Available online at http://www.journalcra.com

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

International Journal of Current Research
Vol. 4, Issue, 05, pp.073-076, May, 2012

ISSN: 0975-833X

RESEARCH ARTICLE

THE INFESTATION RATES AND PREDILECTION SITES OF TICKS ON CATTLES AND DOGS IN CALABAR, NIGERIA

*[1]Arong, G. A., [1]Okon, O. E., [2]Obhiokhenan, A. A., [3]Esekhagbe, O. R, [1]Okorafor, K. A. and [1]Emevatha, O.

[1]Department of Zoology and Environmental Biology, University of Calabar, Nigeria
[2]National Productivity Centre, Calabar, Nigeria
[3]National Productivity Centre, Kaduna, Nigeria

ARTICLE INFO

Article History:
Received 19th February, 2012
Received in revised form
26th March, 2012
Accepted 25th April, 2012
Published online 30th May, 2012

Key words:
Bovidae, Ixodidae,
Boophilus decoloratus,
Rhipicephalus,
Haemopysalis leachi

ABSTRACT

Ticks infestation is highly significant in the provision of meat, milk and other animal products. The infestation rate and predilection sites of 50 each of cattles and dogs was studied in relation to age and sex between June and December, 2011. *Boophilus decoloratus, Rhipicephalus annulatus, Rhipicephalus appendiculatus, Rhipicephalus sanguineus, Rhipicephalus microplus and Haemopysalis leachi* were species of ticks identified. Although dogs and cattles were both infested, tick infestation was significantly higher ($P<0.05$) in cattles (74.3%) compared to dogs (25.66%). The dorminant species of ticks in cattles was *Boophilus decoloratus* (37.8%) while dogs had *Rhipicephalus sanguineus* (53.8%). Infestation in cattles was highest at the Groin (8.6 ± 0.31) and least on the face and neck regions (2.84 ± 0.026) while in dogs infestation was highest in the ears (2.96 ± 0.19) and least on the head, face and neck regions (1.24 ± 0.11). Prevalence of ticks infestation was highest in female cattles (59.1%) than in males (40.9%) and in dogs tick infestation was significantly ($P<0.05$) higher in the female dogs (60.2%) than in males (39.8%). Infestation was higher in younger dogs (58.8%) than in adult dogs (41.5%). The Findings of this study is important in planning the control strategy of ticks in Calabar.

INTRODUCTION

Ticks are small wingless ectoparasitic arachnid arthropods that are cosmopolitant in distribution and are prevalent in warmer climates (Olwoch *et al* 2009). Oviposition is aided by moisture with light to moderate rain fall (Furman and Loomis, 1984; Lord, 2008). Ticks have a wide host range like birds, mammals, reptiles and amphibians. Most ticks prefer different host at each stage of life cycle (Vredevoe, 2011) and their bites cause irritation, itching, burning, redness and blood sucking leads to a anemia, weakness, paralysis, and fever. They transmit pathogens causing Babesiosis, Erhlichiosis, Tularemia, Lyme disease, Rickettsia disease along with their saliva during feeding and their forceful removal may lead to lesions or myasis (Sonenshine 1993). Ticks infestation in cattle and dogs leads to loss of blood, thereby causing retarded growth and loss of weight. Access of germs to the blood streams causes disease in animals which contaminates the meat. Hides of infested cattle are damaged by tick bite which reduces their value (Radunz, 2008). Cattle are free ranging and they graze extensively which makes them prone to diseases and parasites (Marufu, 2008). Ticks acquire pathogens from an infested host during a blood meal, maintain infested through multiple life stages by the means of transtidial passages and transmit it on to other hosts when feeding again (Klareenbeek, 2010). Dogs are one of the most important hosts in the maintenance of tick population, mainly because of their proximity to humans as pets, which can easily favour human infection (Rosa *et al*., 2006). The people of Calabar are widely known for dog meat consumption, the other predomonant meat readily available is cattle meat. These sources of meat are brought from Northern Nigeria and kept in collection centers within the city from where they are slaughtered for meat. The unslaughtered cattles are allowed to range freely in undeveloped plots untill demanded for meat while the dogs may be kept in cages or bought for domestication by keepers. This research is to investigate the infestation rate and point of attachment of ticks on dogs and cattle in Calabar.

***Corresponding author:** gabrielarong@yahoo.com

MATERIAL AND METHODS

Cattle ticks were collected at Nasarawa, Calabar where cattles from the northern part of the country are collected. Dog ticks were collected at Eta Agbor, Calabar. Ticks were gently removed from the bodies of the cattles and dogs by brushing their hair with fine comb as described by Ekanem *et al*., (2010). And by smearing the area around the ticks body of the dogs and cattles with ethanol to loosen the attachment of the ticks from the body surface as described by Kabir *et al*., (2011) and Arong *et al*., (2011). Ticks collected were transferred into level labeled sample bottles, containing 70%

ethanol, smaller ticks were cleared of debris in a test tube containing 3ml of potassium hydroxide and rinsed with distilled water; all ticks were cleared with xylem and mounted in Canada Balsam. Ticks were identified with keys and atlases produced by Cable, (1967), Cheng (1973), Soulsby, (1982). Data was analyzed using Statistical Package for Social Sciences (SPSS), Version 14.

RESULTS

The 50 cattles and 50 dogs sampled were all infected with different species of ticks. In cattles *B. decoloratus* 37.8% (510/1347) was dominant followed by *R. annulatus* 25.8% (343/1347), *R. appendiculatus* 19.2% (258/1347), *R. sanguineus* 8.9% (120/1347) and *R.microplus* 8.2% (111/1347). In dogs *R. sanguineus* 53.8% (250/465) was most prevalent followed by H. *leachi* 33.9% (154/465) and B. *decolartus* 13.1% (61/465).

Table 1: Species composition of Ticks of cattles and dogs in Calabar

TICKS SPECIES	No. OF TICKS (%) Cattles	Dogs
Boophilus decoloratus	510 (37.8)	61(13.1)
Rhipicephalus annulatus	348(25.8)	0(0.0)
Rhipicephalus appendiculatus	258(19.2)	0(0.0)
Rhipicephalus sanguineus	120(8.9)	250(53.8)
Rhipicephalus microplus	113(8.2)	0(0.0)
Haemophysalis leachi	0(0.0)	154(33.1)
	1347 (74.34%)	**465 (25.66%)**
TOTAL	**1812**	

Table 2: Distribution of ticks on different body parts of dogs and cattles

Predilection sites	Dog X+S.E	Cattle X + S.E
Head, Face and neck	2.84 ± 0.26	1.24 ± 0.11
Groin	8.62 ± 0.31	0.00 ± 0.00
Scrotal region/mammary gland	4.40 ± 0.26	0.00 ± 0.00
Ear	6.82 ± 0.28	2.96 ± 0.19
Tail	4.44 ± 0.22	0.00 ± 0.00
Pelvic and anal region	0.00 ± 0.00	1.36 ± 0.13
Limb and interdigital space	0.00 ± 0.00	2.40 ± 0.37
Back	0.00 ± 0.00	1.34 ± 0.13

Table 3: Distribution of ticks by Age and Sex of dogs

Predilection Sites	Male Young (x± S.E)	Male Adult (X±S.E)	Female Young (x±S.E)	Female Adult (X ±S.E)
Limb and inter Digital space	2.0 ± 0.25	1.67 ± 0.14	3.30 ± 0.21	2.58 ± 0.23
Head, face and neck	1.23 ± 0.20	1.0± 0.21	1.23 ± 0.17	1.50 ± 0.26
Back	1.15 ± 0.25	1.17 ± 0.27	1.78 ± 0.23	1.25 ± 0.25
Pelvic and Anal region	1.46 ± 0.24	1.17 ± 0.51	0.19 ± 0.18	1.17 ± 0.29
Ear	2.78 ± 0.17	1.41 ± 0.38	4.08 ± 0.26	3.50 ± 0.15

Table 4: Distribution of ticks by Age and Sex of cattle

Predilection sites	Male Young (x± S.E)	Male Adult (x±S.E)	Female Young (x±S.E)	Female Adult (x±S.E)
Face and neck	1.07± 0.24	3.0± 0.39	3.53 ± 0.58	3.83 ± 0.47
Groin	6.0± 0.32	8.25 ± 0.25	9.07 ± 0.31	11.31 ± 0.28
Scrotal region and mammary gland	2.77± 0.39	4.67± 0.41	4.85 ± 0.42	5.41 ± 0.57
Ear	4.69± 0.33	7.17± 0.60	6.77 ± 0.17	8.83 ± 0.39
Tail	3.0± 0.32	4.17± 0.32	4.77 ± 0.30	5.91 ± 0.39

Infestation was higher in cattles 1347 (743%) than dogs 465 (25.66%) (Table 1). Ticks were distributed in different parts of the body on the dogs and cattles (Table 2). Infestation was highest in the Groin (8.62 ± 0.31) followed by the Ear (6.82 ± 0.28) and Tail (4.43 ± 0.22) and scrotal region and mammary gland (4.40 ± 0.30) and infestation was lowest in the face and Neck region (2.84 ± 0.26) (Table 1). In dogs infestation was highest in the ear (2.96 ± 0.19) then the limbs and interdigital space (2.40 ± 0.37) and at a lesser degree in the pelvic and anal region (1.36 ± 0.13), Back (1.34 ± 0.13) and in the head, face and neck region (1.24 ± 0.11). Statistical analysis showed that no significant difference ($P>0.05$) occurred in the species but site of attachment of the tick differs significantly between dogs and cattles ($P<0.05$) (Table 2).

Infestation was highest in the ear of the young female dog (4.08 ± 0.26) and significantly different ($P<0.05$) compared to that of adult male dog (2.78 ± 0.17). In the limbs and interdigital space of the adult female dogs (2.58 ± 0.28) showed no significant difference with that of the young male (2.0 ± 0.25). in the pelvic and anal region of the young male dog (1.46 ± 0.24) showed no significant difference with that of the adult female dog (1.7 ± 0.29) (Table 3). Ticks significantly prefered the groin of the adult female cattles (11.31 ± 0.28) compared to young females (5.3 ± 0.58) (Table 4). The ears of adult female cattles was preferable (8.83 ± 0.39) to that of young male cattles 4.69 ± 0.33). Tick infestation was higher in the face and neck regions of adult females (3.83 ± 0.47) than those of young males (1.07 ± 0.24) ($P<0.05$).

DISCUSSION

The result of this study showed that infestation was higher in cattles 1347 (74.34%) than in Dogs 465 (25.66%) of the total ticks collected. This study revealed that in cattles the *Boopholus decoloratus* (34.8%) which was also found in dogs is the most dominant species of ticks in the study area followed by the *Rhipicephalus annulatus* (25.8%), *Rhipicephalus appendiculatus* (19.2%) then the *Rhipicephalus sanguineus* (18.9%) and the *Rhipicephalus microplus* (8.2%). In dogs the *Rhipicephalus sanguineus* (53.8%) is the dominant species of ticks followed by the *Haemoplysalis leachi* (33.1%) and the *Boophilus decoloralus* (13.1%). This finding is in line with earlier studies that the only tick found in dogs is *R. sanguineus* and *H. Leachi* (Dipeou *et al.*, 1982; Ali and Ali, 2010; Amuta *et al.*, 2010), also Okoli *et al*, (2006) reported that *Rhipicephalus sanguineus* is the most dominant tick of dog in Nigeria. A Study on tick infestation of domestic dogs in Uyo showed that *Rhipicephalus sanguineus* is the prevalent species (Ekanem *et al*, 2010). This result corroborates with findings conducted on the ectoparasites of dogs in Calabar Nigeria (Etim *et al.*, 1996) that the *Rhipicephalus sanguineus* is the dominant species of ticks that infest dogs in Calabar. Ticks are known to be distributed in different parts of the body of the host, in this study infestation in cattles was highest in the Groin (8.62 ±0.31) and least on the face and neck region (2.84 ± 0.26). This result is similar to a study by Kabir *et al* (2011). Also, Yakchali and HasazanJehzara (2004) found out that hard tick infestation was prevalent in the groin and mammary glands. Rahbari *et al* (2007) reported that 62% tick infestation in cattle during the survey was attached to the face and ears of the host.

In dogs, the ticks preference to the ears (2.96 ± 0.19) limbs and interdigstal space (2.40 ± 0.37) agrees with a study in Mexico where the ears and interdigital space were prefered sites of ticks (Nerves *et al.*, 2004) and Mumcuoglu *et al.*, (1993). Probably these sites are preferred because they are sites less accessible for the dogs to remove them with their claws as compared to the neck and face region (Luis *et al.*, 2007). A study by Ekanem *et al.*, (2010) showed that ticks took preference to the head region and limbs of the dog. This is because these regions first come in contact with infested surfaces such as vegetation, abdominal region of the nursing female dog and the ground. Tick infestation was highest in the female cattles (59.1%) than male cattles (40.9%), which is similar to the Stubly by Kabir *et al*, (2011) although the exact cause of higher prevalence of tick infestation in female cannot be explained but it can be hypothesized that some hormanal influence may be associated with this phenomenon. Arong, *et al.*, (2011) report higher prevalence of ticks in females than males agrees with the present study, the reason was due to sedentary habit of female dogs. Lloyd (1983) reported that higher level of prolactin and progesterone hormones make the individual more susceptible to any infection, serves of production such as pregnancy and lactation make the female animals more susceptible to any infection. The present study showed that in dogs, infestation was higher in the female dogs (60.2%) than in male dogs (39.8%). In this study infestation was highest in the adult cattle (55.5%) than in the young cattle (44.5%) this is in line with the study by Yakhchali and HasanzaJehzarza (2004) and Razzak and Shaikh (1969). But Kabir *et al.,* (2011) found out that tick infestation is higher in younger cattle (46.28%) followed by in adult (27.80%) it is very difficult to explain exactly the frequent occurrence of tick infestation in young cattles and adult cattles, more over ticks are voracious blood suckers for their survival and reproduction which may be responsible for higher prevalence of tick infestation in young and adult cattles. In dogs infestation was higher in young dogs (58.5%) than in adult (41.5%). A study by Luis *et al* (2007) also showed in higher infestation in young dogs than in older dogs, this situation could be due to resistance to reinfestation with *Rhipicephalus sanguineus* due to their immunological status (Inokuma *et al*., 1997). Tick showed a significant infestation preference in younger dogs, this may be attributed to easier penetration and attachment of ticks to younger skin than the tougher skin of older dogs (Ekanem *et al*, 2010).

CONCLUSION

All cattles and dogs studied were infected with different species of ticks. The tick species are threat to the population of cattles and dogs production in Calabar irrespective of the age or sex of the animal. This result suggests the need for planing a control and preventive measures against ticks infestation on dogs, cattles and other hosts which range freely within the city.

REFERENCES

Ali, M. B. and Ali, D. (2010). Common ectoparasite species of domestic dogs in Western Iran. *World applied sciences journal* 8(10): 1277-1281, 2010.

Amuta, E. U. Atu, B. O. Houmsu, R. S., Ayashar, J. G. (2010) prevalence of *Rhipicephalus sanguineus* infestation and *Basesia canis* infections in dogs with respect to breed, type and degree of freedom in Makurdi, Benue State Nigeria. *The Internet Journal of parasitic diseases* Vol 1 (no. 4):24-29.

Arong, G. A., Shitta, B. K., James-Rugu, N. N., Effanga, E. O. (2011). Seasonal variation in the abundance and striation of ixodid ticks on mongrel, Alstatian and mixed breeds of dogs (*canis* familiaris) in Jos, in plateau state, North central, Nigeria. *World journal of science and technology,* Vol. 1 (No 5)

Cable, R. M., (1967). An illustrated laboratory manual of parasitological. 4th edition, Burgess publishing Co. mineapolis 15, Minnesota, pp.111-132.

Cheng, T. L. (1973). General parasilology. *Academic Press, New York, London, Sanfrancisco.* pg. 695.

Dipeou, O. O., Akinboade (1982). Scavenging dogs and the spread of tick infestation in Nigeria. International journal of zoonoses, vol1. 9, no. 2, pp.90-96.

Ekanem, M. S., Mbagwu, H. O. C. Opara, K. N., Agbata, Q. C., (2010). Ticks infestation of Domestic stick dogs *(Canis Familiaris lupu)* in Uyo Akwa Ibom scale. Ngieria. *World Journal of applied science and technology.* Vol. 2 No. 2. 91-196.

Etim, S. E. Akpan, P. A., Okon V. E. (1996). A survey of ectoparasites of dogs in Calabar. *The Nigerian Journal of parasilology.* 17(8) 153-155.

Furman, D. P. Loomis, E. L. (1984). The ticks of California. University of California publication, Bulletin of the California insects survey, vol. 25 University of California Press, California.

Inokuma, H. Tamura, K., Onishi, T. (1997). Dogs develop resistance to *Rhipicephalus sanguineus*. *Vet parasitol* 68, 295-297.

Kabir, M. H., Mondal H., Eliyas, Mannan, M. A., Hashem, M. A., debnath, N. C., Miazi, O. F., Mobivddin, C. Kashem, M. A., Islam, M. R. and Elahi, M. F. (2011). An epidemiological survey on investigation of tick infestation in cattle at chittagong district, Bandesh. Africa. *Journal of microbiology research* vol. 5(4), 346-352.

Klareenbeek, M. M., (2010). *Rhipicephalus sanguineus, Ehrlichia Canis* and current tick control methods in curacoa. Pp 8-18.

Lloyd, M. (1983). An experiment in the organization of a minimum complex measures against haemosporidiasis in Northern Tadzhikistan. *J. vet. Res.,* 6:64-74.

Lord, C. C. (2008). Dog tick – Rhipicephalus sanguineus laterille, *Journal of parasitology* 53:432-445.

Luis, T. G, Hector, Q. R., Maria, T. Q., Javiar, V., M. (2007), Prevalence OF TICKS (*Rhipicephalus sanguineus)* in dogs from an Urban Mezico – U. S. Border region pp. 1-5.

Marufu, M. C. (2008). Prevalence of ticks and tick-borne disease in cattle on communal rangelands in the highland areas of the Eastern cape province, South Africa. Department of livestock and pasture Science University of Fort Hare. pp. 1-3.

Mumcuogui, K. V. Burgan, I. Ioffe:Uspensky, I., Manor, O. (1993). Rhipicephalus sanguineus: observations on the parasitic dogs in the Negev Desert of Israel. Exp Appl Acarol 17,793-798.

Nerves, L., Afonso, S. Horak, I. G. (2004). Ixodid ticks on dogs in southern Mozambique onderstepoort. *J. vet. Res.* 71(4):279-283.

Okoli, C. O. Okoli, C. G., Opira, M. (2006). Environmental and multi-host infestation of the brown dog tick, *Rhipicephalus sanguineus* in Owerri, South-Eastern Nigeria. *Vertinarski Arhiv* 76(1), 93-100.

Olwoch J. M. Revers, B., Van Jaarsveld, A. S. (2009). Host-parasite distribution patterns under simulated climate:

implications for tick borne disease. *International Journal of climatology.* 29: 993 – 1000.

Radunz, B. (2008) cattle ticks. Northern territory Government No: k39, pp 1-4.

Rahbari, S. Nabian S., Shayan, P., (2007) report on distribution of tick fauna in Iran. *Parasitol. Res.,* 2:175-177.

Razzak, A., Shaikh, H. (1969). A survey on the prevalence of ticks on cattle in East Pakistan. *Pak. J. Vet. Sci*., 3(2): 50 - 60.

Rosa, F., Crespo, M., Ferreirinha, D., Morgado, M., Madeira, M., Santos, A., Sousa, R. (2006). Ticks on Dogs and its Role as vectors/Intermediate hosts in the center – West of Portugal. *11th international congress of parasitology*. 11:567 – 570.

Sonenshine, D. E. (1993). Biology of ticks vol.2. *Oxford University Press, NY*. 465 pages.

Soulsby, E. J. (1982). Heminths, arthropod and protozoa of domesticated animals Bailliere tindal London. Pp 35-778.

Vredevoe, L. (2011) Background information on the biology of ticks. Department of entomology, university of California, Davis. pp. 4-5.

Yakhchali, M. and Hasanzan Dehzarza, H. S. (2004), study on some ecological aspects and prevalence of different species of hard ticks (Acarina: Ixodidae) on cattle, Buffalo and sheep in Oshnarieh suburb. Pajouheseh – vasazandegi in Anim. Fish. Sci., 63:30:35.

****