DIAREENA IS THE BEST ALTERNATIVE OF CHEMICAL DRUG SALINOMYCIN TO CURE AND PREVENTION FROM COCCIDIOSIS

Arvind Sharma* and Shashi Ranjan
Natural Herbs and Formulations, Mandawar, Dehradun Road, Roorkee 247667, (Uttarakhand), India.

ABSTRACT
Drugs and live vaccines are the control measures used recently in the poultry farms. Vaccines are not accepted due to the high cost and not covering all pathogenic species. One of the ways that has been very much accepted nowadays is to use herbal compounds and their active ingredients to treat the disease. In this research, we investigated the effect of different doses of our product Diareena which is herbal (complex of multi medicinal plants) and with a known drug compound, called Salinomycin. Samples were collected 9th day after the treatments and four various growth parameters (weight gain, food conversion rate, Oocyst per gram and caecal length) were assessed. All growth parameters were best with the group b which was treated with Diareena (Anti-diarrhoeal). The present study was akin to the findings of[12], who reported that extracts of Artemisia annua L were shown to improve body mass gain, lesion scores and feed conversion ratios in chicks infected with E. tenella. Similarly DU and HU[15] also observed significantly higher body mass gains and mild lesion score in birds medicated with herbal complex for E. tenella infection in chicken.

KEYWORDS: Coccidiosis, Diareena, FCR, Oocyst, Salinomycin.

INTRODUCTION
Coccidiosis is a protozoan disease, that affects different parts of the intestine therefore impairs feed utilization, decreases broilers growth and egg production of laying hens and causes death of birds.[1] The causative agent is Eimeria and birds become infected when they ingest the Oocysts.
Drugs and live vaccines are the control measures used recently in the poultry farms. However, producers are faced with expensive vaccines and use of drugs for long periods; hence necessity for cheap and safe alternatives rises up\cite{2,3} Vaccines are not accepted due to the high cost and not covering all pathogenic species. One of the ways that has been very much accepted nowadays is to use herbal compounds and their active ingredients to treat the disease. Because, on the one hand, these compounds are very cheap and available and on the other hand, no resistance to molecules contained within them will not happen. In this research, we investigated the effect of our product Diareena and with a known drug compound, called Salinomycin.\cite{4,5,6}

However, much more information is available on the *Berberis aristata*, *Polygonum viviparum*, *Acacia catech*, *Fordia floribunda*, *Hollrhana antidysenterica* and many more herbal species that should suppress any doubts in minds about the efficiency of natural herbs in the prevention or treatment of certain diseases. What should be advocated therefore is the increased of these low cost materials to restore better health to farm animals. The development of those disease control measures in a population has so far enable large numbers of birds to be kept in close proximity and has therefore made intensive poultry management practicable now than ever before but still lacking in duck production which has and still remain extensively managed. Hence, this work seeks to ascertain and investigate the efficacy of the herbal remedies for Coccidiosis.

**MATERIALS AND METHODS**

A total of 4 week - old broiler chicks, procured from a poultry farm of Natural Herbs and Formulation Pvt. Ltd. Roorkee, District Haridwar, were divided into 5 groups (A, B, C, D and E) of 10 chicks each and maintained in a cage system for 42 days. During this period, the birds were fed with anticoccidial free feed. Chicks in groups A, B, C and D were challenged with 30 thousands sporulated Oocyst of *E. tenella* on 28th day of age\cite{7}, while chicks in groups D and E served as positive and negative controls respectively. After 3 days of challenge infection, the chicks in groups A and B were treated with a product Diareena manufactured by Natural Herbs and Formulations Pvt. Ltd. India 500g/ton and 1 kg/ton in feed respectively, while group C was treated with standard anticoccidial drug Salinomycin in the feed.
Composition of herbal formulation

The herbal complex was prepared by mixing extracts obtained from fresh leaves of twelve plants, viz., *Hollrhana antidysenterica, Berberis aristata, Polygonum viviparum, Acacia catech*, *Fordia floribunda* and many more.

Growth performance

Body mass gain and feed intake of birds from all groups were recorded at weekly intervals for up to 5th weeks of age. The general health of the birds and mortality, if any, were also monitored regularly.

Estimation of oocyst

Droppings were collected from all groups on days 6, 7, 8, 9 and 10 of post challenge for estimation of oocyst per gram of faeces (OPG) by Mc Master egg counting technique.\(^8\)

Pathological study

All the birds were sacrificed on day 11-post challenge to determine the lesions score and caecal length.\(^9\) For histopathological observations representative tissues of caeca were collected in 10% formalin. Tissues were processed by standard methods and stained by haematoxylin and eosin.\(^10\)

Statistical analysis

The complete randomized model (CRD) was used to analyze data for weight gain, feed conversion rate, Caecal length and Oocyst counts. All data was analyzed according to the ANOVA model, using the Statistical Package GEN STAT.

RESULTS AND DISCUSSION

Results obtained during our research were followed as given in Table 1. five different treatments provided to birds and samples were collected 9th day after the treatments and four various growth parameters (weight gain, food conversion rate, Oocyst per gram and caecal length) were assessed. Maximum mean weight gain (392.33 gm) was observed in negative control (E) followed by in Group B (341.72 gm) and Group C (310.71 gm), which were treated with Diareena 1kg/ton feed and Salinomycin drug respectively whereas minimum mean weight gain was found in Group D which was infected with *E. tenella* and no one treatment was given to this group. Least significant difference (13.92) with 6.91 of standard error of difference was observed among the all treatments.
Fig. 1 weight gain under various treatments against Coccidiosis

As compared to negative control best feed conversion rate (1.68) was observed in the treatment of Diareena with 1 kg/ton in feed followed by in group c (1.70), which was treated with Salinomycin in feed (Fig. 2) with the least significant difference (0.04), standard error of difference (0.02) and CV (2.3) among all the treatments (Table 1).

Table 1: Various growth parameters observed under various treatments against Coccidiosis.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Growth parameters</th>
<th>A (Diareena 500g/ Ton)</th>
<th>B (Diareena 1kg/Ton)</th>
<th>C (Salinomycin)</th>
<th>D +Ve control</th>
<th>E -Ve control</th>
<th>S.E.D</th>
<th>CV</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WG (gm)</td>
<td>292.10</td>
<td>341.72</td>
<td>310.71</td>
<td>260.6</td>
<td>392.33</td>
<td>6.91</td>
<td>4.7</td>
<td>13.92</td>
</tr>
<tr>
<td>2</td>
<td>FCR</td>
<td>1.80</td>
<td>1.68</td>
<td>1.70</td>
<td>1.94</td>
<td>1.58</td>
<td>0.02</td>
<td>2.3</td>
<td>0.04</td>
</tr>
<tr>
<td>3</td>
<td>OPG</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+++</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>4</td>
<td>CL (cm)</td>
<td>10.19</td>
<td>12.21</td>
<td>11.55</td>
<td>10.07</td>
<td>15.86</td>
<td>0.24</td>
<td>4.6</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Oocysts of *E. tennela* per gram were observed (Fig. 2) least in group b (Diareena 1 kg/ton) and group c (Salinomycin) followed by group a (Diareena 500 g/ton) and group d (+Ve control) whereas no Oocysts counts were observed in group e (-Ve control).

Maximum cecal length was observed in -Ve (15.86) control followed by in group b (12.21 mm), group c (11.55 mm) and group a (10.19 mm) with least significant difference of 0.49, S.E.D. (0.24) and CV (4.6).

Coccidial challenge significantly affected the body mass gain and feed conversion ratio of the chicks. It is evident that the body mean mass gain of uninfected unmedicated birds at 5th weeks of age was higher (392.33 g) compared to 260.6 g in the +Ve control group (Table 1).
The findings of the present investigation are in agreement with the findings of Chandrakesan et al.[11], who stated that Coccidial challenge showed effect on body mass gain and feed conversion ratio. The birds treated with Diareena 1 Kg/ton had better body mass gain (341.72 g) and best feed conversion ratio (1.68) despite the Coccidial challenge. Oh et al.[12] conducted the first experimental trial to evaluate the anticoccidial activity of A. annua extracts against *E. tenella* in chickens. A. annua extracts showed the anticoccidial activity in terms of improved weight gain, improved feed conversion ratio and reduced lesion scores.

Later, Allen et al.[13] reported a significant anticoccidial effect of *A. annua* against *E. tenella*, measured as reduced lesion scores, when fed to broiler chickens for three weeks as dried leaves at a dietary concentration of 5% (equivalent to 17 ppm pure artemisinin). Brisibe et al.[14] studied the effect of feeding 20% dried pulverized *A. annua* leaves against *E. tenella* both in broiler and layer chickens. The anticoccidial effects of diets containing *A. annua* leaves were almost equal to the commercial anticoccidial both in broiler and layer chickens.

The above findings of the present study are akin to the findings of OH et al.[12], who reported that extracts of *Artemisia annua* L were shown to improve body mass gain, lesion scores and feed conversion ratios in chicks infected with *E. tenella*. Similarly DU and HU[15] also observed significantly higher body mass gains and mild lesion score in birds medicated with herbal complex for *E. tenella* infection in chicken.

Further, the birds that received Diareena 1 Kg/ton showed a less oocyst counts and moderate caecal length (Fig 2), endorsing the fact that herbal complex had some palliative effect.
against coccidiosis. Abbas et al.\textsuperscript{[16]} reported an anticoccidial effect of Neem fruit against mixed Eimeria species in terms of reducing the oocyst per gram of faeces. In addition to the anticoccidial effect of Neem fruit, some reports have shown the anticoccidial activity of an aqueous extract of Neem leaves against \textit{E. tenella} alone\textsuperscript{[17]} as well as in a mixed infection\textsuperscript{[18]}, which was comparable to the commercial anticoccidial Amprolium and Baycox.

REFERENCES