Gastrointestinal helminths of West African Dwarf (WAD) goats in Ido Local Government Area, Ibadan, Oyo State, Nigeria

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ABSTRACT: A study on the prevalence of fecal helminth parasites in adult WAD goats was carried out in five different areas of Ido Local Government Area of Oyo State, Nigeria. The objectives of the study were to determine the prevalence of fecal helminth parasites of goats in some areas including Gbekuba, Adabeji, Adifase, Owode and Lade-Owo as well as the genera distribution of faecal helminth parasites of goats in the study area. A total of 22 faecal samples per area were collected summing up to 110 samples from 110 goats. Simple floatation technique was used to identify eggs of parasites in the faecal samples and the eggs examined under light microscope for typing. Out of the 110 fecal samples, 78 (70.91%) of them were positive for helminth endo-parasites including five genera of nematodes: Ascaris spp (56.36%), Strongyloides spp (2.73%), Trichuris spp (0.91%), Nematodirus spp (2.73%) and Trichostrongylus spp (1.82%) and a genus of trematode: Fasciola spp (6.36%). The results showed that Ascaris spp was the most prevalent followed by Fasciola spp, Trichuris spp, Nematodirus spp, Strongyloides spp and Trichostrongylus spp. It is therefore recommended that routine deworming should be embraced using broad spectrum anthelmintics particularly against nematodes and trematodes to bring to minimal or possibly stamp out endo-parasites from the study area.

Key words: Deworming, Faecal Helminths, Floatation Technique, Goats, Prevalence.

INTRODUCTION

Goats are very important domestic animals. The importance of goat husbandry includes, goats reared for the provision of meat and milk for human consumption and raw materials for industries (Devendra and Meloroy, 2001). The breeds of goat found in Nigeria are Sahel, West African Dwarf (WAD) and Red Sokoto or Maradi (Ajala, 1998). Small ruminants form an integral part of the cultural life and farming system of Nigeria peasantry. Goat production in Nigeria is essentially a traditional activity in which household units feature prominently (Ajala, 1998). Despite the high small ruminant population in developing countries particularly in Africa, their prolificacy, cheap production cost and the indiscriminate demand for their product, goat production potential remains poorly exploited, due largely to neglect, disease, lack of motivation on the part of decision makers and the conservative traditional management system (Ajala,1998). Ruminant animals have been the major source of meat in Nigeria. Relative to other ruminants, goats are easier to keep and require smaller capital investment (Momoh et al., 1998).

Goats are important domestic animals in the tropical livestock production system. In subsistence sector, pastoralists and agriculturists often depend on them for much of their livelihood (Devendra and Meloroy, 2001). Goat, being a small sized ruminant is capable of integrating itself into dissimilar socio-economic situation prevailing in our country. Despite indiscriminate slaughtering
of goats, the total population keeps increasing due to its prolificity in producing more than one young one per kidding and of short generation interval. Being prolific breeders, the unique ability of the goat, kidding twice in 14 months and of producing several female kids in eight years cannot be achieved either by a cow or buffalo in their life period (Gopalakrishman and Mohanyal, 1991). The importance of goat in the rural economy is evidenced by its unparalleled economic traits, ability to get acclimatized under diversified agro-climatic conditions, unfastidious choosing of available forage, high fertility and short generation interval, practically no religious restriction to goat and its products among the diversified religious people in rural area (Gopalakrishman and Mohanyal, 1991).

Although small ruminants represent a great resource for the nation, the productivity per animal is low. Small ruminant diseases, poor management and lesser efforts provided to improve the performance of the animals are to be responsible for the reduced productivity (Ademosun, 1992). Stomach worms affect especially camels, goats and sheep. Different types of worms are transmitted when an animal eats grass or drinks water contaminated with larva or eggs. The problem is especially common in the rainy season (IIRR, 1996). Historically, gastrointestinal helminthes infestations have been associated with great economic losses to farmers throughout the world, these losses manifest through morbidity in acute cases and in chronic infections, reduced weight gains, reduced food conversion, abortion, infertility, reduced meat and milk production (Ogunrinade, 1984; Karki, 1987). These parasites are very ubiquitous and have also remained the major constraint, hindering the efficiency of rearing cattle and goats successfully (Khin-Khin, 2007; Siddiki et al., 2009). The negative impact of helminthes infections on livestock productivity in tropical countries has long been established. Reports by Ndorath et al. (1989), Olusi (1997) and Edosomwan and Ewarami (2012) contained recent appraisals of this problem. The helmint infestations of ruminants are mostly caused by Nematodes (such as Ostertagia spp, Capillaria spp, Trichuris spp, Strongyloides spp); Cestodes (such as Moniezia spp, Taenia spp) and Trematodes (such as Dicrocoelium spp, Fasciola gigantica, Amphistomes) (Zahid et al., 2005). According to Regassa et al. (2006) ruminants infected by gastro intestinal helminthes parasites cause loss to farmers through; low milk production, low fertility, reduced work capacity, involuntary culling, treatment cost, mortality and reduction in the market value of infected animals. Helminthisis is one of the important parasitic diseases contributing to losses in productivity (Agyei, 2003; Odoi et al., 2007).

Worldwide, parasitic helminthes are a major cause of losses in productivity and health problems of goats and sheep and are usually associated with huge economic losses especially in resource poor regions of the world (Cernanska et al., 2005). Parasitic helminthes also cause immuno-suppression and as a result enhance susceptibility to other diseases (Kumba et al., 2003; Torina et al., 2004; Githigia et al., 2005). The problem is much more severe in tropical countries due to very favorable environmental conditions for parasite transmission, poor nutrition of host animals and poor sanitation in facilities where animals are housed. As a result, diseases caused by helminthes remain one of the major impediments to small ruminant’s production in the tropics (Maichomo et al., 2004; Kumsa and Abebe, 2009). In the tropics, up to 95% of sheep and goats are reported to be infected with helminthes of which Haemonchus and Trichostrongylus are the two most commonly involved genera (Opara et al., 2005; Odoi et al., 2007; Mbuh et al., 2008). However, the majority of the animals infected with helminthes do not show clinical signs owing to the chronic nature of the disease. Sub-clinical signs helminthisis is considered the most common form of infection and cause of economic losses (Opara et al., 2005). This work was designed to estimate the array of Genera of parasites as well as level of their prevalence in the study area.

MATERIALS AND METHODS

Experimental site

The experiment was conducted at Ido Local Government Area of Oyo State, Nigeria. This is located between 7°45N, 7°15N and 3°30E, 3°50E and covers 986km², located in the forest belt zone and characterized by two distinct seasons: the dry season which lasts from November to March and the rainy season which starts from April and ends in October. It enjoys abundant rainfall of over 1800mm annually. It has relatively high humidity and average daily temperature ranges between 25°C and 35°C almost throughout the year. The vegetation pattern consists of rainforest in the south and guinea savannah in the north (Oluwabunmi and Ayode, 2014).

Experimental animals, materials, duration and procedure

One hundred and ten fecal samples were collected randomly from mixed-sex adult West African Dwarf (WAD) goats reared within Ido LGA, Oyo State, Nigeria between March and April, 2013. The study was conducted for a period of 5 weeks. Feces were collected from the rectum of the goats using sterile procedure (Urguhart et al., 1996) at different geographical areas within the metropolis. The feces were put in separate sample bottles which were labeled appropriately. The samples were then immediately taken to the laboratory for analysis for the presence of parasites eggs and oocysts. The method employed was the simple floatation
Table 1. Prevalence of Faecal Helminth Parasites of Goats in Ido Local Government Area of Oyo State.

<table>
<thead>
<tr>
<th>Location</th>
<th>No Examined</th>
<th>No Infected (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gbekuba</td>
<td>22</td>
<td>13 (11.82)</td>
</tr>
<tr>
<td>Adabeji</td>
<td>22</td>
<td>16 (14.55)</td>
</tr>
<tr>
<td>Adifase</td>
<td>22</td>
<td>14 (12.73)</td>
</tr>
<tr>
<td>Owode</td>
<td>22</td>
<td>13 (11.82)</td>
</tr>
<tr>
<td>Lade-Owo</td>
<td>-</td>
<td>22 (20.00)</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>78 (70.91)</td>
</tr>
</tbody>
</table>

Table 2. Genera Prevalence of Faecal Helminth Parasites of Goats in Ido Local Government Area of Oyo State.

<table>
<thead>
<tr>
<th>Genus spp</th>
<th>Gbekuba</th>
<th>Adabeji</th>
<th>Adifase</th>
<th>Owode</th>
<th>Lade-Owo</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaris</td>
<td>11(10)</td>
<td>10(9.09)</td>
<td>9(8.18)</td>
<td>12(10.91)</td>
<td>20(18.18)</td>
<td>62(56.36)</td>
</tr>
<tr>
<td>Trichuris</td>
<td>0</td>
<td>1(0.91)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1(0.91)</td>
</tr>
<tr>
<td>Trichostrongylus</td>
<td>1(0.91)</td>
<td>1(0.91)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2(1.82)</td>
</tr>
<tr>
<td>Strongyloides</td>
<td>1(0.91)</td>
<td>0</td>
<td>1(0.91)</td>
<td>1(0.91)</td>
<td>0</td>
<td>3(2.73)</td>
</tr>
<tr>
<td>Fasciola</td>
<td>0</td>
<td>4(3.64)</td>
<td>2(1.82)</td>
<td>0</td>
<td>1(0.91)</td>
<td>7(6.36)</td>
</tr>
<tr>
<td>Nematodirus</td>
<td>0</td>
<td>0</td>
<td>2(1.82)</td>
<td>0</td>
<td>1(0.91)</td>
<td>3(2.73)</td>
</tr>
<tr>
<td>Total</td>
<td>13(11.82)</td>
<td>16(14.55)</td>
<td>14(12.73)</td>
<td>13(11.82)</td>
<td>22(20.00)</td>
<td>78(70.91)</td>
</tr>
</tbody>
</table>

Some sample techniques as described by Foryet (2001). Simple floatation is based on the assumption that helminth eggs will float to the surface of the floatation medium (Saline water) which has a higher specific gravity than the eggs. About 2 to 3 g of the feces was crushed using a sterilize swab stick to break the feces, which in most cases was in pellets so as to give a solution. After obtaining homogenous mixture, it was sieved and placed in a test tube. The coarse debris was then trapped on gauze. The test tube containing the homogenous mixture was then placed in the centrifuge machine for about 5 mins at 1200 rpm. The floatation medium (NaCl solution) was then added to the filtrate and filled to the brim until a convex meniscus was formed on the test tube. A cover slip was then placed and left for about 3 mins. After then, the cover slip was pulled gently from the test tube and placed on a slide ready for viewing under low power magnification of a compound microscope.

Statistical Analysis

Descriptive statistics was used to analyze the results by calculating the percentage positivity of gastrointestinal parasites.

RESULTS AND DISCUSSION

The prevalence of fecal helminth parasites of goats in some sampled locations in Ido L. G. A of Oyo State is as shown in Table 1. Out of 110 samples of goat feces randomly collected at Gbekuba, Adabeji, Adifase, Owode and Lade-Owo and examined parasitologically in the laboratory, the prevalence rates of 13(11.82%), 16(14.55%), 14(12.73%), 13(11.82%) and 22(20%) respectively were got giving a total of 78(70.91%) as the overall prevalence rate in the study area (Table 1).

Table 2 shows the genera distribution of helminth parasites of goats in the study area. The following helminth parasites were observed using qualitative and quantitative microscopic examinations of the faecal samples. These include Ascaris spp, Trichuris spp, Trichostrongylus spp, Strongyloides spp, Fasciola spp and Nematodirus spp with their prevalence rates as 56.36%, 0.91%, 1.82%, 6.36% and 2.73% respectively (Table 2). The result showed that Ascaris spp had the highest prevalence rate of 56.36% followed by Fasciola spp (6.36%), Strongyloides spp (2.73%), Nematodirus spp (2.73%), Trichostrongylus spp (1.82%), and Trichuris spp (0.91%) respectively.

Faecal helminth parasites were present in the five (5) geographical areas sampled in Ido Local Government Area of Oyo State, Nigeria with an overall prevalence of 70.91% (78 out of 110 animals) and local prevalences of 11.82%, 14.55%, 12.73%, 11.82% and 20% out of 22 animals/location at Gbekuba, Adabeji, Adifase, Owode and Lade-Owo respectively (Table 1). The overall prevalence rate of 70.91% is lower than the results of
Hassan (1964), Getachew (1998), Hailelul (2002) and Nath et al. (2011) who reported prevalence rates of 82.1%, 96.38%, 84.32% and 94.67% respectively in goats while Silva et al. (2010) also observed a parasite frequency of 94.5% among sheep. However, the result of the present study is similar to those obtained by other researchers (Genene, 1994; Tesfaye, 1998; Abebe and Essayas, 2001; Hailelule, 2002; Amenu, 2005; Regassa et al., 2006; Sissay et al., 2007; Ahid et al., 2008; Tefera et al., 2011; Kumsa et al., 2011; Vanessa et al., 2014). In contrast, the finding is higher than reports of Assoku (1981) in Ghana and Vercruyssee (1985) in Senegal, Patet et al. (2001) who recorded 54.92% in goats in India, 65.5% got by Osakwe and Anyigor, (2007) in goats in Ikwo L.G.A. of Ebonyi State, Nigeria, Raza et al. (2007) that reported the infection rate of GIT helminths in goats at 52% in Southern Punjab, India, Ijaz et al. (2008) who reported 63.33% in Lahore, Pakistan, Shimelis et al. (2011) that found 47.67% in sheep and goats in North Gondar zone, Northwest Ethiopia, prevalence of 55.47% (n=213) in goats and overall prevalence of 61.4% (384 goats and 384 sheep) in both sheep and goats (Tesfaheywet, 2012), Kuchai et al., (2012) who reported 31.42% in Pashima goats of Ladakh, India, and Elele et al. (2013) that reported 62.1% in cattle.

The low prevalence could be due to the period in which the research was carried out which coincided to end of dry season when moisture and high humidity which support multiplication and growth of parasites were still low. Similarly, high ambient temperature and low humidity that characterized the period could have drastically reduced the number of parasites through desiccation in the study area. This is in consonance with the assertions of Lima (1998) and Andrews (1999) that unfavorable environmental factors hinder development and growth of most helminth species. Equally, Banks et al. (1990), Tembely et al. (1998) and Waruiru et al. (2005) stated that most helminth species are susceptible to desiccation in dry climatic conditions that results from the high temperature at which even eggs fail to develop into L3. Another probable reason is that goats prefer to browse shrubs (Taylor, 1985) which might reduce the infection rate by reducing larval consumption during grazing. Immunological response of goats for helmith infection is limited compared to sheep (Urquhart et al., 1996). The findings of this work is in a harmony with different researchers (Regassa et al., 2006; Keyyu et al., 2006; Raza et al., 2007) who have found a direct influence of grazing characteristics on the prevalence of most of gastrointestinal helminths. There existed direct relationship between moisture and prevalence of parasitosis (Regassa et al., 2006) while desiccation suppresses the development and growth of parasite (Dagnachew et al., 2011) thereby reducing the infection rate. Furthermore, management system (Regassa et al., 2006) could also contribute in the difference in the prevalence as well as medicaments. It has also been observed that sheep mostly have a higher prevalence of GIT parasites than the goats which is in agreement with other previous works (Teklye, 1991; Waruiru et al., 2005; Asif et al., 2008) and this is assumed to be due to the grazing habit of the sheep where they graze closer to the ground fostering opportunity of exposure to parasites (Tesfaheywet, 2012). Also the genera prevalences of 56.36%, 0.91%, 1.82%, 2.73%, 6.36% and 2.73% for Ascaris spp, Trichuris spp, Trichostrongylus spp, Strongyloides spp, Fasciola spp and Nematodirus spp respectively was contrary to Hailelul (2002) who reported species prevalence rates of 36.04% (Trichuris spp), 12.86% (Fasciola spp), 8% (Trichostrongylus spp), and 6.42% (Strongyloides spp) in goats reared around Wollaita, Asella and Soddo areas in Kombolcha in Ethiopia as well as 1.71% for fasciolosis in cattle reported by Unigwe and Nwakpu (2006) at Bodija Abattoir, Ibadan, Nigeria. The result is however similar in respect of Trichuris spp in pigs at Bodija Abattoir, Ibadan, where a finding of 0.99% was found (Okorator et al., 2014). The results of this study have also shown that nematodes are the most common helminth parasites of goats in the study area which was in line with the result of the Hailelul (2002).

Conclusion and recommendation

The extensive grazing system, inadequate and irregular deworming as well as ignorance have all combined with other factor bordering on immunity and malnutrition to conspire against eradication of this menace. It is therefore imperative to recommend quarterly (three monthly) deworming with broad spectrum anthelmintics to help reduce losses associated with helminthiosis. In the same vein, regular spraying of pastures with potent parasiticides is also recommended. Similarly, ruminants on pasture should be given nutritious supplements regularly to boost their immunity against parasites.

REFERENCES


