



Short Communication

Comparative Efficacy of some Herbal and Homeopathic Preparations against Coccidiosis in Broilers

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ABSTRACT

The study was designed to compare the efficacy of some herbal and homeopathic preparations against coccidiosis on the basis of weight gain, feed conversion ratio, oocyst count and mortality rate. A total of 240, day-old broiler chicks were reared under standard management practices. The chicks were randomly divided into six groups (A to F) on 22nd day of age. The chicks of all the groups except group F were inoculated orally with sporulated oocysts (30,000 chick⁻¹) and treated with *Polygonum bistorta* Linn. (Anjbar), *Agele marmelos* (Bael), Merc sol. (*Mercurius solubilis*) and Darvisul liquid. *A. marmelos* (Bael fruit) and Darvisul liquid showed better results in terms of weight gain, feed consumption, oocyst count as compared with *P. bistorta* Linn. (Anjbar) and Merc sol. Anticoccidial effect of used herbs and homeopathic preparations suggests that further studies should be carried out to determine the possible maximum safe levels with least toxic effects to be used as coccidiostat.

Key Words: Herbs; Homeopathic; Coccidiosis; Broilers

INTRODUCTION

Coccidiosis is one of the most detrimental and lethal managemental disease of poultry. It causes high mortality in affected flocks. Many anticoccidial drugs have been developed and introduced in the poultry industry all over the world. Since Levine (1939) discovered sulfanilamide would cure coccidiosis in chickens, various anticoccidial feed additives, predominantly polyether ionophorous antibiotics, have been developed and used (Matsuda *et al.*, 1989). While effective for avian coccidiosis, the continuous use and misuse of anticoccidial drugs have led to the emergence of drug-resistant strains (Long, 1982; Ruff & Danforth, 1996). Furthermore, drug residue in the poultry products is also undesirable for the consumer (McDougald & Seibert, 1998). Therefore, there is need to find out the safe alternatives for the control of avian coccidiosis. In this context, a number of plants and herbal products have been found to be effective for a broad range of parasites such as protozoa, arthropods and helminths (Akhtar & Rifaat, 1985; Jiang *et al.*, 1985; Klayman, 1985; Cooke *et al.*, 1987; Lin *et al.*, 1987; Dutta *et al.*, 1989, 1990; He & Zhang, 1989; Matsuda *et al.*, 1989; Quan, 1990).

Information regarding anticoccidial activity of herbs and homeopathic products is very limited. Therefore, the present study was carried out to evaluate the anticoccidial effect of *Polygonum bistorta* Linn. (Anjbar) and *Agele marmelos* (Bael), and Merc sol (a homeopathic preparation) in comparison with Darvisul liquid, a standard anticoccidial in broilers.

MATERIALS AND METHODS

Birds. Two hundred and forty day-old broiler chicks were purchased from local hatchery. Chicks were reared under standard management practices in the University of Veterinary and Animal Sciences, Lahore for the period of six weeks. All the chicks were kept on broiler starter ration up to 2 weeks of age and later on fed on broiler finisher ration. The chicks were randomly divided into six groups A, B, C, D, E and F, each having 40 birds. Each group was further subdivided into four replicates each having 10 chicks. The chicks were provided with standard coccidiostats free feed. The feed and water were provided *ad libitum* during the study period. All the birds were tagged to maintain their identity.

Parasite and dose. Coccidial oocysts of *Eimeria* spp. were obtained from the guts of infected chicks and propagated in broiler chicks by giving oral infection. After obtaining sufficient amount of oocysts, they were sporulated by placing in 2.5% K₂Cr₂O₇ at suitable humidity and temperature (Davies *et al.*, 1963). Sporulated oocysts were cleaned and counted by the McMaster technique (MAFF, 1986). The required concentration of the sporulated oocysts (30,000 mL⁻¹) was maintained with phosphate buffered saline. The sporulated oocysts were inoculated in chicks orally (30,000 oocysts chick⁻¹) on the 22nd day of age.

Preparations of herbal extracts. Fine ground powder (125 g) of each plant was added in 1 L of boiling water. After 5 min boiling and stirring, the mixture was cooled and sieved. The extracts were separately stored in clean and dried bottles.

Experimental design. There were 6 experimental groups and each was having 40 chicks. The infection was given on 22nd day of age to all the groups except group F, which served as uninfected un-medicated group. The medication with herbal extracts and homeopathic preparations was started according to the following schedule.

Group-A: *P. bistorta* Linn. (Anjbar) orally @ 2 mL b.i.d. for 5 consecutive days.

Group-B: *A. marmelos* (Bael) orally @ 2 mL b.i.d. for 5 consecutive days.

Group-C: Merc sol @ 5 mL L⁻¹ in drinking water for 5 consecutive days.

Group-D: Darvisul liquid @ 3 mL L⁻¹ in drinking water for 3 days on, 2 days off, 3 days on i.e. 3-2-3.

Group-E: Infected and unmedicated group.

Group-F: Control uninfected and unmedicated group.

Evaluation parameters. The efficacy of different treatments was evaluated on the basis of weight gain, feed conversion ratio, oocyst per gram of faeces and mortality. The weight gain and feed conversion ratio was recorded on weekly basis from the day of infection (22nd day of age) till end of experiment. For the oocysts per gram (OPG) of faeces, modified McMaster counting technique was done before medication (6th day post infection). After medication, OPG was performed on 7th, 8th, 9th, 11th and 13th day and their average was obtained.

Statistical analysis. The data obtained were analyzed statistically by two way analysis of variance and Duncan's multiple range test (Steel & Torrie, 1982).

RESULTS AND DISCUSSION

It is evident from Table I that weight gain was significantly higher in all the treated groups compared to infected un-medicated control group. However, weight gain

of *A. marmelos* (Bael) and Darvisul treated groups was significantly higher compared with *P. bistorta* Linn. (Anjbar) and Merc sol treated groups. The results of FCR revealed almost similar pattern as that of weight gain among different groups. Although a statistical comparison could not be made due to group feeding, the FCR values of treated groups were numerically lower compared with infected un-medicated groups. The oocysts out put and mortality rate were lower in all the treated groups as compared to infected un-medicated control group. However, among treated groups the birds treated with *A. marmelos* (Bael fruit) and darvisul liquid showed better results in terms of oocyst count per gram of faeces and mortality rate as compared to those treated with *P. bistorta* L. (Anjbar) and Merc sol.

It was concluded that the plants evaluated in the study have anticoccidial activity. These results support the findings of earlier workers as far as potential of plants as to their anticoccidial activity is concerned (Akhtar & Rifaat, 1987; Guha *et al.*, 1992; Hayat *et al.*, 1996; Youn & Noh, 2001; Tippu *et al.*, 2002; Abasy *et al.*, 2003).

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Table I. Relationship of feed conversion ratio with weight gain

Group	Dose Oocysts mL ⁻¹ inoculation day ⁻¹	Post-treatment 1 st week		Post-treatment 2 nd week			
		FCR	WG (g)	FCR	WG (g)		
<i>Polygonum bistorta</i> Linn. (Anjbar)	30,000	2.05	230	2.90	224 ^a	2.92	295 ^a
<i>Agele marmelos</i> (Bael)	30,000	2.06	228	2.41	453 ^b	2.43	472 ^b
Merc sol	30,000	2.13	209	2.81	285 ^a	2.97	291 ^a
Darvisul liquid	30,000	2.07	221	2.43	447 ^b	2.47	417 ^b
Infected Unmedicated	30,000	2.23	217	3.80	32 ^c	3.70	45 ^c
Uninfected Unmedicated	-	1.86	469	2.36	471 ^b	2.56	473 ^b

FCR=feed conversion ratio WG=weight gain *= Significant (P<0.05) NS=non-significant (P<0.05)

A-C^{NS} A-F* B-E* B-C* B-F^{NS} C-F* D-E* F-E*

Table II. Relationship of feed conversion ratio with oocyst count and mortality

Groups	Feed conversion ratio		Average oocyst count g ⁻¹		Mortality rate %
	Before Rx	After Rx	Before Rx	After Rx	
<i>Polygonum bistorta</i> Linn. (Anjbar)	2.05	2.90	5500	19460	12(35)
<i>Agele marmelos</i> (Bael)	2.06	2.41	6000	2004	10(29)
Merc sol	2.13	2.81	4400	15080	14(39)
Darvisul liquid	2.07	2.43	6500	1956	6(17)
Infected Unmedicated	2.23	3.80	4300	52200	14(42)
Uninfected Unmedicated	1.86	2.36	-	-	-

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(Received 31 December 2005; Accepted 11 October 2006)