IDENTIFICATION OF FASCIOLA GIGANTICA EGGS IN GALL BLADDER OF SLAUGHTERED CATTLES IN IJEBU-IGBO ABATTOIR

OJO ADEMOLA JULIUS

MATRIC NO: [illegible]

AKINLUYI OMOWUNMI

MATRIC NO: AAP 2009 00320

MARCH, 2012

IDENTIFICATION OF *FASCIOLA GIGANTICA* EGGS IN GALL BLADDER OF SLAUGHTERED CATTLES IN IJEBU-IGBO ABATTOIR

BY

OJO ADEMOLA JULIUS
MATRIC NO. AAP/2009/00035

AND

AKINLUYI OMOWUNMI
MATRIC NO: AAP/2009/00320

DEPARTMENT OF SCIENCE LABORATORY TECHNOLOGY,
ABARAHAM ADESANYA POLYTECHNIC, IJEBU-IGBO,
OGUN STATE, NIGERIA.

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN SCIENCE LABORATORY TECHNOLOGY OF ABRAHAM ADESANYA POLYTECHNIC, IJEBU-IGBO OGUN STATE, NIGERIA.

MARCH 2012

CERTIFICATION

This is to certify that this research project is an authentic record of the work carried out by **OJO ADEMOLA JULIUS** and **AKINLUYI OMOWUNMI** under the supervision and guidance of **MRS. OLUWABIYI, B. A.**

31/05/2012

MRS. B. A. OLUWABIYI
B.SC, (UNAAB), M.SC (UI)

MR. A. A. OKUSANYA
Departmental Coordinator

DEDICATION

This research report is dedicated to almighty God, and to our supervisor, Mrs. Oluwabiyi, B.A. and to all our lecturers in Science Laboratory Technology Department, Abraham Adesanya Polytechnic.

God bless you all. Amen.

ACKNOWLEDGMENT

All the praises and thanks be to almighty God, the most beneficent, the most merciful, for his favour, protection and guidance over us throughout our programme in the campus.

Our profound gratitude goes to our supervisor, Mrs. Oluwabiyi B. A. who offered unquantifiable support, efforts and advice throughout the period of the research work.

We sincerely appreciate the responsibilities of our humble parents, Mr. and Mrs. Ojo and Mr. and Mrs. Akinluyi for their financial, moral and spiritual support rendered during the course of our study. May the almighty God reward them abundantly.

We also seize this opportunity to thank all the members of our family. We say, may God continue to bless you all. (Amen)

Finally, our special appreciation goes to all our lecturers in Science Laboratory Technology Department and of course our Departmental Coodinator, Mr. A. A. Okusanya and to everybody at everywhere who contributed one way or the other to the successful completion of our programme. We say thank you and god bless.

ABSTRACT

The presence of *Fasciola gigantica* eggs in gall bladder of slaughtered cattle in Ijebu-Igbo abattoir was investigated in order to assess the quality of liver supplied to the consumer market in Ijebu-Igbo. The parasite (*Fasciola gigantica*) causes the disease fascioliasis in various mammal including humans. A total of 18 gall bladder were collected and examined for the study, of these, 2(11.1%) were found to harbor *Fasciola gigantica* eggs, 7(38.9%) gall bladders had golden yellow coloured bile while 11(61%) gall bladder had dark brown coloured bile. Out of the 7 golden yellow coloured bile, 2(28.6%) were found to harbor eggs of *Fasciola gigantica*. This study shows that fascioliasis prevalence is very low in the study area which is an indication that the cattle slaughtered in the area are in good condition of health. As a result of these, the liver supplied to the market and consumed by the inhabitant are free of any infection.

TABLE OF CONTENT

CHAPTER ONE

1.0 INTRODUCTION

Fasciola gigantica also known as the common liver fluke of cattle, sheep, goats and wild ruminants in Africa & Asia, is a parasitic flatworm of the class Trematoda, Phylum platyhelminths that infects the liver of various mammals including human, the fluke cause the disease Fascioliasis. (Ukoli, 1991)

Fasciola gigantica is distributed worldwide and causes great economic losses in sheep and cattle, it has been known as an important parasite of sheep and cattle for hundred of years, because of its size and economic importance (Carl Linnaeus, 1758).

An Englishman A.P.W. Thomas and the German Rudolph Leukhart (1882) were the first to unraveled its life cycle. *Fasciola gigantica* infections begins when metacercaria infected aquatic vegetation is eaten or when water containing metacercaria is drunk by cattle or human being (Dixon, 1966 as cited by Ukoli, 1991). Little damage is done by juveniles penetrating the intestinal wall and the capsule surrounding the liver but much necrosis results from migration of flukes through the liver parenchyma (Sewell, 1966).

CHAPTER ONE

1.0 INTRODUCTION

Fasciola gigantica also known as the common liver fluke of cattle, sheep, goats and wild ruminants in Africa & Asia, is a parasitic flatworm of the class Trematoda, Phylum platyhelminths that infects the liver of various mammals including human, the fluke cause the disease Fascioliasis. (Ukoli, 1991)

Fasciola gigantica is distributed worldwide and causes great economic losses in sheep and cattle, it has been known as an important parasite of sheep and cattle for hundred of years, because of its size and economic importance (Carl Linnaeus, 1758).

An Englishman A.P.W. Thomas and the German Rudolph Leukhart (1882) were the first to unraveled its life cycle. *Fasciola gigantica* infections begins when metacercaria infected aquatic vegetation is eaten or when water containing metacercaria is drunk by cattle or human being (Dixon, 1966 as cited by Ukoli, 1991). Little damage is done by juveniles penetrating the intestinal wall and the capsule surrounding the liver but much necrosis results from migration of flukes through the liver parenchyma (Sewell, 1966).

Fasciolasis estimation has been very difficult because of its widespread, but Taylor (1964) cited an example of the condemnation of 12,000 tons of liver of cattle per annum in United Kingdom and Cheng (1973 as cited by Ukoli (1991) present annual loss of 1 dollar due to condemnation for cattle liver in the United States. In temperate conditions e.g. Africa the estimation is impossible because the cattle rearing is done by nomadic herdsmen driving cattle through vast distance (Babalola and Schillhorn Van Veen, 1976 as cited by Ukoli 1991).

The pathological effect of *Fasciola gigantica* is widespread particularly in United State where sheep grazes in areas in which the lymnaeid snail host thrives. In cattle, *Fasciola gigantica* penetrates the liver tissues while in human its features are anemia, pneumonia and peribronchial inflammation. (Pantalouris, 1965 as cited by Ukoli, 1991).

This study investigates *Fasciola gigantica* eggs in gall bladder of slaughtered cattles in Ijebu-Igbo Abattoir, Ogun State with the aim of assessing the quality of liver supplied to the consumer market.

Fasciolasis estimation has been very difficult because of its widespread, but Taylor (1964) cited an example of the condemnation of 12,000 tons of liver of cattle per annum in United Kingdom and Cheng (1973 as cited by Ukoli (1991) present annual loss of 1 dollar due to condemnation for cattle liver in the United States. In temperate conditions e.g. Africa the estimation is impossible because the cattle rearing is done by nomadic herdsmen driving cattle through vast distance (Babalola and Schillhorn Van Veen, 1976 as cited by Ukoli 1991).

The pathological effect of *Fasciola gigantica* is widespread particularly in United State where sheep grazes in areas in which the lymnaeid snail host thrives. In cattle, *Fasciola gigantica* penetrates the liver tissues while in human its features are anemia, pneumonia and peribronchial inflammation. (Pantalouris, 1965 as cited by Ukoli, 1991).

This study investigates *Fasciola gigantica* eggs in gall bladder of slaughtered cattles in Ijebu-Igbo Abattoir, Ogun State with the aim of assessing the quality of liver supplied to the consumer market.

CHAPTER TWO

2.0 LITERATURE REVIEW

In years back, the productivity of Cattles has been limited by parasitic infestation thus a study of its parasite will lead to improvement in its rearing and the nutritional quality of man's protein intake, there is however, lack of adequate epidemiological data in the prevalence of fasciolasis in human in Nigeria, hence evaluating the prevalence in cattle from abattoir record may prove useful in assessing the potential risk to human. (Raji *et al* 2010).

Fasciola gigantica was reported to cause several diseases like poor health, reduce growth rate, high mortalities, especially in small ruminants and calves and liver condemnation at slaughtered house. (Ngategize *et al*, 1993).

Fasciola gigantica is common in Africa an Asia and the infection leads to reduction of milk, meat production losses and loss of drought power. (Dalton 1999 and Diaw *et al*, 1998).

Dipeolu *et al* (1998); Ibironke (2010); Ulayi *et al* (2007); all studied prevalence of liver fluke infection in gall bladder of cattle which was reported to remain high in the study areas.

Schistosome research group 2001, also reported that up to 50% of *Fasciola hepatica* infection are asymptomatic and disease may appear anywhere from a few days to several years after infection. The need for temperature slow moving or standing water in *Fasciola gigantica* life cycle and transmission had kept infection of these disease limited to population within well-defined water shed boundaries. Recently, however, urbanization, migration and development practice such as dam building and immigration have increased the population at risk and the incidence of human infection has increased significantly over the past 20 years. (Chitsola and Savioli, 2001).

The World Health Organization (WHO, 2006) estimated that 2.4million people are infected with *Fasciola hepatica* and a further 180 million are at risk of infection. (Annonymous, 1995). Recently, worldwide losses in animal production due to Fascioliasis were conservatively estimated as over US dollar 3.2 billion per annum. (Spithill *et al*, 1999)

In the study carried out by Raspsch *et al* (2006) to estimate the true prevalence of *Fasciola hepatica* in cattle slaughtered in Switzerland in the absence of an absolute diagnostic test, shows that out of 1,331 cattle presented for slaughtered at two abattoirs in Switzerland using

diagnostic parameters of visual meat inspection, coproscopy after sedimentation technique, a commercial ELISA test for specific antibody detection in serum and the post mortem microscopic detection of eggs in bile, the true prevalence of *Fasciola hepatica* infection was estimated at 18.0% which was reported to be high. In a similar study by Docconium and Pfiser (1991) the prevalence was reported to be 10% in the study area.

In a study carried out recently by Olusegun-Joseph *et al*, (2011), 117 gall bladder were sampled and their bile content were examined for fluke using the concentration by centrifugation technique, with the aim of assessing the quality of liver supplied to consumer markets within Zaria Nigeria. It was reported that *Fasciola gigantica* has a prevalence of 52.1% (61) and *Dicrocoelium dendriticium* with a prevalence 82.9% (97). 43.6%(51) gall bladders had mixed infection.

CHAPTER THREE

3.0 MATERIAL AND METHODS

3.1 STUDY AREA

The study area was carried out in Ijebu-Igbo situated in Ijebu-North Local Government Area, Ogun State, Nigeria. Its geographical coordinates are Longitude 6°58° North and Latitude 4° East.

3.2 ANIMAL SAMPLING AND COLLECTION OF GALL BLADDER

Study animals were randomly selected and after been slaughtered intact gall bladder were removed from these animals with the opening tied with rubber bands, they were put into polythene bags and was transported to the school laboratory for recovery and identification of eggs of fluke. Collection of sample was done between 7:00am and 10:00am, the period when cattle are slaughtered in the area.

The abattoir was visited once a week for the collection of samples. A total of 18 samples were collected for the study.

3.3 ETHICAL CONSIDERATION

Before the commencement of the study, approval was obtained verbally from the Chairman, Meat sellers Association, Ijebu-Igbo Abattoir to carry out the research work on slaughtered cattle.

3.4 EXAMINATION, IDENTIFICATION AND COUNTING OF EGGS

The gall bladder content was poured into sterile bottles. It was left to stand for few hours undisturbed in order for it to sediment. After sedimentation, it was decanted and transferred onto cleans glass slides and covered with cover slip. The preparation was examined for eggs of *Fasciola gigantica* microscopically. Using the x10 and x40 objectives lenses.

3.3 ETHICAL CONSIDERATION

Before the commencement of the study, approval was obtained verbally from the Chairman, Meat sellers Association, Ijebu-Igbo Abattoir to carry out the research work on slaughtered cattle.

3.4 EXAMINATION, IDENTIFICATION AND COUNTING OF EGGS

The gall bladder content was poured into sterile bottles. It was left to stand for few hours undisturbed in order for it to sediment. After sedimentation, it was decanted and transferred onto cleans glass slides and covered with cover slip. The preparation was examined for eggs of *Fasciola gigantica* microscopically. Using the x10 and x40 objectives lenses.

CHAPTER FOUR

4.0 RESULT

A total of 18 gall bladder were collected and examined for the study, of these, 2(11.1%) were found to harbor *Fasciola gigantica* eggs. (Table 1).

Gall bladder samples were sorted according to bile colour into dark brown and golden yellow. It was observed that 7(38.9%) gall bladder had golden yellow coloured bile while 11(61.1%) gall bladder had dark brown coloured bile of the 7 golden yellow coloured bile, 2(28.6%) were found to harbor eggs of *Fasciola gigantica* (Table 2).

Table 1: Presence of *Fasciola gigantica* Eggs in Gall Bladder of Cattle Slaughtered at Ijebu-Igbo Abattoir

Sample Period	Number of Samples Collected Per Visit	Presence of *Fasciola gigantica* Eggs (%)
1	3	-
2	4	2(11.1%)
3	4	-
4	3	-
5	4	-

Table 1: Presence of *Fasciola gigantica* Eggs in Gall Bladder of Cattle Slaughtered at Ijebu-Igbo Abattoir

Sample Period	Number of Samples Collected Per Visit	Presence of *Fasciola gigantica* Eggs (%)
1	3	-
2	4	2(11.1%)
3	4	-
4	3	-
5	4	-

Table 2: Bile colour in Relation to Eggs of fluke

Bile Colour	Number Examined	*Fasciola gigantica* Eggs
Dark brown	11(61.1%)	-
Golden Yellow	7 (38.9%)	2 (28.6%)
Total	18 (100%)	

CHAPTER FIVE

5.0 DISCUSSION AND CONCLUSION

Meat derived from cattle, sheep and goats provides major source of animal protein for the populace of Nigeria (Ekwunife and Eneanya, 2006). Hence, investigating the prevalence of liver fluke infection in gall bladder of cattle slaughtered at the Ijebu-Igbo abattoir seems necessary in order to assess the quality of liver supplied to the consumer market.

The result of this study shows that liver fluke infection in the study area is low. The prevalence of Fasciola infection obtained in this study was lower than what was reported in Adedokun *et al,* (2008) Ekwunife and Eneanya, (2006), Ulayi *et al*, (2007) and Olusegun – Joseph *et al* (2011). The differences in the findings may be as a result of differences in geographical location and seasonal variation.

Cawdery *et al*, (1977) had suggested that a prevalence rate of up to 25% is indicative of a level of infection in which most of the animals affected would have had their livers damaged rendering them unfit for human consumption. Although in this study, liver samples were not analyzed directly, it is expected that the result obtained using gall bladder

CHAPTER FIVE

5.0 DISCUSSION AND CONCLUSION

Meat derived from cattle, sheep and goats provides major source of animal protein for the populace of Nigeria (Ekwunife and Eneanya, 2006). Hence, investigating the prevalence of liver fluke infection in gall bladder of cattle slaughtered at the Ijebu-Igbo abattoir seems necessary in order to assess the quality of liver supplied to the consumer market.

The result of this study shows that liver fluke infection in the study area is low. The prevalence of Fasciola infection obtained in this study was lower than what was reported in Adedokun *et al*, (2008) Ekwunife and Eneanya, (2006), Ulayi *et al*, (2007) and Olusegun – Joseph *et al* (2011). The differences in the findings may be as a result of differences in geographical location and seasonal variation.

Cawdery *et al*, (1977) had suggested that a prevalence rate of up to 25% is indicative of a level of infection in which most of the animals affected would have had their livers damaged rendering them unfit for human consumption. Although in this study, liver samples were not analyzed directly, it is expected that the result obtained using gall bladder

contents is an indication of liver infection. Therefore, the prevalence rate of 11.1% recorded in the index study goes to prove that each liver supplied to the market is fit for public consumption.

Ogunrinde, (1983) observed that the colour of infected bile is dark green. On the other hand Six cited by Tielens *et al* (1981) reported that bile of an infected cattle were more red or yellow coloured. The golden yellow coloured bile obtained which had 28.6% infection thus agree with the later report. However, a firm conclusion on the status of bile colour with regards to the liver fluke infection cannot be reached because of the small sample size used in this study.

The study shows that fascioliasis prevalence is very low in the study area which is an indication that the cattle slaughtered in the area are in good condition of health. As a result of these the liver supplied to the market and consumed by the inhabitation are free of any infection. However, more work need to be done on fascioliasis in ruminants using large sample size and putting the size of the gall bladder and colour of the bile in relation to infection into consideration.

REFERENCES

Adedokun, O. A., Ayinmode, A. B. and Fagbemi, B. O. (2008): Seasonal Prevalence of *Fasciola gigantica* Infection Among the Sexes in Nigeria Cattle. *Veterinary Research* 2(i): 12-14.

Babalola D. A. and Schillhorn Van Veen, T. W. (1976). Incidence of fascioliasis in Cattle slaughtered in Bauchi (Nigeria), Trop. Animal. Health. Prod., 8,243-247

Carl Linnaesus (1758): BMC Evolotionary Biology *Fascioliasis hepatica.* http://www.standford.edu/class/humbio103/parasites200/Fascioliasis/fasciola.html

Cawdery, H.M.J., Strickland, L.K. and Crowe, P. J. (1977): Production Effect of Liver in Cattle, the effect on Live Weight Gain, Feed Intake and Food Conversion Efficiency in Beef Cattle, *British veterinary Journal 133:145-159.*

Chitsola, Savioli, Markel and Voge's Medical Baltimore: Williams and Wilkes, 1999. Triclabendazole, and Antihelmitic Agent Long

Used in Veterinary Medicine. http://www.standford.edu/.2/fasciola.html

Chitsola, and Savioli, (2001): New Opportunities for the Control of Fascioliasis. *Bulletin of the World Health Organization.*

Diaw, D.T, Seye M. and Sarr Y. (1998): Epidemiology of Trematodes in Livestock in the Kolda Region, Casamance. *Rev. Elev Med Pays Vet.Trop, 41:257-264pg.*

Dalton, J.P. (1999): *Financial Losses Caused by Ovine Fascioliasis in the Ethiopian Highlands. Trop. An Health Prod. 26; 156-157pg.*

Dipeolu, A.Z., Dipeolu, M. A. and Erubetine (1998): *Prevalence of Fascioliasis in Cattle in Ogun State. Proc. 25th Ann. NSAP Conf., Abeokuta, Nigeria.*

Dixon, K. E. (1966) The Physiology of exycstment of the matecercaria of *Fasciola hepatica* L., *Parasitology, 56, 431-456pp.*

Ducconium and Pfiser (1991): *Introduction to Parasitology in Tropical Africa. Prod, 8,96pg.*

Ekwunife, C. A. and Eneanya, C. I. (2006): *Fasciola gigantica* in Onitsha and Environs. *Animals Research International* 3 (2) 448-450.

Ibironke, A. A. (2010): A Retrospective Study of Liver Fluke Disease in Cattle Based on Abattoir Data in Agege, Lagos, Nigeria. *African Journal of Food Agriculture Nutrition and Development10 (2): 1-5.*

Ogunrinde, A. F. (1983): Bovine Fascioliasis in Nigeria, the Pathogenecity of Experimental Infection in White Fulani Cattle. *Revee D'elevage et de Mededine Veterinaira* in the Ethiopian Highlands. *Trop. An Health Prod. 25:155-161pg.*

Ngategize, P.K., Bekele T., Tilahum G. (1993): Financial Lossess Caused by Ovine Fascioliasis in the Ethiopian Highlands. *Trop. An Health Prod. 25:155-161pg*

Olusegun-Joseph, T. S., Doherty, V. F. and Edeghagba, B. O. (2011): Prevalence of Fascioliasis in Cattle Slaughtered at Zaria Abattior. *Journal of Environment Issues.* 1(i):50-56.

Ekwunife, C. A. and Eneanya, C. I. (2006): *Fasciola gigantica* in Onitsha and Environs. *Animals Research International* 3 (2) 448-450.

Ibironke, A. A. (2010): A Retrospective Study of Liver Fluke Disease in Cattle Based on Abattoir Data in Agege, Lagos, Nigeria. *African Journal of Food Agriculture Nutrition and Development10 (2): 1-5.*

Ogunrinde, A. F. (1983): Bovine Fascioliasis in Nigeria, the Pathogenecity of Experimental Infection in White Fulani Cattle. *Revee D'elevage et de Mededine Veterinaira* in the Ethiopian Highlands. *Trop. An Health Prod. 25:155-161pg.*

Ngategize, P.K., Bekele T., Tilahum G. (1993): Financial Lossess Caused by Ovine Fascioliasis in the Ethiopian Highlands. *Trop. An Health Prod. 25:155-161pg*

Olusegun-Joseph, T. S., Doherty, V. F. and Edeghagba, B. O. (2011): Prevalence of Fascioliasis in Cattle Slaughtered at Zaria Abattior. *Journal of Environment Issues.* 1(i):50-56.

Pantalouris, E. M., (1965). The common Liver Fluke *Fasciola hepatica, Introduction to Parasitology in Tropical Africa.* Textflow Limited, Ibadan, Nigeria. 94-103g

Raji, (2010): Prevalence of Fascioliasis in Cattle Slaughtered at Zaria Abattoir. *Journal of Environmental Issues.* Vol. 1(i):51.

Rapsch C. Schweizer G., Grimm F., Kohler L., Bauer C., Deplazes P., Braun U., Torgerson P.R. (2006): Estimating the True Prevalence of *Fasciola hepatica* in Cattle Slaughtered in Switzerland in the Absence of an Absolute diagnostic Test. *International Journal for Parasitology.* Vol. 36, 1153-1158pg.

Schistosome Research Group, (2001): Prevalence of Fascioliasis in Cattle. *Journal on Infection Research.* Vol. 6(ii): 12

Sewell, M.M.H (1966): *The pathogenesis of fascioliasis, Introduction to Parasitology in Tropical Africa.* Textflow Limited, Ibadan, Nigeria. 98-105pg.

Spithill, T.W., Smooker, P.M, Coperman, D.B. (1999): *Fasciola gigantica*: Epidermiology, Control, Immunology and Molecular

Biology. In: Dalton J.P. (Ed), *Fascioliasis. CAB International Publishing*. Wallingford. 465-525.

Taylor, (1964) The Annual Loss of Cattle in United State and Environs. *Prod. 10, 126pg.*

Tielens, A.G.M., Van Der Meer, P. and Bergh Van Den, S.G. (1981): *Fasciola hepatica:* Simple, Large Scale in Vitro Excystments of Metacercariae and Subsequent isolation of Juvenile Liver Fluke. *Experimental Parasitology.* 51:8-12.

Ukoli, (1991): *Introduction to Parasitolory in Tropical Africa.* Textflow Limited, Ibadan Nigeria. 91-104pg.

Ulayi B. M., Umaru-Sule, B. and Adamu S. (2007). Prevalence of *Dicrocoelium hopes* and *Fasciola gigantica* Infection in Cattle Slaughter in Zaria, Nigeria. *Journal of Animal and Veterinary Advances 6(9):1112-1115pg.*

WHO (World Health Organization) (2006). Animal Production and Health Paper No. 78. USA.