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Comparative Study of Ectoparasites of Exotic and Locally Bred Dogs in IkotEkpene Local Government Area, Niger-Delta Region of Nigeria

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Abstract: ***This study was conducted to identify, quantify and compare the species of ectoparasites and also their prevalence in exotic and locally bred dogs in IkotEkpene Local Government Area, Akwa Ibom State Nigeria. The study was carried out in company of a Veterinary Doctor in the town as part of a routine treatment plan to homes with dogs. The collected ectoparasites were preserved in 70% ethanol. Ticks 107(94.6%) were greater in number amongst the ectoparasites. Rhipicephalussanguineus was identified as the major species of tick infesting dogs in IkotEkpene LGA. Higher prevalence of ectoparasites were found on locally bred dogs than in the exotic dogs. No fleas and mites were found in the companion dogs. There was a significant difference based on the predilection sites. No significant difference was observed on the type of tick species infestation between the exotic and locally bred dogs as they all harbour the same species. The main factors influencing the dogs' tick infestation in this study were probably the environment and degree of freedom of the companion dogs. To contain these ectoparasites (especially ticks) regular application of ascaricides, grooming and restriction of movement, especially in peak periods of the infestation are recommended.***

Keywords: Ectoparasites, exotic and locally bred dogs, *Rhipicephalussanguineus, Canisfamiliaris,* ticks

1. Introduction

Dog, *Canisfamiliaris* is trained and used to unravel criminal intelligence by law enforcement agents while some are kept as pets due to their tremendous potential to contribute significantly to the security requirement of the rising population in Nigeria (Arong et al., 2011). Ticks, apart from mosquitoes are most numerous of all arthropodsas transmitters of pathogens, such as viruses, bacteria and parasites (Hoogstraal et al., 1968).Ticks and tick-borne diseases such as *Babesiacanis* and *Haemobatonella sp*.constitute some notifiable diseases that act as barriers to the achievement of the goals of "health for all" and Millennium Development Goals (MDGs)besides their public health significance.(James-Rugu,2001,Leleke and Beleke,2004,James-Rugu and Idu,2008).

Ectoparasites are common and important cause of skin diseases in dogs and cats. They have a worldwide distribution and are capable of disease transmission. They cause life-threatening anemia and occasionally hypersensitivity disorders in young and debilitated animals (Araujo and Silva.,1998). Some ectoparasites of pet animals, notably fleas, can infest humans and may lead to the development of dermatitis and transmit vector-borne diseases (Scott et al.,2001). Ticks also cause paralysis, the condition caused by toxins found in their saliva (XhaxhiuKusi et al., 2009).

Sarcoptic mange is a highly contagious non-seasonal and pruritic skin condition caused by infestation with *Sarcoptesscabiei* var. *canis*, a burrowing mite, which is transmitted by direct contact between dogs. Various studies have found that *Ctenocephalidesfelis*, *C. canis* and *Pulexirritans*, are the three most common flea species found on dogs. Methods of deep and superficial skin scraping, acetate tape preparation, combing the entire body surfaces, exotic swabs and clinical trials are usually used for the detection of ectoparasites(Scott et al.,2001). In urban or suburban areas, people traditionally raise dogs as pets with or without health check-ups to protect them from infestation by ectoparasites. Thus, knowledge of types of species, density and prevalence of ectoparasites is needed to effectively control them (Scott et al.,2001,Nuchjangreed and Somprasong, 2007).

The infestations with these ectoparasites on dogs, *Canisfamiliaris*and their attendant public health importance deservea focus. Interestingly, ticks and tick-borne diseases, in particular have in addition to other socio-economics consequences, constituted major setbacks to the development of an economically viable livestock industry in Africa and other parts of the world. Baseline information on ectoparasites infesting dogs is of special interest with the growing use of this animal as pet, companion and for security purposes in most parts of Nigeria, especially in the Niger-Delta region. This study aimed at determining the occurrence and prevalence of ectoparasites found in both exotic and locally bred dogs in IkotEkpene Local Government Area, Niger-Delta Region of Nigeria. The main essence was to provide a baseline information and data onectoparasitesinfestation in the study area, and to further enrich the depository of knowledge available in the field of Public Health Entomology and Parasitology.

2. Methodology

Study Area

This study was conducted in IkotEkpene Local Government Area, Niger-Delta Region of Nigeria.The Local Government Area has a total number of one hundred and sixty seven villages(167) which are divided into nine(9)clans for traditional administrative purposes, and is further sub-divided into thirteen(13)wards for political governance and convenience. The area is bounded on the north by IkonoLGA,on the south by EssienUdimLGA, on the west by ObotAkaraLGA, on the east by IniLGA, on the north- west by Abak LGA Area, all inAkwa Ibom State, Niger-Delta Region of Nigeria.

Sample Collection Procedure and Identification

Ectoparasites were collected from 20 exotic dogs and 40 locally bred dogs. The dogs were classifiedaccording to sex, breed and age. Age was estimated using theowner's information. The dogs were examined for ectoparasites infestation through a complete examination of their skin and all selected dogs were examined for ticks on the ear,neck/head,back,belly and limb(interdigital spaces) by combing of the body with stainless steel fine-toothed comb. The number of ticks found on them werecounted and properly recorded.Mechanical restraint was administered to the dog by covering the dog's mouth with mouth muzzle,all ticks on them were manually removed with great care to ensure that the mouthparts remained intact. The ticks were collected together with any fleas and lice seen on the comb. All the ectoparasitesfound and removed from the animals were stored in labelled bottles containing 70% ethanol.

The ticks collected were mounted on a glass slide and each slide was completely and carefully examined using dissecting microscope(Nikon), and with the use of appropriate taxonomic keys they were fully identified by a trained Laboratory Scientist(Entomology) (Hoogstraal et al., 1968, Nuttal and Warbuton, 1991, Soulsby, 1982).

Data Analysis

The data collected from the study were correctly recorded, collated and analysed based on stated research questions and statements of hypothesis.Chi-square test was used to analyse the data at 0.05 level of significance (95% significance level).

3. Results

A total number of sixty (60) dogs, made up of twenty (20) exotic dogs and forty (40) locally bred dogs were examined during the study duration. The species of ticks identified was *Rhipicephalussanguineus*. The infestations were based on breed, age, predilection sites and gender. Out of 20 exotic dogs examined, 10(50.0%) were infested with ticks while 4 (20.0%) were infested with lice. The prevalence in the 40 locally bred dogs examined was: out of the total, 11 (27.5%) dogs were infested with ticks while 6 (15.0%) were infested with lice. In all, the total number of ticks recovered were 107.

Data shown on Table 1 revealed that the calculated value of χ^2 is less than the table value, hence the hypothesis which stated that, there is no significant difference in the prevalence of ectoparasites found on dogs based on breed in IkotEkpene LGA (χ^2 =3.748, P > 0.05) was accepted. On Table 2, the data gathered revealed that the calculated value of χ^2 is less than the table value, hence the hypothesis which states that there is no significant difference in the prevalence of ectoparasites found on dogs in IkotEkpene LGA based on age(χ^2 = 4.229,P> 0.05) was accepted.

The prevalence of ectoparasites based on age distribution on Table 2 shows exotic dogs between the age of 12-24 months were infested with more ticks 8 (7.6) than other age groups but no lice was recovered, while the locally bred dogs between the age of 25-36 months were infested with more ticks 27(26.5%) than the other age groups, locally bred dogs between the age of 12-24months were also infested with lice 3(1.2%).

Table 3 revealed that the calculated value of χ^2 is less than the table value.Hence the hypothesis is accepted. This shows that there is no significant difference in the prevalence of ectoparasites on companion dogs based on gender.(χ^2 = 3.84,P>0.05)

Ectoparasites infestation of dogs based on gender is shown on Table 3.The number of exotic males infested with ticks were higher than females 7(6.1%) and 3 (3.4%) respectively. They also had the same number of lice infestations .In the locally bred dogs the malesalso had the higher number of ticks infestation than the females 6(6.8%) and 5 (4.7%) respectively. They had different number of lice infestations 4(3.2%) for males and 2(2.3%) for females. Table 4 revealed that the calculated value of χ^2 is less than the table value. Hence, the hypothesis is rejected. This means that there is a significant difference in the prevalence of ectoparasites in dogs based on predilection sites.(χ^2 =4.885,P< 0.05).

Distribution of ectoparasites based on predilection sites is shown on Table 4.The ears and the limbs have the highest number of ectoparasites infestation 31 (32.2%) and 27 (28.4%), respectively. The head/Neck had the least number of ectoparasites infestation.

Table 1: Prevalence of ectoparasitesfound on dogs in IkotEkpene Local Government Area based on distribution of breed

Ectoparasites	No.of exotic dogs examined	No.of exotic dogs infested (%)	No. of locally bred dogs examined	No.of locally bred dogs infested (%)	No. of ectoparasites recovered
Ticks	20	10 (50.0)	40	11 (27.5)	107
Lice	20	4(20.0)	40	6 (15.0)	6

Table 2: Prevalence of ectoparasites in dogs based on age distribution in IkotEkpene Local Government Area

Ectopara-sites	Exotic Dogs				Locally Bred Dogs				Total
	12-24 months No.(%)	25-36 months No.(%)	37-48 months No.(%)	48 months and above No.(%)	12-24 months No.(%)	25-36 months No.(%)	37-48 months No.(%)	48 months and above No.(%)	
Ticks	8 (7.5)	4 (3.7)	4 (3.7)	5 (4.6)	19 (20.8)	27 (26.5)	18 (18.0)	22 (21.8)	107
Lice	0	0	0	0	3 (50.0)	1(16.7)	1 (16.7)	1(16.7)	6

Table 3: Ectoparasites infestation of dogs based on gender in IkotEkpene Local Government Area

Ectoparasites	Exotic Dogs		Locally Bred Dogs		Total
	Males No.(%)	Females No.(%)	Males No.(%)	Females No.(%)	
Ticks	7 (33.3)	3 (14.3)	6 (28.6)	5 (23.8)	21
Lice	2 (20.0)	2 (20.0)	2 (20.0)	4 (40.0)	10

Table 4: Distribution of ectoparasites based on predilection sites in dogs in Ikot Ekpene Local Government Area

Ectoparasites	Sites					Total
	Ear No. (%)	Limb No. (%)	Belly No. (%)	Back No. (%)	Head/Neck No. (%)	
Ticks	31 (29.0)	27 (25.2)	22 (20.6)	19 (17.8)	8 (7.5)	107
Lice	3 (50.0)	3 (50.0)	0	0	0	6

4. Discussion

The results of this study show that there was a slightly higher prevalence of tick infestation in locally bred dogs compared to exotic dogs in in IkotEkpene Local Government Area. This could be attributed to the reason that these areas are densely populated, inhabited mainly by farmers, petty traders, palm wine tappers and hunters who keep dogs as companion and for hunting without proper care of them. In addition to this, there is poor environmental sanitation prevailing in these areas, represented by the common sights of garbage dumps where dogs frequently source for food. The presence of other susceptible animals (cattle, goats and sheep) in the communities could also be a major factor contributing to the survival and propagation of these ticks. In this study area, it was observed that exotic dogs were properly cared for and kept in kennel preventing them from roaming the area sourcing for food.

The study observed that age does not influence the prevalence of ectoparasites on dogs as the ectoparasites can infest dogs of any age. Gender of the companion dogs was also seen not to have any influence on the infestation of ectoparsites in the dogs. The ears and interdigital spaces of limbs were found to be the most predilection sites for ticks on dogs in the study area. The presence of ticks in these sites could probably be due to their exposure to the questing ticks as the dogs roam about. These parts of the body are hiding places for the ticks and are less accessible to the dogs to reach out and remove them by their paws compared with locations such as the neck or the head. The ears and inter digital spaces are the preferred sites of the ticks on dogs. The low infestation observed on the head and the belly could probably be due to the exposure of these parts to environmental factors, or the fact that the ticks are often more easily seen and removed by the dog owners. This study shows that there is a slightly higher prevalence of ectoparasites on locally bred dogs than the exotic dogs. This could be because locally bred dogs are associated with farmers, hunters, and palm wine tappers, and it is also possible for the locally bred dogs to be taken along to farm or for hunting which makes them further exposed. It was observed that some of the locally bred dogs were owned by people who may not take dog bath seriously, the ticks therefore found suitable environment on them to aggregate and multiply hence their abundance on locally bred dogs. The low infestation of the ectoparasites observed in the exotic dogs could also be as a result of their release and interaction with the locally bred dogs at night. It is also possible for these dogs to become infested from the households in the compounds they are bred. Furthermore, the low rate of infestation observed in these exotic dogs in the study area may be due to their degree of restriction which shields them from infestation, also owners of exotic dogs are better income earners who take dog bath seriously and also take them for vaccination, when necessary. Moreover, these dogs are closer to their owners who always care for them by removing any visible ectoparasite on them. This shows that in the study area, habitat and restriction are strong factors on tick infestation in dogs.

The study concluded that, there is no difference in the species of tick infestation on exotic and locally bred dogs in IkotEkpene LGA. The tick species identified in this study was *Rhipicephalussanguineus* and this species was the major tick species attacking both the exotic and locally bred dogs in IkotEkpeneL.G.A.

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