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Abstract: Common use of non-steroidal anti-inflammatory drugs (NSAIDs), including ibuprofen, leads to drug presence in sewage but also in surface waters, which they enter with municipal treatment plants effluent. As a result, the drugs may also be found in tap water. Due to low ibuprofen concentration in aquatic environment, acute toxicity is not observed. Yet, continuous exposure of aquatic organisms to the drug makes it important to study chronic toxicity mechanisms. Moreover, knowledge of ibuprofen migration and the time course of its biodegradation in the aquatic environment is incomplete. Only a few microorganism species (mainly fungi) able to metabolize ibuprofen have been described. The current research suggests that ibuprofen biotransformation proceeds by its hydroxylation to 1,2-dihydroxyibuprofen. *Sphingomonas* spp. Ibu-2 is the only described bacterial strain able to use ibuprofen as a sole carbon and energy source. Thioestrification is the first step in ibuprofen degradation. Then, propionic chain is removed with simultaneous oxidation of aromatic ring to 4-isobutylcatechol, which is then cleaved by extradiol enzymes. Knowledge of pathways of NSAID metabolism will allow for more effective removal of such pollutants from municipal wastewater, resulting in a significant improvement of surface water quality.

Keywords: Non-steroidal anti-inflammatory drugs (NSAIDs), sewage, surface waters, biotransformation.