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Authors: BARRETT, R. E., and WORLEY, D. E.

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The Incidence of *Dictyocaulus* sp. in Three Populations of Elk in South-Central Montana[1]

R. E. BARRETT AND D. E. WORLEY

Montana Veterinary Research Laboratory, Montana State University, Bozeman

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Although the elk (*Cervus canadensis*) is widely distributed in the northern Rocky Mountain region and is highly regarded as a game animal, little information is available on the incidence of internal parasites or on the relative significance of parasitism in elk herds maintained under varying range conditions. The months of December through February of 1964-65 afforded an excellent opportunity to survey the incidence of *Dictyocaulus* sp. from three isolated populations of elk from adjacent ranges in the Yellowstone, Gallatin and Madison drainages in south-central Montana. The Yellowstone herd, which occupies the northern section of Yellowstone National Park, has had a relatively stable population since the major reduction in the winter of 1961-62. The Gallatin sample originated from a stagnated population where the range conditions warranted a special elk hunting season in the winter of 1964-65. The Madison animals were obtained from a herd which is fairly dynamic and within its range carrying capacity. Previous records of *Dictyocaulus* sp. in the northern Yellowstone elk herd were published by Rush (1932), Mills (1936), and Honess and Winter (1956).

A total of fifty-nine sets of lungs were examined for the presence of *Dictyocaulus* sp. Twenty-three animals (one male and 22 females) were obtained from Yellowstone National Park biological studies, 19 (nine males and 10 females) were made available from the special hunting season in the Gallatin drainage in Gallatin County, and 17 elk (three males and 14 females) were collected from the Madison drainage in Madison County. Female elk ranged in age from six months to 15 years, while males were six months to 6.5 years old. Lungs were examined grossly for adult worms after opening the trachea and following the respiratory tree to its apices.

The incidence of *Dictyocaulus* in 23 sets of lungs from the northern Yellowstone elk herd was 8.7% (2/23). Individual infections ranged from two to five worms with the average being 3.5. Nineteen sets of lungs collected during the special elk season on the Gallatin drainage showed a lungworm incidence of 15.8% (3/19). The worm burden ranged from 16 to 32 with an average of 23.3. One animal from this area was also infected with *Thysanosoma actinioides* in the bile duct.

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Seventeen sets of lungs from the Madison drainage were negative for *Dictyocaulus* sp., but one *Protostrongylus* sp. was found in a single animal. One elk in this group was also infected with *Thysanosoma actinioides*, and a total of four animals were infected with the nasal bot, *Cephenomyia jellisoni*.

Of the elk from the Yellowstone, Gallatin and Madison populations 78% were females averaging 4.2, 3.5 and 3.2 years of age, respectively. Despite these limitations with respect to age and sex of the sample, studies have indicated that there is little difference in lungworm incidence when attempts are made to correlate this with the age and sex of the host (McBee *et al.*, 1964). The primary indication from this survey of lungworm occurrence in three adjacent elk populations occupying similar habitats is that the incidence and average worm burden of *Dictyocaulus* sp. seems to be directly correlated to the past and/or present use of the range, which produced the conditions that were favorable for the propagation and transmission of this lungworm.

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Some Blood Parasites from Minnesota and Wisconsin Birds

D. J. MARX[1]

Department of Zoology, University of Minnesota, Minneapolis, Minn.

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Although the occurrence of blood parasites in birds has been reported from many parts of the United States, work on avian fauna in Minnesota, is limited to a study of blood parasitism in Ruffed Grouse (Erickson, Higby, and Carlson, 1949, J. Wildl. Mgt., *13*:188-194).

To partially fill this gap, 237 juvenile and adult birds of 36 species (33 genera, 16 families, 5 orders) were collected between March 3, 1964 and July 25, 1964

[1]Present address: Department of Veterinary Pathology and Parasitology, College of Veterinary Medicine, University of Minnesota, St. Paul, Minn. 55101.