

## **A Search for Parelaphostrongylus andersoni in White-Tailed Deer from Maine**

Author: Bogaczyk, Brian A.

Source: Journal of Wildlife Diseases, 28(2) : 311-312

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-28.2.311>

---

BioOne Complete ([complete.BioOne.org](https://complete.BioOne.org)) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](https://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

## A Search for *Parelaphostrongylus andersoni* in White-Tailed Deer from Maine

Brian A. Bogaczyk,<sup>1,2</sup> <sup>1</sup>Maine Cooperative Fish and Wildlife Research Unit, 240 Nutting Hall, University of Maine, Orono, Maine 04469, USA. <sup>2</sup>Present address: U.S.D.O.I.-B.L.M., Steese-White Mts. District, 1150 University Avenue, Fairbanks, Alaska 99709-3844, USA

**ABSTRACT:** Longissimus dorsi muscles from 42 white-tailed deer (*Odocoileus virginianus*) from Maine (USA) were examined for the *Parelaphostrongylus andersoni*. No adult nematodes were found. Prevalence based on the Poisson approximation of a binomial distribution could have been between 0 and 9% (95% C.I.). However, based on prevalence documented elsewhere (10 to 18%), it is unlikely that *P. andersoni* occurs in white-tailed deer in central Maine.

**Key words:** *Parelaphostrongylus andersoni*, muscleworm, distribution, metastrongyloid parasites, white-tailed deer, *Odocoileus virginianus*, survey.

*Parelaphostrongylus andersoni*, or muscleworm, is a metastrongyloid nematode found within or adjacent to blood vessels in musculature surrounding the lumbar vertebrae and upper hind legs of white-tailed deer (*Odocoileus virginianus*) (Prestwood, 1972; Pybus and Samuel, 1984) and caribou (*Rangifer tarandus*) (Lankester and Hauta, 1989). Muscleworm has been found in white-tailed deer throughout the southeastern United States (Prestwood et al., 1974), in New Jersey (Pursglove, 1977), British Columbia (Pybus and Samuel, 1981) and Michigan (Pybus et al., 1990) and in caribou of northcentral and northeastern Canada (Lankester and Hauta, 1989). Five metastrongyloid parasites infecting cervids in North America produce dorsal-spined larvae (*Parelaphostrongylus tenuis*, *P. andersoni*, *P. odocoilei*, *Elaphostrongylus cervi* and *Varestrongylus alpenae*) (Pybus and Samuel, 1981). However, only *P. tenuis* is known to exist in Maine (Gilbert, 1973). Considering geographic distributions and host requirements of these parasites, *P. andersoni* could occur in the northeastern USA, and recent reports that extended the range of *P. andersoni* (Lankester and Hauta, 1989; Pybus et al., 1990) throughout North Amer-

ica led me to believe this parasite could occur in Maine. Therefore, the objective of this survey was to determine if *P. andersoni* occurs in deer of Maine.

Deer were collected from September 1988 to October 1989, although most were obtained from April to September 1989 from vehicle/deer collisions. Only backstraps not traumatized by collision were examined. Fawns killed during their first summer were not examined because they would have been recently infected, thus worms may not have matured and migrated to the backstraps. Deer age class (fawn = <1 yr; yearling = ≥1 and <2 yr; adult = ≥2 yr) was determined by tooth wear and replacement (Severinghaus, 1949). Deer densities in the collection area ranged from two–six deer/km<sup>2</sup> (Maine Department of Inland Fisheries and Wildlife, unpubl. data).

Pybus and Samuel (1981, 1984) and Prestwood et al. (1974) emphasized that *P. andersoni* displayed a preference for the longissimus dorsi (backstrap). In this study, backstraps were removed and examined following Lankester and Hauta (1989). Forty-two white-tailed deer from Maine, three female fawns, five male fawns, eight female yearlings, five male yearlings, 17 female adults, and four male adults, were examined for adult *P. andersoni*. Twenty-eight specimens were collected from or immediately adjacent to southern Penobscot County, six from coastal eastern Maine, three from Franklin County, two each from York and southern Oxford Counties, and one from northern Piscataquis County (general area 43°00' to 45°50'N, 67°00' to 71°00'W). Five samples were examined immediately after receipt, all others were frozen from three days to seven months before being examined.

Thirty of 42 deer were from central Maine (43°50' to 45°00'N, 70°00' to 71°00'W), where Maine's highest deer densities occur (5 to 6 deer/km<sup>2</sup>, Maine Department of Inland Fisheries and Wildlife, unpubl. data). No adult *P. andersoni* were found in any of the deer examined.

Although no nematodes were found, the possibility remains that *P. andersoni* occurs in Maine. A Poisson approximation of the binomial distribution (Fells, 1968; Chemical Rubber Company, 1968) was used to obtain an estimated prevalence of musclem worm given the number of deer examined. Ninety-five percent confidence limits around the estimated prevalence of zero were 0 and 8.8%.

Prestwood et al. (1974), using methods similar to this study, found *P. andersoni* in backstraps of 18% ( $n = 121$ ) of white-tailed deer from South Carolina, and Pursglove (1977), also examining backstraps, found musclem worm in 10% ( $n = 10$ ) of deer in New Jersey. Furthermore, Prestwood et al. (1974) suggested presence of this parasite could probably be detected if five deer were examined, but cautioned that five may be inadequate where prevalence is low. Therefore, the probability of *P. andersoni* being present in central Maine is slight, and I suggest that *P. andersoni* is probably not present in central Maine.

I wish to thank M. W. Lankester, Lakehead University, and personnel from the Southeast Cooperative Wildlife Disease Study for providing training in necropsy procedures for *P. andersoni*, and G. Lavigne, D. Kane, and others of the Maine Department of Inland Fisheries and Wildlife for obtaining specimens. Also, I thank W. B. Krohn and H. C. Gibbs for advice in study design and review of this manuscript. Financial support for this project was provided by the U.S. Fish and Wildlife Service through Cooperative Agreement #14-16-0009-1557, Research Work Order #11, and by the Maine Department of Inland Fisheries and Wildlife. This is Publication Number 1623 of the Maine Agricultural Experiment Station and is a con-

tribution of the Maine Cooperative Fish and Wildlife Research Unit (U.S. Fish and Wildlife Service, Maine Department of Inland Fisheries and Wildlife, University of Maine, and Wildlife Management Institute, cooperating).

#### LITERATURE CITED

- CHEMICAL RUBBER COMPANY. 1968. Binomial, Poisson, hypergeometric and binomial distributions. In Handbook of tables for probability and statistics, 2nd edition, W. H. Beyer (ed.). C.R.C. Press, Cleveland, Ohio, pp. 182-266.
- FELLS, M. 1968. An introduction to probability theory and its applications. John Wiley and Sons, Inc., New York, New York, 153 pp.
- GILBERT, F. F. 1973. *Parelaphostrongylus tenuis* (Dougherty) in Maine: I—The parasite in white-tailed deer (*Odocoileus virginianus*). Journal of Wildlife Diseases 9: 136-142.
- LANKESTER, M. W., AND P. L. HAUTA. 1989. *Parelaphostrongylus andersoni* (Nematoda: Protostrongylidae) in caribou (*Rangifer tarandus*) of northern and central Canada. Canadian Journal of Zoology 67: 1966-1975.
- PRESTWOOD, A. K. 1972. *Parelaphostrongylus andersoni* sp. n. (Metastrongylidae: Protostrongylidae) from the musculature of white-tailed deer (*Odocoileus virginianus*). The Journal of Parasitology 58: 897-902.
- , V. F. NETTLES, AND F. E. KELLOGG. 1974. Distribution of musclem worm, *Parelaphostrongylus andersoni*, among white-tailed deer of the southeastern United States. Journal of Wildlife Diseases 10: 404-409.
- PURSGLOVE, S. R. 1977. Helminth parasites of white-tailed deer (*Odocoileus virginianus*) from New Jersey and Oklahoma. Proceedings of the Helminthological Society of Washington 44: 107-108.
- PYBUS, M. J., AND W. M. SAMUEL. 1981. Nematode musclem worm from white-tailed deer of southeastern British Columbia. The Journal of Wildlife Management 45: 537-542.
- , AND ———. 1984. *Parelaphostrongylus andersoni* (Nematoda: Protostrongylidae) and *P. odocoilei* in two cervid definitive hosts. The Journal of Parasitology 70: 507-515.
- , ———, D. A. WELCH, AND C. J. WILKE. 1990. *Parelaphostrongylus andersoni* (Nematoda: Protostrongylidae) in white-tailed deer from Michigan. Journal of Wildlife Diseases 26: 535-537.
- SEVERINGHAUS, C. W. 1949. Tooth development and wear as criteria of age in white-tailed deer. The Journal of Wildlife Management 13: 195-215.

Received for publication 6 February 1991.