



PREVALENCE OF GASTROINTESTINAL TRACT PARASITES IN CATTLE OF KHYBER PAKHTUNKHWA

Rafiullah, Anwar Ali Turi, Abdul Sajid, Sayyed Rahimullah Shah, Shabbir Ahmad and Muhammad shahid

Veterinary Research Institute, Khyber Pakhtunkhwa, Peshawar, Pakistan

E-Mail: dr-rafi_ullah@yahoo.com

ABSTRACT

The present study was carried out to establish the gastrointestinal parasites profile in cattle at Parasitology Division of the Veterinary Research Institute, Khyber Pakhtunkhwa, Peshawar. A total of 4490 fecal samples of cattle of different breeds consisting of 3731 (83.09%) females and 759 (16.91%) males were examined. These samples were processed and screened by direct smear method for the detection of parasitic ova. Ova of parasites were identified through their morphological features using the available keys. Fecal examination revealed an overall prevalence of 2901 (64.61%), while the prevalence in females and males were 2411 (83.10%) and 490 (16.90%), respectively. Out of 2901 gastrointestinal parasites encountered 2209 (76.15%) were helminthes and 395 (13.62%) were protozoan parasites. 297 showed mixed infestation. The helminthes observed were Nematodes (*Strongyloides papillosus*, *Trichuris*, *Haemonchus contortus*, *Nematodirus spathiger*, *Enterobius vermicularis*, *Dictyocaulus viviparus*, *Ostertagia ostertagi*, *Trichostrongylus colubriformis*, *Oesophagostomum radiatum*), Trematodes (*Fasciola hepatica*, *Fasciola gigantica*, *paramphistomum cervi*, *Dicrocoelium dendriticum*, *Fasciolopsis buski*, *Schistosoma sp*) and Cestodes (*Taenia*, *Moniezia expansa sp*), while *Entamoeba sp* and *Eimeria* were the protozoa encountered. In the males, *Trichostrongylus colubriformis sp.* had the highest prevalence of 13.83%, while in female *Trichostrongylus colubriformis spp* and *Ostertagia ostertagi sp* had the prevalence of (16.24%) and (6.65%), respectively.

Keywords: cattle, parasites, GIT, fecal examination.

INTRODUCTION

The gastrointestinal tract (GIT) of animals harbor a variety of parasites particularly helminthes, which causes clinical and sub clinical parasitism. These parasites adversely affect the health status of animals and cause enormous economic losses to the livestock industry.

Gastrointestinal parasites not only affect the health but also affect the productive and reproductive performance of the cattle and buffalo. Gastrointestinal worms are recognized as by far the most significant part of diseases in livestock sector (Waller 1997, and Waller 1999). It has been established that parasitic infestation results in considerable losses in milk production in cattle and buffalo (Hayat *et al.*, m 1984). Among the predisposing factors of internal parasites infection are climates, nutritional deficiency, grazing habits, immunological status, pasture management, presence of intermediate host and vector and the number of infective larvae and eggs in the environment (Radostits *et al.*, 1994). Damages inflicted to the health and productivity includes loss in body weight, poor reproductive performance, digestive disturbance, and emaciation for longer period (Radostits *et al.*, 1994).

Almost mature worms produce toxins that destroy Red Blood Cells, leading to unthrifty anaemic condition. Immature worms migrating through the body tissues open the way for bacteria and fungi to enter, causing some other serious diseases. Other economic losses are poor work performance, involuntary culling, lower milk production, treatment costs, and mortality in heavily parasitized animals (Lebbie *et al.*, 1994). So it is important to control internal parasites through better

management as in developed countries, and knowledge on prevalence of these parasites is mandatory.

The present research was designed to record the parasitic profile of GIT and give awareness to the farmers about parasitism and its impact on the health and production of cattle and buffaloes. Furthermore to suggest proper treatment, control and preventive measures to the farmers regarding the GIT parasites.

MATERIALS AND METHODS

A total of 4490 fecal samples consisting of 759 samples from male and 3731 from female cattle were received from different areas of Khyber Pakhtunkhwa to the parasitology section of Veterinary Research Institute Peshawar for helminthological examination during April 2009 through July 2010. Most of these were received from Civil Veterinary Hospitals, Military Farms and Govt. Dairy farms.

The samples were processed and screened by direct smear method and ova of parasites were identified through their morphological features (Soulsby, 1982). The rate of infection among the animals was derived in terms of percentage of total samples examined.

RESULTS AND DISCUSSIONS

Out of 4490 samples examined, 2506 (55.81%) were found positive for helminths. Among these positive samples 358 were positive for trematodes, 1828 for nematodes, 23 for cestodes and 297 samples showed mixed infection.



Prevalence of helminthes in cattle of Khyber Pakhtunkhwa

The over all prevalence of parasitic gastro intestinal ova identified in these field samples was 55.59% out of 4490 samples. This finding is in coordination with the reports by Adejinmi and Harrison (1997), that the prevalence of these parasites in ruminants is usually high especially those kept under traditional methods of husbandry. The present documented data has not revealed any significant difference in infestation and egg output among age, sex and breed of the ruminants investigated similar observation was reported by (Pal and Qayyum 1993), that the prevalence of these parasites is related to the agro- climatic conditions including quantity and pasture quality, temperature, humidity and grazing behavior of the host.

Trematodes

When the data was analyzed it reflects that *Faciola hepatica* (5.40%) was the most prevalent spp among the trematodes while the lowest prevalent spp was *Dicrocoelium dendriticum* with 0.26%. For *Faciola hepatica* about similar result was reported by (Sardar *et al.*, 2006). In male when the prevalence rate among the different trematodes were compared it was found that the second more prevalent was *Faciola gigantica* then *paramphistomum cervi* and the lowest prevalent spp was *Dicrocoelium dendriticum*. The more prevalence of *Faciola hepatica* and *Paramphistomum* is because rainfall is abundant and there is abundance of intermediate hosts of *Fasciola* and *Paramphistomum*. While the temperature and humidity also become optimum for larval development of these parasites in this season and are favourable for the migration and development of infective stage in snails. The prevalence rate sequence of theses trematodes was same in female cattle (Table-1).

Nematodes

When the documented data was analyzed for nematodes it shows that the most prevalent spp in male cattle among nematodes was *Trichostrongylus colubriformis* (13.83%). The prevalence of this parasite was more in the dry season as compared to the rainy season. Similar results were reported by (Belem *et al.*, 2001). The infestation rate of different nematodes in male cattle was found that the second more prevalent spp was *Nematodirus* (6.58%) followed by *Ostertagia* (6.45%), *Trichuris* (5.27%), *strongylidis papillosus* (4.21%) and *Haemonchus contortus* (2.76%). In case of female cattle the prevalence rate of these nematode spp was

Trichostrongylus colubriformis (16.24%) followed by *Ostertagia* (6.64%), *Nematodirus* (6.24%), *Trichuris* (6.05%), *strongylidis papillosus* (3.40%) and *Haemonchus contortus* (2.46%) (Table-2).

Cestodes

When the data was for *Moneizia* spp of cestodes it was found that male cattle are most infected (0.65%) as compared to the female cattle (0.48%) (Table-3). Similar results were reported by Ken and Rex (2001).

Infestation by multiple helminthes

A mixed infestation by Nematodes and Trematodes in male cattle was 3.55% and in female it was 3.26%. The infestation rate of different combine helminthes in male cattle was found that the second more prevalent spp were trematode/cestode (2.23%) followed by cestodes/nematodes (1.58%) and nematode/trematode/cestodes. While the infestation rate of different combine helminthes in female cattle was found that the second more prevalent spp were Cestode/nematode (1.58%) followed by trematod/ cestode (1.34%) and nematode/trematode/cestode (0.32%) (Table-4). These results show similarity with the results as reported by Bui *et al.*, 2009.

Season wise prevalence

Season wise prevalence rates of each parasite is presented in their respective Table which shows that the seasonal prevalence of gastrointestinal helminthic infection is higher in summer season i.e. in April, May, June, July, similar findings are reported by (Sardar *et al.*, 2006). Higher prevalence of helminth parasitic infection during summer and rainy season might be due to high temperature and moisture content which favors the growth and development of larvae on pasture resulting in increased contact between the host and parasites. These findings are also in agreement with Dhoot *et al.*, (2002) and Bhattacharya and Ahmed (2005), who recorded higher prevalence of parasitic infection during rainy season.

The climate of the area is tropical and the vegetation cover is typical of the rain forest type. The area is situated in the rainforest region where two seasons-wet and dry occur. Usually, the wet season extends from April to September, while the dry season covers the other months of the year. The mean annual rainfall is 2500mm, while the temperature and humidity range from 25°C to 35°C and 70% to 80%, respectively.

**Table-1.** Prevalence of trematodes parasites in both sexes of adult cattle in Khyber Pakhtunkhwa.

S. No.	Month	TREMATODES															
		Fasciola hepatica				Fasciola gigantica				Paramphistomum cervi				Dicrocoelium dendriticum			
		Male		Female		Male		Female		Male		Female		Male		Female	
		Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve
1	Apr-09	54	3	251	16	54	1	251	4	54	0	251	2	54	0	251	0
2	May-09	50	4	287	19	50	1	287	5	50	0	287	0	50	0	287	0
3	Jun-09	54	3	259	14	54	2	259	6	54	2	259	4	54	0	259	0
4	Jul-09	52	5	257	23	52	1	257	3	52	0	257	0	52	1	257	1
5	Aug-09	46	2	246	10	46	1	246	2	46	0	246	0	46	0	246	0
6	Sep-09	38	2	177	10	38	1	177	5	38	1	177	3	38	0	177	0
7	Oct-09	35	2	131	9	35	1	131	3	35	0	131	0	35	0	131	0
8	Nov-09	32	0	137	2	32	2	137	4	32	0	137	1	32	0	137	1
9	Dec-09	40	1	201	4	40	2	201	7	40	0	201	0	40	0	201	0
10	Jan-10	51	1	238	4	51	1	238	3	51	0	238	0	51	0	238	0
11	Feb-10	44	2	193	9	44	1	193	5	44	0	193	0	44	0	193	0
12	Mar-10	55	6	289	28	55	2	289	6	55	1	289	3	55	0	289	2
13	Apr-10	42	1	208	10	42	2	208	7	42	0	208	0	42	0	208	0
14	May-10	51	2	266	8	51	1	266	3	51	0	266	0	51	0	266	0
15	Jun-10	44	1	241	12	44	1	241	5	44	1	241	5	44	0	241	0
16	Jul-10	71	6	350	23	71	1	350	4	71	0	350	0	71	1	350	3
Total		759	41	3731	192	759	21	3731	72	759	5	3731	18	759	2	3731	7
% age			5.40		5.14		2.76		1.92		0.65		0.48		0.26		0.18

**Table-2.** Prevalence of nematode parasites in both sexes of adult cattle in Khyber Pakhtunkhwa.

Month	Nematodes																							
	Strongyloides papillosus				Trichuris				Haemonchus contortus				Nematodirus spathiger				Ostertagia astertagi				Trichostrongylus colubriformis			
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female	
	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve
Apr-09	54	3	251	12	54	3	251	18	54	2	251	10	54	4	251	18	54	4	251	20	54	8	251	45
May-09	50	1	287	6	50	5	287	27	50	1	287	5	50	2	287	7	50	5	287	34	50	10	287	55
Jun-09	54	1	259	4	54	3	259	18	54	0	259	4	54	2	259	16	54	6	259	18	54	12	259	70
Jul-09	52	1	257	3	52	2	257	13	52	1	257	3	52	3	257	8	52	2	257	14	52	9	257	52
Aug-09	46	1	246	5	46	3	246	18	46	1	246	4	46	2	246	7	46	4	246	17	46	6	246	35
Sep-09	38	2	177	7	38	1	177	6	38	2	177	6	38	3	177	11	38	2	177	4	38	3	177	18
Oct-09	35	3	131	8	35	2	131	9	35	1	131	5	35	1	131	4	35	0	131	1	35	4	131	25
Nov-09	32	1	137	4	32	0	137	2	32	0	137	3	32	3	137	9	32	0	137	2	32	2	137	7
Dec-09	40	3	201	9	40	2	201	8	40	0	201	2	40	4	201	15	40	3	201	9	40	3	201	24
Jan-10	51	1	238	12	51	2	238	10	51	2	238	6	51	7	238	33	51	3	238	19	51	5	238	34
Feb-10	44	4	193	16	44	1	193	7	44	2	193	8	44	2	193	9	44	2	193	13	44	5	193	25
Mar-10	55	6	289	13	55	3	289	19	55	3	289	10	55	1	289	6	55	4	289	22	55	9	289	50
Apr-10	42	1	208	4	42	3	208	14	42	2	208	8	42	4	208	19	42	2	208	12	42	5	208	24
May-10	51	1	266	9	51	4	266	22	51	1	266	5	51	1	266	6	51	4	266	26	51	7	266	41
Jun-10	44	1	241	7	44	2	241	8	44	1	241	6	44	5	241	27	44	2	241	7	44	4	241	21
Jul-10	71	2	350	8	71	4	350	26	71	2	350	7	71	6	350	38	71	6	350	30	71	13	350	80
total	759	32	3731	127	759	40	3731	225	759	21	3731	92	759	50	3731	233	759	49	3731	248	759	105	3731	606
% age	4.21		3.40		5.27		6.03		2.76		2.46		6.58		6.24		6.45		6.64		13.83			16.24

**Table-3.** Prevalence of cestode parasites in both sexes of adult cattle in Khyber Pakhtunkhwa.

Cestodes					
S. No.	Month	Moneizia			
		Male		Female	
		Total sample	Positive sample	Total sample	Positive sample
1	Apr-09	54	2	251	5
2	May-09	50	0	287	3
3	Jun-09	54	0	259	0
4	Jul-09	52	0	257	0
5	Aug-09	46	0	246	2
6	Sep-09	38	1	177	1
7	Oct-09	35	0	131	0
8	Nov-09	32	0	137	0
9	Dec-09	40	0	201	0
10	Jan-10	51	1	238	3
11	Feb10	44	0	193	1
12	Mar-10	55	0	289	0
13	Apr-10	42	0	208	0
14	May-10	51	0	266	0
15	Jun-10	44	0	241	1
16	Jul-10	71	1	350	2
Total		759	5	3731	18
%age			0.65		0.48

**Table-4.** Shows the presence of mixed infestation in both sexes of adult cattle in Khyber Pakhtunkhwa.

Month	Nematode/Trematode				Trematode/Cestode				Cestode/nematode				Nematode/Trematode/cestode			
	Male		Female		Male		Female		Male		Female		Male		Female	
	Total	+ve	Total	+ve	Total	+ve	Total	+ve	total	+ve	Total	+ve	total	+ve	Total	+ve
Apr-09	54	3	251	10	54	1	251	3	54	1	251	2	54	0	251	1
May-09	50	2	287	8	50	1	287	5	50	1	287	6	50	0	287	1
Jun-09	54	3	259	12	54	2	259	4	54	1	259	3	54	0	259	0
Jul-09	52	4	257	15	52	1	257	6	52	2	257	7	52	0	257	0
Aug-09	46	2	246	8	46	1	246	1	46	0	246	1	46	0	246	0
Sep-09	38	1	177	6	38	2	177	3	38	1	177	3	38	0	177	0
Oct-09	35	3	131	11	35	0	131	4	35	0	131	3	35	1	131	1
11-09-10	32	4	137	15	32	1	137	1	32	1	137	1	32	1	137	2
Dec-09	40	1	201	6	40	0	201	3	40	1	201	6	40	1	201	3
Jan-10	51	1	238	4	51	2	238	4	51	2	238	4	51	1	238	0
Feb-10	44	0	193	2	44	2	193	3	44	0	193	3	44	0	193	0
Mar-10	55	0	289	3	55	1	289	4	55	0	289	2	55	0	289	0
Apr-10	42	1	208	5	42	1	208	2	42	0	208	1	42	1	208	2
May-10	51	1	266	6	51	1	266	1	51	1	266	2	51	1	266	1
Jun-10	44	0	241	4	44	1	241	2	44	0	241	3	44	0	241	1
Jul-10	71	1	350	7	71	0	350	4	71	1	350	4	71	0	350	0
Total	759	27	3731	122	759	17	3731	50	759	12	3731	51	759	6	3731	12
% age		3.55		3.26		2.23		1.34		1.58		1.36		0.79		0.32

REFERENCES

Adejinmi J.O. and Harrison L.J.S. 1997. Parasitic nematodes of domestic ruminants in Nigeria: impact on ruminant production and control. *Tropical Veterinarian*. 15: 137-148.

Bhattacharya D. K. and Ahmad K. 2005. *Indian Vet. J.* 82: 900-901.

Belem. A.M.G, O. P. Ouédraogo and R. Bessin. 2001. Gastro-intestinal nematodes and cestodes of cattle in Burkina Faso *Biotechnol. Agron. Soc. Environ.* 5(1): 17-21.

Biu A. A., A. Maimunatu, A. F. Salamatu and E. T. Agbadu. 2009. A faecal survey of gastrointestinal parasites of ruminants on the University of Maiduguri Research Farm. *International Journal of Biomedical and Health Sciences*. 5: 175-179.

Chaudhry N.I., M.S. Durrani and T. Aziz. 1984. The prevalence of gastrointestinal parasites in buffaloes and calves of Azad Kashmir. *Pakistan. Vet. J.* 4(1): 60-61.

Dunn AM. 1978. *Veterinary Helminthology*. 2nd Edition. London: William Heinemann Medical Books.

Godara R., Manohar G. S. and Pathale K. M. L. 2003. *J. of Vet. Parasitol.* 17: 167-168.

Iqbal M. M. 1987. Survey of gastrointestinal parasites of buffaloes in Faisalabad and evaluation of efficacy of Albendazole against these infections. M.Sc. (Hons.) Thesis. Deptt. Clin. Med. Surg. Univ. Agri., Faisalabad.

Irfan M. 1984. Key note address on effects of parasitism in lowering livestock population. *Pakistan Vet. J.* 4(1): 25-27.

Javed S., R. Ahmad, R. Anjum and S.U. Rehman. 1993. Prevalence of endo parasites in buffaloes and cattle. *Pakistan Vet. J.* 13(2): 88-89.



Ken H.D, Rex. W.C. 2001. Prevalence of gastrointestinal helminths in domestic bison herds in northwestern Alberta. *Can Vet J.* 42: 295-296.

Lebbie SHB, Rey B, Irungu EK. 1994. Small ruminant research and development in Africa. Proceeding of the second Biennial conference of the African Small Ruminant Research Network. ILCA. pp. 1-5.

Hayat. C.S. B. Hayat. M. Ashfaq and K. Muhammad. 1984. Bottle jaw in Berberi (Teddy) goat. *Pak. Vet. J.* 4: 183.

Pal R.A and M. Qayyum. 1993. Prevalence of gastrointestinal nematodes of sheep and goats in upper Punjab, Pakistan. *Pak. Vet. J.* 13(3): 138-141.

Pandit B. A., Sahardar R. A., Banday M. A. A., Darzi M. M. 2004. *Ibid.* 18: 63-65.

Pritchard R. K., S. Ranjan, C. Trudeau and C. Piche. 1990. Epidemiology of bovine nematode parasites in Eastern Canada. In: Guerrero and W.H.D. Leaning (Editors), epidemiology of Bovine nematode parasites in the Americas, Proceeding. MSD Symposium, 13-17, Salvador. Bahia, Brazil. Vet. Learning systems, Trenton, NY. USA. pp. 89-96.

Radostis. O.M., D.C. Blood and C.G. Gay. 1984. *Veterinary Medicine* 8th ed. Published by Bailliere and Tindall. London.

Radostits O.M., Blood D.C. and Gay C.C. 1994. Diseases caused by helminth parasites. In: *Veterinary Medicine: a textbook of diseases of cattle, sheep, pigs, goats and horses*, 8th Edition. London, Balliere Tindall. pp. 1223-1230.

Sardar S. A., M. A. Ehsan, A. K. M. M. Anower, M. M. Rahman and M. A. Islam. 2006. Incidence of liver Flukes and gastrointestinal parasites in cattle. *Bangl. J. Vet. Med.* 4(1): 39-42.

Soulsby. 1982. Helminths, arthropods and protozoa of domesticated animals. *Transactions of the Royal Society of Tropical Medicine and Hygiene.* 78(3): 329.

Teklye B. 1991. Epidemiology of endoparasites of small ruminants in sub-saharan Africa. *Proceedings of 4th National Livestock Improvement Conference.* Addis Ababa, Ethiopia; 13-15 November. pp. 7-11.

Urquhart GM, Armour J, Duncan JL, Dunn AM. 1994. Jennings FW: *Veterinary Parasitology*. 1st Edition. Singapore; Longmann.

Waller. 1997. P.J. Waller, Anthelmintic, resistance, *Vet. Parasitol.* 72: 391-405.

Waller 1999. P.J. Waller, International approaches to the concept of integrated control of nematodes parasites of livestock, *Int. J. Parasitol.* 29: 155-164.