

Determination of Some Organochlorine Pesticide Residues in Vegetable and Soil Samples from Alau Dam and Gongulong Agricultural Sites, Borno State, North Eastern Nigeria

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Abstract : Five vegetables (spinach, lettuce, cabbage, tomato, and onion) were freshly harvested from the Alau Dam and Gongulong agricultural areas for the determination of some organochlorine pesticide residues (o, p-DDE, p,p'-DDD, o,p'-DDD, p,p'-DDT, α -BHC, γ -BHC, metoxichlor, lindane, endosulfan dieldrin, and aldrin.) Soil samples were also collected at different depths for the determination of the above pesticides. Samples collection and preparation were conducted using standard procedures. The concentrations of all the pesticides in the soil and vegetable samples were determined using GC/MS SHIMADZU (GC-17A) equipped with electron capture detector (ECD). The highest concentration was that of p,p'-DDD ($132.4 \pm 13.45 \mu\text{g/g}$) which was observed in the leaf of cabbage, while the lowest concentration was that of p,p'-DDT ($2.34 \mu\text{g/g}$) was observed in the root of spinach. Similar trends were observed at the Gongulong agricultural area, with p,p'-DDD having the highest concentration of $153.23 \mu\text{g/g}$ in the leaf of cabbage, while the lowest concentration was that of p,p'-DDT ($12.45 \mu\text{g/g}$) which was observed in the root of spinach. α -BHC, γ -BHC, Methoxychlor, and lindane were detected in all the vegetable samples studied. The concentrations of all the pesticides in the soil samples were observed to be higher at a depth of 21-30cm, while the lowest concentrations were observed at a depth of 0-10cm. The concentrations of all the pesticides in the vegetables and soil samples from the two agricultural sites were observed to be at alarming levels, much higher than the maximum residue limits (MRLs) and acceptable daily intake values (ADIs). The levels of the pesticides observed in the vegetables and soil samples investigated, are of such a magnitude that calls for special attention and laws to regulate the use and circulation of such chemicals. Routine monitoring of pesticide residues in these study areas is necessary for the prevention, control and reduction of environmental pollution, so as to minimize health risks.

Keywords : Alau Dam, gongulong, organochlorine, pesticide residues, soil, vegetables

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