

**Title: ANTIBACTERIAL PROPERTIES FROM THE PRODUCTS OF THE *Apis mellifera* BEEHIVE.**

**Authors** Pereira, A.F.M.<sup>1</sup>, Alves, F.C.B.<sup>1</sup>, Albano, M.<sup>1</sup>, Barbosa, L.N.<sup>1</sup>, Andrade, B.F.M.T.<sup>1</sup>, Furtado, F.B.<sup>1</sup>, Dos Santos, L.D.<sup>1</sup>, Orsi, R.O.<sup>1</sup>, Fernandes Júnior, A<sup>1</sup>.

**Institution:** <sup>1</sup>UNESP – Universidade Estadual Paulista – Júlio de Mesquita Filho (Distrito de Rubião Júnior, S/N, CEP: 18618-970 - Botucatu / SP, Brasil)

**Abstract:**

Bacterial strains and multi-drug resistant to conventional antibiotics have become common, especially in hospital settings, where drugs for treating bacterial infections are overused. So the search for new antimicrobials is in evidence, including natural products such as those produced by *Apis mellifera* bees that are already known for their antibacterial action. Therefore this study verified the antibacterial action of these natural products: propolis, four types of venom bees, each corresponding to different floral sources, which are: wild, eucalyptus, orange and wild with artificial feeding, sugar syrup, and melittin, a polypeptide which represents approximately 50% of the dry weight of venom. We tested these products over five clinical isolates from methicillin-resistant staphylococcus aureus (MRSA), *Escherichia coli* and *Pseudomonas aeruginosa* and their ATCC. Resazurin Assays Microtiter Plate (REMA) were performed for obtaining the Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC); and MIC<sub>90%</sub> were calculated to compare the efficacy of each compounds tested. We also tested the combination of alcoholic extract of propolis and the four types of venom bees through the Time Kill Curve, we used only the ATCC strain of each species tested. The MIC<sub>90%</sub> indicated that melittin had the best performance of all the tested products (MRSA - 10.03 ug/ml *E. coli* - 24.36 mg/ml, and *P. aeruginosa* - 26.94 ug/ml) and melittin tested in *E. coli* showed no significant difference compared to the orange venom. Excluding propolis, the other products were more effective on MRSA. Time Kill Curve indicated a bacteriostatic synergism for the studied combinations and showed again the best effects on MRSA. We can conclude that all tested compounds have an antimicrobial activity and the antibacterial activity of venoms is probably due to the melittin. The four types of venom have different actions, which can be explained by the different floral sources. The propolis has the best action in *P. aeruginosa* strains, opposing the literature reports in which propolis is more effective on gram-positive bacteria. Further studies should be performed to check the cytotoxicity of the compounds for the development of antibiotics to treat infectious diseases caused by these bacteria.

**Key Words :** antibacterial activities, melittin, propolis, venom bee, *Apis mellifera*..