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MOLDS IN LITTER, AIR AND IN-CONTACT WORKERS

IN POULTRY HOUSES.

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INTRODUCTION

Some mycotic diseases are quite common among birds. The possibility of the transmission of these diseases from birds to man can not be neglected. From these diseases, aspergillosis proved to be the most serious. Aspergillosis occurs in crowded poultry houses and sometimes causes severe losses in the flock of young chickens. This mostly occurs after exposure of the birds to spores of the fungus from heavily contaminated litter, hau or other moldy feedstuffs [Ross 1966 Ainsworth and Austwick 1973 and Hubbert et al. 1975].

Aspergilli are abundant in the environment and can grow under a wide range of conditions in litter as saprophytes and produce large numbers of spores which are distributed throughout the environment [Aleksandrov et al. 1974].

Man is also susceptible to pulmonary aspergillosis which is an occupational disease of agriculture workers and others who are often exposed to high concentrations of spores [Buxton and Fraser, 1977].

The purpose of this study was to detect fungus contamination in litter, air and among workers in poultry houses.

Material and Methods

- Poultry Houses : The study was conducted at Zagazig Sharkia Governorate. Five broiler poultry houses, of a deep litter system, were investigated periodically for collecting specimens from litter and air.

- Man - Fifteen persons in-contact with birds in poultry houses were examined.

1. Collection of specimens:

1. Litter : Under complete aseptic conditions samples of litter from different poultry houses were collected. A handful samples of the litter were collected randomly, in sterile polyethylene bags, from different places. The procedure recommended by Williams et al. [1975] was adopted.

2. Air:- This was carried out by the use of settling plate technique. Five sterile Petri-dishes of 10 cm diameter containing Sabouraud's dextrose agar were placed open for 30-60 seconds in different places in each poultry house that was previously subjected to litter sampling. These plates were placed at a height corresponding to the poultry level. The plates were then covered and labelled.

3. Man: 15- workers attending the same poultry houses were examined and subjected to nose, ears, and hands swabbing. Under aseptic conditions, 2 sterile cotton swabs were taken from inside the nares and external

Zagazig Veterinary Journal.

ears, they being thus moistened with their secretions. Two sterile cotton swabs were also streaked against the skin of worker's hands. All swabs were placed into sterile tubes containing Sabouraud's dextrose broth.

Collected samples were transferred to the laboratory within 2 hours.

II. Mycological investigations :

I. Litter: One gm. of thoroughly mixed litter sample was suspended in 9 cc. sterile saline solution. One ml. from the sample was transferred into 2 sterile Petri-dishes. Ten ml. of melted Sabouraud's dextrose agar (at 40 C) were aseptically poured into each dish and thoroughly mixed with the sample. After solidification, the plates were labelled, and incubated at 25 C for 3 - 5 days and were not discarded before 2 weeks.

2. Air Sabouraud's settling plates were incubated for 3-5 days at 25 C and they were not discarded before 2 weeks.

3. Man: Swabs from man were pressed against the sides of the tubes to expel the excess of broth into the Sabouraud's dextrose broth. The tubes were then centrifuged for 20 minutes at 3000 r.p.m. The supernatant fluid was discarded. Loopfulls from the sediment were inoculated into 4 plates containing Sabouraud's agar. Plates were incubated at 25 C for 3-5 days and were not discarded before 2 weeks.

L.E. MOWAFY et al.

BIII. Identification of various isolated Fungi:

Fungal growth was identified according to Emmons et

al., (1977) and Treagan and Pulliam (1982).

Results are shown in Tables (1 & 2).

Table (1) Molds isolated from 50 samples of each litter and air in poultry houses.

Mold spp.	Litter		Air	
	No. of isolates	%	No. of isolates	%
A.fumigatus	8	16	10	20
A.flavus	10	20	6	12
A.niger	--	--	3	6
Penicillium	2	4	4	8
Alternaria	--	--	6	12
Mucor	2	4	4	8
Cephalosporium	--	--	1	2
Scopulariopsis	1	2	1	2

Zagazig Veterinary Journal

Table [2] Molds isolated from nose, ears and hands of 15 workers in poultry houses.

Mold spp.	Nose		Ears		Hands	
	No. of isolates	%	No. of isolates	%	No. of isolates	%
A.fumigatus	5	33.3	3	20.0	3	20.0
A.flavus	7	46.7	4	26.7	6	40.0
A.niger	3	20.0	3	20.0	2	13.3
Penicillium	-	--	3	20.0	2	13.3
Alternaria	-	--	5	33.3	-	--
Mucor	-	--	-	--	2	13.3
Cephalosporium	-	--	-	--	3	20.0
Hormodendrium	-	--	2	13.3	-	--
Stemphyllium	3	20.0	4	26.7	-	--

Discussion

Air and litter play an important role in transmitting some mycotic diseases between man and birds [Emmons et al. 1977].

Tables [1 & 2] show that Aspergillus fumigatus was isolated from litter and air of poultry houses with percentage of 16 and 20, respectively, whereas the percentage of A. flavus was 20 in

litter and 12 in air. Moreover, in man *A. fumigatus* was recovered from nose, ears and hands of in-contact workers with percentage of 33.3, 20.0 and 20.0, respectively, while the percentages of *A. flavus* were 46.7 in nose, 26.7 in ears and 40.0 on hands.

From these results, it is evident that *A. fumigatus* and *A. flavus* are isolated from litter, air and man. A fact which may throw light on the occurrence of these species in the litter and man, and the possibility of the transmission of their spores from litter to man through air. Buxton and Fraser [1977] and Emmons et al. [1977] mentioned that *Aspergillus* species grows frequently and abundantly as saprobes on decaying straw, and under certain circumstances man and chickens are exposed to the disease by inhaling a great number of the *Aspergillus* spores, especially *Aspergillus fumigatus*.

Otherwise, *A. fumigatus* and *A. flavus* were reported to invade and colonize nasal sinuses in man [Emmons et al. 1977]. Buxton and Fraser [1977] stated that *Aspergillus* spp. may be associated with lesions in the skin, external ear, nasal sinuses, and occasionally in the bones and meninges, but the ear and nails are relatively the commonest sites of infection.

Concerning, *A. niger* it was isolated from air, nose, ears and hands of in-contact workers with percentage of 6, 20, 20 and 13.3 respectively.

A. niger was reported to be an important etiologic agent of otomycosis [Emmons et al. 1977]. Koneman et al. [1979] indicated that *A. niger* may be associated with fungus ball infections of the nasal sinuses or lung, and the agent mostly commonly recovered from cases of otitis externa "Swimmers ear".

Table [1] also shows that, besides *Aspergillus* spp., there are many other molds recovered from litter. There were *Penicillium*, *Mucor* and, *Scopulariopsis* with percentage of 4, 4 and 2, respectively. *Penicillium*, *Alternaria*, *Mucor*, *Cephalosporium* and *Scopulariopsis* were also isolated from air with percentage of 8, 12, 8, 2 and 2 respectively. *Penicillium* sp., *Mucor* sp., *Aspergillus fumigatus*, *A. niger*, and *A. flavus* were isolated from air by Dye and Vernon [1952], Gupta et al. [1960], Aleksandrov and Peev [1974] and Metwally & Aidaros [1979]. These molds are blamed for the cause of many diseases in man.

Regarding in-contact workers, (Table 2) Clarifies the isolation of molds, other than *asperillus* spp., from nose, *stemphyllium* was isolated with percentage of 20.0, *pemicillium*, *alternaria*, *hormodendrium* and *stemphyllium* were isolated from the ear with percentage of 20.0, 33.3, 13.3 and 26.7, respectively. Molds isolated from hands were *Penicillium*, *Mucor*, and *Cephalosporium* with percentage of 13.33, 13.3. and 20.0 respectively. Also, it is noted that most persons out of 15, were multicarriers of *A. fumigatus*, *A. flavus* and *stemphyllium* in nose, *Alternaria*, *stemphyllium*, and *A. flavus* in ears and *A. flavus*, *cephalosporium* and *A. fumigatus* on hands.

Accordingly, contaminated litter [moldy straw] and air, other than infected person or birds, may a role in transmitting mycotic diseases to man and birds in poultry houses. A fact which throws light on the importance of environmental sanitation in poultry houses, Particulary avoiding damp litter, cleaning food troughs and efficient ventilation.

Summary

Litter, air, and in-contact workers of five poultry houses were examined mycologically.

The isolated fungus species from 50 air samples were *A.fumigatus*, *A.flavus*, *A.niger*, *Penicillium*, *Alternaria*, *Mucor*, *Cephalosporium* and *Scopulariopsis*.

The fungus-species isolated from 50 litter samples were *A.fumigatus*, *A. flavus*, *Penicillium* and *Scopulariopsis*.

15 in-contact workers were found to be nose, ear and hand carriers of nine strains of which seven were previously isolated from air and litter of the poultry houses.

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L.E. MOWAFY et al.

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ملخص البحث

العفن في الفرشة والهواء والعمال المخالطين

داخل مساكن الدواجن

مـــــــــــــــــمـــــــــــــــــم

بدراسة خمسون عينة من الفرشة في خمس مزارع لانتاج دجاج التسمين تم عزل الانواع الاتيه من العفن : اسبرجيلوس فيوميكتيس ، اسبرجيلوس فلافس ، بنسليوم ، ميوكسر ، سكا بيولاريوبسيس . كما تم عزل الانواع الاتيه من العفن : اسبرجيلوس فيوميكتيس ، اسبرجيلوس فلافس اسبرجيلوس نيجر ، بنسليوم ، الترناريا ، ميوكسر ، سيفالوسبوريس سكا بيولاريوبسيس . من خمسون عينة من الهواء داخل هذه المساكن الدواجن .

فحص خمسة عشر من العاملين في هذه المساكن بأخذ عينات من الانف ، والاذن والايدي بأمكن عزل نفس السفن المعزولة سابقا من الفرشة والهواء ولاسيما فطر اسبرجيلوس فيوميكتيس ، اسبرجيلوس فلافس ، اسبرجيلوس نيجر ، بنسليوم .