



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 08, Issue, 11, pp.6820-6823, November, 2017

RESEARCH ARTICLE

PREVALENCE OF GASTROINTESTINAL PARASITISM IN OSMANABADI GOATS

*Chavhan P.H., Dr. G.R. Gangane, Dr. B.W. Naraladkar, Dr. S.D. Moregaonkar and Dr. J.Y. Waghaye

Department of Veterinary Pathology, College of Veterinary and Animal Sciences, MAFSU, Parbhani (MS)

ARTICLE INFO

Article History:

Received 19th August, 2017

Received in revised form

26th September, 2017

Accepted 22nd October, 2017

Published online 30th November, 2017

Key words:

Osmanabadi goats,
Haemonchus spp.,
Strongyle spp.,
Eimeria spp.

ABSTRACT

The necroscopic study was carried out to know the prevalence of gastrointestinal parasites in 235 Osmanabadi goats in Parbhani (Maharashtra, India) during February, 2017 to July, 2017. The overall prevalence was 71.06% (167/235). The season wise prevalence was 84.35% and 48.86% during monsoon and summer seasons respectively. The age wise prevalence was 73.07% in kid, 72.82% in young, and 66.15% in adult goats. The sex wise prevalence noted 77.32% (133/172) in female and in male 53.96% (34/63). The overall species wise prevalence was 29.36% of *Strongyle* spp. (*Haemonchus* spp. and *Oesophagostomum* spp.) followed by mixed (30.63%), *Eimeria* spp., *Moniezia* spp., *Strongyloides* spp., *Trichuris* spp. observed to an extent of 4.68%, 4.68%, 1.75% and 0.42% respectively. An approximate economic losses due to gastrointestinal parasitism in goats accounts to a tune of Rs. 31494475 /- per annum (Rs. Three crore fourteen lakhs ninety four thousand four hundred and seventy five rupees only).

Copyright©2017, Chavhan et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

India is an agrarian economy, most of the population of India depends on the agriculture sector and subsector. The small ruminants like sheep and goats play critical role in socio-economic development of the rural poor. Among all species of farm animals, sheep and goats are the earliest ruminants to be domesticated. Despite importance of goat, the tropical productivity is quite low. This is because of neglected management and poor health of animals due to various factors, such as improper nutrition and sanitation standards. Parasitic gastroenteritis caused by gastrointestinal parasites pose a serious health threat and a limitation to the productivity of goat due to the associated morbidity and mortality (Nwosuet al., 2007 and Bandopadadyayet al., 2011). Infection in the gastrointestinal tract with parasites is still one of the main constraints to goat production (Rinaldiet al., 2007) and poses major global threat to animal production, which leads to serious economical and health problems. Considering the direct, indirect losses being caused due to gastrointestinal parasitism in Osmanabadi goats, the present study was conducted for knowing gastrointestinal prevalence by screening and collecting samples from the slaughtered Osmanabadi goats in Parbhani, one of the district place in Marathwada region of Maharashtra state (India).

*Corresponding author: Chavhan P.H.,

Department of Veterinary Pathology, College of Veterinary and Animal Sciences, MAFSU, Parbhani (MS).

MATERIALS AND METHODS

The gut of freshly slaughtered Osmanabadi goats at local slaughter places and also died Osmanabadi goats was collected and screened for identification of parasites. The faecal sample from the affected gastrointestinal tract of Osmanabadi goats were collected and grossly observed for presence of tapeworm proglottids, roundworm, if any, then processed by standard parasitological techniques. Total 235 carcasses of Osmanabadi goats were categorized into three age groups:- Age between 0-6 month designated as kids; Age between 6 month to 1 year designated as young adults goats; Age above 1 year were designated as adult goats. The screened goats were also distributed on the basis of total number of male and female goats affected. The Modified Stoll's dilution method was performed to determine the number of eggs/oocyst per gram of faeces. These economical losses were calculated by considering the losses being caused due to milk and meat production. The data generated was subjected to Chi-square test for analysis (Snedecor and Cochran 1982).

RESULTS AND DISCUSSION

After thorough post-mortem examination, the overall prevalence in slaughtered and died Osmanabadi goats appeared to be 71.06% (167/235). Out of 235 (220 slaughtered and 15 died goats) screened Osmanabadi goats, 167 (161 slaughtered and 6 died) were positive for the most commonly occurring helminthic infections responsible for causing

gastrointestinal parasitism. The present findings are well supported by the observations of Vieira *et al.* (2014), Olanike *et al.* (2015) Mohanta *et al.* (2007) and Gadahi *et al.* (2009) who reported 79.3%, 75.75%, 94.67%, and 63.35% prevalence of gastrointestinal parasitism in goats respectively.

Season wise prevalence of gastrointestinal parasitic infection in Osmanabadi goats

The season wise prevalence recorded during study period is depicted through table 1. In respect of season wise prevalence of gastrointestinal parasitism in Osmanabadi goats noted 84.35% and 48.86% prevalence during monsoon and summer season, respectively.

Varadrajan and Vijayalakshmi (2015) observed higher prevalence in rainy season (68.36%) followed by winter (60.84%), summer (55.30%).

Age-wise prevalence of gastrointestinal parasitic infection in Osmanabadi goats

The screened goats were categorized into three age groups such as goats ageing 0 – 6 months were grouped as kids, goats ageing 6 months to 1 year were grouped as young and goats ageing 1 year to above were considered as adult. The age wise prevalence revealed 73.07% in kids followed by 72.82% in young and 66.15% in adult goats. Statistically, the age wise prevalence of gastrointestinal parasitism in Osmanabadi goats

Table 1. Season wise prevalence of gastrointestinal parasitism in Osmanabadi goats

Sr. No	Season	Number of goats screened	Positive	Percentage	X ² Table			Significance
					X ²	1%	5%	
1	Summer *	88	43	48.86	6.099			
2	Monsoon *	147	124	84.35	3.655	6.64	3.84	Significant
	Total	235	167	71.06	9.754			

Table 2. Age wise prevalence of gastrointestinal parasitic infection in Osmanabadi goats

Sr. No.	Age Groups	Number of Osmanabadi goats screened	Positive	Percentage	X ² Table			Significance
					X ² CAL	1%	5%	
1	Age between 0-6 Month	78	57	73.07	0.045			
2	Age between 6 Month - 1 year	92	67	72.82	0.040	9.21	5.99	Non-Significant
3	Age above 1 year	65	43	66.15	0.220			
	Total	235	167	71.06	0.305			

Table 3. Sex wise prevalence of gastrointestinal parasitism in Osmanabadi goats

Sr. No.	Sex	Number of goats screened	Positive	Percentage	X ² Table			Significance
					X ² CAL	1%	5%	
1	Female	172	133	77.32	0.16			
2	Male	63	34	53.96	4.68	6.64	3.84	Significant
	Total	235	167	71.06	4.84			

Table 4. Species prevalence of different gastrointestinal parasites in Osmanabadi goats

Name of Parasites	Number of goats Screened	Positive	Percentage %	X ² Table			Significance
				X ² CAL	1%	5%	
<i>Strongyles spp.</i>	235	69	29.36	60.90			
i. <i>Haemonchus spp.</i>							
ii. <i>Oesophagostomum spp.</i>							
<i>Strongyloides spp.</i>	235	3	1.27	22.15			
<i>Trichostrongylus axei</i>	235	1	0.42	25.86			
<i>Moniezia spp.</i>	235	11	4.68	10.17	15.086	11.070	Significant
<i>Eimeria spp.</i>	235	11	4.68	10.17			
Mixed infections	235	72	30.63	70.10			
Total number of animals examined	1410						
Total positive and percentage		167		199.35			

In present study, the per cent prevalence noted during monsoon was higher than summer season. During monsoon season the larval population of parasites increases mainly due to favorable environment. The ambient temperature and humidity for better development of parasitic larvae is 18°C-26°C and 100%. Hence, during monsoon season increases the susceptibility for parasitism. The observations of present study are in consonance with the findings of Pathak and Pal (2008) who reported highest seasonal prevalence in monsoon (94.60%), moderate in summer (87.50%) and lowest in winter (63.15%) season.

did not show any significant difference. The kids showed comparatively high prevalence than young and adults (Table 2). Raza *et al.* (2014) observed high prevalence of gastrointestinal parasitism in suckling goats followed by young and adult. The high prevalence of gastrointestinal parasitism due to weaker immune response of young goats and comparatively fast recovery from gastrointestinal parasitism in adult goats might have shared this condition as hypothesized by researcher. The observations of present study corroborates with the reports of Okoye *et al.* (2013), Emiru *et al.* (2013), Admasu and Nurlign (2014).

Table 5. Annual and daily loss due to gastrointestinal parasitism in goats

Host species	Pop ^a	% pop ^{a,b}	Total pop ^a affected ^c (axb/100) ^c	Avg Milk prod ^d	milk loss due to parasitism @27% ^e	Total loss @ Rs. 35 (Rs)	AvgMeat production per goat ^f	Total meat loss due to parasitism @ 29% ^g cxgx20% ^{g-h}	Total loss in Rs @ Rs 400 /Kghx400
Male	32514	53.96	17544	219 gm/day** 219x78203= 17126Liters	4624 Liters		11.611** kgs	17544x11.611x 29= 5906 kg loss	2362400=00
Female	101143	77.32	78203			161840 loss per day Rs			
Daily loss						29132075= 00 loss			Rs 23,62,400=00 loss
Annual loss (Daily loss x180 Days)									

Total. Rs. 31494475=00 Rs Three crore fourteen lacs ninety four thousand four hundred and seventy five only per annum

Rs. 86286=00 Rs Eighty-Six thousand two hundred and eighty six only per day

Rs. 235=00 Rs Two hundred and thirty five only per goat

Sex-wise prevalence of gastrointestinal parasitic infections in Osmanabadi goats

The sex wise prevalence of gastrointestinal parasitic infections was high in females 77.32% (133/172) as compared to males 53.96% (34/63) (Table 3). The high prevalence of gastrointestinal parasitism in female goats was recorded in present study due to physiological stressors such as lactation, pregnancy and parturition. Also, the malnutrition might have contributed at considerable level in exposing female goats to gastrointestinal parasitism. Similar findings have also been reported by Shimeet *et al.* (2016) who observed higher prevalence of helminthes infection in female than male goats.

Species wise prevalence and intensity of different gastrointestinal parasitic infections in Osmanabadi goats

The overall species wise prevalence of gastrointestinal parasitism in goats revealed 29.36% prevalence of *Strongyle spp.* (*Haemonchus spp.* and *Oesophagostomum spp.*) followed by mixed (30.63%). The percent prevalence of *Eimeria spp.*, *Moniezia spp.*, *Strongyloides spp.*, *Trichuris spp.* observed in present study was 4.68%, 4.68%, 1.75% and 0.42% respectively (Table 4.). The observation of present study goes in line with the findings of Sutar *et al.* (2010) and Gebeyehuet *et al.* (2013) who reported variable percent prevalence of various species of gastrointestinal parasites.

Intensity of gastrointestinal parasitism in Osmanabadi goats

The representative positive samples of each affected goats were further subjected to study the intensity of infection by estimating EPG and OPG. The samples were processed by employing the Modified Stoll's dilution method for eggs per gram (EPG) as described by Soulsby, (1982). The EPG and OPG of studied samples ranged from 100-400, 500-800, 1300-2200 and 100-300, 400-600 and 700-800 eggs/oocytes per gram of intestinal content/faeces which was as low, moderate and intense infection of gastrointestinal parasitism. Squire *et al.* (2013) used EPG to judge intensity of infections in Cattle.

Projected economic losses due to Haemonchosis

The economic losses due to gastrointestinal parasitic infection in Osmanabadi goats for Parbhani are described in Table 5. The economic losses were calculated by considering goat population in Parbhani as per census 2012, per cent population of goats affected with gastrointestinal parasitism in Parbhani, average milk and meat production of goats. An approximate

seventy five rupees only). These losses were calculated by considering the losses being caused due to milk and meat production. In present study, the losses occurred due to mortality, ectoparasitism in goats were not considered while calculating the economic losses. The findings of Qamar *et al.* (2011) were referred and considered as base for calculating the losses.

Acknowledgement

Authors are thankful to the Associate Dean, College Veterinary and Animal Science, Parbhani, MAFSU, Nagpur (Maharashtra, India) for providing necessary facilities to carried out research work.

REFERENCES

- Admasu P. and L. Nurlign 2014. Prevalence of Gastrointestinal Parasites of Small Ruminants in Kuarit District, North West Ethiopia. *African Journal of Basic & Applied Sciences* 6 (5): 125-130.
- Bandyopadhyay, S., P., A. Devi, D. Bera, D. Bhattacharya, 2011. Prevalence of gastrointestinal parasite in goats in Shillong, Meghalaya, India. *Webmed Central Parasitology*; 1(9):01-10.
- Emiru B., Y. Amede, W. Tigre, T. Feyera and B. Deressa 2013. Epidemiology of Gastrointestinal Parasites of Small Ruminants in Gechi District, Southwest Ethiopia, *Advances in Biological Research* 7 (5): 169-17.
- Gadahi J.K., M. J. Arshed, Q. Ali, S. B. Javaid and S. I. Shah, 2009. Prevalence of Gastrointestinal Parasites of Sheep and Goat in and around Rawalpindi and Islamabad, *Pakistan; Veterinary World*, Vol.2(2): 51-53.
- Gebeyehu E. B., M. G. Seo, B. Y. Jung, J. W. Byun, J. K. Oem, H. Y. Kim and D. Kwak 2013. Prevalence of gastrointestinal parasites in korean native goats (*Capra hircusaegagrus*). *The Journal of Animal & Plant Sciences*, 23(4), Page: 986-989.
- Mohanta U.K., Anisuzzaman, T. Farjana, P. M. Das, S. Majumder and M. M. H. Mondal 2007. Prevalence, population dynamics and pathological effects of intestinal helminths in black bengal goats; *Bangl. J. Vet. Med.* 5 (1 & 2): 63-69.
- Nwosu, C.O., Madu, P.P. and Richards, W.S. 2007. Prevalence and seasonal changes in the population of gastrointestinal nematodes of small ruminants in the semi-arid zone of north-eastern Nigeria; *Vet. Parasitology*. 144: 118-124.

- Olanike, A. O., A. J Olayide, F. O Oludunsin,., A. O., Racheal, D. W Japhet,. 2015. Prevalence of gastrointestinal parasites of goats in ibadan, southwest, nigeria. *World Journal of Agricultural Research*. 3(2): 49-51.
- Pathak A. K. and S. Pal, 2008. Seasonal Prevalence of Gastrointestinal Parasites in Goats from Durg District of Chhattisgarh, *Veterinary World*, 1(5):136-137.
- Qamar M.F., A. Maqbool and N. Ahmad, 2011. Economic losses due to haemonchosis in sheep and goats, *Sci.Int. (Lahore)*, 23(4), 321-324.
- Raza M. A., M. Younas, E. Schlecht 2014. Prevalence of gastrointestinal helminths in pastoral sheep and goat flocks in the cholistan desert of Pakistan, *The Journal of Animal and Plant science*, 24(1) 127-134.
- Rinaldi, L., Veneziano, V., G. Cringoli 2007. Dairy goat production and the importance of gastrointestinal strongyle parasitism. *Trans. R. Soc. Trop. Med. Hyg.* 101,745-746.
- Shime A. and S. Derso 2016. *Advances in Life Science and Technology* ,ISSN 2224-7181 (Paper) ISSN 2225-062X (Online) Vol.49.
- Snedecor, G. W. and Cochran, W.G. 1982 *Statistical Methods*. 7th Edition, Iowa State University Press, Towa, 511.
- Squire S. A., H. A. D. and J. Beyuo, 2013. Epidemiology of gastrointestinal parasites of cattle from selected locations in Southern Ghana, *Livestock Research for Rural Development*
- Sutar A.U., S.B. Kengar, S.S. Patil and M.R. Khan, 2010. Prevalence of gastrointestinal parasites in goats of Ahmednagar district of Maharashtra. *Veterinary World*, Vol.3 (10):456-457.
- Varadharajan A. and R. Vijayalakshmi, 2015. Prevalence and seasonal occurrence of gastrointestinal parasite in small ruminants in coastal areas of TamilNadu; *International Journal of Scientific and Research Publications*, Volume 5, Issue 2.
- Vieira V. D., T. F. Feitosa, V. L. R. Vilela & S. S. Azevedo & J. L. de Almeida Neto & D. F. de Moraes & A. R. C. Ribeiro & A. C. R. Athayde, S. 2014. Prevalence and risk factors associated with goat gastrointestinal helminthiasis in the Sertão region of Paraíba State, Brazil; *Trop Anim Health Prod* 46:355–361.
