DIROFILARIA SCAPICEPS FROM THE RABBIT (*SYLVILAGUS FLORIDANUS MEARNSI*) IN OHIO

(NEMATODA: DIPETALONEMATIDAE)

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Several surveys of parasites from rabbits have been made in the United States in past years, but records of filariae are scarce. *Dirofilaria scapiceps* has not been reported from Ohio.

Leidy (1866) found filarial worms under the skin of the hind foot of *Lepus sylvaticus* (*Sylvilagus floridanus mallurus*). He named these worms *Filaria scapiceps*. The locality of Leidy's collection is not given, but Hall (1916) believed that Leidy probably collected them in Pennsylvania. Hall reported two other cases, one from *Lepus campestris*, locality not given, and another collected by Douthitt from *Sylvilagus floridanus alacer* at Sulphur Springs, Oklahoma. The parasites collected by Douthitt were found under the skin of the lumbar region. In 1927, Harkin reported microfilariae in the blood of a rabbit from British Columbia.

Alicata (1929) recorded a previously unreported case from a rabbit collected in 1916. In this case, the adult nematodes were inside the tarsus of *Sylvilagus floridanus mallurus* from Woodford, Virginia. He also reported worms from inside the tarsus of the hind leg of what was probably the marsh rabbit, *Sylvilagus palustris*, from Kingston, North Carolina. Schwartz and Alicata (1931) described microfilariae from the blood of *Lepus washingtonii* collected in Washington State. MacLulich (1937) found *Dirofilaria scapiceps* adults in *Lepus americanus* in Ontario.

Manweiler (1938) found this parasitic nematode in the snowshoe hare, *Lepus americanus phaeonotus* in Minnesota. About one-third of all the snowshoe hares collected by Manweiler during the winters of 1936–1937 and 1937–1938 were infected. He found the incidence increased from October to February and then decreased to July. Highby (1938) observed microfilariae in the blood of a snowshoe hare in Minnesota. Wild mosquitoes were allowed to feed on this rabbit. Twelve days after this feeding, infective stages were seen actively moving within the probosces of the mosquitoes. Microfilariae were also observed in the gut contents of an engorged tick. In 1943, Highby reported 23 cases of infection from 57 snowshoe hares examined in Minnesota. He found that the incidence varied from 13 to 58 percent in animals collected from three geographic extremes of the hosts' range. Highby also demonstrated that five species of mosquitoes (*Aedes canadensis*, *A. cinereus*, *A. excursians*, *A. fitchii*, and *A. verlans*) were susceptible as hosts to complete larval development. Transmission through the mosquito from the snowshoe hare to a domestic rabbit was accomplished.

Llewellyn and Handley (1945) found a small percentage of rabbits infected with this parasite in Virginia. They sent infected rabbits to Bell and Chalgren of U.S.P.H.S. for parasite identification. The nematodes were found in the intermuscular fasciae of the hind legs except for one from the subcutaneous fasciae of the back just posterior to the shoulder. Penner, Dery, and Knuckles (1953) examined four cottontails which were apparently *Sylvilagus floridanus mallurus* from Connecticut. Three of the four rabbits examined contained microfilariae in the blood, but these workers were able to recover only a single pair of adults from the left rear foot near the Achille's tendon of one of the rabbits. These same workers identified, as *D. scapiceps*, five adult nematodes from the hind leg of a cottontail rabbit killed in Massachusetts.

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Erickson (1947) examined 97 cottontails for parasites, and reported 15 different helminth species, but even though the leg joints of 30 rabbits were carefully examined, *Dirofilaria scapiceps* was not found. In studies made by Clancy, Jungherr, and Sime (1940) filariae were not reported from 342 cottontail rabbits examined for parasites. Cheatum, working in New York State, examined 937 cottontails but found no *D. scapiceps*. Several studies of population fluctuation have been made for rabbits in Ohio. Some of these involved an examination of animal parasites, but there was no record of filarial worms. Phinney (1956) x-rayed the legs of 78 rabbits from Ohio, in a study of aging techniques, but he never observed nematodes in the legs.

We obtained our specimens from two *Sylvilagus floridanus mearnsi* which were shot by Mr. Phinney and Mr. Loren Mosely in the Zaleski State Forest, Madison Township, Vinton County, Ohio, in December, 1955. Each of these two rabbits had a large swelling on the left hind foot. When these swellings were incised, they were found to be filled with large filarial worms (fig. 1). The nematodes were in the intermuscular fasciae of the hock of the foot, and in the joint between the tibia, fibula and tarsal bones. Seventy-six nematodes were removed from one rabbit and there were 84 in the tissues of the other. We have identified these parasites as *Dirofilaria scapiceps* (Leidy, 1886) Railliet and Henry, 1911.

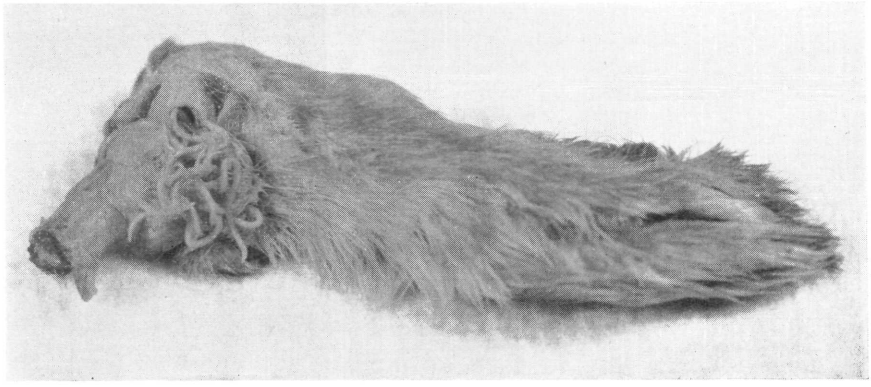

FIGURE 1. Nematodes protruding from the intermuscular fasciae of the hock of the left rear leg.

The males range from 11 to 16 mm in length and from 305 to 375 microns in width. The left spicule is 113 to 139 microns long and the right spicule is 84 to 86 microns in length. The females are 25 to 30 mm long and 745 to 765 microns wide. The vulva is located approximately 1.5 mm from the anterior end. The embryos are slender and filiform.

There has been some importation of cottontail rabbits from other states into Ohio in the past; however, the importation has been from states where this nematode has not been reported. It seems probable that these nematodes have been parasitizing rabbits in Ohio for many years. The pathology is not well known; Schwartz and Alicata (1931) reported one rabbit with microfilariae which appeared to be in a stupor. The adult nematodes did not seem to disturb the movement of cottontails collected in Ohio, but the effect of adults over a long period of time should be studied. Careful examination of fresh blood smears and leg joints should reveal the incidence and distribution of this parasite in Ohio.

With this report *Dirofilaria scapiceps* has been recorded from wild rabbits of ten states in the United States and from two provinces of Canada. In the United States it is known in Pennsylvania, Oklahoma, Virginia, North Carolina,

Minnesota, Washington, Wisconsin, Connecticut, Massachusetts, and Ohio, and in Canada from British Columbia and Ontario.

Specimens collected in Ohio are deposited in the Helminthological Collection, Department of Zoology and Entomology, The Ohio State University.

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