
Initial report of leaf blight of Pigeonpea caused by *Rhizoctonia solani* from Tripura

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Climate change has shifted paradigm of insect pests and diseases occurring in different crops throughout the world. Diseases which were of minor importance few years back are becoming a major threat for Agriculture production during present scenario. Thus, the present case of study was undertaken in the year 2017-18 and 2018-19 to identify new emerging diseases of pigeonpea in North Eastern region of India at Tripura. Pigeonpea plants grown were evaluated for diseases of interest in the year 2017-18 and 2018-19. Affected plant parts were observed for nature of symptom development. Samples from upper part of foliage showing desired disease symptoms were collected and brought into the laboratory for isolation of the pathogen and confirmation of Koch postulates. Results revealed that pigeonpea plants suffers from foliar blight symptoms caused by the fungal pathogen *Rhizoctonia solani*. Infected plants showing leaf blight symptoms later on become light brown to dark brown in color followed by drying and withering. At advance stage of disease leaves may fall or become dry. Resting structure of the fungus namely sclerotia were also observed. The isolated fungi show near right angle branching with basal constriction, fungi produce cream colored colony producing light brown rough and irregular sclerotia. Disease incidence varies from 2.0 % to 5.0 %. Results of pathogenicity test further confirms development of above-mentioned symptoms followed by successful re-isolation of the pathogen. In control pots no disease symptoms were developed.

Key words : Disease incidence, pathogenicity test, North Eastern Region of India.

INTRODUCTION

Pigeonpea is domesticated more than 3500 years ago in India (Vavilov, 1951). Climate change has shifted paradigm of insect pests and diseases occurring in different crops throughout the world. Diseases which were of minor importance few years back are becoming major threat for Agriculture production during present scenario. Like other regions of the world, North Eastern India is also witnessing change in interaction pattern between organisms, hosts and environment. Many new diseases are also occurring in this region of the India. Most research in plant pathology focuses on two types of diseases: those that are established and actively managed and those that are emerging and less well understood (Rodrigo and Almeida, 2018). The accurate diagnosis of plant pathogenic fungi is one of the urgent needs

due to its importance in reaching rapid and efficient disease management systems to reduce or prevent damages caused by the fungal infections (Balodi et al., 2017). Thus, the present survey was undertaken in the year 2017-18 and 2018-19 to identify new emerging diseases of pigeonpea in Tripura. The crop is grown in an area of about 6,500 ha having productivity of 1.8 t /ha crop. Pigeonpea plant are grown at kitchen gardens in different regions by the Tribal community of the state who mainly prefers to consume it as vegetables.

MATERIAL AND METHODS

Pigeonpea plants grown at different trial plots of All India Co-ordinated Research Project of College of Agriculture, Tripura, Lembucherra, West Tripura as well as different fields of farmers were evaluated for diseases of interest in the year 2017-18 and 2018-19. Affected plant parts were

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observed for nature of symptom development. Samples from upper part of foliage showing desired disease symptoms were collected and brought into the laboratory. Pathogen concern was isolated aseptically in Potato Dextrose Agar (PDA) slants. Before isolation small bits from the diseased plant parts or sclerotia collected from the infected plant were washed in running tap water. The washed samples were then dipped in 0.1% NaOCl₂ (Sodium Hypo Chloride) solution for 30 to 45 seconds for surface sterilization and then washed consecutively for 3 times in sterile distilled water. The PDA slants were then incubated at 28 ± 1°C in B.O.D. incubator for 14 days, for isolation of the concern pathogen. Further, sub culturing was carried out by taking 6 mm discs or single sclerotia of fungus. The isolated fungus was inoculated into healthy plants grown in pots for confirmation of Kotch postulates. Sclerotia were further inoculated in PDA petri plates to study cultural and morphological characteristics of the fungus. The isolated fungi causing foliar blight is deposited at National Fungal Collection, Agharkar Research Institute, Pune and accession number was obtained. *In vivo* disease incidence was recorded randomly at different places and disease incidence was calculated by using the formulae, Numbers of infected plant / Total numbers of plant x 100.

RESULTS AND DISCUSSION

Pigeonpea crops were found to be suffered by foliar blight symptoms. Based on study of symptoms it was revealed that mainly before flowering mature *Pigeonpea* plants shows leaf blight symptoms. Leaves become light brown to dark brown in color, dry, withers and often twisted



Fig. 1 : Individual plant showing foliar blight



Fig.2: Enlarged view of blighted leaves

(Figure 1 and Figure 2). At advance stage leaves may fall or becomes dry to such an extent that even slight touch leads to their detachment. Resting structure of the fungus namely sclerotia were also observed *in vivo* as well as *in vitro* and

which may be regarded as the characteristic symptom for confirmation of disease (Figure 3).

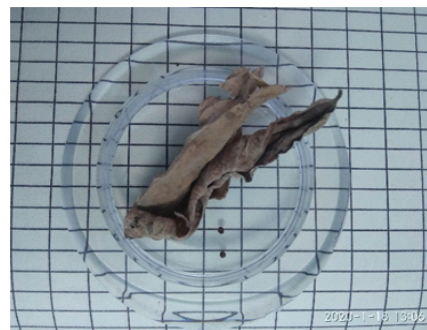


Fig. 3: Sclerotia of fungi

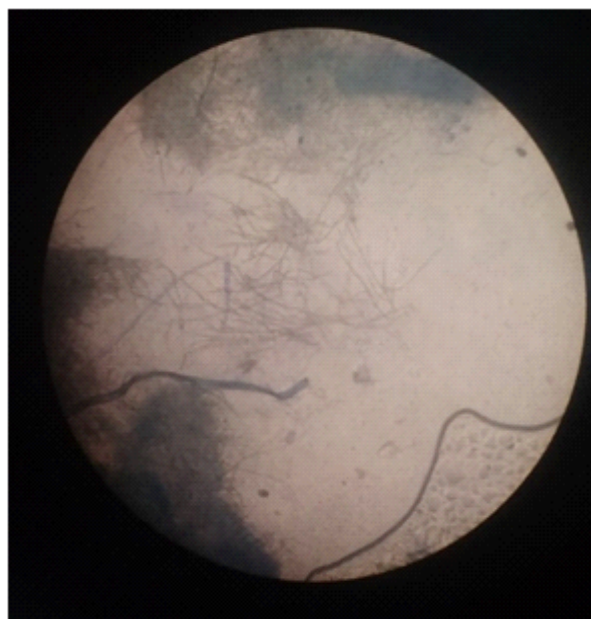
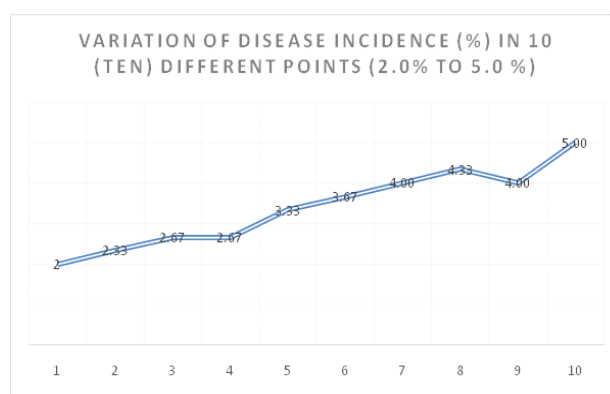


Fig. 4 :Mycelium of fungi visible under optical microscope (100 x)



The isolated fungi show near right angle branching with basal constriction, fungi produce cream colored colony having light brown sclerotia. Disease incidence varies observed at ten different locations shows that it varies from 2.0 % to 5.0 %.

Results of pathogenicity test further confirm development of above-mentioned symptom followed by successful re-isolation of the pathogen. In control pots no disease symptoms were developed.

Rhizoctonia solani is a soil borne pathogen having ability to infect wide range of hosts. Apart from causing root rot, color rot, stem rot etc. its incidence as foliar blight and web blight pathogen has also been established well. Recently many reports has been documented for its occurrence as causal agent of leaf blight / foliar blight etc. like Nechet and Vieira (2007) confirmed first report of *Rhizoctonia solani* causing web blight on pigeonpea in Brazil which also supports the above-mentioned result obtained during this study at Tripura. Srinivasan and Visalakchi in the year 2010 published first report of *Rhizoctonia solani* causing a disease of sunflower in India. First report of sugar beet *Rizoctonia* crown and root rot was reported from China (Zhao and Wu, 2014) while first report of leaf blight on foxglove was reported from Italy (Garibaldi et al., 2009).

The present study reveals that foliar blight of pigeonpea caused by *Rhizoctonia solani* is reported to be first time at Tripura which may

become a potential emerging disease for pigeonpea cultivation in this region of India for upcoming future days.

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