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Performance And Carcass Analysis Of Growing Snails Fed *Calopogonium mucunoides* (Calopo) And *Pueraria phaseoloides* (Kudzupuero)

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Abstract

An experiment was carried out to determine the effect of feeding growing snails with two different leguminous plants, Calopogonium mucunoides, Pueraria phaseoloides, using pawpaw (Carica papaya) leaf as control. A total of 72 growing snails (Archachatina marginata) of mean weight 74.73 ± 3.5g were used for the feeding trial. The snails were randomly allotted into 3 different groups and each group was replicated 4 times with 6 snails per replicate in a completely randomized design. Snails in T_1 were fed pawpaw leaf (control), while snails in T_2 were fed Pueraria phaseoloides and snails in T_3 were fed Calopogonium mucunoides. Parameters measured were feed intake, weight gain, shell length and width and feed conversion ratio. The feeding trial lasted for 12 weeks. The results on growth performance revealed that the highest feed intake was recorded in snails fed pawpaw leaf (PL) which was similar to those fed Pueraria phaseoloides (PP), while the lowest feed intake was recorded in snail fed with Calopogonium mucunoides (CM). The highest weight gain was also recorded in snails fed with pawpaw leaf and Peuraria phaseoloides (PP) than those fed Calopogonium muculoides (CM). In conclusion, Pueraria phaseoloides could be used as substitute for pawpaw leaf.

Keywords: *Calopogonium mucunoides, Pueraria phaseoloides,* weight gain, feed conversion ratio, snails

Introduction

Snail farming is receiving more attention in Nigeria because snail has been found to be nutritious and command high price in the restaurants than other conventional meat such as beef, goat meat and pork. It is easy to establish snail farming because of low capital involved and the management practices are simple (Awah, 1992 ;Amubode and Ogogo 1994 ; Aribisala, 1998). The medicinal importance of snail is also another attribute for growing interest in snail farming (Akinnusi,1998;Amusan and Omidiji, 1999). The

common feeds for snail include pawpaw fruit and leaf, cocoyam leaf and tuber, sweet potatoes (Odukoya, 1998; Omole,2001) . There is competition between man and snail for these aforementioned feeds hence there is the need to look for alternative feed resources. Leguminous plants are rich in protein and could serve as feed resources in feeding livestock and they are readily available in South-western part of Nigeria as weed (Ekpenyong,1986). *Calopogonium mucunoides* and *Pueraria phaseoloides* are leguminous plants, rich in protein, well adapted to a wide range of soils and they are perennial plants and serve as green manure and cover crops (Ikisan,2000). *Stylosanthes guianensis* and *Lablab purpureus* have been used to feed snails (Okpeze *et al.*, 2007). However there is paucity of information on the use of these two leguminous plants in the feeding of snails. The objective of this feeding trial was to determine the performance characteristics of growing snails fed *Calopogonium mucunoides* or *Pueraria phaseoloides* as substitute for pawpaw leaf which is the commonly acceptable feed for snails.

Materials and Methods

The experiment was carried out at the Snailery Unit of the Institute of Agricultural Research and Training, Moor Plantation, Ibadan Oyo state, Nigeria. A total of 72 growing snails (*Archachatina marginata*) of mean weight 74.73 ± 3.5g were used for the trial. The snails were randomly allotted into 3 different groups and each group was replicated 4 times with 6 snails per replicate in a completely randomized design. Snails in T_1 were fed pawpaw leaf (PL) (control). Snails in T_2 were fed *Puereria phaseloides* leaf (PP) while Snails in T_3 were fed *Calopogonium mucunoides* leaf (CM). Parameters measured were feed intake, weight gain, shell length and width. Feed conversion ratio was calculated as the ratio of feed intake to weight gain. Feed intake was calculated by deducting the left-over feed from the feed given on a daily basis with the use of electric weighing balance. Weight gain was obtained by deducting initial weight from final weight on weekly basis with the use of sensitive weighing balance. Feed conversion ratio was calculated as the ratio of feed intake to weight gain. The snails were sprinkled with water in the morning and night using watering can. The feeding lasted for 12 weeks. At the end of the feeding trial, 2 snails per replicate were randomly selected, starved over-night and killed by breaking the shell with stone. The shell, offals and the foot (edible portion) were later separated. Dressing percentage was calculated as the ratio of the foot to the live-weight on percentage basis. The feeding trial lasted for twelve weeks. The chemical composition of the feed was carried out according to the methods of A.O.A.C. (1990). All data were subjected to statistical analysis of variance. The means were separated if found significant using Duncan Multiple Range Test (SAS, 1999).

Results and Discussion

The results of chemical composition of the forages showed that the protein content of the PP was higher than either of PL or CM (Table 1). The crude fibre was higher in CM than either of PL and PP. The summary of performance of growing snails fed different leguminous plants are shown in Table 2. There were no significant

difference in the mean initial weight of the snails as shown in Table 2 (P>0.05), thus indicating that there was no variation in the weight which may affect the results. There were significant differences (P<0.05) in the mean total weight gain of the snails. The highest weekly weight gain of 15.31g was recorded in T_1 which was relatively similar to that of T_2. The mean total feed intake showed significant differences among the treatment means (P<0.05). The highest mean weekly feed intake of 82.37g was recorded in T_1 while there was no significant difference in the weight gain between T_1 and T_2. The highest weight gain recorded in T_1 could be due to highest feed intake recorded. As reported by (Akinnusi, 1998) that there is positive relationship between the feed consumption and weight gain of snails. Again, the lowest feed intake reported in T_3 could be due to the effect of high fibre content in CM. The feed intake and weight gain recorded in T_1 and T_2 compared favourably with the observation of Greglione,

Table 1: Chemical Composition Of Pawpaw Leaf (T_1) *Pueraria phaseoloides* (T_2) And *Calopogonium mucunoides* (T_3) (% Dry Matter Basis).

Parameters (%)	T_1	T_2	T_3
Dry matter	20.84	19.75	22.56
Cude protein	23.84	24.57	22.36
Crude fibre	14.15	15.38	18.72
Ether extract	1.89	1.80	1.77
Ash	9.58	9.92	9.65
Nitrogen free extract	49.46	48.53	47.50

Table 2: Summary Of Growth Performance Of Snails Fed Pawpaw Leaf (T_1), *Pueraria phaseoloids* (T_2) And *Calopogonium mucunoids* (T_3).

Parameters (Mean values)	T_1	T_2	T_3	± SEM
Initial weight(g)	75.68^a	74.38^a	75.25^a	3.57
Final weight (g)	359.40^a	255.58^a	200.65^b	10.11
Total weight gain (g)	183.72^a	181.20^a	125.40^b	4.91
Weekly weight gain (g)	15.31^a	15.15^a	10.45^b	2.10
Total feed intake (g)	988.44^a	979.92^a	781.20^b	12.30
Weekly feed intake (g)	82.37^a	81.66^a	65.10^b	5.20
Feed conversion ratio	5.38^a	5.39^a	6.23^b	0.13

a,b: Means along rows with different superscripts are significantly different from each other (P<0.05)

± SEM -- Standard error of means

Table 3: Shell Growth Of Snails Fed Pawpaw Leaf (T_1). *Pueraria phaseoloides* (T_2) and *Calopogonium mucunoides* (T_3).

Parameters (Mean values)/cm	T_1	T_2	T_3	± SEM
Initial shell length	9.38[a]	9.37[a]	9.38[a]	0.23
Final shell length	12.07[a]	12.05[a]	12.05[a]	0.21
Total shell length increment	2.69[a]	2.68[a]	2.65[a]	0.06
Initial shell width	8.58[a]	8.59[a]	8.58[a]	0.03
Final shell width	11.15[a]	11.09[a]	11.14[a]	0.14
Shell width increment	2.57[a]	2.58[a]	2.56[a]	0.05
Initial shell thickness	0.15[a]	0.15[a]	0.14[a]	0.03
Final shell thickness	0.25[a]	0.25[a]	0.24[a]	0.05
Shell thickness increment	0.10[a]	0.10[a]	0.09[a]	0.03

a,b: Means along rows with different superscripts are significantly different from each other ($P<0.05$)

± SEM -- Standard error of means

Table 4: Carcass Analysis Of Snails Fed Pawpaw Leaf (T_1), *Pueraria phaseoloides* (T_2) And *Calopogonium mucunoides* (T_3).

Parameters (Mean values)	T_1	T_2	T_3	± SEM
Live weight (g)	258.60[a]	255.12[a]	201.34[b]	3.79
Shell weight (g)	56.40[a]	54.06[a]	40.63[b]	2.63
Offal weight (g)	53.48[a]	52.35[a]	40.63[b]	2.41
Foot (edible portion) weight) (g)	99.48[a]	97.72[b]	76.33[c]	3.13
Dressing %	38.70[a]	38.30[a]	37.91[a]	2.10
Shell/live weight %	21.81[a]	21.19[a]	20.88[a]	1.93
Offal/live weight %	20.68[a]	20.52[a]	20.18[a]	1.31

a, b: Means along rows with different superscript are significantly different from each other ($P<0.05$)

± SEM -- Standard error of means

(1992) and Odukoya, (1998). The feed conversion ratio was relatively the same in snails fed *Pueraria phaseloides* and Pawpaw leaf hence PP could be used as substitute for pawpaw leaf. No significant differences were observed in the shell length, thickness and width increments (Table 3). The result of carcass analysis as shown in Table 4 indicated that the foot weight which is otherwise referred to as edible portion was significantly affected by the treatments effect ($P<0.05$) with T_1 and T_2 having the highest values. However, the dressing percentage of the snails varied between 43.75 and 44.01%, though there were no significant differences among the treatment means ($P>0.05$). The dressing percentage reported was relatively the same with that of Akinnusi, 1998 and Aribisala, 1998. Based on the results of weight gain, feed efficiency and dressing percentage that were relatively the same in snails fed PL and PP, *Pueraria phaseloides* could be used as alternative feed for snails instead of pawpaw leaf. It could be recommended that further research should be carried out to determine the effect of these plants on the reproductive performance of breeding snails.

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