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A STUDY ON HELMINTH PARASITES OF BUFFALOES BROUGHT TO AHMEDABAD SLAUGHTER HOUSE, GUJARAT, INDIA

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ABSTRACT

Based on this study, the general prevalence rate of helminth parasites in buffaloes was found to be 64.67% on screening of 150 samples viz. faecal sample, affected tissues, abomasal content and other samples as per necropsy lesions. On class wise analysis it was revealed that 64 % cases are of trematodes, followed by nematodes and cestodes with 26% and 10% infection, respectively. On species wise analysis, it was found that the prevalence of Fasciola gigantica was the highest (15.33%) and that of Moniezia benedeni was the least (2.66%) among eight observed species. On quantitative examination of faecal samples, it was revealed that the egg counts for all observed species were ranged between 100 to 1400; with a maximum count for F. gigantca and lowest for Strongyle group. On age wise analysis, it was revealed that the prevalence of helminth was maximum (46.39%) in young age group; followed by adult (27.83%) and old animals (25.77%). On season wise analysis, it was observed that the rainy season (51.54%) has highest prevalence followed by winter (34.02%) and summer (14.43%).

Key Words: helminth, faecal, trematode, nematode and cestode.

INTRODUCTION

India is an agriculture based country and livestock sector is a major part of it. Livestock sector plays a major role in Indian economy, which is about 5.36 per cent of total GDP and 26.62 per cent of agricultural GDP (Anonymous, 2008-09). The livestock sector in India is experiencing fast growth since last decade. Livestock resources have to be utilized optimally, to achieve the targets of providing wholesome, healthy and nutritional food to the the huge population of our country. Buffaloes are the important multipurpose farm animals in the Indian sub-continent, contributing significantly to meat and milk production. According to the latest FAO statistics (2008), world buffalo population is estimated at 185.29 million, spread in some 42 countries, of which 179.75 million (97%) are in Asia. India has 105.1 million and they comprise approximately 56.7 per cent of the total world buffalo population. Because of their habitats, they suffer from a wide variety of parasitic diseases. The frequency of outbreaks increases between October and May, but sporadic outbreaks continue throughout the year (Qureshi et al., 2012). The host suffers from unnoticed ill effects of the disease for a prolonged period before the disease is detected at a veterinary clinic and/ or at the abattoir (Edith et al.,

2010). The effect of these parasites is strongly dependent on the number of parasites and the nutritional status of the animals they are infecting. A severe infection of gastro intestinal parasites in buffaloes ultimately leads to production losses.

MATERIALS AND METHODS

1.Study area and sample collection

The present study was carried out to know the prevalence of different helminth parasites in buffaloes brought to Ahmedabad Slaughter House, Gujarat. The duration of study was from February, 2011 to January, 2012 which encompasses all the three seasons viz. winter, summer and monsoon. For findings of prevalence, the slaughtered buffaloes were examined for the presence of helminthic infection in rumen, reticulum, liver, bile duct, intestine and other organs during post-mortem examination and faecal samples and intestinal contents were also collected for the detection and identification of ova of different helminth parasites during anti-mortem and post-mortem examination, respectively. During the study, the samples were collected during evening hours from Ahmedabad slaughter house and samples were collected in small and clean sterilized polythene bags and preserves in 10% formalin. The bags were numbered, ligated with rubber bands and were brought to the laboratory for further processing and examination for the presence of parasitic infection.

2. Processing of collected samples

2.1 Processing of faecal samples: Faecal samples were processed by qualitative examination viz; sedimentation technique for the identification of the ova in the laboratory.

2.2 Processing of collected organs

Different organs were examined at the slaughter houses only for the detection of presence of mature and immature stages helminthic infection. Infected organs were brought to the department laboratory preserved in 10% formalin. Parasites were collected from organs for further identification of the species of the parasites.

RESULTS AND DISCUSSION

1. General prevalence of helminths of buffaloes

During this study, a total of 150 faecal samples were collected from Ahmedabad Municipality Slaughter House, Ahmedabad during the one year period (February, 2011 to January, 2012). This slaughter house is situated in the heart of a city and providing meat to various governmental and private consumers. Here buffaloes along with other species are brought for slaughtering from nearby area, which encompasses Ahmedabad, Mehasna, Kheda, Anand and Surendranagar district. But many supplier brought animals from various distantly located parts of Gujarat; where farmer ready to sell their unproductive or male animals for slaughter purpose. After taking permission from competent authority, various samples were collected for this study with due care. After bringing samples in laboratory, they are examined for helminth parasites and their eggs with the help of floatation and sedimentation technique. From total 150 samples, 53 samples were found negative (35.33%) and 97 samples positive (64.67%) for the presence of gastro intestinal helminthes. Therefore, the general prevalence rate of helminth parasites in buffaloes was around 64.67%. Many researchers had reported that buffaloes have high prevalence rate of helminthes. Recently Wadhwa et al., (2011) and Kakar and Kakarsulemankhel (2011) concluded that the prevalence of fascioliasis in buffaloes were higher than cows. Kakar and Kakarsulemankhel has also said that the high prevalence might be due to difference in feeding and hygienic habitats of buffaloes. In the same year Mamun et al., investigated that the prevalence of gastro-intestinal parasites in buffaloes is very common and quite severe. Thus it's not false to say that the buffaloes are highly susceptible to various gastro intestinal parasites. In the present study, we found that the prevalence of gasto-intestinal parasites in buffaloes is about 64.67% in the study area. Similar studies were conducted by various groups and our finding is in agreements with them. This prevalence rate is almost similar to the findings reported by Azam et al., (2002); who revealed that 64.41% of the buffaloes were positive for internal parasites in Pakistan. Akhtar and Mohammad (2005) revealed 15.2% prevalence of helminthiasis in buffaloes in

colony, Hyderabad, which is less than our report that might be due to difference in study area and season. Asif et al., (2007) had recorded the 47% overall prevalence of helminthiasis in buffaloes with nematodes being the most common helminths in an irrigated area of lower Punjab, Pakistan which is almost nearer to present findings. In contrast to our and many others finding Rehman et al., (2009) reported 91.44% prevalence of helmithes in buffaloes. This might be due to habit of pasture grazing and study area falls near and around the water bodies, which is fertile land for various intermediate hosts and presence of infectious stage of parasites at high concentration.

2. Species wise prevalence of helminths of buffaloes

In present study species wise analysis of prevalent gastro intestinal parasites of buffaloes was carried out. Eight species of helminths (ova/eggs/parasites) were recorded. In it, three species were of trematode viz., Fasciola gigantica (15.33%), Gigantocotyle explanatum (11.33%) and Paramphistomum cervi (08.66%). Mix infection of Fasciola gigantica and Paramphistomum cervi was recorded in 6.0% cases. Beside this, three species of nematode viz., Toxocara vitulorum (7.33%), Trichostrongylus axei (5.33%), Trichostrongylus colubriformis (4.00%) and two species of cestode viz. Moniezia expansa (4.00%) and Moniezia benedeni (2.66%) were also observed on faecal examination. Based on these findings, it was worth to conclude that the prevalence of F. gigantica (15.33%) was the highest; in contrast to Moniezia benedeni (2.66%), which has the least prevalence rate in the study area. Species wise prevalence of gastro-intestinal helminths was given in Table-I. On class wise analysis it was revealed that 63.92 % cases are of trematodes, followed by nematodes and cestodes with 25.77% and 10.31%, respectively. Recently Morsy et al., (2005), Mamun (2011) and Shazly et al., (2007) recorded 20%, 22.46% and 9.73% infection of fasciolosis from their country. All these finding concluded that faciolosis is the major disease that prevalent in the buffalo population irrespective of its geographical area. These documentations are in agreement with our findings that fasciola has highest prevalence among all observed helminths. Van et al., (2000) observed that overall prevalence of Strongyles infection was 53% for buffaloes in Mindanao, the Philippines. Haridy et al., (2006) reported 17.7% Fasciola and 10% Paramphistomum infection in buffaloes in Al-Sanla centre, Egypt. Condoleol et al., (2007) detected 33.1% Strongyles, 3.1% Strogyloides spp. and 7.1% Paramphistomum cervi in buffaloes in central Italy. Similar findings of other trematodes and nematodes was also in agreement with Mamun (2011) who found prevalence of Paramphistomum cervi (29.24%), Schistosoma indicum (1.27%), Schistosoma spindale (0.85%), Toxocara vitulorum (2.54%), Strongyles (0.85%) and Strongyloides spp. (0.42%) while no cestodes were detected which is slightly contraindicated with this study. Raza et al., (2010) examined rumen of 10 buffaloes and found 20% infection of Paramphistomum cervi in buffaloes. The variations among the findings might be due to the difference in the sample size, selection of samples, techniques of sample collection, period and place of study, environmental factors, breed of the animals etc.

3. ***Age related prevalence of helminths of buffaloes***

Age of the host is one of the most important factor, which has serious impact on prevalence of gastro-intestinal helminths of buffaloes. Immune system is powerful and well developed in adult animal in compared to young ones and old. In the present study, animals were grouped in three categories viz., less than 2.5 (young), 2.5 to 5.0 (adult) and more than 5 years of age (old). It was revealed that the prevalence of gastro-intestinal parasites is maximum (46.39%) in young age group; followed by adult (27.83%) and then old animals (25.77%). In adult animals (2.5 to 5years) group, the highest prevalence was reported for F. gigantica (18.51%), followed by 14.81% prevalence of Gigantocotyle explanatum, Paromphistomum cervi,, and T. vitulorum each. Prevalence of Moniezia expansa, Moniezia benedeni and Trichostrongylus colubriformis were 7.40%, 3.70% and 11.11%, respectively. In young (< 2.5 years) group highest prevalence was noticed for F. gigantica (28.88%), followed by that of Gigantocotyle explanatum (20.00%), Paromphistomum cervi (13.33%) and Trichostrongylus axei (8.88%); while, 6.66% for T. vitulorum and Moniezia expansa and 4.44% for Moniezia benedeni and Trichostrongylus colubriformis. In old group (>5 years) also highest prevalence was reported for F. gigantica (24.00%), followed by 16.00% prevalence of Gigantocotyle

explanatum and T. vitulorum. Paromphistomum cervi and mix infections were prevalent at the rate of 12.00%. The prevalent rate for Moniezia expansa, Moniezia benedeni and Trichostrongylus colubriformis was 4 % each and for T. axei it was 8.0% (Table II)

During the study, it was revealed that, the age of the buffaloes had a significant effect on gastro-intestinal parasitic infection. This was also reported by various authors in different part of the world. It was reported that young animals (46.39%) were more susceptible to infection than adult (27.83%) and older animals (25.77%), which supported the findings of different workers viz. Azhar et al., 2002; Asif et al., 2007; Mamun et al., 2011. Asif et al., (2007) reported the higher prevalence of helminths infection in young animals compared to adults in buffaloes of Pakistan. Azhar et al., (2002) noticed higher infection rate in buffaloes aged < 2 years of age than the buffaloes aged >2 years. While, Mamun et al., (2011) also reported prevalence of endoparasites significantly higher (65.85%) in young animals aged < 2.5 years than in adult buffalo aged 2.5 to 5 years (63.16%) and in older animals aged > 5 years (59.66%). However the present finding is in contrast to the previous reports of Alim (1997) who observed that infection rate of fasciolosis increased with the increase of age. The cause of this variation in the prevalence of infection in different age groups of buffaloes is difficult to explain but it might be due to auto-immunological phenomenon as it was stated by Baily (1971) who suggested that the fasciolosis is not as self- limiting in the buffaloes as this in the cattle.

4. Season wise prevalence of helminths of buffaloes

In present study, maximum prevalence of helminths was reported during rainy season (51.54%) followed by winter (34.02%) and summer (14.43%); Species wise seasonal prevalence of helminths is given in table-III. In contrast, Ross (1966) and Henrikson and Pilegaard-Anderson (1980) reported the highest rate of prevalence of adult flukes during the winter months. Phiri et al., (2005) also reported seasonal variation of Fasciola gigantica and the pattern of distribution of F. gigantica was significantly higher in areas of higher rainfall than in those of relatively low rainfall, which is in agreement with this findings. Sharp seasonal variation was also described by (Soulsby, 2012). Jithendran and Bhat (1999) reported that Fasciola spp. infection was endemic throughout the year, with a higher percentage infection in buffaloes than in cattle in Himachal Pradesh, India. Other fluke and nematode infections showed a seasonal pattern in prevalence, with a small peak in March and April followed by a high peak in July and September. Wadhwa et al., (2003) reported high prevalence of flukes (amphistomes and fasciola) in rainy season (April to September) with a maximum of 70.44% infection rate in July is in line with our findings. Azhar et al., (2002) reported highest seasonal prevalence during autumn (24.0%), followed by spring (20.0%), winter (13.0%), and lowest (9.0%) during summer.

Table-I

Species wise prevalence of helminths of buffaloes:

Name of parasites	No. of animal affected	Percentage (%) of prevalence
Fasciola gigantica	23	15.33
Gigantocotyle explanatum	17	11.33
Mix Infection of *F. gigantica* & *P. cervi*	09	06.00
Paramphistomum cervi	13	08.66
Moniezia expansa	06	04.00
Moniezia benedeni	04	02.66
Toxocara vitulorum	11	07.33
Trichostrongylus axei	08	05.33
Trichostrongylus colubriformis	06	04.00
Total	**97**	**64.66**

Table-II

Age wise prevalence of helminths of buffaloes

Age	Name of Parasite	No. of Animals (N=150)	Percentage (%)
Young (< 2.5 years) N= 45 (46.39%)	*Fasciola gigantica*	13	28.88
	Gigantocotyle explanatum	09	20.00
	Mix Infection of *F. gigantica* & *P. cervi*	03	06.66
	Paramphistomum cervi	06	13.33
	Moniezia expansa	03	06.66
	Moniezia benedeni	02	04.44
	Toxocara vitulorum	03	06.66
	Trichostrongylus axei	04	08.88
	Trichostrongylus colubriformis	02	04.44
	Sub total	**45**	**99.95=100%**
Adult (2.5 to 5 years) N= 27 (27.83%)	*Fasciola gigantica*	05	18.51
	Gigantocotyle explanatum	04	14.81
	Mix Infection of *F. gigantica* & *P. cervi*	02	07.40
	Paramphistomum cervi	04	14.81
	Moniezia expansa	02	07.40
	Moniezia benedeni	01	03.70
	Toxocara vitulorum	04	14.81
	Trichostrongylus axei	02	07.40
	Trichostrongylus colubriformis	03	11.11
	Sub total	**27**	**99.95=100%**
Old (> 5 years) N= 25 (25.77%)	*Fasciola gigantica*	06	24.00
	Gigantocotyle explanatum	04	16.00
	Mix Infection of *F. gigantica* & *P. cervi*	03	12.00
	Paramphistomum cervi	03	12.00
	Moniezia expansa	01	04.00
	Moniezia benedeni	01	04.00
	Toxocara vitulorum	04	16.00
	Trichostrongylus axei	02	08.00
	Trichostrongylus colubriformis	01	04.00
	Sub total	**25**	**100%**

Table-III
Season wise prevalence of helminths of buffaloes

Season	Name of Parasites	No. of Animals (N=150)	Percentage (%)
Monsoon (July to October) N=50 (51.54%)	*Fasciola gigantica*	13	26.00
	Gigantocotyle explanatum	08	16.00
	Mix Infection of *F. gigantica* & *P. cervi*	05	10.00
	Paramphistomum cervi	07	14.00
	Moniezia expansa	03	06.00
	Moniezia benedeni	03	06.00
	Toxocara vitulorum	04	08.00
	Trichostrongylus axei	04	08.00
	Trichostrongylus colubriformis	03	06.00
	Sub total	**50**	**100%**
Winter (November to February) N= 33 (34.02%)	*Fasciola gigantica*	07	21.21
	Gigantocotyle explanatum	06	18.18
	Mix Infection of *F. gigantica* & *P. cervi*	04	12.12
	Paramphistomum cervi	04	12.12
	Moniezia expansa	02	6.06
	Moniezia benedeni	01	3.03
	Toxocara vitulorum	04	12.12
	Trichostrongylus axei	02	6.06
	Trichostrongylus colubriformis	03	9.09
	Sub total	**33**	**100%**
Summer (March to June) N=14 (14.43%)	*Fasciola gigantica*	03	21.43
	Gigantocotyle explanatum	03	21.43
	Mix Infection of *F. gigantica* & *P. cervi*	00	00.00
	Paramphistomum cervi	02	14.29
	Moniezia expansa	01	07.15
	Moniezia benedeni	00	00.00
	Toxocara vitulorum	03	21.43
	Trichostrongylus axei	02	14.29
	Trichostrongylus colubriformis	00	00.00
	Sub total	**14**	**100%**

CONCLUSION

In general on screening of 150 samples, it was noticed that gastro-intestinal helminths are prevalent at the rate of 64.67% in buffaloes. On class wise analysis it was found out that 63.92% cases were of trematodes, followed by nematodes and cestodes with 25.77% and 10.31%, respectively. On species wise analysis, it was worth to conclude that the prevalence of *F. gigantica* was the highest (15.33%) and *Moniezia benedeni* is least (2.66%) among all observed species. Faecal egg count revealed that the egg counts for all observed species were ranged between 100 to 1400; with maximum count for *Fasciola spp.* and lowest for *Strongyle* group. In age wise study, it was revealed that the prevalence of gastro-intestinal parasites is maximum (46.39%) in young age group; followed by adult (27.83%) and old animals (25.77%). In the present study, maximum prevalence of helminth was reported during rainy season (51.54%) followed by winter (34.02%) and summer (14.43%).

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