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TICKS INFESTATION OF DOMESTIC DOGS (*CANIS FAMILIARIS LUPUS*) IN UYO, AKWA IBOM STATE, NIGERIA

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ABSTRACT: In Uyo, a town in Southeastern Nigeria, 208 domestic dogs (109 males: 99 females) ranging in age from 1 month to 6 years were examined for tick infestations in the months of April to September, 2009. One hundred and fifteen (55.3%) of the number of dogs examined were infested with one or more tick species. Prevalence with *Rhynchophalus sanguineus* was statistically ($P < 0.05$) the highest (30.8%), and was followed by *Dermacentor andersoni* (19.2%), *Ixodes scapularis* (16.8%), and *Haemaphysalia leachii* (7.4%). *R. sanguineus* was also statistically ($P < 0.001$) the commonest tick species collected, (531/1150; 46.2%). Puppies of 1-6 months were the most significantly infested with *R. sanguineus* ($P < 0.001$) and *D. andersoni* ($P < 0.01$), while infestations with *I. scapularis* and *H. leachii* among age groups were statistically (> 0.05) similar. *R. sanguineus*, *D. andersoni*, and *H. leachii* showed significant preferences ($P < 0.001$) for the head and limb regions. Seventeen (34.7%) of the 49 regularly bathed dogs were tick infested, 76 (56.3%) of the 135 irregularly bathed dogs had tick infestation, while two (8.3%) of the 24 no bath dogs were not infested with ticks. In view of the public health implications of ticks infestation, there is the need for proper education of dog owners on the zoonotic consequences of ticks on dogs.

INTRODUCTION

The dog is the most widely kept working, hunting, and companion animal in human history (Dewey and Bhagat, 2002). According to Coppinger (2001) there are about 400 million dogs in the world. They perform many roles for man such as, hunting, herding, protection, detective work, and as pets. In Uyo, a metropolitan City in Akwa Ibom State of Nigeria, many households own dogs. In this town, dogs serve as pets, and house guards. Their playfulness and ability to learn and fit into human households are attributes which have earned the dog a unique relationship with humans. However, the negative outcome of this relationship has been the issue of diseases transmission between the man and his dog. Ticks, mites, fleas, and lice have been incriminated as the vectors in the diseases transmission, (WHO 1984; Shaw *et al* 2001, Dagnone *et al* 2003 among others). In Nigeria, several studies have been undertaken on ectoparasites of dogs (Chukwu 1985, Ugochukwu and Nnadozie, 1985; James-Rugu and Iwuala 2002; Agbolade *et al* 2008, among others). However, to the best of our knowledge, no such studies have been undertaken in Uyo, and this is a fast expanding metropolitan town. This expansion into hitherto habitats of wild animals may have health implications for the inhabitants of the town because the dog, if not restrained, by its predatory and snoop habits around bushes, poses serious health hazards to humans in Uyo.

MATERIALS AND METHODS

Study area

The study area Uyo, is a fast growing town in the southeastern part of Nigeria (Fig. 1). The town lies within the rainforest belt (Latitude $4^{\circ}52'$ and $5^{\circ}05'N$, and Longitude $7^{\circ}45'$ and $8^{\circ}02'E$). The area experiences two seasons, the rainy or wet season, and the dry season. The wet season lasts for about 8 months (April – early November) while the dry season is for about 4 months (November to April of the following year). Uyo town is surrounded by farmlands and rural settlements, which are rapidly turning into satellite settlements for civil servants and businessmen working in Uyo.

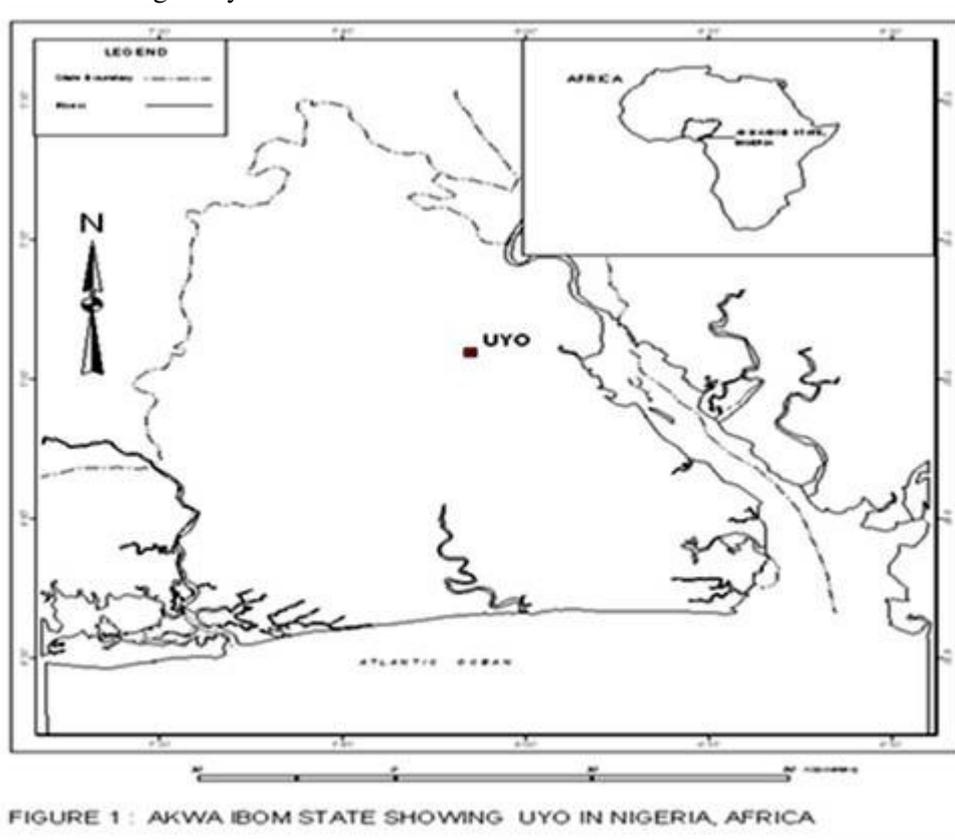


FIGURE 1 : AKWA IBOM STATE SHOWING UYO IN NIGERIA, AFRICA

METHODOLOGY

In the months of April to September, 2009, 208 dogs in Uyo, were examined for ticks. Dogs were examined with the consent of their owners, who also supplied information on age, bathing, purpose of keeping dogs, and general welfare of their dogs. Each dog was held while each body part was examined for presence of ticks. Ticks were collected by picking them out with forceps from the hair, as well as brushing out of the hair with a fine comb. Specimens taken from each body region (head/neck, back, abdomen, pelvic/anal regions, limbs/interdigital spaces) were collected into labelled specimen bottles containing 70% ethanol, and taken to the laboratory where the specimens were identified with keys by Soulsby (1982), and Cheng (1973). Specimens were counted, and recorded according to body regions.

RESULTS

Of the 208 dogs examined in Uyo (109 males; 99 females), 115 (55.3%), made up of 60 (52.2%, 60/115) males, and 55 (47.8%, 55/115) females, were infested with ticks. Infestation of male

and female hosts were statistically similar ($P>0.05$). Four tick species, *Rhipicephalus sanquineus*, *Ixodes scapularis*, *Dermacentor andersoni*, and *Haemaphysalis leachi* were recorded (Table 1.) *R. sanquineus* had statistically the highest prevalence of 30.8% ($P<0.05$), and was also statistically ($P<0.001$) the commonest species (46.1%) recorded. The arithmetic mean intensities of tick infestations recorded were 8.3 *R. sanquineus*/dog, 7.3 *scapularis*/dog, 6.2 *D. andersoni*/dog, and 7.7 *H. leachii*/dog.

Table 1: Prevalence of ticks on dogs in Uyo, Akwa Ibom State, Nigeria

| Ticks | Number (%) infestation |
|----------------------|------------------------|
| <i>R. sanquineus</i> | 64 (30.8) |
| <i>I. scapularis</i> | 35 (16.8) |
| <i>D. andersoni</i> | 40 (19.2) |
| <i>H. leachii</i> | 15 (7.4) |

Of the 115 cases of tick infestations, 76(66.1%, 76/115) were monoinfestations, while 39(33.9%, 39/115) were double infestations. Single infestations with *R. sanquineus* were 36 (47.4%, 36/76), *I. scapularis* 16 (21.1%, 16/76), *D. andersoni* 18 (23.7%, 18/76), and *H. leachii* 6(7.9%, 6/76). Double infestations were as follow; 13 cases of R+D (33.3%, 13/39), 12 of R+I (30.8%, 12/39), 5 of I+D (12.8%, 5/39), 4 of H+D (10.3%, 4/39), 3 of R+H (7.7%, 3/39), and 2 of I+H (5.1%, 2/39). There was no significant difference between mono-and double infestations ($t_8 = 1.9(t>0.05=2.31)$) of the dogs. The commonest tick infestation of dogs aged 1 month to 4 years in Uyo was *R. sanquineus* (Fig. 2), while *D. andersoni* was the commonest tick on dogs of 5years and above.

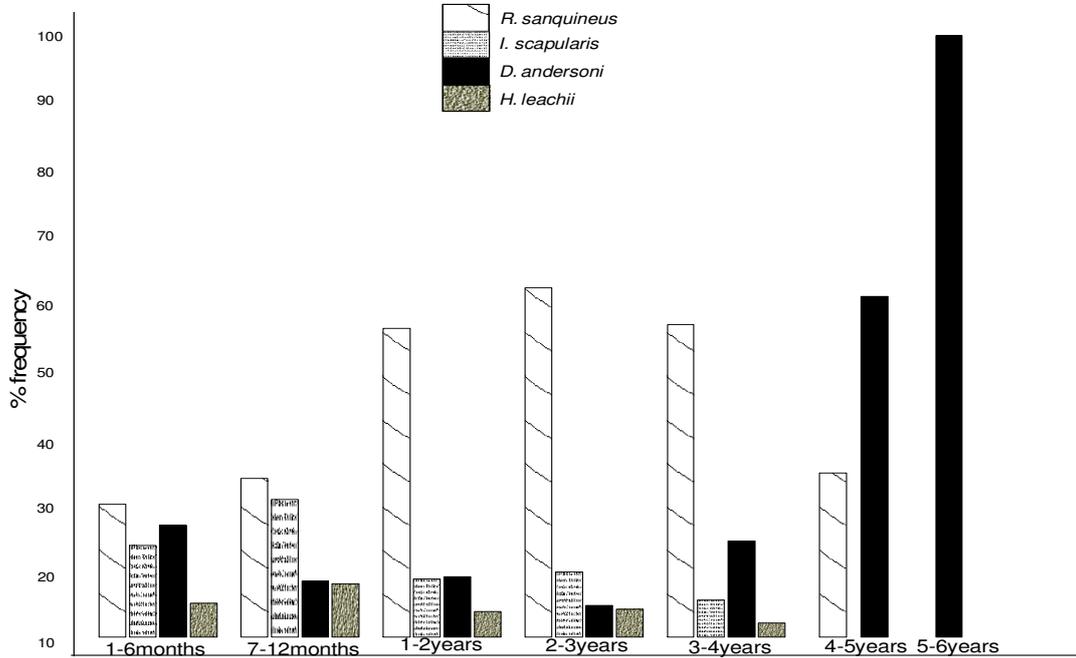


Figure 2: Age range infestation of ticks in Uyo, Akwa Ibom State, Nigeria

Age group infestations are summarized in Table 2. Puppies of 1-6 months were the most significantly infested with ticks ($P<0.01$), while dogs aged 5 to 6 years were the least infested.

Infestation of puppies 1-6 months with *R. sanguineus* was highly significant ($P < 0.001$), while least infestations occurred on older dogs of 5 years and above. The pattern of tick infestation with *D. andersoni* was similar to that of *R. sanguineus* i.e 1-6 months puppies were significantly more infested with *D. andersoni* ($P < 0.01$), while with increasing age of dog, infestation decreased. Infestations with *I. scapularis* and *H. leachii* showed statistically similar trends ($P > 0.05$) in the different age groups of dogs.

Table 2: Ticks infestation and prevalence (%) in relation to age of dog in Uyo, Akwa Ibom State, Nigeria

| Age of dog | <i>R. sanguineus</i> | <i>I. scapularis</i> | <i>D. andersoni</i> | <i>H. leachii</i> |
|--------------|----------------------|----------------------|---------------------|-------------------|
| 1-6months | 180 (33.9) | 107(41.8) | 121(49.0) | 46(39.7) |
| 7-12months | 88(16.6) | 72(28.1) | 39(15.8) | 38(32.8) |
| 1-2years | 107(20.2) | 36(14.1) | 34(13.8) | 15(12.9) |
| 2-3years | 108(20.3) | 33(12.9) | 16(6.5) | 14(12.1) |
| 3-4years | 41(7.7) | 8(3.1) | 21(8.5) | 3(2.6) |
| 4-5years | 7(1.3) | - | 11(4.5) | - |
| 5-6years | - | - | 5(2.0) | - |
| Total | 531(100%) | 256(100%) | 247(100%) | 116(100%) |

Table 3 is a summary of site preferences of ticks on body regions of dogs in Uyo. The back and abdominal regions were significantly the most unattractive areas ($P < 0.001$) for attachment of *R. sanguineus*, *D. andersoni*, and *H. leachii*, while *I. scapularis* showed no significant preference ($P > 0.05$) for any regions of the body.

Table 3: Site preferences of ticks for attachment on dogs in Uyo, Akwa Ibom State, Nigeria

| Body regions | <i>R. sanguineus</i> | <i>I. scapularis</i> | <i>D. andersoni</i> | <i>H. leachii</i> |
|---------------------------|----------------------|----------------------|---------------------|-------------------|
| | No (%) | No (%) | No (%) | No (%) |
| Head & neck | 207(39.0) | 71(27.7) | 87(35.2) | 28(24.1) |
| Back | 40(7.5) | 38(14.8) | 10(4.0) | 14(12.1) |
| Abdomen | 69(13.0) | 30(11.7) | 17(6.9) | 9(7.8) |
| Pelvic/anal region | 63(11.9) | 44(17.2) | 74(30.0) | 29(25.0) |
| Limbs/interdigital spaces | 152(28.6) | 73(28.5) | 57(23.1) | 36(31.0) |
| Total | 531 | 256 | 247 | 116 |

Information on care of the 208 dogs by their owners are as presented in Table 4. Only 49 of the 208 dogs (23.6%) received regular baths, at least once in a four-night with water, and at least with an antiseptic soap, while baths for 135 (64.9%) were not regular, and 24(11.5%) had no bathing records. Furthermore, of the 49 regularly bathed dogs, 21 (42.9%, 21/49) usually had their fur treated with an acaricide with a pyrethroid base, while the remaining 28(57.1%, 28/49) were only bathed with an antiseptic soap. Of the 135 irregularly bathed dogs, 43(31.9%, 43/135) were usually bathed with water, antiseptic soap and the fur treated with an acaricide, while 80(59.3%, 80/135) had baths with any antiseptic soap and 12(8.9%, 12/135) were bathed with any bathing soap.

Table 4: Tick infestations in relation to frequency of dog bathing in Uyo, Akwa Ibom State, Nigeria

| Bathing frequency | Water+antiseptic soap+acaricide n = 64 | | Water+antiseptic soap n = 108 | | Water+ordinary soap n = 12 | | Total | |
|-------------------|-------------------------------------------|-----------|----------------------------------|-----------|-------------------------------|----------|--------------|------------|
| | Not Infested | Infested | Not infested | Infested | Not infested | Infested | Not infested | Infested |
| Regular baths | 19(36.8%) | 2(4.1%) | 13(26.5%) | 15(30.1%) | - | - | 32(65.3%) | 17(34.7%) |
| Irregular baths | 26(19.0%) | 17(12.6%) | 31(23.0%) | 49(36.3%) | 2(1.5%) | 10(7.4%) | 59(43.7%) | 76(56.3%) |
| No baths | - | - | - | - | - | - | 2(8.3%) | 22(91.7%) |
| Total | | | | | | | 93 | 115 |

DISCUSSION

Our result shows a high prevalence of ticks infestation of domestic dogs (55.3%) in Uyo. This finding is worrisome in view of the established public health significance of the ticks involved. *R. sanguineus* is reported as the commonest species in Uyo. This corroborates with earlier findings from studies elsewhere in Nigeria, Ugochukwu *et al.* 1985; Etim *et al.* 1996; James-Rugu and Iwuala 2000; Agbolade *et al.* 2008; Amuta *et al.* 2010, and other parts of the world, such as González *et al.* (2004), Nithikathkul *et al.* (2005) among others. The similarity in mono-and multiple infestations observed in this study may suggest similarity in conditions for development of the tick species in this study area. A significant infestation preference for young dogs was observed, particularly with *R. sanguineus* and *D. andersoni*. This preference may be attributed either to, the easier penetration and attachment of ticks to young skin than the tougher skin of older dogs, or to conditions in kennels. For example, *R. sanguineus* is known to adapt to domiciliary environments and become established indoors in kennels and homes (Fox and Sykes, 1985 and Dame and Fasulo, 2002). Young dogs, with more restricted movements, reared in such infested environments are more exposed to tick infestations than older dogs that are freer. *D. andersoni* infestations with older dogs of 5 years and above and the infestation similarities among different age groups with *I. scapularis* and *H. laechnii* may be circumstantial.

R. sanguineus, *D. andersoni*, and *H. laechnii* had shown significant preferences for the head regions and limbs of the dog. This is because, these regions first come into contact with infested surfaces such as, vegetation, abdominal region of the nursing female dog, and the ground. The reasons for the non-preference for any body region by *I. scapularis* is not known to the authors.

Information obtained in this study revealed that most dogs in Uyo are used primarily as house guards, and secondarily as pets. As house guards not much attention is paid by dog owners in Uyo to the hygienic conditions of their dogs. The high prevalence of tick infestation in Uyo is therefore aggravated by the inadequate hygienic attention given to dogs in the area. Of much interest to dog owners is the fact given regular baths alongside treatment with acaricides, ticks infestations can be controlled.

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