SOME INFECTIOUS AND PARASITIC DISEASES IN OKLAHOMA RAPTORS

Author: KOCAN, A. ALAN

Source: Journal of Wildlife Diseases, 13(3) : 304-306

Published By: Wildlife Disease Association

URL: https://doi.org/10.7589/0090-3558-13.3.304

SOME INFECTIOUS AND PARASITIC DISEASES IN OKLAHOMA RAPTORS

A. ALAN KOCAN, Veterinary Parasitology, Microbiology and Public Health, Oklahoma State University, Stillwater, Oklahoma 74074, USA

JOHN SNELLING,[1] Oklahoma City Zoo, Oklahoma City, Oklahoma 73111, USA

ELLIS C. GREINER, International Reference Centre for Avian Haematozoa, Memorial University of Newfoundland, St. John's, Newfoundland, Canada

Abstract: Blood films and sera samples from wild Oklahoma raptors (Strigiformes —36 birds, 3 species; Falconiformes—50 birds, 7 species) were examined for hematozoa and tested for serologic antibody response to Newcastle Disease Virus (NDV), encephalitis (EEE and WEE), ornithosis, and influenza. Twenty-nine of 36 (80.5%) Strigiformes and 24 of 50 (48.0%) Falconiformes showed the presence of one or more hematozoa. Serologic testing revealed the serum of one adult male red-tailed hawk positive for antibody to NDV and one additional adult male red-tailed hawk positive for antibody to type-A influenza.

INTRODUCTION

The presence, distribution and species susceptibility of infectious and parasitic diseases of "healthy" North American raptors is presently poorly understood.[2] Although considerable information concerned with haemosporidia and other infectious diseases of raptors has been gathered, little of this information is available from wild birds or from birds from the southwestern United States.

The southwest (especially Oklahoma) is a known wintering area for numerous species of raptors. Additionally, many species breed and reside in this area throughout the year. This overlapping and dispersal of populations allows for unique possibilities for infectious disease transmission and perpetuation. The only available information on raptor disease for Oklahoma is a single report of a *Plasmodium* of unknown species identified from a red-shouldered hawk (*Buteo lineatus*).[4]

MATERIALS AND METHODS

In cooperation with local falconers and the Oklahoma City Zoo raptor rehabilitation program, native wild birds brought to the zoo or the Oklahoma State University College of Veterinary Medicine were examined for hematozoa and for serologic activity to Newcastle disease, type-A influenza, encephalitis, and ornithosis. The majority of samples were taken between October and April over a three year period.

Blood to be used for thin films and for serum separation was taken from the brachial vein of all birds. Blood films were stained with Giemsa stain. No efforts were made to examine bone marrow. All films were scanned at 150X and under oil immersion (1000X).

Sera were screened for the presence of Newcastle disease virus (NDV) antibody by the microhemagglutination-inhibition (HI) test. All HI reactions (titers of 1:2 or higher) were retested before

[1] Present address: Department of Zoology, University of Oklahoma, Norman, Oklahoma 73069, USA.

considered positive. Hemagglutination-inhibition tests also were used to screen sera for the presence of antibodies to Eastern Equine Encephalitis (EEE) and Western Equine Encephalitis (WEE). In addition, serum samples were screened for *Chlamydia* antibody and antibody to type-A influenza using the agar-gel precipitin test (AGP).[1,7]

RESULTS AND DISCUSSION

A total of 86 wild raptors representing 10 species (3 Strigiformes and 7 Falconiformes) were examined in this study.

Haemosporidia

The results of the examination of 86 birds are shown in Table 1. These results (Strigiformes, 80.5% positive; Falconiformes, 48.0% positive) are similar to the findings for Colorado raptors.[9]

The elongate gametocytes of the *Leucocytozoon* recovered from the Falconiformes are believed to be *L. toddi* Sambon, 1908, in accordance with Greiner and Kocan.[3] The haemoproteids recovered from the Falconiformes are considered to be *H. elani* de Mello, 1935. Both round and elongate gametocytes of *Leucocytozoon* were recovered from the Strigiformes, and these are considered to be *L. ziemanni* Laveran, 1903, as reported by Khan.[5] The *Haemoproteus* recovered from the Strigiformes is tentatively considered to be *H. celli* Coatney and Roudabush, 1937. The *Plasmodium* recovered from the American kestrel (*Falco sparverius*) is believed to be *P. relictum* (Grassi and Feletti, 1891), which was recently reported from captive falcons in Colorado.[6]

TABLE 1. Hematozoa from Strigiformes and Falconiformes in Oklahoma.

Species Examined		Total	No. Pos.*	H	L	P
Strigiformes						
Barred Owl	*Strix varia*	9	7	6	5	—
Great Horned Owl	*Bubo virginianus*	21	19	14	11	—
Screech Owl	*Otus asio*	6	3	1	2	—
		36	29	21	18	—
Falconiformes						
Red-tailed Hawk	*Buteo jamaicensis*	34	16	11	12	—
Ferruginous Hawk	*Buteo regalis*	1	1	—	1	—
American Kestrel	*Falco sparverius*	5	4	4	1	1
Marsh Hawk	*Circus cyaneus*	3	0	—	—	—
Red-shouldered Hawk	*Buteo lineatus*	2	0	—	1	—
Cooper's Hawk	*Accipiter cooperii*	3	1	1	1	—
Rough-legged Hawk	*Buteo lagopus*	2	2	1	2	—
		50	24	17	17	1

Abbreviations: H = *Haemoproteus;* L = *Leucocytozoon;* P = *Plasmodium*

*Due to mixed infections, the sum of the individual infections may be greater than the number of positive birds.

Serologic Examinations

Of the 86 samples tested, only one adult male red-tailed hawk (*Buteo jamaicensis*) had a positive HI antibody response for the NDV (titer - 1:100). Eighty-five of the 86 samples tested were negative for antibody to type-A influenza with one adult red-tailed hawk proving positive. Eighty-six samples were negative for EEE, WEE, and ornithosis. Although these serologic findings represent a low percentage of reactors to these infectious diseases, they do supply evidence supporting the existence of these diseases in wild raptors in Oklahoma.

LITERATURE CITED

1. BEARD, C. W. 1975. Avian influenza, In: *Isolation and Identification of Avian Pathogens.* S. B. Hitchner, C. H. Domermuth, G. H. Purchase and J. E. Williams, eds. New York: Arnold Printing Co.
2. COOPER, J. E. 1969. Some diseases of birds of prey. Vet. Rec. 84: 454-457.
3. GREINER, E. C. and A. A. KOCAN. 1977. *Leucocytozoon* (Haemosporidia: Leucocytozoidae) of the Falconiformes. Can. J. Zool. In Press.
4. JANOVY, J., JR. 1963. A preliminary survey of blood parasites of Oklahoma birds. Proc. Okla. Acad. Sci. 44: 58-61.
5. KAHN, R. A. 1975. Development of *Leucocytozoon ziemanni* (Laveran). J. Parasit. 61: 449-457.
6. KINGSTON, N., J. D. REMPLE, W. BURNHAM, R. M. STABLER and R. B. McGHEE. 1976. Malaria in a captively-produced F. gyrefalcon and in two F. peregrine falcons. J. Wildl. Dis. 12: 562-565.
7. PAGE, L. A. 1975. Chlamydiosis, In: *Isolation and Identification of Avian Pathogens.* S. B. Hitchner, C. H. Domermuth, G. H. Purchase and J. E. Williams, eds. New York: Arnold Printing Co.
8. STABLER, R. M. and P. A. HOLT. 1965. Hematozoa from Colorado birds. II. Falconiformes and Strigiformes. J. Parasit. 51: 927-928.

Received for publication 17 November 1976