BENZOPHENONE-3 NEPHROTOXIC IMPACTS IN ZEBRAFISH MODEL: HISTOPATHOLOGICAL AND OXIDATIVE IMBALANCE ALTERATIONS

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ABSTRACT

INTRODUCTION: Benzophenone-3 (BP-3), widely used as a UV photostabilizer in sunscreens, has been shown to cause adverse effects in vertebrates, prompting concerns regarding its potential risks to human health. Notably, its ability to penetrate into the deepest layers - attributed to its relatively low lipophilicity and consequently reduced retention of the barrier level - suggests possible interactions beyond the stratum corneal. **GOAL:** This study aimed to investigate the impact of BP-3 exposure (1 μg/L) on the renal histology and oxidative stress in Zebrafish (*Danio rerio*) over 96 hours. **MATERIALS AND METHODS:** Adult Zebrafish were randomly distributed into 20-liter aquaria and assigned to one of three experimental groups in triplicate (n = 10 per group): water control, solvent control (ethanol 0.01%), and BP-3 exposure (1 ug/L). A stock solution of BP-3 was prepared in 99.8% ethanol. The selected exposure concentration was based on reported environmental levels of BP-3 in aquatic ecosystems (ranging from 0.5 to 1400 μg/L). **RESULTS AND CONCLUSION:** The results showed that the exposure to BP-3 induced significant histophatological alterations, including glomerular capillary dilation, increased Bowman's space, vacuolization and hypertrophy of tubular cells and focal necrosis. Furthermore, a significant increase was observed in the activity of superoxidized dismutase (SOD) and a decrease in the activity of catalase (CAT), indicating an imbalance in the renal antioxidant system. These alterations suggest that BP-3 may impair renal function and compromise the organism's detoxification capacity. Collectively, these findings reinforce the toxic potential of BP-3 and support further regulatory scrutiny regarding its inclusion in cosmetics. The study also highlights the relevance of the Zebrafish in toxicological assessments of environmental contaminants.

Keywords: sunscreen; contaminant; renal histopathology.