SOME PARASITES OF ELK IN NEW MEXICO

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Source: Bulletin of the Wildlife Disease Association, 5(1) : 23-24

Published By: Wildlife Disease Association

URL: https://doi.org/10.7589/0090-3558-5.1.23

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Over a period of 13 years, 20 elk *(Cervus canadensis)* from Grant County, New Mexico and 2 from Rio Arriba County were examined to evaluate the importance of parasitic disease in elk and the extent to which elk might serve as carrier hosts for parasites of domestic animals. Nine elk were examined for helminths only, whereas, the remaining 13 were examined for external and blood parasites as well as helminths. The lungs, liver, spleen, kidneys, brain, heart, arteries, and rumen of each elk were examined. Contents of the abomasum, small intestine, and large intestine were sampled by dilution methods. The following parasites were recovered:

Helminths — 22 elk examined

Thysanosoma actinioides was found in 4 elk from Grant County and had been reported from Yellowstone elk as early as 1927 (Murie, 1951, The Elk of North America, Stackpole Publ. Co., 376 pp.). This tapeworm is very common in sheep in the Southwest (J. T. Lucker and H. O. Peterson, unpubl.; Allen and Jackson, 1953, Vet. Med. 48: 352-354); other wild ruminants are also parasitized.

Dictyocaulus viviparus was found in 5 elk from Grant County with from 8 to 40 worms per elk and is a common parasite of cattle. Dikmans (1939, Helm. Soc. Wash., 6:97-101) and Cowan (1951, Proc. Game Conv., Prov. Brit. Col., Canada, 5:37-64), also reported *D. viviparus* from elk, and others have reported *D. hadweni,* later synonymized with *D. viviparus,* and *Dictyocaulus* sp.

Elaeophora schneideri was found in 2 elk from Grant County with 1 and 8 worms per elk. This parasite causes poll lesions in sheep (Kemper, 1938, N. Am. Vet., 19:36) and Adcock et al. (1965, Bull. Wildl. Dis. Ass., 1:48) associate it with blindness in elk. Deer, which are believed to be the normal hosts, do not develop external lesions.

Trichostrongylus axei was found in 1 elk from Grant County and 1 from Rio Arriba and is a common parasite of domestic ruminants. This parasite has been reported by Eveleth and Bolin (1955, J. Wildl. Mgmt., 19:157) from elk kept on a Minnesota farm but has not previously been reported from wild elk. Only 3 and 48 worms were found.

Trichostrongylus colubriformis was found in 1 elk from Grant County and, although not previously reported from elk, is very common in other ruminants. Approximately 200 worms were present.

Ostertagi ostertagi, found in 1 elk from Grant County, had not been previously reported from elk although it is a common parasite of cattle. Approximately 20 worms were recovered.

Identifications of the last 3 parasites were confirmed by W. W. Becklund of the Beltsville Parasitological Laboratory, Beltsville, Maryland. Male specimens are on file in the U.S. National Museum Helminthological Collection as follows: *T. axei*—No. 58187; *T. colubriformis*—No. 58186, and *O. ostertagi* — No. 58185.

No helminths were found in 14 of the 22 elk examined.

External parasites — 13 elk examined

Dermacentor albipictus was found on 11 elk, although none were heavily infested. This tick is very common on elk (Murie, 1951, The Elk of North America, Stackpole Publ. Co., 376 pp.) and many wild and domestic animals are also attacked.

All of the helminths listed above have been reported from domestic ruminants and none are believed to be primarily parasites of elk. With the possible exception of *E. schneideri,* no helminths were found in large enough numbers to produce disease in elk, and conditions were not favorable for a buildup to serious proportions. Elk, therefore, are probably unimportant in maintaining helminths of domestic animals in the areas mentioned here. Elk, however, are one of the principal hosts of *D. albipictus* and might be a source of infection to domestic animals utilizing the same ranges. Cattle graze the lower elevations of the elk ranges in moderate numbers and some areas are grazed by sheep. Only a few horses graze in or pass through these areas.

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September 3, 1968

Some of the material examined in this study was collected by K. S. Samson and R. W. Allen of this laboratory.
This work was carried out in cooperation with the New Mexico Agricultural Experiment Station and the New Mexico Department of Game and Fish.

REVIEW

Natural Nidality of Diseases and Questions of Parasitology. 1968. Edited by Norman D. Levine and Translated by Fredrick K. Plous, Jr. University of Illinois Press, Urbana, 483 pp.

This book, originally published in Russian in 1961, represents the proceedings of a conference held in September, 1959, at Alma-Ata, Kazakhstan, USSR. It contains translations of 125 papers, 25 on natural nidality of diseases, 19 on protozoology, 35 on helminthology, and 33 on arachnoentomology. It constitutes a worthwhile review of the research in progress on livestock and wildlife diseases and on zoonoses. Epidemiologic theories presented follow closely the pattern set by E. N. Pavlovsky and his associates, with emphasis on the concepts of natural nidality, or the natural focal persistence of infections, and landscape epidemiology. The first paper is by E. N. Pavlovsky himself. Many of the authors show commendable zeal to convert recently acquired knowledge to practical disease control methods. One gets the impression that wildlife diseases are studied not for the sake of wildlife conservation however, but only to protect man and his livestock.

The most frustrating deficiency in this book is the total lack of references in about half the papers and careless, incomplete presentation of literature citations in many others. For example, a review paper by E. V. Gvozdev, of 18 pages on helminths of wild fauna, makes reference to 265 papers by 118 authors, yet there is no list of references given! In other papers, citations in text do not appear in the lists of references appended. The usefulness of this book is thus severely limited. One presumes the fault lies with the original authors, and that Levine and Plous have done their best to present an accurate translation of the Russian text. In spite of the lack of references, this book stands as an open door to contemporary Russian epidemiology, a door otherwise generally closed to most western scientists.