

**TITLE:**DEGRADATIVE ENZYMES PRODUCED BY PENICILLIN-SUSCEPTIBLE AND PENICILLIN-RESISTANT *Enterococcus Faecalis* CLINICAL ISOLATES

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**ABSTRACT:**

*Enterococcus faecalis* is one of the most relevant bacteria in healthcare-associated infections. Characterized by intrinsic and acquired resistance to different classes of antimicrobials, the genome of *E. faecalis* strains capable of causing tissue damage and inflammation contains a pathogenicity island carrying genes encoding some virulence factors, such as aggregation substance, extracellular surface proteins, and degradative enzymes. The aim of this study was to determine the activity of some degradative enzymes among clinical isolates of penicillin-susceptible (PSEF) and penicillin-resistant *E. faecalis* (PREF). The presence of hemolytic activity, hydrolysis of gelatin and casein, presence of lipase and deoxyribonuclease (DNase) were evaluated using culture media containing specific substrates. Additionally, the influence of the culture medium pH on the bacterial growth and activity of the enzymes was evaluated. *E. faecalis* strains were previously isolated from different clinical specimens taken from patients attended at a University hospital, in Uberaba-MG. DNase production was observed in all *E. faecalis* strains evaluated (n=12), while lipase production was not observed in any of them. Among the PSEF (n=6), 2 isolates had hemolytic activity, 4 had gelatinase activity and 3 isolates were able to metabolize casein. All PREF strains (n=6) showed gelatinase and caseinase activities. Culture medium pH influenced the growth of the *E. faecalis* strains, with reduced bacterial growth at pH 4, and also influenced the activity of the degradative enzymes evaluated. Among the PSEF, at pH 4, reduction of hemolysis for isolate 228 and reduction of casein activity for isolate 221 were observed; at pH 9, increased caseinase and gelatinase activities were observed for isolates 221 and 228. Among the PREF, in pH 4, the gelatinase activity was reduced for isolates 157, 250, 269 and 313, while lower caseinase activity was observed for isolates 20 and 269; at pH 9,

increased activity of caseinase was observed for isolate 291. The production of hemolysin, gelatinase, caseinase and DNase by the *E. faecalis* strains, regardless of susceptibility or resistance to penicillin, appears to be constitutive, since the activity of such enzymes was detected even after bacterial culture in the absence of specific substrates. The presence of degradative enzymes may favor the persistence of *E. faecalis* in the hospital environment, making the enterococcal infections more difficult to treat.

**Key words:** *Enterococcus faecalis*, hemolysin, gelatinase, caseinase, DNase.

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