



Short communication

Management of bacterial blight of anthurium (*Anthurium andreaeanum* Linden.) using ecofriendly materials

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Received 22 February 2006; received in revised form 3 October 2006; accepted 6 October 2006.

Abstract

Four ecofriendly materials viz., turmeric powder impregnated in sodium bicarbonate (0.15%), neem oil (2%), *Pseudomonas fluorescens* (a proprietary product at 1.5%) and cow dung extract (7.5%) were compared with streptomycin (100 µg ml⁻¹) and Captan (0.3%) for their efficacy in controlling bacterial blight of anthurium. Five sprays (at weekly intervals) of both turmeric powder and streptomycin proved to be very effective and gave 100% control as against 97% for *Pseudomonas*, neem oil, and Captan; cow dung extract, however, was less effective (75%).

Keywords: Captan, Neem oil, Streptomycin, Turmeric powder.

Bacterial blight caused by *Xanthomonas axonopodis* pv. *dieffenbachiae* (Mc Culloch and Pirone) is one of the major diseases of anthurium (*Anthurium andreaeanum* Linden). It was first reported from Brazil in 1960 (Nishijima, 1988) and is prevalent in almost all anthurium growing regions of the world including the state of Kerala (Dhanya et al., 2000). Antibiotics such as streptomycin sulphate and oxytetracycline are frequently recommended for its control (Nishijima and Fugjiyama, 1985). However, excessive use of these chemicals may impair the environment. Therefore, the efficacy of four ecofriendly materials was evaluated.

The experimental variables included turmeric powder impregnated with sodium bicarbonate in 10:1 proportion (0.15%), neem oil emulsion (2.0%), *Pseudomonas fluorescens* (a proprietary product; 1.5%), cow dung extract (7.5%), streptomycin (100 µg ml⁻¹), and Captan (0.3%), as well as a control. The pots were arranged in a glasshouse adopting a completely randomized design with three replications. The test variety was Cancan, which is highly susceptible to bacterial blight. Seven-

month-old tissue culture-derived anthurium plants were artificially inoculated with 24 h old bacterial suspension in the pinpricked collar region by swabbing with cotton dipped in the bacterial suspension. Seven days after inoculation, symptoms appeared as small lesions around the pinpricks, following which five sprays were given at weekly intervals. Scoring was done using the disease scale given in Table 1. Percentage of infection was recorded before each spray and seven days after the fifth spray and disease index (DI) calculated using the formula,

$$DI = \frac{\text{Sum of individual scores}}{\text{Total leaves observed} \times \text{Maximum score}} \times 100$$

Disease control was apparent only from the third schedule of spray onwards and the maximum effect was discernible after the fifth (Table 2). Turmeric powder + sodium bicarbonate and streptomycin gave consistently better disease suppression. That is, after five rounds of spraying, both treatments showed 100% control. *Pseudomonas fluorescens*, neem oil, and Captan also gave a reasonably good control of about 97%, however, cow dung extract demonstrated a relatively lower efficacy (75%). The efficacy of spraying streptomycin and turmeric powder

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Table 1. Score chart for comparing bacterial blight incidence of anthurium (*Anthurium andreaanum*).

Disease scale	Infection (%)	Extent of disease development
0	0	No infection
1	1 – 5	Lesion at pinpricks
2	6 – 25	Lesion at pinpricks along with yellowing of 1-2 leaves
3	26 – 50	Lesion of size 1.2 x 0.5 cm along with yellowing of 1-2 leaves
4	51 – 75	Yellowing of all leaves with blackening of petiole of leaves
5	76 – 100	Complete death of the plant

Table 2. Effect of spraying ecofriendly materials, antibiotic, and fungicide on the control of bacterial blight of anthurium (*Anthurium andreaanum*).

Treatments	Disease index after sprays ¹					Reduction over control after sprays ¹ (%)		
	1	2	3	4	5	3	4	5
Turmeric in sodium bicarbonate (0.15%)	12.92 ^a	12.92 ^a	6.64 ^a	1.91 ^a	0.0 (1.0 ^a)	95	73	100
Neem oil (2.0%)	12.92 ^a	20.75 ^b	10.52 ^a	1.91 ^a	1.91 (1.71 ^b)	95	57	97
<i>Pseudomonas fluorescens</i> (1.5%; proprietary product)	12.92 ^a	16.59 ^a	14.75 ^a	9.97 ^a	1.91 (1.71 ^b)	75	39	97
Cow dung extract (7.5%)	12.92 ^a	26.55 ^b	25.09 ^b	19.31 ^a	14.09 (3.89 ^c)	52	3.3	75
Streptocycline (100 µg ml ⁻¹)	12.92 ^a	10.52 ^a	8.13 ^a	1.9 ^a	0.0 (1.0 ^a)	95	67	100
Captan (0.3%)	12.92 ^a	12.92 ^a	10.52 ^a	3.83 ^a	1.91 (1.71 ^b)	90	57	97
Control	10.52 ^b	12.92 ^a	24.30 ^b	39.98 ^b	57.38 (7.64 ^d)	-	-	-

¹Numbers appearing as column subtitles indicate spray schedules and reduction over control for the first two sprays is not reported; means with the same superscript do not differ significantly; numbers in parentheses are square root (x+1) transformed values.

in the control of bacterial disease has been demonstrated previously for *X. campestris* pv. *oryzae* in rice (Mahto et al., 1988). Similarly, Gangopadhyay (1998) reported that a foliar spray with 0.1 % turmeric powder impregnated in sodium bicarbonate is effective against rice bacterial diseases.

Acknowledgement

This paper forms a part of the MSc (Ag) thesis submitted to the Kerala Agricultural University by the senior author.

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