

## Antifungal activities of bark extract of *Calotropis procera* (Ait.) R. Br.

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### Abstract

The present manuscript deals with the antifungal activities of bark extract of *Calotropis procera* (Ait.) R.Br. a significant member of family Asclepiadaceae. The plant is glabrous herb or shrub with lower woody portion having erect, solid, branched and cylindrical stem with white latex. The leaves are simple, opposite, cauline, ramal, exstipulate, entire, glabrous and having reticulate venation. The fruit is characteristic follicle type. The leaf extract, flowers and latex is applied as folk-medicines over ringworm infection, rotting nails and other fungal diseases of skin as revealed out by the concerned authors during the Ethnomedicobotanical survey of Hardoi and Shahjahanpur districts of Uttar Pradesh between December 2008 to June 2012. Therefore, the present investigation was carried out to confirm its antifungal activities experimentally.

Four dermatophytes namely *Candida albicans* (MTCC#183), *Tinea capitis* (MTCC#7739) *Epidermophyton floccosum* (RV # 71625) and *Microsporum canis* (CRV#66973) were cultured in the laboratory. The bark was dried, crushed and powdered by mortar and pestle with the use of electric grinder too. The powder was extracted at room temperature and ethanol extract was prepared. The sterile Whatman filter paper disks (6mm) were saturated with the extract and applied over culture media. The zones of inhibition were recorded to find out the efficacy of bark extract against aforesaid fungi. In the present investigation Ketoconazole was used as control.

**Keywords:** *Calotropis procera*, Phytomedicines, Dermatophytes, Medicobotanical Survey.

### 1. Introduction

Since past mankind has known about the benefit of drugs obtained from the nature. Extract of Plants and their part for the treatment of various ailments, were highly regarded by the ancient civilization. The Ayurveda, Sushrut Samhita, Charak Samhita are some of the glorious books of this field. Even today, plant materials are regarded as important resources for combating illnesses including infectious diseases for the development of new therapeutic agents.

The treatment of infectious diseases with antifungal and antimicrobial agents continues to present problems in modern-day medicines with many studies showing a significant increase in the incidence of microbial resistance to several antibiotics. Due to increase in the resistance of many microbes towards established antibiotics, investigation of the chemical compound within traditional plant has become desirable.

Internationally, scientist believe that the treatment by plants provide less phytotoxic and more systemic along with easily bio-degradable substance as compared to the treatment from allopathic drugs. Therefore plants extract were used by several workers globally to eradicate diseases and pathogens. A few of them include antimicrobial testing of selected plant extract from combretum species[1], antimicrobial activity of *Tamarindus indica*[2], Ethno medicinal Plants Used Against Skin Diseases in Malayalis of Vannadu[3] Anti fungal activities of leaf extract of *Calotropis procera*[4] Antimicrobial and anti-inflammatory activity of *Mallotus pelatus* leaf extract[5] A new antifungal chromene and related dichormene from *Hypericum revolutum*.[6] Antiseptic Indian Medicinal Plants[7] Antimicrobial Screening of Some Medicinal Plants.[8] Antimicrobial studies in *Ficus glomerata*[9]. Anti bacterial activity of *Eupatorium glandulosum*[11]

Antifungal activities of leaf extract of *Holoptelea intergifolia*[12] Study of some uncommon folk medicinal plants of HarDOI District[13] Antimicrobial activity of Guinea Bissau traditional remedies[14] Antimicrobial effect of some medicinal plants extract[15] Screening Methods for antibacterial and antiviral agents from higher plants[16].

However several plants blessed with considerable antifungal activities are still awaiting to be investigation. Hence the present investigation was completed in regard to antifungal activity of *Calotropis procera* (Ait.) R. Br. a well known plant of family Asclepiadaceae. It is commonly known as Milkweed or the Shallow-wort. The plant is glabrous small herb with woody lower portion and erect, solid branched and cylindrical stem. The leaves are simple, opposite, exstipulate, entire coriaceous and glabrous with reticulate venation. Inflorescence is axillary cyme, flowers are white or pinkish and fruit is peculiar follicle type.

## 2. Methodology

The fungal battery was composed of *Candida albicans* (MTCC#183), *Tinea capitis* (MTCC#7739) and isolates of *Epidermophyton*

*floccosum* (RV# 71625) & *Microporum canis* (RV# 66973) were obtained in the laboratory. Filamentous fungi were grown on diluted Sabouraud streak plates at temperature for 15 days while yeasts were grown on Sabouraud streak plates at room temperature for 48 hours. The plants flowers were extracted at room temperature with the help of successive extraction with different solvents. The shade dried bark of *Calotropis procera* (Ait.) R.Br. were crushed into small pieces and powdered by pestle and mortar. With the help of Soxhlet extractor the powder was loaded and subjected to extraction for about 25-30 hours with ethyl acetate. After extraction the solvent was distilled off. The extract was concentrated by a waterbath under reduced pressure and below 50°C temperature. A syrupy liquid is obtained and it was dried in the dessicator. The extract was about 6% only The sterile Whatman filter paper disks (6mm) were saturated with extract of about 1mg. / disk applied over culture media as suggested by Kirby-Bauer and Stockes methodology[17][18]. The zone of inhibition were recorded for the bark extract of *Calotropis procera* (Ait.) R. Br. In the present investigation Ketoconazole was used as control with the quantity of 10 mg/disc.

## 3. Observation

**Table 1: Bark Extract of *Calotropis procera* (Ait.) R.Br.**

S.No.	Fungal Strains	Ethanol Ext.	Water Ext.	Control.
1	<i>Candida albicans</i>	+++	++	+++++
2	<i>Tinea capitis</i>	+++	+++	+++++
3	<i>Epidermophyton floccosum</i>	++++	++++	+++++
4	<i>Microsporium canis</i>	+++	++++	+++++

Inhibition is recorded on diameter of growth inhibition zone: 0, d = <0.5mm. (No Activity); +, d = 0.5 to 0.6mm; ++, d = 0.6 to 0.8mm; +++, d = 0.8 mm to 10 mm; +++, d = 10mm to 15mm; +++, d = 15 to 20mm; Ketoconazole disks were used as control

## 4. Results & Conclusion

The present study safely concludes that the bark extract of *Calotropis procera* (Ait.) R.Br. may be used in developing phytomedicines with antifungal properties. The work experimentally proves and supports the use of bark extract over ringworm infection, rotting nails and other fungal diseases of skin. The growth inhibiting zones were studied and reported that the chief dermatophytes namely *Tinea capitis*, *Candida albicans*, were diminished by the bark extract as well as by water extract very good, whereas it revealed moderate activity against *Microsporium canis* and *Epidermophyton floccosum*. The result can broadly be utilized in pharmaceutical sphere against infections quite easily<sup>10</sup>. The investigation also opens door to get rid of the fungal and yeasts infections to modern workers in this line to find out its antifungal as well as antimicrobial

activities of this plant against new pathogenic strains. The chemical constituents need search to draw the new drugs for pharmaceutical research and industry.

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