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Pasture larval burden in a grazing land of subtropical hill region of Meghalaya

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Introduction

Gastrointestinal (GI) helminths infections are considered as one of the most devastating diseases of livestock as it causes mortality, morbidity and thereby economic losses to the livestock owners. Infective larvae of nematodes are the source of infection to the livestock and one of the ways of nematode infection to the livestock is the ingestion of infective larvae (L3) through contaminated pasture. The count of infective larvae could give an idea of infection in animals grazed in a particular pasture land. Management of pasture is an important component of nematode parasite control programs. In the present study, pasture larval burden (PLB) of nematodes in a grazing pasture land of goats of a subtropical hill region of RiBhoi district of Meghalaya has been worked out during the year 2012-13, as such type of study has not yet been done earlier in this region.

Materials and Methods

The grazing land is situated at an altitude of about 900m above mean sea level where minimum and maximum temperature were recorded as 4.60C and 29.10C; relative humidity ranged from 70.9% to 90.00% and receives a mean annual rainfall 2142.4 mm during the period of study i.e. from April, 2012 to March, 2013. The meteorological data for the study period of the area was collected from the meteorological section of the ICAR Research Complex for NEH Region, Umiam, Meghalaya. For this study, herbage was collected from different places of this grazing land at monthly interval by conventional 'W' shaped sampling and recovery of nematode larvae from that herbage was done as per standard method (MAFF, 1986). The concentrated nematode larvae (L3) were stained with Lugol's iodine solution, counted and expressed as per kg dry matter of herbage (L3/kg DM). The nematode larvae were identified as per standard method (MAFF, 1986). The faecal samples of goats from this subtropical hill region of Meghalaya were collected month wise to detect gastrointestinal parasitic infections using standard parasitological techniques. To know the nematode eggs per gram of faeces (EPG), Modified MacMaster Technique (MAFF, 1986) was followed. A total of 1651 numbers of faecal samples of goats were collected throughout the study period.

Results and Discussion

Month wise distribution of PLB along with percentage of GI parasitic infections and EPG of GI nematodes has been presented in Table 1. The meteorological data has been shown in Table 2. It could be observed from Table 1 that PLB of this subtropical hill region of RiBhoi district of Meghalaya ranged from 166.57 to 1878.40 larvae/kg dry matter (DM) of herbage per month. Highest PLB was recorded in the month of August (1878.40 larvae/kg DM of herbage) and lowest in the month of January (166.57 larvae/kg DM of herbage). Graphical representation of month wise distribution of PLB shown in Figure 1 and its correlation with percentage of GI parasitic infections, EPG of GI nematodes and meteorological parameters of the study has been presented in Figure 2. The state Meghalaya has four distinct seasons i.e. the rainy season from May to September, cool season from October to November, the cold season from December to February and the warm season or hot season from March to April, unlike most of the states of India, where three seasons like summer, rainy and winter have been observed. In that respect, highest PLB observed during rainy season with highest nematode eggs per gram of faeces of goats during rainy season. The lowest PLB and lowest GI parasitic infections in goats were recorded during cold season. From Assam, India, highest PLB was recorded during monsoon and lowest during winter in grazing land of goats (Bulbul *et al.*, 2011), supported the present findings but they observed a low numbers of larvae in comparison to the present study. Similarly, peaks pasture infectivity in the month of July (1383 larvae/kg DM of herbage) and lowest in the month of February (293 larvae/kg DM of herbage) from Madhya Pradesh, India has been reported earlier (Kumar *et al.*, 2013). From Pakistan, highest PLB in the month of August and lowest PLB in the month of January, in pasture land grazed by sheep have been observed (Al-Shaibani *et al.*, 2008). The highest burden of nematode larvae in pasture land of this subtropical hill region was recovered during rainy season and lowest in the cold season found to be associated with rainfall. The larvae of nematodes *Haemonchus contortus*, *Oesophagostomum* spp., *Strongyloides* spp. and

Trichostrongylus spp. were recovered from this pasture. These four different types of GI nematode parasites has been reported to found in goats of this subtropical hilly region (Laha *et al.*, 2013).

Table 1: Month wise distribution of PLB, percentage ofGI parasitic infections and EPG of GI nematodes of goats in subtropical hill region of Meghalaya (2012-13)

Month/year	Pasture larval burden per kgDM of herbage	Positive%	EPG
Apr'12	475.05	32.53	560.97
May'12	733.11	35.61	843.26
Jun'12	820.11	45.03	1386.02
Jul'12	1228.98	50.33	1721.33
Aug'12	1878.40	49.28	1507.24
Sep'12	1691.02	39.72	1334.48
Oct'12	1064.79	32.84	1007.78
Nov'12	751.29	28.16	751.25
Dec'12	460.12	27.27	756.41
Jan'13	166.57	25.80	439.06
Feb'13	305.55	25.75	219.11
Mar'13	342.58	27.82	193.75

Table 2: Meteorological observation of the study area from April, 2012 to March, 2013

Month	Av. T_min(°C)	Av. T_max (°C)	TRF (mm)	Av. RH (%)
Apr'12	16.0	27.8	139.6	77.0
May'12	17.6	29.1	273.9	76.9
Jun'12	19.4	28.1	312.7	88.4
Jul'12	20.3	28.8	256.0	87.5
Aug'12	19.7	29.1	440.0	89.1
Sep'12	19.0	27.4	384.8	90.0
Oct'12	14.9	26.4	251.5	83.0
Nov'12	10.0	24.1	30.0	83.1
Dec'12	7.31	21.0	0.0	84.5
Jan'13	4.6	20.8	0.0	81.5
Feb'13	8.4	25.3	10.2	70.9
Mar'13	12.1	27.5	43.7	78.1

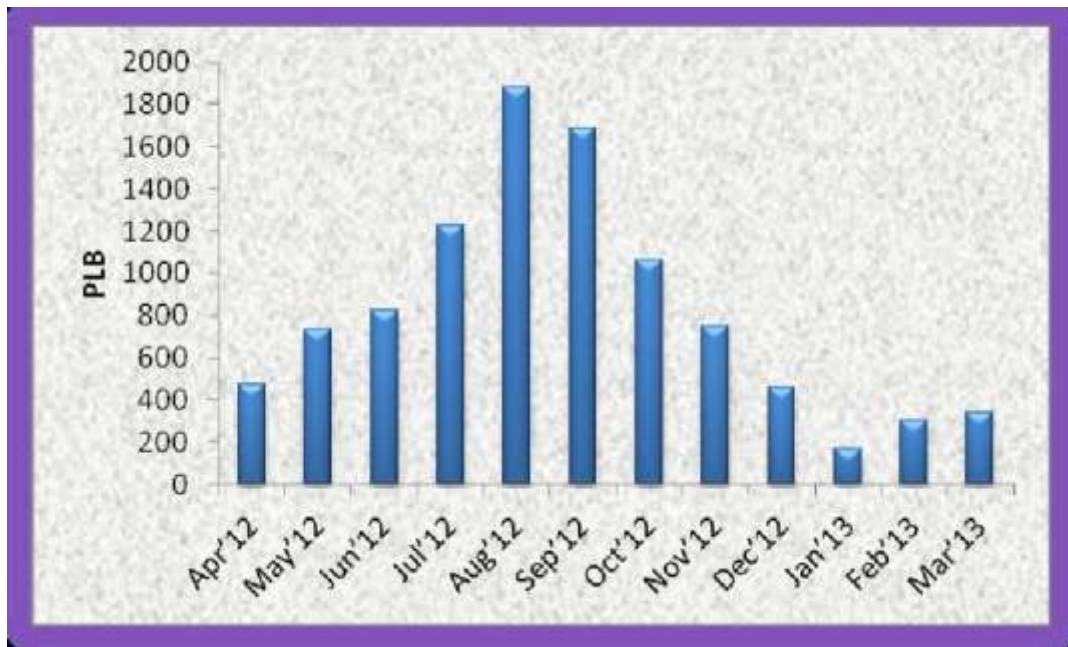


Fig. 1: Pasture larval burden (per KgDM of herbage) of Ri-Bhoi district of Meghalaya

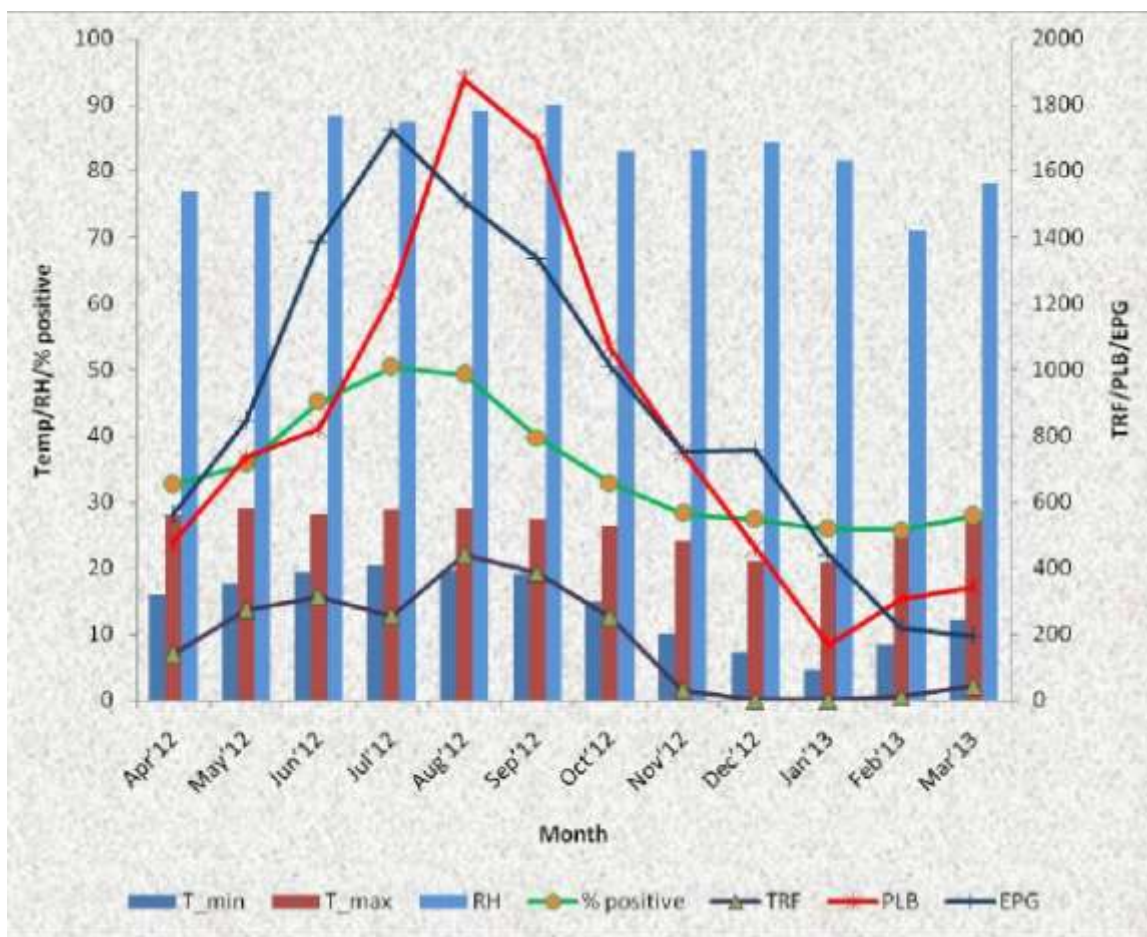


Fig. 2: Correlation of month wise distribution of PLB with percentage of GI parasitic infections, EPG of GI nematodes and meteorological parameters of the study area

Conclusion

It can be concluded that this pasture land of goats of subtropical hill region harbor nematode larvae of goats throughout

the year with highest count in the month of August and lowest in the month of January, that are responsible for nematode infections to goats throughout the year.

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