

Innovative monitoring of emerging micropollutants in Psyttalia WWTP and the Saronikos Gulf Ecosystem

Georgios Katsouras^a, Theodora Paramana^a, Antigoni Konomi^b, Georgios Gkotsis^b, Ioannis Mandilaras^a, Stylianos Samios^a, Efthymios Lytras^a, Nikolaos Thomaidis^b and Giorgos Sachinis^a

^a*Athens Water and Sewerage Company S.A (E.Y.D.A.P.) – Oropou 156, 11146, Galatsi, Athens, Greece*

^b*Laboratory of Analytical Chemistry - National and Kapodistrian University of Athens, Greece*
e-mail: gekats@eydap.gr

Emerging micropollutants (EMPs) detection in wastewater & marine environment is of great concern for Athens Water Supply and Sewerage Company S.A. (EYDAP S.A.) harmonizing that way with the recast of the new urban wastewater treatment directive [1]. Pharmaceuticals, per- and polyfluoroalkyl substances (PFAS), industrial chemicals, pesticides, and many other pollutants are classified as EMPs. In this direction, the Horizon Europe ENVIROMED project aims to address the environmental impact of pharmaceuticals during their lifecycle. The case study is the Psyttalia WWTP and EYDAP is responsible for the monitoring campaigns of inlet, effluent and marine environment around the WWTP. The wide-scope target screening of more than 2,400 chemicals was conducted in the Laboratory of Analytical Chemistry, Department of Chemistry of NKUA leveraging complementary chromatographic techniques coupled to high resolution mass spectrometry (HRMS). This study presents the preliminary results from six seawater samples collected on May 21, 2024, from the Saronikos Gulf. Overall, 22 organic micropollutants were detected in the tested seawater samples. The most abundant class (36%) was the industrial chemicals, including PFAS, bisphenols etc. Another 27% of the detected contaminants were coffee and tobacco related contaminants, while 18% of the detected contaminants were classified as pesticides. Lastly, pharmaceuticals and artificial sweeteners were detected, both at 9%. Regarding the two pharmaceuticals detected, venlafaxine (antidepressant) was present in all samples, while cimetidine was detected in two samples but in the highest concentrations, ranging from 15.0 to 217 ng/L. In conclusion, EYDAP, is responsible for the development of a report, which will serve as feedback to the European Union, in order to better manage the presence of pharmaceuticals and their derivatives in waste and sea waters.

Acknowledgements:

ENVIROMED project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057844.

References:

[1] <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0541>