

Microplastic pollution of the ocean - Trillions of tiny threats?

A recent study has estimated that by the year 2050 there will be more plastic than fish in the world oceans, measured by weight. Considering the ever increasing production of plastic and the alarming amounts that reach the ocean each year, this is not an unlikely scenario. The reason plastic waste is so problematic, is that it is extremely durable. Instead of decomposing, it only breaks into smaller and smaller pieces, yet remains plastic. And the smaller the pieces get, the more easily they can enter the food chain.

Once the pieces of plastic become smaller than 5 mm in diameter, they fit under the definition "microplastics". These small plastic fragments have been found virtually everywhere that we have looked for them, in all kinds of marine environments, from the Arctic to the Antarctic. Especially high concentrations of microplastics have been found close to population centres, but also in so called *sub-tropical ocean gyres*,



which are large, circular current patterns that trap floating plastic waste, following long distance transportation. However, the plastic floating on the ocean surface is only a fraction of the plastic that has entered the marine environment, and it is still unknown where most of it ends up.

Consequences?

Plastic in itself, is not particularly harmful when it comes to toxicity. However, plastic usually contains a bunch of harmful chemicals, which are added to change the properties of the plastic. In addition, plastic tends to attract harmful chemicals from the ocean, which stick to the surface of the plastic. Microplastics in particular can become highly toxic this way, since their surface area is so big compared to their volume. It is therefore a concern that microplastics might act as a carrier of these harmful chemicals into the food chain, since a wide variety of marine organisms mistake these plastic fragments for food.

The impact of microplastic pollution is still poorly understood and few field studies have attempted to investigate this. However, an increasing amount of laboratory studies on the subject are emerging, and some of them have already demonstrated negative effects of microplastic exposure. For example, an impaired function has been seen in organisms such as algae and plankton. These indications of negative effects to the base of the food chain should not be taken lightly, as they could affect the productivity of the entire marine ecosystem.

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