Original Research Article

Virulence of *Rhizoctonia solani* to potato

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Abstract

The virulence of *Rhizoctonia solani* causing black scurf was carried out by Electrophoretic method. 15 different isolates of *Rhizoctonia solani* causing black scurf of potato were used. The observations shows that the different isolates i.e. Rs. 2, 3, 5, 7, 8, 9, 12 and 14 gives more clear bands as compared with λ DNA which shows the virulence of the disease black scurf of potato.

Key Words: Potato, *Rhizoctonic solani*, Virulence.

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INTRODUCTION

In India potato is grown in 7 different zones and different centers under All India coordinated potato improvement project (AICPIP). The zones and area under cultivation of different varieties are as follow (Karvy 2010, Das 2000 and Gerewal *et al*, 1992). Potato research in India is carried out mainly by two agencies i.e. Central Potato Research Institute (CPRI) Shimla and All India Coordinated Potato Improvement Project (AICPIP). The latter has it's headquarter at CPRI, Shimla. Both are under the Indian Council of Agricultural Research. The CPRI has 10 research stations in different parts of India and AICPIP coordinated research through a network of canters located at the research station of CPRI and State Agricultural Universities. The details of the centers under AICPIP are given below (Nayar and Verma, 1992). Potato is susceptible to different pests and diseases, hence, an attempt has been made to study of virulence of *Rhizoctonia solani* to potato in this investigation.

MATERIALS AND METHOD

Virulence of *Rhizoctonia solani* causing black scurf: In order to study the molecular variability in relation to different isolates of *Rhizoctonia solani*, electrophoresis method was used by comprising with 40, 80 and 120 λ DNA. The electrophoresis study of 15 different isolates of *Rhizoctonia solani* causing black scurf of potato was carried out by DNA extraction i.e. inoculated on Czpeak–dox broth. (CDB). The DNA extraction was carried out by rapid fungal DNA extraction as per the method given by Plaza, *et al*, (2004).The electrophoresis study was carried out by loading 2 µl of sample DNA was loaded per well i.e. mixture of DNA sample and tricking dye. This was comprised with loaded λ DNA i.e. 40, 80, 120 ngm. The gel was observed by using UV torch and captured the image through gel documentation system.

RESULTS

The observation shows that different isolates i.e. Rs. 1, 2, 3, 5, 7, 8, 9, 10, 12 and 14 gives more virulence because of more clear bands as shown in gel viz. comprised with λ DNA test. The virulence of the disease was indicated as +, whereas – sign shows non virulence of the diseases as recorded in Table- 46 and Plate-27.

DISCUSSION

In order to know the virulence of *Rhizoctonia solani* causing black scurf of potato was studied by electrophoresis. Total 15 isolates of *R.solani* were used for DNA extraction. The DNA was extracted by rapid fungal DNA method (Plaza, et.al, 2004).The 2 µl of sample of DNA was loaded per well i.e. mixture of DNA sample and tricking dye. This was comprised with loaded λ DNA i.e. 40, 80,120 ngm. The gel was observed by using UV torch and captured the image through gel documentation system. It was observed that among the different isolates of *R.solani* (Rs-1 to Rs-15), the isolates of Rs 2,3,5,7,8,9,10,12, and 14 gives more clear band as compared with λDNA which shows the virulence of the disease. Lees, et.al, (2002) developed conventional and

PCR assays for the detection and identification of *Rhizoctonia solani* AG-3 in potato. This method was mostly used for differentiating anastomosis group of *R.solani*, despite of being time consuming of 12 individual anastomosis group. The *R.solani* anstomosis group can be defined by using different method i.e. cultural and pathogenic variation, biochemical and molecular method such as electrophoresis of soluble properties. Chauhan and Singh, (2004) studied genetic divergence for late blight field resistance components and morphological traits. They were used 60 genotype belongs to wild/ semi cultivated solanum sp. All these cultivars were after 70 days after planting was inoculated with Race 1,2,3,4,5,7,8,9,10 of *Phytophora infestans*. In order to study the late blight field resistance components. The genotype was divided into five cluster based on multivariable analysis of these cluster as II and III shows maximum divergence. Then, it was found that intermaiting between the genotype into II cluster are to through segregant with better resistant to late blight. Singh and Singh, (2007) studied races of *Phytopthora infetans* in India. They surveyed the present Indian scenario of *Phytopthora intestins* Race-0 and Race-1 viz. found in north western hills, while race-0 was present in worth eastern hills. In 2005-06, a total 29 race processing 7 to 11 genes was recorded. The frequency of 11 gens complex races i.e. 1,2,3,4,5,6,7,8,9,10,11 was highest in all location. The R gene of 1, 2, 3 and 4 was present in all the isolates, where as the frequency of other R genes were varied from place to place.

Table 1: Molecular Variability (DNA) in different Isolates of *Rhizoctonia solani* causing Black scurf

Isolates	Molecular Characteristics (DNA)		
	λ DNA		
	40	80	120
Rs-1	+	+	+
Rs-2	+	+	+
Rs-3	+	+	+
Rs-4	-	-	-
Rs-5	+	+	+
Rs-6	-	-	-
Rs-7	+	+	+
Rs-8	+	+	+
Rs-9	+	+	+
Rs-10	+	+	+
Rs-11	-	-	-
Rs-12	+	+	+
Rs-13	-	-	-
Rs-14	+	+	+
Rs-15	-	-	-

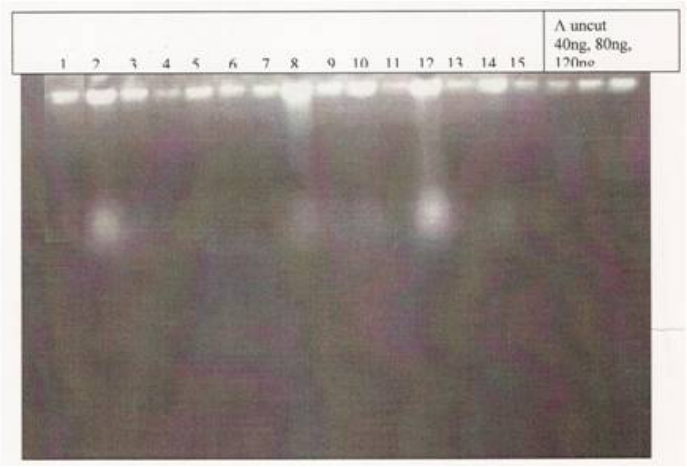

Figure 1: Electophoresis of DNA Isolated from fungal potato Rhizoctonia soalni were separated on 1 agarose gel in 1x TBE buffer Lane 1-1 gives different isolates DNA sample and 16-18 lanes gave standard A uncut DNA 40ng.80ng, 120ng.

Plate-1:- Molecular Variability (DNA) in different Isolates of Rhizoctonia solani causing Black scurf

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