Short Communication

Preliminary investigation of the effect of *Rhizophora racemosa* (mangrove) feed additive on broiler performance

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An experiment was conducted to determine the effect of consumption of *Rhizophora racemosa* (Mangrove) incorporated feed on feed intake, body weight gain, and some visceral organs of broiler chicks. Sixty day-old Hubbard broiler chicks were randomly allocated into four treatment groups, A, B, C and D of 15 birds per group and 5 birds per replicate. The dosages of the groups were 0 (control), 10, 20 and 30 g per kilogram of feed, respectively. Results obtained showed that there were no significant differences ($P > 0.05$) among the treatment means with respect to feed consumption/efficiency, and body weight gain. However, a linear body weight gain was observed. There was obvious hypertrophy of the bursa of Fabricus of groups B, C, and D, indicative of defensive reaction to *R. racemosa* (foreign body) and increase of antibody production. The observed atrophy of the ovaries and the converse hypertrophy of the testes are analogous to decreased ovarian and increased testicular functions, respectively.

Key words: Mangrove, feed intake, weight gain, visceral organs, broilers.

INTRODUCTION

*Rhizophora racemosa* is a vast and abundant salt-water forest tree, native to and extending from Senegal in West Africa to Angola in Central Africa. It is also found along the east coast of tropical America and the neighbouring islands. Feed additives are non-nutrients of diverse sources including synthetic, biological, medicinal or mineral sources. They may be anabolic, antibiotics, hormones, plants or shrubs or other chemical agents incorporated in feeds to increase production. For example, the use of antibiotics (Maynard et al., 1979; Griffin, 1979; Taylor, 1988; Wekhe and Taylor, 1992; Wekhe and Olowo, 1994), hormones and anabolic (Phimia, 1987; Berepubo and Wekhe, 1993) and amino acids by Syed et al., 1983; Okonkwo and Alhassan, 1977; Wekhe, 2000) to increase weight gain has been severally reported. The use of the shrub *Leucaena leucocephala* as a growth promoter in young chicks (D’Mello et al., 1978), the tree *Mansonia altissima* to increase egg production (Ogbamgba and Wekhe, 2005) and *M. altissima* as a growth promoter (Ogbamgba and Wekhe, 2006) have also been reported.

It is the abundance and the seemingly forgotten possibility of the economic use of this abundant foliage, *R. racemosa*, which prompted its trial as an additive in broiler feed. Its implication as a feed additive is that it should be included in very small and insignificant economic quantities capable of impacting desirable or suppressing undesirable properties (Richard, 2001) to add significant economic value. It is the objective of this work to explore the possibility of using the foliage of *R. racemosa*, a mangrove forest tree, as a feed additive to enhance the performance of broilers in the tropics.

MATERIALS AND METHODS

Sixty (60) day-old Hubbard broiler chicks were randomly allocated to four treatment groups A, B, C, and D of 15 birds per group. The groups were further replicated randomly into three sections of 5 birds each. The birds had an initial average weight of 40 g each at day old. Pen A was the control while B, C, and D were administer-
tered the powdered dried mangrove leaf (*R. racemosa*) on dosages of 10, 20 and 30 g per kilogram of feed respectively. At the end of each week the birds in the replicates were weighed collectively, using Avary Diamond weighing scale. Whole fresh leaves of the mangrove tree *R. racemosa* were harvested at the Eagle Island, Port Harcourt, Nigeria, oven dried at 28 – 34°C for 1 - 2 h, milled (pulverized), and weighed out according to their treatment levels with the aid of top load balance (Ohaus Scout II). A proximate analysis of the mangrove leaves *R. racemosa* was done to determine the crude protein, ash and fat contents. The powder was administered to the birds in the third week of the experiment.

The proximate composition (g/kg) of the dried mangrove leaves *R. racemosa* were: crude protein 9.6, ash 34.69, and fat 2.5%. The average weight gain of 1817.1 g was forage for lean pork production because of its fat content but mineral source for broilers (ash 34.69%) and perhaps as a feed for brooders using electric bulb of 200 watts to provide heat. The feed intake (g/bird) was done to respond to the coccidiostat which was prophylactically treated with the aid of top load balance (Ohaus Scout II). A proximate analysis of the mangrove leaves *R. racemosa* was done to determine the crude protein, ash and fat contents. The powder was administered to the birds in the third week of the experiment.

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of *R. racemosa* was optimum for the development or sustenance of the testes. This suggests that *R. racemosa* could be used to enhance the performance of breeder cocks in the broiler industry. While this is suggested, there is the need to assay the hormone levels of testosterone at these dosages. Conversely, the ovaries of the control groups were bigger than those of all the other treatment groups. This means that the ovaries were negatively affected while the testes were positively affected by *R. racemosa*. Again, hormonal assay for estrogen is necessary, just like that for testosterone. When this is done using male and female chickens, the effect of *R. racemosa* in laying birds and cocks will be elucidated.

The increase in size of the bursa of Fabricius in groups B, C and D, suggests an immunological reaction of the birds to the presence of a foreign body. The bursa of Fabricius is a lymphoepithelial organ peculiar to birds. The hypertrophy of the bursa of Fabricius was due to an increased production of antibody against *R. racemosa* which the body regarded as foreign. This finding corroborates the work of Wekhe (2002) who reported an increase in size of the bursa of Fabricius of broilers fed pulverized root bark of *Alchornea cordifolia*, and that of Glick et al. (1967) who reported that the bursa of Fabricius conferred immunological competence to fowls. The other visceral organs, namely, liver, spleen, gizzard, kidney, and heart, did not show any visible pathological differences either in size, texture, or appearance. Consequently *R. racemosa* is not toxic to broiler birds at these levels.

**Conclusion**

Broiler birds could be fed pulverized leaves of the mangrove tree *R. racemosa* for weight gain though only lineal increases may be observed. The growth enhancing effects of this mangrove tree may be better appreciated if the broiler birds are fed fresh leaves or if higher dosages of the pulverized dried leaves are used. It is inconclusive at this point to prescribe *R. racemosa* for weight gain in broilers or to enhance the performance of breeding cocks until further experiments elucidate the enhancing properties more clearly.

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**REFERENCES**


