



**STUDIES OF THE COMPARATIVE EFFICACY OF ALCOHOLIC EXTRACTS OF BIRONJA, TURMERIC, AND VERANDA LEAVES WITH THAT OF PATENT DRUG NILZAN AGAINST TREMATODIASIS IN SHEEP**

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**ABSTRACT**

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The study compared the efficacy of some indigenous plants (Bironja, Turmeric and Veranda leaves) with that of patent drug Nilzan against Trematodiasis in sheep. Seventy five sheep suffering from trematode, aged 2-3 years and weighing about 10-12 kg. were used for this study. The sheep were divided into 15 equal groups A, B, C, D, E, F, G, H, I, J, K, L, M, N and O. Administration of three different doses of powdered Bironja 3,6 & 9 ml /kg body wt to the group A, B, C, D and E, Turmeric at the dose rate of 2,4 & 6 ml /kg body wt to the groups F, G, H, I and J, Veranda leaves 2, 4 and 6 ml /kg body wt to the groups K, L, M, N and O showed 15-52% , 11-15% and 4-8% efficacy, respectively against trematodes in sheep. Administration of Nilzan 30 mg/kg body wt orally was highly effective 73-89% against all the species of trematodes in sheep. Among medicinal plants Bironja was found to be most effective followed by turmeric. Veranda leaves were found to be totally ineffective against trematodiasis in sheep.

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## INTRODUCTION

There are 195.28 million of livestock in Bangladesh of which sheep 1.09 million (Amin, 1994). In Bangladesh sheep are raised for meat production, though they are basically dual purpose animal producing both meat and wool. Field veterinarians often speak of parasitic disease as being one of the important hindrances to sheep productivity in the country but very few published reports could be traced in respect of their clinical details. Due to various problems, the health, production and performance of livestock in Bangladesh are at the lowest ebb compared with those of other countries. Parasitism is also an important limiting factor of livestock production in most of the tropical and sub-tropical countries. It is established that infestations due to trematode undermine the health and productivity of animals. Asian Development Bank (ADB) report clearly mentioned the loss of productivity of animals in terms of mortality, loss of milk, meat, generation loss and loss of reproductive rate due to animal parasites to the extent of 50 % in Bangladesh (ADB, 1984). Besides the use of various modern patent drugs for the treatment of various diseases people throughout the world have been using the traditional indigenous medicinal plants and herbs as remedial agents for prevention, mitigation and cure of disease conditions since long. A variety of medicinal preparations from indigenous herbs and plants are now-a-days manufactured by same pharmaceutical industries in India, Indonesia and Thailand. In our country the Hakms, Ayurveds and kabiraj's are using indigenous plants for the treatment of human being. In village condition animal diseases are treated by Kabirajs and Quacks who use various indigenous plants. Research in India towards the direction of application of indigenous plants and their products to veterinary practice have lead to the development of certain industries of which Indian Herbs Research Company of Shaharanpur in Uttar Pradesh needs worth mentioning. Therefore, this study was conducted to evaluate the efficacy of Bironja, Turmeric and veranda against trematodiasis in sheep.

## MATERIALS AND METHODS

### Experimental animals

Eighty five sheep of indigenous breed were collected from adjacent area of BAU, Mymensingh. The sheep were allowed to graze on pasture of the BAU campus for about one month. These sheep were suspected to be suffering from helminth by observing clinical sign and symptoms. Microscopic examination of faeces of the suspected sheep was carried out for trematode egg count. Seventy five sheep were selected for this study on the basis of the physical and clinical examination and result of the fecal egg count. The age of sheep ranged between 2 and 3 years approximately. The weight of all selected sheep ranged between 10 and 12 kg.

### Collection and preparation alcoholic extracts of Bironja, turmeric and veranda

Bironja and turmeric were purchased from local market. The veranda leaves were collected from Bangladesh Agricultural University campus. The collected sample were washed thoroughly with water, the veranda leaves and turmeric were cut into small pieces and sun dried for seven days. Then these samples were dried separately in a hot air oven at 45°C for six hours. The dried samples were taken into equal parts by measuring with balance and pulverised to 60 meshes in a grinding machine separately. 100 gm of each sample was stored in air tight bottle separately. Alcoholic extracts of selected medicinal plants were obtained by Soxhlet method. The alcoholic extracts of each kind of sample was then kept in separate air tight bottle and labeled for further study.

### Determination of biochemical parameters

Biochemical parameters like serum glucose and SGPT (serum glutamic pyruvic transaminase) were also determined by using autoanalyser (Model No. Reflotron M-06).

### Drugs and chemical used

Nilzan (Tetramizol hydrochloride and oxclozanide) was purchased from local market. Diagnostic kit (Glucose, SGPT) test combination used in this study were purchased from Fisons Bangladesh Ltd. Anticoagulant Haymes solution, 0.14 hydrochloric acid solution, Wrights stain, 90% alcohol, 10% formalin, normal saline (0.09) saturated salt solution, were prepared in the laboratory.

### Statistical methods

The data was analyzed statistically between normal and treated values by the well-known students test ( $t^*$  test).

## RESULT AND DISCUSSION

**Bironja:** The oral administration of alcoholic extracts of Bironja in doses of 3, 6 and 9 ml/kg body wt. was partially effective against *Fasciola* spp. In sheep (table I) Nilzan was very effective against *Fasciola* spp. In group B (3 ml/kg) the mean EPG (Egg per gram) values were 910 at pre-treatment period 770 on 24<sup>th</sup> day after medication. Similarly, the mean EPG values was 920, before treatment and on day 24 after treatment the value was 690 with 6 ml/kg body wt. of Bironja in sheep. In group D (9 ml/kg) the mean EPG values were 900 and 640 respectively before treatment and on 24<sup>th</sup> day after treatment. Following Nilzan (30 mg /kg body wt) administration the mean EPG was 890 before treatment and 950 on 24<sup>th</sup> day of treatment. The administration of 3, 6 and 9 ml/kg of bironja extracts could reduce the mean EPG upto 15-31% against *Fasciola* spp. This result shows that Bironja was partial effective against *Fasciola* spp. In partial agreement of the present findings, Andraske et. al (1974) recorded 90% efficacy in cattle of Czechoslovakia and Afaz Uddin(1985) 93.18% in cattle of Savar Military farm, Dhaka.

In case of paramphistomum spp., in group B (3 ml/kg) the mean EPG count was 990 before treatment and on 24<sup>th</sup> day of treatment value was 860. In group C (6ml/kg) the mean EPG count was 990 before treatment and on 24<sup>th</sup> day of treatment the value was 580. Similarly, in group D, the mean EPG values were 1010 and 480 before treatment and on day 24 respectively of treatment with 9 ml alcoholic extract of Bironja per kg body weight. Following Nilzan administration the mean EPG was 980 before treatment on 24<sup>th</sup> day after treatment it was 130 in group E. In group A, which was kept as control, the mean EPG reduction was up to 13 to 52% against paramphistomum spp. The efficacy of highest dose (9 ml/kg) which reduced mean EPG upto 52% was satisfactory. The efficacy of Nilzan (30 gm/kg body wt) was also satisfactory (mean EPG reduction 87%).

**Table 1.** The comparative efficacy of Bironja with that of patent drug Nilzan against *Fasciola* spp in sheep.

Groups	Drug and dose/kg body wt	Pre-treatment period EPG	Post-treatment period						% of EPG Reduction
			4th day EPG	8th day EPG	12th day EPG	16th day EPG	20th day EPG	24th day EPG	
A	Control	890± 22.36	910± 26.62	910± 28.32	920± 12.06	930± 11.05	940± 9.86	950± 10.09	
B	Bironja (3ml/kg)	910± 19.79	900± 17.32	890± 21.32	880± 11.79	850± 12.63	790**± 16.87	770**± 8.86	15.38 %
C	Bironja (6ml/kg)	920± 32.09	910± 8.86	890± 10.11	870± 19.31	790**± 7.32	740**± 8.38	690**± 3.79	25.00 %
D	Bironja (9ml/kg)	900± 22.02	890± 12.21	850± 17.71	790**± 7.59	740**± 2.08	650**± 6.75	640**± 10.90	31.11 %
E	Nilzan (30mg/kg)	890± 10.86	520**± 21.24	410**± 3.82	290**± 27.56	180**± 18.53	140**± 8.63	100**± 9.36	87.64 %

Values given above represent the mean ± SE of 5 sheep.

\*\*Significant decrease ( $p < 0.01$ ).

**Table 2.** The comparative efficacy of Bironja with that of patent drug Nilzan against *Paramphistomum spp* in sheep.

Group of animal	Drug and dose/kg body wt	Pre-treatment period	Post-treatment period						% of EPG Reduction
			4th day	8th day	12th day	16th day	20th day	24th day	
			EPG	EPG	EPG	EPG	EPG	EPG	
A	Control	1000±21.12	1010±17.76	1020±12.36	1020±10.92	1030±9.86	1040±12.36	1060±10.83	
B	Bironja (3ml/kg)	990±29.39	990±20.86	970±10.43	920±19.83	890±11.91	880**±8.23	870**±5.83	13.13%
C	Bironja (6ml/kg)	990±17.74	940±21.32	900±12.21	820±9.32	750**±20.03	610**±10.92	580**±31.32	41.41%
D	Bironja (9ml/kg)	1010±9.89	970±10.56	940±17.07	640**±19.03	500**±11.03	490**±2.56	480**±8.83	51.47%
E	Nilzan (30mg/kg)	980±4.78	620**±22.25	430**±13.94	370**±7.56	250**±8.65	260**±4.53	130**±11.25	86.73%

Values given above represent the mean ± SE of 5 sheep.

\*\*Significant decrease ( $p < 0.01$ ).

### Turmeric

In case of *Fasciola spp.* in group G (2 ml/kg), the mean EPG was 880 and 780 respectively at pre-treatment and 24<sup>th</sup> day of treatment. In group H, the mean EPG 910 and 400 respectively at pre-treatment and 24<sup>th</sup> day of treatment following administration of alcoholic extracts of Turmeric at the dose rate 4ml/kg body wt/ sheep. In group I (6 ml/kg) the mean EPG values were 900 and 770, respectively at pre-treatment and 24<sup>th</sup> day after treatment. Following Nilzan administration (30 mg /kg body wt.) the mean EPG was 900 and 120 respectively at pre-treatment and 24<sup>th</sup> day of medication. All the three doses of turmeric i.e 2, 4 and 6 ml/kg body wt could reduce the mean EPG upto 11-14%. The results were not satisfactory in comparison to Bironja against *Fasciola* in sheep. However, Nilzan gave similar result as observed in previous study (87% mean EPG reduction).

In case of *paramphistomum spp.* in group G (2ml/kg), the mean EPG was 820 and 720 respectively at pre-treatment and 24<sup>th</sup> day of medication. Similarly in group H, the mean EPG was 880 and 760 respectively at pre-treatment and 24<sup>th</sup> day of medication. Following administration of alcoholic extracts of turmeric at the dose rate of 4 ml/kg body wt.. In group I (6ml/kg) the mean EPG values were 850 and 730 respectively before treatment and 24<sup>th</sup> day of treatment. Following Nilzan administration the mean EPG was 830 and 110 respectively before and 24<sup>th</sup> day of medication. The different doses of Turmeric (2-6 ml/kg body wt) could reduce the mean EPG upto 12-14% against *Paramphistomum spp.* This result was not satisfactory against *Paramphistomum spp.* but Nilzan (30 mg/kg body wt.) could reduce the mean EPG up to 87% which was highly satisfactory.

Table 3. The comparative efficacy of Turmeric with that of patent drug Nilzan against *Fasciola spp* in sheep

Group of animals	Drug and dose/kg body wt	Pre-treatment period EPG	Post-treatment period						% of EPG Reduction
			4th day EPG	8th day EPG	12th day EPG	16th day EPG	20th day EPG	24th day EPG	
F	Control	950±32.46	960±8.96	970±4.56	980±11.58	990±16.32	1000±9.82	1010±10.58	
G	Turmeric(2ml/kg)	880±16.78	870±12.56	860±22.32	840±14.86	800**±7.68	790**±19.35	780**±22.32	11.36%
H	Turmeric(4ml/kg)	910±7.86	890±6.44	870±23.53	850±18.58	830**±6.37	820**±8.56	800**±13.36	12.08%
I	Turmeric(6ml/kg)	900±14.54	880±7.38	860±9.56	840**±4.53	800**±6.95	790**±17.58	770**±8.63	14.44%
J	Nilzan(30mg/kg)	900±32.46	820**±8.96	550**±2.32	420**±4.86	290**±14.35	150**±10.58	120**±8.63	86.66%

Values given above represent the mean ± SE of 5 sheep.

\*\*Significant decrease (p<0.01).

**Table 4.** The comparative efficacy of Turmeric with that of patent drug Nilzan against *Paramphistomum spp* in sheep.

Group	Drug and dose/kg body wt	Pre-treatment period EPG	Post-treatment period						Percentage of EPG Reduction
			4th day EPG	8th day EPG	12th day EPG	16th day EPG	20th day EPG	24th day EPG	
F	Control	820±22.67	830±11.11	840±9.03	860±19.86	850±7.03	860±11.9	880±22.03	
G	Turmeric (2ml/kg)	820±14.08	810±8.10	800±6.08	770±22.75	750±23.70	730**±12.95	720**±21.93	12.34%
H	Turmeric (4ml/kg)	880±8.80	860±7.86	840±11.45	820±21.08	790**±9.7	770**±12.76	760**±6.76	12.50%
I	Turmeric (6ml/kg)	850±29.67	840±31.13	820±3.20	790±5.97	770±21.72	750**±22.50	730**±7.96	14.11%
J	Nilzan (30mg/kg)	830±11.32	640**±15.01	480**±19.37	200**±21.11	210**±29.36	150**±31.03	110**±6.89	86.74%

Values given above represent the mean ± SE of 5 sheep.

\*\*Significant decrease (p<0.01).

### Veranda

The alcoholic extracts of Veranda leaves in doses of 2, 4, 6 ml/kg body weight orally was almost ineffective against Fascioliasis in sheep. In group L(2 ml/kg) the mean EPG values were 910 and 860, respectively, in group M, the mean EPG values were 980 and 920 respectively(4ml/kg), in group N receiving

highest dose (6 ml/kg) the mean EPG values were 960 and 890 respectively at pretreatment and 24<sup>th</sup> day of treatment. In group O, following administration of Nilzan (30 mg/kg body wt.) the mean EPG values were 930 and 100 respectively at pre-treatment and 24<sup>th</sup> day after medication. In case of *Paramphistomum* spp. In group L (2 ml/kg) the mean EPG values were 930 and 860 respectively, in group m, the mean EPG values were 730 and 690, in group N (6 ml/ kg) the mean EPG values were 870 and 800 respectively at pre-treatment and 24<sup>th</sup> day of treatment. Following administration of Nilzan (30 ml/kg) the mean EPG values were 830 and 100 respectively at pre-treatment and 4<sup>th</sup> day of medication. The three different doses of alcoholc extracts of veranda leaves i.e 2, 4 and 6 ml/ kg body wt c (the mean EPG reduction upto 4-7% against *Fasciola* spp. and *paramphistomum* spp.

**Table -5:** The comparative efficacy of Verenda with that of patent drug Nilzan against *Fasciola* spp in sheep.

Group	Drug and dose/kg body wt	Pre-treatment period EPG	Post-treatment period						% of EPG Reduction
			4th day	8th day	12th day	16th day	20th day	24th day	
			EPG	EPG	EPG	EPG	EPG	EPG	
K	Control	920±19.50	930±17.56	940±13.63	950±2.53	990±11.59	960±2.64	970±6.95	
L	Verenda (2ml/kg)	910±23.52	890±5.86	880±8.43	880±7.35	870±2.36	860±11.0 9	860±4.46	5.49%
M	Verenda (4ml/kg)	980±15.84	970±21.32	960±14.32	950±11.57	940±18.35	930±16.6 7	920.65±12 .56	6.12%
N	Verenda (6ml/kg)	960±18.36	950±3.52	930±12.54	920±9.86	910±2.76	900±6.87	890.89±7. 73	7.29%
O	Nilzan (30mg/kg)	930±14.32	740**±5.6 9	600**±22. 03	430**±2.6 4	390**±7.3 5	160**±11 .31	100.63**± 4.95	88.24%

Values given above represent the mean ± SE of 5 sheep.

\*\*Significant decrease (p<0.01).

**Table-6:** The comparative efficacy of Verenda with that of patent drug Nilzan against *Paramphistomum* spp in sheep.

Group	Drug and dose/kg body wt	Pre-treatment period EPG	Post-treatment period						% of EPG Reduction
			4th day	8th day	12th day	16th day	20th day	24th day	
			EPG	EPG	EPG	EPG	EPG	EPG	
K	Control	850±16.86	860±17.42	870±2.32	890±12.5 3	900±16.32	920±12.8 6	930±18.23	
L	Verenda (2ml/kg)	930±29.62	920±15.56	910±19.3 2	900±7.98	890±20.91	880±13.3 6	880±7.69	5.37%
M	Verenda (4ml/kg)	730±14.68	720±22.35	710±16.7 8	710±18.3 6	700±16.96	690±13.5 6	690±19.56	5.47%
N	Verenda (6ml/kg)	870±18.83	862±6.36	840±22.3 5	830±16.3 8	820±17.56	810±13.8 9	800±19.58	8.04%
O	Nilzan (30mg/kg)	830±6.85	620**±12.3 6	480**±8. 56	320**±6. 57	240**±12. 35	180**±8. 83	100.35**±2 3.36	87.95%

Values given above represent the mean ± SE of 5 sheep.

\*\*Significant decrease (p<0.01).

**Determinatio of biochemical and haematological parameters**

Biochemical parameters like serum glucose and SGPT(serum glutamic pyruvic transaminase) were also determined by using autoanalyser (Model No.Reflotron M-06 ).

**Table-7:** Effect of alcoholic extracts of Bironja and patent drug Nilzan on SGPT(U/L) in sheep.

Group	Drug and dose/kg body wt P.O.	SGPT level on different days( U/L) of treatment and Post-treatment period						
		Pre-treatment period	Post-treatment period					
		0	4th day	8th day	12th day	16th day	20th day	24th day
A	Control	10.32±0.02	10.34±0.02	10.42±0.02	10.48±0.03	10.54±0.03	10.58±0.05	10.42±0.07
B	Bironja (3ml/kg)	6.72±0.03	6.73±0.0312	6.74±0.0294	6.82±0.0152	6.76±0.0327	6.78±0.02	6.74±0.01
C	Bironja (6ml/kg)	8.58±0.01	8.57±0.01	8.56±0.0179	8.58±0.0159	8.59±0.0147	8.60±0.01	8.59±0.08
D	Bironja (9ml/kg)	8.01±0.06	7.98±0.03	8.01±0.03	8.02±0.05	8.03±0.06	8.14±0.05	8.26±0.07
E	Nilzan (30mg/kg)	8.12±0.07	7.836±0.06	7.712±0.04	7.814±0.04	7.75±0.04	7.80±0.04	7.82±0.07

Values given above represent the mean ± SE of 5 sheep.

**Table -8:** Effect of alcoholic extracts of Bironja and patent drug Nilzan on Glucose(mg/dl) in sheep.

Group	Drug and dose/kg body wt P.O.	Glucose level on different days( U/L) of treatment and Post-treatment period						
		Pre-treatment period	Post-treatment period					
		0	4th day	8th day	12th day	16th day	20th day	24th day
A	Control	85.20±0.04	85.28±0.04	85.42±0.08	85.42±0.02	85.34±0.07	85.42±0.02	85.39±0.41
B	Bironja (3ml/kg)	84.40±0.06	84.45±0.05	84.40±0.05	84.44±0.07	84.58±0.06	84.58±0.08	84.52±0.12
C	Bironja (6ml/kg)	88.24±0.10	88.28±0.06	88.36±0.92	88.40±0.93	88.52±0.01	88.60±0.02	88.44±0.09
D	Bironja (9ml/kg)	79.56±0.09	79.48±0.09	79.48±0.07	79.40±0.08	79.44±0.11	79.44±0.10	79.41±0.23
E	Nilzan (30mg/kg)	86.32±0.09	86.36±0.03	86.38±0.05	86.54±0.05	86.54±0.05	86.64±0.07	86.62±0.09

Values given above represent the mean ± SE of 5 sheep

**Table 9.** Effect of alcoholic extracts of Turmeric and patent drug Nilzan on SGPT(U/L) in sheep.

Group	Drug and dose/kg body wt P.O.	SGPT level on different days( U/L) of treatment and Post-treatment period						
		Pre-treatment period	Post-treatment period					
		0	4th day	8th day	12th day	16th day	20th day	24th day
F	Control	9.26±0.16	9.321±0.08	9.23±0.22	9.25±0.20	9.24±0.11	9.26±0.13	9.23±0.26
G	Turmeric(2 ml/kg)	5.58±0.36	8.55±0.10	8.56±0.21	8.58±0.40	8.56±0.42	8.57±0.26	8.53±0.78
H	Turmeric(4 ml/kg)	9.39±0.12	9.41±0.25	9.46±0.32	9.48±0.19	9.49±0.14	9.45±0.24	9.41±0.25
I	Turmeric(6 ml/kg)	8.76±0.18	8.78±0.26	8.73±0.50	8.76±0.38	8.79±0.09	8.81±0.26	8.83±0.31
J	Nilzan(30mg/kg)	10.25±0.24	10.25±0.10	10.48±0.17	10.36±0.26	10.34±0.16	10.26±0.07	10.35±0.22

Values given above represent the mean ± SE of 5 sheep.

**Table 10.** Effect of alcoholic extracts of Turmeric and patent drug Nilzan on Glucose(mg/dl) in sheep.

Group	Drug and dose/kg body wt P.O.	Glucose level on different days( U/L) of treatment and Post-treatment period						
		Pre-treatment period	Post-treatment period					
		0	4th day	8th day	12th day	16th day	20th day	24th day
F	Control	81.86±0.32	82.02±0.10	82.06±0.29	80.99±0.16	81.32±0.09	81.56±0.26	81.58±0.24
G	Turmeric (2ml/kg)	85.38±0.16	85.38±0.21	85.46±0.17	85.40±0.15	85.42±0.23	85.60±0.12	85.63±0.38
H	Turmeric (4 ml/kg)	84.56±0.06	84.65±0.22	84.92±0.16	84.05±0.15	84.38±0.42	84.63±0.56	84.46±0.17
I	Turmeric (6ml/kg)	84.86±0.21	84.62±0.14	84.83±0.08	84.64±0.19	84.92±0.23	84.32±0.38	84.92±0.10
J	Nilzan (30mg/kg)	83.39±0.43	83.93±0.29	83.43±0.14	83.64±0.24	84.13±0.33	84.64±0.17	84.56±0.18

Values given above represent the mean ± SE of 5 sheep.



**Table 11.** Effect of alcoholic extracts of Veranda and patent drug Nilzan on SGPT(U/L) in sheep.

Group	Drug and dose/kg body wt P.O.	SGPT level on different days( U/L) of treatment and Post-treatment period						
		Pre-treatment period	Post-treatment period					
		0	4th day	8th day	12th day	16th day	20th day	24th day
K	Control	8.85±0.32	8.83±0.31	8.76±0.38	8.81±0.26	8.79±0.09	8.78±0.26	8.75±0.26
L	Verenda (2ml/kg)	8.72±0.51	8.58±0.40	8.25±0.31	8.52±0.77	8.56±0.21	8.62±0.42	8.85±0.35
M	Verenda (4ml/kg)	9.38±0.12	9.31±0.25	9.25±0.20	9.36±0.31	9.48±0.19	9.41±0.25	9.56±0.18
N	Verenda (6ml/kg)	10.11±0.18	10.25±0.24	10.15±0.1	10.26±0.07	10.56±0.1	10.38±0.1	10.36±0.26
O	Nilzan (30mg/kg)	10.23±0.21	10.25±0.10	10.16±0.1	10.46±0.1	10.52±0.1	10.25±0.	10.32±0.2

Values given above represent the mean ± SE of 5 sheep.

**Table 12.** Effect of alcoholic extracts of Verenda and patent drug Nilzan on Glucose(mg/dl) in sheep

Group	Drug and dose/kg body wt P.O.	Glucose level on different days( U/L) of treatment and Post-treatment period						
		Pre-treatment period	Post-treatment period					
		0	4th day	8th day	12th day	16th day	20th day	24th day
K	Control	88.02±0.32	87.92±0.11	88.12±0.16	87.67±0.09	88.12±0.10	88.18±0.32	87.32±0.21
L	Verenda(2ml/kg)	85.55±0.17	84.95±0.08	85.02±0.12	85.95±0.22	89.32±0.18	84.92±0.19	85.15±0.22
M	Verenda c (4ml/kg)	84.95±0.13	84.42±0.15	84.64±0.26	84.95±0.38	83.98±0.15	84.04±0.53	84.64±0.23
N	Verenda (6ml/kg)	86.32±0.43	85.92±0.12	85.85±0.63	86.12±0.09	86.21±0.16	85.32±0.13	85.12±0.25
O	Nilzan(30mg/kg)	85.55±0.15	85.65±0.56	84.95±0.29	85.85±0.21	84.92±0.18	84.82±0.12	85.05±0.13

Values given above represent the mean ± SE of 5 sheep.

Following treatment with alcoholic extracts of Bironja, Turmeric and Verenda leaves and patent drug Nilzan activities of SGPT and serum glucose level were not significantly changed. Parasitism is one of the most damaging diseases in sheep. It is established that infestations due to trematode undermine the health and productivity of animals such as loss of milk, meat, generation loss and loss of reproductive rate due to animal parasites to the extent of 50 % in Bangladesh. From this point of view a research was conducted to study i) the comparative efficacy of Bironja, Turmeric and Verenda leaves with patent drug Nilzan against trematodiasis in sheep and ii) the effects of Bironja, Turmeric and Verenda leaves and Nilzan on some biochemical parameters in sheep. Fifteen groups of sheep (each consisting of 5 sheep) naturally infected with various trematodes i.e. *Fasciola spp*, *Paramphistomum spp*, were used to study the anthelmintic efficacy of Bironja, Turmeric and Verenda leaves and patent drug Nilzan. Administration of three different doses of

Bironja(3,6 & 9ml/kg body wt), Turmeric (2,4 & 6 ml/kg body wt) and Verenda leaves(2,4 & 6 ml/kg body wt) showed 12-15% ,11-15% and 4-8% efficacy against trematodes in sheep. Administration of Nilzan(30mg/kg body wt) orally was highly effective (73-89%) against both species of trematodes mentioned above in sheep. Among the medicinal plants , Bironja seeds was found to be most effective followed by Turmeric. Veranda leaves was found to be totally ineffective against tramatodiasis in sheep.No significant change was observed following treatment with Bironja seeds, Turmeric and Verenda leaves and Nizan on serum glucose and SGPT in sheep.

Therefore it can be concluded that the patent drug Nilzan is highly effective against trematodes in sheep. However, among the medicinal plants, Bironja seeds and turmeric may be used against trematodes when patent drugs are not available or become out of reach for the poor farmers of Bangladesh.

## REFERENCES

1. Aassan NSBY and Nabi SG, 1987. Comparative efficacy of Banminth-II and Distadin in naturally infected sheep in Kasmir valley. Indian journal in comparative Microbiology, Immunology and Infectious siseases 8: 43-45.
2. Afaz Uddin M, 1985. General Incidence and therapeutic measures of disease in cattle of Savar Military Farm. M. Sc. Thesis submitted to the department of Medicine. B.A.U. Mymensingh.
3. Anonymous (1960): Reported on marketing of wool in Pakistan. Cooperation and marketing Advison, Govt. of Pakistan 1960, 21-22.
4. Arsad MA, Khan AH and Zaman MB, 1956. A note on the plants of medicinal values found in Pakistan. Medicinal plant brance. Pak. Forest Research Institute, Abottabad.
5. Balterwort JH and Morgan ED, 1971. Investigation of the locust feeding inhibition of the seeds of the Neem tree. (*Azadirachta indica* ). Journal of Insect physiology, 17: 969-979.
6. Bezubic, B Borowik, M.m and Brzozowska, w./(1978). The effect of panacuron Helminth parasites gnnaturally indected lamb. Actaparasitological polanica. 26: 75-82.
7. Boisvencu RJ, Colestock EL and Hendrix JC, 1988. Anthelmintic activity of continuous low doses of fenbendazole into the number of sheep. Veterinary parasitology, 26: 321-327.
8. Broughton,H.B,Jones PS,Ley Sv, Morgan ED,Slaurin AMZ, Williams DJ, 1987. The chemical structure of azadirachtis. Proc 3<sup>rd</sup> Int. Neem cont.Nairobi,Keya 103.
9. Chowdhury II, 1956. Medicinal plants of West Pakistan. Podophylum. Emodil, Pakistan Journal fo Science, 5: 110-116.
10. Faiz MA, 1972. Report on investigation into the epidemiology of parasitic disease in East Pakistan. In Activities of the Research Section of Directorate of livestock services, Bangladesh.1968-1972.
11. Foreyt WJ, 1968. Efficacy of a fenbendazole-Triclabendazole combination against *Fasciola hepatica* and gastrointestinal nematodes in sheep. Veterinary Parasitology, 26: 265-271.
12. Horak IG, 1978. Parasites of domestic and wild animals in South Africa. V. Helminthes in sheep on dry land pasture on the transval Highland. Onderstepoort Journal of Research.45: 1-5.
13. Joshi HC, 1970. Some pharmacological studies with the seed of *Bruten frondosa ormissa*. The Veterinary Journal. 5: 5-8.
14. Muktar-Reshid.Mengesha-Fantaye, Feseha-Gebreab, Moges-Moldemeskel, 1993. On the Helminthiasis at Bako. Institute Agricultural Resaerch, Addis Ababa(Ethiopia. Proceedings of 4<sup>th</sup> national livestock Improvement conference. Addis Ababa(Ethiopia) IAR 1993,P.273-275.
15. Ogunsusi RA, 1978. Changes in blood values of sheep suffering from acute and chronic helminthiasis. Research in veterinary science,25(3):298-301.
16. Soulsby EJJ, 1986. Helminth, Arthropodas And protozoa of Domesticated animals, 7th edi,The ELBS and Bailliers, Tindle, Cassell,London,p.216,234,763-766.