BIOCHAR-BASED WASTEWATER TREATMENT TO COMBAT ANTIMICROBIAL RESISTANCE

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Antimicrobial resistance (AMR) is driven in part by environmental reservoirs of antimicrobial-resistant organisms and genes, as well as antimicrobials themselves, which drive resistance via selective pressure. According to the UN, 80% of all wastewater flows into the environment untreated. When wastewater is treated, treatment plants can act as hotspots of horizontal gene transfer from resistant to non-resistant organisms. There is therefore an urgent need to filter wastewater from sources rich in resistant bacteria and antimicrobials, like hospitals and pharmaceutical plants, before they reach environmental reservoirs where resistance can spread. Biochars produced from waste lignocellulosic biomass are ideal for this purpose, as they are highly adsorbent, affordable, and sustainable, with morphologies and surface chemistries that are tunable by choice of production conditions. Here, we link peak pyrolysis temperatures and alkaline pretreatment of walnut shell biochars to their filtration performance, showing these materials are suitable for in-line filtration of wastewater to combat AMR.