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Survival of *Alternaria brassicae* and *Alternaria brassicicola* in different plant parts of mustard

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Abstract: Rapeseed-mustard (*Brassica* spp.) contribute 28.6% in the total production of oilseed. Among the various diseases Alternaria blight caused by *Alternaria brassicae* (Berk.) Sacc. and *Alternaria brassicicola* (Schw.). After the harvest of the mustard crop (2011-12), the infected samples were collected from Genetics and Plant Breeding Research Farm and stored at room temperature and in refrigerated conditions. The pathogen survival was determined from the infected plant parts every 20 days intervals since April, 2012 to November, 2012. The survival of the blight causing pathogen was recorded up to November, 2012 from leaf; stem, pods and seed stored at room and refrigerated condition.

Key words: Alternaria blight, *Alternaria brassicae* and *Alternaria brassicicola* survival

Introduction

Indian mustard commonly grown in *Rabi* is the most important member of cruciferous oilseed occupying nearly 70 per cent of the total area under rapeseed-mustard. Rapeseed-mustard (*Brassica* spp.) contribute 28.6% in the total production of oilseeds. The edible oil industry is one of the most vibrant sectors of the Indian agriculture economy. The country ranked second in area of rapeseed-mustard and third in production after China (11.12 mt) Indian mustard is the second most important edible oilseed after ground nut sharing 30% in the Indian oilseed economy. The share of the oilseed is 14% out of the total cropped area in India (Anonymous, 2012). Indian mustard account for about 75-80% of the 5.8 million hectare (mha) under these crops in the country during 2009-10. Uttar Pradesh covered an area of 6.39 lakh ha with the productivity of 11.25 kg/ha during 2011-12 (Anonymous, 2012). The lower productivity in state may be due to several biotic and abiotic stresses. Out of which, diseases happen to be most important ones. Among the various diseases *Alternaria* blight caused by *Alternaria brassicae* (Berk.) Sacc. And *A.brassicicola* (Schw.) Wiltshire is one of the most severe periods of survival of pathogens involved causing disease is very little.

Materials and Methods

This study was carried out to know the period of viability of the pathogen in plant debris under different conditions namely at room temperature and refrigerated conditions. For the purpose affected parts were collected and stored under different condition as maintained above. Periodic isolation of pathogen was made at an interval of 20 days from the affected parts following (Standard tissue) isolation through poison technique was followed for this purpose. Recovery of blight causing pathogen from infected parts was recorded. The study was continued form a period till the least recovery of fungus from different plant parts. Potato-Dextrose- Agar medium (PDA medium) having following composition was prepared by following method described by **J**ohnson and Booth (1983) was used for present study. Peeled potato 200.00g, Dextrose 20.00 g, Agar 20.00g, Distilled water 1000 ml. Potato were peeled, chopped into small pieces and boiled in 500 ml distilled water. The potato decoction was strained and adds 20g Dextrose in beaker, agar-agar was put into 500 ml boiling water. Finally both the potato decoction and molten agar were mixed together. Potato Dextrose Agar medium was sterilized at 15 lbs/squares inch of steam pressure (121.6^{0}C) for 20 minutes in autoclave. Isolation of the diseased plants of mustard was collected from the experimental plots of Genetics and Plant Breeding Farm of Narendra Deva University of Agriculture and Technology. *Alternaria brassicae* and *Alternaria brassicicola* survival were isolated from different infected plant part (Leaf, Pod, and Stem). The affected plant part were first washed in tap water to remove dust particles and then thoroughly washed with sterilized water in order to remove the surface contaminants. Instruments to be used were sterilized by using 95 per cent methylated alcohol. Small pieces of diseased portion along with healthy parts were cut into small pieces of about 2-5 mm with a sterilized blade. The cut pieces were surface sterilized with 0.1 per cent mercuric chloride solution under aseptic conditions inside the laminar flow and washed

Table-1: Survival of the pathogen in different affected parts of Indian mustard

Date	Infected leaf		Infected stem		Infected pod		Infected seed	
	Room temp.	Refri. temp.	Room temp.	Refri. temp.	Room temp.	Refri. temp.	Room temp.	Refri. temp.
4-4-2012	+	+	+	+	+	+	+	+
24-4-2012	+	+	+	+	+	+	+	+
14-5-2012	+	+	+	+	+	+	+	+
4-6-2012	+	+	+	+	+	+	+	+
24-6-2012	+	+	+	+	+	+	+	+
4-7-2012	+	+	+	+	+	+	+	+
24-7-2012	+	+	+	+	+	+	+	+
13-8-2012	+	+	+	+	+	+	+	+
2-9-2012	+	+	+	+	+	+	+	+
22-9-2012	+	+	+	+	+	+	+	+
12-10-2012	+	+	+	+	+	+	+	+
2-11-2012	+	+	+	+	+	+	+	+
22-11-2012	+	+	+	+	+	+	+	+

thoroughly 3-4 times with sterilized water to remove the traces of mercuric chloride. Excess moisture was removed by placing them in the fold of sterilized blotting papers. These pieces were transferred to 2 per cent Potato Dextrose Agar (PDA) medium in 90 mm petri-dishes, previously autoclaved at 15 p.s.i. (121.6^{0}C) for 20 minutes with the help of sterilized needles. The petridishes were then transferred at 26±2^{0}C temperature for 7 days in B.O.D. incubator. These incubated plates were observed for mycelial growth of the causal fungus after 24 hours of inoculation daily once till the growth of the fungus was noted.

Results and Discussion

Diseased samples (leaves, stem, pod and seed) collected from the fields were stored at room temperature and refrigerated conditions the disease causing pathogen was isolated periodically at 20 days intervals to know the presence of fungus started from April 4, 2012 to November 22, 2012. A perusal of the table-1 indicates that survival of pathogen recorded up to November 22, 2012 from each affected parts (leaf, stem, pods and seeds) stored under different situations (room and refrigerated condition). Due to shortage of materials, the experiment could not be conducted further. It requires further study to confirm the exact survival period of the pathogen in different affected parts of Indian mustard. The pathogen was isolated on Potato Dextrose Agar medium (Singh and Chaube, 1970; Mehta, 2002) from infected leaf of the plants. The presence of black fluffy colony of *Alternaria brassicae* and *Alternaria brassicicola* was identified based on their morphological characters with the help of microscope. The mycelium was septate, brown to brownish grey. The conidiophores were dark, septate, arises in fascicles. Conidia were found either single or in chains of upto four, arising through small pores in the conidiophore wall, straight or slightly curved, obclavate, rostrate, muriform with 10-11 transverse and 0-8 longitudinal or oblique septa.

References

Alka and Singh, S.P.: Survival of *Alternariatenuissima* causing leaf spot of pigeon pea in diseased plant debris. *Ann. Pl. Protc. Sci.,* **12**: 231-232 (2004).

Anonymous, Economic Survey of Indian (2008).

Anonymous, Uttar Pradesh Ke Krishi Ankare, Directorate of Agriculture, Lucknow (2012).

Humpherson, Jones, F. M. Survival of *Alternaria brassicae* and *Alternaria brassicicola* on crop debris of oilseed rape and cabbage. *Ann. Applied Biol.***115** (1): 45-50 (1989).

Johnston, A. and Booth C. Plant Pathologists Pocket Book. Oxford and IBH Publishing Co., 439 pp. (1983).

Kumar Arun, Kulkarni, K.T., Thammaiah, M.S.,and Hegde, Y.: Survival of *Alternaria solani* in crop plant debris under different conditions. *J. Pl. Dis. Sci.,* **3**: 125-126 (2008).

Mehta, N.S., Srivastava, M.S., and Kumar, R.: Survival of *Alternaria brassicae* causing *Alternaria* blight in rapeseed-mustard. *J. Mycol. Plan Pathol.***, 27:** 29-31. (2002).

Shresta, S.K., Mulk, L. and Mathur, S.B.: Survival of *Alternaria brassicae* in seed and crop debris of rapeseed-mustard in Nepal. *Sci. Tech.***, 31**: 103 -109 (2003).

Singh, R.S. and Chaube, H.S.: Selective agar media for the isolation of fungi. *Indian J. Mycol. Pl. Pathol.,* **3**: 67-70 (1970).

Srivastava, K.C., Ghosh, S. and Mishra,V.: Survival of *Alternariaalternata* in plant debris under different temperatures and soil depths.*Ann. Pl. Protc. Sci*., **13**: 261-262 (2005).

Vloutoglou, I., Fitt, B.D.L. and Lucas, J.A.: Survival and seed to seedling transmission of *Alternarialinicola* on linseed.*Ann. Applied Biol*., **127**: 33-47 (1995).