

TITLE: RESISTANCE MARKERS TO BETA-LACTAMICS, MACROLIDES AND TETRACYCLINE IN GOATS WITH AND WITHOUT PERIODONTAL DISEASE

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Abstract

Periodontitis causes significant losses in goat production, leading to systemic impairment and economic losses. It is recognized the importance of Gram negative anaerobic bacteria in the development of goat periodontitis, which show marked resistance to antimicrobials. The present study aimed to identify the presence of bacteria of *Fusobacterium* and *Prevotella* genera, as well as markers of resistance to antimicrobials in the oral biofilm of goats with different periodontal conditions. For this purpose, bacterial DNA was obtained from goats with periodontitis (n = 21) and healthy goats (n = 23), aged between 13 and 36 months, kept in a feedlot regime, with no history of having received antibiotics or chemotherapy with antimicrobial activity in the past few months. The detection of *Fusobacterium nucleatum*, *F. necrophorum*, *Prevotella intermedia*, *P. buccae*, *P. loescheii*, *P. melaninogenica*, *P. nigrescens* and the genes *tetM*, *tetO*, *tetK*, *tetA* (tetracycline), *blaTEM*, *blaCTX-M*, *blaSHV*, *AmpC* (β -lactam), *ermA*, *ermB*, *ermC*, *ermF* (macrolides, lincosamines and streptogramin B) and *nim* (metronidazole) were evaluated by amplifying the target DNA by polymerase chain reaction (PCR) with specific primers and amplification conditions. The results were subjected to Spearman's and Pearson's Chi-square correlation tests ($p < 0.05$). In healthy animals, there was a significant occurrence of only *F. nucleatum* (69.6%), with the *tetO* gene being the only one detected (8.7%). However, in animals with periodontitis, the presence of *F. nucleatum* (95.2%), *F. necrophorum* (61.9%) and *Prevotella* genus (42.9%) was shown to be associated with periodontal destruction. The occurrence of *AmpC* and *tetM* (23.8%), *ermC* (28.6%), *ermF* (33.2%), *tetQ* and *tetO* (38.1%) genes was higher among animals with periodontitis (p ranging from $p = 0.018$ to $p = 0.026$), while the Spearman correlation test suggested a strong association between the presence of fusobacteria, *P. intermedia* and *P. nigrescens* in the gingival sulcus and the presence of *tet*, *erm* and *AmpC* genes in samples of goats with periodontitis. The results suggest that animals with periodontal involvement, even if they have not received antimicrobials, can harbor microorganisms and resistance markers to some of the main antibiotics used in human and veterinary medical clinic, in addition to dentistry, which can contribute to horizontal or vertical dissemination of these same markers.

Keywords: Resistance genes, Periodontitis and Goat

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