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ANTAGONISTIC EFFECT OF SOME MANGAL SOIL FUNGI AGAINST COLLETOTRICHUM FALCATUM WENT. AND CURVULARIA PALLESCENS (WALKER) BOEDIJN

SUDHA, S.S., PANNEERSELVAM, A. and *THAJUDDIN, N.

Department of Botany and Microbiology, A.V.V.M. Sri Pushpam College (Autonomous), Poondi-613503, India

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ABSTRACT

Antagonistic effect of mangrove soil fungi, *Aspergillus flavus*, *A. fumigatus*, *A. luchuensis*, *A. niger*, *A. ochraceus*, *A. terreus*, *Penicillium citrinum*, *Penicillium* sp., *Trichoderma harzianum* and *T. pseudokoenigii* against *Colletotrichum falcatum* and *Curvularia pallescens* were studied *in vitro* on nutrient medium amended with staled products of the test fungi.

INTRODUCTION

Cell-free culture filtrates have been used to demonstrate the role of antibiosis in biological control (Khara & Hadwan, 1990; Tu, 1992; Naik & Sen, 1992; Panneeselvam & Saravanamuthu, 1994, 1996, 1999). In the present study antagonistic activity of mangrove soil fungi against *Colletotrichum falcatum* and *Curvularia pallescens* have been emphasized *in vitro* with cell-free culture filtrates of fungi amended in medium.

MATERIALS AND METHODS

The test pathogens *C. falcatum* and *C. pallescens* were obtained from A.V.V.M. Sri Pushpam College, Poondi and soil fungi isolated from Muthupet mangal ecosystem viz., *Aspergillus flavus*, *A. fumigatus*, *A. luchuensis*, *A. niger*, *A. ochraceus*, *A. terreus*, *Penicillium citrinum*, *Penicillium* sp., *Trichoderma harzianum* and *T. pseudokoenigii* were maintained on potato dextrose agar (PDA) and sea water corn meal agar (SWCMA), respectively.

Erlenmeyer flask (250 ml) containing 100 ml sterilized sea water corn meal broth were inoculated with three blocks (5 mm dia.) cut from the actively growing margin of the individual fungus and incubated at $25\pm 2^\circ\text{C}$ for 15 days, after which the hyphal mat of each filtered first through Whatman No. 42 filter paper and finally through Seitz filter (G5). Final pH of each filtrate was determined. Staled filtrates of each fungus was added to the sterilized PDA medium in such a way as to get the final concentration as 5, 10, 25%. The amended PDA medium dispersed in petriplates was allowed to solidify. Thereafter 5 mm agar blocks cut from the actively growing margin of the test fungus were inoculated separately and incubated at $25\pm 2^\circ\text{C}$ for 5 days and the radial growth was recorded periodically (Grover & Moore, 1962).

RESULTS AND DISCUSSION

The staling products of the antagonistic fungi have inhibited the growth of *C. falcatum* and *C. pallescens*. The maximum inhibition

*Department of Microbiology, NFMC, Bharathidasan University, Tiruchirappalli-620 024.

Table 1. Effect of culture filtrate of mangrove soil fungi on the growth of *Colletotrichum falcatum* (C.f.) and *Curvularia pallescens* (C.p.).

Culture filtrate	pH	Concentration (%)	Growth rate (cm/day)		% inhibition	
			C.f.	C.p.	C.f.	C.p.
Control			2.3±0.1	2.5±0.2		
<i>A. flavus</i>	6.5	5	0.9±0.1	2.03±0.1	60	18.8
		10	0.8±0.1	2.0±0.0	65	20
		25	0.3±0.1	1.8±0.1	87	28
<i>A. fumigatus</i>	6.5	5	1.3±0.16	2.0±0.0	43	20
		10	0.7±0.01	1.9±0.1	69	24
		25	0.6±0.1	1.8±0.1	73	28
<i>A. luchuensis</i>	6.5	5	2.0±0.0	2.4±0.1	13	4
		10	1.8±0.0	2.3±0.1	21	8
		25	1.5±0.0	2.2±0.0	34	12
<i>A. niger</i>	4.5	5	1.8±0.0	2.1±0.1	21	169
		10	0.7±0.0	1.7±0.1	69	32
		25	0.2±0.1	1.6±0.1	91	36
<i>A. ochraceous</i>	5.0	5	1.8±0.1	2.4±0.1	21	4
		10	1.6±0.0	2.3±0.1	26	8
		25	1.1±0.16	2.2±0.0	52	12
<i>A. terreus</i>	6.5	5	1.3±0.1	2.5±0.1	43	0
		10	1.0±0.1	2.4±0.0	56	4
		25	0.7±0.1	2.3±0.0	69	8
<i>P. citrinum</i>	7.5	5	1.5±0.0	2.1±0.1	34.7	16
		10	1.2±0.0	1.9±0.1	47	24
		25	0.8±0.1	1.7±0.1	65	32
<i>Penicillium sp.</i>	5.0	5	1.4±0.0	2.4±0.0	39	4
		10	1.0±0.0	1.8±0.1	56	28
		25	0.5±0.0	1.2±0.1	78	52
<i>T. harzianum</i>	6.5	5	1.8±0.0	1.9±0.1	21.7	24
		10	1.4±0.1	1.5±0.1	39	40
		25	0.8±0.1	1.0±0.0	65	65
<i>T. pseudokoeningii</i>	6.0	5	1.2±0.1	1.4±0.1	47	44
		10	1.1±0.0	1.3±0.1	52	48
		25	0.7±0.1	0.9±0.0	69	64

of growth of test fungi observed with staling product of the antagonistic fungi *A. niger* followed by *A. flavus*, *Penicillium sp.*, *A. fumigatus*, *A. terreus*, *Trichoderma pseudokoeningii*, *T. harzianum*, *Penicillium citrinum*, *A. ochraceous*, *A. luchuensis* for *C. falcatum* (Table 1).

The maximum inhibition of growth of test fungus *C. pallescens* was observed with

staling products of the antagonistic fungi *Trichoderma harzianum* followed by *T. pseudokoeningii*, *A. niger*, *Penicillium sp.*, *A. niger*, *P. citrinum*, *A. flavus*, *A. fumigatus*, *A. luchuensis*, *A. ochraceous* and *A. terreus* (Table 1).

Differential sensitivity of the pathogen to the staling growth products of the fungi was observed. This may be due to the genetic

potentialities of the pathogen to tolerate a particular antibiotic substance and the chemical properties of the staling substance. It has been reported that the environmental parameters, nutrients media and assay method also influence the antifungal activity of the fungus (Upadhyay & Arora, 1986; Fravel, 1988).

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