OCCURRENCE OF MYCOPLASMA IN SOME MIGRATORY BIRDS

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ABSTRACT

One hundred and twenty migratory birds (Qutemix quails) and 64 Mallard –ducks were examined to investigate the prevalence of mycoplasma species. A total of 28 Mycoplasma isolates were recovered from Q. quails (22.3%) and 12 isolates from M. ducks (18.8%) suffering from respiratory syndrome. Serotyping of the Mycoplasma isolates proved the occurrence of four species e.g. *M. gallisepticum, M. gallinarum, M. pullorum* and *M. anatis. Mycoplasma gallisepticum* was identified from quails and ducks (32.1% and 16.7% respectively) while the incidence of *Mycoplasma gallinarum* was 28.6% and 33.3% respectively. *Mycoplasma pullorum* was recorded only from quails (17.9%), while *Mycoplasma anatis* was reported from ducks (33.3%). The remains isolates could not be further identified with the available antisera. Experimental infection was designed to infect 40 quails and 20 ducks (2-weeks old) intranasal with 10^7 CFU of the isolated *Mycoplasma. gallisepticum* , *Mycoplasma. gallinarum* , *Mycoplasma pullorum* and *M. anatis* .The experiment revealed no mortality with the different types of Mycoplasma isolates. PM lesions were recorded only on birds inoculated by *Mycoplasma. gallisepticum* and *M. anatis* including congestion of the lungs and liver as well as congestion ,turbidity and thickening of the air sacs. No lesions were recorded in birds inoculated with *M. gallinarum* , *M. pullorum* and in the control negative group.

INTRODUCTION

Migratory birds play a considerable role in dissemination of many pathogens and act as a reservoir and carrier of microbial agents for birds and human and this supports the importance of sanitation and sound management in poultry farms against such birds (**EL-Attar *et al.*, 1996**).

Cookson and Shiraprasad, (1994) reported that Mycoplasma infection in quails and ducks should be considered not only as a potential source of transmission to other birds but also as a potential selection pressures for the generation of new variant and possibly pathogenic strains.

Yoder and Hofstad, (1964) reported that nine of 12 quails inoculated with the first yolk passage of *M. gallisepticum* developed evidence of infection in the form of detectable antibodies by the HI procedure.

David *et al.*, (1967) considered that the significance of migratory birds such as Q. quails and M. ducks (Anasplatyrhynhos) in epizootiology of mycoplasma is unclear.

Tiong, (1990) isolated *M. anatis* and *M. gallinarum* from clinically diseased ducks of all ages. Some studies in migratory birds e.g. ducks were done in Egypt by **El-Abeedy, (1976); El-Abeedy *et al.*, (1987); Zeinab, (1997) and Mahmoud, (1999).**

This work was done to investigate the occurrence of mycoplasma organisms in some migratory birds.

MATERIAL AND METHODS

Specimens:

A total of 184 live migratory birds (120 Quternix quails and 64 Mallard ducks) were collected by hunting from different localities in Ismallia Governorate.

Lungs, trachea and air sacs specimens were subjected to mycoplasma investigation.

Culturing methods:

1- Isolation procedure using P.P.L.O. broth and agar media **(Hayflick, 1965)**.
2- Purification and maintenance of isolates **(Sabry, 1968)**.
3- Genus determination using digitonin sensitivity test **(Erno and Stipkovits, 1973)**.
4- Biochemical characterization tests were carried out using glucose fermentation and arginine deamination tests **(Erno and Stipkovits, 1973)**.
5- Serological identification of the isolates was conducted by growth inhibition test **(Clyde, 1964)**.

Standard antisera were kindly obtained from Prof. Dr. Amal Rashwan, Mycoplasma Department, Animal Health Research Institute, Dokki, Giza.

Experimental design:

Forty Q quails and 20 ducks (two weeks old) free from mycoplasma as evidenced culturally and serologically was choosen for experimental infection. They were divided into 4 groups as in Table (I) (10 quails, 5 ducks each) .The first group comprised 10 quails and 5 ducks were used as control. The other groups were inoculated intranasal with 0.2 ml of the local mycoplasma 10^7 C.F.U. which isolated on the 3rd week of age according to **Kuba *et al.*, (1968)**. Clinical and post-mortem examination were applied on 10 quails and 5 ducks (each group).

RESULTS

Isolation of mycoplasma:

Twenty-eight mycoplasma isolates from Quternix quails (120) and 12 isolates from Mallard ducks (64) were recorded.

The isolates could be divided into tow groups according to their biochemical reactions.

The first group comprised 25 mycoplasmal isolates which were glucose positive and arginine negative (18 isolates from Q. quails and 7 isolates from M. ducks).

While group 2 revealed 15 isolates as glucose negative and arginine positive (10 isolates from Q. quails and 5 isolates from M. ducks) Table (2).

Serologieal identification:

Serological typing of mycoplasmal isolates by using growth inhibition test was summarized in Table (3).

Quternix quails revealed the occurrence of *Mycoplasma. gallisepticum* (7.5%) , *Mycoplasma. gallinarum*(6.7%) , *Mycoplasma. pullorum* (0.8%) and untyped species (5%).

Mallard duck isolates indicated the occurrence of *Mycoplasma. gallisepticum*(3.1%) , *Mycoplasma. gallinarum*(6.25%) , *M.anatis* (6.25%).and untyped isolates (3.1%).

Experimental infection: reisolation results were recorded in Table (4).

Clinical signs:

Birds infected with *M. gallisepticum or M. anatis* showed inappetence, emaciation, ruffled feather, depression, sneezing and watery nasal discharge. The control group revealed no apparent changes.

P.M lesions:

1- The control groups: No PM lesions were detected.
2- The birds infected with *M. gallisepticum or M. anatis* (quails- ducks) showed congestion of lungs, liver, thickening and turbidity in air sacs.
3- Birds infected with *M. gallisepticum or M.pulorum* (quails- ducks) showed very slightly congestion in lungs or liver.

DISCUSSION

Mycoplasmosis is considered a world wide economic problem in poultry industry causing economic losses due to reduction in egg production, the hatchbility and body weight gain as well as down grading of carcasses and increasing the medication costs (**Bencina *et al.*, 1988**).

The present study was therefore carried out to investigate the incidence and possible role of mycoplasma in migratory birds, which acts as a reservoir and carrier of microbial agents for birds and human **(Davide *et al.*, 1966 and El-Attar *et al.*, 1996)** and this support the importance of sanitation and sound management in poultry farms against such infection.

The obtained data revealed that 28 mycoplasmal isolates were recovered from 120 Qutemix quails and 12 isolates from 64 Mallard ducks. Identification of the 28 quail's isolates revealed the occurrence of *Mycoplasma. gallisepticum* (7.5%) , *Mycoplasma. gallinarum*(6.7%) , *Mycoplasma. pullorum* (0.8%) and untyped (5%).

These results are in agreement with those reported by **Tiong, (1978); Cookson and Shiraprasad, (1994) and Reece *et al.*, (1986)** who isolated *Mycoplasma. gallisepticum* from two flocks of quails with an incidence of 10% and 13%. **Kardel, (1987)** serologically identified *Mycoplasma pullorum* (46.3%) from multiple age chicken flock. The serological Identification of the 12 duck isolates revealed the occurrence of *Mycoplasma gallisepticum* (3.1%) ,*Mycoplasma gallinarum* (6.25%) , *M.anatis* (6.25%).and untyped isolates (3.1%).

These results agreed with previous studies done in Egypt by **El-Ebeedy *et al.*, (1987)** who isolated mycoplasma (25%) from dead and living ducks., and with those of **Zeinab, (1997)** who isolated (20%) mycoplasma from one day to 14 days old chicks as well as with those of **Bencina *et al.*, (1987)** who isolated mycoplasma from chickens, chick embryo , turkeys, ducks, geese, pigeons and Japanese quails and their embryos. **Sokkar *et al.*, (1986)** isolated *M.anatis* with an incidence of (16%) then *Mycoplasma. gallinarum* , 24% in ducks of different ages .

Tiong, (1990) isolated *M.anatis and M.. gallinarum* from clinically diseased ducks of all ages . There was a speculation that the adaptation of mycoplasma to different host species may lead to specific genotypic charge (**Yoger *et al.*, 1988**). Therefore, mycoplasma infection in migratory birds should be considered not only a potential source of transmission to other birds but also a potential selection pressure for the generation of new variants and possibly pathogenic strains.

The post mortem lesions detected in quails and ducks after experimental infection including congestion of lungs, liver, thickening and turbidity in air sacs (air sacculitis). No mortalities were recorded from infected ducks and quails at two weeks after infection with some mycoplasma species. These results are in agreement with that obtained by **Yagihashi *et al.*, (1988)** and **Soeripto *et al.*, (1989)**.

Reisolation of Mycoplasma from experimentally infected birds after two weeks of infection agreed with that revealed by **El-Ebeedy, (1976)** and **Mahmoud, (1999)**.

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Table (1): Design of the experiment.

Groups	Strains	No. of quails	No. of ducks
1	Control negative	10	5
2	M. gallisepticum	10	5
3	M. gallinarum	10	5
4	M. pullorum	10	0
	M. anatis	0	5

Table (2): Total number of isolates and their biochemical reactions.

*Samples	No. of samples	No. of positive	Biochemical reactions		
			%	Group1 Glucose+ve Argenine-ve	Group2 Glncose-ve Argenine+ve
Quternix quails	120	28	23.3	18	10
Mallard ducks	64	12	18.8	7	5

*Samples: Mixture of lung –air sac and trachea

Table (3): Serological identification of mycoplasma isolates from the migratory birds.

Species of M.O.	Quternix quails		Mallard ducks	
	No. of +ve	%	No. of +ve	%
M. gallisepticum	9	7.5	2	3.1
M. gallinarum	8	6.7	4	6.25
M. pullorum	5	0.8	0	0
M. anatis	-	0	4	6.25
Untyped	6	5	2	3.1
Total	28	21.7	12	18.75

Table (4): Results of Mycoplasma reisolation after experimental infection

Samples	Total No.	M. gallisepticum	M. Gallinarum	M. Pullorum	M. anatis	control
Quails	40	8/10*	9/10	9/10	0	0/10
Ducks	20	5/5	0/5	0	5/5	0/5

*No. of positive / No. of examined.

الملخص العربي

اشتملت الدراسة على مائة وعشرون من السمان تعانى من أمراض تنفسية و ٦٤ بطة لتحديد نسبة حدوث الميكوبلازما. وتم عزل ٢٨ عترة ميكوبلازما من السمان بنسبة (٢٢,٣%) و ١٢ عترة من . البط (١٨,٨%).

أجريت الاختبارات السيرولوجية على معزولات الميكوبلازما أوضحت النتائج عن وجود أربعة أنواع ميكوبلازما جاليسبتكم ، ميكوبلازما جالينارووم ، ميكوبلازما بلورم و ميكوبلازما اناتس.

ميكوبلازما جاليسبتكم تم عزلها من السمان والبط بنسبة (٣٢,١ و١٦,٧% على التوالي) بينما عزلت ، ميكوبلازما جالينارووم بنسبة ٢٨,٦ و ٣٣,٣% على التوالي.

ميكوبلازما بلورم تم عزلها فقط من السمان(١٧,٩%)، بينما ميكوبلازما اناتس قد عزل من البط بنسبة ٣٣,٣%.و لم يتم تصنيف باقي العترات.

وتم عمل عدوى تجريبية على ٤٠ من السمان و ٢٠ بطة (بعمر ٢ أسابيع)داخل الأنف بجرعة 10^{7} (CFU) باستخدام عترات ميكوبلازما جاليسبتكم ، ميكوبلازما جالينارووم ، ميكوبلازما بلورم و ميكوبلازما اناتس.

كشفت التجربة عن عدم وجود وفيات بالأنواع المختلفة للميكوبلازما.

الصفات التشريحية سجلت فقط على الطيور التي تم حقنها بالميكوبلازما جاليسبتكم و ميكوبلازما اناتس. وشمل ذلك احتقان الرئات والكبد وأيضا احتقان وعكرة وتكثيف الأكياس الهوائية. بينما لم تظهر أي صفات تشريحية في الطيور التي حقنت بالميكوبلازما جالينارووم و ميكوبلازما بلورم وفي سيطرة المجموعة السلبية.