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دراسة لمدة عامين عن سالمونيلا البط في الوادي الجديد
١- عزل سالمونيلا من بط التربية
٢- اختبار الضراوة والحساسية للعترات المعزولة

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- سالمونيلا تيفي-ميوريم وسالمونيلا انترتيد س وسالمونيلا بارتيفي ج وسالمونيلا طومسون عزلت في العام الاول للدراسة (١٩٨٠) في حين سالمونيلا تيفي-ميوريم وسالمونيلا انترتيد س فقط عزلت في العام الثاني للدراسة ١٩٨١ .
- اختبار العدوى الصناعية في كتاكيت البط عمر يوم واحد اثبتت أن العترات المستخدمة كانت عالية الضراوة .
- النيتروفوران والكلورامفينيكول والجراميسين كانت ذات فاعلية بالنسبة للعترات المعزولة عند اختبارها معطيا .

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A TWO-YEAR STUDIES ON DUCK SALMONELLOSIS IN NEW-VALLEY, EGYPT
I- RECOVERY OF SALMONELLAE FROM BREEDING DUCK FLOCKS
II- PATHOGENICITY OF ISOLATED SEROTYPES AND THEIR SENSITIVITY TO ANTIMICROBIAL AGENTS
(With 4 Tables)

By

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SUMMARY

Salmonella typhi-murium, *S. enteritidis*, *S. paratyphi C* and *S. thompson* were isolated at the first year of study (1980), while *S. typhi-murium* and *S. enteritidis* were the only isolates in the second year (1981).

Experimental infections on one-day-old ducklings revealed that the isolates were highly pathogenic.

The isolated *Salmonella* serotypes were sensitive *in vitro* to Nitrofurantoin, Chloramphenicol and Garamycin.

INTRODUCTION

The revolution in poultry industry has been one of the more significant phenomena in food production in the last few years.

Salmonellosis is considered to be the most frequently encountered bacterial disease affecting ducks, the disease is not only responsible for high mortality but also for low fertility, hatchability in eggs laid by carrier birds.

The data of duck flocks in the last two years showed sharp decrease in egg production, fertility "66%", hatchability "52.3%" and increase of mortality rate of newly hatched ducklings "7.8%".

This work was planned to study:

- 1- Isolation of the microbial agents which may be responsible for these economic losses.
- 2- The pathogenicity of the isolated organisms to one-day-old ducklings, as well as.
- 3- Their sensitivity to different antimicrobial agents.

MATERIAL and METHODS

Examined samples:

A total of 3000 cloacal swabs were collected at random as a representative of 26756 breeding ducks of 6-month-old.

Culture media:

Selenite F broth, MacConkey agar and S.S. agar plates.

Antisera:

Polyvalent O,H and monovalent *Salmonella* agglutination sera obtained from Wellcome Research Laboratories, Beckenham, England were used.

Experimental birds:

55 one-day-old Pecking ducklings were kindly supplied by Faculty of Agriculture, Assiut University, Duck Farm.

Antibiotic sensitivity discs:

Antibiotic and chemotherapeutic undiscs obtained from Oxoid and B.B.L. Laboratories including: Streptomycin 10 ug, Penicillin G 10 i.u., Neomycin 30 ug, Nitrofurantoin 300 ug, Erythromycin 15 ug, Ampicillin 10 ug, Chloramphenicol 30 ug, Oxytetracycline 10 ug, Sulphamethoxazole, 25 ug, Kanamycin 30 ug and Garamycin 30 ug were used.

Isolation and identification of Salmonellae:

The collected swabs were inoculated into Selenite F. broth, incubated at 37°C for 18 hours, then subcultures were made on MacConkey and S.S. agar plates, incubated at 37°C for 48 hours. The suspected colonies were subjected to further biochemical and serological identification using slide agglutination technique according to the criteria of EDWARDS and EWING (1972) and Modified KAUFFMANN White Schema described by MCWHORTER, *et al.* (1977) respectively.

Experimental infections:

Random samples of 5 ducklings were sacrificed for post-mortem as well as bacteriological examination which proved that the birds were healthy and Salmonella-free. Fifty ducklings were divided into 5 equal groups each of 10, the birds of the first four groups were inoculated orally with 100×10^6 viable organisms/bird "SHAHATA, M.A. (1979)" using the first year isolates, while the last group was left as control. All of the inoculated and control ducklings were kept under observation for 30 days. Clinical signs and postmortem findings were recorded and re-isolation of the organisms was attempted.

Sensitivity of the isolates to antimicrobial agents:

For this purpose the paper disc technique was performed. The test was carried out after KOLMER, *et al.* (1951), SOJKA, *et al.* (1974) and CRUICKSHANK, *et al.* (1975).

Results of this work are shown in tables (I, II, III and IV).

DISCUSSION

Paratyphoid infection is regarded as one of the common obstacle for establishment of Poultry-Production Projects in Egypt. The history of the examined flocks revealed that the birds suffered for several years from high losses in ducklings in addition to decrease of production, fertility and hatchability of eggs "EL-AKKAD, *et al.* (1967) and SHAHATA (1979)".

Results of identification showed that 18 Salmonella isolates belong to four serotypes were recovered out of 1400 cloacal swabs collected from the breeding duck flocks of the first year, while 8 isolates only belong to two serotypes were detected from 1600 cloacal swabs obtained from the breeding flocks of the second year. Some-what similar results were also reported by REFAIE, (1967), SOKKAR and REFAIE, (1967), EL-AKKAD, *et al.* (1967), EL-AGROUD and SADEK (1968), EL-SAWY (1976), EL-TAHER (1977) and SHAHATA (1979). S.typhi-murium was the most frequently encountered serotype isolated by investigators, while S.paratyphi C was recovered for the first time by the authors from ducks in Egypt.

The experimentally infected ducklings showed signs of depression, loss of appetite, weakness, diarrhoea, lacrimation, inability to stand and moving in circles. The postmortem examination revealed enlarged, haemorrhagic liver, spleen, distended gall-bladder, unabsorbed yolk and focal necrosis of liver. All the isolates proved to be highly pathogenic to one-day-old ducklings with mortality percent ranging from 70 up to 100%.

Our results were in close agreement with those of SHAHATA (1979) who reported that the mortality rate of 2-day old duckling inoculated orally by 100×10^6 viable organisms of S.typhi-murium and S.thompson was 87.5% in both cases, and to some extent with those recorded by EL-SAWY (1976) and EL-TAHER (1977).

Testing of the isolated serotypes in vitro against different antimicrobial agents indicated that all the isolates were highly sensitive to Nitrofurantoin, Chloramphenicol and Garamycin. Almost the same findings were recorded by SETTNES (1968), (1970), SOJKA, *et al.*, (1972), (1974) and SHALABY (1977), while some-what similar results were also reported by EL-SAWY (1976) and SHAHATA (1979), but on the other hand EL-TAHER (1977) found that Kanamycin, Streptomycin and Gentamycin were the drugs which produced the largest inhibitory zones of the tested serotypes. Our isolates were completely resistant to Penicillin G, Neomycin, Erythromycin, Ampicillin and Sulphamerythoxazole and their sensitivity was varied to Streptomycin, Kanamycin and Oxytetracycline. Similar findings were recorded by EL-SAWY (1979) and SHAHATA (1979), although SOJKA, *et al.* (1972) reported that out of 511 Salmonella strains belong to 32 serotypes, all were sensitive to Ampicillin, Kanamycin and Polymixin B.

The present work revealed that the use of Furazolidone "100 gm/ton" and Chloramphenicol "100 gm/ton" as a

A TWO-YEAR STUDIES ON DUCK SALMONELLOSIS IN NEW-VALLEY, EGYPT

prophylactic medication to ducklings and breeding ducks lead to decrease of mortality percent as well as increase egg production, fertility and hatchability.

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Table (1)

Shows the antigenic structure of the isolated Salmonella serotypes

Serotypes	Antigenic structure		
	Somatic "O" antigens	Flagellar "H" antigens	
		Phase I	Phase II
S.typhi-murium	1,4,(5),12	i	1,2
S.enteritidis	1,9,12	g,m	(1,7)
S.paratyphi C	6,7	c	1,5
S.thomson	6,7	k	1,5

M.A. SHAHATA, *et al.*

Table (II): illustrates the results of the isolation and identification of different Salmonella serotypes

Year of study	No. of ducks	No. of samples	Frequency of isolated Salmonella serotypes			
			S.typhi-murium	S.enteritidis	S.paratyphi C	S.thomson
1980	11072	1400	6	6	3	3
1981	15684	1600	4	4	-	-

Table (III)
Shows the results of the experimental infections

Group No.	Inoculated serotypes	No. of tested ducks	No. of daily deaths											Total	%
			1	2	3	4	5	6	7	8	9	10	30		
1	S.typhi-murium	10	-	-	1	2	2	-	1	1	-	-	-	9	90
2	S.enteritidis	10	-	1	1	2	1	1	2	1	-	1	-	10	100
3	S.paratyphi C	10	1	1	2	1	2	1	-	-	1	-	-	9	90
4	S.thomson	10	-	-	1	1	1	2	1	1	-	-	-	7	70
5	Control	10	-	-	-	-	-	-	-	-	-	-	-	-	--

Table (IV)
Illustrates the results of the sensitivity test

Antimicrobial agents	Isolated Salmonella serotypes			
	S.typhi-murium	S.enteritidis	S.paratyphi C	S.thomson
Streptomycin	+	-	+	+
Penicillin G	-	-	-	-
Neomycin	+	-	+	-
Nitrofurantoin	++++	++++	++++	++++
Erythromycin	-	-	-	-
Oxytetracycline	++	+	-	++
Sulphamethoxazole	-	-	+	-
Ampicillin	-	-	-	-
Chloramphenicol	++++	+++	++++	+++
Kanamycin	-	+	++	-
Garamycin	++++	++++	++++	++++