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SHORT COMMUNICATION

In vitro Biological control of *Microsporum gypseum* Bodin

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The present investigation is carried out to study the *in vitro* antibiosis against *Microsporum gypseum*. Dual culture and streaking methods are adopted. Three fungi namely *Aspergillus flavus, Aspergillus niger* and *Trichoderma viride* and one bacterium *Pseudomonas aeruginosa* are employed to study their antagonist effect against *Microsporum gypseum*. It has been found that highest growth inhibition was caused by *Aspergillus niger* followed by *Aspergillus flavus, Trichoderma viride* and *Pseudomonas aeruginosa.*

Key words: *Aspergillus flavus, Aspergillus niger, Trichoderma viride, Pseudomonas aeruginosa Microsporum gypseum,* Biological control

Isolation studies of keratinophilic fungi and related dermatophytes from decomposing keratinous substrates in soil have revealed the occurrence of *Microsporum gypseum* Bodin in almost all habitats of the world. The world-wide distribution of this fungus has been thought to be due to its successful competition with keratinophilic and saprophytic fungi in colonizing keratinous substrates. Griffin (1960) demonstrated that initial colonizers of hair were fungi of high saprophytic ability they gave way to less competitive fungi, which in turn were usually replaced by keratinophilic fungi. Nigam and Kushwaha (1990) have studied the ability of *Chrysosporium tropicum* to interact with 12 keratinophilic and saprotrophic fungi in dual cultures. Frequent curling, penetration, granulation, lysis and chlamydospore formation in *C. tropicum* were observed during hyphal interference. Wicklow (1981) suggested that precolonized substrates were colonized by fungi of antagonistic activity, which would involve the production of antimicrobial agents or direct hyphal interference. However, no concerted effort has been make to study hyphal interference and antagonism among keratinophilic fungi Deshmukh and Verekar (2010), Deshmukh *et al.* (2012). In the present study an attempt has been made to study the *in vitro* antibiosis against *Microsporum gypseum*.

Dual culture method and streaking have been adopted to study the *in vitro* antibiosis against *Microsporum gypseum.* The following fungi and one bacterium have been employed to study their antagonist effect against *Microsporum gypseum.*

1. *Aspergillus flavus* Link, 2. *Aspergillus niger* Van Tieghem, 3. *Trichoderma viride* Pers.ex Fries, 4. *Pseudomonas aeruginosa* The interaction tests were performed in petridishes. They mycelial discs (5 mm diameter) from 4 day old actively growing

culture of supposed antagonists were placed on PDA plates 6 cm apart against test fungus separately. The plates were incubated at 28±2^{0}C for 7 days. They were observed for zone of inhibition, contact inhibition and over growth. For bacterial

$$\text{Percentage growth Inhibition} = \frac{\text{Growth of } \textit{Microsporum gypseum} \text{ in control plate} - \text{Growth of } \textit{M. gypseum} \text{ in the presence of biocontrol agent}}{\text{Growth of } \textit{Microsporum gypseum} \text{ in control plate}} \times 100$$

antagonists, the antagonist was streaked near the periphery and the pathogen at right angles to the antagonist. The percentage growth inhibition was calculated by the following equation

Table 1 gives a picture of the percentage of growth inhibition of *Microsporum gypseum* caused by different organisms. Highest growth inhibition was caused by *Aspergillus niger*(68%) followed by *Aspergillus flavus* (64%), *Trichoderma viride* (46%) and *Pseudomonas aeruginosa* (50%). Fungi like *Trichoderma, Chaetomium, Penicillium Aspergillus, Verticillium* and other which are the common fungi were considered as biocontrol agents as evidenced by their antifungal activity through antibiosis, antagonism and fungistasis. Therefore, the present study was carried out to study the efficacy of three soild fungi *(Aspergillus niger, Aspergillus flavus, Trichoderma viride)* and one bacterium (*Pseudomonas aeruginosa*) on the growth of *Microsporum gypseum*. The data has revealed that of all the organisms tested, *Aspergillus niger* could check the fungal growth of *Microsporum gypseum* to a greater extent followed by *Aspergillus flavus, Trichoderma viride* and *Pseudomonas aeruginosa.*The variability antagonism exhibited by different organisms against *Microsporum gypseum* on Potato dextrose agar may be due to different diffusible mycostatic staling substances produced by them. The antagonistic factors that are present may be volatile and nonvolatile metabolites (Webber and Hedger, 1986), antifungal toxins (Pachneri and Dix, 1980), substances altering the pH of the medium (Bartman *et al,* 1981), organic acids (Birkinshaw *et al,* 1952). The antagonistic potentiality of *Aspergillus niger* against *Microsporum gypseum* was noteworthy and is an indicative of the production of some inhibitory substance.

Table 1 : The percentage growth inhibition of *Microsporum gypseum* by different organisms

Name of the organism	% growth inhibition
Aspergillus niger	68
Aspergillus flavus	64
Trichoderma viride	46
Pseudomonas aeruginosa	50

The present observation clearly indicates that the common soil fungi which are present in abundance than *Microsporum gypseum* have the potential to check the population of *Microsporum gypseum.*

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