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بعض جوانب عدوى ميكروب السيدوموناس ايروجنوزا في الدجاج

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تم عمل مسح بكتريولوجي للتعرف عن مدى انتشار ميكروب " السيدوموناس ايروجنوزا في ٢٢٠٠ عينة تشمل بيض غير مخصب ، أجنة دجاج ميتة ، كتاكيت سن يوم ، مبايض أمهات نافقة وقد تم عزل ١٠ ، ٣ عترات على التوالي من ٨٢٠ جنين دجاج ميت ، ٧٥٠ كتكوت سن يوم ، ولم يتم عزل الميكروب من البيض غير المخصب وكذلك مبايض الامهات النافقة

باجراء اختبار حساسية العترات المعزولة لثلاثة عشر مضادا حيويا أوضحت النتائج حساسية هذه العترات للجينتاميسين بنسبة ١٠٠٪ بينما وجدت أقل حساسية أو مقاومة للمضادات الاخرى المستخدمة .

أثبتت العدوى الصناعية بأحد العترات المعزولة لكتاكيت عمر يوم محدثا أعراض مرضية ووفيات .

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SOME ASPECTS ON PSEUDOMONAS AERUGINOSA INFECTION IN CHICKENS

(With 2 Tables)

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SUMMARY

Cultural monitoring was used to study the presence of Pseudomonas aeruginosa in 2200 non fertile eggs, dead in shell embryos, baby chicks and ovarised of dead parents. Pseudomonas aeruginosa could not be isolated from any of 420 non fertile eggs or 210 ovaries of dead parents, while 10 and 3 isolates were isolated respectively from 820 dead in shell embryos and 750 baby chicks.

The 13 Ps.aeruginosa isolated strains were 100% sensitive to gentamycin, while less sensitive or resistant to the other used 13 antibiotics.

In experimental infection the isolated organism was pathogenic to one day old chicks causing symptoms and mortality.

INTRODUCTION

Pseudomonas aeruginosa had been isolated from hen eggs (ZAGOEVSKI, 1956) and also found to be associated with other pathogenes incriminated in embryo mortalities (SATO, et al. 1961; RESENS and SAZLY, 1974). This organism was isolated from outbreaks in baby chicks by MIRELES, et al. (1979); AWAAD, et al. (1981) and ANDRAEV, et al. (1981).

The antibiograms for Pseudomonas aeruginosa were studed by MACDONALD, et al. (1973); MARKARGAN (1975); SIRNIVASAN, et al. (1975) and CHAKRABARTY, et al. (1980). So this work was planned to study the prevalence of Pseudomonas aeruginosa orgaanisms in poultry as well as their antibiogram and pathogenicity to one day-old chicks.

MATERIAL and METHODS

1- Samples:

The yolk material or sac of 420 non fertile hen eggs, 820 dead in shell embryos, 750 newly hatched chicks and 210 ovaries of dead parents were collected from 15 farms and 5 hatcharies and subjected to bacteriological examination.

2- Bacteriological examination:

The collected samples were streaked on neutrient and MacConky agar plates and incubated at 37°C for 24 hours and then purified. The obtained growth was ibentified morphologically

and biochemically according to CRUICKCHANK, et al. (1970).

3- Antibiogram:

The isolated Pseudomomas aeruginosa organisms were subjected to the antibiotic sensitivity testing (CHABBERT, 1982) using the most known antibiotics used in the poultry field including ampicellin, chloramphinicol, erythromycin, nitrofurantion, nalidixic acid, gentamycin, spiramycin, doxycycline, streptomycin, bacitracin, kanamycin, penicillin G and oxytetracycline obtained from Bio Meriux. Alplucin obtained from Virbac scientific office, Cairo.

4- Experimental investigation:

Eighty-five, one day-old Fayomi chicks were used in this work to study the pathogenicity of the isolated Pseufomonas aeruginosa isolates. Ten out of these chicks were taken randomly, sacrifised and subjected to bacteriological examination at the 1st day of life to be sure that they were free from Ps.organisms. The remaining 75 chicks were divided randomly into 3 equal groups; 25 chicks each. Chicks of the 1st group recived $4x10^6$ viable organisms intra crop, while those of the 2nd group were subcutaneously inoculated each with $2x10^6$ viable cells of the same Ps.organism. Birds of the 3rd group were kept as negative control. The three groups were kept under daily observation for symptoms and mortalities for 21 days.

RESULTS

1- Clonial morphology of the isolated bacteria as well as their growth and biochemical character proved that the isolated 13 isolates could be identified as Ps.aeruginosa (Table 1). Ten isolates (1.2%) were isolated from dead in shell eggs and the other 3 isolates (0.4%) were isolated from the newly hatched chicks while no Ps.organisms could be detected from both non fertile and ovaries of dead parents. The total isolation percent was 0.59.

2- Antibiogram showed that (table 2) 100 percent of the tested isolated were sensetive to gentamycin, while sensetivity of these organisms varied from 0.0 to 38.46 percent to the other used antibiotics.

3- Experimental infection of one day-old chicks showed that: Birds of the 1st group that intra crop infected; showed only symptoms of depression, ruffeled feather, droping of wings, staggering gate and 5 of them had pasty vent. 14 chicks out of 25 were deied 3-15 days post infection, and the mortality rate reached 56%. Post mortem lesions in dead chicks were emaciation with liver and heart congestion. Ps.aeruginosa could be re- isolated from dead birds. At the end of the observation period the survivors showed no macroscopic lesions and all of them were negative to bacteriological examination.

In the 2nd group, that subcutaneously inoculated, the mortality reached 100% in the frist 18 hours after infection without detectabel clinical signs. The main recorded post mortem lesions were severe congestion of the whole body specially heart and liver. ps.aeruginosa organism could be reisolated from the internal organs of all dead birds.

The 3rd control negative, group remained without detectable signs or deaths. Birds of these group showed negative bacteriological examination to Ps.organisms at the end of the experiment.

DISCUSSION

Isolation of Pseudomanas aerugenosa from dead embryos indicates that this organism could be incriminated with causes of embryonic mortality. RENSE and SAZALY (1974) and SAAD, et al. (1981) found simillar findings. HONICH (1972) found that bursting of putrid eggs in the incubator was the source of Pseudomonas infection in an outbreak involving newly hatched pheasants.

The in vitro sensitivity of the 13 isolated Ps.aeruginosa was 100% to gentamycin which agrres with those reported by CHAKRABARTY, et al. (1980). While was less sensitive to streptomycin which disagrees with that reported by CRISTCA, et al. (1969), KARKARYAN (1975), SRINIVASAN, et al. (1975) and AWAAD, et al. (1981). However, this result agrees with that observed by PALLII, et al. (1975). The reduced sensitivity fo the Ps.aerugenosa strains to kanamycin agrees with the results of AWAAD, et al. (1981) and disagrres with that observed by LUSIS and SOLTYS (1971). While resistance of the isolated Ps.aeruginosa strains to oxytetracycline is in accordance with findings reported by LUSIS and SOLTYS (1971), SIRNIVASAN, et al. (1975) and AWAAD, et al. (1981).

Results of experimental investigation in chicken group inoculated subcutaneously; 100% mortality; with special congested heart and liver a result which agree with those obtained by AWAAD, et al. (1981) and LUI (1966) who had explained this mortalities to the exotoxins of Ps.aeruginosa which could kill the experimental animal in few hours after injection and suggested that the toxin appeared to act on the nervous and circulatory systems, while the results of orally infected group was 56% in 3-15 days after infection, these results are higher than that obtained by AWAAD, et al. (1981) and agreed with those oF GROSS (1978) who recorded that the mortality due to Ps.aeruginosa could be ranged from less than 1 to over 90%.

We can say that the infective dose should be furtherly studed to determine the acurate infective dose for both subcutaneous and oral route of infection.

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Table (1)
Results of bacterial monitoring of samples

Origin of culture	No. of examined samples	No. of positive samples	No. of negative samples	percentage of positive
Dead in shell	820	10	810	1.2
Newly hatched chicks	750	3	747	0.4
Non fertile eggs	420	-	-	0.0
Ovaries of dead parents	210	-	-	0.0

Table (2)
Results of invitro antibiotic sensitivity testing (Antibiogram)

Drugs	No. of sensitive/No. of tested isolat	Standard zone diameter	Recorded inhibitory zone diameter	Percent of sensitive
Gentamycin	13/13	12 - 13	13 - 28	100.00
Chloramphinicol	5/13	12 - 18	13 - 25	38.46
Doxycyeline	4/13	12 - 16	12 - 14	30.76
Nitrofurantion	4/13	14 - 17	14	30.76
Penicillin G	2/13	12 - 20	12 - 15	15.38
Ampicillin		11 - 14	11	
Streptomycin		11 - 15	14	
Spiramycin	1/13		25	7.69
Kanamycin		13 - 18	13	
Bacitracin		8 - 13	8	
Albucine			0	
Nalicixic acid	0/13	13 - 19	0	0.00
Erythromycin		13 - 18	0	
Oxytetracycline		14 - 19	0	