

Title: SYNERGISM OF PROPOLIS AND TETRACYCLINE AGAINST *Bacillus cereus*

Authors: Bonfim R.A.T.¹, Viana, D.J.S.¹, Pinto, S.S.S.¹, Alves, P.A.B.¹, Santos, F.A.¹

Institution: ¹UFVJM - Universidade Federal dos Vales do Jequitinhonha e Mucuri (Rua da Glória, 187, Centro, Diamantina – MG, CEP 39100-000)

Abstract:

Propolis is a resinous material collected by bees for the beehive protection, specially due to its antimicrobial activity. This bee product has several biological activities and the antibacterial activity is one of the most important and it has been evaluated against Gram-positive and Gram-negative bacteria. Since bacteria can be resistant to several antimicrobial drugs, the synergistic effect of propolis and antibiotics are relevant and may constitute an alternative for treating these pathogens. The aim of this research was evaluate the synergism of ethanolic extract of propolis from Vale do Jequitinhonha and tetracycline against *Bacillus cereus* ATCC 11778. Ethanolic extract of propolis (EEP) were prepared with propolis collected in the cities of Gouveia, Palmital, Itamarandiba and Turmalina, Minas Gerais State, Brazil. The ethanolic extract of propolis were standardized by submitting them to a temperature of 50°C. after which the resin content was diluted with 95% ethanol to obtain stock solutions of 100 mg/mL. The determination of minimum inhibitory concentration (MIC) was performed by the method of dilution in Brain Heart Infusion Agar, containing increasing concentrations of EEP (0.03 a 2048 µg/mL). Tetracycline MIC was also performed by the method of dilution in Brain Heart Infusion Agar, containing increasing concentrations (0.008 a 1024 µg/mL). Inoculums were prepared with approximately 10⁵ CFU/mL of *B. cereus* in Brain Heart Infusion Broth. In vitro synergism was performed with *B. cereus* cultures incubated with ½ and ¼ of EEP MIC and ½ and ¼ of tetracycline MIC, in Brain Heart Infusion Agar. The plates were incubated at 37° C for 24 hours. All assays were performed in duplicate. Resin content ranged from 106 to 154 mg/mL for all EEP tested. EEP MIC ranged from 32 to 1024 µg/mL and was 4 µg/mL for tetracycline. The best synergism results were observed at concentrations of ½ EEP MIC and ¼ of tetracycline MIC. EEP from Vale do Jequitinhonha presented synergistic effect with tetracycline against *Bacillus cereus* at lower concentrations when compared with MIC of EEP or tetracycline separately.

Key-words: propolis, tetracycline, synergism, antibacterial effect

Funding: FAPEMIG and UFVJM