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RESEARCH PAPER

Studies on prevalence of GI nematodes in cattle in Udaipur, district (Rajasthan)

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Abstract : A study was conducted from Sept. 2020 to January 2021 in and around Udaipur district and the overall prevalence of for gastrointestinal nematode in the cattle of Udaipur district was reported. The Overall prevalence of GI nematode infection in cattle was (64.28%). Among various GI nematode infections reported in the present study, *Strongyles* (44.55%) were the most prevalent gastrointestinal nematode followed by *Trichuris, Toxocara* and *Strongyloides.* In cattle seasonal analysis revealed highest prevalence in rainy season (72.61%) and lowest in winter (39.62%). Sex wise observations that the females (67.39% and 58.33%) were more infected with GI nematode infection than the males cattle, respectively. The age wise prevalence of GI nematode infection reported highest prevalence in age group below 3 years (82.79%) followed by 3-5 years age group (55.07%) and above 5 years age group (41.66%) in cattle. Month wise GI nematode infection showed higher prevalence in September Month (75.92%) in cattle.

Key Words : GI Parasites, Prevelance

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INTRODUCTION

India is predominantly an agricultural country where livestock and agriculture are closely associated with each other. The role of livestock sector is very crucial in the economy of India (Rajakaruna and Warnakulasooriy, 2011). Parasitic infection are very common in tropical and sub-tropical regions of World and causes major economic losses to the livestock industry (Velusamy *et al*., 2014). The economic impact of GI parasites in livestock industry encompasses mortality and morbidity losses, enhanced susceptibility to diseases, losses resulting from condemnation of carcasses and viscera as well as cost of drugs and veterinary aids (Rajakaruna and Warnakulasooriya, 2011). Gastrointestinal parasites not only affect the health but also disturbs the feed intake, feed conversion and utilization as well as growth of the animal thereby severely affect the productive and reproductive performance of the animals which can be seen as loss in body weight, poor reproductive performance, digestive disturbance, emaciation for longer period and increased susceptibility of animals to other infections (Radostits *et al.*, 1994; Yadav *et al*., 2004). Gastrointestinal (GI) nematodes rank highest on

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global index with *Haemonchuscontortus* on top for substantial loss of productivity in the livestock industry (Perry *et al.,* 2002). Internal parasites are a significant threat facing today's in cattle and buffalo. Problems associated with parasites, particularly those of the gastrointestinal tract of cattle and buffalo can cause irreversible damage or even death of the animal, reduced performance and economic losses for the farmer. Animals that are over burdened with parasites can be hindered in their reproductive performance, experience reduced growth rates and become less productive overall, whether their purpose be milk, meat and draft. The harmful effects on these animals range from gastroenteritis, anorexia, abdominal distention, diarrhoea, emaciation, all of which result in serious economic losses to the farmer particular and nation in general. Gastrointestinal nematode (GINs) infections are considered to be of serious concern in first- season grazing (FSG) calves. However, there is substantial evidence that they can also have a negative impact on the productivity of adult dairy cows (Sanchez *et al*., 2004). Interaction of various risk factors influences the prevalence of gastrointestinal nematodes in food animals and includes age, sex, season, use of anthelmintics and hus bandry or management practices at the farm (Raza *et al*., 2007; Khan *et al*., 2009). A better understanding of the epidemiology and biology of parasites is essential for a successful parasite control programme. (Coppieters, 2009). The problem is however much more severe intropical countries due to very favourable environmental conditions for helminth transmission poor nutrition of the host animal (Mbuh *et al.,* 2008) and poor sanitation in rural areas (Badran *et al.,* 2012). Ecological conditions like weather, texture of soil, population density, type and amount of vegetation, management system, host species and age of the animals play an important role in the prevalence of parasites (Thomas, 1982). In grazing animals, parasitic stages enter the body from the contaminated pasture and water (Levine, 1968).

MATERIAL AND METHODS

Study area :

The study was conducted from the month of Sept. 2020 to January 2021 in and around Udaipur district in Southern Rajasthan.

Study population:

From a total population of large ruminants present in and around Udaipur district, a sample size of 210 cattle from in and around Udaipur district.

Study methodology :

Cross-sectional study method was followed in this study. A total of 210 faecal samples were collected from cattle during morning hours directly from the rectum of the each animal or during defecation with strict sanitation and placed in air and water tight polythene containers and then taken to the laboratory for routine examination.

Collection of faecal samples :

A total of 210 faecal samples of large ruminants were collected randomly from in around Udaipur district during morning hours in rainy and winter season from Sept. 2020 to January 2021. The faecal samples of individual animal were collected by means of rectal examination using new unused glove and put in individually marked and well labelled polythene air tight containers. The relevant information regarding place, rearing, age, sex, source of feed and water, deworming history, clinical signs etc. were also recorded. After collection the samples were tried to process on the same day itself and those from far villages were collected, transported to the laboratory by using ice bag and stored in refrigerator (4°C) and processed within 2 days.

Faecal examination methodology :

To know the prevalence of parasitic infections, the collected faecal samples were processed and examined by Sedimentation and Centrifugal Floatation technique each and results were recorded.

Sedimentation technique:

1-3 gram of faecal sample was mixed with 10-15 ml of ordinary tap water and triturated by pestle and mortar. It was strained and taken in 15 ml centrifuge tube and centrifuged at 1000-1500 rpm. The supernatant was discarded and one drop of sediment was placed on a clean microglass slide, a micro coverslip was put over it and was examined under low power objective (10^X) of the microscope. The presence of parasites was recorded with presence of eggs or ovas.

Centrifugal floatation technique :

1-3 gram of faecal sample was mixed with 10-15 ml of ordinary tap water and triturated by pestle and mortar. It was strained and taken in 15 ml centrifuge

tube and centrifuged for 1-2 min. at 1000-1500 rpm. The supernatant was removed and after emulsifying the sediment, centrifugation was repeated one or more time till the colour of the supernant was cleared. After last washing in water, the faecal sediment at the bottom of the tube was mixed with Sheather's sugar solution (specific gravity 1.27), filling the tube to its brimand centrifuged similarly covered with a clean cover slip, and the tube was placed in vertical position in the tube stand for 2 minutes. The coverslip was then picked up gently and put over a slide for examination under low power objective (10^X) of the microscope. The results were noted for the presence of different parasitic eggs orovas.

Statistical analysis :

The prevalence studies were analysed by Chi-square test.

RESULTS AND DISCUSSION

A total of 210 faecal samples of cattle were collected from in and around Udaipur during September 2020 to January 2021. These faecal samples were examined using different parasitological technique to find out the presence of nematodes eggs/oocysts/cysts for the presence or absence of nematodes in cattle. Out of 210 faecal samples, 93 samples were from animals below 3 years, 69 samples from 3-5 years, 48 samples from above 5 years age group.

Overall prevalence of nematode infection in cattle:

Out of 210 examined samples from cattle, 135 (64.28%) were found to be infected. Total prevalence for mixed infection was 32 (23.71%) in cattle. Among the various nematode infection in cattle the *Strongyle* sp. was found in 56 (41.48%) animals with highest prevalence followed by *Trichuris* sp. in 26 (19.26%), *Toxocara* sp. in 16 (11.85%), *Strongyloides* sp. in 5 (3.71%) animals (Table 1).

Season wise prevalence of nematode in cattle :

Significant ($p<0.05$) prevalence was observed 114 (72.61%) during rainy season, 21 (39.62%) in winter season. Among the various nematode infections highest prevalence was of *Strongyle* sp. 47 (41.23%) followed by *Trichuris* sp. 22 (19.30%), *Toxocara* sp. 15 (13.16%), *Strongyloides* sp. 5 (4.39%) were recorded in rainy season. In winter season also *Strongyle* sp. 9 (42.85%) was highest followed by *Trichuris* sp. 4 (19.05%), *Toxocara* sp. 1(4.76%), *Strongyloides* sp. were not recorded. In winter mixed infection was highest 7(33.33%) followed by rainy season 25(21.92%) with an overall prevalence of 23.71% for mixed parasites with 32 animals (Table 2). Ganguly *et al.* (2017) recorded (37.26%) in rainy season and (26.37%) in winter season. Patel *et al*. (2015) also found highest prevalence in rainy season (51.54%) followed by winter (34.02%).

Gender wise prevalence of nematode incattle :

Out of a total of 210 cattle faecal sample examined 72 were male and 138 were female. The overall prevalence of infections in cattle was not found to be significant ($p<0.05$). Nematode infection showed higher prevalence in female (67.39%) in comparison to male

Table 1 : Overall prevalence of nematode of large ruminants in Udaipur

Species	Examine	Infected	Mix infection	Strongyle	Trichuris	Toxocara	Strongy-loides
Cattle	210 (40.70)	135 (64.28)	32 (23.71)	56 (41.48)	26 (19.26)	16 (11.85)	5 (3.71)

Table 2 : Season wise prevalence of nematode in cattle

Season	Examine	Infected	Mix infection	Strongyle	Trichuris	Toxocara	Strongyloides
Rainy	157	114 (72.61)	25 (21.92)	47 (41.23)	22 (19.30)	15 (13.16)	5 (4.39)
winter	53	21 (39.62)	7 (33.33)	9 (42.85)	4 (19.05)	1 (4.76)	0 (0)
Total	210	135 (64.28)	32 (23.71)	56 (41.48)	26 (19.26)	16 (11.85)	5 (3.71)

Table 3 : Gender wise prevalence of nematode in cattle

Gender	Examine	Infected	Mix infection	Strongyle	Trichuris	Toxocara	Strongyloides
Male	72	42 (58.33)	8 (19.04)	18 (42.86)	12 (28.57)	4 (9.53)	0 (0)
Female	138	93 (67.39)	24 (25.81)	38 (40.86)	14 (15.06)	12 (12.90)	5 (5.37)
Total	210	135 (64.28)	32 (23.70)	56 (41.48)	26 (19.25)	16 (11.85)	5 (3.70)

cattle (58.33%).

In females, among various nematode, *Strongyle* sp. was noted in 38 (40.86%) which was highest followed by *Trichuris* sp. in 14 (15.06%), *Toxocara* sp. in 12 (12.90%), *Strongyloides* sp. 05 (5.37%) animal whereas in male *Strongyle* sp. was found in 18 (42.86%) animals which was highest followed by *Trichuris* sp. in 12 (28.57%), *Toxocara* sp. in 04 (9.53%), *Strongyloides* sp. were not recorded in male. In mixed infection female has 25.81% prevalence with 24 animals and in male it was found to be 19.04% with 08 animals infected with nematode (Table 3). The results are in accordance with those of Raza *et al.* (2013) with female (71.72%) and male (34.46%), Maharana *et al*. (2016) in female (31.97%) and male (29.03).

Age wise prevalence of nematode in cattle :

The overall highest prevalence of nematode infection was significantly ($p<0.05$) during in age group of below 3 years77 (82.79%) followed by 3-5 years group 38 (55.07%) and with 20 (41.66%) in above 5 years group. The prevalence of *Strongyles* sp. in 32 (41.56%) animals was highest followed by *Trichuris* sp. in 16 (20.78%), *Toxocara* sp. in 08 (10.39%) and *Strongyloides* sp. 02 (2.59%) in below 3 years of age (Table 4). Patel *et al.* (2015) was reported that young animals (46.39%) were more susceptible to infection than adult (27.83%) and older animals (25.77%).

Month wise prevalence of nematode infection in cattle:

The overall prevalence of nematode infection in cattle was highly significant ($p<0.01$) during October month 48 (73.84%), followed by September month 41 (75.92%), November month 28 (65.11%), December month 11 (37.93%) and January month 7 (36.84%).

Among various nematode, in September Month *Strongyle* sp. was found 18 (43.90%), *Trichuris* sp. 08 (19.52%), *Toxocara* sp. 05 (12.19%) and *Strongyloides* sp. 01 (2.43%) were recorded. In October month *Strongyle* sp. was found 21 (43.75%), *Trichuris* sp. 09 (18.75%), *Toxocara* sp. 05 (10.42%) and *Strongyloides* sp. 03 (6.25%) were recorded. In November Month *Strongyle* sp. was found 10 (35.71%), *Trichuris* sp. 05 (17.86%),*Toxocara* sp. 04 (14.28%) and *Strongyloides* sp. 01 (3.57%) were recorded. In December Month *Strongyle* sp. was found 04 (36.36%), *Trichuris* sp. 02 (18.19%), *Toxocara* sp. 01 (9.09%) and *Strongyloides* sp. were not recorded. In January month *Strongyle* sp. was found 03 (42.87%), *Trichuris* sp. 02 (28.57%) and *Toxocara* sp. 01 (14.28%) and *Strongyloides* sp. were not recorded (Table 5).

In mixed nematode infection from September month 09 (21.95%), October month 10 (20.83%), in November month 08 (28.57%), in December month 04 (36.36%) and in January month 01 (14.28%) were recorded in cattle. Similar findings were reported by Marskole *et al*. (2016) higher prevalence in Sept. (81.81%) followed by lowest prevalence was recorded in Dec. (61.11%) and Raval and Sachaniya (2020) found higher prevalence in Sep. (23.15%) and lowest in Dec. (16.18%).

Table 4 : Age wise prevalence of nematode in cattle

Age	Examine	Infected	Mix infection	Strongyle	Trichuris	Toxocara	Strongyloides
Below 3 years	93	77 (82.79)	19 (24.68)	32 (41.56)	16 (20.78)	8 (10.39)	2 (2.59)
3-5 years	69	38 (55.07)	10 (26.31)	16 (42.10)	7 (18.43)	4 (10.52)	1 (2.63)
Above 5 years	48	20 (41.66)	3 (15.0)	8 (40)	3 (15.0)	4 (20.0)	2 (10.0)
Total	210	135 (64.28)	32 (23.71)	56 (41.48)	26 (19.26)	16 (11.85)	5 (3.71)

Table 5 : Month wise prevalence of nematode infection in cattle

Month	Examine	Infected	Mix infection	Strongyle	Trichuris	Toxocara	Strongyloides
Sept.	54	41 (75.92)	9 (21.95)	18 (43.90)	8 (19.52)	5 (12.19)	1 (2.43)
Oct.	65	48(73.84)	10 (20.83)	21 (43.75)	9 (18.75)	5 (10.42)	3 (6.25)
Nov.	43	28 (65.11)	8 (28.57)	10 (35.71)	5 (17.86)	4 (14.28)	1 (3.57)
Dec.	29	11 (37.93)	4 (36.36)	4 (36.36)	2 (18.19)	1 (9.09)	0 (0)
Jan.	19	7 (36.84)	1 (14.28)	3 (42.87)	2 (28.57)	1 (14.28)	0 (0)
Total	210	135 (64.28)	32 (23.71)	56 (41.48)	26 (19.26)	16 (11.85)	5 (3.71)

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