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Effect of culture filtrates of contaminants on the diametric growth of *Calocybe indica*

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When the culture filtrates of contaminants viz.., *A flavus*, *A. niger*, and *T. harzianum* was amended in the potato dextrose agar at different concentrations of 10, 20, 30, 40 and 50 per cent on mycelial growth of *Calocybe indica* there was decrease in growth of mycelium with increase in concentration of culture filtrate from 10 to 40 per cent and no growth at all at 50 per cent. The results indicated that the sensitivity of *Calocybe indica* to culture filtrate of contaminants.

Key words : Mycelial diametric growth, *Calocybe indica*, culture filtrate, *Aspergillus flavus*, *Aspergillus niger*, *Trichoderma harzianum*

INTRODUCTION

From time immemorial man has relied upon fungi as source of food. Among the macrofungi which are directly consumed as food, a majority belongs to Basidiomycetes, the notable exception being the edible species of tubers and *Morchella* of the Ascomycetes group. Mushroom have a great nutritive value. They usually contain more protein than any other comparable source and can claims to be 'protective food'. The contaminating organisms reduce the yield of mushroom to a great extent, sometimes causes even complete crop failure as reported by Thapa *et al.* (1979). Interactions among the predominant fungi and their effects on the mycelial growth of *Agaricus bisporus* were studied under *in vitro* conditions by Sohi and Grewal (1987). Culture filtrate of *Gliocladium deliquescens* after autoclaving, showed stimulatory effect on mushroom mycelium (Jandaik and Guleria, 1988). Vijay and Sohi (1989) found that the culture filtrate of *Aspergillus niger* at 50 per cent concentration inhibited the mycelial growth of *Pleurotus sajor-caju, P. flabellatus* and *P. citrinopileatus* by 100 per cent. Singh *et al.* (1992) reported that the culture filtrate of *Trichoderma harzianum* was tested against radial colony growth of *Rhizoctonia solani*.

MATERIALS AND METHODS

Potato dextrose broth was taken in 250 ml conical flask @ 100 ml each, sterilized and inoculated with the contaminants namely, *Aspergillus flavus, Aspergillus niger* and *Trichoderma harzianum* separately. The mycelial mats from the actively growing region served as inoculum. The conical flasks were incubated at room temperature, 27±1^{0}C for 10-12 days. After the incubation period, the content of the flasks were filtered through Whatman No. 1 filter paper and filtrates were collected. The filtrates were centrifuged at 3000 rpm for 30 minutes and the supernatants were filtered through pre-sterilized bacteriological filter. The filtrates served as culture filtrate devoid of spores and mycelium of contaminant fungi.

Culture filtrates were amended in the sterilized PDA medium, before pouring into Petri dishes under aseptic condition, in quantities so as to get the final concentration of 10, 20, 30, 40 and 50 per cent of culture filtrate in the medium. The medium not amended with culture filtrate served as control. The Petri dishes containing various concentrations of culture filtrates were inoculated with mycelial discs of *Calocybe indica* taken from actively growing region. The plates were incubated at room

temperature (27±1°C). The colony diameter of *Calocybe indica* was measured in individual plates when the organism completely covered 90 mm petri dishes in control.

RESULTS AND DISCUSSION

When the concentrations of culture filtrates of *A. flavus* and *A. niger* were amended in the medium by 10, 20, 30, 40, 50 per cent, diametric growth of *Calocybe indica* was reduced by 44.26, 21.13, 15.59, 6.90, 100 and 45.56, 20.49, 12.48, 5.46, 100 per cent respectively. When the concentration of culture filtrate of *T. harzianum* was amended i.e. 10, 20, 30, 40 and 50 per cent in the medium, diametric growth of *Calocybe indica* was reduced by 52.13, 18.11, 10.59, 3.65 and 100 per cent respectively.

Table 1 : Effect of culture filtrate of contaminants on the diametric growth of *Calocybe indica* under *in vitro* conditions.

Treatment No.	Concentration of culture filtrate used (%)	Diametric growth of *Calacybe indica in mm* Culture filtrate of the contaminat used*		
		A. flavus	*A. niger*	*T. harzianum*
T_1	10	44.26(50.82)e	45.56(49.38)e	52.13(42.08)e
T_2	20	21.13(76.53)d	20.49(77.24)d	18.11(79.88)d
T_3	30	15.59(82.68)c	12.48(86.13)c	10.59(88.23)c
T_4	40	6.90 (92.33)b	5.46 (93.93)b	3.65 (95.95)b
T_5	50	0.00 (100.00)a	0.00 (100.00)a	0.00 (100.00)a
T_6	0 (Control)	90.00(0.00)f	90.00(0.00)f	90.00(0.00)f
SED		1.34	1.10	094
CD(P=0.05)		2.86	2.23	1.87

* Mean of three replicates

Figures in parentheses are per cent reduction of diametric growth.

Values with different alphabets differ significantly.

Culture filtrates of all the contaminants tested were found to arrest the growth of *C. indica* at 50 per cent concentration completely. *Aspergillus* spp. are known to produce acids in culture (Turner, 1971). Final pH was below 3. Growth of *C. indica* was adversely affected with decrease in pH and hence low pH of the medium rather than chemical nature of metabolites could be responsible for this reduced growth. Yee and Ho (1980) while stydying the interaction between *Volvariella volvacea* and the contaminants viz., *Coprinus cinereus, A. fumigatus* and *A. niger*, reported decrease in pH of the culture filtrates of contaminants resulting in low growth of mushroom mycelium when grown on these filtrates. With regard to *A. niger*, the results obtained in the experiment was similar to the results obtained by Vijay and Sohi (1989) who used the autoclaved culture filtrates. They also reported that autoclaved culture filtrate of *Trichoderma viride* at 50 per cent concentration inhibited the growth of *Pleurotus sajorcaju* 11.8 per cent only. In the present study, autoclaving was not done, but the filtrate was filtered through bacteriological filter, hence the metabolite could not be decomposed and it resulted in complete inhibition at 50 per cent concentration.

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