

QUANTIFICATION OF *Fasciola gigantica* INFESTATION IN ZEBU CATTLE OF BANGLADESH

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Summary

A research study was undertaken to quantify fascioliasis in both live and slaughtered zebu cattle at Savar, Bangladesh. Eggs of *Fasciola gigantica* per gram of feces (EPG) was determined in a total of 213 fasciola infested live cattle. The EPG per animal ranged from 100 to 400 (mean 138.03 ± 4.27 SE). Counting of *F. gigantica* was made in a total of 63 fasciola infested livers of slaughtered cattle. Number of immature flukes per liver ranged from 0 to 37 (mean 8.74 ± 0.85 SE) and mature flukes ranged from 2 to 121 (mean 20.54 ± 2.23 SE). Total load of flukes recovered per liver varied from 4 to 132 (mean 29.28 ± 2.42 SE). Significantly higher EPG ($p < 0.05$) and higher load of flukes in the livers ($p < 0.01$) were observed from September to December (post monsoon and winter). The EPG and fluke counts were found significantly higher ($p < 0.01$) in animals after one year of age and these were also higher in female animals ($p < 0.05$) than the males.

(Key Words : Fascioliasis, EPG, Fasciola Counts, Liver, Zebu Cattle)

Introduction

Fascioliasis is one of the major factors limiting livestock development in Pakistan (including present Bangladesh) (Kendall, 1954). The usual method for the diagnosis of chronic fascioliasis in animals is the detection of fasciola eggs in the feces. Number of fasciola in the liver and their egg producing capacity greatly influence the epidemiological pattern of fascioliasis. Thus, accurate quantitative diagnosis is needed to know the intensity of fascioliasis, to evaluate the efficacy of flukicide and for epidemiological studies. In Bangladesh, limited informations are available for quantitative detection of fascioliasis in goat (Nooruddin, 1977; Howlader, 1983), but no published information in this regard is available in cattle. The present paper deals with the quantitative detection of fasciola eggs in feces and fasciola parasites in the livers in different age and sex groups of respectively live and slaughtered zebu cattle in different periods of the year, May 1989 to April 1990, at Savar, Bangladesh.

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Materials and Methods

Rectal fecal samples of live zebu cattle from some villages at savar and livers of slaughtered zebu cattle from Savar markets were collected randomly every two months of the year. Stoll's egg counting technique was used to examine the fecal samples. Identification of fasciola eggs was made according to their characteristic morphological features as described by Soulsby (1982). The fasciola eggs were then counted and eggs per gram of feces (EPG) was determined (by multiplying the total number of eggs found in 0.15 ml of fecal mixture with 100). During liver examination, first the main bile ducts were open to collect the flukes. Then the liver was cut into small slices. These sliced pieces were pressed to squeeze out the parasites. The flukes were measured grossly with a meter scale. Flukes upto 25 mm in length were considered as immature and above this length were considered as mature and these were counted separately. Some flukes in each period were stained in fresh state with Semichon's carmine according to the methods described by Cable (1950). Under microscope, these stained flukes were identified as *Fasciola gigantica* on the basis of their characteristic morphological features (Soulsby, 1982). Chi-square (X^2) test as described by Gupta (1983) was used to detect the significance of the variation of load of eggs in feces and load of flukes in the

livers in different periods (seasons), age and sex groups.

Results and Discussion

Fecal egg counts of *F. gigantica* per gram of feces (EPG) in infested live zebu cattle are shown in table 1. Counting of eggs were determined in

a total of 213 fasciola infested live cattle. The EPG per animal ranged from 100 to 400 with a mean of 138.03 ± 4.27 SE. Both the lowest and the highest fecal egg counts were lower than the finding of Contreras et al. (1979) who recorded 200 to 2,800 EPG in cattle. This variation could be attributed to the number of adult flukes present in the liver and the breeds of cattle involved.

TABLE 1. EGG COUNTS OF *Fasciola gigantica* PER GRAM OF FECES (EPG) IN INFESTED LIVE ZEBU CATTLE

Factors	Factor level	No. of infested animal	Egg counts per gram of feces (EPG)	
			Mean \pm SE	Range
Months	May-June	22	113.63 \pm 7.48	100-200
	July-Aug.	28	121.43 \pm 7.89	100-200
	Sept.-Oct.	48	150.00 \pm 9.42*	100-300
	Nov.-Dec.	52	161.54 \pm 11.37*	100-400
	Jan.-Feb.	37	129.73 \pm 8.55	100-300
	Mar.-Apr.	26	119.23 \pm 7.88	100-200
	Overall	213	138.03 \pm 4.27	100-400
Age group	Upto 1 year	39	102.56 \pm 2.56	100-200
	1-3 years	89	148.31 \pm 6.61**	100-300
	Above 3 years	85	143.53 \pm 7.57**	100-400
Sex group	Male	87	118.39 \pm 5.31	100-300
	Female	126	151.58 \pm 5.93*	100-400

SE: standard error.

* Indicate the values (same column) in 'months' or 'sex group' which were significantly ($p < 0.05$) higher than the rest.

** Indicate the values (same column) in 'age group' which were significantly ($p < 0.01$) higher than the rest.

Counts of *F. gigantica* in infested livers of slaughtered zebu cattle are presented in table 2. Counting of flukes were made in a total of 63 fasciola infested livers. Number of immature flukes per liver ranged from 0 to 37 (mean 8.74 ± 0.85 SE) and mature flukes ranged from 2 to 121 (mean 20.54 ± 2.23 SE). Total load of flukes recovered per liver varied from 4 to 132 with a mean of 29.28 ± 2.42 SE. These lowest and highest fluke counts per liver were higher than the record of Nooruddin (1977) and Howlader (1983). Nooruddin (1977) recovered 1 to 100 flukes and Howlader (1983) recovered 1 to 14 flukes from a single liver of goat in Mymensingh, Bangladesh. This variation among the findings was possibly due to variation in the level of infestation in different place and

period of studies and the species of animals involved. Significantly higher EPG ($p < 0.05$) and higher load of flukes in the livers ($p < 0.01$) were observed from September to December (post monsoon and winter). These findings were almost in agreement with that of Petkov et al. (1988) who studied fascioliasis in sheep in Bulgaria between 1984 and 1987. The higher EPG and fluke counts during September-December was attributed to higher level of fasciola infestation during that period (Al-Barwari, 1978; Lemma et al., 1985), which was resulted from taking of heavy infestation during monsoon period (June to August) when the cercarial infestation increased in snails. The EPG and fluke counts were found significantly higher ($p < 0.01$) in cattle above one year of age.

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Because, these animals were grazed in submerged infested areas and become heavily infested. Al-Barwari (1978) found higher fasciola infestation in older animals in Iraq. EPG in feces and fluke load in the livers were also observed significantly higher ($p < 0.05$) in female animals than the males and this was perhaps due to alteration of their physiologic condition during lactation (productive

activity) and/or lack of proper nutrition for production causing low resistance. Higher EPG and fluke counts were also recorded in female goat by Howlader (1983). The length and breadth ranges of *F. gigantica* found in this study were 12 to 72 mm and 2 to 12 mm respectively. According to Soulsby (1982), the length of *F. gigantica* is between 25 to 75 mm and breadth is upto 12 mm.

TABLE 2. COUNTS OF *Fasciola gigantica* IN INFESTED LIVERS OF SLAUGHTERED ZERU CATTLE

Factors	Factor level	No. of infested liver	Immature (Upto 25 mm)		Mature (above 25 mm)		Total (Mature+Immature)	
			Mean \pm SE	Range	Mean \pm SE	Range	Mean \pm SE	Range
Months	May-June	4	1.75 \pm 0.63	0-3	8.75 \pm 2.25	5-14	10.50 \pm 2.75	5-17
	July-Aug.	8	16.62 \pm 4.05	6-37	9.75 \pm 1.91	3-18	26.37 \pm 3.76	9-43
	Sept.-Oct.	14	12.35 \pm 1.20	3-19	20.07 \pm 2.84	6-39	32.42 \pm 3.37**	16-55
	Nov.-Dec.	18	7.44 \pm 1.03	0-15	35.33 \pm 5.87	7-121	42.77 \pm 6.21**	7-132
	Jan.-Feb.	12	6.25 \pm 1.17	0-15	14.92 \pm 1.92	3-25	21.16 \pm 2.50	5-38
	Mar.-Apr.	7	4.14 \pm 0.74	2-7	12.14 \pm 2.74	2-26	16.28 \pm 3.23	4-32
	Overall	63	8.74 \pm 0.85	0-37	20.54 \pm 2.23	2-121	29.28 \pm 2.42	4-132
Age group	Upto 1 year	9	3.77 \pm 1.09	0-10	8.88 \pm 2.42	2-23	12.66 \pm 2.63	4-28
	1-3 years	26	9.46 \pm 1.48	0-37	22.04 \pm 2.42	5-61	31.50 \pm 2.60**	5-64
	Above 3 years	28	9.68 \pm 1.19	2-27	22.89 \pm 4.26	4-121	32.57 \pm 4.46**	7-132
Sex group	Male	23	6.35 \pm 0.98	0-16	13.65 \pm 1.75	2-36	20.00 \pm 2.07	4-39
	Female	40	10.12 \pm 1.17	0-37	24.50 \pm 3.21	3-121	34.62 \pm 3.35*	5-132

SE: standard error.

* Indicate the value (same column) in 'sex group' which was significantly ($p < 0.05$) higher than the rest.

** Indicate the values (same column) in 'months' or 'age group' which were significantly ($p < 0.01$) higher than the rest.

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