

Title: Influence of growth temperature on the antimicrobial activity of essential oil clove and eugenol against *Salmonella enteric* Enteritidis

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Abstract:

The antimicrobial properties of essential oils and their compounds have attracted interest for representing an alternative answer to consumer demands for natural additives in foods. Such oils are capable of acting on the surface of bacterial cells, damaging the cellular wall and membrane. The search for bioactive compounds originating from plants with both bactericidal and bacteriostatic action has interested researchers because of their greater health safety. *Salmonella* is one of the most common zoonotic pathogens worldwide, causing clinical diseases in human and animal hosts. It is highly resistant to antimicrobials due to its outer membrane's hindering of the diffusion of the bacterial cell's constituents. This study evaluated the influence of growth temperature on the antimicrobial activity of eugenol and essential oils extracted from clove (*Syzygium aromaticum*) on *Salmonella enteric* Enteritidis S64. To determine the minimum inhibitory concentration (MIC), 20; 30 and 37°C, Brain Heart Infusion (BHI) containing 0.5% (v / v) Tween 80 was used. The broth was added in polystyrene microplates with 96 wells. Different concentrations were obtained by homogenization of the antibacterial agents with culture media: 0,00; 0,05; 0,09; 0,19; 0,39; 0,78; 1,56; 3,12 and 6,25 % (v/v). The minimum inhibitory concentration of clove oil and eugenol was 0.19% at 20 °C and 30 °C. Minimum inhibitory concentration values were 0.39% for clove oil and eugenol at 37 °C. The results were similar for the two oils antimicrobials tested. This study demonstrated that growth temperatures influence MIC values. However, the antimicrobials were more effective at combinations with low temperatures showing that when the microorganism is closer to optimal temperature conditions, higher concentrations are needed.

Keywords: MIC, antimicrobial, essential oil.

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