

**STUDY ON DIAZINON PESTICIDE IMPACT TO
THE AQUATIC INVERTEBRATES**

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by

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ABSTRACT

Diazinon is an organophosphate categorized under insecticide. The use of pesticide has increased today. When pesticides are applied, it is subjected to different complex processes and small part is adsorbed by soil. Presence of pesticide in environment poses adverse effects on health and the environment. Vegetable cultivation in Upper Mahaweli Catchment (UMC) consumes large volume of pesticide. Therefore, main objective of this study is to determine the adsorption amount of diazinon in different soil and sediment samples taken from selected locations of UMC and to determine the toxicological impact of diazinon on *Daphnia magna* and *Moina* species. Both soil and sediment samples were collected from 4 randomly selected sampling locations in UMC. Collected samples were oven dried at 105⁰ C and sieved using a sieve with 2 mm mesh size. Then diazinon with known concentration was added into the soil samples and kept in shaker for the adsorption. The non-adsorb diazinon portion was extracted by Solid Phase Extraction and the concentration was determined by gas chromatography (Agilent 6890 GC). For the toxicity test, diluted non-adsorb diazinon solution was used. LC₅₀ value of *Daphnia magna* and *Moina* species was determined by following the OECD Guidelines for the Testing of chemicals. According to the findings of the study, diazinon pesticide was adsorbed into the selected soil and sediment samples. Highest total organic carbon content was reported in Soil 3. Negative correlation between soil total organic carbon content and pesticide adsorption by soil was reported in 0.5 ppm and 1 ppm diazinon concentrations. Positive correlation was reported in 2 ppm diazinon concentration. Diazinon adsorption by soil was significantly difference with the soil total organic carbon content and the pesticide concentration. Both *Daphnia magna* and *Moina* species mortality percentages were significantly different with the diazinon concentration and the exposure time. Highest 48 hr LC₅₀ value of *Daphnia magna* was 0.000201 ppm. *Moina* species had highest 48 hr LC₅₀ value of 0.000360 ppm. As the considerable portion of diazinon is adsorbed by the soil, it may contaminate the environment. Considering the toxicity effect of diazinon it can cause adverse health effects on health and environment. It can be recommended to carry out further research on pesticide adsorption and their toxicity.