International Journal of Science, Environment and Technology, Vol. 6, No 2, 2017, 1231 – 1235
ISSN 2278-3687 (O)
2277-663X (P)

EXPLANATUM EXPLANATUM INFECTION IN THE LIVER OF WATER BUFFALO: A SLAUGHTER HOUSE REPORT

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Abstract: The study was designed to find out the prevalence of *Explanatum explanatum* amphistome at slaughter house Kolkata, West Bengal. In the study, about one hundred seventy (n=170) liver specimens of buffaloes were examined and twenty (n=20) liver samples were found to be infected with *E. explanatum*. The prevalence of this trematode in the water buffaloes was about 11.76%. Infected specimens were collected and stored in 70% alcohol as well as 10% formalin for further use. Adult trematode specimens as well as eggs were examined by parasitological techniques for further confirmation. The animals infected with this trematode were anaemic, emaciated, dull, depressed and uneconomical for further dairy use. Such infections are endemic in the region which needs attention to minimize the problem.
Keywords: *Explanatum explanatum*, Liver, Buffalo.

Introduction

In India, livestock is an essential and major part of income to the farmers from livestock products and byproducts (milk, meat, dung etc). Buffalo milk contributes about 12.1% to the world's total milk production, 38.0% in Asia, 55.0% in India, 16.4% in China, 50.8% in Egypt, 65.2% in Nepal and 66.6% in Pakistan (Sohail *et al.,* 2009). This production is affected by many infectious and noninfectious diseases including helminth parasites. There are many helminth parasites affecting livestock population and causing heavy production and reproduction losses to the farmers. Among them, paramphistomosis has been considered as a neglected trematode infectious disease, but has recently emerged as an important cause of productivity loss in ruminant population (Anuracpreeda *et al*., 2008). It has a wide geographical distribution in subtropical and tropical areas, where the infection leads to economic losses related to mortality and low productivity (Kilani *et al*., 2003).

E. explanatum (Creplin, 1847) Nasmark, 1937 is a very common digenetic trematode affecting domesticated ruminants and is found in the liver, bile duct and gall bladder. It is

*Received Feb 25, 2017 * Published Apr 2, 2017 * www.ijset.net*

included in phylum platyhelminthes and class trematoda and have an indirect life cycle includes at least two hosts. The fresh water snails predominantly *Gyrulus convexiusculus* act as an intermediate host for *E. explanatum* (Patzelt, 1993). Adult trematodes infect the bile ducts of buffaloes and form plugs on the luminal surface by their acetabulum (Malik, 2010). This trematode can also cause the secondary infections and leads to productivity losses and mortality in the ruminant population (Soulsby, 1982).

E. explanatum is prevalent in all seasons due to availability of hosts and ability to produce relatively large number of eggs in all months. The heavy losses due to parasitic disease cause great damage to livestock field. This study is helpful in the development of rational control measure against *E. explanatum* in water buffaloes. The objective of the present study was to determine the prevalence of *E. explanatum* in the livers/bile duct of buffaloes slaughtered at slaughter house, Kolkata.

Materials and methods

Collection of samples

About one hundred seventy (n=170) liver specimens from slaughter house were examined and twenty (n=20) livers were found to be infected with *E. explanatum.* Infected liver specimens were isolated and immediately stored in 70% alcohol as well as 10% formalin and transported to the laboratory. In the study, heavily emaciated and anaemic animal carcasses with scarring, enlarged liver and flukes attaching with the surface as well as lumen were encountered. From infected specimens, large no. of conical shaped flukes were recovered and stored separately.

Processing of samples

Adult specimens were washed properly with the normal saline solution (NSS). For proper morphological examination, trematodes were stained by borax carmine solution. Briefly, specimens were fixed in the 10% formalin, washed with the distilled water, then dehydration was done by ascending grade of alcohol. Staining was done by borax carmine solution and examined using the keys according to Singh (1958).

For eggs, adult specimens were teased using needle on the glass slide and observed under microscope.

Results

In macroscopic examination, 20 liver specimens were found to be infected with the amphistome *E. explanatum*. Among them, only two liver specimens were infected massively with this trematode. Infected liver specimens were atrophied, inflamed, and partially or

completely occluded by the adult amphistomes attaching in the lumen of ducts. Lumen was filled with the light pink coloured adult amphistomes and necrotic materials (Fig. 1). A transverse cut across the liver the liver showed inflammation, thickening and fibrosis of mucosa and submucosa of ducts. A longitudinal cross across the bile ducts showed numerous trematodes, being attached throughout the wall of lumen. The bluish black nodules were present at the site of attachment because of the powerful sucking action of the sucker.

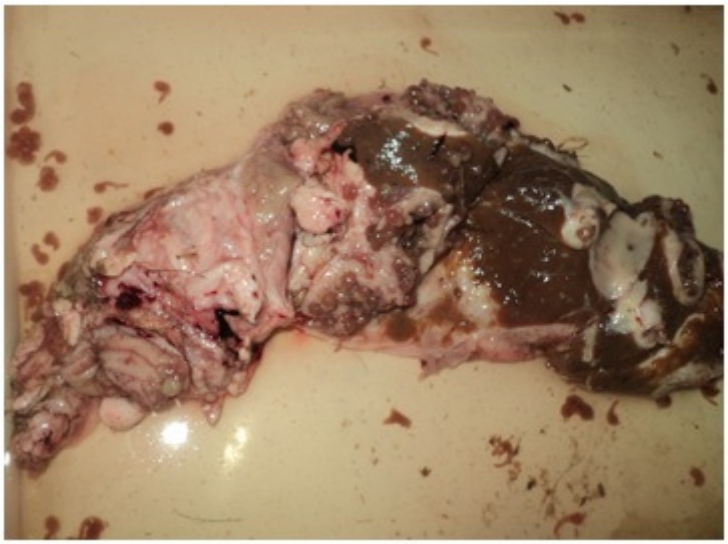

Figure 1. Buffalo liver infected with the amphistome *E. explanatum*

Isolated amphistome specimens were varied in size and conical in shape. Posterior portion was wider because of larger acetabulum. Oesophagus was longer and intestinal caeca were reached upto the anterior part of the acetabulum. Vitelline follicles were large and distributed from the oesophageal part to the acetabulum. The eggs obtained by the teasing of uterus, were oval in shape having colourless egg shell with operculum at one end (Fig. 2). Average size of eggs was 0.19× 0.86mm. The recorded observations were in accordance with Rajabloo *et al.* (2014).

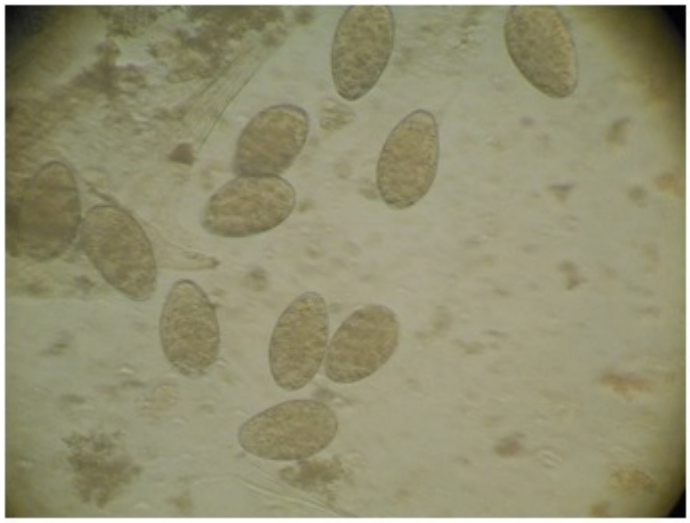

Figure 2. Eggs of *E. explanatum* extracted directly from the uterus

Discussion

Amphistomosis is considered as a neglected tropical disease in the ruminant population because of their milder and slower pathogenecity. Amphistomes are less pathogenic as compared to the other digenic trematodes, so less importance has been given to these flukes. *E. explanatum* affects liver and bile ducts of swamp or water buffalo in the tropical and subtropical areas. The *Gyrulus convexiusculus* acts as an intermediate host for this amphistome. Adult trematodes normally present in lumen of the bile ducts and leads to pathogenic effects in terms of losses in production as well as reproduction. In the study, 170 liver specimens were examined from the slaughter house and 20 samples were found to be infected with the trematode. This trematode is present in the environment and has a high biotic potential. This trematode cause significant production as well as reproduction losses in the ruminant population, it needs prompt control measures to minimize the infection.

Acknowledgements

The authors express sincere thanks to the Director and Joint Director Research, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly, India for providing necessary facilities to conduct the study.

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