Anthelmintic Property of Fresh Cassava (*Manihot esculenta*) Leaves Incorporated in the Diet of West African Dwarf Goats

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Key words : cassava leaves ,feeding ,anthelmintic property ,West African Dwarf Goats ,Cameroon

Introduction Poor socio-economic status and management ,malnutrition and parasitic diseases are major constraints limiting productivity of goats in the tropics .The exorbitant cost of standard drugs against parasitic infections and development of resistance limit their use by marginal poor farmers .The present study investigates the anthelmintic and anticoccidial properties of cassava leaves incorporated in the diet of West African Dwarf goats (WAD) in Cameroon .

Materials and methods During a 90 days study period 18 female and non-pregnant WAD naturally infested with gastrointestinal parasites (GI) were randomly distributed into 3 treatment groups (T0 ,T1 & T2) of 6 animals each .All the animals were placed on *Brachiaria ruziziensis* , *Pennisetum purpureum* and *Trypsacum laxum* .Chopped fresh cassava (*Manihot esculenta*) leaves (CL) were supplied in feeding boxes as follows : 0 (T0) ,400 (T1) and 800 (T2) g CL / animal / day .Rectal faecal samples were collected at the start and thence every 10 days to determine the evolution of GI as described by Soulsby [1972] .The critical efficacy (E) for each species following treatment was calculated using the formula : E={OP/(OP+OR)x100} ; where : OP= the parasite ova / oocysts passed before treatment ; OR= the parasite ova / oocysts passed after treatment .The obtained data were submitted to ANOVA ,Student's t test and regression analyses .

Results and discussion The average acceptance of the leaves was high (above 78% intake rate) and increased steadily to a peak at 100% on day 40 for both treatment groups .The nature of faeces passed was comparable between the control and treatment groups .Nematodes and coccidia were the main infestations recorded with 100% infestation rates for *Eimeria* ,*Trichostrongylus* , *Chabertia* and *Oesophagostomum spp* , 27 .78% for *Haemonchus* ,*Strongyloides* 16 .67% and *Moniezia spp* . 5 .56% .During the study treatment with 800 gCL/animal/day showed significantly higher critical efficacy than for 400 gCL/animal/day and natural elimination (control) rates for nematodes .However ,both CL treatment groups showed better results for *Eimeria spp* . elimination during the initial 30 days of the work than the control .Apparent increases in the faecal egg / oocyst counts observed in the study suggested reinfestation and / or maturation of intermediate stages of the gut parasites .Very high levels of parasitism and reinfestation ,even following frequent use of anthelmintics ,have been found in fully confined goats on forage cut on a short period basis from contaminated fields .The study period coincided with the rainy season and the goats used were restricted to rotational paddock grazing ,supplied extra forages and lodged in slatted floor housing with poor sanitary conditions . The anti-parasite properties in this work agree with those of Sokerya and Preston(2003) who observed similar results when cassava foliage was fed alone or in combination with grass to confined goats but there was also reinfestation amongst animals placed on grass after invermectin treatment .The regression equations derived after comparing critical efficacy of CL treatment or natural elimination of GI and duration of treatment (Table 1) revealed mild but positive gradients for nematodes in the CL groups and a negative gradient for the control group .Steeper and negative gradients were obtained for coccidia .Therefore , increase in duration of CL treatment had increasing effect on the intestinal nematodes and vice versa for the control while CL incorporation and duration of treatment seemed to have decreasing or practically no effect on coccidia .

Table 1 *Regressions for critical efficacy vs duration of treatment on gut parasites .*

Treatment	Nematodes	Coccidia
Whole study period (90 days)		
Control (0 gCL)	y=-1 ,05x+36 ,78 ; R^2=0 ,1199	y=-6 ,10x+50 ,02 ; R^2=0 ,3120
400 gCL/ goat /day	y=0 ,72x+26 ,47 ; R^2=0 ,0680	y=-9 ,89x+78 ,01 ; R^2=0 ,5220
800 gCL/ goat /day	y=0 ,80x+57 ,53 ; R^2=0 ,0354	y=-10 ,94x+79 ,96 ; R^2=0 ,6109
Before reinfestation (or during the initial 40 (Nematodes) / 30 (Coccidia) days of study)		
Control (0 gCL)	y=4 ,25x+26 ,40 ; R^2=0 ,6724	y=27 ,88x-7 ,17 ; R^2=0 ,9033
400 gCL/ goat /day	y=5 ,02x+17 ,71 ; R^2=0 ,586	y=19 ,30x+33 ,26 ; R^2=0 ,9497
800 gCL/ goat /day	y=5 ,41x+49 ,86 ; R^2=0 ,5955	y=15 ,27x+39 ,82 ; R^2=0 ,7500

Increasing the dose of CL further improved the potential critical efficacy . CL treatment had the most effect on Oesophagostomum sp and least on Eimeria spp .The therapeutic effect of cassava leaves can be attributted to its rich condensed tannin content (Sokerya and Preston , 2003 ; Lin et al , 2003) which directly interferes with metabolic activities of the parasites . However ,there is need for further research into the nature ,extraction processes and activity spectrum of cassava leaves before it can be recommended to farmers .

Reference

Soulsby ,E J .C .1972 .Helminths ,Arthropods and Protozoa of domesticated animals .*Baillière Tindall* ,London , 809pp .