ATTEMPTS AT INFECTING RINGED TURTLE DOVES WITH VIRULENT Trichomonas gallinae

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ATTEMPTS AT INFECTING RINGED TURTLE DOVES WITH VIRULENT *Trichomonas gallinae*

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Abstract: Twenty *Trichomonas*-free ringed turtle doves *(Streptopelia risoria)* were inoculated per os with the highly virulent Jones' Barn strain of *Trichomonas gallinae*. None became infected. Three F_1 females housed together were similarly inoculated with this strain and remained *Trichomonas*-positive for upwards of 182 days. They showed no disease and eventually lost their infections. These three positive females "mated" and laid several six-egg sets in a communal nest. At successive nestings they were given: 1) a fertile domestic pigeon *(Columba livia)* egg, and 2) two fertile ringed dove eggs, all of which hatched. The pigeon squab died of trichomoniasis on day four; the doves survived to maturity. When trichomonads from these doves were placed in *Trichomonas*-free domestic pigeons the latter all died of *T. gallinae* trichomoniasis on postinoculation day 8.1 (average).

INTRODUCTION

In 1936 Cauthen[1] described trichomoniasis due to *Trichomonas gallinae (Trichomonas columbae* sic) in a colony of pigeons and doves which included the ringed turtle dove *(Streptopelia risoria)*. In 1974, however, Kocan and Banko[3] failed to include this dove in their list of columbids (domestic pigeon — *Columba livia;* mourning dove — *Zenaida macroura;* and inca dove — *Scardafella inca)* with natural *T. gallinae* trichomoniasis. In answer to the author's letter[5] calling attention to their apparent oversight, Kocan[2] replied that he had been unable to produce trichomoniasis in the ringed turtle dove even when using Stabler's virulent Jones' Barn (JB) strain of *T. gallinae*. He was, however, able to recover the organisms from dove lung and liver tissues three weeks postinoculation.

Considering it most unusual that a columbid should be resistant to this highly virulent strain of *T. gallinae,* it appeared important to investigate further this host-parasite relationship.

MATERIALS AND METHODS

Trichomonas-free ringed turtle doves donated by the U.S. Fish and Wildlife Service, through the kindness of James O. Keith, and *Trichomonas*-free domestic pigeons from the author's colony were used, the latter serving as controls. The trichomonad was the highly virulent JB strain of *T. gallinae* which was isolated from the caseous lesions in the mouth of a pigeon squad in 1943. Inoculations were effected by pipetting 5,000-10,000 trichomonads into the recipients' mouths.

EXPERIMENTS

Twenty *Trichomonas*-free ringed turtle doves and eighteen comparable domestic pigeons were given JB *T. gallinae*. The pigeons all died in about eight days ($\bar{x}$=8.1) postinoculation with extensive caseation of the liver. No dove developed trichomoniasis and all were *Trichomonas*-free at the first check (five days postinoculation). Four of the above doves were then given an extremely heavy inoculation of *T. gallinae*. Again no permanent infections resulted.

Three F_1 female doves raised from the above parental stock were housed together. They "mated" (Levi[4]: p. 350, para. 613) and laid several six-egg clutches in a communal nest. On inoculation, all were successfully infected with JB trichomonads. At a routine setting their eggs were replaced by a fertile domestic pigeon egg. This egg hatched and the squab was *Trichomonas*-positive

when checked at 24 hr. It died on the fourth day, its mouth showing caseations and its saliva heavily infected with *T. gallinae*. These trichomonads killed a *Trichomonas*-free pigeon in eight days.

Eggs from the three JB-positive F_1 females were next replaced by two fertile dove eggs. These hatched and the dove squabs and their three foster parents were all *Trichomonas*-positive when examined seven days after hatching. When the dove squabs were fifteen days old, examination showed that they and their female parents were *Trichomonas*-free. The three F_1 doves had carried their trichomonads for a known period of 182 days; they and their squabs were then flagellate-free seven days later. At no time did these three F_1 doves or their dove squabs, which were raised to maturity, show any signs of trichomoniasis. Domestic pigeon controls infected from the three females died ($\bar{x}$=8.1 da). with typical JB trichomoniasis.

DISCUSSION

Short-lived outbreaks of trichomoniasis caused by *T. gallinae* have occurred sporadically in chickens and turkeys. Epizootiologic evidence indicates that the columbid bird is the natural host. Columbids thus far shown to have harbored *T. gallinae* are: domestic pigeon; band-tailed pigeon *(Columba fasciata);* white-crowned pigeon (*C. leucocephala*); mourning dove; white-winged dove *(Zenaida asiatica);* inca dove; white-fronted dove (*Leptotila verreauxi*); ground dove (*Columbina passerina*); barred dove (*Geopelia striata*); and the ringed turtle dove *(Streptopelia risoria).*

Aside from the trichomoniasis reported by Cauthen[1], Kocan and the author have failed to produce disease in the ringed turtle dove by inoculation of the highly virulent JB strain of *T. gallinae*. It seems unlikely that Cauthen was mistaken in attributing the pregastric lesions in his ringed turtle doves to the effects of *T. gallinae*. It seems equally improbable that in the hands of two independent researchers the virulent JB trichomonad failed to cause disease in a series of inoculated ringed turtle doves.

It is apparent from the above that the ringed turtle dove is an extremely resistant columbid to even the most virulent strain of *Trichomonas gallinae*.

Siblings of the three F_1 females are available and can be shared with serious students of the host-parasite relationships involved. Three birds have been forwarded to B. M. Honigberg, University of Massachusetts, who is investigating immunological aspects of the association. Dr. Honigberg maintains the JB strain of *T. gallinae* in liquid nitrogen. Because of the not infrequent outbreaks of *T. gallinae* trichomoniasis in domestic and feral columbids, studies on the nature of the apparent resistance of the ringed turtle dove to this disease are of considerable importance.

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