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## Antifungal Activity Of Some Medicinal Plant Extracts On Indoor Dematiaceous Fungi Of Kanpur

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### Abstract

Azadirachta indica (Neem) and Aloe vera plant has been used in agriculture and as medicinal plants for thousands of years ago. Medicinal plant parts are effective against some fungi and bacteria, that could infect human beings. Aqueous extract of the neem and aloe vera leaf was diluted with sterile water to prepared at five different concentrations of 10,20,30,40 and 50 percent. To evaluate the antifungal activities of the extracts were tested on SDA (Sabourauds Dextrose Agar) medium by inoculating isolated dematiaceous fungi Chaetomium globosum and Chrysosporium tropicum respectively. The growth of the dematiaceous fungal genera was affected due to the presence of plant extracts. The effectiveness of the extracts increased with increasing the concentration in the SDA medium. A lower concentration of leaf extracts showed less antifungal activity. The aim of this research is to access the study of antifungal activity of Indian neem and aloe vera plant leaves extracts on the growth of pathogenic fungi Chaetomium globosum and Chrysosporium tropicum.

**Keywords:** antifungal, aqueous, extract, dematiaceous, leaf, pathogen.

### Introduction

The dematiaceous fungi have a large heterogeneous group of microorganisms that are characterized by a light to dark color pigmentation in their hyphae or conidia. These fungi are widely distributed among the Ascomycetes, Basidiomycetes, and Zygomycetes. Most strains of these molds are pathogenic and cause the disease to plants, animals, and human beings. The taxa with the largest number of plant pathogens is the class of Deuteromycetes and Ascomycetes of kingdom fungi. Mostly species of dematiaceous fungi cause morbidity and mortality in expanding Immuno-compromised patient population. The huge occurrence of skin infection and limited number of available drugs which are effective against them (Jacobs 1990), have led researchers to investigate new antimycotic agents. There has been a recent enhancement in frequency of skin mycoses (Valeria et al. 1996). However, some of the advanced antifungal treatment still causes considerable side effects (Stehlich and Torok 1993; Lopez-Gomez et al. 1994) and adverse effects (Del Aguila et al. 1992) in some of the treated patients. In many cases resistance to treatment with certain drugs has been reported, as well as need for a prolongation of the duration of the treatment, Cheeleok et al., Gugnani et al. 1994. The use of natural products for the control of fungal disease is considered an interesting alternative to artificial fungicide due to their fewer side effects on the environment. Much attention was drawn towards plant-originated fungicides, based on the information that plants have their own defense against fungal pathogens (Gurela et al., 2005). In folk medicine, medicine herbs and plant products were used in treating a wide spectrum of infections and other diseases. There are approx. 2500 plant species of which more than approx. 600 are noted for their uses as medicinal herbs {Ali-Shtayeh and Ghdeib, 1999}. Today, a large number of different medicinal plants products are available in market {including pharmaceuticals and cosmetics}, which contain

biologically active substances. In past several years, there have been a gradual interest in the use of aromatic and medicinal plants in developed as well as developing countries, because plant- derived drugs have been reported to be safe and without side effects. In vitro studies in this study showed that the plant extracts inhibit fungal growth but this effectiveness varied. The aim of this research was to study the antifungal activity of neem and aloe vera leaf extract against indoor dematiaceous fungi *Chaetomium globosum* and *Chrysosporium tropicum*.

## MATERIAL METHODS:

### Plant Collection

The plant *Azadirachta indica* (Neem) and *Aloe Vera* was selected for the study. Its leaves were collected from the college campus garden. The collected leaves were identified with the help of the taxonomic key and departmental library and confirmed with departmental herbarium.

### Leaf Extraction

The collected Neem and *Aloe Vera* leaves were firstly washed and then sterilized with distilled water. 100 gm. of the leaves of each plant were grinded into the grinder in 100 ml of water. Each extract was filtered with two layer of muslin cloth and then finally filter with Whatman filter paper (no.1). The clear extract was collected and considered as 100 percentage basic stock. To observe the antifungal activity of the leaf extract of five different concentrations 10,20,30,40 and 50 percentage was obtained by adding suitable amount of pure extract in to SDA medium.

### Sterilization of Materials

All glassware used in this test was washed and sterilized in microwave oven at 100-120°C for 3 hours. The SDA medium was sterilized by autoclaving at a temperature of 121°C for 20 min. at 15 lbs pressure. The cork borer was sterilized by dipping them into 90% Alcohol.

### Inoculation

The sterilized SDA medium was placed in petridishes. Petridish were inoculated by a disc of (6mm) obtained from the periphery of 8-10 days old colony of the isolated both fungus that previously grown on Sabouraud's dextrose agar medium and then incubated at 28±2°C temperature for 8 days. The antifungal effect of neem and aloe vera leaves extracts and growth of *Chaetomium globosum* and *Chrysosporium tropicum* were observed regularly for each fungus after 10 days of the incubation period. All the experiments were performed in triplicate and values expressed as mean ± standard deviation.

The Sabouraud's dextrose agar medium without any extracts served as control and percent inhibition was calculated by the following formula:

$$\% \text{ inhibition} = \frac{\text{control} - \text{treated}}{\text{control}} \times 100$$

## RESULT AND DISCUSSION:

In this experiment all the plant extracts were more or less inhibitory to mycelial growth of the isolated fungus. Data are presented in Table (1), and fig (1),(2). Presence of plant extracts affected the normal growth of test fungus. The effectiveness of the extracts increased with an increase in concentration and

maximum inhibition was recorded at (50%). Lower concentration of Aloe extract (10%) caused 39.34 % inhibition in *C. tropicum* and 43.18% in *C. globosum*, however highest concentration of Aloe extract (50%) caused 72.13% inhibition in *C. tropicum* and 75.96 % in *C. globosum*. Lower concentration of Neem extract (10%) caused 13.20% inhibition in *C. tropicum* and 32.79% in *C. globosum*, however highest concentration of Neem extract (50%) caused 42.77 % inhibition in *C. tropicum* and 66.67% in *C. globosum*.

**Table 1: Effect of plant extract on the growth of dematiaceous fungi**

Plant extracts	Conc. (%)	Growth of dematiaceous fungi (mm) in different concentration of plant extract			
		Chrysosporium tropicum mean $\pm$ s. d      % inhibition		Chaetomium globosum mean $\pm$ s. d      % inhibition	
Neem	10	46.00 $\pm$ 2.00	13.20	40.66 $\pm$ 2.16	32.79
	20	40.00 $\pm$ 1.83	24.52	36.66 $\pm$ 3.38	39.90
	30	36.00 $\pm$ 4.00	32.08	34.33 $\pm$ 2.19	43.72
	40	34.00 $\pm$ 1.53	35.84	28.33 $\pm$ 1.81	53.56
	50	33.33 $\pm$ 1.81	42.77	20.33 $\pm$ 1.70	66.67
Aloe	10	37.00 $\pm$ 3.92	39.34	34.66 $\pm$ 1.81	43.18
	20	32.00 $\pm$ 3.21	47.54	30.66 $\pm$ 2.10	49.74
	30	26.00 $\pm$ 2.00	57.38	26.33 $\pm$ 1.68	56.84
	40	22.00 $\pm$ 2.00	65.57	22.33 $\pm$ 1.33	63.39
	50	17.00 $\pm$ 1.00	72.13	14.66 $\pm$ 3.15	75.96
Control		53.00 $\pm$ 0.00	0.00	61.00 $\pm$ 0.00	0.00

S.d - Standard Deviation of mean

**Fig 1: Effect of plant extracts on the growth of dematiaceous fungi**

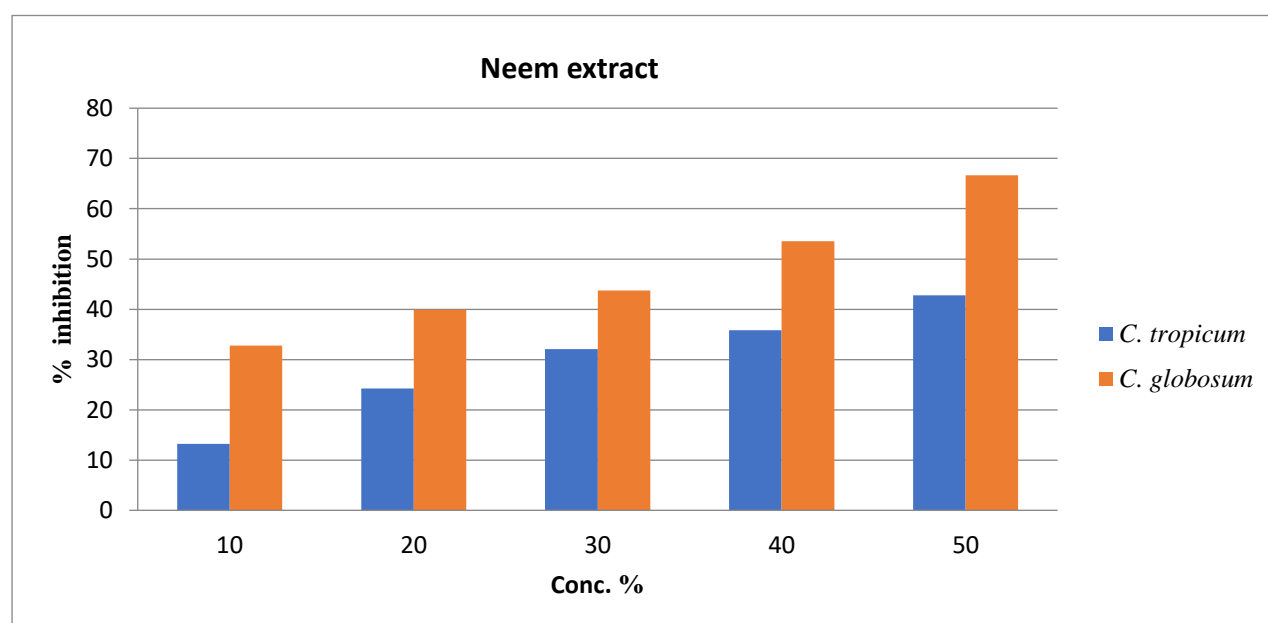
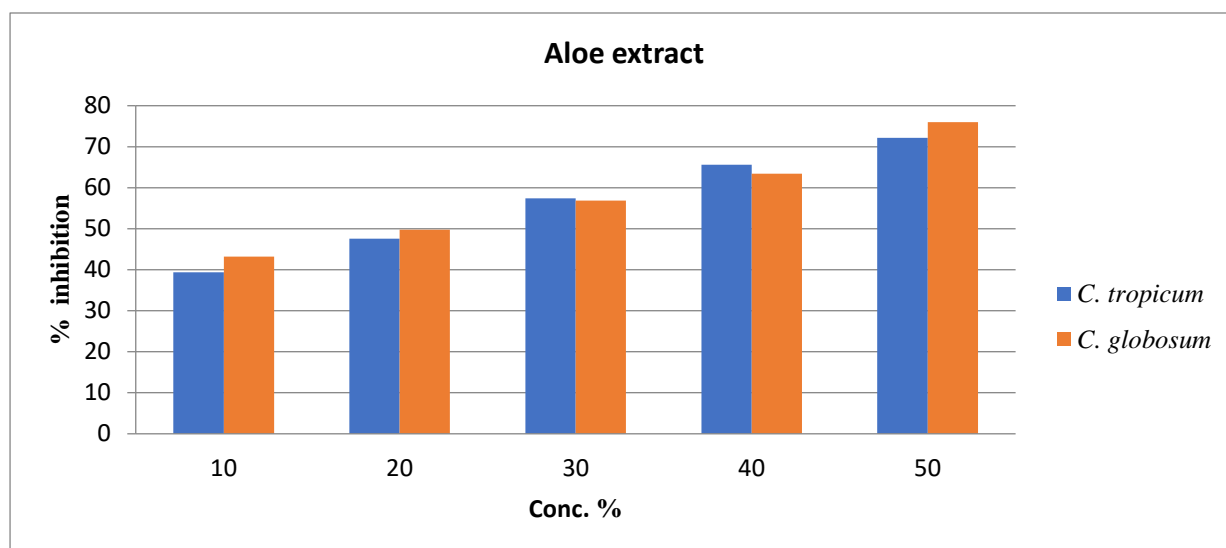


Fig. 2

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