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SEASONAL BEHAVIOR OF SOME PHARMACEUTICAL COMPOUNDS PRESENT IN INFLUENTS OF TWO WASTEWATER TREATMENT PLANTS LOCATED IN PORTUGAL

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In the urban water cycle, wastewater treatment plants (WWTPs) are crucial barriers against pharmaceutical compounds (PhCs) contaminants, with their efficiency and removal ability depending of several factors such as PhCs psychochemical properties, climate conditions, employed technologies, operational conditions and PhCs concentration in raw influents [1, 2].
In this work, a SPE-LC-MS/MS methodology was applied for the measurement of 24 PhCs (10 therapeutic classes) in wastewater influents from two portuguese WWTP (Beirolas and Faro Nw), under project LIFE IMPETUS. In 2017, 23 sampling campaigns were performed to assess seasonal variations. Regarding Beirolas WWTP, antibiotics, analgesics, beta-blockers and NSAIDS showed seasonal variations, mainly in autumn. This distribution is characteristic of therapeutic classes whose consumption rate varies with weather conditions due to the increase of flu, colds and febrile seizures. These therapeutic classes showed concentrations between 0.95 µg/L (beta-blockers, in spring) to 74 µg/L (analgesics, in winter). The main representative PhCs were acetaminophen (18 – 99 µg/L), ibuprofen (5.0 – 17 µg/L), and naproxen (3.0 – 10 µg/L). Regarding Faro WWTP, no significant seasonal variations of the therapeutic classes were observed, probably due to the mild climate. Similarly to Beirolas, the main representative PhCs were acetaminophen (16 – 124 µg/L), ibuprofen (2.8 – 27 µg/L), and naproxen (3.3 – 11 µg/L). This approach allows a better understanding of PhCs seasonal profile, giving relevant information towards improving the WWTPs removal barriers.

Topics: pharmaceuticals and drugs of abuse; water quality and the water cycle.

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