Microplastic ingestion in jellyfish *Pelagia noctiluca (Forsskal, 1775)* in the North Atlantic Ocean: unpublished results.

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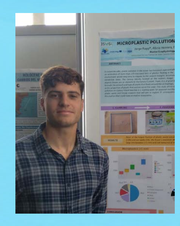
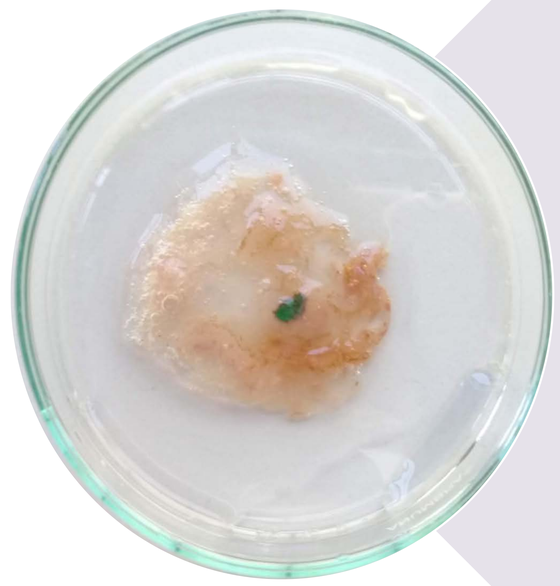


ABSTRACT

The presents work is the first study that evidences the ingestion of plastic and microplastics in jellyfish *Pelagia noctiluca* in the Atlantic Ocean. A bloom of this organisms occurred during the summer of 2019 was collected from Gran Canaria island coast (Canary Islands, Spain). Then, separating umbrella from tentacles, a process of KOH digestion was carried out to obtain and quantify the plastic particles. A 97% of the individuals analysed had microplastics, mostly microfibres and blue. Plastic ingestion was confirmed with the presence of items in the gastrovascular cavity.

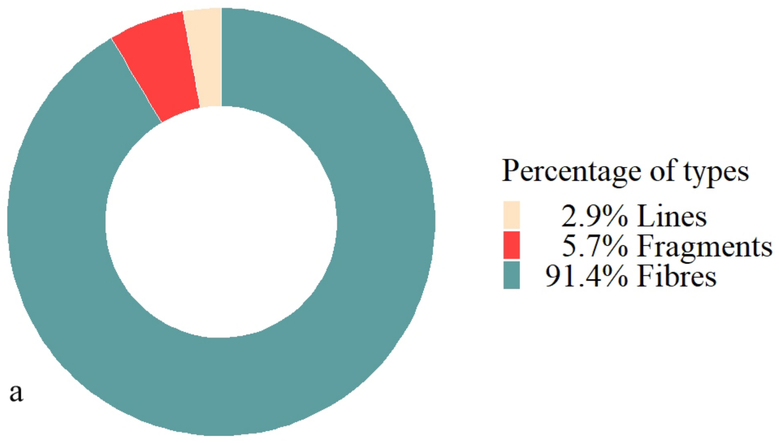
Fig. 1. Photograph of jellyfish *Pelagia noctiluca* on the coast of Gran Canaria, Canary Islands (Spain).

MATERIAL AND METHODS



A total of 30 *Pelagia noctiluca* were collected, floating near the shore of Las Canteras beach (28° 7.854′N; 15° 26.775′W). Then, the organisms were stored individually and frozen at -20ºC.

In the laboratory, from each jellyfish the umbrella and tentacles were analysed separately, in order to determine whether the microplastics were adhered to the tentacles or within the gastrovascular cavity. Later, following the protocol proposed by Herrera et al. (2018), both parts were digested for 24 hours at 60ºC with KOH at 10%. Finally, the plastics were analysed under a binocular stereomicroscope (Leica S9i with integrated CMOS camera); differentiating by types and colours.



RESULTS AND DISCUSSION

Based on the whole jellyfish, 29 of the 30 jellyfish assessed had microdebris. The analysis by parts reveals a greater impact in tentacles section, showing the incidence of 86.7% (Fig. 2) and an average of 2.47 ± 2.01 microplastic items per jellyfish, while the umbrella section shown an incidence of 53.3% (Fig. 2) and average of 1.17 ± 1.70. The major part of these items were fibres (synthetic or semi-synthetic), followed by plastic fragments and lines (Fig. 3.a). The main colour of these items was blue (Fig. 3.b), the most predominant colour for these types of debris (Gago et al., 2018).

The presence of microplastic items after KOH digestion in the umbrella sections confirms the presence of debris within the gastrovascular cavity, then, the intake of microplastic by jellyfish during the bloom is checked. Based on umbrella microplastics presence, one out of every two jellyfish would have ingested plastic before being sampled, showing a higher percentage of affected jellyfish than the values reported in the Mediterranean sea (Macali et al., 2018). A possible hypothesis for this high incidence is that the area where the jellyfish were collected is a closed bay that concentrates a large amount of microplastics and has a high microplastic/zooplankton ratio (Herrera et al., 2020).
These results warn about the implications for jellyfish health, the transfer to jellyfish predators, human consumed jellyfish and the transport of carbon and microplastic in the water column.

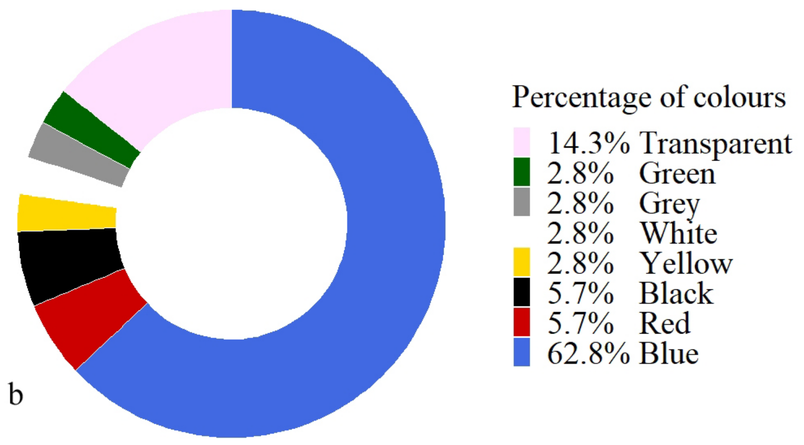


Fig. 3. Percentage of types (a) and colours (b) of the microplastics found in *P. noctiluca* samples gastrovascular cavity.

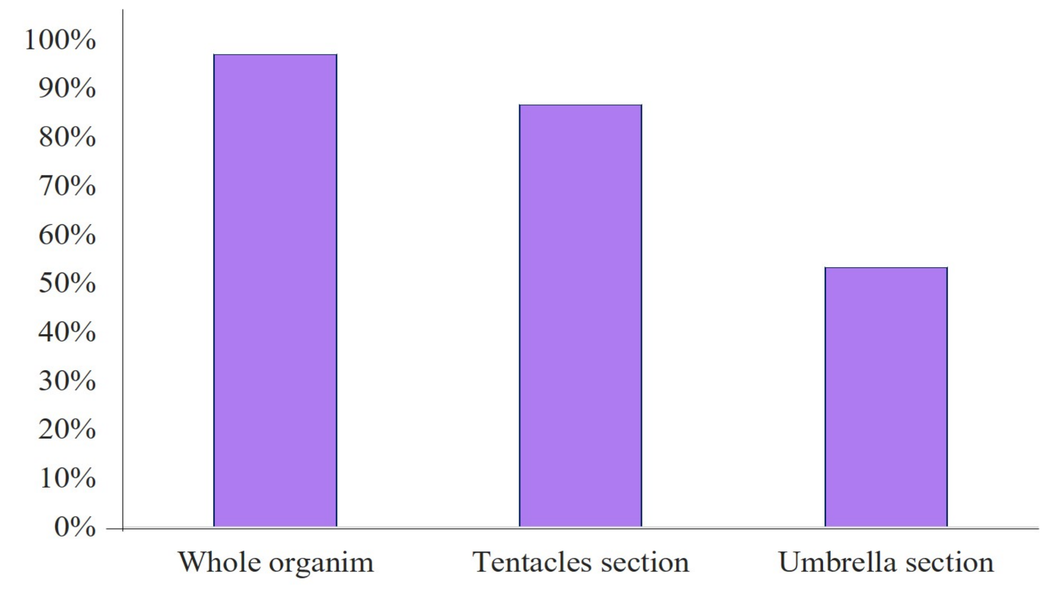


Fig. 2. Percentage of microplastic presents in the 30 caught *P. noctiluca*.

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