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Antagonism interaction of some soil fungi against *Microsporam gypseum*

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ABSTRACT

Antagonistic interaction of some soil fungi namely Pencilium citrinum, Alternaria alternate, Fusarium moniliform, Curvularia lunata and Aspergillus terreus against Microsporam gypseum was studied invitro in dual culture and in periplate on potato dextroxe agar medium amended with staied products of the test fungi. The maximum percentage of inhibition of the pathogen was 72% against pecillium citrinam and 50%of inhibition was against curvularia lunata andAspergillus terreus.

Keywords*: Microsporam gypseum*, antagonism, inhibition, soil fungus.

INTRODUCTION

Microporam gypseum produces both microconidia and macroconidia. Macroconidia are multiseptate,with a thin or thick enhinulate cell wall. Spindle-shaped and may be numerous or scare.The thickness of the cell wall and shape vary depending on the species. Soil inhabiting species of Microporam gypseum have as Anthroderma of Ascomycetes The world wide distribution of dermatotophytes and their related keratinophilic fungi in soil revealed that some of *Microsporam gypseum* species are geophilic , mainly survive keratinous substrate in soil in all habitats. The develop telemorphs in soil which is an additional character and through which their long-term survival in soil is possible .During their survival in soil,these have to interact with neighbouring soil fungi and exert antagonistic potential. The occurrence and saprophytic survival of dermatophytes in soil are now very well documented (de hoog and Guarro 2005).survival of *Microsporam gypseum* species in the form of telemorphs is an additional adaptation of their geophilic nature .Which provides them longer stability in soil(Currah 1985). Several studies report on competitive ability among soil inhabiting fungi based on antibiotics or enzyme production or substrate colonisation (Dixit 1991) .The success of biocontrol of phytopathogenic fungi prompted screening of fungal strains for potential antagonism among dermatophytes,keratinophilic and soil inhabiting fungi.The main of this study was to determine the extent of antagonism among species of *Microsporam gypseum* and inter-and

intera specific pairing invitro. This may throw some light on selecting appropriate species and isolate combination of keratinophilic fungi to be used against target fungi.

METERIALS AND METHODS

Dual culture Experiments*(skidmore and Dickinson(1976)*
The sterilized potato dextrose agar medium was poured in to the petriplate and allowed to solitify. After solidification colony interaction between the test pathogen *Microsporam gypseum* and the soil fungi were studied in vitro dual culture experiments.The test pathogen *Microsporam gypseum* and the soil fungi such as *Pencillium citrinam,alternaria alternata,Fusarium moniliform,Curvularia lunata and Aspergillus terreus* the fungal and pathogen were grown separately on PDA medium.

Then agar blocks cut form the actively growing margin of the individual species of pathogen and test organism were inoculated just opposite to each other approximately 3cm apart on potato dexstrose agar medium in periplate.Three replicates for each set in single and dual inoculated culture of the fungus. The position of the colony margin on the black of the disc was recorded daily.The measure ment was taken on the fifth day.

Assessments were made when the fungi has achived an equilibrium after which there was no further alteration in the growth. Since both of the organism were mutually inhibited the assessment was made for both organisms.

The percentage inhibition of growth was calculated as follows.

Percentage inhibition of growth = r-r1/r x100

r=growth of the fungus was measured from the centre of the colony towards the centre of the plate in the abscence of antagonistic fungus.
r1= growth of the fungus was measured from the centre of the colony towards the antagonistic fungus.

The colony interaction between the test pathogen and the soil fungi were assessed following the model proposed byPorter(1924) and Dickinson and Broadman (1971).Five type of interactions grade as proposed by Skidmore and (1976)have been used.

Types are as follow:
1.Mutual intermingling with out any macroscopic sights of interaction-Grade1.
2. Mutual intermingling growth where the growth of the fungus is ceased and bing over growth by the opposed fungus –Grade 2.
3.Intermingling growth where the fungusunder observation is growing in to the opposed fungus either above (or) blow –Grade3.
4.Sight inhibition of both the in teracting fungi with narrow demarcation line (1-2)-Grade 4.
5. Mutual inhibition of growth at a distance of >2mm-Grate5.

RESULTS AND DISCUSSION

The type of interaction of the pathogen with soil fungi were as follows

Pecillium cirinum	Grade1
Curvularia lunata and Aspergillus terreus	Grade2
Alternaria alternata	Grade3
Fusarium moniliform	Grade4

The maximum pertentage inhibitionof *Microporam gypseum* with *Pencillium citrinum* (72.0) followed by *curvularia lunata* (50.0) *Aspergillus terreus* (50.0) The mycelium of *Alternaria alternata* (41.93) *Fusarium moniliform*(35.29) were found growing over the pathogen (Table 1)

Differencial sensitivity of the pathogen to the staling growth products of the fungi was aiso observed.The dermatophytes inhabiting soil are affected by soil microflora and indicate antagonistic and hypoparasitic activity antagonistic and hypoparasitic activity. It has been repotted influence of staling substances caused by earlier established microorganism (Dwivedi and Garrett 1968)The keratinophillic fungi unable to decomposehair exerted longer inhibitory effect on pathogenic dermatophytes in which Tricophyton rubram were more sensitive(Ulfig1996).

Table 1.Colony intraction between *Microsporam gypseum* and soil fungi in dual culture experiments

S. NO	Growth response of the antagonistic and test fungus(mm)	Antagonistic fungus tested (mm)				
		At	*Fm*	*Cl*	*Pc*	*Aa*
1	Colony growth of pathogen towards antagonist (mm)	15	22	10	07	18
2	Colony growth of pathogen away from the antagonist	30	34	20	25	31
3	%growth inhibition of the pathogen in the zone of interaction(mm)	50.0	35.29	50.0	72.00	41.93
4	Colony growth antagonist in control ie growth towards the centre of the plate in the abscence of the pathogen.(mm)	55	58	48	50	41.93
5	Colony growth antagonist towards the pathogen.(mm	22	17	12	10	41
6	Colony growth antagonist away from the pathogen.(mm	11	08	06	05	08
7	% of growth inhibition ofantagonistic in the zone of interaction(mm)	60.0	70.68	75.00	80.00	07

A.t-Aspergillus terreus , F.m –Fusarium moniliform , C.l-curvularia lunata, P.c-Pencillium citrinum,A.a-Alternaria alternata.

Growth *Microsporam gypseum* towards the centre of the plate in the absence of any antagonistic fungus (control) was 72.00mm.

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