

Ectoparasites of Domestic Dogs in Some Ijebu Communities, Southwest Nigeria

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Abstract: Two hundred and two (90 males, 112 females) domestic dogs with an age range of 1 month to 7 years were examined for ectoparasitic infestations in some Ijebu communities of Ogun State, southwest Nigeria, between January and December, 2007. Information on age, feeding, bathing, keeping place and purpose of keeping were obtained by questioning the owners. One hundred and ninety-nine (98.5%) of the examined dogs had one or more ectoparasitic arthropod infestations. *Rhipicephalus sanguineus* had statistically highest prevalence of 89.6% ($P < 0.001$), followed by *Haemophysalis leachii* (78.7%), *Ctenocephalides canis* (13.4%) and *Damalina* sp. (1.5%). *R. sanguineus* was statistically the most abundant species (848/1358, 62.4%) ($P < 0.001$). 174 (86.1%) and 28 (13.9%) of the dogs examined were used as pets/house-guards and for hunting, respectively. Dog bathing 1 time/month with non-chemical treated water was the commonest practice, although the use of chemicals including kerosene, lindane, diazinon and coumaphos was also practised by some dog owners. The study shows the need to educate dog owners of reliable and safe methods of domestic dog care.

Key words: *Rhipicephalus sanguineus* • *Haemophysalis leachii* • *Ctenocephalides canis* • *Damalina* sp. • domestic dog care • Nigeria

INTRODUCTION

Many arthropods, such as the ixodid ticks and fleas, live as blood-sucking ectoparasites on domestic dogs [1]. These ectoparasites cause severe dermatitis or act as vectors of various microorganisms which are pathogenic in domestic dogs, other animals and humans [2-5]. Domestic dogs are used as pets, house-guards and for hunting in many parts of the world, including Nigeria. Therefore, ectoparasitic infestations in dogs have received much attention from several workers the world over [6-10].

In Nigeria, a number of studies on the ectoparasites of domestic dogs have been reported. For example, from certain parts of the eastern region, Chukwu [11] reported that 2.1% of dogs had *Echidnophaga gallinacean* while 26.3% had *Ctenocephalides canis*. From certain parts of the mid-western Nigeria, Ugochukwu and Nnadozie [12] found that 30% of the dogs examined were infested by ticks, 27.56% by lice, 25.85% by fleas (*C. canis*) and 13.29% by mites. In the Jos Plateau area of central Nigeria, James-Rugu and Iwuala [13]

reported that 65.7% of dogs had ticks including *Rhipicephalus sanguineus*, *Boophilus decoloratus*, *Haemophysalis leachii* and *Amblyomma lepidum*, while 28.3% were infested with fleas which were *C. canis* and *Xenopsylla cheopis*.

To the best of our knowledge, there is paucity of information on ectoparasites of domestic dogs in Ijebu area of Ogun State, southwest Nigeria. In view of the foregoing, this paper reports the ectoparasites of domestic dogs in relation to frequency of bathing and usefulness of the examined dogs in some communities in Ijebu area, southwest Nigeria.

MATERIALS AND METHODS

Study area: This comprised of Ago-Iwoye, Oru, Awa and Ijebu-Igbo in Ijebu North Local Government area, Ijebu-Ode in Ijebu-Ode Local Government area and Ijebu-Imushin in Ijebu East Local Government area of Ogun State, southwest Nigeria. The study area lies in the tropical rainforest belt within latitudes 6° 15' and 6° 50' N, longitudes 3°40' and 4°45' E.

Examined dogs, specimens collection and examination: A total of 202 (90 males, 112 females) dogs with an age range of 1 month to 7 years were examined between January and December, 2007. Information on age, feeding, bathing, keeping place and purpose of keeping were obtained by questioning the owners. Each dog was examined by checking and, sometimes combing, all the body regions beginning from the head, followed by the neck, dorsum, trunk, limbs and tail. All specimens collected from each dog were transferred into labelled specimen bottles containing 70% ethanol. In the laboratory, the specimens from each dog were identified, counted and recorded according to body regions.

RESULTS

One hundred and ninety-nine (98.5%) of the 202 domestic dogs examined in this study had one or more ectoparasitic arthropods. In each of the towns, the infestation rate was 100%, except in Awa where the infestation rate was 80%. The recorded species of ectoparasitic arthropods are *R. sanguineus* which had statistically highest prevalence of 89.6% ($P < 0.001$), *H. leachii*, *C. canis* and *Damalina* sp. (Table 1).

The prevalence of infestation with the ectoparasites among males (87/90, 96.7%) was statistically similar to that among females (112/112, 100%) ($P > 0.05$). The non-infested males were two 1-month-old dogs and one 2-year-old dog.

Among the infested dogs 123 (61.8%), 25 (12.6%) and 1 (0.5%) had double, triple and quadruple infestations, respectively. The statistically commoner double infestation was *Rhipicephalus*+*Haemophysalis* which had 95.9% (118/123) prevalence, while *Rhipicephalus*+*Ctnocephalides* had 4.1% (5/123) ($P < 0.001$). The prevalence of *Rhipicephalus*+*Haemophysalis*+*Ctnocephalides* triple combination (92%, 23/25) was statistically higher than that of *Rhipicephalus*

+*Haemophysalis*+*Damalina* (8%, 2/25) ($P < 0.001$). The only recorded quadruple infestation, *Rhipicephalus*+*Haemophysalis*+*Ctnocephalides*+*Damalina*, was recorded in a female 1-year-old dog in Ago-Iwoye.

A pooled total of 1358 specimens of ectoparasitic arthropods were recorded. The relative abundance of *R. sanguineus* (62.4%) was statistically highest, followed by *H. leachii* (33.2%), *C. canis* (4.0%) and *Damalina* sp. (0.4%) ($P < 0.001$). The adult male: female ratios were 1:1.7 and 1.3:1 for *H. leachii* and *R. sanguineus*, respectively. The arithmetic mean intensities recorded were 4.7 ticks/dog, 2.8 ticks/dog, 2 fleas/dog and 1.7 lice/dog for *R. sanguineus*, *H. leachii*, *C. canis* and *Damalina* sp., respectively. These mean intensities were statistically similar ($P > 0.05$). 3.1% (5/159) of the dogs infested with *H. leachii* had nymphs of *Haemophysalis* sp. while 7.1% (13/181) of those with *R. sanguineus* had nymphs of *Rhipicephalus* sp. The number of *Haemophysalis* nymphs ranged 1-2/dog while that of *Rhipicephalus* ranged 1-87/dog.

The distribution of the ectoparasite species on the body parts of infested dogs is summarised in Table 2. *H. leachii* had statistically highest occurrence on the head of infested dogs ($P < 0.02$). There was no significant difference in the percentage of occurrence of *R. sanguineus* in all the body parts ($P > 0.05$). *C. canis* had statistically highest occurrence on the stomach of infested dogs ($P < 0.01$).

The results of the interviews held with dog owners showed that 174 (86.1%) and 28 (13.9%) of the dogs examined were used as pets/house-guards and for hunting, respectively. There were definitive responses on the frequency of bathing of 163 (80.7%) of the examined dogs. Out of these, 4 (2.5%) were not bathed, while 159 (97.5%) were bathed. Among the latter group (those bathed), 132 (83.0%) were bathed using common bathing and/or washing soaps and non-chemical treated water, while 27 (17.0%) were bathed using common bathing

Table 1: Prevalence of ectoparasitic infestations in domestic dogs in Ijebu area, southwest Nigeria

Community	No. examined	No. (%) infested			
		<i>H. leachii</i>	<i>R. sanguineus</i>	<i>C. canis</i>	<i>Damalina</i> sp.
Ago-Iwoye	94	79 (84.0)	86 (91.5)	11 (11.7)	1 (1.1)
Oru	37	26 (70.3)	34 (91.9)	6 (16.2)	1 (2.7)
Awa	15	12 (80.0)	11 (73.3)	1 (6.7)	0 (0.0)
Ijebu-Igbo	30	23 (76.7)	28 (93.3)	5 (16.7)	0 (0.0)
Ijebu-Ode	6	12 (75.0)	14 (87.5)	2 (12.5)	1 (6.3)
Ijebu-Imushin	10	7 (70.0)	8 (80.0)	2 (20.0)	0 (0.0)
Total	202	159 (78.7)	181 (89.6)	27 (13.4)	3 (1.5)

Table 2: Distribution of ectoparasites on body parts of infested dogs in Ijebu area, southwest Nigeria

Body part	No. (%) of occurrence			
	<i>H. leachii</i>	<i>R. sanguineus</i>	<i>C. canis</i>	<i>Damalina</i> sp.
Head and neck	63 (29.4)	83 (26.6)	5 (16.7)	1 (33.3)
Stomach	33 (15.4)	49 (15.7)	10 (33.3)	0 (0.0)
Back	36 (16.8)	62 (19.9)	3 (10.0)	1 (33.3)
Limbs	58 (27.1)	77 (24.7)	6 (20.0)	0 (0.0)
Genitals	24 (11.2)	41 (13.1)	6 (20.0)	1 (33.3)
Total	214 (100.0)	312 (100.0)	30 (100.0)	3 (100.0)

Table 3: Frequency of dog bathing with chemical treated water in Ijebu area, southwest Nigeria

Frequency of bathing	No. (%) bathed with chemical					Total
	Diazinon	Coumaphos	Lindane	Kerosene	Unknown	
Once /2 days	0 (0.0)	0 (0.0)	0 (0.0)	2 (14.3)	0 (0.0)	2 (7.4)
1-2 times/week	5 (83.3)	0 (0.0)	1 (33.3)	6 (42.9)	0 (0.0)	12 (44.4)
2-3 times/month	1 (16.7)	2 (100.0)	0 (0.0)	6 (42.9)	2 (100.0)	11 (40.7)
1 time/month	0 (0.0)	0 (0.0)	2 (66.7)	0 (0.0)	0 (0.0)	2 (7.4)
Total	6 (22.2)	2 (7.4)	3 (11.1)	14 (51.9)	2 (7.4)	27 (100.0)

and/or antiseptic soaps and chemical treated water. For those bathed with non-chemical treated water, 1 time/month (43.2%) was the statistically highest frequency of bathing, followed by 1-2 times/week (37.9%), 2-3 times/month (16.7%) and 1 time/2-5months (2.3%) (P<0.001). Frequency of bathing of dogs with water treated with different chemicals is summarised in Table 3. Bathing with water mixed with kerosene (51.9%) had statistically highest occurrence (P<0.001).

DISCUSSION

The recorded high prevalence of ectoparasitic arthropods in domestic dogs in the study area is worrisome in view of the established public health significance of the parasites which are known to elicit serious inconveniences and havocs in dogs, other animals and even humans [2-5, 14]. The presence of *R. sanguineus*, *H. leachii* and *C. canis* in Ijebu area of southwest Nigeria agrees with previous reports from some other parts of the country [11-13]. However, the presence of *Damalina* sp. in dogs recorded in this study is an important find. This is because *Damalina* species are normally found in other animals such as cattle and sheep [15, 16]. Sheep rearing by the indigenous population and cattle rearing by nomadic fulanis are common in the study area. Close contact between the infected dogs and the usual hosts (especially sheep) might have been responsible for the presence of *Damalina* sp. in dogs.

This assertion is further strengthened by the fact that *Damalina* sp. had the lowest prevalence and abundance in dogs in the study area.

The occurrence of mixed infestations in this study conforms to some previous reports [17] and possibly indicates that similar conditions favour the development and transmission of the various ectoparasitic species in the study area.

The relative abundance of the ectoparasitic species of dogs recorded in this study followed same sequence with their prevalences. *R. sanguineus* was the most abundant species and *C. canis* was the only flea species recorded in agreement with some previous findings elsewhere [7, 9]. The adult male:female ratio recorded for *R. sanguineus* and *H. leachii* showed that both genders have similar abundance in the study area. The reasons for similar mean intensities of the ectoparasites prevalent in the study area are unknown to the authors.

This study has shown that *H. leachii* and *C. canis* had preference for head and stomach of infested dogs, respectively. On the other hand, *R. sanguineus* and *Damalina* sp. appeared to be indiscriminately distributed.

The results of this study showed that most of the domestic dogs in the study area are used as pets and/or house-guards. Most of the dogs are bathed monthly with non-chemical treated water and the efforts of owners who bathed their dogs regularly are commendable. Unfortunately, however, only one of such regularly-bathed dogs was not infested with ectoparasites during

in study. This possibly demonstrates that routine bathing with common bathing and/or washing soaps cannot control the ectoparasitic infestations. The study has also shown that even those bathed with chemical treated water (kerosene being the commonest) were not free from ectoparasitic infestations. It is important to note that although some dog owners bathed their dogs with lindane, those dogs were still infested with ectoparasites. It necessarily implies that such owners need to be adequately educated especially on the health hazards associated with the use of such an environmentally-unsafe chemical [18, 19]. It is interesting to find that dogs bathed regularly with diazinon treated water or coumaphos treated water were not negative for ectoparasitic infestations. Although diazinon and coumaphos are organophosphate acaricides, some previous studies have the occurrence of resistance in some ectoparasites against them [19, 20]. In view of this, it may be advisable to combine, or even replace, the use of the two afore-mentioned acaricides with more potent broad-spectrum anti-parasitic drugs such as selamectin [21].

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