



Research Article

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Effects of *Thonningia sanguinea* (*Balanophoraceae*), a plant extract on broiler chickens (Hubbard race) in Côte d'Ivoire

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Abstract

Objective: To evaluate the effect of aqueous extract of *Thonningia sanguinea* on 1000 broilers (Hubbard race) raising for six weeks (from the 2nd week to the 7th week). The effect of this plant extract was felt on the weight, mortality rate and feed efficiency.

Methods: We arranged two lots A and B of 500 chickens each. Lot A consisted of chickens following a normal dietary program, against chickens of Lot B each received 50 mL (10 g / L) of *Thonningia sanguinea* every morning in drinking water for six weeks.

Results: The chickens in Lot B had a weight gain which increased from 280 g to 2100 g with an average weight gain of 360 g per week. Chicken in lot A had weight increased from 150 g to 1200 g that is a weekly gain of 210 g. We recorded 2% (10 chickens) and 6% (30 chickens) deaths for Lot B and Lot A respectively. Lot B chickens consumed 28 bags of livestock feeds against 35 bags for lot A.

Conclusion: This plant should be recommended to poultry farmers especially in poor countries to prevent them from excessive spending. *Thonningia sanguinea* could be useful veterinary drugs.

Keywords: *Thonningia sanguinea*, broilers, Côte d'Ivoire.

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1. Introduction

Animal husbandry in particular poultry is a very ancient practice. In Côte d'Ivoire, this activity dated back before independence. In the past it was entirely traditional, it has been modernized over the years and is practiced today in all parts of the country either for own consumption or for commercial purposes [1]. In order to fully satisfy the needs of our growing population, the poultry sector has benefited from the assistance of various specialized organizations [2]. With the support of these organizations, poultry meat, including chickens has become the main source of animal

protein [3]. Today poultry activity is threatened by different diseases which affect the meat quality and quantity of available meat [4]. Today, throughout the world and particularly in Africa, medicinal plants play an important role in therapy in scientific circles as well as in rural and urban areas [5]. African Floristic heritage is well endowed in medicinal plants whose effectiveness is well proven. Indeed, it has been reported that the continent have over 5000 species of medicinal plants [6]. Concern for the efficient utilization of this heritage has attracted a lot of research work to provide scientific basis of actions of these plants [7, 8]. *Thonningia sanguinea* (*Balanophoraceae*) extracts are traditionally used to treat salmonellosis, coccidiosis, and colibacillosis [9]. In order to reduce the high cost of veterinary drugs used in broilers breeding on one hand, and the duration of breeding that lasts for 45 days (seven weeks) on the other hand, we are going to use the aqueous extract of *Thonningia sanguinea* (*Balanophoraceae*), a substance of plant origin, on the productivity of broilers production.

2. Experimental

Plant material

The plant material consists of the aqueous solution from inflorescences of *Thonningia sanguinea* (*Balanophoraceae*) harvested in Daloa in the western region of Côte d'Ivoire. This plant has been identified by an expert from The National Floristic Centre of Côte d'Ivoire, where sample has been kept.

Place of study:

The study was conducted in a poultry farm at Azito (Yopougon South). This farm is located in Abidjan, Côte d'Ivoire.

Animal material

We used in this study, 1000 chickens Hubbard race (white plumage) aged 2 days, with an average weight of 30 g divided into two groups (A and B) of 500 chickens each.

Preparation of the plant extract

Thonningia sanguinea (*Balanophoraceae*) Inflorescences were harvested, cut and dried in the Laboratory at room temperature away from sunlight for two weeks. They were grounded, a red powder was obtained. A 2 L of distilled water was added to 20 g of plant extract in the presence of a magnetic stirrer for 48 hours at room temperature. The homogenate was filtered through Büchner with Whatman 3 mm paper. The filtrate obtained was evaporated under vacuum at 30°C in a Büchi rotary evaporator. The dry evaporate was recovered in powder form which constitute the total aqueous extract.

Experimental approach

This experimental study was conducted on a sample of 1000 chickens of Hubbard race (white plumage), all aged 2 days and an average weight of 30 g. The chickens of both lots were heated for one week (7 days) and fed using the same dietary program. After one week, we made two lots A and B of 500 chickens each. Lot A consisting of chickens following normal dietary program, against Lot B chickens which received 50 mL (10 g / L) of *Thonningia sanguine* each every morning. This experiment was done for six weeks. Throughout the duration of the experiment, the two lots A and B received the same types of poultry feeds, all chickens had an average weight of 75 g. In this experiment, we assessed, weight gain, mortality rate due to the presence of avian diseases and feed efficiency.

Statistical Analysis

To process data, we used the statistical law of Fisher-Snedecor based on the comparison of variances of the two groups. Working at the simplest level, we have computerized and analyzed data to produce cross, medium and graphics tabs.

3. Results and Discussion

Results

Measuring the weight gain of two lots of chickens

Table I shows the weight gain of two lots of chickens from the second week. We noted that for Lot B which was given *Thonningia sanguinea*, weight increased from 280 g to 2100 g in the 7th week. Against Lot A following a normal dietary program only, has a weight increase from 150 g to 1200 g from the 2nd to the 7th week.

Table 1: Weekly measure of the average weight of chickens

Age of chicken (Week)	Average weight in Lot A (g)	Average weight in Lot B (g)
1	75	75
2	150	280
3	300	490
4	500	775
5	750	1300
6	1000	1700
7	1200	2100

Determination of the mortality rate of chickens in the two lots.

The mortality rate in this study, gives 2% (10 chickens) and 6% (30 chickens), respectively for lot B and lot A (Figure1).

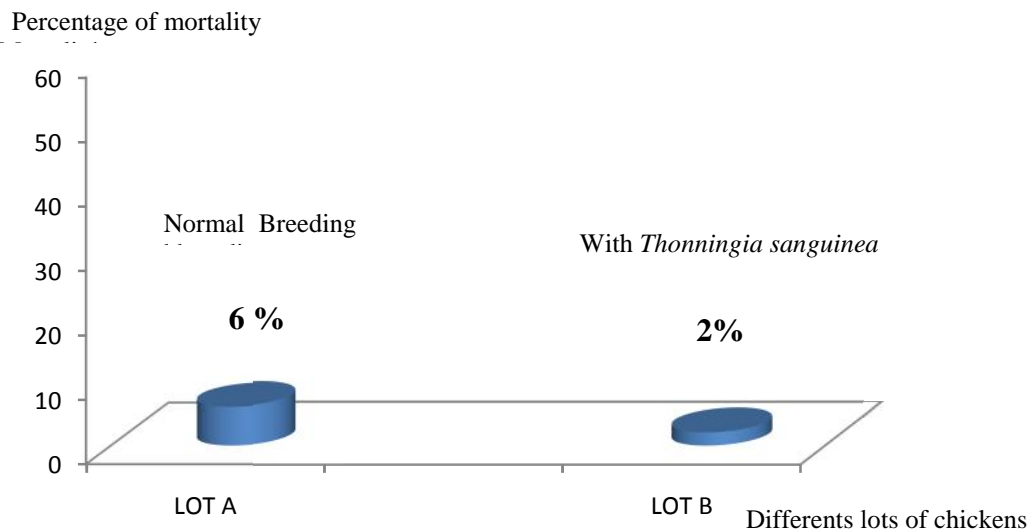


Figure 1: Determination of the mortality rate

Determination of the consumption rate of chickens in the two lots

Table II gives the feeding index of the two lots A and B during the period of the experiment. Chickens of Lot B subjected to *Thonningia sanguinea* consumed 1425 kg (30 bags of feed) against 1725 Kg (35 bags of feed) for lot A.

Table II: Consumption Index of chickens in the two lots

Age of chicken (Weeks)	Quantity of feeds consumed (Kg)	
	Lot A	Lot B
1	70	70
2	150	105
3	175	150
4	245	200
5	315	250
6	368	300
17	403	350
Total consumed (Kg)	1725	1425

Discussion

The aim of our study was to evaluate the effect of aqueous extract of *Thonningia sanguinea* on poultry using 1000 broilers (Hubbard race) for six weeks (from 2nd week to 7th week). We grouped the chicken into two lots A and B of 500 chickens each. Lot A contains chickens that have been fed with a normal feed against Lot B which contained chickens that received 50 ml of *Thonningia sanguinea* every morning at a concentration of 10g / L. the effect of this plant was felt on the weight, mortality rate and feeding efficiency of two lots of chickens.

Chickens of Lot B had a weight gain which increased from 280 g in the 2nd week to 2100 g in the 7th week with average weight increase of 360 g per week. Lot A, which has been fed with a normal diet without *Thonningia sanguinea* had a weight increase from 150 g to 1200 g that is a weekly gain of 210 g during the six weeks of experiment. Several research studies conducted on the effectiveness of this plant on poultry are in agreement with our results. In fact in 2012, a study was conducted on the influence of *Thonningia sanguinea* on the productivity of layers for two weeks divided into two lots. Lot that received 500 mg of this plant had a weight gain and good quality eggs. [3] Our results were confirmed by the work done in 2010 in Côte d'Ivoire on poultry layers [1]. Concerning mortality rate, we recorded 2% (10 chickens) and 6% (30 chickens) death during the six-week period our experience

in Lot B and Lot A respectively. This result shows that the aqueous extract of this plant has *in vivo* anticoccidial activity. This result was observed in the work done in 2010 on the *in vivo* anticoccidial activity of this plant in laying hens. Results showed that lots of chickens infected via drinking water by 100000 oocysts of *Eimeria tenella* and *Eimeria necatrix*, the infected chickens were treated with aqueous extract of *Thonningia sanguinea*. This study showed that the aqueous extract of this plant has a very high anticoccidial activity on *Eimeria necatrix* and *Eimeria tenella* [1, 10]. These results were also reported by work in Côte d'Ivoire in 2005 and 2011 [11, 12].

During the six weeks that our study lasted, chickens of Lot B consumed 30 bags of poultry feed with a weekly weight gains of 360 g. Against chicken of lot A 35 bags of poultry feed, more than 7 bags of feed than Lot B with only 210 g as a weekly weight gain. These results showed that *Thonningia sanguinea* in addition to being a plant extract which has anticoccidial activity allows chickens to consume less with high weight gain. The results concerning the consumption index and weight gain ratio were reported by several research works carried out in various part of the world and in Côte d'Ivoire [13, 14]. This plant should be advised in poultry farming because in less than five weeks *Thonningia sanguinea* allows us to have chickens weighing over 1300 g and significantly reduced mortality rate. A study in 2010 revealed that this plant is not toxic so it can be used without fear in poultry because it is not dangerous for consumption by chickens [15, 16].

4. Conclusion

Our study showed that the aqueous extract of *Thonningia sanguinea* allows chickens to have a very significant weight gain in five weeks with low feed consumption. This plant also has anticoccidial activity. It should be recommended to farmers in poor countries to prevent them from spending much. *Thonningia sanguinea* can participate in the discovery of veterinary drugs.

5. Competing Interests

The authors declare that they have no competing interests.

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