NOTE

Dicrocoeliasis in the Wild Japanese Serow, *Capricornis crispus*

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Dicrocoeliasis was studied parasitologically and pathologically in five wild Japanese serows. The worm found in the intrahepatic bile duct was identified to be the lancet fluke, *Dicrocoelium dendriticum*. The bile duct revealed severely hyperplastic epithelial cells accompanied by globule leucocytes. There was an infiltration of lymphocytes, plasma cells and eosinophils in the submucosa, with proliferation of granulation tissue in and around their walls. These findings coincided with those of *Dicrocoelium* infection in domestic animals.—*Key words*: Dicrocoeliasis, Wild Japanese serow.

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Recently there have been a couple of reports on the wild Japanese serow, *Capricornis crispus*; pulmonary lesions due to infection with the lungworm, *Protostrongylus shiozawai* [9] and morphology on reproduction and prenatal growth [8]. Since 1979, many serows have been necropsied in our Department of Veterinary Pathology, Tokyo University of Agriculture and Technology. Having carried out the necropsy, the authors could be aware of the fact that no report has been made on infestation of the lancet fluke, *Dicrocoelium dendriticum* in the serow, although the lancet fluke infestation has been recognized in domestic animals [2, 7]. The purpose of the present note is to describe the infestation of the fluke in the serow liver.

Of 19 serows necropsied in 1980, we encountered one case harbored the lancet fluke in the liver. Of 83 serows necropsied in 1981, 15 were selected at random and their hepatic bile was examined for *Dicrocoelium* eggs by the sedimentation method, AMS III [3]. Of the 15 serows examined, 4 were positive for the fluke eggs. The livers of the 5 serows with the flukes or their eggs were

subjected to histopathological examination. Several flukes removed from the intrahepatic bile ducts were compressed between two slide glasses before being fixed with 70% alcohol. For morphological observation, they were stained with borax carmine and mounted with balsam.

No significant gross lesions were found in any of the infected livers.

Histologically, some of the intrahepatic bile ducts in all the five serows had matured flukes containing several eggs. As shown in Fig. 1, the bile ducts were greatly thickened with proliferation of granulation tissue in and around their walls. In correspondence to such marked proliferation of granulation tissue, there were, more or less, cellular infiltrations consisting of eosinophils and lymphocytes. Around the thickened bile ducts, there were also proliferation of fibrous connective tissue in all the five animals. Lumina of such bile ducts were dilated probably due to parasitism of the worm. The lining epithelium revealed severe hyperplasia. Occasionally some hyperplastic cells appeared to be adenomatous (Fig. 2). In the submucosa of

Fig. 1. Cross section of the bile duct infested with a lancet fluke, *D. dendriticum* in a wild Japanese serow. H-E stain. $\times 78$.

the bile ducts, an infiltration of lymphocytes and plasma cells was observed, associated with mild proliferation of granulation tissue and sometimes with a few lymphoid follicles with germinal center. Marked eosinophilic infiltration was also noted in the submucosa of two cases.

Furthermore, some globule leucocytes were found among the hyperplastic epithelial cells (Fig. 3). All globules of the leucocytes were strongly acidophilic and usually liable to coalesce, forming more or less large aggregations within the cytoplasm. There was little or no destruction in the liver parenchyma. Only one serow, however, exhibited cholangiohepatitis showing mild proliferation of connective tissue with an infiltration of a few lymphocytes and plasma cells around the portal triads. In addition, some interlobular bile ducts had no fluke worm, but their walls showed fibrous thickening.

The worm body was slenderly lanceolate,

Fig. 2. Adenomatous hyperplasia of the bile duct mucosa. Note the oral sucker of a lancet fluke (arrow). H-E stain. $\times 78$.

measuring 7.0 mm long and 1.2 mm wide (Fig. 4). The ventral sucker was nearly as large as the oral sucker and located in the anterior third of the body. The ovoid testes were laid in almost tandem posterior to the ventral sucker and the ovary was behind them. The uterus was arranged in a coil in the central field behind the ovary. The vitellaria occupied the middle third of the lateral field. The operculate eggs were dark brown in color, 48–56 μm by 21–31 μm in size.

Both morphological findings of the fluke worm and histological changes of the bile ducts infested with the worm mentioned above, basically were similar to those of *Dicrocoelium* infection in domestic animals. Though the configuration of the fluke appeared to be meagerly slender in comparison with that of *D. dendriticum*, the inner structure of the fluke was quite identical to that of *D. dendriticum* [2, 7]. The bile duct lesions were characterized by hyperplasia of their

Fig. 3. Globule leucocytes (arrows) in the hyperplastic epithelium of the bile duct. H-E stain. $\times 485$.

lining epithelium and thickening of the walls with the fluke. These changes were quite compatible with those of cattle and goats affected with this parasite [5]. There were little destructive changes in the liver parenchyma.

The findings of the globule leucocytes found in the walls of bile ducts of the present serows, were the same as those seen in fascioliasis of cattle, sheep and mice, or in dicroceliasis of cattle, sheep and goats [5]. It is interesting to note that such leucocytes are concerned with antibody transfer across the epithelium [4].

As the wild Japanese serow lives usually in the forest or mountain, actually the infection rate of *D. dendriticum* might be high surprisingly and unexpectedly. The reason is that the intermediate hosts, snails and ants, which are necessary to complete the life cycle of *D.*

Fig. 4. Lancet fluke recovered from a serow liver. Mounted specimen. Ventral view. OS: oral sucker, VS: ventral sucker, T: testis, O: ovary, V: vitellaria and U: uterus. $\times 13$.

dendriticum, thrive better in the forest land (1). In addition, it is interesting description that the frequency of dicroceliasis was approximately three times as high in cattle deriving from farms in the forest district as in those from farms on the plain [1].

The incidence of dicroceliasis reported in this paper might offer an important prospect for the field of biology in the wild Japanese serow. More detailed researches on this disease will be required, particularly with regard to the parasitological or pathological background.

The outline of this paper was presented at the 93th Meeting of the Japanese Society of Veterinary Science in Kanagawa in 1982. At the same time, Yagi, K. *et al* had also presented parasitological investigations including *D. dendriticum* at the Meeting.

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要 約

日本カモシカの槍形吸虫症について（短報）：中村 孝・中張淳平・町田 登・桐生啓治・町田昌昭¹⁾（東京農工大学家畜病理学教室，¹⁾国立科学博物館動物研究部）——日本カモシカの剖検例5例の肝臓に槍形吸虫（*Dicrocoelium dendriticum*）の寄生をみとめた。吸虫は胆管内に寄生し，粘膜における上皮細胞の過形成および globule leucocyte の出現，粘膜下織におけるリンパ球・好酸球の浸潤，胆管壁における肉芽組織増殖および線維性肥厚がみられた。