

Survival ability of *Cercospora capsici* infecting chilli (*Capsicum annuum*)

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Cercospora capsici cause leaf spot in chilli is survive in infected plant debris and become a primary source of inoculum. The survival ability of the fungus was studied in three conditions under room, on soil surface and refrigerator. For every fifteen days interval the fungus was isolated from stored *Cercospora* infected chilli leaves under different environmental conditions. Fungus could survive up to 120, 165 and 195 days in infected plant debris placed under room, soil surface and refrigerator conditions respectively. *C. capsici* survived in the form of conidia or dormant mycelium in infected plant material and it plays an important role in the perpetuation.

Key words: *Cercospora capsici*, chilli, leaf spot, survival ability

INTRODUCTION

Leaf spot of chilli caused by *Cercospora capsici* was considerably associated with foliage, reducing the photosynthetic area and premature defoliation of leaves leading to loss in yield. Leaf spot disease and the organism are gaining importance in the irrigated tracts where high input chilli cultivation is practiced with closer plant spacing which in turn create a micro climate very congenial for leaf spot and other foliar diseases. It has become a serious problem in some of the major chilli growing states of India particularly in the early stage of crop. The pathogen has been first isolated and named from bell pepper by Heald and Wolf (1911) and later studied by several researchers (Chupp, 1953; Vasudeva, 1963; Meon, 1990; Lim and Kim, 2003 and Bhat *et al.*, 2008).

The survival of pathogen in nature on infected host material during unfavorable environmental condition is an important factor in the perpetuation and dissemination from one season to another. Most of the plant pathogenic fungi survive in infected plant tissues in soil because the natural soil environment is more conducive to survival (Rangaswami and

Prasad, 1961 and Rangaswami and Ethiraj, 1963). The present investigation has been carried out to assess the survival ability of *C. capsici* in infected chilli leaves under room, refrigerator and on soil surface.

MATERIALS AND METHODS

The *C. capsici* infected chilli leaf samples were collected from field during 2nd fortnight of October, 2009. The moisture was removed from collected leaf samples by pressing in between blotting paper. The infected leaf spot samples were kept under three different environmental conditions. In soil infected samples were kept on surface soil under natural condition. Under laboratory condition, the infected leaves were placed in glass beaker and under refrigerator (4° C) condition they were kept by covering infected leaves with cotton cloth. Each set of experiment was replicated thrice. The infected samples kept in different environmental conditions were subjected for isolation at 15 days interval on potato dextrose agar medium (PDA) using tissue isolation and incubated at 25±1°C. Similar procedure was repeatedly followed at 15 days interval until the pathogen could not be recovered from the infected leaves preserved under different environmental conditions.

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Table 1: Survivalability of *Cercospora capsici* in infected plant debris under three different environmental conditions

Date of isolation	Days after recovery	Recovery of <i>C. capsici</i> from infected plant debris under three different environmental conditions		
		Laboratory/room	Soil	Refrigerator
19-10-2009	0	+	+	+
03-11-2009	15	+	+	+
18-11-2009	30	+	+	+
03-12-2009	45	+	+	+
18-12-2009	60	+	+	+
04-01-2010	75	+	+	+
19-01-2010	90	+	+	+
03-02-2010	105	+	+	+
18-02-2010	120	+	+	+
05-03-2010	135	-	+	+
20-03-2010	150	-	+	+
04-04-2010	165	-	+	+
19-04-2010	180	-	-	+
04-05-2010	195	-	-	+
19-05-2010	210	-	-	-
04-06-2010	225	-	-	-
19-07-2010	240	-	-	-

'+' Growth, '-' No growth

RESULTS AND DISCUSSION

Survival of *C. capsici* in infected plant debris in the form of conidia or dormant mycelium plays an important role in the perpetuation, dissemination and inciting of disease from one season to another. In the present study, the results (Table 1) showed that *C. capsici* could survive up to 120 days in debris placed under room condition (30-42°C), 165 days on the soil surface, under field condition and 195 days in refrigerator conditions (4°C). This result was supported by earlier studies conducted on the genus *Cercospora* infecting many crops plants. The pathogen *C. beticola* perpetuated during unfavorable conditions in infected sugarbeet leaves on ground and it survived for 12-18 months even if buried 30-50 cm deep in soil (Canova, 1959). The mycelium and conidia of *C. hayii* infecting banana survived 15 and 5

weeks respectively (Kaiser and Lukenzic, 1966). *C. kikuchii* overwintered on infected soybean debris (Jones, 1968). *C. spinaciae* on infected spinach leaves survived up to six months from diseased leaves kept in sterilized and un sterilized soil (buried in 1-5 inch deep) and in laboratory (5-38°C) (Verma *et al.*, 1968). *C. cofficola* survived up to 36 days in conidial form and 218 days in infected coffee plant materials in the form of mycelia. *C. moricola* survived for 35 days in conidial form and 210 days in mycelial form in infected leaves of mulberry (Kanti, 1975). *C. moricola* survived up to 155 days in infected mulberry plant debris preserved under room temperature (22 to 38°C) during summer and 16 to 32 days when kept under natural condition (Siddaramaiah, 1986). Survival of *C. kikuchii* on infected soybean debris from March 1998 to September 1999 was significantly reduced from the first to the last evaluation on buried debris (15 to 20 cm deep) or on the soil surface (Almeida *et al.*, 2001).

There is variation in the viability of fungal pathogens in infected host debris in three different environmental conditions. The fungus *C. capsici* survived in undecomposed host debris in the soil. Soil flora supported pathogen survival over a longer period compared to room condition. Because of inactive condition the fungus might have been viable for long period under refrigerator (4°C). In room condition it was viable for short period could be due to prevailing high temperature (30-42°C). The fungus *C. capsici* could survive well during off season in the infected host tissue and serve as source of inoculum for next season. For this reason clean cultivation by destroying the infected plant materials is must for reducing inoculum.

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