STUDIES ON TICKS OF CATTLE AND THEIR BACTERIAL ISOLATES

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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.

INTRODUCTION
Ticks as obligatory blood sucking arthropods found world over, are the most important vectors of human and animal diseases (Turner and Stephens, 2008; Youseffi et al., 2008) particularly bacteria associated with tick pyemia, acute and per acute mastitis, septicemia, abscession and lameness (Shanson, 1983., Zaria et al., 2009). This study was conducted to indentify 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 48hours 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 form 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 1: Isolation rate of bacteria from various tick species examined

<table>
<thead>
<tr>
<th>Tick</th>
<th>No. bacterial isolates</th>
<th>No (%) infected</th>
<th>No (%) of isolates</th>
<th>examined</th>
<th>with bacterial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>bacterial isolates</td>
<td>isolates</td>
<td>Staph.</td>
<td>Coryne</td>
</tr>
<tr>
<td>Boophilus</td>
<td>144</td>
<td>130(90.3)</td>
<td>116(73.8)</td>
<td>58(50.0)</td>
<td>29(25.0)</td>
</tr>
<tr>
<td>Rhipicephalus</td>
<td>121</td>
<td>101(84.2)</td>
<td>72(23.5)</td>
<td>24(33.3)</td>
<td>48(66.7)</td>
</tr>
<tr>
<td>Hyalomma</td>
<td>117</td>
<td>46(39.3)</td>
<td>71(23.1)</td>
<td>47(66.2)</td>
<td>24(33.8)</td>
</tr>
<tr>
<td>Amblyomma</td>
<td>122</td>
<td>25(20.5)</td>
<td>48(39.6)</td>
<td>-</td>
<td>48(100)</td>
</tr>
<tr>
<td>Total</td>
<td>504</td>
<td>302(59.9)</td>
<td>307</td>
<td>129(42.0)</td>
<td>149(48.5)</td>
</tr>
</tbody>
</table>

Table 2: Antibiogram of isolates

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Width (mm) of zone of clearance/resistance (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram +ve:</td>
<td>CIP</td>
</tr>
<tr>
<td>Staph.</td>
<td>27</td>
</tr>
<tr>
<td>Coryne.</td>
<td>29</td>
</tr>
<tr>
<td>Gram -ve:</td>
<td>CIP</td>
</tr>
<tr>
<td>Proteus</td>
<td>25</td>
</tr>
</tbody>
</table>

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 toxaemia 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.
REFERENCES


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