

Title: Contaminants of emerging concern over the seasons – a non-targeted analysis in the Baltic Sea

Authors: Paulina Goździk¹, Dagmara Leszczyńska¹, Danuta Dudzik², Katarzyna Smolarz³, Mikołaj Mazurkiewicz¹, Anna Hallmann¹

Affiliations:

¹Department of Pharmaceutical Biochemistry, Medical University of Gdańsk; Dębinki 1, 80-211 Gdańsk, Poland

²Division of Biopharmacy and Pharmacokinetics, Medical University of Gdańsk; Hallera 107, 80-416 Gdańsk, Poland

³Department of Marine Ecosystem Functioning, University of Gdańsk, Piłsudskiego 46, 81-378 Gdynia, Poland

Presenting author: Paulina Goździk (paulina.st@gumed.edu.pl)

The advances in medical sciences result in development of various therapeutical strategies that allow efficient treatment and increase the quality of life of patients suffering from numerous diseases. However, pharmaceuticals may affect not only the patients themselves. The growing consumption of drugs may lead to their accumulation in the environment and non-target organisms, causing detrimental effects. The goal of our study was to perform non-targeted analysis of water samples obtained from the Baltic Sea in order to assess the presence and concentration of various chemicals potentially harmful to the marine organisms, including pharmaceuticals and their metabolites. The samples were collected in four seasons, in the vicinity of the sewage treatment plant “Dębogórze” in the Gulf of Gdańsk and in a location situated further from the coast, considered as a less polluted area (reference point). Seawater samples were filtered utilizing glass filters and HLB extraction discs. The filters were washed with methanol, collected eluents undergone evaporation, and dry residues were dissolved in 80% acetonitrile. The samples were subjected to LC-QTOF-MS analysis and for separation of analytes a C18 column was used (Zorbax Extend C18 2.1x100 mm; 3.5 μm). The chromatograms were processed with MassHunter Qualitative Analysis software (Agilent). The results of our study revealed the presence of different chemical compounds, including pharmaceuticals (e.g. carbamazepine, an antiepileptic drug), and pave the way for new ecotoxicological studies in the Baltic Sea region. Such research seem necessary, as these contaminants may lead to disturbances in the physiological functions of marine organisms and affect biodiversity.