Chemosphere

Volume 68, Issue 5, June 2007, Pages 832–837

Organochlorine pesticides and metabolites in young leaves of *Mangifera indica* from sites near a point source in Coast Region, Tanzania

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https://doi.org/10.1016/j.chemosphere.2007.02.026

Abstract

Young leaves of *Mangifera indica* (mango tree) from nine sites were used as bioindicators of local atmospheric contamination by organochlorine pesticides and metabolites from a point source, an old storage site at Vikuge farm in Tanzania. Sample extracts were analyzed by GC-ECD and GC-MS. The concentrations ranged 2.7–649 ng g^{-1} *p,p'*-DDT, below detection limit (bdl)–290 ng g^{-1} *o,p'*-DDT, 0.4–13 ng g^{-1} *p,p'*-DDE, bdl to 4 ng g^{-1} *o,p'*-DDE, 1–231 ng g^{-1} *p,p'*-DDD and 0.5–55 ng g^{-1} *o,p'*-DDD. The concentrations of other compounds were up to 3.9 ng g^{-1} pentachloroanisole, 1.3 ng g^{-1} α-HCH, 12 ng g^{-1} β-HCH and 2 ng g^{-1} γ-HCH, on fresh weight basis. The compounds *p,p'*-DDT, *p,p'*-DDE, *p,p'*-DDD and *o,p'*-DDD were found in 100% of the samples, while pentachloroanisole, *o,p'*-DDT and *o,p'*-DDE were detected in 78%, 56% and 67% of the samples, respectively. The low DDE/DDT ratios (0.01–0.20) in all samples indicate recent input of significantly non-degraded DDT from the point source. The low α-/γ-HCH ratios (<0.3–0.7) in most samples indicate recent input of lindane (99% γ-HCH). The slightly high α-/γ-HCH ratios in some samples might be due to photochemical or bacterial transformation of γ-HCH to α-HCH, or could reflect input of technical HCH. The very strong positive correlations in the concentrations of *p,p'*-DDT, *p,p'*-DDE, p,p'-DDD, *o,p'*-DDT, *o,p'*-DDE and *o,p'*-DDD ($r = 0.91–0.98$, $n = 18$, $p < 0.01$) indicate that they have a common source. The results suggest that young mango leaves are suitable bioindicators of recent inputs of organochlorine contaminants from a point source.

Keywords: Organochlorine pesticides; metabolites; mango leaves; Tanzania

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