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SHORT COMMUNICATION

Antibacterial activity of some Root extracts against *Xanthomonas campestris* pv. *mangiferaeindicae*

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ABSTRACT

Mango bacterial canker disease (MBCD) caused by Xanthomonas campestris pv. mangiferaeindicae (Xcmi) is one of the important diseases of mango affecting the number of commercial cultivars. The pathogen affects different plant parts like leaf, stem and fruit. Favorable environmental conditions cause severe loss to the crop. Root extracts of various plants are known to possess antimicrobial activity. The in vitro studies have been performed by using cup-plate method to examine the antibacterial activity of root extracts. Root extracts of 8 plants were screened against 11 strains of Xcmi. Out of 8 roots extracts 2 root extracts viz. the extract of Rauvolfia serpentina and Tribulus terrestris showed antibacterial activity against the Xcmi strains under investigation.

KEYWORDS: *Antibacterial activity, Root extracts, Xanthomonas campestris pv. mangiferaeindicae.*

I

INTRODUCTION

Bacterial diseases of fruit plants are known to cause great damages all over the world. Mango (Mangifera indica L.) is the most ancient among the tropical fruits. Among the bacterial diseases, bacterial canker is the most severe disease on Mango, which is caused by Xanthomonas campestris pv. Mangiferaeindicae. The pathogen affects different plant parts like leaf, stem and fruit. Favorable environmental conditions cause severe loss to the crop.

In order to manage plant diseases, various chemicals are used since last several years, the world over. They tend to accumulate in animal tissues posing threat to human health. Green plants represent a reservoir of effective chemotherapeutants and can provide valuable sources of natural pesticides [1, 2]. Indian literature is wealthy with regards to the scientific information and knowledge about plants and their uses. Medicinal properties of roots have been mentioned [3-5]. Root extracts of various plants are known to possess antibacterial activity [6]. Hence, in the present investigation, we have performed in vitro studies to examine the antibacterial activity of root extracts.

MATERIALS AND METHODS

The strains of the causal organism of MBCD i.e. Xanthomonas campestris pv. mangiferaeindicae were collected from different parts of Aurangabad district. Studies were performed using these strains. They were maintained as Nutrient agar (NA) medium.

Preparation of root extracts

The roots of the plants were collected, thoroughly washed with tap water and then rinsed with sterile distilled water. For the study, dried root extracts were used. They were dried in shade until all moisture evaporated. Then these roots were powdered by using electric grinder and packed in to polythene bags. One gm dried root powder was taken and added to 10 ml of sterile distilled water. Then it was subjected to ultracentrifuge for 20 min at –4oC at the 11000 rpm speed.

Cup Plate Method

It is a method of testing antibacterial activity. For this, the bacterial suspension was prepared by adding 10 ml sterile distilled water to 2 days old NA slope culture. Five drops of bacterial cell suspension were poured in sterilized petridishes (9 cm diameter) on to which 20 ml of nutrient agar was poured and thoroughly mixed. It was

allowed to solidify.

In the centre of the medium, a cup cavity of 8 mm diameter was made with sterilized No. 4 cork borer. This cup was filled with 0.1 ml of the plant extract [7]. The petridishes were incubated for 24 hrs at 25±2°C and the observations were recorded as diameter of inhibitory zone in mm. Cup plate filled with sterile distilled water was used as control in all the experiments. All experiments were in duplicate.

RESULTS AND DISCUSSIONS

Root extracts of various plants are known to possess antibacterial activity [6]. Therefore, root extracts of 08 plants were screened for their antibacterial activity against 11 strains of *X. campestris* pv. *mangiferaeindicae* and the observations are presented in table 1.

It is revealed from the data (Table 1) that out of 08 root extracts tested against the pathogen, only two extracts viz. *R. serpentina* and *T. terrestris* have showed the activity. Maximum activity was shown by the root extracts of *T. terrestris* (Mean activity zone – 10.90 mm) followed by *R. serpentina* (Mean activity zone – 10.81 mm). While, the root extracts of *Asparagus recemosus, Cyperus rotundus, Cyperus scariosus, Glycyrrihiza glabra, Terminalia thorelii* and *Withania somnifera* could not exhibit any antibacterial effect on *Xcmi* strains.

Osborn [8] screened 2300 plant species so as to know their antibacterial activity against the bacteria like *Escherichia coli* and *Staphylococcus aureus*. Pawar [6] has screened 110 leaf extracts, 09 root extracts, 36 fruit extracts, 05 stem extracts, 10 seed extracts, 04 bark extracts, 08 gum and 06 latex against 05 bacterial phytopathogens. He observed that, the root extract of *Rauvolfia serpentina* more effective against the 05 bacterial pathogens, he tested. Effectivity of root extracts of 12 plants has been reported by [3].

Sr. No	Name of the Plant	Zone of Inhibition (in mm) against the strains											
		Xcmi 1	*Xcmi* 2	*Xcmi* 3	*Xcmi* 4	*Xcmi* 5	*Xcmi* 6	*Xcmi* 7	*Xcmi* 8	*Xcmi* 9	*Xcmi* 10	*Xcmi* 11	Mean
1.	*Asparagus recemosus* Willd.	–	–	–	–	–	–	–	–	–	–	–	–
2.	*Cyperus rotundus* L. sp. r*otundus*.	–	–	–	–	–	–	–	–	–	–	–	–
3.	*Cyperus scariosus* R. Br.	–	–	–	–	–	–	–	–	–	–	–	–
4.	*Glycyrrihiza glabra* L.	–	–	–	–	–	–	–	–	–	–	–	–
5.	*Rauvolfia serpentina* (L.) Benth. Ex Kurtz.	10	12	11	10	10	12	11	11	10	11	11	10.81
6.	*Terminalia thorelii* Ganep	–	–	–	–	–	–	–	–	–	–	–	–
7.	*Tribulus terrestris* L.	10	11	11	12	10	10	11	10	12	12	11	10.90
8.	*Withania somnifera* (L.) Dunal var. ashwagandha Dunal	–	–	–	–	–	–	–	–	–	–	–	–

– : No Activity.

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