



BOTANY

EFFICACY OF LEAF EXTRACTS OF *TAPHROSIA PURPUREA* AND *CATHARANTHUS ROSEUS* AGAINST ROOT ROT DISEASES OF CHICKPEA (*CICER ARIETIUM* L.)

M. S. Wadikar^{1*} and R. K. Nimbalkar²

¹Department of Botany, Vinayakrao Patil Mahavidyalaya Vaijapur-423701, Dist. Aurangabad (M.S)

²Department of Zoology, Vinayakrao Patil Mahavidyalaya Vaijapur-423701, Dist. Aurangabad (M.S)

Abstract

The efficacy of leaf extracts of *Taphrosia purpurea* and *Catharanthus roseus* against *Macrophomina phaseolina* and *Sclerotium rolfsii* the causal agents of root rot diseases of chickpea plants respectively were studied. A comparison between the in vitro activity of *Taphrosia purpurea* and *Catharanthus roseus*, leaf extracts against these two pathogenic fungi were investigated. Two plant extracts tested for their fungitoxic activity gave significant inhibition of two pathogenic fungi at various concentration i.e. 25, 50, 75, 100% respectively.

Keywords: Leaf extract, *Taphrosia purpurea*, *Catharanthus roseus*, *Macrophomina phaseolina*, *Sclerotium rolfsii*, Chickpea.

Introduction

The inappropriate use of agrochemicals especially fungicides were found to possess adverse effect on ecosystem and possible carcinogenic risk than insecticides and herbicides together [1, 2] moreover, resistance by pathogen to fungicides is effective [3]. Due to the aforementioned consideration, there may be a need to develop new management systems 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 *Macrophomina phaseolina* and *Sclerotium rolfsii*.

Materials and Methods

The organism *Macrophomina phaseolina* and *Sclerotium rolfsii* were isolated from infected chickpea plant from field. Fresh leaves of *Taphrosia purpurea* and *catharanthus roseus* were collected and washed, 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 was determined against *Macrophomina phaseolina* and *sclerotium rolfsii* by the food poisoning technique [4] at four different concentrations. Petri dishes contain CZA supplement with different plant extract at four concentration with three replication were inoculated with fresh 7 days old culture of test fungus 8mm cork borer disc kept upside down in BOD incubator (at 28±1°C). Plates without plant extract served as control, linear growth of the fungus was measured at regular

intervals. The linear growth of test fungi inhibited by leaf extract of *Taphrosia purpurea* and *Catharanthus roseus*.

Result and Discussion

Macrophomina phaseolina and *Sclerotium rolfsii* are common pathogen on economically important crop plant. In this investigation these fungi were isolated from Chickpea plant. Two leaves extract i.e. *Taphrosia purpurea* and *Catharanthus roseus* belonging to various families. In the present work attempts were made to discover potential Fungitoxic plant against *Macrophomina phaseolina* and *Sclerotium rolfsii*. Two leaf extracts tested for their fungi toxic activity gave significant inhibition of *Macrophomina phaseolina* and *Sclerotium rolfsii* at various concentrations i.e. 25, 50, 75 and 100% respectively.

The result from Table 1 *Taphrosia purpurea* showed less effect at 25 and 50 percent concentration, but at higher concentration i.e. 75 and 100% it strongly inhibits the mycelial growth of *Macrophomina phaseolina* and *sclerotium rolfsii* were compared with the control. From Table 2 The leaf extract of *catharanthu roseus* showed a generally non significant effect at 25 percent concentration against *Macrophomina phasellina* but it strongly inhibited mycelial growth of *macrophomina phaseolina* and *sclerotium rolfsii* 50, 75 and 100% concentration were compared with the control. But do not inhibit growth of *sclerotium rolfsii* at any concentration.

These results were in agreement with many earlier workers. Ethanol extract of *Azadirchta indica*, *Datura*

* Corresponding Author, Email: drmswadikar@gmail.com

stramonium, *Oscimum sanctum*, *Polyalthia longifolia* and *Vinca rosea* were more toxic to *Alternaria brassicola*, *Colletotrichum capsici*, *Fusarium oxysporum* and *Rhizoctonia solani* [5]. In vitro studies on the growth of different test Fungi on the medium amended with leaf extract of the selected plants revealed that the maximum inhibition of mycelia growth of the test fungi was recorded on PDA amended with

10% leaf extract of *Hyptis suaveolens* and *Adenocalymona alleces* as compared with control [6]. The fungitoxic properties of some leaf extract on *Macrophomina phaseolina* [7]. Leaf extract of *Clematis gouriana* was very effective against root infecting fungi i.e. *Fusarium oxysporum*, *Rhizoctonia solani*, *Macrophomina phaseolina* and *Sclerotium rolfsii* of Chickpea[8].

Table 1: Effect of leaf extract *Taphrosia purpurea* on growth of *Macrophomina phaseolina* and *Sclerotium rolfsii*

Name of leaf extract	Concentration %	Linear growth of fungus In mm	
		<i>Macrophomina phaseolina</i>	<i>Sclerotium rolfsii</i>
<i>Taphrosia purpurea</i>	25	18.00	25.00
	50	16.00	00.00
	75	00.00	00.00
	100	00.00	00.00
	Control	72.00	80.00

Table 2: Effect of leaf extracts of *Catharanthus roseus* on growth of *Macrophomina phaseolina* and *Sclerotium rolfsii*

Name of leaf extract	Concentration %	Linear growth of fungus In mm	
		<i>Macrophomina phaseolina</i>	<i>Sclerotium rolfsii</i>
<i>Catharanthus roseus</i>	25	17.00	25.00
	50	00.00	30.00
	75	00.00	27.00
	100	00.00	27.00
	Control	72.00	80.00

References

1. Cameron H.J., Julian GR., (1984). The effect of four commonly used fungicides on the growth of cyanobacteria. *Plant Soil*. 78: 409-415.
2. Siva N., Ganeshan S., Banumathy N., Muthuchelian (2008). Antifungal effect of Leaf-Extract of some medicinal plants against *Fusarium oxysporum* causing wilt diseases of *Solanum melogena* (L.). *Ethnobot. Leafl.* 12 : 156-163.
3. Zhonghua Ma, Michailides TJ (2005). Advances in understanding mechanism of fungicides resistance and molecular detection of resistant genotype in phytopathogenic fungi. *Crop. Prot.* 24 : 853-863
4. Nene Y.L. and P.K.Thapliyal (1993). Evaluation of fungicides in plant diseases control (3rd Ed) oxford and IBH publishing co. New Delhi, 531
5. Shivapuri Asha and R.B. Gupta (2001). Evaluation of different Fungicides and plant extracts against sclerotinia sclerotium stem rot of mustard. *Indian Phytopathology*.54-2.
6. Singh J.L. and V.L. Mujumdar 2001. Efficiency of plant extracts against *Alternaria alternate*, the incident of Fruit rot of pomegranate (*Punica granatum*). *Journal of Mycology and Plant Pathology*. 31.3.
7. Dubey V.H and Dwivedi M.R.1 991. Fungitoxic properties of some plant extract against vegetative growth. 94-3:127-129.
8. Basher M.A. and Bharat Raj (1992). Antifungal properties of *Clematis gouriana* against some Pathogenic root infecting fungi of Chickpea. *Journal of the Indian Botanical Society*. 71: 307-308.