Title: EVALUATION OF ADAPTIVE RESPONSE OF *Salmonella enterica* Enteritidis EXPOSED TO SUBLETHAL CONCENTRATIONS OF ESSENTIAL OILS OF OREGANO AND CLOVE

Authors COELHO, M. S.[1], PAGNOSSA, J. P.[1], PICOLLI, R. H.[1]

Institute [1]UFLA – Federal University of Lavras (University Campus, PO Box 3037, CEP 37200-000, Lavras / MG)

Abstract:

The need to produce safe food led food industry to use different antimicrobial agents for both the sanitizing of utensils and equipment and for disinfection of handlers. However, the organisms are constantly exposed to sublethal concentrations of antimicrobials which may lead to their adaptation or cross-adaptation providing their survival in harsh environments. The objective of this study was to evaluate the adaptive response of *Salmonella enterica* Enteritidis, pathogenic for humans Gram-negative rod, to the essential oils (EOs) of *Origanum vulgare* (oregano) and *Syzygium aromaticum* (clove). For evaluate the adaptive response was first assessed the minimum inhibitory concentration (MIC) and bactericidal (MBC) of each EOs was studied using the technique of broth microdilution. Antibacterial agents were used in concentrations of 0.00; 0.05; 0.09; 0.19; 0.39; 0.78; 1.56, 3.12 and 6.25 (v/v). In all experiments, the EOs were homogenized in brain heart infusion broth (BHI), supplemented with 0.5% (v/v) of Tween 80. Bacterial growth was checked by reading the absorbance (DO_{620nm}) after incubation of the cultures for 24 hours. To evaluate the adaptive response, microorganisms were exposed to sublethal concentrations of 1/4 MIC and 1/8 MIC of EO of clove and oregano for 6 hours and then incubated at 37° C for 24 hours in concentrations above the MIC. MICs of EOs of clove and oregano were of 0.39% for both. *S. Enteritidis*, adapted in the EO of clove but not adapted in EO of oregano in sublethal concentrations of 1/4 MIC, at sublethal concentrations of 1/8 MIC were more sensitive to the previously determined in 1/4 MIC. The bacteria studied were capable of adapting to conditions prior to the inadequate growth when exposed to sublethal conditions indicating risk in getting safe food.

Keywords: Adaptation, Essential oils, *Salmonella*

Development agency: FAPEMIG, CNPq and CAPES.