

MYCOPLASMA GALLISEPTICUM AND STAPHYLOCOCCUS AUREUS INFECTION IN OSTRICH (STRUTHIO CAMELUS) IN MATROUH GOVERNORATE

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ABSTRACT

Ostrich farms in Matrouh Governorate were investigated for the detection of mycoplasma infection. Mycoplasma could be isolated from ostriches suffered from respiratory troubles, arthritis and conjunctivitis. The highest incidence of infection was found in winter at age of 10 month (21.74%), followed by fall at age of 7 1/2 (17.24%), while in spring at age of 11/2 was the least (9.38%).

All the isolated strains were identified as M. gallisepticum. The present study is considered the first record for the isolation of M. gallisepticum from ostriches in Egypt.

Moreover, Staphylococcus aureus played an important role in infection of ostriches. Isolates from birds had arthritis and conjunctivitis were highest at winter season at birds of 10 month age (21.74%) followed by summer at birds of 4 1/2 month age (16.13%), while spring was the least (6.25%) at age of 11/2 month. All isolates were identified as S. aureus. Some cases gave mixed infection.

INTRODUCTION

Although, *Perelman (1999)* and *Huchzermeyer (1998)* throw light on the diseases of ostriches yet. The information on the infectious diseases of ostriches is not enough. The use commercial enzyme linked immunosorbant assay (ELISA) lists to detect antibodies of infectious diseases in ostriches has not been possible, because anti-chicken antibodies do not react with ostrich immunoglobulins, and anti-ostrich antibodies are not generally available (*Cadman et al., 1994a*).

Knowledge of the immunoglobulins of domestic animals has permitted the development of serological tests, which have become widely used for the diagnosis and monitoring of infectious diseases. Although the ostrich industry is rapidly expanding in both third and first-world countries, serological tests for detecting infectious agents are not in common use, partly because specific reagents for such tests are not commercially available.

Cadman et al.,(1994b) isolated and characterized the immunoglobulins in ostrich sera. Unfortunately, ostrich in Matroeh more or less suffered from respiratory diseases and conjunctivitis and synovitis.

Therefore, the aim of the present work was to study the mycoplasma, and staphylococcus infection and characterization of the immunoglobulins in these affected ostrich sera.

MATERIALS & METHODS

I. Samples:

Nasal cleft, conjunctival, synovial and serum samples were collected from ostriches showed severe respiratory symptoms, conjunctivitis and synovitis.

II. Media:-

a) For mycoplasma

Prepared and used as described by *Frey et al. (1968)*.

b) For staphylococcus blood agar media (Difco).

III. Biochemical characterization of the isolated strains of mycoplasma

Were carried out according to *Erno and Stiplsovits (1973)*. The isolate was serologically identified by growth inhibition test as described by *Clyde (1964)*.

IV. Biochemical reactions of isolated staphylococcus strains:-

Were carried out according to *MacFaddin (1980)*. Using the following reactions haemolysis on blood agar, catalase, coagulase DNase tests and sugar fermentation tests.

V. Serum samples were examined by:

A)Serum plate agglutination (SPA) was used for the detection of *M. gallisepticum* antibodies in the collected serum samples.

B)Sodium dodecyl sulphate–polyacrylamide gel electrophoresis (SDS–PAGE) was carried out as described by *Laemmli (1970)* to characterize the immunoglobulins in ostrich sera.

RESULTS

According to the site of infection out of 15 cases of conjunctivitis 2 (13.33) were positive for *M. gallisepticum* (11.76) and 7 (46.07%) positive for *S. aureus*. Out of 83 suffered form respiratory manifestations cases 12 (14.64%) were positive for *M. gallisepticum* and 4 (4.81%) were positive for *S. aureus*. Out of 17 cases of arthritis 2 (11.76%) were positive for *M. gallisepticum* and 5 (29.41%) for *S. aureus*.

Table(2) shows the incidence of mycoplasma infection in ostriches. One hundred and fifteen samples (17 arthritis, 83 nasal cleft and 15 conjunctival) were collected at 21 day, 4 months, 10 months and 12 months old. We found that highest incidence of mycoplasma was at 10 months (21.74%), followed by (17.24%) at 7¹/₂ months, while it was the least at 1¹/₂ month (9.38%). The highest incidence of staphylococcus infection was at 10 months (21.74%) followed by at 4¹/₂ months(16.13%) and the least incidence was at 1¹/₂ month (6.25%).

Concerning biochemical characterization of the isolated strains of mycoplasma, they were digitonin sensitive, glucose positive and arginine negative. As for serological identification, the isolates were identified as *Mycoplasma gallisepticum*(Table2)For isolated strains of staphylococcus all isolates were positive for MacFaddin reaction, catalase and DNase as well as maltose sugar fermentation and identified as *S. aureus*.

SDS-PAGE of the diseased (by *M. gallisepticum*) and healthy cases sera revealed the increased γ -globulin in sera of diseased ostriches.

Serologically, out of 115 serum samples, 29 (25.2%) were positive for *M. gallisepticum* antibodies as detected by serum plate agglutination test (SPA).

Table(1): Incidence of mycoplasma and staphylococcus infection in ostrich at different sites.

Site	No. examined	Positive for mycoplasma		Positive for <i>S. aureus</i>		Mixed infection	
		No.	%	No.	%	No.	%
Arthritis	17	2	11.76	5	29.41	2	11.76
Nasal cleft	83	12	14.46	4	4.81	-	-
Conjunctivitis	15	2	13.33	7	46.67	1	6.67
Total	115	16	13.91	16	13.91	3	2.61

- 1- All mycoplasmal isolates were +ve for glucose and -ve for arginine.
- 2- All Staphylococcus isolates were positive for MacFaddin reaction, catalase and DNase as well as maltose sugar fermentation.
- 3- All mycoplasmal isolates give large zone of inhibition with *Mycoplasma gallisepticum* antisera coated discs.

Table(2):Effect of age and/or season on the incidence of mycoplasma and staphylococcus infection in ostrich.

Season and age	No.of exam. birds	Positive for mycoplasma		Positive for <i>S. aureus</i>		Mixed infection	
		No.	%	No.	%	No.	%
Spring (1 $\frac{1}{2}$ month)	32	3	9.38	2	6.25	-	-
Summer (4 $\frac{1}{2}$ months)	31	3	9.67	5	16.13	1	3.23
Fall (7 $\frac{1}{2}$ months)	29	5	17.24	4	13.79	1	3.45
Winter (10 months)	23	5	21.74	5	21.74	1	4.35
Total	115	16	13.91	16	13.91	3	2.61

Table(3): Serum profile of ostriches using SDS-PAGE electrophoresis.

	Clinically Health		Had mycoplasma infection	
	KD	%	KD	%
Albumin	43	51	45	42
α_1 - Globulin	53	8	54	7
α_2 Globulin	60	7	63	5
β - Globulin	82	16	83	15
γ - Globulin	128	18	130	31



Fig (1) Arthritis in ostrich caused by *Mycoplasma gallisepticum* and *Staphylococcus aureus*.

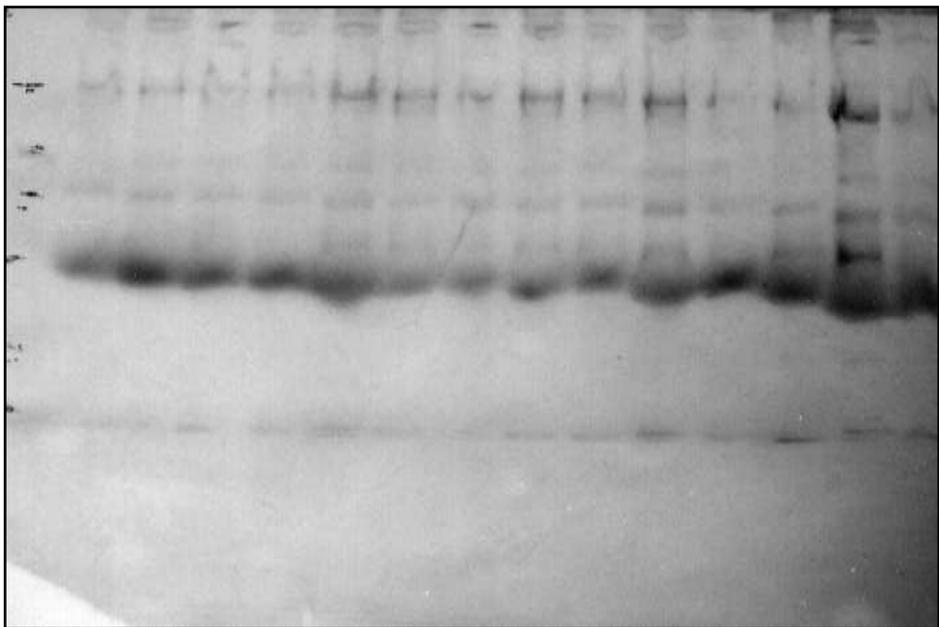


Fig (2) SDS-PAGE for serum collected from *M. gallisepticum* diseased and healthy ostriches.

DISCUSSION

Mycoplasma gallisepticum (MG) is an important respiratory tract pathogen of commercial poultry and is generally regarded as an economically significant cause of disease confronting poultry production world wide (**Yoder, 1991**). Also, an important bacteria recorded to cause respiratory diseases and arthritis in ostrich was *S. aureus*. In the present study, *M. gallisepticum* was isolated from ostriches showed severe respiratory symptoms. The highest incidence of infection (21.74) was detected in winter (10 months), while in spring (1¹/₂ month) it was the least (9.38).

S. aureus was isolated from different cases with highest incidence in winter at age of 10 months (21.74%) and lowest incidence in spring at age of 1¹/₂ month (6.25%). Out of 115 serum samples were positive for *S. aureus* samples, 29 (25.2%) were positive for *M. gallisepticum* by SPA test. **Hartap et al., (2001)** mentioned that *M. gallisepticum* has produced conjunctivitis eastern House Finches of North America, conjunctivitis produced ranged from 0 to 43%, and exhibited marked seasonal fluctuation (elevation during fall and winter and lower disease prevalence during the breeding season). Also, **Korbel (1991)** revealed that *M. gallisepticum* cause ocular manifestation in ostriches.

Perelman (1991) Shivaprasad (1993) and Huchzermeyer (1998) recorded that *M. gallisepticum* and *S. aureus* were isolated from respiratory diseased ostriches.

Generally, characterization of the serum immunoglobulins classes it coincide with **Cadman et al. (1994)**.

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عدوى الميكوبلازما جاليسبتكم والميكروب العنقودي الذهبى فى النعام بمحافظة مطروح

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تم فحص مزارع النعام فى محافظة مطروح لتحديد الإصابة بالميكوبلازما. وقد أمكن عزل الميكوبلازما من النعام الذى يعانى من مشاكل تنفسية ، والتهاب فى المفاصل والتهاب العين. ووجد أن أكبر نسبة إصابة بالميكوبلازما كانت فى فصل الشتاء (عند عمر عشرة أشهر) بنسبة 21.74% وتلاه فصل الخريف (عند عمر سبعة أشهر ونصف) حيث كانت نسبة الإصابة 17.24% وكانت أقل نسبة إصابة فى فصل الربيع (عند عمر شهر ونصف) حيث بلغت 9.38% وقد صنفت جميع عترات الميكوبلازما المعزولة على أنها ميكوبلازما جاليسبتكم ، ويعتبر هذا هو أول تسجيل لعزل الميكوبلازما جاليسبتكم من النعام بمصر.

وإضافة إلى الميكوبلازما لعنق الميكروب العنقودي الذهبى دورا مهما فى إصابة النعام. وكانت نسبة الميكروب المعزول من الطيور المصابة بالتهاب المفاصل والتهاب العين فى أعلى معدلاتها خلال فصل الشتاء (عند عمر 10 أشهر) 21.74% وتلاها فصل الصيف (14.5 شهر) 16.13% وكان فصل الربيع هو أفضل الفصول بالنسبة للإصابة (عند عمر 1.5 شهر) حيث بلغت 6.25%.

وتم تصنيف العترات المعزولة على أنها الميكروب العنقودي الذهبى. وقد وجدت أيضا إصابات

مشتركة.