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## A study on prevalence of tick infestation in dogs in Guwahati, Assam

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**Abstract**

The present study was conducted with the objective to study the prevalence of tick infestation in dogs in Guwahati, Assam. A total of 10315 numbers of dogs were screened and tick infestation was recorded in 45 numbers of dogs. The overall prevalence of tick infestation in dog was recorded 0.43%. Age-wise prevalence was highest in 1 to 3 years (0.69%) age group. Male dogs were highly infested (0.63%). Among breeds the highest prevalence was recorded in the Non- Descript dogs (0.80%). Monsoon (0.65%) was found to be the most favourable season for higher prevalence of tick infestation in dogs. The most common clinical sign associated with tick infestation is pruritus which is present in 100% of the cases. As per the distribution of ticks on different body regions of dogs, ear (73.30%) was found to be the most common site for attachment of ticks.

**Keywords:** prevalence, *Rhipicephalus sanguineus*, infestation, pruritus, clinical sign

**Introduction**

Dog always keeps a special space in the hearts of their human companions. Their role among humans was mostly utilitarian until the 18<sup>th</sup> Century, when the term “man’s best friend” came into lexicon. Although the importance of dogs in the society is well established but there are well documented health hazards associated with owning a pet with a diverse range of infectious diseases including parasitic diseases. Among different parasites, ectoparasitic diseases, mostly tick infestation is the most important. Ticks are voracious blood suckers and causes irritation, redness, swellings and itching of the skin leading to self-inflicted trauma. Severe infestations may cause anemia, weight loss and even death from the consumption of large quantities of blood. The brown dog tick when present in large numbers can also cause skin irritation in their host. It can infest houses and kennels and more significantly, the tick can carry and spread a range of blood-borne diseases affecting both animals and human beings. One of the most harmful impacts of tick bite, is the release of neurotoxins from the tick saliva leading to tick paralysis, systemic illness and hypersensitive reactions (Taylor *et al.*, 2007) [16]. The ticks have worldwide distribution and their species diversity is greatest in tropical and subtropical regions. Among different species of ticks infesting dogs, the brown dog tick (*Rhipicephalus sanguineus*) is the most common dog tick prevalent throughout the world (Agbolade *et al.*, 2008; Troyo *et al.*, 2009; Dantas-Torres, 2010) [1, 17, 6].

**Materials and Methods**

An epidemiological investigation on the prevalence of tick infestation in dogs in an around greater Guwahati area under Kamrup Metro district of Assam was undertaken for a period of one year from July, 2019 to June, 2020. The clinical cases of dogs presented to Teaching Veterinary Clinical Complex, College of Veterinary Science, Khanapara were enrolled and screened through clinical examination for presence of ticks on their body. A total of 10315 dogs (2219 local and 8096 exotic / crossbreeds.) were included to record the prevalence of ticks in the study area. The entire external body coat of the dog was examined thoroughly by inspection and parting their hairs against natural direction for detection of ticks, if any. The inner surface of the ear, interdigital space, shoulder, neck and tail were examined thoroughly for presence of different stages of ticks (larva, nymph, adult male and female.)

**Collection of ticks**

For collection of ticks, a piece of cotton soaked in Chloroform was applied at the site of tick

attachment to make it dislodged. Then these ticks were collected with the help of fine toothed forceps but utmost care was taken to keep the mouthparts and appendages of the ticks intact. Ticks thus collected were put into clean glass vials after proper labeling. The collected ticks were preserved in 70% alcohol in clean, well-stoppered glass vials and labeled properly.

### Statistical Analysis

The statistical analysis of the data was carried out according to the standard statistical procedure using SPSS version 20.0 and SAS 9.0.

## Results and Discussion

### Overall prevalence

In the present study, out of 10315 dogs examined, 45 cases were found to be positive for tick infestation with a percentage of prevalence being recorded as 0.43 percent. The present findings were in agreement with the reports of Dimri and Sharma (2000) [7]. However, the prevalence rate in the present finding was found to be lower than the findings of Cruz-Vazquez (1999) [5]; Soundararajan *et al.* (2016) [15] and Gonde *et al.* (2017) [8].

The actual reason for lower prevalence of tick infestation in dogs in the present study is not known but might be due to the fact that nowadays most of the pet owners are interested to keep exotic dogs as compared to non-descript dogs, which are generally well maintained and application of acaricidal preparations are used routinely and regular grooming is also practiced.

### Age-wise prevalence of tick infestation

The age-wise prevalence of tick infestation was found to be the highest (0.69%) in the age group 1 to 3 years (Table 1), followed by 3 to 5 years (0.45%), 0 to 1 year (0.37%) and lowest being in the age group of above 5 years (0.24%).

**Table 2:** Chi-Square Test For Sex-Wise Prevalence of Tick Infestation

Sex	No. of dogs Screened	Positive	Prevalence (%)	Chi-square value
Male	5514	35	0.63	10.74576**
Female	4801	10	0.20	
Total	10,315	45	0.43	

\*\* Highly significant (p<0.01)

### Breed-wise prevalence of tick infestation

The breed-wise prevalence of tick infestation was found to be the highest (0.80%) in non-descript dogs (Table 3), followed by Labrador retriever (0.59%), cross breeds (0.49%), German Spitz (0.48%), Golden retriever (0.30%), German Shepherd (0.26%), Lhasa Apso (0.23%), Doberman (0.22%) and lowest being in the Beagle (0.20%). However, the tick infestation among non-descript or mongrel dogs was not found to be statistically significant as compared to other breeds of dogs. The present findings are in agreement with Arong *et al.* (2011) [3] who reported highest prevalence of tick infestation among mongrel dogs. However, the present findings

However, the tick infestation in the age group of 1 to 3 years was not statistically significant as compared to other age group of dogs. Similar observations were also reported by Misra (1984) [10], Bhadesiya *et al.* (2014) [4], Soundararajan *et al.* (2016) [15] and Gonde *et al.* (2017) [8]. The actual reason for higher prevalence of tick infestation in dogs in the age group 1-3 years is not known but thought to be due to the wandering and active nature of the adult dogs which makes them to come in contact with other tick infested dogs during outdoor activities.

**Table 1:** Chi-Square Test For Age-Wise Prevalence Of Tick Infestation

Age (years)	Total no. of cases screened	No. of positive cases	Prevalence (%)	Chi square value
0-1	2131	8	0.37	6.266642 <sup>NS</sup>
1-3	2316	16	0.69	
3-5	2649	12	0.45	
Above 5	3219	8	0.24	
Total	10315	45	0.43	

NS- Non-significant

### Sex-wise prevalence of tick infestation in dogs

The prevalence of tick infestation was found to be significantly (p<0.01) higher (0.63%) in male (Table 2) as compared to female dogs (0.20%) in the present study. The present findings were in agreement with the findings of Soundararajan *et al.* (2016) [15], Gonde *et al.* (2017) [8], Akande *et al.* (2018) [2], Hadi *et al.* (2016) [9], Silveira *et al.* (2009) [13] and Bhadesiya *et al.* (2014) [4]. The higher prevalence of tick infestation in male dogs might be due to the wandering habit of male dogs during breeding season which exposes them to more tick infestation. Besides this, hormonal factors might also play some role on tick infestation in dogs in the study area (Sahu *et al.*, 2013) [12].

contradicts with the reports of Soundararajan *et al.* (2016) [15] and Gonde *et al.* (2017) [8] who reported higher incidence of tick infestation in German spitz dogs. The actual reason for higher occurrence of tick infestation in non-descript dogs is not known but thought to be due to more number of non-descript dog population in the study area. Besides this, non-descript dogs are although reared by the owner but not much care is being taken for their diet, health etc. and often kept loose, making them to expose to other free ranging dogs and thereby get infested with ticks as compared to exotic dogs where owners takes sufficient care for maintenance of their health.

**Table 3:** Chi-Square Test For Age-Wise Prevalence of Tick Infestation

Breeds	Total no. of cases screened	No. of positive cases	Prevalence %	Chi-square value
Labrador	1180	7	0.59	4.108537 <sup>NS</sup>
Non-descript	1619	13	0.80	
German Shepherd	1116	3	0.26	
German Spitz	1228	6	0.48	
Cross	1425	7	0.49	

Golden retriever	986	3	0.30
Beagle	988	2	0.20
Doberman	900	2	0.22
Lhasa Apso	873	2	0.23
Overall	10,315	45	0.43

**Season wise prevalence of tick infestation in dogs**

The seasonal variations on the prevalence of tick infestation in dogs was found to be significantly ( $p < 0.01$ ) higher in monsoon (0.65%), followed by post monsoon (0.52%), pre-monsoon (0.20%) and the lowest in winter (0.19%) season. Similar findings were also reported by Gonde *et al.* (2017) [8], Soundararajan *et al.* (2016) [15] and Sahu *et al.* (2013) [12].

Earlier workers (Raut *et al.* 2006 and Arong *et al.* 2011) [11, 3] have recorded highest incidence rate during post-monsoon and lowest in winter, respectively. Variation in the percentage of prevalence during different season could be attributed to the fact that the breeding of ixodid ticks is highly favoured by warm and humid climate (Soulsby, 1982) [14] which is variable with the geographical situation of a region in a year.

**Table 4:** Chi-Square Test For Season-Wise Prevalence of Tick Infestation

Season	Numbers of dogs examined	Numbers of dogs found positive	Prevalence (%)	Chi square value
Pre -monsoon	1796	4	0.20	<b>9.888718*</b>
Monsoon	3845	25	0.65	
Post-monsoon	2080	11	0.52	
Winter	2594	5	0.19	
Total	10315	45		

\* $<0.05$  Significant

**Clinical signs recorded in tick infested dogs**

Pruritus was found to be the most common clinical sign (100%), followed by rashes (77.77%), rough body coat (66.66%), pale mucous membrane (66.66%), alopecia (22.22%) and inappetance (20.00%).

**Table 5:** Different Clinical Manifestations Recorded In Tick Infested Dogs

Clinical manifestations (N=45)	No. of animals exhibiting clinical signs	Percentage (%)
Pruritus	45	100.00
Rashes	35	77.77
Rough body coat	30	66.66
Pale mucous membrane	30	66.66
Alopecia	10	22.22
Inappetance	9	20.00

**Distribution of ticks on different body region**

In the present study, ticks were distributed all over the body of the dogs, but particularly confined to the ears, shoulders, neck, back, interdigital space and over the tail head.

Tick infestation was most commonly found on the body regions of dogs was recorded on the ears (73.33%) followed by shoulder (57.77%), back (46.66%), neck (44.44%), interdigital spaces (42.22%), Abdomen (17.777%), chest (15.55%) and face (13.33%).

**Table 6:** Distribution of Ticks on Different Body Region

Body region (n=45)	No. of cases with various location	Percentage (%)	Chi-square value
Ear	33	73.33	<b>38.06**</b>
Shoulder	26	57.77	
Back	21	46.66	
Interdigital spaces	19	42.22	
Neck	20	44.44	
Face	6	13.33	
Chest	7	15.55	
Abdomen	8	17.77	



**Fig 1:** Heavy Tick Infestation on Ear Fold Of A Dog



**Fig 2:** Presence Of Tick On Groin Region Of A Dog



**Fig 3:** Heavy Tick Infestation In The Ear Pinna Of A Dog



**Fig 4:** Presence of Ticks In Interdigital Space

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