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Biofilm induction in mucormycosis-causing fungi and the synergistic antifungal activity of Amphotericin B and thyme oil

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Fungal infections caused by opportunistic pathogens have gained clinical importance in the last decade, with a significant increase in infections due to the *Zygomycetes*, *Mucor*, *Rhizopus* and *Absidia*. These serious and sometimes fatal infections are often associated with biofilm formation. The formation of biofilm often increases resistance to antifungal agents when compared to free living colonies. This study investigates both the biofilm formation and the antifungal susceptibility of two species known to cause mucormycosis infections namely: *Rhizopus oryzae* and *Absidia corymbifera*. Upon successful biofilm formation, the synergistic effects between thyme oil and amphotericin B were tested. Results indicate that both *R. oryzae* and *A. corymbifera* are able to form biofilms under specific conditions and that these biofilms were significantly inhibited by Thyme oil. The MIC₅₀ of thyme oil on *Absidia corymbifera* and *Rhizopus oryzae* was 0.0005 µL/mL and 0.0001 µL/mL respectively. Results also indicate a strong synergistic relationship between Amphotericin B and Thyme oil when used in combination against fungal biofilms.

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