An in-vitro Study on the effect of Calotropis *Gigantea* in different Potencies on *Trichophyton Rubrum*

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Abstract

Background: The emergence of resistant fungal strains due to irrational use of antifungal agents highlights the need for alternative therapies. *Calotropis gigantea*, known for its traditional medicinal uses, has been explored for its antifungal properties against *Trichophyton rubrum*, a common dermatophyte causing skin infections.

Materials and Methods: Standard strains of *T. rubrum* (ATCC MYA-029) were cultured on Sabouraud Dextrose Agar (SDA). Various potencies of *C. gigantea* (3X, 6X, 3C, 6C, 12C, 30C, 200C, and 1000C) were evaluated for antifungal activity using the disc diffusion method. Griseofulvin served as the positive control, and homeopathic placebo (90% ethanol) as the negative control. Minimum Inhibitory Concentration (MIC) values were determined using turbidometry and analyzed statistically using the Kruskal-Wallis Test.

Results: Lower potencies of *C. gigantea* (3C, 3X, and 12C) demonstrated significant antifungal activity, with inhibition zones ranging from 9 ± 0.5 mm to 10 ± 0.3 mm ($p < 0.05$). MIC50 and MIC90 values for *C. gigantea 3C* were 100 µL and 200 µL, respectively, indicating higher efficacy compared to higher potencies (30C, 200C, and 1000C), which showed MIC50 and MIC90 values of 500 µL and 900 µL. Griseofulvin exhibited the highest antifungal activity with MIC50 and MIC90 values of 100 µL each. The negative control showed no significant inhibition.

Discussion: The antifungal efficacy of *C. gigantea* is attributed to its bioactive compounds, including flavonoids and terpenoids. Lower potencies exhibited stronger activity, aligning with traditional applications of the plant. The findings support its potential as a topical antifungal treatment and highlight the value of MIC in guiding effective dosing strategies.

Conclusion: Homeopathic medicine *Calotropis gigantea* demonstrates significant antifungal activity, particularly in lower potencies (3X, 3C, and 12C), offering a promising alternative for managing dermatophytic infections. Further research should focus on optimizing treatment regimens, exploring synergies with other homeopathic medicines, and validating findings in clinical settings to address antifungal resistance effectively.

Keywords: *Calotropis gigantea, Trichophyton rubrum*, Antifungal activity, Minimum Inhibitory Concentration (MIC). Homeopathic medicine

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