



Bio-indicators and induced stress-response of giant land snail (*Archachatina marginata* Swainson) in polluted ecosystem

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ABSTRACT

Background and objectives: The giant land snail is an important source of revenue to farmers and animal protein to human beings. Molluscs are good bio-indicators of polluted and stressed environments. Metabolism and bioaccumulation of toxic chemicals by edible organisms require constant monitoring because of their potential risks to human nutrition and health.

The response of giant land snail to lethal and sub lethal levels of an organophosphate pesticide (dichlorvos) was assessed. This is with a view to determining the physical and physiological changes of snails in polluted ecosystem and safety limits of exposure to the pesticide.



Results: Assessment of the mortality of snails (110-140 g) to dimethyl-O-(2-2 dichlorovinyl)-phosphate (Dichlorvos) showed that concentrations above 0.135 mM caused death within 24 h while 0.002 – 0.02 mM resulted in death after 48 h. The symptoms accompanying mortality included physical and physiological changes like swelling of the muscular foot, inflammation, and colour change from brown to grey, black or white, flaccidness, and outright withdrawal from food and the environment. Exposure of the snails for 168 h to 0.0023 mM Dichlorvos resulted in 50% mortality – LC 50. a concentration of 0.0011 mM was non-lethal beyond 168 h (7 d) assay, with evidence of recovery. Sub lethal assessments of 10, 50 and 100 times dilution of LC 50 showed that the snails gained little weight. Histopathological studies of hepatopancrease showed lesions and foci of the snails exposed to 1/10th of LC 50. However, the ovotestes and muscular foot were normal.

Conclusion: Colour changes, swelling, flaccidness and withdrawal by snails are indication of contaminated environments that may also pose health hazards to human beings.