

Seasonal Prevalence of Gastro-Intestinal Helminth Parasites of Goats (*Capra* Sp.) of Shivraj Municipality-13 Kapilvastu, Nepal

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Abstract

Goat (*Capra* sp.), an important source of meat is greatly affected by the helminth parasites. The current study aimed to determine the seasonal prevalence of intestinal helminthes parasites using sedimentation and flotation techniques. The overall prevalence of helminthes parasite found to be 58 (54.71%) and 86 (81.13%) for the winter and summer respectively. Fecal samples collected during winter season revealed the presence of trematodes (12.26%), cestodes (6.66%), and nematodes (35.84%) and other 6.31%. Similarly the fecal samples collected during summer season revealed presence of helminth eggs including trematodes (17.92%), cestodes (10.37%) and nematodes (52.83%) nematodes. The prevalence percentages of identified genera of trematodes were *Dicrocoelium* sp. (3.47%), *Fasciola* sp. (15.97%) and *Paramphistomum* sp. (2.77%). The difference in the prevalence of different genera of trematodes during winter and summer were not found statistically insignificant ($\chi^2= 1.325$, $p 0.250$). Among cestodes the only one genus identified with were *Moniezia* sp. (2.77%) and *Taenia* sp. (9.72%). The difference in the prevalence of different genera of cestodes during winter and summer were not found statistically insignificant ($\chi^2= 2.186$, $p 0.139$).

Similarly the identified nematode genera included *Toxocara* sp. (16.66%), *Strongyl* sp. (1.38%), *Bunostomum* (2.77%), *Capillaria* (4.86%), *Chabertia* (4.16%), *Cooperia* (2.08%), *Heamonchus* (3.47%), *Oesophagostomum* (8.33%), *Nematodirus* (0.69%), *Ostertagia* (1.38%), *Strongyloides* (6.25%), *Trichuris* (5.55%), *Trichostrongylus* (4.86%) and others (4.86%). Mixed infection was observed in out of a total of 134 (63.20%) mixed infection 54 (50.94%) and 80 (75.47%) samples showed helminthes eggs during winter and summer season were respectively detected. The difference in the prevalence of helminth parasites during winter and summer seasons were found statistically significant ($\chi^2=6.193$, $P<0.013$, d. f. = 1)

Key words: Helminth, Trematodes, Cestodes, Nematodes, Parasite, Prevalence, Sedimentation, Flotation.

Introduction

Goat (*Capra* sp.) belongs to family bovine and subfamily caprinae, is one of the important oldest domesticated small ruminant, raised mainly for meat, dairy, and manure. The animal is widely distributed all over the world. The national production is unable to fulfill the need of Nepal; hence significant numbers of goats are imported from neighboring countries. About 74% of goats are brought from India and 26% from different parts of Nepal in the Kathmandu market (3rd NASc Conv., 1998/1999). Livestock

farming is an integral part of the farming system and goats contribute substantially in the livestock sector of Nepal.

Goats are very much prone to the infection of gastrointestinal helminthes parasites. The parasites cause more than 20 percent loss in the production and productivity of animal. It is very important to know the status helminthes in various geoclimatic conditions in order to design an appropriate prevention and control strategies. Therefore present study aimed at the determination of the status of gastrointestinal helminthes in buffaloes.

Materials and Methods

The study area “Shivraj Municipality-13” Balanagar is the one of the village of Kapilvastu district of Nepal, where people kept many domestics animals including goats mainly for meat and income generation purpose. It's about 330 km west for the capital city Kathmandu. The goats are supplied from this place to slaughter house of Khasibazar, Chandrauta, Kapilvastu.

The present study was carried out in May/June (summer) 2012 and December/January (winter) 2012-2013. The site of collection of samples was Shivraj Municipality-13, Kapilvastu, Lumbini.

The study was aimed to determine the seasonal prevalence of helminth parasites in goats. A total of 212 fecal samples including 106 each collected during winter and summer season were collected from the study area and preserved in 2.5% potassium dichromate. The samples were tested at the laboratory of Central Veterinary Hospital, Kathmandu using both sedimentation and flotation method. The eggs of different genera of helminthes were identified according to their size, shapes and other morphological features as observed in microscope.

Results

Out of total 212 fecal samples tested, 144 (67.92%) samples showed the presence of helminth eggs with flotation and sedimentation technique. The seasonal difference of negative samples were found statistically insignificant ($\chi^2= 3.118$, $p 0.077$).

Among the positive samples, the trematode, cestode and nematode eggs were detected in 32 (22.22%), 18 (12.50%) and 94 (65.27%) samples. Out of a total of 106 fecal samples, the helminth eggs were detected in 58 (54.71%) and 86 (81.13%) samples collected during winter and summer season respectively.

A total of 17 helminthes genera identified included 3 trematodes, 2 cestodes and 12 nematodes. The prevalence of each of those helminth parasites has been given in Table 1. The prevalence of helminth was found more during summer 81.13% than in winter 54.71%. The seasonal prevalence of different genera of helminth parasites were found statistically insignificant ($\chi^2= 3.118$, $p=0.077$).

Out of 106 samples tested, 32 (22.22%) samples including 19 (17.92%) and 13 (12.26%) samples tested during summer and winter respectively showed trematode eggs. The 13 trematode positive samples of winter season, included *Fasciola* (11 or 10.37%) and *Dicrocoelium* (2 or 1.88%) sp. Similarly 19 trematode positive samples of summer season include *Fasciola* sp. (12 or 11.32%), *Paramphistomum* sp. (4 or 3.77%) and *Dicrocoelium* sp. (3 or 2.83%). Prevalence of *Fasciola* (15.97%) was found to be the highest followed by *Dicrocoelium* (3.47%) and *Paramphistomum* (2.72%). The seasonal prevalence of various trematodes were found statistically insignificant ($\chi^2= 1.325$, $p 0.25$).

Out of 106 samples tested during summer and winter, altogether 18 (12.50%), including 8 (7.54%) summer and 6 (5.66%) winter samples, were found positive for cestodes. The genera of *Taenia* and

Moniezia were identified in 4 (3.77%) samples. The seasonal prevalence of various cestodes were found statistically insignificant ($\chi^2 = 2.186$, $p = 0.139$).

Out of the total samples 94 (65.27%) samples showed nematode eggs including *Toxocara*, *Bunostomum*, *Oesophagostomum*, *Chabertia*, *Capillaria*, *Heamonchus*, *Cooperia*, *Strongyloides*, *Trichuris*, *Trichostrongylus* and *Ostertagia*. (Table 1). The highest and lowest prevalence was shown by *Toxocara* (16.66%) and *Ostertagia* (1.38%) sp. respectively. 6.31% samples showed nematodes that could not be identified. The seasonal prevalence of various nematodes were found statistically insignificant ($\chi^2 = 6.193$, $P < 0.013$, d. f. = 1).

Table1. Prevalence of various helminth genera

S.N	Class	Genera of helminth	Prevalence Percentage
	Trematoda	<i>Fasciola</i>	15.97%
	(Total positive: 32)	<i>Dicrocoelium</i>	3.47%
		<i>Paramphistomum</i>	2.77%
	Cestoda	<i>Taenia</i> sp	9.72%
	(Total positive: 18)	<i>Moniezia</i>	2.77%
	Nematoda	<i>Toxocara</i>	16.66%
	(Total positive: 94)	<i>Bunostomum</i>	2.77%
		<i>Chabertia</i>	4.16%
		<i>Capillaria</i>	4.86%
		<i>Oesophagostomum</i>	8.33%
		<i>Heamonchus</i>	3.47%
		<i>Cooperia</i>	2.08%
		<i>Strongyloides</i>	6.25%
		<i>Trichuris</i>	5.55%
		<i>Trichostrongylus</i>	4.86%
		<i>Ostertagia</i>	1.38%
		Others	6.31%

A higher rate of mixed infection was found during summer season (134 or 63.20%) as compared to that of winter (54 or 50.94%) samples.

Light infection (+) was found in 5 *Fasciola* positive samples whereas mild (++) infection was shown by 5 *Toxocara* positive samples. Moderate infection (+++) was shown by 4 *Toxocara* positive samples and heavy infection 1 (+++++) was shown by 1 *Taenia*, 1 *Fasciola* and 1 *Toxocara* positive samples.

Discussion and Conclusion

Out of total 212 samples tested, 86 (81.13%) and 58 (54.71%) samples showed the presence of helminthes eggs in summer and winter season respectively indicating that the parasites were infecting the goats throughout the years.

Present study showed a prevalence of trematode (22.22%), cestode (11.08%) and nematode (65.27%). Opara et al. (2005) reported a prevalence of trematode (78.4%), cestodes (13%) and nematode (8.7 %)

respectively in Nigeria. Presence of suitable temperature and moisture and availability of intermediate host could be the reason behind higher prevalence of certain helminth parasites during summer season.

Present study showed a higher prevalence of nematodes (65.27%), cestodes (11.08%), and trematodes (22.22%) which somehow corroborated to the findings of Ijaz et al. (2008) who showed highest infection rate of nematodes (42.67%) followed by trematodes (16.67%) and cestodes (4%) in Lahore, Pakistan.

A research by Wanjala et al. (2002) in the month of May/June and August /September showed 52% infection of helminths in small ruminants in pastoral community in Kenya.

In the present study, 3 genera of trematodes, 2 genera of cestodes and 14 genera of nematodes were identified. Among trematodes *Fasciola*, was common during both winter and summer season but *Dicrocoelium* was found only during winter season and *Paramphistomum* in summer only. Present study exhibited 10.37% and 11.32% prevalence of fascioliasis during winter and summer season respectively. The increase in the prevalence during summer may be due to increase in humidity and availability of favorable temperature. High prevalence of *Fasciola* was reported from Surkhet among goats (Ghimire 1987) followed by 58% from Chitwan district (Dhakal and Kharel 1988), 31.25% infection from Dhanusa district (Jaiswal 2006). Similarly, the prevalence of *Dicrocoelium* was reported to be 1.88%. that corroborated with the earlier finding of Jithendran (1997). Present study recorded a 2.77% prevalence of *Paramphistomum* in summer samples.

Among cestodes, *Moniezia* was found only in summer and *Taenia* found in both seasons. *Moniezia* has been reported from Kathmandu and Surkhet district among buffaloes, sheep, goat and cattle (Ghimire 1987). In the present study, *Moneizia* has been reported only in summer only.

The findings of present study regarding the prevalence of nematodes included *Toxocara*, *Bunostomum*, *Chabertia*, *Capillaria*, *Oesophagostomum*, *Heamonchus*, *Cooperia*, *Strongyloides*, *Trichuris*, *Trichostrongylus* and *Ostertagia*. However, *Bunostomum* and *Ostertagia* were not observed during winter season. Mankir (2007) reported highest prevalence rate of *Haemonchus* followed by *Trichostrongylus* in goats and sheep in Ethiopia. The difference in the result could be due to the variation in weather conditions and humidity in atmosphere.

Yadav et al. (2005) reported the highest prevalence of *Heamonchus*, *Trichostrongylus*, *Bunostomum*, *Oesophagostomum* and *Strongyloides*.

In the current study, the rate of mixed infection was also observed. Among 144 (67.92%) positive samples, 134 (63.20%) samples were found to have mixed infection. During winter and summer 54 (50.94%) and 80 (75.47%) mixed infection had been shown out of 106 samples. In the current study, the rate of mixed infection was also observed. Among 144 (67.92%) positive samples, 134 (63.20%) samples were found to have mixed infection.

Acknowledgements

We are greatly thankful to all persons who helped to complete this study. Special thanks to Anju Bhusal.

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