International Journal of Biosciences (IJB)
ISSN: 2220-6655 (Print) 2222-5234 (Online)
Vol. 2, No. 2, p. 72-76, 2012
http://www.innspub.net

RESEARCH PAPER OPEN ACCESS

Comparative effects of piperazine of citrate and papaya seeds on *Ascaridia galli* in layers harco

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Received: 16 January 2012
Revised: 27 January 2012
Accepted: 29 January 2012

Key words: Citrate of piperazine, papaya seeds, *Ascaridia galli*, layers harco.

Abstract

Ascaridia galli worms are very important in poultry breeding; they cause necrosis of the mucosal layer with a high rate of mortality of chickens. The present study has been undertaken in Atlantique-Littoral province (Bénin), from May to June 2011. A number of 300 layers Harco have been used for the test and have been separated into 6 groups of 50 hens which have been differently treated. At state 1 (before the treatment), the average quantity of the Eggs Per Gram (EPG) are statistically the same. In other words, the situation before the treatment is identical with the 6 groups. After the treatment (state 2), there was a difference highly significant between the treatments with an efficiency rate of -50% for the witness group; 80% for the treatment 1; -14% for the treatment 2; 4% for the treatment 3; 16% for the treatment 4 and 65% for the treatment 5. Papaya seeds have reduced significantly the number of EPG comparing to the witness group. But that reduction remains lower than the one of citrate of piperazine (2.5g/L of the solution) in *Ascaridia galli's* eggs reduction. In water treatment of chickens infected by *Ascaridia galli*, Piperazine citrate is recommended; but the papaya seeds can play also an important role, reducing the eggs of this worm in poultry's feaces.

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Introduction

Sanitary risks are the main obstacle to the development of poultry farming even though food availability is more or less favorable in Benin (Abou, 1994). Indeed, the economic damage caused by parasites with a variety of parasites is very important. Among these parasites, *Ascaridia galli* is a serious threat to the chickens. Clinical signs of Ascaridia are more pronounced in chickens up to 3 months of age, after which the worm burden normally decreases but can still be very high (Gauly et al., 2002). Birds will suffer from blood loss, reduced blood sugar and distended ureters with urates (Taylor et al., 2007). Ascarids cause anorexia, diarrhea, dehydration, stunted growth, unthriftiness, drooping wings, ruffled feathers, weight loss, reduced feed consumption rates, changes in behavior, dullness, lethargy and misshapened and soft thin shelled eggs in poultry (Kaufmann et al., 2011). For information, calculations done by Adjanohoun (1995) show that each *Ascaridia galli* in chickens is now responsible for a weight loss of about 15 g in 3 weeks. But according to Affognon (2000) and Adoté et al (2001), the approach which consists in following or copying the industrialized countries using the synthetic pharmaceuticals developed or selected could be reviewed to the extent that these products are less accessible because of the sale price still galloping and purchasing power of smaller and smaller African populations. Thus, we see the realization of revenues endogenous form of revenue adopted by some producers. But they have unfortunately no effective control structures. Based on these observations, it is essential to find ways cheap, efficient and above all accessible to our poultry. It is with this in mind that this study has been conducted.

Materials and methods

Ripe papaya seeds were harvested in Parakou in the Department of Borgou-Alibori. They were identified in the National Herbarium of the Faculty of Science and Technology, University of Abomey-Calavi (FAST-UAC). They were then dried at FAST-UAC and then powdered. Harco laying hens were imported at level of Chicken from the Society for the Promotion of Poultry (Soproda) in France. Piperazine Citrate® is a veterinarian, manufactured by the Veterinary Laboratory LAPROVET, France. This product, made with 100 g bag is distributed to chickens in solution of 2.5 g / L. The experimental group consists of 300 laying hens Harco. They were divided into six lots of 50 chickens: group of witness receives no treatment. Treatment 1 (2.5g/L of citrate of pipérazine solution) for the group 1; treatment 2 (2.5g/L of papaya seeds solution) for the group 2; treatment 3 (2g/L of papaya seeds solution) for group 3; treatment 4 (3g/L of papaya seeds solution) for group 4; treatment 5 (4g/L of papaya seeds solution) for group 5. The coefficient of reduction of EPG was calculated.
The feces of chickens (200 g) were collected in icebags and transported in a cooler to stool analysis at the Veterinary analytical Laboratory of the Department of Animal Production and Health of the University of Abomey-Calavi (UAC). On the previous day of each session of recollection of excrement, cement paper is left in baskets in which the chickens sleep. A stool analysis was done before treatment and 2 times after the treatment at intervals of 2 weeks. *Ascaridia galli* eggs were identified using the technique of Thiempont et al (1995). The rate of reduction of parasite eggs for each batch was calculated.

Statistical analysis

Statistical analysis was performed with the ANOVA test to compare average of EPG ; the Newman and Keuls test was used to structure these averages in case of significant difference.

Results and Discussion

The results listed below show that Phase 1 is to say, before treatment, the average amount of EPG treatment is statistically identical. In other words, the situation before the treatment is the same at the six lots (Table 1).

The experimental hens are all raised on the ground which probably contributed to the conditions of parasitism.

Table 1. Analysis of fecal layers.

Treatments	EPG average	
	Phase 1	**Phase 2**
0	1466.67 ± 523.87 (3.11) A	2214.29 ± 123.53 (3.33) A
1	1633.33 ± 466.67 (3.17) A	328.57 ± 17.15 (2.51) D
2	1116.67 ± 394.05 (3.00) A	1275.00 ± 165.15 (3.05) B
3	1433.33 ± 1063.15 (2,86) A	1375.00 ± 172.23 (3.08) B
4	1033.33 ± 598.84 (2.75) A	867.86 ± 179.94 (2.85) C
5	2416.67 ± 906.15 (3,28) A	771.43 ± 130.16 (2.82) C
Probability	0.71 ns	0.0001 ***
CV%	14.82	7.18
Conclusion	***Difference not significant at 5%	*** Difference significant at 0.1%

According to Chrysostome and Allard (1997), *Ascaridia galli*'s eggs are eliminated in the outdoor environment through feces and spread by natural elements (wind and rain). They can be carried by earthworms that swallowed them but most of the time, the infection is through direct ingestion of eggs. Poor raising conditions also favor infestation. Poor raising practices could be the basis of hatch out of parasite often seen in our farming community (Dèka, 1998). Farmers, in the context of poultry farming in Benin have no training and use of all-out synthetic anthelmintics repeatedly which create addictions and problems of resistance in negative efficacy.

This is also in this context since the work of Hounguèvou (1999), it was found that 85% of developing countries use primarily medicinal plants in an infestation of birds. Thus, farmers add value to indigenous knowledge to manage the health of their birds.

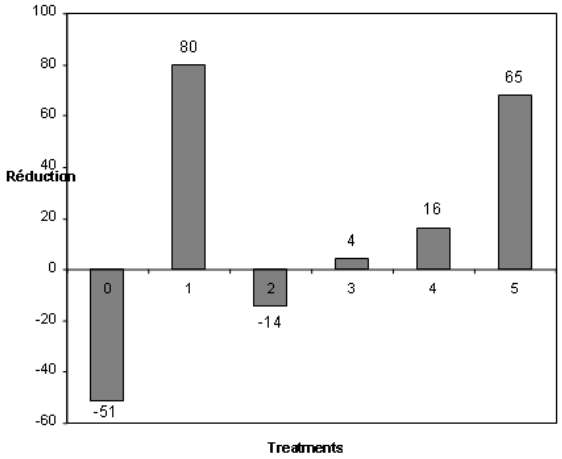

Fig. 1. Percentage reduction of EPG by different treatments. 0→ witness group (no treatment); 1→ 2.5 g/L of Citrate of piperazine; 2 → 2.5 g/L of papaya seeds solution; 3 → 2 g/L of papaya seeds solution; 4 → 3 g /L of papaya seeds solution; 5 → 4g/L of papaya seeds solution.

After the application of treatments, that is to say at phase 2 (table 2), there is a very highly significant difference between treatments. Indeed, the witness treatment that is to say, the lot that received no treatment recorded the highest average of EPG, this contrasts with a lot who received treatment with a lower parasite load. It is statistically followed by treatments 5 and 4 (papaya seeds 4g / L and 3 g / L) that are followed by treatments 2 and 3 (papaya seeds to 2.5 g / L and 2g / L). There is no significant difference between these two treatments which differ however from the witness group. We can mentione that the papaya seeds whatever the dose used, reduced significantly the number of EPG comparing to the witness. But this reduction remains small compared to Piperazine citrate (2.5 g/L). Note also that the higher the dose of papaya seeds increases, more significant is the reduction. The effectiveness of the papaya seeds on Ascaris was demonstrated by Villate (1997). N'Noume (2001) has also proven its effectiveness on infected West African dwarf sheep. The greatest reduction in

parasite load, obtained with the solution of papaya seeds to 4 g / L could be inferred that the papaya seed powder is effective at high doses. This situation can be explained by the impurities found in the seeds. However, none of these products (papaya seeds, Piperazine citrate) has, at different doses, reduced to zero the EPG; this confirms the study of Dèka (1998). Indeed, this author has demonstrated that any anthelmintic isn't effective with a rate of 100% against target pests.

Conclusion

Stool tests carried out during the trial showed that the Piperazine citrate used at the same concentration as the seeds of papaya is more effective in reducing the burden of *Ascaridia galli* eggs. However, the papaya seeds used to eliminate a higher concentration of parasite eggs compared to the witness group.

The use of papaya seeds in the fight against *Ascaridia galli* is a problem of drug's form presentation. Powdered papaya seeds may contain impurities. It would be interesting to conduct studies in the Laboratory on the papaya seeds to extract the active ingredient for use in Ascarids of chickens.

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