SEASONAL INCIDENCE OF IXODID TICKS GROWN IN PASTURE OF BANGLADESH

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Summary

The study was conducted in the Bangladesh Agricultural University campus, Mymensingh, from July 1988 to June 1990. Five grazing fields consisting of five different vegetations were selected for this study. The specimen were collected from this study. The specimen were collected from the grazing fields by dragging method. The results revealed that two species of ticks namely *Boophilus microplus* and *Haemaphysalis bispinosa* were collected from five different vegetation. The highest incidence of both *B. microplus* and *H. bispinosa* were recorded during winter season and lowest in Monsoon for the year of 1988-89 and 1989-90. These two species were significantly occurred in Winter followed by Monsoon and Autumn.

(**Key Words**: Dragging, *Boophilus microplus*, *Haemaphysalis bispinosa*, Winter, Monsoon, Autumn)

Introduction

Ticks are distributed all over the world but occur principally in tropical and sub-tropical countries. Rahman et al. (1972) reported that about 15.2% ectoparasite incidence was found in cattle of Mymensingh District. The damage done by the ticks causes a considerable amount of blood loss, irritation and annoyance to animal which results in disturbed feeding and improper digestion which may lead to retarded growth, loss of weight, decreased milk and meat production (Basu, 1951). Springella (1974) estimated the annual economic loss caused by *Boophilus microplus* in Australia to the tune of US $ 65 million. Similar findings were reported in Britain by Barnett (1974) who assign substantial improvement in meat and milk production to the better control of ticks and tick borne diseases. Ticks also transmit numerous pathogenic organisms which pose serious threats to both public health and livestock industry in the world. Tick spends a long period of their life cycle on pasture. So it is therefore, necessary to have some information on ecological aspects of ticks, which helps to undertake appropriate control measures for the destruction of ticks.

Materials and Methods

The study was conducted in the Bangladesh Agricultural University campus, Mymensingh, from July 1988 to June 1990. Five grazing fields consisting of five different vegetations and open for grazing throughout the year were selected for this study. The experimental fields were Field no. 1, Bangladesh Agricultural University Residential area, stands on the bank of river Brahmaputra which consists of San (*Imperata cylindrica*) and durba grass (*Cynodon dactylon*). Field no. 2, Bangladesh Agricultural University Residential areas' playing ground adjacent to the veterinary hospital, this field also consists of "San grass". Field no. 3, University stadium area which consists of durba and san grass. Field no. 4, University dairy farm area where mostly para grass (*Brochiaria mutica*) is cultivated for grazing of cattle. Field no. 5, was Bangladesh Agricultural University Central Mosque area alongside the Teachers Student Center (TSC) consists of mostly durba grass. The fields were exposed to direct sunlight and height of the grass varies from season to season. The growth pattern of different grasses were higher during Monsoon, followed by Summer, Autumn and winter season they were

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minimum in growth.

The specimen were collected from the grazing fields by dragging (flagging) method (Milne, 1945) The flag was one square meter and was made of a white cotton flannel sheet. A stick was attached on one end of the flag and a convenient length of rope was tied to the ends of the stick for dragging the flag. The flag was dragged slowly over the grass surface. The sample was collected from 10 meter (m) long and 1 m wide plots at a time. After 5 m was dragged, the sheet was examined and sample was removed with the help of a pair of fine forceps. The number of ticks collected from the 10 m plots were counted and preserved for identification. All the five fields were sampled randomly twice in a month and each sampling was replicated 10 (ten) times in a month. The different places were selected randomly for dragging. After collection, the ticks were preserved in hot glycerine alcohol. Identification of the ticks were made under dissecting microscope, on the basis of the descrip tions given by Hoogstraal et al. (1965) and Razzak (1969).

Analysis of variance and DMRT of seasonal incidence of ixodid were done by using General Linear Model by SAS/PC package (1988).

Results and Discussion

During this investigation two species of ticks namely *Boophilus microplus* and *Haemaphysalis bispinosa* were collected from five different vegetations. Razzak and Shaikh (1969) and Rahman and Mondal (1985) who recorded these ticks from cattle of Bangladesh. A total number of 1113 ticks were collected from July 1988 to June 1990. Influence of season's on the incidence and density of *B. microplus* and *H. bispinosa* in pasture are shown in table 1 and 2. The highest incidence were recorded during the Winter season and lowest during the Monsoon.

The highest percentage of tick (52.49 and 50.87 *B. microplus* and 51.15 and 40.88 *H. bispinosa* in 1988-89 and 1989-90 respectively) were recorded during the winter season and the lowest (4.20 and 3.11 *B. microplus* and 0.38 and 2.7 6 *H. bispinosa* in 1988-89 and 1989-90 respectively) during the Monsoon season. The average number of *B. microplus* in 50 sqm area were found highest during Winter (33.33%) followed by Autumn (14.33%) then Summer (13.14%) and Monsoon (2.67%) and there exist a significant ($p < 0.05$) difference among Winter and Monsoon similar results also found in case of *H. bispinosa* in 1988-89. This findings were completely correlated with the works of Rawlins (1979) who reported that the rainfall above 150/month contributed to maintaining low tick population. Wilkinson and Wilson (1959) also observed same findings and referred to the averages effects of rain by dislodging ticks from their resting places. Rawlins (1979) also reported that rainfall between 50-150 mm/month creative optimal conditions for embryonic development and larval survival, which lead to build up the larval population in the pasture within few months later. Annual incidence of Ixodid ticks in pasture were exhibited in table 3. Comparative study of tick incidence between two years were shown in this table. The highest incidence recorded during the Winter season 51.94% and 47.02% and lowest during the Monsoon in both the years. No significant difference were found in ticks collection between two years but among the seasons of the year significant differences were observed. More ticks were collected in the year 1988-89 than 1989-90. These less number of ticks collection may be due to more rainfall (273.66 cm) during the year 1989-90.

The effect of seasons on the response of tick species is exhibited in table 4. From the table, it is revealed that the highest average incidence of *Boophilus microplus* was observed in Winter (187), followed by Autumn (84.5), Summer (64.5) and Monsoon (12.5). Similarly, the highest average incidence of *Haemaphysalis bispinosa* was also higher Winter (104), followed by Autumn (62) Summer (50) and Monsoon (5.5), this finding was an agreement with the results of Rawlins (1979), who found that rainfall between 50-150 mm/month creats optimal conditions for embry onic development and larval survival, which lead to build up the larval population in the pasture few months later.

Conclusion

This study reflected that the highest incidence of ticks were observed on pasture during the Winter season and significantly lower in Monsoon and Autumn. So, it is concluded that shifting cultivation of pasture during Winter and alternate

TABLE 1. INFLUENCE OF SEASONS ON THE INCIDENCE OF IXODID TICKS IN PASTURE (FROM JULY 1988 TO JUNE 1989)

Season	Meteorological data			Total no. of dragging days, in a season	*Boophilus microplus*		*Haemaphysalis bispinosa*	
	Mean Temp (℃)	Mean rainfall (mm)	Mean R. H. (%)		Average no. of ticks in 50 sqm	Percentage of total collection	Average no. tick in 50 sqm	Percentage of total collection
Winter (December to February)	19.57 (17.42-21.11)	8.2 (1.4- 16.8)	76.82 (71.46-82.64)	6	33.33[a] (200)	52.49	23.33[a] (134)	51.15
Summer (March to May)	27.38 (24.53-28.9)	133.37 (2.0-374.5)	74.36 (69.77-81.35)	6	13.17[b] (79)	20.73	9.67[b] (58)	22.14
Monsoon (June to August)	28.59 (28.38-28.85)	452.03 (389.7-572.8)	87.55 (86.87-88.61)	6	2.67[c] (16)	4.20	1.0[c] (6)	0.38
Autumn (September to November)	26.66 (24.03-28.75)	198.2 (133.4-266.0)	82.72 (79.97-85.13)	6	14.33[b] (86)	22.57	10.67[b] (64)	24.43

Figure in the parenthesis shown the total number except meteorological data where lowest and highest figure was given.
Means with the same letter are not significantly different ($p > 0.05$).

TABLE 2. INFLUENCE OF SEASONS ON THE INCIDENCE OF IXODID TICKS IN PASTURE (FROM JULY 1989 TO JUNE 1990)

Season	Meteorological data			Total no. of dragging days, in a season	*Boophilus microplus*		*Haemaphysalis bispinosa*	
	Mean Temp (℃)	Mean rainfall (mm)	Mean R. H. (%)		Average no. of ticks in 50 sqm	Percentage of total collection	Average no. tick in 50 sqm	Percentage of total collection
Winter (December to February)	24.23 (18.96-28.36)	26.4 (0.0- 58.0)	76.68 (74.89-78.61)	6	24.5[a] (147)	50.87	12.33[a] (74)	40.88
Summer (March to May)	25.31 (22.81-27.37)	205.10 (65.2-448.1)	79.58 (75.16-83.10)	6	8.33[b] (50)	17.30	7.0[ab] (42)	23.20
Monsoon (June to August)	28.61 (28.38-28.97)	456.37 (188.2-775.7)	86.99 (84.81-88.17)	6	1.5[c] (9)	3.11	0.83[c] (5)	2.76
Autumn (September to November)	26.09 (23.09-27.96)	224.37 (0.0-396.6)	84.72 (79.80-89.13)	6	13.83[b] (83)	28.72	10.0[b] (60)	33.15

Figure in the parenthesis shown the total number except meteorological data where lowest and highest figure was given.
Means with the same letter are not significantly different ($p > 0.05$).

TABLE 3. ANNUAL SEASONAL INCIDENCE OF IXODID TICKS IN PASTURE

Year	Winter	Summer	Monsoon	Autumn	Total
July 1988 to June 1989	334 (51.94)	137 (21.31)	22 (3.42)	150 (23.33)	643
July 1989 to June 1990	221 (47.02)	92 (19.57)	14 (2.98)	143 (30.43)	470

Figure in the parenthesis shown the percentage.

TABLE 4. EFFECT OF SEASON ON THE RESPONSE OF TICK SPECIES

Tick species	Season[1]			
	Winter	Summer	Monsoon	Autumn
Boophilus microplus	187 (374)	64.5 (129)	12.5 (25)	84.5 (169)
Haemaphysalis bispinosa	104 (208)	50 (100)	5.5 (11)	62 (124)

[1] Average of two seasons.
Figure in the parenthesis shown the total number.

grazing of pasture land and also sometimes burning of pasture may be followed for the control of ticks.

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