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*8th
meeting on
medicinal
biotechnology*

BOOK OF ABSTRACTS

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BOOK OF ABSTRACTS OF THE 8TH MEETING ON MEDICINAL BIOTECHNOLOGY

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Enhancing Antifungal Activity Against *Candida albicans* Using Novel Organic Compounds

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Candida albicans is the predominant cause of invasive candidiasis, a major global health threat [1]. The increasing emergence of resistance to commonly used antifungals (ex.: azoles and polyenes) demonstrates an urgent need for alternative therapeutic strategies. The objective of this study was to evaluate the antifungal activity of novel organic derivatives from bioactive natural compound, including Naphthalene, Betulinic Acid (BA) [2]; Protocatechuic Acid (PCA) and Gallic Acid (GA), alone, or in combination with conventional antifungals to investigate synergistic effects that enhance their efficacy. Antifungal susceptibility assays were performed in *C. albicans* ATCC 10231 using the broth microdilution method, according to CLSI M27 guidelines, to determine Minimum Inhibitory Concentrations (MICs) and Minimum Fungicidal Concentrations (MFC). The interaction between BA derivatives and amphotericin B was assessed by checkerboard assay and fractional inhibitory concentration index

(FICI). Naphthalene, PCA and GA derivatives showed low antifungal activity, falling within the moderate to weak bioactivity range (MIC $\geq 100 \mu\text{g mL}^{-1}$; [3]). Among BA derivatives, BA-4 and BA-5 exhibited the best antifungal activity, with MIC values of 0.95 and $1.91 \mu\text{g mL}^{-1}$, respectively, achieving 99% fungicidal activity at the same concentration. Furthermore, in combination assays, both compounds enhanced Amphotericin B activity, showing synergistic effects (FICI = 0.50), resulting in a decrease in MIC. Although most newly synthesized compounds exhibited limited antifungal potential, BA-4 and BA-5 demonstrated very strong bioactivity and fungicidal effects against *C. albicans*. The observed synergy with amphotericin B highlights their potential role as antifungal adjuvants and supports the further exploration of betulinic acid derivatives as viable approaches to overcoming antifungal resistance.

KEYWORDS: *candida albicans*; antifungal therapy; bioactive natural compounds

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