ANTIFUNGAL PROPERTIES OF A NONSPECIFIC LIPID TRANSFER PROTEIN FROM NONI (Morinda citrifolia L.) SEEDS

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Lately many fungal species have become resistant to the main currently used antifungal agents and several approaches have been proposed to overcome resistance, including drug combinations as well as research on new bioactive molecules from natural sources. Lipid Transfer Proteins (LTPs) constitute a family of basic polypeptides that has shown relevant antimicrobial activities in vitro against species of clinical interest. This work aimed to evaluate the antifungal activity of a lipid transfer protein, named McLTP1, isolated from noni seeds and to investigate its synergistic effect when combined with amphotericin B (AmB). Antifungal activity was carried out in 96-well microplates according to the guidelines M27-A2 of the Clinical and Laboratory Standards Institute using Candida albicans (01-05-005) and Candida parapsilosis (ATCC 22019). McLTP1 was purified from noni seed extract using a combination of trichloroacetic acid precipitation and size exclusion chromatography and was assayed at concentrations ranging from 25 – 400 μg/mL. In addition, the nature of the interaction between McLTP1 (12.5 – 100 μg/mL) and AmB (0.06 – 2 μg/mL) in the presence of either C. albicans or C. parapsilosis inoculum was also analyzed. McLTP1 was able to significantly inhibit the growth of C. parapsilosis at concentrations ranging from 25 μg/mL (52.72% of inhibition) to 400 μg/mL (60.48% of inhibition; p<0.05). Growth inhibition was significantly increased when McLTP1 (25 μg/mL) was combined with AmB 0.125 μg/mL (76.0% of inhibition). Contrary to C. parapsilosis, McLTP1 did not show any antifungal activity against C. albicans. However, when McLTP1 (25 μg/mL) was applied in combination with AmB (0.5 μg/mL; 20.2% inhibition of fungal growth) a significant (p<0.05) growth inhibition potentiation of 75.04% was observed. In conclusion, McLTP1 displayed relevant antifungal properties and investigations to determine the applicability of these antifungals combinations to in vivo systems would deserve particular attention.

Key Words: Antifungal activity; Lipid Transfer Protein; Synergistic effect.

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