

TITLE: INVESTIGATION OF THE MINIMUM INHIBITORY CONCENTRATION (MIC) OF THE *Syzygium aromaticum* (CLOVE) ESSENTIAL OIL OBTAINED BY SUPERCRITICAL FLUID (CO₂) METHODOLOGY ON YEASTS OF THE GENUS *Candida*.

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ABSTRACT

Candida yeasts reside as commensals, being part of the normal microbiota of healthy individuals. However, in immunologically compromised patients, they are able to cause infections that range from superficial to severe ones named as invasive, leading to mortality and morbidity relevant rates. The resistance and undesirable side effects of antifungal drugs used in medical practice has intensified the research for new natural products that may act as alternative antifungal agents in order to resolve these therapeutic limitations. In addition, oils and plant extracts may reveal new substrates with potential use as an antimicrobial drug or as a model for the development of new drugs. Thus, this work aimed to determine the minimum inhibitory concentration of the *Syzygium aromaticum* essential oil extracted by supercritical fluid (CO₂) methodology. A total of 189 yeast strains of the genus *Candida* were evaluated. *S. aromaticum* essential oil was obtained under pressure of 300 bar and at temperature of 50°C. The minimum inhibitory concentration was determined by the microdilution technique in a polystyrene plate, where the oil was diluted in 5% Dimethyl Sulfoxide (DMSO) at the serial concentrations of 1.25% to 0.01% and analyzed by resazurin developer dye. Analysis of the results revealed that the majority of the isolates (107/189) had MIC of 0.31%, followed by 0.16% (67/189), 0.63% (10/189), and 0.08% (5/189). No strain had a maximum value of 1.25%. Ten strains that shown the highest MIC value (0.63%) belong to *C. parapsilosis* species and four strains with lower MIC values (0.08%) to the species *C. haemolunii* (2), *C. albicans*, and *C. parapsilosis*. It is known that the crude extract of *Syzygium aromaticum*, extracted by organic solvents such as Ethyl Acetate, Hexanic and even alcoholic, has shown some action on yeasts of the genus *Candida*. However, methodology for the extraction of botanical compounds by Supercritical Fluid, using CO₂ as solvent, has been gaining prominence in relation to conventional techniques, since it is more efficient, selective, presents high quality of purity, less cost and it is 100% clean technology. The results obtained indicate that the *S. aromaticum* essential oil had action on the *Candida* species, and could be useful for future investigations.

Key words: *Candida* spp; Supercritical Fluid; Supercritical CO₂; *Syzygium aromaticum*; Susceptibility.

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