Chemosphere

Volume 78, Issue 10, March 2010, Pages 1250–1255

Organochlorine pesticides in soils from south-western Uganda

Patrick Ssebugere[a], John Wasswa[a], Jolocam Mbabazi[a], Steven A. Nyanzi[a], Bernard T. Kiremire[a], John A.M. Marco[b]

[a] Department of Chemistry, Makerere University, P.O. Box 7062, Kampala, Uganda
[b] Chemistry Department, University of Dar es Salaam, P.O. Box 35061, Dar es Salaam, Tanzania

Received 30 August 2009, Revised 21 November 2009, Accepted 16 December 2009, Available online 12 January 2010

https://doi.org/10.1016/j.chemosphere.2009.12.039

Abstract

Organochlorine (OC) residues were analysed in soil samples collected from Kihiihi sub-county, Kanungu District, which is located in south-western Uganda. Mabira Central Forest Reserve which is located in central Uganda was used as a reference site in this study. The samples were collected at 15–20 cm depths below the soil surface and extracted with organic solvents. The extracts were cleaned using florisil, and were analysed using a gas chromatograph (GC) equipped with an electron capture detector (ECD). The results were confirmed using a GC equipped with a mass spectrometer (MS). The levels of the OC residues in soil from Kihiihi sub-county varied from non-detectable (ND) to 59 μg kg^{-1} dry weight. The frequencies of detection for *p*,*p′*-DDT, *p*,*p′*-DDE and *p*,*p′*-DDD in the total soil samples were 47%, 24% and 11%, respectively. The *o*,*p′*compounds were detected in the following frequencies: *o*,*p′*-DDT (23%), *o*,*p′*-DDE (19%) and *o*,*p′*-DDD (8%). The low *p*,*p′*-DDE/*p*,*p′*-DDT residue ratios (0.2–0.9) in Kihiihi samples suggest recent inputs of DDT in Kihiihi sub-county. The detection frequencies for dieldrin, endosulfan-*α*, -*β* and -sulphate in the soil samples were 21%, 26%, 31% and 19%, respectively. Mabira Forest Reserve soils showed detection frequencies of *p*,*p′*-DDT (5%) and *p*,*p′*-DDE (9% of the soil samples), varying from ND to 9 μg kg^{-1}. Although the use of OCPs has been banned, our results show that they can still be detected in the environment. Their presence may be attributed to adulteration of pesticides which are not banned and also atmospheric deposition.

Keywords: Organochlorine pesticides; Residues; Soil; Kihiihi sub-county

Corresponding author. Tel.: +256 782 307233; fax: +256 41 531061.