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Identification and prevalence of intestinal parasites from slaughtered cows in Saki and Ago-Are Abattoirs

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Abstract

Taxonomy is the scientific practice of identifying different organisms, classifying them into categories (taxa) and naming them. A cross-sectional systematic random sampling of 101 cattle slaughtered in major Abattoirs of Saki and Ago –Are were undertaken for six months. The samples were collected and processed by using simple flotation technique. The fecal sample (5g) was collected into a sterile polythene bag and transported to the laboratory for microscopic examination. One gram of fecal sample were dissolved in 20% Sodium Chloride solution in a universal bottle and centrifuge at 1000rpm for 3 minutes. A wet preparation of the supernatant was put on a grease-free microscopic glass slide and observed under the microscope. The species of parasite were morphologically correlated with published works online by using Google search engine. The result was statistically analyzed using chi-square at significant difference of P≥ 0.05. The study showed that *Oesophagomum* (19.8%), Paramphistomum (5.94%), Bourgelatia (4.95%), Eimeria (2.97%), *Trypanosoma spp* (6.93%), *Fasciola gigantica* (9.90%), *Fasciola hepatica* (5.94%), *Schistosoma spp* (14.85%), *Tetrahymena* (6.93%) and *Trichonympha* (2.97%). In conclusion, male cow were more likely to be infected with gastrointestinal parasites than the female cows. Grazing fields should be kept free from contamination with fecal of cows.

Keywords: Prevalence; Gastrointestinal helminths; Parasites; Taxonomy; Helminthiasis

1. Introduction

A taxonomy is a field of science (and major component of systematics) that encompasses description, identification, nomenclature, and classification [1] of organism. The "definition" of a taxon is encapsulated by its description or its diagnosis or by both combined. There are no set rules governing the definition of taxa, but the naming and publication of new taxa is governed by sets of rules [2, 3]. In evolutionary biology, parasitism is a relationship between species, where one organism, the parasite, lives on or in another organism, the host, causing it some harm, and is adapted structurally to this way of life [2]. The entomologist has characterized parasites as "predators that eat prey in units of less than one" [4] Parasites include protozoans such as the agents of malaria, sleeping sickness, and amoebic dysentery; animals such as hookworms, lice, mosquitoes, and vampire bats; fungi such as honey fungus and the agents of ringworm; and plants such as mistletoe, dodder, and the broomrapes. Cattle, the most prominent domesticated livestock in Nigeria, represent some valuable asset in both traditional and modern agriculture. In addition, it also provide meat, milk, skin and draught power for farming [5]. The quantity of meat and revenue obtained from domestic livestock is far below the

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nation demand due to factors such as death and ill heath with associated reduced productivity and increase cost of treatment [6, 7].

Farming generates employments and creates markets for larger number of people who explore the animal's products and by products for economic gain [8]. Gastrointestinal parasites (helminthes) cause a major public health problem for farmers in many rural communities including the study area. Adult worm produce eggs that are passed to field in the feces or stool. Under favorable conditions the egg will hatch and larva transmitted to intermediate host snails infect many cattle as well as man [9]. Helminthosis in large part is caused by nematodes, *cestodes* and *trematodes* in domestic animals. Helminthosis lead to a reduction in fertility, reduction in food intake, weight loss and milk production increased mortality rate. Gastro intestinal nematode are cosmopolitan parasites that develop within the digestive tract of domestic nematode. The gastrointestinal tract (GIT) of cattle harbors a variety of parasites, particularly helminthes, which cause clinical and sub clinical parasitism. These parasites adversely affect the health status of animals and cause enormous economic losses of the livestock industry [10, 11]. The effects of infection by gastrointestinal parasites varies according to the parasite concern the degree of infestation and other risk factors such as species, age, season and intensity of worm burden [12].

2. Material and methods

2.1. Study Area

Saki: is a border town in Oyo State Nigeria bounded by Kwara State in the North and to the West by Cotonou (Republic of Benin) and Lome (Togo). It comprises of three Local Government Area; viz: Saki West, Saki East and ATISBO (Ago-Are, Tede, Irawo, Sabe, Baasi and Oje-owode).

2.2. Demographic Description

Saki has a population of 178,677 making it the 3rd biggest city in Oyo. It operates on the WAT time zone, which means that it follows the same time zone as Ibadan. It is situated at elevation 472 meters above sea level.

Ago-Are: Ago Are is located in Nigeria. It is positioned in "Africa/Lagos" time zone (GMT+1) with current time of 02:50 PM, Tuesday (difference from your time zone: 99 hours). Ago Are is populated place in Oyo in ATISBO local government area with population of 13.9 thousands.

2.3. Sample Collection

Advocacy visits were paid to the abattoirs during pilot study on each day of the sample collection. The study period was between August and October as early as 6:00 am when the animals are usually taken to the abattoir. Healthily animals were identified and labelled as male and female. A total of 101 samples of fresh fecal samples (directly from the rectum of slaughtered cattle, two samples per animal) were collected into clean labeled sterile vials or sample bottles and subsequently taken to the laboratory for microscopic examination.

2.3.1. Laboratory Preparation

One gram of fecal sample was dissolved into 20% solution of sodium chloride (floatation technique) in a universal bottle and centrifuge at 1000 revolution per minutes (1000rpm) for 3 minutes According to [13]. The supernatant was collected in a container and pick on a microscopic glass slide covering with cover slip. The slides were examined microscopically, using digital microscope.

2.3.2. Examination of Samples

The slides containing the fecal sample were examined under the microscope using 40x objectives lens for estimation of parasite according to the protocols earlier described by [14]. All structures seen under the microscope were compared with the standard retrieved online thereby the identification of the parasites.

2.3.3. Statistical Analysis

Data were subjected to descriptive statistical analysis using percentages in determining the prevalence rate base on the sex. Prevalence of parasite in relation to sex was analyzed using chi-square statistical test (test for significance at p> 0.05%).

3. Results

Table 1 Prevalence of Gastrointestinal Parasites in Slaughtered Cows

Parasites	Sample Examined	Number of positive sample	Prevalence (%)
Bourgelatia diducta	101	5	4.95
Elimeria macusaniensis	101	7	6.93
Trypanosome spp	101	1	0.99
Elimeria spp	101	3	2.97
Fasciola gigantica	101	10	9.90
Fasciola hepatica	101	6	5.94
Flagellate protozoan	101	10	9.90
Oesophagostomum bam	101	20	19.80
Opalinidea spp	101	6	5.94
Opisthorchiasis spp	101	6	5.94
Paramphistomum spp	101	6	5.94
Schistosoma bovis	101	15	14.85
Tetrahymena vorax	101	7	6.93
Trichonympha spp	101	3	2.97
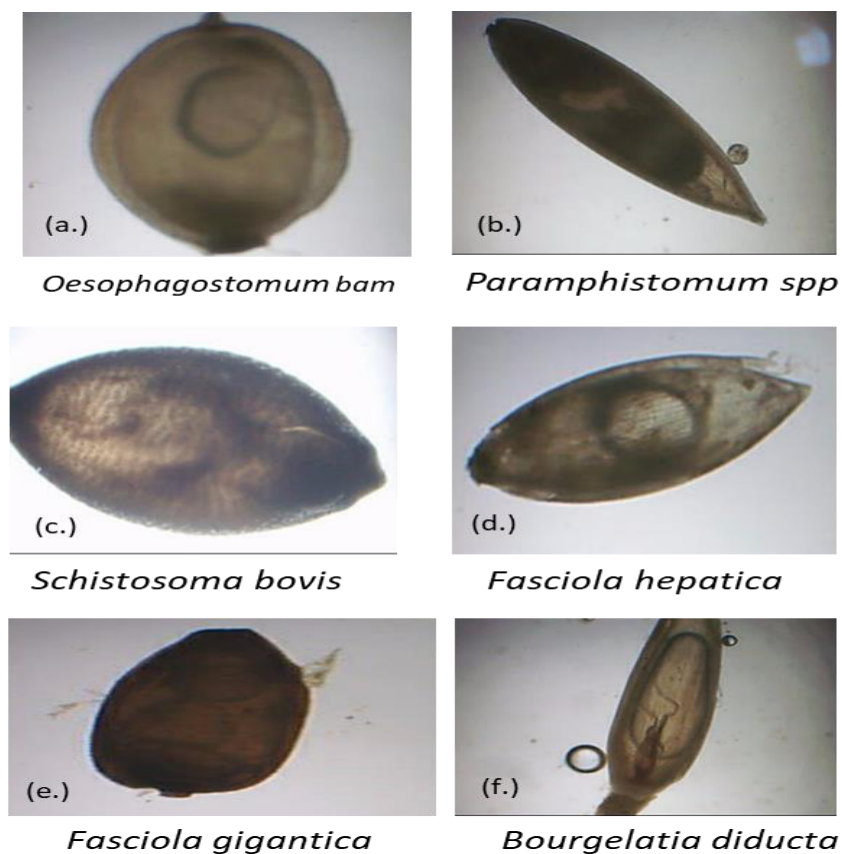
Figure 1 Gastrointestinal Parasites in Slaughtered Cows

Table 2 Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Male Cattle	7	1.57	.535	1	2
Female Cattle	7	.14	.378	0	1

Table 3 Male Cattle

	Observed N	Expected N	Residual
1	3	3.5	-.5
2	4	3.5	.5
Total	7		

Table 4 Female Cattle

	Observed N	Expected N	Residual
0	6	3.5	2.5
1	1	3.5	-2.5
Total	7		

Table 5 Statistical Test

	Male Cattle	Female Cattle
Chi-Square	.143a	3.571a
Df	1	1
Asymp. Sig.	.705	.059

A= 2 cells (100.0%) have expected frequencies less than 5.
The minimum expected cell frequency is 3.5 table 5 above,

3.1. For Male Cattle in Ago-are

Since Asymptomatic Significance = 0.705 is greater than the P-value (0.05) then the Parasites has significant impact on Male cattle in Ago-are at 5% significance level.

3.2. For Female Cattle in Ago-are

Since Asymptomatic. Significance = 0.059 is greater than the P-value (0.05) then the Parasites has significant impact on female cattle in Ago-are at 5% significance level.

Table 6 Saki Chi-Square Analysis Outputs Chi-Square Test

	N	Mean	Std. Deviation	Minimum	Maximum
Male Cattle	13	1.31	1.932	0	5
Female Cattle	13	6.08	4.443	0	15

Table 7 Male Cattle

	Observed N	Expected N	Residual
0	8	2.6	5.4
1	1	2.6	-1.6
3	1	2.6	-1.6
4	2	2.6	-.6
5	1	2.6	-1.6
Total	13		

Table 8 Female Cattle

	Observed N	Expected N	Residual
0	2	1.4	.6
3	1	1.4	-.4
4	2	1.4	.6
5	1	1.4	-.4
6	3	1.4	1.6
7	1	1.4	-.4
10	1	1.4	-.4
13	1	1.4	-.4
15	1	1.4	-.4
Total	13		

Table 9 Statistical Test

	Male Cattle	Female Cattle
Chi-Square	14.308a	2.923b
Df	4	8
Asymp. Sig.	.006	.939

Since Asymptomatic Significance = 0.006 is less than the P-value (0.05) then the Parasites does not have significant impact on Male cattle in Saki at 5% significance level. Since Asymptomatic Significance = 0.939 is greater than the P-value (0.05) then the Parasites has significant impact on female cattle in Saki at 5% significance level.

4. Discussion

The findings of this study showed that 95.5% (96/101) of the cattle screened had parasite infection, thus providing valuable information on the burden of parasite among cattle in Saki, Oyo State. Animals slaughtered in this abattoir are representatives of cattle in the region. Precisely, trematodes such as *Fasciola gigantica*, *Fasciola hepatica*, *Paramphistomum spp*, *Schistosoma bovis* and *Opisthorchaisis* was as high as (42.6%) compared to the result obtained by [15] whose result revealed low infection by trematodes (26.5%). *Fasciola gigantica* are liver trematodes known to be zoonotic and have caused considerable economic losses and health problems [16]. Also the high trematodes in this study was in disagreement with the results observed by [16] this might be because they require intermediate hosts to complete their life cycle and so transmission is dependent on the availability of intermediate host *Hymnaea spp* (snail). This study was in agreement with previous studies conducted in India, Ethiopia and Eastern Nigeria showing that trematodes as the most prevalent helminthes. The present of high trematode in this study compared to the result of [15,

16] which could be attributed to the differences either in geographical or climatic conditions and ecology since the presence of trematode infections is known to be dependent on availability of the intermediate hosts. Also, this study observed certain prevalence of *Tetrahymena spp*, *Trichonympha spp*, *Opalinidaes spp*, and *Trypanonsoma spp*. The result of this present study clearly indicates that cattle slaughtered in Saki and its environs of about 450,000 population is served by this abattoir where this study was carried out were infected with a wide variety of gastrointestinal parasite including nematodes, *trematodes* protozoan and coccidian from the month of August to October. During this rain season, the higher prevalence observed could be attributed to the high moisture content and lower temperature which favor the growth and development of larvae on pasture, in turns favour, contact between the host and parasites. Higher parasitic infection during raining season was reported by some studies [17].

5. Conclusion

Various gastrointestinal parasites has been implicated in cattle in Saki compared to Ago-Are due to the cross-migration in the study population. Epidemiological facts suggests that high standard of scriptorium in moder0n animal husbandry will prevent exposure of livestock to graze in deteriorated and polluted land which will be effective in controlling epidemics. Animal should be restricted to special area of land provided by the government for grazing. The public should be enlightened on proper cooking of animal parts especially the intestine and the abattoir workers should be properly trained on meet handling and zoonotic infections. A comprehensive approach should be adopted to ensure all-inclusive meat inspection in the abattoirs before distribution to the public for consumption.

Compliance with ethical standards

Disclosure of conflict of interest

All the authors hereby declared that there is no conflict of interest whatsoever.

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