

## ECTOPARASITES OF GOATS IN ETINAN, AKWA IBOM STATE, NIGERIA

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Accepted 5<sup>th</sup> June

In Etinan, a town in Akwa Ibom State, Nigeria, 492 goats were examined for ectoparasites. Of this number 212 bucks and 173 does were infested. Goats penned in homesteads were 76 (15.4 %) while 416 (84.6%) were on free range. Of the total penned goats only one was infested with ectoparasites. The ectoparasites were characterised and identified based on their morphological characteristics. Two lice species-*Linognathus africanus* and *Damalinia caprae*, six tick species- *Ixodes ricinus*, *Haemaphysalis punctata*, *Rhipicephalus appendiculatus*, *Boophilus decoloratus*, *Dermacentor andersoni*, and *Amblyomma variegatum*, and a flea- *Ctenocephalides sp* were collected. *L. africanus* was statistically the commonest ectoparasite infesting goats in Etinan ( $P < 0.001$ ). Does were statistically more infested ( $t_{(18)} = 2.62^*$ ;  $t < 0.05$ ) with *L. africanus* than bucks. Similarly, *I. ricinus* infestation of bucks was significantly higher ( $t_{(14)} = 3.90^{**}$ ;  $t < 0.01$ ) than infestation of does. Most of the goats (66.0%, 194/294) were monoinfested. Monoinfestations with only *L. africanus* was the highest (74.2%, 144/194), and was statistically the commonest. There were 82 (27.9%; 82/294) cases of double infestations, 13 (4.4%, 13/294) of triple infestations, and five cases (1.7%, 5/294) of quadruple infestations. Only *L. africanus* infestation increased significantly ( $P < 0.01$ ) with age of goat. No significant preferences for body regions of host were shown by ectoparasites. In view of the health and economic implications of ectoparasites infestations of goats, there is need for advocacy programmes on control of ectoparasites in small ruminants.

**Key words:** Goats, ectoparasites, infestations, Nigeria.

### INTRODUCTION

The West Africa Dwarf goat is found in both the savanna and forest zones of West Africa (Oppong and Yebuah, 1981). In Nigeria they thrive on grazing, browsing, or scavenging, and appear to relish road side and fallow grasses as well as shrub and bushes. Goat is an important source of meat. Productivity of livestock in the tropics is limited by their infestation with various ectoparasites. However, the way goats are reared by man, and the environmental conditions, could also determine the presence or survival of a particular species of ectoparasite on goats (Soulsby, 1978). The diseases caused by these ectoparasites of goats include, tick paralysis, retching, drooling saliva, choroptic mange disease, scabies, and skin lesions (Soulsby, 1978, Handerson 1986).

In Nigeria, a number of studies on the ectoparasites of goats have been reported. Okoh and Gadzama (1982), reported on the outbreak of *Sarcoptes mange* in Plateau state, where the morbidity was 61%; Iwuala and Okpala (1976), found *Ctenocephalides canis* infestation to be predominant in goats throughout the year. These observations were corroborated by Akinboade (1978). Reports by Ikeme (1976), show that *Amblyomma variegatum* ticks were

responsible for large septic sores and severe inflammation of the mammary gland of goats. Also high infestations of small ruminants by ectoparasites in Markurdi, Nigeria have been reported (Ofukwu and Akwuobu, 2010). There are documented reports on occurrences and distributions of ectoparasites infestations of goats in parts of Nigeria. However to the best of our knowledge, there are no such reports on ectoparasites infestations of goats in Akwa Ibom State, Nigeria.

Therefore, the aim of this study is to assess the ectoparasites situation of goats in Akwa Ibom area.

### MATERIALS AND METHOD

#### Study area

The study was conducted in Etinan, a semi-urban town in south-eastern Nigeria (Fig. 1). It lies in the tropical rainforest belt of West Africa, and is located on Latitude 5° 10' North and Longitude 7° 54' East. The area experiences two distinct seasons, the rainy or wet season (April to October), and the dry season (November to March) (Ime, 1989). The vegetation originally of the rainforest type, has now been greatly reduced to that of semi savanna because of human encroachment. Thirty eight villages of this town were

surveyed during the rainy season (April to September) for ectoparasites of the indigenous goat of the area, the Nigerian Dwarf Goat. In six of these villages all goats were penned in homesteads. Goats penned, tethered in bushes or free-ranging were examined for ectoparasites. In all cases, permission was first sought from owners to examine their goats. Owners also provided information on the age of their goats.

### Sample collection and identification

Goats were randomly selected and examined for ectoparasites. Samples collections were done in the mornings and evenings i.e when both the free-range and penned goats were at their sleeping quarters. To collect ectoparasites, each goat was held standing on a large white tarpaulin placed on the ground. The hair was brushed with a fine comb to remove lice and fleas, while forceps was used to pick out ticks. Hair parting [Lewis *et al.*, 1976] was also done, especially on regions with thick growth of hair.

Each body region was brushed separately, and the ectoparasites collected into labelled specimen bottles containing 70% ethyl alcohol. The ear, and the interdigital spaces were examined to remove ectoparasites. Specimens were latter counted, recorded and identified, (Soulsby, 1978, Hoogstraal, 1956, Cheng, 1973).

## RESULTS

Out of 492 goats examined 294 (59.8%), made up of 116 (39.5%) bucks and 178 (60.5%) does, were found to be infested with various species of ectoparasites. Total penned goats examined were 76 (15.4%), while those on free-range were 416 (84.6%). Three groups of ectoparasites namely ticks, lice and fleas were recorded (Table 1). There was no significant difference between the infestations of bucks and does (341; 50.8% and 330; 49.2%), respectively, ( $P > 0.05$ ). *Linognathus africanus* (331, 49.3%) was significantly the commonest ectoparasite infesting goats in the area ( $P < 0.001$ ). However, *L. africanus* infestation (24.5%) of bucks was statistically lower ( $t_{(18)} = 2.62^*$ ;  $t < 0.05$ ) than infestation of does (75.5%) as shown in Fig. 2, the prevalence of the other ectoparasites in relation to sex of hosts was higher in bucks (89.6%) than does (10.4%), especially with the tick *Ixodes ricinus* which was significant ( $t = 3.90^{**}$ ;  $t < 0.01$ ). With the exception of one goat, ectoparasites were rare on penned goats (Table 2).

Majority of the affected goats (66%, 194/294) were monoinfested, (Fig. 3) and infestation with *L. africanus* was the commonest (74.2%, 144/194). There were 82 (27.9%, 82/294) occurrences of double infestations, 13 cases of triple infestations (4.4%, 13/294), and five cases of quadruple infestations (1.7%, 5/294), (Fig. 3)

Incidence of ectoparasite infestations within the different age groups of goats (Tables 3) and (Fig. 4) revealed that, while *L. africanus* infestations increased significantly with increased age of goat, infestations with the other pests showed no such pattern.

Ectoparasites' predilection sites on the body of affected goats was shown in Table 4. Highest proportions of *L. africanus*, *D. caprae* and *Ctenocephalides* sp. were taken from the brisket, abdomen, and back regions (trunk). Preferences for the pelvic regions was noted for *I. ricinus*, *H. punctata*, and *De. andersoni*, while *A. variegatum*, *B. decoloratus* and *R. appendiculatus* showed preferences for the head region.

## DISCUSSION

In most villages of Etinan, goats are on free range fending for themselves in bushes along road sides and refuse dumps. They become easily exposed to pick ectoparasites from the environment, as well as transmit and receive infestations from other affected individuals. Ectoparasites were rare in six villages of the study area because in those villages there is a by-law prohibiting goats on free range. Goats in these villages appeared clean and healthy. The observed predominance of lice, ticks, and fleas as the main pests of goats in the study area is in consonance with previous studies, (Iwuala and Okpala, 1976, Kumar *et al.*, 1994). The high infestation rate of the free ranging goats emphasizes the need for optimal management system in goat keeping. The most abundant ectoparasite species in this study was *L. africanus*. This phthirapteran species has been reported elsewhere (Kumar *et al.*, 1994, Mulugeta *et al.*, 2010) as one of the major louse of goats. Lice may live on their hosts for several generations without dropping off as ticks do. This way, the infestation may accumulate with age of the goat. There were more *L. africanus* infested does than bucks in the study because, in this area, bucks are usually slaughtered at tender ages for meat, while does are usually retained for many years for breeding. As a consequence of this, does may, as they grow older, accumulate a large number of ectoparasites, especially if they are not well cared for.

The preference of *L. africanus* for the trunk region may be circumstantial, since it was not statistically significant. This preference may also be because, on the trunk, the hair is shorter and thinner thus making it easier for movement of lice. Movement of lice with their claws on the host's skin, as well as the piercing of the host skin with their mouth parts, may irritate the host so that a lousy goat scratches its trunk against walls, wooden objects and other similar hard structures. To avoid possible disturbance or sudden dislodgement from their hosts, ticks may select the

pelvic and head regions which are further away from the trunk for their attachment.

Free range goats acquire their infestation of ticks from infested vegetations. The young bucks are freer and explore a wider terrain than the does which are usually encumbered with kids and thus acquire less number of ticks, particularly *I. ricinus*. Some preference of ticks for younger goats was noted. Suggestion is that the skin of younger goats may be easier for ticks to pierce than that of old goats.

Ectoparasitism is still regarded as a serious problem for stock raising in Nigeria. Cost-effective control measures such as clean and well-constructed pens are recommended if increased productivity of goat meat is to be achieved.

**ACKNOWLEDGEMENTS**

The authors are grateful to all the farmers who permitted the use of their goats for the study. The contributions of Professor M. C. Dike of Ahmadu Bello University, Zaria, Nigeria, who confirmed the identities of the specimens is hereby appreciated.

**TABLE 1: Prevalence of Ectoparasites on goats in Etinan, Nigeria**

Ectoparasites	Hosts		
	Males No(%)	Female No(%)	Total No(%)
Insecta			
<i>Linognathus africanus</i>	81(24.5)	250(75.5)	331(49.33)
<i>Damalinia caprae</i>	-	5(100.00)	5(0.75)
<i>Ctenocephalides sp.</i>	2(11.8)	15(88.2)	17(2.53)
Arachnida			
<i>Ixodes ricinundu</i>	163(89.6)	19(10.4)	182(27.12)
<i>Boophilus decoloratus</i>	16(61.5)	10(38.5)	26(3.87)
<i>Rhipicephalus appendiculatus</i>	8(66.7)	4(33.3)	12(1.79)
<i>Haemaphysalis punctata</i>	44(73.7)	16(26.7)	60(8.94)
<i>Dermacentor andersoni</i>	14(43.8)	18(56.3)	32(4.77)
<i>Amblyomma variegatum</i>	6(100.00)	-	6(0.89)
<b>Total</b>	<b>341(50.8%)</b>	<b>330(49.2%)</b>	<b>671(100%)</b>

**Table 2: Ectoparasites counts on penned and free ranging goats in Etinan, Nigeria**

Ectoparasites	Penned goats no(%)	Free range no(%)	Total
<i>L. africanus</i>	3(0.91)	328(99.1)	331(49.3)
<i>D. caprae</i>	-	5	5(0.75)
<i>Ctenocephalides sp.</i>	-	17	17(2.5)
<i>I. ricinundu</i>	-	182	182(27.1)
<i>B. decoloratus</i>	-	26	26(3.9)
<i>R. appendiculatus</i>	-	12	12(1.8)
<i>H. punctata</i>	-	60	60(8.9)
<i>De. andersoni</i>	-	32	32(4.8)
<i>A. variegatum</i>	-	6	6(0.9)
<b>Total</b>	<b>3(0.4%)</b>	<b>668(99.5%)</b>	<b>671(100%)</b>

**TABLE 3: Infestation of goats with lice, ticks and fleas in relation to ages of goats in Etinan, Nigeria**

Ectoparasite	0-1 no(%)	Age group of animals in year					Total
		1-2 no(%)	2-3 no(%)	3-4 no(%)	4-5 no(%)	5 no(%)	
<i>L. africanus</i>	4(16.7)	79(44.4)	89(41.4)	56(40.9)	54(85.7)	49(90.7)	331
<i>D. caprae</i>	-	2(2.2)	3(1.4)	-	-	-	5
<i>Ctenocephalides sp.</i>	1(4.2)	2(2.2)	8(3.7)	6(4.4)	-	-	17
<i>I. ricinundu</i>	12(50.0)	58(32.6)	69(32.1)	38(27.7)	5(7.9)	-	182

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Table 3 continues

<i>B. decoloratus</i>	1(4.2)	6(3.4)	13(6.0)	5(3.6)	1(1.6)	-	26
<i>R. appendiculatus</i>	1(4.2)	2(2.2)	6(2.8)	3(2.2)	-	-	12
<i>H. punctata</i>	1(4.2)	12(5.6)	16(9.0)	23(16.8)	3(4.8)	5(9.3)	60
<i>De. andersoni</i>	4(16.7)	13(7.3)	12(5.6)	3(2.2)	-	-	32
<i>A. variegatum</i>	-	-	3(1.4)	3(2.2)	-	-	6
<b>Total</b>	<b>24</b> <b>(3.6%)</b>	<b>174</b> <b>(25.9%)</b>	<b>219</b> <b>(32.6%)</b>	<b>137</b> <b>(20.4)</b>	<b>63</b> <b>(9.4%)</b>	<b>54</b> <b>(8.0%)</b>	<b>671</b> <b>(100%)</b>

Table 4: Predilection sites of ectoparasite species on goats in Etinan, Nigeria

ECTOPARASITES	Head No(%)	Neck No(%)	Trunk No(%)	Legs No(%)	Pelvic region No(%)	Total
<i>L. africanus</i>	50(15.1)	30(9.1)	187(56.5)	40(12.1)	24(7.3)	331
<i>D. caprae</i>	-	1(20.00)	4(80.00)	-	-	5
<i>Ctenocephalides sp.</i>	1(5.9)	3(17.6)	13(76.5)	-	-	17
<i>I. ribicundus</i>	50(27.5)	22(12.1)	15(8.2)	25(13.7)	70(38.5)	182
<i>B. decoloratus</i>	10(38.5)	1(3.8)	4(15.4)	5(19.2)	6(23.1)	26
<i>R. appendiculatus</i>	6(50)	2(16.7)	-	2(16.7)	2(16.7)	12
<i>H. punctata</i>	13(21.7)	5(8.3)	6(10.00)	11(18.3)	25(41.7)	60
<i>De. andersoni</i>	4(12.5)	2(6.3)	5(15.6)	7(21.9)	14(43.8)	32

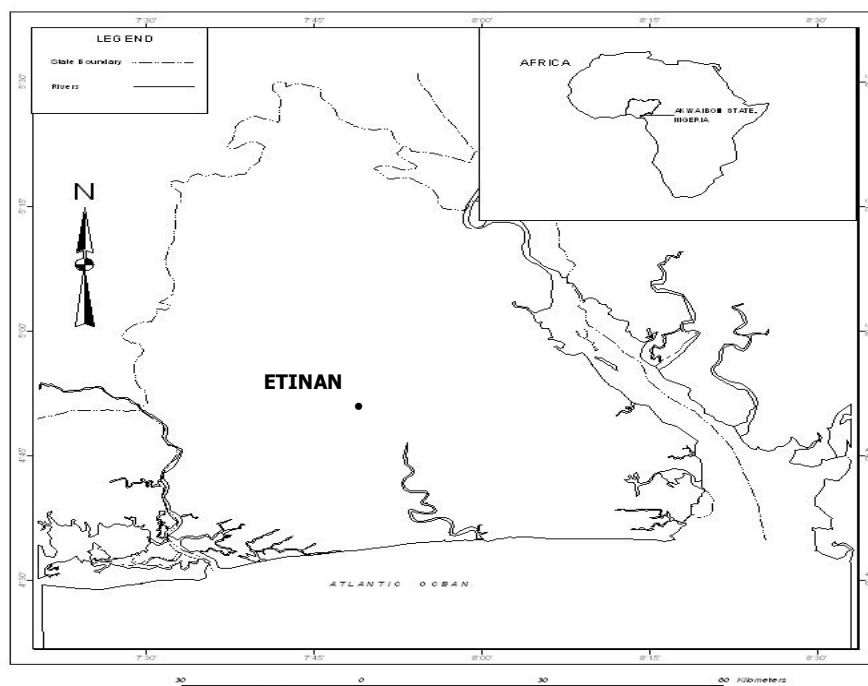


FIGURE 1: Map of Southeastern Nigeria showing position of Etinan

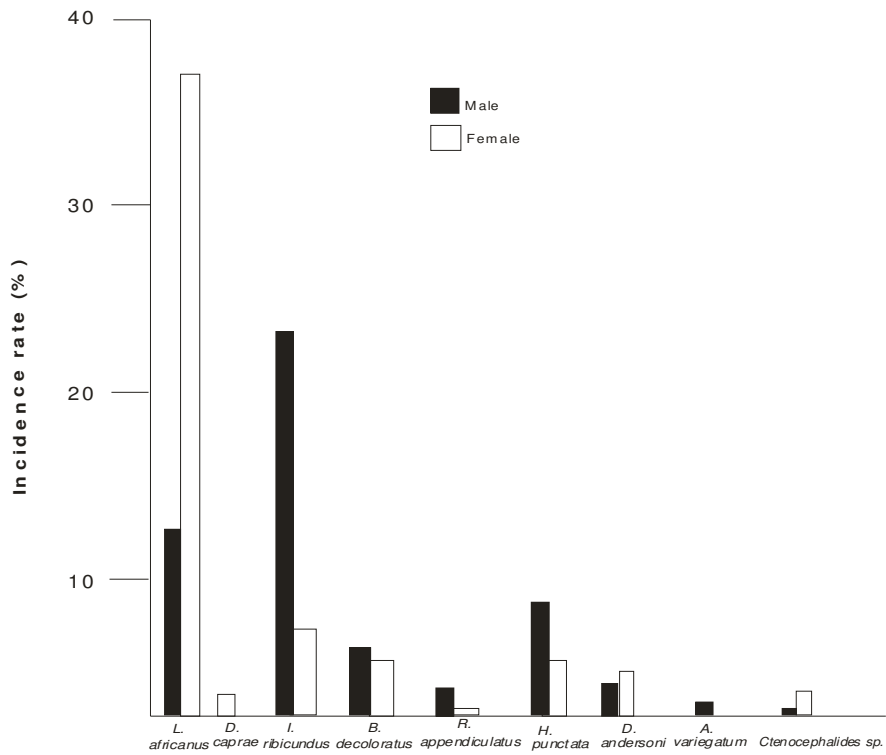


Fig 2. Prevalence of lice, ticks, and fleas in relation to sex of goats in Etinan

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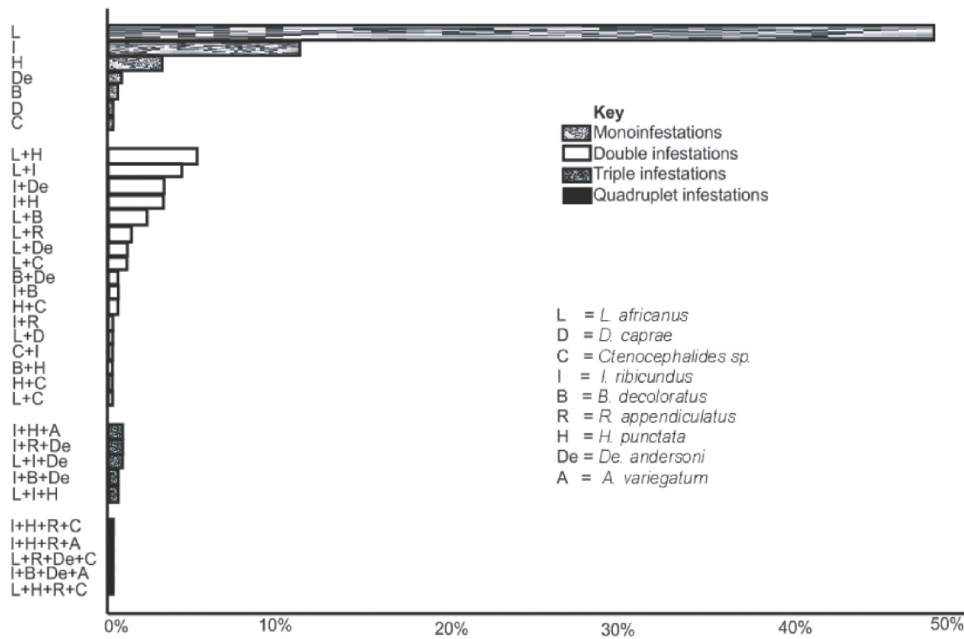


Fig. 3: Incidence of infestation of ectoparasites on goats in Etinan

Fig 3. Incidence of infestation of ectoparasites on goats in Etinan

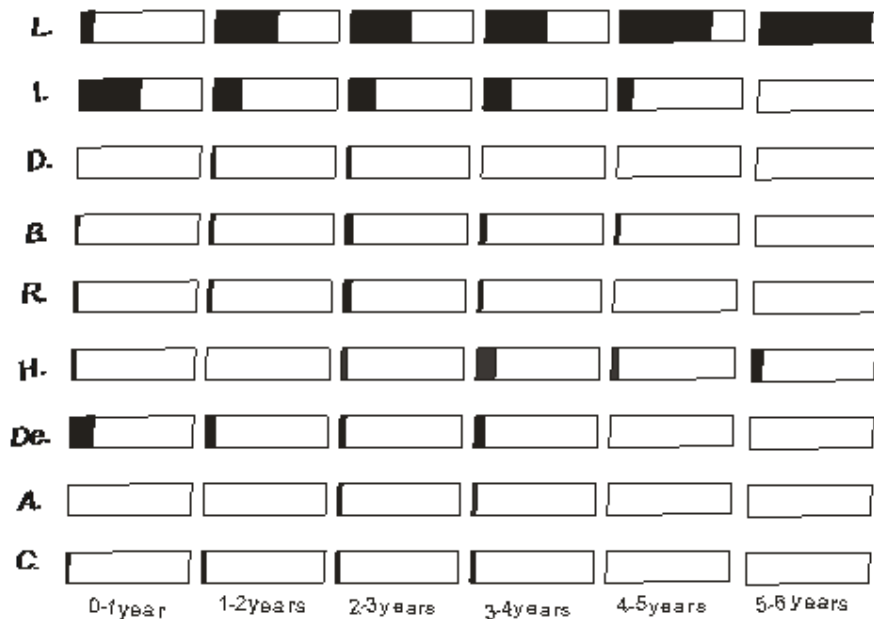


Fig. 4 : Prevalence of Lice, Ticks, and fleas on age of goats in Etinan

Fig 4. Prevalence of lice, ticks, and fleason age of goats in Etinan

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