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Effect of fungicides on mycelial growth of Sclerotinia stem rot of Indian mustard

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SUMMARY

Indian mustard (*Brassica juncea* (L.) Czern and Coss.) Commonly known as *Rai* is the most important member of *Rabi* oilseed crop. Next only to Alternaria blight, stem rot caused by *Sclerotinia sclerotiorum* (Lib.) de Bary causes considerable yield losses as high as 70 per cent in susceptible spp. The present study was undertaken using eight fungicides *viz.*, Thiram (0.1%),Companion[Carbendazim12%+Mancozeb63%w/w](0.2%), Ridomil(0.1%), Sulphur dust(0.2%), Matco[Metalaxyl18%+ Mancozeb64%] (0.2%), Mancozeb(0.2%), Carbendazim (0.1%) and Thiophanate methyl (0.1%) to find out their relative efficacy in inhibiting mycelial growth of the pathogen *in vitro* by poisoned food technique. The observations revealed that all the tested fungicides except with sulphur dust 6.00 mm. growth of the pathogen was recorded and thereby 93.33 per cent inhibition in colony growth of the pathogen was recorded against control.

Key words : Indian mustard, *Sclerotinia sclerotiorum*, Control, Fungicide, Sclerotinia stem rot

Sclerotinia stem rot of Indian mustard [*Brassica juncea* (L) Czernj and Coss.] caused by *Sclerotinia sclerotiorum* (Lib.) de Bary has been reported from major rapeseed and mustard growing areas of the world (Morall *et al.,* 1976; Kang and Chahal, 2000). Among oil seed crops, rapeseed-mustard occupy an area of 6.85 million ha., yielding 8.64 million tones with an average productivity of 1220 kg/ha (Rai, 2006). The disease was of minor importance till few years back, but recently it has assumed a serious problem in major mustard growing areas in the country (Shivpuri *et al.,* 2000; Ghasolia *et al.*, 2004; Tripathi and Tripathi, 2008). In Rajasthan, it has been observed in almost all the districts where its incidence varied upto 72 per cent (Krishnia *et al.,* 2000 and Ghasolia *et al.*, 2004). Hence, the present investigation was undertaken to formulate the effective strategies to manage this emerging problem.

MATERIALS AND METHODS

Eight fungicides *viz*., Thiram (0.1%) Companion [Carbendazim12%+Mancozeb63%] (0.2%), Mancozeb (0.2%), Carbendazim (0.1%), Ridomil (0.1%), Sulphur dust (0.2%), Matco[Metalaxyl 18%+Mancozeb64%] (0.2%) and Thiophanate methyl (0.1%) belonging to different groups were evaluated against the pathogen under laboratory conditions to find out their relative efficacy in inhibiting the growth of the pathogen in culture by poisoned food technique (Schmitz, 1930). Requisite quantity of each fungicides was incorporated in two per cent potato dextrose agar medium, thoroughly mixed by shaking prior to pouring in sterilized Petriplates and were allowed to solidify. These Petriplates were inoculated with 5mm. disc of four day old culture in the centre of the plate and incubated at 20+ 1^0C. Each treatment was replicated thrice with a suitable control. The efficacy of fungus in each treatment and average of three replications was calculated. Per cent over control was calculated by the following formula suggested by Bliss (1934)-

$$\text{Per cent inhibition over control} = \frac{C - T}{C} \times 100$$

C = growth of fungus in control

T = growth of fungus in treatment

RESULTS AND DISCUSSION

The present study revealed that all the fungicides *viz*., Thiram (0.1%), Companion [Carbendazim12%+ Mancozeb 63%] (0.2%), Mancozeb (0.2%), Carbendazim (0.1%), Ridomil (0.1%), Sulphur dust (0.2%), Matco [Metalaxyl 18%+Mancozeb64%] (0.2%) and Thiophanate methyl (0.1%), which were tested against *Sclerotinia sclerotiorum in vitro* using poisoned food technique, completely inhibiting mycelial growth of the pathogen over control except sulphur dust. In case of sulphur dust, 93.33 per cent growth inhibition was recorded (Table 1). The results thus obtained are in accordance with Hawthorne and Jarvis (1973) who reported that effectiveness of Benomyl, Thiram and Dichlozaline at different concentration against *Sclerotinia sclerotiorum*. Singh *et al.* (2003) and Chattopadhyay *et al.* (2004) studied the effect of various fungicides on myceliogenic and

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Table 1 : Effect of fungicides on mycelial growth of *S. sclerotiorum in vitro*

Fungicides	Mycelial growth of pathogen (mm.)	Per cent over control (%)
Thiophanate methyl (0.1%)	0.00	100.00
Sulphur dust (0.2%)	6.00	93.33
Companion (0.2%)	0.00	100.00
Matco (0.2%)	0.00	100.00
Ridomil (0.1%)	0.00	100.00
Mancozeb (0.2%)	0.00	100.00
Thiram (0.1%)	0.00	100.00
Carbendazim (0.1%)	0.00	100.00
Control	90.00	
C.D. (P=0.05)	3.34	

carpogenic germination of sclerotial bodies of *S. sclerotiorum*. They observed that Carbendazim and Ridomil-MZ completely inhibited the mycelial growth.

The findings of the study correlates with the study of other workers *viz*., Singh *et al*. (2003); Chattopadhyay *et al*. (2004); Ghasolia and Shivpuri (2008).

An inference may be drawn that the fungicides which are utilized in the present study may be exploited in managing the Sclerotinia stem rot of Indian mustard *in vivo*.

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