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Some Ecological Aspects of *Bagrusbayad* and *Clariasgariepinus* in Thomas Lake, Kano State, Nigeria

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A study of some ecological aspects of *Bagrusbayad and Clariasgariepinus* in Thomas Lake, Kano State, Nigeria was conducted. A total of 290 samples of *B. bayad* and 175 of *C. gariepinus* were collected by artisanal fishermen using various fishing gears including cast net, seine net and gill net. Water physico-chemical parameters of the lake which include Temperature, pH, Transparency and Dissolved oxygen (DO) were determine from the field with exception of pH and DO which were determined in the laboratory. Temperature was determined by using thermometer with range of 20.50° - 30.00°C, pH was measured by pH meter (HI98130) with range of 5.6-7.9, transparency was determined using sacchi disc with values range of 132 – 450cm and DO with values of 3.9 - 8.0mg/l by Winkler method. The fish length and weight were measured using meter rule and electric weighting balance (XY500JB) respectively. The values of regression co-efficient obtained using least square method for the length-weight relationship were 2.3641 for male B. bayad and 2.7191 for the female, the values for *C. gariepinus* were 2.6211 and 2.6765 for male and female respectively. This suggests a negative allometric growth for both the two species with “b” value less than three (b<3) in all the specimens sampled. There was no significant difference at (p>0.05) in the male and female regression co-efficient. The result for the condition factor showed range of 0.041 – 0.061 for male and 0.0066 – 0.116 for female B. bayad while 0.0024 – 0.019 for male and 0.0052 – 0.01 for female *C. gariepinus*. These values for both species was less than one indicating the fishes in the lake were not favourable due to the unfavourable environmental conditions in the Lake. The food and feeding habit of the lake fishes were analyzed using frequency of occurrence method which revealed that B. bayad were carnivorous with dietary preference of fish material (52.17%), insect part (23.48%), plant material (1.30%) unidentified materials (23.04%), while food contents of *C. gariepinus* revealed that its omnivorous with dietary preference of insect parts (42.88%), fish parts (23.80%), detritus (3.81%), plants parts (1.90%) and unidentified materials (27.62%).

Keywords: physico-chemical parameters, *Bagrusbayad and Clariasgariepinus,* Thomas Lake

INTRODUCTION

Fish and other organisms live in water. Thus, It is no surprise that professional fish culturists state that “water quality determines to a great extent the success or failure of a fish culture operation” (Piper *et al.,* 1982). Water quality includes all physical, chemical and biological factors that influence the beneficial use of water. A Lake with good water quality will produce more and healthier fish than a Lake with poor quality water (Boyd, 1998). Some of the physicochemical parameters that are regularly measured within an aquaculture pond include dissolved oxygen, alkalinity, hardness, pH, conductivity, temperature, turbidity and biological oxygen demand (BOD). Water qualities in ponds changes continuously and are affected by each other along with the physical and biological characteristics (USDA, 1996). Water quality is frequently a prominent concern where aquaculture is practiced. Maintaining a healthy environment is not only important to the organisms being cultured, but also, to the flora and fauna that are indigenous to the site, as well as the migratory species that circulate through and around the site (Environmental Review, 2008). Maintaining a good water quality in aquaculture ponds will require effective monitoring to detect changes in environmental quality that results from aquaculture operations. Some water quality factors that are more likely to be implicated with fish losses include dissolved oxygen, temperature and ammonia. Others, such as pH, alkalinity, hardness and clarity can affect fish, but usually not directly toxic (Stevens, 2007). Each water quality factor interacts with and influences other parameters, sometimes in complex ways (Meade, 1989).

The length-weight relationship (LWR) is an important factor in the biological study of fishes and their stock assessments (Haimovici and Velasco, 2000). It is also used to determine possible differences between separate unit stocks of the same species (King, 2007). Length-weight relationships are important in Fisheries Science, notably to raise length-frequency samples to total catch, or to estimate biomass from underwater length observations. It is also important in parameterizing yield equations and in estimations of stock size. This relationship is helpful for estimating the weight of a fish of a given length and also in studies of gonad development, rate of feeding, metamorphosis, maturity and condition (Le Cren, 1951and Thomas *et al*., 2003).

Length-weight relationship of fishes can be used as an estimation of the average weight of the fish of a given length group by establishing a mathematical relation between the two (Beyer, 1987 and Tebieira de Mello (2006). Like any other morphometric characters, the length and weight relationship can be used as a character for the differentiation of taxonomic units and this relationship is seen to change with various developmental events in life such as metamorphosis, growth and the onset of maturity (Thomas *et al*., 2003).

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Length–Weight Relationship (LWR) is useful tool in fish growth pattern or age determination and fishery assessment (Pepple and Ofor, 2011). Beyer (1987) reported that Length–Weight Relationship of fishes are important in fisheries biology because they allow the estimation of the average weight of fish of a given length group by establishing a mathematical relation between the two. When the b-value is less than 3, the fish has a negative allometric growth but when it is greater than 3, it has a positive allometric growth and when it is equal to 3, the fish has isometric growth

LWR is also an important factor in fish ecology and in the biological study of fishes, being of prime importance in parameterizing fish yield equations in stock assessments and management (Bagenal, 1978, Nash *et al*., 2006). LWR can also be used to calculate condition indices, to compare life history and morphology of population belonging to different regions and to study on to genicallometric changes (Tebiera de Mello, 2006:Sani *et al*., 2010). The mathematical parameter of LWR offish furnishes further information on the weight variation of individuals in relation to their length. Condition factor (K) is a factor that estimates the general well-being or relative fatness (plumpness) of the individual fish and is usually influenced by age, sex, season and maturity (Anyanwu *et al*., 2007).

In fisheries science, the condition factor is used in order to compare the “condition”, “fatness” or wellbeing of fish to determine possible differences between separate unit stocks of the same species (King, 2007). The condition factor often referred to as “K” provides information on the wellbeing of a fish and is usually influenced by the fish, sex, season, maturity stage etc. (Anyanwu *et al.,* 2007). Fulton (1902) proposed the use of a mathematical formula for quantifying or estimating the condition of fish as $K= 100W/L^b$. The role of the condition indices as stated by Stevenson and Woods (2006) is to quantify the health of individuals in a population or to tell whether a population is healthy relative to other populations. When fish of a given length exhibits higher weight it means they are in better condition (Anwa-Udondiah and Pepple, 2011).

Understanding the stomach contents of fish is useful in guiding towards formulation of artificial diets in fish culture (Fagade, 1978). Studies on gut contents of fish ascertain dietary requirements in their natural habitat, the relationship between the fish and the abiotic environment and to establish tropic inter- relationship (Ugwumba, 1988). Fish exploit food substances in an aquatic ecosystem according to the adaptations possessed (mouth, gill rakers, dentition and gut system) which are related to feeding. According to Miller and Harley (1996), food habit of fish could be related to its structural morphology, the way it captures food and how it digests it. Studies on fish structural adaptations could provide useful information on their food habits and management in ponds (Ipinjolu *et al*., 2004; and Malami *et al*., 2004). This study is aimed at determining physicochemical parameters of Thomas Lake, length-weight relationship, condition factor as well as food and feeding habit of *Bagrusbayad* and *Clariasgariepinus* in Thomas Lake.

MATERIAL AND MTHODS

Study Area

Thomas is one of the three rivers (the other two are Gari and Jakara rivers) which drain about 4,921sg km of the upland areas situated north and east of Kano city. It rises 6.24km northeast of Bichi in Kano State and transverses a length of 34.18Km before joining Gari river. The river is part of the drainage area of the Chad basin. Thomas Lake is located on Kano – Dambatta road under Makoda local government, also serving as bridge over the Tomas water flow. The lake is about 56Km north of Kano, between latitude 12°27' and 12°29'N and longitude 8°31' and 8°32'E. The lake gets its main source of water from Tomas and other small rivers. The Lake is zoned earth fill type constructed from 1975 – 1976. It's main aim is for irrigation of about 1166htrs and fisheries (WRECA,1975).

Water sampling

Water was sampled fortnightly from the lake using sampling bottles. Temperature and transparency were measured immediately, before transporting the samples to the laboratory for determination of pH and dissolved oxygen (DO).

Fish Sampling

A total sample of 290*Bagrusbayad*fish species and 175 *C. gariepinus* were collected fortnightly from the lake using seine net (20mm x 20mm fully scratched mesh size twelve meters long, combination of casts of 2-7 mesh sizes, hooks and traps with the help of the fishers were used. The fish samples were transported to the laboratory of biological science department Bayero University Kano on ice for further analysis.

PHYSICO-CHEMICAL PARAMETERS

Temperature determination

This was determined as described by Bennet & Humphries, 1974. The apparatus used to determine the temperature is division mercury in glass thermometer, Hach model. It was done by immersing the thermometer into the sampling site for about (20) seconds precisely (till the reading stabilizes) and the reading was taken, expressed in ^{0}C. The same procedure was repeated twice and the average was recorded.

pH determination

This was measured *in situ* using Hanna PH/EC/Temp/TDS analyzer model Hi 98130. The instruments will be pre-rinse and standardized (set at zero point) with distilled deionized water. After which the electrode will be dipped in to the water until the screen showed a fixed reading, and the values recorded. (HANNA Instruments, 2004).

Transparency determination

Transparency was determined directly in the field using secchi disc as described by Boyd (1984). The disc was immersed until it just disappeared and the depth recorded as T_1. The disc was then raised until it just re-appeared and depth also recorded as T_2. The average of the two readings gives the transparency values. The disc was painted with alternate black and white and was observed from above while backing the sun.

Dissolved oxygen (DO) determination

Dissolved Oxygen (DO) was determined by the modified Winkler's method (APHA, 1985).

Length and weight measurement

The fishes were identified and body length and weight were measured. The fishes length measurements taken were the total length (TL) and standard length (SL) according to Lagler (1970). Standard length (mm) were measured as the distance of the fish from its most anterior extremity (mouth closed) to the end of the caudal peduncle, while the total length (mm) were measured as the length of the fish from anterior most extremity to the end of the caudal fin. Weight of the fishes was measured to the nearest grams using electric weighting balance(Anderson, 2000). The length-weight relationship in fishes is usually determined by using the equation described by LeCren (1951).

$W = aL^b$

W = Total body weight of fish (g)
L = Standard length of fish (mm)
b = Growth exponent or regression coefficient whose value is usually between 2 and 4
a = is a constant

When weight is plotted against length, the plot usually yields a curved. A logarithmic transformation such equation gives a straight line relationship as:

$$Log W = Log a + b Log L$$

A plot of $Log_{10}W$ against $Log_{10} L$ yields an intercept equal to$Log_{10}a$ and gradient that equals 'b'. This transformation helps in an easy determination of a and b. A personal computer (PC) in computer unit of Bayero University Kano was used in computing the regression equation of $Log_{10}W$ on $Log_{10} L$ by method of least squares for each sex of the fish species of the lake.

Condition factor

The condition factor of the fishes was calculated from the length and weight relationship. The condition factor(k) was estimated from the relationship:

$K = 100w/l^b$

Where:

K = condition factor.

w = Weight (g) (Tudorancea, 1988).

l = Standard length (mm)

b = Regression co-efficient.

Food and feeding habits

The specimens were cut open and the sex and maturity stage of the fish is recorded. The stomach was removed and preserved in 5% neutralized formalin for further analysis. For the analysis, a longitudinal cut was made across the stomach and the contents were transferred into a Petri dish. The contents then kept for five minutes to remove excess formalin and then examined under binocular microscope. The gut contents were identified and the relative importance food items were determined using the following standard method (Windell and Bowen, 1978).

Frequency of occurrence

The stomach contents were analyzed by frequency of occurrence as described by Hynes (1950) and Bagenal (1978). In the frequency of occurrence method each food item was identified and number of stomach in which each food occurred was counted and expressed as a percentage of stomach containing food. The method showed the proportion of individuals eating a particular food item in a species. The occurrence of each food item was expressed as a percentage of all stomach with food.

That is, $P = (b/a) \times 100$

Where a = Total number of fish examined with food in the stomach;

b = number of fish containing a particular food;

P = percentage of occurrence of each food item.

Data analysis

Descriptive statistic was used to analyze data on physicochemical parameters and food and feeding habit using frequency of occurrence method, least square method was used to analyzefor the length – weight data. Microsoft excel computer analysis package was used in the data analysis of the study.

RESULTS

Physico-chemical parameters

The surface water temperature ranged from 20.50°C to 30.00°C with mean of 26.13°C ± 6.2. The highest value of 30.00°C was recorded in the month of April, while the lowest value of 20.50°C was recorded in December. The temperature is within the favourable range for growth of fishes and it remain high throughout the season (Table 1)

The pH of the water ranged from 5.6 to 7.9 with a mean of 6.58 ±2.3. The highest value of 7.9 was recorded in the month of April, while the lowest value of 5.6 was recorded in August. (Table 1).The pH of the lake obtain in this study was within the favourable range for the growth of the fishes.

The transparency of the lake ranged from 132cm to 450cm with a mean of 294.75cm. The highest value of 450cm was recorded in the months of March and April while the lowest transparency value of 132cm was recorded in September (Table 1).

The dissolved oxygen (DO) in the lake ranged from 3.9 - 8.00mg/l with mean value of 6.74 ± 1.14mg/l. The highest value of 8.00mg/l was recorded in June while the lowest value of 3.9mg/l was obtained in Septemberduring the rainy season (Table 1). The DO was generally low in the middle of the rainy season.

Length – weight relationship

The result for length-weight relationship showed that the b value for male *B. bayad* as 2.3641 and 2.7141 for female, while 2.6211 and 2.6765 were the b- values for male and female *C. gariepinus* respectively. The length-weight relationship and logistic length-weight relationship of the lake fishes are shown in figure 1 – 2.The best-fit regression of weight (WT) on standard length (SL) by method of least squares presented the following relationship:

$W = 0.0004L^{2.3641}$ or $Log W = 2.3641L – 3.4026$ ($r = 0.9042$; $P < 0.05$; $n = 175$), and

$W = 6E – 05L^{2.7141}$ or $Log W = 2.7191L – 4.2182$ (r =

Table 1: Physicochemical parameters of Tomas Lake

MONTHS	TEMPERATURE (°C)	pH	TRANPARENCY	D0 (mg/l)
July	28.8	6.3	150	7.9
August	29.6	5.6	140	5.9
September	29.8	6.5	132	3.9
October	27.4	6.7	190	5.0
November	23.5	6.9	200	6.3
December	20.5	6.5	275	7.2
January	21.0	6.5	390	7.0
Febuary	22.0	6.8	430	6.8
March	23.0	6.4	450	7.4
April	30.0	7.9	450	6.4
May	29.0	6.5	410	5.7
June	29.0	6.5	320	8.0
Mean	26.13	6.58	294.75	6.74

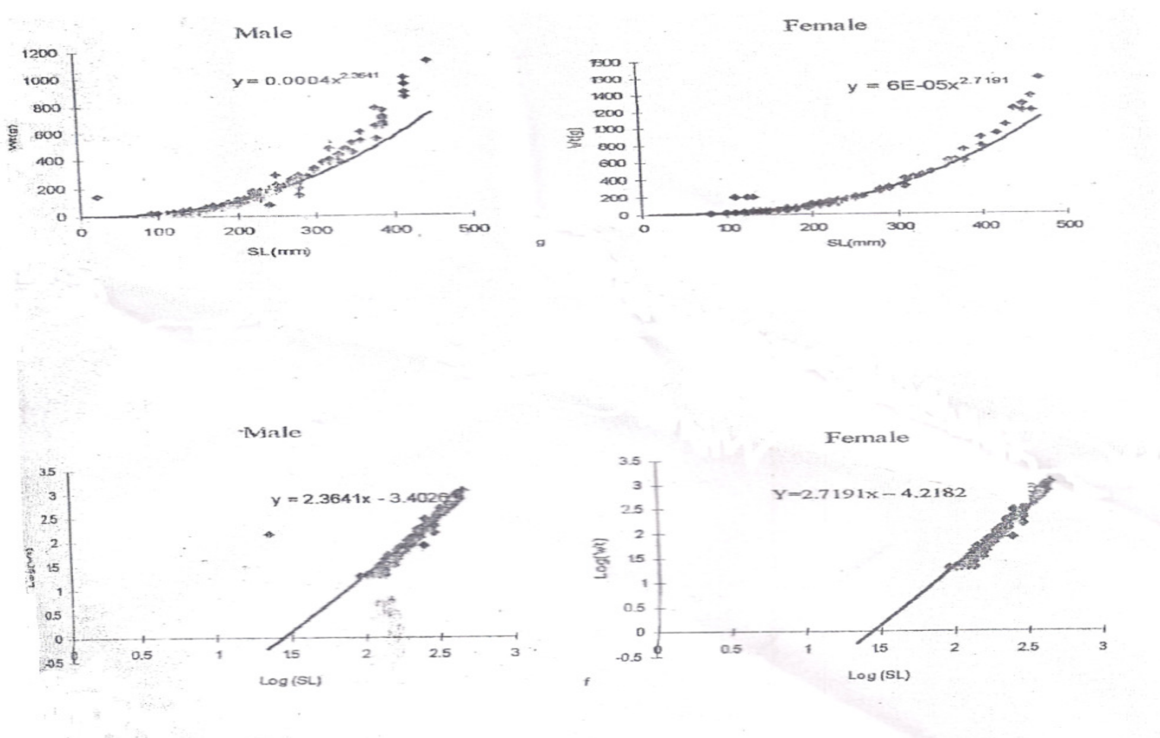

Figure 1: Length-Weight Relationship of *B. bayad* from Tomas Lake

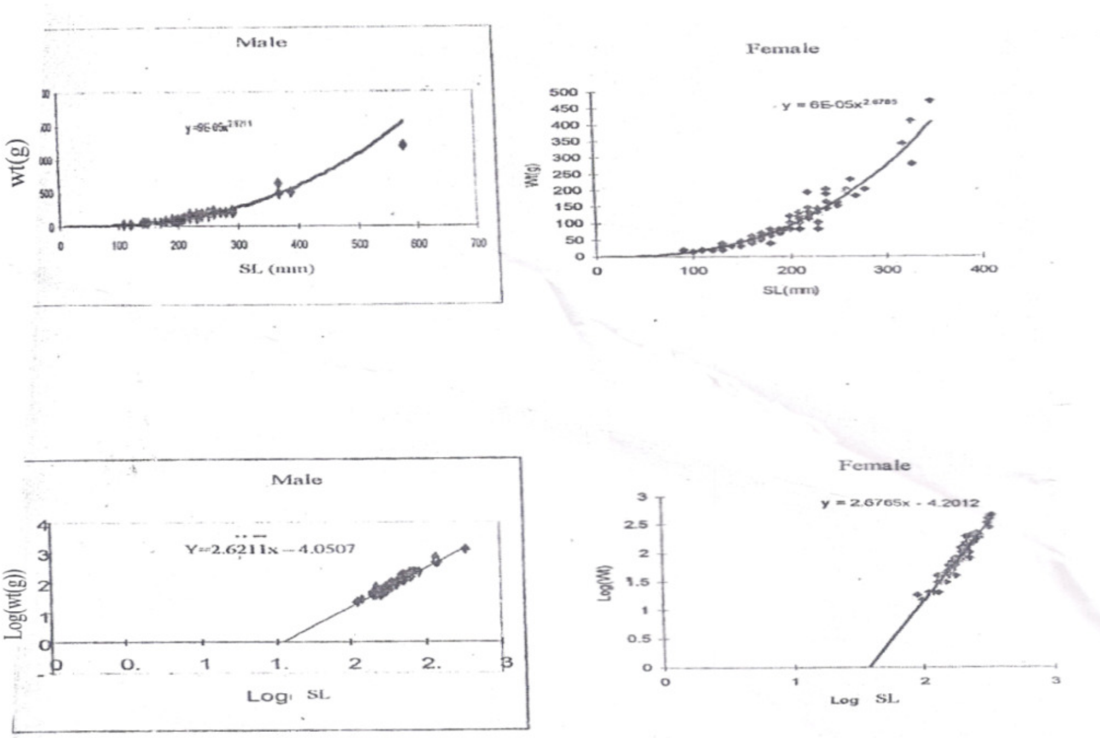

Figure 2: Length-Weight Relationship of *C. gariepinus* from Tomas Lake

0.9539; $P < 0.05$; n = 115) for male and female *B. bayad* respectively.

$W = 9E - 05L^{2.6211}$ or Log W = 2.6211L – 4.0507 (r = 0.7310; $P < 0.05$; n = 99), and

$W = 6E\text{-}05L^{2.6765}$ or Log W = 2.6765L – 4.2012 (r = 0.9648; $P < 0.05$; n = 76) for male and female *C. gariepinus* respectively.

(r = regression coefficient; n = number of samples; W = weight (g); L = standard length (mm) and P = level of probability). All the 'b' values of the fish species in the lake were less than 3.0 and were significantly varied from 3.0 ($P<0.05$) using least square method.

Condition factor

The result for the condition factor showed the range of 0.038– 0.061 for male and 0.0066 – 0.116 for female *B. bayad* while 0.0024 – 0.019 for male and 0.0052 – 0.01 for female *C. gariepinus.* The lowest condition factor was recorded for the month of January and the highest value was recorded in May for male *B. bayad* and lowest value for female was recorded in September and June while highest in the month of May. Lowest value for male *C. gariepinus* was recorded in September and highest value was in July and for the female lowest value was recorded in January and highest value was in September. The overall condition factor for both species was less than one (Figure 3-6).

Food and feeding habit

290 samples of *B.bayad* were examined. 230 (78.31%) contain food materials, 1.30% of the fish had plant parts, 23.48% of the fish contain insect parts, fish part dominated the diet with 52.17% occurrence, 23.04% of the fish contain unidentified materials and 20.69% as the percentage of empty stomachs (Table 2).

In 175 samples of *C. gariepinus,* 105 (60.00%) Contain almost all the food materials assessed in the lake. Insect parts constitute the largest part (42.86%) followed by fish parts with 23.80% of occurrence. Plants parts constitute of 1.90%, 27.62% of stomach of the fish contain unidentified materials while 40.00% contained empty stomachs. This revealed that *C.gariepinus* is omnivorous in its mode of feeding (Table 3).

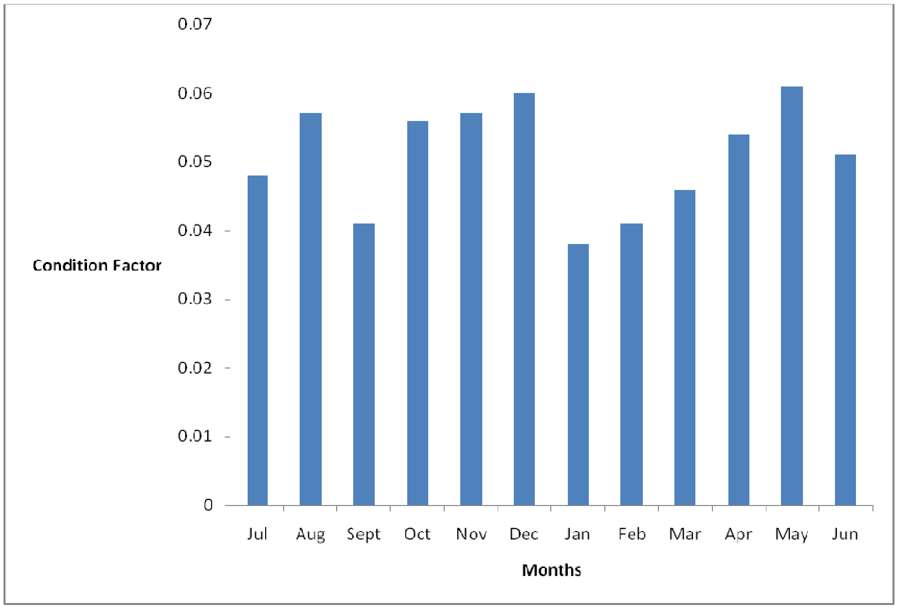

Figure 3: Mean monthly values of condition factor of male *B. bayad* of Tomas Lake

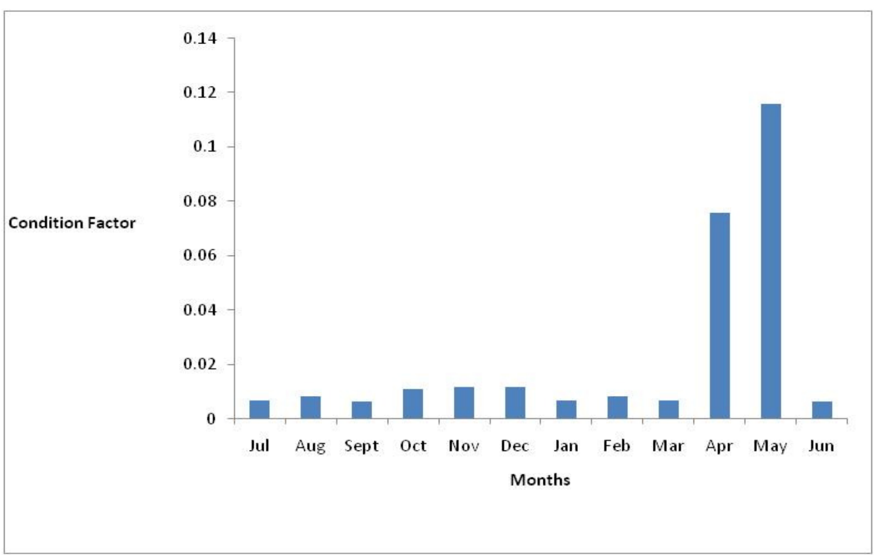

Figure 4: Mean monthly values of condition factor of female *B. bayad* of Tomas Lake

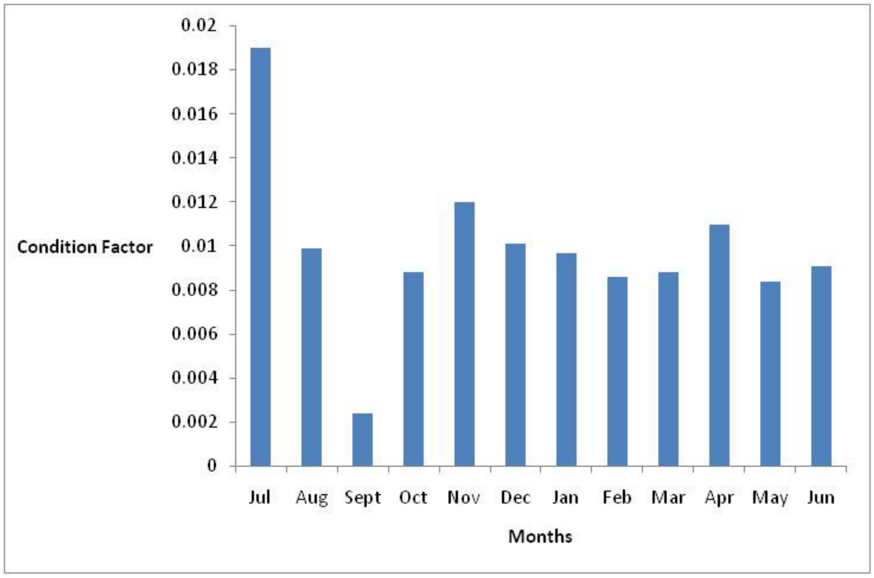

Figure 5: Mean monthly values of condition factor of male *C. gariepinus* of Tomas Lake

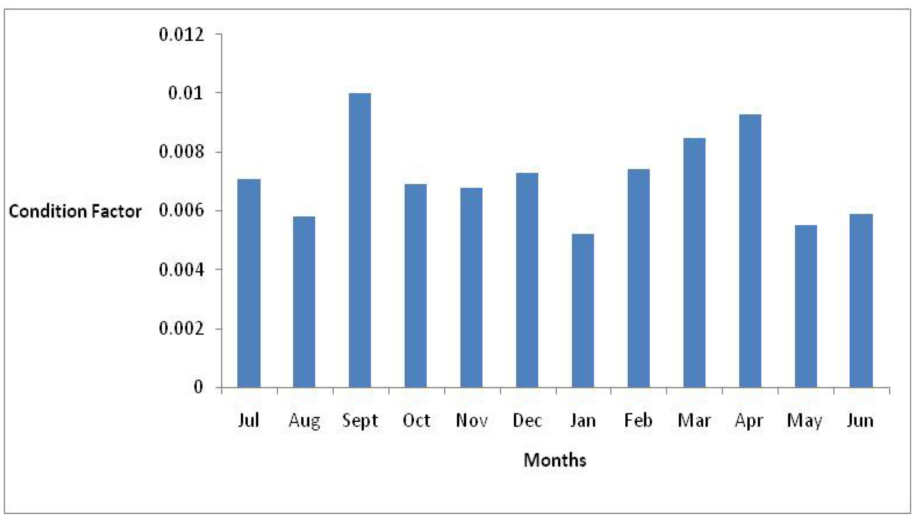

Figure 6: Mean monthly values of condition factor of female *C. gariepinus* of Tomas Lake.

Table 2: stomach contents of *B. bayad*in Tomas Lake

Species	*B. bayad*	% Occurrence
No. examine	290	
No of stomach with Food	230	79.31
Food items		
Fish parts	120	52.17
Insect parts	54	23.48
Plants parts	3	1.30
Unidentified materials	53	23.04
No. of empty stomach	60	20.69

Table 3: Stomach contents of C. *gariepinus* in Tomas lake

Species	*C. gariepinus*	% Occurrence
No. examine	175	
No of stomach with Food	105	60.00
Food items		
Fish parts	25	23.80
Insect parts	45	42.86
Plants parts	2	1.90
Detritus	4	3.81
Unidentified materials	29	27.62
No. of empty stomach	70	40.00

DISCUSSION

Physico-chemical paramters

The surface temperature of the lake fluctuated between 20.50°C in the month of December a period characterized by a cold and dusty harmattan wind to 30°C in April, a period of dry and hot wind just before rainfall start. The temperature remained moderate throughout the rainy season.

The surface water temperature of the lake is within the favourable temperature ranged of 16-30°C reported by Chapman (1992), and also Alabaster and Lioyd (1980) reported that the normal range temperature in the tropic region to which fish is adapted is between 8°C and 30°C and these make the critical thermal minimum and maximum respectively. Awwal (1995) and Sambo (1999) reported the highest value of surface water temperature in the month of April with values of 29.10°C and 24.00°C in Magaga and Dambo lakes respectively. Similar result of this study was obtained by Solomon *et al.* (2013) with valyes of 24 - 28°C of some fish pond in Gwagwalada and Kuje, Abuja. Solomon, (2011) also reported a temperature range of 26 - 28°C in botanical garden, university of Abuja for *Heterbranchus Longifillis* and *Clarias Gariepinus* At such temperatures obtained in this study, fish growth and development could be favourable with very low concentration of pollutants.

Generally the lake pH is around neutral during the dry season and tends towards slight acidic during the rainy season and this could probably be due to the dilution effect of the rain water (Haruna, 1992). The lowering of pH during the rainy season could also be due to the derived materials within the lake as reported by Boyd (1981). Change in pH indicates the presence of certain effluents particularly when continuously measured (Chapman, 1992). The pH range of 5.6 - 7.9 obtained in this study is favourable and compared with that recommend by Huet (1972) of pH 7-8 as the best for the fish production and the less variable the fluctuation in the pH the better the biological condition. Bhatnagar and Devi (2013) recommended that optimum pH level in ponds should be between 6.5 and 9.0. Adebola *et al.* (2015) reported a pH range of 6.60 to 9.15 in a reputable farm in Ibadan, Oyo state. Low pH values of less than 7 are not suitable for the production of fish including Tilapia (Nisbet and Vernaux, 1970; Belaud, 1987). Prowse (1962) states that fish die at 5.5 pH, especially if the level of the iron in solution is greater than 0.9ppm. Swann (2007) discovered that productive ponds, especially those with low alkalinity may have daytime pH of 10, which can be lethal to young fishes especially hybrid species. Lee and Gerkin (1980) reported that a prolonged exposure to low pH values below 6.5 could results in significant reduction in egg hatchability, egg laying and general growth in many fish species. Bardach,(1972) stated that Tilapia did not grow well in the acid water of west Congo. It could therefore seem that the acid condition of the lake would have adverse effect on fish growth and production.

The transparency of the lake in this study range from 132 to 450mm which is within the normal range of 17 - 42cm reported by Stepane (1959). Stepane (1956) reported that the value for transparency in Assam Lake was 20 – 50cm. Therefore transparency obtained in this study is favourable for growth and production of the fish. Mary (2004) reported that high turbidity affects fish directly by making it harder. For them to see their prey, leading to reduced feeding efficiency, reduced feeding rate and depressed growth.

The dissolved oxygen values are typical of those for fresh water systems ranging from 3.9-8.0mg/l. The values obtained follow the general trend of being higher during the early rainy season (Bankole, 2002). And the low dissolved oxygen in the rainy season (Baijot *et al.,* 1997). The same trend had been recorded in the lower reaches of the Num River (Yakubu *et al,* 1998; Udoidiong and King 2000).The range of 3.9 - 8.0mg/l seems favourable for the fish growth. The minimum requirement of dissolved oxygen for the fish growth is 5mg/l (Agarwal, 1999) and values recorded in this study agrees with the findings of Mahaman (1999) and

Bankole (2002) who reported 0.4-9.omg/l and 4.3-8.8mg/l respectively. Solomon *et al.* (2013) reported 7.13 ± 1.10mg/L to 8.50 ± 0.23mg/L in fish ponds in Gwagwalada and Kuje .However the result was in contrast with that of Haruna (1992) with values of range of 0.3-3.2mg/l in JakaraLake and Hamisu (1993) with values range of 1.70-2.60mg/l in Watari Lake. Boyd (1981) reported that dissolved oxygen of less than 2mg/l is deleterious. Payne (1970) noted reduced food consumption and growth at low levels of oxygen. High values of dissolved oxygen and transparency could be a favourable parameter in a water body.

The b-value of length-weight regression co-efficient of this study was significantly less than 3 for the studied fish species in the lake and this indicated negative allometric growth of the fishes. This agreed with Abdullahi *et al.,* (2006) who reported negative allometric growth for *B. bayad* and *Tilapia zilli*i in River Wudil. Ikongbeh *et al.* (2012) also reported negative allometric growth for *Bagrusdomac* in lake Akata. (King, 1996) also reported b-value of 2.911 and 2.794 for *Clariasgariepinus* (African sharp tooth catfish).The finding is in contrast with Ogbe *et al.* (2006) report of positive allometric growth pattern for *Bagrusbayad* from Lower Benue River. In a similar study (Ogbe and Ataguba, 2008) also reported an isometric growth pattern for *Malapteruruelectricus* from Lower Benue River. Entsua-Mensa *et al. (*1995) also reported isometric growth for *B. docmac* in Volta River because the fish the fish increases in length as it increase in weight. Variation in b-values could be due to the fact that studied species were obtained from the Dam while the work of Ogbe et al. (2006) from the river. Several other factors could be the cause of variation in b-values such as period of the year, stage of maturity, water quality and food availability. (Weatherley and Gill, 1987).

C. gariepinus showed b- values of 2.6211 and 2.6765 for male and female which indicated negative allometric growth in this study. This agrees with the finding of Bagenal (1978). It is in contrast with the finding of Srisuwantach *et al*. (1980) that reported b-value of 3.0857 for combined sexes of cultured *Clariasgariepinus,* Pepple and Ofor (2011) obtained a positive allometric growth with regression equation for the combined sexes as Log W= -2.1612+ 3.0445 Log L (r= 0.95466) for *Heterobranchuslongifilis* reared in earthen ponds in Lagos State.

In this study a very low condition factor were obtained which might be due to poor environment for the fishes and this is similar with the finding of Onimisi and Ogbe(2015), Fafioye and Oluajo (2005) reported condition factor of 0.79±0.15for *C. gariepinus* in Epe Lagoon. Anyanwu *et al.* (2007) recorded K of 0.654±0.1907 for *C. gariepinus* reared in water recirculation system.The finding is in contrast with Nwabueze and Garba (2015) with condition factor of 1.30 and 1.28 for male and female *C. gariepinus* respectively. Factors known to influence condition factor include prevailing environmental condition, availability of food, feeding intensity, density or population changes, the period and duration of gonadal maturation among others. Anyanwu et al. (2007) noted that condition factor which is an estimate of the general well -being or relative fatness (plumpness) of the individual fish may be influenced by age, sex season and maturity.

The result on food and feeding habit of *Bagrusbayad* showed that, they feed mainly on fish material, insect, sand particles, mollusc and plant material. This is in agreement with the finding of Hashem (1981) in his study of food and feeding habits of *B. bayad* in Nozha, mentioned that this species fed mainly on fish prey, crustaceans and organic detritus that are mostly composed of animal origin. This also agree with Bishai (1970) in his work on *B. bayad* in Sudan estimated that frequency occurrence of fish prey was high followed by aquatic insects and crustaceans. Malami *et al*., (2004) who reported that fish part were highly consumed than other animal followed by insect and insect part in *B.bayad.* Adikwu (1999) reported *Hydrocynus brevis* fed mainly on Alestes nurse from Tiga lake, Mahamam (1999) reported that *B. Bayad*as carnivorous in Dambo lake and Umeh (2002) reported that based on food items, *B. domac* fed on fish and decapod crustaceans. This may be due to the carnivores feeding habit of *B. bayad* to catch scarce and fast moving preys.

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