

## METACESTODES INFECTION IN BLACK BENGAL GOATS IN BANGLADESH

M. K. Islam, M. M. H. Mondal<sup>1</sup> and P. M. Das<sup>2</sup>

Department of Parasitology, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

### Summary

In this study out of 3036 Black Bengal goats examined, 1755(57.80%) were infected with different types of metacestodes. The metacestodes were *Cysticercus tenuicollis* (54.54%), *Coenurus cerebralis* (6.32%) and hydatid cysts (11.13%). Animals > 18 months old were relatively more susceptible to *Cysticercus tenuicollis* and *Coenurus cerebralis* infection. On the contrary, animals > 8 months to 18 months old were more susceptible to hydatid infection. Both male and female goats were found to be equally infected with the metacestodes. A fully grown *Coenurus cerebralis* was also recovered from the abdominal muscles of a goat. In *Cysticercus tenuicollis* infection, pathological effects were not so marked. However, in few cases of *Coenurus cerebralis* infection the bones of the skull were found to become thin and soft. The hydatid cysts were found to develop in the vital organs by replacing the tissues, thus impairing normal functions.

(Key Words : Prevalence, Metacestodes, Black Bengal Goats, Bangladesh)

### Introduction

Goats stand the second highest position of the livestock populations in Bangladesh. The majority are indigenous Black Bengal variety and about 98% are distributed in rural areas (Devendra and Burns, 1983; BBS, 1986). The Black Bengal goats are prone to different parasitic infections. Among the infections, the metacestodes of the taeniids are most common (Rahman et al., 1975). Metacestodes of the taeniids caused considerable damages in different vital organs of goats and sometimes even death have been reported (Sweetman and Plummer, 1957; Ahmed and Ali, 1972; Sanyal and Sinha, 1983). Since the definitive hosts of the taeniids are the dog, fox, jackal etc. and are in abundance in Bangladesh, the magnitude of metacestodes infection in Black Bengal goats might be very high. This is because of traditional rearing of the goats in scavenging condition in rural areas and also slaughtering of food animals along the roadsides and/or open market, which provide ample opportunity for the canine hosts to pick up the

metacestodes and completing the taeniids life cycle. In Bangladesh, except for some isolated reports on metacestode(s) infection in goats (Ahmed and Ali, 1972; Ahmed and Haque, 1975; Islam, 1980; Karim et al., 1982) countrywide information on the prevalence of the metacestodes infection in relation to age and sex and their pathological effects in Black Bengal goats has not yet been carried out. The present paper describes the results of an investigation on the metacestodes infection in slaughtered Black Bengal goats in Bangladesh.

### Materials and Methods

In this study, a total of 3036 Black Bengal goats (1302 male and 1734 female) were examined slaughtered at different places of Bangladesh during the period from July, 1989 to January, 1993. The criteria used by Sharma (1981) for age determination were followed. Age groups were, 5 months to 8 months; > 8 months to 18 months; and > 18 months. The carcasses were opened accordingly and various organs and adnexa were examined carefully to see the presence of the metacestodes as well as pathological changes caused by them if any. Likewise, cranial cavities were opened and brain tissues were examined for the cysts. Identification of the metacestodes were done by following the description of Soulsby (1982).

<sup>1</sup>Address reprint requests to Prof. Dr. M. M. H. Mondal, Department of Parasitology, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh.

<sup>2</sup>Department of Pathology, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh.

Received May 11, 1994

Accepted August 23, 1994

## Results

### Prevalence

Of 3036 Black Bengal goats examined, 1755 (57.80%) were infected with different types of

metacestodes and mixed infection were recorded in 399 (13.14%) cases. The metacestodes were *Cysticercus tenuicollis* (54.54%), *Coenurus cerebralis* (6.32%) and hydatid cysts (11.13%). The details are shown in tables 1 and 2.

TABLE 1. THE PREVALENCE OF METACESTODES INFECTION IN BLACK BENGAL GOATS

Number of animals examined	Number of animals infected with metacestodes	Number of animals infected with more than 1 type of metacestodes (mixed infection)	Types of metacestodes recorded*
3036	1755 (57.80%)	399 (13.14%)	<i>Cysticercus tenuicollis</i> 1656 (54.54%) <i>Coenurus cerebralis</i> 192 (6.32%) Hydatid cyst 338 (11.13%)

\* The number exceeds the total because of multiple infections.

TABLE 2. THE PREVALENCE OF METACESTODES INFECTION IN RELATION TO AGE AND SEX OF BLACK BENGAL GOATS

Parameter	Types of metacestodes		
	<i>Cysticercus tenuicollis</i>	<i>Coenurus cerebralis</i>	Hydatid cysts
Age			
5 months to 8 months n = 678	202 (29.79%)	10 (1.47%)	30 (4.42%)
> 8 months to 18 months n = 492	244 (49.59%)	29 (5.89%)	75 (15.24%)
> 18 months n = 1,866	1,210 (64.84%)	153 (8.19%)	233 (12.48%)
Sex			
Male n = 1,302	702 (53.91%)	87 (6.68%)	140 (10.75%)
Female n = 1,734	954 (55.01%)	105 (6.05%)	198 (11.41%)

### Pathological effects

*Cysticercus tenuicollis* were found to occur in the mesentery, peritoneum, liver and kidney with slight haemorrhagic spots at the site of attachment and pressure atrophy to the surrounding tissues. *Coenurus cerebralis* recovered from the brain tissues were found to cause congestion, oedema and haemorrhages. A fully grown *Coenurus cerebralis* was also recovered from abdominal muscles causing damages to the surrounding tissues

(figure 1). In few cases, the skull of the affected animals became thin and soft. Hydatid cysts were found in the liver, lungs, heart, spleen and kidneys, where they developed by replacing the surrounding tissues and impaired normal functions.

### Discussion

In rural Bangladesh, goats are usually kept under

traditional management. They live on scavange feeds, fallen leaves and green grasses. The goats are allowed to graze in the fields only in noncropping seasons. In the present study, the animals slaughtered only at various localities of the country included were mostly Black Bengal variety. Therefore, the influence of breed, nutritional status of the animals and the management practised could not be determined.

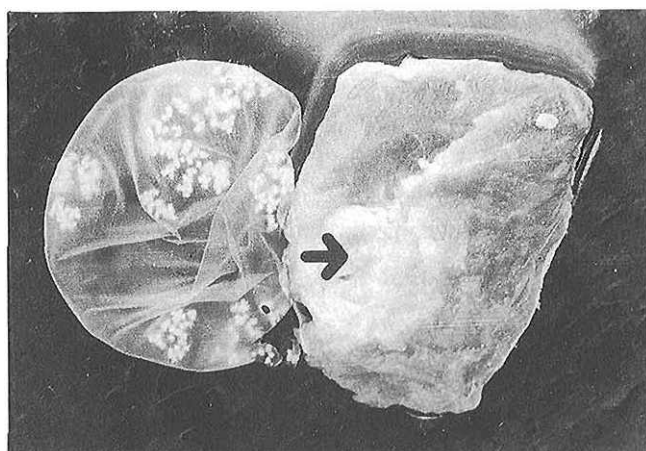


Figure 1. A *Coenurus cerebralis* in the abdominal muscles (arrow indicates the location of cyst).

### Prevalence

The present findings on the metacestode infections in Black Bengal goats are in close conformity with that of Ahmed and Ali (1972), Rahman et al. (1975) and Islam (1980) but with marked variation from that of Karim et al. (1982). The aged animals (> 18 months) were found to be more infected with *Cysticercus tenuicollis* and *Coenurus cerebralis* than young animals (5 months to 8 months). A lower rate of prevalence in young animals cannot be explained so easily. But this might be due to a shorter period of exposure of the goats to the contaminated pasture. The animals > 8 months to 18 months old were found to be more infected with hydatid cysts which is contradictory to the findings of Islam (1980) who reported that animals > 5 years old were highly susceptible to hydatid infection.

The reason for such variation is not clear but this might be due to the examination of animals from a particular locality where the prevalence of hydatid cysts was assumed to be more. Both sexes were found to be almost equally infected with the metacestodes. Similar finding was also recorded by El-Badawi et al. (1979) in case of hydatid infection. Recovery of *Coenurus*

*cerebralis* (metacestode of *Taenia multiceps*) from the abdominal muscles of goat in this study is in agreement with the studies of Clapham (1942) and Soulsby (1982). The presence of metacestode of *Taenia gaigeri* in the intramuscular connective tissue of goat as has been reported by Karim et al. (1982) was not observed in the present study. Metacestodes of *Taenia gaigeri* and *Taenia multiceps* are almost identical in size and appearance. According to Soulsby (1982) the metacestodes of *Taenia multiceps* also developed in the intramuscular spaces and in the subcutaneous tissues of goats which is our present finding. So, the metacestode of *Taenia gaigeri* reported by Karim et al. (1982), might be that of *Taenia multiceps*.

### Pathological effects

The pathological changes caused by the metacestodes varied greatly. It depended on the organs involved and also the volume of the fluids contained in the cysts. *Cysticercus tenuicollis* were found in the mesentery, peritoneum, liver and kidney, causing no remarkable pathological changes except slight haemorrhagic spots at the site of attachment and pressure atrophy to the surrounding tissues. However, the fibrotic changes of the liver including adhesions of the organs in the abdominal cavity (Sweatman and Plummer, 1957) were not observed in the present study. Pathological changes in the brain tissues due to *Coenurus cerebralis* infection were congestion, oedema and haemorrhages which also conformed to the reports of Sharma and Tyagi (1975) and Soulsby (1982). The hydatid cysts were most frequently seen in the liver than other organs, which correlates the findings of Islam (1980). The development of hydatid cysts in the vital organs like liver, lungs, heart, spleen and kidneys found to cause destruction of the surrounding tissues and thus interfered with normal functions of the organs. Pathological effects due to metacestodiosis in goats as have been seen in this study might not reflect the true picture of field cases because of the fact that the butchers usually select the apparently healthy animals from the fields.

### Literature Cited

- Ahmed, J. U. and M. I. Ali. 1972. Incidence of *Coenurus cerebralis* in goat in Bangladesh. *Indian Vet. J.* 49:1157-1158.
- Ahmed, J. U. and M. A. Haque. 1975. Surgical treatment of Coenurosis in goats in Bangladesh. *Bang. Vet. J.* 9:31-34.
- BBS. 1986. Statistical pocket-book of Bangladesh, Dhaka. pp.258.

- Clapham, P. A. 1942. On identifying *Multiceps* spp. by measurement of the large hook. *J. Helminthol.* 20:31-40.
- Devendra, C. and M. Burns. 1983. Goat production in the Tropics. Commonwealth Agricultural Bureaux, Farnham Royal, Slough, U. K. pp.183.
- El-Badawi, E. K. S., A. M. Eisa., N. K. Slepenev and M. B. A. Saad. 1979. Hydatidosis of domestic animals in the Central region of the Sudan. *Bull. Anim. Hlth. Prod., Africa.* 27:249-251.
- Islam, A. W. M. S. 1980. Hydatid diseases in goats in Bangladesh. *Vet. Parasitol.* 7:103-107.
- Karim, M. J., H. Shaikh and M. M. Huq. 1982. Prevalence of larval taeniids in Bangladesh. *Trop. Anim. Hlth. Prod.* 14:166.
- Rahman, A., M. U. Ahmed and S. A. Mia. 1975. Studies on the diseases of goats in Bangladesh : Mortality of goats under farm and rural conditions. *Trop. Anim. Hlth. Prod.* 8:90.
- Sanyal, P. K. and P. K. Sinha. 1983. Caprine metacestodiasis : Incidence in West Bengal. *Haryana Veterinarian.* 22:38-40.
- Sharma, H. N. and R. P. S. Tyagi. 1975. Diagnosis and surgical treatment of Coenurosis in goat (*Capra hircus*). *Indian Vet. J.* 52:482-488.
- Sharma, S. U. 1981. *Veterinary Jurisprudence.* 3rd Edn., Oxford and IBH Publishing Co., 66, Janapath, New Delhi-110001. India. pp. 115-116.
- Soulsby, E. J. L. 1982. *Helminths, Arthropods and Protozoa of Domesticated Animals,* 7th Edn., ELBS, Bailliere Tindall, London. pp. 113-123.
- Sweatman, G. K. and P. J. G. Plummer. 1957. The biology and pathology of the tapeworm *Taenia hydatigena* in domestic and wild hosts. *Canadian J. Zool.* 35:93-109.