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Occurrence of pesticide non extractable residues in physical and chemical fractions from two natural soils.

K. ANDREOU, K. JONES, and K. SEMPLE

Department of Environmental Science and the Lancaster Environment Centre, Lancaster University, Lancaster, LA1 4YQ, United Kingdom

Distribution of pesticide non extractable residues resulted from the incubation of two natural soils with each of the isoproturon, diazinon and cypermethrin pesticide was assessed in this study. Pesticide non extractable residues distribution in soil physical and chemical fractions is known to ultimately affect their fate. This study aimed to address the fate and behaviour of the non extractable residues in the context of their association with soil physical and chemical fractions with varying properties and characteristics. Non extractable residues were formed from incubation of each pesticide in the two natural soils over a period of 24 months. Soils containing the non extractable residues were fractionated into three solid phase fractions using a physical fractionation procedure as follows: Sediment (SED, >20 μm), (II) Microaggregate (MA, 20-2 μm) and (III) Colloid phase (COL, 2-0.05 μm). Each soil fraction was then fractionated into organic carbon chemical fractionations as follows: Fulvic acid (FA), Humic acid (HA) and Humin (HM). Significant amount of the pesticides was lost during the incubation period. Enrichment factors for the organic carbon and the 14C-pesticide residues were higher in the MA and COL fraction rather than the SED fraction. Greater association and enrichment of the fulvic acid fraction of the organic carbon in the soil was observed. Non extractable residues at the FA fraction showed to diminish while in the HA fraction were increased with decreasing the fraction size. An appreciable amount of non extractable residues were located in the HM fraction but this was less than the amount recovered in the humic substances. Long term fate of pesticide non extractable residues in the soil structural components is important in order to assess any risk associated with them.