

TITLE: ANTIMICROBIAL ACTIVITY OF PLANT COMPOUNDS AGAINST DENTAL PLAQUE FORMING BACTERIA.

AUTHORS: ¹CUNHA-JUNIOR, R.M; ¹SOUZA, M.P.F.; ²BARROS, M.; ²ALBUQUERQUE, J.L.; ¹DOMINGUES, P.B.A.; ²SANTOS, M.H., ²MOREIRA, M.A.S; ¹PIERI, F.A.

INSTITUTION: ¹INSTITUTO DE CIÊNCIAS DA VIDA, UNIVERSIDADE FEDERAL DE JUIZ DE FORA - CAMPUS GOVERNADOR VALADARES (RUA MANOEL BYRRO, 241, CEP 35032-620, GOVERNADOR VALADARES – MG, BRAZIL); ²UNIVERSIDADE FEDERAL DE VIÇOSA (RUA PH ROLFS, S/N, CAMPUS UNIVERSITÁRIO, CEP: 36570-900, VIÇOSA – MG, BRAZIL)

ABSTRACT

Caries and Periodontal Disease are the main diseases that affect humans and dogs, respectively, and both have dental plaque as the etiological agent. The bacteria involved in the formation and development of this biofilm are from genus *Streptococcus*, with *S. mutans* being the main etiological agent in humans and other species of *Streptococcus spp.* and some other bacteria in dogs. The antimicrobial agent most used to combat dental plaque is chlorhexidine digluconate, but it has several side effects such as loss of taste, tooth darkening and irritation of the oral mucosa. Thus, it is necessary to search for alternatives with fewer side effects and potential use for long periods of time, and currently several plant extracts have been highlighted as sources of several compounds with potential antimicrobial activity. The aim of this study was to evaluate the antimicrobial potential of Guttiferone-A, 2,2',4-trihydroxybenzophenone and β -caryophyllene, as well as its associations against canine oral bacteria (16 isolates of the genera *Streptococcus*, *Staphylococcus*, *Lactobacillus*, *Bacillus*, *Aeromonas*, *Haemophilus* and *Enterococcus*) and human oral bacteria (*S. mutans*, *S. sanguinis* and *Staphylococcus aureus*). Minimum inhibitory concentration (MIC) of the compounds was determined by broth microdilution, followed by addition of resazurin to identify cell viability, and possible interactions between the different compounds were evaluated by checkerboard. Guttiferone-A presented relevant results against all bacteria from human and dog dental plaques, with MICs ranging from 7.81 μ g/mL to 62.5 μ g/mL. β -caryophyllene showed good activity on all isolates of dogs, with MICs ranging from 12.5 μ g/mL to 100 μ g/mL, but it was not evaluated the activity against strains of humans origin. 2,2',4-trihydroxybenzophenone also showed activity on *S. mutans* with MIC of 100 μ g/mL, however there was low or no activity of the compound on the other bacteria. The Checkerboard showed a positive synergistic interaction between β -caryophyllene and Guttiferone-A compounds against a isolate of *Streptococcus* from dog dental plaque. It is concluded that for human dentistry Guttiferone-A presents as a potential antimicrobial drug for treatment and prevention of caries, and that Guttiferone-A and β -caryophyllene present high potential for the formulation of antimicrobial drug prototype for treatment and prevention of periodontal disease in dogs.

Palavras-chave: Antimicrobials, natural compounds, dental plaque, dog, human.

Aknowledgements: FAPEMIG, CAPES and CNPq