

Antidermatophytic Activity of *Acacia concinna*

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Abstract: Antidermatophytic activity of pods of *Acacia concinna* was studied against *Trichophyton rubrum*, *Trichophyton mentagrophytes*, *Trichophyton violaceum*, *Microsporum nanum* and *Epidermophyton floccosum*. In this study, significant antidermatic activity was recorded for the extracts prepared with ethanol, ethyl acetate and hexane against the dermatophytes studied with the MIC value of 62.5µg/ ml.

Key words: *Acacia concinna* • Dermatophytosis

INTRODUCTION

The decoction of the pods of *Acacia concinna* is used in hair wash in lieu of soap. The pods ground up and formed into an ointment makes a good application in skin diseases. *Acacia concinna* popularly known as 'Shikakai' has been widely used in washing hair by the people of India and Sri Lanka.

Dermatophytes are the most common causative agents of cutaneous mycosis and remain a major public health problem in spite of the availability of an increasing number of antifungal drugs. Several antifungal agents including various azoles, tolnafate cream and allylamine derivatives were introduced in the treatment. However, these antifungal agents are expensive and have varying degrees of toxicity. Hence, there is a need for new antifungal companions with broad spectrum activity which are cheaper and with less toxicity.

Herbal medicines have been known to man for centuries. Some Indian medicinal plants have been used widely in treating a variety of skin diseases by the Sidha and Ayurvedic physicians. *Acacia concinna* reported to be used for various dermatological problems. The traditional claim for its usefulness in skin disease prompted us to investigate the antidermatophytic activity of *Acacia concinna*.

MATERIALS AND METHODS

Plant Material: Pods of *Acacia concinna* were collected from Annamalainagar, Cuddalore District, Tamil Nadu, India during January, 2008 and the plant was identified by

the Department of Botany, Annamalai University, where the herbarium was deposited.

Preparation of Extract: Healthy dry pods of *Acacia concinna* were collected and washed with tap water, then surface sterilized with 10 per cent sodium hypochlorite solution to prevent the contamination of any microbes. Then rinsed with sterile distilled water and air dried in shade at room temperature. The samples were ground into a fine powder.

Powdered pods of *Acacia concinna* suspended in petroleum ether and kept in refrigerator over night for removing all the fatty substances. After over night incubation, the supernatant was discarded and the residue dried at room temperature. The residue was further divided into three parts and each part was suspended in ethanol, ethyl acetate and hexane respectively in a 250 ml conical flask and kept at 4°C overnight. Each 100 gms of powdered leaf material were soaked in 250 ml of ethanol, ethyl acetate and hexane. After over night incubation, the supernatant was filtered through a Whatman No. 1 filter paper and the filtrate was dried to evaporate. The organic solvent was evaporated at rotary evaporator at 40-60°C and the sedimented extract was weighed and dissolved in 5 per cent dimethyl sulfoxide (DMSO).

Microorganisms Used: Fifteen strains of *Trichophyton rubrum* which were isolated from clinical cases of *Tinea unguinum*, *T. criuris* and *T. corporis*. Ten strains of *T. mentagrophytes* which were isolated from *Tinea pedis*, *T. corporis* and *T. captis*. Two strains of *Epidermophyton*

Table 1: *In vitro* Susceptibility Testing of Various Organic Extracts of Acacia Concinna

Organism tested	No. of strains	Ethanol Extract µg/ml		Ethyl acetate Extract µg/ml		Hexane Extract µg/ml	
		MIC ₁₀₀	MFC ₁₀₀	MIC ₁₀₀	MFC ₁₀₀	MIC ₁₀₀	MFC ₁₀₀
Trichophyton rubrum	15	62.5	62.5	62.5	62.5	62.5	62.5
Trichophyton mentagrophytes	10	62.5	62.5	62.5	62.5	62.5	62.5
Microsporium nanum	01	62.5	62.5	62.5	62.5	62.5	62.5
Epidermophyton floccosum	02	62.5	62.5	62.5	62.5	62.5	62.5

floccosum were isolated from *Tinea cruris* and *T. croporis* and one strain of *Microsporium nunum* was isolated from *Tinea corporis* were tested.

Preparation of Fungal Inoculum: These organisms were grown on Sabouraud's Dextrose Agar plates. The 21 day old culture was scraped with a sterile scalpel and macerated in 10ml sterile distilled water. The ground fungal suspension was adjusted Spectrophotometrically to an absorbance of 0.6 at 530nm. Each tube was inoculated with 50µl of fungal suspension [1].

Determination of Minimum Inhibitory Concentration (MIC) and Minimum Fungicidal Concentration (MFC): MIC and MFC were determined according to the method described by Irobi *et al.* [2]. MIC was determined by incorporating various concentrations of extract (1000 µg/ml to 31.25 µg/ml) in sabouraud's dextrose broth. 50 µl of standard fungal inoculum was added to each tube and incubated at room temperature for 21 days. Amphotericin B (100units/ disc) was used as the positive control. The MIC was regarded as the lowest concentration of the extract that did not permit any visible growth after 21 days of inoculation.

The MFC was determined using the method of Rotimi *et al.* [3]. The dilution of extract which showed no visible growth after 21 days of incubation were subcultured on to extract free Sabouraud's Dextrose Agar plated at room temperature for 21 days using as inoculum size of 1ml.

RESULTS AND DISCUSSION

The ethanol, ethyl acetate and hexane extracts of the pods of *Acacia concinns* showed MIC and MFC Value of 62.5 µg/ml for all the dermatophytes tested. All the extracts of pods of *Acacia concinna* had identical inhibitory properties against the tested organisms (Table 1).

Antimicrobial properties of plant extracts are now recognized by several workers. The present study showed that the hexane, ethanolic and ethyl acetate extracts of the pods of *Acacia concinna* had significant

antidermatophytic properties in vitro. The MIC and MFC values of these extracts were 62.5 µg/ml.

The major compounds of pods of *A. concinna* 'Saponin' which is detergent in nature may be the reason for its popular use. The saponin is reported to possess the cell wall toxicity and may be the reason for fungicidal activity [4]. In this study we used only crude extracts of pods of *Acacia concinna*. Identification of active principle and use of pure compounds will help us to compare the activity of known antifungal agents.

Nevertheless, our present study suggest, further study of plant extract for their therapeutic efficacy is essential.

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