BOOK OF ABSTRACTS



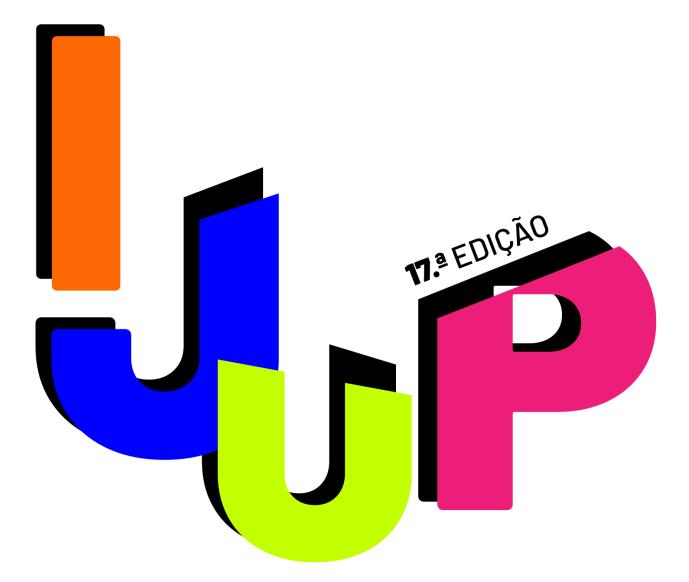
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21877 | A dive into diversity and antimicrobial resistance of *Enterococcus* from rivers used for drinking water production

Cátia Matos^{1,2}; Bárbara Duarte^{1,2}; <u>António Magalhães³</u>; Francisca Pereira³; Rui Azevedo⁶, Ana R. Freitas^{1,2,4}; Margarida Valente⁵; Carolina Tavares⁵; Juliana Rodrigues⁵; Agostinho Almeida⁶; Luísa Peixe^{1,2}; Patrícia Antunes^{1,2,3}; Carla Novais^{1,2}

UCIBIO-Applied Molecular Biosciences Unit, Laboratory of Microbiology, Department of Biological Sciences, Faculty of Pharmacy, University of Porto. Porto, Portugal¹; Associate Laboratory i4HB -Institute for Health and Bioeconomy. Faculty of Pharmacy. University of Porto. Porto, Portugal²; Faculty of Nutrition and Food Sciences, Porto University, Porto, Portugal³; 1H-TOXRUN, One Health Toxicology Research Unit, University Institute of Health Sciences, CESPU, CRL - Gandra (Portugal)⁴; Águas do Douro e Paiva, Laboratory of Microbiology. Porto. Portugal⁵; LAQV/REQUIMTE, Laboratory of Applied Chemistry, Faculty of Pharmacy, University of Porto. Porto. Portugal⁶

Background & Aim: Antimicrobials affect microbial diversity and the spread of antimicrobialresistance (AMR) in surface waters. Here we studied the occurrence and diversity of antimicrobial-resistant Enterococcus, a water quality indicator, in rivers used for drinking water production. Methods: Water (n=42) and sediments (n=34) samples were collected (n=6 rivers-A-F; Porto region; 10 months/2022-2023) and *Enterococcus* recovered by standard water quality protocols. Species were studied by PCR, antimicrobial (antibiotics/biocides) susceptibility by disk diffusion/broth-microdilution (EUCAST/CLSI, 2023), linezolid resistant (optrA/poxtA) or metal tolerance (copper-tcrB/cueO; arsenic-arsA; mercury-merA) genes by PCR and metals by ICP-MS. Results: Enterococcus were in 89% of the samples (2-6000CFU/100ml), below the maximum advised values for surface waters supporting chemical+physical+disinfection treatment. Isolates (n=208) belong to 9 species. The clinical-relevant E.faecium (Efm) and E.faecalis were less detected than other species (2-5%, 17-36% or 83-100% of samples, respectively). Resistance to chloramphenicol, linezolid, gentamicin, ciprofloxacin (0-17%, each), quinuspristin-dafopristin (0-33%), streptomycin (7-25%), erythromycin (21-50%) or tetracycline (42-50%) was similar (p>0,05; Fisher) among rivers. Linezolid-resistance (MIC=8-16mg/L) was found in Efm (optrA+poxtA), E. gallinarum or E.durans (optrA) from two rivers. Benzalkonium-chloride MIC/MBC values were of wild-type strains (0.5-4mg/L; n=62). Few samples carried tcrB±cueO (8-33%/river; including the linezolid-resistant-Efm), arsA_I (17%/river-C) or merA_IV (0-17%/river), supporting low concentrations of metals found in water (copper:0.27-1.94µg/L; arsenic: 0.78-15.6 μg/L; mercury: <0.048μg/L). **Conclusions:** The year-round presence of MDR-*Enterococcus* emphasizes the role of surface waters in spreading AMR. Of concern are MDR+linezolidresistant+copper-tolerant isolates occurring in samples with an *Enterococcus* load below the advised legal limits if treatment barriers prove ineffective.

Keywords: Water Quality Indicators, *Enterococcus*, Antimicrobial Resistance, Surface Waters, Environment, Public Health.

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