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Do microplastics affect the bioavailability of harmful pollutants?
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INTRODUCTION:
Microplastic Definition = Pieces of plastic smaller than five millimetres (Arthur et al., 2009).

What we know ➤
• Millions of tonnes of plastic are produced every year (Browne et al., 2011)
• Microplastics are dispersed globally in the oceans (Thompson et al., 2004)
• Microplastics accumulate harmful toxic compounds (including phenanthrene), up to a million times more than sea water (Melo et al., 2001)
• Many marine organisms ingest microplastic at different trophic levels (Gregory, 2009)

What we don’t know ➤
• If the harmful toxic compounds on the surface of microplastics go into the tissues of the organisms (bioavailability)

Research aims ➤

METHOD:
• Contaminate microplastic particles (200-250 µm) with Phenanthrene (Phe)
• Expose zebrafish larvae to contaminated plastic (PVC) in benthic and pelagic scenarios

• Analyse cyp1a gene expression as a biomarker for bioavailability

RESULTS:
1.) Benthic scenario

2.) Pelagic scenario

3.) cyp1a expression to Phe conc. dose-response

DISCUSSION:
➤ Phe induces cyp1a in concentrations of 0.1mg L\(^{-1}\) and above
➤ Using cyp1a as a biomarker of bioavailability, it was demonstrated that microplastics reduce the bioavailability of Phe in two ecological scenarios
➤ Overall it was shown that microplastics modify the bioavailability of co-contaminants, highlighting the need for further research into the ecological fate of sorbed pollutants
➤ The present study provides a novel and effective method for studying the bioavailability of microplastic co-contaminants

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