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Short Communication

STUDIES ON THE EFFECTS OF *Amaranthus spinosus* LEAF EXTRACT ON THE HAEMATOLOGY OF GROWING PIGS

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Ethanol extract of Amaranthus spinosus leaf (EEAL) was administered orally to growing pigs to determine its effects on the haematological characteristics-packed cell volume (PCV) red blood cell (RBC) and white blood cell (WBC) counts, and haemoglobin (HB) concentration. Eighteen growing pigs were randomly allotted to two treatments with each treatment replicated thrice. Pigs in treatment 1 were administered with EEAL. Treatment 2 served as control receiving no treatment. Results showed that there were significant (P<0.05) reduction in the PCV, RBC and Hb of the pigs administered with EEAL seven days post treatment and their weight gains significantly (P<0.05) improved. Amaranthus spinosus, although an active vermifuge should be used in animals with adequate precaution to avoid any probable toxic effects.

Key words: *Amaranthus spinosus, leaf extract, pig haematology.*

INTRODUCTION

Amaranthus spinosus is an annual weed that is widely distributed in the humid zone of the tropics including Nigeria (Assiak *et al* 2001). The weed has been reported to have some pharmacological properties (Ayethan *et al,* 1995).

The leaf contained anthriquinone derivatives, cardiac glycosides and saponins (Table 1). Extracts of the leaf had also been used in the treatment of menstrual disorders in man (Ayethan *et al* 1996). The present report presents the results of our preliminary study on the administration of the extract of *A. spinosus* leaf in growing pigs and its effects on some blood parameters and weight gain of the pigs.

MATERIALS AND METHODS

The *A. spinosus* leaf was harvested from a cultivated plot, sun-dried to crispiness, and milled. The milled leaf was macerated in 50% ethanol for 72 hours. The cold extract was then filtered and the filtrate concentrated to slurry over a water bath. The slurry was stored in a refrigerator at 4^{o}C prior to administration. *A. spinosus* was identified at the Botany museum of the Department of Botany, University of Ibadan Nigeria.

Eighteen growing pigs were used for this study. They were randomly allotted to two treatments, each treatment was replicated thrice. Treatment 1(T1) pigs were administered with Ethanol extract of *Amaranthus spinosus* leaf (EEAL). Treatment 2 (T_2) received no treatment and served as control. EEAL was administered at 0.5g per kg body weight as slurry orally.

Blood samples were collected from the animals pre-treatment and 1, 7, 14 and 21 days post treatment. The weights of the animals were also taken during the period. Blood samples were collected in Ethylene diamino-tetra-acetic-acid (EDTA) bottles. Parked cell volume (PCV) was determined using Wintrobe haematocrit method (Wintrobe, 1933), red blood cell (RBC) and white blood cell counts (WBC) were determined using the Neubauer haemocytometer. All data collected were analysed using the analysis of variance and Duncan multiple range test (Steel and Torrie, 1982).

RESULTS

Table 2 shows the blood characteristics of the pigs pre and post treatment. The PCV, RBC and Hb of pigs treated with EEAL were significantly (P<0.05) depressed seven days post treatment. PCV reduced from 43.5 to 16.2 at day 7 and increased to 28.50 and 38.5 at day 14 and 21 respectively. RBC reduced from 8.22 to 3.85 at day 7 and rose to 6.2 and 11.2 at days 14 and 21. White blood cells (WBC) also was affected falling from 15 to 13.95 and 8.80 on days 7 and 14.

Table 1:
Phytochemical Screening of sundried *Amaranthus spinosus* leaves.

Secondary Metabolites	Occurrence
Anthriquinone Derivative	++
Cardiac Glycosides	++
Saponins	++
Alkaloids	-
Tannins	-

NB: - means absent; + means present after Assiak et al. 2001.

Table 2: Hematological characteristics in Pretreatment and 7, 14, & 21 days after treatment.

Treatment	Blood character	Pre-treatment	Days post treatment		
			7	14	21
1	PCV (Vol/%)	43.50±0.69a	16±2.45d	28.50±1.89b	38.5±2.36c
	RBC ($x10^6/\mu l$)	8.22±0.78b	3.85±1.56	6.20±0.56c	11.20±1.96a
	Hb (g/100ml)	13.85±0.57a	5.00±1.54c	8.90±0.43b	12.60±1.2b
	WBC ($x10^3/\mu l$)	15.00±0.96	13.95±1.45	8.80±4.6	14.90±3.10
2	PCV (Vol/%)	38±2.76	37.5±2.20	34.5±2.51	33.50±1.26
	RBC ($x10^6/\mu l$)	7.98±1.68	6.95±2.28	6.85±0.25	12.50±2.03
	Hb (g/100ml)	12.2±0.47	12.00±1.45	10.5±0.86	10.70±0.45
	WBC ($x10^3/\mu l$)	12.10±1.28	9.0±3.85	13.20±3.56	22.00±2.99

NB: All means with different superscript in the same column are significantly different (P<0.05)

Table 3:
Average Weight Gain Kg/Pig/Day Pretreatment and in 7, 14 & 21 days Post-treatment.

Treatment	Pre-treatment	Days post treatment		
		7 (Kg)	14 (Kg)	21 (Kg)
1	0.13 ±0.03	0.12 $\pm0.06^c$	0.46 $\pm02^b$	0.48 $\pm0.03^a$
2	0.10 ±0.02	0.22 $\pm0.03^b$	0.29 $\pm0.02^c$	0.26 $\pm0.06^b$

NB: All means with superscript in the same column are significantly different (P<0.05).

These characteristics were not significantly affected in the control pigs. The EEAL significantly reduced the PCV, RBC and Hb of pigs albeit temporarily. The final weight and average weight gains of the pigs were significantly improved with the administration of EEAL (Table 3).

DISCUSSION

Saponins are subgroup of glycosides and are known to cause haemolysis of red blood cells (Lawrence *et al* 1977; Roden, 1994; Mohammed, 1994). This property may have been responsible for the altered RBC, WBC profile days after application (Table 2). The final weight and average weight gains of the pigs were significantly improved with the administration of EEAL. This may have been as a result of some unidentified growth factors (UGF) present in natural plant products and the vermifuge effects (Assiak *et al* 2001). The fall in white blood cell count on 7th and 14 days indicated immune-suppression. There is therefore the need to back up treatments with antibiotic wherever and whenever this is indicated.

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