

Recovery of Pathogenic Human Intestinal Parasites in Fecal Effluents Obtained from Donkey Abattoir at Nkwo-Izhia, Ebonyi State

Agumah Nnabuike Bernard^{1,*}, Nwakaeze Emmanuel Amobi¹, Nwachi Anthonia Chinyere¹, Ilang Donatus Chukwuma², Ebiega-Oselebe Ifeoma Nora³, Iyidiobi Tochukwu Chiaghanam⁴, Dzingina Garba Douglas⁵, Uhuo Cosmas⁶

¹Department of Applied Microbiology, Ebonyi State University, Abakaliki, Nigeria

²Department of Biological Sciences, Federal University, Ndufu-alike Ikwo, Nigeria

³Department of Epidemiology and Medical statistics, University of Ibadan, Ibadan, Nigeria

⁴Department of Internal medicine, Federal teaching hospital, Abakaliki, Nigeria

⁵School of Medical laboratory Sciences, Ahmadu Bello University, Zaria, Nigeria

⁶Department of Applied biology, Faculty of Science, Ebonyi state University, Abakaliki, Nigeria

Email address:

buifewenemighty@gmail.com (A. N. Bernard)

To cite this article:

Agumah Nnabuike Bernard, Nwakaeze Emmanuel Amobi, Nwachi Anthonia Chinyere, Ilang Donatus Chukwuma, Ebiega-Oselebe Ifeoma Nora, Iyidiobi Tochukwu Chiaghanam, Dzingina Garba Douglas, Uhuo Cosmas. Recovery of Pathogenic Human Intestinal Parasites in Fecal Effluents Obtained from Donkey Abattoir at Nkwo-Izhia, Ebonyi State. *American Journal of Biomedical and Life Sciences*. Vol. 3, No. 3, 2015, pp. 71-74. doi: 10.11648/j.ajbls.20150304.11

Abstract: Donkey meat is a delicacy in some cultures even though it is abhorred in some quarters; and because it is relatively cheaper, tastier and nutritionally-rich, donkey meat is preferred to some other types of red especially in this part of the world. Donkeys are usually imported from the Northern part of Nigeria to some parts of the South where people buy them for consumption and other economic purposes. This study was aimed at recovering pathogenic human intestinal parasites from donkeys to ascertain if they could be potential reservoirs of human parasites. The fecal effluents from the donkey abattoir were analyzed based on current parasitological techniques; and the parasites were confirmed by microscopic and concentration techniques. Twenty-five (79.5%) species of helminths and 9 (20.5%) species of protozoa were identified in the donkeys slurry samples examined in this study. This gives a general parasite prevalence of 55.0% (44/80). These comprised of 16 (36.4%) *Fasciola hepatica*; 10 (22.8%) *Taenia* spp; 7 (15.9%) *Giardia lamblia*; 3 (6.8%) *Ascaris lumbricoides*; 3 (6.8%) *Strongyloides stercoralis*; 2 (4.5%) *Trichuris trichuria*; 2(4.5%) *Entamoeba histolytica* and 1 (2.3%) hookworm. One animal each harbored 3 species, 17 animals had two separate parasitic infections and 26 harbored one parasitic species. It could be deduced from our results that parasitic infections are not duly considered in veterinary control especially in slaughter houses as possible causes or source of infections. Thus, parasitic control and protective actions will be necessary in order to utilize donkeys more efficiently as well as to contain the spread of infections via their consumption.

Keywords: Parasites, Donkey, Abattoir, Fecal, Effluents, Ebonyi

1. Introduction

Donkeys (*Equus asinus*) are among the early-domesticated equines that have been around as long as mankind; and they serve a variety of economic importance to mankind (Saul *et al.*, 1997; Alemu *et al.*, 2004; Abayneh *et al.*, 2002). In some area of North West Kenya and Southern Ethiopia, donkey meat is a delicacy and the milk is believed to treat whooping

cough (Fred and Pascal, 2006; Pearson *et al.*, 2009). Donkeys are prone to a number of infectious and non-infectious diseases; and they harbour parasites such as Strongyles, Ascarids, pin worms, *Gastrophilus*, lung worms, fluke and tape worms amongst others. Even though donkeys have often been described as study animals, they succumb to a variety of diseases and a number of other conditions (Svensen, 2007).

Parasitic helminthes are one of the most common factors that constrain the health and working performance of

donkeys and horses worldwide. They cause various degrees of damage depending on the species and number at present, nutritional and the immune status of equids (Asefa *et al.*, 2011). They decrease the performance, production and productivity in the animals mainly in the reduction of body weight or failure to gain weight or even increase the mortality in acute case (Ramaswamy, 1994). A number of studies conducted to detect association between poverty and animal diseases identified gastrointestinal parasitism as one of the most important problems for equids in developing countries (Perry *et al.*, 2002; Valdez-Cruz *et al.*, 2006).

The prevalence and type of internal parasites affecting equids, in general, are ubiquitous with equines being continually exposed throughout their lives. The attention given by Governmental and non-Governmental organizations to donkeys has been far below to what it deserves. This might be partly due to the wrong perception that the donkey does not require a lot of care, that when donkeys do get sick they are quick to die, and the donkey's low traditional status (Marshall and Ali, 2004). The attention given by donkey owners to their animals is below the level that it should be. This might be partly due to the incorrect perception that donkeys do not require a lot of care, but it can be concluded that the elimination of their parasites would improve the adaptation of the animals to the harsh dry season and also the cold winter in most regions of Nigeria. Butchers as well as individuals who purchase donkey meat for consumption are prone to risks of being infected with these pathogenic intestinal parasites especially when hygiene practice is low. Effluents that result from the abattoir harbor potentially pathogenic parasites. Some of these parasites have inherent mechanisms that enable them to penetrate intact skin while the others gain entrance through the ingestion of infected and poorly cooked donkey meat. This study evaluated the incidence of pathogenic human intestinal parasites in fecal effluents obtained from donkey abattoir in Abakaliki, Ebonyi state.

2. Materials and Methodology

Study Area: The study area is Ohaukwu local government area in Ebonyi State, South Eastern part of Nigeria. It has an area of 517 km² and a population of 196,337 at the 2006 census (The world-Gazetteer, 2007). Ebonyi State is located at 6° 15' north of the equator and longitudes 8° 05' east of the meridian. This location confers on the state the equatorial climatic conditions. There are two distinct seasons namely wet and dry seasons. The wet season is the period for rainfall, which is between mid-April and October. The dry season lasts between November and March. The rainfall pattern is remarkably constant ranging between 1,211 mm and the mean temperature is 33°C. Rice and roots crops like yam are the main agricultural products.

Sample Collection: Donkey slurries were randomly collected from the donkey abattoir at Nkwo-Izhia in Ohaukwu Local Government Area in Ebonyi State. A total of

320 samples were collected and used in this study. The samples were aseptically collected and analyzed at the Applied Microbiology and Parasitological laboratory, Faculty of Sciences Complex, Ebonyi State University, Abakaliki. All samples were collected in clean transparent wide mouth, screw capped universal container for laboratory processing. And the slurry samples collected were properly numbered, labeled and transported to the laboratory for parasitological investigations.

Concentration techniques: All Slurry samples collected were analysed using the Formol ether concentration technique (Cheesbrough, 2006; Ochei and Kolhatkar, 2007).

3. Result

Table 1 shows the prevalence of parasites in the study population included in this current study. Most of the slurries examined were found to harbour gastrointestinal parasites. The infection status prevalence in donkeys is shown in Table 2. A general incidence rate of 55% was recorded with over 176 slurry samples out of 320.

Seventy five percent (79.5%) of parasites discovered were helminthes while 20.5% were Protozoan parasites.

Parasites recovered include *Fasciola* spp (36.4%) *Taenia* spp (22.8%), *Giardia lamblia* (15.9%), *Ascaris* spp (6.8%), *Strongyloides* spp (6.8%), *Trichuris trichuria* (4.5%), *Entamoeba histolytica* (4.5%) and Hookworms (2.3%).

Figure 1 shows the percentage of protozoa and helminths in the isolated parasites.

Table 1. Prevalence of Parasites in the Study Population.

| Parasite | No recovered | Prevalence (%) |
|------------------------------|--------------|----------------|
| <i>Fasciola hepatica</i> | 64 | 36.4 |
| <i>Taenia</i> spp | 40 | 22.8 |
| <i>Giardia lamblia</i> | 28 | 15.9 |
| <i>Ascaris</i> spp | 12 | 6.8 |
| <i>Strongyloides</i> Spp | 12 | 6.8 |
| <i>Trichuris trichuria</i> | 8 | 4.5 |
| <i>Entamoeba histolytica</i> | 8 | 4.5 |
| Hookworm | 4 | 2.3 |
| Total | 176 | 100 |

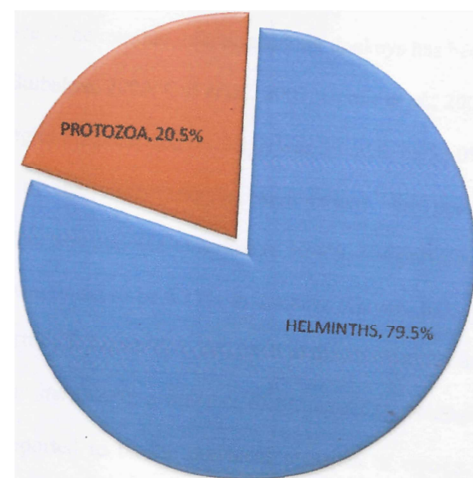


Figure 1. percentage of protozoa and helminthes in the isolated parasite.

Table 2. Infection Status Prevalence in Donkeys.

| Infection status | No of Infected Sample | Prevalence (%) |
|------------------|-----------------------|----------------|
| Total | 44 | 55.0 |

4. Discussion

The incidence of helminthic infection among donkeys has been reported from other studies with values ranging from 77.3%-100% (Gulbahce, 2000; Gul *et al.*, 2003; Demir *et al.*, 2005; Arslan and Umur, 2008). Though this study reported a lesser incidence (55%), it is relatively assumed to be line in with previous studies. From this study, the incidence of *Fasciola* spp, a helminthic parasite, was observed as 36.4%. The prevalence of *Fasciola* sp. in the Konya region was found to be 6.17% in donkeys (Gavor, 2005; Demir *et al.*, 2005). These two findings do not tally as the incidence of this trematode was higher from this study. *Strongyloides stercoralis*, a member of Strongylidae, belonging to the nematode family, has been reported to be the prevalent parasites of equids (Arslan and Umur, 2008). Examination of fecal by-product of donkey reported in other studies presented incidence rates ranging from 72.7-100%, which is quite higher than the 6.8% rate reported in our study (Gul *et al.*, 2003; Demir *et al.*, 2005; Arslan and Umur, 2008). The disparity in prevalence's could be due to the different geographical regions of origin of these donkeys and number of slurry samples examined. Demir *et al.*, 2005 and Arslan and Umur, 2008 reported incidence of *T. trichuria* as 1.2% and 1.3% respectively and their findings were lesser as compared with this study (4.5%). The incidence of *Fasciola* spp and *Taenia* spp. in this study could be a possible indication that donkeys are potential reservoirs for *Fascioliasis* and *Taeniasis* which are two of the most important and prevalent species of nematodes in ruminants. *Fascioliasis* is also prevalent in humans in Nigeria (Moghadam, 2004). In general, in Ebonyi State, as in many other parts of the world, the attention given by donkey owners to their animals is below the level that it should be. This might be partly due to the incorrect perception that donkeys do not require a lot of care, but it can be concluded that the elimination of their parasites would improve the adaptation of the animals to the harsh dry season and also the cold winter in most regions of Nigeria. Records from this study can still be attributed to other factors like: physical distribution, the general health and nutrition of these animals and the condition under which the animals are kept. The effective inspection of donkeys for consumption purposes is critical as this will halt the transmission of pathogenic parasites to humans through consumption. Adequate veterinary care should be maintained especially as regards the deworming of these animals. Donkey abattoirs should be properly sanitized and fecal effluents from such slaughter houses should be properly disposed or channeled so that they do not contaminate the sources of drinking water for people living in the environs where these animals are kept or slaughtered.

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