

Behavioral alterations in Cattle and Buffaloes due to tick infestation in Nanded (MS)

*Afreen Fatema R. K.¹, Vidya V. Bhojar²

¹N. E. S. Science College, Nanded, Maharashtra, India

²Late Babasaheb Deshmukh Gortheekar College of Arts Commerce and Science, Umri, Nanded, Maharashtra, India

*Corresponding email: afreenfatema1763@gmail.com

ARTICLE INFO	ABSTRACT
<p>Original Research Article Received on November 22, 2024 Revised on November 27, 2024 Accepted on December 14, 2024 Published on December 23, 2024</p> <p>Article Authors Afreen Fatema R.K., Vidya V. Bhojar</p> <p>Corresponding Author Email afreenfatema1763@gmail.com</p>	<p>Understanding the health problems that animals experience because of tick bites is made easier by this study. Cattle and buffaloes' behavioural patterns can be easily understood thanks to this study. The current study is useful because behavioural changes may serve as a warning sign for an early infestation. In 2024, the basic survey approach is used to gather data for this investigation. According to this study, the overall prevalence for cattle in 2024 is 23.42%, whereas the prevalence for buffaloes is 33.89%. This paper details on the symptoms of the infestation, which include anxiety and restlessness. The safety precautions that must be taken to protect farm animals and people. This study shows the comparative observations of uncommon behaviour in cattle and buffaloes. The summarised conclusion of this research is that the infection in buffaloes is severe than cattle, hence buffaloes need more attention during infestation period.</p>
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The parasitic insects known as ticks pose a health concern to humans, cattle, buffaloes, goats, and sheep. Ticks are tiny arachnids that are parasitic and members of the parasitiformes family. Rashes, skin allergies, and other behavioral abnormalities are among the negative effects that ticks have on the host body. The life stages of ticks include egg, larva, nymph, and adult. Ticks are remarkably similar in all phases; probably because they are small, larvae and nymphs also consume blood meal. Because larvae have three pairs of legs, they are occasionally mistaken for insects. Nymphs have four pairs of legs; they are smaller than adults and larger than larvae. The morphology of male and female ticks is different.

In females, the scutum is located on the dorsal side and is modest, while in males, it is dispersed throughout the body. Both the male and female consume the host's blood. They use the mouth parts on the capitulum to adhere to the skin. During blood feeding, ticks serve as intermediaries in the spread of numerous infections, which causes disease and other health problems in the host body. Health problems can range from minor to severe. Minor illnesses include skin rashes, vomiting, diarrhea, and fever, while severe illnesses include Lyme disease, *Babesia*, *Anaplasma*, and *Tularemia*. The Centers for Disease Control and Prevention (CDC), an official government website in the United States, has 50 publications about diseases spread by ticks.

According to research on tick-borne illnesses in Africa, *Rhipicephalus* sp. ticks spread tick-borne pathogens such as *Anaplasma*, *Babesia*, and *Theileria* spp., which lead to significant financial losses in livestock production and also play a role in the emergence of zoonotic diseases (Mucheka, 2023). Tick illnesses cause a variety of symptoms in their hosts, including behavioral and morphological abnormalities. Animals that are affected or who have been attacked by ticks also exhibit physiological changes. While some ticks prefer to complete their life cycle on two or three hosts, others might finish their life cycle on a single host. As soon as the larval stages emerge from the egg, they attach themselves to the host body and begin feeding. They may stay on the same host or, once they have matured into nymphs, they may resume feeding on blood meal to reach adulthood. At the adult stage, they also separate from the host body after finishing their blood meal. When they have two or three hosts, the ticks prefer to separate from the host body after each blood meal, mature, and procreate. The primary focus of this study is on how cattle and buffaloes behave after tick attack. This study will be focusing on the skin infections caused by tick's bite. The blood feeding of tick causes the anemia in host body. The cattle and buffaloes are used in field work due to blood loss they face weakness, which can affect their working ability.

Review of Literature

In the realm of livestock management, there aren't many historical publications that explain why animals get sick and suffer financial losses. The literature that is currently available on India, which has a sizable portion of the world's livestock resources, tick-borne diseases (TTBDs), and livestock production is significantly impacted by ticks, is extensive and focuses particularly on the opportunities and challenges for the integrated control of ruminant ticks, with a particular focus on livestock farming systems in India. Future livestock output in India should be impacted by developments covered in the review about tick vaccines and other tick management methods (Ghosh, 2006). In addition to projecting the epidemiological characteristics of common ticks infesting water buffaloes, this study focuses on the economic impact of different tick species on livestock.

Only buffaloes were reported to have a 51.81% total prevalence of tick infestation in this study. According to this study, animal housing and management techniques have an impact on tick infestations on the host's body. The spread of ixodid ticks is clearly primarily controlled by precipitation and rainfall in the tropics and subtropics (Verma *et al.*, 2015). *Rhipicephalus (Boophilus) microplus* is one of the most significant ectoparasites of cattle in the globe, according to the study. This study also attempts to address the growing population of water buffaloes (*Bubalus bubalis*) in regions afflicted with *R. microplus*. The purpose of this proposed study is to ascertain whether these ruminants can support the full tick life cycle. It also implies that in every metric examined, there were no statistically significant differences between the buffalo and the bovine. The water buffalo can serve as a good reservoir for *R. microplus* ticks, it was determined. When conducting tick control and eradication programs on water buffalo grazing regions, these findings should be considered (Daniel Benitez, 2012). There has been a growing body of research in recent years regarding ticks as crucial infection vectors and reservoirs, resulting in several human and animal illnesses as well as annual livestock damage. The feeding stage, or the time when ticks feed on their hosts' blood and spread pathogens, is the primary focus of current research on tick protection and tick-borne disease prevention. Neuropeptides and peptide hormones regulate tick physiological processes, including food intake, salivary production, reproduction, development, and others. These substances may have a role in the spread of pathogens that cause tick-borne encephalitis or *Lyme borreliosis* (Hromníková *et al.*, 2022).

Methodology

Seasonal research of cattle and buffaloes was carried out to collect tick samples and examine the allergic reactions they cause. The survey or fieldwork methods are used in this investigation. Buffaloes and livestock afflicted with ticks were examined. Photographs of these buffaloes and other animals were also taken during the inspection process. Without putting the host in danger, the ticks were removed from their body using forceps. 747 cattle and 652 buffaloes were among the 1399 cattle and buffaloes assessed for the study.

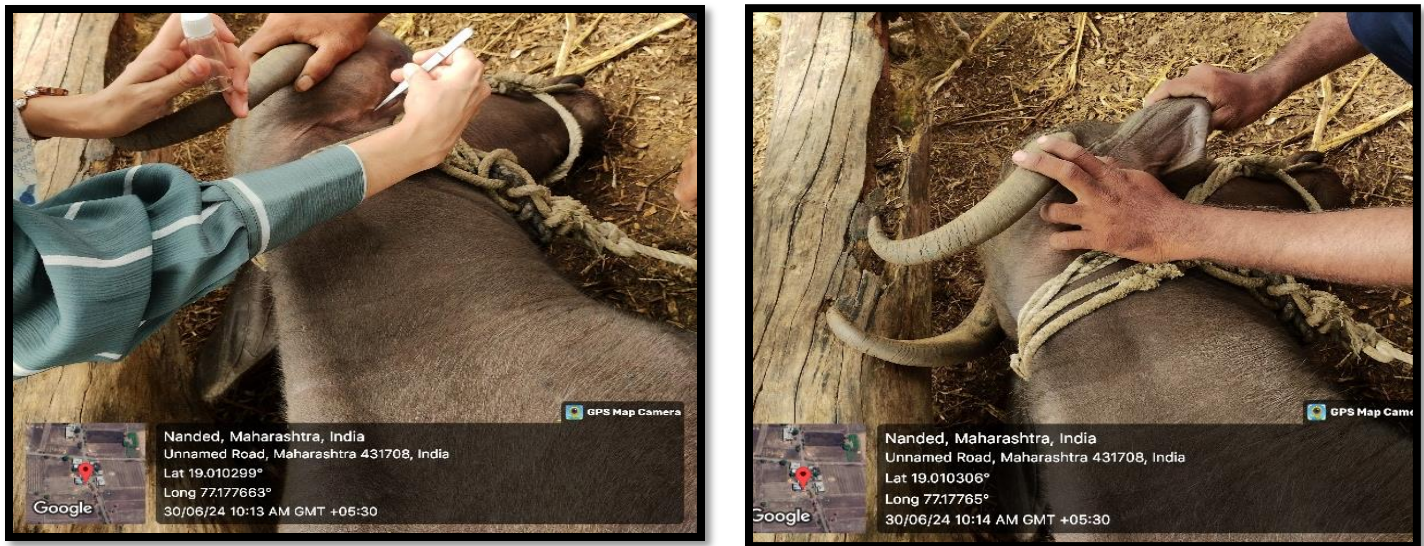


Fig 1. Study is to investigate the Behavioural Changes

Table 1. Tick infected Cattle and Buffaloes in 2024

S. N.	Season	Cattle Samples			Buffaloes Samples		
		Total Cattle Observed	Infected Cattle	Prevalence of Cattle	Total Buffaloes Observed	Infested Buffaloes	Prevalence of Buffaloes
1.	Summer	273	56	23.42%	181	59	33.89%
2.	Winter	246	50		224	83	
3.	Monsoon	228	69		229	79	
		$\Sigma= 747$	$\Sigma= 175$		$\Sigma= 652$	$\Sigma= 221$	

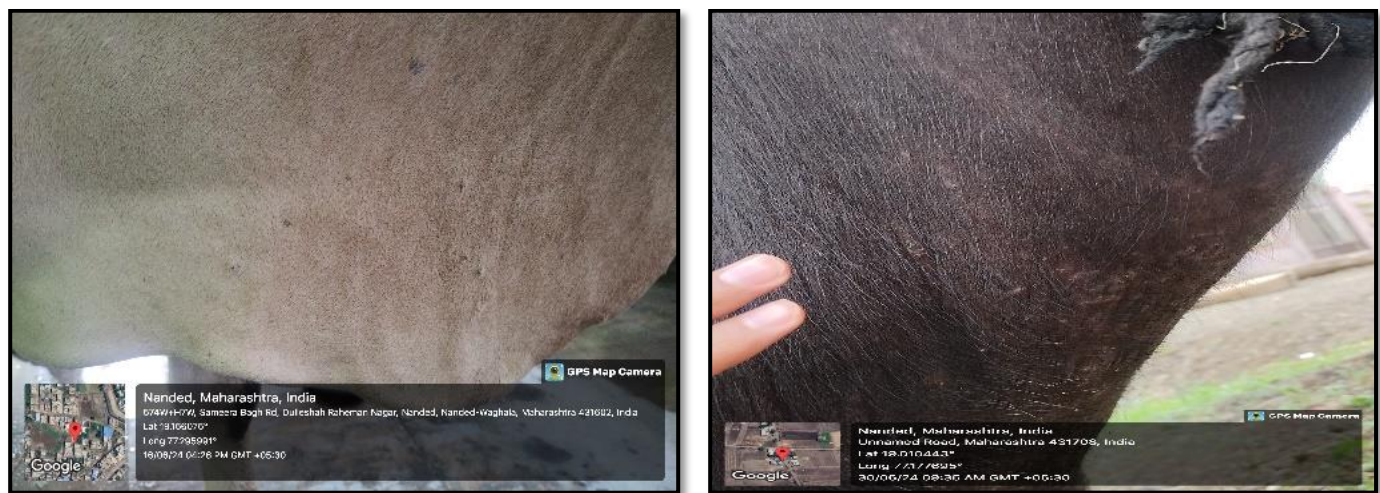


Fig 2. Infected Cattle and Buffalo

Out of the 396 animals surveyed, 396 were found to have been afflicted with ticks, with 175 cattle and 221 buffaloes having infestations. The infestation was not serious but still they show change in their behavior.

Results and Discussion

The goal of the current study is to investigate the behavioural changes that occur in cattle and buffaloes that are infested with ticks. These animals are typically located in sheds that are poorly maintained.

The current study is useful because behavioural changes may serve as a warning sign for an early infestation. We can determine the average number of infected cattle in year 58 and the average number of infected buffaloes in year 74 based on the values of observed and infected animals in the table below. Compared to buffalo, who have a prevalence of 33.89%, cattle have a prevalence of 23.42%. The prevalence varies by about 10 percent, indicating that buffaloes are more likely than cattle to be attacked.

Cattle and buffaloes in this study exhibit some uncommon behaviors that are typical; these characteristics are described in comparison below:

- Buffaloes are more un-rested during infestation, yet cattle and buffaloes both exhibit the same head movements.
- Compared to cattle, buffaloes continuously move their tails, which is also easily noticeable.
- Infected buffaloes are more aggressive than infected cattle, and in rare instances, some oxen exhibit the same level of hostility as buffaloes.
- Although both animals exhibit a lack of appetite, cattle are less stressed than buffaloes.
- The level of milk production was also impacted by the lack of hunger. Buffaloes exhibit a greater decline in milk output than cattle, which exhibit a moderate decline.
- During an infestation, buffaloes remain motionless and separate from the herd for an extended period of time, while cattle remain active and partially separate.
- Cattle occasionally scratch their bodies, while buffaloes scratch their bodies more forcefully, leaving markings.
- Buffaloes have a more severe skin infection than cattle, which only have a moderate one.
- Compared to cattle, buffaloes are more agitated and hostile due to serious skin infections

Conclusion

It is possible to draw the conclusion that buffaloes are suffering from more serious skin illnesses than cattle based on the previously described observations. Because buffaloes and cattle have different coat colours, the prevalence difference indicates that buffaloes are attacked more frequently than cattle.

Due to their darker body colours, buffaloes' dark coats make it simple for ticks to escape. Buffaloes require special attention since their severe tick-borne infections put them under more stress. Cattle require care as well, although not to the same extent as buffaloes because they are less susceptible to infection. The straightforward conclusion is that buffaloes are more susceptible and have lower stress tolerance levels than cattle, which have higher stress tolerance levels and are more resistant to tick infestation. High levels of care and upkeep are necessary to prevent tick attacks on animals. The people who look after the shed should keep it clean and hygienic.

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