

Epidemiological Studies on Haemonchus Parasites of Local Goats in Assam

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Abstract

The epidemiological studies were carried out in local goats under local climatic condition during the period from December 2003 to November 2004 in Assam. Monitoring the fecal egg counts assessed the seasonal fluctuation in infection. Throughout the study in different seasons on the basis of fecal examination, egg output of *Haemonchus* in local of goat was highest in monsoon season (mean EPG 948.86 ± 183.30) followed by post-monsoon season (mean EPG 519.09 ± 116.48), winter season (mean EPG 188.48 ± 49.3) and pre-monsoon season (mean EPG 119.39 ± 38.18) season. The *Haemonchus* egg output was highest in August (overall mean EPG 1332.72 ± 219.77) and lowest in April (overall mean EPG 103.64 ± 36.14) irrespective of age and sex.

Key words : *Haemonchus* parasites, Local goats, Epidemiology studies.

Among various disease that impaired productivity of goats *Haemonchus* spp. infection is recognized as one of the major causes and the sub-clinical infection may also result in considerable economic effects due to poor growth rate in Assam. Understanding the epidemiology of the disease, which in turn is a prerequisite for effective control of *Haemonchosis*, can minimize these losses. Keeping in view the economic importance of this disease, the present study was conducted to determine the epidemiology of *Haemonchosis* in local goat in Assam.

Methods

The investigations covered a period of one year from December 2003 to November 2004 and were classified into four seasons viz. winter (December, January and February), pre-monsoon (March, April and May), monsoon (June, July, August and September) and post-monsoon (October and November). The climate of this particular area is pleasant with an average minimum temperature 20.29 C and maximum 29.18 C, humidity 79.46% and rainfall of 87.90 mm.

In this study, a total of 660 fecal samples were

collected from local goats 55 (10 + 45) from different age groups kids (below 1 year of age) and adults goats in Goat Research Station, Burnihat, AAU, Assam. Fecal samples were subjected to direct examination followed by floatation (saturated salt solution specific gravity 1.125) for optimum recovery. The eggs per gram (EPG) count from positive samples were done following the modified Mc Master method described by HMSO (1).

After ascertaining the positive diagnosis of suspected freshly collected samples were coprocultured for the development of infective larval (L3) stage following the procedure described by Roberts and O' Sullivan (1) to identify the egg. Statistical analysis was done following as Snedecor and Cochran (2).

Results and Discussion

All the goats found to release maximum number of *Haemonchus* eggs (mean EPG 948.48 ± 183.30) in monsoon season might be due to higher rainfall and relative humidity, which provide favorable environment for the development and dissemination of exogenous stage of worms. The high rainfall was said

Table 1. Meteorological data of Assam in study area during 2003-2004.

| Parameters | | Winter | | | Pre-monsoon | | | | Monsoon | | Post-monsoon | | |
|-------------------------|---------|--------|------|------|-------------|------|------|-------|---------|-------|--------------|------|------|
| | | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov |
| Average temperature (C) | Max | 25.2 | 21.7 | 25.8 | 27.6 | 31.5 | 31.6 | 31.8 | 32.7 | 33.6 | 30.5 | 29.8 | 28.3 |
| | Min (C) | 10.3 | 10.1 | 13.2 | 17.1 | 22.9 | 22.4 | 25.2 | 26.3 | 26.6 | 25.9 | 24.1 | 19.4 |
| Average RH | Max (%) | 85.1 | 89.7 | 93.5 | 77.0 | 80.5 | 77.6 | 81.0 | 85.8 | 86.1 | 88.9 | 86.8 | 74.3 |
| | Max (%) | 80.6 | 75.2 | 73.0 | 59.2 | 70.2 | 69.1 | 75.5 | 79.5 | 80.1 | 80.5 | 78.5 | 79.2 |
| Average rainfall (mm) | | 27.9 | 21.7 | 28.0 | 68.2 | 84.0 | 96.1 | 102.0 | 198.4 | 192.2 | 129.0 | 71.3 | 36.0 |

to help in providing molarity of salt present in soil, which was an important factor for ecdysis (3). It also helps in larval dispersion on the herbage, which increases the chance of contact between host and larva.

The seasonal variations were noticed in the present investigation and the monsoon season was the most vulnerable period which might be due to heavy rainfall, relative humidity (Table 1) and availability of larvae on pasture and due to the influence of managerial conditions, grazing behavior of the host and over stocking pasture. These findings were in agreement with that of Misra (4), Singla (5) and Swaranker et al. (6).

The lowest fecal egg counts were lowest in pre-monsoon in local goats (mean EPG 119.39 ± 38.18). This might be due to low temperature, which help in arresting development in hot and environment and

also might be periodical expulsion of worms without the appearance of eggs in faeces.

The observation on EPG counts were generally in agreement with that of Verducruysse (7), Ndao et al. (8), Sinngla (5), Danlakshmi et al. (9) and Rajkhowa and Hazarika (10). It was slightly similar to the observations on fecal egg counts of *Haemonchus* reported by Misra and Ruprah (11), Misra et al. (4) and Vasudevan and Basuthakur (12), who reported that intensity of function with *Haemonchus* was highest in rainy season due to the effect of dry climate on the survival rate of eggs and developing larval stages.

Month wise mean EPG of *Haemonchus* in different age groups of local goats is shown in Table 2. During the period of understudy, the highest fecal egg count was recorded during August with an overall mean EPG of 1332.72 ± 219.77 and lowest in April overall mean EPG 103.64 ± 36.14 . It was also observed that adult goats harboured more *Haemonchus* than the kids, which might be due to more exposure of adult goats to herbage than that of kids that are usually kept intensively. This finding was in agreement with Maingi et al. (13), Dorney et al. (14), Talukder (15), Bandopadhyay (16) and Kalwaghe (17). Gupta et al. (18) reported the highest and lowest incidence of *H. contortus* during July to October and from March to June, respectively, in the present investigation, it observed that infection with *Haemonchus* mostly recorded during the period of July, August, September and October and this higher EPG of *Haemonchus* might be either due to favorable environmental condition during the period, which were conducive for the development of exogenous stage of parasites or due to prepatent period and increased larval population. This finding also in conformity with that of Misra et al. (4), Singla (5) and Rajkhowa and Hazarika (10).

Table 2. Monthly variation in overall mean EPG of *Haemonchus* in different age groups in Local Goats in Assam, during 2003-2004. **, $P < 0.01$.

| Months | Mean EPG \pm SE of Local goats | | |
|---------|----------------------------------|----------------------|----------------------|
| | Adult | Kid | Overall mean |
| Dec | 251.11 \pm 85.61 | 140.00 \pm 93.33 | 230.91 \pm 72.00 |
| Jan | 173.33 \pm 64.54 | 40.00 \pm 26.67 | 149.99 \pm 53.36 |
| Feb | 212.22 \pm 72.32 | 65.00 \pm 43.49 | 185.45 \pm 60.03 |
| Mar | 142.22 \pm 56.18 | 120.00 \pm 72.72 | 138.18 \pm 47.60 |
| Apr | 108.89 \pm 43.09 | 80.00 \pm 46.67 | 103.64 \pm 36.14 |
| May | 135.56 \pm 56.31 | 30.00 \pm 15.28 | 116.36 \pm 46.39 |
| Jun | 305.56 \pm 100.43 | 240.00 \pm 135.97 | 293.64 \pm 85.42 |
| Jul | 1402.22 \pm 574.50 | 570.00 \pm 304.80 | 1250.91 \pm 474.09 |
| Aug | 1368.89 \pm 256.00 | 1170.00 \pm 385.30 | 1332.72 \pm 219.77 |
| Sep | 1002.22 \pm 152.78 | 540.00 \pm 329.04 | 918.18 \pm 192.75 |
| Oct | 657.78 \pm 152.87 | 350.00 \pm 183.33 | 601.82 \pm 129.84 |
| Nov | 457.78 \pm 131.90 | 340.00 \pm 228.62 | 436.36 \pm 114.98 |
| t Value | 3.166** | | |

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