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ASSESSMENT OF MALATHION INDUCED TOXICITY IN *DATTAPHRYNUS MELANOSTICTUS* TADPOLES: A BIOCHEMICAL INVESTIGATION

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ABSTRACT: Environmental pollutants apart from other factors like habitat loss and interventions of invasive species, is regarded as a likely cause towards a worldwide decline in amphibian population. The present study attempts to elucidate the toxicity of commercially formulated malathion (MAT) by investigating biochemical aspects in *Dattaphrynus melanostictus* tadpoles. Three sublethal concentrations of MAT (1.0, 1.8, and 2.5 mg/l) were considered to which the tadpoles (Gosner stage 27) were exposed for five days. The outcome of the present investigation revealed a significant decline ($P < 0.05$) in activities of catalase, superoxide dismutase, glutathione peroxidase while suggesting a significant elevation in lipid peroxidation. The inhibition acetylcholinesterase activity confirmed MAT as anticholinesterase product. The overall outcome of the present investigation suggests the toxic potentials of MAT; which could have possibly resulted in compromised antioxidant status and neurobiochemical makeup of the exposed tadpoles. Thus, based on the results obtained, it could be ascertained that the commercial grade MAT may pose a potential threat to the tadpoles of *D. melanostictus* under the selected sublethal concentrations. The study further validates the feasibility to measure the intensity of aquatic pollution in the course of regulatory surveillance and monitoring the waters with suspected organophosphate contamination.

INTRODUCTION: Large scale anthropogenic activities have been associated with the drastic decline of amphibian populations globally^{1, 2, 3}. Evaluation by the International Union for Conservation of Nature, category for vulnerable or critically endangered species suggested that 32.5% of total amphibian species have declined in terms of their number, which is far critical than for birds and mammals^{4, 5}.

Amphibians, unlike other animals, constitute a unique group among many ecosystems due to their active and multiple roles as, prey, predators and herbivores^{6, 7}. Their contribution to trophic dynamics makes them one of the crucial features in determining the survival ability of other organisms through food chain^{8, 9}. Hence, their existence at a certain population ratio could be considered as accountable for the continuity of other species as well. Even though the loss of habitat is considered to be the primary reason behind amphibian decline¹⁰, the role of pesticide contamination in freshwater habitats often questions its contribution in survival rate and reproduction of anurans¹¹.

In addition to this, tadpoles are known to complete a part of their life cycle (larval development) in an

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