

1 RESISTANCE AND VIRULENCE PROFILES AND CYTOTOXIC POTENTIAL OF *Enterococcus*
2 sp. ISOLATES FROM AQUATIC ENVIRONMENT

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11 **ABSTRACT:**

12 *Enterococcus* spp. are ubiquitous in nature and common inhabitants of the microbiota of the
13 gastrointestinal tract of humans and animals and are often associated with opportunistic
14 infections. Such infections are often associated with polymicrobial biofilms and antimicrobial
15 resistance. In recent decades unusual species of enterococcus have been described. Therefore,
16 the understanding of the cytotoxic potential of species of the genus as well as their virulence
17 factors are important for the identification of new strategies to control infections caused by these
18 microorganisms. Our study aimed to evaluate the presence of vancomycin resistance genes (*van*
19 *A* e *van B*), the presence of genes related to virulence factors such as *gelE* (production de
20 gelatinase), *ace* (*Enterococcus* collagen adhesin), *cylA* (Cytolysin-activating bacteriocins), *sprE*
21 (serine endopeptidase), *PAI* (Island of pathogenicity), *asa1* (aggregation substance), *cpd* (sex
22 pheromone) e *agg* (aggregation substance) as well as to evaluate the cytotoxic potential of
23 *Enterococcus* sp. from aquatic environments. In addition, the isolates were evaluated for the
24 antibiotic resistance profile and the ability to form biofilms. As for the resistance genes, we
25 observed that 8,33 % and 33,33% of the isolates had the *vanA* and *vanB* genes, respectively. As
26 for virulence genes, frequencies of 41,66% for *gelE* and *ace*; 25 % for *cylA* and *sprE*; 33,33 %
27 and 50% for *asa1* and *agg*, respectively. None of the isolates analyzed showed the *cpd* and *PAI*
28 genes. As for the phenotype of antimicrobial resistance, 66.66% of the isolates presented
29 resistance to vancomycin and 58% to ampicillin. An isolate of *E. casseliflavus* (14) presented
30 resistance to all tested antibiotics. All isolates showed metabolites with cytotoxic potential against
31 HeLa cells. The ability to form biofilm was observed in all isolates and 50% of these were classified
32 as strongly biofilm forming. Of these, 66% had resistance to more than five of the antibiotics
33 tested. The present study demonstrates that different species of *Enterococcus* sp. can present
34 different profiles of resistance and virulence, which reinforces the importance of the studies of
35 these profiles in *Enterococcus* sp. from the most varied environments.

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37 Key words: *E. casseliflavus*, *E. mundtii*, HeLa cells , genotype, fenotype, environmental

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