

Toxicity Assessment of a Commercial Product Containing D-Tetramethrin and Cyphenothrin on Ecosystem by using Butterflies as Indicator Species

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Ecotoxicology is a specialized form found in toxicology that focuses more specifically on the toxic substances and its effect on ecosystems. In Sri Lanka, over the past decade there is an increase in the use of pesticides. More importantly, the increase in mosquito borne diseases such as dengue fever have been resulted to the extensive use of insecticides to control the mosquito populations especially in urban areas. These chemicals can exert toxic effects for other non-target species including butterflies. This research was conducted to determine the toxic effects of a commercial pesticide containing d-tetramethrin and cyphenothrin on butterflies. This chemical is mixed with diesel and fogged extensively in urban areas. Butterflies were used as indicator species since they are very sensitive to the changes in the environment. The 5th instar larvae of *Tirumala limniace exotica* (Blue Tiger) were used as the test species. The larvae used for the experiment were obtained by breeding the adult species in a butterfly cage. The larvae were exposed to 6 different formulations which included 'Aged Aerated Water' as Control, Diesel as Solvent Control and 4 increasing concentrations of the commercial pesticide (10, 100, 500 & 1000 ppm). A volume of 1µl was applied to the thorax region of the larvae (4 per each concentration). The chemical was allowed to air dry for a few seconds and observations were recorded. The larvae that were exposed to all the concentrations of the commercial pesticide including the solvent control did not manage to survive. This study concludes that the chemical has an effect on butterflies, thus on ecosystem. However, further studies including Acute and Chronic toxicity assessments must be conducted. The outcomes will be important in establishing conservation plans to protect butterflies as well as other insects that play a vital role in a balanced ecosystem.

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