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BACTERIAL CAUSES OF LOWERING HATCHABILITY AND EARLY EMBRYONIC CHICKEN DEATHS IN BALADY HATCHERIES IN DAKAHILA GOVERNORATE

(With 4 Tables)

By

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المسببات البكتيريه لقلة الفقس ونفوق أجنة الدجاج المبكر فى المفرخات البلديه فى محافظة الدقهليه

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تم فحص ٦٦٢ عينه من البيض غير المخصب والمحتوى على أجنه ميته . تم جمع العينات عشوائيا من المفرخات البلديه فى محافظة الدقهليه لاستبيان المسببات البكتيريه لهذه المشكله .كانت العينات الايجابيه للفحص البكتريولوجى من البيض الغير مخصب بنسبة ١ر١٨٪ وفى البيض المحتوى على أجنه ميته بنسبة ٩ر٣٢٪. كانت عترات الميكروب القولونى هى السائده فى البيض الغير مخصب بنسبة ٤ر٢٦٪ وفى البيض المحتوى على اجنه ميته بنسبة ٩ر٢١٪ وهذه العترات قد عرفت سيريولوجيا. ميكروبات البروتيس ، السيدوموناس ، العنقودى الذهبى ، الكلبسيلا ، الستروباكتر ، والانتيروباكتر تم عزلها من البيض الغير مخصب بنسب ٦ر٢٢ ، ٣ر١٢ ، ٤ر٩ ، ٣ر١١ ، ٥ر٧ ، و ٥ر٧ ٪ على التوالى. ومن البيض المحتوى على أجنة ميته تم عزل ميكروبات السيدوموناس ، والعنقودى الذهبى ، الكلبسيلا ، والستروباكتر ، والانتيروباكتر بنسب ٤ر١٠ ، ١ر ١٧ ، ٦ر١١ ، ٦ر١١ ، ٥ر٥ ٪ على التوالى . أما ميكروب السالمونيلا فقد تم عزله من البيض المحتوى على أجنه ميته بنسبة ٣ر٧ ٪ ومن البيض الغير مخصب بنسبة ٨ر١٪ وقد تم التعرف سيريولوجيا على المعزولات لهذا الميكروب .

SUMMARY

A total of 662 samples including infertile eggs and dead inshell chicken embryos were collected from different balady hatcheries located in Dakahlia Governorate. The samples were examined bacteriologically for detection the actual bacterial causes of this hatching problems. The percentage of positive samples from infertile eggs and from dead in shell chickens embryos were 18.1 and 32.9% respectively *E.coli* isolates were the most prevalent organism isolated from infertile eggs with an incidence of

(26.4%) and from dead in shell embryos (21.9%). *E.coli* isolates were serologically identified. Proteous, Pseudomonas, Staph aurecus, Klebsiella, Citrobacter and Enterobacter organisms were successfully isolated from infertile eggs with an incidence of 22.6%, 13.2%, 9.4%, 11.3%, 7.5%, and 7.5% respectively. The same organisms except Proteous were recovered from dead chicken embroys at rate of 10.4%, 17.1%, 11.6%, 11.6% and 5.5% respectively. Salmonella was the lowest organism isolated from infertile eggs (1.8%) and from dead chicken embryos (7.3%), and they were serologically identified.

Keywords: *Bacterial causes, lowering hatchability, early embryonic deaths, chickens, balady hatcheries, Dakahila Governorate, Egypt.*

INTRODUCTION

Hatching in Egypt is done either by old (balady) hatcheries or modern ones, the balady ones still represent an important and continuous source of day old chick. As known the healthy day-old chick is considered the nucleus of poultry industry in Egypt.

Many-problems involved the baladuy hatching process. Such construction of buildings, the lack or even complete absence of hygienic measures, un-sanitary conditions of egg collection, unsuitable storage and hatching process are the main causes of the bacterial infections. Such infections lead to early embryonic death, lowering hatchability and reduction of the fertility of hens egg. Several microorganisms were incriminated as a causes of embryonic deaths and lowering hatchability, *Salmonella sp. (HAMADA,1968).E.coli (STIPKOVITS and SOLYON, 1970), Klebsiella Spp. (SAKAZAKI and NAMIOKA, 1958),* Proteus spp. *(DAWEDKAR and DHANSER, 1960), Pseudomonas spp (SATO et al., 1981)* and *Staphylococcus spp. (HARRY, 1975).*

This study was done to find out the prevalence of bacterial agents ponsble for, low hatchability and early embryonic deaths in Balady hatcheries in Dakahlia governorate.

MATERIAL and METHODS

MATERIALS:

Samples:

A total of 662 sample from infertile and dead in shell eggs were collected from private Balady hatcheries from different localities in Dakahlia Governorate.

Collection of Samples:

The out side of the egg shells were disinfected with tincture iodine 2% for five minutes and left fifteen minutes and with the aid of sterile scissor a sufficient area around the air sac was removed and the egg content was drained into sterile petridish. The egg fluids and samples from liver, heart and yolk of dead embryos were used for bacterial isolation.

METHODS:

Samples of both infertile and dead in shell ones were cultivated onto nutrient agar, blood agar, manitol salt agar, McConkey's agar plates, nutrient broth (for further purefication) and selenite

F.broth (nourishment and specific for Salmonella isolation) then aerobically incubated at 37 °C for 24-48 hours. The growing colonies were subjected to the morphological and biochemical criteria for their identification according to *FINEGOLD and MARTIN (1982).*

Serological identification of Salmonella and E.coli:

Salmonella and *E. coli* isolates were identifed according to *EDWARD'S and EWING (1972) and SOJKA (1985).*

RESULTS

The results are recorded in 1, 2, 3 and 4 tables.

DISCUSSION

Balady hatcheries still represent a major source of day-old chick production in Egypt. The process of production faces great losses mainly due to microbial contaminants. The present work was planned to throw some lights on the role of bacterial agents which may incriminated in lowering hatchability and early embryonic death in balady hatcheries.

The obtained data revealed that *E.coli* was present at a total incidence of 23.04%. The incidence percentage nearly simulated with those stated by *ENANY et al., (1989).* Such results were lower than obtained by *SHALABY and ABD EL-HAMID (1987)* and higher than obtained by *DAWEDKAR and DHANSER (1960).* Such flactuation in the prevalence strains of E.cloi as a possible causative agents may be due to the variable sanitary conditions of hatching, quality of the used eggs and the maternal health of parent flock.

With regard to Salmonella, its incidence percentage was 6% which corresponded with that reported by *HALL et al., (1949).* The results in this work were higher than obtained by *EL-AGROUDI and AWAD (1966). KARAMAN (1980) &* our results were lower than obtained by *MUNIBARY (1980).*

Concerning Klebsiella, the results revealed that it was isolated at an incidence of 1.5%. These results agree with those of *SARAKEBI et al., (1981).* Such findings are very lower than obtained by *SOKKAR et al., (1985).* On other hand the obtained results are higher when compared with that reported by *SAID (1988).*

With regard to the isolation of Proteous, the data indicated that it was 16.6%. These results agree with *ENANY et al., (1989).* Such rate is lower when compared with that reported by *SHALABY and ABD EL-HAMID (1987).*

Concerning Pseudomonas aerginosa, it was isolated with an incidence of 11.1%. These results simulate with the findings of *NASHED et al., (1981).* Such results are lower than those obtained by *KARAMAN (1980) and SOKKAR et al., (1985)* and higher than obtained by *EL-ATREBY (1982).*

With regard to the isolation of Staph. aureus it was isolated with an incidence of 15.2% that nearly corresponded with that reported by *SAID (1988).* The obtained results were lower than those obtained by *EL-DIMERDASH (1974)*

and higher than obtained by *ENANY et al., (1989).*

Citrobacter and Enterobacter were isolated with an incidence of 10.6% and 6% respectively.

The difference in the rate of isolation may be attributed to some deffects in sanitation as explained by *GYLSTORFF (1982).* Moreover the disease conditions of the parent flocks, incubators and enviroment may play an important role on the rate of hatchability. So the best sanitary measures and planned program for eradication of diseases from parent flocks will help for controlling low hatchability and minimizing the number of dead in shell of microbial organisms.

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Table 1:

Results of isolation from infertile eggs and dead in shell embryos from different localities

Locality	Infertile eggs			Dead in shell embryos		
	No of examined eggs	No of positive cases	%	No of examined eggs	No of postive cases	%
Mansoura	35	12	34.3 %	85	30	35.3 %
Dekernes	45	9	20 %	82	28	34.1 %
Menyt El Nasser	50	7	14 %	70	26	37.1 %
Manzala	28	6	12.4 %	80	25	31.2 %
Sherbeen	31	2	6.5 %	60	20	33.3 %
Aga	32	4	12.5 %	64	16	25 %
Total	221	40	18.1 %	441	145	32.9 %

Table 2:

Results of bacterial identification of isolated microorganisms recovered from dead in shell chicken embroys and infertile eggs collected from baladi hatcheries in different areas of Dakahlia Governorate.

	No of positive samples	No of isolates		E. coli		Salmonella sp.		Klebsiella sp.		Proteus sp.		Ps. aeurginosa		Staph. aureus		Citrobacter sp.		Enterobacter sp.	
		I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D
Mansoura	42	13	38	4	10	1	3	2	4	2	7	1	3	2	8	-	2	1	1
Dekernes	37	13	35	4	7	-	3	1	2	4	6	2	5	1	5	-	5	1	2
Ment El Nasser	33	8	28	2	5	-	2	-	5	3	5	1	3	-	4	1	3	1	1
Manzala	31	10	21	3	7	-	1	1	1	2	3	2	1	-	3	2	2	-	3
Sherbeen	22	5	21	-	3	-	2	2	3	-	1	1	2	1	5	-	4	1	1
Aga	20	4	21	1	4	-	1	-	4	1	2	-	3	1	3	1	3	-	1
Total	185	53	164	14	36	1	12	6	19	12	24	7	17	5	28	4	19	4	9
Incidence Percentage				26.4%	21.9%	1.8%	7.3%	11.3%	11.6%	22.6%	14.6%	13.2%	10.4%	9.4%	1'.1%	7.5%	11.6%	7.5%	5.5%

I = Infertile eggs D = Dead in shell chicken embroys

Table 3:

Incidence percentage of different microorganisms isolated from both infertile eggs and dead in shell chicken embryos.

Bacterial isolates	Dead in shell	Infertile eggs	Total	%
	No of isolates	No of isolates		
E. coli	36	14	50	23.04
Proteous	24	12	36	16.6
Pseudomonas	17	7	24	11.1
Klebsiella	19	6	25	11.5
Salmonella	12	1	13	6
Staphylococci	28	5	33	15.2
Citrobacter	19	4	23	10.6
Enterobacter	9	4	13	6
Total	164	53	217	

Table 4: Serological typing of E. coli and Salmonella recovered from dead shell embryos and infertile eggs.

Microorganism	No of isolates	Serological types	No. of strains isolated
E. coli	50	026 : B 7	12
		0111 : B4	6
		0126 : B 7	5
		0119 : B 14	5
		086 : B 7	3
		0125 : B 15	4
		0127 : B 8	3
		055 : B 5	6
		Untypable	6
Salmonella	13	Sal. Pullorum	5
		Sal. typhimurium	3
		Sal. paratyphi	2
		Sal. montevideo	2
		Sal. infantis	1