

Title: BACTERICIDAL EFFECT OF DIFFERENT ESSENTIAL OILS AGAINST *Clostridium sporogenes*

Authors MARTINS, H. H. A.¹, PAGNOSSA, J. P.¹, PICOLLI, R. H.¹

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

Abstract:

In search of better quality of life and longevity, consumers rather prefer natural products while essential oils emerges by its versatile use in food safety combining antimicrobial and antioxidant activity. *Clostridium sporogenes*, an anaerobic and spore producer specie of bacteria, is commonly related to food deterioration and occasionally to pathogenesis. Because of its genetic and physiological similarity with species of *Clostridium botulinum* Group I (proteolitical), *C. sporogenes* is frequently used as a substitute for this type of microorganism in laboratory uses. This study objectives the determination of minimum bactericidal concentration (MBC) of different essential oils against *C. sporogenes* ATCC 3584 strains. MBC was determined employing microdilution in broth technique using Reinforced Clostridial Broth containing 0.5% (v/v) Tween 80. Essential oils of nutmeg (*Myristica Fragans*), oregano (*Origanum vulgare*), white thyme (*Thymus vulgaris*), mandarine (*Citrus nobilis*) and clove (*Syzygium aromaticum*) were used in the following concentrations (%): 0; 0.2; 0.5; 1.0; 1.25; 1.50; 1.75; 2.0. Aliquots of 5 µL of standard strains (105 UFC/mL) were transferred into tubes containing 5 mL of broth plus essential oils concentrations; these were mixed and incubated at 37°C/24h in anaerobically conditions. After this period, the culture was inoculated in Clostridium Agar by pour plate with overlay technique and 37°C/24h incubation. MBC was determined based on the lack of growth on the plates. Experiment occurred in three repetitions and triplicate. Oregano essential oil showed the lowest MBC (0.2%) which contains carvacrol as its major antimicrobial compound. Carvacrol interacts with cellular membrane distorting and destabilizing its physical structure, which raises fluidity and passive permeability. All other bactericides concentrations were considered low ranging from 0.5% (white thyme and clove) to 1.0% (mandarine and nutmeg) indicating essential oil high potential on safety control of this microorganism.

Keywords: *Clostridium sporogenes*, Essential oils, MBC

Development agency: FAPEMIG, CNPq and CAPES.