

Dept. of Microbiology,
Faculty of Vet. Med., Suez Canal University,
Head of Dept. Prof. Dr. M. Anani.

**BACTERIOLOGICAL AND MYCOLOGICAL
EXAMINATION OF SOME MIGRATORY BIRDS
IN SINAI
(With Two Tables)**

By

**EL.ATTOR, A.A. AHMED*, I.A. KAFAGI, A.M.
and H.A. HISSIEN***

*Dept. of Poultry and Fish Disease, Fac. Vet. Med., Suez Canal Univ.
(Received at 19/11/1996)

فحص بكتريولوجى وميكولوجى لبعض الطيور المهاجرة فى سيناء

عرفه العطار ، أحمد ابراهيم ، أحمد خفاجى ، حسين حسنين

تم جمع عدد 110 من طائر السمان و 90 من البط البرى من أماكن مختلفه فى سيناء. وبعد فحص الطيور إكلينيكيًا وتشريحياً تم جمع مسحات من القصبة الهوائية وفتحة المجمع وكذا تم جمع الكبد والقلب والرئتين للفحص البكتريولوجى والميكولوجى وأسفرت النتائج عن عزل الميكروبات الآتية: بكتريا أيشريشيا كولى وسالمونيللا تيفيموريوم و سيدوموناس و الكورينيباكتريوم و ستافيلوكوكس إيبيديرميدس و ستافيلوكوكس أنباس و و لاکتوباسيلس. وكذا فطر أسبيرجيلس فلافاس و أسبيرجيلس فيوميجاتوس والميكور وفطر الخميره (كانديدا ألبيكانس). هذا وقد تم تسجيل معدل عزل هذه الميكروبات فى كل من السمان والبط. وقد تأكد من نتائج هذه الدراسة الدور الذى قد تلعبه الطيور المهاجرة فى نقل وانتشار الميكروبات الممرضة لمزارع الدواجن.

SUMMARY

A total of 110 (Quaterinx quail) and 90 *Anas Platyrhynhos* (Mallard ducks) were collected by hunting from various localities in Sinai. Tracheal and cloacal swabs, lung and liver specimens were subjected to bacterial and mycological examination. Bacterial isolates were *E. coli*, *Salmonella spp.*, *Pseudomonas spp.*, *Corynebacterium spp.*, *Staph.epidermidis*, *Staph. albus* and *Lactobacillus spp.* Mycotic isolates were *Aspergillus flavus*, *Aspergillus*

fumigatus, *Mucor spp.* and *Candida albicans*. From the obtained results its is obvious that migratory birds may harbour some pathogenic bacteria and fungi.

Key words: *Migratory birds - Sinai - Examination*

INTRODUCTION

Various species of migratory birds play an important role in transmission of viral, bacterial and mycotic diseases. Various species of *Proteus* which exist mainly as saprophytes are known to cause septic infection in man (Wilson and Miles, 1975) and animals (Kahlil *et al.*, 1968, Murdoch and Baker, 1977; Pine *et al.*, 1973). Under certain conditions the organism has been incriminated in omphalitis and persistent yolk sac infection in chickens (Bhatia *et al.*, 1972) and turkey poults (Hungeford, 1969). Salmonellosis, pasteurelosis, streptocococemia, pseudomoniasis and colibacillosis were recorded in passerina birds and some of these diseases were recorded in psittasine birds (Fawter, 1986).

Aspergillosis is a chronic disease in wild birds which appear quite healthy until respiratory diseases and abnormal respiratory sounds become evident right before death. *Aspergillus* may be found in the brain causing mycotic encephalitis (Steiner and Davis, 1981).

Thrush had been observed in chickens, pigeons, geese, pheasants, quail and migratory birds. Deaths were also reported in pea cocks due to candidiasis (Sampuranand *et al.*, 1990).

Isolation of viral agents from apparently healthy migratory birds in Sinai had been encountered by Abdien (1990) and Abd El Daim (1995) while the prevalence of bacterial and mycotic pathogens in such area still need more investigation.

The aim of this study is to demonstrated the bacteriological and mycological status of the migratory birds in Sinai.

MATERIAL and METHODS

Specimens: A total of 200 live migratory birds (110 quaternix quail and 90 Mallard ducks) were collected by hunting from different localities in Sinai.

Tracheal and cloacal swabs as well as lung and liver specimens were subjected to bacterial and mycological investigation.

Clinical and postmortem examination: All birds were subjected to clinical and post mortem examination and the most prominent symptoms and lesions were recorded.

Culturing methods: All samples were cultured in an identical manner on : Blood agar (5% Sheep defibrinated blood), MacConkey agar (Difco), Nutrient agar, Sabouraud dextrose agar (Difco and selenite F broth (Difco), Brilliant green , and Milk agar. All media were incubated at 37°C except for Sabouraud agar plates were held at room temperature for one month.

Identification of bacterial isolates: Gram stain, morphology of organism, culture characters and biochemical tests used for identification of isolates Buchanan and Gibbons (1974), Holis and Weavers (1981).

Identification of mycotic isolates: The direct microscopic of clinical specimens containing *Candida* will reveal budding yeast cells (blastoconidia) and pseudohyphae showing regular points of constriction resembling lengths of sausages and true septated hyphae. The blastoconidia, hyphae and pseudohyphae are strongly Gram positive. *Canidida albicans* was identified by production of germ tube and presence of chlamyospores, fermentation and assimilation of sugars. Concerning identification of moulds, colonies were identified by careful observation and measurements of its macro and micro characteristics (Raper and Fennel, 1965).

RESULTS

Clinical and postmortem of 110 Quaternix quail and 90 Mallard ducks revealed about 70% of the examined birds ducks and quail were apparently healthy while about 30% showed clinical symptoms in the form of emaciation and diarrhea and the most prominent lesions were mild inflammation of duodenum, balloned caeci, necrotic patches on spleen, enlarged gall bladder and necrotic foci in the liver.

The results of bacteriological examination of specimens collected from both quail and ducks revealed that 49.1% and 48.9% respectively as shown in Table (1).

The obtained results showed that gram negative bacilli represented the highest incidence of isolation. *E.coli* was the most common bacteria isolated (18.1% in quail and 14.4 in mallard) while *pseudomonas* spp. represented the lowest incidence (1.8% in quail and 1.1% in mallard) of isolation. *Salmonella* spp. was also identified with an incidence of 5.5% and 8.9% in quail and mallard respectively. The bacterial isolates also included

gram positive cocci and bacilli, as shown in table(1) the *lactobacillus* spp. represented the highest incidence of isolation (8.2% in quail and 12.2% in mallard) while *staphylococcus* albus represented the lowest incidence (2.7% in quail and 4.4% in mallard). *Corynebacterium* spp. and *staphylococcus epidermidis* were also identified with the same incidence (6.4%) in quail while in mallard was 3.3% and 4.4% respectively.

The mycological examination revealed 39.1% and 33.3% in both quail and mallard respectively. *Aspergillus flavus* was identified with an incidence of 5.5% in quail and 5.6% in mallard and *Aspergillus fumigatus* with an incidence of 9.1% in quail and 5.6% in mallard. All isolates were from the respiratory tract with macroscopic changes except one isolat only from the intestine.

Mucor spp. was identified with an incidence of 7.3% in quail and 2.2% in mallard while *Candida albicans* was identified with 17.3% in quails and 20% in mallard. Sixteen cases (14.5%) and 3 cases (3.3%) revealed isolation of both bacteria and fungi in quail and mallard respectively as shown in table 2. Aspergillus isolates were found in combination with 9 cases of bacteria.

DISCUSSION

The bacteria represented the higher incidence of isolaton in copmarsion with fungi

The results shown in table1. revealed that the identified gram negative bacteria were *E. coli*, *Salmonella* spp. and *pseudomonas* spp. *E. coli* represented the highest incidence of isolation (18.1% in quail and 14.4% in mallard).

The incidence of *Salmonella* spp. was 5.5% in quail and 8.9% in mallard, *Pseudomonas* spp. was 1.8% in quail and 1.1% in mallard.

Those gram negative organisms might be the probable cause of enteritis, septicemia (Steiner and Davis, 1981) and Pneumonia (Gerlach, 1986).

Lactobacilli are commonly found in water, grain products, fruits and intestinal tracts of homothermic animals including humans (Buchanan and Gibbons, 1974). Concerning *corynebacterium*, it was the second highest gram positive bacteria isolated in this study with an incidence of 8.2% in quail and 12.2% in mallard, it was recovered only from cloacal swabs, this organism has occasionally been reported as causative agents of diseases in birds (Fiennes, 1982). The incidence of isolation for *staph. albus* was 2.7%

and 4.4% while for *staph. epidermids* was 6.4% and 4.4% in quail and mallard respectively.

Mycotic agents were isolated from birds with an incidence of 39.1% in quail and 33.3% in mallard. About 50% of the isolates were *candida albicans* while *Aspergillus flavus* and *Aspergillus fumigatus* were isolated with varying incidence. Most of the *Aspergillus* isolates were isolated from respiratory alterations of lungs. This confirm the fact that the fungus was an air borne or food contaminant, *Aspergillus* is an opportunistic pathogen capable of causing a fatal respiratory disease in birds (Campbell, 1986) and humans (Rippon, 1982). The finding might reflect the opportunistic nature of *Candida albicans* which is probably found in highest number in birds flora has been altered (Woodcock, 1979). These alterations might be attributed to environmental stresses or physiological disturbances. *Mucor* was isolated with the lowest incidence amongst fungal isolates.

From this study we can concluded that migratory birds act as a reservoir and carrier of microbial agents for birds and human and this support the importance of sanitation and sound management in poultry farms against such birds.

REFERNCES

- Abd El Daim, M.M. (1995):* The role of migratory birds in the transmission of some viral diseases. M.V.Sc. Fac. of Vet. Med., Suez canal Univ.
- Abdien, H.M. (1990):* Viological and serological survey on the viral diseases of migrating birds in Sinai. M.V.Sc. Fac. of Vet. Med., Suez canal Univ.
- Bahtia, K.C., Sharman, U.K. and Singh, N. (1972):* Studies on persistent yolk sac condition in chicks. Indian J. Anim. Health. 11: 173-176.
- Buchanan, R.E. and Gibbons, N.E. (1974):* Bergy's manual of determinative bacteriology, 18th ed. Williams and Wilkins, Baltimore.
- Campbell, T.W. (1986):* Mycotic diseases. In: Clinical avian medicine and surgery. G.J. Harrisons and L.R. Harrisons, eds. W. B. Saunders Co. Philadelphia. pp. 464-471.
- Fawter, M.E. (1986):* Zoo and wild animal medicine 1127pp. B. saunders company, Philadelphia.
- Finnes, R.N.T.W. (1982):* Diseases of bacterial origin. In: Diseases of cage and aviary birds, 2nd ed. M.L. Petrak. ed. lea and Febiger, Philadelphia pp. 497-515.

- Gerlach, H. (1986):* Bacterial diseases. In: Clinical avian medicine and surgery. G.J. Harrison and L.R. Harrison, eds. W.B. Saunders Co., Philadelphia. pp.434-453.
- Hollis, D.G. and Weaver, R.E. (1981):* Gram positive organisms: A guide to identification. Special bacteriology section. Centers for diseases control, atlanta, Georgia.
- Hungerford, T.G. (1969):* Diseases of poultry 4th ed. Angus and Robertson, Sydney p.275.
- Kahlil, R., Karadzhev, Y. and Angelov, A. (1968):* Clinical hematological studies on septicemic infection in cattle. 11. *Proteus vulgaris* infection in calves Nauchen. Tr. Vyssh. Vet. Med. 20: 325-332. (Vet. Bull. 40 Abstr. 5451).
- Murdoch, D.B. and Baker, J.R. (1977):* Bacterial endocarditis in the dog. J.Small Animal. Pract. 18: 678-699.
- Pine, J.H; Richer, W. R. and Esterly, J.R. (1973):* Bacterial pneumonia Ultrastructural, autoradiographic and histochemical observations. Am. J. Pathol. 73: 115-124.
- Raper, K.B. and Fennel, D.L.(1965):* The genus *Aspergillus*. 1st. Ed. , Williams and Wilkins Baltimore, U.S.
- Steiner, C.V.J. and Davis, R.B. (1981):* Caged birds medicine, Iowa State University Press, Ames, Iowa.
- Wilson, G.S. and Miles, A. (1975):* Principles of bacteriology, virology and immunity. 6th ed. Vol. 1.Edward Arnold Ltd. London. pp.878-900.
- Woolcock, J.B. (1979):* Bacterial infection and immunity in domestic animals. Elsevier Scientific publishing Co. Amsterdam.

Table (1) Results of bacterial and mycotic isolation from migratory birds.

Microorganisms	Coturnix quail		Mallard	
	No. of isolates	%	No. of isolates	%
1- Bacteria				
a- Gram -ve bacilli				
- E. coli	20	18.1	13	14.4
- Salmonella typhimurium	6	5.5	8	8.9
- Pseudomonas spp.	2	1.8	1	1.1
b- Gram +ve bacteria				
- Corynebacterium spp.	7	6.4	3	3.3
- Staph. epidermidis	7	6.4	4	4.4
- Staph. albus	3	2.7	4	4.4
- Lactobacillus spp.	9	8.2	11	12.2
		00.1		
Total	54/110	49.1	44/90	48.9
2- Fungi				
- Aspergillus flavus	6	5.5	5	5.6
- Aspergillus fumigatus	10	9.1	5	5.6
- Mucor spp.	8	7.3	2	2.2
- Candida albicans	19	17.3	18	20.0
Total	43/110	39.1	30/90	33.3

Table (2) Accompanied bacteria with the fungal isolates.

Migratory bird	Coturnix quail					Mallard				
	A*	B	C	D	E	A	B	C	D	E
Accompanied bacteria										
Fungal isolates										
1- Aspergillus flavus	2	2	0	0	0	1	0	0	0	0
2- Aspergillus fumigatus	3	1	0	0	0	0	0	0	0	0
3- Mucor spp.	0	0	0	0	0	0	0	0	0	0
4- Candida albicans	3	0	2	1	2	1	0	1	1	0

* A = Salmonella typhimurium
 C = Corynebacteria spp.
 E = Staph. epidermidis.

B = Escherichia coli
 D = Pseudomonas spp.

