

LimnoPlast ITN: Chronic toxicity of microplastics in fish species



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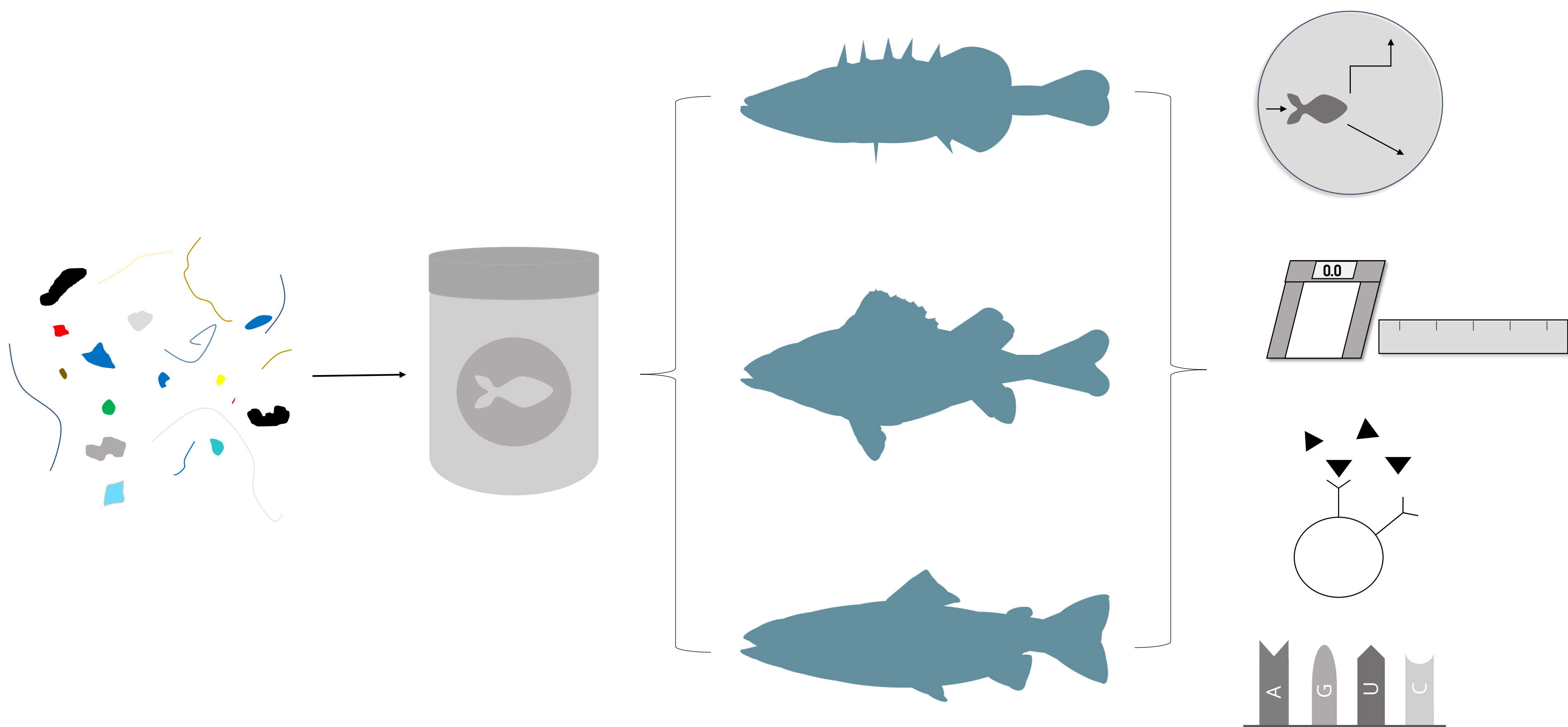


The issue: Increasing plastic pollution and the degradation of these plastics to microplastics in the environment is an omnipresent problem. The endangering of marine ecosystems by polymer particles and fibers has caught the attention of both scientists and the public, whereas freshwater ecosystems require more research on this topic. This is the target of LimnoPlast ITN, an interdisciplinary approach on microplastics in freshwater systems.

Microplastics have been shown to harm organisms on several levels in a variety of studies², yet the mechanisms and extent are still unknown. Further studies are required to determine the which combinations of factors are driving impacts (particles, polymers, chemicals).

The project: This research project is part of the ITN project LimnoPlast, funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska Curie grant agreement no 860720.

Acute and chronic toxicity of several different polymers, which are biodegradable and/or biobased, will be studied. Particles ranging in size from 45 - 200 μm will be used in in vivo exposure experiments with several freshwater fish species. Focus will be placed on fish species endemic to Northern Europe, like rainbow trout, stickleback or perch. The fish will be exposed to microplastics via food pellets, trophic transfer and/or water/sediment exposures. We will place focus on end points with ecological relevance, and the fish will be exposed in adult and larval stages. Studies of toxicity will be based on behavioral endpoints, gene/protein expression, hormone levels, life cycle parameters and immune responses. In vitro assays may be used to elucidate toxicity of chemical extracts. Additionally, accumulation of microplastics in fish tissues and faeces will be determined, as there will be possible changes in the polymers as they pass through the gut.



The projected outcome: The fate and toxicity of chosen microplastics will be determined, and the impacts in life stages, exposure time and polymer/particle properties further elucidated.

References: 1: <https://www.amcham.se/newsarchive/2019/4/16/nordics-push-for-agreement-on-plastics>

2: SAPEA, Science Advice for Policy by European Academies. (2019). A Scientific Perspective on Microplastics in Nature and Society. Berlin: SAPEA. <https://doi.org/10.26356/microplastics>

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