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Incidence of gastro-intestinal strongylosis during monsoon seasons in native goat breeds of Kerala#

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Abstract

Gastro-intestinal strongylosis is a major parasitic infection in caprine causing reduced performance, irreversible damage and death, which eventually leads to huge economic loss to the producers. The use of anthelmintics as a simple, effective and quick control method against the parasitism by the farmers has been rampant since decades. But its indiscriminate and undue usage invariably paved way to the development of anthelmintic resistance in parasites. It is high time that control strategies are designed so as to utilise chemotherapy appropriately at the time that coincide with heavy incidence of strongylosis. In the present study, a total of 109 goats, comprising of 58 Malabari and 51 Attappady Black goats from an organised farm were screened for the incidence for strongyle infection. The infection was found to be very high throughout the monsoon seasons in Kerala (June to October) with 94.86 ±1.47 per cent. Majority of the animals exhibited very heavy infection with faecal egg count of (FEC) >1500 during the study period. On coproculture, Haemonchus contortus was found to be the most predominant strongyle followed by Oesophagostomum spp. and Trichostrongylus spp.

Keywords: *Incidence, strongylosis, monsoon, Haemonchus contortus*

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Small ruminants play a major role in providing the livelihood security to the marginal and landless farmers considerably. Gastro-intestinal (GI) parasitism is a major limitation in grazing livestock adversely affecting the production and welfare of the affected animals. Goats being a reservoir of parasitic infection are a major source of pasture contamination (Fthenakis and Papadopaulos, 2018). In the absence of effective alternate control strategies, frequent and indiscriminate use of anthelmintics (Rajagopal *et al.,* 2013) resulted in the development of anthelmintic resistance. Although the farmers are well aware of the benefit of anthelmintics, it is required to convince them of the importance of giving the right kind of product in the optimum dose to the right category of animals with effective use of epidemiological intelligence. The geo-climatic infection conditions in the humid tropical Kerala are conducive for the optimum growth of GI strongyles. The aim of the present study was to record the incidence of GI nematode infection in goats that were not dewormed for a period of six months prior to the study, and to highlight the most suitable time for anthelmintic medication in goats.

The study was carried out at the University Goat and Sheep Farm, Mannuthy, Thrissur district of Kerala situated at longitude 76.265°E and latitude 10.5363°N. The study was conducted for a period five months from June to October, 2021 to coincide with the two monsoon seasons in Kerala. The study was conducted in 109 adult goats of 2 to 5 years of age comprising of 58 Malabari and 51 Attappady black goats of University Goat and Sheep Farm, Mannuthy. They were reared under semi- intensive system with 5 to 6 hours of grazing and also stall fed with green fodder and concentrate feed. The faecal samples were collected directly from the rectum of each animal at fortnightly intervals from June, 2021 to October, 2021. These sampled animals were not dewormed for a period of six month, prior to the assessment of parasitological parameters to maximise the likelihood of natural parasite infection. The intensity of strongyle infection was assessed by FEC using modified McMaster technique (Coles *et al.*, 1992). Copro-culture was carried out on pooled faecal samples collected from each flock by modified Veglia's Method (Sathianesan and Peter, 1970) on the same day of collection. Samples for copro-culture were not refrigerated. Morphological identification of third stage larvae of strongyles was done based on the keys provided by van Wyk *et al.* (2004) and van Wyk and Mayhew (2013).

The incidence of strongylosis was estimated at fortnightly intervals from June to October in the native goats of Kerala and the results are shown in Fig.1. On qualitative examination of the faecal samples, all the 109 goats under study were found positive for strongyle ova during the month of June. Concurrent infection with *Strongyloides papillosus* was observed in 8.25 per cent (n=9) goats and that with *Trichuris ovis* was observed in 0.92 per cent (n=1) of the sampled goats. The incidence (per cent) of strongylosis ranged from 87.85 to 100 with a mean ± SE of 94.86 ±1.47 per cent throughout the study period. The highest incidence of infection was observed in the first and second fortnight of June and the lowest during the first fortnight of August. Asha (2017) had observed a higher prevalence (81.5 ± 5.5 per cent) of strongylosis in the state during 2015-2016 while Syamala (2020) had reported 67.2 per cent of strongylosis during 2018-2019. The prevalence of caprine strongylosis is influenced by geographical disparity, climatic conditions, management practices and sampling methods. The high prevalence determined in the current work could also be due to the fact that the study animals were not dewormed for a period of six months prior to sampling. The high rainfall during these months provided suitable molarities of soil which favoured the egg hatching (Soulsby, 1982). The high incidence of strongyle infection was noticed throughout the study period could be endorsed to the congenial environment for hatching of eggs, survival of exogenous stages like the larvae and dispersion of the infective stage on the herbage (Singh *et al.,* 2015; Singh and Swarnkar, 2013; Singh *et al.,* 2018; Syamala *et al*., 2021).

The estimation of intensity of strongylosis showed that majority of the goats harboured very heavy infection with a FEC >1500

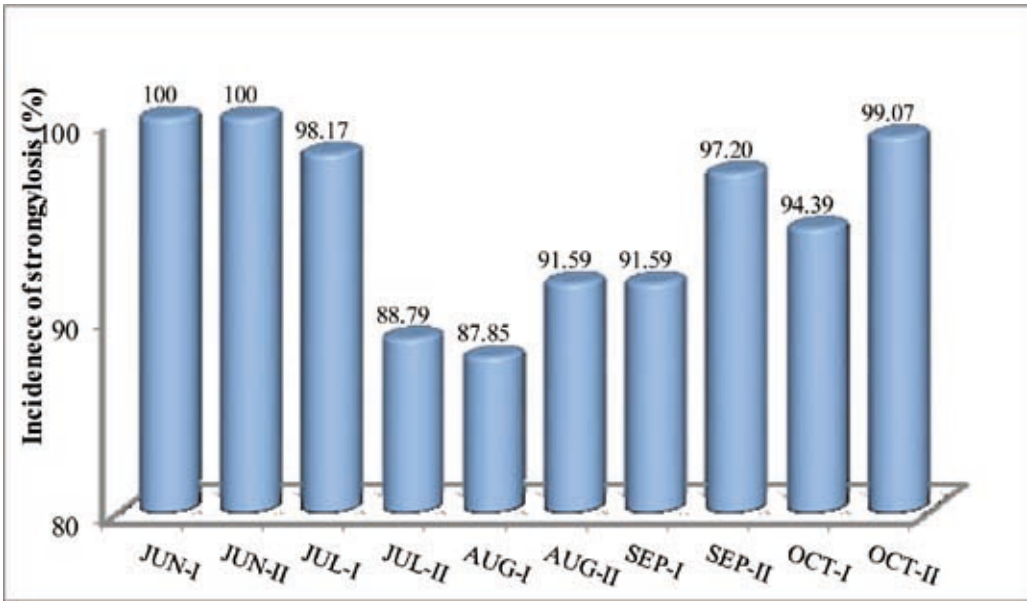

Fig.1. Incidence of strongylosis at fortnightly intervals from June to October, 2021 in the native goats of Kerala

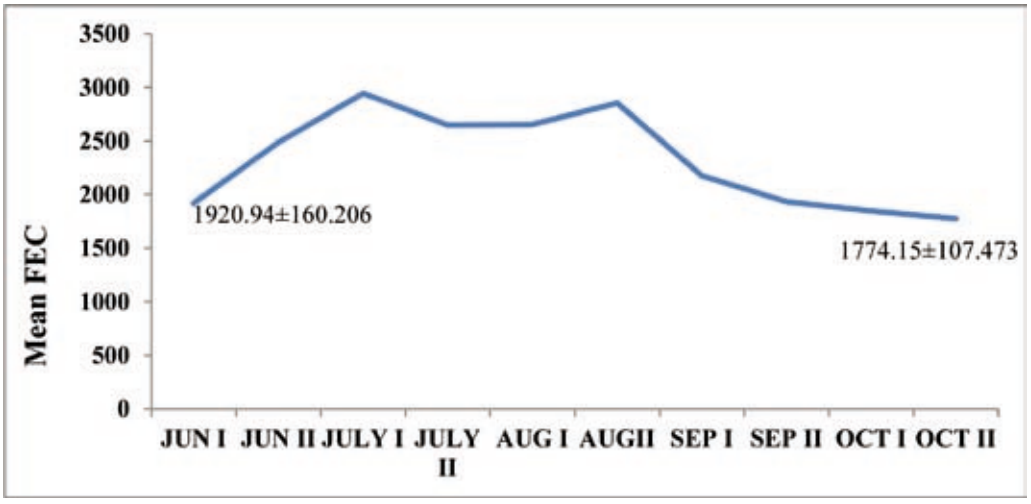

Fig.2. Intensity of strongylosis (FEC) during the study period

throughout the study period (Fig.2). The highest FEC (mean ± S.E) of 2945.87±188.530 was observed in first fortnight of July; the lowest FEC (mean ± S.E) of 1774.15±107.473 was noted in the second fortnight of October, 2021. The results highlight the fact that deworming should be according to the epidemiological calendar of a particular region. The deworming should coincide with the environmental conditions that favoured the ecdysis and larval development in the pasture and in the host. The temperature, relative humidity and rain fall were favourable for the development, survival and dispersal of the parasite. The salinity of soil during monsoon season also favoured the ecdysis and the high bacterial count during this season, would help in the development of free- living stages like L1 and L2 of strongyle parasite (Singh and Swarnkar, 2013). In addition, the rich fodder in monsoon season protected the infective larval stages from direct sunlight, thus enhancing its survivability and transmission during these seasons. The study suggested a revisit into the deworming practices followed in Kerala and to make the stakeholders aware of the fact that anthelmintic treatment should coincide with the high pasture larval contamination and extent of parasitism inside the host animals.

Fig 3. *Haemonchus contortus* larvae from pooled faecal culture

Pooled faecal culture examination revealed the presence of larvae of *H. contortus* (Fig.3) as the most predominant throughout the study period in Kerala, followed by those of *Oesophagostomum* spp., *Trichostrongylus* spp. The high prevalence of *H. contortus*, the most pathogenic nematodes of goats, could be credited to its high biotic potential as well as its capability to acquire resistance faster than other nematodes (Jeyathilakan, 1995; Singh *et al.,* 1997; Deepa and Devada, 2007).

Summary

The high incidence of strongylosis was noticed in the native breeds of goats during monsoon season in Kerala. *Haemonchus contortus* was the most predominant strongyle species found. Majority of animals harboured very heavy infection with FEC> 1500. This suggests the significance of epidemiological calendar in deciding the deworming practices of the state and to create awareness among the various stakeholders on effect of environmental factors in the epidemiology of gastro intestinal strongylosis in animals.

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Conflict of interest

The authors declare that they have no conflict of interest.

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