

## MONITORING OF ORGANIC MICROPOLLUTANTS ADSORBED ON MICROPLASTIC FROM COASTAL AREA OF THE MACARONESIA

**Pacheco-Juárez, Javier\*, Guedes-Alonso, Rayco, Montesdeoca-Esponda, Sarah,  
Santana-Viera, Sergio, Torres-Padrón, María Esther, Santana-Rodríguez, José  
Juan and Sosa-Ferrera, Zoraida**

Instituto Universitario de Estudios Ambientales y Recursos Naturales (i-UNAT), Universidad de  
Las Palmas de Gran Canaria, 35017 Las Palmas de Gran  
Canaria, Spain

javier.pacheco@ulpgc.es, rayco.guedes@ulpgc.es, sarah.montesdeoca@ulpgc.es,  
sergio.viera@ulpgc.es, josejuan.santana@ulpgc.es, zoraida.sosa@ulpgc.es,  
miriam.torres@ulpgc.es

This work aims at evaluating the presence of different organic micropollutants adsorbed on microplastics debris collected in coastal area from 4 archipelagos of the Macaronesia. Microplastics debris show strong hydrophobic properties and they exhibit a remarkable adsorption capacity of the organic pollutants that surround them and thus, can act as a vehicle for the transmission of these micropollutants.

For such goal, in the IMPLAMAC Project, the microplastics debris collected in coastal area from 4 archipelagos of the Atlantic Ocean (Azores, Cape Verde, Canary Islands and Madeira) were analysed. The incidence of the following contaminants adhered to the samples are studied: 12 UV filters (UVFs) and UV stabilizers (UVSs), 13 hormones and 10 drugs.

The analyses were carried out by ultrasound-assisted extraction (UAE) and ultrahigh-performance liquid chromatography with tandem mass spectrometry detection (UHPLC-MS/MS). (Montesdeoca-Esponda *et al.*, 2021, Guedes-Alonso *et al.*, 2021, Santana-Viera *et al.*, 2020).

This process was applied a microplastics debris collected in 2020, 2021 and 2022 from 30 different beaches of Macaronesia. In total, 150 samples have been analysed, of which 108 were fragments and 42 were pellets.

Results showed the presence of mostly all the analytes through all archipelagos. UV filter were present in all the sampling beaches, where octocrylene was the most frequently found. Regarding to the Steroid hormone up to up to thirteen of the different steroid hormones were detected, being the highest concentrations of steroid hormones corresponded to the progestin norgestrel.

In the case of drugs, several pharmaceutical compounds were detected being the caffeine the most frequently found. The concentration ranged from <LOQ to even up to 6690.27 ng·g<sup>-1</sup>, obtaining higher concentrations for UV filters and UV stabilisers, then hormones and lastly drugs.

**Key words:** UV filters, hormones, drugs, UAE, UHPLC-MS/MS

**Acknowledgments:** Both funds and samples were provided by Project MAC 2/1.1<sup>a</sup>/265 (IMPLAMAC) Cooperation Programme INTERREG MAC 2014-20.

**References:**

- Guedes-Alonso, R., Sosa-Ferrera, Z. and Santana-Rodríguez, J.J. (2021). Analysis of microplastics-sorbed endocrine-disrupting compounds in pellets and microplastic fragments from beaches. *Microchemical Journal*, 171, 106834.
- Montesdeoca-Esponda, S., Santana-Viera, S., Sosa-Ferrera, Z., and Santana-Rodríguez, J. J. (2021). UV filters and UV stabilisers adsorbed in microplastic debris from beach sand. *Marine Pollution Bulletin*, 168, 112434.
- Santana-Viera, S., Montesdeoca-Esponda, S., Torres-Padrón, M.E., Sosa-Ferrera, Z., Santana-Rodríguez, J.J. (2020). An assessment of the concentration of pharmaceuticals adsorbed on microplastics. *Chemosphere*, 266, 129007.