The Haryana Veterinarian (December, 2024) **63(2),** 259-261 ISSN 0033-4359 (P) **Short Communication**

OCCURRENCE OF VECTOR BORNE HAEMOPARASITIC INFECTIONS IN BOVINES OF LOW LYING AREAS OF PUNJAB

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SUMMARY

Haemoparasitic diseases have the deleterious effect on the health and production of dairy animals, responsible for causing mammoth losses to the growth of livestock sector. The present study aimed to record the incidence of haemoparasites on 783 diary animals from low lying districts of the Punjab by microscopic examination of the blood smears. An overall incidence rate was 16.73 % further comprising of *Theileria annulata* (7.79%) followed by *Anaplasma marginale* (7.27%), *Babesia bigemina* (2.25%) and *Trypanosoma evansi* (0.25%). Cattle (28.04%) were significantly more susceptible than buffaloes (9.85%). Among the single infection *T. annulata* in cattle and *A. marginale* in buffaloes was predominant. The majority of identified ticks were *Rhipicephalus microplus*.

Keywords: Buffalo, Cattle, Haemoparasites, Low lying, Punjab

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Punjab is located at 29”30’N to 32”32’N latitude and 73”55’E to 76”50’E longitude, 180 to 300 meters above sea level with total surface area of 50, 362 km^2. It has main seasons (summer, rainy and winter) with two transitional seasons (pre and post monsoon). The subtropical latitudinal and continental location of Punjab is responsible for diverse range of temperature (0-46.1º C) and rainfall (250-1000 mm). Punjab 22 districts falls under five agroclimatic zones classified based on homogencity, rainfall pattern and soil texture. The districts adjoining the rivers Sutlej, Beas, Ravi and Ghaggar are considered as low lying area or ‘bet’ area in vernacular language is generally flood prone regions. Cattle (2.53 million) and buffaloes (4.01 million) are the main component of the dairy sector in Punjab that is at risk to the bite of vectors and diseases transmitted by them. Tick and tick-borne diseases (TTBD) are responsible for the significant economic losses of 787.63 million USD in India (Singh *et al.*, 2022). An estimated economic loss due to tropical theileriosis, babesiosis and anaplasmosis is to the tune of 8426.7 and 551.54 crore rupees, respectively (Naraladkar, 2018). Several studies on prevalence of haemoprotozoan disease theileriosis (Tuli *et al.*, 2018), anaplasmosis (Ntesang *et al.*, 2022), babesiosis (Kaur *et al.*, 2021) and trypanosomosis (Singla *et al.*, 2013) in cattle and buffaloes published across the Punjab but scarcity of data from the bet regions of the state. The objective of this study is to report the incidence of haemoparasites in cattle and buffaloes from the low lying (bet) area of Punjab.

The blood samples were randomly collected from 783 bovines (296 cattle and 487 buffaloes) from 14 districts of low lying (bet) areas adjoining the water bodies. Approximately five ml of blood sample from jugular vein were collected aseptically in ethylene diamine tetracetic acid and blood smears were prepared at the time of sampling and transported to the laboratory. The smears were fixed in methanol and subsequently stained with Giemsa stain as per the standard procedure (Soulsby, 1982) and examined under oil immersion objective of the microscope for the presence haemoparasites.

A total of 500 ticks from 90 tick infested animals were collected manually without any damage to the mouth parts of the ticks. The ticks were processed for identification by keeping in 10% potassium hydroxide for 24 hrs and swollen ticks were pierced with dissecting needle at their lateral margins to remove the blood. After through washing under tap water, ticks were dehydrated in ascending grade of alcohol and mounted in distyrene, plasticizer and xylene (DPX). The ticks were morphologically identified under stereomicroscope as per the key genera of Miranpuri (1979). The data on the incidence of haemoprotozoan parasites in cattle and buffaloes was statistically analysed by Chi-square test using Win Episcope 2.0 software.

An overall haemoparasitic infection in bovines from low lying areas of Punjab was 16.73 % (131/783). Among the both species, cattle showed significant ($p<0.01$) higher (28.04%) infection of haemoparasites than buffaloes (9.85%). Concordance to the present finding several published reports from different states of the country revealed cattle are more susceptible to the haemoprotozoan infections than buffaloes (Chaudhri *et al.*, 2013; Jaryal *et al.*, 2018). Parasite wise overall prevalence of *T. annulata*, (7.79%) followed by *A.*

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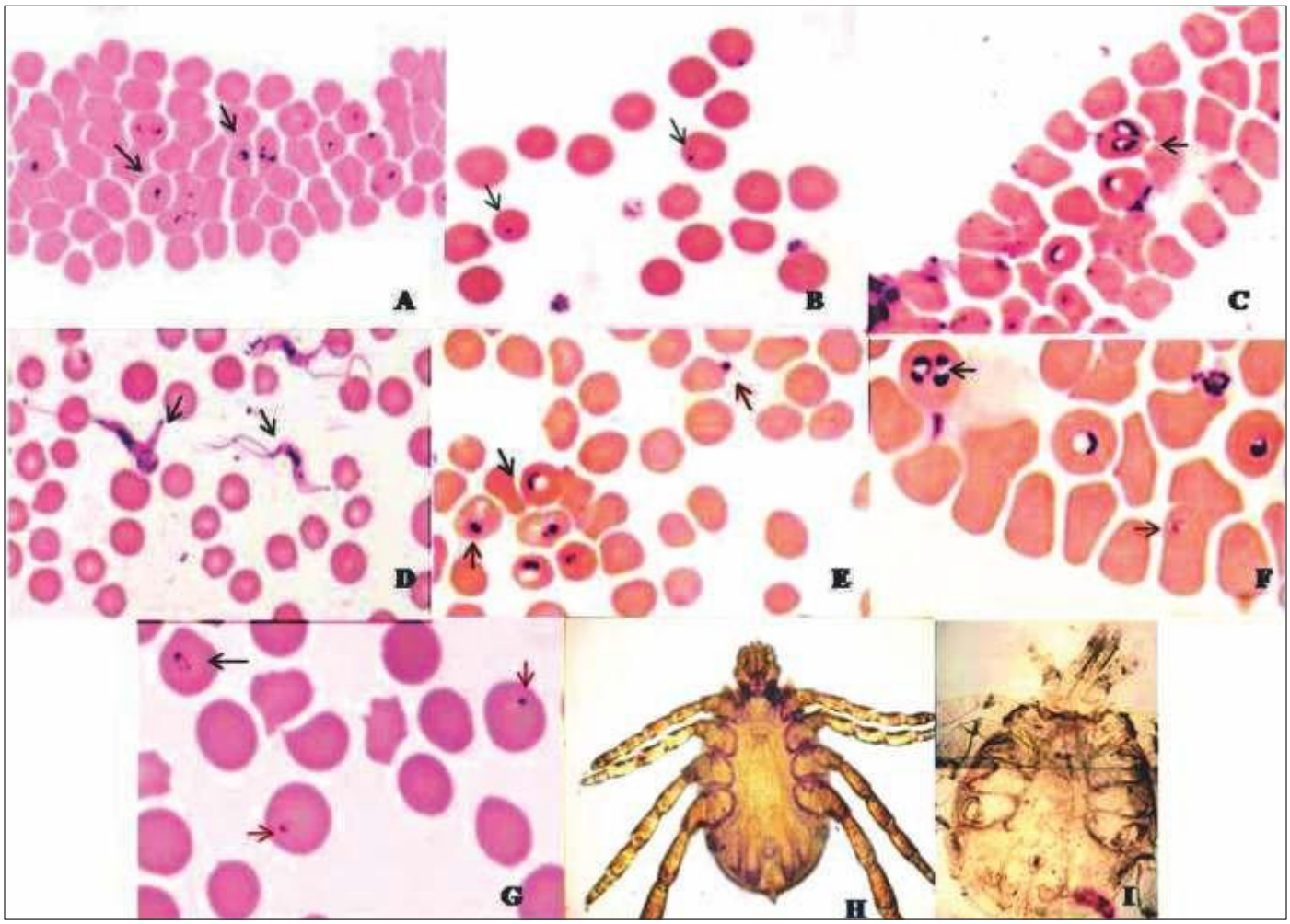

Fig. 1. Photomicrographs of Giemsa stained blood smear showing piroplasms of *T. annulata* (A), *A. marginale* (B), *B. bigemina* (C), *T. evansi* (D), mixed infection of *B. bigemina* and *A. marginale* (E), mixed infection of *B. bigemina* and *T. annulata* (F) mixed infection of *T. annulata* and *A. marginale* (G), male of *Rhipicephalus microplus* (H) and *Hyalomma anatolicum* tick (I)

marginale (7.27%), *B. bigemina* (2.25%) and *T. evansi* (0.25%) in both cattle and buffaloes. Cattle harbored highest single (P<0.01) infection of *T. annulata* (18.58%) and lowest of *T. evansi* (0.33%), however, in buffaloes the highest infection of *A. marginale* (8.08%) and lowest infection of *T. evansi* (0.21%) was observed. Similarly, the prevalence of the haemoprotozoan infection in cattle from Ludhiana district of Punjab showed highest prevalence of *T. annulata* (14.65 %) and lowest of *T. evansi* (0.28%) (Singh *et al.*, 2012). Likewise, the similar findings were recorded in several studies from neighbouring states of Punjab. Chaudhri *et al.* (2013) observed (P<0.05) highest infection of *T. annulata* (22.88%) and lowest infection of *T. evansi* (0.33%) in cattle and *B. bigemina* (0.32%) and *T. evansi* (0.32%) in buffaloes (0.6%) from Haryana. Conversely a study from Jammu showed lowest prevalence of *Theileria* spp. (0.3%) (Kaur *et al.*, 2021). Mixed infection of haemoparasites predominantly encountered in cattle during the study revealed 2.02% of *T. annulata* and *A. marginale*, 0.67 % of *T. annulata* and *B. bigemina* and 0.33% mixed infection of *B. bigemina* and *A. marginale*, however, from buffaloes only two cases of mixed infection of *T. annulata* and *A. marginale* (Fig. 1) was recorded. The perusal of literature depicted many studies on occurrence of haemoprotozoan parasites based on microscopy from the adjoining states; Himachal Pradesh (Jaryal *et al.*, 2018), Jammu (Kaur *et al.*, 2021) and Haryana (Bhanot, 2021) and Rajasthan (Damor *et al.*, 2023) are reported.

Out of the total ticks collected most were identified as *Rhipicephalus microplus* (95.8%) and *Hyalomma anatolicum* (2.1%). Previous studies from the Punjab state also recorded the dominance of the *R. microplus* tick (Singh & Rath, 2013). To conclude the present investigation indicated the incidence of haemoparasites in bovines especially theileriosis in buffaloes that needs further investigation on a greater number of the dairy animals.

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