MARINE MICROBIAL COMMUNITIES AS A PROXY TO EVALUATE WATER QUALITY: LAS CANTERAS BEACH (GRAN CANARIA ISLAND) AS A CASE STUDY.

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Increased population density, tourism and leisure activities on coastal regions are potentially altering marine ecosystem due to different anthropogenic impacts. Las Canteras, an urban beach hosting a high marine biodiversity, is not exempt from these impacts. Hence, the need to evaluate periodically its current status and sustainability. Conventionally, the coastal water quality in the beach, in terms of microbial affection, has been monitored only by examining fecal bacteria. Here we present a complementary approach using flow cytometry, to identify how smaller organisms inhabiting aquatic ecosystems (such as bacteria and phytoplankton) may respond to changes in inorganic and organic nutrients. The aim is to derive indicators of the environmental status of coastal ecosystems, based on microbial organisms, that could be considered in future monitoring programs (e.g. EU MSFD). In this recent study, we carried out a monthly sampling at eight points along Las Canteras, to look at the response of microbial organisms to physical (temperature) and biogeochemical (inorganic and organic nutrients) environmental drivers. Our results show that, in spite of observed temporal (seasonal) and spatial (sample locations) variability, the nutrients and microbial indicators gave evidence of a healthy ecosystem. The sensitivity of our approach, however, allowed to identify small signals of perturbation. There were significant differences in microbial abundances before and after the COVID lockdown, as well as between stations, with Peña La Vieja presenting the lowest abundances and Hotel Cristina, Reina Isabel and Playa Chica the highest ones. We also found that the ratio of bacteria with high and low nucleic acid content (HNA/LNA) correlated significantly with total organic carbon. This result supports previous observations in other coastal locations of Gran Canaria affected by untreated sewage outfalls, pointing out the HNA/LNA as a potentially fast, early warning proxy to detect organic carbon contamination in coastal regions and beaches.

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