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SHORT COMMUNICATIONS

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Serological Monitoring of Eastern Wild Turkeys for Antibodies to *Mycoplasma* spp. and Avian Influenza Viruses

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ABSTRACT: From 1981 through 1986, plasma or serum samples were obtained from 322 wild turkeys (*Meleagris gallopavo*) from Georgia (n = 111), Kentucky (n = 21), Louisiana (n = 22), North Carolina (n = 118), Tennessee (n = 19), Missouri (n = 24) and Iowa (n = 7). These samples were tested for antibodies to *Mycoplasma gallisepticum* (MG) and in most instances, *M. synoviae* (MS), *M. meleagridis* (MM), and avian influenza (AI) virus. All 322 turkeys were seronegative for MG by the rapid plate agglutination (RPA) test. All of a subsample (n = 147) also were negative (titer ≦1:40) for MG by the hemagglutination inhibition (HI) test. Five of 253 turkeys (2%) were seropositive (+4 reaction) for MS by the RPA test; however, HI tests for MS on these five turkeys were negative as were attempts to isolate MS from trachea and homogenized lung tissue. Three of 253 turkeys (1%) were seropositive (+1 to +3 reactions) for MM by the RPA test. None of 210 turkeys had antibodies to AI by the agar gel precipitation test. These data suggest that populations of native eastern wild turkeys are not important in the epizootiology of MG, MS, MM, or AI.

Key words: Wild turkey, *Meleagris gallopavo*, serology, *Mycoplasma gallisepticum*, *M. meleagridis*, *M. synoviae*, avian influenza, survey.

Restoration of the wild turkey (*Meleagris gallopavo*) has been one of the most noteworthy successes of the wildlife management profession (Mosby, 1973). An acknowledged key to the success of this restoration effort has been the capture and relocation of native wild turkeys for restocking unoccupied habitat (Lindzey, 1967; Bailey and Rinell, 1968; Mosby, 1973). Recent reports of clinical *Mycoplasma gallisepticum* (MG) infection in wild turkeys from three separate areas (Davidson et al., 1982; Jessup et al., 1983; Adrian, 1984) and the detection of MG seropositive wild turkeys in other areas (Hensley and Cain, 1979; Amundson, 1985) have prompted considerable interest in *Mycoplasma* infections in wild turkeys. These events have led to recommendations for serologic monitoring of wild turkeys being relocated during restoration programs (Nettles and Thorne, 1982; Nettles, 1984; Amundson, 1985; Wildlife Disease Association, 1985). Here, we report the results of serological testing of wild turkeys sampled during restoration programs being conducted by several state wildlife agencies in the southeastern United States.

The majority of the turkeys tested were live-trapped during restocking programs being conducted by the state wildlife agencies in Georgia, Kentucky, Louisiana, North Carolina, and Tennessee. Included in this group were a few turkeys originating from Iowa and Missouri that were relocated to Kentucky for release. State wildlife agency personnel were instructed on venipuncture techniques and were provided with EDTA tubes (3 or 7 ml), mailing cartons and record sheets. Whole blood samples in EDTA were obtained and sent to the laboratory by surface mail or by courier service. Transit times ranged from 8 to 120 hr, although most were received within 72 hr. This procedure was utilized to acquire plasma samples from 282 turkeys during 1984–1986. The state and

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county of origin and number of turkeys sampled per county were as follows: Georgia—Camden (2), Chattahoochee (2), Floyd (10), Glynn (1), Liberty (2), Lincoln (7), McIntosh (9), Murray (4), Rabun (9), Randolf (7), Talbot (4), Telfair (5), Troup (3), White (3), and Wilkes (8); Iowa—County Unknown (7); Kentucky—Anderson (6), Lyon (8), Trigg (4) and County Unknown (3); Louisiana—East Feliciana (6) and West Feliciana (16); Missouri—Ozark (7) and County Unknown (17); North Carolina—Bertie (14), Caswell (15), Cherokee (9), Clay (6), Jackson (1), Macon (14), Madison (10), Martin (7), Onslow (41), and Pender (1); and Tennessee—Coffee (4), Cumberland (5), Montgomery (4) and Union (2).

Serum samples were collected from an additional 40 wild turkeys as follows: 30 from Chatham County, Georgia collected in 1981 during another research project; five from Cheatham County, Tennessee during 1986 as part of a wild turkey population health profile; and five hunter harvested turkeys from Oconee, Greene, Oglethorpe, and Wilkes counties, Georgia in 1986.

Plasma or serum samples were prepared by centrifugation of whole blood immediately upon receipt at the Southeastern Cooperative Wildlife Disease Study (SCWDS, The University of Georgia, Athens, Georgia 30602, USA) and were tested for antibodies to *M. gallisepticum, M. synoviae* (MS), *M. meleagridis* (MM), and avian influenza (AI) virus. Specific tests performed were: (1) the rapid plate agglutination (RPA) test for MG (Yoder, 1980), utilizing either United States Department of Agriculture (USDA, National Veterinary Services Laboratory, Ames, Iowa 50010, USA) antigen or commercially prepared antigen (Salsbury Laboratories, Inc., Charles City, Iowa 50616, USA), on all 322 samples; (2) RPA tests using USDA antigen for MS and MM on 253 samples; (3) microtiter hemagglutination inhibition (HI) tests (Yoder, 1980) using USDA antigen for MG on 147 samples; and (4) the agar gel precipitation (AGP) test (Beard, 1970) for antibody to type A influenza viruses on 210 samples.

Results of serologic tests are summarized in Table 1 and indicated an absence of antibodies to MG and AI and a low prevalence of antibodies to MM (1%) and MS (2%). Three turkeys (one of nine from McIntosh County, Georgia, one of five from Telfair County, Georgia, and one of 10 from Madison County, North Carolina) had weak (+1) to moderate (+3) RPA reactions to MM. All of five turkeys from Cheatham County, Tennessee had strong (+4) RPA reactions to MS. These five turkeys had been trapped and transported to SCWDS for a comprehensive health profile, and thus we were able to obtain additional samples for further testing. HI tests for MS were performed with uniformly negative results. Isolates of MS were not obtained from cultures of fresh trachea and homogenates of frozen lung using standard methodology (Yoder, 1980). Both serologic tests and culture attempts were repeated with identical results.

The absence of MG antibodies suggests that native wild turkeys in the southeastern United States have very limited exposure to MG. Earlier we noted that extensive disease studies on wild turkeys in the southeastern United States have routinely failed to disclose clinical MG infection (Davidson et al., 1982, 1985). The only reported instance of MG in wild turkeys in this region occurred in semi-tame turkeys from a site with other domestic fowl (Davidson et al., 1982) which suggests cross transmission of MG from domestic fowl to wild turkeys. The occurrence of antibodies to MG in wild turkeys in Texas was correlated with the level of commercial poultry production in various counties (Hensley and Cain, 1979), and clinical MG in a single flock of wild turkeys in California was linked to MG infected poultry on an adjacent farm (Jessup et al., 1983). In Colorado, circumstantial evidence suggested that the occurrence of MG and other diseases in wild turkeys was related to contact

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TABLE 1. Results of serologic tests for antibodies to *Mycoplasma meleagridis* (MM), *M. synoviae* (MS), *M. gallisepticum* (MG), and avian influenza (AI) virus in wild turkeys from seven states.

State	RPA test			HI test	AGP test
	MM	MS	MG	MG	AI
Georgia	2/106[a]	0/106	0/111	0/106	0/76
Iowa	0/7	0/7	0/7	ND[b]	0/7
Kentucky	0/16	0/16	0/21	ND	0/11
Louisiana	ND	ND	0/22	ND	ND
Missouri	0/24	0/24	0/24	ND	0/16
North Carolina	1/81	0/81	0/118	0/36	0/81
Tennessee	0/19	5/19	0/19	0/5	0/19
Totals	3/253	5/253	0/322	0/147	0/210

[a] Figures in columns are number positive/number tested.
[b] ND, not done.

with domestic poultry because of prior winter feeding programs (Adrian, 1984). Collectively, available evidence suggests that when MG does occur in wild turkeys, it commonly originates from domestic poultry.

Despite negative HI tests and culture results, the occurrence of strong RPA titers to MS in the single group of turkeys from Tennessee is suggestive of prior infection with MS. However, in the absence of MS isolation, confirmation is not possible. Factors that might have led to exposure of turkeys to MS at this location were unknown. The infrequent occurrence of generally low level RPA titers to MM suggested very limited exposure to this agent. Alternatively, these titers may represent false positives which occasionally occur.

Rocke (1985) did not detect antibodies to AI viruses in 442 wild turkeys from Texas, and Nettles et al. (1985) did not isolate AI viruses from wild turkeys during an outbreak of influenza in domestic poultry in Virginia. Current data in conjunction with these previous reports suggest that wild turkeys are rarely infected by AI viruses.

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