

Survey of Ectoparasites of Farm Animals

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ABSTRACT

An investigation of ectoparasites of farm animals and their predilection sites was conducted in Michael Okpara University of Agriculture Umudike, animal husbandry farm Umuahia Nigeria from August to December 2008. The study was centred on cattle, sheep, goat and rabbit. Visible ectoparasites were collected from a total of 194 animals comprising of 40 cattle, 26 sheep, 72 goats and 56 rabbits. Out of the total, 97 (50%) were infested with one or more ectoparasites. The result showed that 24 (12.4 %) cattle, 37 (19.0%) goats, 17 (8.7 %) sheep and 19 (9.9 %) rabbits were infested. The ectoparasites identified were ticks 62 (31.9%), lice 18 (9.3%) and fleas 17 (8.8%). For all the animal species ticks were more prevalent and most common was *Rhipicephalus bursa* (17.5%) in goat, followed by *Hyalomma detritum* (11.3%) in cattle. Abdominal and tail region in cattle were found to be more infested. Age and season were significantly associated with the prevalence of the ectoparasites. The survey showed a high prevalence rate. To lessen the occurrence and influence of ectoparasites on farm animals suitable and planned control measure; extension services aiming at creation of awareness about the importance and control of ectoparasites for farmers are crucial.

Keywords: Ectoparasites, Predilection Sites, Farm Animals, Prevalence.

INTRODUCTION

Ectoparasites are diverse and highly adapted group of animals that inhabit the external body surface of vertebrates. They may live permanently on their host or they may occupy the host's immediate environment and visit the body of the host periodically. Ectoparasites, particularly ticks and mites are important parasites because of their voracious blood-feeding activity and as vectors of various agents of diseases in both man and livestock (Leeflang and Ilemobade, 1977; Agbede, 1981; Petney *et al.*, 2007). As a result of their activity, they may

have a variety of direct and indirect effects on their hosts (James-Rugu and Idu, 2008). Organophosphate - based dips serve as broad spectrum toxicant for control against all the ectoparasites in farm animals and dipping remains the most common method of prevention and treatment.

Farm animals are exploited in the country for diverse purposes including meat, milk and skin production, and also breeding as a means of cash income. Ectoparasites play key role in the rejection of skin (Nwosu *et al.*, 1990). They cause blood loss and very heavy infestations resulting in severe anaemia and generalized weight loss with a tendency to result in zoonosis. All these contribute towards the extreme reduction of animal productivity. The occurrence of ectoparasites of ruminants in Michael Okpara University of Agriculture, Umudike (MOUUAU) farm are yet to be quantified. Because of certain geographical specification and the probable presence of different types of ectoparasites, MOUUAU animal husbandry farm was selected for this study. In addition, animal farming is one of the main animal husbandry activities in MOUUAU. In Nigeria as a whole, ruminants and other mammals are particularly the major hosts for arthropod ectoparasites. Reports on ectoparasites in various parts of Nigeria exist Makurdi (Ofukwu and Akwuobu, 2010), Akwa Ibom (Ekanem *et al.*, 2011). Therefore, the objective of this study is to estimate the prevalence and to identify the prevailing species of farm animal ectoparasites in this agro- ecological zone of eastern Nigeria.

MATERIALS AND METHOD

Study Area

The study was carried out in Michael Okpara University of Agriculture (MOUUAU) Umudike Animal Husbandry Farm in Abia State, Nigeria and this has been described earlier (Ohaeri and Iwu, 2003). The climate is purely tropical with wet and dry seasons. Rainy season is from March to October while dry season is from November to February. The mean monthly rainfall is 146.5mm, mean monthly relative humidity is 80%, monthly temperature range from 21.9°C to 31.5°C, wind speed is 73.1km/day, vapour pressure is 27.6 millibare. Daily radiation is 369% cal cm²/day and daily evaporation is 3.2mm/day.

Ruminant Breed

Ruminant species involved in the study were;

Cattle comprising of three major breeds namely; White Fulani, Ndama specie and Muturu species while sheep/goat involved were all West African Dwarf.

Rabbit studied were three (3) different species comprising of Chinchilla, Newzeeland white and the Dutch species.

Sampling Method

The animals where sampled according to different ruminant sections during 2008. The total number of ruminants examined was 194, which comprised of 40 cattle, 26 sheep, 72 goats and 56 rabbits. This sampling was done based on the age and sex of the ruminants on weekly basis for a period of four months. The parasites were collected from animals of ages < 1 - 5 years.

Physical handpicking, use of forceps and brushing method were employed and specific points from where the ectoparasites were removed were noted. Visual inspection and palpation of the skin for ectoparasites on all parts of the animal body were performed and the parasites seen were collected from their attachment site. The collected samples were then transported in clean specimen bottles with 70% alcohol to Biological Science Laboratory of MOUUAU for identification and other entomological determination using dissecting microscope and light microscope. Identification of the ectoparasites was done using keys provided in Urquhart *et al.*, (1996) and Soulsby (1982).

Data Analysis

Data were analysed using simple percentages and chi-square was used to test for significance in infestation levels on the sampled animals according to sex and age.

RESULTS

The result of this study presented in Table 1 shows the occurrence of ectoparasites in ruminants in MOUUAU farm during 2008. Of 194 animals examined 97 (50.0%) were infested with higher infestation in goats 37 (19.0%). Fig 1 reveals higher prevalence of ticks 62 (31.9%) than the other arthropods.

Table 2 shows the frequency of occurrence of ectoparasites of ruminants in MOUUAU farm with respect to sex. In the overall animal species' sex prevalence, more males (25.2%) were infested than females (24.7%), though not significant ($X^2 = 2.94$, $df = 1$, $P > 0.05$). Individual animal sex infestation prevalence varies. The result in Table 3 shows that ruminants of above 2 years of age were more infested (33.0%) by ectoparasites than age group <1-2 which recorded an infestation rate of 17.0%. This age infestation difference was more evident ($X^2 = 7.52$, $df = 1$, $P < 0.05$) in cattle than in the other animal species studied.

Tables 1: Occurrence of Ectoparasites in Farm Ruminants

Animal Species	Number Examined	Number Infected	% Infected
Cattle	40	24	12.4
Sheep	26	17	8.7
Goat	72	37	19.0
Rabbit	56	19	9.9
Total	194	97	50.0

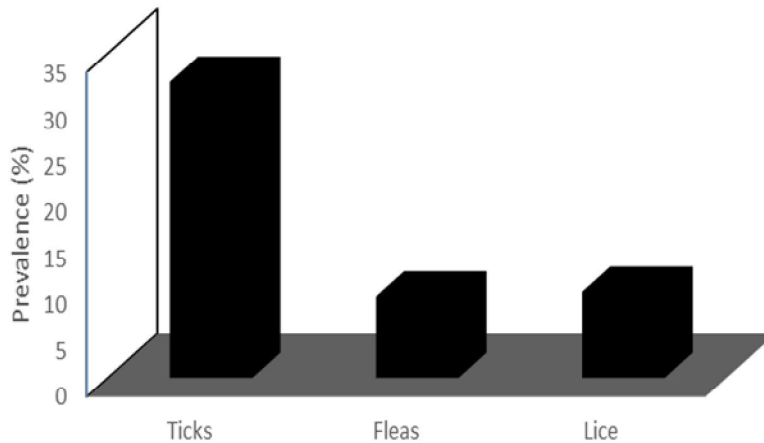


Fig 1: Prevalence of Ectoparasite Species Among Farm Animals

**Table 2: Occurrence of Ectoparasites in Farm Animals with Respect to Sex
Number Examined = 194**

Animal Species	Number Examined	Male Number Infected	% Infected	Number Examined	Female Number Infected	% Infected
Cattle	13	8	4.1	27	16	8.2
Sheep	9	7	3.6	17	10	5.2
Goat	32	24	12.3	40	13	6.7
Rabbit	18	10	5.1	38	9	4.6
Total	72	49	25.2	122	48	24.7*

* $P > 0.05$ ($\chi^2 = 2.94$, $df = 1$, Not significant) as compared to male

Table 3: Occurrence of Ectoparasites of Ruminants with Respects to the Age of the Ruminants

Number Examined = 194

Animal Species	<1 - 2 Years			> 2 Years		
	Number Examined	Number Infected	% Infected	Number Examined	Number Infected	% Infected
Cattle	16	7	3.6	24	19	9.8*
Sheep	9	6	3.1	17	11	5.7
Goat	29	16	8.2	43	21	10.8
Rabbit	18	4	2.1	38	9	4.6
Total (%)	72	33	17.0	122	64	33.0*

* $P < 0.05$ ($\chi^2 = 7.52$, $df = 1$, Significant) as compared to <1-2 years

Table 4 indicates that several kinds of arthropod ectoparasites (ticks, lice and fleas) existed on the body of the farm animals and that ticks were the most frequent. The highest number belonged to *Rhipicephalus bursa* 17 (17.5%) in goat followed by *Hyalomma detritum* 11 (11.3%) in cattle.

Table 5 shows the species of ectoparasites found on the farm animals according to the number collected from each species and the part of the body infested. The result showed that the abdomen and tails of the animals had more infestation than other regions. The predominant species in cattle was *H. detritum*, which was located more around the abdomen and tail. *R. bursa* was most predominant in the sheep and goat than other species. The main area of predisposition of *R. bursa* in sheep and goat were the abdominal and tail regions. In Rabbit, *R. bursa* was most predominant on the abdominal region.

DISCUSSION

The limiting supply of animal protein in Nigerian diet lies on the low or poor husbandry practices, inadequate feed supply and disease conditions especially those caused by ectoparasites. These diseases are associated with drop in milk production, poor quality hides and skin and generalized loss of weight with a tendency of becoming zoonotic (Nwosu *et al.*, 1990). Other diseases such as helminthiasis and coccidiosis are also frequently encountered with tremendous loss in farm animals.

Table 4: Ectoparasite Species Identified in Farm Animals

Animal Species	Number Infested	Ectoparasite Species	No. Identified (%)
Cattle	24	<i>Boophilus annulatus</i>	4 (4.1)
		<i>B. decoloratus</i>	1 (1.0)
		<i>Amblyomma variegatum</i>	2 (2.1)
		<i>Rhipicephalus bursa</i>	2 (2.1)
		<i>R. sanguineus</i>	3 (3.1)
		<i>Hyalomma detritum</i>	11 (11.3)
		<i>H. truncatum</i>	1 (1.0)
Goat	37	<i>R. bursa</i>	17 (17.5)
		<i>R. sanguineus</i>	4 (4.1)
		<i>Haematopinus spp</i>	5 (5.2)
		<i>Damalina ovis</i>	2 (2.1)
		<i>Linognathus stenopsis</i>	9 (9.3)
Sheep	17	<i>R. bursa</i>	9 (9.3)
		<i>R. sanguineus</i>	2 (2.1)
		<i>B. annulatus</i>	2 (2.1)
		<i>Ornithodoros laborensis</i>	2 (2.1)
		<i>Damalina caprae</i>	2 (2.1)
Rabbit	19	<i>Ctenocephalides felis</i>	9 (9.3)
		<i>C. canis</i>	8 (8.2)
		<i>R. bursa</i>	2 (2.1)

Michael Okpara University of Agriculture Umudike (MOUUAU) farm is a modern university animal production. Animals are grazed on pastures during the day and are housed at night. Supplementary feeds such as concentrates are often provided. In this research, a cross-sectional study extending over a period of four months was conducted from August to December 2008 with the objective of estimating the prevalence of ectoparasites in farm animals and identifying the predilection sites. The study revealed high prevalence of ectoparasites in the animals with highest infestation in goats. Ticks were the major ectoparasite encountered. This finding is in agreement with the report of Ofukwu and Akwuobu, (2010) in Makurdi, Nigeria as well as some other parts of the world (Yacob *et al.*, 2008). The study showed that more than half of the farm animals were infested and this has great impact on animal production. Therefore appropriate control measures are recommended.

Table 5: Occurrence of Ectoparasites According to Body Sites

Ruminants	No. Infested	Ectoparasite Species	No. Identified	Body Sites/Location						
				Head	Neck	Abdomen	Trunk	Leg	Tail	Pelvic
Cattle	24	<i>Boophilus annulatus</i>	68	2	4	23	5	8	17	9
		<i>B. decoloratus</i>	11	0	0	7	2	0	2	0
		<i>Amblyomma variegatum</i>	16	0	0	4	1	0	3	8
		<i>Rhipicephalus bursa</i>	22	2	3	9	4	2	2	0
		<i>R. sanguineus</i>	19	3	1	6	4	0	3	2
		<i>Hyalomma detritum</i>	83	0	0	32	10	12	20	9
		<i>H. truncatum</i>	3	0	0	1	0	0	0	2
Goat	37	<i>R. bursa</i>	51	4	5	24	4	1	13	0
		<i>R. sanguineus</i>	28	0	7	10	7	0	4	0
		<i>Haematopinus spp</i>	9	7	2	0	0	0	0	0
		<i>Damalina ovis</i>	4	2	2	0	0	0	0	0
		<i>Linognathus stenopsis</i>	25	19	6	0	0	0	0	0
Sheep	17	<i>R. bursa</i>	32	4	2	13	2	3	6	2
		<i>R. sanguineus</i>	12	0	2	4	2	0	4	0
		<i>B. annulatus</i>	6	0	0	2	2	0	0	2
		<i>D. caprae</i>	10	2	4	0	4	0	0	0
		<i>Ornithodoros laborensis</i>	4	0	0	1	0	1	2	0
Rabbit	19	<i>Ctenocephalides felis</i>	26	18	8	0	0	0	0	0
		<i>C. canis</i>	15	11	4	0	0	0	0	0
		<i>R. bursa</i>	4	0	0	4	0	0	0	0
Total			448	74	50	140	47	27	76	34

The prevalence and general indices of ectoparasites showed differences in all the animal species studied. Although ectoparasites were present on the animal population throughout the study period, their numbers seemed to increase particularly in August and September with higher temperatures and low relative humidity, and highly reduced during the period of late October and November. This result is comparable to the report of Pukuma *et al.*, (2011). Hot and humid season favour the propagation and multiplication of ticks (Soulsby, 1982; Estrada-Peña *et al.*, 2006). However influence of seasonal variation in this study did not cover all the periods of the year for in-depth discussion. The highest number of identified tick species belonged to *Rhipicephalus bursa* (9.3%) in sheep and (17.5%) in goat. In cattle the highest number of identified tick species was *Hyalomma detritum* (11.3%), In Rabbit the most prevalence ectoparasites identified was *Ctenocephalides felis* (9.3%) though according to Iwuala and Okpala, (1978), *B. annulatus* were the most prevalent ticks in the Eastern Nigeria.

Sheep and goats were infested by *Damalina ovis*, *Damalina caprae* around the neck and back areas, *Haematopinus spp* and *Linognathus stenopsis* on goats were recovered from the facial areas. Thus, *C. felis* infested the rabbit on the head (facial region and parts of the nostril) and *C. canis* infested the rabbit on the head (mouth) region. The preference for attachment sites on the host might be

due to easiness for the ectoparasites to acquire blood meal.

The control of ectoparasites is the greatest problems facing farm animal production in Nigeria currently. Accurate diagnoses of the type of ectoparasites that are infesting the farm animals with an understanding of the period of proliferation are essential for cost-effective control. Arthropod ectoparasites of farm animals are quite abundant in nature affecting the day-to-day activity and health status of animals and at the same time a jeopardy to food security (Young *et al.*, 1988; Olabode *et al.*, 2010). Therefore, to reduce the high prevalence and impact of ectoparasites on farm animals, appropriate and strategic control measure; extension service all aimed at creation of awareness about the importance and control of these ectoparasites for animal farmers are indispensable.

CONCLUSION

Annual losses in livestock production due to ectoparasite infestations are very alarming. This survey provides important information on the occurrence and dynamics of ectoparasites species and their predilection sites on farm animals in MOUAU. It also confirms the endemicity of arthropod ectoparasites and their associated diseases with their negative impact on animal production. Therefore, the control of these ectoparasite species is paramount if productivity of livestock is to be enhanced.

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