

Antifungal properties of some plant-extracts against *Chaetomium globosum*

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ABSTRACT

The efficacy of aqueous extracts of twenty plants was observed for their antifungal activity against *Chaetomium globosum*, causal organism of decay of cotton and other cellulose materials. The maximum inhibitory effect was shown by stem extracts of *Aloe vera* (85.72%), while leaf extracts of *Camellia sinensis* (79.69%), bark extracts of *Acacia arabicae* (79.06%) and bark extracts of *Callistemon lanceolatus* (58.34%) showed strong inhibitory effect. Some of the other plants showed moderate inhibition against the mycelium growth of test fungi i.e. *Azadirachta indica* > *Albizia lebbbeck* > *Aegle marmelos* > *Acacia catechu*.

Key words : *Chaetomium globosum*, Antifungal activity, Plant-extracts, Phytochemicals.

INTRODUCTION

In order to maintain the productivity, more and more chemicals are being added in the natural environment, which enter the food chain through water, soil, and air resulting serious harmful affect in human health (Ramachandra and Nagarathna, 2003). According to the survey made by the WHO, more than 50,000 people in developing countries are annually poisoned and 5,000 die as a result of the effects of toxic agents, used in agriculture. In India 35,000 – 40,000 tons of hazardous chemicals are sprayed on the crops every year. Instead of helping the poor, these chemicals are causing cancer, sterility and death (Das, 1983). To avoid the use of these horrible diseases causing synthetic chemicals, the plants and their product should be utilized to combat the diseases causing pathogens. As plants are known to possess various secondary metabolites, which showed inhibitory effect against the growth of pathogens. Keeping these problems in view, efforts are underway to search economic safe phytochemicals, which could be utilized for disease control.

MATERIALS AND METHODS

The various parts of each plant were collected from different region of Haryana and its neighboring states on the basis of their traditional values (Table 1). The collected plant materials were thoroughly washed with tap water, followed with distilled water and then kept in dark under the filter papers at room temperature till completely dry. Each sample was individually grounded into powder form for preparation of extract. The fungi *Chaetomium globosum* used for the study was procured from the Division of Plant Pathology, IARI, New Delhi. The culture was maintained at 4°C on Yeast Glucose Agar medium with periodic sub-culturing. Fifteen per cent plant part

extract was prepared by brewing in hot water for 20 minutes. The assay for antifungal activity of each plant part extract was assayed by measuring the growth inhibition as described by Bragulat *et al.* (1991). A known volume of 15 per cent plant sample extract was supplemented with yeast extract, glucose and agar. The medium was sterilized by autoclaving at 15lb. pressure for 15 minutes. Yeast Glucose Agar plates, without any plant extract supplementation was run as a control. The test inoculums consisted of a disc 2 mm in diameter cut out from the edge of a growing fungal colony on glucose agar medium using a cork borer and placed at the center of the agar medium in sterile conditions. The experiments were conducted in triplicates along with equal number of controls. The fungus was incubated at $26 \pm 1^\circ\text{C}$ and their growth diameters were measured after five days. The percentage inhibition was calculated by the formula as: % inhibition = $((C-T) \times 100/C)$ where C= Diameter of control, T= Diameter of test.

RESULTS AND DISCUSSION

The activities of the plant-extracts against the mycelium growth of *Chaetomium globosum* are presented in Table 2. It is commonly observed that out of 20 plants parts extracts tested, four plants have shown marvelous inhibitory effect against the mycelium growth of *Chaetomium globosum* i.e. stem extracts of *Aloe vera* (85.72%), leaf extracts of *Camellia sinensis* (79.69 per cent), bark extracts of *Acacia arabicae* (79.06%), bark extracts of *Callistemon lanceolatus* (58.34%) while four other plants have shown moderate inhibitory effect i.e. *Acacia catechu* (37.78%), *Aegle marmelos* (40.08%), *Albizia lebbbeck* (40.6%), *Azadirachta indica* (34.36%) and seven plants have shown insignificant inhibition of mycelium growth against the test fungi and rest five plants samples did not show any antifungal activity.