YIELDS OF PROTOPTERUS ANNECTENS (OWEN) FROM RIVER RIMA AND GORONYO DAM, SOKOTO STATE.

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Abstract
Ninety five (95) specimena of *P. Annectens* (Owen) weer caught from Goronyo Dam (26) and River Rima (69) and analysed for theitr flesh and waste yieldd. The analysis was based on monts and sub-seasons/seasons. The result revealeds flesh yeild of 44.29±2.52 in August to 49.46± to 5.68 in October which was not significant in samples from River Rima. The flesh yield from samples in Goronyo Dam ranged from 46-95±2.43 in June to 54.28±3.36 in September indicating significant difference between the months. The waste yield also varied significantly in samples from Goronyo Dam 45.72±3.36 in September to 53.05± 2.43 in June. However the results indicated non-significance (P>0.05) difference in samples from River Rima with a range of 50.54± 6.68 in October to 55.71±2.55 in August. Similarly the flesh yields were found to be higher during the dry season than in the rainy season. The sample specimens were found to contain enough flesh thereby creating potentialities to canning industries. The yileds and fish weight exhibited rectilinear relationship with highly significant (P<0.01) correlations and the coefficients (b) of the predictory yield equations for flish-weight and waste-weight were fractions of one. (1)

INTRODUCTION

Protopterus annectens (Owen), commonly known as African lungfish is the only survivor species of primitive family Lepidosirenidae occurring in West African fresh waters (Reed et al 1967). This ancient fish used to be very unpopular because of the traditional taboos and belief associated to the eating of the species. However, market survey indicated that significant catches are on the increase and people admit the palatbility of the flesh. In Sokoto, (where this study was conducted) hardly you meet a fish processor without samples of this fish fried for scale to consumers.

Information on this species is only concentrated on its taxonomy and biology (Reed et al., 1967; Lewis, 1974, Malami et al., 2007 and Oniye et al. 2006). Data on the flesh and waste yields of this important species are unavailable to the authors, however, may works on the tpic have been reserached on ohter speceis (Balogon and Adebayo 1996); Ketiku and Akinsiku 2000; Ipinjolu et al. 2004; Fagbenro et al., 2005). This paper presents the results of the analysis of the flesh and waste yields of P. Annectens with a view of providng information of its potentials or use by canning industries in order to ensure sustainable supply of highly rich proteinous source to consumers.

MATERIALS AND METHODS.

The fish samples were caught using cast and gillnets from the two most important water bodies (River Rima and Goronyo Reservioir) in Sokoto State. Samples so obtained were either alive or very much fresh and were immediately stunned (in the case of life samples) and packed in cold boxes carrying ice flakes for onward tranportation to control laboratory of the Facultry of Agriculture, Usman Danfodiyo University, Sokoto.

Sharp knives, dissecting scissors and otehr assocaited dissecting material were maximimally used for the separation of the

fish into its various anatomical components, individual fish samples initally weighed before sepeparation into their anatomical fractions in order to obtain total weight. The annatomical fractions namely; flesh, waste (head, scale, bone, fins, and skin (where obtainable) were also weighed. Each of these weights was expressed as a pecentage of the total fish weight and averages were obtained.

Monthly. sub-seanal, seanal variations of all parameters under anatomical analysis of variance, means were separated using New Duncan's Multiple range test (Steel and Torrie, 1980). Similarly, correlations and regresson analysis including predictory equations for flesh and waste yields were computed using linear regression analysis

RESULTS

The results of the monthly percentage flesh and wate yields of P.annectens in River Rima and Goronhyo Reservoir are contained in Table 1 and 2 respectively. The percentage flesh yield of samples from River Rima ranged from 44.29±2.52 in Auaugst to 49.46±5/68 in October. There were no significant differences (P>0.05) in the flesh yield of the soecies between the months. However, samples from Goronyo Reserviour showed marked difference in the percent flesh yield. Percent flesh yield in September in samples from Goronyo Reserviour (54.28±3.36) was significantly higher (P<0.05) than those of the other months. The waste yield indicated non-significant difference in samples from River Rima (50.54 6.68 in October to 55.71±2.52 in August). But the waste of 45.72±3.36 in September to 53.05±2.43 in Junc for samples from Goronyo Reserviour were significantly different (P<0.05)

The sub-seanal, seanal and overall analysis of the percentage flesh and waste yield for sampes from River Rima and Goronhyo Reserviour are preseted in Table 3 and 4 respectively. \In samples from River Rima, the percentage flesh yield varied between 44.40±4.99% in the flood sub-season and 48.51±,23% in early dry sub-season. While the waste ranged from 51.49±5.28 in early dry to 55.59±4.99% in the flooed subseasons. The seanal results showed that flesh yield was significanly higher (P<0.05) during the dry season (48.51±5.23% than in the rainy season (45.82±5.05%). The total waste as usual, follwed the normal trnd, being significantly higher (P<0.05) during the rainy reaon (54.17±5.05).

From samples from Goronyo Reserviour the percentage felsh yield ranged from 47.05±3.3 in rainy sub-seasons to 62.76 in mid-dry sub season. The percentage total waste ranged from 37.24 to 52.94±3.34 for both mid-dry and rainy-seasons, respectively.

The correlation matrix of the anatomical yields of *P.annacens* is depicted in Table 5 and 6 samples from River Rima and Goronyo Reserviour, respectively. In samples from River Rima, the total weight-gutted weight of the species exhbited positive correlation)r=0.99) while samples from Goronyo Reserviour showed a perfect linear relationship (r=0,99); however both were highly significat (P<0,01). An inverse non-significant relationship (-0.205) was observed between gonad and kidney in samples from River Rima. Scale and gonad, fins and liver, gutted weight and goand and gall bladder and kidney showed significant (P<0.05) positive relationships in samples from booth locations.

The result of the predictory equation of the flesh and waste yields of *P.annectens* is presented in Tables . The regression coefficients were highly significant for both yields in the two locations. However, b values in samples from Goronyo Reserviour were higher in all cases.

Discussion

Protopterus annectens was conspciously absent during the peak of the dry season confirming the observed behaviour of the

species by Ree et al (1967), Lewis (1974) and Oniye et al (2006) that the species hibernate in a cocoon during the dry season until the next rainy season when it wakes up to continue its normal activities.

The average flesh yield of samples *P. Annectens* used in this research was 48.13±5.42% which could be considered modrate and hence good candidates for acqulture and cottage industries (Balogun and Adebayo 1996). The percent flesh yields were observed to be higher during the flood sub-seasons than in the rainy sub-seasons. This could be attributed to the fact that the species might have just awakened during the on set of rain with little feeding (Reed et al 1967). However, during the flood season the species must have stablized and had regained all its lost energy.

The sub-seasonal variation in the flesh and waste yields of this species between the two locations in an indication that the seasonal productivity of the two water bodies are differnt. While in Rima, the flesh yield was higher during early dry (immediately after rain) and rainy sub-seasons, that of Goronyo was higher during the flood sub-season. In general, flesh yield for samples from Goronyo Reserviour was higher which indicates more productivity and food availability than in moving water of River Rima. Ballogun and Talibi ((1986) observed that the interplay of nutrtional, physiological biotic and climatic factors could facilitate favourable growth and allowfish flourish. This could be the reasons why fish from Goronyo were having more flesh yield than their counterparts in River Rima

The pattern of relationship between flesh fish and weight and waste yields fish weight for *p. Annections* was directed and represented by linear regression equation. An inverse rwlwtionship between fleah and yield was observed, that is as flesh yield increases, the waste yield decreases and vice-versa as described by the relative value of b.

Conclusion and recommendations

The present investigation has revealed variations in the proportions of flesh and waste yields of *p. Annections* in the two water bodies. Goronyo reserver's samples appeared to have more flesh than those from river Rima, however, both were found to be promising in satisfying the requirments of aquaculturists. It is in view of this that we recommend the ways of culturing this species in large scale for prospective buyers in the canning indusries who may wish to utilize the flesh of this species. The waste generated by this species is quite substantial and therefore should not be allowed to go as waste. This calls for creation of small scale industries for both food and non-food by-products production.

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