OPEN ACCESS Scientific Letters

IV 1H-TOXRUN INTERNATIONAL CONGRESS 2025 | 08-09 MAY, 2025 Porto, Portugal

Poster 39

Enantioselective liquid chromatography method for the simultaneous determination of chiral and achiral fungicides in aqueous matrices

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Abstract

Background: Fungicides are organic compounds, many of them chiral, used in various applications such as medicines, personal care products, agrochemicals and industry. Although they have beneficial effects in controlling fungal plagues and treating diseases, their widespread use has led to their detection in the environment [1-3]. As a result, fungicide contamination is increasingly a global environmental concern, due to the risks it poses to non-target organisms and to human health. Given that enantiomers of chiral fungicides can show different bioactivity, toxicity and degradation, monitoring the enantioselective occurrence of these compounds in the environment is very important to assess the toxicity and adverse effects of each enantiomeric form [3-5]. **Objective:** The aim of this study is to develop and validate an enantioselective chromatographic method for analyzing a group of five chiral fungicides (ipconazole, metconazole, penconazole, tebuconazole, and tetraconazole) as well as an achiral one (fluconazole) in aqueous matrices. **Methods:** The chromatographic method was developed using the chiral polysaccharide column Lux i-cellulose 5 [cellulose tris(3,5-dichlorophenylcarbamate)] under reversed elution mode in a liquid chromatograph with a diode array detector. Different compositions and proportions of the mobile phase, various column temperatures and different flow rates were tested. **Results:** An enantioselective chromatographic method was optimized, allowing to enantioseparate the enantiomers of ipconazole, metconazole, penconazole, tebuconazole, and tetraconazole and of the achiral fungicide fluconazole. **Conclusions:** This optimized method will be validated and used for the determination of the enantiomers of each chiral target fungicide – ipconazole, metconazole, penconazole, tebuconazole, and tetraconazole – as well as the achiral fungicide fluconazole in water matrices.

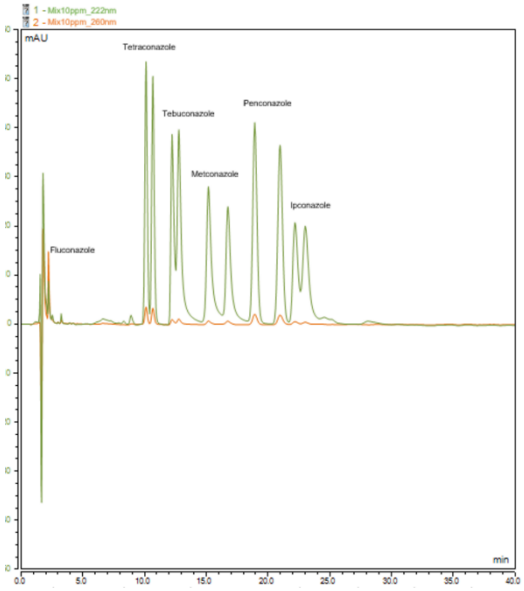

Figure 1. Chromatogram of a mixture of target fungicides, each at 10 mg L^{-1}, at two different wavelengths (222 nm and 260 nm).

Keywords: environmental contaminants; fungicides; water monitoring; chiral chromatography

Acknowledgments/Funding

This work was financially supported by national funds through the FCT/MCTES (PIDDAC), under the projects: STAR - STereoselective environmental processes in Antibiotics: role for Resistance (DOI: 10.54499/2022.02842.PTDC); LSRE-LCM (DOI: 10.54499/UIDB/50020/2020 and 10.54499/UIDP/50020/2020); ALiCE (DOI: 10.54499/LA/P/0045/2020). Additionally, this work was also partially supported by FCT/MCTES (PIDDAC) via institutional funding to the associate laboratory UCIBIO (DOI: 10.54499/LA/P/0140/2020) - Associate Laboratory i4HB and through the annual funding of 1H-TOXRUN of the University Institute of Health Sciences (IUCS-CESPU). ARLR acknowledges the support from FCT funding under the Scientific Employment Stimulus - Individual Call (DOI: 10.54499/ 2022.00184.CEECIND/CP1733/CT0001.

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