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First Observation of *Elaeophora schneideri* Wehr and Dikmans, 1935 (Nematoda: *Filariidae*) in Mule Deer from Nebraska

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ABSTRACT: Between November 2000 and November 2005, approximately 200 mule deer (*Odocoileus hemionus hemionus*) and white-tailed deer (*Odocoileus virginianus*) from western Nebraska were extensively examined for the presence of *Elaeophora schneideri*, Wehr and Dikmans, 1935; three adult *E. schneideri* were detected from three mule deer. This represents the first documented occurrence of *E. schneideri* from wild deer in Nebraska.

Key words: *Elaeophora schneideri*, mule deer, Nebraska, *Odocoileus hemionus hemionus*.

Elaeophora schneideri (Nematoda: *Filariidae*) was first described by Wehr and Dikmans (1935) in domestic sheep (*Ovis aries*) and mule deer (*Odocoileus hemionus hemionus*) from New Mexico, and has been reported subsequently from seven Western states: Arizona (Hibler and Adcock, 1968), California (Weinmann et al., 1973), Colorado (Madden, et al., 1991), Montana (Worley, 1975), Texas (Waid et al., 1984), Utah (Jensen et al., 1982), and Wyoming (Abdelbaki, 1975). In addition, it has also been reported from three Southeastern states: Georgia, Florida, and South Carolina (Couvillion et al., 1984) as well as from British Columbia in Canada (Cowan, 1946). The list of naturally occurring definitive hosts has also been expanded to include other wild, domestic, and exotic ruminant species. Comprehensive reviews of the affected hosts, associated pathology, and intermediates of this parasite in North America have been published by Hibler and Adcock (1968), Hibler and Prestwood (1981), Pence (1991), and Anderson (2001).

The only existing reference to this parasite being found in the state of Nebraska is that of Smith et al. (1954)

describing “sore head” or filarial dermatitis in a flock of domestic sheep near Pender, Nebraska, on the Omaha Indian Reservation in the northeastern corner of the state. However, as stated by the authors, because of the common practice of transporting livestock from state to state, it is sometimes difficult to determine where animals originated. This may be the case with this particular band of sheep. Consequently, although clinical signs of the infection occurred while the sheep were in Nebraska, they may very well have acquired the infection elsewhere. Notwithstanding the finding of filarial dermatitis in these sheep, there have been no other reports of *E. schneideri* in either wild or domestic ruminants from Nebraska, but *E. schneideri* has been reported from the neighboring states of Colorado and Wyoming.

During the 2000 Nebraska deer season, heads from carcasses of hunter-killed mule and white-tailed deer (*Odocoileus virginianus*) were taken to a meat-processing facility in southeastern Nebraska (Clay County) and examined for parasites. Of the 11 mule deer examined, two males were found to be positive, one with two and the other with three adult *E. schneideri* in the carotid arteries. Unfortunately, the exact locations of where these deer were harvested are not known because the state deer seal was not present on either head. Therefore, although it is likely, the authors could not be sure that these deer were harvested within the state of Nebraska.

As a result of the above findings, further efforts were initiated during a culling effort undertaken by the Nebraska Game

and Parks Commission (NGPC) to monitor chronic wasting disease (CWD), to examine these deer for the presence of *E. schneideri*. During two culling attempts in the spring of 2001, one from 5 March to 7 March and another from 23 April to 25 April, a total of 104 deer (90 mule deer and 14 white-tailed deer) were harvested by NGPC personnel. Both carotid arteries were removed from these deer and examined for the presence of *E. schneideri*. All deer were negative. During the 2001 firearm season, an additional 804 hunter-killed white-tailed and mule deer heads were collected for CWD surveillance in the western Nebraska panhandle. Although these animals were not specifically examined for *E. schneideri*, by chance a nematode was seen and removed from the cut end of one carotid artery of a mule deer and was later positively identified as an adult *E. schneideri*. The voucher specimen has been deposited in the Harold W. Manter Laboratory (HWML) of Parasitology, University of Nebraska, Lincoln, Nebraska (Accession Number HWML 16613). This mule deer was collected from Sioux County, Nebraska, approximately one-half mile from the South Dakota border.

In 2002, the NGPC culled deer and elk in a high fenced-in enclosure on a private ranch in Sioux County. It was also decided to remove as many deer as possible within a 3- to 5-square-mile area surrounding the enclosure. In total, 79 deer, both white-tailed and mule deer, were taken. All of the carotids were removed and examined for the presence of *E. schneideri*. A single mule deer from outside the pen was found to be positive. In 2005, 20 hunter-harvested mule deer from western Nebraska had carotids removed and examined. Out of this group, one deer from Sheridan County was positive for *E. schneideri*.

To date, a total of three mule deer harvested in the Nebraska panhandle have been positive for *E. schneideri*. Two of these deer are from Sioux County, and the

other deer is from Sheridan County, Nebraska. The life cycle of *E. schneideri* requires tabanid flies to serve as intermediate hosts. Of the 46 tabanid species reported to be present in Nebraska (Wehr, 1922; Burcham, 1951), four have been shown to be suitable intermediate hosts in other states: *Silvius quadrivittatus* in New Mexico (Clark and Hibler, 1973); *Tabanus punctifer* and *Tabanus stonei*, also in New Mexico (Davies, 1979); and *Tabanus lineola* in South Carolina (Couvillion et al. 1984). At this time, the vectors in Nebraska are unknown.

Sequential studies should be considered to determine the parasite's prevalence and distribution within the state. Secondly, tabanids that may serve as intermediate hosts for *E. schneideri* in Nebraska should be identified. Consequently, NGPC, ranchers, farmers, and the hunting public should be made aware of the presence of the parasite in the native deer population and determine what, if any, effect its presence will have on wildlife and domestic populations within the state.

LITERATURE CITED

- ABDELBAKI, Y. Z. 1975. Angiographic studies of the carotid arteries in animals infected with *Elaeophora schneideri*. Colorado-Wyoming Academy of Science Journal 7: 38.
- ANDERSON, R. C. 2001. Filariid nematodes. In Parasitic diseases of wild mammals, 2nd Edition, W. M. Samuel, M. J. Pybus and A. A. Kocan (eds.). Iowa State University Press, Ames, Iowa, pp. 342-356.
- BURCHAM, E. G. 1951. Tabanidae of Nebraska. MS Thesis, University of Nebraska, Lincoln, Nebraska, 68 pp.
- CLARK, G. G., AND C. P. HIBLER. 1973. Horse flies and *Elaeophora schneideri* in the Gila National Forest, New Mexico. Journal of Wildlife Diseases 9: 21-25.
- COWAN, I. M. 1946. Parasites, diseases and anomalies of the Columbia black-tailed deer (*Odocoileus hemionus columbianus*) (Richardson) in British Columbia. Canadian Journal of Research 24: 71-103.
- COUVILLION, C. E., D. C. SHEPARD, V. F. NETTLES, AND O. M. BANNAGA. 1984. Intermediate hosts of *Elaeophora schneideri* Wehr and Dikmans, 1935, on South Island, South Carolina. Journal of Wildlife Diseases 20: 59-61.

- DAVIES, R. B. 1979. The ecology of *Elaeophora schneideri* in Vermejo Park, New Mexico. PhD Dissertation, Colorado State University, Fort Collins, Colorado, 216 pp.
- HIBLER, C. P., AND J. L. ADCOCK. 1968. Redescription of *Elaeophora schneideri* Wehr and Dikmans, 1935 (Nematoda: *Filariidae*). *Journal of Parasitology* 54: 1095–1098.
- , AND A. K. PRESTWOOD. 1981. Filarial nematode of white-tailed deer. In *Diseases and parasites of white-tailed deer*, W. R. Davidson, F. A. Hayes, V. F. Nettles and F. E. Kellogg (eds.). Miscellaneous publications, Tall Timbers Research Station, Tallahassee, Florida, pp. 351–362.
- JENSEN, L. A., J. C. PEDERSON, AND F. L. ANDERSON. 1982. Prevalence of *Elaeophora schneideri* and *Onchocerca cervipedis* in mule deer from Utah. *Great Plains Naturalist* 42: 351–352.
- MADDEN, D. J., T. R. SPRAKER, AND W. J. ADRIAN. 1991. *Elaeophora schneideri* in moose (*Alces alces*) from Colorado. *Journal of Wildlife Diseases* 27: 340–341.
- PENCE, D. B. 1991. Elaeophorosis in wild ruminants. *Bulletin of the Society for Vector Ecology* 16: 149–160.
- SMITH, H. C., V. E. LOVELL, AND R. F. REPERT. 1954. Filarial dermatitis of sheep. *North American Veterinarian* 35: 588–589.
- WAID, D. D., R. L. WARREN, AND D. B. PENCE. 1984. *Elaeophora schneideri* (Wehr and Dikmans, 1935) in white-tailed deer from the Edwards Plateau of Texas. *Journal of Wildlife Diseases* 20: 342–345.
- WEHR, E. E. 1922. A synopsis of the Tabanidae of Nebraska, with a description of a new species from Colorado. *University Studies* 22: 107–118.
- , AND G. DIKMANS. 1935. New nematodes (*Filariidae*) from North American ruminants. *Zoological Anzeiger* 110: 202–208.
- WEINMANN, C. J., J. R. ANDERSON, W. M. LONGHURST, AND G. CONNOLLY. 1973. Filarial worms of Columbian black-tailed deer in California: 1. Observations in the vertebrate host. *Journal of Wildlife Diseases* 9: 213–230.
- WORLEY, D. E. 1975. Observations on epizootiology and distribution of *Elaeophora schneideri* in Montana ruminants. *Journal of Wildlife Diseases* 11: 486–488.

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