BE THE WAVE
AR FRIG Y DON

Microfibres

Background Information

cadwch keep gymru'n wales daclus tidy

MARINE CONSERVATION SOCIETY

UNDEB EWROPEAIDD EUROPEAN UNION

Llywodraeth Cymru Welsh Government

Cronfeydd Strwythurol a Buddosoddi Ewropeaidd

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Microplastics are defined as plastic particles **less than 5mm in size**.

Primary microplastics can be a voluntary addition to products such as scrubbing agents in personal care products (shower gels, creams, etc.).

Secondary microplastics originate from the abrasion of large plastic objects during manufacturing use or maintenance such as the erosion of tyres when driving or the abrasion of synthetic textiles during washing.

Plastic has penetrated everyday life, this is due to its properties. Plastic is cheap, durable, lightweight and malleable, resulting in a practically unlimited number of possible applications. The disadvantages of plastics however are large quantities of plastics leak into rivers and oceans, with adverse effects to marine ecosystems and related economic activities.

Over the past few decades, microbeads have increasingly been used in a wide range of products, including (but not limited to) facial and body scrubs, toothpastes, and washing powders. These small pieces of plastic are designed to be washed down the drain and end up discharged to the ocean through our sewerage systems. The deliberate inclusion of microbeads in cosmetics was banned in the UK in 2018. Microbeads are different to microplastics. Microbeads are typically between 0.5 and 500mm spherical and added as exfoliant to cosmetics. Cosmetics can still contain microplastic such as polyethene and polypropylene and used as fillers in cosmetics.

Microplastics in the marine environment are a serious concern, because:

They are eaten by aquatic life at all stages of the food chain, from plankton through to fish and marine mammals, including species important to fisheries and ecosystem function.

- The transfer of microplastics up the food chain has been demonstrated,
- They release toxic chemicals into the surrounding water, and attract chemicals onto their surface, which can have toxic impacts on living organisms
- They persist in the environment for hundreds of years
- They have been found in every ocean and in all marine habitats.
- Once released into the marine environment, it is impossible to clean them up

The overwhelming majority of the losses of primary microplastics (98%) are generated from land based activities. Only 2% is generated from activities at sea. The largest proportion of these particles stem from the laundering of synthetic textiles and from the abrasion of tyres while driving. Most of the releases to the oceans are occurring from the use of products (49%) or the maintenance of products (28%). The main pathways of these plastics into the ocean are through road runoff (66%), wastewater treatment systems (25%) and wind transfer (7%)

By 2018, in marine and freshwater ecosystems combined, microplastics had been found in more than 114 aquatic species. Microplastics have been found lodged in the digestive tracts and tissues of various invertebrate sea animals, including crustaceans such as crabs. Fish and birds are likely to ingest microplastics floating on the water surface, mistaking the plastic bits for food. The ingestion of microplastics can cause aquatic species to consume less food and therefore to have less energy to carry out life functions, and it can result in neurological and reproductive toxicity. Microplastics are suspected of working their way up the marine food chains, from zooplankton and small fish to large marine predators.

Microplastics have been detected in drinking water, beer, and food products, including seafood and table salt. In a pilot study involving eight individuals from eight different countries, microplastics were recovered from stool samples of every participant. Scientists have also detected microplastics in human tissues and organs. The implications of these findings for human health were uncertain.

Reducing microplastics pollution

Between 1950 and 2015, some 6,300 million metric tons of plastic waste were generated. The majority of this waste, about 4,900 million metric tons, ended up in landfills and the environment. On the basis of trends from that period, researchers estimated that by 2050 the amount of plastic waste in landfills and the environment would reach 12,000 million metric tons. Nonetheless, the potential dangers of escalating plastics pollution, especially pollution from microplastics, remained largely ignored by governments and policy makers.

To help overcome this obstacle, organizations such as the United Nations Expert Panel of the United Nations Environmental Programme engaged more than 100 countries in educational campaigns aimed at raising awareness of plastics pollution and encouraging reuse and recycling of plastics. Other international cooperative programs were established to address marine wastes, including microplastics pollution. In 2015 the United States passed the Microbead-Free Waters Act, which prohibits the manufacture and distribution of rinse-off cosmetics products that contain plastic microbeads. Many other countries also placed bans on microbeads.

Remediation of microplastics already in the environment is another key component of reducing microplastics pollution. Strategies under investigation included the use of microorganisms capable of breaking down synthetic microplastic polymers. A number of bacterial and fungal species possess biodegradation capabilities, breaking down chemicals such as polystyrene, polyester polyurethane, and polyethylene. Such microorganisms potentially can be applied to sewage wastewater and other contaminated environments.

https://www.britannica.com/technology/microplastic

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