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BIOCONTROL OF SESAMUM BLIGHT BY USING TRICHODERMA SPP.

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Abstract :
Antigonastic action of *Trichoderma spp.* was checked *in vitro* against *Alternaria sesami* causing leaf blight of *Sesamum* sensitive and resistant to bavistin (carbandezim) by dual culture technique. Among the three spp. of *Trichoderma viride* was found to be most effective against *Alternaria sesami* inhibiting the pathogen above 73% and 67% in sensitive and resistant isolates respectively.

Keywords : Sensitive, resistant, carbandezim, *Sesamum* blight.

Introduction :

Sesamum [Sesamum indicum L.] is one of the oil yeilding crops belongs to family pedaliaceae. It is cultivated mostly by small and marginal farmers in the states of Gujarat, Rajasthan, Madhya Pradesh, Tamil – nadu, Maharashtra, Orisa, West Bengal, Andhra Pradesh, Panjab and Chhattisgarh. It is cultivated in an area of about 1.85 million ha. with production of 0.65 million tones and productivity of about. 350 Kg/ha (Venkateswarlu, 2011). Sesame oil contains antioxidant called sesamol. *Sesame* oil has excellent nutritional, medicinal, cosmatic and cooking qualities due to which *Sesamum indicum* is called as queen of oil crops. The *Sesamum* seeds contain 50 % oil, 25 % proteins and rich in many essential minerals like Ca, Fe, Mn, Zn, Mg, Cu, etc.

There are number of fungal, bacterial, mycoplasma and viral diseases responsible for reduction of *Sesamum* yeilds. Among them bacterial blight, fungal blight, stem and root rot, powdery mildew and phyllody are major diseases. Alternaria leaf spot is prevalent in all the sesame growing area of world. It is also reported in Kenya, Ethiopia, El -Salvador. Nigeria, India and USA (Verma et al., 2005; Ojiambo et al., 2003; Kolte 1985 and Bhale *et al.,* 1998). The *Alternaria* leaf spot caused by *Alternaria sesami (Kawamura)* Mohanty and Behera produces small, irregular brown spot on the leaf blade. These spots collapse each other and form elongated lesions. Same symptoms may also appear on stem and seed capsule. Due to servere infection, the plants may become defoliated completely. Alternaria, leaf spot was responsible for 20-40 % loss in Sesame crop in Uttar, Pradesh, India (Kumar and Mishra, 1992).

During present investigation an attempt was made to study antigonastic action of *Trichoderma* spp. against *Alternaria sesami* resistant to bavistin (carbendazim) *in vitro.*

Material and Methods :

Samples of Sesamum blights were collected from different states of India.These samples brought to labratory in sterile polythene bags and the isolation of *Alternaria sesami* was made within 24 hours after the collection. Sensitivity of *Alternaria sesami* to Bavistin was tested by food poisoning technique. (Dekker and Gielink 1979).

The *Trichoderma* spp. isolates were used against bavistin sensitive and resistant isolates of *Alternaria sesami* dual culture technique (Morton and Stroube 1955). Sterilized Czapek's Dox Agar medium was poured into petriplates and allowed to solidify. A 6 mm diameter mycelial disc from the activily growing margins was taken from 7 days old culture of *Trichoderma* spp. *(T. Viride, T. harzianum, T. asperllium)* and 6 mm disc of *Alternaria sesami* were placed on the opposite of the plate at equal distance from periphery and incubated at 28 20 C. The three replications were maintained for each sensitive and resistant isolate. In control plates (without Trichoderma spp) a sterile agar disc was placed at opposite side of sensitive and resistant isolates of *Alternaria sesami.* After 15 days incubation period radial growth of pathogen was measured. The colony diameter was recorded and inhibition in each treatment was calculated using the formula. (Vincent, 1947)

Percent mycelial growth (L) = $\frac{C-T}{C\times 100}$

Where,

C – Radial growth of pathogen on controlled plate.

T – Radial growth of pathogen in treated plates.

Result and Discussion :

In the present investigation use of *Trichoderma* spp. used against bavistin for biocontrol of *Alternaria sesami.* It was observed that all *Trichoderma* spp. were effective against the fungal pathogen. *Alternaria sesami. Trichoderma viridae* was most effective against *A. Sesami* inhibiting the pathogen above 73 % and 67 % in sensitive and resistant isolates respectively. *Trichoderma asperllium* inhibiting

the pathogen 71 % and 66 % in sensitive and resistant isolates respectively and *T. harzianum* showed 58 % and 64 % inhibition in sensitive and resistant isolates respectively. As compared to chemical control biocontrol by using *Trichoderma* spp. showed very good result.

Among number of biocontrol agents *Trichoderma* spp. are used abundantly against plant pathogens. *Trichoderma* produce volatile, non volatile antibiotics and enzymes are antagonistic to phytopathogenic fungi and nematodes. In 1930 Weindling first discovered the genus *Trichoderma* spp. as a biocontrol agent and since then numerous studies have demonstrated that *Trichoderma* is an effective biocontrol agent for phytopathogenic micro-organisms (Harmen, 1996*). Trichoderma* attaches to the host and coil hyphae around the host cell and collapses the host hyphae (Steyaert, *et al.* 2003). *Trichoderma* spp. have great inhibitory action against soil born pathogen and may be able to replace chemical pesticide in near future. Kamalalakshmi (1996) reported that phylloplane microflora of jasmine such as *Aspergillus flavus, A nigar, Trichoderma* spp. *Penicillium* spp. and gram positive bacterium were effectively reduced the mycelial growth of the jasmine leaf blight pathogen. *Alternaria alternata.*

Akabari and Parakhi (2007) reported. *T. viride* - I and *T. hamatum* - IV V isolates showed strong antagonism against *Alternaria alternata* causing blight of sesame.

Waghmare and Kurundkar (2011) reported efficiency of *Trichoderma* spp. against *Fusarium oxysporum* f. spp. *carthami* causing wilt of Saff-flower and isolates no 20 and 33 were found to minimum growth of pathogen compared to others.

According to Dighule et. al. (2011) *Trichoderma varide* was also found effective in reducing the *Helminthosporium* leaf spot by 47-86 %.

According to Waghe *et al.* (2014) *T. harzianum* was found most effective showed 72.22 % mycelial growth inhibition and *T. Viride* showed 70.27 % mycelial growth inhibition in *Alternaria helianthi* Hansf. caused alternaria blight disease in sunflower.

According the Ambuse (2012) *T. viride T. koningii* and *T. pseudokoningii* showed 80 % antagonistic activity in case of sensitive isolates of *Alternaria tenussima* inciting leaf spot of *Rumex acctosa.*

Belete *et al.* (2015) reported that under dual culture the percentage of mycelial growth inhibition of *Fusarium solani* by *Trichoderma* ranged from 33.9 to 67 %. *Fusarium solani* that caused Feba bean black rot disease.

Recently Trivedi and Singh (2016) reported that *Trichoderma harzianum* and *T. viride* were effective against the fungal pathogen of stripe disease of barly.

Table 1: Biocontrol of *Alternaria Sesami* by *Trichonderma* spp, in dual culture technique.

Trichoderma spp.	Isolate	Control	Radial growth of Pathogen in treated Plate mm				%
inhibition			1	2	3	mean	
1) *T. Viride*	Sensitive	90	25	24	24	24	73.33
	Resistant	90	28	29	29	29	67.77
2) *T. asperllium*	Sensitive	90	27	26	26	26	71.11
	Resistant	90	30	30	31	30	66.66
3) *T. harzianum*	Sensitive	90	37	37	37	37	58.88
	Resistant	90	32	32	31	32	64.44

Conclusion :

Trichoderma viride showed maximum inhibition of sensitive and resistant isolates of *Alternaria sesami.* It was effective in controlling growth of pathogen causing leaf blight of *Sesamum indicum* L. Application of *Trichoderma* spp. for controlling leaf blight of *Sesamum* is ecofriendly more effective technique. It is one of the good alternative to avoide hazardous effect of chemical fungicide application.

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