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In Vitro Efficacy of Chemicals Against Cluster Bean Blight Pathogen

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Guar (*Cyamopsis tetragonoloba*) Taub has been used in India since ancient times for forage, vegetables and green manuring.

This crop has assumed industrial importance because of gum content in its seeds. Bacterial blight of guar caused by *Xanthomonas campestris pv cyamopsidis* is one of the serious diseases in several states of India. Patel *et al.* (1952) reported this disease for the first time. The widespread growing of susceptible varieties and prevalence of favourable weather conditions in the monsoon season enhance the intensity of the disease resulting into severe yield reduction (Srivastava and Rao, 1963; Bisht *et al.* 1992). Varietal resistance and evaluation of seed dressers against bacterial blight have been reported by several workers (Gandhi *et al.* 1978; Lodha, 1984; Chand, 1985).

This disease appeared in servere form during the *kharif* 1990-91 at Anand (Gujarat) which necessitated to explore the efficacy of selected antibiotics and chemicals against *Xanthomonas campestris pv. cyamopsidis* under Gujarat conditions. Present investigation reports the results of *in vitro* screening of chemicals.

The pathogen was isolated locally from diseased plant of GAUG 34 variety. It was purified and pathogenicity was proved using Koch postulates. The *in vitro* screeing of different chemicals and antibiotics against the pathogen was undertaken on the basis of their efficacy against various bacterial plant pathogens. List of chemicals and antibotics tested is as under :

a : Streptocycline (50 ppm),
b : Streptocycline (50 ppm) + glycerine (1.0%),
c : streptocycline (50 ppm) + Copper oxychloride (50 ppm),
d : Streptomycin sulfate (250 ppm)
e : Tetracycline (250 ppm),
f : Terramycin (250 ppm),
g : Paushamycin (75 ppm),
h : Copper oxychloride (200 ppm),
i : Emisan-6/MEMC (3300 ppm) j; Bleaching powder (200 ppm).

The molten nutrient agar (15 ml) containing the purified *Xanthomonas campestris pv. cyamopsidis* culture (10 cells/ml) was poured into sterile petridish, mixed gently and

TABLE 1

Effect of various chemicals and antibiotics on the growth of *Xanthomonas campestris pv cyamopsidis* of cluster bean.

Sr. No.	*Treatments*	*Zone of Inhibition (mm)*
1.	Streptocycline (50 ppm)	4.7079^{AB} (21.66)
2.	Streptocycline (50 ppm) + Glycerine (1.0%)	5.8803^{AB} (23.32)
3.	Streptocycline (50 ppm) + Copper oxychloride (50 ppm)	4.7079^{AB} (21.66)
4.	Streptomycin sulfate (250 ppm)	5.6419^{A} (31.33)
5.	Tetracycline (250 ppm)	4.3001^{B} (17.99)
6.	Terramycin (250 ppm)	3.9787^{B} (15.33)
7.	Paushamycin (75 ppm)	4.5996^{B} (20.66)
8.	Copper oxychloride (200 ppm)	1.6499^{C} (02.22)
9.	Emisan-6/ MEMC (3300 ppm)	4.7079^{AB} (21.66)
10.	Bleaching Powder (200 ppm)	0.7071^{D} (00.00)
11.	Control	0.7071^{D} (00.00)
	SEM	0.288
	CV %	13.52

NOTE : a. Treatment means with the letter/letters in common are not significant by Duncan's New Multiple Range Test at 5% level of Significance.

b. Figures in parentheses are retransformed values.

allowed to solidify at room temperature. The wells (5 mm) were punched with a sterile cork borer and were sealed from bottom with 0.8% sterilized agar. The chemicals were carefully loaded into wells (50 ul/well) under aseptic conditions. Sterile distilled water (50 ul/well) was kept as control. There were three replications for all the treatments. The plates were incubated at 37 C for 48-72 hrs. For the development of zone of inhibition. The inhibition zones were measured after 72 hrs for each treatment and data were analysed using Duncan's New Multiple Range Test. The data have been presented in Table-1.

It is evident from Table-1 that, out of ten chemicals screened in the laboratory, streptomycin sulfate (250 ppm) proved best over all other treatments and produced maximum zone of inhibition (31.33 mm). However, streptocycline (50 ppm) alone and in combination with glycerine (1.0%) and copper oxychloride (50 ppm) as well as Emisan-6/ MEMC (3300 ppm) were at par with each other. Bleaching

powder (200 ppm) was least effective and did not inhibit the growth of *Xanthomonas* on nutrient agar plate.

Lodha (1984) has suggested that seed treatment with streptocycline (250 ppm) proved effective in reducing the disease intensity and increase in the yield. However, higher dose of streptocycline (1000 ppm) has been recommended for seed treatment of guar against seed borne pathogens (Sowell, (1965).

It can be seen from Table-1 that streptocycline (50 ppm) was not effective over streptomycin sulfate (250 ppm) in the present studies. The poor response by streptocycline could be attributed to low dose of antibiotic. However, seed treatment with higher dose can be tried for the control of bacterial blight of cluster bean as suggested by Lodha (1984).

On the basis of *in vitro* screening of various chemicals and antibiotics, streptomycin sulfate (250 ppm) could be used for the seed treatment for the control of bacterial blight.

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