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DISEASES DIAGNOSED IN WILD TURKEYS (*MELEAGRIS GALLOPAVO*) OF THE SOUTHEASTERN UNITED STATES

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ABSTRACT: Diagnostic findings are presented on 139 sick or dead wild turkeys examined during the period 1972 through 1984. Turkeys originated from eight southeastern states (Alabama, Arkansas, Florida, Georgia, South Carolina, Tennessee, Virginia, West Virginia) and included 31 turkeys categorized as capture-related mortalities and 108 turkeys categorized as natural mortalities. Frequent diagnoses (≥10% of case accessions) in the natural mortality group were trauma, avian pox, and histomoniasis. Less frequent diagnoses (≤4% of case accessions) included malnutrition/environmental stress syndrome, coligranuloma-like condition, crop impaction, bumblefoot, organophosphate toxicosis, infectious sinusitis, a lympho-proliferative disease, salmonellosis, aspergillosis, toxoplasmosis, crop trichomoniasis, and melorheostosis.

INTRODUCTION

Since the 1950's, wild turkeys have been the subject of intensive and highly successful restoration programs by wildlife agencies (Mosby, 1973). These successes have been accompanied by interest in many aspects of the biology of turkeys including several broad studies of the significance of diseases and parasitism to turkey populations (Maxfield et al., 1963; Prestwood, 1968; Kellogg et al., 1969; Prestwood et al., 1973, 1975; Forrester et al., 1974, 1980; Hon et al., 1975). Despite the increased emphasis on research involving diseases and parasitism among wild turkeys, comparatively few accounts of natural mortality due to disease appear in the literature. This report presents the results of diagnostic examinations on wild turkeys by personnel of the Southeastern Cooperative Wildlife Disease Study (SCWDS) during a 13-yr period.

MATERIALS AND METHODS

Necropsy and laboratory records on wild turkeys submitted to the SCWDS for diagnostic examination were reviewed for the period 1 January 1972 through 31 December 1984. Because necropsies were oriented toward determination of the cause of morbidity or mortality, diagnostic procedures varied among cases. In addition, examinations were sometimes hampered by postmortem decomposition or inadequate preservation techniques. All cases were submitted by personnel of state or federal wildlife agencies.

Data reviewed on each accession were number of birds involved, location, date, case history, and major diagnostic findings. Some accessions were turkeys that had died or had become debilitated during or following capture for restocking programs or research projects. These capture-related cases were treated separately from natural mortality cases. Diagnostic findings on a few of the turkeys examined have been presented in separate case reports (Nettles, 1976; Davidson et al., 1982; Howerth, 1985; Howerth and Rodenroth, 1985). In order to facilitate presentation of the data, cases were categorized according to 12 fundamental causes of morbidity and mortality as outlined by Hayes and Prestwood (1969).

RESULTS AND DISCUSSION

During the 13 yr, 139 wild turkeys were submitted for diagnostic purposes. These turkeys originated from 115 separate case accessions with a maximum of five birds per accession. Case histories and/or diagnostic examinations revealed that mortality in 31 turkeys was related to capture and handling. Capture related causes of mortality were as follows: trauma (eight

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TABLE 1. Diagnostic findings in 108 wild turkeys from the southeastern United States from 1972 through 1983.

Category[a]	Diagnosis		No. (%) birds	No. (%) accessions
Trauma	Acute blunt trauma		7 (6)	7 (7)
	Electrocution (lightning)		3 (3)	1 (1)
	Chronic gunshot injuries		8 (7)	8 (8)
	Trauma (agent unknown)		13 (12)	13 (14)
		Total	31 (29)	29 (30)
Neoplasia	Lympho-proliferative disease		1 (1)	1 (1)
		Total	1 (1)	1 (1)
Toxicoses	Organophosphate poisoning		3 (3)	1 (1)
		Total	3 (3)	1 (1)
Nutritional diseases	Malnutrition		10 (9)	4 (4)
		Total	10 (9)	4 (4)
Viral diseases	Avian pox		24 (22)	24 (25)
		Total	24 (22)	24 (25)
Bacterial diseases	Salmonellosis		1 (1)	1 (1)
	Infectious sinusitis		3 (3)	1 (1)
	Fusobacterium septicemia		1 (1)	1 (1)
	Coligranuloma-like[b]		3 (3)	3 (3)
	Bumblefoot[b]		2 (2)	2 (2)
	Necrotic enteritis[b]		1 (1)	1 (1)
	Bacterial septicemia[b]		3 (3)	3 (3)
		Total	14 (13)	12 (13)
Mycoses	Aspergillosis		1 (1)	1 (1)
		Total	1 (1)	1 (1)
Parasitic diseases	Histomoniasis		11 (10)	11 (12)
	Toxoplasmosis		1 (1)	1 (1)
	Crop trichomoniasis		1 (1)	1 (1)
		Total	13 (12)	13 (14)
Miscellaneous lesion diagnoses[c]	Crop impaction		4 (4)	4 (4)
	Melorheostosis		1 (1)	1 (1)
	Arthritis/nephrosis		1 (1)	1 (1)
	Hepatic necrosis		1 (1)	1 (1)
	Salpingitis		1 (1)	1 (1)
	Chronic enteritis		1 (1)	1 (1)
	Diarrhea, hemosiderosis		1 (1)	1 (1)
	Emaciation		1 (1)	1 (1)
		Total	11 (10)	11 (12)

[a] Categories of morbidity or mortality as presented by Hayes and Prestwood (1969).
[b] Various bacteria isolated in these cases; primary etiologic agent uncertain.
[c] Assignment to category considered inappropriate due to condition of specimen, etc.

turkeys); suffocation (8); anesthetic overdose (2); aortic rupture (1); and a syndrome of overexertion, heat prostration, and shock (12).

The remaining 108 turkeys were sick from or died due to natural mortality factors (Table 1). Data presented in Table 1 were not obtained in a manner that would allow an accurate assessment of the relative importance of natural mortality factors in wild turkeys. The submission of cases was influenced by many unknown

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factors and the data undoubtedly are biased. For example, field personnel normally would not submit a turkey that died of a known source of trauma. Conversely, turkeys with strikingly obvious disease conditions, such as avian pox, might be submitted at a rate disproportionately higher than their actual occurrence. Nevertheless, the information should be useful in identifying important mortality factors.

Trauma was the most frequent diagnosis; however, it probably was underrepresented in relation to its actual importance as a natural mortality factor. Predation, for example, is a major mortality factor for turkeys but was not diagnosed in this study. The most interesting instance of trauma was three turkeys killed by lightning in a soybean field in Grady County, Georgia.

Neoplasia was diagnosed in one turkey. An immature male turkey had multifocal 0.5- to 2.0-mm white to gray lesions in the lungs, trachea, kidneys, abdominal serosa, and skeletal muscles. Microscopically, these foci were comprised of basophilic round mononuclear cells, and the lesions tended to have a vascular orientation. The case was diagnosed as a lymphoreticular neoplasia. A similar lympho-proliferative disease has been reported previously in wild turkeys from Florida (Busch and Williams, 1970; Colwell et al., 1973; Grant et al., 1975).

A single instance of toxicosis was confirmed in the turkeys examined. This case, which involved poisoning by O,O-diethyl O[p-(methylsulfinyl) phenyl] phosphorothioate (Dasinit®, Chemagro Corp., Kansas City, Missouri 64120, USA), has been described in detail elsewhere (Nettles, 1976).

A syndrome of malnutrition/environmental stress was diagnosed in four accessions in which the primary diagnostic finding was emaciation. The case histories of three of these accessions, two from West Virginia and one from Georgia, were similar and revealed that the birds had been found either dead or in a weakened condition following periods of snow cover and subfreezing temperatures. Winter mortality previously has been reported to account for a minor portion of annual mortality in West Virginia (Bailey and Rinell, 1968). The fourth accession, from Louisiana, involved birds found in a similar physical condition following an extended period of flooding.

Viral diseases were represented only by avian pox which was the second most frequent diagnosis following trauma. At least one turkey with pox was received from each state that submitted cases (Alabama, Arkansas, Florida, Georgia, South Carolina, Tennessee, Virginia, and West Virginia). Avian pox also was diagnosed in 12 of the 13 yr of this study. Pox lesions were of varying severity and included both cutaneous and diphtheritic forms. Avian pox has been reported previously in wild turkeys from Alabama, Mississippi, South Carolina (Prestwood et al., 1973), and Florida (Prestwood et al., 1973; Akey et al., 1981). Collectively, available information indicates that avian pox is widespread, occurs frequently, and probably is one of the most important infectious diseases of wild turkeys in this region.

Bacterial diseases were represented by a variety of specific infections including salmonellosis, infectious sinusitis, a coligranuloma-like condition, bumblefoot, and cases where bacterial septicemias were suspected. Detailed information on the salmonellosis and infectious sinusitis cases has been presented elsewhere (Davidson et al., 1982; Howerth, 1985). The coligranuloma-like condition was similar to that reported by Prestwood et al. (1973). Collectively, bacterial diseases accounted for at least 13% of the case accessions, suggesting that bacterial infections may be a more frequent cause of mortality than is generally recognized.

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Aspergillosis was the only mycotic disease found as a primary diagnostic finding. The single turkey involved had typical respiratory involvement with numerous discrete firm white plaques in the lungs and on the air sacs. On several occasions, upper digestive tract candidiasis was noted as a secondary or an incidental finding, particularly in turkeys with concomitant avian pox infection.

Primary parasitic diseases were represented by histomoniasis, toxoplasmosis (Howerth and Rodenroth, 1985), and crop trichomoniasis. Histomoniasis was the third most frequent diagnosis in the birds examined and was noted in turkeys originating from Georgia, Tennessee, and Virginia. Five of the 11 accessions diagnosed as histomoniasis were from four contiguous counties (Dawson, Fannin, Gilmer, Lumpkin) in northern Georgia. These accessions occurred between 1972 and 1983, and the clumped distribution of these cases suggests that histomoniasis may be an important mortality factor in that area. Although there are relatively few primary accounts of histomoniasis in wild turkeys in the Southeast (Stoddard, 1935; Mosby and Handley, 1943; Thomas, 1964; Bailey and Rinell, 1968; Prestwood et al., 1973; Hurst, 1980), we concur with Hurst's (1980) conclusion that histomoniasis is a more important mortality factor in wild turkeys than indicated by the number of primary reports in the literature.

Because of limitations imposed by the condition of the specimens, several cases could not be placed accurately in categories outlined by Hayes and Prestwood (1969). Lesion diagnoses from these accessions are listed in Table 1 under the "miscellaneous" heading. Of interest in this group were four emaciated turkeys with greatly distended, food-impacted crops. The crop contents in the most severely affected turkey accounted for one-third of the total body weight. The condition was similar to crop impactions in domestic turkeys (Peckham, 1978). Also of interest was an adult male turkey that had a markedly enlarged left humerus. Radiographically the lesion appeared as proliferative bone with erosion of the normal cortical bone. Microscopically, the lesion was a severe, diffuse, linear periosteal and endosteal hyperostosis and petrosis and was diagnosed as unilateral melorheostosis.

At least eight of the 12 fundamental causes of mortality described by Hayes and Prestwood (1969) were represented in this study. The categories of trauma, viral diseases, bacterial diseases, and parasitic diseases accounted for the majority (81%) of the accessions. Although more information is needed on all types of natural morbidity and mortality in wild turkeys, the specific infectious diseases noted herein should receive priority in future research.

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