



Distribution of aged Pesticide Residues in Physical and Chemical fractions of two previously organically managed soils

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Soils are considered to be a significant sink for organic contaminants, including pesticides, in the environment. Understanding the distribution and localisation of aged pesticide residues in soil is of great importance for assessing the mobility and availability of these chemicals in the environment. This study aimed to characterise the distribution of radiolabeled herbicide Isoproturon (14C-IPU) and the radiolabeled insecticides Diazinon (14C-DIA) and Cypermethrin (14C-CYP) in two organically managed soils. The soils were spiked at the maximum recommended single application rate and aged under laboratory conditions for 17 months. The labile fraction of the pesticides was recovered in 0.01M CaCl₂ (0.01M) and then subjected to physical size fractionation using sedimentation and centrifugation steps, with >20 μ m, 20-2 μ m and 2-0.1 μ m soil fractions collected. Further, the distribution of the pesticide residues in the organic matter of the fractionated soil was investigated using a sequential alkaline extraction (0.1N NaOH). The alkaline extraction method resulted in the fractionation of the organic matter into the fulvic acid, humic acid and the humin fraction. Soil fractions of 20-2 μ m and 2-0.1 μ m had the largest proportion of the 14C-residues. In this study, the humin fraction played a major role in the sequestration of non-extractable residues. Non-extractable pesticide residues were located in the fulvic acid and humic acid fraction in lesser extent. Humic acid, fulvic acid and humin fractions are being used for investigating the remobilizing or not of the non-extractable residues-in this case pesticide residues. In order to assess the likelihood of the pesticide residues to become available to soil biota is important to describe as closely as possible the kinetics of the pesticide residues in different soil organic matter pools as a function of the time.