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Distribution of Keratinophilic Fungi in the Soil Surrounding the Slaughter Houses of Betul City, MP India

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Abstract – A total of six soil samples were examined for the isolation of keratinophilic fungi. All soil sample were collected from around the slaughter houses located in different areas of Betul City. A total of 28 isolates including 4 species belonging to 03 genera were reported using hair-bait technique. The fungi so isolated belongs to two species from genus Chrysosporium, and one species from each of the genera Trichophyton and Scopulariopsis.

Key Words: Keratinophilic Fungi, Pathogenic Fungi, Slaughter House.

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INTRODUCTION

The soils represent the main reservoir of fungi. Soil that are rich in keratinous material are the most conductive for the growth of occurrence of keratinophilic fungi. The majority of the fungi producing disease in human beings and animals exist freely in nature as soil saprophytes. (Kumari et.al. 2005) The presence of keratinophilic fungi and their distribution patterns in environment depends, in part, on human and animal presence in the environment itself. Such a relationship is therefore important in determining the epidemiology of diseases caused by these fungi. In recent past many investigations have been carried out to find the distribution pattern of the keratinophilic fungi in, many parts of India (Jain & Sharma, 2011, Singh et.al. 2009, Sharma et.al. 2008, Anbu et.al. 2004, Deshmukh 2002, 2004, Ghosh and Bhatt 2000, Sarkar Ashis et.al. 2014). The study was undertaken to explore the occurrence of keratinophilic mycoflora from soils of garbage areas around / near the slaughter houses located in different areas of Betul city.

MATERIAL AND METHODS:

Soil samples was collected from superficial layer at the depth of 3-6 cm. from six garbage sites around / near the slaughter houses located in different areas of Betul city. The soil samples were placed in sterile polythene bags, brought to the laboratory and stored in refrigerator at 4^{o}C until processed. Approximately 20 to 25 gms of soil from each samples were placed in sterile petri-plates in five replicates. Short (1-2 cm length) pieces of sterilized hair, nails, horn hoof and feathers were scattered on the surface of soil for baiting in each soil sample. The petri-plates were moistened with sterilized distilled water and incubated at room temperature (26 + 2^{o} C) for a period of 4-6 weeks. The plates were examined daily, if cottony growth was observed then baits were selected at random from each petri-plate and transferred aseptically to plates containing Sabourauds Dextrose Agar (SDA) medium supplemented with cycloheximide (0.5 mg/ml) and chloromphenical (0.05 mg/ml). The SDA plates were incubated at room temperature (26 + 2^{o} C) for further examination. Fungal colonies were examined under the microscope and identified by preparing the slide in cotton blue on the basis of morphological characteristics.

RESULTS :

A total of 28 keratinophilic fungi represented by 3 genera, were isolated from the six soil samples collected from different slaughter houses located in different areas of Betul city (Table-1).

Table-1 also showed the bait specificity for isolated keratinophilic fungi. *Chrysosporium* sps. were reported from all the baits (Nail, Hair, Horn, Feather, Hoof) used in present investigation, while *Scopulariopsis* spp. were reported on hair and feather. *Trichophyton* sp. were growth on hair only.

Table-2 showed that out of 28 colonies isolated, 22 were *Chrysosporium* sps (78.57%) followed by *Scopulariopsis* Spp. (17.85%) and *Trichophyton* sp. (3.57%).

Table-3 revealed that all the sites examined for keratinophilic fungi were positive for

Chrysosporium indicum (100%) followed by *Scopulariopsis* brevicaulis (66.6%) and *Trichophyton* sps. (16.6%).

Table – 1

Showing Colonisation of Keratinophilic fungi in soil samples on different baits

S. No.	Sites of collected Soil Samples	Fungi Isolated from Different Baits				
		Nail	Hair	Horn	Feather	Hoof
1	Murgi Chouk Kothibazar, Betul-1	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Scopulario psis brevi caulis*	-
2	Murgi Chouk Kothibazar, Betul-2	*Chryso-sporium indicum*	*Scopulariopsis brevicaulis*	*Chryso-sporium indicum*	*Scopulario psis brevicaulis*	*Chryso-sporium indicum*
3	Murgi Chouk Kothibazar, Betul-3	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*
4	Sadar over Bridge, Betul	*Chryso-sporium indicum*	*Chryso-sporium Sps.*	*Chryso-sporium indicum*	*Scopulario psis brevicaulis*	*Chryso-sporium indicum*
5	Abkari Bhaggudhana, Betul-1	*Chryso-sporium indicum*	*Trichophyton Sps.*	*Chryso-sporium indicum*	*Scopulario psis brevicaulis*	-
6	Abkari Bhaggudhana, Betul-2	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*	*Chryso-sporium indicum*

Table – 2

S. No.	Isolated Species	Sampling Sites						Total No. of Colonies	Frequency of isolated species	Frequency of isolated genera
		SH 1	SH 2	SH 3	SH 4	SH 5	SH 6			
1	*Chrysosporium indicum*	3	3	5	3	2	5	21	75%	78.57%
2	*Chrysosporium Sps.*	-	-	-	1	-	-	1	3.57%	
3	*Scopulariopsis brevicaulis*	1	2	0	1	1	0	05	17.85%	17.85%
4	*Trichophyton Sps.*	0	0	1	0	0	0	01	3.57%	3.57%

Table – 3

Soil - Samples Positive for Keratinophylic Fungi

S. No.	Name of Isolated Fungi	Mugri Chouk 1	Mugri Chouk 2	Mugri Chouk 3	Sadar over Bridge, Betul	Abkari Bhaggu-dhana Betul-1	Abkari Bhaggu-dhana Betul-1	No. of sample positive	Fre-quency
1	*Chrysosporium indicum*	+	+	+	+	+	+	6	100%
2	*Scopulariopsis Spp.*	+	+	-	+	+	-	4	66.6%
3	*Trichophyton Sps.*	-	-	-	-	+	-	1	16.6%

DISCUSSION:

Keratinophilic fungi are an ecologically important group of fungi that play a significant role in the natural degradation of keratinized residues (Shrama & Rajak 2003; Fillipello, 2000). Although, the distribution of keratinophilic fungi and related dermatophytes in Indian soils were reported by many workers. These studies clearly indicates the variable distribution pattern of keratinophilic fungi in soils. However, there was no evidence of any study on mycoflora from slaughter houses surrounding areas. Therefore the present investigation was carried out for the first time to explore the soils of surrounding areas from near the slaughter houses for the presence of keratinophilic fungi, as these areas are enriched with keratinous material.

It is obvious from our results that soils near around the slaughter house are ideal environment for the growth of keratinophilic fungi and dermatophytes. These fungi which are human pathogens could be considered as bioindicators of environmental pollution and can pose risk of human and animal mycoses. (Madisen et.al. 2007).

REFERENCES

1. Anbu P., Hilda A., Gopinath S.C.B. (2004) : Keratinophilic fungi of poultry farm and feather dumping soil in Tamil Nadu, India, Mycopatholigia 158 : pp. 303-309.

2. Deshmukh S. K. (2002): Incidence of keratinophilic fungi from selected soil of Kerala State (India), Mycopatholigia 158 : pp. 177-181.

3. Deshmukh S. K. (2004): Isolation of dermatophytes and other keratinophilic fungi from the vicinity of salt pan soils of Mumbai, India, Mycopathologia 157 : pp. 265-267.

4. Fillipello M.V. (2000) : Keratinophilic fungi : Their role in nature and degradation of keratinic substrates. In : Biology of dermatophytes and other keratinophilic fungi, Kushawaha RKS, Guarro J, editors. Revista Iberoamericana de Micologia. Spain, pp. 77-85.

5. Ghosh G.R. and Bhatt S. (2000) : Keratinophilic fungi from Chilka Lakeside soil Orissa (India). Ind. J. Microbiol. 40 : pp. 247-254.

6. Jain N., Sharma M. (2011) : Distribution of dermatophytes and other related fungi in Jaipur city, with particular reference to soil pH. Mycoses 54 : pp. 52-58.

7. Kumari G.R., Mahrora S., Rao P.S. (2005) : Prevalence of Non-Keratinophilic Fungi in the Soil. Indian Journal of Medical Microbiology, 23 : pp. 144-145.

8. Madisen A.M., Hansen V.M., Meyling N.V. and Eilenberg J. (2007) : Human exposure to airborne fungi from genera used as biocontrol agents in plant protection. Ann Agric Environ Med. 14: pp. 5-24.

9. Sarkar Ashis Kumar, Rai V. & Gupta A.K. (2014): Incidence of keratinophilic fungi in areas of Raipur city, Chhattisgarh region,

India. African Journal of Microbiology, pp. 264-269.

10. Sharma R., Rajak R.C. (2003): Keratinophilic fungi: Nature's keratin degrading machines! Their isolation, identification, and ecological role. Resonance, pp. 28-40.

11. Sharma R., Presber W., Rajak R.C., Grasar Y. (2008): Molecular detection of *Microsporum persicolor* in soil suggesting widespread dispersal in central India. Med. Mycol. 46: pp. 67-73.

12. Singh I., Kushwaha R.K.S., Parihar P. (2009): Keratinophilic fungi in soil of potted plants of indoor environments in Kanpur, India, and their proteolytic activity. Mycoscience 50: pp. 303-307.

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