

Preliminary analysis of microplastic load in avian digestive tracts across diverse trophic guilds

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Microplastics are nonbiodegradable particles (250 $\mu$ m-5mm) polluting environmental systems. Birds are model organisms for microplastic analysis due to high mobility, their distribution across trophic levels, and as examples of biomagnification for pollutants. This study recorded abundance and locations of microplastic accumulation in digestive tracts and how species-specific microplastic accumulation varies with mass and trophic level. Specimens (n=63) from 40 species were collected postmortem in Wisconsin with salvage permits. Digestive tracts were removed and treated with KOH to break down organic matter. The solution was density separated in CaCl<sub>2</sub> to remove heavier materials. Microplastics were isolated on filters for enumeration and general characterization via microscopy. In total, 1294 microplastics were found in 63 bird digestive tracts (mean[range]=19.2 [0-83] particles/bird). There was no significant difference in the site of microplastic accumulation within the digestive system and smaller birds exhibited a higher relative abundance of microplastics/grams of body weight. Microplastic abundance did not vary significantly among trophic guilds. These results confirm birds ingest microplastics, however harmful thresholds remain unknown. In the future, Fourier Transform Infrared (FTIR) Spectroscopy will verify microplastic polymer. Regardless, the prevalence of microplastics in birds highlights the importance of reducing plastic pollution and the need for monitoring microplastics in ecological systems.