معمل بحوث صحة الحيوان - قنها
معهد بحوث صحة الحيوان - الدقي
رئيس المعمل: د. أبو المجد محمود محمد

فطريات تجمعات الدواجن بمحافظة قنا

عبد الفتاح البدري، إبراهيم سكر

2038 عينة أخذت من أعضاء الجهاز الهضمي والتنفسي لعدد 150 فراخ ميتة
جمعتم من المزارع المختلفة بقنها وفحصت فطريا.
وفي الجانب الآخر عزلت 100 عطرة اسبرينج، 30 عطرة عفن أخرى بالإضافة إلى
4 عطرات خميرة من العلائق ومياه الشرب وقشر البيض والمفرخات وعناصر التربة من
تلك المزارع المختلفة بقنها.

اجريت الدراسة المرضية ببعض العنرات الفطرية المعزولة على كنثيكت فيومسي
عمر 3 يوم وقد سجلت الأعراض المرضية ونسبة النافع والأعراض التشريحي لكتيكت
الكنثيكت المعدية.

وقد درست تأثير بعض العناصر على بعض الفطريات المعزولة معملاً، وثبت
أن عصارتي نبات التم ودواء الشبونزول أكثر تأثيراً من دواء الميكوستاتين ومركبة
كبريتات النحاس.

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MYCOTIC FLORA OF CHICKEN POPULATION IN KENA GOVERNORATE
(Wit 4 Tables)

By
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(Received at 1/6/1387)

SUMMARY

A total of 1038 samples were taken from the digestive and respiratory organs of 352 dead chickens collected from different farms in Kena. They were examined for mycotic flora, 228 Aspergillus species (A. fumigatus, A. flavus, A. niger) as well as 306 other moulds belonging to Mucor, Rhizopus, Paecilomyces, Penicillium and Sporotrichum were recovered. In addition to a 23 yeast species (Rhodotorula and Saccharomyces) were isolated from the examined organs. On the other hand 40 Aspergillus species (A. fumigatus, A. flavus, A. niger and A. flavipes) and 33 other mould species (Mucor, Rhizopus, Sporotrichum and Paecilomyces), together with 6 yeast species belonging to Geotrichum and Rhodotorula were isolated from feed, drinking water, egg-shell, hatcheries and brooder rooms. Pathogenicity of some isolates were studied in 3 days-old Fayoumi chicks, clinical signs, mortality and P.M. lesions were recorded. The effect of drugs on some isolates was studied in vitro. Garlic and thiobenzole were more effective than mycostatin and copper sulphate.

INTRODUCTION

In the last few years, the poultry population in Kena Governorate has increased considerably. Mycotic diseases of poultry caused high economic losses particularly when associated with other infections. However, pathogenic fungi has been isolated by many workers from chickens and the surrounding environments. In Egypt (REFAI et al., 1966, 1968, 1971 and 1976 isolated several species of fungi from poultry farms). SAIF, 1976 reported great losses of turkeys due to A. flavus. SAIF et al., 1977 found that A. fumigatus was common in chicken farms. ABOU-GABAL et al., 1977 studied the incidence of pathogenic fungi in poultry. EL-BADRI, 1979 isolated a number of Aspergillus species from turkeys. EL-BATRANI, 1980 isolated Calbicans from the crop of chickens. EL-BADRI, 1983 isolated Calbicans and other mould species from chicken farms in Kena. IBRAHIM et al., 1983 were able to isolate Aspergillus species, Penicillium spp. and Calbicans from lungs, crops and intestinal samples from a broiler flock in Assiut.

The incidence of mycotic infection in the wide population of chicken farms in Kena called for further studies attempting to the:
1- Isolation and identification of the mycotic flora from chickens and their surrounding environment.
2- Study the pathogenicity of some isolated fungi to susceptible chicks.
3- Study the effect of some drugs on the growth of some isolated fungi in vitro.


MATERIAL and METHODS

Samples were taken from the esophagus, proventriculus, trachea and lungs, as well as dead in shell chicken embryos (135 adult and baby Fayoumi chicks, 60 Fayoumi dead embryo, 90 adult and baby L.S.L. chicks, 30 adult high-six, 25 adult Matrooh and 12 baby Dokki 4 chicks). In addition, 20 ration samples, 20 drinking water samples, 120 egg-shell samples, 20 samples of the atmosphere of brooder rooms and 20 samples of hatcheries atmosphere were all examined for fungi.

Media : Sabouraud's agar "tubes".
- Czapeks agar "plates".
- Corn-meal agar (BACKERSPIGEL, 1954).
- Sugar assimilation media (BISPIN, 1961).
- Raw - egg white (BUCKLEY and VAN UDEN, 1963).
- Normal saline containing 250 mg streptomycin and 250 mg chloramphenicol/Liter.

Drugs for sensitivity test :
- Copper sulphate (El- Nasr).
- Thiobenzole (M.S.D.).
- Mycostatine (Memphis).
- Garlic juice (Plant).

Birds for experimental infection :
50 Fayoumi chicks, 3 days-old were subjected to experimental infection.

Mycological isolation and identification was conducted by direct swabs from digestive and respiratory organs. Swabs were streaked on slope Sab. agar containing 250 mg. streptomycin and 250 mg. chloramphenicol/liter. Egg-shell and ration samples were suspended in normal saline to which streptomycin and chloramphenicol were added for 2 hours on 37°C, a loop-full was inoculated on slope Sab. agar. Plates of Czapeks agar were exposed in the atmosphere of brooder rooms and hatcheries for 2 hours. All the cultured media were incubated at 37°C for 7 days before recording the result. Fungal Growth was identified morphologically and physiologically.

Pathogenicity study :
Subcultures from Aspergillus, Aflavus, Ariger and Paecilomyces spp. were made on Czapeks agar plates and incubated at 37°C for 7 days. Spore suspensions were made by adding 10 ml. distilled water containing 0.1 ml glycerol as a wetting to the cultures. Fifty apparently healthy 3-day-old Fayoumi chicks were obtained from Saadi Abdel Rehem poultry farm. The chicks were divided into five groups each of 10 birds. They were treated as follows:
- Birds of group "I" were injected with 0.25 ml. Aspergillus spores/bird via heart.
- Birds of group "II" were inoculated by the same dose and route using Aflavus spores.
- Birds of group "III" were given the same dose and route using Ariger spores.
- Birds of group "IV" were injected with Paecilomyces spores by the same dose and route.
- Birds of group "V" were injected by the same dose and route using normal saline. All chicks were kept under observation for 3 weeks. Clinical signs, mortality, and P.M. lesions were recorded. Reisolation of the injected fungi were carried out from organs showing gross P.M. lesion.
Mycotic Flora of Chicken

The effect of some drugs on some isolated fungi:

Known concentration of drugs were dissolved in Sab. agar at 60°C. Garlic juice was mixed with the media in serial conc. (0.1, 0.2 and 0.4 ml/10 ml media) as well as the tested fungal spores were mixed in serial dilutions of garlic juice (0.1, 0.2 and 0.4 ml/10 ml dist water) for 2 hours before inoculation on Sab. agar media; the inoculated plates were incubated for 7 days at 37°C. The control plates of fungi without drugs were also incubated.

RESULTS

Results of the isolation and identification as well as the distribution of the different organisms are summarized and presented in tables I & II.

Pathogenicity test:

The daily mortalities as well as the total deaths appear in Table III.

It is worth stating that depression, diarrhoea and gasping started to occur after 2 days in birds inoculated with A. fumigatus. Those receiving A. flavus had closed eyes, ruffled faethers, paralyses of legs, twisting of head and neck followed by mortalities after 3 days and there after (see Table III). Group 4 infected with paecilomyces appeared sleepy and depressed after 2 days post infection followed by mortalities. Neither symptoms nor mortalities occurred in group III or V. Post mortem changes in dead or killed birds showed airsacculitis, pneumonia, necrotic foci in lungs and heart as well as distension of the gall bladder. Yellowish necrotic foci occurred in the liver and brain of birds inoculated with A. flavus.

In vitro trials to determine the sensitivity of some isolated fungi to some antifungal drugs are shown in Table IV.

DISCUSSION

Isolation of fungi from the upper digestive and respiratory tracts of dead birds without P.M. lesions indicates that some of fungal flora may be picked up from the surroundings and harboured by the fowls without causing any apparent ill-effects. In this investigation, Rhizopus (24%), Mucor (19%), Paecilomyces (0.07%), Penicillium (0.03%), Sporotrichum (0.009%) as well as Aniger (18%), A. fumigatus (13%) and A. flavus (10%) in addition to Rhodotorula (0.02%), Sacchromyces (0.018%) were isolated from the respiratory and digestive tracts of the dead birds without P.M. lesions. It was found that the different fungi isolated from dead birds were also isolated from feed, drinking water, hatcheries, egg-shell and brooder-rooms, thus it appeared that the surrounding play a role in being a source of infection and the problem of poultry mycosis is mainly hygienic. This idea is supported by REFAI and RIETH, 1966. Our isolates are similar to those isolated by JORDAN, 1954; CHUTE et al., 1956; RAJAN, 1965; SHARMA et al., 1971 JAND et al., 1973. In Egypt REFAI et al., 1974; SAIF et al., 1979 and IBRAHIM et al., 1983. On the other hand Sporotrichum, Rhodotorula and Sacchromyces spp. were not isolated by any of the above mentioned authors.

Mould species isolated from poultry feed, drinking water, hatcheries, egg-shell and brooder rooms were Aniger (24%), A. flavus (14%), A. flavipes (0.02), Mucor (22%), Rhizopus (0.08%), Sporotrichum (0.02%) and Paecilomyces (0.02%), in addition to Geotrichum spp. (0.01%) and Rhodotula spp. (0.03). The present results may agree with those described by CARLL et al., 1955; CHUTE et al., 1964; NIKOLEV, 1965; REFAI et al., 1968; REFAI, 1971; JAND et al., 1973 and SAIF, 1979. Sporotrichum and A. flavipes appeared to be isolated from the chicken environment in Egypt for the first time. in the pathogenicity studies, only Aniger
was found to be without clinical signs or mortalities during the observation period. P.M. lesions in all injected birds were similar, while in chicks infected with A.fumigatus, yellowish necrotic hard nodules appeared on the liver and yellowish necrotic foci occurred on the brain. The results of this experiment are similar to the results recorded by CHUTE and O'MEARA, 1958; MITROJU et al., 1962; RAJAN et al., 1963; MATUKA, 1968; SINGH and HALHOTRA, 1974; NAFADY 1978; EI-BATRAWI, 1980 and IBRAHIM et al., 1983. The pathogenicity of Paecilomyces on 3 days old chicks in Kenya was described for the first time by the authors. Cultured growth of the tested fungi could be inhibited in vitro by thiobenzole 5 mg/ml and Garlic juice 0.2 and 0.4 ml/10 ml media. Copper sulphate 30 mg/ml media was of moderate effect on the tested fungi. Mycostatine 100 IU/ml media had no fungicide or fungistatic effect. Similar results to some extent were reported by TARLATZIS et al., 1957; DEVOS et al., 1967; STANKUSHEV and DUPARIREVA, 1971; SAIF, 1967; and SAIF & REFAI, 1977. Our results disagree with those recorded by STEWART et al., 1977 and IBRAHIM et al., 1983. The effect of the Garlic juice on the tested fungi in this study is considered to the best of our knowledge, the first record in Egypt. From the obtained results of this work, it could be concluded that the fungal flora of chickens vary considerably both in species and in the amount in which they were present in the digestive and respiratory tracts although not causing disease. They may be considered as a stress factors affecting the hatchability, growth and development of birds. Hygienic conditions of the flock played an important role in complication of this fungal infections. Also, it can be concluded that Garlic is an efficient drug which can be used successfully in controlling mycotic infection.

REFERENCES


MYCOTIC FLORA OF CHICKEN

Refai, M.; El-Bab, G.M. (1960); Incidence of Moulds in poultry feed in Egypt. Mykosen 11,954.
Singh, D.; Hlhotra, R.C. (1974); Experimental studies on pathology and pathogenesis of Aspergillosis in chicks. Indian J. of poultry Sci. 9 (1); 64.
Staukushe, Kh. and DupariNova, M. (1971); Disinfection of straw (for use as poultry litter) contaminated with Aspergillus. Vet. Sbir., Sof., 68, 4 pp. 11-13 (B).
Table (1): Incidence & Distribution of Fungi in Organs of Different Breeds of Chicken.
| No. | Water | Drinking | Feed | 14 | 10.0 | 2 | 5 | 2 | 3 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 200 |
|-----|-------|----------|------|----|------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1   |       |          |      |    |      |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2   |       |          |      |    |      |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3   |       |          |      |    |      |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Table (II):** Isolated Fungi from different Poultry environments.


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<th>Total Mortality</th>
<th>Deaths due to sudden shock</th>
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* Deaths due to sudden shock.

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<th>Group</th>
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TABLE (III): Experimental infection of baby chicks with the different isolates.
TABLE (IV): Effect of different drugs on some of the isolated fungi.

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<tr>
<th>Chemical Drugs</th>
<th>Sporotrichum</th>
<th>L.S.L. Corn</th>
<th>A.niger</th>
<th>A.flavus</th>
<th>A.fumigatus</th>
<th>Brooder Room</th>
<th>Hatchar</th>
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<td>Garlic Juice</td>
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No effect of drug on fungus growth.

(-) Few growth of fungi.

(+) Complete inhibition of growth.