

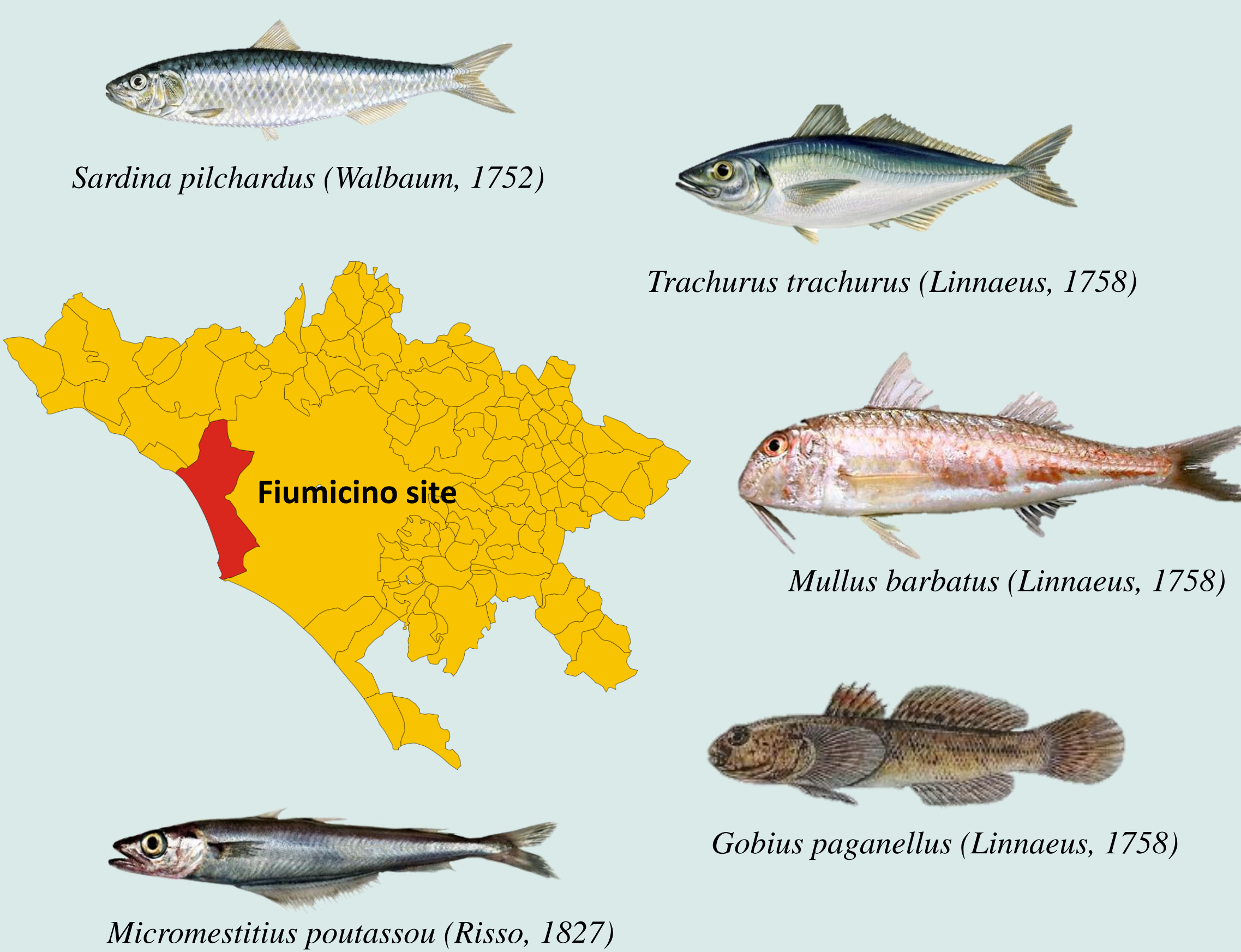
Introduction

- ❖ Every year, ca. 300.000 million tons of single-use plastic objects are produced worldwide which often enter and persist for centuries the marine environment as waste
- ❖ Microplastics ($1 \mu\text{m} < \text{MPs} < 5 \text{mm}$) are one of the category most harmful for organisms, since they can be ingested by a wide range of organisms provoking mechanical, physical and biochemical harms
- ❖ Human health is at risk, as the consumption of edible species, such as fishes, can lead to the ingestion and bioaccumulation of plastic particles in human bodies

AIMS: 1. detect MPs abundance and type (i.e. color, shape, size) in five fish species of commercial interest (*Gobius paganellus*, *Micromesistius poutassou*, *Mullus barbatus*, *Sardina pilchardus*, *Trachurus trachurus*) 2. Analyze the influence of ecological parameters (diet) on MPs contamination of fishes.



Material & methods



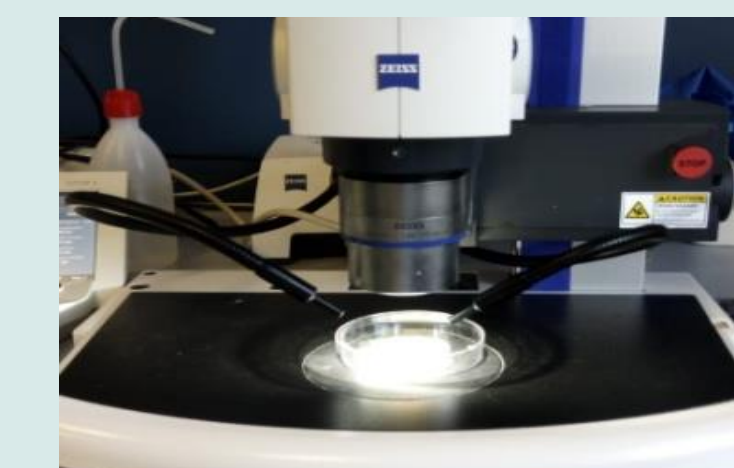
Identification of MPs



- ❖ **DIGESTION:** 15% H_2O_2 20ml each gram of tissue and store overnight at 60°C



- ❖ **FILTRATION:** vacuum pump on GF/DTM filters

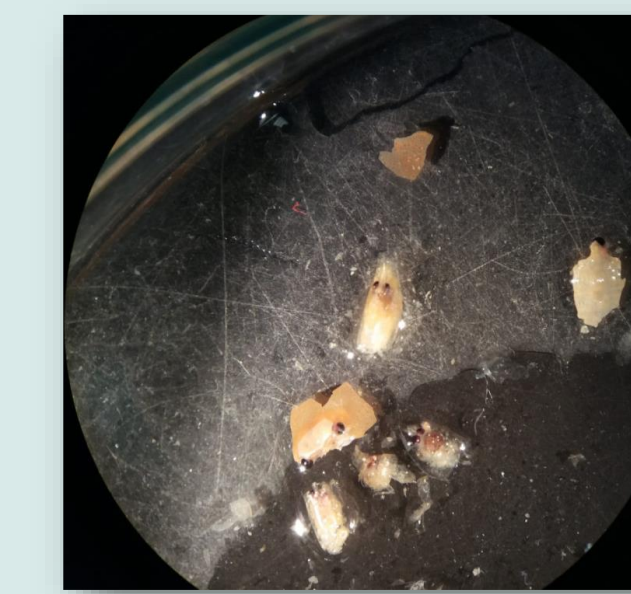
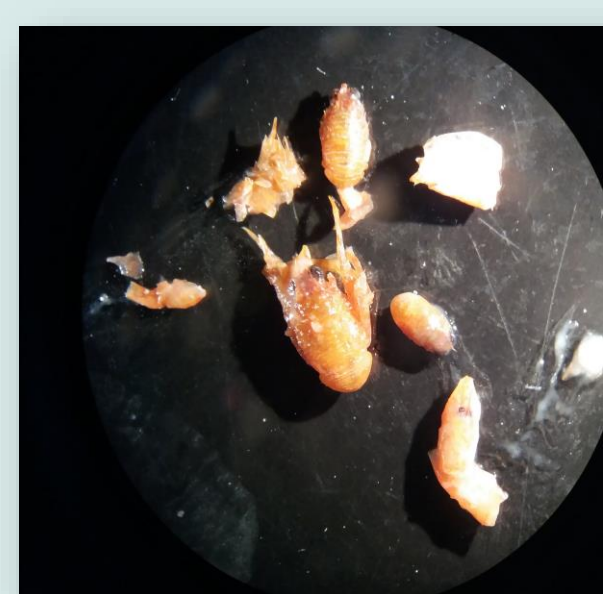


- ❖ **PHYSICAL CHARACTERIZATION:** classification in shape, colours and dimensions



- ❖ **CHEMICAL CHARACTERIZATION:** Polymer identification: Nicolet micro-FTIR iNTM10

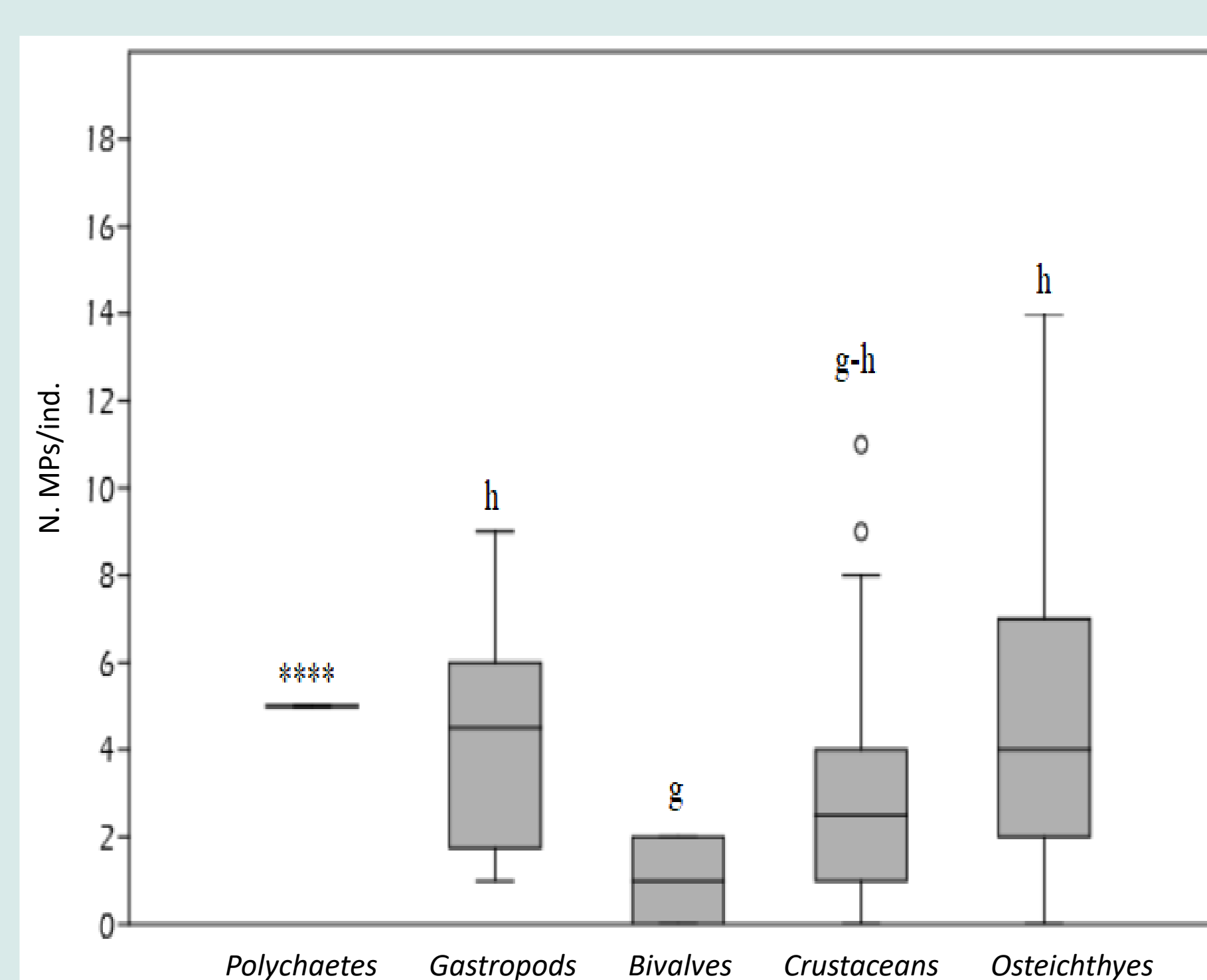
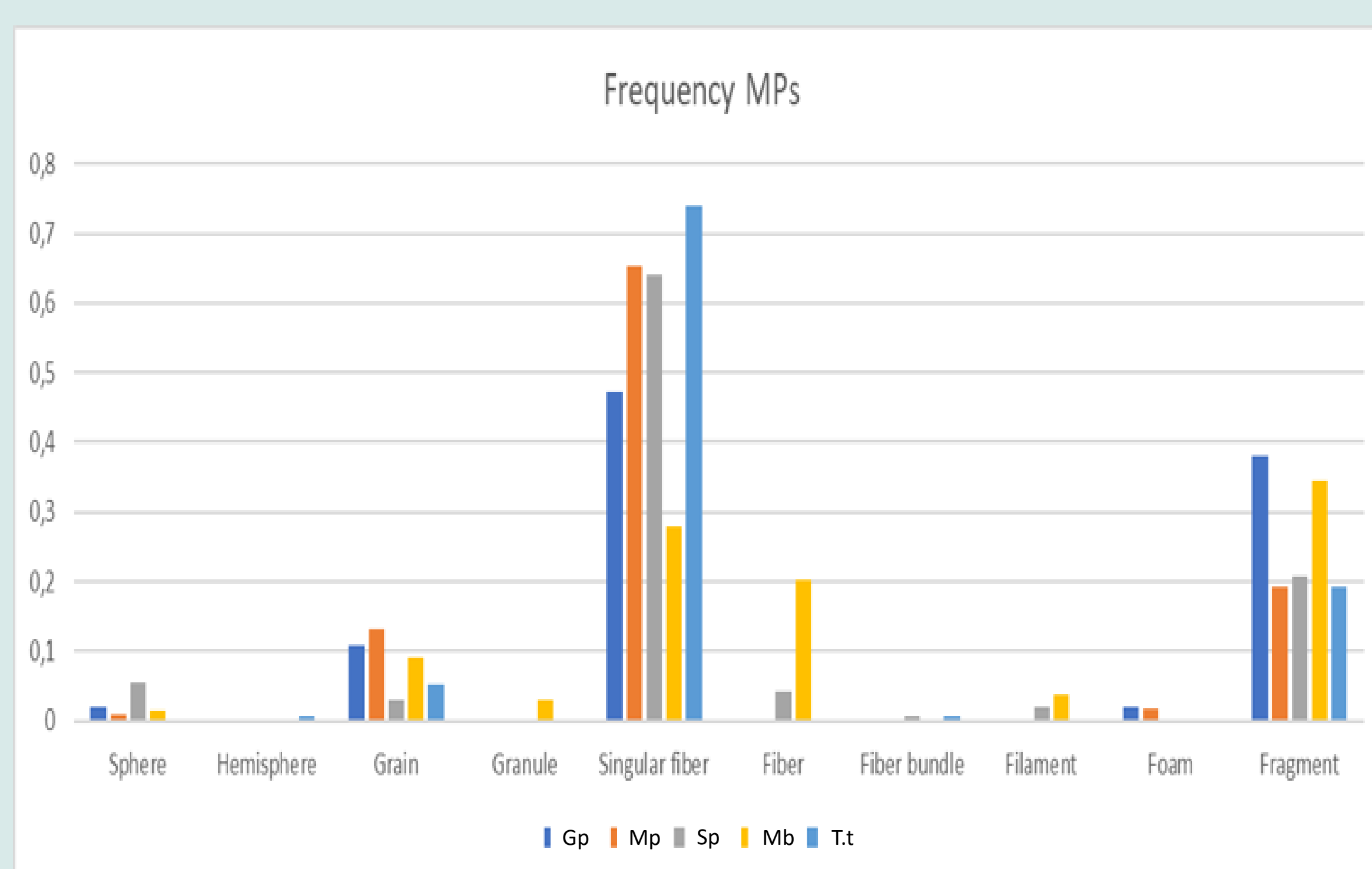
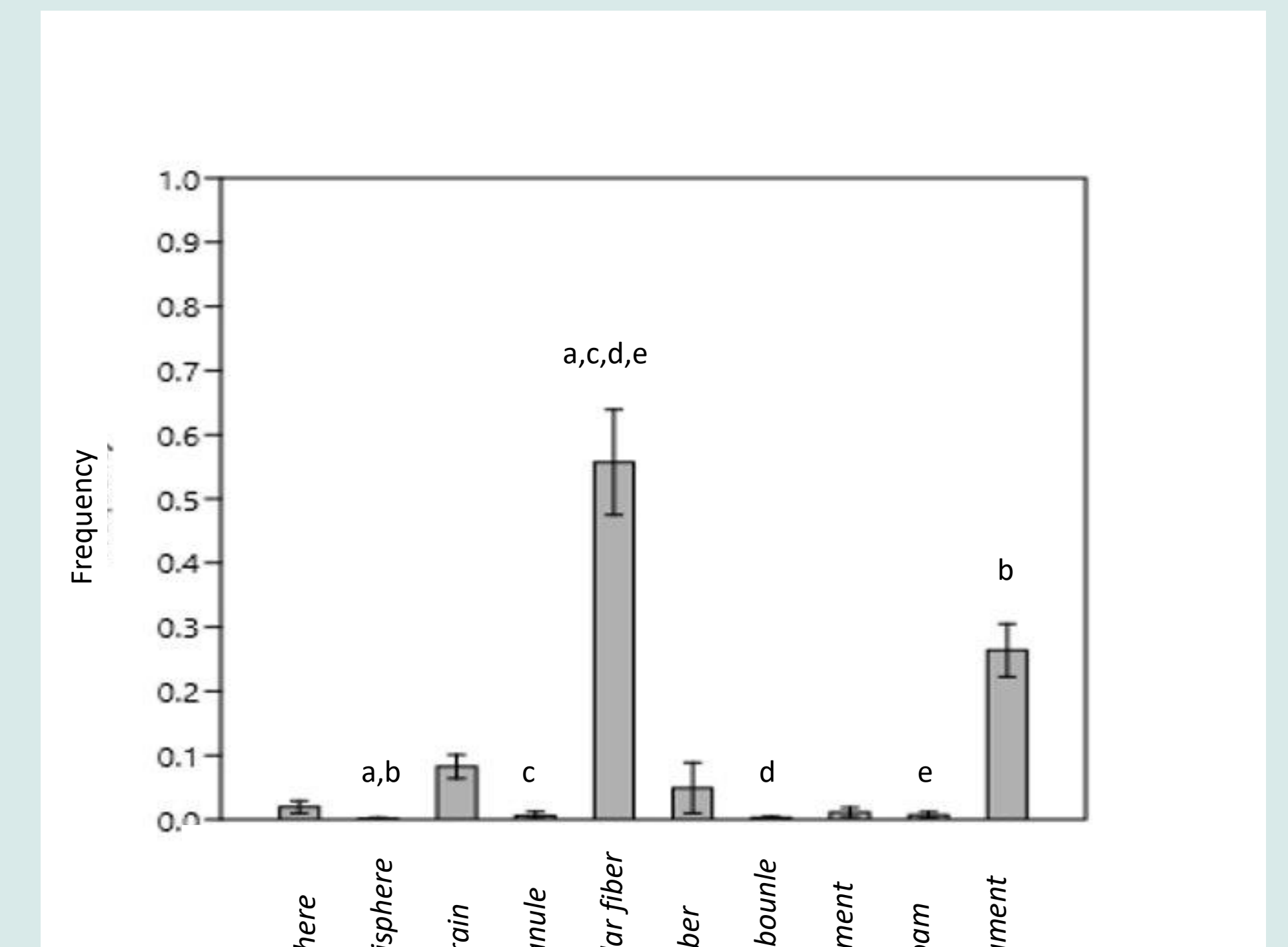
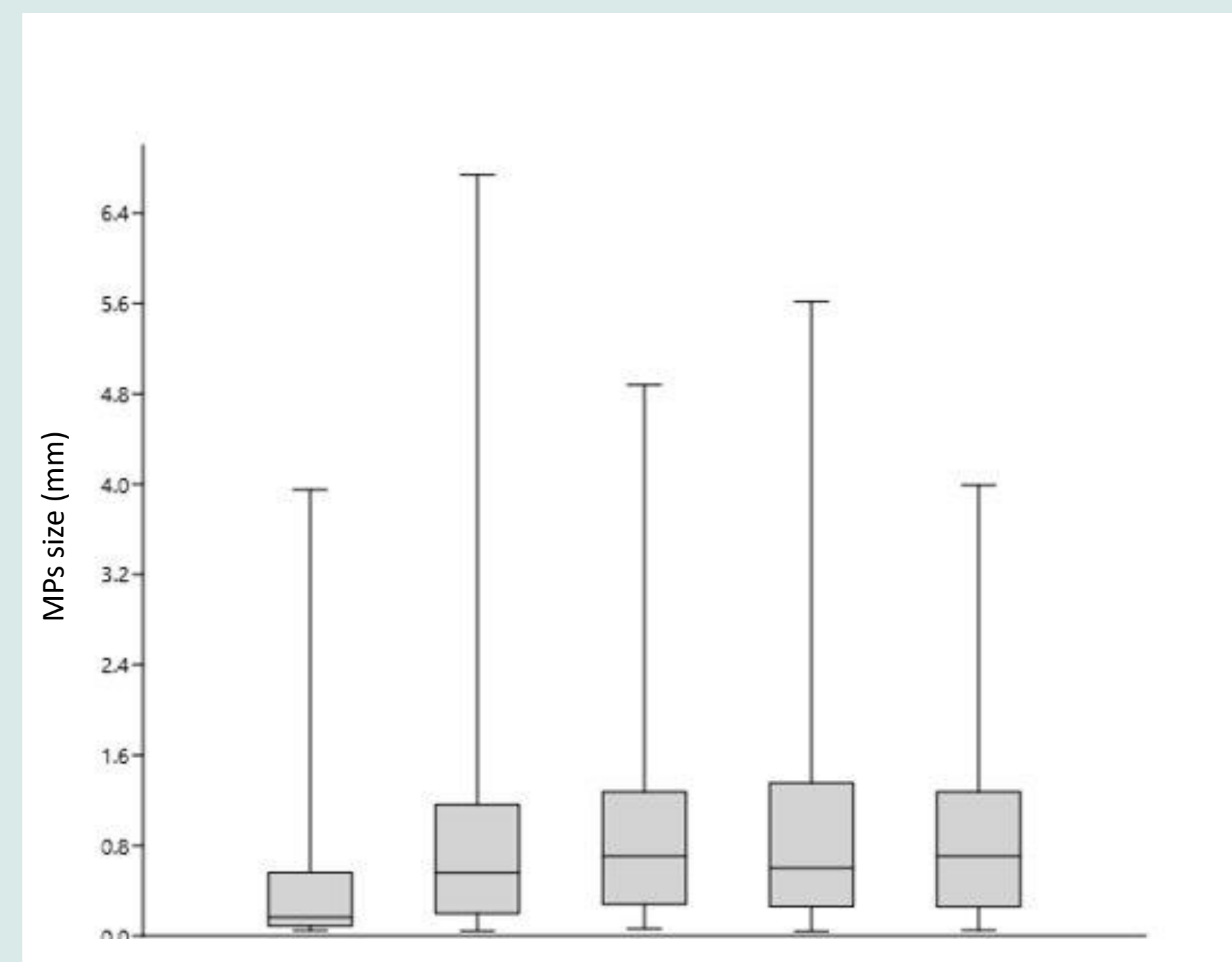
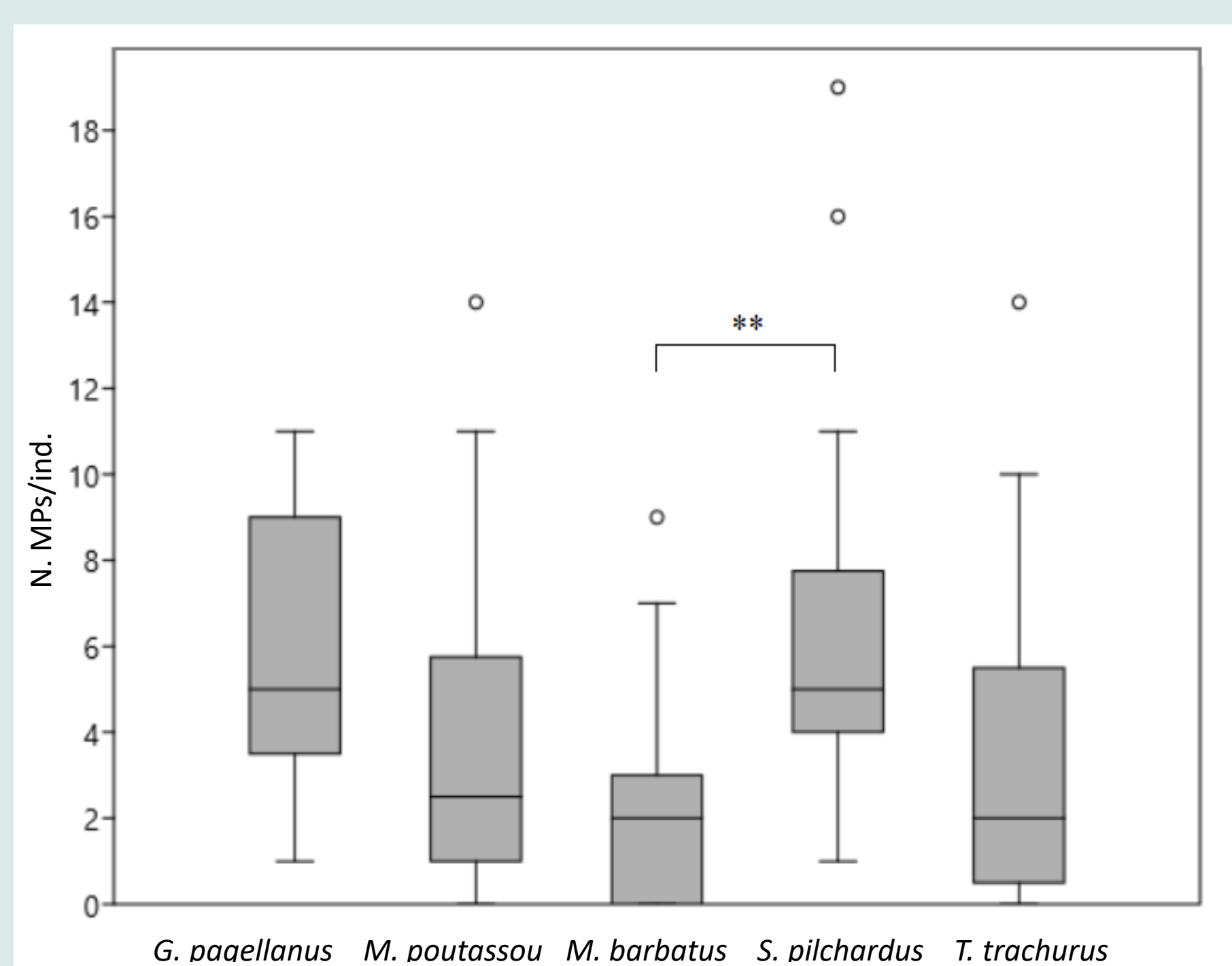
Identification of prey



- ❖ **STOMACH ANALYSIS:** prey were identified through stereomicroscope at the lowest taxonomic level possible.

- ❖ Samplings of 5 target fish species were carried out in Fiumicino site. Stomach contents were observed to study MPs contamination and the relation of plastic presence –diet of fishes.

Results and Discussion



- ❖ The greatest number of MPs was found in *S. pilchardus*.
- ❖ The size of mps ingested is similar to all species, except for *G. pagellanus* which ate the smaller plastics.
- ❖ Singular fibers are the category of plastics most found in the stomach contents of all species, except in *M. barbatus* in which a greater quantity of fragments have been found.
- ❖ Individuals with a diet based on fish and gastropods had more microplastics in their stomachs.
- ❖ The presence of microplastics was found in the stomachs of all the species analyzed, even if in different concentrations, quantities, sizes and shapes. Further analyzes are certainly needed to understand the severity of microplastic contamination in edible fish species.

Acknowledgments

Bianchi, Jessica, Tommaso Valente, Umberto Scacco, Roberta Cimmaruta, Alice Sbrana, Cecilia Silvestri, and Marco Matiddi. 2020. "Food Preference Determines the Best Suitable Digestion Protocol for Analysing Microplastic Ingestion by Fi Sh." *Marine Pollution Bulletin* 154 (October 2019): 111050.

<https://doi.org/10.1016/j.marpolbul.2020.111050>.

Lusher, A L., Inger Lise N. Bråte, Keenan Munno, Rachel R. Hurley, and Natalie A. Welden. 2020. "Is It or Isn't It: The Importance of Visual Classification in Microplastic Characterization." *Applied Spectroscopy* 74 (9): 1139–53. <https://doi.org/10.1177/0003702820930733>.