos concentration degradation in spinach coincided with $C=2.112e^{-0.09993t}$ respectively. The half-life of chlorpyrifos in spinach were about 6.93 days with correlation coefficient of $R^2 = 0.99383$. Chlorpyrifos degradation in soil coincided with the dynamic regression equation and the half-life of chlorpyrifos in soil sample were as follows: $C=2.102e^{-0.01653t}$, $R^2 = 0.99383$, $T_{0.5}= 42.09$ days. When the chlorpyrifos formulations were applied according to the recommended dose, the final residues in both spinach and soil are exceed the CODEX maximum residue limit of 1 mg kg⁻¹. Therefore, the harvest interval should be more than 14 d, which could be considered as safe to animal and human beings.