

Characterization of microplastics in seawater, fish, and mussels from the Adriatic Sea

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INTRODUCTION

- marine fish and bivalves take up microplastic (MP) through ingestion or water filtration, but research on occurrence, distribution and identification of accumulated MP is still limited
- novel data on the distribution and types of MPs in specific tissues of bivalves and fish from the Adriatic Sea are presented
- the mass of the plastic waste in fish trawl in the Adriatic Sea represents 15-20 % of the total catch

METHODOLOGY

sampling area



SEAWATER

filtration: 1000 L
pumped through
set of sieves



> 1 mm
1 mm – 500 µm
500 – 125 µm
125 – 63 µm



vacuum filtration
over gold-coated
polyester filters
(5 µm pore size)

IR microscope



ORGANISMS

sea bream
(*Sparus aurata*)



gills
gonads

mussels
(*Mytilus galloprovincialis*)



gills
mantle

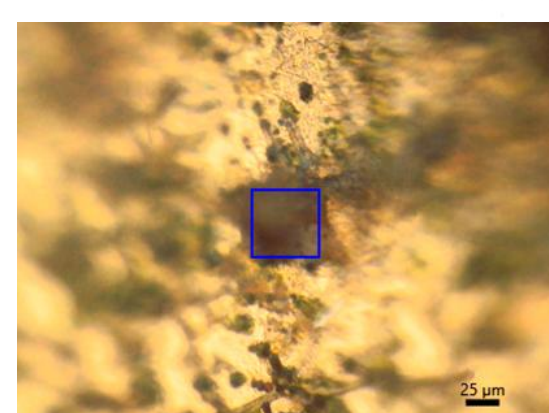
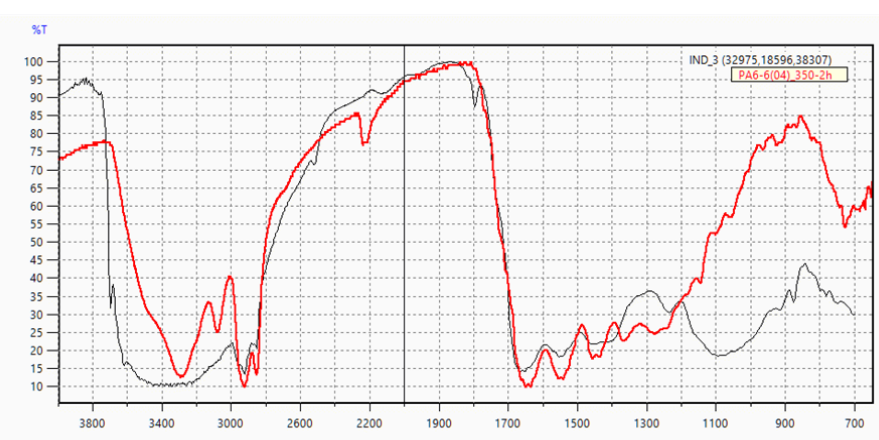
digestion
by HNO₃
at 85 °C
for 3.5 h

protective cabinet and "blank
sample" were used to check the
accuracy of the work and to
prevent contamination

RESULTS

SEAWATER

polyamide

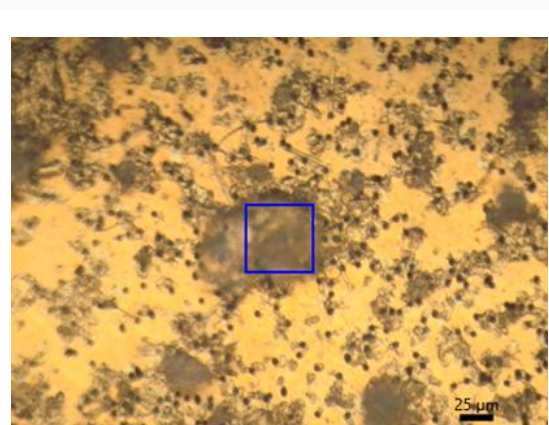
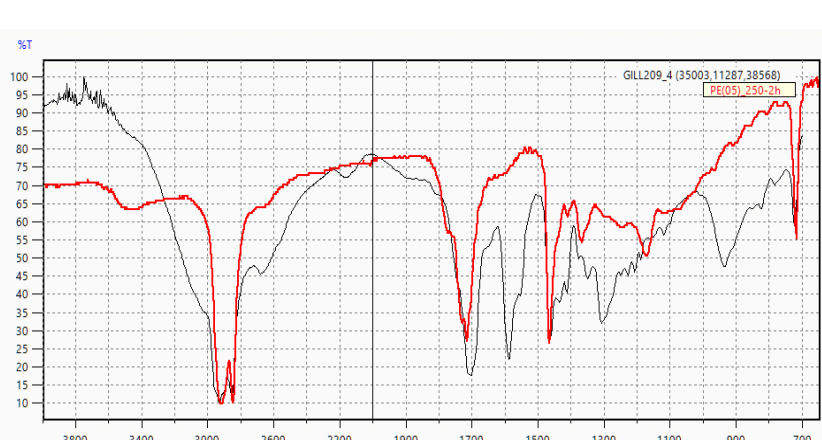


- higher MP abundance in smaller size fractions
- fibres were the most common shape

MUSSELS

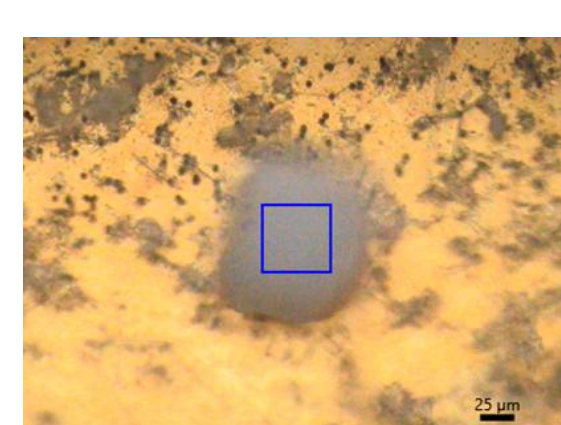
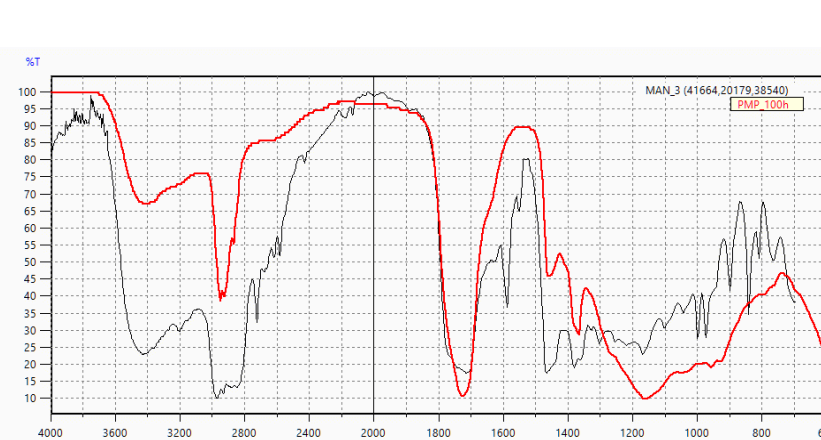
gills

polyethylene



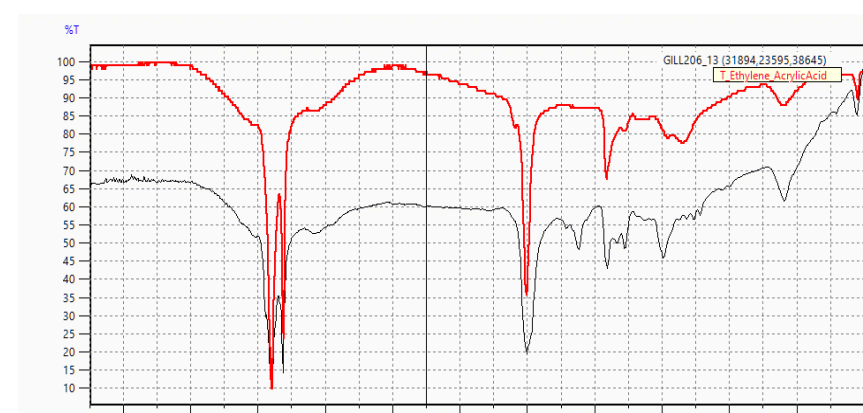
mantle

polymethylpentene

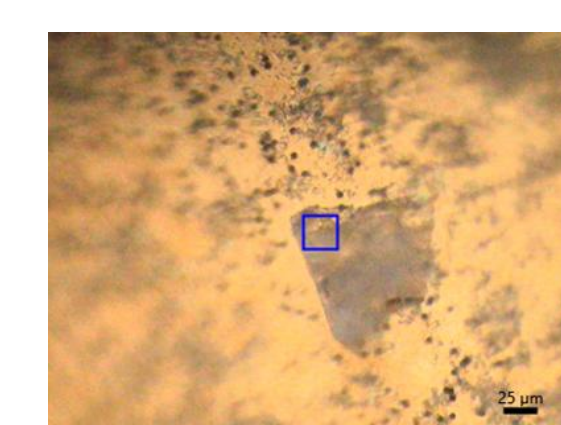
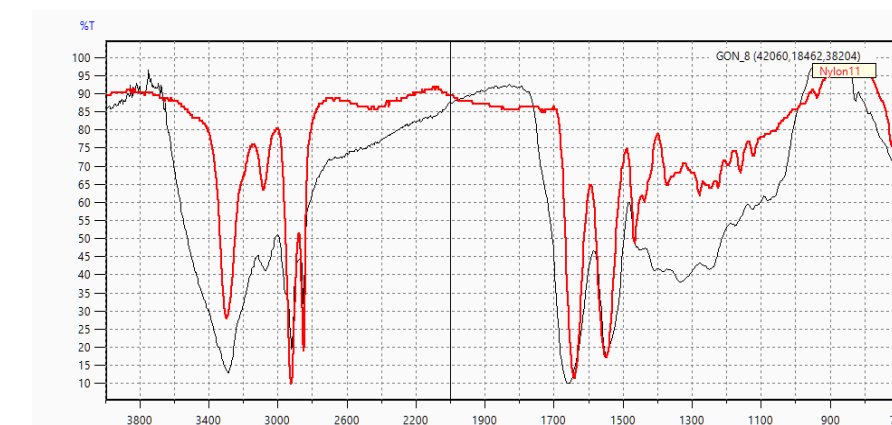


SEA BREAM

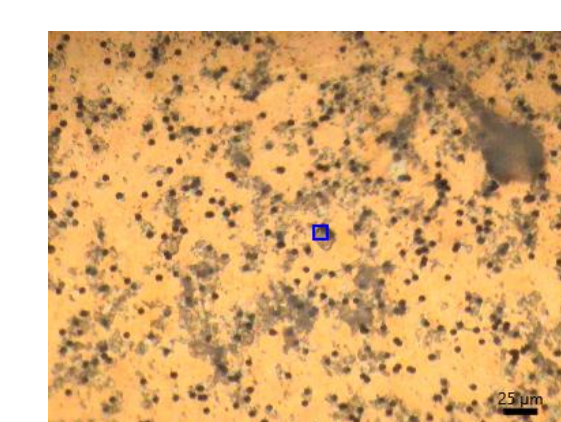
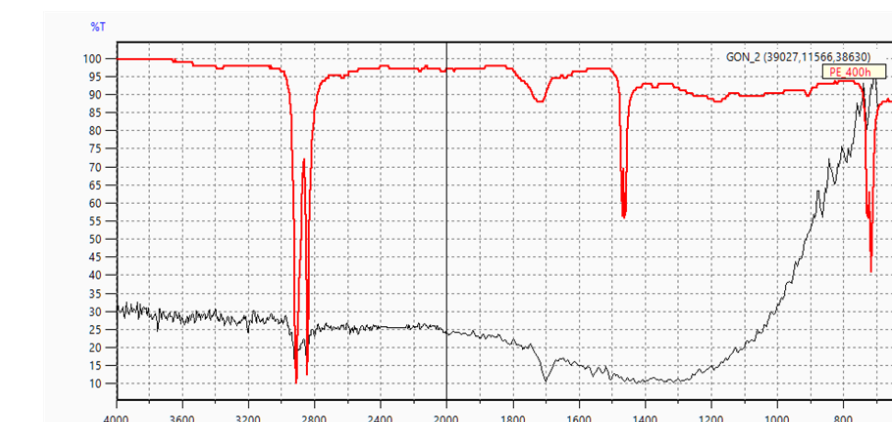
gills poly(ethylene-co-acrylic acid)



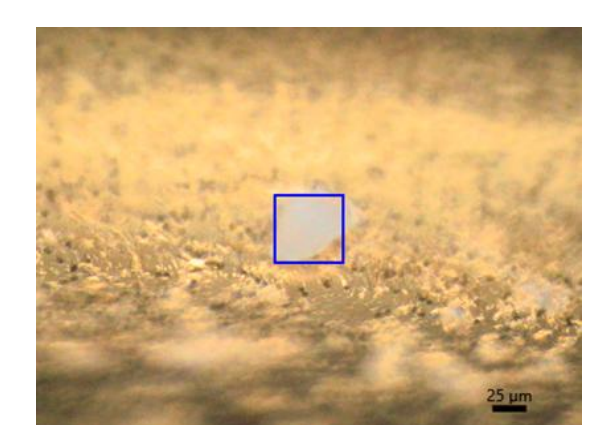
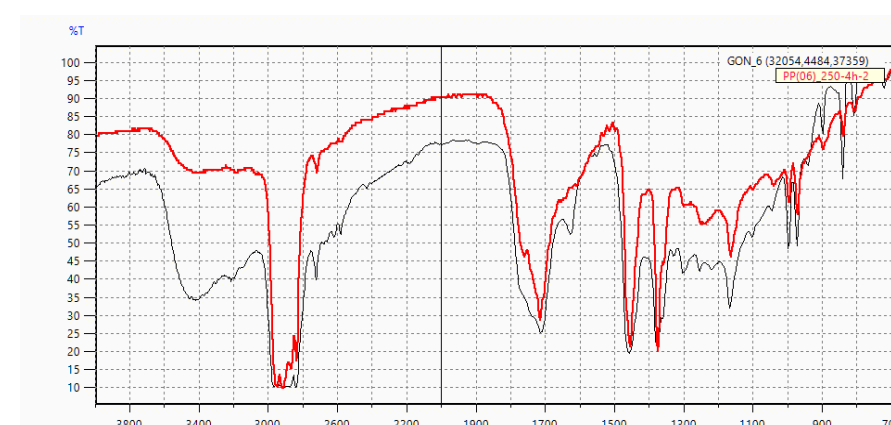
gonads polyamide



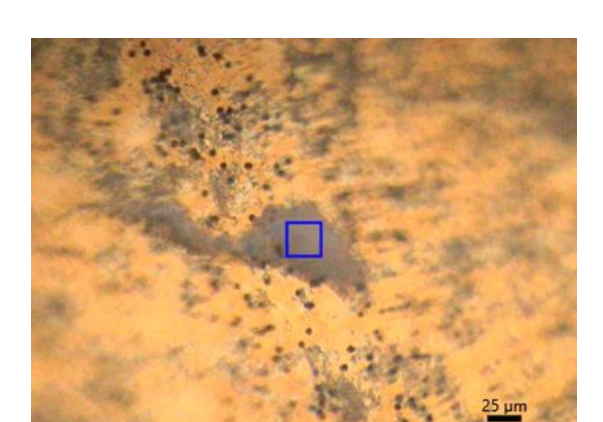
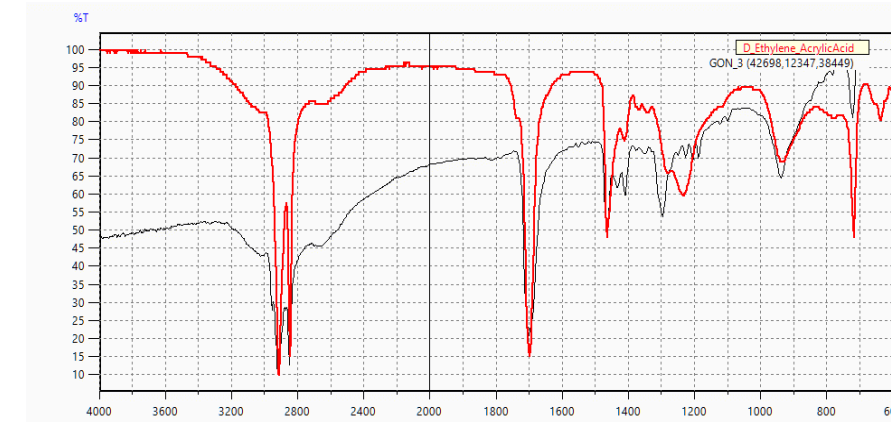
polyethylene



polypropylene



poly(ethylene-co-acrylic acid)



- although MPs were found in all tissues, the majority of isolated particles were of non-plastic origin

CONCLUSIONS

MP presence was confirmed in both seawater and marine organisms in the Adriatic Sea, underlining the need for continued monitoring of their exposure, accumulation, and potential biological impacts