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A Coprological Survey of Gastrointestinal Parasites of Cattle in Udgir, Marathwada, India

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A B S T R A C T

In a coprological survey of gastrointestinal parasites in cattle of Udgir and surrounding area was conducted during August 2015 to July 2016. The overall prevalence of gastrointestinal parasites in cattle was recorded to the extent of Strongyles sp. 9.30%, *Strongyloides* sp. 3.40%, *Trichuris* sp. 1.80%, *Moniezia expansa* 0.70%, *Moniezia benedeni* 0.20%, *Eimeria* sp. 1.30%, mixed infection 1.20% and *Toxocara* sp 0.70%. In monsoon showed the highest infection of 30.27 % while in winter 16.06% whereas summer season contributed to 7.76% infection. Age wise distribution of parasites showed declining trend with advancement of age the infection of parasites. Breed-wise analysis conducted for prevalence of gastrointestinal parasitic infection showed significant variation within the breeds of cattle present in the region.

Introduction

The gastrointestinal tract (GIT) of animals harbor wide variety of parasites like helminthes, coccidia *etc*. which cause clinical and sub clinical parasitism. 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). In addition, there will be considerable economic losses due to morbidity and mortality, predisposition to other diseases, loss in products such as meat, milk *etc* as well as those incurred on cost of drugs and veterinary aids. In spite of significant production losses, the problem is neglected due to its chronic and insidious nature. Therefore, the information on prevalence of gastrointestinal helminthes is always considered mandatory for evolving effective strategies for their management.

However the prevalence of gastrointestinal parasite infection in livestock exhibits differently with respect to the age sex breed of the animal, management practices, local climatic attributes such as temperature, rainfall, humidity, vegetation *etc*. and also the parasite species themselves. Therefore it is needed to estimate the possible variation in parasitic infection of each host species of animals in different geographic regions and which could help to design an effective control measures against economically important parasitic diseases. The present research work was planned with an objective to record the clinical and subclinical Gastrointestinal parasitic profile in cattle from Udgir region of Marathwada.

Materials and Methods

Location of study *i.e.* Udgir lies in the southern extreme of Marathwada region in Maharashtra state. The geographical location as per coordinates is 18°23′46″N 77°07′03″E. Udgir's climate is classified as tropical. The area receives 977 mm average annual rainfall and is characterized by 40 to 80% range of humidity and range of temperature lowest being 12 ^{Œ}C and highest being 40 ^{Œ}C.

Faecal samples from the cattle were collected throughout year during August 2015 to July 2016 comprising of all three seasons of the year from the TVCC of college, adopted villages, clinical camps and nearby Udgir area. These samples were processed in the laboratory by standard methods Flotation and Sedimentation techniques (Soulsby, 1982). Samples were examined under low and high power microscopic fields for presence of round worm eggs, tape worm proglottids, eggs of fluke and oocysts of enteroprotozoan. The eggs/oocysts so detected were further examined for morphology to know the specification of fluke eggs, tape worm, round worm and entero-protozoa. The data obtained were analyzed by Chi square test and conclusions presented accordingly.

Results and Discussion

During the period a total of 999 samples were included for the study and the overall prevalence of gastrointestinal parasites was found as 18.61% in cattle. The parasitic species wise prevalence is presented in Table 1. As regards season wise picture of parasite prevalence the per cent infection noted during the three seasons was 30.27 % in monsoon, 18.61 % in winter and 7.76% in summer Table 2). In summer least infection was recorded compared to monsoon and winter, while significantly higher infection was observed during rainy (monsoon) season.

Similar pattern of seasonal variation was observed for each individual parasitic species and species found as *Toxocara* sp, Strongyles sp., *Strongyloides* sp, *Trichuris* sp, *Moniezia expansa*, *Moniezia benedeni*, *Eimeria* sp, and mixed infections. In the present study mostly individual gastrointestinal parasitic infection as well as overall parasitic infections were reported as highest during monsoon, moderate during winter and lowest during summer in all host species. Similar pattern of seasonal variation was observed and reported by Sahoo *et al.,* (2003), Pathak and Pal (2008), Shirale *et al.,* (2008), Aktaruzzaman *et al.,* (2013) and Laha *et al.,* (2013).

The reasons for seasonal pattern experiencing highest prevalence of parasitic infections during monsoon season, slightly lower during winter and still lower or almost negligible during summer season could be due to various reasons. According to Soulsby (1966), the higher rainfall during monsoon season provides suitable molarity of salt which is important factor for ecdysis. It also helps in larval dispersion on pasture and increases the chances of contact between host and infective larvae. Stability of monsoon season for survival, development and dissemination of parasitic larvae and suitable environment for sporulation of *Eimeria* spp. oocysts. Devoid of optimum moisture and temperature for development of larvae in pasture during winter and summer might be the reason for lower infection.

Table.1 Species wise prevalence of gastrointestinal parasites

	Species	**% prevalence**
1	*Toxocara vitulorum*	0.70
2	*Strongyloides* sp	3.40
3	*Trichuris* sp	1.80
4	*Moniezia expansa*	0.70
5	*Moniezia benedini*	0.20
6	*Eimeria* sp	1.30
7	Mixed infections	1.20
8	In Strongyle Group.	9.30
	Trichostrongylus sp.	31.8
	Bunostomum sp.	17.2
	Mecistocirrus sp.	16.7
	Haemonchus sp	11.9
	Cooperia sp	8.9
	Overall Prevalence	18.61

Table.2 Season wise prevalence of gastrointestinal parasites in cattle at Udgir

Season / Parasite	Summer	Monsoon	Winter
Toxocara vitulorum	0.32	0.83	0.90
Strongyles *sp*	3.88	14.16	9.09
Strongyloides sp	1.29	6.38	2.12
Trichuris sp	0.64	3.61	0.90
Moniezia expansa	0	1.66	0.30
Moniezia benedeni	0	0.27	0.30
Eimeria sp	0.64	1.66	1.51
Mixed infections	0.97	1.66	0.90
Total number of animals examined	309	360	330
Total positive and percentage	*7.76	*30.27	*16.06

* Chi-square value 81.33 (1%-9.21, 5%-5.99)

Table.3 Age wise prevalence of gastrointestinal parasites in cattle at Udgir

Age group	Age group 1st (0-6 month)		Age group 2nd (6-18 month)		Age group 3rd (above 18 month)	
Parasite	Positive	%	Positive	%	Positive	%
Toxocara vitulorum	7	6.19	0	0	0	0
Strongyles *sp*	8	7.07	24	12.18	61	8.85
Strongyloides sp	3	2.65	10	5.07	21	3.04
Trichuris sp	1	0.88	3	1.52	14	2.03
Moniezia expansa	7	6.19	0	0	0	0
Moniezia benedeni	2	1.76	0	0	0	0
Eimeria sp	3	2.65	2	1.01	8	1.16
Mixed infections	5	4.42	3	1.52	4	0.58
% positive	36	*31.85	42	*21.31	108	*15.7
Total number of animals examined	113		197		689	
Chi-square value calculated was 5.72 (1%-9.21, 5%-5.99)						

Table.4 Sex wise prevalence of gastrointetstinal parasites in cattle at Udgir (%)

Sex	Male	Female
Toxocara vitulorum	0.43	0.93
Strongyles *sp*	10.10	8.61
Strongyloides sp	4.30	2.62
Trichuris sp	1.29	2.24
Moniezia expansa	0.86	0.56
Moniezia benedeni	0	0.37
Eimeria sp	1.07	1.49
Mixed infections	1.29	1.12
Total number of animals examined	465	534
% positive	**19.35**	**17.97**
Chi-square value calculated was 0.24 (1%-6.63, 5%-3.84)		

Table.5 Breed wise prevalence of gastrointestinal parasites in cattle at Udgir (%)

Breed	Non-Descript	Red Kandhari	Deoni
Toxocara vitulorum	0.95	0.88	0.27
Strongyles *sp*	7.16	14.15	8.69
Strongyloides sp	3.7	4.86	2.17
Trichuris sp	2.71	1.76	0.81
Moniezia expansa	0.24	1.32	0.81
Moniezia benedeni	0.49	0	0
Eimeria sp	0.98	0.44	2.17
Mixed infections	1.23	0.44	1.63
Total number of animals examined	405	226	368
% positive	**17.53**	**23.89**	**16.6**
Chi-square value calculated was 4.45 (1% - 9.21, 5% - 5.99)			

The age wise parasite profile of the animals under study depicted *Toxocara vitulorum*, *Moniezia expansa* and *Moniezia benedeni* infection was highest in the calves (age group I), while Strongyles sp. and *Strongyloides* sp. were noted more in young adults (age group II), followed by in adults (age group III) and calves respectively (Table 3). Other parasitic species such as *Trichuris* sp., *Eimeria* sp. and quantum of mixed infections showed the less differences in three different age groups. Overall gastrointestinal parasitic infection in calves, young adults and adult were 31.85 %, 21.31 % and 15.67 % respectively. Mixed infections in the calves were found as higher as it were mostly contributed due to combination of *Eimeria* sp with helminthes. On the other side, mixed parasitic infections reported in young adults and adults was lower compared to calves. Statistically significant difference was noted in prevalence rates amongst three different age groups. Present results are in agreement with the reports of Pfukenyi *et al.*, (2007) and Kabaka *et al.*, (2013). The reason for higher prevalence in calves may be due to the susceptibility and first time exposure to the parasitic infections. It could also be due to non-adoption of recommended calf management. Contrary to present study observations, Akanda *et al.*, (2014) noted higher parasitic infections in adults compared to young and weaners and it was ascertained to keeping adults for a longer period of time in breeding and milk production purposes or supply of inadequate feed against their high demand. Moreover, stress like lactation, pregnancy, nutritional deficiency which might be accounted for higher prevalence in adult cattle. While in another study Mathew *et al.*, (2017) noted the prevalence of strongylosis irrespective of age groups.

In the present study, the overall prevalence of gastrointestinal infections in cattle didn't show any significant difference between two sexes, despite, in male cattle slightly higher prevalence (19.35%) was recorded as compared to females (17.97%). Mixed infections, like *Toxocara* sp and *Trichuris* sp were noted slightly higher in females as compared to males, while, other parasitic species Strongyles sp., *Strongyloides* sp, *Moniezia expansa*, *Moniezia benedeni* and *Eimeria* sp found slightly more in males in comparison to females (Table 4). In Udgir region males and females were taken for grazing to same pasture areas, having equal chances of acquiring the infections, which has been exactly reflected in the present study. Similar observation has been reported by Kemal and Teref (2013), who also narrated the similar reason that, an equal opportunity for infection when they were exposed to the parasites in the communal grazing pasture.

During the study, the faecal samples of three indigenous breeds i.e. Non-descript (ND), Red Kandhari (R.K) and Deoni were examined (Table 5). Among the indigenous breeds, Red Kandhari cattle showed the highest prevalence of gastrointestinal parasitic infections of 23.89%, followed by Non-descript (17.53%) and Deoni (16.57%) cattle. As regards to individual parasite species, *Strongyles* sp. observed to be the most commonly infecting to all the breeds of host species and the infection percentage noted as 7.16%, 14.15% and 8.69 percent in ND, Red Kandhari and Deoni breeds of cattle, respectively. *Strongyloides* sp, *Trichuris* sp and *Moniezia expansa* showed little variation amongst the breeds studied. Mixed infections were found more in ND and Deoni than Red Kandhari cattle. However, statistically no significant differences were noted amongst the parasitic prevalence in these breeds. These differences may be attributed to the genetic makeup of the animals considering its role in susceptibility to the parasitic infection.

This study warrants the animal health machinery of the state to devise and implement a strategic plan to control the parasite infestations and maintain the livestock health and thereby production in this rainfed area.

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