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RHIZOCTONIA BATATICOLA IS A SERIOUS PATHOGEN IN THE SEEDS OF *VIGNA ACONITIFOLIA*

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Only 23% of moth bean seed samples collected from 11 districts of Rajasthan showed 0.5 to 32.5% infection range of *Rhizoctonia bataticola*. On the basis of seed symptoms the seeds were classified into asymptomatic and symptomatic with few to many microsclerotia. The mycelium was found restricted in seed coat and hilar region in symptomless seeds. In symptomatic seeds, infection was deep seated and showed microsclerotia and inter and intracellular mycelium in different layers of seed coat, hilar region aleurone layer, cotyledons and hypocotyl - radicle axis. Amount of colonization by pathogen varied with severity of seed infection. No infection was recorded in vascular elements of cotyledons.

Keywords : Pathogen; *Rhizoctonia bataticola; Vigna aconitifolia.*

Introduction

Moth (*Vigna aconitifolia*) (Jacq. Marechal) is an important pulse crop of western Rajasthan. Only a few fungal diseases namely leaf spot caused by *Colletotricbum truncatum*[1] seedling rot by *Macrophomina phaseolina*[2] are important. Jain *et al*[3] and Sharma and Gupta[4] have reported 11 and 14 seed borne fungi of moth bean respectively. But in none of those studies *Rhizoctonia bataticola* has been recorded in the seed. However Tiagi and Chitlay[5] have described it as a serious pathogen affecting leaf. During survey of seed borne mycoflora, *Rhizoctonia bataticola* was recorded as an important pathogen. The observation on the histopathology of *Rhizoctonia bataticola* infected seeds are reported here. Location of the pathogens, in seed is not known, therefore, the study has been conducted.

Materials and Methods

Out of 198 seed samples of Moth collected from eleven districts of Rajasthan were screened by using dry seed examination Fig - 1 and SBM[6]. For histopathological studies seed sample ac. no. 3058 was selected and sample ac. no. 3072 was used as control. The infected seeds were categorised in asymptomatic and symptomatic carrying infection of micosclerotia. The symptomatic seeds were further categorised as weakly, moderately and heavely infected on the basis of sclerotial intensity, were studied by using component plating on moistened blotters and wholemount cleared preparations by using lactophenol and cotton blue (1:1v/v) for 5 min. For thin section 5 seeds of each category were boiled in water for 10 min, fixed in 70% ethanol for 48 hrs, dehydrated through TBA series and embedded in paraffin wax. One or two transverseincisions were made with blade into each seed to ensure dehydration, infilteration and embedding. The bloks were softened by immersing in aquous 1% sodium lauryl sulphate for 24 hrs then was held in water and transfered to a mixture of glycerol and glacial acetic acid (1 : 1 v/v) for 7 days. Serial microtome sections were cut at 10-20 nm thick and stained with safranin and light green combinations. All stained sections were mounted in DPX[8].

Results and Discussion

The infected seeds carried brown to black, few to numerous microsclerotia. The severely infected seeds had cracked testa and compactly covered with microsclerotia (Fig - 1A). 23% seeds of sample ac. no. 3058 were symptomatic where as on PDA test the incidence of *R. bataticola* was 32.5%. *R. bataticola* was recorded on incubated components of symptomatic as well asymptomatic seeds.

The seed samples carried 0.5-23% symptomatic seeds with jet black coloured pin head like spots or microsclerotia.

Microsclerotia developed more on

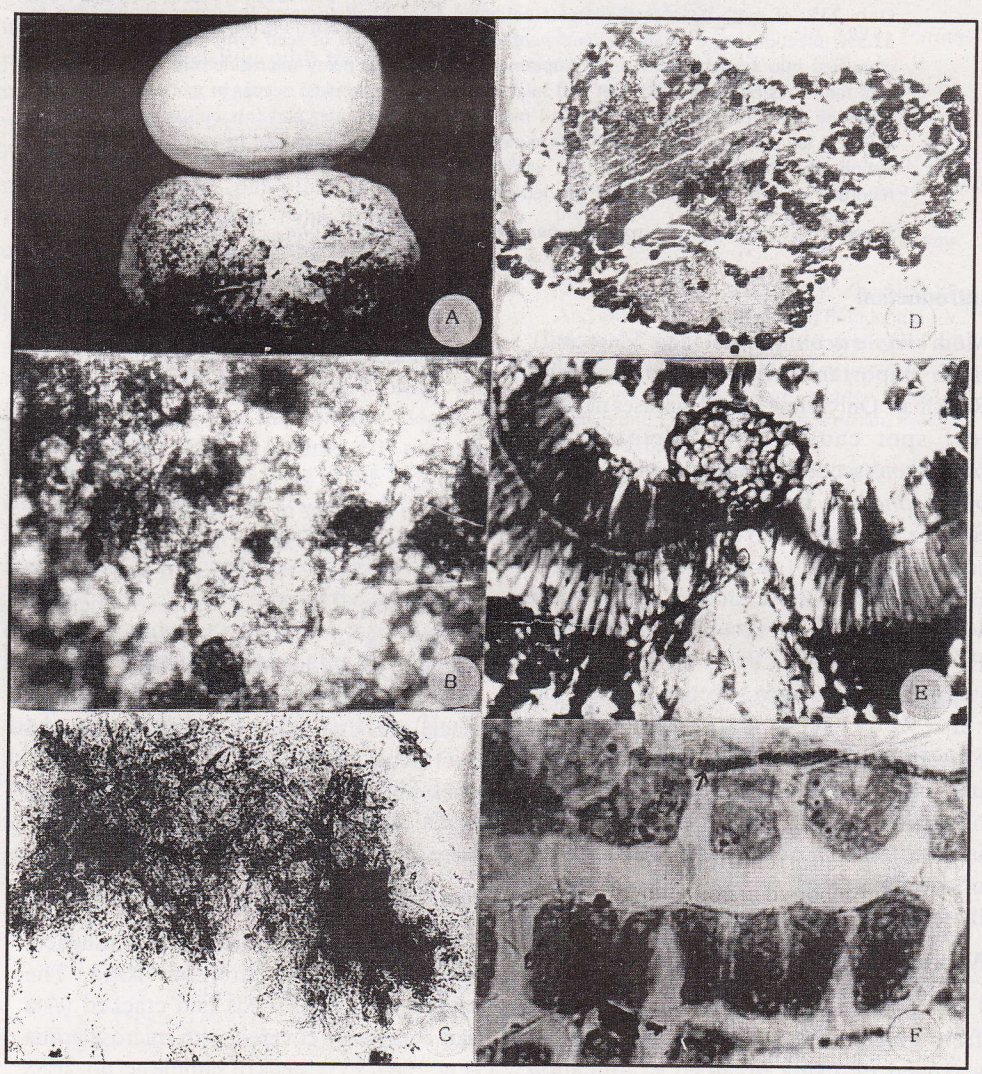

Fig. 1(A-F). *A* : Normal and infected seed with microsclerotia of *Rhizoctonia bataticola* x 35; B : Cleared mount of seed coat showing sclerotia and mycelium x 50; C : Cleared preparation of Cotyledon x 10; D : Hyphae and sclerotia in plumbic and Cotyledons x 50; E : Hilar region with microsclerotia, Hyphae in tracherial bar x 120; F : Hyphae in embryonal axis x 50.

hilar region of the seed. Heavily infected seeds were shrivelled and showed dull back mycelial growth and microsclerotia. Highest visible seed infection 0.5-23% was observed in Bikaner.

On incubation (0.5-16.59%) infection of *R. bataticola* occurred in untreated and 1-12.5% chlorine pretreated seeds. Osteolate pycnidia with pycniospores developed frequently on the hilar region of the seed.

The incidence was high in sample form Bikaner. In component plating the symptomless seeds carried low incidence of infection 20% in seed coat and cotyledons but the embryonal axis did not show any infection. In symptomatic seeds the infection varied from 100% in seed coat, 30-45% in cotyledons and 10-30% in embryonal axis, shrivelled heavily infected seeds showed 90-100% infection in all parts.

Cleared tissues of seed coat, cotyledons and hypocotyl - shoot root axis showed presence of profuse, thick knotty, hyaline to dark brown, branched, septate mycelium and microsclerotia. The microsclerotia were frequent in seeds with heavy infection (Fig - 1 B,C).

In microtome sectioning of 5 asymptomatic seeds showed hyphal infection in hypodermis and parenchyma of seed coat and in stellate parenchyma of hilar region. In weakly infected symptomatic seeds (sclerotia upto 10) the sclerotia were restricted to hilar fissure and parenchymatous funiculus but the mycelium was present in hilar tracheids (Fig. 1-E), seed coat and rarely in aleurone layer (endosperm). Seeds with moderate infection (sclerotia scattered on seeds) carried mycelial and sclerotial infection in all tissues of seed. Seed coat and hilar region were heavily colonized (Fig. - 1D), its growth was dense in hourglass layer and around cotyledons. Hyphal mat was formed in paranchyma layer of seed coat and embryonal axis (Fig - 1F), hyphae penetrated direclty through the seed coat. Lytic cavities were formed in cotyledons and embryonal axis. The surrounding cells were necrotic. Occassionally hyphal bits were seen in vascular elements of cotyledons.

R. bataticola was reported to be associated with seeds of many pulse crops[9]. However Hedgecock[10] was probably the first to report it on bean seeds. In moth seeds the heavy grwoth of *R. bataticola* in hilar fissure and its tissues shows that seeds receives infection from mother plant directly through hilar fissure.

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