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Cysticerci of *Taenia ovis krabbei* Moniez, 1879, in the Brain of Moose, *Alces alces* (L.) in Maine

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Some 40 years after hunting of moose in Maine was prohibited, a hunting season was re-introduced in the fall of 1980. During this season a number of the moose were examined for a variety of biological purposes. One involved examination of heads for the occurrence of meningeal worms, *Parelaphostrongylus tenuis*, which occur sporadically in moose in this region (Gilbert, 1974, *J. Wildl. Manage.* 38: 42–46).

After collection, heads were frozen until examination. They were skinned, split longitudinally on a band saw, and the meninges, brain and a portion of the spinal cord of 80 animals were examined by teasing with a dissection needle under a magnifying light.

During the course of these examinations three of the brains were observed to contain single, small, cyst-like structures. These were all found in the cerebrum, situated just below the surface, on the right side, in the region of the frontal pole and were readily seen on cursory examination. Portions of tissue containing the cysts were fixed in 10% formalin, and sectioned at 6 μm and stained with hematoxylin–eosin. On histologic examination the cyst was seen to be a cysticercus. There appeared to be some compression of the surrounding brain tissue. A well defined, capsular structure surrounded the cyst and was comprised of dense fibrous connective tissue and infiltrating cells. These latter were mainly mononuclears, lymphocytes and plasma cells, with a few polymorphonuclear leukocytes. There was some perivascular cuffing (lymphocytes) of vessels immediately adjacent to the cyst capsule. In addition, there seemed to be increased gliosis locally in the nerve tissue adjacent to the cyst. Overall, however, there appeared to be minimal reaction in the tissue to the presence of the cyst.

A cyst was dissected from the brain tissue and after clearing in lactic acid was measured and the rostellum of the larval cestode examined. The numbers of hooks were counted and five representatives large and small hooks measured. The cyst diameter was 4.7 mm. The rostellum comprised a double row of 29 hooks. Large hooks measured 140–176 μm with the blade measuring 58–72 μm long and the handle 86–122 μm . Small hooks were 90–122 μm long with blades measuring 45–50 μm and handles 72–86 μm . Comparison of these values with those given for *Taenia ovis krabbei* (Sweatman and Henshall, 1962, *Can. J. Zool.* 40: 1287–1311) showed that these cysticerci represented the larval forms of that species. This material has been deposited in the U.S. National Parasite Collection (Beltsville, Maryland) as Accession Number 77355.

There are a number of reports of *T. o. krabbei* in moose from various parts of North America (Samuel, 1972, *Trans. Eighth N. Am. Moose Conf. and Workshop, Ont. Min. Nat. Res.*, pp. 18–41), and it is frequently found in Maine. Samuel has speculated that possibly, in very large numbers, the cysts of this parasite might modify the behavior of the moose host so that it was more susceptible to predation. In all instances so far reported these cysticerci have only been reported in various groups of muscles, including the myocardium, sometimes in large numbers. There have been no reports of it occurring in the brain. This present report, therefore, represents a new record on the occurrence of this cysticercus in an unusual anatomical location.

Other cestodes whose larval forms have been reported from the central nervous system include *Taenia multiceps* and *T. solium* (Soulsby, 1968, *Helminths, Arthropods and Protozoa of Domesticated Animals* (Mönnig), 6th Ed., Lea and Febiger, Philadelphia, Pennsylvania, 824 pp.). In both these instances the larval forms

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are responsible for producing central nervous disturbances, often of a profound nature. However, in the present instance, based on the fact that there appeared to be minimal tissue reaction, and that the moose seemed healthy when shot by the hunters, deleterious effects of *T. ovis krabbei* in the brain were minimal. The fact that it was seen in moose collected in three

different areas in the state suggests that it is of fairly common occurrence. Unfortunately, it was not possible to correlate the finding of the brain cysticerci with the occurrence of muscle cysticerci in the hosts examined.

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Helminth Fauna of Ring-Necked Pheasants from the Texas High Plains¹

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Presently there is limited information on the helminth fauna of ring-necked pheasants (*Phasianus colchicus* Gmelin) in the Texas High Plains. Pence et al. (1980, *Proc. Helminthol. Soc. Wash.* 47: 144-147) reported one trematode, one cestode, and two nematode species in seven of 78 (9%) pheasants from the Texas Panhandle. These authors noted a basic similarity in the helminth fauna of pheasants from the Texas Panhandle with that of pheasants in Nebraska, but noted a much lower prevalence and intensity of helminth species from the Texas birds. Since the above study was based entirely on hunter-killed, cock pheasants collected during the fall from a single area, the present study was initiated to further examine the helminth fauna of this host as related to age, sex, season, and geographic area.

Eighty-four pheasants were collected in February, May, August, and November 1981 from Deaf Smith, Castro, and Parmer Counties (Area 1) and Hale County (Area 2), Texas. The two areas were chosen because of differences in

pheasant density (Dowell and Warren, 1982, *Proc. Annu. Conf. Southeast. Assoc. Fish Wildl. Agencies* 36: In press). Pheasants were collected with shotguns and consisted of 35 males and 49 females. There were 24 juveniles and 60 adults. Fifty and 34 birds were collected from Areas 1 and 2, respectively. Necropsy procedures and collection methods for identification of helminths followed the method of Pence et al. (1980, *op. cit.*). Representative specimens of helminths have been deposited in the U.S. National Parasite Collection, Beltsville, Maryland (Accession Nos. 77253-77255). The terms prevalence, intensity, and abundance follow the definitions of Margolis et al. (1982, *J. Parasitol.* 68: 131-133). The Mann-Whitney *U*-test statistic for data with ties (Conover, 1980, *Practical Nonparametric Statistics*, 2nd Ed., John Wiley and Sons, New York, 493 pp.) was used to determine significant differences ($P < 0.05$ unless otherwise indicated) in helminth prevalence and abundance between areas, ages (adult vs. juvenile), sexes, and seasons (warm vs. cool).

Helminths were recovered from 18 of 84 (21%) birds examined. There were no hosts infected with more than one helminth species. Fifteen of 84 (18%) pheasants were infected with *Choanotaenia infundibulum* (Bloch, 1779). Intensities ranged from 1 to 25 ($\bar{x} = 5.3$) and the abundance value was 0.980 for this

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