Biochemical Changes in Goats treated with anthelmintic indigenous herbs

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Abstract

The present study was undertaken to assess the biochemical changes in goats treated with anthelmintic indigenous herbs. The analysis of data was done in 18 goats, irrespective of age, sex and breed. The experimental goats were randomly divided in six groups. The effect of crude powder and cold aqueous extract of Nigella sativa, Swertia chirata and *Piper longum* was studied on various biochemical parameters, i.e., Blood glucose, Total protein, Albumin and Globumin. Significant increase was noticed in the level of blood glucose, serum total protein and albumin.
Keywords: Anthelmintic, Biochemical, *Nigella sativa*, *Swertia chirata, Piper longum*, Goat.

Introduction

Infections by gastrointestinal helminth parasites of livestock are among the most common and economically important diseases of grazing livestock (Perry et. al., 2002). They are characterised by lower outputs of animal products (meat, milk, hides and skins), manure and traction, which all impact on the livelihood of smallholder farmers. As such, their effects, in terms of productivity losses and control costs, are generally dealt with at the producer rather than at the societal level. The greatest losses associated with nematode parasite infections are sub-clinical, and economic assessments show that financial costs of internal parasitism are enormous (Preston & Allonby,1979; McLeod, 1995).

Consequently, there is an urgent and ever-present need to control infections caused by nematode parasite in small ruminants. Control is generally achieved by the use of synthetic anthelmintics in combination with grazing management. However, misuse and poor formulations of these products have led to the development of anthelmintic resistance.

Therefore the present investigation was undertaken to evaluate the anthelmintic efficacy of indigenous herbs; i.e Nigella sativa, Swertia chirata and Piper longum, in natural infested goats based on EPG and biochemical changes associated with helminthiasis.

Materials and Methods

The assessment of status of parasitic infestation was made on the basis of fecal examination, collected from the experimental goats, by qualitative and quantitative techniques for the eggs of gastrointestinal nematodes, viz. *Bunostomum spp., Trichostrongyles spp., Oesophagostomum spp.* and *Haemonchus spp.* Fecal examination for anthelmintic efficacy was done on day 0 (pretreatment) and on day 7 and day 15 (post treatment).

Experimental goats were randomly divided into six groups (T1, T2, T3, T4, T5, and T6) each comprising of six animals and were subjected to crude and aqueous extract each indigenous herb at the dose rate of 500 mg/kg b. wt., orally for 7 consecutive days.

The effect of crude powder and aqueous extract of Nigella sativa, Swertia chirata and Piper longum, was studied on various biochemical parameters. Blood and serum samples were collected from each animal by jugular venipuncture for estimation by autoanalyser by using Erba diagnostic kits prior to treatment and on 15th day post treatment. The following biochemical parameters were recorded:

1. Blood glucose (mg/dl)
2. Serum Total protein (gm/dl)
3. Albumin (gm/dl)
4. Globulin (gm/dl)

Statistical Analysis

Means and Standard error were obtained as per standard procedure. Each parameter was analyzed by using Student-'t' test with 6 treatments allotted to group of 6 animals each. The difference between pre treatment and post treatment were tested statistically for their significance (Snedecor and Cochran, 1994)

Table 1: EPG in helminth-infested goat treated with the indigenous herbs

Plants	Part of Plant	Preparation used	EPG count		
			Pre treatment	Post treatment	% efficacy
Nigella sativa	Seeds	Crude powder	1991.25	454.50*	77.17
		Cold aq. Ext.	1995.74	320.25*	83.96
Swertia chirata	Seeds	Crude powder	2179.16	574.99*	73.65
		Cold aq. Ext.	2083.30	433.99*	79.17
Piper longum	Seeds	Crude powder	2120.83	537.49*	74.68
		Cold aq. Ext.	1991.66	420.83*	78.90

* Significant (P<0.05)

Results and Discussion

The field based clinical trials were conducted in goats identified for the load of parasitic infestation and thereafter, goats were treated with crude powdered and aqueous extracts of respective herbs @ 500 mg/kg, b. wt, orally for 7 consecutive days. The egg per gram (EPG) count was recorded on day 0 (pretreatment), day 7 and day 15 (post treatment). The findings indicated that indigenous herbs; Nigella sativa, Piper longum and Swertia chirata, produced significant anthelmintic efficacy against gastrointestinal nematodes, viz. *Bunostomum spp., Trichostrongyles spp., Oesophagostomum spp.* and *Haemonchus spp.* to the extent of 70 to 90 percent (Table 1).

The biochemical observations in goats treated with indigenous herbs viz *Nigella sativa, Piper longum* and *Swertia chirata,* are given in Table-2. Infested goats with suboptimal levels of blood glucose, serum total protein, albumin and globulin which could be due to the effect of helminth infestations on the metabolism causing reduction in these values. A significant increase in the levels of blood glucose, total protein and albumin was recorded after treatment. These findings are in agreement with Ramteke et. al (2004). However, non-significant difference was noticed in the levels of albumin before and after treatment.

From the table-2, it is evident that the faecal egg count of helminth infested goats were significantly reduced with improvement in biochemical levels following the treatment of indigenous herbs; Nigella sativa, Swertia chirata and Piper longum. From the present observations, it is also concluded that the easily available indigenous plants may be recommended for effective deworming of goat.

Table 2: Biochemical observations in goats treated with indigenous herbs

Parameters	Plants	Preparation used	Intervals	
			Before treatment Day '0'	After treatment Day '15'
Blood Glucose(mg/dl)	*Nigella sativa*	Crude powder	38.99±0.14	44.84±0.06*
		Cold aq. Ext.	38.97±0.05	48.29±0.06*
	Swertia chirata	Crude powder	38.80±0.20	49.17±0.01*
		Cold aq. Ext.	38.82±0.24	54.72±0.18*
	Piper longum	Crude powder	38.72±0.23	44.92±0.20*
		Cold aq. Ext.	38.90±1.50	51.45±0.14*
Total protein(gm/dl)	*Nigella sativa*	Crude powder	4.21±0.01	4.48±0.02
		Cold aq. Ext.	4.05±0.01	5.04±0.01*
	Swertia chirata	Crude powder	4.41±0.01	5.24±0.09*
		Cold aq. Ext.	4.64±0.21	7.20±0.05*
	Piper longum	Crude powder	4.08±0.02	4.87±0.06
		Cold aq. Ext.	4.51±0.02	6.42±0.14*
Albumin(gm/dl)	*Nigella sativa*	Crude powder	3.07±0.07	3.76±0.01
		Cold aq. Ext.	3.04±0.08	4.27±0.04*
	Swertia chirata	Crude powder	3.01±0.04	4.42±0.06*
		Cold aq. Ext.	3.02±0.04	5.79±0.01*
	Piper longum	Crude powder	3.23±0.03	3.46±0.05
		Cold aq. Ext.	3.11±0.10	5.42±0.07*
Globulin(gm/dl)	*Nigella sativa*	Crude powder	1.13±0.01	0.72±0.02
		Cold aq. Ext.	1.00±0.01	0.77±0.01
	Swertia chirata	Crude powder	1.12±0.01	0.82±0.13
		Cold aq. Ext.	1.61±0.21	1.41±0.04
	Piper longum	Crude powder	1.85±0.01	1.40±0.07*
		Cold aq. Ext.	1.40±0.10	0.78±0.14*

* Significant (P<0.05)

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