

## **Pesticides Bioconcentration Potential of Aquatic Plants in the Volta Lake**

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### **Abstract**

The Volta Lake is known for the proliferation of numerous aquatic plants in its shallow waters. A major cause for the presence of the luxuriant vegetation is the intensive agricultural activities along the banks. These activities are heavily dependent on agrochemicals including fertilizers, which eventually get into the aquatic ecosystem via water ways. In this study, two aquatic plants; *Ceratophyllum demersum* and *Nymphaea lotus* were investigated in a pilot study to determine their bioconcentration of pesticides. Levels of organochlorine (OCs) and synthetic pyrethroids (SPs) were analysed using gas chromatography equipped with electron capture detector while gas chromatography equipped with pulse flame photometric detector was used for the organophosphorus pesticides (OPs) determination in the plant tissues. The ambient concentrations of these pesticides in the aqueous medium were also determined and the ratios of pesticide concentration in the plant and water samples estimate bioconcentration potential of the plants. Out of 38 detected pesticides, 22 (representing 58%) were bioconcentrated by the aquatic weeds. The Bioconcentration Factor (BCF) range for *Ceratophyllum demersum* was 1.06 – 4,470 and that for *Nymphaea lotus* was 1.27 – 800. By the standard of the European Union regulation for registration of chemicals, levels of diazinon and chlorpyrifos in *Ceratophyllum demersum* fulfilled the ‘bioaccumulation’ criterion (i.e BCF > 2000) while fenitrothion, with BFC of 5500 in the same plant fulfilled ‘very bioaccumulation’ criterion (BCF ≥ 5000). This study shows that aquatic weeds in their natural ecosystem have the remediation potential, though to varying degrees and hence play a role in the improvement of water quality.