

Research Paper :

## ***In vitro* evaluation of different fungicides, plant extracts and bio-agents against *Alternaria alternata* (Fr.) Keissler causing leaf blight of cowpea**

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### **SUMMARY**

The pathogenic fungus was isolated on PDA medium. The colony of *Alternaria alternata* was circular, grayish black with whitish growth on the upper surface on PDA with profuse growth and sporulation. Among different fungicides tested *in vitro*, Mancozeb (0.2 per cent) and Propiconazole (0.05 per cent) completely inhibited the growth of the test fungus. *In vitro* screening of the plant extracts revealed that the bulb extract of garlic was most effective in inhibiting the growth of the test fungus followed by sadaphuli and glyricidia. The antagonistic effect of the fungal bioagents against *Alternaria alternata* revealed that *Trichoderma harzianum* and *Trichoderma viride* significantly inhibited the mycelial growth of the test fungus.

### **Key words :**

Leaf blight, *Alternaria alternata*, Fungicides, Plant extracts, Bioagents, Cowpea

Pulses have been recognized as a major source of vegetable protein with needed minerals and vitamins. India grows a variety of pulse crops on about 223.91 lakh hectares with annual production of 133.81 lakh tonnes. In Maharashtra, pulses are cultivated on 34.32 lakh hectares area with a productivity of about 584 kg<sup>ha</sup> (Anonymous, 2007). Among the pulses, cowpea [*Vigna unguiculata* (L.) Walper] is nutritionally the most important legume containing 63.6 per cent carbohydrates, 24.8 per cent proteins, 1.9 per cent fats, 6.3 per cent fibre, 3-3.8 per cent ash and 9-11 per cent moisture. It is a rich source of calcium and iron.

In India, it is cultivated on about 1.5 million hectares with annual production of 0.5 million tonnes (Reddy, 2004). In Maharashtra, it is cultivated on 11800 hectares area with a productivity of about 390 kg ha<sup>-1</sup> (Apte and Jadhav, 2002). In the Konkan region of Maharashtra, cowpea is grown as a sole crop, mostly during late *Kharif* or *Rabi* or *summer* season after rice on 1200 hectares area with a productivity of 400 kg ha<sup>-1</sup> (Apte and Jadhav, 2002).

Among various diseases of cowpea, the leaf blight caused by *Alternaria alternata* was noticed in severe form on cowpea crop at the farms of Agric. Botany and Agronomy, College of Agriculture, Dapoli during the summer sown crop in the year 2008. The disease incidence was observed to be more than 40 per cent.

Prevalence of such newly introduced leaf blight disease on cowpea in Konkan region was found very severe. So far no research was undertaken, on this disease in Konkan, hence it was felt necessary to study its control by use of fungicides, plant extracts and bioagents *in vitro*.

### **MATERIALS AND METHODS**

#### **Efficacy of different fungicides against causal organism:**

Seven different fungicides belonging to different groups were tested against the causal fungus by using 'poisoned food technique' (Nene and Thapliyal, 1979). The mycelial discs of 5mm diameter were cut from 7 days old culture of test fungus with the help of sterile cork borer and transferred aseptically to the centre of the poisoned PDA poured plates. The PDA plates containing no fungicide but inoculated with fungal culture, served as control. The inoculated plates were incubated at 27 ± 1°C. Three replications per treatment were maintained. The observations on colony diameter and sporulation were recorded when Petri plate in control treatment was fully covered with mycelial growth. Per cent inhibition of growth of the test fungus was calculated by the following formula (Horsfall, 1956):

$$X = \frac{Y - Z}{Y} \times 100$$

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