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Tap water contamination: Multiclass endocrine disrupting compounds in different housing types in an urban settlement

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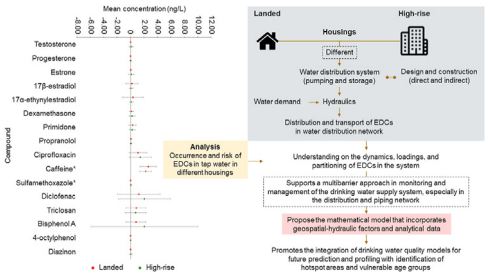
HIGHLIGHTS

- EDC levels and physicochemical parameters varied between housing types ($p < 0.05$).
- Dynamics, loadings, and partitioning of EDCs differed in the supply system.
- All age groups have no risk of EDC exposure via drinking water intake.
- Predicting and profiling of EDCs are vital for effective mitigation and prevention.

GRAPHICAL ABSTRACT



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ABSTRACT

Contamination of endocrine disrupting compounds (EDCs) in tap water is an emerging global issue, and there are abundant influencing factors that have an ambivalent effect on their transportation and fate. Different housing types vary in terms of water distribution system operation and design, water consumption choices, and other hydraulic factors, which potentially affect the dynamics, loadings, and partitioning of pollutants in tap water. Thus, this study analyzed 18 multiclass EDCs in tap water from different housing types (i.e., landed and high-rise) and the associated health risks. Sample analyses revealed the presence of 16 EDCs, namely hormones (5), pharmaceuticals (8), a pesticide (1), and plasticizers (2) in tap water, with the prevalent occurrence of bisphenol A up to 66.40 ng/L in high-rise housing. The presence of caffeine and sulfamethoxazole distribution in tap water was significantly different between landed and high-rise housings ($t(152) = -2.298$, $p = 0.023$ and $t(109) = 2.135$, $p = 0.035$). Moreover, the salinity and conductivity of tap water in high-rise housings were significantly higher compared to those in landed housings ($t(122) = 2.411$, $p = 0.017$ and $t(94) = 2.997$, $p = 0.003$, respectively). Furthermore, there were no potential health risks of EDCs (risk quotient < 1) estimated in different age groups via drinking water intake. However, EDC variation in different housing types requires simulation of the occurrence, transport, and fate of EDCs in the distribution system and investigation of the underlying factors for effective mitigation, prevention, and intervention.

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