

PREVALENCE AND IDENTIFICATION OF TICK INFECTION ON BUFFALOES BY DIFFERENT ECTO-PARASITES IN THE EASTERN PART OF UTTAR PRADESH

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ABSTRACT

The present study was designed to find out the prevalence and identification of ecto-parasites to evaluate and compare the efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) leaves against tick infestation in buffaloes. For this purpose a total of 1264 buffaloes were examined for the prevalence of ecto-parasites in and around eastern part of Uttar Pradesh. The prevalence of ticks, mites and lice was found to be 455(36%), 101(8%) and 63(5%), respectively. The efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) against ecto parasites was 100%, 60% and 0%, respectively. From this study it was concluded that ivermectin is the choice of drug against ecto-parasites of buffaloes.

KEYWORDS: Ivermectin, Doramectin, *Azadirachta indica*, Prevalence, Ecto-parasites

Uttar Pradesh, India is blessed with a large population (30.6 million) of buffaloes, of which 15.6 (15%) are found in the eastern part of Uttar Pradesh. (Rony *et al.* 2010). These buffaloes are playing a vital role in fulfilling the ever increasing demand for animal protein and milk for mankind and also draft power for agriculture in the Uttar Pradesh, India. Tick infection especially ecto-parasites are the major veterinary problem in most of the developing and under developing countries of the world. The health and production in buffaloes is severely affected by diseases caused by tick infection. The characteristic symptoms are local itchiness, loss of hair, and other production losses. These ecto-parasites suck blood and tissue fluid and are also responsible for the transmission of various diseases causing economical losses, accounting for around 52.5% of the nations of the total and 64% of the world milk production (Asma *et al.*, 2020). In neglected and untreated buffaloes death could occur (Manurung *et al.*, 1986). The increased incidence of various ecto-parasites infections including the infestation of different species of mites may be due to a number of factors like poor management, malnutrition and unhygienic sanitary conditions of the animal houses (Payne *et al.*, 2017). In view of the clinical and economic importance of tick infection of buffaloes, the present study was designed to find out the prevalence and identification of tick infection on buffaloes by different ecto-parasites and host population, socioeconomic, technological advances in control measures, they have an association with the host. Comparative study of different blood feeding ectoparasites such as mosquitoes, bugs, vampire, bats and leeches, the ixidid eat for a long

time. The tick alternates between imbibe blood components that penetrate in to the feeding lesion as it feeds and returning excess fluid an ion through the saliva back to the host, thus concentrating the blood meal nutrients in the gut for future development of eggs. Uttar Pradesh climatic conditions are ideal for the rapid growth of different tick species. Therefore lack of systemic examines occurrence and distribution of different tick infesting ruminants. Previous studies were limited to a specific region and didn't taking to account sampling methods, that can influence prevalence of tick and due to global warming, environmental conditions are shifting, which may altered the distribution pattern and vector ability of ticks. However to estimate the prevalence and distribution of tick born disease, it is important to get accurate information as measurement that is collected prior to intervention to starting. It can be collected through various measures including: percentage accuracy, frequencies duration rate and intervals data for further studies in this area. Therefore, the aim of this stud were to estimate the tick prevalence in ecological zone among buffaloes; to identify tick species infesting farm animals in the area of Uttar Pradesh, India, and to identify risk factors associated with high tick infestation to promote the design to effective tick control intervention.

MATERIALS AND METHODS

A total of 1264 buffaloes irrespective of their age, sex and breed were surveyed and examined for the presence of ecto-parasites in and around eastern part of Uttar Pradesh, India and included farm located in rural and urban areas of six different

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district of eastern Uttar Pradesh (Gorakhpur, Varansi, Jaunpur, Allahabad, Mirzapur and Azamgarh). Off these six different districts consists of 1.41 million buffaloes distributed across 2835 farm properties as well as buffaloes possessed by local farmer for milk and agriculture purposes.

Tick Collection

Adult and various developmental stages of tick were collected from infested animals without damaging their mouth parts with lightly by using forceps. The ticks collected were put into glass bottles containing 70% alcohol with 5% glycerol for preservation.

Collection of Samples for Mites

Buffaloes were examined for the presence of ecto-parasite lesions especially on the neck, head, back around the tail and sides of the body. The confirmations of mites, the skin scrapings were collected in a petri plate from the margins of lesions after clipping and cleaning the areas. The skin scrapings were treated with 10% potassium hydroxide (KOH) or 10% sodium hydroxide (NaOH) solution to dissolve the debris. The supernatant was discarded and the sediment was examined under the microscope.

Examination of Samples

Identification and confirmation of ecto-parasites the samples of ticks, mites and lice were examined under low and high power magnification of microscope. Diagnoses of different types of ecto-parasites were accomplished with the help of morphological characteristics of each parasite as described by Soulsby (1982).

Animals Used

The buffaloes found positive for ticks' infestation were tagged for identification. Of these 1264 buffaloes were selected for therapeutic trials. These were randomly divided into two groups i.e. A, B, C, D and E. Buffalo in groups A were treated with Ivermectin 1% (Ivomec), B were doramectin 1%, C were Dectomax and *Azadirachta indica* (neem) leave, respectively. Whereas 10 buffaloes in group D found positive were served as control and no treatment was given to this group. In addition to that 10 healthy animals were also included (group C) as negative (healthy) control.

Drugs Used: the following drugs were tried.

- Ivermectin (Ivomec) - a product of Marial Private Limited given subcutaneously at the rate of 0.2 mg/Kg body weight.
- Doramectin (Dectomax) – a product of Pfizer, Limited, Pakistan given subcutaneously at the rate of 0.2 mg/Kg body weight.
- *Azadirachta indica* (neem) dry leave in powder form given at the rate of 40 gm per 100Kg body weight soaked in 3-4 liters of water for 48 hours then applied topically.

The percent efficacy of ivermectin, doramectin and neem was calculated at day 7 and 14 by using following formula,

$$(\%) \text{ efficacy} = \frac{\text{No. of animals Cured}}{\text{No. of Animals treated}} \times 100$$

RESULTS AND DISCUSSION

The prevalence of tick infestation was reported to be 455(36%) out of 1264 buffaloes were included in this study. The ticks belonging to species *Boophilus microplus*, *Boophilus annulatus*, and *Hyalomma aegyptium* were identified. Out of 1264 surveyed animals, 101 (8%) were positive for mites belonging to *Psoroptes bovis*, and *Sarcoptes scabiei* whereas 63 (5%) were found positive for lice infestation. The most common species of lice were found to be *Haematopinus tuberculatus* and *Linognathus vituli*. Various workers like Chaudhry (1965), Hiregoular and Harlapur (1988) and Khan *et al.* (1993) reported the prevalence of tick infestation in buffalo was 28.2, 22.6 and 39.2 percent, respectively. Their findings are closely related to the results of present study. Ali (1988) reported prevalence of mites (9%) which is also in close agreement with findings of the present study. Joseph *et al.* (1986), Nelson and Howard (1986) and Munoz *et al.* (1987) reported prevalence of lice (6%) which is also closely related to the findings of the present study.

In this study the efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) was found to be 100%, 60% and 0%, at day 14 (post-medication), respectively. Campbell *et al.*, (1983) reported the biochemistry structure, mode of action and safety of ivermectin in detail. It was observed in the present study that ivermectin was the most effective and safest drug against ecto-parasites in cattle at a dose rate of 0.2 mg/kg body weight.

Table 1: Prevalence of ecto-parasites in Buffaloes in and around eastern Uttar Pradesh

Type of ecto-parasites	Number of Buffaloes	Percentage of infections
Ticks	455	36%
Mites	101	8%
Lice	189	5%
No parasites	645	51%

Table: 2 Comparative efficacy of ivermectin, doramectin and azadirachta (neem) leave against ticks infestation in buffaloes

Group n=10	Drugs used	Efficacy 7	(%) of drugs at day 14
A	Ivermectin	759	1264
B	Doramectin	505	759
C	Azadirachta indica(neem)	0	0
D	Control positive	-	-
E	Control negative	-	-

The same dose was administered by Poupard and Detry (1982) and Leaning (1984) who reported that successful treatment was done for ecto-parasites in cattle. Magnano (1983), Empel and Koanacki (1990), and Kutzer *et. al.* (1990) further recorded that a single subcutaneous injection of ivermectin was sufficient for the complete cure against ecto-parasites. Skosyrskikh (1987) stated that mange mites could be treated by single s/c injection of ivermectin for complete cure. Results of the present study are also in close agreement with results of Said (1969). In the present study; untreated group of animals did not show any spontaneous recovery. These observations are in accordance with the study of Manurung *et. al.* (1986) who reported similar findings in untreated animals.

From the present study it was concluded that ivermectin (Ivomec-Merial, Pvt. India), @ 0.2 mg/kg body weight subcutaneously is the drug of choice for the treatment of tick infestation in buffalo.

Conflict of interest: The authors have no conflict of interest in this article.

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