

**TITLE:** BIOACTIVITY OF *Mentha* spp. ESSENTIAL OILS AGAINST *Candida* spp.

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## **ABSTRACT**

*Candida* spp. have been associated with increasing cases of resistant fungal infections, particularly in immunocompromised patients. Studies with *Mentha* spp. have showed potential antimicrobial action against *Candida* spp. becoming important in the studies of this infections. The aim of this research was to evaluate the antifungal activity of the *Mentha* spp. essential oil against planktonic yeasts and *Candida* spp biofilm obtained commercially, as well as your action at morphologic structure of *Candida* cell. The composition of oils were analyzed by gas chromatography GC-EMS. The minimal inhibitory concentration (MIC) and minimal fungicidal concentration (MFC) was determined by microdilution in broth method (CLSI, 2008). The biofilm formation and mature biofilm was analyzed by microplate spectrometry after 2h exposure of XTT at 490nm and displayed by scanning microscopy after treatment. The morphology activity of oils was evaluate by flow citometry and Transmission Electron Microscopy (TEM). The presence of isomentone, mentone and menthol were detected as major compounds in essential oils. *Mentha* essential oils tested showed antifungal activity against species of *Candida* spp. in range 1 to 0,0315 mg/mL for *M. arvensis* and 2 to 0,062 mg/mL for *M. piperita*. Both essential oils showed fungistatic activity compared of MIC. Biofilm formation and mature biofilm showed decrease in metabolic activity of up to 50% in concentrations of 0,0156 - 16 mg/mL and 0,0312 - 16 mg/mL for *M. arvensis* and *M. piperita* respectively. The images obtained by scanning microscopy showed cellular wilting and loss of intracellular content. The yeast structure affected by the action of the oil was the membrane, evidenced by 99,5% of DiOC<sub>3</sub>(6) fluorochrome marking by flow citometry, evidencing membrane depolarization. TEM images confirmed this action, showing membrane destabilization, presence of vacuoles and internal cell disorganization for both oils tested. The action on membrane may have been caused due to the presence of terpenes in the essential oil composition. The essential oils of *Mentha* spp. show antifungal action and antibiofilm against *Candida* spp. The morphological structure affected by the action of the oil is the plasma membrane. These results demonstrate that *Mentha* essential oils can be alternative therapy in the control of *Candida* spp. and their virulence factors.

**Keywords:** *Candida* spp.; *Mentha* spp.; Medicinal Plants.

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