

Seasonal variations in the mean body weight, length and capture rate of cane rats (*Thryonomys swinderianus*) in Ibadan, Oyo State, Nigeria

^{*1}Okorafor Kalu A., ²Okete James A., ¹Eleng Ituna E. and ³Odaibo Alex B.

¹Department of Zoology and Environmental Biology, University of Calabar, Calabar, Nigeria

²Department of Biological Sciences, Federal University of Agriculture, Makurdi, Benue State, Nigeria

³Department of Zoology, University of Ibadan, Ibadan, Nigeria

ABSTRACT

A survey was carried out to determine seasonal variations in the mean body weight, length and number of cane rats captured or killed for sales in Ibadan and its environs in Oyo State, Nigeria. The data were collected from two processing slabs located in Odo-Ona, Kekere in Oluyole Local Government Area and Asejire in Egbeda Local Government Area between May 2007 and February 2008. A total of 6079 carcasses of grasscutters in ten months, were examined in the processing locations. The number of grasscutters caught was significantly higher ($p < 0.05$) in the dry season (4521) than in the rainy season (1558). The mean body weight of the grasscutters were not significantly different ($P > 0.05$) in the stock of carcasses examined in the two seasons. The males tend to weigh more (4.6kg and 4.9kg) than the females (3.4kg and 3.6kg) in both seasons. There was a strong positive correlation between the body weight and standard length of the adult grasscutters carcasses in the two seasons. Grasscutters in the range of 0.5 – 1.4 kg were rarely caught in rainy season and only few were caught in dry season. The large sized grasscutters (8.0 – 8.4 kg) were caught in dry season and none was caught in rainy season. Accordingly, this study concludes that there were seasonal variations in the population of grasscutters captured through hunting.

Keywords: Cane rat, Grasscutters, *Thryonomis swinderianus*, Body Weight, Standard Length, Seasonal variation, Capture rate.

INTRODUCTION

Grasscutters, also known as cane rats, are rodents which constitute 40% of mammal species, found in vast numbers on all continents other than Antarctica [1]. Rodents are important in many ecosystems because they reproduce rapidly, and can serve as food source for predators, seed dispersal agent, as well as disease vectors. Humans, however, use rodents as a source of fur, as pets, as model organisms in animal testing, for food, and even in detecting landmines [2].

Grasscutter is widely known throughout West Africa. There are two species of grasscutters belonging to the genus *Thryonomys*. These are: *Thryonomys swinderianus* known as greater cane rats which are found in Africa south of Sahara and *Thryonomys gregorianus* known as lesser cane rats found in Cameroon, Southern Sudan, and Zimbabwe [3].

The females have three mammae on each side, sited laterally rather than ventrally. The males have scrotal sac which carries the testes. The scrotum is situated within the body cavity. These features are the distinguishing features used to distinguish the male from the female. In many parts of Nigeria and West Africa, greater cane rats are hunted and trapped in their numbers as their meat is considered a delicacy [4]. It has a wide acceptability as bush meat and it is not prohibited by any religious or ritual belief [5]. The animal has a great turn-over rate for meat production within a short period [6]. This makes it a prospective source of generating income coupled with this ecotourism potential to entertain interested viewers in the Zoological gardens [7].

Grasscutters reproduce year ó round, although the births seem to peak at certain times of the year, correlated with weather conditions [8]. Grasscutters grow to a considerable weight. The mature adult male may sometimes reach more than 10kg, while females may reach 5 to 7kg [9]. [8] stated that the total body length (i.e. from the snout to the end of the tail) of adult grasscutters ranges from 35cm to 60cm and its tail length varies from 7cm to 25cm. Similarly, the body weights and external measurements indicated significant difference in the stock of carcasses recorded in two ecological zones (rainforest and savannah) with those obtained from savannah zone appearing heavier. According to [10], there was strong positive correlation between the weights and length of the adult grasscutter carcasses in the two zones (rainforest and savannah).

This study is aimed at investigating the influence of seasonal variations in the mean body weight, length and capture rate of cane rats in Ibadan, Oyo State, South-western Nigeria.

MATERIALS AND METHODS

Sources of Data Collection

Collection of samples was carried out in two locations ó Asejire dam in Egbeda Local Government Area and Odo ó Ona Kekere in Oluyole Local Government Area. The slabs along Ibadan ó Lagos express way, after Gurumaharaji, was also covered from Odo-Ona. The two locations ó Asejire and Odo-Ona are about eighteen kilometres from the University of Ibadan. The major occupations of the villagers are farming, hunting, and trading. Most of their women engage themselves in bush meat trading.

Data Collection

Fresh (undressed) carcasses of grasscutter (*Thryonomys swinderianus*), were collected on each sampling day. Data collection was carried out twice a month for a period of ten months (i.e. from May 2007 to February 2008). The data obtained from each specimen include:

- Sex (i.e. identifying the grasscutters as males and females). The presence of mammary gland in the females and the presence of scrotal sac containing the testes in males were used to differentiate both sexes.
- Weight in Kilogram (kg). This was carried out with the use of a hanging pocket balance calibrated in kilograms. Weight measurement was carried out by hooking the balance on the teeth of each specimen and hanging it on a tree to get the weight.
- Standard length (i.e. the linear measurement from the snout to the posterior end of the pelvic girdle). The length of each specimen was determined with the aid of a tape, calibrated in centimeters (cm).
- Tail length was also measured. The summation of the standard length and tail length gave the total length.

Statistical analysis such as correlation was employed in this work to establish the weight-length relationship of both sexes of the species in both seasons.

RESULTS

The survey revealed that for the period of ten months, a total of 6079 grasscutters were available in the two locations, Odo-Ona and Asejire, giving an average of 609 individuals per month (Table 1). Table 1 also shows the monthly variations in the supply of grasscutters carcasses from May, 2007 to February, 2008. The lowest percentage (4.1%) of carcasses was recorded in the month of August, while the highest percentage (17.4%) was recorded in the month of February. Table 2 shows the overall number and percentage of grasscutters carcasses available on the slabs of Odo-Ona, Kekere and Asejire per month in the rainy season (May to September) and dry season (October to February). In the rainy season, the highest percentage (27.9%) and the lowest percentage (15.9%) of the carcasses were recorded in the months of September and August respectively while in the dry season, the highest percentage

(23.4%) and the lowest percentage (16.5%) were recorded in February and October respectively. On the overall, the total number of carcasses sampled in the rainy season was 1558 while a total of 4521 were sampled in the dry season.

Table 1: Overall numbers and percentages of grasscutters carcasses available on the slabs of Odo-Ona, Kekere and Asejire collection points per month

Collection period (2007-2008)	Average number of carcasses per day (\pm SD)	Total number of carcasses per month	Percentage (%)
May	9 \pm 3.7	279	4.6
June	9 \pm 3.7	270	4.4
July	10.5 \pm 3.2	326	5.4
August	8 \pm 4.0	248	4.1
September	14.5 \pm 1.8	435	7.2
October	24 \pm 1.3	744	12.2
November	25.5 \pm 1.8	765	12.6
December	30 \pm 3.3	930	15.3
January	33 \pm 4.3	1023	16.8
February	36.5 \pm 5.5	1058	17.4
Total		6,079	100

Table 2: Overall number and percentage of grasscutters carcasses available on the slabs of Odo-Ona, Kekere and Asejire per month in the rainy season (May to September) and dry season (October to February)

Rainy season (May to September)				Dry season (October to February)			
Collection period (2007)	Average number of carcasses per day (\pm SD)	Total number of carcasses per month	%	Collection period (2007-2008)	Average number of carcasses per day (\pm SD)	Total number of carcasses per month	%
May	9 \pm 0.6	279	17.9	October	24 \pm 2.9	744	16.5
June	9 \pm 0.6	270	17.3	November	25.5 \pm 2.1	765	16.9
July	10.5 \pm 0.2	326	20.9	December	30 \pm 0.1	930	20.6
August	8 \pm 1.1	248	15.9	January	33 \pm 1.4	1023	22.6
September	14.5 \pm 2.1	435	27.9	February	36.5 \pm 3.3	1059	23.4
Total		1558	100			4521	100

Table 3: Length-frequency (cm) and percentage frequency distribution of grasscutter carcasses in the rainy season (May to September) and dry season (October to February)

Rainy season (May to September)			Dry season (October to February)	
Standard length (cm)	Frequency	% Frequency	Frequency	% Frequency
30 ϕ 34	2	2.0	4	1.3
35 ϕ 39	6	5.9	12	4.0
40 ϕ 44	15	14.7	22	7.4
45 ϕ 49	25	24.5	75	25.2
50 ϕ 54	24	23.5	66	22.1
55 ϕ 59	24	23.5	75	25.2
60 ϕ 64	6	5.9	44	14.8
Total	102	100	298	100

Table 3 shows the length frequency distribution of grasscutters carcasses in terms of standard length in centimetres. In the rainy season, the modal class occurred in the class-size of 45 ϕ 49cm with the percentage frequency of 24.5% whereas in the dry season, the mode occurred in the class-sizes of 45 ϕ 49cm (25.2%) and 55 ϕ 59 (25.2%) respectively. The weight-frequency and percentage frequency distribution of grasscutters carcasses in terms of body weight is shown in Table 4. The modal class of grasscutters carcasses recorded in the rainy season is 5.0 ϕ 5.4kg (13.7%) while that of the dry season occurred in the class-size 4.5 ϕ 4.9kg (12.4%).

Figure 1 shows the linear relationship between body length and weight of combined sexes (male and female) grasscutters carcasses in the two seasons. Pearson correlation coefficient of 0.876 in the raining season and 0.923 in the dry season depict a strong positive relationship between log-length and log-weight of combined sexes of grasscutters carcasses in both seasons.

Table 4: Weight-frequency (kg) and percentage frequency distribution of grasscutter carcasses in the rainy season (May to September) and dry season (October to February)

Rainy season (May to September)			Dry season (October to February)	
Weight (kg)	Frequency	% frequency	Frequency	% frequency
0.5 6 0.9	0	0	1	0.3
1.0 6 1.4	0	0	5	1.7
1.5 6 1.9	9	8.8	14	4.7
2.0 6 2.4	11	10.8	12	4.0
2.5 6 2.9	9	8.8	24	8.1
3.0 6 3.4	10	9.8	32	10.7
3.5 6 3.9	11	10.8	35	11.7
4.0 6 4.4	12	11.8	35	11.7
4.5 6 4.9	7	6.9	37	12.4
5.0 6 5.4	14	13.7	30	10.1
5.5 6 5.9	10	9.8	33	11.1
6.0 6 6.4	5	4.9	19	6.4
6.5 6 6.9	1	1.0	6	2.0
7.0 6 7.4	3	2.9	10	3.4
7.5 6 7.9	0	0	3	1.0
8.0 6 8.4	0	0	2	0.7
Total	102	100	298	100

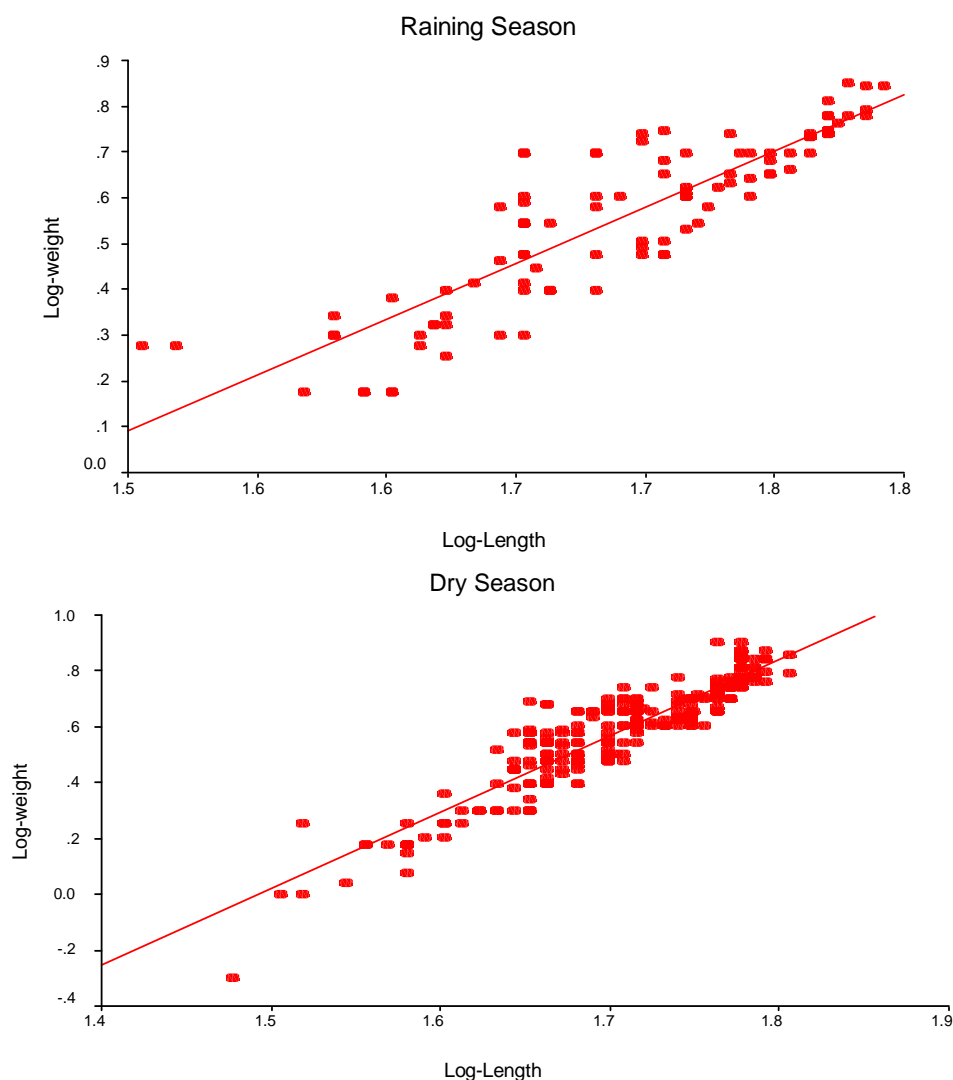


Figure 1: The Weight-length relationship of combined sexes of grasscutters carcasses recorded in rainy season (May to September) and dry season (October to February).

DISCUSSION

Grasscutters appeared to be most abundant in the two sampling areas in the drier periods of the year with the peak being in the month of February. This observation was further supported by the information gotten from the hunters and sellers of grasscutters that grasscutters are mostly hunted during the dry season than in the wet season. It also agrees with the findings of [11] who carried out a market survey of the species in Ghana. [10] also observed that grasscutters were most abundant in the drier season in Benin-City and Idah markets when he carried out a comparative study of grasscutters population in those two ecological zones. The variation in the population of grasscutters in the two seasons (Rainy season and dry season) may be due to some weather factors that may hinder the rate of hunting of grasscutters in the rainy season.

The parameters, which give the range of carcasses that were sampled in either of the seasons as 30 ó 64cm long and/or 0.5 ó 8.4kg suggest that virtually all the grasscutters hunted in the two seasons were adults. [12] reported that grasscutters mature at about five months of age and the heaviest animals at this age were 1.0kg (male) and 0.86kg (female). In terms of weight, the results from this study showed that males tend to be heavier than the females in both seasons. [10] recorded a mean weight of 4.32kg and a range of 2.82 ó 6.60kg for male grasscutters and a mean weight of 4.17kg and a range of 3.07 ó 5.55kg for the females in Benin City. On the other hand, more number of males was readily available in the sampling points than females in both seasons. [13] wrote that male grasscutters are dominant over the females. [14] and [15] observed that more number of males, older and heavier were frequently encountered in the markets. It was reported that in a given population of grasscutters, male, older and weaker animals were liable to be displaced and thereby be subjected to attack by hunters. Males lead the group [15] and are thus most prone to being trapped.

It was also observed that the grasscutters carcasses appeared heavier in the raining season than in the dry season. This may be due to the fact that their foods are more abundant in the raining season than in the dry season. Since grasscutters feed on grasses, they have enough to feed on in the raining season than in the dry season. The analysis used to determine the weight-length relationship of combined sexes of grasscutters carcasses in both seasons showed a positive correlation, that is, any increase in length leads to a corresponding increase in weight. This is to be expected because as an animal grows in length or girth, there will be corresponding increase in weight.

CONCLUSION

It has been shown in this study that the rate of capture/hunting of cane rats is probably affected by seasons. The rate of hunting is higher in the dry season than in the rainy season. Information gotten from the hunters and sellers of grasscutters in the sampling locations revealed that dryness of the environment favours hunting. The hunters attested that in the dry season, the grasses that would have created a hideout for the animals die off, exposing them to the hunters. On the other hand, rainfall will no longer hinder the hunters from entering the bush as it used to be after a heavy downpour during rainy season. Bushes also can easily be set on fire with the intention of killing grasscutters in the dry season. The aforementioned factors and some other factors can favour increased hunting of grasscutters in the dry season.

Only adult grasscutters were hunted in the two seasons. This suggests that grasscutters mature early and the males tend to be heavier than the females. Grasscutters carcasses are heavier in the rainy season than in the dry season. Their foods are more abundant in the rainy season since they feed on grasses. There is a positive correlationship in the weight-length relationship of grasscutters.

REFERENCES

- [6] S.S. Ajayi. The Biology and Domestication of African giant rat (*Cricetomys gambianus*). Department of Forest Resources Management University of Ibadan, Ibadan. **1974**.
- [5] A.A. Alarape. Grasscutter (*Thryonomys swinderianus*) breeding as a source of effective income generation. Green magazine. 1999 edition. **1999**.
- [12] E. O. A. Asibey. *Symp. Zool. Soc.*, **1974a**, 34:251-263.
- [15] E.O.A. Asibey. *Biological Conservation*, **1974b**, 6(1):32 –39.
- [11] E.O.A. Asibey. Wild Animals and Ghana Economy. Department of Game and Wildlife, Accra Ghana 48pp. (Mimeogr). **1969a**.

-
- [13] E.O.A. Asibey. Grasscutter (*Thryonomys swinderianus*) as a source of bush meat in Ghana. Department of Game and Wildlife, Accra, Ghana: 44pp. (Mimeogr). **1969b**.
- [9] R. Baptist and G.A. Mensah. *World Animal Review*, **1986**, (60):2 – 6.
- [1] M.D. Carleton and G.G. Musser. *Mammalian Species of the World*, 3rd edition, **2005**. Vol.2, p.745.
- [3] G.B. Corbet and J.E. Hill. A World list of Mammalian Species. Published by Natural History Road London SW 75 BD. PP. 207. **1991**.
- [10] I.A.A. Ejima. *The Zoologist* . **2003**.Vol. 2(1) 46 – 55.
- [14] F.R. Ewer. Form and function in the grasscutter, *Thryonomys swinderianus*, Temm, (Rodentia, *Thryomyidae*) Ghana, J. Sci.,**1969**. 131 ó 149.
- [7] L.O. Falade, M.Sc Thesis, University of Ibadan (Ibadan, Nigeria, **1999**).
- [8] J. Kingdom. East African Mammals. Vol. i and ii. Academic Press. London Publ. **1971**. 758.pp.
- [4] D.R. Rosevear. The Rodents of West Africa. London. British Museum (Natural History). **1969**, pp 452 ó 458.
- [2] M. Wines. òGambian rodents risk death for bananas,ö the Age. The Age Company Ltd. **2004**.