

# INGESTION OF MICROPLASTICS IN THE DEEP-SEA FISH *PHYCIS BLENNOIDES* (BRÜNNICH, 1788) ALONG THE SPANISH CATALAN COAST

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## INTRODUCTION

### Microplastics (MPs)

- Ubiquitous plastic particles, man-made and smaller than 5 mm (Thompson et al., 2004)
- The effects of ingestion in natural environments are still poorly known (Wright et al., 2013)

The aim of this study is to evaluate the levels of microplastic ingestion in *Phycis blennoides*, the most abundant benthopelagic fish on the upper slope (200-690 m depth) of the NW Mediterranean, its potential effects on fish health and the geographical variation among 3 localities with different impacts (Barcelona, Ebro River Delta and Blanes).



## RESULTS

Table 1. Biological parameters measured in *P. blennoides* from the three sampling areas

Area	Barcelona	Blanes	Delta
Mean fish standard length (cm) (SL)	17.47 ± 1.08 <sup>a</sup>	19.19 ± 1.20 <sup>b</sup>	16.11 ± 1.82 <sup>c</sup>
Mean fish eviscerated weight (g) (EW)	56.76 ± 8.84	81.77 ± 13.86	44.97 ± 17.54
Fulton's condition factor (K)	1.06 ± 0.09 <sup>a</sup>	1.15 ± 0.07 <sup>b</sup>	0.64 ± 0.32 <sup>a</sup>
Mean HSI (%)	3.46 ± 0.98 <sup>a</sup>	4.04 ± 1.49 <sup>a</sup>	2.37 ± 0.67 <sup>b</sup>
Mean GSI (%)	0.06 ± 0.03 <sup>a</sup>	0.11 ± 0.03 <sup>b</sup>	0.08 ± 0.03 <sup>a</sup>

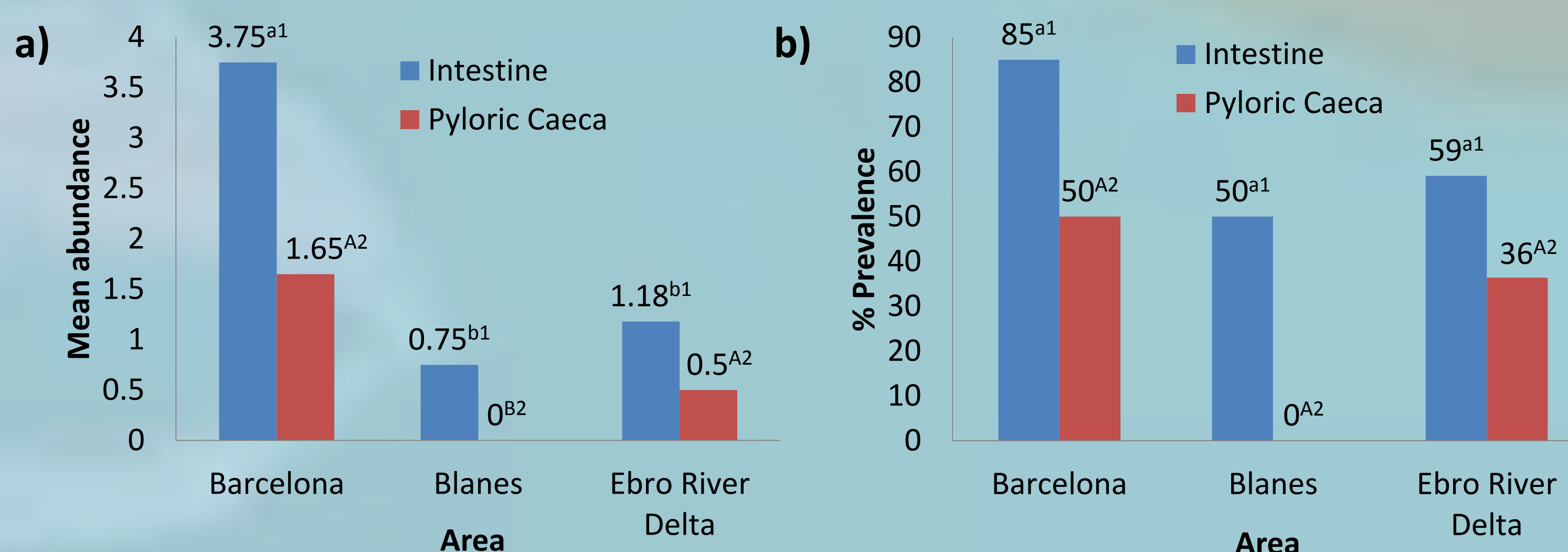
Different superscript letters indicate significant differences among sampling areas (One-Way ANOVA and post-hoc analyses)

Table 2. Prevalence (%) and AFs parameters in *P. blennoides* from the three sampling areas

Area	Barcelona	Blanes	Delta
AF Prevalence (%)	90 <sup>a</sup>	50 <sup>b</sup>	73 <sup>a</sup>
Mean Abundance	5.15 <sup>a</sup>	0.75 <sup>b</sup>	1.72 <sup>b</sup>
Mean AF length (µm)	1.68 ± 1.05 <sup>a</sup>	4.81 ± 3.74 <sup>b</sup>	1.89 ± 1.33 <sup>a</sup>
Mean AF diameter (µm)	0.02 ± 0.02 <sup>a</sup>	0.024 ± 0.01 <sup>a</sup>	0.01 ± 0.005 <sup>a</sup>

Different superscript letters indicate significant differences among sampling areas (Kruskal-Wallis, Wilcoxon test)

Figure 1. Mean abundance (a) and prevalence (%) (b) of AFs present in intestine and pyloric caeca contents of *P. blennoides* across localities

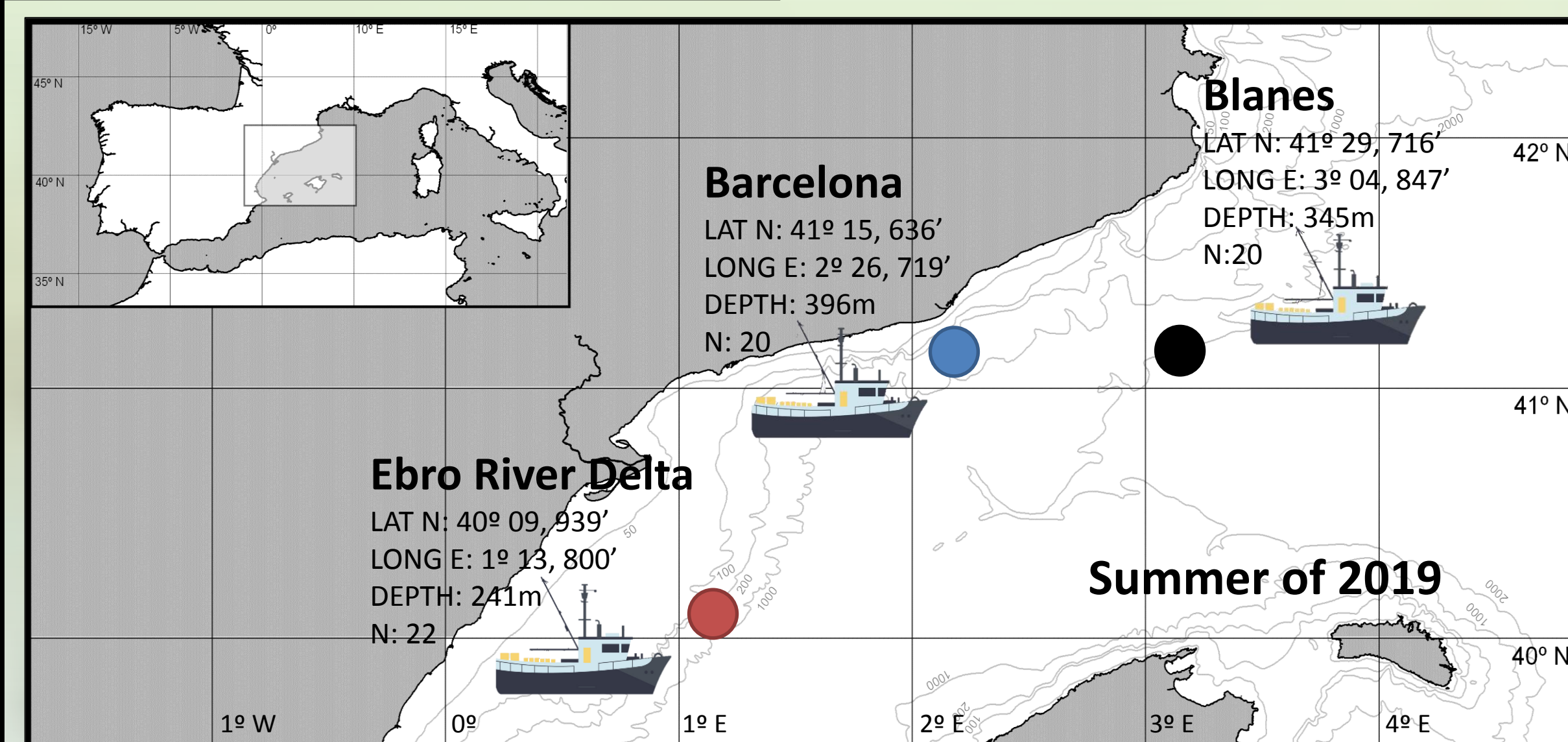


Different superscript letters and numbers indicate significant differences among sampling areas (Kruskal-Wallis test, logistic model) and between organs examined (Wilcoxon test), respectively

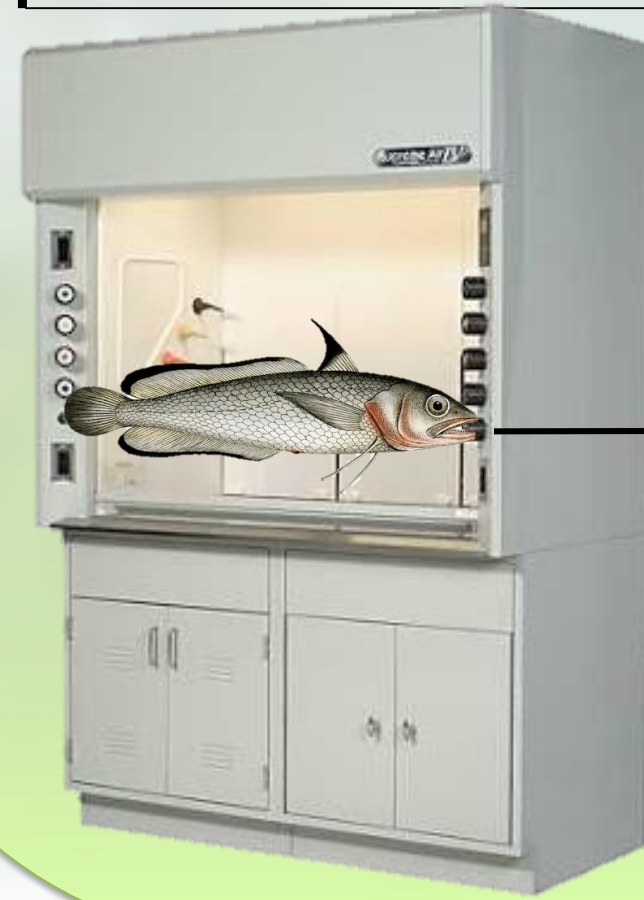
- No relationships were observed between area and number of CMM and the rest of parameters (health indices, AFs parameters) nor differences in CMM among areas.
- No relationships were observed between health indicators and AFs parameters.

## MATERIALS & METHODS

### 1. Study area and sampling



### 2. Laboratory dissections



### 3. Visual inspection of AFs



Besides AFs, only three fragments were found in Barcelona, for this reason only AFs were considered in subsequent analyses

### 5. Statistical analysis

- Relationships among health indices, AFs parameters and area and number of CMM
- Differences among geographic areas for these variables

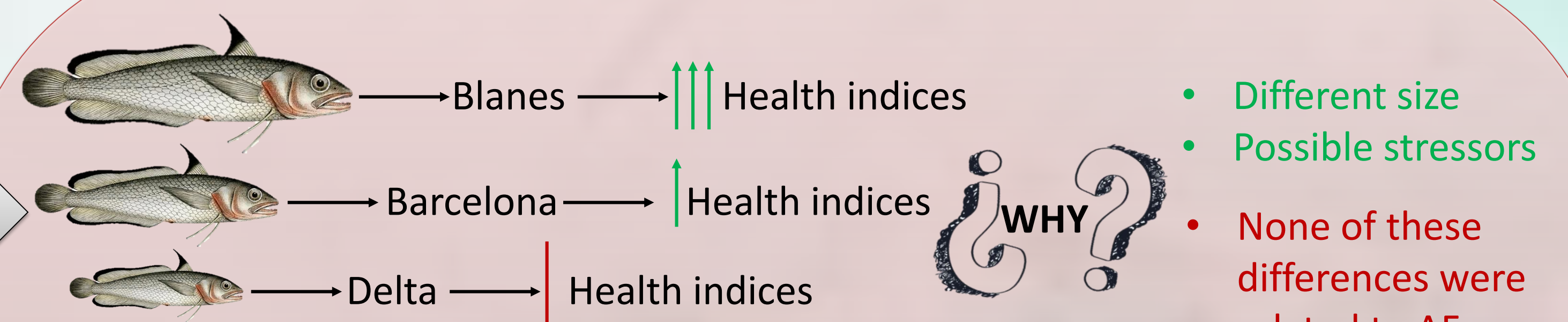
### 4. Fish health indicators

- Condition indices:
  - Standard length (SL)
  - Eviscerated weight (EW)
  - Fulton's condition factor (K)
  - Gonadosomatic index (GSI)
  - Hepatosomatic index (HSI)
- Splenic melanomacrophage centres (CMM):
  - Area and number

Anthropogenic fibres (AFs):

- Prevalence
- Abundance
- Diameter
- Length

## DISCUSSION

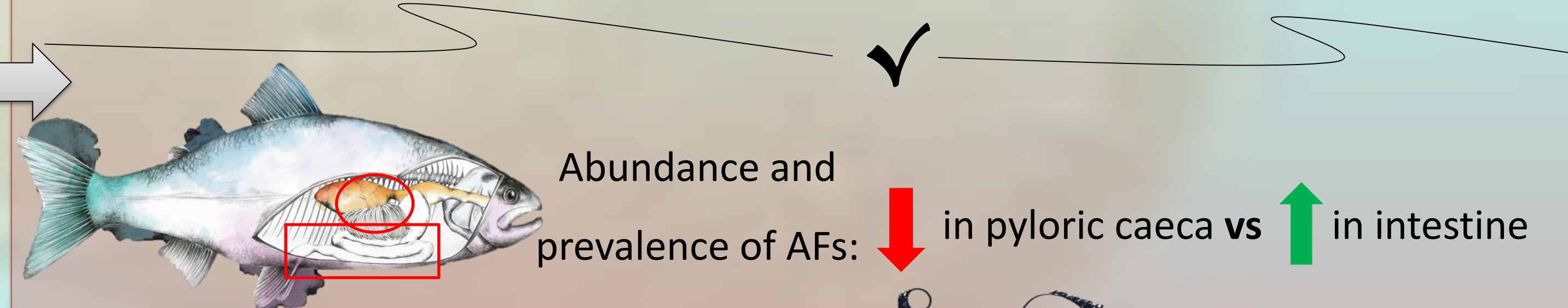


- Different size
- Possible stressors
- None of these differences were related to AFs parameters

*P. blennoides* from Barcelona presented the highest abundance and prevalence (%) of AFs



Barcelona is the second city of Mediterranean Sea in terms of estimated inputs of plastic marine debris, with a total contribution of 1800 tons per year (Liubartseva et al., 2018)

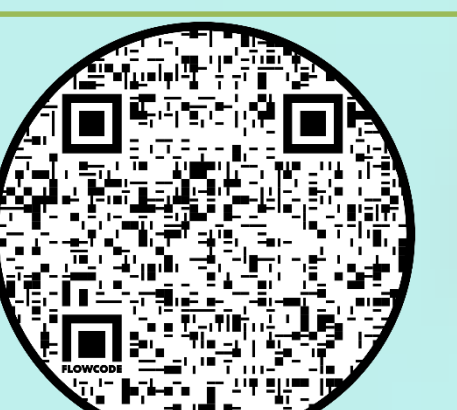


ORGAN FUNCTION: Food reservoir vs Nutrients absorption

## CONCLUSION

- Greater presence of AFs in Barcelona
- AFs found in *P. blennoides* do not seem to have an impact on the health of the fish

## REFERENCES



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