

مرض الاسبرجيللوسز بالعراق مع اشارة خاصة الى  
التأثير الباثولوجي لفطر الماي سنوما في الدجاج  
الرومي

ع.ج. الزبيدي ، ا. ابوالعزم ، ا. س. عبد الله ، س. ع. ظافر

لقد شخص المرض في تسعة حالات من اربعمائة من افراخ الرومي والدجاج والحمائم  
بأختبارهم بكتريولوجيا واثولوجيا ولقد دونت ونوقشت النتائج وكذلك الصفات النسيجية كما  
تم عزل فطر الاسبرجيلاس فيموميحيتس من ٢٠٠ عينة من العلائق المقدمة لهذه الطيور .



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AVIAN ASPERGILLOSIS IN IRAQ WITH SPECIAL REFERENCE TO  
THE PATHOLOGY OF THE FUNGAL MYCETOMA IN TURKES.

(With One Table and 4 Figures)

By

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(Received at 1/1/1977)

SUMMARY

Nine case diagnosed as aspergillosis in turkey poults, chickens and pigeons were examined both bacteriologically and pathologically. The mycological findings and histological features are described and discussed.

*Aspergillus fumigatus* have been isolated from the ration.

INTRODUCTION

Fungi of the Genus *Aspergillus* are ubiquitous and exposure to spores through inhalation and/ or ingestion is an every day matter. Spores of fungi are common in the environment especially in mouldy chopped straw (tiben) which is commonly used as litter for chickens and turkeys in commercial flocks where birds are kept in close confinement.

*Aspergillus* have been reported from all domestic animals and birds in different parts of the world (AINSWORTH and AUSTWICK, 1959).

*Aspergillus* in birds may take several forms: A diffuse pneumonic form, a nodular pulmonary form, and a diffuse infection of the air sacs (SMITH, JONES and HUNT, 1972).

The disease is quite common in turkey poults in some

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turkey-raising areas, and was reported as back as 1904 in Flaminge ( MOHLER and BUCKLEY ). KNOO, SGAI and LEONG (1966) have reviewed the world literature.

As far as the authors know the infection has not been reported to occur in avian species in Iraq.

The purpose of the present investigation is to put on record the occurrence of the disease for the first time in Iraq affecting commercially reared turkeys of a governmental farm at Abou-Graib area. Also to describe and report the pathological features of the disease as it occurred in chicks, pigeons and turkeys.

#### MATERIALS AND METHODS

1- Two out of 100 chickens and 5 out of 200 turkey poults from the governmental farm at Abu-Graib area as well as 2 out of 100 pigeons from the same area showed disseminated nodular lesions at necropsy, suggestive of tuberculous infection. Tissue samples were taken for bacteriological, mycological and histopathological studies.

2- Two hundred ration samples from 20 pens of infected farms, were collected in sterile plastic containers for bacteriological and mycological examinations.

#### Mycological Procedures:

Samples from suspected tissues were aseptically collected in sterile petri dishes. Small tissue fragments were flattened under the cover slips and examined with and without digestion in 10% sodium hydroxide.

Smears made from nodules and organs were stained with lactophenol-Methylene blue, Giemsa and Grams stain.

Cultures from both samples (nodules and organs) as well as from ration or litter were moistened with sterile distilled water and each was inoculated into Sabourauds dextrose



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agar (Difco), Kimmig media and incubated at 28°C as well as 37°C. Other inoculations were made on blood agar and MacConkeys media and were incubated at 37°C for bacteriological studies.

### Histological Procedures:

Tissue sections of the suspected organs and nodules were fixed in 10% Formol-saline and processed for routine method of Haematoxylin and Eosin (H&E) stain. They were also stained with periodic acid schiff (PAS) method.

## RESULTS

### a- Mycological Findings:

Direct smear examination of affected tissues showed branched septate, slender mouldy hyphae with radiate branching mycelium, while in ration the hyphae were compact with tangled filaments (granules).

Conidiospores and spores were seen in necrotic tissue stained by lactophenol-methyline blue and Giemsa stains. Fungll colonies grown on Sabourauds dextrose agar, Kimmig media after 4 days incubation at 37°C and 45°C were flat, velvety and dark bluish-green which changed to grey-green or smoky black in older cultures.

Microscopical studies revealed septate hyphae in Methylin blue and lactophenol methylin blue stained preparations. The conidiospores were relatively short, smooth walled and the vesicles were about 20-30 microns in diameter, bearing a single row of crowded parallel sterigmata upon their upper half. The conidia were globus or subglobus and 2-3 microns in diameter, as shown in (Table I).

No pathogenic microorganisms were isolated from the infected organs or moistened ration by means of blood agar or MacConkeys examination.



**b- Pathological Findings:**

Pulmonary lesions were predominant and appeared as many discrete nodules about 0.5 - 1 Cm. in diameter, greyish white in colour with a narrow rim of hyperaemia. Severe pulmonary congestions were also seen in very young poults.

Nodules were also scattered on the intestinal walls as well as on abdominal organs including liver, kidneys and air sacs (Fig. 1).

Microscopically, the nodular lesions consisted of a central core of caseation necrosis in which the organisms were found surrounded by thick layer of epithelioid cells, few lymphocytes and giant cells. Few heterophils can also be seen (Fig. 2).

The organisms in these granulomas appeared as short slender septate branching filaments 3 - 4 microns wide about 10 microns long (Fig. 3). The organisms did not stain with H&E but PAS stain had differentiated the mycelia by colouring the cell wall intensely (Fig. 4). Short mycelia appeared almost spherical, but pseudo-spores were also seen in tissue sections.

Table 1

Results of examination of tissue samples from diseased birds as well as the ration of infected farms.

Sample	Total Samples examined	Infected Samples		Culture Result	Microscopical Result
		No.	%		
Pigeon	100	2	2	++	+
Chickens	100	2	2	++	+
Turkeys	200	5	2.5	++	+
Ration	200	80	40	++	+

+ : Spores and hyphae present.

++ : Colonies as well as microscopical studies revealed *Aspergillus fumigatus*.



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### DISCUSSION

The present study shows that infection with mycotic organisms particularly *Aspergillus fumigatus* is most prevalent in birds, because the organisms are extremely common in nature or occurring on food stuffs, bedding, litter and plants.

According to JUBB and KENNEDY (1970), aspergillosis in animals is, in most instances, a primary respiratory infection initiated by inhaling the spores. The described disseminated systemic fatal disease among housed turkey poults would indicate that these poults became infected from contaminated bedding while they were in brooder stage of growth and may further be exacerbated by contaminated litter and ration.

The isolation of the fungus from the ration and the litter of these poults is an indication that infection may not take place through the respiratory system as JUBB and KENNEDY (1970) have contended.

As reported by AINSWORTH and ROWELL (1949) avian aspergillosis is characteristically a disease of captivity. This would explain the occurrence of the disease in ABU GRAIB farm where turkeys are kept in close, damp confinement and the litter which was used for chicken have also been used for turkeys.

Debilitating conditions and antibiotic therapy enthusiastically practised in the farm have predisposed the flock of turkey poults to aspergillosis. Moreover stress factor due to transportation may be a further burden since the flock was recently imported from Holland.

Our findings revealed that disseminated nodular lesions were that of mycotic granulomas consisting of caseation necrosis in which the organisms were surrounded by a wide zone



of epitheloid granulation tissue with scanty lymphocytes and giant cells of foreign body type. This may indicate that aspergillosis is a disease of depressed immunity. The organisms were found surrounded by the granulomatous response and they were poorly or stained with H&E, but were PAS positive, indicating that they contain glycogen. The stain further differentiated the mycelia as short spherical bodies, a further evidence of aspergillosis infection. The short spherical, rounded bodies which were intensely PAS positive have led us to think of them as spores, however SMITH, JONES and HUNT (1972) rekind that there is no true spores found in tissue in aspergillosis.

Representative sections stained with Carbol Fuchsin (Ziehl-Neelson) method were negative for any acid-fast microorganisms. This observation proved that the condition is not tuberculous although the disseminated nodular lesions were grossly suggestive of tuberculosis. The lesions may be confused with coli granuloma (Hjarre's disease) but Gram stained sections showed negative results. It is interrested to mention that no growth of Salmonella microorganisms on MacConkey media was noticed.

The isolation of *Aspergillus fumigatus* from turkeys in Baghdad agrees with that reported by KHOO et al. (1966) in SOUTH East Asia and whose findings are in complete agreement with our results.

From the available literature it is evident that there was no previous report on aspergillosis in chickens, particularly in turkeys, in this country. This may be attributed to the fact that rearing chickens and turkeys on a large scale in one of the recent events in Iraq.



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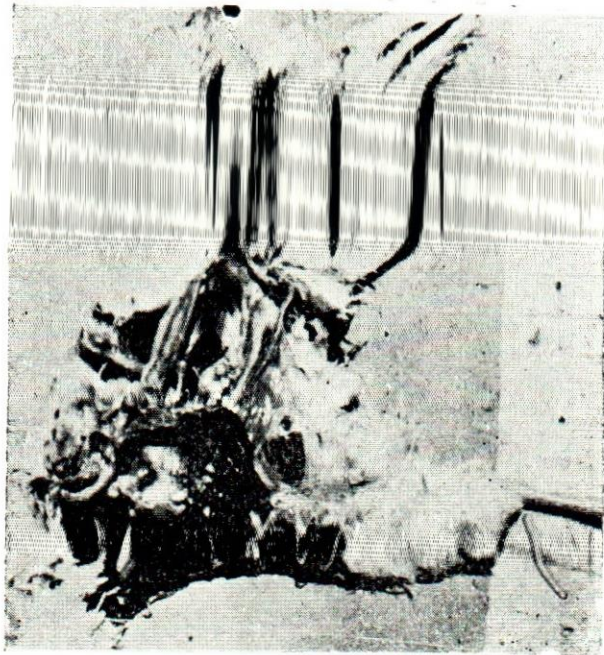


Fig. 1 shows nodules scattered on the intestinal wall as well as on abdominal organs of infected bird [ x 200 ]



Fig. 11 shows necrosis in nodular lesions, caseation necrosis in which the microorganisms were demonstrated which surrounded by thick layer of epithelioid cells, lymphocytes and giant cells [ x 200 ]

