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P Kumari
Ph.D., Scholar, Department of Livestock Production Management, CVAS, Bikaner, Rajasthan, India

AS Dewna
Veterinary Officer, Department of Animal Husbandry, Govt. of Rajasthan, Rajasthan, India

T Bothra
Assistant Professor, Department of LPM, CVAS, Rajuvas, Bikaner, Rajasthan, India

R Panwar
MVSc., Department of Veterinary Microbiology, CVAS, Bikaner, Rajasthan, India

Corresponding Author:
P Kumari
Ph.D., Scholar, Department of Livestock Production Management, CVAS, Bikaner, Rajasthan, India

Effect of giloy (*Tinospora cordifolia*) and neem (*Azadirachta indica*) on gastrointestinal parasites and wool yield of Marwari lambs under arid zone

P Kumari, AS Dewna, T Bothra and R Panwar

Abstract
Gastrointestinal infection is the major problem in the sheep industry which affects the economy of farmers. Continuous use of anthelmintics and other chemical therapeutics can use resistance and other health issues in animals and humans also. Ethno veterinary medicine can be use as an alternate to replace these chemicals without affecting the health of animal. An experiment was conducted to assess the effect of Giloy (*Tinospora cordifolia*) and Neem (*Azadirachta indica*) alone and in combination on gastrointestinal infection and wool yield of 42 Marwari male lambs for 12 weeks, divided into seven groups, six lambs in each group in a randomized block design. The lambs of T_1 group were provided only basal diet (grazing + *ad lib.* fodder + 400 g concentrate per lamb per day) and were kept as control group and lambs of all other treatment groups were provided basal diet with herbal supplementation i.e. 0.5 percent Giloy stem powder in group T_2, 1.0 percent Giloy stem powder in group T_3, 0.5 percent Neem leaf powder in group T_4, 1.0 percent Neem leaf powder in group T_5, 0.25 percent Giloy stem powder along with 0.25 percent Neem leaf powder in group T_6 and 0.5 percent Giloy stem powder along with 0.5 percent Neem leaf powder in group T_7. Results of parasitic infection showed significant difference in the infection rates among the treatment groups and group T_7 have minimum parasitic infection compared to other treatment groups. Statistical analysis of variance revealed that there was better greasy fleece production in treatment groups at the time of first shearing, though it was statistically non-significant.

Keywords: Gastrointestinal infection, wool yield, giloy, neem, arid zone

1. Introduction
Sheep represent an important source of income in many countries in terms of wool, meat and milk production but the effects of parasitism on production have been recognized [1]. Gastro-intestinal parasitism is one of the most common infections in sheep. Clinical signs and sequelae are dependent on the parasite fauna present and the intensity of infection. In sheep, these can range from subclinical weight loss to lethal pathologies such as anaemia, diarrhoea and severe protein loss [2-5]. In addition, parasitism can have indirect consequences on metabolism such as mobilisation of proteins for an immune-response, reduced feed intake due to anorexia or increased susceptibility to other pathogens [3]. Since the 1960s the use of anthelmintics has become an important strategy to control nematode infections in livestock and increase their production performance [5]. Anthelmintic resistance and climate change is likely to alter the geographical distribution of parasites and their impact on production animals, thus increasing the need for a clear understanding of the cost of parasitism in order to develop sustainable control strategies. Giloy (*Tinospora cordifolia*) commonly known as a Rasayan-plant as it contains more than 100 constituents in their structure and widely used in Veterinary folk, Ayurveda and other systems of medicine for its general tonic, antioxidant, antibacterial, immunomodulator, hepatoprotective and anti-inflammatory properties [6]. Neem leaf contains approximately 20.69 percent crude protein and 4.1 percent fat after processing into Neem meal via through drying and milling [7]. More than one hundred and thirty-five compounds have been isolated from different Neem trees. Traditionally, it was used by the Indians for treatment of a number of health problems including parasitic infections. It is claimed that the Giloy climbing up the Neem tree is said to be the best as synergy between these two bitter plants enhances Giloy`s efficacy.

2. Materials and Methods

The present study was conducted on Marwari lambs maintained at Arid Region campus of Central Sheep and Wool Research Institute (ICAR-ARC-CSWRI), Bikaner. The average rainfall is low (250 mm) and erratic. The temperature varies between sub zero (-2 °C) during winter and high (49 °C) during summer. The experiment was conducted from May to July, 2019. Forty-two growing male Marwari lambs (3-4 months old) were divided into seven groups T_1, T_2, T_3, T_4, T_5, T_6 and T_7 having six lambs in each group on body weight basis. The lambs of T_1 group were provided only basal diet (grazing for a period of 8 hours + *ad lib*. fodder + 400 g concentrate per lamb per day) and were kept as control group. The lambs of T_2 group were provided basal diet supplemented with 0.5 percent Giloy stem powder. The lambs of T_3 group were provided basal diet supplemented with 1.0 percent Giloy stem powder. The lambs of T_4 group were provided basal diet supplemented with 0.5 percent Neem leaf powder. The lambs of T_5 group were provided basal diet supplemented with 1.0 percent Neem leaf powder. The lambs of T_6 group were provided basal diet supplemented with 0.25 percent Giloy stem powder and 0.25 percent Neem leaf powder. The lambs of T_7 group were provided basal diet supplemented with 0.5 percent Giloy stem powder and 0.5 percent Neem leaf powder.

Total 420 samples, 60 samples from each group were collected during the period of experiment of 12 weeks to check the effect of Giloy and Neem alone and in combination on gastrointestinal parasitic infection.

The samples were placed in sterile polythene bags after labelling group and Tag no. of lamb, kept in cool transport box and brought to the Postgraduate laboratory, Department of Veterinary Parasitology, CVAS, Bikaner, for further examination.

2.1 Qualitative examination of faecal samples

Qualitative examination was conducted to record the presence/ absence of gastrointestinal parasitic eggs/ cyst/ oocysts in the faeces of experimental lambs. The faecal samples were qualitatively examined by using centrifugal floatation and sedimentation techniques.

2.1.1 Centrifugal floatation technique

Two grams of strained faecal sample was mixed with ordinary water in 15 ml centrifuge tube and centrifuged for 1-2 minutes at 1500 RPM. The supernatant was removed and similarly two washings were given so that the colour of the faecal sample was removed. After last washing, the faecal decant at the bottom of the tube was mixed with Sheather's sugar solution and was filled up to its brim and was covered with clean coverslip and centrifuged at 1500 RPM for 2 minutes. After centrifugation, the coverslip was then picked up gently and put over a slide for examination under low power objective (10X).

2.1.2 Sedimentation technique

Two grams of strained faecal sample was mixed with ordinary water in 15 ml centrifuge tube and centrifuged for 1-2 minutes at 1500 RPM. The supernatant was removed and similarly two washings were given so that the colour of faecal sample was removed. After last washing in water, the faecal decant at the bottom of the tube was mixed with 10 ml of 10% formalin. After that 3 ml of ether was added and tube was shaken vigorously. The tube was centrifuged for 3 min at 1200 RPM. There is a formation of plug between layers of two solutions, which is broken by glass rod. Supernatant was removed and a drop of sediment placed on a clean microglass slide, a micro coverslip was put over it and was examined under low power objective (10X) of the microscope.

The presence was recorded if parasitic infection was shown by any or all of these methods i.e., sedimentation and/ or floatation methods.

The weight of greasy fleece yield (GFY) was recorded after complete shearing of lambs at the time of first shearing.

3. Results

The mean values of gastrointestinal parasitic infection in lambs under different treatment groups of experiment have been presented in table 4.1. Out of 420 samples, 140 samples were found positive with an overall infection rate of 33.33% for gastrointestinal parasites. Group wise overall parasitic infection revealed maximum infection in group T_1 (38.33%) followed by group T_2, T_4 and T_5 (31.67%), group T_3 (16.67%), group T_6 (13.33%) and group T_7 (10.00%). *Trichuris* sp. infection showed higher infection (19.2%) followed by *Eimeria* sp. infection (10.47%). Statistical analysis using chi-square test revealed highly significant difference in the infection rates among the treatment groups. A highly significant difference in the infection of *Trichuris* sp. was reported while a non-significant difference in *Eimeria* sp. infection was reported.

The mean values of greasy fleece yield (GFY) at the time of first shearing of different treatment groups of experiment have been presented in Table 4.2. The mean values of greasy fleece yield of lambs at the time of first shearing were recorded to be 606.67 g in T_1, 703.34 g in T_2, 690.00 g in T_3, 618.34 g in T_4, 688.34 g in T_5, 708.34 g in T_6 and 760.00 g in T_7 group. The statistical analysis of variance revealed no significant effect on greasy fleece yield at the time of first shearing.

4. Discussion

Looking into the results of present study group T_7 having supplementation of 0.5 percent Giloy stem powder and 0.5 percent Neem leaf powder showed minimum parasitic infection as compared to other treatment groups which may be due to anthelmintic activity of neem leaves [8] along with antistress activity of Giloy [9].

The results of greasy fleece yield of lambs at the time of first shearing there was better greasy fleece production in all treatment groups, though it was statistically non-significant. Higher greasy fleece yield was obtained in group T_7 and lowest in T_1 (control). It may be due to better health of lambs, low parasitic infection and immunity of lamb due to combined effect of Giloy and Neem.

Table 1: Overall infection of gastrointestinal parasites of lambs

Treatment Groups	Examined	Infected	*Trichuris*	*Eimeria*
T_1	60	23 (38.3)	18 (30)	8 (13.33)
T_2	60	19 (31.67)	15 (25)	7 (11.67)
T_3	60	10 (16.67)	8 (13.33)	6 (10)
T_4	60	19 (31.67)	15 (25)	7 (11.67)
T_5	60	19 (31.67)	14 (23.33)	6 (10)
T_6	60	8 (13.33)	6 (10)	5 (8.33)
T_7	60	6 (10)	5 (18.33)	5 (8.33)
χ^2 value	-	23.873**	16.886**	1.320
Total	420	140 (33.33)	81 (19.28)	44 (10.48)

Note: Figures in parenthesis are percentage.
NS = non-significant and ** = highly significant ($p \leq 0.01$).

Table 2: Wool yield (gm) of lambs at the time of first shearing in different treatment groups

Treatment group	T_1	T_2	T_3	T_4	T_5	T_6	T_7	SEM
Wool yield	606.67	703.34	690.00	618.34	688.34	708.34	760.00	45.99

Table 3: Analysis of variance for wool yield at the time of first shearing.

	Source	DF	MSS	F Value	Level of significance
Wool yield	Treatment	6	17065.08	1.344867	NS
	Error	35	12689.05		

Note: NS = non-significant

5. Conclusion

Supplementation of Giloy (*Tinospora cordifolia*) and Neem (*Azadirachta indica*) appears to be effective to control gastrointestinal parasites and improve wool yield in sheep. At the end, it appears that incorporation of 0.5 percent Giloy stem powder along with 0.5 percent Neem leaves powder can be used as a part of strategy to be adopted to control gastrointestinal infection and to boost immunity in growing lambs in Arid region of Rajasthan.

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7. References

1. Charlier J, van der Voort M, Kenyon F, Skuce P, Vercruysse J. Chasing helminths and their economic impact on farmed ruminants. Trends in Parasitology. 2014;30(7):361-367.
2. Coop RL, Kyriazakis I. Nutrition–parasite interaction. Veterinary Parasitology. 1999;84(3-4):187-204.
3. Moreau E, Chauvin A, Moreau E, Chauvin A. Immunity against helminths: Interactions with the host and the intercurrent infections. Journal of Biomedicine and Biotechnology, 2010.
4. Sykes AR, Coop RL. Interaction between nutrition and gastrointestinal parasitism in sheep. New Zealand Veterinary Journal. 2001;49(26):222-226.
5. Kaplan RM. Drug resistance in nematodes of veterinary importance: a status report. Trends in Parasitology. 2004;20(10):477-481.
6. Krishna K, Jigar B, Jagruti P. Guduchi (*Tinospora cordifolia*): biological and medicinal properties, a review. The Internet Journal of Alternative Medicine. 2009;6(2):1-12.
7. Oforjindu O. The toxicity of graded levels of Neem (*Azadirachta indica*) leaf meal. B. Agric.Tech. Project Report. Federal University of Technology, Owerri. 2006, 57-67.
8. Amin MR, Mostofa M, Islam MN, Asgar MA. Effects of neem, betel leaf, devil's tree, jute and turmeric against gastrointestinal nematodes in sheep. Journal of Bangladesh Agricultural University. 2010;8(2):259-263.
9. Devasena B, Adilaxmamma K. Anti-stress activity of *Tinospora cordifolia* in goats maintained under different managemental conditions. Indian Journal of Small Ruminants. 2014;20(1):104-107.