

SHORT COMMUNICATION

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***In vitro* assay of antibiotics against *Ralstonia solanacearum* causing Bacterial wilt and Brown rot of potato**

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Bacterial wilt and brown rot caused by *Ralstonia solanacearum* are two of the most dreaded disease of potato in Odisha which cause pre and post emergence rotting of seed tubers, wilting of plants at any stage of growth and rotting of tubers at harvest and to some extent at storage. Uses of antibiotics against *R. solanacearum* have also been reported since four decades ago. In the present studies antibiotics belonging to different groups have been tested *in vitro* following inhibition zone technique. It revealed that maximum zone of inhibition was observed in Cetriaxone (39.94mm) followed by both Cefaperazone (37.94mm) and Augmentin (37.94mm). In Cefixime no inhibition was observed.

Key words: *In vitro*, antibiotics, Bacterial wilt, Brown rot

Potato is one of the most popular vegetable crop in Odisha. The yield is much below the national average because of short winter and occurrence of varied number diseases. Among them Bacterial wilt and Brown rot caused by *Ralstonia solanacearum* are two of the most dreaded disease of potato in Odisha (CPRI, 2011; Pandey, 2007; Ranjan *et al.* 2015; Satapathy *et al.* 2012) that causes both pre and post emergence rotting of seed tubers, wilting of plants at any stage of growth and rotting of tubers at harvest and to some extent at storage. The integrated disease management methods like cultural practices, growing of tolerant varieties, applications of different chemicals including antibiotics are followed against this disease (Biswal *et al.*, 2010; CPRI, 2011). In the present studies other groups of antibiotics were tested *in vitro* prior to field application.

Twentythree antibiotics, i.e. Cefpodoxime, Chloramphenicol, Vancomycin Streptomycin,

Rifampicin, Levofloxacin, Cetriaxone, Clindamycin, Augmentin, Amikacin, Cephadroxil Augmentin, Cefixime, Tetracycline, Cefuroxime, Penicillin, Cephotoxime, Cefachlor, Azithromycin, Erythromycin, Cefaperazone, Clarithromycin, Ciprofloxacin and Ampicillin were tested against *R. solanacearum* causing Bacterial wilt and Brown rot of potato.

The cell suspensions of bacterium were prepared and smeared separately on the surface of agar plates containing NSA medium. The commercially available of antibiotic discs loaded with mini um inhibitory concentration (MIC) of the antibiotics were placed on the agar surface inoculated with specific bacterium served as control. Each treatment was replicated thrice. The inoculated plates were incubated at 27°C for 24-48 hrs. Observations on the inhibition zone around the discs were recorded by measuring the diameter of zone.

All antibiotic discs showed inhibition zone except

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Table 1 : Effect of antibiotics used against *R.solanacearum*

Antibiotic	Dose(mcg)/ Units	Diameter of inhibition zone (in mm)
Cefpodoxime(Aminoglycine group)	10	25.00 (5.05)
Chloramphenicol(Aminoglycine group)	30	25.00 (5.05)
Vancomycin(Aminoglycine group)	30	25.00 (5.05)
Sreptomycin(Aminoglycine group)	10	25.00 (5.05)
Rifampicin (Cephalo group)	5	18.25 (4.33)
Levofloxacin(Cephalo group)	5	35.86 (6.030)
Cetriaxone (Cephalo group)	30	39.94 (6.36)
Clindamycin (Cephalo group)	2	29.42 (5.47)
Augmention(Cephalo group)	30	37.94 (6.20)
Amikacin(Cephalo group)	30	10.99 (3.39)
Cefixime (Cephalo group)	5	0.00 (0.5)
Tetracycline	30	25.00 (5.05)
Cefuroxime(Tetracycline group)	30	35.98 (6.04)
Cephadroxil Augmentin(Tetracycline group)	30	37.69 (6.19)
Pencillin(Tetracycline group)	10 *	19.93 (4.52)
Cephotaxime (Macrolids)	30	7.01 (2.74)
Cefachlor(Macrolids)	30	26.02 (5.15)
Azithromycin(Macrolids)	15	7.01 ((2.74)
Erythromycin(Macrolids)	15	26.02 (5.15)
Cefaperazone	75	7.01 (2.74)
Clarithromycin	15	37.94 (6.20)
Ciprofloxacin	5	26.02 (5.15)
Ampicillin	10	35.98 (6.04)
Sterile water		0.00 (0.50)
SE (m)±		0.08
CD(p=0.5)		0.21

* = Units

Cefixime (Table 1). Maximum zone of inhibition was observed in Cetriaxone (39.94mm) followed by both Clarithromycin (37.94mm) and Augmentin (37.94mm). In Cefixime no inhibition was observed. In other antibiotics the inhibition zone varied from 7.01mm to 37.69 mm. The effectiveness of Erythromycin and Streptocycline have already been reported from field condition (Sangoyami *et al.* 2011; Sawant *et al.* 2014 and Verma *et al.* 2014). Hence these antibiotics may be effectively adopted in field condition.

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