POSTER

IMMUNE HANDLING OF PET NANOPLASTICS IN *POMACEA CANALICULATA*: ACCUMULATION BY CIRCULATING AND TISSUE-RESIDENT HEMOCYTES FOLLOWING ACUTE EXPOSURE

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The contamination of freshwater ecosystems by nanoplastics (NPs) is a growing concern, yet the eco-immunological responses of freshwater invertebrates remain largely unexplored. We characterized the short-term fate and immunological impact of fluorescently labelled Polyethylene terephthalate (PET)-NPs (Nile Red, mean diameter 82 nm) in the eco-immunological model Pomacea canaliculata, a freshwater snail with remarkable physiological resilience and a well-characterised innate immune system. Animals were injected in foot with 5 or 10 mg/L PET-NPs and sacrificed at 24 or 72 hours post-injection (hpi). Fluorescence microscopy on cryosections revealed rapid PET-NPs accumulation in both kidneys, persisting up to 72 hpi independently of dose. Despite clear particle accumulation, histological examination showed no signs of tissue damage. Transcriptional analysis of stress (Pc-HSP70, Pc-HSP90) and immune (Pc-AIF1) markers revealed no organ-specific modulations, with downregulation at 72 hpi in the lower dose group. Circulating hemocytes from injected animals showed internalized PET-NPs in both adherent cells displaying pseudopodia and smaller, round hemocytes. Intercellular particle transfer via cytoplasmic protrusions was also observed, as reported in other molluscs. Ex vivo phagocytosis experiments confirmed a positive correlation between PET-NP concentration and phagocytic activity, significantly reduced by anticoagulant treatment, supporting active NPs internalization. These findings indicate that P. canaliculata rapidly sequesters PET-NPs in immune-associated tissues through hemocyte-mediated mechanisms, with limited short-term physiological impact. This study promotes P. canaliculata as a resilient model for eco-immunological research on NPs and lays the groundwork for future investigations into chronic exposure and immune modulation.

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