Vet.Med.J.,Giza. Vol.41,No.3.(1993):63-65

INCIDENCE OF ISOLATION OF MICROORGANISMS LEADING TO EMBRYONIC MORTALITIES AND REDUCING HATCHABILITY OF DUCK EGGS

BY

I.H.GHARIB, A.M.W. KHEIR ELDIN*, M.A. BASTAMI*, SALAH WAHBA**, E.E.A. SAFWAT*** AND ESAM HATEM*

* Faculty of Vet. med. Cairo University.
** Vet. Ser. and Vacc. Res. Inst. Egypt.
*** Animal Health Inst.

Received 10/7/1993.

SUMMARY

This work is concerned with the infectious agents which may lead to death of duck embryos before hatching and lower the production of the duck hatcheries. Bacteriological examination of samples taken from ducks reared in Ismailia province revealed that out of 600 total isolates; Pseudomonas aeruginosa was the most prevalent bacterial agent (10.5%) followed by Proteus species (7%), E. coli (6.5%), Salmonella spp. (5.3%), Klebsiella (3.5%) and Staphylococci (3%). The fungal agents were; Asperigillus flavus (3.7%), Penicillium spp. (3.5%) and Asperigillus fumigatus (1%).

INTRODUCTION

Refai, (1971) isolated Asperigillus flavus, Asperigillus niger, Mucor, Fusarium and Stemphylium from dead-in-shel duck embryos.

Sadek, (1972) found that Salmonella muenchen caused remarkable low hatchablity percent in ferile duck eggs and high death rate in newly hatched ducklings.

Talaat and Fawzia, (1975) examined bacteriologically 2615 infertile duck eggs, dead-in-shell embryos and one day old ducklings for isolation of Salmonellae and could recover 171 isolates from the examined samples.

The aim of this work was to reveal the microbial agents resulting in embryonic mortalities and reducing the hatchability percent in ducks.

MATERIAL AND METHODS

MATERIAL:

A total of 600 samples were collected from duck hatcheries in Ismailia governorate. The duck hatcheries were belonging to three private duck producing enterprises which were El-Tal El-Kebir, Abo-Soir and Nefisha areas which housed about 20000 pekin breeder ducks aged 9-12 months. The egg production ranged between 55 and 70% and the hatchability ranged from 45-65%. Suitable bacteriological media, reagents, chemicals and diagnostic antisera were prepared and used as necessary.

METHODS:

Isolation and culture procedures:

A loopful from the content of each infertile egg, as well as, another loopful from liver and yolk sac of each dead-in-shell embryo were inoculated on nutrient agar, blood agar and McConkey agar then incubated at 37°C for 24 hours. Similar samples were incubated at 37°C for 12-18 hours. Then the inoculated tubes were subcultured on McConkey agar and incubated at 37°C for 24 hours. Moreover, a loopful from the fluids surrounding the embryos were streaked on Sabouraud maltose agar medium with 0.5 mg/ml from chloramphinicol. The plates were incubated at

25°C for 5 days. The isolated fungi were examined morphologically and identified microscopically according to Ajelle et al. (1963). Biochemical identification of the isolated agents carried out following Cruickshank et al. (1975). Serological typing was carried out according to Edwards and Ewing (1972), inodified by kauffman White Scheme.

RESULTS

The results of isolation are summerized in the following table.

unhatched duck eggs.

Safwat et al. (1984) isolated *P. vulgaris* at a rate of 8.5% from 200 duck eggs and Safwat et al. (1986) isolated *Pr. species* at a rate of 19.3% from dead duck embryos which is much higher than our results (7.3%) which are in agreement with Dhawedkar and Danser (1960) and were lower than reported by Ranes and Szaly, 1974 (15%).

We could isolate 28 E.coli strains from 450 dead-in-shell duck embryos at a rate of 6.2%. This result is inagreement with that of El-Ebedy et al.

Table : Results of isolation of microorganisms

Isolate	From total samples 600		From infertile duck eggs 150		From dead-in-shell embryos 450	
	Frequ	%	Frequency	%	Frequency	%
Ps. aerug.	63	10.5	9	6	54	12
Prot. spp.	42	7	9	6	33	7.3
E. Coli	39	6.5	11	7.3	28	6.2
Salmonell.	32	5.3	6	4	26	5.8
Klebsiella	21	3.5	3	2	18	4
Staphyloc.	18	3	5	3.3	13	2.9
Prot. vulg.				2.7		3.8
Prot. rettg.				1.2		
A. flavus	22	3.6	5	3.3	17	3.7
Penicillium Species	21	3.5	6	4	15	3.3
A. fumigatus	6	1	2	1.3	4	0.9
A. niger	8	1.3	1	0.6	7	1.5

DISCUSSION

It is clkear that *Ps. aeruginosa* was the most prevalent organism as it represent 10.5% from the total samples. 9 from 150 infertile eggs (6%) and 54 from 450 dead-in-shell duck embryos (12%). Moreover, *Ps. aeruginosa* was isolated at a rate of (13.9%) from 238 unhatched duck eggs. Similar results were obtained by Safwat et al. (1984) who isolated *Ps. aerginosa* at a rate of (11%) from 200 infertile duck eggs.

Safwat et al. (1980) isolated *Ps. aerugnosa* at a rate of (13.3%) from 150 dead embryos as well as 5 out of 75 infertile eggs at a rate of 6.6%. Similar findings were recorded by Sokkar et al. 91985) isolated Proteus spp. at a rate of 5.6% from (1967) 6.5%. Higher results were obtained by Gajdsid (1985) 9% from 600 dead duck embryos and Safwat et al. (1986) 18.6% from dead duck embryos.

However, Zagaevski (1956) isoalted Sal. spp. at a lower rate than our results, and isolated *S. pullorum* in a rate of 0.2% and *S. typhimurium* in a rate of 0.5% from yolk of duck eggs.

The relatively higher rate of Salmonella isolation from duck eggs and dead embryos recorded in this study may confirm the higher susceptibility of ducks than the chickens to the infection with Salmonella spp. Anderson (1932) and Dhawedkar and Dansar (1960).

In our study, 21 klebsiella spp. were isolated at a

rate of 3.5% from 600 samples, 2% from infertile duck eggs and 4% from dead-in-shell embryos. Sokkar et al. (1985) recorded a slightly higher rate of isoaltion, 32 Kl. from 560 unhatched duck eggs at a rate of 5.7%.

18 Staphylococci were isolated in our study at a rate of 3% from total samples, 5 Staph. from 150 infertile eggs and 13 Staph. from 450 dead-in-shell duck embryos at the rate of (3.3%) and (2.9%) respectively. Lower rate was obtained by Sokkar et al. (1985) who isolated 9 Staph. from 560 unhatched eggs at a rate of 1.6%. The incidence of As. fumigatus was very low (1.0%) in the examiend samples, this agree with the resutls obtained by Sokkar et al. (1985) 0.9% from unhatched duck eggs, as well as Gajdsis (1985) isolated (0.9%) from dead duck embryos. The incidence percent of Asp. Niger was 1.3% and this agreed with that reported by Sokkar et al. (1985) 1.1% from unhatched duck eggs, but it differ greatly from the results of Saif and Abol Khier (1979) who isolated 70 A. niger from 80 dead-in-shell duck embryos. Asp. flavus recovered in a rate of 3.7%, a finding which is much higher than the figure given by Sokkar et al. (1985) 0.5% from unhatched duck eggs, and lower than that obtained by Saif and Aboul Khier (1979) 60 from 80 from dead-in-shell embryos. Penicillium was isolated in a rate of (3.5%) which differ greatly from that obtained by Saif and Aboul Khier (1979) who isolated this organism as 50 out of 80 dead-in-shell duck embryos.

REFERENCES

Ajellol, George, L.K., Kaplan, W. and Kaufmann, L. (1963): Laboratory Mannual for Medical Mycology, Washington U.S. Gov. Printing Office.

Anderson, F. (1932): The incidence of bacteria in eggs. Cited in Vet. Bul. 4, (1934).

Cruickshank, R., Duguid, J.P., Marmion, B.P. and Swain, R.H.A. (1975): Medical Microbiology 12th ED. Churchill Livingstone, Edinburgh, London and New York.

Dhawedkar, R.G. and Dansar, N.S. (1960): Microflora of dead in shell embryos. Ind. Vet. J. a 48, 233.

Edwards, P.R. and W.H. Ewing (1972): Identification of Enterobacteriaceae. Burgess, Minneapolis.

El-Ebeedy, A., Sokkar, I., Soliman, A., Rashwan, A. and Ali, N.M. (1987): Incidence of mycoplasmas, acholeplasmas and asociated E. coli and Fungi in duck at upper Egypt. J. of the Egyptian Vet. Med. Ass. (1987), 47, (1/2), 143-151.

Gajdsis, K. (1985): Prevalence of diseases of genital organs of ducks and geese in large flocks and analysis of the effect on reproduction. Zeszyty Naukowe Akadamii Rolnicze J. we Worclawiu Weterynaria, (1985) 42, (157) 7-27.

Refal, M. (1971): The incidence of mould in poultry industry and determination of pathogenicity and disinfection. Proc. of the Mycology Congress Frankfort, W. Germany.

Renes, I. and Szalay, G. (1974): Bacteriological examination of chick embryos that died during incubation. Magyar Allatatrasak Lapja, 29, 153.

Sadek, Ikhlas, M. (1972): Recording Salmonella muenchen (6, 8:d 1,2) from duckling in Egypt. 10th Arab Vet. Cong., 1972.

Safwat, E.E.A., Awaad, M.H.H., Ammer, A.M. and El-Kinawy A.A. (1984): Studies on Pseudomonas aeruginosa, Proteus vulgaris and S. typhimurium in ducklings. Egypt. J. Anim. Prod. 24, 1-2.

Safwat, E.E.A., S. Wahba, N. Metwally and M. Refai (1986): Incidence of Salamonellae and other gram negative organisms in balady ducks and infertile eggs. J. Egypt. Vet. Med. Ass. 46, No. 2, 199-206. (1986).

Saif, A. and Aboul-Khier (1979): Studies on the epidemiology of Aspergillosis in poultry and poultrymen. J. Egypt. Vet. Med. Ass. 39, No. 2, 395 (1979).

Sokkar, I.H., Saif, E., Ibrahim, A.A., Shehata, M.A., Moussa, S. Hashem, S. and El-Kinawi, A. (1985): The role played by the microbial infection on hatchability rate of duck embryos. Assiut Vet. Med. J. Vol. 14, No. 28: 227.

Talaat Shouman and Fawzia, M.M. (1975): A trial to investigate epidemiology of Salmonella in ducklings and ducks. J. Egypt. Vet. med. Assoc. (1975), 35, No. 3, 257 -274.

Zagaevski, I.S. (1956): Factors contributing to estab;lishment of the microflora in eggs and methods of chlorinating eggs before incubation. veteriynaria Moscow (1956), 33, 58.