

A STUDY ON THE PREVALENCE OF GASTRO-INTESTINAL PARASITISM IN SMALL RUMINANTS AND ITS ECONOMIC IMPORTANCE IN THE RURAL AREAS OF MIDDLE KERALA

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ABSTRACT

The present study was carried out to uncover the prevalence and economic constraints encountered by farmers in rearing of the small ruminants due to gastro-intestinal parasitic infestation, maintained at the rural livelihoods of middle Kerala. A total of 200 goats presented to the Veterinary Hospital, Kavanoor, Malappuram for a duration of 3 years (2014 April – 2017 April), with clinical signs suggestive of parasitism like anorexia, regurgitation, anaemia, emaciation, pale mucus membrane and diarrhoea formed the material for the present study. The faecal samples were collected from the rectum with a sterile swab and examined for parasitic ova as per the standard procedure. Out of the total 200 cases, 155 (77.5 percent) cases were positive for parasitic ova. Out of the 77.5 percent of parasitic infestation, *Strongyle spp.*, *Strongyloid spp.*, *Coccidia oocyst*, *Trichuris spp.*, *Monezia spp.*, *Faciola spp.* and *Oesophagostomum spp.* were detected in 28.38, 9.03, 20.64, 14.19, 21.93, 3.87 and 1.94 percent of cases respectively. Most of the goat intestinal parasites identified in the present study are cosmopolitan in their distribution, but the prevalence of each species varies from one region to another as a function of climate, cultural habits, diagnostic resources, and level of notification. On analysing the mean occurrence of parasites with respect to the climatic variations, it was found that the incidence is at its peak during Monsoon (95 percent season). The incidence was less during Winter Season. Also the parasitic attack was more common among the kids as compared to the adults. Hence, proper deworming schedule is needed.

KEYWORDS: *Strongyle spp.*, *Strongyloid spp.*, *Coccidia oocyst*, *Trichuris spp.*, *Monezia spp.*, *Faciola spp.* and *Oesophagostomum spp.*

The small ruminant, goat commonly referred to as a poor man's cow (or mini-cow) owing to its enormous impact to the poor man's economy. These browsers supply not only nutritious and easily digestible milk to their children but also regular source of additional income for poor and landless or marginal farmers. Goats are very friendly, docile, small sized, easily manageable animals and that makes it easy to handle even for children and household ladies. Feeding, milking and care of goats does not require much equipment and hard work. Capital investment and feeding costs are also quite low (Raghavan and Raja, 2012). Four goats can be maintained as cheaply as one indigenous cow. Returns on capital of up to 50% and recovery of 70% of retail price are possible in goat farming. In rural areas, goat farming plays a vital role in providing gainful employment.

Goat is one of the earliest domesticated animals in livestock farming. In rural areas, majority of the people practise goat rearing and hence an additional income to those houses. Goats can efficiently survive on available shrubs and trees in adverse harsh environment in low fertility lands where no other crop can be grown. It is a multifunctional animal, providing meat, milk and wool

and it gains much importance among the landless, small and marginal farmers due to its higher prolificacy and short generation interval. Hence aptly called as "Poor Man's Cow." In many parts of our country, goat has a religious and ritualistic importance and also in ceremonial feastings and for payment of social dues. One of the economic values of goat farming is that there is no religious taboo against goat slaughter and meat consumption, slaughter and dressing operation and meat selling can be carried out without much environment restriction.

Goats may fit well into the biological and economic niches in a farm operation that otherwise go untapped. They can be incorporated into existing grazing operations with sheep and cattle. Goats can also be used for control of weeds and brush to help utilize a pasture's diversity, as long as they are not allowed to overgraze. They provide food and nutritional security to the millions of marginal and small farmers and agricultural labourers. The proper management of internal parasites is extremely important to the success of the goat producer. The worm attack can reduce the growth rate, health status which in turn affects the farmers' economy. The ability to

detect the clinical signs of a major infection, to properly treat the herd, and to effectively reduce the herds exposure to parasites are all very important aspects of internal parasite management. As the goat producer faces issues like the rise of anthelmintic resistance among parasites, the knowledge of how to properly manage internal parasites becomes necessary for the survival and the economic viability of herd (Gayathri et al., 2016).

The present study was carried out to uncover the prevalence and economic constraints encountered by farmers in rearing of the small ruminants due to gastro-intestinal parasitic infestation, maintained at the rural livelihoods of middle Kerala.

MATERIALS AND METHODS

A total of 200 goats presented to the Veterinary Hospital, Kavanoor, Malappuram for a duration of 3 years (2014 April – 2017 April), with clinical signs suggestive of parasitism like anorexia, regurgitation, anaemia, emaciation, pale mucus membrane and diarrhoea formed the material for the present study. The faecal samples were collected from the rectum with a sterile swab and examined for parasitic ova as per the standard procedure. Both the direct smear and flotation methods described by (Urquhart et al., 1996) were performed to screen out the positive samples. Modified McMaster Counting technique developed by (Soulsby, 1986) and (Tibor, 1999) was also carried out to determine the parasitic eggs load.

RESULTS AND DISCUSSION

Out of the total 200 cases, 155 (77.5 percent) cases were positive for parasitic ova. Out of the 77.5 percent of parasitic infestation, *Strongyle spp.*, *Strongyloid spp.*, *Coccidial oocyst*, *Trichuris spp.*, *Monezia spp.*, *Faciola spp.* and *Oesophagostomum spp.* were detected in 28.38, 9.03, 20.64, 14.19, 21.93, 3.87 and 1.94 percent of cases respectively (Figure 1).

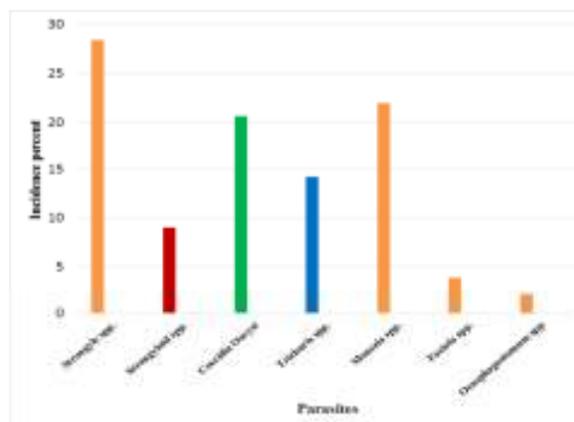


Figure 1: Various parasitic infestation encountered in small ruminants



Figure 2: Gastrointestinal parasitic load in goat faecal sample

The overall prevalence of endo-parasites (Figure 2) in the present studied goats was 77.5 percent which is similar to the results obtained in the studies conducted on goats at the hilly regions of Kerala (Gayathri et al., 2017). The various species of endo-parasites encountered during the present investigation have been reported by various researchers in different parts of the world (Gadahi et al., 2009; Nwosu et. al., 2007, Raza et. al., 2007). The present study reveals that the *strongyle spp.* (Figure 3) infestation is comparatively at its highest when compared to all other infestation observed and hence *strongyle* parasitism can be integrated to a nutritional disease, because the occurrence of worms usually brings a decrease in appetite, a decreased digestibility of the food and a diversion of nutrients from production sites towards the repair of tissue-damage provoked by the parasites.



Figure 3: Ova of *Strongyle spp.* in goat faeces (Microscopic view)

Goats are usually considered to be less resistant and more susceptible than sheep to GI *strongyle* infections. Henceforth, these small ruminants appeared to be the suitable host model because of their diversity of food selection, their ability to exploit both grass and shrubs, and their adaptation to a wide range of environment. Gastro- intestinal *strongyle* infection is strongly associated with grazing management and has profound depressive impacts upon long-term animal productivity (Hoste et al., 2005). *Moniezia spp.* generally competes for nutrients with the host and their presence can negatively affect productivity (Figure 4). Kids are more susceptible and massive infections can cause diarrhoea, reduced weight gain and intestinal obstruction. Goats are rather resistant to the attack of whip worms (*Trichuris spp*) but heavy infestation can cause thickening of the intestinal wall and diarrhoea. In goats, the incidence of coccidiosis occur more in young because they have not had the opportunity to develop immunity to these parasites. Kids between 3 weeks and four months are the most susceptible to this disease. The parasite invades the cells in the lining of the intestine, reproduces and causes the cells to rupture and die. The disease normally takes about 3 weeks after the initial infection to develop and includes symptoms like soft stool, decreased appetite, bloody diarrhoea, straining, poor weight gains and possibly death. A more serious manifestation of the disease may develop in the young, animals that had not been exposed previously, or those with a poor immune system (Gayathri et al., 2016).

Most of the goat intestinal parasites identified in the present study are cosmopolitan in their distribution, but

the prevalence of each species varies from one region to another as a function of climate, cultural habits, diagnostic resources, and level of notification. On analysing the mean occurrence of parasites with respect to the climatic variations, it was found that the incidence is at its peak during Monsoon (95 percent) season. The incidence was less during Winter Season. Also the parasitic attack was more common among the kids as compared to the adults (Figure 5 and Figure 6).



Figure 4: Gastro-intestinal worm *Moniezia spp.*



Figure 5: Nodules found on Large intestine of goat due to *Oesophagostomum spp.* infection (Post-mortem examination)



Figure 6: Thin walled small intestine with frothy contents in goat due to *Oesophagostomum spp.* infection (Post-mortem examination)

Parasitic infestation pose a major threat to the livestock sector leading to a decline in the production performance which in turn manifest the economic loss to small scale dairy farmers. The lack of awareness about the deworming of these small ruminants has had led to the farmers life in a dilemma. Awareness campaigns about the deworming and effective control of parasites must be conducted by the government authorities through the Veterinary dispensaries so that the effectiveness may reach to each and every household of the rural poor. Also the emerging drug resistance must also be taken into consideration while developing a deworming protocol for a particular area. Reckless use of anthelmintic should be avoided by the practising Veterinarians and faecal sample examination must be conducted prior to the prescription of the drugs. Thus, it should be the combined effort from the Government officials and Veterinarians to tackle the prevalence of gastro-intestinal parasitism and to uplift the economy of the farmer.

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