

Assessment of endocrine disrupting pesticides and other pesticides in the aquatic environment and selected foodstuffs in Dar es Salaam the case of Kizinga and Msimbazi rivers

Aldo Kitalika

Master of Science (Chemistry)

University of Dar es Salaam, College of Natural and Applied Sciences, 2011

This thesis reports on the levels of endocrine disrupting and other pesticides in aquatic environment and foodstuff in Dar es Salaam City, Tanzania. Samples of water, soil, sediments and ,Amaranthis spp. were collected from Msimbazi and Kizinga rivers and were extracted, cleaned and analyzed for pesticides using GC-ECD and GC-MS. Eight endocrine disrupting pesticide residues, namely γ -HCH, α -HCH, β -HCH, p,p'-DDE, p,p'-DDD, o,p'-DDT, p,p'-DDT and dieldrin were detected at concentrations of up to 82 ng/g dw in sediments. The highest average concentrations of endocrine disrupting pesticide residues in water, sediments, soil and Amaranthi spp. were 4.9 ng/l (γ -HCH), 15.3 ng/g dw (α -HCH), 6.6 ng/g dw (p,p'-DDT) and 9.3 ng/g dw (dieldrin), respectively. The detection frequencies of most endocrine disrupting pesticide residues varied from 13% to 100%. The most frequently detected compounds in this group were HCHs, dieldrin, p,p' -DDE, p,p' -DDD and p,p' - DDT Concurrently, three non-endocrine disrupting pesticide residue were detected which are: diaznon, endosulphan sulphate, parathion, parathion methyl, α -endosulphan, β -endosulphan and ethion. Among these, parathion methyl had the highest average concentration in water, sediments, soil and ,Amaranthis spp. at concentrations of 11.1 ng/l, 26.3 ng/g dw, 38.1 ng/g dw and 23 ng/g dw, respectively. The detection frequencies of non-ED pesticides varied from 17% to 94% for most compounds. The most frequently detected compounds in this group were parathion methyl, β -endosulphan, diaznon and parathion. There were no significant differences in concentrations of residues between seasons despite the higher concentrations noted for some residues in the rainy season