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Archinephric Duct Lesions Caused by *Phyllodistomum superbum* and *P. lysteri* (Digenea: Gorgoderidae) in Catostomid Fishes

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The effects of trematodes upon epithelial linings have been examined for a variety of host–parasite systems, but few studies have been reported on the effects of those that inhabit the archinephric ducts of fish. Choquette (1947, Can. J. Res. 16: 131–135) reported that *Phyllodistomum lachancei* Choquette caused dilation of the lumen and flattening of the cells of the epithelial lining in the ureters (=archinephric ducts) of the eastern brook trout, *Salvelinus fontinalis* (Mitchill). Herein are reported observations on the lesions occurring in the archinephric ducts of the hogsucker, *Hypentelium nigricans* (Lesueur), and the spotted sucker, *Minytrema melanops* (Rafinesque), attributed to infections with *Phyllodistomum superbum* Stafford and *P. lysteri* Miller, respectively.

Material for this study was obtained from naturally infected fish. Hogsuckers were collected from the West Fork of Drake's Creek, Simpson Co., Kentucky, by electrofishing, brought to the laboratory alive and killed. Spotted suckers were collected from Kentucky Lake, Trigg Co., Kentucky by gill netting, and stored on ice for a maximum of 3 hr before necropsy. In both cases, the kidneys and archinephric ducts were removed intact, fixed in Bouin's solution, sectioned at 6 μm, and stained with hematoxylin and eosin. Uninfected ducts from both species of fish were collected in a similar manner and were used for comparative purposes. Representative whole mount specimens of *P. lysteri* and *P. superbum*, and two slides of sections from naturally infected fish of both species have been deposited in the U.S. National Parasite Collection, Beltsville, Maryland (USNM Helm. Coll. Nos. 77373–77375).

Phyllodistomum superbum and *P. lysteri* were observed in the lumens of the archinephric ducts of their respective hosts. The *P. superbum* were found more frequently in the distal region of the duct in hogsuckers, while *P. lysteri* from spotted suckers were found in the proximal region. Trematodes almost completely occluded the ducts in several specimens, and cellular debris was concentrated in the lumen of the ducts proximal to this blockage. There did not seem to be any major differences in the lesions caused by the two species of *Phyllodistomum* in their hosts. Pathologic changes associated with the flukes seemed to be entirely mechanical and were primarily related to feeding and(or) attachment activities of the oral sucker and acetabulum. Not all flukes were attached with both or either sucker, and in some cases there was no evidence of recent attachment sites in the vicinity of the fluke.

The oral suckers and acetabula of the trematodes often were filled with epithelial cells (Figs. 1, 2). Frequently these cells were still a part of the epithelial lining, but occasionally they had been completely separated from the

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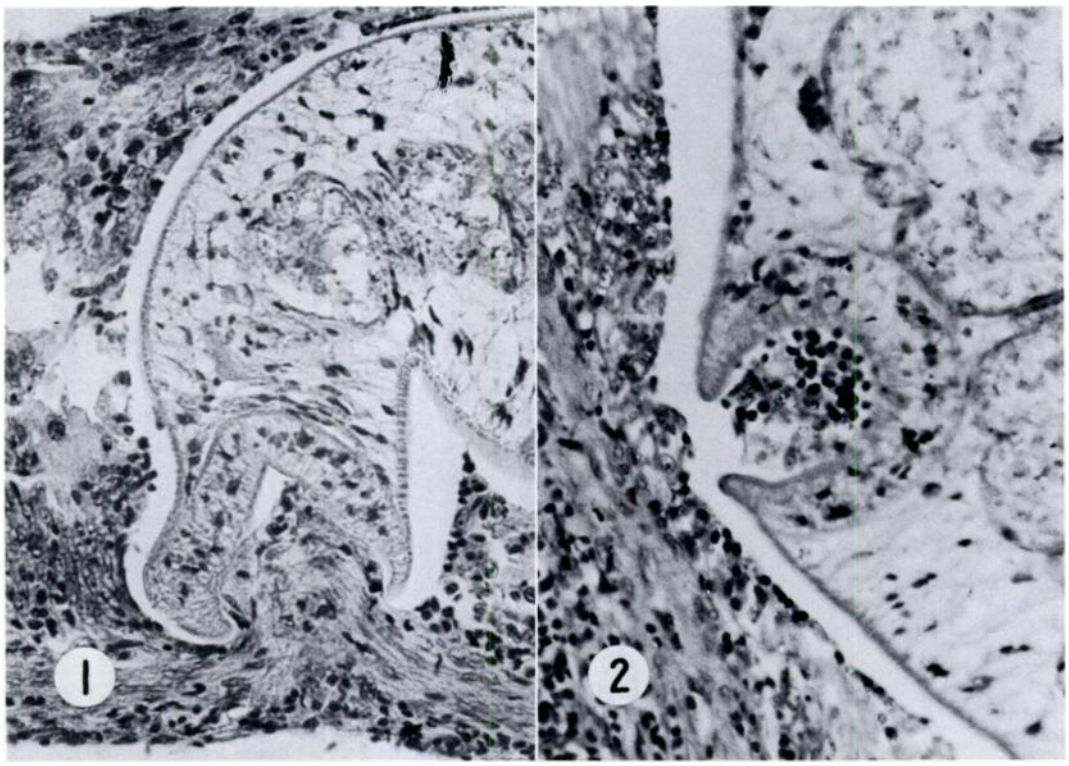

FIGURES 1, 2. *Phyllodistomum lysteri* in the archinephric duct of the spotted sucker. 1. A portion of the epithelial lining and underlying muscle and connective tissue layers were within the oral sucker. 2. The acetabulum contained epithelial cells and leukocytes. The normal pattern of epithelial cells has been disrupted and the acetabulum has left a depression in the lining. ×310.

lining. Cells within the suckers were in stages of disruption, and cellular components were observed in the digestive tracts of some of the flukes. Complete penetration of the oral sucker and anterior region of a worm through the duct wall was observed in one instance in a spotted sucker infected with *P. lysteri*.

At points of contact between the trematode tegument and the epithelial lining, there was disruption of the normal architecture. A movement of the nuclei from their normal basal positions in the epithelial cells (as observed in sections from uninfected ducts) toward the lumen was noted, and the pseudostratified columnar epithelium appeared deflected toward the distal region of the duct and the posterior area of the fluke. Leukocytes infiltrated the subepithelial and muscular layers of the archinephric duct to the base of the epithelial cells. In addition, a few leukocytes were observed in the lumen of the duct, but this was only evident in areas where the epithelium was badly eroded. Infiltrating leukocytes were predominantly granulocytes, among them eosinophils, but there were some lymphocytes present. Compression and erosion of the epithelial cells in contact with trematodes occurred in some areas. This usually was related to the relative size of the fluke for the portion of the archinephric duct that it occupied, with more disruption occurring when the lumen was fully occupied. Changes in the epithelial lining were particularly evident where contact was made with the lateral margin of the trematode. This was true even though the lumen of the duct was not completely occupied by the fluke. Epithelial cells were eroded at some points, possibly indicating prolonged contact at these sites.

Pathologic changes observed in this sample did not seem to cause any dysfunction of the urinary system, but it is conceivable that infections with a large number of worms could serve

as an additional stress, thereby directly, or indirectly, causing poor condition or death of the host.

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Cerebral Abscess and *Cephenemyia phobifer* in a Mule Deer in Central Nebraska

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A wild yearling male mule deer (*Odocoileus hemionus hemionus*) from south central Nebraska was submitted to the University of Nebraska North Platte Station Diagnostic Laboratory with the history of severe depression, slight incoordination, and visual impairment. Gross examination revealed a large abscess in-

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FIGURE 1. Sagittal section of mule deer head showing large cerebral abscess (1) and bots (*Cephenemyia phobifer*) in retropharyngeal area (2).