

ASSESSMENT OF ANTHROPOGENIC POLLUTION BY ORGANIC UV FILTERS USING MACROPHYTES AS BIOINDICATORS

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Abstract:

Marine environment pollution has increased in recent decades as a result of anthropogenic activities. Macrophytes can assimilate the compounds dissolved in the water and respond to changes in surround conditions, for that, they can be used as bioindicators of pollution in aquatic environments.

Currently organic ultraviolet (UV) filters have shown ever-increasing in pollution levels in marine ecosystems. The anthropogenic pollution produced by eight organic UV filters in coastal macrophytes was studied. A microwave-assisted extraction (MAE), followed by ultrahigh-performance liquid chromatography with tandem mass spectrometry (UHPLC-MS/MS) was applied to 76 macrophyte (seaweeds and seagrass) samples from three different beaches on the Gran Canaria Island (Spain), collected for 6 months. All studied UV filters were found with different detection frequencies from 16% to 100% in macrophyte samples. Octocrylene (OC) was detected in all the analysed samples throughout the sampling period. The highest concentration ($19,369 \text{ ng}\cdot\text{g}^{-1}$ dry weight, dw) correspond to this compound in the seagrass *Cymodocea nodosa*.

The bioconcentration ratio was determined for several seaweed groups (red, brown, green). Different bioconcentration grades were obtained. Those above 1,000 indicated significant accumulation, which increases the possibility of chronic effects on seaweed and at upper tropic levels.

Key words: anthropogenic contamination, macrophytes, organic UV filters, microwave assisted extraction

Acknowledgments: M. Isabel Cadena-Aizaga would like to thank to University of Las Palmas de Gran Canaria (Spain) for Ph.D. student grant