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PREUSSIA AFRICANA ENDOPHYTE AN ALTERNATIVE SOURCE FOR THE PRODUCTION OF ANTIFUNGAL METABOLITES

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Invasive fungal infections (IFIs) represent a major threat to global health, particularly in immunocompromised individuals. Treatment is hindered by the limited availability of antifungal drugs and the increasing prevalence of antifungal resistance (WHO, 2022), underscoring the urgent need for novel antifungal agents with both effective and reduced side effects (El-Sayed et al., 2024). In this context, the genus *Preussia* has emerged as a promising source of secondary metabolites with antimicrobial activity (Xu et al., 2019). This study aimed to optimize the cultivation conditions of *Preussia africana* endophyte, isolated from *Handroanthus impetiginosus*, in order to maximize the production of antifungal compounds against *Candida* species. A Central Composite Rotatable Design (CCRD) was employed to evaluate selected carbon sources and inoculum numbers. Ethyl acetate (AcOEt) and chloroform ($CHCl_3$) extracts were tested against *Candida albicans*, *C. glabrata*, and *C. tropicalis* by determining the Minimum Inhibitory Concentration (MIC). Toxicity was assessed in the *in vivo Galleria mellonella* model. The extracts showed higher activity against *C. albicans* and *C. glabrata*. $CHCl_3$ extracts obtained at the optimal point (OP) exhibited MIC values ranging from 25 to 100 µg/mL against *C. albicans*, whereas AcOEt extracts displayed MIC values from 50 to 100 µg/mL. Assays 10 and 12 ($CHCl_3$ extracts) also stood out for their antifungal activity against *C. glabrata* (MIC 25–50 µg/mL). AcOEt extracts from the OP demonstrated good activity against both *C. glabrata* and *C. albicans* (MIC 50–100 µg/mL), exhibiting fungicidal action at the same concentration against *C. albicans*. Notably, the most active extracts displayed low toxicity against *G. mellonella* at concentrations up to 800 µg/mL, resulting in high larval survival rates. In conclusion, optimization of *P. africana* cultivation proved to be an effective strategy for producing extracts with potent and selective antifungal activity, highlighting this endophyte as a promising source for the development of novel therapeutic agents.

Keywords: *Preussia africana, antifungal activity, Candida, secondary metabolites, cultivation optimization.*