

## STUDIES ON TICKS OF CATTLE AND THEIR BACTERIAL ISOLATES

<sup>1</sup>ZARIA, L.T., <sup>2</sup>BIU A.A. <sup>3</sup>RABO, J.S., <sup>4</sup>Dawurung J.S and <sup>5</sup>ESTER, N.M.

<sup>1,2&5</sup>Department of Veterinary Microbiology and Parasitology, Faculty of Veterinary Medicine, University of Maiduguri, Nigeria

<sup>3</sup>Department of Veterinary Pathology and Microbiology, Faculty of Veterinary Medicine, University of Agriculture, Makurdi, Nigeria

<sup>4</sup>WHO National Polio Laboratory, University of Maiduguri teaching Hospital, Maiduguri, Nigeria  
[dawurungj@yahoo.com](mailto:dawurungj@yahoo.com)

**ABSTRACT:**Entomological and bacteriological Studies on tick species infesting cattle was conducted in this investigation. A total of 504 ticks were found to infest the 50 cattle examined indicating a burden of 144 [28.6%], 121 [24.0%], 117 [23.2%] and 122 [24.2%] for *Boophilus*, *Rhipicephalus*, *Hyalomma* and *Amblyomma* species respectively. Bacteriological examination revealed that 302 [59.9%] ticks were positive for bacterial growth viz; *Boophilus* 130 [90.3%], *Rhipicephalus* 101 [84.2%], *Hyalomma* 46 [39.3%] and *Amblyomma* 25 [20.5%]. Colony count [CC] from *Boophilus* was 58 [50.0%] for *Staph. aureus* and 29 [25.0%] each for *Proteus* and *Corynebacterium*. *Rhipicephalus* harboured 24 [33.3%] *Staph. aureus* and 48 [66.7%] *Corynebacterium*, *Amblyomma* harboured only 48 [100%] *Corynebacterium*, while *Hyalomma* had 47 [66.2%] *Staph. aureus* and 24 [33.8%] *Corynebacterium* species. The disk diffusion sensitivity method revealed that both gram positive isolates were susceptible to CIP, GN, CO and OF and the gram negative *Proteus* to CIP only.

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### INTRODUCTION

Ticks as obligatory blood sucking arthropods found world over, are the most important vectors of human and animal diseases (Turner and Stephens, 2008; Youssefi *et al.*, 2008) particularly bacteria associated with tick pyemia, acute and per acute mastitis, septicemia, abscessation and lameness (Shanson, 1983., Zaria *et al.*, 2009).

This study was conducted to identify the bacterial isolates associated with tick species infesting cattle and to assess the antibiotic sensitivity of these isolates.

### MATERIALS AND METHODS

#### Tick Collection and identification:

Cattle brought for sale at the Maiduguri Cattle market were examined and 504 ticks were manually collected using hand forceps and put into 70% alcohol to sterilize. Ticks were then identified to the genus level as described by Soulsby (1982) at the Veterinary Parasitology Laboratory of University of Maiduguri, Nigeria.

#### Bacteriological examination:

Different scalpel blades were used to dissect each tick, and their intestinal contents inoculated on blood and Mac Conkey agar, and incubated at 37°C for 48 hours to observe for bacterial growth as

described by Murray *et al.*, (1995). The growth on each culture media was transferred to a drop of distilled water on grease free glass slides and made into a thin smear which was allowed to air-dry and then fixed with heat from a Bunsen burner, gram stained, air dried and observed at x100 of the light microscope. Standard biochemical tests were performed on the isolates as a means to further characterize them.

#### Sensitivity testing:

This was performed by the disk diffusion method according to CLSI standards (Clinical and Laboratory Standards Institute) and the zone of growth /inhibition read as described by Habrun *et al.*, (2010).

### RESULTS

The results of this study as shown in Table I indicated that a total of 504 ticks examined for bacterial isolates, 302 (59.9%) were infected with various species comprising of *Boophilus* 130 (90.3%), *Rhipicephalus* 101 (84.2%), *Hyalomma* 46 (39.3%) and *Amblyomma* 25 (20.5%).

A total of 116 (37.8%) Isolates were obtained from *Boophilus* comprising of *Staph. aureus* 58 (50.0%), *Proteus* 29 (25.0%) and *Coryne.* 29 (25.0%).

*Rhipicephalus* had 72 (23.5%) isolates comprising of *Staph. aureus* 24 (33.3%) and *Coryne.* 48 (66.7%).

*Hyalomma* had 71 (23.1%) comprising of *Staph aureus* 47 (66.2%) and *Coryne.* 24 (33.8%).

*Amblyomma* had 48 (15.6%) of only *Coryne.* species (100%).

Table 2 shows the disk diffusion sensitivity test results with both gram positive isolates susceptible to CIP, CN, CO and OF and the gram negative *Proteus* to CIP only.

Table 1: Isolation rate of bacteria from various tick species examined

Tick	No. bacterial isolates	No (%) infected	No (%) of isolates	No (%) of isolates genera <i>Staph.</i>	genera examined <i>Coryne</i>	with bacterial <i>Proteus</i>
<i>Boophilus</i>	144	130(90.3)	116(37.8)	58(50.0)	29(25.0)	299(25.0)
<i>Rhipicephalus</i>	121	101(84.2)	72(23.5)	24(33.3)	48(66.7)	-
<i>Hyalomma</i>	117	46(39.3)	71(23.1)	47(66.2)	24(33.8)	-
<i>Amblyomma</i>	122	25(20.5)	48(15.6)	-	48(100)	-
Total	504	302(59.9)	307	129(42.0)	149(48.5)	29(9.5)

Table 2: Antibiogram of isolates

Bacteria	Width (mm) of zone of clearance/resistance (R)									
Gram +ve:	CIP	GN	CX	CO	FX	AP	CD	AU	OF	E
<i>Staph.</i>	27	14	10	22	R	R	R	R	23	R
<i>Coryne.</i>	29	18	R	19	R	R	R	R	25	R
Gram -ve:	CIP	TE	NB	AX	OF	C	CF	AP	GN	N
<i>Proteus</i>	25	R	R	R	17	R	R	R	R	R

## DISCUSSION

This study has revealed the close association of cattle ticks *Boophilus*, *Hyalomma*, *Rhipicephalus* and *Amblyomma* with bacterial species of *Staphylococcus aureus*, *Corynebacterium Spp.* and *Proteus Spp.*

*Boophilus* was the most frequently infected with bacteria (90.3%) from which *Staph. aureus*, *Coryne. Spp.* and *Proteus Spp.* were isolated while *Rhipicephalus* and *Hyalomma* harboured *Staph. aureus* and *Coryne Spp.* and *Amblyomma* had only *Coryne. Spp.* These findings conform with those by Tomasz *et al.*, (2009) and Zaria *et al.*, (2009) that ticks are reservoirs of *Staph. aureus* known to predispose livestock to abscessation, septicemia, tick borne fever, tick borne typhus and complicated dermatophilosis.

*Corynebacterium* species are known to cause nasal, nasopharyngeal and tonsillar diphtheria often with marked oedema of the neck, and some species produce strong exotoxins and if absorbed

unto broken mucous membrane causes toxemia leading to cardiac and neural complications (Jesus *et al.*, 2008).

*Proteus* species are known to cause urinary tract infection (UTI), abdominal and wound infections and serve as a secondary invader in ulcers, pressure sores, and burns and damaged tissues. It also causes septicemia, meningitis and chest infections (Parola and Rault, 2001).

The organisms isolated were found to have high antibiotic resistance indicating a need for tick control so as to reduce economic losses accrued from tick and tick borne diseases as the saying goes "prevention is better than cure".

In conclusion, ticks carry pathogenic bacteria that show multiple antibiotic resistances and could play an important role in the epidemiology of bacterial diseases of man and his livestock.

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