# PREVALENCE OF HELMINTHIC INFESTATIONS IN ZEBU CATTLE (*Bos indicus*) AT SAVAR, BANGLADESH

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## Summary

Rectal fecal samples from zebu cattle (*Bos indicus*) at Savar, Dhaka, were collected in every two months of the year from March, 1987 to February, 1988 and were examined using Stoll's dilution technique. Out of a total of 737 fecal samples examined in six periods, 589 (79.9%) samples were found to be positive for one or more helminths. Overall prevalences for fasciola, paramphistome, schistosome, strongylids, ascaris, strongyloides, trichuris and capillaria infestations were respectively 19.5%, 48.0%, 5.9%, 52.2%, 1.5%, 2.5%, 5.5% and 12.7%. Prevalences of fasciola, paramphistome and schistosome infestations were significantly ($p < 0.01$) higher from middle of August to December. Strongylids, trichuris and capillaria infestations were significantly ($p < 0.01$) higher from July to October, although strongylids infestation also increased during January-February. Significantly ($p < 0.01$) higher fasciola and paramphistome infestations were observed in animals after one year of age, whereas strongylids, ascaris, strongyloides and trichuris infestations were significantly ($p < 0.01$) higher in cattle upto one year of age. Fasciola infestation was significantly ($p < 0.01$) higher in female cattle and significantly ($p < 0.05$) higher strongylids infestation was found in males.

**(Key Words :** Prevalence, Helminthic Infestation, Zebu Cattle)

## Introduction

Helminth parasites are potential health hazard to livestock population and produce enormous economic loss. Trematode parasites like fasciola, paramphistome and schistosome have indirect life cycle using snails as their intermediate hosts. Cattle become infested with fasciola and paramphistome by ingesting the larval stage, metacercariae with grass. Cercariae of schistosome introduce in cattle actively by skin penetration. Nematode parasites like strongylids, ascaris, strongyloides, capillaria and trichuris have direct life cycle and cattle become infested by ingesting infective nematode larvae or eggs containing infective larvae with grass. Limited incomplete information regarding prevalence of helminth parasites of cattle is available in Bangladesh (Rahman et al., 1972; Rahman and Razzak, 1973; Qadir, 1974; Garrels, 1975; Nooruddin et al., 1987). The present study was undertaken to determine the prevalence of various helminthic infestations in different age and sex groups of zebu cattle during different periods (months) of the year at Savar, Dhaka, Bangladesh.

## Materials and Methods

Fecal samples were collected randomly directly from the rectum of zebu cattle of different age and sexes in every two months of the year, March, 1987 to February 1988. The feces were examined using Stoll's dilution technique and helminth eggs were identified on the basis of their characteristic morphological features as described by Soulsby (1982) and Samad (1986), and then the eggs were counted.

### Statistical analysis

Analysis of the data of individual parasitic infestation was made by Chi-square test using the following formula as described by Gupta (1983).

$$\chi^2 = \frac{(O-E)^2}{E}$$

Here, O = Observed value = Number of positive cases from the observed number of animals in each period (months)/each age group/each sex.

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E = Expected value, which was determined from the observed number of animals in each period (months)/each age group/each sex in relation to overall percentage.

Value of $\chi^2$ in respective parasitic infestation was the sum of the values of different periods (months)/age groups/sex groups. Calculated $\chi^2$ value in respective cases was compared with tabulated value of $\chi^2$ to determine the level of significancy either at 1% or 5% level.

Environmental data consisting of temperature, humidity and rainfall were collected from the Dhaka Meteorological department for Dhaka area in which Savar was placed. Feeding practice of cattle in the investigated area was also noted in different periods (months).

## Results and Discussion

Out of a total of 737 fecal samples from zebu cattle examined in different months, 589 (79.9%) were found to be positive for one or more helminths. This finding was almost in conformity with that of Garrels (1975) who found 83.7% gastro-intestinal helminthic infestations in cattle. Overall prevalences for fasciola, paramphistome, schistosome, strongylids, ascaris, strongyloides, trichuris and capillaria infestations were respectively 19.5%, 48.0%, 5.9%, 52.2%, 1.5%, 2.5%, 5.5% and 12.7% (table 1, 2). These findings of fasciola, strongyloides, ascaris and capillaria infestations differed slightly with those of earlier reports (Rahman and Razzak, 1973 and Garrels, 1975). Paramphistome infestation was lower than the findings of Rahman and Razzak (1973) and Garrels (1975). Schistosome and strongylids infestations were higher in comparison with the findings of Rahman and Razzak (1973). Trichuris infestation was lower than the record of Rahman and Razzak (1973), Garrels (1975), Qadir (1974) and Nooruddin et al. (1987). The differences in the prevalence of various helminthic infestations

TABLE 1. PREVALENCE OF DIFFERENT HELMINTHIC INFESTATIONS IN ZEBU CATTLE IN DIFFERENT MONTHS

| Months | 3-4 March-April | 5-6 May-June | 7-8 July-August | 9-10 Sep.-Octo. | 11-12 Nov.-Dec. | 1-2 Jan.-Feb. | Total |
|---|---|---|---|---|---|---|---|
| No. of animals examined | 153 | 150 | 150 | 119 | 119 | 46 | 737 |
| Fasciola | 23 (15.0) | 15 (10.0) | 28 (18.6) | 33 (27.7)* | 35 (29.4)* | 10 (21.7) | 144 (19.5) |
| Paramphistome | 44 (28.7) | 30 (20.0) | 94 (62.6)* | 91 (76.4)* | 81 (68.1)* | 14 (30.4) | 354 (48.0) |
| Schistosome | 3 ( 1.9) | – | 7 ( 4.6) | 7 ( 5.8) | 27 (22.6)* | – | 44 ( 5.9) |
| Strongylids | 53 (34.6) | 42 (28.0) | 108 (72.0)* | 91 (76.4)* | 57 (47.9) | 34 (73.9)* | 385 (52.2) |
| Ascaris | 1 ( 0.6) | 1 ( 0.6) | 2 ( 1.3) | 2 ( 1.6) | 4 ( 3.3) | 1 ( 2.2) | 11 ( 1.5) |
| Strongyloides | 4 ( 2.6) | 3 ( 2.0) | 3 ( 2.0) | 1 ( 0.8) | 4 ( 3.3) | 4 ( 8.7) | 19 ( 2.5) |
| Trichuris | 3 ( 1.9) | 4 ( 2.6) | 8 ( 5.3) | 13 (10.9)* | 11 ( 9.2) | 2 ( 4.3) | 41 ( 5.5) |
| Capillaria | 1 ( 0.6) | 2 ( 1.3) | 19 (12.6) | 38 (31.9)* | 24 (20.2) | 10 (21.7) | 94 (12.7) |

Parenthesis indicate percentage of infestation.
Values in the same row with star mark (*) were significantly ($p < 0.01$) higher than the rest.

in cattle among the findings of different investigators were thought to be due to differences in the size of the sample examined, place and period of studies, environmental condition, frequency of examination of the animals and distribution of the snails (for flukes only).

Prevalence of fluke infestations with fasciola, paramphistome and schistosome were significantly ($p < 0.01$) higher from the middle of August to December (monsoon and postmonsoon). Rahman and Razzak (1973) reported that fasciola and paramphistome infestations increased only in monsoon. The higher fluke infestations during monsoon and postmonsoon periods were thought to be due to warm, humid climatic condition and rainfall from early monsoon which cause the development of fluke eggs and snail intermediate hosts. Prevalence of nematode infestations with strongylids, trichuris and capillaria were significantly ($p < 0.01$) higher from July to October (monsoon) although strongylids infestation also increased during January and February (winter). This finding was in agreement with that of Rahman and Razzak (1973). The higher prevalences of these nematods from July to October might be attributed to warm and humid climate existing from June to September which was helpful for the development of worm eggs and larvae. The cause of higher strongylids infestation during January and February (winter) could not be properly ascertained, but this might be due to the fact that during winter there was sufficient dew on the grassblades in the morning and evening which was conducive to the migration of nematode larvae upto the blades and taken by the animals. Variations of ascaris and stron-

TABLE 2. AGE AND SEX SPECIFIC PREVALENCE OF DIFFERENT HELMINTHIC INFESTATIONS IN ZEBU CATTLE

| | Age groups | | | Sex groups | | Overall |
|---|---|---|---|---|---|---|
| | Upto 1 year | 1-3 years | Above 3 years | Male | Female | |
| No. of animals examined | 136 | 224 | 377 | 324 | 413 | 737 |
| Fasciola | 5 ( 3.7) | 52 (23.2)* | 87 (23.1)* | 46 (14.2) | 98 (23.7)* | 144 (19.5) |
| Paramphistome | 27 (19.8) | 148 (66.1)* | 179 (47.5)* | 153 (47.2) | 201 (48.7) | 354 (48.0) |
| Schistosome | 4 ( 2.9) | 11 ( 4.9) | 29 ( 7.7) | 22 ( 6.8) | 22 ( 5.3) | 44 ( 5.9) |
| Strongylids | 105 (77.2)* | 137 (61.2) | 143 (37.9) | 192 (59.3)** | 193 (46.7) | 385 (52.2) |
| Ascaris | 9 ( 6.6)* | 1 ( 0.4) | 1 ( 0.2) | 6 ( 1.8) | 5 ( 1.2) | 11 ( 1.5) |
| Strongyloides | 10 ( 7.4)* | 2 ( 0.9) | 7 ( 1.9) | 8 ( 2.3) | 11 ( 2.7) | 19 ( 2.6) |
| Trichuris | 15 (11.0)* | 9 ( 4.0) | 17 ( 4.5) | 21 ( 6.5) | 20 ( 4.8) | 41 ( 5.6) |
| Capillaria | 12 ( 8.8) | 35 (15.6) | 47 (12.5) | 40 (12.3) | 54 (13.1) | 94 (12.7) |

Parenthesis indicate percentage of infestation.

Values with star mark (*) in age or sex groups in the same row were significantly ($p < 0.05$) higher than the rest.

Value with star marks (**) in the sex groups in the same row was significantly ($p < 0.01$) higher than the rest.

gyloides infestations in different months were not significant.

Fasciola and paramphistome infestations were significantly ($p < 0.01$) higher in animals after one year of age (table 2). Young animals, specially calves, were less grazed in submerged areas than the older animals, as a result infestation was lower in claves than the older ones. Nematode infestations with strongylids, ascaris, strongyloides and trichuris were significantly ($p < 0.01$) higher in cattle upto one year of age (table 2). Calves easily took nematode infestations even from high-land grass fields and became heavily infested because of their low immunity. Age variations in schistosome and capillaria infestations were not significant.

Significant sex variations were observed in the prevalences of fasciola ($p < 0.01$) and strongylids ($p < 0.05$) infestations (table 2). Higher prevalence of fasciola infestation was found in older females and this was possibly due to change of physiologic condition during lactation (productive activity) and/or lack of proper nutrition required to the females for production causing low resistance. Strongylids infestation was recorded higher in male calves than in the females. This was perhaps due to better husbandry usually practiced for female calves than the males.

Favourable temperature, humidity and rainfall for the development of parasitic ova and larval stages and for development of snails were existed from May-June to September-October (figure 1). During this period the animals lived mainly on green grass both in high and low land grass fields including the submerged areas. Animals were also grazed from November to January when rice straw was given as additional feed. As an effect of the above condition, the helminthic infestations were higher in animals from July to December (figure 1). Strongylids infestation was

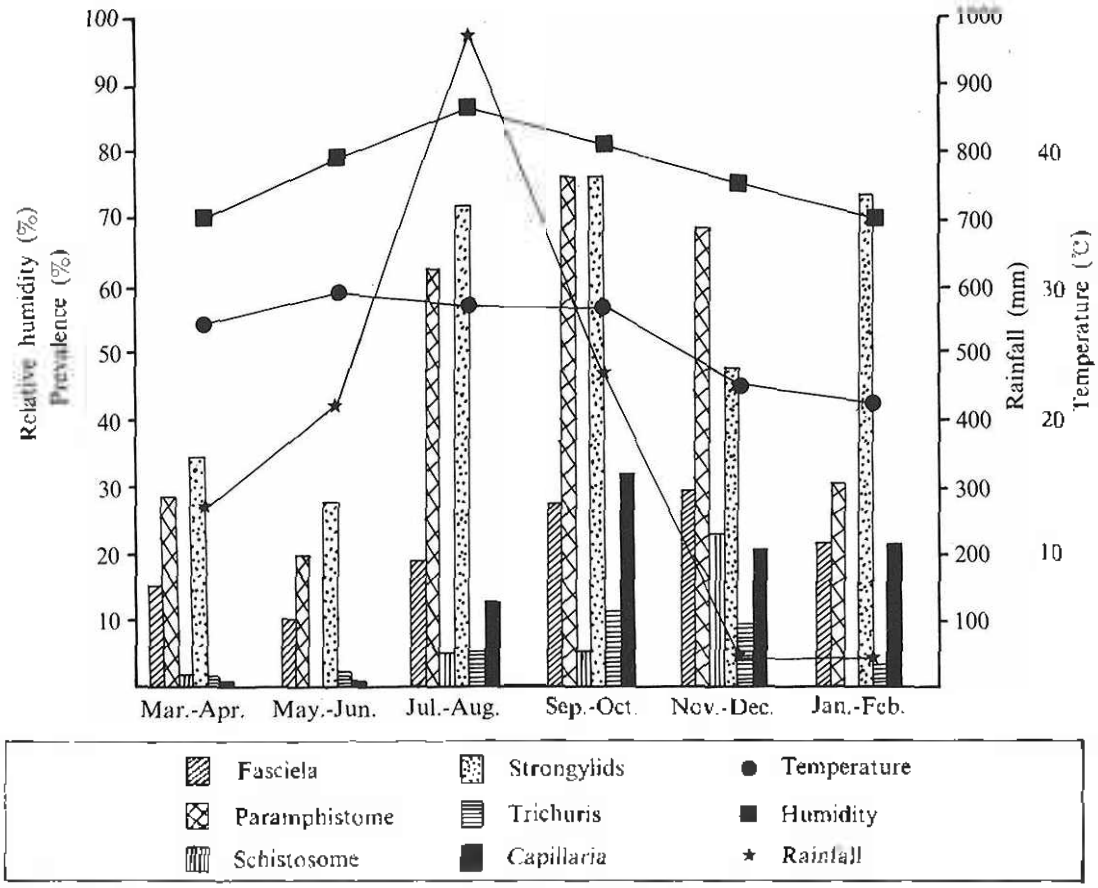


Figure 1. Relationship of the prevalence of different helminths with rainfall, temperature and humidity in different periods (months).

also high in January-February (winter) which was supposed to be due to avaibility of sufficient moisture (dew) on the grassblades during winter. Temperature, humidity were low and rainfall was very low from November to April (figure 1). Animals were less grazed from February to May due to scarcity of grass in the fields and during this period the animals feed consisted mainly of rice straw and also sometimes rice bran, wheat bran, pulse bran etc. Different parasitic infestations were, thus, remained in low level from January to May.

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## Literature Cited

Garrels, G. 1975. Gastro-intestinal parasitic infestation of cattle in some villages of Dhaka and Tangail districts of Bangladesh. Bang. Vet. J. 9(1-4):9-10.

Gupta, S. P. 1983. Statistical Methods. 19th Edn., Sultan chand and sons Publishers, 23 Daryaganj New Delhi-110002.

Nooruddin, M., M. A. Baki and J. G. Das. 1987. Clinicopathological studies of an outbreak of trichuriasis in cow calves. Indian J. Vet. Med. 7 (2):116-119.

Qadir, A. N. M. A. 1974. A preliminary survey on the incidence of Trichuris infection in domestic ruminants and pathogenesis related with it. Bang. Vet. J. 8(1-4):33-36.

Rahman, A., K. M. Ali and A. Rahman. 1972. Incidence of diseases of cattle in Mymensingh. Bang. Vet. J. 6:25-30.

Rahman, M. H. and A. Razzak. 1973. Incidence of helminth parasites infecting cattle in the kotwali thana of Comilla. (Abstract). First Bang. Vet. Conf. Agril. Univ., Mymensingh. pp. 25.

Samad, M. A. 1986. Veterinary Clinician Guide. 1st Edn., Lyric-Epic Prokashoni, Bangladesh Agricultural University, Mymensingh, Bangladesh.

Soulsby, E. J. L. 1982. Helminths, Arthropods and Protozoa of Domesticated animals. 7th Edn., ELBS, Bailliere Tindall, London.