Bioscience Discovery, 5(2):248-250, July - 2014
© RUT Printer and Publisher (http://jbsd.in)
ISSN: 2229-3469 (Print); ISSN: 2231-024X (Online)
Received: 02-06-2014, Revised: 22-06-2014, Accepted: 24-06-2014

Full Length Article

Antimicrobial Activities of *Argemone Mexicana* and *Calotropis gigantea* on Root Rot Diseases of chickpea

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ABSTRACT

Antimicrobial activity of leaf extracts of *Argemone Mexicana* and *Calotropis gigantea* on the causal organism of root rot diseases of chickpea were studied. A comparison between in vitro activity of *Argemone Mexicana* and *Calotropis gigantea*, leaf extract against these two pathogenic fungi were investigated. Two plants extract for their antimicrobial activity gave significant control of two pathogenic fungi at various concentration i.e 25, 50, 75 and 100 percent respectively.

Keywords: Antimicrobial, *Argemone Mexicana, Calotropis gigantea*.

INTRODUCTION

The inapropriate use of agrochemicals especially fungicides were found to possess adverse effect on ecosystem and possible carcinogenic risk than insecticides and herbicides together (Camreron *et al.,* 1984 and siva *et al.,* 2008) moreover, resistance by pathogen to fungicides in effective (Zhonghua Ma, 2005).Due to the aforementioned consideration ,there may be a need to develop new management system to reduce the dependence on the synthetic agrochemicals. Chickpea (*Cicer arietium* L.) is an important pulse crop in India and chief source of dietary protein in the vegetarian diet. This crop is susceptible to root rot fungi like *Rhizoctonia solani* and *Macrophomina phaseolina*.

Material and Methods: *Rhizoctonia solani* and *Macrophomina phaseolina* pathogen of chickpea plants were collected from different farmers field in Marathwada and their isolation, purification were done. Fresh leaves of *Argemone Mexicana* and *Calotropis gigantea* were collected and washed with tap water and oven dried and pulverized to obtain dry powder. One hundred gm of powder was taken. Extract of each plant was prepared with water and condensed to serve as stock extract. The toxicity of stock extract were determined against *Rhizoctonia solani* and *Macrophomina phaseolina* by the food poisoning technique (Nene, 1993) at four different concentrations. Petri dishes contain CZA supplement with three replication were inoculated with fresh 7days old culture of test fungus 8 mm cork borer disc kept upside down in BOD incubator $at\ 28 \pm 1℃$ Plates without leaf extract served as control.Linear growth of the fungus were measured at regular intervals. The linear growth of test fungi inhibited by leaf extract of Argemone *Mexicana* and *Calotropis gigantea*

RESULTS AND DISCUSSION

Rhizoctonia solani and *Macrophomina phaseolina* are common pathogen of economically important crop plant. In this investigation these fungi were isolated from chickpea plant. Two leave extract i. e *Argemone Mexicana* and *Calotropis gigantea* belonging various families. In the present work attempts were made to discover potential antimicrobial activity against *Rhizoctonia solani* and *Macrophomina phaseolina*.

Two leaf extact tested for their antimicrobial activity gave significant inhibition of *Rhizoctonia solani* and *Macrophomina phaseolina* at various concentration i.e 25, 50, 75 and 100 percent respectively. The result from Table 1. *Argemone Mexicana* showed less effect at 25 and 50 percent concentration, but at higher concentration i.e 75 and 100 percent it strongly inhibits the mycelia growth of *Rhizoctonia solani and Macrophomina phaseolina* are compared with control. From Table 2. The leaf extract of *Calotropis gigantea* showed a non significant effect at 25 percent concentration against *Rhizoctonia solani* and *Macrophomina phaseolina* but it strongly inhibited mycelial gowth of *Rhizoctonia solani* and *Macrophomina phaseolina* at 50,75,and 100 percent concentration were compared with control.

These result were in agreement with many earlier workers. Aqueous extract of four plants viz *Argemone Mexicana, Semecarpus ancardium, Cassia fistula* and *Tephrosia purpurea* was evaluated against seed borne infection of *Collectotrichum destructivum* on *vigna uniguculata* L.(Mogle and Maske 2012). Leaf extract of Tephrosia *purpurea* and *Catharanthus roseus* showed maximum efficacy against *Macrophomina phaseolina* and *Sclerotium rolfsii* (Wadikar and Nimbalkar, 2010). In vitro studies on *Macrophomina phaseolina, Trichoderma viride, Trichoderma polysporum* and *Pseudomonas fluroescens* was found more effective as compared to other bio-control agents and inhibited maximum fungal growth (Rekha Kumari, KS Shekhawat, Renu Gupta and MK Khokari, 2012). Leaf extract of *clematis gouriana* was very effective against root rot infecting fungi viz. *Fusarium oxysporum, Macrophomina phaseolina* and *Sclerotium rolfsii* (Basher and Bharat Raj, 1992).

Table 1: Antimicrobial activity of *Argemone Mexicana* on growth of *Rhizoctonia solani* and *Macrophomina phaseolina.*

Name of Leaf extract	concentration %	linear growth of fungus in mm	
		Macrophomina phaseolina	Rhizoctonia solani
Argemone Mexicana	25	20.00	26.00
	50	18.00	20.00
	75	00.00	00.00
	100	00.00	00.00
	Control	76.00	82.00

Table 2: Antimicrobial activity of Argemone Mexicana on growth of Rhizoctonia solani and Macrophomina phaseolina.

Name of Leaf extract	concentration %	linear growth of fungus in mm	
		Rhizoctonia solani	Macrophomina phaseolina
Calotropis gigantea	25	30.00	32.00
	50	00.00	00.00
	75	00.00	00.00
	100	00.00	00.00
	Control	76.00	82.00

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How to Cite this Article:

Wadikar M S and V B Kadam, 2014. Antimicrobial Activities of *Argemone Mexicana* and *Calotropis gigantea* on Root Rot Diseases of chickpea. *Biosci. Disc.,* **5**(2):248-250.