

Alternaria*, A DOMINANT FUNGAL PATHOGEN OF NUTRITIONALLY AND MEDICINALLY SIGNIFICANT PLANT *Vigna radiataRASHMI DEVI SONI^{a1} AND RUPINDER DIWAN^{tb}^{ab}Department of Botany, Govt. Nagarjuna P. G. College of Science, Raipur, Chhattisgarh, India**ABSTRACT**

Vigna radiata is a plant having good nutritional values and medicinal importance. They have high protein content and play significant role in human nutrition. *Alternaria chlamyospora* & *Alternaria raphani* were isolated from leaves of *Vigna radiata*, a major kharif crop of Chhattisgarh, for which five locations of Raipur district viz. Indira Gandhi Krishi Vishvavidyalaya, Raipur, two villages Jora and Bhatagaon, farm house and kitchen garden of Kushalpur were selected. A periodical survey was conducted during November 2012 to March 2013, severe brown spots were observed on the plants of *Vigna radiata*. Total two fungal pathogens have been isolated from the leaves of the crop. *Alternaria chlamyospora* was isolated from leaves showing dark brown, circular, regular, necrotic spots. *Alternaria raphani* was isolated from leaves showing reddish brown circular, regular, necrotic spots. Leaves were severely damaged in both symptoms and both species of *Alternaria* showed severe degree of infection and diseases intensities. Pathogenicity test was proved by Koch's postulate.

KEYWORDS: Isolation, Disease Intensity, Nutritional And Medicinal Significance, *Vigna radiata*

Vigna radiata is one of the most important pulse crops and is grown in almost all parts of the country. It has the capacity to fix atmospheric nitrogen through symbiotic nitrogen fixation. Many recent studies have been conducted on the nutritional quality of *Vigna radiata* (Hussain *et al.*, 2010; Blessing and Gregory, 2010). These studies suggested that these beans are good source of protein, carbohydrate and minerals (Agugo and Onimawo, 2009; Suneja *et al.*, 2011). *Vigna radiata* is highly used for therapeutic purposes. Due to the antidotal activity, it has been used as medicinal or cosmetic material since ancient times. (Jo *et al.*, 2006; Sharma and Mishra, 2009). They are known to possess antihypertensive and antidiabetic properties (Lin *et al.*, Gary, 2006; Yang *et al.*, 2008). *Vigna radiata* is also reported for the treatment of various ailments like hepatitis, gastritis, heat rash etc. (Leung, 2007; Huijie *et al.*, 2003). The present paper deals with the survey, screening and isolation of the *Alternaria spp.* along with the nutritional and medicinal significance of the plant.

MATERIALS AND METHODS

The fungi were isolated from infected leaves on Potato Dextrose Agar (PDA) medium (25.0 g potato, 20.0 g dextrose, 20.0 g agar, 1000ml distilled water, pH 4.5). Diseased leaves were collected and brought to the laboratory in polythene bags for the isolation and identification of the causal organisms.

Infected portion of leaves were cut by means of sterilized razor in small pieces and dipped in 0.001% mercuric chloride solution for 30 seconds. The diseased pieces were then successively washed in sterilized petridishes containing PDA medium. The entire operations were carried out under aseptic conditions. The organisms thus obtained were repeatedly subcultured in order to get pure cultures. Pure cultures were maintained on PDA slants for further studies.

Pathogenicity was proved by attached leaf method under natural conditions to ensure Koch's Postulate, pathogenicity was confirmed by attached leaf method under greenhouse condition the leaves were pin pricked using sterilized needle and cultures were inoculated on the respective leaves in triplicate under aseptic conditions.

RESULTS AND DISCUSSION






During field survey November 2012 to March 2013, from five different locations the foliar infections were collected and their symptoms were analysed. The foliar disease occurred as spots on leaves. Initially, minute, dark brown and reddish brown sub circular to circular spots appeared forward from the leaf tip to margin. Disease development was more rapid on the upper portion of the leaves than lower portion. The disease progression was very fast. Two different pathogenic organisms have been isolated. *Alternaria chlamyospora* was isolated from

disease leaf showing dark brown, sub circular to circular spots, moderate to severe degree of infection. *Alternaria raphani* was isolated from leaves showing reddish brown circular or sub circular spots. Severity of disease ranged from moderate to severe. Isolates differed for their cultural characteristics on PDA. *Alternaria chlamyospora* produced ring like colony, center portion of colony greyish–white, second layer, light pink colour, outer most layer was having reddish pigmentation. *Alternaria raphani* produced round colony, greyish–white in colour, smooth, reddish pigmentation. Pathogenicity test (Koch’s postulate) was proved by direct inoculating healthy

leaves of the respective host plant with conidial suspension and within 8 to 15 days similar symptoms were observed as on naturally infected leaves .The leaves spread with distilled water only did not show any symptoms. The re-isolated causal organisms were identical with that from the natural affected leaves. *Alternaria* was found to be a dominant pathogen infecting the leaves severely with necrotic symptoms. Suitable control protective measures should be taken to prevent this major kharif crop from the microbial invasion so as to get a healthy crop of immense nutritive value.

Table 1: Symptoms & Disease potential a *Alternaria* spp. on *Vigna radiata*

S. No.	Crop Host Kharif	Isolation Code	Pathogen	Degree of Infection	Disease Intensity	Symptoms
1	<i>Vigna radiata</i>	VR1	<i>Alternaria chlamyospora</i>	Severe	80%	Dark Brown, Necrotic spots
2	<i>Vigna radiata</i>	VR2	<i>Alternaria raphani</i>	Severe	90%	Reddish brown Necrotic spots

	
<i>Vigna radiata</i>	<i>Alternaria chlamyospora</i>
	
<i>Vigna radiata</i>	<i>Alternaria raphani</i>
	
Pathogenicity Test (pot culture)	

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