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Distribution of aged atrazine related 14C-residues in natural soil following incubation with the earthworm Apporectodea caliginosa

KOSTAS ANDREOU (1), KIRK SEMPLE (2), and KEVIN JONES (2)

(1) CYPRUS UNIVERSITY OF TECHNOLOGY, LIMASSOL, Cyprus, (2) LANCASTER UNIVERSITY, LANCASTER, United Kingdom

The distribution and localisation of atrazine related 14C-residues into the different physical fractions of soil may reveal information on processes taking place in soil. Soils amended with 14C-atrazine, were aged for 22 years under environmental conditions in a lysimeter in Germany. The soil was sampled and subjected to physical and chemical fractionation before and after incubation for 7 days with the earthworm Apporectodea caliginosa. No significant change in the soil physical and chemical fractionation of the atrazine related 14C-residues and organic carbon was observed in this study due to the activity of the A. caliginosa. The smaller size soil fractions (Microaggregates and Colloids) were highly enriched with aged atrazine 14C-residues equivalents and organic carbon. Also the humic acid extracted using a simple alkaline extraction have were also enriched with aged atrazine 14C-residues equivalents. The low organic carbon content of the soil, the absence of relatively fresh organic matter and the long ageing time might explain the limited bioavailability of the atrazine related 14C-residues to the earthworm. This finding is of particular importance given that the soil used here was aged under natural environmental conditions compared to laboratory studies. Earthworms are important species in soil ecology and thus, the question of the bioavailability of aged pesticide residues to such organism is critical. The bioavalability of the atrazine 14C-residues equivalent was absent in the current study illustrating that those aged residues posed minimal risk to earthworms.