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Marine Life is Toxic, Posing a Serious Global Risk to the Environment and Halal Certification

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Introduction

Since microplastics are so pervasive in nature and result from the degradation of plastics, they have an impact on both wildlife and people. They have also been found in drinking water and a variety of foods, including salt, honey, and marine organisms, in addition to many marine species. Air inhalation can also expose one to microplastics. According to data from animal studies, plastic micro and nanoparticles can spread to the liver, spleen, heart, lungs, thymus, reproductive organs, kidneys, and even the brain after being absorbed (crosses the blood–brain barrier). Microplastics also act as carriers of heavy metals or persistent organic pollutants from invertebrate organisms to other higher trophic levels. After consumption, the monomers and additives in their formulation can affect crucial biological processes [1].

In the late 19th century, around the 1860s, synthetic polymers first appeared, but the "plastics boom" didn't really start until after World War II. Since its beginnings as a phenol-formaldehyde resin, plastic has evolved into one of the most commonly used materials. The primary goal of plastic was to enhance human living conditions, but it is now recognised as a serious threat to the planet's safety and the environment. Today, plastic is found everywhere in the environment (air, water, and soil), particularly because the food packaging for foods like dairy, meat, fish, and beverages like mineral water that is sold on the market is largely made of plastic. There is almost no contact between food and plastic packaging [2].

Sometimes the nutritional qualities are changed in the packaging composition, doubling them and endangering consumer safety. Even rain and snow contain significant amounts of microplastics, some of which are often invisible to the naked eye. Microplastics have been found in soil ecosystems, surface waters, coastal sediments, beach sands, freshwater sediments, and deep environments. In fact, there has been a significant buildup of plastic waste in the environment due to the extensive use of plastic and the subpar performance of waste management systems, including end-of-life collection and capture. Plastic waste discharge into the environment is acknowledged as a significant pollution issue [3].

Microplastics are becoming more and more prevalent in the environment, which is seriously polluting the planet. Microplastics are easily introduced into the environment and remain there for a long time due to their characteristics, which include synthetic materials with a high polymer content, solid particles smaller than 5 mm, insoluble in water, and non-degradable. Food chains experience significant pollution as a result of hydrophobic organic chemical emissions. Marine organisms are either directly or indirectly exposed to microplastics due to their presence in a variety of aquatic ecosystems (surface waters, oceans, estuarine waters, etc.). The adverse effects of microplastics on benthic organisms are documented in the scientific literature. The toxic effects of these pollutants on the feeding habits, growth, and reproductive systems of various aquatic species have been studied. Consequently, consumption of seafood exposes humans to these pollutants [4].

Description

Microplastic (MP) or Nanoplastic (NP) particles are produced as a result of the degradation of plastic waste. With MPs having a diameter of less than 5 mm and NPs having a diameter of 1 to 100 or 1000 nm, this division is based on the size of the plastic fragments or particles. The scientific literature offers additional details and classifications of microplastics regarding the diameter of plastic particle sizes. When it was first mentioned in 2004, 20-m-diameter plastic fragments were referred to as "microplastic." Despite the fact that these early reports discussed genuinely microscopic particles, they lacked a clear definition of microplastics. The first international workshop on microplastics was held in Washington, D.C., in 2008, and as part of that event, the National Oceanographic and Atmospheric Administration (NOAA) of the United States [5].

This article's goal is to raise awareness of the seriousness of the threat posed by microplastic contamination of the environment and its detrimental effects on the food supply and implicitly on human health, highlighting the necessity of stepping up efforts to halt the spread of these particularly adaptable and toxic pollutants. The devastating effects of microplastics on the environment and the safety of food intended for human consumption are better understood when these contaminants are presented in detail, correlated with the categories of food products most at risk of contamination, and the disruptive mechanisms at the level of live food sources as well as in the body.

There is enough data to support the claim that microplastics have harmful effects on living things, particularly aquatic species that are otherwise regarded as important sources of nutrients for people. As a result, the buildup of microplastics in marine organisms poses a threat to both the health of consumers who consume contaminated species and the survival of these nutrient-rich species.Unfortunately, it has become clear that many types of food products, including some that are consumed frequently and in large quantities, such as drinking water and kitchen salt, have microplastic contamination.

90 percent of the waste floating in the seas and oceans is made of plastic materials, which account for 60 to 80 percent of the waste found in the marine environment. Due to the possibility of marine life ingesting plastic waste, it poses a threat to both the environment and the marine fauna. According to statistics, this issue affects at least 267 species worldwide, including 86% of turtles, 44% of birds, 43% of mammals, and 44% of fish species. The growing number of marine species that are impacted by plastic waste is evidence that it has a detrimental effect on the health of marine ecosystems. These plastic material fragments, which have broken down into microparticles suspended in the water column or have been deposited in sediments, slow down or stop the vertical.

Ingesting food, such as seafood contaminated with microplastics, commercially processed fish, sea salt, honey, beer, and food ingredients, is the main way that people are exposed to MPs. The majority of these food products are occasionally also contaminated by contaminants found in the packaging and impurities from processing materials. The second method of exposure involves breathing in dust and air that contain MPs. Because seafood has a high nutritional value and is a staple of the human diet, eating contaminated seafood poses a health risk, especially for small fish that are consumed whole.

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Microplastics are created by degrading and fragmenting plastic waste or by mixing a variety of polymeric materials with different additives.

Conclusion

As was already mentioned, the size, shape, and colour of microplastics serve as general descriptors. Although definitions vary between research groups, the five categories of fragments, spheres, fibres, granules (or pellets) of industrial plastic, and "foam" are generally used to classify the form of microplastics (which refers to fragments of expanded polystyrene). The two main sources of microplastics in the aquatic environment are primary microplastics, which are made directly into tiny particles, and secondary microplastics, which are made when larger plastic debris (>5 mm) is broken down using a combination of physical, chemical, and biological processes. This distinction makes it possible to identify specific microplastic sources and take preventative action to lessen their impact on the environment.

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Conflict of Interest

There is no conflict of interest by author.

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