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A SURVEY ON THE ECTOPARASITES OF SOME LIVESTOCK FROM SOME AREAS OF BORNO AND YOBE STATES

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SUMMARY

An investigation into ectoparasites of livestock from Maiduguri Metropolitan and Askira Uba (Borno State), Fika and Nangere (Yobe State) was conducted. A total of 1,600 camels, 2,200 cattle, 500 sheep, 400 goats, 230 dogs and 250 pigs were examined for ectoparasites. Ticks, lice and flies were the ectoparasites recorded. Infestation rate of ticks was high on camels, cattle and dogs. Tick infestation rate on sheep and goats was 43.0% and 26.5% respectively. The species of ticks recorded were all from the Family Ixodidae. Ticks on camels were *Hyalomma rufipes, Hyalomma dromedarii, Boophilus decoloratus* and *Hyalomma truncatum*. In order of predominance, cattle were infested with *Boophilus decoloratus, Hyalomma tuncatum, Rhipicephalus sanguineus, Haemaphysalis leachii* and *Amblyomma lepidum*. Sheep and goats were also infested with ixodid ticks though the infestation rates were relatively low. The flies trapped in this study comprised of members of the Order Diptera while lice were drawn from the Order Anoplura. The level of infestation rates of ectoparasites in relation to age groups and sex of hosts were assessed. The population of the ectoparasites on different hosts showed wide differences.

KEY WORDS: Ectoparasites, Livestock, Borno and Yobe States

INTRODUCTION

Ticks, mites, lice and fleas have been noted as ectoparasites of livestock (Soulsby, 1975). Iwuala and Okpala (1978a,b) stated that the productivity of livestock animals in the tropics is limited very much by their relationship with obligate resident blood sucking arthropods. It has been reported that a period of increase in numbers of parasites is usually followed by a period of decline in numbers (Nelson *et al.*, 1979).

Detail reports have been presented on the ectoparasites of farm and domestic, wild and game animals in different parts of developed countries. In Nigeria, Mohammed (1974) reported the species of ticks on cattle in Zaria area of Northern Nigeria. Similarly, Dipeolu (1974, 1975) identified the ticks of trade and trek cattle in Western Nigeria. Also from the Eastern part of the country, Iwuala and Okpala (1978 a,b) presented a list of various ectoparasites of Nigerian livestock. James-Rugu and Iwuala (2000) have listed ectoparasites hosted by domestic animals in parts of the middle Belt zone.

Certain factors have been observed to affect the distribution of ectoparasites on their hosts. Among these factors are season (James-Rugu and Iwuala, 1992) and mode of livestock rearing (James-Rugu and Iwuala, 1995). The behaviour of animals such as rolling of some animals on grasses contributes a great deal in the number of ticks harboured by their hosts (James-Rugu and Iwuala, 1998).

The host not only nurtures ectoparasites but, in turn receives secretions and

excretions from them, as well as trauma (Bell *et al.*, 1982). Some of the substances are antigenic and are therefore, capable of eliciting allergic and immune reactions. Ticks for, instance, have been incriminated as reservoirs and vectors of a number of protozoan, viral, rickettsial and bacterial infections (Harwood and James, 1969).

Ectoparasites distributions in some parts of the country are unknown. Although Unsworth (1952) surveyed ticks of cattle from the Northern Territories, the study concentrated entirely on ixodid ticks of cattle. There is paucity of information on ectoparasites of domestic animals from Borno and Yobe States of Northern Nigeria. Considering the devastating effects caused as a result of ectoparasites infestation, this study was undertaken in order to determine the species of ectoparasites that commonly infest domestic animals in these areas, to relate prevalence of ectoparasites to sex of hosts and to ascertain ectoparasites infestation rate in the different sampling areas.

MATERIALS AND METHODS

Study area

The study was conducted in Askira Uba and Maiduguri Metropolitan Local Government Councils of Borno State; Fika and Nangere Local Government Councils of Yobe State.

Animals sampled

The animals sampled were either free-ranging or penned camels, cattle, sheep, goats, dogs and pigs. Parameters such as age group, sex of hosts and predilection of the ectoparasites were carefully noted during sampling of ectoparasites from the laboratory.

Collection of ectoparasites

Ticks and lice were collected by forceful detachment (Iwuala and Okapala, 1978a,b, James-Rugu and Iwuala, 1998). The specimens were preserved in labeled glass bottles containing 70% alcohol. All ectoparasites collected were transported to the laboratory within the shortest time possible but never more than 12 hours.

Processing of ectoparasites

With the exception of flies, smaller ticks, lice and fleas were processed. The method of Iwuala and Okpala (1978a,b) was employed. This involved warming in potassium hydroxide, rinsed in distilled water and dehydrated through ascending grades of methanol or ethanol, cleared in Xylene and mounted in Canada Balsam.

Identification of the ectoparasites

Ectoparasites were identified to species level using the parameters stipulated by Hoogstraal (1956, 1958, 1964), Kaiser and Hoogstraal (1964).

RESULTS

All the camels examined and 81.8%, 90.4% and 43.0% of cattle, dogs and sheep were respectively were infested with ticks (Table I). Goats were the least infested with ticks (Table 1). Goat infestation with ticks (26.5%) was the least (Table I). Lice and flies were the other group of ectoparasites recorded. Lice infestation was noticeable on pigs and dogs. All the pigs examined (100%) and 13.0% of dogs were infested by lice. As shown in Table I, flies were predominantly recorded in dogs (54.3%), cattle (34.2%) and camels (12.5%).

Ectoparasites recorded in relation to age group and sex of hosts showed that a mean score of 46.0 ticks occurred on adult male

dogs whereas 9.44 flies were recorded per adult female dog (Table IIA). Similarly, young males (36.22) and adolescent females (33.33) camels had the highest prevalence of ticks infestation (Table IIB). Tick infestation on sheep was more pronounced on adult female animals than on the other age groups with a mean score of 21.25 of ticks per female sheep. In the case of goats, 97.5 of ticks were observed per adult male animal (Table IIB).

Species of ticks recorded on camels were *Hyalomma rufipes* (34.86%), *Hyalomma dromedarii* (30.35%), *Boophilus decoloratus* (24.00%) and *Hyalomma truncatum* (10.55%) (Table IIIA). In ascending order, ticks on cattle were *Amblyomma lepidum* (2.00%), *Haemaphysalis leachii* (8.77%), *Rhipicephalus sanguineus* (8.90%) *Amblyomma variegatum* (11.37%), *Hyalomma rufipes* (11.46%), *Rhipicephalus everisi* (7.85%), *Hyalomma truncatum* (17.90%) and *Boophilus decoloratus* (21.78%) (Table IIIA).

TABLE I: Infestation rates of ectoparasites on livestock in selected Local Government Councils of Borno and Yobe States

Hosts (Number sampled)	Number of animals infested with various ectoparasites		
	Ticks	Lice	Flies
Camels (1,600)	1600 (100.0*)	-	200 (12.5)
Cattle (2,200)	1800 (81.8)	-	752 (34.1)
Sheep (500)	25 (42.0)	-	-
Goats (400)	106 (26.5)	-	-
Dogs (230)	208 (90.4)	30 (13.0)	125 (54.3
Pigs (280)	-	280 (100.0)	-

*percentage of population of animals infested by ectoparasite

TABLE IIA: Mean distribution of ectoparasites in relation to the age group/sex of dogs and pigs

Host animals	Age-group	Sex of animals examined	No. of animals examined	Total no. of Ectoparasites		
				Ticks	*Flies*	*Lice*
	Young	Male	9	-	-	300 (33.33)
		Female	10	-	-	25 (2.50)
Dogs	Adolescent	Male	36	-	215 (5.97)	60 (1.67)
		Female	80	-	245 (3.06)	51 (0.64)
	Adult	Male	50	2300 (46.0)*	140 (2.8)	854 (17.08)
		Female	45	800 (17.78)	425 (9.44)	815 (18.11)
	Young	Male	67	-	-	38 (0.57)
		Female	70	-	-	17 (0.24)
Pigs	Adolescent	Male	60	-	-	120 (2.00)
		Female	21	-	-	25 (1.19)
	Adult	Male	50	-	-	2800 (56.00)
		Female	12	-	-	5700 (475.00)

* Mean occurrence of ectopaeasites/animal

TABLE IIB: Mean distribution of ectoparasites in relation to the age group/sex of camels, cattle, sheep and goat

Host animals	Age group	Sex of animals aniamals	No of animals examined	Total number of Ectoparasites	
				Ticks	Flies
	Young	Male	36	1304 (36.22)*	1000 (27.78)
		Female	49	6 (0.12)	175 (3.57)
Camels	Adolescent	Male	1000	60 (0.06)	80 (0.08)
		Female	24	800 (33.33)	20 (0.83)
	Adult	Male	29	1020 (3.51)	200 (0.69)
		Female	300	430 (1.43)	100 (0.33)
	Young	Male	420	600 (1.43)	25 (0.06)
		Female	320	611 (1.19)	74 (0.23)
Cattle	Adolescent	Male	160	1065 (6.46)	18 (0.11)
		Female	855	1015 (2.86)	15 (0.04)
	Adult	Male	450	1600 (3.56)	300 (0.67)
		Female	490	500 (1.02)	2 (0.00)
	Young	Male	100	-	-
		Female	85	-	-
	Adolescent	Male	152	180 (1.18)	-
Sheep		Female	102	366 (3.59)	-
	Adult	Male	76	145 (1.91)	-
		Female	12	255 (21.25)	-
	Young	Male	142	279 (1.79)	-
		Female	105	-	-
Goat	Adolescent	Male	120	120 ()	-
		Female	3	-	-
	Adult	Male	8	780 ()	-
		Female	22	300 ()	-

TABLE IIIA: Percentage population and mean occurrence of ticks in the different animal species in selected communities of Borno and Yobe States

Species of ticks	Animal hosts and tick population			
	*Camels (3620/1600)**	*Cattle (5391/2,200)*	*Sheep (947/500)*	*Dogs (3100/230)*
Rhipicephalus sanguineus	0	480 (8.90)	0	0
Unidentified *Rhipicephalus* species	0	0	0	673 (21.17)
Ripicephalus evertsi	0	962 (17.84)	0	0
Haemaphyalis leachii	0	437 (8.77)	0	215 (6.94)
Amblyomma variegatum	0	613 (11.37)	473 (49.95)	728 (23.48)
Amblyomma lepidum	0	106 (1.97)	0	219 (7.06)
Boophilus Decoloratus	876 (24.20)**	1174 (21.78)	474 (50.05)	1265 (40.81)
Hyalomma truncatum	382 (10.55)	965 (17.90)	0	0
Hyalomma rufipes	1262 (34.86)	618 (11.46)		0
Hyalomma dromedaeii	1100 (30.38)	0		0

*Total number of ticks collected/Total number of of animals examined

**Tick species population as a percentage of total number of all ticks from animal species

TABLE IIIB: Percentage population and mean occurrence of lice on the different animal species in selected communities in Borno and Yobe States

Species of Lice	Animal hosts and lice population				
	*Camels (0/1600)**	*Cattle (0/2,200)*	*Sheep (0/500)*	*Dogs (2105/230)*	*Pigs (8700/280)*
Haematopinus suis	0	0	0	0	8700 (100)
Linognathus setasus	0	0	0	2105 (100**)	0

*Total number of lice collected/Total number of of animals examined

**Lice species population as a percentage of total number of all lice from animal species

Species of ticks on dogs were *Bhoophilus decoloratus* (40.81%), *Amblyomma variegatum* (23.48%), unidentified *Rhipicephalus species* (21.71%), *Amblyomma lepidium* (7.06%) and *Haemaphysalis leachii* (6.94%). *Musca domestica* accounted for 38.92% of flies on camels while Tabanus species accounted for 61.08% (Table IIIC). Infestation rate of *Musca domestica* on cattle was 71.89% which was by far more tan the prevalence rate of Tabanus species (Table IIIC).

Regarding infestation rates of ectoparasites in the different localities, cattle examined from Askira/Uba showed tick infestation rate of 89.5% while 48.0% of sheep from the same area were infested with ticks (Table IV). Similarly, 90.0% of sheep from Fika/Nangere were infested with tick (Table IV). Infestation rates of the different animal species by the different ectoparasites varied widely between the different localities.

TABLE IIIC: Percentage population and mean occurrence of flies on the different animal species in selected communities in Borno and Yobe States

Species of flies	Animal host and flies population			
	*Camels (1575/1600)**	*Cattle (434/2,200)*	*Sheep (0/500)*	*Dogs (1025/230)*
Musca domestica	613 (38.92)**	312 (71.89)	0	1025 (100)
Tabanus spp	962 (61.08)	122 (28.11)	0	0

*Total number of flies collected/Total number of of animals examined

**Flies species population as a percentage of total number of all flies from animal species

TABLE IV: Comparative rates of ectoparasites infestation at selected Local Government Area o Borno and Yobe State

LGA	Hosts and number of animals examined	Number infested with ticks (%)	Number infested with lice (%)	Number infested with flies (%)
	Cattle (670)	600 (89.55)	-	400 (59.70)
	Sheep (250)	120 (48.0)	-	-
Askira/Uba	Goats (100)	6 (6.00)	-	-
	Dogs (230)	115 (50.0)	30 (13.04)	-
	Pigs (280)	-	280 (100)	
Maiduguri	Camels (596)	596 (100)	-	120 (20.13)
Metropolitan	Cattle (1020)	1010 (99.0)	-	248 (32.5)
Council	Sheep (200)	50 (25)	-	-
	Goats (180)	20 (11.1)	-	-
	Camels (200)	200 (100)	-	80 (40.0)
Fika/Nangere	Cattle (510)	190 (37.5)	-	406 (21.31)
	Sheep (50)	45 (90.0)	-	-
	Goats (120)	80 (66.6)	-	-

DISCUSSION

Parasites of animals from Borno and Yobe States were noted to be ticks, lice and flies. All the Camels examined (100.0%) were infested with ticks. Dogs and cattle also showed high infestation rate. This is in agreement with the work of James-Rugu and Iwuala (1992, 1995, 1998) who recorded high infestation rates o ticks on these hosts.

The infestation of sheep and goats was low compared with the collection made from camels, dogs and cattle. This pattern of infestation rate has also been reported by Beaton (1939) and Dipeolu (1975). Except for dogs and pigs all other animals were free from lice infestation. This finding in agreement with the work of James-Rugu (1993) who observed high infestation rate of lice, *Haematopinus suis* on pig. Dogs, cattle and camels harbored species of flies. further observations showed that pigs were unifested with flies, this differed from the findings of James-Rugu and Anosike (1994) who recorded flies as frequent ectoparasites of these animals.

The parasitic level of infestatiionr ate of ectoparasites was determined in relatiion to the age group and sex of host. Data presented revealed that ticks and flies occurred on young camels. The study also showed that fewer ticks occurred on adolesent male and adult male cattle. This findings agree with the report of James-Rugu and Iwuala (1998) who noted that adult/older animals usually carry greater load of ticks than the young hosts.

Ectoparasites recovered in this study are from the genera of ticks previously reported by Unsworth (1952), Mohammed (1974), Dipeolu (1974, 1975), Iwuala and Okpala (1978a,b) and Pegram (1976). The species of ticks which are from the Family Ixodidae comprised of the genera *Hyalomma, Amblyomma, Boophilus* and *Haemaphysalis*.

Fewer numbers of *R. sanguineus* occurred on cattle. The low number of these ticks on cattle is because *R. sanguineus* has been reported to be associated with dogs (Hoogstraal, 1956) and its incidence on cattle might have been accidental which is supported by the relatively low number. In a similar investigation Ouhelli and Pandey (1982) attributed the presence of these ticks on cattle to the close contact of these animals with infested dogs.

H. leachii occurred at a low rate. Very few of these ticks were sampled on dogs from the two states. Its low incidence may be associated with the pasture conditions of the area which is unfavourable for development of these ticks (Hitchcoch, 1955). Similarly, Theiler (1969) reported that the distribution and abundance of ticks can be related to climate and vegetation.

The dominant species of ticks on camels were *H. rufipes* and *H. dromedarii*. The high prevalence rate of these ticks on camels has been recorded by Pegram (1976) who recorded numerous number on these ectoparasites. From the above, it would appear that there is narrowness of host range.

Musca domestica and *Musca sorbens* were caught on dogs, sheep, goats and cattle. The flies were not host specific. Their presence on these hosts showed their potential in being good mechanical vectors on a wide range of hosts.

Having assessed the ectoparasitic levels on the different hosts, the study has opened

new areas that will expand and update our knowledge on the understanding of ectoparasite in the transmission of various disease agents. It is hoped that when this is achieved, appropriate steps would be taken towards controlling these ectoparasites so that this will not pose deleterious effects on the animal.

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