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Poster 40

Monitoring azole antifungals in water: a step toward environmental and human health protection

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Abstract

Background: Water is an essential resource for all living organisms and human activities. However, the presence of organic micropollutants (OMPs) at residual levels (ng/L–µg/L) in aquatic environments raises significant concerns. Among these, Priority Substances (PSs, Directive 2013/39) and Contaminants of Emerging Concern (CECs, Watch Lists of Decisions 2015/495, 2018/840, 2020/1161, 2022/1307, and 2025/439) have been detected in surface water (SW) and drinking water (DW) [1], prompting regulatory action within the European Union (EU). Monitoring these compounds is crucial for risk assessment and environmental protection. Azole antifungals, recently included in the EU Watch Lists, represent an emerging threat due to their potential ecotoxicological risks and their role in promoting antifungal resistance. Their presence in aquatic environments may contribute to the spread of resistant pathogens, such as *Candida auris* and *Aspergillus fumigatus*, which pose direct risks to human health [2]. **Objective:** To address this challenge, this study focuses on optimizing a solid-phase extraction (SPE) method using carbon-based adsorbents for the detection of azole antifungals in SW and DW matrices. **Methods:** Key parameters, including different carbon materials, sample pH, and elution solvents, were evaluated to enhance extraction efficiency. **Results:** The results suggest that carbon-based SPE cartridges have potential for monitoring azole compounds, with the added advantage of being reusable for at least three cycles without loss of performance. Further optimization is required to improve extraction efficiency and ensure reliability in routine analysis. **Conclusions:** This work contributes to the development of advanced analytical methods for water quality assessment and supports efforts to mitigate environmental and human health risks associated with emerging contaminants.

Keywords: contaminants of emerging concern; analytical methods; antifungal resistance

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