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Assessment of microplastic particles ingested by *Mytilus galloprovincialis* along the Adriatic coast

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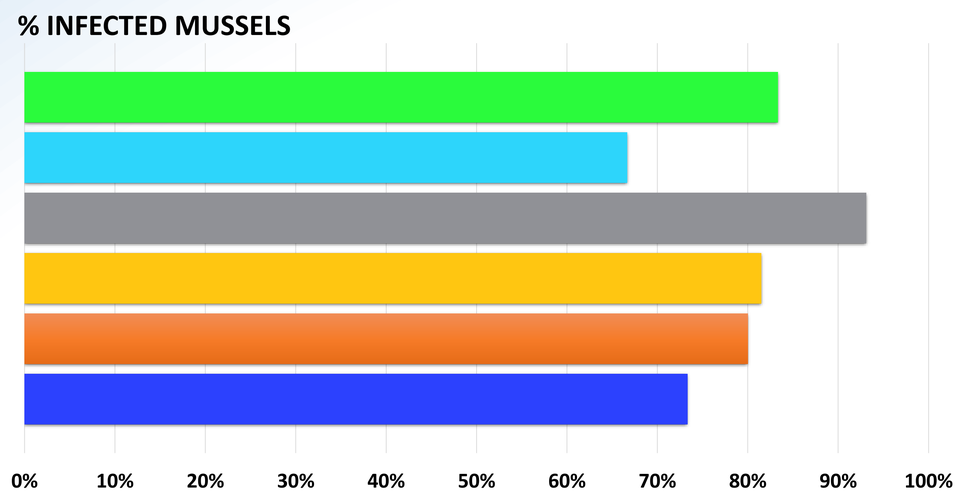
Introduction

Microplastic particles (MPs) smaller than 5mm in size are one of the most widespread pollutant and an emerging threat to marine ecosystem (Mercogliano et al., 2021). Mussels have been widely used for biomonitoring studies in the marine environment due to their broad geographical distribution and easy accessibility (Pizzurro et al., 2022). For this research, mussels *Mytilus galloprovincialis*, were sampled in 6 different stations located in the Adriatic Sea in the framework of the INTERREG IT-HR MARLESS pilot project with a total of 176 analyzed mussels. MP were found in mussels from all investigated regions *(Legend 1; Figure 1*).

Figure 1: Sampling regions

Materials and methods

- Collection of 30 *M. galloprovincialis* individua (4-6 cm in length) per site in 6 different region (*Figure 1.*) and analyzed in the laboratories of the Center for Marine Research, IRB in Rovinj, Croatia
- In order to avoid contamination, experiment was performed in an environment where we minimized MP contamination (glassware instead of plastic dishes and tips) and two blanks (''dry'' and ''wet'') were added to each batch of samples
- Mussels were freshly dissected and then stored at -20°C or frozen and dissected after thawing right before the experiment
- Dissected tissue digested in 35% H_2O_2 (50ml per gram tissue)
- Samples were heated at 60°C till completed tissue digestion
- 100ml of NaCl saturated solution (250g/L) was added to the sample and stirred for 2 minutes prior filtration
- Surface layer of sample was collected with a pipette and filtered over a 0.2 µm pore size Nucleopore™ Track-Etch Membrane cellulose filter
- Filters were transferred into a glass petri dish and left in the desiccator
- Dry samples were examined under Leica M205C stereomicroscope



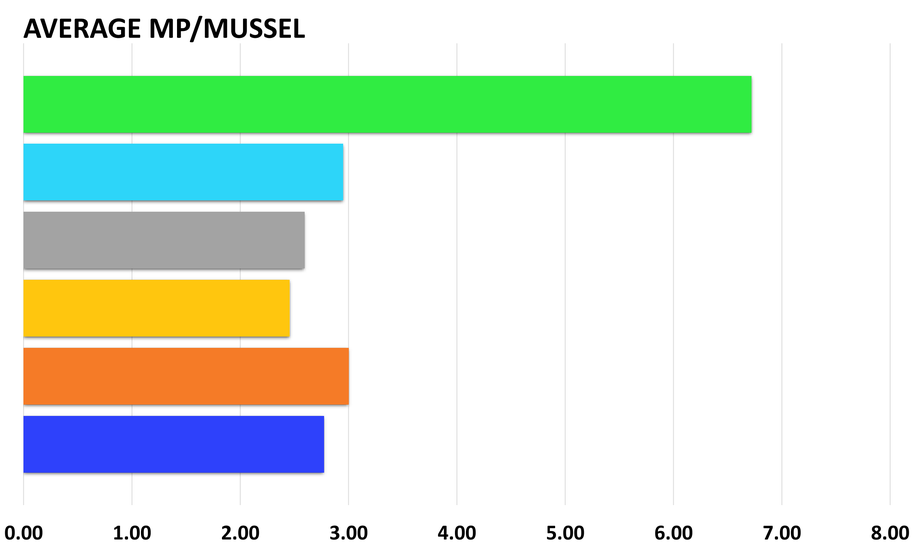
Graph 1: Frequency of infected mussels per region

DUBROVNIK -NERETVA | ISTRIA | FRIULI VENEZIA-GIULIA | VENETO | EMILIA ROMAGNA | PUGLIA

Legend 1: Names of the sampling regions associated with their marking color

RESULTS

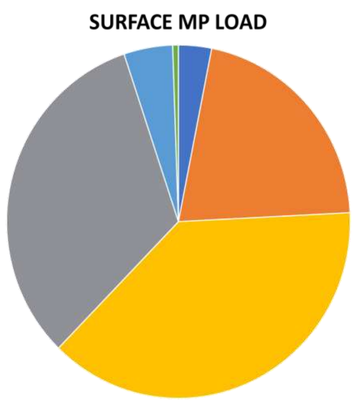
MPs are found in all the sampled regions. The results showed that the average frequency of MP occurrence (%F) in mussels is 80% with an average numerical abundance (%N) of 3 MP per mussel. Filaments are found to be the most prevalent group followed by plastic fragments while pellets were found only in one sample.



Graph 2: Average of microplastic particles found per mussel

DISCUSSION

MP were found in mussels from all investigated regions. Friuli Venezia-Giulia region has the highest infected rate but second lowest average MP/mussel number which is negatively correlated to the average surface MP load of the region (*Graph 3,* yellow area). On the other side, Dubrovnik-Neretva region, with the second highest rate of infected mussels has the highest average of MP/mussel, but is negatively correlated with the average surface MP load (Graph 3, green area). With this we conclude that there's no direct correlation between average MP found in mussels and the surface MP load.



Graph 3: Average surface microplastic particles load per region (paticles per km2). (source: LITTERBASE/AWI)

Biblopgraphy

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