

KERATINOLYTIC MYCOFLORA FROM THE SLUDGE IN KHAIRPUR, SINDH, PAKISTAN

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Abstract

Keratinolytic mycoflora from sludge were studied by Hair Bait Technique in Khairpur, Sindh, Pakistan. Fifteen species of fungi viz., *Aspergillus niger*, *A.fumigatus*, *A. flavus*, *A.candidus*, *A. wentii*, *Alternaria alternata*, *A. tenuis*, *Drechslera spicifera*, *Chochliobolus lunatus*, *Microsporum gypseum*, *M. canis*, *Penicillium* sp., *Chrysosporium asperatum*, *Chaetomium crispatum* and *Acremonium* sp., were isolated from the sludge. *A. niger* was found dominant as it was isolated from 19.78% whereas *C. crispatum* was lowest since it was recovered from 01.06% in occurrence.

Introduction

Keratinolytic mycoflora grow and reproduce on keratin materials such as skin, hair, nail fur, feather, horn, hoof, beak etc. They utilize keratin as carbon source (Cooke 1980). Keratin is highly insoluble protein having fibrous helical structure and numerous disulfide linkages which make it resistant to many proteases but is easily degraded or hydrolyzed by the keratinase enzymes (Grant & Long, 1981). Keratinases also confer the virulence to certain fungi like Dermatophytes such as *Trichophyton* sp., *Epidermophyton* sp., and *Microsporum* sp., to cause dermatophytosis or Tinea generally known as ringworm in human and animals (Roberts & Mackenzie, 1985 Barryl *et al.*, 2003 Azam *et al.*, 2003) Keeping in view their significance for pathogenicity and production of keratinases, the present work was carried out to investigate the occurrence of these mycoflora in the sludge in Khairpur.

Materials and Methods

One Hundred forty five sludge samples were collected from Khairpur Hair Bait Technique (HBT) was used for the isolation of keratinolytic mycoflora (Pandey *et al* 1990, Soomro & Zardari, 1996, 2002). The sludge samples were placed in sterilized Petri dishes and baited by placing short filaments of autoclaved horse hair upon the surface of the samples. The plates were incubated at 29°C. After 3 weeks the plates were examined for the development of mycelium on the hair filaments. Hair over grown with mycelium were mounted in 2-3 drops of 15% potassium hydroxide (KOH) solution on a clean slide and observed under microscope (Soomro & Zardari 1996) for arthrospores and hyphae. The invaded hair were inoculated on Sabouraud's Dextrose Agar (SDA) supplemented with chloramphenicol 0.05 mg/liter for obtaining the cultural growth. Cultures were maintained on Potato dextrose agar (PDA) at 5°C. Wet mount of cultures in lactophenol cotton blue was prepared for microscopic characteristic as reported by Rippon (1988). The identification of the isolates was made after reference to Domesch *et al.*, (1980) & Dexter (1983).

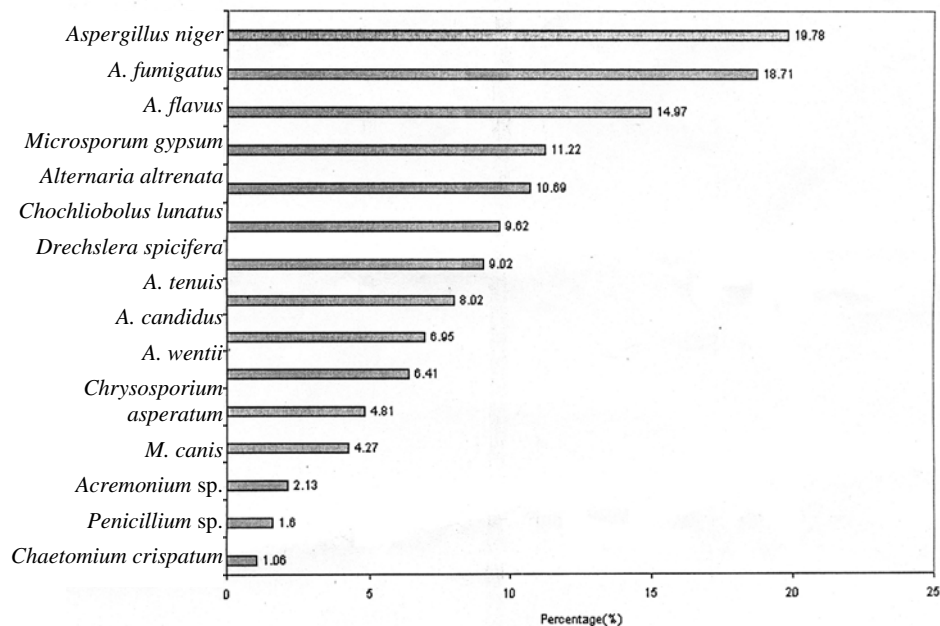


Fig. 1. Karatinolytic mycoflora from sludge.

Results and Discussion

During this investigation fifteen species of fungi *Aspergillus niger* 19.78% *A. flavus* 14.97% *A. candidus* 6.95%, *A. wentii* 6.04%, *A. fumigatus* 18.71% *Alternaria alternata* 10.69% *A. tenuis* 8.02% *Drechslera spicifera* 9.02%, *Chochliobolus lunatus* 9.62% *Microsporium gypseum* 11.22% *Microsporium canis* 4.27%, *Penicillium sp.*, 01.6%, *Chrysosporium asperatum* 4.81%, *Chaetomium crispatum* 1.06% and *Acremonium sp.*, 2.13% were isolated (Fig. 1).

These keratinolytic fungi have been recorded from different parts of the globe (Ulfig, 1985; Fernandez, 1987; Mercantini, 1989; Abdel *et al.*, 1989; Srivastava 1991; Soomro & Zardari, 1996, 2002)

It is general practice of the personnel of Municipal Committee that they always keep the sludge on sides of the road. When it becomes dry the heavy transport plying on road spread the dried sludge into air and then these mycoflora become air borne and cause the skin, respiratory tract diseases and allergies. It is, therefore, suggested that such material should be carried to areas far from the city. By doing this the people living in the city will get rid of these biopollutants and environment would be healthy.

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