

PARASITES OF RUMINANTS:
POSSIBLE CROSS-TRANSMISSION OF Dictyocaulus sp.
LUNGWORM BETWEEN CATTLE AND ELK

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Purpose

Determine the relationship of elk lungworm, Dictyocaulus hadweni, and a related species, D. viviparus in cattle.

Elk are reinfected annually in the spring months with the lungworm species noted above. Serum samples from the elk are needed in order to attempt to explain why the elk make no immune response to lungworm infections during the period, April-June.

Additionally, epidemiological work with the lungworm of cattle in areas also utilized by elk in Teton and Fremont Counties of Wyoming will be completed so as to learn more about possible cross-transmission of the lungworm infections in the cervids and bovids.

Scope

Studies will be limited by time available. About 30-40 days can be devoted to this research project each year.

Introduction (1983)

A knowledge of current prevalence and intensity of lungworm infections in elk and domestic ruminants sharing the same range would be useful to wildlife managers, ranchers, forest service personnel and others.

Limited epidemiological studies of the interaction of hosts and their parasites and the possibilities of cross-transmission from wild to domestic ruminants or from domestic to wild ruminants have been conducted in Georgia (Davidson, et al., 1981) and on a similar scale in some other states but not in Wyoming.

Objectives

1. A continuation of the study of prevalence of Dictyocaulus sp. lungworm in elk in Teton and Yellowstone National Parks throughout the various seasons of the year.

2. Initiate research of the prevalence of Dictyocaulus sp. in cattle sharing ranges, usually summer ranges, with elk.
3. Analyze genera of nematodes recovered from vegetation taken from the cattle-elk ranges. Isolate Dictyocaulus sp. from the vegetation or from elk and cattle feces.
4. Continue studies of trichostrongylid nematodes in cattle in the areas adjacent to the national parks or forest service land where Dictyocaulosis has been a problem during the past few years.

Comment

Spring months are the time of heavy contamination of vegetation by lungworm larvae but spring-like conditions are encountered at higher elevations in the Rocky Mountains where infective larvae of stomach or intestinal worms as well as lungworm larvae may be important potentiators of disease much later in the season than at lower elevations.

PREVIOUS WORK

From research results gathered during the past 10 years, the present investigators have shown the time of infection and re-infection of elk annually by Dictyocaulus sp. lungworm (Bergstrom, 1975). In general, the data published in 1975 resemble those of Worley and Barrett, (1964) who worked with the Lamar River elk in Yellowstone National Park. The reason for predictable annual infections of elk in the Tetons and in Yellowstone Park herds has not yet been shown.

Results

During May, 1983, 47 cow elk grazing the Snake River meadows and the sagebrush "pothole" areas south of Signal Mountain were checked for lungworm larvae in fecal samples weighing 45-70 g. Seventy-five per cent of the elk were positive for lungworm, Dictyocaulus sp. Numbers of larvae in the fecal samples was average, 0.4 - 80 larvae/gram, for samples taken at that time of year.

During the same week, 5/23 and 5/24, registered Galloway cattle on a ranch near Bondurant, WY were checked for possible lungworm problems. Two of the bovids, one cow and one yearling from a group of 7 cows and yearlings (29%) were positive for Dictyocaulus sp. lungworm according to the Baermann funnel type analysis of feces (first stage larvae are recovered by the funnel method).

Yearling cattle on two ranches north and east of Dubois (Fremont Co.) were checked via fecal analyses for the presence of abomasal and intestinal worms as well as for lungworm larvae in feces during August, 1983. The average eggs/g counts were low (0-20, mean 6) on one ranch and 10-40, mean 16 in feces of yearlings from the second ranch. One lungworm larva was found in feces of one calf on the first ranch checked, (1 of 14 bovids checked = about 7% positive for

Dictyocaulus sp. larvae).

On a ranch along the lower reaches of the Buffalo Fork of the Snake River twelve yearling steers were checked via fecal analyses, August 19 and 20, for gastrointestinal worm eggs and lungworm larvae in feces. Gastrointestinal worm egg numbers were low (2-70, mean 20 e.p.g.) but 75% of the steers were positive for Dictyocaulus sp. larvae with 2-4 larvae per gram feces recovered via Baermann funnel sedimentation.

Discussion

During the past 5 years, lungworm infections in elk have been shown by Bergstrom and Worley (1982) to be predictable, i.e. a low order of infection is carried by a few elk throughout the winter. During spring month, April-June, a predictable rise in prevalence of infection is noted in elk. Both sexes, but especially yearling and pregnant cow elk are positive for Dictyocaulus lungworm at that time of year. Infection levels and prevalence percentages are similar in free-ranging elk, e.g., those elk in the Gibbon River-Madison River area of Yellowstone National Park and those elk grazing the vegetation on the National Elk Refuge, Jackson.

During the last 5 years, lungworm infections in cattle have increased dramatically in Wyoming herds. More deaths due to the lungworm have been documented during these years (1978-1983) than during the previous 25 years. Increased surveillance will be needed. More comprehensive cooperation of federal agencies and private enterprises will be necessary. We do not know, at present, whether lungworm infections pass from elk to cattle and/or from cattle to elk under natural conditions. Apparently, the greatest danger to either host species is the transfer of infection to the homologous host, cattle to cattle, elk to elk, etc. The importance of transfer of infection to the heterologous host is not yet known. Our research may aid in determining that point within the next few years.

Literature Cited

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