Microplastics Ingestion in Macaronesian Fishes

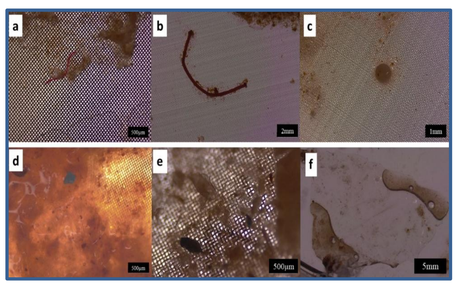
Gómez M[1]., Martínez I[1], Cree A[1], Nogueira N[2], Cavaleiro B[2], Pham C.K[3], Pereira J.M[3], Hernández-Borges J[4], Villanova-Solano C[4], Hernández-Sánchez C[4], Abu-Raya M[5], Herrera, A[1].

[1]Marine Ecophysiology Group (**EOMAR**). ECOAQUA Institute, Universidad de Las Palmas de Gran Canaria, Canary Islands, Spain, [2] Direção Regional do Mar (DRM), Funchal, Portugal, [3]Instituto de Investigação em Ciências do Mar – OKEANOS, Universidade dos Açores, Portugal [4]Universidad de La Laguna (ULL). San Cristóbal de La Laguna, España, [5]Universidad de Cabo Verde, Faculdade de Ciências e Tecnologia

RESILIENCE AND RECOVERY IN AQUATIC SYSTEMS
ASLO AQUATIC SCIENCES MEETING 2023
4–9 JUNE 2023 · PALMA DE MALLORCA, SPAIN

Presentation number: 5127
Poster: 511

The Gastrointestinal Content (GI) of **776 fishes** belonging to six species from the four Macaronesian archipelagos were analysed in order to study the ingestion of microplastics (MPs). These six species were chosen according to their different habitats and feeding behaviour, as well as being representative of the different archipelagos: *Katsuwonus pelamis* (181), *Scomber colias* (184), *Pagrus pagrus* (171), *Mullus surmuletus* (124), *Aphanopus spp*. (60) and *Cephalopholis taneopsis* (56).



MATERIAL & METHODS

All organisms were weighed and measured for total length before dissection. The GI tract was weighed and digested with a 10% KOH solution for 24 h at 60°C. The material was filtered through a 25 µm metal filter, examined and counted under a stereo microscope

Katsuwonus pelamis
Migratory pelagic species
Top predator
Madeira, Azores and Canary Islands

Scomber colias
Coastal pelagic
Madeira, Azores and Canary Islands

Pagrus pagrus
Demersal of rocky and sandy bottoms
Madeira, Azores and Canary Islands

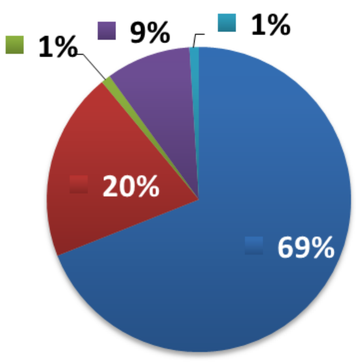
Mullus surmuletus
Demersal of sandy bottoms
Azores and Canary Islands

***Aphanopus* spp.**
Batpelagic species
Madeira

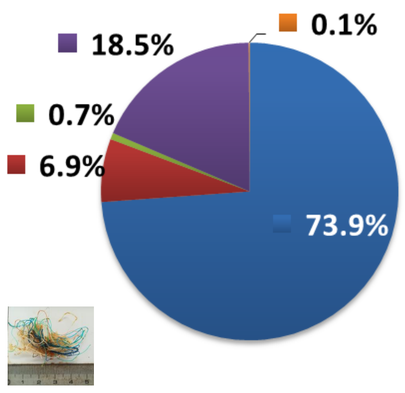
Cephalopholis taneopsis
Demersal of rocky and sandy bottoms
Cape Verde

RESULTS

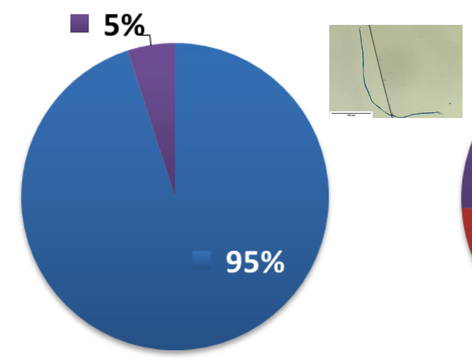
Aphanopus spp (Madeira) **97%**



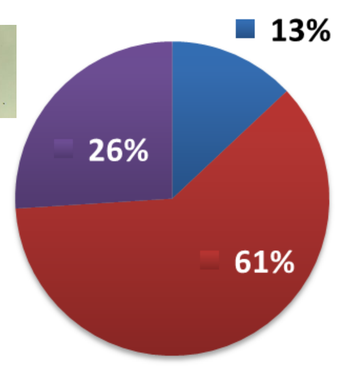
Katsuwonus pelamis (Canary Islands) **89%**



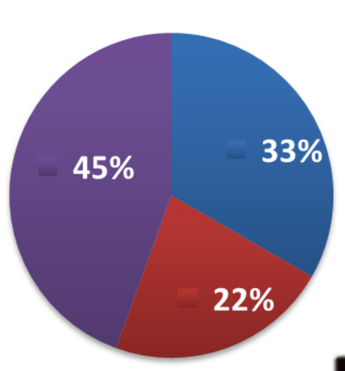
Cephalopholis taneopsis (Cape Verde) **83%**



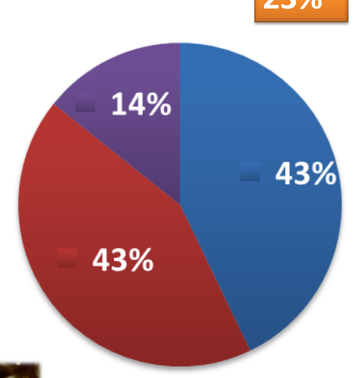
Mullus surmuletus (Azores) **53.5%**

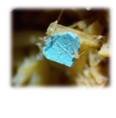


Scomber colias (Azores) **37.5%**

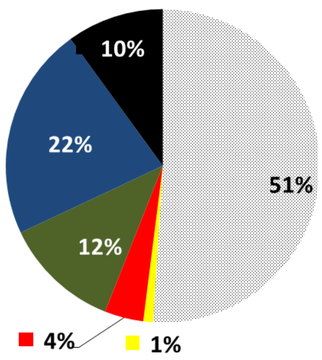


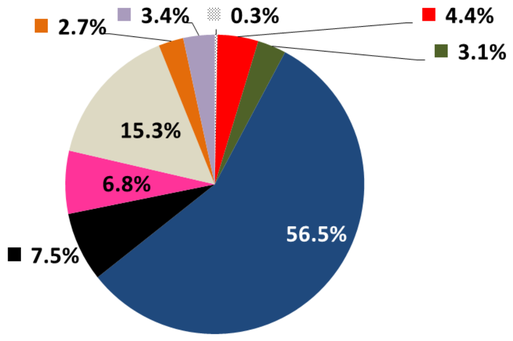
Pagrus pagrus (Canary Islands) **23%**

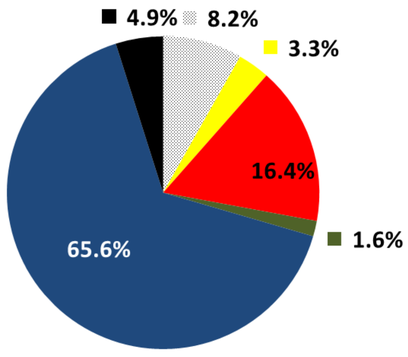


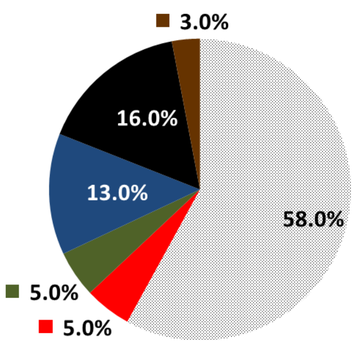


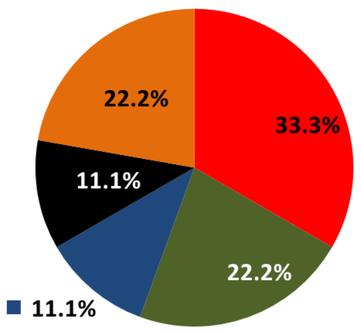
Fibers **Lines** **Films** **Fragments** **Foams** **Tangled mess**

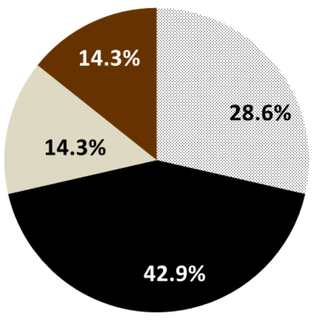












No color/White **Yellow** **Red** **Green** **Blue** **Black** **Pink** **Translucent** **Orange** **Purple** **Brown**

Species	Year	Location	Nº	Lenght (cm)	Mass (g)	Items/ individual	Fishes with MPs (%)
Scomber colias	2019 2020 2021	Madeira Azores Canary Islands	60 62 62	25.5± 1 29 ± 2 28 ± 5	161.5 ± 21.5 183 ± 42.5 282 ± 126	1.5 ± 2.05 0.78 ± 1.21 1.25 ± 0.45	**57%** **37.5%** **47%**
Pagrus pagrus	2017 2020 2021	Madeira Azores Canary Islands	60 81 30	33 ±4 43.5 ±1.5 31 ± 2	590 ± 223 762 ± 131 442 ± 68	1.7 ±1.7 0.3 ±0.4 1.17 ± 0.41	**67%** **26%** **23%**
Katsuwonus pelamis	2020 2021	Madeira Azores Canary Islands	60 60 61	53 ± 3.9 51 ± 3 50.5 ± 7	3051.5 ±806 2308.5 ±355 3420 ± 5061	1 ± 6 0.84 ± 1.62 5.05 ± 4.2	**37%** **47%** **89%**
Mullus surmuletus	2019 2021	Azores Canary Islands	64 60	22.5 ± 1 21.2 ± 1.4	141 ± 19.5 177 ± 52	1.23 ± 1.5 1.70 ± 0.95	**53.5%** **30%**
***Aphanopus* spp.**	2020 2021	Madeira	60	113 ± 8.1	2016 ± 338	7.0 ± 7.0 2.7 ± 1.6	**97%**
Cephalopholis taenopsis	2020 2022	Cape Verde	56	28 ± 2	340 ± 60	3.9 ± 1,5	**82.6%**

CONCLUSIONS

1.- The highest incidence of MPs was found in ***Aphanopus spp.*, (97%), *Katsuwonus pelamis*, (89%)** from the Canary Islands and ***Cephalopholis taneopsis*, (83%).**

2.- The other species had moderate values, ***Scomber colias*, (37-57%), *Pagrus pagrus*, (23-67%)** and ***Mullus surmuletus*, (30-54%).**

3.- **Fibres (27-97%)** and **lines (6-60%) predominated in most species**.

4.- **Fragments** varied between **6-24%** with the exception of fishes from the Azores which had **52-79% of fragments.** No pellets were observed in any of the organisms.

5.- The predominant colours were **blue (11-66%) and black (15-43%),** with the exception of ***Mullus surmuletus*** from Azores, (**58%**) ***Aphanopus spp.*,** from Madeira **(51%) and *Pagrus pagrus* (43%) from Canary Islands** which had transparent MPs.

6.- The colour of the MPs found in the GI tract could indicate **selective ingestion** based on colour in **pelagic fishes**, together with **accidental ingestion** of transparent MPs **due to reduced visibility at depth in demersal fishes.**

ACKNOWLEDGMENTS

This study was supported by project:
IMPLAMAC (MAC 2/1.1a/265) INTERREG MAC 2014-2020..