



Original Research Article

Prevalence of amphistome parasites (Trematoda: Digenea) in Udaipur of Southern Rajasthan, India

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A B S T R A C T

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Rajasthan is well known for its cattle wealth and contributes in the economy of this state. Besides natural calamities, paramphistomiasis is most pathogenic disease found in domestic cattle of Udaipur. It causes heavy losses to poor cattle farmers of this region. An epidemiological study was conducted in Udaipur and its adjoining areas from July 2012-June 2013. The 435 rumen of slaughtered buffalo from different slaughter houses have been examined in and around Udaipur. Out of 435 buffaloes, 329 (75.63%) were found infected with one or multiple species of amphistomes parasites and trematode parasites. The highest infection of *Paramphistomum cervi* (74.71%) and lowest in (32.87%) mixed species like *Fasciola* and *Gigantocotyl* spp. The infection also found throughout the year in different seasons, in summer (52.94%), winter (68.75%) and maximum in monsoon (85.77%). Age wise prevalence showed the highest infection in adult buffaloes (90.00%) and lowest (56.83%) in buffalo calves. Sex wise occurrence revealed that the male buffaloes (79.46%) were more susceptible to the infection as female buffaloes (51.66%). The present study shows the severity of infection in the area and need to develop suitable management strategies for the diagnosis of paramphistomiasis.

Introduction

Paramphistomiasis is one of the major problems in the productivity of cattle and health of human being throughout the world. This disease causes loss of life of cattle, loss of milk, meat and wool production. In context to India, livestock are of great economic importance as they are closely associated with the life activities of resource-poor rural people.

They contribute to financial independency for the people by providing milk, meat and skin. Besides natural calamities, cattle are susceptible to parasitic diseases which bring great loss to poor farmers. Paramphistomiasis has a wide geographical distribution in subtropical and tropical areas, where the infection leads to mortality and low productivity

(Benesch 1993; WHO 2002; Vatta & Krecek., 2002; Hassan *et al.*,2005; Uddin *et al.*,2006; Hoste *et al.*, 2010; Kakkar & Kakersulamankhel.,2008; Kanyari *et al.*, 2009; Tsotetsi *et al.*,2013 and Sharma and Busang ., 2013). It is a group of disease caused by the various species of trematode parasite; *Paramphistomum cervi*, *Gastrothylax* spp, *Cotylophoron* spp, *Orthocoelium* spp, *Fasciola* spp are found to be predominant in domestic ruminants. The disease is a major concern in the areas where snail population's viz. *Indoplanorbis exustus*, *Lymnea* increases during monsoon and post monsoon season. Incidence of amphistomosis in cattle, buffaloes, sheep and goat have been reported in different states of India from time to time (Varma 1957; Chhabra & Gill., 1975; Gupta *et al.*, 1987; Hafeez & Rao., 1987; Varma *et al.*, 1989; Sahay *et al.*, 1989; Sanyal 1991; Banerjee & Agarwal., 1992; Manna *et al.*,1994; Tondon *et al.*, 2005; Hassan *et al.*,2005; Sreedhar *et al.*,2009; and Lone *et al.*, 2013). In Rajasthan prevalence of trematode parasites have been observed in southern part of state (Swarnakar, 2007; Wadhawa *et al.*, 2011 and Swarnakar & Kumawat., 2013). However, the prevalence of amphistomes in buffaloes in association with age, sex and seasons has not been studied in Rajasthan. Therefore, in this study, an attempt was made to record the prevalence of amphistomes associated with the influence of age, sex and seasons.

Materials and Methods

The amphistomes were collected from infected parts of rumen of Buffalo (*Bubalus bubalis*) at local zoo abattoir and various slaughtered houses in Udaipur from July 2012 - June 2013. The infected part of rumen from time to time was brought to the laboratory and amphistomes

were washed several times in the tap water and they were transferred into 0.9% physiological saline, fixed in hot AFA (Alcohol 85 ml, formalin 10 ml and acetic acid 5ml.) at 80 to 85° C for few second then pressed between two slides (to make them flat) left in cold AFA, bleached in chlorinated alcohol for twelve hours. Bleached amphistomes were washed in 70% alcohol, stained with alcoholic borax carmine for 5 min, dehydrated in alcoholic series and cleared in clove oil for twelve hours. Cleared amphistomes were mounted in DPX on glass slides and examined under light microscope to finally identify the species. The whole mounts of parasites were used for identification of the worms, on the basis of their morphological character as detailed by Dutt (1980).

Results and Discussion

The amphistome parasites were collected from ruman of the freshly slaughtered buffaloes (*Bubalus bubalis*) from July 2012 to June 2013. The whole mounts of parasites were used for identification of worms, on the basis of their morphological character as detailed by Dutt (1980). Out of 435 buffaloes, 329 buffaloes were found infected with amphistomes, resulting rate of 75.63%.

Four species of amphistomes viz. *Orthocoelium scoliocoelium*, *Paramphistomum cervi*, *Gastrothylax cruminifer* and *Cotylophorum cotylophorun* were recorded in present investigation (Table 1).The cattle were highly infected with *Paramphistomum cervi* (69.42%) followed by *Orthocoelium scoliocoelium* (63.44%)and lowest percentage of infection of *Cotylophoron cotylophorum* (61.60%), *Gastrothylax cruminifer* (40.22%) and mixed species (32.87%).

Table.1 The infection percentage of different species of amphistomes in buffaloes in Udaipur

Species identified	No of Infected buffaloes n - 435	Prevalence (%)
<i>Paramphistomum cervi</i>	302	69.42%
<i>Orthocoelium scoliocoelium</i>	276	63.44%
<i>Cotylophoron cotylophorum</i>	268	61.60%
<i>Gastrothylax cruminifer</i>	175	40.22%
Other species (<i>Fasciola</i> and <i>Gigantocotyl spp</i>),	143	32.87%

Table.2 Seasonal occurrence of amphistomes in Buffaloes in Udaipur

Seasons	No. of buffaloes Examined	No of buffaloes Infected	Prevalance (%)
Summer(March to June)	68	36	52.94%
Monsoon(July to October)	239	205	85.77%
Winter(November to February)	128	88	68.75%
Total	435	329	

Table.3 Age wise occurrence of amphistomes in buffaloes in Udaipur

Age group	No of buffaloes Examined	No. of buffaloes Infected	Prevalence (%)
Buffaloes calf(8-12months)	139	79	56.83%
Buffaloes bull (2-3years)	236	206	87.28%
Buffaloes adult(5-6 years)	60	54	90.00%
Total	435	329	

Table.4 Sex wise occurrence of amphistomes in buffaloes in Udaipur

Sex	No. of buffaloes Examined	No. of buffaloes Infected	Prevalence (%)
Male	375	298	79.46%
Female	60	31	51.66%
Total	435	329	

After statistical analysis it can be documented that buffaloes are more susceptible to *paramphistomum cervi* and *Orthocoelium scoliocoelium*. The highest incidence of amphistomes (85.77%) in buffaloes were recorded in monsoon during the year (Table 2), which were closely related to the work of (Nwosu *et al.*, 2007; Shreedhar *et al.*, 2009; Bhat *et al.*, 2012; and Swarnakar & Kumawat, 2013). The reason was that this season was the most conducive to the breeding of snail viz. *Indoplanorbis*, *Lymnea* and *Gyraulus* spp. Moderate infection recorded in winter (68.75%) which was then followed by summer (52.94%). Some reports also records high infection in summer (Manna *et al.*, 1994; Kanyari *et al.*, 2009; Gadhai *et al.*, 2009 and Lone *et al.*, 2012 & 2013). The geographical and climatic condition like temperature, rainfall, humidity etc. may play the role in such type of incidences.

In Udaipur, arrival of rainy season starts at ending of summer, at that time snails were reactivated after aestivation and dispersed throughout the fields and become infected with miracidium larva of amphistomes. The infection takes place in early rainy season, that's the reason mature amphistomes are prevalent in monsoon. As metacercaria remain viable for 2-3 months (Soulsby. 1982) so the infection seen in winter also.

Table 3 shows the infection in different age group. Highest infection was found in adult buffaloes (90.00%) followed by Buffalo bull (87.25%) than calves (56.83%). This result shows the age dependency of infection of amphistomes. Heavy infection was found in buffaloes more than 2 years of age. The difference in the percentage of infection in various age groups may depend on the exposure to the source of infection.

Table 4 shows the sex wise occurrence of amphistomes parasites, male (79.46%) were found to be more infected as comparison to female buffaloes (51.66%). The higher percentage of infection in male buffaloes was due to lack of caring, improper food supplement, uncontrolled grazing practice, lack of hygienic cattle farming and low economic value, whereas females buffaloes were look after properly because of their future economic importance. This was also a reason that female buffaloes were brought to slaughter houses only in the condition of illness, sterility or due to aging.

The above finding indicates that infection of amphistomes parasite in water buffaloes is major problem for the cattle farmers of Udaipur. The study shows that amphistomes infection is dependent on age, sex and seasons. The above information on the prevalence of amphistomes parasites of cattle gathered in Udaipur can be used to design appropriate control measure, and focusing on the severe problem, further investigation is needed.

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