



MICROPLASTICS AND CdCl₂ CO-EXPOSURE IN FEMALE TROPICAL FRESHWATER CRAB *Sartoriana spinigera* - EVIDENCE FROM GROWTH, MOULTING, HEMATO-BIOCHEMICAL INDICES, BEHAVIOR AND HISTOMORPHOLOGY

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Comprehensive knowledge of the toxicological effects and mechanisms of microplastic (MP) and heavy metal (HM) invasion in freshwater crustaceans remains limited globally. The current study aims to explore the individual and combined effects of MP (polystyrene-PS, polyethylene terephthalate-PET) and HM (Cadmium-Cd) on behavioral responses, growth, hemato-biochemical and cellular structure of the freshwater crab *Sartoriana spinigera*. Female crabs were exposed for 14 days across six designated treatment groups, i.e., T1(PS 200 µg/L), T2 (PET 200 µg/L), T3 (Cd 0.0625 mg/L), T4 (PS 200 µg/L + Cd 0.0625 mg/L), T5 (PET 200 µg/L + Cd 0.0625 mg/L), and Control (0 MP, 0 HM). Significant alterations in growth behavior, and low survival rates in the toxicant-exposed groups compared to the control have been reported ($p < 0.05$). Changes in hemato-biochemical parameters such as AST, ALT, cholesterol, triglycerides, Brix, hemolymph glucose, and total protein confirm the stress induced by toxicants. Histomorphological deformities in major organs like the hepatopancreas and gills reflect how the accumulation of PS, PET, and Cd challenges the survival of crabs by disrupting the fundamental functions of these organs. Interestingly, the current study observed successful moulting induced by PET exposure, while the moulting inhibitory effects of Cd showcased challenges in molting completion in PET+Cd. Overall results indicate that, compared to single exposure, the combined exposure to MPs and Cd poses a greater threat to *S. spinigera*. This comprehensive knowledge will benefit further advanced research into moulting and toxicology studies in this indicator species, especially for females.

Keywords: Acute exposure; Bioaccumulation; Brix.