

AN ASSESSMENT OF PESTICIDE INDUCED EFFECTS ON ENZYMATIC ACTIVITIES OF FRESHWATER SNAILS EXPOSED TO WATER COLLECTED FROM DIFFERENT DAMS.

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This study involved the assessment of the effects of pesticides on esterase enzyme activity of the freshwater snails *Lymnaea natalensis*, exposed to water collected from two different dams.

Groups of adult snails were exposed to 0.006 ppm chlorpyrifos and 0.003 ppm aldicarb in polluted water from Umguza dam and unpolluted water from Hillside dam for 14 days. Carboxylesterase, acetylcholinesterase and arylesterase activities were measured. Both pesticides were observed to cause significant inhibition of esterase activity after the exposure period, with exposures performed in Umguza dam water showing higher inhibition, compared to Hillside dam water. Aldicarb and chlorpyrifos both showed a time-dependent inhibition of enzyme activity, the former causing a higher inhibitory effect as compared to the latter. Acetylcholinesterase showed up to 80% inhibition following exposure to either pesticide, with chlorpyrifos exposure in Umguza water causing only 40% inhibition. Carboxylesterases similarly showed increased inhibition, greater than 70%, while arylesterases showed 80-90% inhibition, with an exception of chlorpyrifos spiked Hillside dam water which caused 45% inhibition.

The results highlight the toxic effects of pesticides introduced into water on non-target organisms, evidenced by the inhibition of esterase activity. Contaminated water also appears to enhance the effects of pesticides, compared to relatively pristine water.

Keywords: Esterases, inhibition, pesticides, polluted water, protein biochemistry.