

# Skin Tumors in New York Deer<sup>□</sup>

MILTON FRIEND

*New York State Conservation Dept., Albany, New York 12226*

Received for Publication 14 April, 1967

## ABSTRACT

Examination of 2,440 deer in the Catskill Region and 609 in the Adirondack Region revealed skin tumor prevalence of 1.4 per cent and 1.3 per cent respectively. A total of 37 or 88.1 per cent of the infected deer from these two areas were males. Infections involving five or less small tumors were most frequently encountered.

## INTRODUCTION

Occurrence of cutaneous fibromas of white-tailed deer, *Odocoileus virginianus*, is poorly documented in the literature, especially regarding sex and age distribution of infected animals or prevalence of infection among various herds. This report documents the findings from examination of over 3,000 deer during the 1962 New York State deer season. Severinghaus and Cheatum<sup>3</sup> have reported previously on skin tumors among deer in New York and Fay<sup>1</sup> has summarized the available literature on neoplastic diseases of white-tailed deer.

## PROCEDURE

Hunter-killed deer were examined at seven deer check stations in the Catskill Mountain Region and one check station in the Adirondack Mountain Region. These regions are located in the eastern portion of the State and are primarily forested areas. At the Catskill stations each deer examined for skin tumors was tallied by sex and age; at the Adirondack station only the total number of deer, irrespective of sex or age, was recorded. All deer were aged by game management and research personnel operating the stations. The method of tooth wear and replacement was employed<sup>2</sup>. Sex and age were recorded for all deer with skin tumors. Number, location and size of tumors were also recorded.

## RESULTS

A total of 42 deer (1.4 per cent) with skin tumors was observed from 3,049 deer examined at the Adirondack and Catskill stations; of these 37 (88.1 per cent) were males. In addition eight random reports were received, six of these being of skin tumors in male deer.

In appearance these tumors were typical of those described by Shope<sup>4</sup> in New Jersey deer and by workers in many other states and Canada. They appeared as firm, wart-like attachments fastened only to the skin and generally having roughened surfaces and displaying some pigmentation. The larger masses were pendulous and pedunculated. Grossly, cut sections of several growths showed them to be tough, white, and fleshy, typical of the fibromas described by Shope.<sup>4</sup>

The size and total number of fibromas per infected deer varied, ranging in diameter from six to 197 mm. and from one to fifty in number. Forty-four cases involved five or less tumors per deer (28 had single tumors), two had six to ten, one was in the 11 to 20 range, and three had 25 to 50 tumors. These growths were randomly distributed on the

□ A contribution of Federal Aid in Fish and Wildlife Restoration Project W-35-R.

deer with the heaviest prevalence noted about the eyes, neck, face and front shoulders. In many instances of single tumors the growth was as small as a pea. Several deer were observed with what appeared to be remains of tumors that had recently regressed.

Of the 2,440 deer checked in the Catskills, tumors were found on 2.1 per cent of the males and 0.4 per cent of the females. A similarly high proportion of infected males was found in the Adirondack Region (Table 1). A tabulation of incidence by sex and age class is presented in Table 1.

**DISCUSSION**

The high predominance of male deer infected with skin tumors was significant when the Yates correction for small expected numbers in Chi-square test was used.<sup>6</sup> A possible explanation may be a combination of the nature of the disease and the activities of male deer. Shope

et al.<sup>5</sup> showed that the causative agent of the disease was a host-specific filterable virus which may gain entrance to the host through abrasions in the skin. Fighting during the rut and rubbing of antlers to shed velvet favor the occurrence of abrasions and subsequent foci for infection, especially in the region of the head, neck, and front shoulders. Fighting also favors direct transmission from one infected deer to another. Some supporting evidence for this theory may be found in Table 1, however, the relatively small sample size must be kept in mind. The data indicate that the fawn class has a lower incidence than the presumably antlered and more aggressive older bucks.

The appearance of lesions suggesting recent tumor infection is in agreement with the findings of Shope et al.<sup>5</sup> who reported a regression of all the small tumors in their experimental deer, with

TABLE 1. Sex and age composition of 50 white-tailed deer with skin tumors during the 1962 New York deer season.<sup>[1]</sup>

Age Class	Catskill Check Stations <sup>[2]</sup>									Adirondack Check Station (Lake George)		
	Number Examined			Number with Skin Tumors			Per Cent with Skin Tumors			Number		
	♂	♀	Total	♂	♀	♂	♀	Total	Examined	Skin Tumors	♂	♀
Fawns	187	202	389	2	0	1.1	0	0.5	Not recorded by sex and age class	0	0	0
1 yr. 5 months	273	85	358	1	1	0.4	1.2	0.6		1	0	0
1.5 yr.	243	57	300	7	0	2.9	0	2.3		1	0	0
1 yr. 7 months	291	107	398	7	2	2.4	1.9	2.3		0	1	0
2.5 yr.	242	164	406	10	0	4.1	0	2.5		3	0	0
3.5 yr.	134	150	284	1	0	0.7	0	0.3		1	0	0
4.5 yr.	36	95	131	0	0	0	0	0		1	0	0
5.5 yr.	9	45	54	1	0	11.1	0	1.8		0	0	0
6.5 yr.	5	44	49	0	0	0	0	0		0	0	0
7.5 yr.	2	44	46	0	0	0	0	0		0	0	0
8.5 yr. - 9.5 yr.	2	20	22	0	0	0	0	0	0	0	0	
Totals	1424	1013	2437	29	3	2.0	0.3	1.3	609	7	1	
Add:												
Incomplete data	1*	1*	3**	1*	1*							
Grand totals	1425	1014	2440	30	4	2.1	0.4	1.4	609	7	1	

[1] Eight random reports from other areas of the State are included in the total as follows: 1 yr. 5 mo.-2 males and 1 female, 2.5 yr.-1 female, 3.5 yr.-3 males and 4.5 yr.-1 male.

[2] Stations located at Kingston, Quarryville, Cairo, Roscoe, Fair Oaks, Sparrowbush, and Deposit.

\* Only sex recorded — \*\* Only age recorded

the exception of a single animal, after a two-month period. They further stated that in nature the number of deer encountered with advanced disease represents a small proportion of the animals that have undergone infection with the tumor agent, since in most naturally infected deer, tumors regress before they reach a readily observable size.

In rare instances tumor masses develop to large size and may contribute to the death of deer as a result of mechanical obstruction to vision, breathing, and eating. Severinghaus and Cheatum<sup>3</sup> reported death in a young adult buck resulting from absorption of bacterial poisons which developed within a large tumor mass which had become lacerated and then abscessed. No other incident of this nature was found in the literature. This suggests the rarity of such an occurrence in nature. No evidence of abscess within a tumor mass was observed during this survey. Metastasis from skin tumors to internal organs has not been recorded nor is there reason to believe it occurs.

The figures obtained during this survey should be considered minimum, as

some deer with tumors were undoubtedly missed since most deer were examined at night with the aid of lights. In addition, many deer were secured to the vehicle transporting them in such a manner that the entire animal could not be examined. Hunters were questioned about the condition of their deer to minimize the number with tumors missed.

The low number of random reports received should not be interpreted as an indication of prevalence within other sections of the State. Requests for reports and descriptive information was not received by field personnel sufficiently in advance to insure coverage of any uniformity or magnitude. A total of six of these eight reports were cases of multiple infection. It appears in most instances that only the more advanced cases created enough interest to be brought to our attention.

#### CONCLUSIONS

The prevalence of skin tumors among deer in New York State is higher than previously realized, consisting primarily of small sized, numerically few growths per infected deer. In rare instances severe infections are encountered.

#### LITERATURE CITED

1. FAY, L. D. 1962. Neoplastic diseases of white-tailed deer. Proc. 1st National White-tailed Deer Disease Symposium, Univ. of Georgia, Athens. 132-137.
2. SEVERINGHAUS, C. W. 1949. Tooth development and wear as criteria of age in white-tailed deer. J. Wildl. Mgt. 13 (2): 195-216.
3. \_\_\_\_\_ and E. L. CHEATUM. 1956. Life and times of the white-tailed deer. In: Deer of North America, Walter P. Taylor (ed.). Stackpole Co., Harrisburg, Pa., and Wildl. Mgmt. Inst., Washington, D.C. 173-174.
4. SHOPE, R. E. 1955. An infectious fibroma of deer. Proc. Soc. Exp. Biol. and Med. 88: 533-535.
5. \_\_\_\_\_ R. MANGOLD, L. G. MacNAMARA, and K. R. DUMBELL. 1958. An infectious cutaneous fibroma of the white-tailed deer (*Odocoileus virginianus*). J. Exp. Med. 108: 797-802.
6. SNEDECOR, G. W. 1940. Statistical Methods, 3rd edition, Iowa State College Press, Ames, Iowa.