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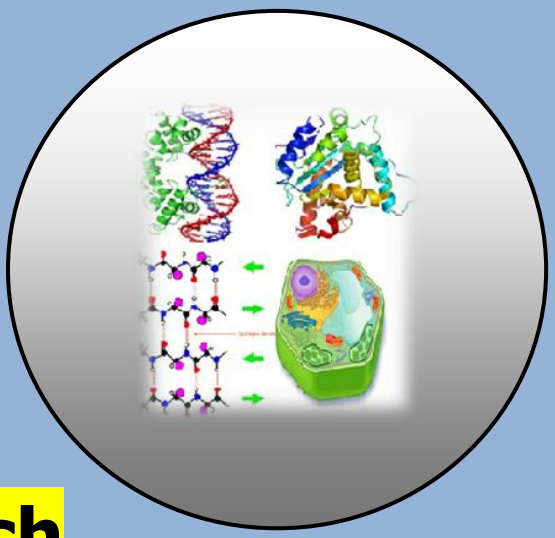

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Ectoparasitic Infestation of Cattle in Brahmanpara Upazilla of Comilla, Bangladesh

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ABSTRACT

The ectoparasitic infestation of cattle around the Bangladesh was recorded high because of positive natural conditions and the cattle were discovered to be infested with several species of ticks and lice. Epidemiological examination was done amid the period from January 2013 to January 2014, of 512 Cattle examined, 364 (71.09%) were discovered to be pervaded with a few types of ectoparasites. The relationship between the sex of the animals and the ectoparasite infestation were likewise determined. The infestation rate was higher in female relative to male. The relationship between the age of cattle and the different species of ectoparasites infestation was also studied. The prevalence rate was highest in case of Rhipicephalus sanguineus (16.80%) followed by, Boophilus microplus (15.82%), Hemaphysalis bispinosa (14.84%), Haematopinus euysternus (14.45%), Linognathus vituli (09.18%). Results communicated that, adolescent dairy cattle matured 1-3 years are more (80.78%) vulnerable than that of grown-ups matured >3 years (58.53%), and young aged <1 years (61.91%). Commonness of ectoparasitic infestation in weakness status was discovered to be fundamentally more significant against such parasitic infestation than ordinary sound cattle. Seasonal prevalence showed that, higher prevalence occurred in summer season (80.74%), followed by winter (80.01%) and rainy season (60.73%).

Keywords: Prevalence, Ectoparasites, Cattle and Bangladesh.

INTRODUCTION

Tropical, agro-based Bangladesh has 47.51 million livestock of which 22.87 million were cattle (BBS, 2008). Livestock is the backbone of Bangladesh's agricultural economy, is at risk of decline in production due to number of ecto- and endo-parasites. Cattle rearing is also hindered by various problem among them malnutrition and parasitic infestation are the major limiting factors especially in Bangladesh (Jabbar and Green, 1983) since the climate condition of Bangladesh is very conducive to a wide variety of ecto and endoparasites. Bangladesh is usually hot and humid except in winter and the climatic condition of Bangladesh is very conducive to a wide variety of parasites as well as ticks (Razzak and Shaikh, 1969). Ectoparasitic infestation is one of the major veterinary problems affecting livestock industries in many parts of the world (Hourrigan, 1979). Ectoparasites including lice, ticks, mites etc. play an important role in the transmission of certain pathogens (Loomis, 1986). The ectoparasites are known to cause heavy economic losses to livestock industry due to their usual habit of blood sucking, which adversely affects the economic production (Branscheid and Schroer, 1997). Among ecto-parasites, ticks have been recognized as the notorious threat due to severe irritation, allergy and toxicosis (Niyonzema and Kiltz, 1986). In some cases, ticks have been reported to cause lowered productivity, mortality (Niyonzema and Kiltz, 1986) and transmit such diseases as babesiosis, theileriosis, anaplasmosis etc (Norval *et al*., 1984). Ticks act not only as potential vectors but also as reservoirs of certain infectious agents e.g. *Pasteurella multocida*, *Brucella abortus* and *Salmonella typhimurium* in man and animals (Jongejan and Uilenberg, 2004). Besides ticks, lice also cause harm in cattle health. Lice infested animals keep poor physical condition and develop an unthrifty, anemic appearance and discolored greasy hair (Nelson, 1984). Louse free animals have been reported to be more profitable than infested animals due to increased rate of weight gain and more feed utilization (Kettle, 1974). The situation of ticks and tick-borne diseases in animals have been partially documented in Bangladesh by number of authors (Samad, 2000), but these studies was fragmented and not yet done in Comilla region. Comilla district is tropical type of area which actually presents in lowland and flood plain based area. Besides, this area also covered by a huge variety of floral composition. Therefore, thusly require a quick activity by the veterinary laborers, improvement accomplices to approach to counteract and minimize the misfortune created by ectoparasitic infestation in dairy cattle. Duly considering the limitation of information on ectoparasitic infestation of domestic animals in and around this area and the importance of cattle wealth in the national economy. The present study was undertaken with the aim to determine prevalence and associated risk factors of ectoparasitic infestation.

MATERIAL AND METHODS

Ethical Issue

Before sampling informed consent was obtained from the animal owners participating in the study and cautions were taken to ensure minimums tress to the animal during sampling.

Study Area and Period

The present research was conducted in cattle of different villages of Brahmanpara Upazilla, Comilla which is located 90km east to Dhaka city. Morphological study for identification of species of ectoparasites was conducted in the Department of Parasitology, Sylhet Agricultural University, Sylhet. The investigation was carried out during the period from January 2013 to January 2014.

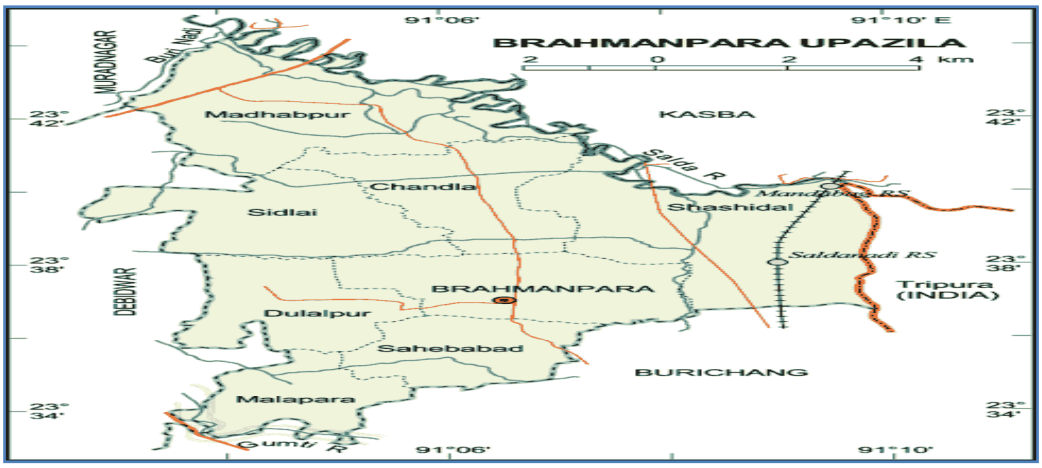

Figure 1. Study area

Survey Design and Sampling

Randomly sampling was performed for this study. 20 villages from in and around Brahmanpara upazila of Comilla were selected randomly followed by ten household from each of the village, from which cattle were examined for ectoparasites. The investigation was carried out in several visits on three seasons (Summer: March- June; Rainy: July-October and Winter: November-February). Total 512 cattle, of which male 225 and female 287 were selected randomly from different areas in and around the study areas for the convenience of the study and availability of the cattle.

Collection and Preservation of Samples

The selected cattle were thoroughly investigated by close inspection, parting the hairs against their natural direction for the detection of ectoparasites. After that, a questionnaire including the age, breed, sex, health status. Ectoparasites were collected from the different parts of the body of the individual cattle by hand picking. When required, small hair brush dipped in ethanol was used for the collection of ticks. Adequate precautions were taken to preserve the mouth parts and appendages of the ectoparasites during collection. Ectoparasites were preserved in 70% alcohol and labeled properly.

Identification of Ectoparasites

Morphology of ectoparasites was studied in the laboratory with the help of dissecting (4X) and compound (10X) microscope. Ectoparasites were identified according to the keys and descriptions given by Wall & Shearer (1997) and Soulsby (1982) by preparing permanent slides according to the procedures described by Cable (1967).

RESULTS

Of 512 cattle examined, 364 (71.09%) were found infested with one or more species of ticks (Table 1). The findings of this study agree with the reports of Islam *et al.* (2009) in Sirajganj, Kamal *et al*. (1996) in Chittagong of Bangladesh, who recorded (65.5%) and (65.4%) prevalence of ectoparasites in cattle, respectively. The findings of this study differ with the previous findings of some other scientists. Higher prevalence (75.1%) in cattle was reported by Sajid *et al*. (2008) in Pakistan.

Roy *et al*. (2001) reported (36.31%) prevalence of tick infestation in cattle at Madhupur in Bangladesh. Three species of arachnids namely, *Boophilus microplus* (15.82%), *Rhipicephalus sanguineus* (16.80%) and *Haemaphysalis bispinosa* (14.84%) and 2 species of lice namely, *Haematopinus eurysternus* (14.45%) and *Linognathus vituli* (09.18%) were identified.

This is similar to the findings of Islam *et al.* (2006) who reported *B. microplus* (17.40%), *H. bispinosa* (12.0%) and *R. sanguineus* (10.8%) in cattle of Bangladesh. The differences between the results of present and earlier study might be due to variation in the geographical locations, climatic conditions of the experimental area, methods of study, selection of sampling animal and breed of animal studied.

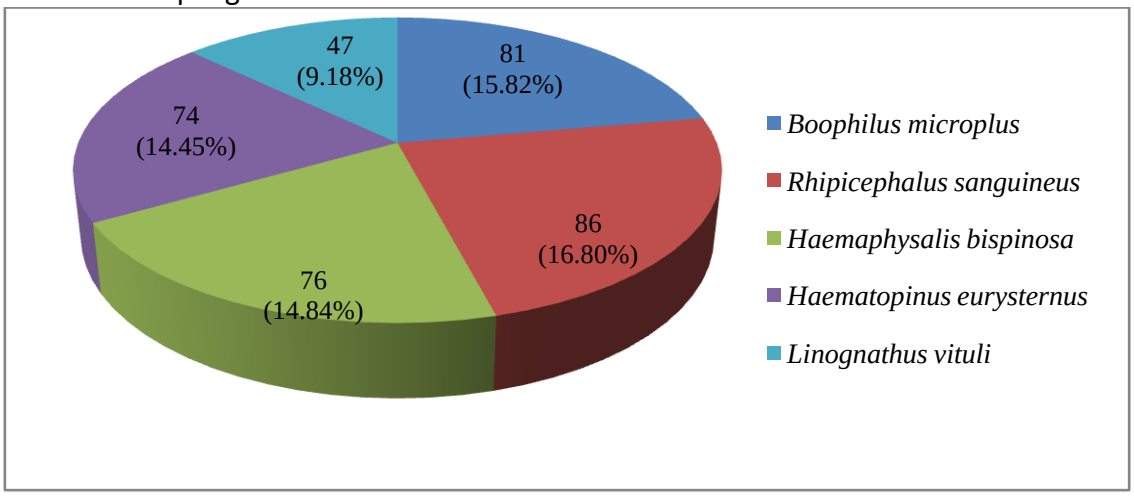

Figure 2. Prevalence of ectoparasitic infestation according to causal agents

Table 1. Prevalence of ectoparasite infestation of Cattle with respect to age, sex, season, breed and body condition.

Name of the ectoparasites	Age			Sex		Season			Breed		Body Condition		Percent Prevalence (n=512)
	Calves (<1yrs) (n=147)	Young (1-3yrs) (n=187)	Adult (>3yrs) (n=178)	Male (n=225)	Female (n=287)	Summer (n=160)	Winter n=(191)	Rainy (n=161)	Cross breed (n=221)	Local Breed (n=291)	Normal (n=249)	Poor (n=263)	
Boophilus microplus	23 (15.65)	33 (17.65)	25 (14.04)	32 (14.22)	49 (17.07)	26 (16.25)	24 (12.57)	31 (19.25)	29 (13.12)	52 (17.87)	34 (13.65)	47 (17.87)	81 (15.82)
Rhipicephalus sanguineus	19 (12.93)	39 (20.86)	28 (15.73)	36 (16.00)	50 (17.42)	28 (17.50)	27 (14.14)	41 (25.47)	36 (16.29)	50 (17.18)	34 (13.65)	52 (19.77)	86 (16.80)
Haemaphysalis bispinosa	17 (11.56)	28 (14.97)	31 (17.42)	31 (13.78)	45 (15.68)	25 (15.63)	21 (10.99)	30 (18.63)	24 (10.86)	52 (17.87)	28 (11.24)	48 (18.25)	76 (14.84)
Haematopinus eurysternus	20 (13.61)	34 (18.18)	20 (11.24)	26 (11.56)	48 (16.72)	28 (17.50)	29 (15.18)	17 (10.56)	31 (14.03)	43 (14.78)	31 (12.45)	43 (16.35)	74 (14.45)
Linognathus vituli	12 (8.16)	17 (9.09)	18 (10.11)	14 (6.22)	33 (11.50)	21 (13.13)	15 (7.85)	11 (6.83)	17 (7.69)	30 (10.31)	20 (8.03)	27 (10.27)	47 (9.18)
Total	61.91	80.78	58.53	61.78	78.39	80.01	60.73	80.74	61.99	78.01	59.02	82.51	71.09

*** Prevalence rate is given in percentage value**

DISCUSSION

Age Wise Prevalence

It was observed that, prevalence of ectoparasites is higher in grownups animals aged 1-3 years (80.78%) followed by in calves < 1 years (61.91%) and lowest in older aged > 3 years (58.53%) (Table 1). The results of present study is not agreed with Stuti *et al.* (2007) who reported that, calves (below one year) were the most susceptible.

The probable reasons for the higher prevalence in young could be poor nutritional status and imbalance hormonal profile (Marufu, 2008). Grownups found to be higher prevalence (80.78%) followed by calves and adult whereas Islam *et al.* (2009) found that prevalence of ectoparasitic infestation was higher in old cattle. On the other hand, Manan *et al*. (2007) found that resistance in the animals was building up as the age advances and the animals became more adoptable than in younger state irrespective of the farm species. It is hypothesized that the strong innate immunity and age resistance of older cattle are responsible for their less vulnerability to ectoparasitic infestation (Sarkar, 2007) and in such way, leads to less ectoparasitic burden.

Sex related prevalence

It was observed that the prevalence of cattle's ectoparasitic infestation was higher in female (78.39%) than the male (61.78%). This result agree with the report of Sarkar (2007) who reported the prevalence of ectoparasites were higher in female than male and also due to post calving stress (Marufu 2008).

Seasonal prevalence

Prevalence of ectoparasites was higher in rainy season (80.74%) followed by summer (80.01%) and lowest in winter season (60.73%). In rainy and summer cattle were 1.33 and 1.32 times more susceptible to such parasitism than winter season, respectively (Table 1). Similarly, Salih *et al.* (2008) found the highest number of ticks occur during the rainy season. Sanjay *et al.* (2007) reported the seasonal prevalence of tick infestation significantly more during the rainy (24.33%) and summer (21.58%) as compared to the winter season (4.03%). Biu and Nwosu (1998) found that although most of the ticks occurred in relatively low numbers throughout the year, they were generally most common from the second half of the rainy season through the dry season. The rise of infestation in summer may be due to rise of temperature in late winter leading to gradual increase in the load as well as percentage of infestation in May and June (Roy *et al*. 2001).

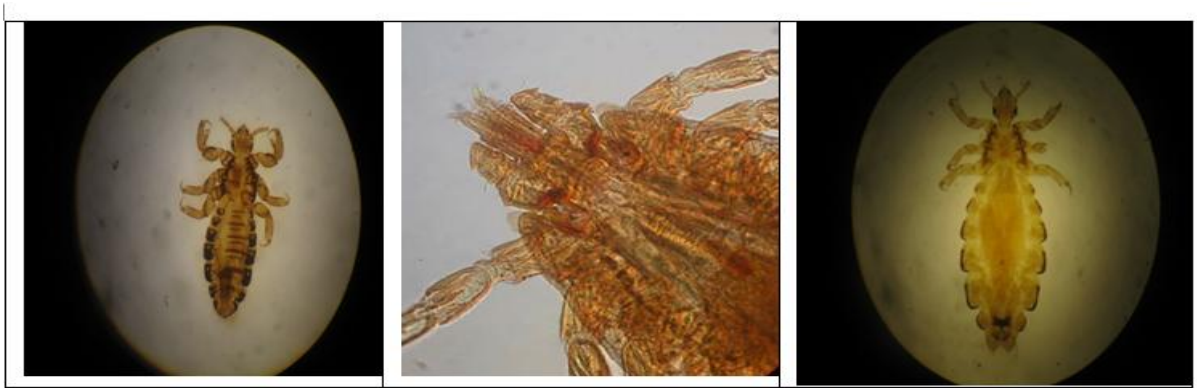

Plate 01. Full view of *Linognathus vituali*

Plate 02. Mouth part of *Boophilus microplus*

Plate 03. Full view of *Haematopinus eurysternus*

Breed related prevalence

Here the local breed shows higher prevalence of ectoparasite infestation (78.01%) than cross breed which shows (61.99%) prevalence of ectoparasite infestation. On the contrary lowest susceptibility of indigenous cattle can be attributable to the higher acquired resistance as a result of continuous exposure of ectoparasites (Sajid *et al.*, 2009). Resistance of indigenous breed to ectoparasites could be related to a pre-immunity against prevailing ectoparasites, skin hypersensitivity and increased grooming (Mattioli *et al.,* 2000; Burger *et al.,* 2012).

Plate 04. Mouth part of *Haemaphysalis bispinosa*

Plate 05. Posterior part of *Rhipicephalus sanguineus*

Plate 06. Full view of *Rhipicephalus sanguineus*

Figure 4. Various ectoparasites of cattle

Nutritional factor related prevalence

Cattle under poor nutritional level (82.51%) were 1.40 times more vulnerable to ectoparasitic infestation than animals with normal health (59.02%) (Table 1). The present study agrees with the earlier study of Lapage (1962) who found malnourished animals are more susceptible to any infection as they are immune compromised. Moreover, Etter *et al.* (1999) also found that in immune compromised animals, prevalence of tick is usually increased. Marufu (2008) also shows due to poor nutritional status the prevalence ectoparasite increased.

CONCLUSION

To sum up, this study provides information on prevalence of ectoparasites species on cattle of Comilla district. It also confirms the endemicity of ectoparasites and their negative impact on cattle production. Hence, proper veterinary services and management practice should be put in the place to control infestations of these valuable animals.

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