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Authors: DOMERMUTH, C. H., FORRESTER, D. J., TRAINER, D. O.,
and BIGLER, W. J.

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SEROLOGIC EXAMINATION OF WILD BIRDS FOR HEMORRHAGIC ENTERITIS OF TURKEY AND MARBLE SPLEEN DISEASE OF PHEASANTS

C. H. DOMERMUTH,^[1] D. J. FORRESTER,^[2] D. O. TRAINER^[3] and W. J. BIGLER^[4]

Abstract: Precipitin antibody which reacted with the hemorrhagic enteritis (HE) of turkeys/marble spleen disease (MSD) of pheasants group of avian adenoviruses, was not detected in serum samples of 618 wild birds (42 species) from Florida, Texas and Virginia. HE/MSD precipitin antibody was detected in serum samples of pen-reared ring-necked pheasants (*Phasianus colchicus*) which had experienced MSD, but not in serum samples of similar MSD unaffected birds.

INTRODUCTION

Pathogenic hemorrhagic enteritis (HE) viruses cause up to 60% mortality and losses of several million dollars a year to the turkey industry. Significant losses of pen-reared pheasants are caused by the marble spleen disease (MSD) virus. Isolants of the HE/MS group of avian adenoviruses^{1,2} are capable of infecting a variety of species of birds in laboratory experiments.² Members of the group with widely divergent degrees of pathogenicity affect many domestic turkey flocks³ and appear to affect other species of pen-reared birds (unpublished). It is not known if members of this virus group affect wild birds. The purpose of this report is to present the results of serologic examination of numerous species of wild birds for precipitin antibody to HE/MSD avian adenoviruses.

MATERIALS AND METHODS

Serum samples from 618 free-ranging wild birds representing 42 species from Florida, Texas and Virginia were tested^{4,6,7} for precipitin antibody to the HE/

MS group of avian adenoviruses (Table 1). Antigen for the test was made of infected turkey spleens and control precipitin positive and negative serum samples were obtained from HE recovered and HE uninfected turkeys, respectively. Details of the test have been described.⁴

RESULTS

All serum samples from the free-ranging wild birds were negative for HE/MS precipitin antibody (Table 1). Serum samples of 25 MSD recovered pen-reared ring-necked pheasants (*Phasianus colchicus*) contained HE/MSD precipitin antibody. Twenty-five similar samples from previously uninfected pen-reared pheasants (*P. colchicus*) did not have HE/MSD precipitin.

The serum of one fish crow, *Corvus ossifragus*, had what appeared to be a very slight reaction, but this was judged to be negative. The serum of one loon, *Gavia immer*, and 2 pelicans, *Pelicanus occidentalis*, with a hemorrhagic enteritis syndrome of unknown etiology also reacted negatively in the precipitin test.

[1] Department of Veterinary Science, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, USA. Supported in part by USDA-CSRS and the Pennsylvania Game Commission.

[2] Laboratory of Wildlife Disease Research, College of Veterinary Medicine, University of Florida, Gainesville, Florida 32610, USA. Supported in part by research grant #1270 from the Florida Game and Fresh Water Fish Commission's Federal Aid for Wildlife Restoration Program, Florida Pittman-Robertson Project W-41.

[3] College of Natural Resources, University of Wisconsin, Stevens Point, Wisconsin 54481, USA.

[4] Health Program Office, Department of Health and Rehabilitative Services, Tallahassee, Florida 32301, USA.

TABLE 1. Bird Sera[§] Tested for HE/MSD Precipitin Antibody.

Family	Genus	Species	Common Name	Number of Samples	Age [§]	Source
Meleagrididae	<i>Meleagris</i>	<i>gallopavo</i>	turkey	211	M 131, I 80	Texas and Florida
Phasianidae	<i>Colinus</i>	<i>virginianus</i>	bobwhite	19	M 13, I 2, NA 4	Florida
	<i>Phasianus</i>	<i>colchicus</i>	ring-necked pheasant	50	M 25, I 25	Virginia
Pelecanidae	<i>Pelecanus</i>	<i>occidentalis</i>	brown pelican	2	NA	Florida
	<i>Phalacrocorax</i>	<i>auritus</i>	double-crested-cormorant	1	NA	Florida
Gruidae	<i>Grus</i>	<i>canadensis</i>	sandhill crane	4	M 2, I 1, NA 1	Florida
Troglodytidae	<i>Thryothorus</i>	<i>ludovicianus</i>	carolina wren	11	M	Florida
Mimidae	<i>Mimus</i>	<i>polyglottos</i>	mockingbird	27	M	Florida
	<i>Toxostoma</i>	<i>rufum</i>	brown thrasher	9	M	Florida
Fringillidae	<i>Richmondia</i>	<i>cardinalis</i>	cardinal	30	M	Florida
	<i>Pipilo</i>	<i>erythrophthalmus</i>	rufous-sided towhee	3	M	Florida
Icteridae	<i>Quiscalus</i>	<i>quiscula</i>	common grackle	18	M	Florida
	<i>Agelaius</i>	<i>phoeniceus</i>	red-winged blackbird	28	M	Florida
	<i>Sturnella</i>	<i>magna</i>	eastern meadowlark	8	M	Florida
	<i>Molothrus</i>	<i>ater</i>	brown-headed cowbird	3	M	Florida
Vireonidae	<i>Vireo</i>	<i>olivaceus</i>	red-eyed vireo	5	M	Florida
Corvidae	<i>Cyanocitta</i>	<i>cristata</i>	blue jay	26	M	Florida
	<i>Corvus</i>	<i>ossifragus</i>	fish crow	2	M	Florida
	<i>Aphelocoma</i>	<i>coerulescens</i>	scrub jay	1	M	Florida
Columbidae	<i>Columbigallina</i>	<i>passerina</i>	ground dove	11	M	Florida
	<i>Zenaidura</i>	<i>macroura</i>	mourning dove	30	M	Florida

TABLE 1 (continued)

Family	Genus	Species	Common Name	Number of Samples	Age [Ⓜ]	Source
Picidae	<i>Centurus carolinus</i>		red-bellied woodpecker	8	M	Florida
	<i>Melanerpes erythrocephalus</i>		red-headed woodpecker	4	M	Florida
	<i>Colaptes auratus</i>		yellow-shafted flicker	3	M	Florida
	<i>Dendrocopos pubescens</i>		downy woodpecker	1	M	Florida
Ptilocidae	<i>Passer domesticus</i>		house sparrow	29	M	Florida
Ardeidae	<i>Ardea herodias</i>		great blue heron	2	M 1, I 1	Florida
	<i>Butorides virescens</i>		green heron	1	M	Florida
	<i>Bubulcus ibis</i>		cattle egret	10	M 9, NA 1	Florida
	<i>Seiurus aurocapillus</i>		ovenbird	7	M	Florida
Parulidae	<i>Crotophaga ani</i>		smooth-billed ani	4	M	Florida
Cuculidae	<i>Hirundo rustica</i>		barn swallow	5	M	Florida
	<i>Tridoprocne bicolor</i>		tree swallow	2	M	Florida
Laridae	<i>Larus delawarensis</i>		ring-billed gull	11	M 4, NA 7	Florida
	<i>Larus atricilla</i>		laughing gull	6	M 5, NA 1	Florida
	<i>Larus argentatus</i>		herring gull	1	NA	Florida
	<i>Thalasseus maximus</i>		royal tern	5	M	Florida
Tyrannidae	<i>Myiarchus crinitus</i>		great crested flycatcher	2	M	Florida
Strigidae	<i>Otus asio</i>		screech owl	2	M	Florida
Gaviidae	<i>Gavia immer</i>		common loon	12	M 9, NA 3	Florida
Paridae	<i>Parus bicolor</i>		tufted titmouse	1	M	Florida
Caprimolgidae	<i>Chordeiles minor</i>		night hawk	3	M	Florida

[Ⓜ] All birds considered normal except 25 MS recovered pheasants, and 1 loon and 2 pelicans with a hemorrhagic enteritis of unknown etiology. The 25 pheasant serum samples were positive for precipitin, the loon and pelican samples and all 590 other samples negative.

[Ⓜ] M = Mature; I = Immature; NA = Not Available.

DISCUSSION

The results of this investigation indicated that the free-ranging wild bird serum studied did not have HE/MSD precipitin antibody. These findings indicate that infection of wild birds is not commonplace. However, the ubiquity of the virus in pen-reared domestic poultry

and pheasants, and the susceptibility to laboratory-induced infection of all avian species tested^{1,3,6} suggests that free-ranging wild birds could be sporadically infected, especially in high density flock situations where large numbers of susceptible individuals might be exposed to pheasants or turkeys contaminated with HE/MSD virus.

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LITERATURE CITED

1. DOMERMUTH, C. H. and W. B. GROSS. 1977 Hemorrhagic enteritis. In: *Diseases of Poultry*, 7th ed., Hofstad, M. S., B. W. Calnek, C. F. Helmboldt, W. M. Reid and H. W. Yoder, (eds.), Iowa State University Press, Ames. In Press.
2. ——— and ———. 1976. A new group of adenoviruses. Proc. 48th Ann. Northeast. Conf. of Avian Dis. Newark, Delaware.
3. ———, ———, C. S. DOUGLASS, R. T. DuBOSE and J. R. HARRIS. 1976. Vaccination for hemorrhagic enteritis of turkeys. Proc. 113 Annual Meeting, Am. Vet. Med. Ass. Cincinnati.
4. ———, ——— and R. T. DuBOSE. 1973. Microimmunodiffusion test for hemorrhagic enteritis of turkeys. *Avian Dis.* 17: 439-444.
5. ———, ———, ———, C. S. DOUGLASS and C. B. REUBUSH, JR. 1972. Agar gel diffusion precipitin test for hemorrhagic enteritis of turkeys. *Avian Dis.* 16: 852-857.
6. HARRIS, J. R. and C. H. DOMERMUTH. 1977. Hemorrhagic enteritis in two and one-half-week old turkey poults. *Avian Dis.* 21: 120-122.
7. JAKOWSKI, R. M. and D. S. WYAND. 1972. Marble spleen disease in ring-necked pheasants: Demonstration of agar gel precipitin antibody in pheasants from infected flocks. *J. Wildl. Dis.* 8: 261-263.

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