

Abstract:

¹⁴C-malathion, [S-1,2-bis(ethoxycarbonyl)ethyl O,O-dimethyl phosphorodithioate] and ¹⁴C-dimethoate, [O,O-dimethyl S-(N-methylcarbamoylmethyl)phosphorodithioate] have been administered to leaves of pea (*Pisum sativum*) plants under simulated tropical conditions in the greenhouse. The results show that ¹⁴C-malathion dissipated faster than ¹⁴C-dimethoate from the leaf surface: After 16 days, 5.7% of the radioactive dose applied as malathion remained on the surface of the treated leaves as surface (dislodgeable) residues. The extractable residues constituted 9% while the bound (non-extractable) residues were 4.2% of the total initial radioactivity. 16.7% of the initial dose had been translocated from the treated leaves to the rest of the plant. 17.1% of the initial dose constituted ¹⁴C-compounds other than ¹⁴CO₂ recovered from the transpired water. The corresponding fractions of dimethoate were 21% dislodgeable, 17.4% extractable, and 5% bound residues. Only 4.6% of ¹⁴C-dimethoate residues were distributed in the plant. Although dimethoate is 170 times more soluble in water than malathion, only 10.4% of the initial pesticide dose of dimethoate constituted ¹⁴C-compounds in the transpired water. Dimethoate formed dimethoxon, the oxygen analogue, while malathion did not form malaoxon in the plant, as revealed by thin layer chromatography (TLC) and confirmed by gas chromatography-mass spectrometry (GC-MS).