

Prevalence of Fascioliasis among Cattle and Goats Slaughtered in Abattoirs within Sagbama Community and Yenagoa Metropolis, Bayelsa State

Ayibadinipre Jennis Gbeghebo¹, Araka Akugbenebibo Dominic², Shine Ebiemi Sarah³

^{1,3}Department of Biology, Isaac Jasper Boro College of Education, Sagbama, Bayelsa State.

²Department of Biology, Bayelsa Medical University, Yenagoa, Bayelsa State.

ABSTRACT

The study of the prevalence of fascioliasis among cattle and goats slaughtered at abattoirs in Sagbama community and Yenagoa metropolis, Bayelsa State was undertaken from July to December, 2022. A total of 60 bile samples were collected from the animals (30 from cattle and 30 from goats). The bile sample from each animal was examined using sedimentation method and microscopically examined for the presence of *Fasciola* eggs. The results showed that 34(56.7%) out of the 60 cattle and goats were infected with *Fasciola hepatica*. The distribution of infection showed that cattle had the highest prevalence of 70% while goats had 43.3% prevalence. Sex-based prevalence showed 73.3% and 66.7% for male and female cattle respectively while male and female goats recorded 46.7% and 40% prevalence respectively. Also, the prevalence was higher among samples collected from Yenagoa (Etegw/Tombia abattoir) (66.7%) and was lower among those collected from Sagbama abattoir (46.7). Regular inspection of animals slaughtered at abattoirs and monitoring of butchers will reduce consumption of infected meat and subsequent reduction of the prevalence of fascioliasis in the study areas.

KEYWORDS: Prevalence, Fascioliasis, Abattoirs, Sagbama, Yenagoa, Bayelsa State.

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INTRODUCTION

Fascioliasis is an infectious disease caused by endoparasites belonging to the genus "*Fasciola*" which are flatworms referred to as liver flukes (1). Fascioliasis is a disease commonly found among cattle, buffalos, sheep, goats, wild ruminants and humans. There are two main species that cause fascioliasis (*Fasciola hepatica* and *Fasciola gigantica*). They are similar and large enough to be visible to the naked eyes (2). The adult (mature) flukes are found in the bile ducts and liver of infected people and animals such as cattle, sheep and goats. In general, Fascioliasis is more common in livestock and other animals than in humans. The disease mainly affects the liver and other associated organs. The parasites are commonly called Liver flukes due to their location of residence. They are food-borne trematode infections and are zoonotic (3).

Fascioliasis is found in all the continents except in Antarctica, covering over 50 countries in distribution, most especially where sheep, goats or cattle are been reared. People get infected with *Fasciola* parasites through eating raw water cress or other contaminated fresh water plants with infested with the parasite larvae or eggs(4). People also can get

infected by ingesting contaminated water through drinking or by eating vegetables washed or irrigated with contaminated water. Fascioliasis has been classified as a neglected tropical disease (NTD) (4). Liver fluke prevalence and development depends on environmental characteristics as infection of both definitive and intermediate host involves an association with external fresh water (5). Larvae development occurs completely within species of fresh water snails which depend on environmental factors. Meanwhile, the transmission of *Fasciola spp.* is influenced by human activities (5,6). Fascioliasis is regarded as one of the most important parasitic diseases, as meat consumption is on the increase worldwide to cover for the protein demands (7). Fascioliasis disease progress through four distinct phases, an initial incubation phase between a few days up to three months with little or no symptoms, an invasive or acute phase which may manifest with fever, gastro-intestinal symptoms, urticaria, anaemia, jaundice and respiratory symptoms at the latent phase which last for months or years and the chronic or obstructive phase. Adult flukes in the bile ducts cause inflammation and hyperplasia of the epithelium of the bile duct and chronic inflammation which is connected to cancer (8)

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The life cycle of Fascioliasis begins from the release of immature eggs which are discharged from the biliary duct and in stool. Eggs become embryonated in water and release miracidia which invade a suitable snail, as an intermediate host. In the snail, the parasites undergo several developmental stages (sporocysts, rediae and cercariae). The cercariae are released from the snail and encyst as metacercariae on aquatic vegetation or other substrates. Human and other mammals like cattle and goats become infected by ingesting metacercariae from contaminated vegetation (e.g watercress) (9). After ingestion the metacercariae encyst in the duodenum and penetrate through the intestinal wall into the peritoneal cavity. The immature flukes then migrate through liver parenchyma into biliary ducts, where they mature into adult flukes and produce eggs. In humans; maturation from metacercariae into adult flukes usually take about 3-4 months; development of the *Fasciola gigantica* may take some what longer than *Fasciola hepatica* (9).

Nigeria is one of the four leading livestock producers in sub-Saharan Africa. Livestock contributes up to 12.7% of the total Nigeria agricultural gross domestic products (10). In Nigeria the goat and cattle rearing is done under the transhumant husbandry system with little supplementary feeding, resulting in low productivity (11). This may lead to weak body conditions, which in turn leads to increased susceptibility to trematode infection.

MATERIALS AND METHODS

Study area

The study was carried out in Sagbama abattoir in Sagbama Community, Sagbama Local Government Area and Etegwe/Tombia, abattoir in Yenagoa metropolis, Yenagoa Local Government Area of Bayelsa State Nigeria. Sagbama is located between latitude 5.1522°N and longitude 6.1925°E. it is the headquarters of Sagbama Local Government Area, Bayelsa state with a population of 187,146 and has an area of 945km² (3655qm). While Yenagoa is located between latitude 4.9538564°N and longitude 6.3582142°E. Both Sagbama and Yenagoa are in Bayelsa State, located in the southern part of Nigeria. This study was carried out between July and December, 2022.

Table 1: Overall Prevalence of *Fasciola hepatica* in the study areas

Total No. Examined	No. Infected (%)
60	34 (56.7)

Prevalence of Fascioliasis in relation to type of animal

The results obtained from the laboratory analysis of the samples further revealed that 21 (70%) samples out of 30

Research design

The research design used in this study was an experimental design. A total of 60 animals(30 Cattle and 30 goats) were randomly selected for examination for the presence of *Fasciola* species.

Samples collection

The gallbladders containing the bile samples were collected from 30 cattle and 30 goats, out of which 15 were males and 15 were females for both cattle and goats respectively. After wearing sterile gloves, the bile of each of the Cattle and goats was placed in different polythene bags and labelled properly for identification. The type of animal (cattle or goat), the location and sex were also recorded. Samples collected were taken to the Biology laboratory in Isaac Jasper Boro College of Education, Sagbama for further analysis.

Laboratory analysis

Centrifugal sedimentation method was used to analyse the bile samples. The gallbladder was cut open with a sterilized knife and its content was emptied into a clean dry beaker and was labelled properly. With the use of a pipette, 2ml of the bile sample was collected from the beaker and introduced into a labelled test tube in a test tube rack. 1ml of 10% formalin was added to the bile sample and allowed to stand for about 5 minutes. Then, 1ml of diethyl ether was added to the test tube after the 5 minutes. The content of the test tube was shaken to obtain a solution and was then centrifuged at 2500rpm (revolution per minute) for 10 minutes. The supernatant was decanted and the sediment was carefully introduced into a clean sample bottle after which a dropper pipette was used to pick a drop of the sediment and was placed on a clean glass slide and was covered with a cover slip which was viewed under the microscope using the ×10 and ×40 objective lenses. The procedure was repeated for all the samples collected for the study. Some samples were considered positive of *Fasciola* eggs with the correct morphology of ellipsoidal and operculated structure as observed when compared with the Atlas of Parasitology.

RESULTS

Overall prevalence of Fascioliasis in the study areas

The results from the laboratory analysis revealed that 34 (56.7%) out of the 60 animals (30 cattle & 30 goats) were infected with Fascioliasis (Table 1)

collected from the cattle were infected with Fascioliasis. Also, 13(43.3) out of the 30 samples collected from goats were infected with Fascioliasis (Table 2)

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Table 2: Prevalence of Fascioliasis in relation to type of animal

Type of Animal	Total No. Examined	No. Infected (%)
Cattle	30	21 (70)
Goats	30	13 (43.3)
Total	60	34 (56.7)

Prevalence of Fascioliasis in relation to sex of animals

The result from the laboratory examination of the bile samples from the animals showed that 11 (73.3%) out of the 15 samples collected from male cattle were infected with *Fasciola hepatica*.

Also, 10 (66.7) out of the 15 samples collected from female cattle were infected with *Fasciola hepatica*. Furthermore, the result showed that 7(46.7%) out of the 15 bile samples from male goats were infected while 6(40%) samples out of the 15 samples collected from female goats were infected with Fascioliasis (Table 3).

Table 3: Prevalence in relation to Sex of animals

Sex	No. examined	No. infected (%)
Cattle:		
Male	15	11 (73.3%)
Female	15	10 (66.7)
Goat		
Male	15	7 (46.7)
Female	15	6 (40)
Total	60	34 (56.7)

Prevalence in relation to location of sample collection

The results obtained from the laboratory analysis of the samples revealed further that 20 (66.7%) out of the 30 samples collected from Abattoirs in Yenagoa

(Etegwe/Tombia), were infected with *Fasciola hepatica* while 14 (46.7) out of the 30 bile samples collected from Sagbama abattoir were also infected with Fascioliasis (Table 4)

Table 4: Prevalence in relation to location of sample collection

Sample location	No examined	No. infected (%)
Yenagoa	30	20 (66.7)
Sagbama	30	14 (46.7)
Total	60	34 (56.7)

DISCUSSION

The result of this study shows the presence of fascioliasis in cattle and goats slaughtered in Yenagoa and Sagbama abattoirs in Bayelsa state with an overall prevalence of 56.7%. This result is lower than the report of (12) who reported overall prevalence of 77%. The report of this study is higher than the 37.3% reported by (13). The 56.7% prevalence recorded in this study could be attributed to the presence of the parasite and the intermediate host in the study areas and the northern part of Nigeria from which the animals were transported from. Cattle and goats recorded a prevalence of 70% and 43.3% respectively in this study. This agrees with the report of (14) who reported 70% in cattle and 43.7% in goats. However, this report is higher compared to the report of (15) who reported 45.7% for cattle and 35.0% for goats. The high prevalence(70%) recorded by cattle in this study could be due to the fact that cattle owing to their size can graze even in waterlogged areas so could consume more contaminated water plants.

The results of this study further showed the distribution of the disease in relation to sex of the animals. A prevalence of 73.3% and 66.7% was recorded for male and female cattle respectively, while 46.7 % and 40% prevalence was recorded for male and female goats respectively. This result is higher compared to (16) who reported 57.59% in male cattle and 25.2% in female cattle. This study is also higher than the 55.3% and 41.3% for male and female cattle as reported by (17). The difference in the prevalence among male and female cattle and goats, despite male and female animals grazing together in the same pastures suggest that the difference may be some susceptibility between sexes (18). The result of the study further showed a higher prevalence in Yenagoa (Etegwe/Tombia abattoir) 66.7% compared to Sagbama abattoir (46.7 %). This variation in prevalence could be due to more animals slaughtered in Etegwe abattoir

CONCLUSION

The consumption of meat for protein has been a common practice which has led to various infections that result in

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parasitic disease conditions. This study examined the prevalence of fascioliasis among cattle and goats slaughtered in Yenagoa and Sagbama abattoirs in Bayelsa State. It aimed to study the overall prevalence of fascioliasis in the study areas, the prevalence in relation to the type of animals, the sex of animals and the location of sample collection. The study revealed that fascioliasis was present among animals slaughtered in the study areas. Though both animals were infected but prevalence was higher among cattle than goats. Also, the prevalence was higher among male cattle and goats than the females. This research has established a total prevalence of 56.7% it can therefore be concluded that fascioliasis is prevalent in the study areas. This calls for a policy plan targeted at prevention and control of this neglected tropical disease.

RECOMMENDATIONS

Based on the findings of this study the following recommendations are made.

1. There is an urgent need for awareness campaign within the communities on the danger of fascioliasis spread among cattle and goats.
2. The intermediate host of the parasite (snails from the family of Lymnaeidae) need to be reduced using environment-friendly molluscicides.
3. Lack of sanitation facilities at local abattoirs call for an urgent concern.

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