

ORGANIC MICROPOLLUTANTS IN THE LOWER SECTION OF RIVER MUR AND ITS TRIBUTARIES

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There is increasing demand for efficient screening methods in organic micropollutants (OMPs) environmental monitoring. The occurrence, attenuation factors, and risks of 31 OMPs, including pharmaceutically active compounds (PhACs), pesticides, and bisphenols were investigated by multiresidue screening analysis in the Croatian-Hungarian border section of the River Mur and five of its tributaries. Water samples were collected monthly for one year. After filtration, SPE was executed as sample preparation. Sample analysis was performed on an ACQUITY UPLC H-Class System (Waters, MA, USA), coupled with a Xevo TQ-S micro triple quadrupole mass spectrometer (Waters, MA, USA), equipped with an ESI source operating in positive ion mode. The chromatographic separation of PhACs and pesticides was carried out on an XBridge Premier BEH C18 column (100×2.1 mm i.d., 2.5 µm particle size; Waters, MA, USA). An ACQUITY UPLC BEH C18 column (50×2.1 mm i.d., 1.7 µm particle size; Waters, MA, USA) was employed for the chromatographic separation of dansyl derivatives of estrogens and bisphenols. The analysis showed that the most polluted streams in terms of both PhACs and pesticides were the smallest tributaries on the Hungarian side. The sum of the mean concentration of the investigated OMPs was 4436.2 ng L⁻¹ in the Hungarian influents, 735.4 ng L⁻¹ in the larger Croatian ones, and 456.0 ng L⁻¹ in the River Mur itself. However, the concentrations of persistent pollutants detected in almost all River Mur samples (e.g., bezafibrate, carbamazepine, diclofenac, atrazine) were not affected by the polluted water of the tributaries, due to the difference in the magnitude of the water flow. This, in turn, highlighted the importance of transboundary pollution of the river. Photo- and biodegradation may be considered the most important attenuation factors in the river, resulting in lower OMP concentrations in warmer seasons and higher concentrations in colder seasons. The risk assessment demonstrated that diclofenac and estrone were the pollutants carrying the highest risks in all watercourses.