PREVALENCE OF TICKS IN BUFFALOES IN THE UPPER SINDH PAKISTAN

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ABSTRACT

Tick infestation is still a major economic dilemma for the dairy owners in Pakistan. The current study reports the prevalence and bionomics of tick in the areas of upper Sindh, Pakistan. The study was carried out to identify and to quantify variation in the prevalence of bovine tick infestation with respect to host (age and species) and area studied. Random sampling was used and 1600 samples of Kundi buffaloes from the different areas were selected from extensive management systems. Prevalence of bovine tick infestation did not differ significantly (OR = 0.876; p>0.05) in Kundi (179/800; 24.75%) and Nili-Ravi buffaloes (172/800; 22.3%). *Hyalomma* was the major tick species (10.2%; 163/1600), followed by *Rhipicephalus* (5.6%; 99/1600). The prevalence of ticks in calves (< 1 year) was significantly (p < 0.05) higher compare to the adult animals (1-2 years and > 2 year animals). However, the prevalence of tick infestation was not associated (p > 0.05) with the location of the district. Moreover, the results of the prevalence of the ticks in the studied area provide the better understanding for evolving the strategic and tactile control of ticks in local breeds of dairy animals in the Sindh province.

Keywords: buffalo, tick, prevalence, *Hyalomma, Rhipicephalus*

INTRODUCTION

Livestock is the key feature of the rural based economy of Pakistan like other tropical and sub-tropical countries. Cattle and buffaloes are the major animals which contribute satisfying the ever increasing demand for milk and meat in the country but the major contribution is fulfilled by buffaloes. Indigenous cattle breeds (Sahiwal, Red Sindhi etc.) also shared but these breeds are now being replaced by crossbred cattle owing to high milk production. Although these breeds are resistant to harsh climatic conditions and resistant to some tropical diseases, farmer breed preference is utmost. These crossbred cattle as compared to buffaloes are greatly influenced by diseases, nutrition and climate changes but parasitism is thought to be a major cause of lower productivity (Sajid *et al.,* 2007). Parasitism also results in mortality, lowered

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general health condition, retarded growth, lower output of work, and decrease in the production of milk and meat. Moreover, financial losses are also significantly associated with nagging irritation and depreciation of the value of skins and hides (Chaudhry *et al.,* 2011).

Pakistan being a tropical and sub-tropical region country, optimal climatic conditions are very conducive for raising the buffaloes and these conditions are also favorable for the growth and development of many tick species (Durrani and Shakoori, 2009). So under these conditions crossbred cows are considered unfit for survivability and adaptability. Poor managemental practices further enhance the severity of the problem (Irshad *et al.,* 2010). Under these poor conditions the buffalo is the only animal that survives with optimal production. The buffalo is also prone to tick infestation but its adaptability in tropical and sub-tropical conditions is excellent. Previous findings of tick prevalence report that exotic breeds suffer more as compared to local breeds of cattle and buffaloes in the climatic conditions of Pakistan.. With regard to the tick prevalence in buffaloes there is scanty information available concerning Pakistan (Manan *et al.,* 2007; Sajid *et al.,* 2008, 2009) and there is no report is available on tick prevalence from the area of Sindh. Therefore, the present cross-sectional study was focused on prevalence and identification of genera of ticks infesting the buffaloes in the upper areas of Sindh province, Pakistan.

MATERIALS AND METHODS

The study area included the district of Khairpur Mirs of the upper Sindh (Pakistan). It is situated south of the Indus River in the Sindh and eastern part consists of the Nara Desert. The study area lies in the sub-tropical region between 27°31'48"N and 68°44'23"E. District Khaipur has eight sub-divisions (*Talukas*): Khairpur city, Kingri, Gambat, Sobhodero, Kotdeji, Nara, Mirwah and Faizgunj. This cross-sectional epidemiological survey was conducted at different locations of the district to analyze the variation in tick infestation during 2008 and 2009.

Sampling of animals

Random sampling was used to select a total of 1600 buffaloes from the study area of Khairpur District. The samples were collected from small dairy herds having no history of use of acaricide for tick control. About 107 farms and 1600 animals were selected for sampling of ticks. Animals were categorized on the basis of b r e e d (Kundi vs. Nili-Ravi buffaloes) and age (< 1 year vs. 1-2 years vs. > 2 years).

Sampling and morphological identification of ticks

Ticks were collected from body parts of the infested animals and careful sampling was made using forceps to avoid de-capitulation (Solusby, 2006). After collection ticks were kept in capped bottles properly labeled containing 70% ethyl alcohol for preservation. Morphological identification of the ticks was made in a laboratory at the Department of Veterinary Parasitology, Sindh Agriculture University Tandojam (Soulsby, 1982; Walker *et al.,* 2007).

Statistical analyses

Statistical analyses were carried out by using statistical package for social science (SPSS) version 11.5. Multiple logistic regression tests were performed to determine the association between

the prevalence of ticks and animal breeds, ages, study area and tick species. Odds ratio measured the possible association tick prevalence between the factors studied. The significance level was set at P value less than 0.05.

RESULTS

The results of the present study demonstrate that the overall prevalence of tick infestation in both breeds was 23% . However, the prevalence of ticks did not differ (OR=0.876; p>0.05) significantly and both breeds were at almost equal risk of tick infestation (Table 1). The study of prevalence of tick species in bovine infestation found that *Hyalomma* (10.5%; 163/1600) was most abundant, followed by *Rhipicephalus* (5.6%; 90/1600), *Boophilus* (5.5%; 88/1600) and *Ablyomma* (2.3%; 36/1600) (Table 1).

In district Khairpur, the current data showed that the tick prevalence (p>0.05) was found to be similar in all *Talukas* and all were under the risk of tick infestation equally. The results of host age prevalence showed that a significantly higher prevalence of tick infestation was observed in calves (p < 0.05) than in adult hosts and that calves were more prone to tick infestation as compared to adults (Table 1).

DISCUSSION

The issue of tick infestation and prevalence was reported from all over the world in connection with different parts of the Pakistan. So keeping this in view the present study was designed to investigate the different aspects of prevalence and identification of ticks in buffaloes from upper areas of Sindh Pakistan.

The results of host susceptibility for tick infestation findings represent that both breeds (Nili-Ravi vs. Kundi) were prone to the infestation at equal rates. These findings of prevalence were not different from the previous reports in different parts of the country (Manan *et al.,* 2007; Sajid *et al.,* 2008). But the findings of the Sajid *et al.* (2009) in the lower Punjab area do not correspond with this current report. This difference might be due to dry and hot environment of Sindh province which reduces the activity of ticks. Moreover, the local breeds of cattle (Sahiwal, Red Sindhi) are resistant due to loose skin coat, and similarly, their thick skin and wallowing habits prevent the buffaloes (Nili-ravi, Kundi) from tick infestation (Sajid *et al.,* 2009). For the further investigation a longitudinal study needs to be done to understand the frequency of tick infestation during different seasons in the Sindh province climate.

Data of host age determined that younger stock were at more tick infestation risk than the adult animals. These findings agrae with the report of Swai *et al.* (2005) who found that calves are more susceptible than adults. But reports that age has no significant association with tick infestation of Sajid *et al.* (2009) and Manan *et al.* (2007) do not agree with our findings . The increased rate of infestation in calves than adult might be due to hairy coat of the calves, less attention of the farmer and unhygienic conditions in places where calves are kept that favor the ticks growth, development and reproduction. Moreover, the thin and easily penetrable skin of calves facilitates the easy approach to the circulation for the nourishment of ticks.

This study of the prevalence of ticks suggests that there is of a need of a longitudinal study to understand comprehensively all epidemiological

Table 1. Prevalence of ticks in buffaloes in upper area of Sindh Pakistan.

Parameter	Variable	Levels	Prevalence (%)	p-value	Odd ratios	Lower 95% CI	Upper 95% CI
Host species	Bovine	Buffaloes	198/800 (24.75)	0.263	0.876	0.696	1.104
		Cow	179/800 (22.38)	-	-	-	-
Age	Buffalo	< 1 year	182/518 (35.1)	0.425	2.448	1.808	3.315
		1-2 years	116/436 (18.0)	0	0.999	0.729	1.37
		>2 years	79/336 (18.1)	-	-	-	-
Origen	Khairpur	City	44/200 (22.0)	0.73	1.206	0.738	1.971
		Kingri	43/200 (21.5)	0.78	1.171	0.715	1.917
		Gambat	44/200 (22.0)	0.78	1.171	0.715	1.917
		Sobhodero	63/200 (31.5)	0.11	2.073	1.303	3.298
		Kotdeji	53/200 (26.5)	0.36	1.588	0.987	2.555
		Nara	43/200 (21.5)	0.78	1.171	0.715	1.917
		Mirwah	50/200 (25.0)	0.46	1.468	0.909	2.371
		Faizganj	37/200 (18.5)	-	-	-	-
Parasite	Tick Species	Amblyomma	36/1600 (2.3)	0.042	0.625	0.284	1.377
		Boophilus	88/1600 (5.50)	0.691	1.13	0.601	2.122
		Hyalomma	163/1600 (10.2)	0	0.269	0.156	0.463
		Rhipicephalus	90/1600 (5.6)	-	-	-	-

Value less than P<0.05 shows significant difference.

aspects of such as frequency, distribution and risk factors associated with tick infestation in the Sindh province of Pakistan, in order to design preventive medicine programs.

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