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### HARD TICKS INDUCED HAEMATOLOGICAL CHANGES IN BLACK BUCK (ANTILOPE CERVICAPRA)



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#### Abstract:-

The present study deals with incidence of Hard Ticks and their impact on haematological values in Black Buck (*Antelope cervicapra*). *Hyalomma anatolicum* and *Boophilus microplus* species of ticks were observed as ectoparasite on *Antelope cervicapra* in the present study. In the present study haematological parameters studied were RBC, WBC, DLC, Hb% and Blood glucose level. In the present study 80% of black buck were found infected by tick. Present study also showed that 80% of black buck are infected with *H. anatolicum* and *B. microplus*. 40% host were with *H. anatolicum* and 40% infected with *B. microplus*. The infected animals showed reduction in the RBC, WBC, DLC count, Hb% and Blood glucose level. In our opinion for effective control it will be better if zoo authority use two or three effective insecticide alternatively, so that parasites may not become resistant against the used insecticides.

**Keywords:** Ecto-parasites, Hard Ticks, *Hyalomma anatolicum*, *Boophilus microplus*, RBC, WBC, DLC, Hb and Blood glucose etc.



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## INTRODUCTION

Parasitic diseases are a global problem and considered as a major obstacle in the health and product performance of animals. These may be due to endo-parasites that live inside the body, or ecto-parasites such as ticks, mites, flies, fleas, midges, etc., which attack the body surface. Among ecto-parasites, ticks are very important and harmful blood sucking external parasites of mammals, birds and reptiles throughout the world(1-4). The major diseases include *Babesiosis*, *Anaplasmosis*, *Theileriosis*, and heart-water, East Coast fever; in addition, other diseases of lesser importance cause severe economic losses to the livestock industry. The presence, dynamics and amount of parasite stock in ticks exert a major influence on the kinetics of transmission of tick-borne parasitic diseases (5-10.) Generally the ticks become infested with the causative organisms of diseases while they are feeding on infected animals. Then the organism may be transmitted from stage to stage in the tick or from the female tick through the egg to the larvae an increase of several thousand times in vector potential. When the next stage or generation subsequently feeds on another animal, the organism is transmitted to that animal if it is susceptible to the disease Tick born diseases generally affect the blood and/or lymphatic system. Tick fever organisms, like *Anaplasma marginale*, are significant Causes of cattle morbidity in Australia, USA, China and other countries (11-14). Cattle tick *B. microplus* produces economically impact on cattle production by transmitting pathogens that cause Babesiosis (*B. bovis* and *B. bigemina*) and *Anaplasmosis (A. marginale)* (15). Feeding causes reduction in live weight and anemia among domestic animals, while tick bites also reduce the quality of hides. Apart from irritation or anemia due to heavy infestations, tick can cause severe dermatitis (16). These parasites generate direct effects in cattle in terms

Milk production and reduce weight gain (17). Ticks can be carrier of pathogens, which they transmit from host to host during blood sucking and cause a large variety of diseases (18). Therefore, the present study was under taken to find out the effects of ectoparasite (Ticks) on *A. cervicapra* of Indore Zoo.

## MATERIALS AND METHODS

**Experimental Animal-** Black bucks (*Antelope cervicapra*) of Kamla Nehru Zoo, Indore (M.P.) were used for the present study with due permission of Zoo Authority. 5 Black bucks were chosen at random out of a yarded population of about 35 animals. Reason for selected less number is that Host species is endangered one and we do not want to disturb it. The blood samples were taken from the jugular vein of each animal with a sterile disposable syringe. Sample of 5ml of blood were preserved in anticoagulant ethylene diamine tetra acetic acid (EDTA) contained in special vials and kept for haematological studies. Uninfected Black buck was used as control animal.

**Experimental parasites-** For the present study hard ticks (*Hyalomma anatolicum*, *Boophilus microplus*) were collected as ectoparasite on *A. cervicapra* (Host)

### Blood Sampling:

Blood samples were taken from the jugular vein of each experimental & control animal with a sterile disposable syringe.

### RBC & WBC counting

RBC & WBC counting were done by Manual method (19).

### DLC counting

DLC counting was done by Leishmann Method (20).

### Haemoglobin analysis

Hb percentage was done by Sahil's Method (21).

### Blood glucose level

Blood glucose level was done by Follin-Wu Method (22).

## RESULTS

**a) Ticks occurrence:** - In the present study 5 *A. cervicapra* were randomly selected out of 35 *A. cervicapra*. Out of these four animals were found positive in respect of tick occurrence. This showed that 80% of black buck are infected by tick, though ticks population is very very less. Present study also showed that 80% of black buck are infected with *H. anatolicum* and *B. microplus* and 40% with *H. anatolicum* and 40% with *B. microplus*. (Table 1).

**Table1: Occurrence of Ticks in *A. cervicapra*.**

Host	Ticks presence	
	<i>Hyalomma anatolicum</i>	<i>Boophilus microplus</i>
<i>A.cervicapra</i>		
Host 1	Positive	Negative
Host 2	Negative	Negative
Host 3	Positive	Positive
Host 4	Positive	Negative
Host 5	Positive	Negative

**RBC & WBC value**

The RBC and WBC of infective host (*A. cervicapra*) was less than the control non infective host. The reduction in RBC count was in between 31.9 to 48.4%, while reduction in WBC count was in between 23.4 to 39.6%. This showed that Ticks present in *A. cervicapra* reduce the RBC & WBC count. (Table 2).

**DLC value**

In infective host Neutrophiles were 35 to 55%, Lymphocytes were 5.6 to 43.3%, Monocytes were 0 to 66.6%, Eosinophiles were 33.3 to 50% and Basophiles were 1%. This showed that ticks present in *A.cervicapra* reduce DLC count, except Basophiles (Table 2).

**Hb value**

In infective host haemoglobin % was in between 5.7 to 6.4%. This showed that ticks present in *A.cervicapra* reduce the haemoglobin level, though reduction was very low (Table 2).

**Blood glucose level value**

Blood glucose level of infective host was less than the non infected host .The reduction in Blood glucose Level was in between 34.4 to 36.9%. This showed that ticks present in *A. cervicapra* reduce the Blood glucose level (Table 2).

**Table 2: Haematological values of experimental animal:**

Parameters	values (Control)	values (experimental)
RBC (million/ml)	6.05	3.858 ± 0.64
WBC (cells/cmm)	7377	5330 ± 444.5
Neutrophiles (%)	40%	23.2 ± 2.85
Eosinophiles (%)	6%	3.6 ± 0.48
Basophiles (%)	1%	0
Lymphocytes (%)	53%	38 ± 8.12
Monocytes (%)	3%	2 ± 1.26
Haemoglobin (gm)	14.0	13.14 ± 0.049
Blood glucose level (mg/dl)	108.0	69.42 ± 1.11

**DISCUSSION**

Ticks can be carrier, of pathogens, which they transmit from one host to other during blood sucking and cause a large variety of diseases. Ticks are attached to the body for a blood meal and may cause irritation and serious physical damages to livestock. This includes “tick worry”, irritation, unrest, and weight loss due to massive infestation of ticks, the direct injury to hides due to tick bites, loss of blood due to the feeding of ticks (16-18).

In the present study host *A. cervicapra* was found infected with Ticks like *Hyalomma anatolicum* and *Boophilus microplus*. The incidence data showed that 80% of Antelope was infected with ticks. This was not good sign. In spite of various measures taken by Zoo Authority, Antelope were infected with ticks. In Author opinion this may be due to the presence of Zoo in the city, where it may come through birds, dogs etc. having Positive with ticks. Thus to control the tick's infection the frequencies of disinfectants need

revision or authority must use two or three kind of insecticide alternatively, so that parasites may not become resistant against used pesticides.

In the present study when we analyzed some haematological parameters both in infected & non infected host. We found that RBC, WBC, Hb and Blood sugar were less in infected host than non infected host. This leads as to conclude that presence of ticks altered or rather reduces the haematological parameters.

In Author's opinion it will be better if Zoo Authority use two or three kind of effective insecticide alternatively, so that parasites may not become resistant against the used insecticide.

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