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ROLE OF SOME WILD BIRDS IN TRANSMITTING SOME BACTERIAL AGENTS AMONG POULTRY FARMS IN SOHAG GOVERNORATE

(With 3 Tables)

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**دور بعض الطيور البرية في نقل بعض الأمراض البكتيرية بين مزارع الدواجن
في محافظة سوهاج**

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تم تجميع عدد ٧٥ من الطيور البرية المختلفة (٢٠ عصفور، ١٥ أبو قردان، ٢٠ غراب و ٢٠ من اليمام) من عدة أماكن في محافظة سوهاج. أسفر الفحص البكتريولوجي والذي شمل مسحات من فتحة المجمع والأحشاء الداخلية (القلب، الكبد، الرئتين والأمعاء) عن عزل ٤١ معزولة بكتيرية بينها على النحو التالي: ١٥ معزولة من العصفير (٥ معزولات من السالمونيلا تيفيميوريم، ٥ معزولات من الميكروب القولوني، ٤ معزولات من المكور العنقودي الذهبي ومعزولة واحدة من البروتيس). ١٢ معزولة من أبو قردان (٣ معزولات من السالمونيلا تيفيميوريم، ٤ معزولات من الميكروب القولوني، ٢ معزولة من المكور العنقودي الذهبي و ٣ معزولات من السيديموناس أيروجينوزا). ٨ معزولات من الغراب (٢ معزولة من السالمونيلا تيفيميوريم، ٣ معزولات من الميكروب القولوني و معزولة واحدة من المكور العنقودي الذهبي و ٢ معزولة من البروتيس) وتم عزل ٦ معزولات من اليمام (٢ معزولة لكل من السالمونيلا تيفيميوريم، الميكروب القولوني وكذلك البروتيس). اجراء اختبار العدوى الصناعية لمعزولات مختارة من السالمونيلا، الميكروب القولوني وكذلك البروتيس في الكتاكيت عمر ثلاثة ايام عن طريق الفم اثبت ضراوة المعزولات وقد وصلت نسبة النفوق إلى ٨٠%، ٧٠%، ٤٠%. اجراء اختبار الحساسية للعترات المعزولة معمليا افاد أنها جميعاً عالية الحساسية لكل من الأنروفلوكساسين، الفلبيموكين والجنتاميسين وكذلك الكلورامفينيكول. هذا وقد تأكد من نتائج الدراسة الدور الذي قد تلعبه بعض الطيور البرية في نقل وانتشار الأمراض البكتيرية بين مزارع الدواجن في محافظة سوهاج.

SUMMARY

A total of 75 different free living birds (20 sparrow, 15 ibis, 20 Jackdaw and 20 of doves) were collected by trapping from different locations in Sohag Governorate. The bacteriological examination of cloacal, heart,

liver, lung and intestinal samples revealed positive isolation of 41 isolates including 15 isolates from Sparrow (*S.typhimurium* (5), *E. coli* (5), *Staph. aureus* (4) and 1 isolate of *proteus spp*), 12 from Ibis (*S. typhimurium* (3), *E. coli* (4), *Staph. Aureus* (2) and *pseudomonas aeruginosa spp* (3), 8 from Jackdaw (*S. typhimurium* (2), *E.coli* (3), *Staph. Aureus* (1) and *protues spp* (2)) and 6 from Doves (2 isolates of each of *S. typhimurium*, *E.coli* and *protues spp*). The pathogenicity test in three- day old chicks using *Salmonella typhimurium*, *E. coli*, and *proteus spp* resulted in 80%, 70% and 40% mortalities respectively. In - vitro antibiotics sensitivity test showed that the isolates were highly sensitive to enrofloxacin, flumequine, gentamycin and chloramphenicol. The present study indicated the possibility of wild birds to play an important role in transmitting of bacterial infection among poultry farms.

Key words: Wild birds, bacterial agents, poultry farms.

INTRODUCTION

There is no doubt that the free living wild birds are considered as a potential source of introduction of many diseases to domestic birds. Shahata *et al.*, (1990) could isolate *Salmonella spp* from several varieties of free living birds. Free living birds may act as introductory hosts for several kinds of bacteria, viruses and parasites to poultry population Kaleta, (2001).

Nowadays, infectious pathogens in wild life have become increasingly important throughout the world, as they have substantial impacts on human health and agricultural production Bengis *et al.*, (2004). Different bacterial pathogenes were transmitted through wild birds as the *Salmonella spp* that described by Pennycott *et al.*, (1998) and Reche *et al.*, (2003). On the other hand, some wild birds especially ibis play a major role in the process of natural selection and in controlling the numbers of agriculture and domestic life enemies such as rodents, reptiles, amphibians, molluscs and arthropods for this it is called farmer's friend, but unfortunately several bacterial agents as *E. coli*, *Salmonella*, *Proteus vulgaris*, *Pseudomonas aeruginosa* and *Pasteurella hemoltica* were isolated from ibis Soad and wafaa, (2003). Also, *E. coli*, *Pseudomonas aeruginosa*, *Klebsiella spp*, *Salmonella spp*, *Pasteurella spp*, *Staph aureus*, *Streptococcus faecalis*, *Bordetella spp* and *Proteus spp* were recovered from hoope, crow, ibis, sparrow, doves, quails and bat with variable rates Effat and Moursi, (2005).

The present investigation was carried out to study the prevalence and recovery of bacterial agents among some wild birds and the possibility of their transmission to other domesticated birds in Sohag Governorate.

MATERIALS and METHODS

1- Samples:

Seventy five of wild birds (20 of sparrow, 15 of ibis. 20 of jackdaw and 20 of doves) were randomly captured from different locations in Sohag Governorate. The specimens were subjected to post-mortem and bacteriological examination.

2- Bacteriological examination:

The samples were obtained aseptically from all internal organs including liver, heart, lungs and intestine as well as cloacal swabs. All samples were inoculated into selenite F. broth as well as nutrient broth and incubated for 18 hours at 37°C for selenite F.broth and 24 hours at 37°C for nutrient broth, followed by plating onto blood agar, nutrient agar, Eosin-methylene blue agar and MacConkey agar plates and incubated for 24-48 hours at 37°C. Suspected colonies from the different media were picked up and subjected for cellular and colonial morphology and serological tests according to Quinn *et al.*, (2002)

3- In vitro- antibiotic sensitivity test:

In vitro antimicrobial susceptibility testing for the isolated bacteria was carried out by the plate technique described by Finegold and Martin, (1986). Antibiotic sensitivity discs including Enrofloxacin (10 / µg), Tetracyclin (30 µg), Colistin sulfate (10 µg), Flumequin (30 µg), Ampicillin (10 µg) Gentamycin (10 µg), Naladixic acid (30 µg), Streptomycin (10 µg), Chloramphenicol (10 µg) and Erythromycin (15 µg) were used.

4- Experimental infection:

Fifty 3- day old chicks were obtained from El-Akthar farm, Sohag Governorate were used to study the pathogenicity of some isolated bacteria. Before infect, a random sample which included 10 birds were sacrificed for p/m, and bacteriological examination to prove that these birds were healthy and bacteria free. Other birds were divided into 4 groups, each group of 10 chicks. The first 3 groups (group 1, group 2 and group 3) were infected orally with *S. typhimurium*, *E. coli* and *proteus spp* respectively. Another group was left as uninfected control. All birds were kept under observation. Symptoms and post-

mortem findings were recorded. Trials for reisolation of the inoculated agents were conducted.

RESULTS

The clinical signs observed in the trapped birds were sever weakness and whitish diarrhea, while the post-mortem lesions revealed the presence of pictures of septicemia, pericarditis, perihepatitis, airsacculitis and pneumonia.

The relative incidence of the recovered bacterial isolated is shown in Table (1). We could recover 41 bacterial isolates as follows, 15 isolates (75%) from sparrow (*Salmonella typhimurium* 5(25%), *E. coli* 5(25%), *Staph. aureus* 4(20%) and *Proteus spp* 1(5%). 12 isolates (80%) from ibis(*Salmonella typhimurium* 3(20%), *E. coli* 4(26.7%), *Staph. aureus* 2(13.3%) and *pseudomonas aeruginosa* 3(20%). 8 isolates (40%) from Jackdaw (*Salmonella typhimurium* 2(10%), *E. coli* 3(15%), *Staph. aureus* 1(5%) and *Proteus spp* 2(10%). And 6 isolates (30%) from doves (*Salmonella typhimurium* 2(10%), *E. coli* 2(10%) and *Proteus spp* 2(10%).

The results of antibiograming on different bacterial isolates are shown in Table (2). Enrofloxacin, flumequin, gentamycin and chloramphenicol were the most effective drugs.

Table (3) illustrates the results of experimental infection. Experimentally infected all chicks in groups 1, 2 and 3 showed clinical signs in the form of depression, weakness, ruffled feathers and diarrhea. The mortality rate varied from 40 – 80 % according to the inoculated microorganisms. The control group remained apparently healthy through the experimentally period. Reisolation of the inoculated organism from the internal organs of experimentally infected chicks were positive.

Table 1: Incidence of bacterial isolates from different wild birds.

Wild birds	+/No	Incidence%	<i>Salmonella spp</i>	<i>E. coli</i>	<i>Staph. aureus</i>	<i>Pseudomonas aeruginosa</i>	<i>Proteus spp</i>
Sparrow	15/20	75%	5 (25%)	5 (25%)	4 (20%)	-	1 (5%)
Ibis	12/15	80%	3 (20%)	4 (26.7%)	2(13.3%)	3 (20%)	-
Jackdaw	8/20	40%	2 (10%)	3 (15%)	1 (5%)	-	2 (10%)
Doves	6/20	30%	2 (10%)	2 (10%)	-	-	2 (10%)

Table 2: Shows the results of in-vitro antibiotic sensitivity test.

Antimicrobial agents	Sensitivity of				
	<i>Salmonella spp</i>	<i>E. coli</i>	<i>Staph. aureus</i>	<i>Pseudomonas spp</i>	<i>Proteus spp</i>
Enrofloxacin	+++	+++	+++	+++	+++
Tetracyclin	+	+	-	-	-
Colistin sulfate	+	+	+	+	+
Flumequin	+++	+++	++	+	+++
Ampicillin	-	-	+	-	-
Gentamycin	+++	++	+	+	+++
Naladixic acid	+	+	-	-	+
Streptomycin	+	+	+	+	-
Chloramphenicol	+++	+++	+++	+++	++
Erythromycin	-	-	++	-	-

Table 3: Results of experimental oral infection of three day old chicks with different bacterial isolates.

Group No	Inoculated organism	Dose	No. of infected chicks	Daily deaths post infection										Total No. of death	No. of survivors	Mortality rate
		Route of infection		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10			
1	<i>Salm. spp</i>	3×10^8 orally	10	1	2	2	-	2	-	-	1	-	-	8	2	80%
2	<i>E. coli</i>	3×10^8 orally	10	-	1	2	1	1	1	1	-	-	-	7	3	70%
3	<i>Proteus spp</i>	3×10^8 orally	10	-	-	1	1	2	-	-	-	-	-	4	6	40%
4	control	uninfected	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Total			40	1	3	5	2	5	1	1	1	-	-	19	11	-

DISCUSSION

Various species of wild birds, because of their propensity to nest and roost near human activity, may harbor and disseminate various species of bacterial microorganisms to human, domestic birds and animals.

The results of post-mortem examination of trapped wild birds revealed the presence of pictures of septicemia, pericarditis, perihepatitis, airsacculitis and pneumonia. Similar findings were reported by Coe, (2002) and Effat and Moursi, (2005).

Bacteriological examination of 75 (20 sparrows, 15 ibis, 20 jackdaw and 20 doves) showed that *S. typhimurium* 5(25%), *E. coli* 5(25%), *Staph. aureus* 4(20%) and *Proteus* species 1(5%) were recovered from Sparrows while 12 isolates (*S. typhimurium* 3(20%), *E. coli* 4(26.7%), *Staph. aureus* 2(13.3%) and *Pseudomonas aeruginosa* 3(20%) were recorded from ibis. Regarding to Jackdaw and doves, our results showed that 8 isolates (*S. typhimurium* 2(10%), *E. coli* 3(15%), *Satph. aureus* 1(5%) and *proteus* species 2(10%) were recovered from Jackdaw and 6 isolates (*S. typhimurium* 2(10%), *E. coli* 2(10%) and *proteus spp* 2(10%) were recovered from doves. These results were to some extent similar to those recorded by Shahata *et al.*, (1990) who isolated *S. typhimurium* from sparrows with an incidence of 1.53% and Soad and Wafaa, (2003) who isolated *E-coli*, *Salmonella*, *Pseudomonas aeruginosa*, *Proteus vulgaris* and *Pasteurella hemolytica* from ibis, while Refsum *et al.*, (2003) and Effat and Moursi, (2005) who could isolate *Salmonella*, *E-Coli*, *Proteus*, *Pseudomonas aeruginosa*, *klebsiella spp* and *Staph. aureus* from different species of wild birds.

Concerning the in-vitro susceptibility of the isolates to antibacterial agents. Enrofloxacin, flumequine, gentamycin and chloramphenciol were the most effective drugs. Similar results were reported by Shahata *et al.*, (1990) and Effat and Moursi, (2005). They showed that *E-coli*, *Salmonella* and *proteus* were highly sensitive to chloramphenciol, flumequine and enrofloxacin.

The results of pathogenicity of the isolated bacteria from wild birds to three-day old chicks indicated that all the inoculated organisms were pathogenic, and these bacteria may be transmitted to poultry farms through wild birds. Our results revealed that the mortality rate was variable according to the inoculated microorganisms and were 80%, 70% and 40% for *S.typhimurium*, *E. coli* and *Proteus spp*, respectively. No deaths were recorded in control group. Somewhat similar findings were reported by Simth and Tucker, (1980) who found that *S. typhimurium* killed 79% of one-day old chicks, and Effat and Moursi, (2005) who reported that *E. coli* and *Salmonella spp* killed 100% and 80% of one day old chicks respectively.

Our results concluded that. the wild birds may cause a problems among poultry farms not only by causing messes with their dropping and nests but also can consume a large amount of feed as well as transmitting of some bacterial diseases.

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