

Acute toxicity of nanoplastics on *Artemia franciscana*: study of the effects of polyethylene terephthalate (PET) nanoplastics on the swimming behavior

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Anthropogenic activities result in the release of pollutants into the marine environment, which represents a worldwide threat to the health of marine organisms and in turn endangers biodiversity. Among contaminants of emerging concern micro- and nanoplastics (MPs/NPs) have become a priority issue in recent years due to their presence and accumulation in all studied ecosystems. The present work aims to study the effects of polyethylene terephthalate (PET) NPs on the motility of mesozooplankton, using *Artemia franciscana* as a model organism. This species is a mesozooplankton organism widely used in ecotoxicological studies. In the last decade, *Artemia Franciscana* has started to gain attention as a biological model suitable for nanoecotoxicity testing. For the purpose of the study, polyethylene terephthalate (PET) environmentally relevant model nanoplastics, similar to those found in the marine environment, produced by means of a fast top-down approach based on mechanical fragmentation, were used. Behavior analysis of the organisms exposed for 24 and 48h to PET NPs was performed using a cell phone camera employing image recognition protocols for automated analysis, allowing real-time integration of behavioral recordings with measurements of physiological outcomes during acute exposure of *Artemia franciscana* to nano-sized PET. The short-term exposure to PET nanoparticles induced significant alterations, consisting in changes of trajectories and acceleration. The obtained results highlight the potential impact that PET NP litter can exert on marine mesozooplankton. The used methodological approaches represent a new direction

that could miniaturize and revolutionize research in aquatic ecotoxicology to study the effects of nanoplastics in field biomonitoring applications.