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Hospital-Adapted Clonal Complex 17 *Enterococcus Faecium* Found among Sand Enterococcal Isolates

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ABSTRACT

Though poorly studied, sand is an environment with an extended degree of interaction with man. Enterococcal strains can be found in sand but we do not know to what extent these ubiquitous opportunistic nosocomial pathogens isolated from sand carry antimicrobial resistances and virulence traits. In an attempt to fill in this knowledge gap, two distinct types of sand (beach and children playground) were examined concerning composition in enterococcal species, genetic diversity of isolates and abundance of resistance to antimicrobials and virulence traits. Five different species were found, namely *Enterococcus faecium*, *Enterococcus faecalis*, *Enterococcus hirae*, *Enterococcus flavescens* and *Enterococcus casseliflavus*. Although genetic diversity was evident, two different *E. faecium* clones, common to the two types of sand, were detected, suggesting the existence of clones well adapted to this specific environment or from a common source. *E. faecium* was associated with multiple antibiotic resistances, including to fluoroquinolones and tetracycline that are commonly used by veterinarians and clinicians. Among the multiresistant *E. faecium* strains from beach sand, two were from sequence type (ST) 442, which belongs to the wide-spread Hospital-adapted clade CC17. They both carried the *esp* gene and the genomic island associated with CC17. The other virulence factors screened were disseminated among *E. faecalis* strains, but seldom detected in the other species, evidencing the existence, in these environments, of *E. faecalis* strains carrying the same virulence factors as the clinical ones. The present work thus stresses the need to follow-up the presence and characterization of enterococcal strains from both beach and children playground sands and of including these environments in the epidemiological global analysis of enterococcal isolates.

KEYWORDS

 Antibiotic Resistance; Beach Sand; Clonal Complex 17; *Enterococcus*; Playground Sand; Virulence Factors

Cite this paper

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