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UPTAKE OF TEXTILE POLYETHYLENE TEREPHTHALATE MICROPLASTIC FIBRES BY FRESHWATER CRUSTACEAN DAPHNIA MAGNA

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THE AIM: Textiles are a recognized source of microplastics (MP) released into the freshwater environment via sewage discharges. However, very little information is currently available on the ingestion and effects of textile-derived microplastic fibres on freshwater organisms. In the current work we focused on the effect on the freshwater crustacean water flea *Daphnia magna* which is one of the dominant members of freshwater zooplankton and it is commonly used as a fundamental model in ecotoxicology and aquatic ecology.

EXPERIMENTAL SET-UP

MICROPLASTIC PROPERTIES

- Short, flattened PET fibers (density 1.38 g/cm³) with approximate length in the range 60 um - 1,270 mm, width 30 - 530 um, and the thickness 2 um - 22 um. The average aspect ratio was 3,2.
- After 48 h of MP incubation in daphnids test medium (ISO 6341:2012)- no leaching of chemicals from MP (GC-MS analysis)





TOXICITY TEST



ENDPOINTS:

- Ingestion of MP-
- SEM analysis of gut content **24 h recovery**
- Survival
 - Body length
- Moult rate
- MP free medium

crustacean water flea Daphnia magna 48 h acute toxicity tests were carried out according to EN ISO 6341:2012 (Daphtoxkit). Daphnids were fed prior to experiment

RESULTS AND DISCUSSION

INGESTION OF MP

ADVERSE EFFECTS ON DAPHNIDS



CONCLUSIONS:

Contrary to our expectations, crustaceans *Daphnia magna* ingest extremely large fibres of textile MP (up to 1,4 mm in length!) Ingestion of long MP fibres result in increased mortality even after incubation in MP free medium

- Further work is needed to investigate the sublethal effects on daphnids after prolonged feeding on MP fibres

