

Marine ecosystems are being invaded by wastes of anthropogenic origin, mostly macro and microplastics. These microplastics, can be ingested by fish, zooplankton, jellyfish and other organisms and transferred through the food chain. Our studies in EOMAR have revealed this facts:

1.- A large amount of microplastics from the ocean accumulate on the Canary Island coast. The Canary Current flows through the Canary Islands in a south-southwest direction (Figure 1), transporting surface wastes that are deposited mainly on the sandy beaches most exposed to the prevailing winds and surface currents (Figure 2). In the areas of maximum concentration, more than 300 grams/m² of microplastics have been detected from the tide line (Figure 3), With a maximum mean concentrations of 4900 item/m² of microfibres (Figure 4) suggesting a possible endogenous contamination in function of the type and amount of wastewater discharged.

2.- The concentration of microplastic in superficial waters can reach values of up to 1,007,872 particles / Km² (Figure 5). This value represent double concentration of microplastics than zooplankton.

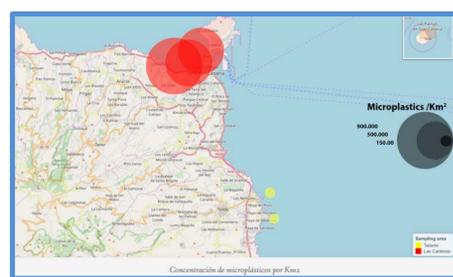


Figure 5: Sampling surface waters with a manta net in Las Canteras beach. Mp's concentration reach values up to 1,007,872 particles /Km² (Herrera et al, 2020).



Figure 6: The stomach contents of 120 mackerel (*Scomber colias*) were studied. (Herrera et al., 2019).

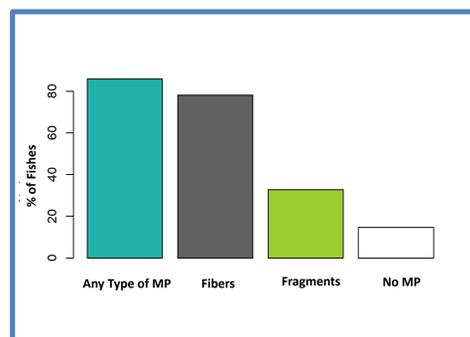


Figure 8: Percentage of fishes that contained different types of microplastics (MPs) in their stomachs. (Herrera et al., 2019).

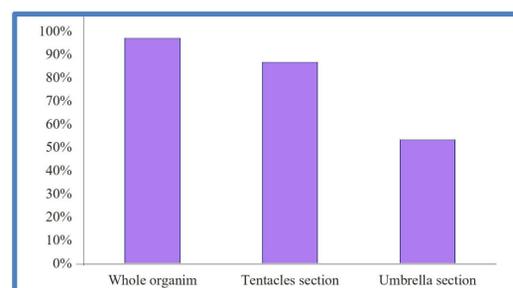
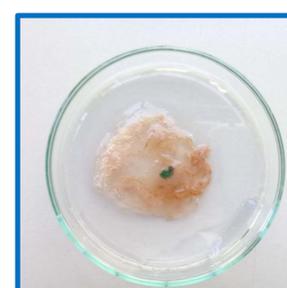


Figure 7: Percentage of microplastics presents in *P. noctiluca* (Rapp et al., 2020b).



4.- In addition to the physical hazards associated with ingestion, there are also biochemical hazards because microplastics adsorb organic chemical contaminants (POPs) among them polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides and derivatives of UV filters, that bioaccumulate and biomagnify in the food chain. Many of these compounds have carcinogenic effects and act as endocrine disruptors (compounds that alter the normal biological function by substituting for hormones).

These organic compounds have already been detected associated with microplastics in waters of the Canary Islands, (Figure 9), but it is still unknown how they impact marine organisms, the food chain, and human health. Therefore, we consider it a priority to study the effect that the ingestion of microplastics and their associated contaminants, has on marine life.

5.- Also, MPs act as vectors in the distribution of species that could be invasive and affect local ecosystems (Figure 10).

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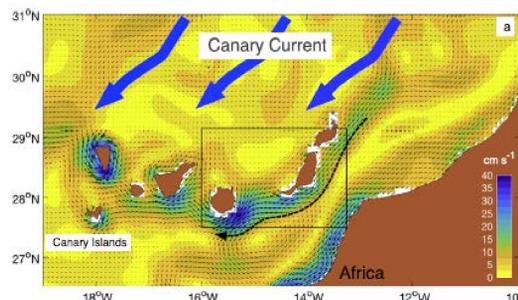


Figure 1: Canary basin circulation. Currents are shown as a vector velocity field (shades of colors are cm⁻¹). (Herrera et al., 2019).

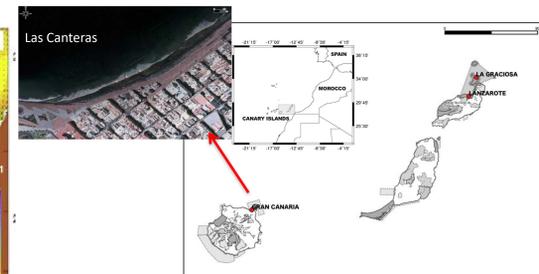


Figure 2: Satellite image of Las Canteras beach, North off Gran Canaria Island. (Herrera et al., 2018).



Figure 3: Accumulation of MPs from Playa Grande (Porís) in Tenerife, Canary Islands, (Reynold et al., 2020).

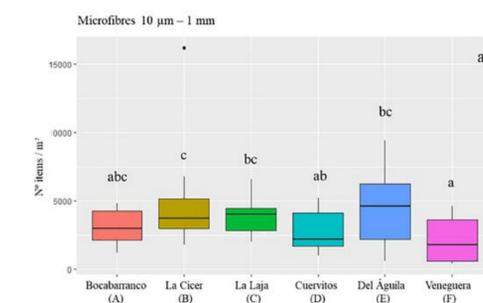


Figure 4: Microfibres concentration in six beaches of Gran Canaria. (Rapp et al., 2020a)

3.- These MPs, are ingested by the planktivorous fish *Scomber colias* (Figure 6), zooplankton, jellyfish (Figure 7) and other organisms.

Around 80% of the mackerel (Figure 8) and 97% of the *P. noctiluca* (Figure 7) analyzed contained some type of MPs in their stomachs, tentacles and umbrella. Once eaten, the MPs are transferred through the food chain.

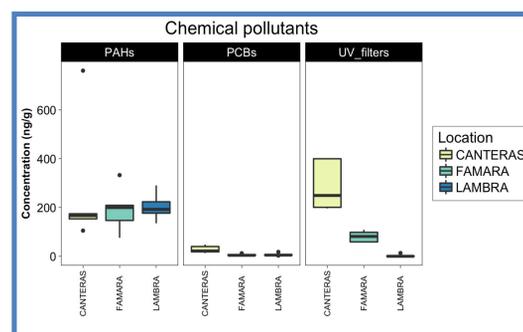


Figure 9: MPs that reach the beaches are contaminated by organic chemicals, among them polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides and derivatives of UV filters, (Camacho et al., 2019).



Figure 10: Cocolithophorids associated with a fragment of plastic collected on the Famara beach, Lanzarote. (Soler et al., 2018).

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