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Indian	PARIPER S	AMP CASE	HISTOMATOUS PARASITES OF BUFFALO: A E STUDY ON THEIR LYMPHATIC SYSTEM	<b>KEY WORDS:</b> Lymphatic system, Buffalo, Amphistomatous parasite
Brij	Kishore		Department of Zoology G.D.(P.G.) College, Etah, U.P	,
Мо	hd.Shoeb		Department of Zoology G.F.College, Shahjahanpur, U	J.P
BSTRACT	The system represents a primitive circulatory system of simple flattened mesenchyma cells and contains a fluid resembling the primitive invertebrate blood. <i>Fischoederius cobboldi</i> , The lymphatic system consists of two main longitudinal lymphatic ducts ducts run parallel and internal to the intestinal caeca, as in the other species, and the distance between the two ducts is proportional to the distance between the caeca. <i>Ceylonocotyle etahensis n.sp.</i> The lymphatic system in this new species consists of a pair of longitudinal lymphatic ducts, running dorsally to the intestinal caeca from the anterior to the posterior end of the body. The lymphatic system in <i>Olveria bosi</i> consists of two longitudinal vessels one on either side, running internal to the			

INTRODUCTION

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The systematic importance of the lymphatic system cannot be much stressed in trematodes, in general, as it probably does not exist in all of them, but in the limited few where it has been reported it does point to a definite phylogenetic and family relationship. Looss (1902) recognised these ducts as a definite entity and in 1912 he even expressed that the worms can be classified on the basis of this system. Mac Callum (1905) described some channels in the amphistomes of fish, but with a wrong observation. Stafford (1905) had clear understanding of the entity and distinction of the lymphatic vessels. Stiles and Goldberger (1910), who did a lot of work an amphistomes, did not mention anyting about the system. Stunkard (1917, 25, & 28) described it in several genera and attached sufficient importance. Maplestone (1923) discarded it for being of no practical importance.. Willey (1929 & 30) studied it in details in a number of genera.

intestinal caeca. As in *0. indica* they give out branches in all directions.

# MATERIALS AND METHODS

The live worms of amphistonnes, though present in smaller number, in the ruminants slaughtered in the local slaughter house could be obtained during the different parts of the year. Gravid as well as very small immature worm can be obtained during the different months of the year. The worms are flattened under pressure of the two slides tied together with a thread and fixed in a concentrated solution of acidic Corrosive sublimate from 10 - 24 hours. After fixation these are washed first in distilled water, then in tap water from an hour to several hours depending upon the size of the worm, as very thin and small worms require a shorter washing period. It is always better to change the water two or three times and to examine the individual worms under the binocular for proper washing. After washing the worms are treated with 0.5% solution of Sodium-thio-sulphate and washed again. In glycerin mounts the .lymphatic ducts appear to be yellow. The permanent preparations are not possible as the precipitate formed in the ducts is washed off during dehydration.

The other method for the fixation of the system has also been quite satisfactory. The live worms are pressed between the two Odes and kept either in a large pettri-dish or a specimen tube and boiling 90% alcohol is poured over them. The lymphatic ducts become very prominent due to the coagulation of the lymphatie fluid within and are fixed with the worm. The worms are cleared in glycerin and studied as such. The ducts so fixed take Borax carmine and Carmine alum stains and their permanent preparations can be made, but as all other parts of the body also take the stain the prominence of the ducts is lost. The smaller worms are directly studied in the live condition, and both the excretory and lymphatic systems can be seen simultaneously.

# OBSERVATIONS Fischoederius cobboldi (Poirier, 1883) (Stiles & Goldberger, 1910)(Plate 1)

The lymphatic sytem consists of two main longitudinal lymphatic

ducts ducts run parallel and internal to the intestinal caeca, as in the other species, and the distance between the two ducts is proportional to the distance between the caeca. This distance is increased near the acetabulum where the ducts begin to run on the two sides of the formes. They also give many branches to the acetabulum over which they ramify. At its anterior end each longitudinal duct, as in the other species, becomes divided into four thin, long branches, which form inverted U-shaped plexus over the oral sucker and are also continued for a short length of the oesophagus. During their course the longitudonal ducts give out a large number of branches to the various organs of the body. The oesophagus, the tests, and the excretory bladder are supplied by branches from both the longitudinal ducts. The intestinal caeca get their supply from the longitudinal ducts of their respective sides. Of all these branches, the genital branches are quite prominent. The ovary is supplied by the branch supplying the testis of its side. The branches in this species are comparatively thinner, and longer than in the other species, and each primary lateral branch may give off eight to ten secondary branches forming a net work in the body. The lateral branches of one side may not only meet the branches of the other side in the median line, but may even be continued upto the longitudinal duct of the other side. The branching in the species resembles the one found in Carmyerius spatiosus.

#### Ceylonocotyle etahensis n.sp.(Plate2)

The lymphatic system in this new species consists of a pair of longitudinal lymphatic ducts, running dorsally to the intestinal caeca from the anterior to the posterior end of the body. At the posterior end, each longitudinal duct divides into two branches, a little anterior to the acetabulum, and also the excretory bladder, while the other longer branch continues laterally and supplies the lateral, dorsal, and ventral part of the acetabulum and also the body in this region. At the anterior end, the longitudinal duct divides into two, which send four recurved branches on the dorsal and the ventral sides of the oral sucker. During their course the two longitudinal ducts supply branches to the various organs of the body forming plexuses round them. The intestinal caeca are richly supplied with branches from the longitudinal ducts of their sides. The branches are simple and small and never more than two branches are given off from a single original branch except in the posterior region of the body. The terminal knobs of the branches are of moderate size.

#### *Olveria bosi* Tendon, 1951 (Plate 3)

The lymphatic system in *Olveria bosi* consists of two longitudinal vessels one on either side, running internal to the intestinal caeca. As in 0. indica they give out branches in all directions. Anteriorly the longitudinal vessels give out 4 or 5 branches forming plexuses near the oral sucker while the main ducts turn posteriorly forming inverted U at their ends. Posteriorly the main ducts cross the intestinal caeca and run on the sides to reach the acetabulum. The

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main ducts in this region give out a large number of branches ramifying all over the acetabulum. The main ducts, during their course, give branches to the oesophagus, the intestinal caeca, the reproductive organs, and the excretory bladder, forming plexuses round theseorgans.





PLATES: 1-3

# REFERENCES

- Starkard, H.W.(1925).

  Wiley, C.H.(1928).

  Ward, H.W.(1925).

  Territorial and the starkard structure in the structur