

Effect of Ornithosis on Experimental Fowl Malaria.* (23225)

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In a large series of immunological experiments with ducklings, heightened resistance to *P. lophurae* infections was found to be associated with mortality from an unknown cause. Ornithosis was isolated and identified as the cause of the unexpected mortality and as responsible for the heightened resistance to experimental malaria infections. The virus was isolated from lymph glands, spleens and from air sacs. The spleen was the most dependable source. The virus was identified as follows. It caused typical disease and histological changes in ducklings with great regularity. Liver and spleen were enlarged due to great expansion of the reticulo-endothelial system. Fibrinous exudates were present in the pericardial sac and in the air sacs. Typical organisms were always to be found in air sac membranes by the Machiavello stain. The virus would not pass a Seitz EK filter. Bacteriological studies in considerable detail disclosed no other organisms. Serological examination of the blood of recovered ducklings was positive for ornithosis-psittacosis, but this evidence is weakened by the fact that the disease was endemic in the laboratory flock. Finally, Dr. Karl Meyer was able to identify our organism as ornithosis. All this evidence, together with the unfailing infectiousness of standard preparations in young ducklings resulting in disease with typical gross and microscopic findings, makes it reasonable to accept the agent as that of ornithosis.

Methods. The virus was kept in passage by intraperitoneal transfer of suspensions of infected spleen. For immunological experiments a clear suspension was made from supernates of infected spleen suspensions by diluting with ice water and bubbling carbon dioxide through in the cold; the white precipitate was removed and suspended in saline to form a colorless, water clear preparation suitable for intravenous use and for filtration experiments. Ordinarily 20 ml of this refined

suspension represented the material from one infected spleen; usually 2 ml was enough when given intravenously to young ducklings to cause typical moderately severe disease in 5-8 days.

Results. Ornithosis infections of graded severity were produced in young (under 6 days) ducklings by intravenous injections of the material described. Ten to 12 days later a challenge dose of 20 million living *P. lophurae* was given intravenously. Twelve experiments in which the original ornithosis infections were purposely severe are shown in resume in Table I. There is some mortality from ornithosis, but a very high resistance to malaria is also evident. Ten other experiments in which the original ornithosis infections were purposely milder are shown in Table II. In this group none of the ducklings died from ornithosis, but a high survival rate from malaria is again evident.

The results appearing in Tables I and II exemplify many others very similar in nature secured in this laboratory from experiments in which infectious material from blood, lymph glands, air sacs, fibrin and liver was given by routes other than the intravenous one (subcutaneous, intramuscular, oral, intraperitoneal). It is safe to say that if young ducklings are adequately infected with ornithosis by any route 7 or more days before challenge they will exhibit greatly heightened resistance to malaria, and that this increased resistance is associated with evidence of the presence of ornithosis. Enlargement of spleen

TABLE I. Young Ducklings Infected with Ornithosis Virus and 12 Days Later Challenged with Malaria. Moderately severe ornithosis. Combined results of 12 experiments.

	Test	Control
No. of ducklings used	156	66
" surviving ornithosis infection	140	
" " malaria challenge	135	6
% " malaria challenge	96.5	9.1
% having mild parasitemia	94	3

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TABLE II. Young Ducklings Infected with Ornithosis Virus and 10 Days Later Challenged with Malaria. Mild ornithosis. Combined results of 10 experiments.

	Test	Control
No. of ducklings used	130	52
" surviving ornithosis infection	130	
" " malaria challenge	126	4
% " malaria challenge	97	7.7
% having mild parasitemia	98	2

and liver (due to ornithosis) is always present

in resistant ducklings.

Summary. 1) Ducklings infected with ornithosis 6 to 14 days before a challenge dose of *P. lophurae* malaria parasites exhibit a marked resistance to the challenge. 2) The resistance is associated with increase of the reticulo-endothelial elements in the enlarged liver and spleen due to the ornithosis infection.

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Oviduct Response to Estrogen and Progesterone in the Ring Dove (*Streptopelia risoria*).^{*} (23226)

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Both antagonistic(1) and synergistic(2,3, 4) effects of progesterone and estrogens on weight of the oviducts of domestic hens have been reported. Mason(5) showed that the amounts and dosage ratios of estrogen and progesterone determined, in part, whether an antagonistic or synergistic effect would be observed. Furthermore, the 2 hormones appear necessary for normal oviduct development, as estrogen alone causes gland growth but progesterone in the presence of estrogen induces formation of secretion granules in the magnum(4).

In the course of a study of the hormonal induction of incubation behavior in the ring dove(6), behavioral effects of the hormones were found which suggested that the normal course of nest-building and incubating behavior depends upon the *successive* effects of estrogen and progesterone. The present study was undertaken to determine whether the effects of estrogen and progesterone on oviduct weights in this species are consonant with the hypothesis that progesterone is secreted after a period of estrogen secretion.

Methods. Sixty-three female ring doves (*Streptopelia risoria*), approximately 4 months of age, were selected for the experiment on

the basis of direct examination of the ovary and oviduct through an incision in the abdominal wall. All had first and second phase ovules and undeveloped oviducts, and were thus not quite mature(4,7). The mean body weight was 148.7 g, S.D. 15.2 g. The substances used were injected (in 0.1 ml sesame oil) into the pectoral muscles on alternate sides from day to day, for 10 days. On the day following the last injection, the birds were killed by an overdose of pentothal sodium, and the oviducts removed and weighed. Groups of 9 birds each were treated as follows: 1) Control. 0.1 ml sesame oil daily x10. 2) Progesterone. 0.1 mg daily x10. 3) Estrogen. 0.4 mg diethylstilbestrol daily x10. 4) Progesterone + Estrogen. 0.1 mg progesterone plus 0.4 mg diethylstilbestrol daily x10. 5) Control primed. 0.1 ml sesame oil daily x8, followed by 0.1 mg progesterone plus 0.4 mg diethylstilbestrol daily x2. 6) Progesterone primed. 0.1 mg progesterone daily x8, followed by 0.1 mg progesterone plus 0.4 mg diethylstilbestrol daily x2. 7) Estrogen primed. 0.4 mg diethylstilbestrol daily x8, followed by 0.1 mg progesterone plus 0.4 mg diethylstilbestrol daily x2.[†]

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