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Evaluation of Keratinophilic Fungi and Dermatophytes in Garbage Soil around the Beauty Parlours of Betul City (MP)

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Abstract – Keratinophilic fungi are a highly specialized group of fungi growing on specific substracts containing the complex nitrogenous material keratin. They are potentially pathogenic to man and animals as they include dermatophyte which parasitize man and animals by invading the keratinized layers of epidermis and epidermal appendages.

Key Words: Pathogenic Fungi, Beauty Parlour.

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INTRODUCTION

Soil that are rich in keratinous materials are the most conductive for the growth and occurrence of keratinophilic fungi (Moallai and Zaini, 2006). Therefore soil rich in keratin residues constitutes a permanent or occasional reservoir for dermatophytes and other keratinophilic fungi and are a source of potential infection for man and animals. On the other hand keratinous material does not accumulate in nature, keratinophilic saprophytes may be presumed to accomplish its degradation and removal. Therefore their survived in soil has great epidemiological as well as ecological significance. In the present paper a study was conducted to explore the keratinophilic mycoflora present in garbage soil around the beauty parlours of Betul city, which is enriched with keratinous material particularly hair.

MATERIAL AND METHODS:

A total of 40 soil samples were collected from around the beauty parlours of Betul city, Toma - Karling - Vanbreuseghem (1952) technique was followed for isolation of fungi from soil samples. Keratinophilic fungi if present in soil sample, appeared on different baits. When growth occurred, a part of this growth was examined microscopically and transferred aseptically in petridishes containing sabourauds dextrose agar media. Isolated fungi were identified on the basis of their cultural and morphological characteristics.

RESULTS AND DISCUSSION:

The different species of kerationophilic fungi isolated from soil samples from around beauty parlour are presented in table-1. All the 40 samples investigated proved to be positive for the colonization of keratinophilic fungi. A total of 4 genera namely *Chrysosporium, Microsporum, Scopulariopsis* and *Aspergillus* were isolated from soil samples on different baits.

In all the soil samples only two genera were isolated more frequently. Maximum number of fungi isolated were the genus *Chrysosporium* (103) followed by *Microsporum* (55). Table-3 shows the frequency of occurrence of *Chrysosporium* genus in collected soil samples was 85% and frequency of *Microsporium Scopulariopsis* and *Aspergillus* was 52.5%, 7.5% and 2.5%, respectively. Table-2 shows the bait specificity of each fungus. *Chrysosporium* Sps were grown on nails in 23 soil samples, on hair in 18 soil samples, on horn in 27 soil samples, on feather in 20 soil samples and on hoof in 15 soil samples. Similarly *Mircrosporum* Sp. were found growing on nail in 6 soil sample, on hair in 17 soil samples, on horn in 8 soil samples, on feather in 13 soil samples and on hoof in 9 soil samples. *Scopulariopsis* Sp. was isolated from 01 soil sample on nails from 01 soil sample on horn and from 2 soil samples on feather. *Aspergillus* species was isolated only from one soil sample on nail. Nail was found to be the best keratin source for the colonization of keratinophilic fungi.

Garbage soil, collected from around the beauty parlour located in different residential areas of city, is rich in keratinous material specially hair, showed more prevalance of keratinophilic fungi and dermatophytes. In the present study isolation of *Microsporum* Sps are significant as it is the well established causal organism of dermatophytosis. Out of 55 isolates of *Microsporum*, 16 were of

common *Microsporum gypseum*. Keratinolytic ability of some of the species of *Chrysosporium* genera have also been proved but there is no evidence in favour of its pathogenicity. The occurrence of *Scopulariopsis* Sps is also noteworthy, as some of the species of this genus have been reported as pathogenic (de Vries 1983, Agrawal and Singh 1980, Naidu et.al. 1991). Now S. brevicaulis has been accepted as the real etiologic agent of onychomycosis. Some species of *Aspergillus* have also been reported as opportunistic pathogen. The present paper conclude that the garbage soil around the beauty parlour serve as a reservoir for these keratinophilic fungi and dermatophytes, and are a source of potential infection for man and animals. The isolation of well known dermatophytes in garbage soil near the residential places, is also important as it indicates that the dermatophytosis may not be uncommon in these areas. It would be a worthwhile line of investigation in the future. On the other hand keratinous material does not accumulate in nature by the keratinolytic ability of keratinophilic mycoflora, present in that particular site and these fungi can be useful for curbing pollution.

Table – 1

Soil Samples Positive for the Colonization of Keratinophilic Fungi showing Bait Specificity

S. No.	Fungi Isolated from Soil Samples	Bait Used				
		Nail	Hair	Horn	Feather	Hoof
1	*Chrysosporium Spp.*	*1,5,6,9,10,12, 13,17,18,19, 20,22,24,27, 28,29,30,31, 32,33,35,37, 39 = 23*	*5,7,12,16, 17,19,22, 24,25,28, 30,31,33, 35,36,38, 39,40 = 8*	*1,3,4,5,6,10,11,12 ,16,17,18,19,20,2 3,24,25,27,28,30, 31,32,33,35,36,37 ,39,40 = 27*	*3,4,12,13,16,17, 18,19,20,22,24, 25,28,30,31,33, 35,36,37,40 = 20*	*4,10,11,12, 13,16, 17,19,20,2 5,31,34,35, 36,38 = 15*
2	*Microsporum Spp.*	*3,4,15,21,23, 26 = 06*	*1,3,4,6,8,9,10,11,1 3,15,18,21,23,26,2 7,32,34 = 17*	*9,13,14, 15,21,22,26,38 = 08*	*1,6,9,10,11,14,1 5,21,23,26,27,3 2,34 = 13*	*1,5,9,14,15 ,21,23,27,3 2 = 09*
3	*Scopulariopsis Spp.*	*11 = One*	-	*7 = 01*	*5, 7 = 02*	-
4	*Aspergillus Spp.*	*34 = 01*	-	-	-	-

Table – 2

Sites Positive for the Colonization of Isolated Keratinophilic Fungi

No. of Sites	*Chrysosporium Spp.*	*Microsporum Spp.*	*Scopulariopsis Spp.*	*Aspergillus Spp.*
1	+	+	-	-
2	-	-	-	-
3	+	+	-	-
4	+	+	-	-
5	+	+	+	-
6	+	+	-	-
7	+	+	+	-
8	-	-	-	-
9	+	+	-	-
10	+	+	-	-
11	+	+	+	-
12	+	-	-	-
13	+	+	-	-
14	-	+	-	-
15	-	+	-	-
16	-	-	-	-
17	+	-	-	-
18	+	+	-	-
19	+	-	-	-
20	+	-	-	-
21	-	+	-	-
22	+	+	-	-
23	+	+	-	-
24	+	-	-	-
25	+	-	-	-
26	+	-	-	-
27	+	+	-	-
28	+	-	-	-
29	+	-	-	-
30	+	-	-	-
31	+	-	-	-
32	+	+	-	-
33	+	-	-	-
34	+	+	-	+
35	+	-	-	-
36	+	-	-	-
37	+	-	-	-
38	+	+	-	-
39	+	-	-	-
40	+	-	-	-
Total :-	**+ 34 Positive - 06 Negative**	**+ 21 Positive - 19 Negative**	**+ 03 Positive - 37 Negative**	**+ 01 Positive - 39 Negative**

+ Sign Indicates the presence of Keratinophilic Fungi.
- Sign Indicates the absence of Keratinophilic Fungi.

Table – 3

Showing Frequency of Occurrence of Isolated Genera

S. No.	Isolated Genera	Frequency of Occurrence
1	*Chrysosporium*	85%
2	*Microsporum*	52.5%
3	*Scopulariopsis*	7.5%
4	*Aspergillus*	2.5%

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