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Comparative host range and aggressiveness of *Colletotrichum capsici*

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Abstract
It is an important spice, vegetable as well as cash crop of Rajasthan, mostly cultivated in *kharif* season, which is quite remunerative for farmers. It is affected by several diseases, but among the fungal diseases, fruit rot caused by *Colletotrichum capsici* (Sydow) Butler and Bisby, is a serious disease and one of the major constraints in chilli cultivation throughout the world. In a screen house experiment, 5 *Kharif* crops (sesamum, groundnut, cowpea, soybean and urdbean) and 2 weeds (motha and jangli chaulai) were inoculated with spore suspension (3×10^4 spore/ml) of *Colletotrichum capsici.* It is evident that the fungus was able to infect 4 *Kharif* crops (sesamum, soybean, cowpea and urdbean) and 1 weed (jangli chaulai) under artificial inoculation conditions and showed anthracnose symptoms on leaves.

Keywords: Chilli, *Colletotrichum capsici*, Host range

Introduction
Red pepper (*Capsicum annuum* L.) commonly known as chilli, is a prominent vegetable crop of India belonging to the nightshade family, Solanaceae. It has 24 chromosomes (2n) and may be herb or sub-shurb of height up to 2.5 m with extensively branched stem having hairy growth with purplish spots near the nodes. The tap root is strong with numerous lateral roots. Chilli fruits are considered vegetable and are botanically berries (Saxena *et al*., 2016) [10]. It is a good source of capsaicin (capsaicinoid), vitamin A, vitamin C, riboflavin and thiamine. It contains about 8.8 g, 5.3 g carbohydrates sugar, 1.9 g protein and 534 micro g beta carotene per 100 g chilli (Panda *et al.*, 2010) [6]. Chilli is a universal spice crop of India grown in almost all the states of the country. The quality of the chilli varies from state to state. For example, chilli of Karnataka is known for its oil content, Gujarat quality is majorly known for its sharp color while that of Rajasthan is well known for making pickles.
Fruit rot or anthracnose or die-back of chilli caused by *Colletotrichum capsici* (Sydow) Butler and Bisby is one of the most destructive diseases of chilli in India. The pathogen cause severe damage to ripened fruits and reduce the quality and quantity of immature and mature fruits. This disease was reported first time in India from Coimbatore of Madras Presidency (Sydow, 1913) [11]. Due to this disease, more than 50 per cent crop loss has been reported from different parts of India (Ramchandran *et al.*, 2007) [9]. In Thiland, Poonpolgul and Kumphai (2007) [7] noticed anthracnose disease (*Colletotrichum* sp.) as most damaging disease of chilli reducing marketable yield up to 80 per cent. The disease has been reported to cause 8-27 per cent yield loss in Maharashtra, 20-60 per cent in Punjab and Haryana and 30-76 per cent in Tamil Nadu (Bansal and Grover, 1969; Sujathabai, 1992 and Datar, 1995) [1, 3]. In India, a calculated loss of 10-54 per cent has been reported in yield of the crop due to the anthracnose disease (Lakshmesha *et al.* 2005) [5]. The loss is high owing to the post and pre-harvest involvement of the pathogen causing a loss of 10-80 per cent of the marketable yield of chilli fruits (Than *et al.*, 2008).

Materials and methods
Host range
To test the host range of the pathogen, an experiment was conducted in screen house of the Department of Plant pathology using 12″ earthen pots. In this experiment, as per availability of seeds, five different *Kharif* crops *viz*., *Sesamum indicum* (sesame), *Glycine max* (soybean), *Arachis hypogaea* (groundnut), *Vigna sinensis* (cowpea), *Vigna mungo* (urd bean) and two weeds *viz*., *Amaranthus spinosus* (jangli chaulai) and *Cyperus rotundus* (motha) were selected and grown in the earthen pots.

Ten seeds of each crop were sown in each pot containing 5.5 kg sterilized soil. After germination, five plants per pot were maintained. Pots were irrigated with equal amount of water when needed. Thirty five days old plants were inoculated with spores suspension (3×10^4 conidia/ml) of *Colletotrichum capsici* prepared from 8 days old culture grown at 28 ± 1^0C. These pots were kept in humid chamber for three days. After that pots were removed from humid chamber and sprayed with distilled water thrice at morning, noon and evening in a day. Observations for the appearance of disease symptoms on these hosts were recorded from 10th day of inoculation to 30 days of inoculation.

Results and discussion

In a screen house experiment, 5 *Kharif* crops (sesamum, groundnut, cowpea, soybean and urdbean) and 2 weeds (motha and jangli chaulai) were inoculated with spore suspension (3×10^4 spore/ml) of *Colletotrichum capsici.* It is evident (Table 1) that the fungus was able to infect 4 *Kharif* crops (sesamum, soybean, cowpea and urdbean) and 1 weed (jangli chaulai) under artificial inoculation conditions and showed anthracnose symptoms on leaves. Scanty information is available on the host range of *Colletotrichum capsici* of chilli. However, some earlier workers have been noted infection in brinjal, French bean, mungbean, betelvine (Lenne and Sonoda, 1978 and Beniwal *et al.,* 1983) [2] soybean, bottlegourd, kondhra, chilmil and santhi (Kumar, 2008) [4] cotton, radish, black gram, sawank, kagaroti, kharjal and mirch booti (Prakash *et al.,* 2012) [8]. Similar observations have also been observed during the present investigation. Out of seven hosts belonging to various families (sesamum, soybean, cowpea, urdbean, motha and jangli chaulai) showed the symptom of the disease. The present investigation confirmed by the findings of other workers (Kumar, 2008; Prakash *et al.,* 2012) [4, 8]. These workers also concluded that the soybean and urdbean act as alternate host.

Table 1: Reaction of some *kharif* crops and weeds to *Colletotrichum capsici* inoculation

Common name	Scientific name	Reaction
Sesamum	*Sesamum indicum*	+
Soybean	*Glycine max*	+
Groundnut	*Arachis hypogaea*	-
Cowpea	*Vigna sinensis*	+
Urdbean	*Vigna mungo*	+
Motha	*Cyperus rotundus*	-
Jangli chaulai	*Amaranthus spinosus*	+

+ = Infected - = Healthy

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