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Analysis of Microplastics in the Digestive Tracts of Mackerel Tuna (*Euthynnus affinis*) and Skipjack Tuna (*Katsuwonus pelamis*) for SDG 14

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ABSTRACT

Objective: Marine ecosystems are increasingly threatened by microplastic pollution, which can accumulate in commercially important fish species and potentially affect human health. This study aimed to identify the characteristics and abundance of microplastics in the digestive tracts of mackerel tuna (*Euthynnus affinis*) and skipjack tuna (*Katsuwonus pelamis*) from Boneage waters, Donggala Regency, and examine the relationship between digestive tract size and microplastic abundance. **Method:** A quantitative descriptive approach was employed using 30 specimens of each fish species collected from local fishermen. Digestive tract samples were digested using 10% KOH, incubated at 75°C, filtered, and observed under a binocular microscope. Microplastic abundance was expressed as particles per gram of digestive tract weight. Simple linear regression analysis using SPSS 25 was performed to evaluate the relationship between digestive tract size and microplastic abundance. **Results:** Three microplastic types were identified: film, fragment, and fiber, with film being dominant in both species. Total microplastic abundance reached 3.940 particles/g in mackerel tuna and 3.071 particles/g in skipjack tuna. Regression analysis showed a weak positive relationship between digestive tract size and microplastic abundance ($R^2 = 0.137$ and 0.140), suggesting that other environmental and biological factors play a greater role. **Novelty:** Providing the first baseline data on microplastic contamination in mackerel tuna and skipjack tuna from Boneage waters, Central Sulawesi, and contributes to SDG 14 (Life Below Water) by strengthening evidence-based efforts to address marine microplastic pollution.

INTRODUCTION

Fish is a highly favored food due to its nutritional value, relatively low cost, and ease of availability. However, fish are not immune to the negative impacts of pollution in aquatic areas. The presence of microplastic contamination found in fish has prompted researchers in various countries to conduct studies to monitor the spread of microplastic pollution (Alwi, 2015). Examples of research on fish contaminated with microplastics include swanggi fish (*Priacanthus tayenus*) in the Brondong Lamongan Coastal Waters (Andrady, 2011), mackerel (*Rastrelliger* sp.), and scad (*Selaroides eptolepis*) in the Tambak Fish Market.

Mackerel tuna (*Euthynnus affinis*) and skipjack tuna (*Katsuwonus pelamis*) are commonly found in shallow tropical and subtropical waters (Barboza et al., 2018). Both species are highly favored due to their affordable prices, delicious taste, and abundant catches. Additionally, their bellies are frequently eaten by locals for their palatability. Mackerel tuna and skipjack tuna are carnivorous fish that primarily feed on Crustaceans, Cephalopods, and Mollusks (Barboza et al., 2018). These fish prefer to forage at night near the water's surface, with peak feeding activity in the early morning hours.

Both mackerel tuna and skipjack tuna have high economic value for export and domestic consumption due to their abundance and low cost (Dueri et al., 2016; Squires et al., 2023; Velmurugan et al., 2026). One of the landing areas for mackerel tuna and skipjack tuna is Boneage in Donggala Regency, Central Sulawesi (Hasanuddin, 2024). This area, in addition to being a fishing ground, is a tourist destination along the Donggala coast, where significant local activities have increased the volume of plastic waste generated by vendors and visitors.