

BIODEGRADABLE BIOPLASTICS: ASSESSING ENVIRONMENTAL RISK

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INTRODUCTION

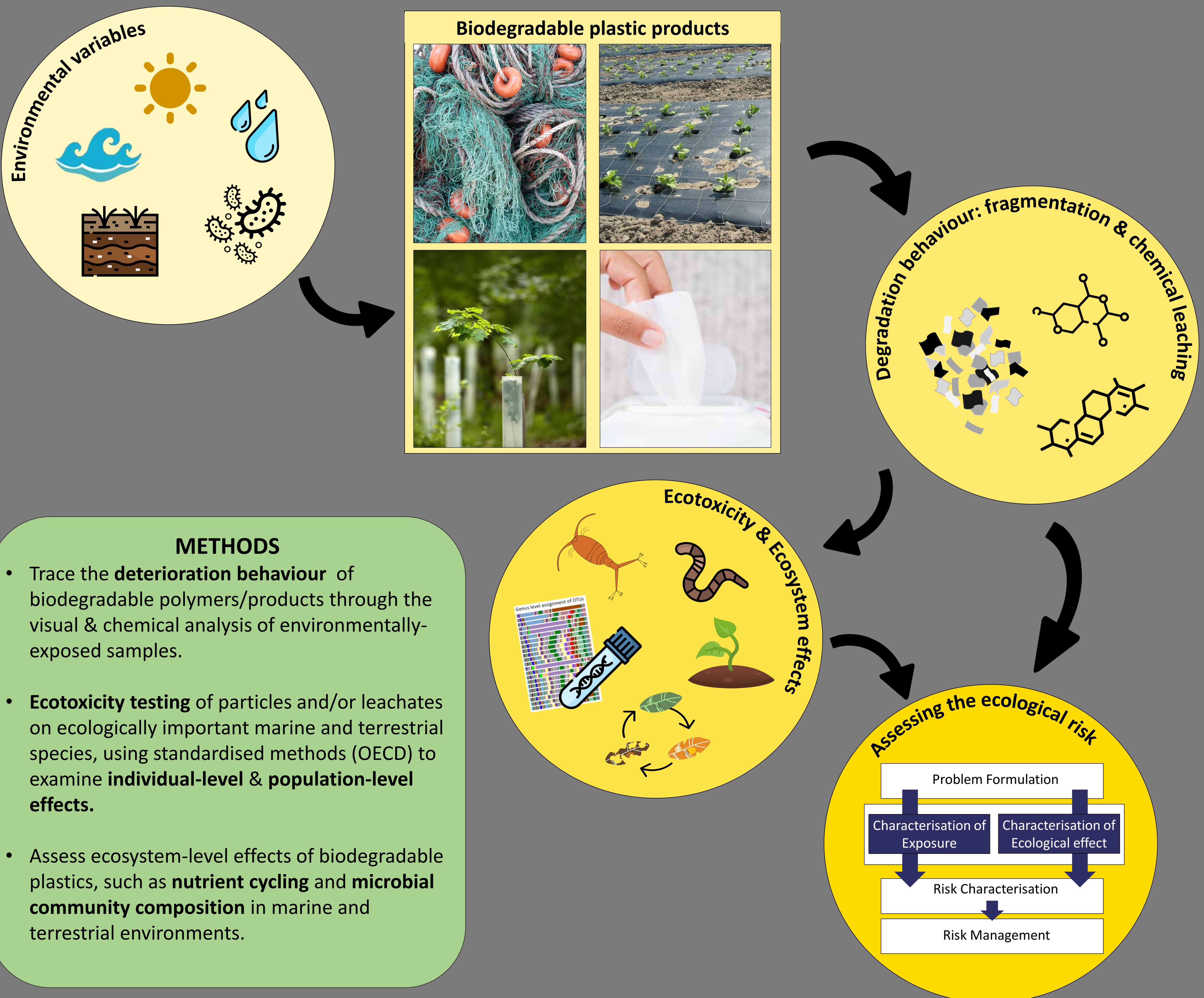
The production of biodegradable polymers has been proposed as part of the solution to combat increasing quantities of plastic in the environment¹. In contrast to 'conventional' non-degradable plastics, biodegradable polymers should mineralize into water, carbon dioxide and biomass once in the environment².

The **degradation of biodegradable polymers in the environment and their associated ecological consequences remains unclear**. These data are required to evaluate the risks posed by biodegradable plastics.

AIMS

For biodegradable plastic products with defined pathways to enter & remain in the environment (e.g. agricultural films, tree guards, fishing gear, nonwoven products), examine:

1. How the **deterioration of biodegradable** polymers, exposed to differing environmental conditions varies over time
2. If biodegradable plastics and their associated chemicals induce **detrimental effects on fauna and flora**
3. If biodegradable plastics cause **impacts on ecosystem functioning**
4. Assess the **ecological risks** posed by biodegradable polymers



METHODS

- Trace the **deterioration behaviour** of biodegradable polymers/products through the visual & chemical analysis of environmentally-exposed samples.
- **Ecotoxicity testing** of particles and/or leachates on ecologically important marine and terrestrial species, using standardised methods (OECD) to examine **individual-level & population-level effects**.
- Assess ecosystem-level effects of biodegradable plastics, such as **nutrient cycling** and **microbial community composition** in marine and terrestrial environments.

REFERENCES & ACKNOWLEDGEMENT

¹ European Union (2019). Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment. European Union. EU 2019/904: 19

² Vert, M., Y. Doi, K.-H. Hellwich, M. Hess, P. Hodge, P. Kubisa, M. Rinaudo and F. Schué (2012). Terminology for biorelated polymers and applications (IUPAC Recommendations 2012). Pure and Applied Chemistry, 84(2): 377-410.

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