Occurrence of selected Covid-19 drugs in water and sediment in the Upper Orange River Basin

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Residues of pharmaceutical compounds remain one of the contaminants of concern in the environment. These substances eventually find their way into various compartments of the ecosystem, such as water, soils, sediments, and biotic components. Consequently, pharmaceutical residues have since gained the attention of researchers, primarily because of the fatal impact they exert on living organisms upon their release into the environment. Among the numerous pharmaceutical compounds manufactured all over the world, the present study focused on prednisone (PRD), metabolite-prednisolone (m-PRD), dexamethasone (DEX), and azithromycin (AZI). In the present study, a solid phase extraction–liquid chromatography–mass spectrometry (SPE-LC-MS) method was used to quantify the analytes of interest in water and sediment samples collected from eight sampling sites within the Upper Orange-Sengu River Basin in Free State, South Africa. The detection frequencies of AZI, m-PRD, DEX, and PRD in the water samples obtained from the eight sampling sites were 87.5%, 12.5%, 37.5%, and 25.0%, while the detection frequencies of the analytes in sediments were 75.0%, 75.0%, 50.0%, and 75.0%, respectively. Among the pharmaceutical compound residues monitored, m-PRD had the highest concentration in water, while the DEX level was the highest in sediments. Since these pollutants were detected within the ecosystem, it is expedient for stakeholders to continually monitor their presence and, most importantly, embark on remediation strategies for their removal from the environment.