

Occurrence and Fate of Anti-inflammatory Drugs in Wastewater Treatment Plants in Japan

Norihide Nakada*, Koya Komori and Yutaka Suzuki

Water Environment Research Group, Public Works Research Institute
1-6 Minami-hara, Tsukuba, Ibaraki 305-8516, Japan

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The fates of anti-inflammatory drugs (e.g., ibuprofen, naproxen, mefenamic acid and ketoprofen), which are frequently detected in the discharges of wastewater treatment plants (WWTPs) and river water in Japan, were clarified in two WWTPs. The concentrations of ibuprofen, naproxen, mefenamic acid and ketoprofen were 69–1080, 179–305, 143–1580 and 160–1060 ng/L in the influent, and N.D. (< 40 ng/L), 74–166, 72–265, 64–107 ng/L in the effluent, respectively. The concentrations of the anti-inflammatory drugs analyzed were almost equal to or lower than those reported in foreign countries. High removal efficiencies of the drugs, except ibuprofen, were observed in the WWTP that has longer hydraulic retention time than that of the other WWTP. For ibuprofen, high removal efficiencies were observed in both WWTPs (84 to 98%). Disinfection by chlorination was not effective to remove the drugs surveyed. On the other hand, the effective removal of ketoprofen by ultraviolet (UV) radiation for disinfection was demonstrated, although the disinfection by-products were not identified.

*E-mail: Nakada55@pwri.go.jp