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RESEARCH ARTICLE

Symptomatological Studies on Leaf Blight of Sunflower Caused by *Alternaria helianthi* in Rohilkhand

Vikas V. Patel, C. P. Singh and U.S. Mishra
Phytopathology Lab, Department of Botany,
Bareilly College, Bareilly
M.J.P. Rohilkhand, University, Bareilly-243001
e-mail: vpversatile@gmail.com

ABSTRACT

Alternaria leaf blight of sunflower is a very common and destructive disease in Rohilkhand. The symptoms of Alternaria leaf blight appeared in the month of March in the form of characteristic small circular, brown coloured patches on the surfaces of sunflower leaves. As the disease progressed, these brownish patches grew in size and finally coalesced to cover the entire surface of leaves producing blight symptoms. The blighted leaf finally get curled and became dark blackish in colour. Marked Blight symptoms are seen in the head (capitulum) of heavily infected plants in which involucres and ray florets are distinctly blighted. Blight symptoms are the result of continuous necrosis in which the infecting fungus has killing effect on invaded tissue. The development of conidia was observed in the second week of May. Etiology of fungus has been investigated in laboratory in vitro to evolve effective control management.

KE YWORDS: *Alternaria helianthi, leaf blight, sunflower, management.*

INTRODUCTION

Sunflower (*Helianthus annus* L.) is one of the important oil seed crops in the world. Despite the rapid spread of the crop in India, the productivity is going down in recent years. Alternaira blight caused by *Alternaria helianthi* (Hansf.) Tubaki and Nishihara is a serious disease of sunflower in India as well as in many parts of the world. In Rohilkhand the disease is particularly destructive in tropical and subtropical regions where high temperature and humidity cause rapid epidemic development, resulting in premature senescence and rapid defoliation, with significant reduction in quantity and quality of the oil [1,2,3]. Under humid conditions spots enlarge in size and coalesce resulting in blighting of leaves and some times rotting of flower heads with brown spots on petals also.

MATERIALS AND METHODS

Plants of sunflower were closely observed from the time of emergence till harvest and changes occurring in the diseased plants were noted carefully. Further, types of symptoms on leaves, stems and flowers (heads) were also noted during the survey of different fields in Bareilly, Shahajahanpur, Pilibhit and, Badaun district of Rohilkhand region.

Infected parts of plants i.e. leaves, stem, flower and seeds were collected from surveyed fields, packed in polythene bags. All the samples were closely examined for studying the characteristic symptoms, mycelium, conidiophores and conidia under the compound microscope. In this purpose standard blotter paper and Agar plate methods were used which followed by ISTA [4].

RESULT AND DISCUSSION

Alternaria leaf blight affected sunflower plants showed non-systemic symptoms. Infected plants became visible in 40-65 days old crop. The first symptoms was the change of leaf colour from normal green to pale-yellow or yellow

with blackish spots on margins of leaves. On the lower surface of the affected leaves. Sporulation started with in 2-3 days of appearance of symptoms. The growth of the plants was checked. The plant looked stunted, unhealthy and did not produce healthy flower (head). If produced, the head remained ineffective. The plant looked ugly due to heavy sporulation on leaves and at this stage the diseased plants became very conspicuous. Subsequently, leaves of affected plants

Plate 1. Symptoms caused by *Alternaria helianthi*

(A) Infection of Alternaria blight in field
(B) Infected leaves with pale yellow spots
(C & D) Infection on flower (head)
(E) Highly infected plant at the time of harvesting

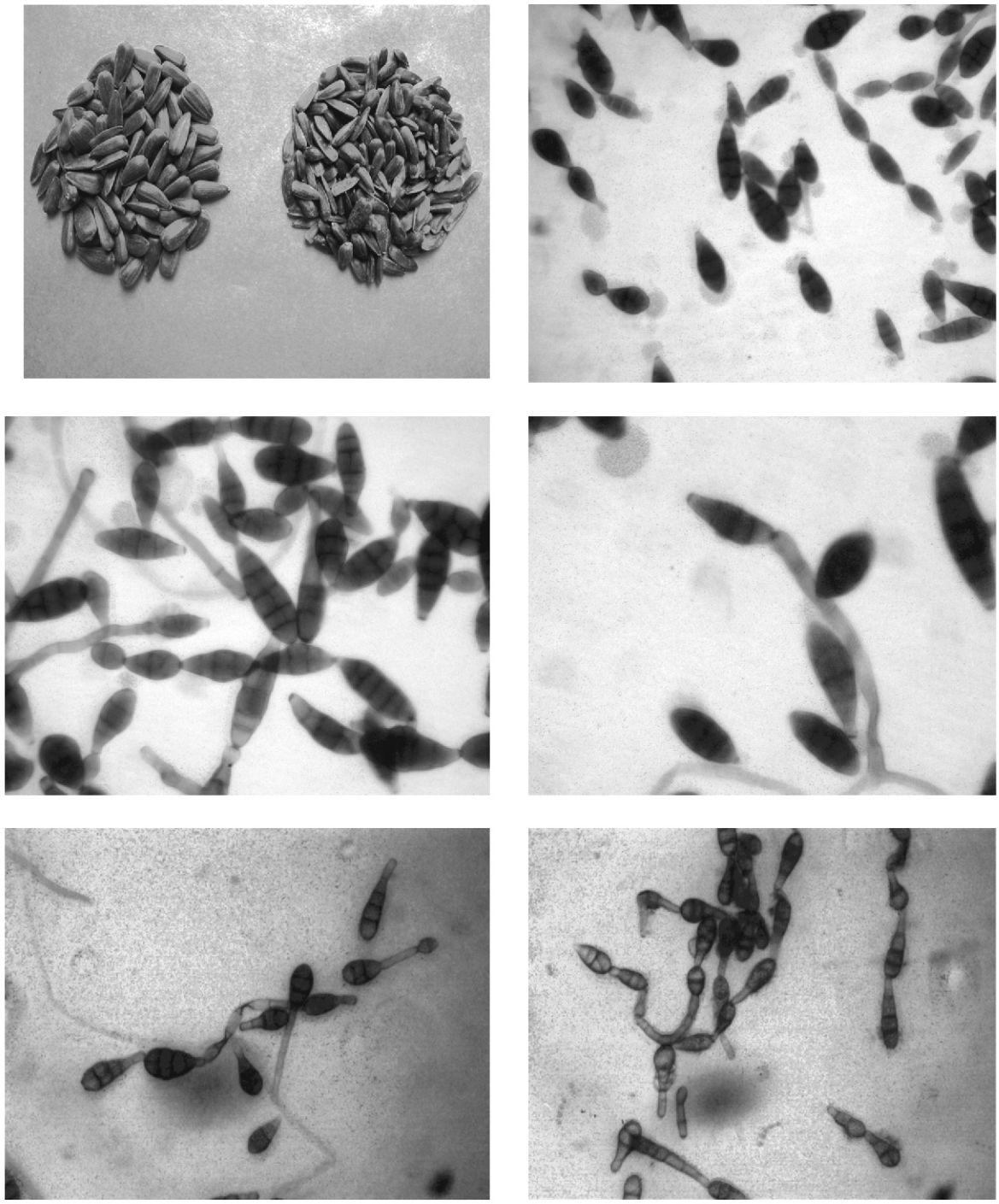

Plate 2. Conidia and Conidiophore of *Alternaria helianthi*

(A) Healthy and infected seeds of sunflower
(B) Conidial chain of *Alternaria helianthi*
(C) Acropital formation of conidial chain
(D) Attachmentof Conidia on Conidiophore
(E&F) Germination of Conidia by germ tube

became necrotic, curled, twisted and the plant started drying, giving a burnt appearance (Plate 1A-B). Some times, the leaves of infected plants became thick and retarded before becoming necrotic. Severely infected plants did not produce any seeds.

Spots generally first appeared on upper half portion from the tip of the leaf. Under favourable conditions, sporulation in the form of conidia and conidiophores occurred first sparsely and then profusely on the corresponding lower surface of leaves. The sporulated area of the leaf was at first grey in colour that turned blackish. As the disease progressed, the leaves become necrotic and started drying from the tip backward. Infected leaves showed typical curling and twisting. Both the margins of leaf lamina started rolling towards the midrib giving the leaf a twisted appearance. Such affected plants remained dwarf, unhealthy and gave blighted appearance. At the time of harvest, leaves of the diseased plants looked black, curled and twisted and their heads were small and thin with affected petals (Ray florets) became curved (Plate 1C-D).

Conidia of *Alternaria helianthi* were mostly solitary but occasionally in chains of 2-3 straight, cylindrical, rounded at the ends, subhyaline or golden brown, smooth with 2-12 transverse and 2 or more longitudinal or oblique septa (Plate 2A). Conidiophores were solitary or in fascicles, simple, straight or slightly flexuous, some time geniculate, pale to mid olivaceous brown, smooth, septate and upto 120 long (Plate 2B). Conidia of *Alternaria helianthi* germinated within 9 hours of inoculum on leaf surface. A conidium germinated by means of germ tube (Plate 2C-D). Many germ tube were arised from one conidium. Satyabrata Maiti et al. [5] reported that Alternaria blight of sunflower caused a reduction of 27 to 80 percent and 17 to 33 percent in seed and oil yield respectively. Similar results were also noted by Patil *et al.* [6] and Rao and Rao [7]. Visually a marked reduction in symptom development of Alternaria blight was observed by two sprays of mancozeb (0.2%) after disease appearance.

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