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

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**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<sup>1,2</sup> are capable of infecting a variety of species of birds in laboratory experiments.<sup>2</sup> Members of the group with widely divergent degrees of pathogenicity affect many domestic turkey flocks<sup>3</sup> and appear to affect other species of pen-reared birds (unpublished).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<sup>4,6,7</sup> 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.<sup>4</sup>

### 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.

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TABLE 1. Bird Sera<sup>§</sup> Tested for HE/MSD Precipitin Antibody.

| Family        | Genus                 | Species                 | Common Name              | Number of Samples | Age <sup>§</sup> | 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 <sup>ⓐ</sup> | 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 |
| Ploceidae     | <i>Dendrocopos pubescens</i>      |         | downy woodpecker         | 1                 | M                | Florida |
|               | <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>Sciuurus auropallius</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 |
| Tyrannidae    | <i>Thalasseus maximus</i>         |         | royal tern               | 5                 | M                | Florida |
|               | <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 |

<sup>ⓐ</sup> 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.

<sup>ⓑ</sup> 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<sup>1,3,6</sup> 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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