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Review of aquatic creature factors in human-involved environments

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ABSTRACT

Concerns regarding the accumulation of microplastic in fish cages that could have an effect on human health when consumed are raised by the way farmed fish bite nylon netting. Net biting is actually caused by biofouling on the mesh, which is a tasty food that attracts fish. Therefore, it is possible that some of the microplastics from the mesh will be consumed by fish and that after people eat the fish, those microplastics will enter their digestive systems. Additionally, through marine currents, land fluxes, and feeding chains in the ocean, caged fish may come into contact with microplastics. Comparisons with natural populations of Turkish and Iranian fish have been done in order to assess the level of microplastic contamination in fish kept in cages. seas, in order to demonstrate the dangers of fish-to-human microplastic transmission. The amount of microplastics in diets has been assessed through analyses of water samples, sediments, diets, zooplankton, and fish tissues. The FT-IR spectrometer was used to identify the polymeric components in the collected microplastics, and Raman spectrometry was used to ascertain the shape, size, and polymer type of the microplastics. Based on the preliminary findings, the connection between the hazards to human health associated with consuming contaminated fish and the effect of cage nets on microplastic buildup in fish digestive systems has been evaluated. The results of this study could contribute to the development of sustainable cage aquaculture management practices that ensure future generations have access to healthy food.

Keywords: Microplastics; Farmed fish; Consumer health

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INTRODUCTION

Due to the extensive use of plastic materials as the only or primary material in the fabrication of fishing gear, nets, buckets, and other equipment in breeding, hatching, and rearing, plastics constitute an inseparable component of the aquaculture business [1,2]. Additionally, every year, enormous amounts of plastic garbage are released into the aquatic ecosystem [3].

Given the prevalence of microplastics in marine species that humans eat (especially species where the entire soft flesh is swallowed, like fish and shellfish), it seems inevitable that people who consume these foods will inhale at least some microplastics [4,5]. In order to examine the degree of microplastic (MPs) contamination in caged fish, comparisons with natural populations of Turkish and Iranian seas were made provided assistance for the study, which was carried out to highlight the dangers of MPs transmission from fish to people [6,7].

The following are the study's goals: Analyse the effects of plastic debris on fish species raised in cages in Turkey and Iran [8]. Examine the amount of MP in the water body, the bottom sediments, and commercial feed, zooplankton, and fish tissues to determine the origins of MP contamination. Examine the impact of cage net material on MP buildup in fish digestive systems and their relationship to dangers to human health when eating fish raised in cages [9].

METHODOLOGY

Fish from marine cages and the natural environment, including Gilthead seabream (Sparus aurata), Seabass (Dicentrarchus labrax), and Barramundi (Lates calcarifer) in Iran and Turkey, respectively.

Fish from the cage farm's harvest batch have been tested. Sampling sites were found in the provinces of Aydn and Mula, which are home to most of Turkey's cage aquaculture operations, off the country's Aegean Sea coast. The main cage farm regions in Iran are the coastal Provinces of Hormozgan and Bushehr, while the Persian Gulf is home to sample locations. In order to assess the concentration of MPs in fish, wild fish from the two study regions of Turkey and Iran have also been sampled using baited tackles from the environment [10].

The summer and winter are the sample seasons for the current investigation. Fish samples from previously designated areas in both nations were collected and sieved using sieves with varying mesh sizes before being cleaned, dried, and weighed in laboratories. Alkaline-oxidation-chemical-digestion procedures for the extraction

of microplastics from organics have been used to analyse water samples, sediments, fish meals, zooplankton, and fish tissues in order to determine the quantities of microplastics (MPs).

CONCLUSION

Microplastics (MPs) are known to exist in a variety of settings and species, and products from aquaculture systems, where the security of the food supply is a top priority, are no exception. Through the food chain and seafood for human consumers, the dramatic rise in industrial activity and the buildup of plastic products in the marine ecosystem represent a serious threat to human health. It has been emphasised that the presence of MPs demonstrates differences between species as well as between fish's gills and digestive systems, which were said to result from various anthropogenic activities. Additionally, it was discovered that MP consumption increased with exposure time but had no effect on the muscle tissues of gilthead seabream. Fishmeal used in aqua-diets has been highlighted as one source of MPs. This fishmeal is likely contaminated by the species used to produce it, and wild fish that are caught for fishmeal production are also exposed to a variety of MPs through the trophic chain. MPs have also been found in zooplankton (Daphnia magna) in the ocean.

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