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Antifungal potential of *Cuscuta reflexa* Roxb

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ABSTRACT

Cuscuta reflexa Roxb. is obligate angiospermic parasite belong to family Convolvulaceae shows worldwide distribution. Present attempt has been made to study the antifungal properties of *C. reflexa* Roxb. For that, aqueous, ethanol, methanol, butanol and acetone extract of *C. reflexa* Roxb. stem examined against the test fungi viz. *Fusarium* sp., *Penicillium* sp., *Aspergillus* sp., *Rhizopus* sp., using disc diffusion method. Butanol, ethanol and aqueous extracts of *C. reflexa* Roxb. were effective against the *Fusarium* sp., *Aspergillus* sp., and *Penicillium* sp. but acetone and methanol extracts did not show any antifungal activity. It is interesting to note that *Rhizopus* sp. do not respond any extract.

Key words: *Cuscuta reflexa* Roxb., antifungal properties, disc diffusion method.

INTRODUCTION

Cuscuta reflexa Roxb (Convolvulaceae) is growing throughout India. It is leafless green yellowish, thread like twinning herb and obligate parasitic plant. It has no chlorophyll and cannot make its own food by photosynthesis [1]. Actually *Cuscuta* is unpopular in farmers but it has a long history of folk use. In traditional Chinese medicine, the seeds of *Cuscuta* called 'tu si zi', have been used for thousands of years [2]. Seeds of *Cuscuta chinensis*, used in Chinese medicine as a tonic and considered to have antitumour activity in the Unani system of medicine in India [3]. According to Gilani and Khalid [4] in Pakistan *C. reflexa* is traditionally used to treat liver disorders, fevers, coughs and itches and for its carminative and anthelmintic properties. *C. Chinensis* was used traditionally in Iraq as a purgative and to treat dandruff and as an anti-inflammatory agent [5].

There is a growing demand for plant based medicines, health products, pharmaceuticals, food supplements, cosmetics etc. [6]. The abundant plants on the earth's surface has potential source of antimicrobial agents [7]. Chemical drugs create the problem on the host including hypersensitivity, immune-suppression and allergic reaction [8]. There is need to produced alternative antimicrobial drugs from medicinal plants [9,10]. In connection with this in present study we examined the effect of aqueous, acetone, methanol, ethanol and butanol extract of *C. reflexa* Roxb. against *Aspergillus* sp., *Fusarium* sp., *Penicillium* sp. and *Rhizopus* sp. fungi to prove antifungal property.

MATERIALS AND METHODS

The fresh plant material of *C. reflexa* Roxb. was collected from campus of Tuljaram Chaturchand College, Baramati, Dist. Pune, Maharashtra, India. The 2g fresh plant material (stem) was homogenized with 10ml distilled water as well as organic solvents like acetone, methanol, ethanol and butanol separately. Extracts were filtered through double layered muslin cloth and filtrates were used for experimentation. The fungal strains viz. *Aspergillus* sp., *Fusarium* sp., *Penicillium* sp. and *Rhizopus* sp. etc. were used as test fungi. The sterilized PDA medium plates were poured with 0.5ml suspension of all test fungi in aseptic conditions and used for further procedure. Disc

Diffusion Assay method was followed to check the antifungal property of *C. reflexa* Roxb by measuring the diameter of growth inhibition zone surrounding of disc [11]. The results were compared with Flucanazole treated as control.

RESULTS AND DISCUSSION

The antifungal property of *C. reflexa* Roxb against four test fungi viz. *Aspergillus* sp., *Fusarium* sp., *Penicillium* sp. and *Rhizopus* sp. was done and results are summarized in Table 1. The results were clearly indicated the growth inhibition zone of test fungi. In methanol extract maximum inhibition zone was observed against *Aspergillus* sp. i.e. 13mm and minimum inhibition zone was observed against *Penicillium* sp. i.e. 5mm. Butanol extract showed maximum inhibition zone against *Aspergillus* sp. and *Fusarium* sp. i.e. 16mm and 20mm respectively, the minimum inhibition zone against *Penicillium* sp. i.e. 10mm. The acetone extract showed inhibition zone only against *Aspergillus* sp. i.e. 15mm. Ethanol extract of *C. reflexa* Roxb showed maximum inhibition zone against *Fusarium* sp. i.e. 15mm and minimum inhibition zone against *Aspergillus* sp. and *Penicillium* sp. i.e. 10mm. Aqueous extract showed maximum inhibition zone against *Fusarium* sp. i.e. 20mm and minimum inhibition zone was showed against *Aspergillus* sp. and *Penicillium* sp. i.e. 9mm and 8mm respectively. The *Rhizopus* sp. cannot respond experimentation because its growth was very faster than the other fungi.

Methanolic extracts of *Solanum nigrum*, *Elettaria cardamomum*, *Cuscuta reflexa* and *Cinnamomum camphora* were tested *in vitro* for their antifungal activities against fungi *Saccharomyces cerevisiae*, *Aspergillus parasiticus*, *Trichophyton rubrum*, *Macrophomina*, *Fusarium solani* and *Candida albicans* by Mehjabeen et al. [11] and showed moderate as well as significant activity against different fungal strains. Faiyyaz Inamdar et al. [12] evaluated the antimicrobial activity of stems of *Cuscuta reflexa* Roxb, using ethanolic extract against gram-positive bacteria like *Bacillus subtilis*, *Staphylococcus aureus* and gram-negative bacteria like *E.coli*, *Pseudomonas aeruginosa* as well as on some fungal strains like *Penicillium citrium*, *Aspergillus niger* and it was observed that gram negative and fungal strains showed more antimicrobial activity as compared to gram positive bacteria. Mateen et al. [13] studied the difference in antimicrobial activity pattern extracts of *Cuscuta reflexa* and *Abutilon indicum* in ethanol, chloroform, ethyl acetate and aqueous solvents against the pathogenic organisms *E. coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Proteus vulgaris*, *Salmonella paratyphi*, *Shigella sonnei*, *Salmonella typhimurium* and *Klebsiella pneumonia* and noticed that among all the extracts ethanol and chloroform showed greater activity with a zone of inhibition ranging from 6mm to 17mm. Aqueous and 50% ethanolic extracts of *Centella asiatica*, *Nerium indicum* and *Cuscuta reflexa* were screened against enteropathogenic bacteria *E. coli* (MTCC723), *Bacillus subtilis* (MTCC10619) and *Staphylococcus aureus* (MTCC96) by Kalita and Saikia [14] and noticed that, *C. asiatica* and *N. indicum* showed good results against *E. coli* and *B. subtilis* and *C. reflexa* showed higher activity against *S. aureus*. Comparative antibacterial study of ethyl acetate extract of *Cuscuta reflexa* grown on *Cassia fistula* and *Ficus benghalensis* was performed by Neetu Bais et al. [15] using disc diffusion method against *Escherichia coli*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Salmonella typhi*. They found promising antibacterial activities and confirms the host dependent antibacterial activity of *Cuscuta reflexa*. From the results it is confirmed that *C. reflexa* Roxb. having antifungal activities against *Aspergillus* sp., *Fusarium* sp. and *Penicillium* sp.

Table 1 : The antifungal potential of *C. reflexa* Roxb. against *Aspergillus* sp., *Fusarium* sp., *Penicillium* sp. and *Rhizopus* sp.

Sr.No	<i>C. reflexa</i> Roxb. stem extract	Diameter of inhibition zone of fungi (mm)			
		<i>Rhizopus</i> sp.	<i>Fusarium</i> sp.	<i>Aspergillus</i> sp.	<i>Penicillium</i> sp.
1.	Control	---	20	30	10
2.	Methanol	---	---	13	05
3.	Butanol	---	20	16	10
4.	Acetone	---	---	15	---
5.	Ethanol	---	15	10	10
6.	Aqueous	---	20	09	08

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