SOME ASPECTS OF BIOLOGICAL STATUS OF *Clarias gariepinus* IN RIVER ILAGIL, NGURORE, YOLA-SOUTH LOCAL GOVERNMENT AREA, ADAMAWA STATE-NIGERIA.

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ABSTRACT
Some aspects of biological status of clarias gariepinus in River Ilagil, Ngurore, Yola-South were studied between May and October, 2009. Length-weight regression analysis showed that the "b" values of male (1.220), and female (0.507) exhibited allometric growth. There was significant correlation (P<0.05) between length and weight of both sexes. The monthly mean range condition factor of males (1.04±0.062 to 1.44± 0.191). females (1.09± 0.011 to 1.50± 0.053) indicated that the species were in relatively stable condition throughout the period of study, while the fecundity values (790.90±871.73 to 1258.80± 527.05) observed was generally low. Condition factor and fecundity were not significantly different (P>0.05) in variability within months.

KEYWORDS: *CLARIAS GARIEPINUS*, LENGTH-WEIGHT RELATIONSHIP, CONDITION FACTOR, FECUNDITY

INTRODUCTION

Clarias gariepinus is distributed throughout Africa form the Nile Delta to Orange River (Bruton, 1998). It is the freshwater species with the widest latitudinal range in the world (Hecht et al 1988). It is a highly priced fish in Yola area and therefore of considerable economic important.

The normal habitat of clarias species is in tropical swamps and rivers which are subject to seasonal drying like river Ilagil, the fish as a result is highly specialized to suit changing environment. Holden and Reed (1972) observed that Clarias can reach a size of 1 metre in length and 7 kilograms in weight. The fish possess specialized structures which enables it to survive outside for several hours. Hitherto, Tilapia were the most widely cultivated fin fish in Africa but Clarias is now widely accepted as the most distinguished candidate for African aquaculture (Haylor, 1989).

Clarias gariepinus has high consumer preference in ranking (Ritcher, 1976). It is generally considered to be one of the most important tropical fresh water fish species for aquaculture (Dada and Wonoh, 2003).

The knowledge of the conditions of the fish in river Ilagil where it is found to be prevalent is required for proper management in developing the fisheries. This paper discusses the length-weight relationship, condition factors and fecundity of *clarias gariepinus* in river Ilagil, Ngurore, Yola-south local government area Adamawa state-Nigeria.

MATERIALS AND METHODS

River Ilagil is located and flows across Ngurore, Yola-south local government area of Adamawa state within the north eastern region of Nigeria. Yola-south local government is located at latitude $9^{o}14'$N and longitude $12^{o}18'$E and area covers about 1,213km and it situated in the Sudan Savannah Vegetation Zone of the country Fig.1. (Adebayo, 2004).

One of the biggest cattle market situated at Ngurore in the North east sub-region of Yola-South and the river Ilagil serves as a dumping site of waste generated from the market.

Fish species were sampled from river Ilagil fortnightly for a period of six months; from May to October, 2009. Fish were sampled using gill nets of different mesh sizes (i.e 2" 2.5"), which was set at morning hours (5:30-9:00AM). *Clarias gariepinus* were selected from the catch and were transported to the laboratory for laboratory measurements.

Laboratory measurement was done as described by Olatunde (1983), and sex determined according to DeGraaf and Janseen (1996).

Length-weight relationship was determined using the conventional formula described by Olurin and Aderibigbe (2006).

$W = aL^{b}$

Where, W = weight (g)

L = total length (cm)

a = constant

b = exponent of values

The log transformed data gave a regression equation.

$Logw = Loga + b \log L$

The condition factor was determined for individual fish using the conventional formula described by Olurin and Aderibigbe (2006).

$$K = \frac{W \times 100}{L^{3}}$$

According to Khanna and Singh (2003), fecundity can be determined using gravimetric method. Matured ovaries were carefully removed and preserved in 10% formalin in Petri dish. The weight of ovaries was determined and 3 samples of 100mg each was taken at random from anterior, middle and posterior parts. The numbers of eggs in each sample was counted under a binocular microscope.

$$F = \frac{S \times OW}{100}$$

Where,

F = Fecundity

S = Average number of eggs from 3 samples of 100mg each

OW = Total weight of ovary

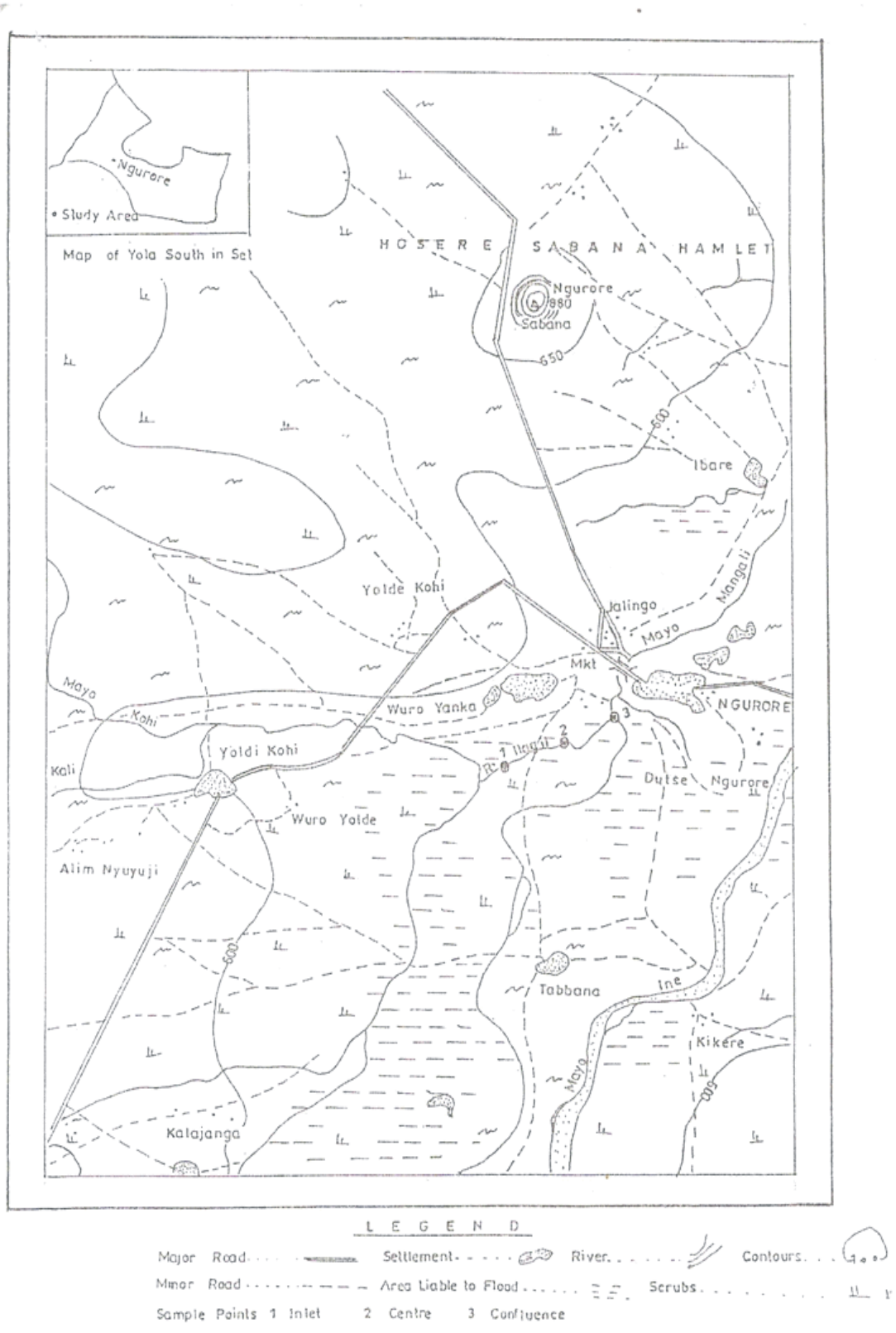

Fig. 1 Map of River Ilagil, Ngurore Showing Sample Sites and Map of Yola-South L.G.A (In Set)

RESULTS

The total number of fish examined was 146 (95 males and 51 females). The results of length-weight regression analysis of *Clarias gariepinus* is shown in Table 1. The "b" values for males (1.220), and females (0.507) show allometric growth. The length-weight relationship of males and females showed linear relationship with significant correlation of 0.069 and 0.840 respectively ($P<0.05$).

The monthly mean condition factor values of male *Clarias gariepinus* Table 2, ranged from 1.04 in July to 1.44 in September, while that of female Table 2, ranged from 1.09 in July to 1.50 in May. There was no significant difference ($P>0.05$) in variability within months. Table 3, shows the monthly mean fecundity which ranged from 790.90 in the months of July to 1258.80 in the month of May. There was no significant difference ($P>0.05$) in variability within months.

DISCUSSION

The result of length-weight regression analysis showed that from the "b" values, males and females exhibited allometric growth. The values of "b" obtained during the period of the study shows that the increase in length is not equal in proportion with the weight under constant specific gravity. This is in consonance with the findings of Abubakar, (2006) and Haruna, (1992). Olurin and Aderibigbe, (2006) stated that there may be differences in length-weight relationship due to sex, maturity, season and environmental condition (e.g pollution). It has been observed that certain factors such as increase in weight due to intake of water or food, season of the year, and the time of the day when the fish was captured, loss of weight due to food regurgitation and spawning can among other things affects "b" values (Lagler, 1952).

The mean condition factor values indicated that males and females were in a stable condition throughout the periods of the study. Slight fall was however observed in June and July during the period of research. This might be due to changes in the physical and chemical condition of the habitat which can affect the fish physiologically (Abubakar, 2006). This may be also attributed to changes in the available dietary items because of the seasonal variation of fish food as stated by Abdullahi and Abolude (2001) in studies of *Bagrus bagad* in Tiga Lake.

The numbers of eggs in mature ovaries of *Clarias garipeinus* ranged from 790.90 to 1258.80 which is almost inline with the observation made by Abubakar (2006). Issa (2006) reported that reproduction behaviour could be affected by environmental factors such as temperature, photoperiod, food and pollution etc. This might be the case in river Ilagil, which suffers a lot of abuse through dumping of waste and at the same time serves as the only sources of water for the residents. It was observed that fish specimens of the same length and weight had variable fecundities. Bagenal (1967) asserted that fish species exhibit wide fluctuations in fecundity among fish of the same species, size and age.

Conclusion: The biological status of *C. gariepinus* in river Ilagil exhibited allometric growth and low fecundity despite its stable condition. This might be as a result of stress imposed by the dumping of waste and other human activities in the river.

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Table 1: length-weight regression analysis of *C. Gariepinus*

Sex	No. of fish examined	Loga	b	Coefficient of correlation
Male	95	0.066	1.220	0.069
Female	51	0.438	0.507	0.840

Table 2: monthly mean condition factor

	Male			**Female**		
	Condition factor			**Condition factor**		
Month	**Total Examined**	**Range**	**X-SD**	**Total Examined**	**Range**	**X-SD**
May	11	1.25-1.03	1.14±0.114	8	1.45-1.55	1.50±0.053
June	17	1.07-1.09	1.08±0.010	7	1.18-1.10	1.14±0.042
July	17	0.98-1.10	1.04±0.062	11	1.09-1.09	1.09±0.011
August	16	1.10-1.41	1.26±0.160	7	1.09-1.44	1.27±0.185
September	16	1.62-1.25	1.44±0.191	10	1.32-1.18	1.25±0.074
October	18	1.18-1.30	1.24±0.062	8	1.43-1.36	1.39±0.037

Table 3: Monthly Mean Fecundity *Clarias gariepinus*

Month	**Total examined**	**Fecundity range**	**Mean**	**Std deviation**
May	8	756-1756	1258.80	527.05
June	7	576-2084	1237.70	794.79
July	11	488-2142	790.90	871.73
August	7	408-1946	1110.20	810.60
September	10	462-2037	974.00	830.10
October	8	590-1376	806.00	414.26