RESEARCH ARTICLE

Prevalence of Gastrointestinal Parasitism in Dairy Cattle of Western Maharashtra

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Abstract

The study aimed to assess the prevalence of gastrointestinal (GI) parasitic infections in dairy cattle across seven districts of Western Maharashtra. A total of 1088 feacal samples were examined by using quantitative and qualitative methods. Overall prevalence of GI parasitic infections was 75.00% (816/1088) along with significant variation across districts, with the highest prevalence in Ahilyanagar district (83.50%) and the lowest in Satara district (71.21%). Dual infections (34.28%) were more common than single (32.17%) and multiple infections (8.54%). Adults showed a higher prevalence (77.78%) as compared to heifers (62.50%) and young ones (58.82%). Seasonal analysis indicated higher prevalence during the monsoon season (82.67%) than in winter season (71.33%).

Key words: Dairy cattle, Gastrointestinal parasitic infections, Maharashtra, Prevalence.

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Introduction

Dairy industry plays important role in Indian rural economy. Farmers in rural area totally depend upon agriculture and dairy industry for their daily livelihood. The farmers of rural areas and agriculturists are still dependent economically on domestic ruminants like cattle and buffaloes in India (Choubisa and Jaroli, 2013). These parasitic infections can lead to clinical diseases such as diarrhea, weight loss, anaemia, reduced milk yield and in severe cases death may occur. In addition to these direct effects, parasitic infestations can compromise the immune system, making cattle more susceptible to secondary infections (Ganguly *et al*., 2019). Gastrointestinal parasitic infections in dairy cattle are caused by a variety of parasite species, including nematodes, trematodes, cestodes, and protozoa. These parasites are transmitted through contaminated feed, fodder, water, or grazing areas, with the infective stages present in pasture, manure, or soil (Singh *et al*., 2017). The parasites can injure and irritate the stomach and intestinal lining or mucosa, leading to a reduction in digestion and absorption of nutrients from the intestine in addition to bleeding and protein loss from the gut (Vanisri *et al*., 2016).

The seasonal variation in rainfall and temperature creates conditions that can either favour or inhibit the survival of these parasites. For example, heavy monsoon rains may increase the numbers of snails (intermediate hosts for liver flukes), while high humidity and warmth may facilitate the development of nematode larvae on pasture (Ganguly *et al*., 2019). Beside from seriously impairing the health of domestic animals, these infections also cause significant financial loss to livestock due to decreased weight, severe debilitation, and morbidity (Swarnakar *et al*., 2015). It is needed to estimate the possible variation in parasitic infection of each host species of animals in different geographic regions, which could help to design an effective control measure 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 Shirwal region of Western Maharashtra.

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Materials and Methods

To know the exact status of gastrointestinal parasites (GIPs) in dairy cattle, a total of 1088 fecal samples of cattle were collected from seven districts of western Maharashtra (India) during September, 2024 to February, 2025. The required sample size was estimated using the online sample size calculator available at Calculator.net. Faecal samples were collected directly from the rectum of animals avoiding any

Table 1: Regional prevalence of gastrointestinal parasitism (GI) in dairy cattle of Maharashtra

District	Talukas	No. of samples examined	Positive samples (%)			Total positive samples (%)
			Single parasitic infection	Dual parasitic infection	Multiple parasitic infection	
Satara	Khandala	69	16(23.18)	23(33.33)	6(8.69)	45(65.21)
	Satara	38	11(28.94)	18(47.36)	2(5.26)	31(81.57)
	Karad	26	10(38.46)	8(30.76)	1(3.84)	19(73.07)
	Phaltan	17	7(41.17)	7(41.17)	0(0.00)	14(82.35)
	Mahabaleshwar	25	6(24.00)	9(36.00)	2(8.00)	17(68.00)
	Wai	23	8(34.78)	6(26.08)	1(4.347)	15(65.21)
	Total	**198**	**58(29.29)**	**71(35.86)**	**12(6.06)**	**141(71.21)**
Kolhapur	Kolhapur	104	40(38.46)	24(23.07)	8(7.69)	72(69.23)
	Panhala	23	5(21.73)	9(39.13)	1(4.34)	15(65.21)
	Hatkanangle	21	9(42.85)	7(33.33)	1(4.76)	17(80.95)
	Karvir	17	5(29.41)	8(47.05)	2(11.76)	15(88.23)
	Kagal	32	9(28.12)	13(71.87)	3(9.37)	25(78.12)
	Total	**197**	**68(34.52)**	**61(30.96)**	**15(7.61)**	**144(73.10)**
Ahilyanagar	Rahuri	98	35(35.71)	41(41.83)	12(12.24)	88(89.79)
	Akole	18	5(27.77)	9(50)	1(5.55)	15(83.33)
	Rahata	20	8(40.00)	5(25.00)	1(5.00)	14(70.00)
	Shrirampur	22	12(54.54)	6(27.27)	0(0.00)	18(81.81)
	shrigonda	19	4(21.05)	9(47.37)	1(5.28)	14(73.68)
	Sangamner	23	10(43.48)	7(30.43)	1(4.35)	18(78.26)
	Total	**200**	**74(37.00)**	**77(38.50)**	**16(8.00)**	**167(83.50)**
Pune	Purander	56	18(32.14)	16(28.57)	5(8.93)	39(69.64)
	Baramati	30	12(40.00)	7(23.33)	2(6.67)	21(70.00)
	Indapur	21	5(23.81)	9(42.86)	4(19.04)	18(85.71)
	bhor	36	10(27.78)	11(30.56)	3(8.33)	24(66.67)
	Total	**143**	**45(31.47)**	**43(30.07)**	**14(9.79)**	**102(71.33)**
Solapur	Barshi	18	8(44.44)	4(22.22)	1(5.56)	13(72.22)
	Sangola	21	8(38.10)	5(23.81)	1(4.76)	14(66.67)
	Mangalvedhe	22	6(27.27)	9(40.90)	2(9.09)	17(77.27)
	Karmala	20	3(15.00)	7(35.00)	7(35.00)	17(85.00)
	Akkalkot	20	6(30.00)	8(40.00)	0(0.00)	14(70.00)
	Total	**101**	**31(30.69)**	**33(32.67)**	**11(10.89)**	**75(74.26)**
Sangli	Khanapur	30	7(23.33)	11(36.67)	6(20.00)	24(80.00)
	Kadegaon	24	9(37.50)	5(20.83)	4(16.67)	18(75.00)
	Atpadi	32	8(25.00)	10(31.25)	3(9.37)	21(65.62)
	Palus	19	3(15.79)	7(36.84)	5(26.32)	15(78.95)
	Miraj	27	8(29.63)	8(29.63)	3(11.11)	19(70.37)
	Total	**132**	**35(26.52)**	**41(31.06)**	**21(15.91)**	**97(73.48)**
Nashik	Nashik	23	8(34.78)	9(39.13)	2(8.70)	19(82.60)
	Nipad	21	7(33.33)	10(47.62)	1(4.76)	18(85.71)
	Baglan	26	7(26.93)	10(38.46)	0(0.00)	17(65.38)
	Sinnar	28	9(32.14)	13(46.43)	0(0.00)	22(78.57)
	Chandwad	19	8(42.11)	5(26.32)	1(5.26)	14(73.68)
	Total	**117**	**39(33.33)**	**47(40.17)**	**4(3.42)**	**90(76.92)**
Total		**1088**	**350(32.17)**	**373(34.28)**	**93(8.54)**	**816(75.00)**
χ^2				**177.669****		**59.377****

** significant at p<0.01.

contamination. Random faecal sampling including all age groups was done for cattle. Samples were collected in small plastic bottles of 6×4 inches and each sample was labeled and information regarding age, sex, management, illness and deworming status was recorded. A questionnaire was prepared to record the information regarding the breed, age, sex, and presence of any symptoms, clinical history and treatment given to the animals. Samples were brought and processed in the laboratory of Department of Veterinary Parasitology of the College in Shirwal (Satara), Maharashtra. Faecal samples were subjected to detailed classical parasitological analyses for presence of parasitic eggs/oocysts by direct smear examination, standard sedimentation and flotation techniques (Soulsby, 1982). The samples found positive for parasitic eggs/ova/cysts were subjected to quantitative technique (McMaster egg counting technique) to get the EPG (eggs per gram).

Data analysis was performed by using SAS for Windows, Version 9.4, USA. Association between the prevalence of gastrointestinal parasitic infections and various factors was carried out by Chi square (X^2) test.

Results and Discussion

In the present study, out of 1088 faecal samples examined from seven districts of Western Maharashtra, 816 samples were found positive for gastrointestinal tract (GIT) parasitic infections, indicating a high level of an overall prevalence (75.00%, 816/1088) in dairy cattle (Table 1). The GIT parasite infections varied significantly among different districts (χ^2: 59.377) with highest prevalence in Ahilyanagar district (83.50%) and lowest in Satara district (71.21%). The overall prevalence of dual infection of GIT parasites (34.28%) was higher (χ^2: 177.669) than the single (32.17%) and multiple infections (8.54%). The higher infection rate of GIT parasites may be due to minimal use of anthelmintic treatment by the farmers combined with exposure to variety of pathogens including the infective developmental stages of the GIT parasites in the contaminated environment. Bushra *et al*. (2013) observed a higher prevalence of gastrointestinal parasites in the central zone of the Kashmir Valley (78.02%). Mir *et al*. (2013) also reported an overall prevalence of endoparasites to be 67.15% in cattle of Jammu area of J&K, which is consistent with what we have seen.

Parasite wise, only the single infection rate of Coccidia (9.10%), *B. coli* (7.35%), eggs of S*trongyle* spp. (6.25%), eggs of *Amphistome* spp. (4.96%), *Strongyloides* spp. (1.75%), *Schistosoma* spp. (1.01%), *Haemonchus* spp. (0.74%), *Trichuris* spp. (0.55%), *E. histolytica* (0.28%) and *Toxocara vitullorum* (0.18%) was observed in cattle samples (Table 2). On the other hand, the high rate of multiple infections (8.55%) in Western Maharashtra, where the history revealed that these animals have been only occasionally subjected to anthelmintic treatment. Analysis of risk assessment for the various parasite infections showed that the most common one was Coccidia

Table 2: Prevalence of species-specific GI parasites in dairy cattle of Maharashtra

Districts	Total sample examined	Total positive %	Single parasite infection (%)								
			Str.	Amph.	Cocc.	*B. coli*	Strgy.	E.hist.	Sch.	Tri.	Haem.	Toxo.
Satara	198	141 (71.21)	11 (5.56)	9 (4.55)	16 (8.08)	12 (6.06)	4 (2.02)	0 (0.00)	1 (0.51)	2 (1.01)	1 (0.51)	2 (1.01)
Kolhapur	197	144 (73.10)	9 (4.57)	11 (5.58)	18 (9.14)	22 (11.17)	3 (1.52)	0 (0.00)	1 (0.51)	2 (1.02)	2 (1.02)	0 (0.00)
Ahilyanagar	200	167 (83.50)	20 (10.00)	10 (5.00)	17 (8.50)	15 (7.50)	3 (1.50)	0 (0.00)	4 (2.00)	2 (1.00)	3 (1.50)	0 (0.00)
Pune	143	102 (71.33)	8 (5.59)	8 (5.59)	16 (11.19)	10 (6.99)	2 (1.40)	0 (0.00)	1 (0.700	0 (0.00)	0 (0.00)	0 (0.00)
Solapur	101	75 (74.26)	7 (6.93)	2 (1.98)	9 (8.91)	7 (6.93)	3 (2.97)	3 (2.97)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Sangli	132	97 (73.49)	6 (4.55)	8 (6.06)	9 (6.82)	5 (3.79)	3 (2.27)	0 (0.00)	2 (1.52)	0 (0.00)	2 (1.52)	0 (0.00)
Nashik	117	90 (76.92)	7 (5.98)	6 (5.13)	14 (11.97)	9 (7.69)	1 (0.85)	0 (0.00)	2 (1.71)	0 (0.00)	0 (0.00)	0 (0.00)
Total	**1088**	**816 (75.00)**	**68 (6.25)**	**54 (4.96)**	**99 (9.10)**	**80 (7.35)**	**19 (1.75)**	**3 (0.28)**	**11 (1.01)**	**6 (0.55)**	**8 (0.74)**	**2 (0.18)**

*indicates values differ significantly at p<0.05 and **at p<0.01. Str.=Strongyle, Amp.=Amphistomes, Cocc.=Coccidia, *B.coli=Balantidium coli*, Strgy.=*Strongyloides*, E.hist.=*Entamoeba histolytica*, Sch.=*Schistosoma*, Tri.=*Trichuris*, Haem.=*Haemonchus* and Toxo.=*Toxocara vitullorum*

infection, which is consistent with that of Chaparro *et al*. (2016). Among the different helminth infections, Strongyle infection was the most prevalent, which is consistent with the findings of the earlier researchers (Swarnakar *et al*., 2015; Renwal *et al*., 2017).

Age-wise Prevalence of GI Parasites in Dairy Cattle

An overall age wise GIP prevalence in cattle was found to be significantly higher (χ^2: 738.735, p<0.01) in adult group (above 3 years, 77.78%) than heifer groups (1-3 years, 62.50%) and calf group (< 1 year, 58.82%). Almost similar pattern was observed in each of 7 districts studied (Table 3). These results corroborated with the findings of Sardar *et al*. (2006), who found that the age group older than 36 months had the higher level of prevalence of endoparasites, while the age group less than 12 months had the lowest levels.

Table 3: Age- and district-wise prevalence of GI parasitism in dairy cattle of Maharashra

District	Age	No. of samples examined	Positive samples	Positive (%)
Satara	0-1	29	16	55.17
	1-3	24	15	62.50
	> 3	145	110	75.86
Kolhapur	0-1	38	21	55.26
	1-3	22	13	59.09
	> 3	137	110	80.29
Ahilyanagar	0-1	30	19	63.33
	1-3	28	20	71.42
	> 3	142	128	90.14
Pune	0-1	18	10	55.55
	1-3	18	11	61.11
	> 3	107	81	75.70
Solapur	0-1	11	6	54.54
	1-3	12	8	66.67
	> 3	78	61	78.20
Sangli	0-1	17	10	58.82
	1-3	16	10	62.50
	> 3	99	77	77.78
Nashik	0-1	13	8	61.53
	1-3	14	10	71.42
	> 3	90	72	80.00
Total	0-1	156	90	57.70
	1-3	134	88	65.67
	> 3	798	638	79.95
Overall total		**1088**	**816**	**75.00**
χ^2			**738.735****	

** Significant at p<0.01.

Season-wise Prevalence of GI Parasites in Dairy Cattle

In the present study, the data collected in different months of the year was divided according to season, *viz.,* monsoon (July to October) and winter (November to February). Season-wise copro-prevalence of GIT parasitic infections was significantly higher (χ^2: 67.103, p<0.01) in monsoon (82.67%, 291/352) than the winter (71.33%, 525/736) in cattle. These findings were in accordance with the various earlier reports (Gupta *et al*., 2012; Laha *et al*., 2013; Maharana *et al*., 2016) and also of Saha *et al*. (2013) and Renwal *et al*. (2017) from different parts of India. The higher prevalence in monsoon could be attributed to favorable climatic conditions in this season, *viz.,* humidity and temperature which support parasitic growth and development leading to increased availability of infective larvae.

Conclusion

The present cross-sectional study reveals a high prevalence (75%, 816/1088) of gastrointestinal parasitism in dairy cattle across seven districts of Western Maharashtra. Coccidia, *Balantidium coli*, and strongyle-type nematodes emerged as the most common infections, with dual infections being more frequent than single or multiple infections. The highest prevalence was recorded in Ahilyanagar district (83.5%), while adult cattle showed significantly higher infection rates than calves and heifers. Infrequent deworming practices and exposure to contaminated environments likely contributed to the widespread parasitism. These findings highlight the urgent need for targeted control strategies, routine monitoring, and farmer awareness programs to mitigate the economic and health impact of gastrointestinal parasitic infections in the region.

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