

Effects of Some Chemicals on Red Rot and Wilt Pathogens of Sugarcane *in vitro*

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ABSTRACT

An experiment was conducted to study the effects of eight chemicals, viz, Tecto, Tilt, Bavistin, Aretan-6, Agallol, MEMC-6, Rovral and Vitavax-200 on red rot (*Colletotrichum falcatum* Went) and wilt (*Cephalosporium sacchari* Butler) pathogens of sugarcane *in vitro* conditions. All the chemicals inhibited the growth of red rot and wilt pathogens in petridishes while 6.0 to 7.7 cm and 6.1 to 6.8 cm radial growth of red rot and wilt pathogens were recorded respectively in the untreated petridishes (control). The radial growth of red rot fungus measuring 1.8 cm in Agallol, 2.0 cm in Rovral and that of wilt fungus measuring 0.6, 0.7 and 3.0 cm in Tecto, Bavistin and Rovral respectively were obtained when 50% of the full doses of the chemicals were used.

INTRODUCTION

Red rot and wilt are two major diseases of sugarcane in Bangladesh. Both the diseases cause serious damages to sugarcane. Often wilt occurs in association with the red rot and causes damage in the later part of the crop season (January to April). Red rot is reported to be the most devastating disease of sugarcane in India (Abbott, 1956). It is also a widely spread destructive disease in Bangladesh (Anon, 1973-78). It is mostly responsible for low productivity (Ahmed, *et. al.* 1977). In India, wilt is a common and destructive disease and was first reported by Butler and Khan (1913). It frequently occurs in association with the red rot parasite (*Physalospora tucumanensis* Speg), and hastens the deterioration of the effected canes (Ganguly, 1964). It is also a disease of great economic importance in Bangladesh since it causes substantial loss in yield (Malek *et. al.*, 1982). It is desirable to find out suitable control measures of these diseases. Little work has been done with chemicals to inhibit or control the growth of *C. falcatum* and *C. sacchari* in Bangladesh. Khirbat *et. al.* (1980) performed laboratory tests with 14 fungicides against *C. falcatum*. In general, the benzimidazole, plantvax (exycarboxin) and Hoe 6053 (pyracarbolid) effectively inhibited spore germination. It was decided to do preliminary assessment on the efficacy of the chemicals in controlling the red rot and wilt pathogens *in vitro* before we go for the use of chemicals *in vivo*. An

experiment was, therefore, undertaken to investigate the efficacy of eight available chemicals against red rot and wilt pathogens under laboratory condition.

MATERIALS AND METHODS

Eight chemicals viz. Tecto, Bavistin, Aretan 6, Agallol, MEMC-6, Rovral, Vitavax-200 and Tilt were used to test against red rot and wilt pathogens, and 128, 38, 188, 175, 188, 300, 188 mg and 0.03 ml of these chemicals were taken respectively for each treatment, and considered as full doses of those chemicals. In each conical flask 75 ml of oat meal agar or PDA medium was taken and the respective quantity of each chemical was added to the medium after melting properly. The conical flask of control treatment was free from any chemical. After adding of the chemicals the contents were shaken thoroughly and then poured in 5 plates containing 15 ml medium in each of the plate. For red rot pathogens oat meal agar and for wilt pathogen PDA medium were used. After solidifying of the medium, red rot inoculum was put at the centre of each plate and radial growth of the fungus was measured at 2 d intervals. Thus, five radial measures were taken for each plate upto 10 d of the growth of culture. In the same way another parallel trial was carried out to test the reaction of these chemical against wilt pathogen. Besides, the above chemicals were tested against these two pathogens using the half of the above mentioned quantities of the chemicals.

RESULTS AND DISCUSSION

Increase in radial growth of *C. falcatum* and *C. sacchari* pathogens was completely checked at higher doses of all the chemicals used (Table 1). Each of the chemicals was also found effective to inhibit the growth of the red rot fungus at lower (50%) doses except Agallo and Rovral. Red rot fungus showed 1.8 and 2.0 cm radial growth at lower doses of Agallol and Rovral respectively. On the other hand in the untreated control 6.0 to 7.7 cm radial growth of red rot fungus and 6.1 to 6.8 cm radial growth of wilt fungus was recorded in the present experiment. Table 1 also shows 0.6, 0.7 and 3.0 cm radial growth of wilt pathogen at lower doses of Tecto, Bavistin and Rovral respectively, and the rest of the chemicals even at this lower dose completely inhibited the growth of this fungus. Laboratory tests with fourteen fungicides against *C. falcatum* were done by Khirbat *et. al.* (1980). They stated that in general, the benzimidazoles performed best and plantvax (Oxycarboxin) and Hoe 6053 inhibited spore germination only. The growth of *C. falcatum* was completely checked when Tecto, Tilt, Bavistin, Aretan-6, Agallol, MEMC-6, Rovral and Vitavax-200 were used at higher doses. when the doses were reduced to half, Agallol and Rovral failed to inhibit the fungal growth effectively. But other chemicals

Table 1. Effect of chemicals on the growth of *C. falcatum* and *C. sacchari* in artificial culture media *in vitro*.

Chemicals	Doses/ 75 ml medium (mg/ml)	Radial growth of 10 d old culture in full doses of chemicals (cm)		Doses/ 75 ml medium (mg/ml)	Radial growth of 10 d old culture at 50% doses of chemicals (cm)	
		Red rot	wilt		Red rot	wilt
Tecto	128	Nil	Nil	64	Nil	0.6
Tilt	0.03*	Nil	Nil	0.015*	Nil	Nil
Bavistin	38	Nil	Nil	19	Nil	0.7
Aretan-6	188	Nil	Nil	94	Nil	Nil
Agallol	375	Nil	Nil	187.5	1.8	Nil
MEMC-6	188	Nil	Nil	94	Nil	Nil
Rovral	300	Nil	Nil	150	2.0	3.0
vitavax	188	Nil	Nil	94	Nil	Nil
Control	No Chemical	6.0	6.8	No chemical	7.7	6.1

at lower doses were found as effective as higher doses. In case of *C. sacchari* also, all the chemicals effectively inhibited the growth of the organism at their higher doses. But Tecto, Bavistin, and Rovral failed to inhibit the growth of the fungus when their doses were reduced to half.

From the results, it may be concluded that the growth of all the test fungi can be inhibited *in vitro* at higher doses of the chemicals tested. These results sought for further trials with sugarcane setts under field conditions.

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