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One Health Surveillance of Antimicrobial Resistance in Integrated Constructed Wetlands

Inhalt

Antimicrobial resistance (AMR) is a major One Health challenge linking human, animal and environmental health. Wastewater systems are recognised as reservoirs of antimicrobial-resistant organisms (AROs), facilitating their dissemination into natural ecosystems. Integrated Constructed Wetlands (ICWs) are nature-based wastewater treatment systems that combine water treatment with biodiversity enhancement; however, their role in mitigating environmental AMR remains poorly understood. This study investigates the occurrence and reduction of AROs within seven ICWs in Ireland treating municipal, agricultural, industrial and companion animal wastewaters. A two-year monitoring programme involved monthly sampling of influent and effluent waters. Target organisms included ESBL-producing, carbapenemase-resistant and fluoroquinolone-resistant Enterobacterales, *Pseudomonas aeruginosa* and *Acinetobacter baumannii*. Isolates were identified by MALDI-TOF, characterised by antimicrobial susceptibility testing, and a subset of *Escherichia coli* isolates underwent whole-genome sequencing. To date, over 660 target organisms representing 20 bacterial species have been identified, with *E. coli* predominating across all sectors. Preliminary findings indicate reduced ARO numbers in effluent compared with influent samples. Multiple multidrug-resistant phenotypes were detected, and AMR profiles differed between wastewater sectors. The findings support ICWs as One Health tools for mitigating environmental AMR.

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i did not receive an email with the registration id.

Eingereicht von **STREPAROLA, Gaia** <gaia.streparola@teagasc.ie> am **Montag, 22. Juni 2026**