

## Research Article

# Liver Fluke: Elisa Diagnosis in Goats in Pakistan

Nasir Mahmood<sup>1</sup>, Muhammad Mazhar Ayaz<sup>1\*</sup>, Raza Hameed<sup>1</sup>, Mudaseer Nazir<sup>1</sup>, Ahsan Sattar Sheikh<sup>2</sup>, Irtza Hussain<sup>1</sup>, Najeeb Ullah<sup>3</sup>, Noreen Samad<sup>3</sup>, Aqal Zaman<sup>4</sup>, Atif Akbar<sup>5</sup>, and Yadong Zheng<sup>6</sup>

<sup>1</sup>Department of Pathobiology, Bahauddin Zakariya University, Multan, Pakistan

<sup>2</sup>Institute of Food Science and Nutrition, Bahauddin Zakariya University, Pakistan

<sup>3</sup>Department of Biochemistry, Bahauddin Zakariya University, Pakistan

<sup>4</sup>Institute of Pure and Applied Biology, Bahauddin Zakariya University, Pakistan

<sup>5</sup>Department of Statistics, Bahauddin Zakariya University, Pakistan

<sup>6</sup>Chinese Academy of Agricultural Sciences, China

## \*Corresponding author

Muhammad Mazhar Ayaz, Department of Pathobiology, Bahauddin Zakariya University, Multan, Pakistan, Tel: 923336460610; Email: mazharayaz@bzu.edu.pk

Submitted: 24 June 2017

Accepted: 25 July 2017

Published: 28 July 2017

ISSN: 2378-931X

## Copyright

© 2017 Ayaz et al.

## OPEN ACCESS

## Keywords

- Fascioliasis
- Liver Fluke
- ELISA
- Diagnosis
- Goats

## Abstract

Fascioliasis is an economically important parasitic disease of small ruminants mainly caused by a trematodes of the genus *Fasciola*. The most important species responsible for fascioliasis are *Fasciola hepatica* and *Fasciola gigantica*. The study was conducted for detection of fascioliasis in small ruminants through ELISA in Multan. A total of 100 samples were collected randomly for examination of GIT parasites especially for prevalence of fascioliasis. The animals under study were selected randomly without any discrimination of sex and age. During coprological parasitological examination of goats of district Multan, the total number of positive cases for *Fasciola hepatica* was 33/100 (33%) by sedimentation technique(s) and 19/100 (19%) by direct examination of the slides while 25/100 (25%) through floatation method were diagnosed respectively. The ELISA was performed on serum samples along with Copro-ELISA on the naturally infested animals. The ELISA gave promising results. It is recommended that there should be a routine procedure for the detection/ diagnosis of fascioliasis in goats through ELISA for good sustainable production practices in free range(s).

## INTRODUCTION

Small ruminants including goats play a vital role in the micro-economy and socio-economic uplift of the farmers including females too. Small ruminants including goats are always at threat of various viral, bacterial, fungal and parasitic problems [1]. They are fast grower and good producers of their young kids [2]. Pakistan is very rich in goat population which is ever increasing from 49.14 million in 2004 to 53.8 in 2008 and 68.4 in 2014-2015 [3]. Such rocket trends have not been seen in any of the production even including crops. By the proper control of various viral, bacterial and parasitic diseases the goat population can be avoided from losses and the small farmers including female small stock holders can evert the economy of nation through the goat production. Among parasitic diseases one of the lethal disease is Fascioliasis, commonly known Liver fluke, caused by a worm that inhabits in the liver, a vital organ in body, and mutilating it badly through crawling in and out has been reported from Pakistan often [4,5]. The *Fasciola hepatica* and *Fasciola gigantica* are commonly present in goats which are reared in range or marshy area. The *Fasciola hepatica* is endemic in the study area [6]. The parasite is escalated through a snail which facilitates its transmission to the healthy goat host. This alone parasite

can kill a lot of goats including kids without any information or notice or showing any signs. This per acute out breaks are common in goat population. To avoid such unpredicted loss a routine parasitological examination is imperative for the timely control of devastating parasite. The country like Pakistan cannot afford such losses where the innocent farmers may lose the head of goat which is only source of milk and money. To escape from such unpredictable losses a timely monitoring and examination is necessary through proper parasitological survey/examination. This paper has been designed to show the real issue to be addressed properly for the strengthening production and sustainable production measures for goats at national level.

## MATERIALS AND METHODS

About 100 goats of Beetal and Nachi breeds endemic at Multan were randomly selected without any sex and age. The animals were subjected to routine fecal Parasitological examination along with Sero-ELISA and Copro-ELISA. For fecal parasitological examination(s) 10 gm fecal material was collected aseptically in sterilized containers and brought to Chemotherpay and Epidemiology Laboratory, Department of Pathobiology, Faculty

of Veterinary Sciences, Bahauddin Zakariya University, Multan, Pakistan. The fecal sample was investigated for examination of GIT parasites especially for prevalence of fascioliasis or eggs [7]. Three coprological methods were employed for the quick exploration of GIT worms including liver flukes eggs or as a whole worm. Three parasitological techniques were employed including Sedimentation technique, direct slide examination and floatation method(s) for the coproexamination of *Fasciola* eggs or worm as a whole or part. The Sero-ELISA was performed on serum collected from naturally infested positive goats while Copro-ELISA was performed on fecal sample of naturally infested positive goats. The results obtained were analyzed statistically through percentage method and probability analysis.

## RESULTS

The animals under study were selected randomly without any discrimination of sex and age. During coprological parasitological examination of goats of district Multan, the total number of positive cases for *Fasciola hepatica* was 33/100 (33%) by sedimentation technique(s) and 19/100 (19%) by direct examination of the slides while 25/100 (25%) through floatation method were diagnosed respectively (Table 1 and Figure1).

For Sero-ELISA test and Copro-ELISA test kits were purchased from BIO-X diagnostics, Belgium. The procedures were adopted strictly according to manufacturer's advice. The comparison of gold standard fecal parasitological tests between ELISA was made and it revealed that Sero-ELISA showed promising results in relation to circulating antibodies in serum while Copro-ELISA proved it's committed due to actual presence of Antigen fragments in the fecal material.

## DISCUSSION

There were 100 goats of Beetal and Nachi breeds endemic in southern Punjab, Pakistan. The goats were selected randomly

without any sex or age. Goats were screened for GIT parasites. The routine copro-examination techniques exhibited that sedimentation techniques proved outstanding showing 33% positive cases and the followed by Floatation method and direct examination as 25% and 19% respectively. The comparison of gold standard fecal parasitological tests between ELISA was made and it revealed that Sero-ELISA showed promising results in relation to circulating antibodies in serum while Copro-ELISA proved it's committed due to actual presence of Antigen fragments in the fecal material. The *Fasciola hepatica* and *Fasciola gigantica* play a major role in liver failure in ruminants and find a suitable vector, a snail for the dissemination of vector-borne disease [8]. It could be fatal to human subjects too if accidentally consumed metacercarie or snail or infected liver. The unhygienic practices could lead to positive infection in humans but in goats the marshy area containing shrubs and plantation is suitable environment for the infection to be established in healthy animals. Fascioliasis could prove fatal to whole of flock of goat if untreated or undiagnosed so there should be a routine procedure for the detection/ diagnosis of fascioliasis in goats for good sustainable production practices in free range(s). To avoid such unpredictable losses a timely monitoring and examination is necessary through proper parasitological survey/ examination and copro-examination through sedimentation is of no question. The most of the population rearing small ruminants including goat(s) are poor or unprivileged but now due to its high growth has attracted a number of business men for goat farming. To save your profit from loss it is necessary to adopt a regime for better and timely curbing of worms including trematodes like fascioliasis. The timely elimination of *Fasciola* from herd may guarantee the strengthening of small ruminants including goats and by proper adaptation of treatment/ prophylactic measure by latest diagnostic facilities [9].

## ACKNOWLEDGEMENT

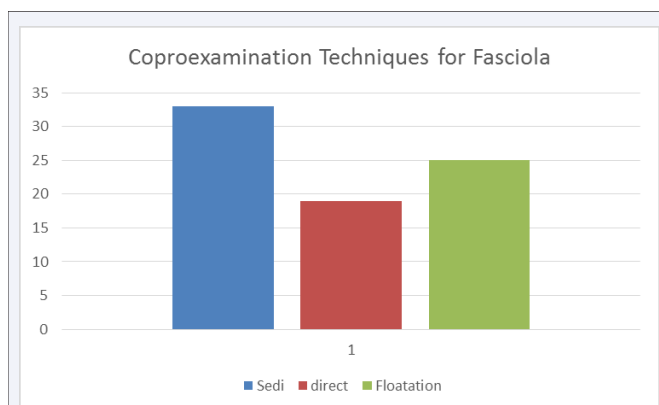
This study was partially supported by Directorate of Research and External Linkages, Bahauddin Zakariya University, Multan under Grant No. DR&EL/D-443.

## REFERENCES

1. Afzal M, Naqvi MN. Livestock Resources of Pakistan: Present Status and Future Trends. Quarterly Science Vision. 2004; 9: 1-2.
2. Khan MS, Khan MA, Mahmood S. Genetic Resources and Diversity in Pakistani Goats. Int J Agriculture Biol. 2008; 10: 2227-2231.
3. Economic Survey of Pakistan (2014-2015). Government of Pakistan, Islamabad.
4. Ahmad S, Nawaz M, Gul R, Zakir M, Razzaq A. Diversity and prevalence of trematode in liver of sheep and goats in Quetta, Pakistan. Pak J Zool. 2005; 34: 205-210.
5. Farooq AA, Lashari AMH, Akhtar MS, Awais MM, Inayatand S, Akhter M. Prevalence of Bovine Fasciolosis in different Commercial and non-Commercial dairy farms of district Rajanpur, Punjab, Pakistan. Pak J Life Soc Sci. 2015; 13: 8-11.
6. Tasawar Z, Minir U, Hayat CS, Lashari MH. The prevalence of *Fasciola hepatica* in goats around Multan. Infection. 2007; 32: 23-50.
7. Ayaz MM. Techniques for Helminthes; Diagnosis of Flukes, Trematodes and Nematodes in Humans and Animals. BBS Life Sci Publisher Group. Multan, Pakistan. 2013.

**Table 1:** Copro-examination Technique(s).

| S.No | Copro Examination Techniques | Positive cases | %age |
|------|------------------------------|----------------|------|
| 1    | Sedimentation technique      | 33/100         | 33%  |
| 2    | Direct examination           | 19/100         | 19%  |
| 3    | Floatation method            | 25/100         | 25%  |



**Figure 1** Copro-examination Technique(s).

8. Afshan K, Fortes-Lima CA, Artigas P, Valero MA, Qayyum M, Mas-Coma S. Impact of climate change and man-made irrigation systems on the transmission risk, long-term trend and seasonality of human and animal fascioliasis in Pakistan. *Geospatial Health*. 2014; 8: 317-334.
9. Shahzad W, Mehmood K, Munir R, Aslam W, Ijaz M, et al. Prevalence and molecular diagnosis of *Fasciola hepatica* in sheep and goats in different districts of Punjab, Pakistan. *Pak Vet J*. 2012; 32: 535-538.

**Cite this article**

Mahmood N, Ayaz MM, Hameed R, Nazir M, Sheikh AS, et al. (2017) Liver Fluke: Elisa Diagnosis in Goats in Pakistan. *J Vet Med Res* 4(6): 1094.