

MICROPLASTICS: AN EMERGING THREAT TO GLOBAL OCEANS

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Microplastics [MPs] include microbeads, fibers and fragments of plastics that are <5 mm in size. Mostly they are produced by solar UV-facilitated weathering of plastic litter in the marine environment. MPs are now ubiquitous in bodies of water worldwide. MPs are ingested by a wide range of marine organisms. Over 185 species of birds, 64 species of marine mammals and numerous plankton species are reported to ingest MPs. At some locations as much as 77% of fish sampled had MPs in their gut. Given the high plastic/water distribution coefficient, MPs tend to sorb and persistent organic pollutants (POPs) in sea water effectively. MPs derived from plastic products contain additives such as plasticizers and flame retardants (that include endocrine disruptors), used during manufacture. Ingestion thus provides a credible pathway for delivery of a variety of toxic chemicals into ingesting organisms. Weathering of plastic debris produces nanoplastics [NPs] or microparticles <micron, in addition to the MPs. Recent studies have shown that far more NPs are produced on weathering of plastics compared to MPs. Ingestion of NPs by marine organisms is even more concern because the smaller NPs can cross the gut tissue to enter their systemic circulation. Some evidence of NPs concentrating in specific organs in fish embryo have been reported, potential delivery of sorbed POPs directly to these organs magnifies their potential adverse physiological impacts. The possibility of MPs and NPs reaching the human consumer via seafood is a matter of concern. Whether this low intake of MP/NP *via* seafood is significant enough to result in health hazards is not known at this time. Even in the absence of enough data for a good risk assessment, a precautionary stance to limit the input of plastics into the oceans needs to be seriously considered.

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