



Epidemiological Study on Some Parasitic Helminths of Cattle in Delta North, Delta State, Nigeria

Lemy EE* and Egunyenga AO

Department of Animal and Environmental Biology, Faculty of Science, Delta State University, Abraka, Nigeria

Abstract

A study to determine the occurrence and distribution of parasitic helminthes of veterinary importance in faecal samples from cattle was carried out at the abattoirs in Delta North, Delta State. Samples were collected from slaughter slabs at Agbor and Asaba. A total of 325 samples were examined for helminth parasites. Differential parasite count, faecal floatation and direct faecal smear technique were used to analyse the faecal samples. The identified species revealed the presence of helminths of three classes which include the Nematodes, Trematodes and Cestodes with a total of 10 species respectively. The occurrence of parasitic helminths in the samples at various locations showed significant ($P < 0.05$) differences between the different helminths species and location respectively. The level of prevalence of parasitic helminths encountered include *Ascaris* sp. 25 (10.5%), *Bonustomum* sp. 19 (8.0%), *Cooperia* sp. 11 (4.6%), *Ostertagia* sp. 15 (6.3%), *Strongyloides* sp. 23 (9.7%), *Trichuris* 35 (14.8%), *Trichostrongyle* sp. 13 (5.5%), *Paraphostimum* sp. 18 (7.6%), *Fasciola* sp. 60 (25.3%) and *Taenia* sp. 18 (7.6%). The results obtained showed high prevalence of helminth parasites which could be due to the free ranging and grazing system and poor animal husbandry practices. However, cattle should be well inspected and at necessary point treated for parasitic diseases. Proper management practices and sanitary measures at slaughter slabs should strictly be employed as this will help check environmental contamination.

Keywords: Parasitic helminthes; Veterinary importance; Abattoir; Delta North

Introduction

Nigeria is the largest livestock producer in the Sub-Saharan Africa with population of 34.5 million goats, 22.1 million sheep and 13.9 million cattle. The larger proportion of these animals' population are however largely concentrated in the northern region of the country than the southern region [1]. This is followed by Ethiopia and the Sudan in the African continent respectively [2]. Among all the livestock that make up the farm animals in Nigeria, ruminants, comprising sheep, goats and cattle, constitute the farm animals largely reared by farm families in the country's agricultural system [1].

Nigeria had a mean cattle population of 13.9 million in 1990, of which 11.5 million of this population were kept under pastoral system [3] and 2.4 million in the villages [4]. Furthermore, these cattle were predominantly zebu, such as, Bunaji (White Fulani), Rahaji (Red Bororo), Sokoto gudali and others. A seasonal change in the relative proportion of these animals in various ecological zones of the country has also been reported. In communities where livestock production have become the mainstay of the people, Gastro-intestinal infection have, in addition to other socio-economic parameters, constituted major impediment to the development of an economically viable livestock industry [5].

The helminths consist of parasites of plants, man and other animals that inhibit different parts of their host. Helminths infection is a worldwide problem which brings about large economic losses in a variety of ways to both large and small scale farmers. Infection can cause reduction in food intake and lower weight gains. There could also be a reduction in milk production or even mortality in extreme cases [6]. The most common intestinal helminths of cattle include the *Trichostrongylus* spp, *Heamonchus* spp, *Oestergia* spp, *Oesophagostomum* spp, *Bunostomum* spp, *Trichuris* spp, etc. The larva of intestinal helminth is released after the host ingests the eggs. The larva penetrates the interior part of small intestine for about 2-10 days before moving to the caecum where it moults to adult [7].

Variation in locations and management practises has been attributed to be a possible reason for differences observed in the prevalence of helminth parasites in cattle [8-10] stated that animals are exposed to massive helminth infection when they are maintained in an unhygienic, dark, congested and poorly kept ranches and also when fed with contaminated food and water. Earlier Dada [11], Cox [12] reported that age affected the distribution of parasites and in the young calves it was characterized by weight loss and diarrhoea. It was further suggested by Dada [11] that poor management such as poor grazing practices, infrequent transfer of animals from the right holding place and watering of animals from natural pool during the rainy season affected the animals.

It has been reported, [13] that prevalence of parasitic gastro-enteritis is related to the agroclimatic conditions like quantity and quality of pasture, temperature, humidity and grazing behaviour of the host and also, that susceptibility to infestation is influenced by factor of age [14]; breed [15]; species [16]; health status, physiological factors of pregnancy and previous exposure to parasites [17]. The findings that nomadic flocks had more infection than the sedentary have been reported to support the higher prevalence of helminth parasites for cattle, sedentary flocks especially, under the traditional management system, are under strict confinement and zero-grazed leading to less risk of helminth infection than in nomadic flocks [18,19].

*Corresponding author: Lemy Emmanuel Ede, Department of Animal and Environmental Biology, Faculty of Science, Delta State University, Abraka, Nigeria, Tel: +2348066231663; E-mail: emmalems03@gmail.com

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In cattle, Helminthiasis is a polyethiologic condition with varying rates of effects brought about by hardship leading to mortality with huge economic losses, hence the great need to control or possibly eradicate this debilitating disease [20]. Based on the above and the scarcity of data on the helminth associated with cattle in this region, this study is therefore carried. The objectives of this study include assessing the presence and distribution of intestinal helminth of veterinary importance of cattle in slaughter houses of Delta North with a view of establishing a general prevalence rate and distribution of various species of intestinal parasites.

Materials and Methods

Description of study area

This study was conducted in Delta State, Nigeria. Delta State covers a landmass of about 18,050 km² of which more than 60% is land. The state lies approximately between Latitude 5000 and 6045' east and Latitude 5000 and 6030' north. The state is generally low-lying without remarkable hills. It has a wide coastal belt inter-lace with rivulets and streams, which form part of the Niger-Delta. Geographically, the climate of Delta State is characterized by two different seasons; the rainy and wet seasons. The rainy season occur between the months of April and October with a break in August popularly known as the "August Break". The annual rainfall varies from 2,032 mm–3,540 mm while the dry season occurs between the months of November and March with short period of cold drought in late December and early January. The state has a tropical climate, rainforest vegetation and a characteristic mangrove in Delta South and Delta North District (Federal Republic of Nigeria Gazette, 2007).

Sample collection

A total number of 325 faecal samples were collected randomly from the abattoir in Delta North comprising of Agbor with 213 faecal samples and Asaba with 112 faecal samples respectively. The samples were collected on weekly basis for the period of five months from October 2014 to February 2015. The samples were collected in the early hours of the morning. All samples were collected in a clean transparent universal bottle for laboratory processing. All specimen collected were properly labelled.

Laboratory procedures

Samples collected were subjected to different methods of laboratory analysis which include the differential parasite count by Armour [21], faecal floatation and direct faecal smear by Hansen and Edosomwan [22,23].

Statistical analysis

Descriptive statistics was used to analyse important variables and Analysis of Variation (ANOVA) was used to test significant association between infection and sex at p<0.05 level of significance.

Results

A total number of 325 faecal samples were collected and examined for helminth parasites; out of which 190 (58.46%) of the samples were positive to helminth parasites while 135 (41.54%) of the samples were negative of helminth parasites. A total of 213 faecal samples were examined from Agbor out of which 117 (54.9%) were positive to helminth parasites and 96 (45.1%) were negative to helminth parasites. Asaba recorded a total of 112 faecal samples that were examined with 73 (65.2%) positive to helminth parasites and 39 (34.8%) negative to

helminthes parasites (Table 1). The prevalence of helminths parasites at the various locations in relation to sex is presented in Table 2. From the 117 positive samples obtained from Agbor, 81 (69.2%) were male while 36 (30.8%) were female. Asaba recorded 73 positive samples out of which 42 (57.5%) were male and 31 (42.5) were female respectively.

The identified species revealed the presence of helminths of three classes which include the Nematodes, Trematodes and Cestodes with a total of 10 species respectively. Helminths of the class Nematode were the most prevalent in all the locations samples. Nematode comprised of seven species which include *Ascaris* sp., *Bonustomum* sp., *Cooperia* sp., *Ostertagia* sp., *Strongyloides* sp., *Trichuris* and *Trichostrongyle* sp. This was followed by the class Trematode which comprised of two species including *Fasciola* sp. and *Paraphostomum* sp. The least was observed in the class Cestode which had one species which is the *Taenia* sp. From the result, *Trichostrongyle* sp. was absent from samples obtained at Asaba.

The occurrence of parasitic helminths in the samples at various locations showed significant (P<0.05) differences between the different helminths species and location respectively. The occurrence of parasitic helminths in the samples at various locations showed significant (P<0.05) differences between the different helminths species and location respectively. The level of prevalence of parasitic helminths encountered include *Ascaris* sp. 25 (10.5%), *Bonustomum* sp. 19 (8.0%), *Cooperia* sp. 11 (4.6%), *Ostertagia* sp. 15 (6.3%), *Strongyloides* sp. 23 (9.7%), *Trichuris* 35 (14.8%), *Trichostrongyle* sp. 13 (5.5%), *Paraphostimum* sp. 18 (7.6%), *Fasciola* sp. 60 (25.3%) and *Taenia* sp. 18 (7.6%) (Table 3).

Discussion

The occurrence and prevalence rate of different species of helminths in animal population is quite a complex subject like worms themselves. It is governed by a variety of factors. Most important, however, may be the climatic conditions supportive to the perpetuation of life cycles of these parasites. Naturally, sub-tropical climates in the temperate and humid regions are more conducive for the development and survival of larval forms and also for the vectors/intermediate hosts [24]. From the above results, nematodes dominated in the overall helminths parasites in cattle at the different abattoirs in Delta North area of Delta State. However, many of them do not require an intermediate host for completion of their life cycle as species of Nematode such as the *Strongyloids*, *Ascaris* and *Trichuria* have direct lifecycle and cattle become infested by ingesting infective larvae with grass [25].

Higher prevalence of helminths parasites in males compared

Location	Number examined	Positive	Percentage (%)	Negative	Percentage (%)
Agbor	213	117	54.9	96	45.1
Asaba	112	73	65.2	39	34.8
Total	325	190	58.5	135	41.5

Table 1: Prevalence of helminths parasites of veterinary importance in cattle at the various abattoirs.

Location	Male		Female	
	Positive	% Prevalence	Positive	% Prevalence
Agbor	81	69.2	36	30.8
Asaba	42	57.5	31	42.5
Total	123	64.7	67	35.3

Table 2: Prevalence of helminths parasites of veterinary importance at various locations in relation to sex.

Location	Nematode							Trematode		Cestode
	<i>Ascaris</i> sp.	<i>Bonustomum</i>	<i>Cooperia</i>	<i>Ostertagia</i>	<i>Strongyloides</i>	<i>Trichuris</i>	<i>Trichostrongyle</i>	<i>Paraphostimum</i>	<i>Fasciola</i>	<i>Taenia</i>
Agbor	14 (10.5)	12 (9.0)	3 (2.3)	9 (6.8)	11 (8.3)	21 (15.8)	13 (9.8)	11 (8.3)	32 (24.1)	7 (5.3)
Asaba	11 (10.6)	7 (6.7)	8 (7.7)	6 (5.8)	12 (11.5)	14 (13.7)	0 (0.0)	7 (6.7)	28 (26.9)	11 (10.6)
Total	25 (10.5)	19 (8.0)	11 (4.6)	15 (6.3)	23 (9.7)	35 (14.8)	13 (5.5)	18 (7.6)	60 (25.3)	18 (7.6)

Table 3: Prevalent helminths parasites species of veterinary importance in Delta North, Delta State, Nigeria.

with females may be because of grazing factors as male cattle are mostly found grazing in field while female are stocked in enclosed environment for reproduction purposes and usually released for sales and consumption due to ill health conditions and aged nature after successive birth. In agreement to the current results, Gulland and Fox [26] reported that prevalence of infection (faecal egg counts) were higher in males than females, except during the lambing periods, and decreased with age in both sexes. Also, Aliyara et al. reported higher prevalence of helminths parasites in male than female cattle. Similar studies on the level of prevalence between male and female include those of [27] who reported prevalence to be more in male than female cattle. Olubukola et al. [28], Chowdhury et al. [25] and Pam et al. [29] reported higher prevalence of helminths parasites in female cattle than male cattle in their study locations.

A total of 10 species of helminths were recorded from the two locations in Delta North area of Delta State of which Nematodes (*Ascaris lumbricoides*, *Bonustomum* sp., *Cooperia* sp., *Ostertagia* sp., *Strongyloides* sp., *Trichuris trichuira* and *Trichostrongyle* sp.) were the predominantly occurring (n=7) helminths followed by Trematodes (*Fasciola* sp. and *Paraphostimum* sp.) (n=2) and Cestodes (*Taenia* sp.) (n=1). This is similar to the reports of Agumah et al. [30], who reported the occurrence of helminth parasites such as *Ascaris* sp., *Taenia* sp. and *Fasciola* sp. from faecal samples of cattle slaughtered at abakaliki abattoir. Also, Oluwole et al., [31] reported the presence of helminth parasites which include *Ascaris* spp., *Fasciola* spp., *Ostertagia* spp., *Trichostrongylus* spp. and *Moniezia* spp. From faecal samples obtained from Oyo State.

The results of this observation corroborates with the earlier findings of Godara and Manohar [32] who reported higher incidence of *Strongyle* sp. in cattle of Rajasthan. Similarly Kashyap et al. reported 40.3 percent prevalence of gastrointestinal helminthosis in cattle and buffaloes from Madhya Pradesh with prominent infection of *Strongyle*. Jagannath et al. [33] reported 36.25 percent of incidence of gastrointestinal helminthosis in cattle. However, more than 50 percent incidence of parasitic infections in cattle has also been recorded from Gujrat [34], Haryana [35] and Rajasthan [32].

The nematode species of economic importance which have been most frequently identified from tropical areas include *Trichostrongylus* spp. and *Ostertagia* spp. [36-38]. The helminths recorded in the study area have also been reported previously by Siddiqi and Ashraf [39], Shah et al. [40], Mohiuddin et al. [41] and Khan et al. [42] from different areas of Pakistan and by Van Aken et al. [43], Pandey et al. [44], Jacquiet et al. [45] and Dorny et al. [46] in different parts of the world. However, these workers have also reported some other helminths in addition to those recorded in the current study as the epidemiology of helminth diseases is determined by several factors governed by the environment-host-parasite interaction.

Conclusion

The epidemiological survey revealed the occurrence of parasitic helminthes in cattle slaughtered in the area. This could be attributed

to the unhygienic abattoir practices, free ranging and grazing system and poor animal husbandry practices. However, cattle should be well inspected and at necessary point treated for parasitic diseases. Proper management practices and sanitary measures at abattoir/slaughter slabs should strictly be employed to minimize the burden of parasitic helminthes in cattle.

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