

POMERANIAN WASTEWATER TREATMENT PLANTS AS HOT-SPOTS OF ANTIBIOTIC RESISTANCE: THE IMPACT ON THE COASTAL WATERS OF THE BALTIC SEA

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Abstract

Wastewater treatment processes are monitored mainly in terms of biogenic substance removal efficiency. Only recently has the treated wastewater started to be perceived as a potential source of pharmaceutical residues to their recipients, and hot-spots for antibiotic resistance dissemination of bacteria. The scale of the problem has not been fully investigated and understood – missing data on pharmaceutical consumption, unidentified and dispersed point sources and non-unified sampling strategies of monitoring programs have been identified as examples of challenges. In the project *REPHIRA (Reduction of Pharmaceutical Emissions from Dispersed Point Sources in Rural Areas)*, financed by Interreg Baltic Sea Region Seed Money, a co-operation network has been established between five partners located in the Baltic Sea catchment area: Poland, Germany, Denmark, Sweden and Finland. In order to fill some of the knowledge gaps, a preliminary study was conducted by the Polish partner on four wastewater treatment plants (WWTPs) localized in the coastal area of northern Poland. The WWTPs differed in terms of load, people equivalents, treatment technology and recipient of the WWTP effluent. The amount of human gut related indicator organism, *E. coli* was estimated in raw and treated wastewater, as well as in the receiver, using a classical microbiology approach and cultivation method. Additionally, the bacterial resistance to cefotaxime – an antibiotic belonging to third-generation cephalosporin family – has been tested.

Keywords: Baltic Sea, antibiotic-resistant bacteria, wastewater treatment processes, rural areas