

POSTER 88

Faecal carriage of enterococci by Portuguese healthy humans: preliminary data towards accurate species identification for forensic applications

Maria J. Teixeira^{1-3*}, Ana C. Almeida-Santos^{3,4}, Bárbara Duarte^{3,4}, Carla Novais^{3,4}, Ricardo Jorge Dinis-Oliveira^{1,2,5}, Luísa Peixe^{3,4}, Ana R. Freitas^{1,3,4}

¹TOXRUN – Toxicology Research Unit, University Institute of Health Sciences, CESPU, CRL, 4585-116 Gandra, Portugal.

²Department of Public Health and Forensic Sciences, and Medical Education, Faculty of Medicine, University of Porto, 4200-319 Porto, Portugal.

³UCIBIO - Applied Molecular Biosciences Unit, REQUIMTE, Department of Biological Sciences, Laboratory of Microbiology, Faculty of Pharmacy, University of Porto, 4050-313 Porto, Portugal.

⁴Associate Laboratory i4HB - Institute for Health and Bioeconomy, Faculty of Pharmacy, University of Porto, 4050-313 Porto, Portugal.

⁵UCIBIO-REQUIMTE, Laboratory of Toxicology, Department of Biological Sciences, Faculty of Pharmacy, University of Porto, Porto, Portugal.

*✉ amariajsteixeira@gmail.com

Doi: <https://doi.org/10.51126/revsalus.v4iSup.355>

Resumo

Introduction: Forensic Microbiology is an emerging discipline in clinical diagnostics and public health that can be applied, for example, to clarify the origin of a hospital-acquired infection [1]. *Enterococcus faecium* (Efm) colonizes the human gut but is also one leading hospital pathogen worldwide. Last year, a taxonomic restructuring proposed that Efm inhabiting the human gut may actually correspond to *Enterococcus lactis* species, while those causing hospital infections are truly Efm [2].

Objectives: Our main goal was to assess the current faecal carriage rate of *E. faecium* in Portuguese healthy humans and to add in the establishment of criteria to differentiate them from *E. lactis* since this species is expectedly dominant in the human gut. **Methods:** Nine faecal samples were obtained from healthy volunteers (5 females, 4 males; age range 23-68 years, mean 46 years) of the metropolitan Porto area (4 cities) between February-March 2022. Sample (2 g) processing included an enrichment step in Brain-Heart Infusion broth without/with 3 antibiotics (ampicillin-16 µg/mL, vancomycin-6 µg/mL or linezolid-4 µg/mL) for 37°C/18h. The resulting enrichment (0.1mL) was seeded onto Slanetz–Bartley agar plates, without/with the same antibiotics (37°C/48 h). From each plate, a colony of each morphology was selected for further species

identification by PCR. Antibiotic susceptibility was studied against 9 antibiotics according to EUCAST/CLSI. **Results:** Enterococci (n=53) were isolated from all samples. They were identified as Efm (n=44, obtained from all samples), *E. faecalis* (n=7, obtained from 3 samples) and *Enterococcus* spp. (n=2). Samples contained enterococci resistant to erythromycin (89%), tetracycline (56%), quinupristin/dalfopristin (44%-only Efm) and/or ampicillin (11%). One sample carried 2 multidrug-resistant Efm. **Conclusions:** Although the number of samples recovered until now is limited, the dominance of Efm in detriment to *E. faecalis* species contrasts with a national survey made 20 years ago reporting a prevalence of *E. faecalis* over *E. faecium* [3]. Future experiments will include the differentiation of these Efm isolates between truly Efm or *E. lactis* species by designing novel specific primers (ongoing). This will be fundamental as these species cannot be confounded whenever a rigorous identification of *E. faecium* as a hospital pathogen is needed for forensic investigations. This project was approved by the Ethics Committee of the Faculty of Pharmacy, University of Porto (CEFFUP) and funded by national funds from FCT—Fundação para a Ciência e a Tecnologia under the project EXPL/SAU-INF/0261/2021.

Keywords: forensic microbiology; *Enterococcus faecium*; *Enterococcus lactis*; hospital infections; antimicrobial resistance.

References:

- [1] Oliveira M, Amorim A. Microbial forensics: new breakthroughs and future prospects. *Appl Microbiol Biotechnol* 102: 10377-91, 2018.
- [2] Belloso Daza MV, Cortimiglia C, Bassi D, Cocconcelli PS. Genome-based studies indicate that the *Enterococcus faecium* Clade B strains belong to *Enterococcus lactis* species and lack of the hospital infection associated markers. *Int J Syst Evol Microbiol* 71, 2021.
- [3] Novais C, Coque TM, Sousa JC, Peixe LV. Antimicrobial resistance among faecal enterococci from healthy individuals in Portugal. *Clin Microbiol Infect* 12: 1131-4, 2006.