

**SCREENING OF *VERONIA ANTHELMINTICA* SEED AND *EMBELIA RIBES*
FRUIT MIXED IN EQUAL PARTS AGAINST GASTROINTESTINAL
NEMATODES**

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ABSTRACT

The antinematodal activity of a mixed prescription of Veronia anthelminca seed (Kali zeeri) and Embelia vibes fruit (Babrang) was evaluated in goats. The EPG (Egg per gram) counts were made in the faeces before and on the 3rd, 10th and 15th days of the treatment with the powder in 0.5, 1 and 2 g/kg body weight doses and with the water and methanol extracts equivalent to 2 g/kg of the original powder. The evaluation of data on 15th day of the administration showed that 2 g/kg of powder, its equivalent amount of methanol extract and 0.01 g/kg of morantel tartrate are equally effective and safe in treating natural gastrointestinal nematode infection of the local goats.

Introduction

Akhtar (1986) has reported that several indigenous drugs used empirically since centuries as deworming agents are quite potent and are safer than many synthetic anthelmintics against different helminthic infections of animals. Thus an effort was made to screen out the anthelmintic activity of a time honoured compound plant prescription containing equal parts of *Veronia anthelminca*, Willd. seed (Kali-Zeeri) and *Embelia ribes*, Burm. fruit (Babrang) in local goats. In addition to their use against worms these plants are claimed to possess laxative, expectorant, diuretic and tonic properties (Nadkarni, 1954; Chopra *et al*, 1956; Ikram and Hussain, 1978). The survey of literature has not revealed any significant published research work on the efficacy of these plants against the helminthic infection.

Materials and methods

Faecal samples of one hundred and three (103) goats were collected from Faisalabad and the nearby villages. They were collected per rectum by finger or at the time of defaecation. The goats were kept under similar unhygienic conditions and were apparently of poor health. For the screening of positive faecal samples, a direct smear method as described by Soulsby (1982) was used. Out of these faecal samples forty three (43) were found positive for mixed gastro-intestinal nematode infection. The nematodes identified included the Hemonchus, Trichostrongylus, Strongylus and Trichuris species. Forty two infected goats were randomly divided into seven groups of six animals each. The positive faecal samples were further examined for the establishment of pre-treatment

faecal egg per gram (EPG) counts by using a binocular microscope and following the method of Stoll and Hauscheer (1926) as described by Soulsby (1982).

Seeds of *Veronia anthelmintica* (Kali zeeri) and fruit of *Embelia ribes* (Babrang) were purchased from the local herbal market of Faisalabad. After pharmacognosy, the seeds of *V. anthelmintica* and fruits of *E. ribes* were powdered separately with an electric grinder. These crude drug powders were mixed thoroughly in equal proportions and the resultant mixed prescription containing equal part of *V. anthelmintica* and *E. ribes* was stored in well stoppered bottles at refrigeration temperature. After suspending in 2% gum tragacanth solution, the powdered mixed prescription was administered individually to the groups of animals at the dosage levels of 0.5, 1 and 2 g/kg of body weight.

In addition, water extract of the drug powder was prepared by cold maceration after soaking 260 g of the mixed prescription in 2600 ml of distilled water and kept over night. The soaked material was sieved through a muslin cloth to obtain the water extract (1 g = 10 ml). The extract was administered to the individual animals at the level of 20 ml/kg body weight which represents 2 g of mixed drug powder/kg body weight of the animal. For the preparation of methanol extract, Soxhlet apparatus was used. The extract obtained was evaporated till complete removal of methyl alcohol (yield 1.5% w/w). The evaporated residue in amounts equivalent to 2 g/kg of the crude drug (mixed prescription) was administered to the individual animals after suspending in 2% solution of gum tragacanth. Morantel tartrate was administered at the rate of 0.01 g/kg body weight to another group which served as a treated control group while a group was kept as untreated infected control which received only the 20 ml of 2% gum solution.

Post-treatment EPG counts were determined on 3rd, 10th and 15th after the drug administration. The data was expressed as mean EPG counts and standard error of means (SEM) and their percentage reductions were also calculated. Student *t* test was used to check the significance (Steel and Torrie, 1980). For the determination of safety of drug, side effects like dullness, restlessness, constipation, diarrhoea, convulsions and abdominal pain were observed in the goats within 15 days after the drug administration.

Results and discussion

Out of one hundred and three (103) faecal samples of the goats collected, forty three were found positive for the mixed gastrointestinal infection of nematodes. So there was 42% incidence of the disease in these herds which reflects quite a high prevalence of nematodal infection in goats. The incidence was higher than that in sheep (28%) as reported earlier by Akhtar and Laved (1985). Therefore, this parasitic infection needs immediate attention and appropriate steps must be taken to its therapy and control. It is obvious from Table 1 that pre-treatment EPG count of untreated infected group of goats did not show a significant ($P > 0.05$) change on 3rd, 10th and 15th days. Similarly,

Table 1

Mean + SEM Faecal EPG Counts and Percentage EPG Reductions in Faeces of Goats Suffering from Nematode Infection after Oral Treatment with Powdered Mixed Prescription of *Veronica antheilmintica* seed and *Embelia ribes* Fruit (0.5, 1 and 2 g/Kg), Its Extracts in Water and Methanol Equivalent to 2 g/Kg of Powdered Mixed Preparation and Morantel (0.01 g/Kg).

Treatment	Dosage (orally)	Pre-treatment Counts	Post-Treatment Faecal EPG Counts			Post-Treatment %age Reductions in EPG Counts		
			3rd day	10th day	15th day	3rd day	10th day	15th day
Untreated (2% solution of gum tragacanth)	20 ml	571 ± 83	572 ± 83	572 ± 80	573 ± 84	0 ± 0	0 ± 0	0 ± 0
Treated with Morantel tartrate	0.01 g/Kg	530 ± 76	1.66** ± 0.33	0.66** ± 0.3	0.66** ± 0.33	99.6 ± 0.05	99.8 ± 0.06	99.8 ± 0.06
Treated with mixed Preparation of <i>V. antheilmintica</i> and <i>E. ribes</i>	0.5 g/Kg	518 ± 69	476 ± 56.4	27 ± 51	399 ± 45	6 ± 1	18 ± 2	27 ± 3
-do-	1 g/Kg	526 ± 72	476 ± 58	401 ± 51	251* ± 43	9 ± 2	24 ± 2	52 ± 4
-do-	2 g/Kg	568 ± 80	382 ± 68	255* ± 54	99** ± 41	33 ± 6	55 ± 7	83* ± 2
Treated with water extract of <i>V. antheilmintica</i> and <i>E. ribes</i>	equivalent to 2 g/Kg of powder	503 ± 56	446 ± 41	402 ± 38	366 ± 32	11 ± 2	20 ± 2	27 ± 3
Treated with Methanol Extract of <i>V. antheilmintica</i> and <i>E. ribes</i>	equivalent to 2 g/Kg of powder	533 ± 77	174* ± 53	101** ± 40	35** ± 21	68 ± 2	81 ± 1	93 ± 0.3

Number of goats in each group = 6
 * : Significantly ($P < 0.05$) less than that of pre-treatment value.
 ** : Highly significantly ($P < 0.001$) less than that of pre-treatment value.
 + : Non-significantly ($P < 0.05$) different than that of respective values of Morantel group.

administration of 0.5 g/kg level of mixed prescription containing powdered *V. anthelmintica* and *E. ribes* could not reduce the EPG counts on post-treatment days 3, 10 and 15. However, 1 g/kg of the powder exerted a significant ($P < 0.05$) decrease in the EPG count on 15th day after the drug administration and EPG count was reduced from 526 ± 72 to 251 ± 43 i.e., the % EPG reduction was 52 ± 4 . The administration of 2 g/kg of powdered drug induced significant ($P < 0.05$ and 0.001) EPG reductions. The values decreased from 568 ± 80 to 255 ± 54 and 99 ± 41 on 10th and 15th days i.e. 55 ± 7 and $83 \pm 2\%$ reductions, respectively. The water extract equivalent to 2 g/kg of crude drug did not significantly ($P > 0.05$) reduce the pre-treatment EPG count on all post-treatment days checked. In the goats treated with methanol extract equivalent to 2 g/kg of mixed drug powder showed significant ($P > 0.05$) and highly significant ($P < 0.001$) reductions of EPG counts which decreased from 535 ± 77 to 174 ± 53 , 101 ± 40 and 35 ± 21 on post-treatment days 3, 10 and 15, respectively. The respective EPG reductions were $68 \pm 2.8 \pm 1$ and 93 ± 0.3 on 3rd, 10th and 15th days. Single oral administration of Morantel tartrate (0.01 g/kg) also highly significantly reduced the EPG counts at all time intervals checked. In these goats, pre-treatment EPG count was 530.76 which reduced to 1.65 ± 0.33 , 0.83 ± 0.3 and 0.66 ± 0.33 on 3rd, 10th and 15th days after the drug administration, inducing 99.6 ± 0.05 , 99.8 ± 0.06 and 99.8 ± 0.06 percent reductions, respectively.

These data clearly show that the powdered mixed prescription containing equal parts of *Veronia anthelmintica* (seeds) and *Embelia ribes* (fruit) is effective for the treatment of goats suffering from mixed gastrointestinal nematode infection. Previously, in separate study it was observed that individually these plant drugs viz., *V. anthelmintica* and *E. fiber* did not exert a significant antinematodal activity at even higher doses in goats (Akhtar, 1986). May be active ingredients of the two medicinal plants potentiate each other or produce a new active principle. However, further work is needed to elucidate these assumptions. It is also evident that the active ingredients of this compound plant prescription are soluble in methyl alcohol and not in water. In conclusion, it is conceivable that 2 g/kg of this powdered compound prescription, its equivalent amount of methanol extract and the morantel tartrate (0.01 g/kg) are equieffective against mixed gastrointestinal nematode infection in goats. Moreover, since 33% goats treated with methanol extract of the mixed drug powder showed side effects including constipation and convulsions, only 17% of the animals treated with 2 g/kg of crude powder suffered temporarily from diarrhoea (Table 2). This seem to support the contention that some synergistic and corrective ingredients are present in the natural form of the plant drugs which make them potent and safer than the extracts (Akhtar, 1986). Further chemical, pharmacological and chronic toxicological investigations are, however, still needed for the evaluation of exact mechanism of action and safety of this compound prescription. The present study seems to support the use of this cheap combined herbal therapy containing equal parts of *Veronia anthelmintica* (seeds) and *Embelia vives* (fruit) for the treatment of goats suffering from gastrointestinal nematode infection.

Table 2

Side Effects Observed in Goats Treated with Mixed Prescription of *Veronia anthelmintica* Seed and *Embelia ribes* Fruit powder (0.5, 1 and 2 g/kg) and Morantel tartrate (0.01 g/kg)

Side Effects	Extracts of Drug Powder/kg			
	Drug Powder/kg 0.5	1 g	2 g	Water (2g) Methanol (2g) Morantel tartrate (0.01 g/kg)
Dullness	0	0	0	0
Restlessness	0	0	0	0
Constipation	0	0	0	1
Diarrhoea	0	0	1	0
Convulsions	0	0	0	1
Abdominal pain	0	0	0	0
Goats Showing Side Effects	0	0	1	2
Percentage of Side Effects	0	0	17	33

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