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Exploring antifungal activities of acetone extract of selected Indian medicinal plants against human dermal fungal pathogens

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ABSTRACT

A broad spectrum of medicinal plants was used as traditional remedies for various infectious diseases. Fungal infectious diseases have a significant impact on public health. Fungi cause more prevalent infections in immunocompromised individuals mainly patients undergoing transplantation related therapies, and malignant cancer treatments. The present study aimed to investigate the *in vitro* antifungal effects of the traditional medicinal plants used in India against the fungal pathogens associated with dermal infections. Indian medicinal plants (*Acalypha indica*, *Lawsonia inermis*, *Allium sativum* and *Citrus limon*) extract (acetone/crude) were tested for their antifungal effects against five fungal species isolated from skin scrapings of fungal infected patients were identified as including *Alternaria* spp., *Curvularia* spp., *Fusarium* spp., *Trichophyton* spp. and *Geotrichum* spp. using well diffusion test and the broth micro dilution method. All plant extracts have shown to have antifungal efficacy against dermal pathogens. Particularly, *Allium sativum* extract revealed a strong antifungal effect against all fungal isolates with the minimum fungicidal concentration (MFC) of 50–100 µg/mL. Strong antifungal activity against *Curvularia* spp., *Trichophyton* spp., and *Geotrichum* spp. was also observed for the extracts of *Acalypha indica*, and *Lawsonia inermis* with MFCs of 50–800 µg/mL respectively. The extracts of *Citrus limon* showed an effective antifungal activity against most of the fungal strains tested with the MFCs of 50–800 µg/mL. Our research demonstrated the strong evidence of conventional plants extracts against clinical fungal pathogens with the most promising option of employing natural-drugs for the treatment of skin infections. Furthermore, in-depth analysis of identifying the compounds responsible for the antifungal activity that could offer alternatives way to develop new natural antifungal therapeutics for combat-resistant recurrent infections.

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1. Introduction

Universally, humans are co-habiting earth with plentiful ecosystems comprises of various classes of microorganisms that may be beneficial or harmful to them. However, humans are evolved in such a way that their inherent innate immune system protects the body from harmful pathogens. It is well known that our human skin is featured to have abundant diversified groups of microorganisms ranging from bacteria, fungi to parasites. Such colonies of microorganism particularly fungi are forming a commensal relationship with human skin (Hurabielle et al., 2020). Thus, fungi contribute to play a role of an essential member of

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