

## **Prevalence Study of Bovine Theileriosis in Herat Province, Afghanistan**

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**Abstract:** *Theileriosis is economically an important disease of cattle in Herat province, while the infection is mostly recognized via clinical findings. The efficient diagnostic methods more frequently to be pragmatic by microscopic readouts. In this study, 1100 samples from 11 districts from cattle regardless of age, sex and breed were randomly collected and tested for microscopic examinations by Giemsa staining for the purpose of prevalence study of the Theileria infection in Herat province. The results ranged from 4% to 37% between districts respectively. The highest percentile for positive recorded cases showed 37% in Enjil districts while the lowest percentile recorded cases showed 4% for Gulran districts.*

**Keywords:** *Cattle, Giemsa staining, Herat province, Infection, Theileriosis,*

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### **I. Introduction**

Hemoparasitic diseases which usually transmit by Arthropods are Vector-borne Disease in the tropical and subtropical regions of the world, and economically are very important [1].

Among those hemoparasitic diseases, Theileriosis is mostly an important infection that often transmit by Ixodidae family of Ticks. *Theileria* spp are obligate intracellular protozoan parasites that infect both wild and domestic cattle in most part of the world (some species also likely to infect small ruminants). *Theileria* parasites mainly spread by Ixodidae ticks family, and have complex life cycle in both vertebrate and invertebrate hosts [2].

Tropical form of Theileriosis which has also known as Mediterranean Coast Fever, is a very fatal and debilitating tick-transmitted disease infecting cattle of all ages and breeds [3].

Geographical distribution of tropical Theileriosis depends on the location and the biology of ticks of *Hyalomma* genus which is playing an important role for the disease outbreaks and occurrences [4]. For occurrence of Bovine Theileriosis, environmental factor is also a remarkable risk factor. The disease rapidly likely to be occurred when such type of ticks are actively existing in the environment, and that mostly happens during summer. But in some condition also a single tick could cause fatal infection [5].

The etiology of Bovine Theileriosis is a parasite belonging to protozoa called *Theileria* which is a round ovoid rod-like organism. *Theileria* tends to live in lymphocytes, histiocytes and erythrocytes [6] and is also known as hemo-tropism-parasite. Diagnosis of Bovine Theileriosis is traditionally based on the microscopic examination of blood smear to detect mainly the appearance of merozoite stage of *Theileria* [7]. This method is frequently used for detection as it is comparatively inexpensive. However, this method is possibly more likely to be not remarkably sensitive and is much less likely to be appropriate procedure for carrier animals because the pathogenicity level is usually low in the blood stream and thus compels an unreliable technique for a better efficient results [3].

### **II. Material and Method**

The study was designed for the estimation of the prevalence of Theileriosis in cattle in 11 districts of Herat province. In total, 1100 number of cattle of all ages and sexes were screened during February to July, 2017. The sampling procedures were designed 100 samples from 100 cattle per district. The samples were collected from those aforementioned fields and the tests are carried out in the Microbiology Laboratory of Veterinary Science Faculty, Herat University. The samples were chosen randomly during the outbreak season of Theileriosis without considering ages, sexes and/or species.

2.1 Collection of Blood Samples

Blood sample were collected from jugular vein of 1100 cows randomly, to prepare thin smears respectively. Blood from jugular veins were collected within dry, sterile and clean vacutainers containing anticoagulant as of EDTA.

2.2 Smear preparation

2.2.1 Giemsa staining

Smears were stained using Giemsa stain, as described by [8] and were examined under oil immersion lens of microscope with 100x magnification for the identification of Theileria parasites based on their morphology.

The overall data were analyzed using Microsoft Excel 2013. Data were calculated for percentile, error range and  $\pm$ SDs.

III. Results

1100 samples from cattle randomly were collected from 11 districts and tested for Giemsa staining. The results ranged from 4% to 37% between districts respectively (Fig 1). The highest percentile for positive recorded cases showed 37% in Enjil districts while the lower percentile recorded cases varied; 4% for Gulran, 7% for Obek and 9% for Koshk districts respectively.

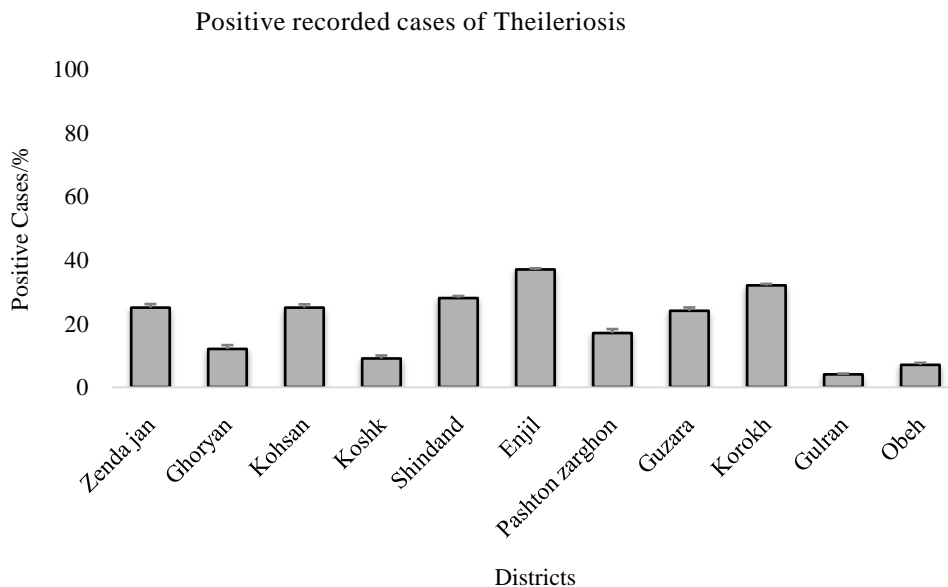


Fig 1. Positive cases recorded by Giemsa staining of blood smear during outbreak season of Theileriosis.

IV. Discussion and Conclusion

In this study, the Giemsa stained blood smear examination revealed 20% prevalence of Theileria parasite in cattle in Herat province. Similar result was derived by Abdel-Radyet *al.* (2008) [9] reporting 17.5% prevalence of Theileriosis in cattle in Egypt. Also similar result were reported by Zoliet *al.* (2001) [10] which was 17.8% in cattle by Giemsa stain in Cameroon. Ibrahim *et al.* (2009) [8] found that the prevalence of Theileria spp was 22% respectively as detected by PCR using a common primer while by microscopic examination the results was 22%.

As conclusion, Theileriosis annual outbreak in Herat province is often occurring during late spring and early summer. The disease outbreak is more overwhelming in young heifers and calves of any local and crossed breeds in Herat, which usually causes huge economic losses require for the treatments and reduction of productions as well as rare fatal cases may be increased in some circumstances.

Therefore, the results of this study could possibly more likely to be a minimum outreach for knowing and to understand the prevalence status of Theileriosis in Herat province without considering the species, sexes, ages and even any clinical signs and symptoms.

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