

Deciphering the mechanistic details of developmental anomalies in the chick embryos exposed to sublethal dose of technical grade diamide insecticide

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**PhD Thesis submitted to
Department of Zoology, Faculty of Science
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**FOR THE AWARD OF
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Pesticides, which are crucial in contemporary agriculture for managing pests and enhancing crop yield, provide environmental hazards to organisms that are not the intended targets. Administering flubendiamide at a concentration of 500 ppm directly into the egg caused significant developmental anomalies. It severely impaired the chorioallantoic membrane (CAM) vasculature, which is crucial for exchanging gases and absorbing nutrients. The embryos showed hemorrhages, vascular rupture and coagulation, suggesting impaired vascular integrity. Flubendiamide also significantly obstructed the growth of the eyes, causing a disruption in the formation of the optic cup and leading to the conditions of anophthalmia (absence of one or both eyes) and microphthalmia (abnormally small eyes). The study revealed hepatotoxic effects characterized by a notable increase in cytochrome P450 enzymes, heightened oxidative stress and higher levels of ALP, ALT and AST, indicating serious liver damage. These findings highlight the necessity of exercising prudence in pesticide usage and conducting additional research to alleviate environmental repercussions.



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