International Journal of Advanced Research in Biological Sciences
ISSN : 2348-8069
www.ijarbs.com

Research Article

Prevalence and seasonal occurrence of gastrointestinal parasites in small ruminants of coastal areas of Tamil Nadu.

A. Varadharajan* and R. Vijayalakshmi

Division of Animal Husbandry, Faculty of Agriculture, Annamalai University, Annamalai Nagar – 608 002, Tamil Nadu, India.
*Corresponding author: *varadharajanah@gmail.com*

Abstract

The study was carried out from October 2013 to September 2014 in both organised and small sheep and goat farms of coastal areas viz. Cuddalore, Nagapattinam of Tamil Nadu, India. The objective of the present study is to determine the prevalence and seasonal variation of gastrointestinal parasites in small ruminants. A total of 1356 faecal samples (63 from goat and 50 from sheep per month) were collected and subjected for analysis. Among the analysed samples 61.50% were positive for endoparasites. The prevalence of gastrointestinal parasites was higher in sheep (66.33%) than in goats (57.67%). The endoparasites found in small ruminants were nematodes, cestodes and trematodes. The nematode *Haemonchus sp* was found to be predominant in both sheep and goat. The results of season wise analysis indicates that the overall infection percentage was higher in rainy season (68.36%) followed by winter (60.84%) than in summer (55.30%).

Keywords: prevalence, seasonal variation, gastrointestinal parasites, small ruminants, Tamil Nadu.

Introduction

Small ruminants are widely distributed and are of great importance as a major source of income for small and the landless farmers in rural areas. Sheep & goat with large genetic diversity accounts for about 0.5 to 5% of total output of livestock sector in India (Singh, 1995). Helminthiasis, especially parasitic gastro-enteritis, poses a serious health threat and a limitation to the productivity of small ruminants due to the associated morbidity, mortality, cost of treatment and control measures (Nwosu *et al.,* 2007). In addition to these threats, infestation with helminths lowers the animal's immunity and renders it more susceptible to other pathogenic infections; finally this may result in heavy economic losses (Garedaghi *et al.,* 2011). The problem is however muchmore severe in tropical countries due to very favourable environmental conditions for helminth transmission (Mohanta *et al.,* 2007).

Three classes of helminthes are distinguished, viz., nematodes (roundworms), cestodes (tapeworms) and trematodes (flukes). Several authors (Katoch *et al.,* 2000, Rahman, and Ali, 2001, Jeyathilakan *et al.,* 2003, Easwaran, 2004, Singh et al., 2005, Mamatha *et al.,* 2007, Kuchai *et al.,* 2011) have explored various aspects of helminth infestation in small ruminants at different localities of Tamil Nadu and other states of India with a range of 25 - 92%. No report is available onprevalence of gastrointestinal helminths in south coastal region of Tamil Nadu viz., Cuddalore and Nagapattinam districts where goat farming is the primordial occupation of the small farmers. Hence, the present study was undertaken to analyze the helminth infestation in small ruminants with appropriate design and effective control measures.

Materials and Methods

Study Population

The sheep and goats maintained along the coastal areas of Tamil Nadu viz. Cuddalore and Nagapattinam districts by the organized farms, small and marginal farmers were selected for the study. Four flocks of goat, five flocks of sheep, each flock with 15 – 20 animals, 45 goats reared under semi-intensive system and goats maintained at division of Animal Husbandry, Faculty of Agriculture, Annamalai University were selected for the study. Depending on the climatic condition the animals were allowed for grazing of 5-8 hrs per day.

Collection and examination of Faecal Sample

From October 2013 to September 2014, a total of 1356 fresh faecal samples were collected from the selected sheep and goat flocks. The faecal samples were examined for helminth eggs using Direct, Sedimentation, Floatation techniques (Foriet, 1999, Kassai, 1999).

Results and Discussion

The analysis of faecal samples revealed that among the 1356 samples examined, 834 were found positive for helminth infection with an overall prevalence of 61.5 percent (Table 1 and Figure 1). The flock wise analysis of helminth infection was given in Fig. 1 which showed sheep flock was most affected than the goat flock. The results of species wise analysis of faecal samples are shown in Table 2 and Figure 2. From the table it was noted that both sheep and goat flocks were affected by nematodes (*Haemonchus sp, Trichuris sp and Strongyloides sp*), cesodes (*Monizia sp*) and trematodes (*Amphistomes and Fasciola sp*). It was found evident that *Haemonchus sp* was the dominant species affecting both sheep and goat flocks. Next to it, the the animals were affected with the trematode *Amphistomes.* The results of season wise infection of helminthes in both sheep and goat flocks are summarized in Table 3 and figure 3. Out of three seasons, higher percentage of infection was detected during rainy season (68.36%) followed by winter (60.84%). However, during summer infection was moderate in both goat and sheep flocks (55.30%). The season wise infection percentage for different seasons was displayed in Fig. 3. As shown in figure, sheep flock has witnessed highest infection percentage than goat for all the three seasons.

Table 1 The flock wise analysis of helminth infection

Animal	No.of samples collected	No.found positive	Infection (%)
Sheep	600	398	66.33
Goat	756	436	57.67
Overall	1356	834	61.50

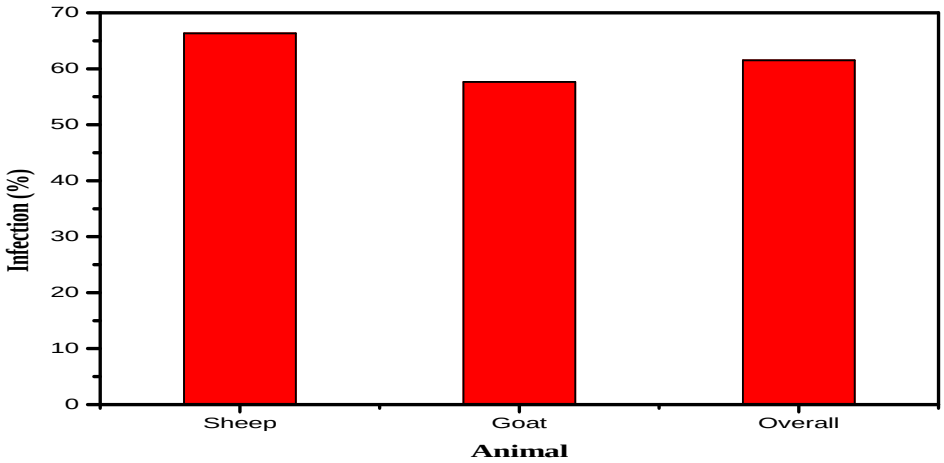

Fig. 1 The flock wise analysis of helminth infection

Table 2 Species wise prevalence of gastrointestinal helminthes in sheep and goats

S. No.	Species	No. of animals examined	Total positive	Infection percentage
1	*Haemonchus sp*	1356	623	45.94
2	*Trichuris sp*	1356	179	13.20
3	*Strongyloides sp*	1356	187	13.79
4	*Monizia sp*	1356	165	12.16
5	Amphistomes	1356	327	24.11
6	*Fasciola sp*	1356	228	16.80

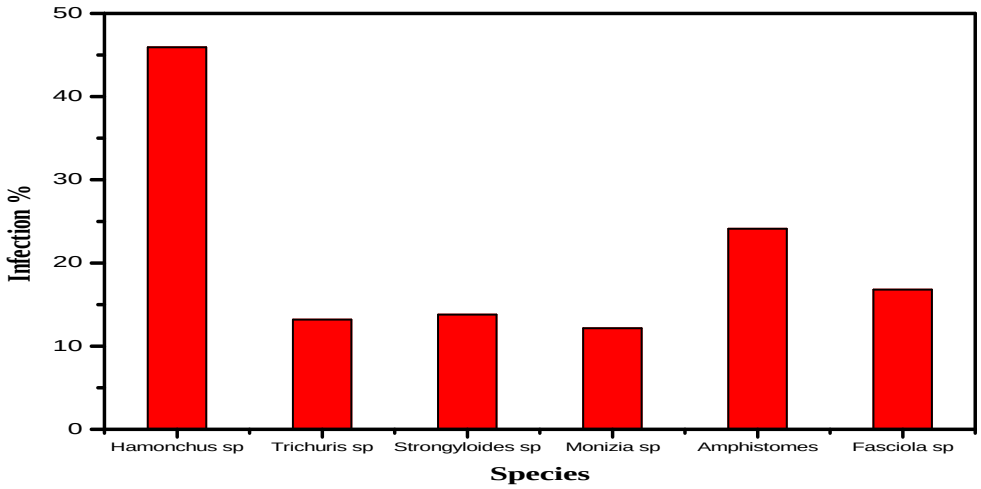

Fig. 2 Species wise prevalence of gastrointestinal helminthes in sheep and goats

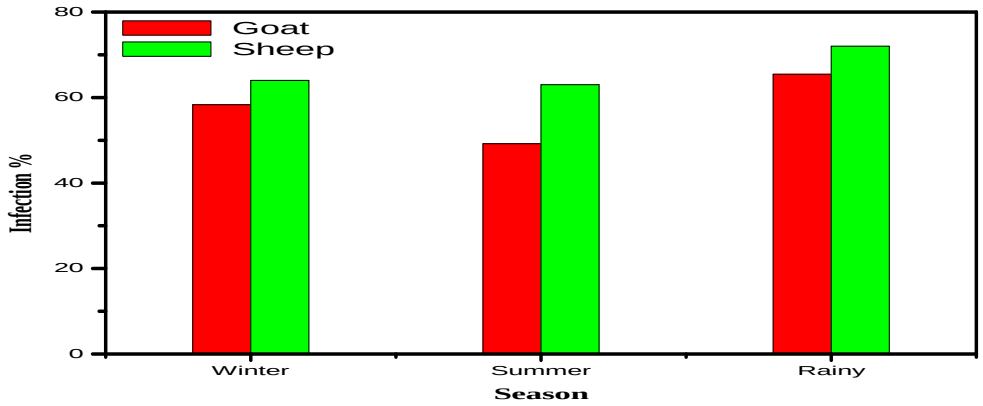

Fig. 3 Season wise occurrence of helminth infection in small ruminants

Table 3 Season wise occurrence of helminth infection in small ruminants

Season	Goat			Sheep			Both		
	No.of samples collected	No.found positive	Infection (%)	No.of samples collected	No.found positive	Infection (%)	No.of samples collected	No.found positive	Infection (%)
Winter	252	147	58.33	200	128	64.00	452	275	60.84
Summer	252	124	49.20	200	126	63.00	452	250	55.30
Rainy	252	165	65.47	200	144	72.00	452	309	68.36

The present study indicated that the infection with gastrointestinal helminthes is a frequent phenomenon among the small ruminants of coastal districts of Tamil Nadu, India. The higher incidence of parasites in different study areas of Tamil Nadu were reported by many researchers (Jeyathilakan *et al.,* 2003, Easwaran, 2004, Meenakshisundaram, 1999 and Palanivel *et al.,* 2012). The observed results were also in agreement with the findings of various authors from other parts of India (Singh *et al.,* 2005, Mamatha *et al.,* 2007, Kuchai *et al.,* 2011, Padmaja *et al.,* 2007, Bandyopadhyay *et al.,* 2010).

The various species of parasites recorded in the present study coincided with the findings of various authors (Kanyari *et al.,* 2009, Gadahi *et al.,* 2009, Palanivel *et al.,* 2012).

The seasonal occurrence of parasitic infection in small ruminants depicted higher infection of helminthes in rainy season followed by winter than in summer. This is in accordance with findings of other researchers (Katoch *et al.,* 2000, Yadav *et al.,* 2006). Heavy rainfall and high relative humidity predisposed to heavy parasitic infection (Hawkins, 1945). Climatic factors also influenced dispersion of larvae in the herbage which increased the chance of contact between host and larvae (Ogbourne, 1972, Croll, 1975). Higher infection during rainy season may also be attributed to suitable molarity of salt present in soil, an important factor for ecdysis (Soulsby, 1966).

Conclusion

From the above findings it was observed that the infections of gastrointestinal parasites among small ruminants were most prevalent throughout the year in organized and small holding flocks in varying intensity. Hence, appropriate strategic treatment with broad spectrum anthelmintic should be practised during the start and end of rainy season. Such treatment regime is strategic to get rid of the parasitic burden in the small ruminants and also minimize the pasture contamination by reducing faecal egg counts.

Acknowledgments

The authors are thankful to the Authorities of the University for the facilities provided, the sheep and goat farmers for collection of samples and the staff of Division of Animal Husbandry for their cooperation in examination of samples.

References

Bandyopadhyay, S., Devi, P., Bera, A., Bandyopadhyay, S and Bhattacharya, D. 2010. Prevalence of Gastrointestinal Parasite in Goats in Shillong, Meghalaya, India, WebmedCentral PARASITOLOGY 1(9):WMC00777.

Croll, N.Al. 1975. Behavioural analysis of nematode movement. Adv. Parasitol., 13:113.

Easwaran, S. 2004. Anthelmintic resistance in gastrointestinal nematodes of sheep and goats. M.V.Sc., thesis submitted to Tamil Nadu Veterinary and AnimalSciencesUniversity, Chennai-51.

Foriet, W. 1999. In: Reference Manual of Veterinary Parasitology. 5th(ed). Wiley Blackwell, New York, USA. 22-26.

Gadahi, J.A., Arshad, M.J., Ali, Q., Javaid, S.B and Shah, S.I. 2009.Prevalence of gastrointestinal parasites of sheep and goats in and around Rawalpindi, Islamabad. Veterinary World. 2:51-53.

Garedaghi, Y., Rezaii-Saber, A.P., Naghizadeh, A and Nazeri, M. 2011. Survey on prevalence of sheepand goats lungworms in Tabriz abattoir, Iran. Adv. Environ. Bio. 5:773-775.

Hawkins, P.A., 1945. Studies of sheep parasites VI. Observations on weather in relation to untreated nematode infections. J. Parasitol. 31:17.

Jeyathilakan, N., Radha, G., Gomathinayagam, S and Lalitha John. 2003. Emergence of anthelmintic resistance in nematodes of sheep in Tamil Nadu. J. Vet. Parasitol.17:159-160.

Kanyari, P.W.N., Kagira, J.M and Mhoma, R.J. 2009. Prevalence and intensity of endoparasites in small ruminants kept by farmers in Kisumu Municipality, Kenya. Livestock Research for Rural Development. 21:1-10.

Kassai, T., 1999. Veterinary Helminthology. Butterworth-Heinemann, Reed Educational and Professional Publishing Ltd., Oxford, USA. 260.

Katoch, R., Chauhan, P.P. S. and Johri, D.K. 2000. Seasonal incidence of gastrointestinal nematodes in goats of Mathura region. Indian Vet. J. **77**:259-260.

Kuchai, J.A.,Chshti,M.Z., Zaki, M.M., Ahmad,J., Rasool, M., Dar, S.A. And Tak, H. (2011) Epidemiology of helminth parasites in small ruminants of ladakh, india. Online J.Ani. Feed Res. **5:**239-242.

Mamatha, G.S and Placid E. D' Souza. 2007.Gastrointestinal parasitism in sheep and goats from different districts of Karnataka. Intas Polivet. 8:112-114.

Meenakshisundaram. 1999. Anthelmintic resistance in gastrointestinal nematodes of sheep. M.V.Sc., thesis submitted to Tamil Nadu Veterinary and Animal Sciences University, Chennai-51.

Mohanta, U.K., Anisuzzaman, T., Das, P.M, Majumder, S. and Mondal, M.M.H. 2007.Prevalence, population dynamics andpathological affects of intestinal helminths in Black Bengal goats. Bangladesh J. Vet. Med. 5:63–69.

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. Veterinary Parasitology.144:118–124.

Ogbourne, C.P. 1972. Observation on the free-living stages of strongylid nematodes of horses. Parasitology. 64:461-477.

Padmaja, K., Haritha, C and Anitha, K. 2007. Prevalence of gastrointestinal parasitism in goats. Intas Polivet. 8:32-34.

Palanivel, K. M., Rishikesavan, R., Sureshkumar, K and Gopi, H. (2012) Epidemiology of parasitic infection in madras red sheep in Tamil Nadu. Intl J.Food Agri. Vet. Sci. 2 (3):140-145.

Rahman, N. and Ali, A. 2001. Monthwise prevalence of gastrointestinal trematodes, cestodes and nematodes infecting Damani sheep and goats in District D.I.Khan. Pakistan. Vet. J.21:111-113.

Singh, H., Rai, H. S., Singh N. K. and Kaur,A. 2005. Prevalence of helminthic infection in sheep in Ludhiana. J. Vet. Parasitol.19:97-101.

Singh, K. 1995. Livestock research and production in South Asia. Proceedings of a Consultation on Global Agenda for Livestock Research. Nairobi, International Livestock Research Institute. 41-48.

Soulsby, E.J.L. 1966. Biology of Parasites. Academic Press, New York and London. 185-196.

Yadav, A.J.K., Khajuria, J.K and Raina, A. K. 2006. Seasonal prevalence of gastrointestinal parasites of sheep and goats of Jammu. J. Vet. Parasitol. 20(1):65-68.