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# STUDIES ON SOME PATHOGENIC FUNGI IN SOIL AND THERE PUBLIC HEALTH SIGNIFICANCE

(With one Table)

By

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# بعض الدراسات عن الفطريات في التربة وعلاقتها بالصحة العامة

عادل الياس

تم تحديد نسبة الفطريات الممرضة فى محافظتى أسيوط وسوهاج . وكانت الفطريات المعزولة فى ٣٠ عينة تربة كالآتي: أسبرجيلس فيموجاتس ٩ر١٠٪، أسبرجلس ينجر ٩ر٧٪، أسبرجيلس فلافس ٧ر-٪، أسبرجيلس استس ٥ر١٪بنسليوم نوتاتم ٩ر٧٪، بنسليوم فينكيلوسم ٧ر٤٪، ميوكر ميوكورليس ٢ر٦٪، ميوكر فراجيلس ٧ر٤٪ ريزوبس اوريزاى ٧ر٤٪، ريزوبس ستولونيفر ٥ر١٪، جواتريكم كانديديم ٢ر٦٪، ترايكوفيتوم تريستر ٣ر٢٠٪، ميكروسبورم جيبسم ١ر١٤٪. تمت مناقشة خطورة هذه الميكروبات على الصحة العامة.

# PATHOGENIC FUNGI, SOIL & HEALTH SIGNIFICANCE


## SUMMARY

The incidene of pathogenic fungi was investigated in Assiut and Suhag Governoreates. *Asp.fumigatus* (10.9%), *Asp.niger* (7.9%), *Asp.nodulans* (4.7%), *Asp.flavus* (4.7%), *Asp.ustus* (1.5%), *Pen.notatum* (7.9%), *Pen.funiculosium* (4.7%), *Mucor mucoralis* (6.2%), *Mucor fragilis* (4.7%), *Rhizopus stolonifer* (1.5%), *Rhizopus oryzae* (4.6%), *Geotrichum candidum* (6.2), *Trichophyton terrestre* (20.3%) and *Microsporum gypseum* (14.1%) were the Isolates in 30 soil samples examined. The public health hazards of these isolates were discussed.


## INTRODUCTION

Soil plays an important role in the epidemiology of animals and human diseases. The transmission of pathogenic fungi to the animals may occurs either by eating contamiated food soiled with fungi or its toxins, or through wounds when soiled by filth. Wind may transfere infection directy or indirecty to animals and man through inhalation dust. Transmission of infection may also occurs by means of contaminated shoes of persons who have walked over infected soil, as well as through hooves and claws of animals reared on infected soils.

Several studies were done on isolation of pathogenic fungi from soil in different localities by different workers as *(Ahmed 1975; Hafez, 1976; Shreeve et al., 1979; Amin, 1980; Mowafi et al., 1980; Saxina & Barau, 1982; Miessner & Gadripu, 1983; Samaha, 1983 and Ezzat et al., 1986).*

The aim of the present work is to investigate and isolate some pathogenic fungi of medical importance from the soil of animal caring centres in Assiut and Sohag Governorate (as careing treating and operation, may done which aid in control program of animal diseases).

## MATERIAL AND METHODS

The soil samples were collected during the period from October 1991 to August 1992 from 30 animals' careing centre at Assiut and Suhag Governorates. Samples were collected (each about 50 grms) by scraping a superficial layer of the soil with a sterile spatula and transfering it to a sterile covered

container. Samples were sent to laboratory with a minimun of delay and then subjected to mycological examination.

**Mycological examination:**

After thorough mixing of sample, one gram was weighted, and triturated well in a sterile morter with 99 ml sterile saline solution. The suspention was strained through sterile gauze into sterile flask and subjeted to culturing.

1- One ml from the original filterate (1:100) was transferred into sterile petri dish, after which 10 ml of Sabouraud's dextrose agar which was previously melted and cooled to 45°C, was added and carefully mixed in a horizontal position. The plates were incubated after solidification at 25°C for 4-6 days and observed daily for the growth of any suspected colonies.

The identification of mould and yeast isolated was carried out according to *Samson (1979) and Gnions* et al. *(1981).*

2- The hair baiting-Technique for isolation of dermatophytes was carried out according to *Vanbreuseghen (1952).*

The soil samples were put in sterile petri dishes and moistened with sterile distilled water. Sterile horse hairs were scatered on the surface of each sample. The inoculated plates were incubated for about one month at room temperature (26°C ± 2). When the substrates eventually became covered with growth of fungus, the later was subcultured on dextrose agar media containing 40 Iu penicllin, 20 mg Streptomycin and 0.5 gm actidione per liter. The inoculated plates were incubated at room temperature for two weeks after which the colonies were examined culturally and microscopically using Aman's lactophenol cotton Blue Technique according to *Emmons* et al. *(1963).*

## RESULTS

Results are presented in Table 1.

## DISCUSSION

From the results given in the table 1, it appears that *Asp. species* form the predominant source of fungal infection. It revealed that *Asp. fumigatus, Asp.niger, Asp. modulas, , Asp.flavus and Asp.ustus* were isolated at an incidence of 29.7%, 10.9%, 7.9%, 4.7%, 4.7% and 1.5% respectively.

Penicillium species (12.6%) of the samples which including *Pen.notatum (7.9%) and Pen.funiculosium (4.7%)* were recovered

from the examined samples. The animal health significance of pencellin was discussed by many authers.

Recently, the production of staggrs syndrome in calves and lambs following oral doses of homogenized mycellium of *Pen. cyclopium*, prevuiously recieved from soil has been reported *(Dianenna et al., 1970)*. The disease may result when the animals normally ingest a quantity of any spores or toxins present in the soil during grazing *(Healy, 1968)*. Therefore the production of tremorgenic metabolites *(Ciegler et al., 1976)*and aflatoxosis were reported among animals eating carntaminating food *(Frey et al., 1979)*. In addition aspergillus and Penicillium species have been incriminated as causative agents in many human mycotic infection especially broncho-pulmonary infection *(Jondary et al., 1971; Criucksh et al., 1975)*. Mucor, Rhizopus and Geotrichium species were isoalted at an incidence of 10.9%, 6.2% and 6.2% respectively. Mucor species has been isolated from respiratory infection of man and animals *(Cruichshank et al., 1975 and Rippon, 1974)*.

Trichophyton and microsporium species were recovered from 20.3% and 14.1% of the soil samples These organisms attack the skin causing ringworm infection in animal and man *(Jordan et al., 1971 and Criucksh et al ., 1975)*.

So, it can be concluded that the soil of animals careing center may harbour some pathogenic organisms coming from carrier and diseased animals as well as working persons. The floor should therefore be made of concrete and kept dry and clean as much as possible. Frequent disinfection with an efficient disinfictant must be carried out.

## REFERENCES

*Ahmed, M.A. (1975):* Ecological investigation on dermatophytes and other pathogenic fungi in soil and its role in the epidemiology of fungus infection of man and animals. Thesis, Fac. Vet. Med., Assiut University.

*Amin, M. (1980):* Occurrence of fungi in the air and soil of animal enclosures under different conditions. Thesis, Fac. Vet. Med., Alex. University.

*Ciegler, A.; Vesonder, R.F. and Cole, R.J. (1976):* Mycotoxins and other fungi related food problems. P 163-177 ed. Rodricks, J.V. Advances in chemistry series No 149. American Chemical Society, Washington D.C.

*Cruickshank, R.; Duguid, J.P.; Marmion, B.P. and Swain, R.H.A. (1975):* Medical microbiology 12 th Ed.E. and S. Livingstone Limited, Edinburg and London.

*Dimenna, M.E.; Mantle, P.G. and Mortimer, P.H. (1970):* New Zealand Vet. J. 24, 45. Cited after *Shreeve et al. (1979).*

*Emmonos, S.W.; Binford, C.H. and Utz, J.P. (1963):* Medical mycology. Philadilphia.

*Ezzat, M.; El-Shaboury, F. and Saif, A. (1986):* Pathogenic species of yeasts from soil in North Delta of Egypt. Alex. J. Vet. Sci. 2(2): 205-213.

*Freg, D.; Bldfied, R.J. and Bridger, R.C. (1979):* A couler atlas of pathogenic fungi. Walfe medical publication LTD.

*Hafez, A.H. (1976):* Studies on the sanitary conditions of some animal enclosures in Assiut. Thesis, Fac. Vet.Med., Assiut University.

*Healy, W.B. (1968):* New Zealand J. of Agriculturel research 11-487. Cited after *Shreeve et al. (1979).*

*Meissner, A. and Gadripur, S.A. (1983):* Occurrence of Keratinophellic fungi in soil from Gottingen. J. Mykosen. 26(2): 61-64.

*Mowafi, L.E.; Marzouk, N.A.; Zakaria, A.H. and El-Olemy, G. (1980):* Soil as a reservoiv of some pathogenic agent in Sharkia Province. J. Egyptian Vet. Mid. Assoc. 40(2): 69-75.

*Gmions, A.H.S.; Allsopp, D. and Egyins, H.O>W. (1981):* Smith's introduction to industrial Mycology 7th *Ed. Edward Arnold.*

*Rippon, J. (1974):* THe pathogenic fungi and the pathogenic actinomycets. Ist *Ed. Saunoler, Ermpon. Philadelphia, U.S.A.*

*Samaha, H. (1983):* Studies on the sanitery condition of some animals enclosures in Behera and Alexandria Governorate. Thesis. M.V.Sc., Fac. Vet. Med., Alex. Univ.

*Samson, R.A. (1979):* A complation of the Aspergilles described since 1965. Studies on mycology No. 18: 1-58.

*Saxena, R.P. and Barvau, P. (1982):* Keratinophilic fungi in soil. J. of Indian Botanical Society 61(1): 80-84.

*Shreeve, B.J.; Patterson, D.S.P.; Roberts, B.A. and Macdonald, S.M. (1979):* The occurrence of soil borne Tremogenic fungi in England and Wales. Vet. Rec. J. 104: P. 509.

*Vanbereusegham, R. (1952):* Biological Technique for isolation of dermatophytes from soil. Ann. Soc. Belge. Med. Trop. 32: 173-178.

Table 1: Number and percentage of fungi isolated from 30 soil samples.

| Isolates | No. | % |
|---|---|---|
| Asp. fumigatus | 7 | 10.9% |
| Asp. niger | 5 | 7.9% |
| Asp. nidulans | 3 | 4.7% |
| Asp. flavus | 3 | 4.7% |
| Asp. ustus | 1 | 4.7% |
| Pen. notatum | 5 | 7.9% |
| Pen. funiculosium | 3 | 4.7% |
| Mucor mucoralis | 4 | 6.2% |
| Mucor fragilis | 3 | 4.7% |
| Rhizopus oryzae | 3 | 4.7% |
| Rhizopus stolonifer | 1 | 1.5% |
| Geotrichum candidum | 4 | 6.2% |
| Trichophyton terrestre | 13 | 20.3% |
| Microsporum gypseum | 9 | 14.1% |