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Prevalence of gastrointestinal parasite, *Paramphistomum* in domestic animals (Cows and Buffaloes) of district Swat and Charsadda, KP, Pakistan

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Abstract
An investigation was carried out to study the prevalence of *Paramphistomum* in doestic cattle's. For this purpose samples were collected from slaughter houses, dairy forms and houses, from two districts (Swat and Charsadda) of KP Pakistan during month of November 2011 to April 2012. Infection rate was 15% in buffaloes and 10% in cows, in district Swat and 10.8% in buffaloes and 7.5% in Cows, in district Charsadda. Overall the highest month wise prevalence in cows 12.5% and in buffaloes 20% was recorded during March. It was also observed that the highest infection rate was recorded in male animals (10%) than female (7.2%) in case of cows and in case of buffaloes the prevalence rate in male was (17%) and in female (10%). Area wise prevalence indicate that infection in buffaloes and cows of district Swat was higher (15% and 10% respectively) than Charsadda (10.8% and 7.5% respectively).

Keywords: *Paramphistomum*, Prevalence, Buffaloes, Cows, Swat, Charsadda

1. Introduction
Paramphistomosis is a disease of domestic and wild ruminants, which is caused by trematoda and commonly belong to the family Paramphistomatidae, which in their early stage present in the small intestine and abomasums, from here they passes to rumen and lastly lodge as an adult trematode [16].

Paramphistomum spp. are Platyhelminth (flatworm) parasites (Platyhelminthes: Trematoda: Digenea) responsible for Paramphistomosis i.e. gastrointestinal parasitic disease in domesticated animals, which causes heavy economic losse [3]. *Paramphistomum* are rounded in transverse section, pear-shaped worms and characterized by possessing distinct suckers which are two in numbers, one for attachment purposes and the other is for mouth. The oral sucker contains a muscular pharynx, which is actually the beginning of the diverged caecum (alimentary canal).The posterior sucker or acetabulum is well developed and present at the posterior end of rumen flukes. The flukes are hermaphroditic organisms and the genital pore is situated ventral medially in the anterior third, acting as a conjoint opening for both male and female sex organs [9].

Trematode parasites of ruminant cattle have a world-wide distribution and even valuable zoonotic organisms among the helminths [11]. In some countries these parasites are considered as a major constriction on productivity. Likewise, *paramphistomum* infections (e.g. *Paramphistomum cervi, P. ichikawai and P. microbothrium*) are widespread in distribution, mainly in Asia. In Asia the prevalence rates (30-60%) are still recorded in some areas [13].

Paramphistomum cervi is a trematode parasite which attacks livestock badly thereby disturbing their productivity. The adult trematode is located in the rumen of ruminant and immature trematode in the snail intestine (duodenum) [5]. In chronic infection, the liver may be turn pale and shows fibrosis. Tissue and organ damages were caused by *Paramphistomum cervi* which causing poor production of milk, meat, skin and retardation in growth [10].

Paramphistomum cervi is particularly disease causing specie, which migrating juveniles and causes severe hemorrhage and enteritis, mostly causing death of the host. Secondary infection also complicates the problem [14]. The main epidemiological variable inducing worm problems of animals is the infection rate from pastures. Paramphistomosis is also influenced by the climatic conditions for hatching of egg, development and existence of larvae in pasture [17].

The harm caused by this infection in bovine affects production, since these parasites provoke a lower nutritious conversion, a loss of weight and/or a decrease in milk production, which cause economic losses. In some areas of India, the Republic of South Africa and Australia, the mortality of cattle has reached 80 or 90% in sheep and cattle. This illness is distributed all around the world, but its highest frequency has been registered in tropical and subtropical regions [12].

The filtration technique with sieves and sedimentation is the most accurate method for identification of eggs in feces, producing stronger evidence in the sediment of sample during microscopy and study. Eggs show similarity in shape with *Fasciola hepatica*, but *Paramphistomum* eggs are somewhat larger (160 – 180 µ) [16].

Most licensed drugs for the treatment of *Fasciola* are not active against paramphistomosis. Only few drugs are efficient against either mature and/or immature flukes, namely; *niclosamide, oxyclozanide, rafoxanide, and resorantel* [19].

Gastrointestinal helminthes prevalence in ruminants has been reported in different areas at different times from 25.1 to 92% in Pakistan [1, 2, 6, 8, 13].

Paramphistomosis is thought to be a main constraint on productivity in many areas. Likewise, *paraphistome* infections (e.g *Paramphistomum cervi*) remain widespread, mainly in Asia. In Asia the prevalence rates of 30-60% are still recorded [13, 15].

The present research was designed to report the seasonal and the overall prevalence of the *paramphistomum* in cows and buffaloes. Furthermore to suggest preventive measures and prevalence of *paramphistomum*, taking this background the study was conducted to find out prevalence of *Paramphistomum* in buffaloes, cows, in district Swat and Charsadda of Khyber Pakhtunkhwa, Pakistan.

2. Materials and Methods

2.1 Epidemiological Study

2.1.1 Study area

Fecal samples of cows and buffaloes were collected from two different Districts (Swat and Charsadda) of Khyber Pakhtunkhwa Pakistan, from November, 2011 to April, 2012 shows in Fig 1

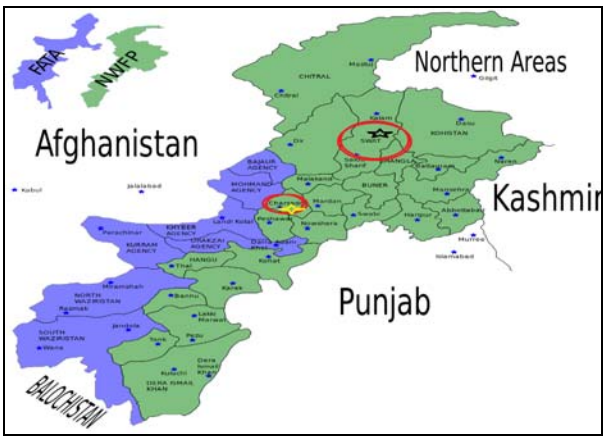

Fig 1: Encircled positions in the map showing study areas: (1) Swat, (2) Charsadda.

2.1.2 Study design

Study design was based under laboratory condition.

2.1.3 Instrumentation

Tools used in this study were as follows:

Cotton, Refrigerator, Cover slip, Slide, Beaker, Glass rod, Gloves, Microscope, Motor and Pestle.

2.2 Coprological examination

2.2.1 Fecal sample collection

From each districts a total of 20 fecal samples each for buffaloes and cows were monthly collected in plastic jars which was clearly labeled with gender, species, date and place of collection. For the presence of *Paramphistomum* eggs these samples were examined on the same day by direct microscopic examination [18]. Samples which were not examined on the same day were preserved in formalin 3.0% to prevent the eggs development and hatching.

2.2.2 Direct microscopic examination

A small amount of fecal sample was mixed with water in a beaker. Few drops of it were place on a glass slide, covered with cover glass and *Paramphistomum* eggs were observed under microscope (10x10 and 10x40). From each sample 3-5 slides were prepared following the direct microscopic examination. Eggs were identified on the basis of morphology [20]. Prevalence of infection was monthly recorded. The age, sex, area wise prevalence was noted. The prevalence of the disease was recorded following the modified formula described by Thursfield (1986):

$$\text{Prevalence (\%)} = \frac{\text{No. of infected individuals at particular point in time}}{\text{No. of total individuals at particular point in time}} \times 100$$

2.2.3 Sedimentation method [7]

First we weighted approximately 3 gm. of faces in container 1. Then we poured 40-50 ml of water in container and filtered the fecal suspension through a tea strainer or double-layer of cheese cloth in container 2. Poured the filtered material into a test tube and allow to sediment for 5 minutes. The supernatant were removed very carefully, re-suspend the sediment in 5 ml of water and allow to sediment for 5 minutes. The supernatant discarded very carefully by pipetting, decantation. Stained the sediment by adding one drop of ethylene blue and transferred the sediment to a micro slide. Cover with a cover slip and was observed under microscope.

3. Results

During the study period of November 2011 to April 2012, an epidemiological survey of 480 samples of cows and buffaloes, were carried out in the two districts of KP (Swat and Charsadda). A total of 240 fecal samples from each district were examined out of which shows the following prevalence percentage (%).

Month, Area and Gender Wise Prevalence of *Paramphistomum* in Cows of KP

An overall prevalence (%) of *Paramphistomum* was found 8.75% in Swat and Charsadda from November 2011 to April 2012. To find out the year's specific period associated with highest prevalence rate, when month wise data recorded, it showed an overall highest prevalence (12.5%) was in March, followed by a decline to the lowest prevalence (5%) in April. Area wise prevalence in cows, two districts of KP province indicates the infection was highest at Swat (10%) followed by (7.5%) in Charsadda. Overall sex wise prevalence showed male (10%) were more susceptible than females (7.2%) for *Paramphistomum* infection. (Table 1. Fig. 2).

Table 1: Month, Area and Gender wise prevalence of *Paramphistomum* in cows at two districts (Swat and Charsadda) of KP from Nov 2011 to April 2012

	Factors	Total no. of sample observed	Total no. of sample infected	Prevalence (%)
Time (Months)	Nov	40	4	10%
	Dec	40	3	7.5%
	Jan	40	3	7.5%
	Feb	40	4	10
	March	40	5	12.5%
	April	40	2	5%
Areas	Swat	120	12	10%
	Charsadda	120	9	7.5%
Gender	Female	111	8	7.2%
	Male	129	13	10%
Total		240	21	8.75%

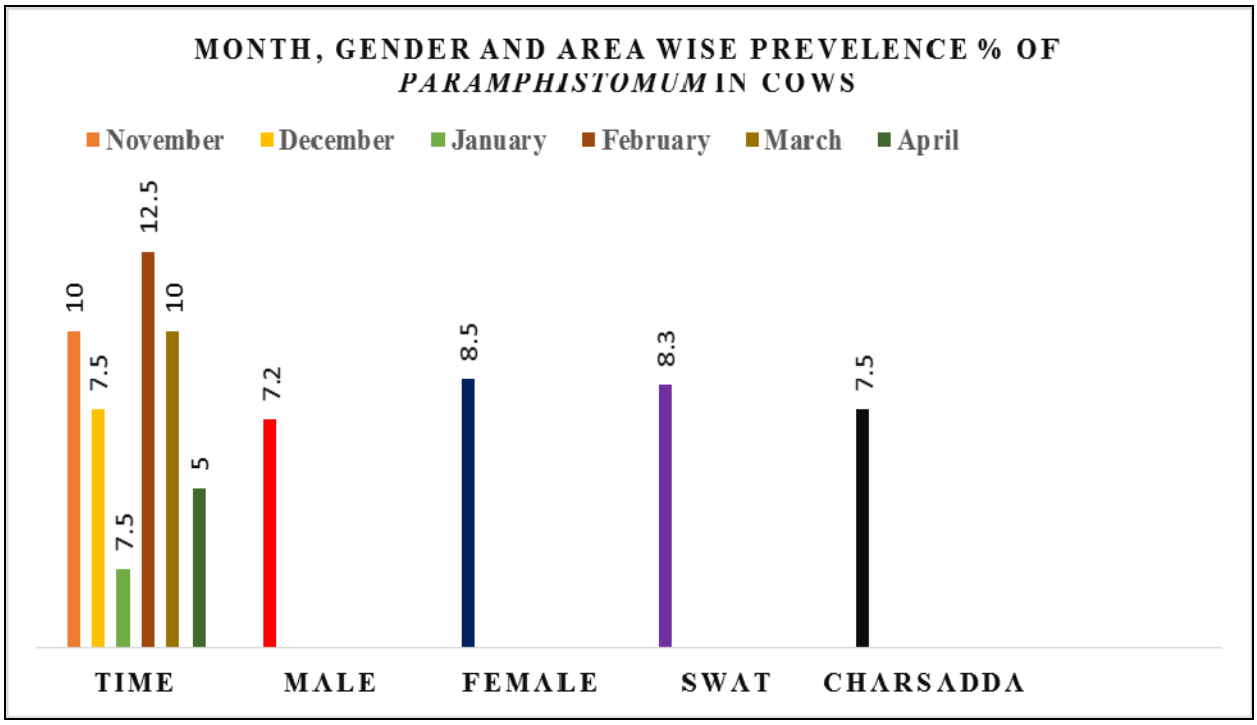

Fig 2: Shows Month wise, Area wise and Gender wise prevalence of *Paramphistomum* in Cows during the study period from November 2011 to April 2012.

3.1 Month, Area and Gender Wise Prevalence of *Paramphistomum* in Buffaloes of KP

Total 240 fecal samples of buffaloes were examined in two districts of KP (Swat and Charsadda).The overall prevalence 12.9% was recorded shown in Table 4.2. To find out the year's specific period associated with highest prevalence rate, when month wise data recorded, it showed an overall highest prevalence (20%) was recorded in March, which was decreased in April (10%). The lowest prevalence (7.5%) was recorded in November. Overall sex wise prevalence showed male (17%) were more susceptible than females (10%) in both districts. (Table 2,-; Fig. 3)

Table 2: Month, Area and Gender wise prevalence (%) of *Paramphistomum* in buffaloes at two districts (Swat and Charsadda) of KP from Nov 2011 to April 2012.

	Factors	Total no. of sample observed	Total no. of sample infected	Prevalence (%)
TIME (Months)	Nov	40	3	7.5%
	Dec	40	4	10%
	Jan	40	6	15%
	Feb	40	6	15%
	March	40	8	20%
	April	40	4	10%
Areas	Swat	120	18	15%
	Charsadda	120	13	10.8
Gender	Female	140	14	10%
	Male	100	17	17%
Total		240	31	12.9%

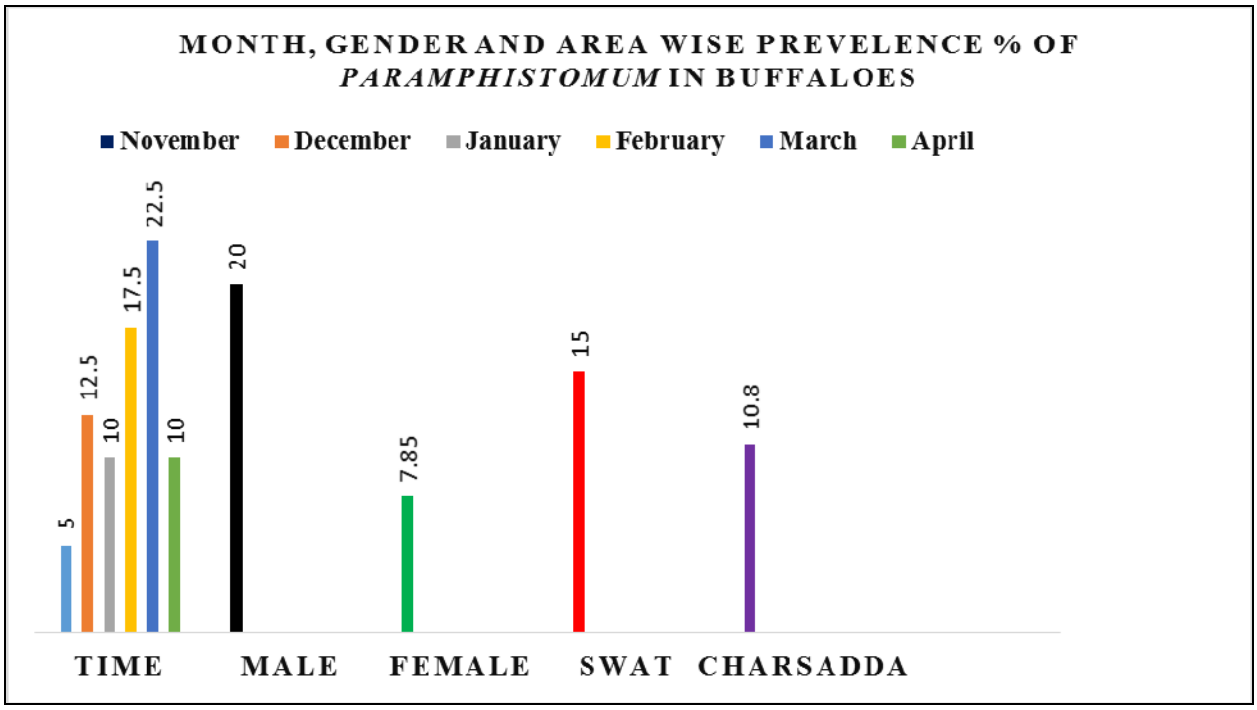

Fig 3: Month wise prevalence, Area wise and Gender wise prevalence of *Paramphistomum* in buffaloes at two districts of KP (Swat and Charsadda) from Nov 2011 to April 2012.

4. Discussion

Cows and buffaloes are not only main source of animal proteins but their products such as bones, skins and goods made from their fetch are of great importance for the man. Watery diarrhea, weakness, weight loss, decrease in milk production, reduced product quality, mortality and other secondary infections are caused by trematode parasites. Helminth parasites are potential health hazard to livestock population and produce enormous economic losses [8].

In heavy infection, the liver may be pale and show a degree of fibrosis. This parasitic infection causes tissue and organ damages leading to poor production of milk, meat, hides and skin and retarded growth. Liver damages caused by Paramphistomiasis have most often been misinterpreted as fascioliasis. It therefore becomes pertinent to study specifically liver damage as a result of Paramphistomiasis as it will update existing information upon which control programe and adequate surveillance will be planned [10].

In the present study, *Paramphistomum* eggs were collected from buffaloes and cows at slaughter houses, dairy forms and houses from Swat and Charsadda of KP Pakistan. Similar *Paramphistomum* was also detected by [10, 13, 16].

The prevalence of adult *Paramphistomum cervi* during January 2007 in Tehsil Jatoi, District Muzaffar Garh Pakistan was found to be 22% (22/100) and species wise prevalence was 28.57% (4/14) in sheep, 23.80% (10/42) in goats, 17.64% (6/34) in cattle and 20% (2/10) in buffaloes [13]. In the present study results indicated 8.75% cows, 12.9% buffaloes were positive for paramphistomosis. The differences in prevalence was due to different time period and different environmental conditions.

According to Rafique *et al* [11] Prevalence of endo and ecto-parasites in cows and buffaloes were investigated in Quetta city, Pakistan. A total of 396 livers and gall bladders of cows and 340 of buffaloes were selected randomly. The prevalence of *Paramphistomum explanatum* found in livers of cows were (7.82%) and mixed infections was (9.34%) that is near to the data observed in the present study.

According to a study conducted by Njoku-Tony and Nwoko [10] Infection was highest in Okigwe (34.5%), followed by Afor-Ogbe (30.0%), Orlu (20.4%), Orieagu (18.4%) and Achingali (16.7%). Sex showed no significant relationship with the infection, however age was found to be highly significant ($p<0.01$) with older animals having more infection than younger ones.

It appears that infection rate in the present study is different from the above mentioned study in Imo State. The different may be due to different geographical regions and varied environmental condition.

Cattle were infected mainly throughout the rainy and windy seasons, during summer, autumn and at the beginning of winter [12]. Present studies shows the highest prevalence in all animals (cows, buffaloes) was recorded in the month of March (13.55%) due to rainy season.

In the present study it was found that infection was lower in females than males, which indicating the reason seems to be related to social practice of keeping females under better management and feeding conditions in comparison to males which are generally let lose to graze freely in pastures.

5. Conclusion

Epidemiological study undertaken at two districts of KP (Swat and Charsadda) under different conditions revealed that infection rate was higher in buffaloes followed by cows. When the data on monthly, and seasonal incidence of paramphistoma infection in cows and buffaloes where analyzed, it was observed that higher incidence of paramphistomosis occurred in the month of March, higher incidence of paramphistomosis also occurred in female than males. And higher incidence of paramphistomosis occurred in Swat than Charsadda.

6. References

1. Ali S, Khan MQ, Qayyum M, Khan MFU. Prevalence of gastrointestinal parasites in sheep and goats maintained at NARC, Islamabad, Pakistan. Pakistan Veterinary Journal.

2000; 20(3):157-158.
2. Al-Shaibani IRM, Phulan MS, Arijo A, Qureshi TA. Epidemiology of ovine gastrointestinal nematodes in Hyderabad district, Pakistan. Pakistan Veterinary Journal. 2008; 28(3):125-130.
3. Chaoudhary V, Hasnani JJ, Khyalia MK, Pandey S, Chauhan VD, Pandya SS *et al*. Morphological and histological identification of Paramphistomum cervi (Trematoda: Paramiphistoma) in the rumen of infected sheep. Veterinary world. 2015; 8(1):125.
4. Chaudhri SS, Gupta RP, Sangwan AK. Helminthic diseases in ruminants of Haryana and their control. Agricultural Reviews-Agricultural Research Communications Centre India. 1993; 14:121-121.
5. Dalton PR, Pole D. Water-contact patterns in relation to Schistosoma haematobium infection. Bulletin of the World Health Organization. 1978; 56(3):417.
6. Ijaz M, Khan MS, Avais M, Ashraf K, Ali MM. Infection rate and chemotherapy of various helminths in goats in and around Lahore. Pakistan Veterinary Journal. 2008; 28(4):167-170.
7. Jørgan H, Perry B. The epidemiology, diagnosis and control of gastro-intestinal parasites of ruminants in Africa. International Laboratory for Research on Animal Diseases. Book, 1990.
8. Kakar MN, Kakarsulemankhel JK. Prevalence of endo (trematodes) and ecto-parasites in cows and buffaloes of Quetta, Pakistan. Pakistan Veterinary Journal. 2008; 28(1):34.
9. Nikander S, Saari S. Notable seasonal variation observed in the morphology of the reindeer rumen fluke (Paramphistomum leydeni) in Finland." Rangifer 27.1, 2009.
10. Njoku-Tony RF, Nwoko BEB. Prevalence of Paramphistomiasis among Goats Slaughtered in some Selected Abattoirs in Imo State, Nigeria. Science World Journal. 2009; 3(1).
11. Rafique A, Rana SA, Khan HA, Sohail A. Prevalence of some helminths in rodents captured from different city structures including poultry farms and human population of Faisalabad, Pakistan. Pakistan Veterinary Journal. 2009; 29(3):141-144.
12. Rangel-Ruiz LJ, Albores-Brahms ST, Gamboa-Aguilar J. Seasonal trends of Paramphistomum cervi in Tabasco, Mexico. Veterinary parasitology. 2003; 116(3):217-222.
13. Raza MA, Murtaza S, Bachaya HA, Hussain A. Prevalence of Paramphistomum cervi in ruminants slaughtered in District Muzaffar Garh. Veterinary Journal. 2009; 29(4):214-215.
14. Robert LS, Schmidt GD. Foundation of parasitology Mc Graw Hill 8thEd.293, 2008.
15. Rolfe PF, Boray JC. Chemotherapy of paramphistomosis in cattle. Australian Veterinary Journal. 1987; 64(11):328-332.
16. Sanabria REF, Romero JR. Review and update of paramphistomosis, *Helminthologia*. 2008; 45(2):64-68.
17. Sintayehu M, Addis M. Prevalence and intensity of Paramphistomum in ruminants slaughtered at Debre Zeit industrial abattoir, Ethiopia. Global Veternaria. 2012; 8(3):315-319.
18. Urquhart GM, Armour J, Duncan JL, Dunn AM, Jennings FW. Veterinary Parasitology, ed. ELBS Langman, U.K, 2005.
19. Waller PJ, Prichard RK. Drug resistance in nematodes. In: Campbell, W.C, Rew, R.S. (Eds.). Chemotherapy of Parasitic Infections, Phenum, New York, USA, 1985, 339-362.
20. Yamaguti S. A synoptical review of life historics of digenetic trematode of vertebrate with special reference to the morphology of their larvae. Keiguka Publ, 1975.