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Growth Parameters and Alliance Between Selected Morphometric Features of *Schilbe mystus* in Asejire Reservoir, Nigeria

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ABSTRACT

Background and Objective: Captive rearing of fish requires up-to-date information on key biological attributes such as growth parameters, size structure and other morphometric indices. This study thus investigates the morphometric characteristics of some key aging structures and growth parameters of *Schilbe mystus* in Asejire Reservoir, Nigeria. **Materials and Methods:** The 306 samples were obtained and weighed. Total length (TL), cleithra length (CL) and otolith height (OH) were measured. Length at first maturity (L_m), optimum length (L_{opt}), asymptotic length ($L\infty$), growth co-efficient (K) and overall growth performance index (Ø) for each sex were calculated using von Bertalanffy growth model. Data obtained were analyzed using descriptive statistics, chi-square and multiple linear regression. All statistical analyses were considered at a significant level of 5% ($p<0.05$). **Results:** The TL of the fish ranged from 11.5-22.0 cm and the body weight ranged from 8.00-74.00 g. The Log W = -1.5836+2.7015 log L described the length-weight relationship. The fish exhibited negative allometric growth (K = 1.195±0.19) while length frequency distribution showed one modal peak (14-17 cm). The growth parameters were: L_m = 12.5, 14.1 cm, L_{opt} = 12.3, 14.1, $L\infty$ = 20.4, 23.2 cm, K = 0.26, 0.05 and Ø = 2.03, 1.43 for male and female, respectively. The regression equation describes the relationship between weight, fish length and otolith, opercula and cleithra dimensions of fish. **Conclusion:** The study suggested that otolith dimensions' increase as fish length increases and therefore, otolith growth correlated with fish growth. The female *S. mystus* grows bigger and are more preponderance in Asejire Reservoir than male.

KEYWORDS

Morphometric, allometric, opercula, cleithra and otolith, *Schilbe mystus*, asejire reservoir

INTRODUCTION

The freshwater Nile Silver Schilbeid Catfish, *Schilbe mystus* (L), family Schilbeidae, is widely distributed in West Africa[1] and constituted one of the most dominant fish species in Nigeria inland waters. It is an inland foraging fish species which move in group in the middle of water with vegetation near the water's edge or below the water surface. This nocturnal species spends its entire life in freshwater but usually travel

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to flood waters for breeding during rainfall[2]. It is highly relish among low-income earners due to its good quality and tasty white flesh[3] and sold in the aquarium trade. *Schilbe mystus* is an omnivore which grows up to 70 cm in length and 250 g in weight[4]. There is a marked sexual dimorphism in the species and both male and female gonads mature at different age depending on the systems[5].

Growth and dimension of morphometric characteristic studies are of practical importance for describing the status of fish population and for predicting the potential of fisheries[6]. Studying age, growth and morphometric characteristics of fishes is necessary for their sustainable exploitation, preservation and management. In fisheries assessment, important information such as weight from a length, ontogenic allometric changes and condition index are used to predict the potential yield and to determine the appropriate size at capture for sustainability[7]. Merino *et al.*[8] pinpointed that length and weight data provide statistics that are cornerstones in the foundation of fishery research and management. In addition, hard parts such as scales, otoliths, spines, opercular bones, fin rays and vertebrae are very useful for age and growth studies, with a focus on inputs for stock assessments[9] and to produce basic information about growth parameters of fish stocks.

There are many works on age and growth of freshwater fish species in Nigerian inland waters[9-11], but there is a need to update information on age and growth of *Schilbe mystus* in Asejire Lake, Nigeria[12]. This study therefore assessed growth parameters, length-weight relationship and condition factor and morphometric characteristics of hard parts of *S. mystus* in Asejire Lake, Nigeria.

MATERIALS AND METHODS

Study area: This study was conducted in Asejire Reservoir between January and July, 2018 covering both dry and wet seasons in the area. The lake is manmade and constructed on Osun River which is the main river in the basin of Southwestern Nigeria. It is situated around 7°21'30", 7°21'50"N, 4°07'30" and 4°08'10"E, at an altitude of 137 m above sea level. The lake is Y-shaped with two unequal arms: The longer arm is River Osun, while the shorter one is River Oba[13]. The basin is inundated by floodwater of the River Oshun and its main tributary River Oba. The lake has a surface area of 24 km^{-2}, a maximum flood elevation of 152.4 m, a catchment and an impounded area of 7,800 km^{-2} and 2,342 ha, respectively. Fishing activity is prominent in the Reservoir.

Sample collection: Samples (n = 306) were collected using cast nets and surface gill nets over 8 months from December, 2018 and July, 2019. Species identification was performed with the aid of reference materials[3]. Specimens were conveyed in ice-packed bags to the wet laboratory, Department of Aquaculture and Fisheries Management, University of Ibadan for further analysis. All fish were sexed, weighted to the nearest 0.01 g and the total length measured to the nearest 0.1 cm.

Length weight relationship (LWR) and condition factor: The relationship between different length types (standard length and total length) and body weight of *S. mystus* specimens was expressed by the following equation described by Le Cren[14]:

$$W = aL^b$$

where, W is total weight, L is length and (a and b) is constants whose values were estimated by the least square method. Fulton's condition factor (K) was c alculated based on Le Cren[14] using the equation:

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

Where:

K = Condition factor
W = Weight of fish (g)
L = Length of fish (cm)

The correlation coefficient (R^2) was estimated to determine the degree of relationship between the length and weight of the samples.

Opercula extraction and measurement: The opercula bones were removed from the fish by prying them off the head with a blunt probe and ripping them off as close to the skull as possible, being careful not to crack the opercula bone. The opercula bones were dipped in a petri dish containing hydrogen peroxide for about two minutes to remove the surrounding tissues and then washed with clean water, air-dried and later examined under a stereoscope[15].

Otoliths extraction and measurement: Otoliths were removed and processed following the procedure of Gebremedhin *et al.*[16]. Otolith images were shot using Leica DM IRB stereo microscope (Microscope central, Bustleton Pike, Pennsylvania and United States of America) with camera system for size dimension. Otolith length and height were calculated to the nearest 0.01 mm. The otolith length was delineated from the midpoint of the rostrum at point A through the primordium to the posterior edge at point B, while height was measured vertically to the length passing through the primordium[17].

Cleithra extraction and dimension: Cleithera is the paired bones of the pectoral girdle that form the frame of the body wall directly posterior to the opercula cavity[18]. Cleithrum was removed and processed using the method of Gebremedhin *et al.*[16]. The structures were cleaned, placed in a vial and dried before measuring. The relationship between the otolith size (length-OL and height-OH), opercula size (OPL and OPH), CL and fish size (total length-TL and total weight-TW) were determined using a power regression model between various measurements[19]. The agreement between the models and the data was verified with the coefficient of determination (r^2).

Growth parameters: Growth was characterized using the von Bertalanffy growth function, fitted to size-at-age data using standard nonlinear optimization methods. The von Bertalanffy growth function is explained as (von Bertalanffy[20]):

$$L_t = L_\infty (1- e^{-k(t-t0)})$$

where, L_t is length at age t, L_∞ is the asymptotic length, K is the growth coefficient and t_0 is the hypothetical age at which length is zero.

The formula of Pauly *et al.*[21] was used to compute the index of overall growth performance:

$$Ø = \log K+2 \log L_\infty$$

where, K and L∞ are parameters of von Bertalanffy growth function.

Statistical analysis: Data obtained were analyzed using descriptive statistics, chi-square and multiple linear regression in Statistical Package for Social Sciences (SPSS for Windows version 20). All statistical analyses were considered at a significant level of 5% ($p<0.05$).

Ethical consideration: The authors confirm that the ethical policies noted on the journal's author guidelines page, have been adhered to and the appropriate ethical review committee approval was received. The US National Research Council's guidelines for the Care and Use of Laboratory Animals were followed.

RESULTS

Morphometric parameters of *Schilbe mystus*: *Schilbe mystus* in Asejire Reservoir had a mean TL value of 16.68±1.41 cm with a Coefficient of Variation of 8.4 (Table 1). The mean value of SL was 4.15±1.22 cm while weight has a mean value of 34.41±9.04 g and a Coefficient Variation of 26.28. The mean length of 0.12±0.02 cm with a Coefficient Variation of 18.83 was obtained for the Otolith. Otolith height had a mean value of 0.08±3.66 cm and Coefficient Variation of 52.29. Opercula length had a mean value of 1.25±1.22 cm while the mean value of Opercula height was 0.96±2.25 cm. Cleithra length had a mean value of 1.68±0.21 cm with Coefficient Variation of 12.34. The TL and SL ranged from 11.5 to 22.0 cm and 10.0 to 18.0 cm, respectively. There was no significant difference in each of the parameters taken between sexes from the population at $p<0.05$.

Morphometric parameters across sexes of *Schilbemystus* in Asejire Reservoir: The mean TL value of 16.65±0.09 and 16.89±0.18 cm was obtained for females and males, respectively. The effect of the sex was also not significant on the Standard length with mean value of 14.11±0.08 and 14.48±0.16.00 cm for females and male, respectively. The Otolith length has a mean value of 0.12±0.001 and 0.12±0.001 cm for females and males, respectively. The effect of sex was also not significant on the Otolith height. The mean value obtained for Opercula length for both sexes were 1.27±0.23 and 1.08±0.02 cm, for females and males, respectively. The effect of the sex was insignificant on the Opercula height for both sexes (0.99±0.27 and 0.75±0.02 cm for female and male, respectively). The Cleithra lengths for females and males, respectively were 1.68±0.01 and 1.69±0.03 cm.

Correlation matrix and regression coefficient for morphometric parameters of *Schilbe mystus*: The correlation matrix for the morphometric of *Schilbe mystus* in Asejire Reservoir is as shown in Table 2. The values obtained for morphometric parameters examined were significantly correlated ($p<0.05$) with each other except OH and OPH. The SL, WT, OL and CL show positive correlation with TL, while OPL and OPH reveal no significant negative correlation ($p>0.05$). The WT, OL, OPH and CL were markedly correlated with SL but OH and OPL were slightly correlated. The OPL had significant negative correlation with SL. The OL and CL had a significant positive correlation with WT while OPL showed slightly negative correlation. Table 3 depicts the regression coefficient for morphometric parameters of *Schilbe mystus* in Asejire. Total length can explain the weight of the fish in the Reservoir by 78% as revealed in the coefficient of determination (R^2) which is highly significant ($p<0.05$). Standard length can predict the

Table 1: Morphometric parameters of *Schilbe mystus* from Asejire Reservoir

					Range		
Variable	N	Mean	Standard deviation	Standard error	Min	Max	CV
TL	306	16.70	1.40	0.08	11.50	22.00	8.43
SL	306	4.15	1.20	0.07	10.00	18.00	8.63
WT	306	34.40	9.04	0.52	8.10	74.00	26.28
OL	306	0.12	0.02	0.00	0.08	0.35	18.83
OH	306	0.08	3.66	0.00	0.06	0.80	52.29
OPL	306	1.25	1.22	0.21	0.08	65.00	23.93
OPH	306	0.96	2.25	0.24	0.06	75.00	42.26
CL	306	1.68	0.21	0.02	0.60	2.30	12.34

TL: Total length (cm), SL: Standard length (cm), WT: Weight of fish (g), OL: Otolith length (cm), OH: Otolith height (cm), OPL: Opercular length (cm), OPH: Opercular height (cm), CL: Cleithra length (cm), CV: Coefficient of variation (%), Min: Minimum and Max: Maximum

Table 2: Correlation matrix for morphometric parameters of *Schilbe mystus* in Asejire Reservoir

Parameters	TL	SL	WT	OL	OH	OPL	OPH	CL
	1	0.91796	0.88218	0.32996	0.06042	-0.18874	-0.01073	0.60458
TL		<.0001	<.0001	<.0001	0.2921	0.0009	0.8517	<.0001
		306	306	306	306	305	306	306
		1	0.80542	0.3276	0.05893	-0.17323	0.03209	0.55839
SL			<.0001	<.0001	0.3042	0.0024	0.576	<.0001
			306	306	306	305	306	306
			1	0.3472	0.0816	-0.14239	0.00169	0.63491
WT				<.0001	0.1545	0.0128	0.9765	<.0001
				306	306	305	306	306
				1	0.22727	-0.09289	-0.02079	0.1902
OL					<.0001	0.1054	0.7172	0.0008
					306	305	306	306
					1	-0.02609	-0.01561	0.08467
OH						0.6499	0.7857	0.1395
						305	306	306
						1	-0.00543	-0.14279
OPL							0.9248	0.0126
							305	305
							1	0.0315
OPH								0.5831
								306
								1
CL								306

TL: Total length (cm), SL: Standard length (cm), WT: Weight of fish (g), OL: Otolith length (cm), OH: Otolith height (cm), OPL: Opercular length (cm), OPH: Opercular height (cm), CL: Cleithra length (cm) and Significant at 5% level ($p<0.05$)

Table 3: Regression Coefficient for Morphometric Parameter of *Schilbe mystus* in Asejire Reservoir

Parameters	a	b	r^2	MSE (b)	p-value	Equation
SL	0.18	0.90	0.86	0.0002	<0.0001	TL = 0.18+0.9 SL
WT	0.80	0.27	0.81	0.00027	<0.0001	TL = 1.51+0.27 WT
OL	1.51	0.32	0.24	0.0012	<0.0001	TL = 1.51+0.32 OL
OH	1.34	0.11	0.06	0.0013	<0.0001	TL = 1.34+0.11 OH
OPL	1.20	0.03	0.01	0.4284	<0.034	TL = 1.20+0.03 OPL
OPH	1.23	0.07	0.07	0.403	<0.0001	TL = 1.23+0.07 OPH
CL	1.15	0.31	0.30	0.001	<0.0001	TL = 1.15+0.31 CL

'a' intercept, 'b' slope, 'r^{2}' coefficient of determination, 'MSE(b)' Mean standard error of the slope, TL: Total length (cm), SL: Standard length (cm), WT: Weight of fish (g), OL: Otolith length (cm), OH: Otolith height (cm), OPL: Opercular length (cm), OPH: Opercular height (cm), CL: Cleithra length (cm) and Significant at 5% level ($p<0.05$)

weight of the fish up to 65% as indicated by R^2 the value (0.65). The Otolith length (OL) can predict the weight of the fish by 24% while Otolith height can only explain the weight of the fish by 6%.

Opercula length can explain the weight of the fish by 10% while Opercula height shows a significant negative correlation. Cleithra length can explain the weight of the fish by 40%. The TL, OH and CL can best predict the weight of the fish in Asejire Reservoir with significant $p<0.05$ following the stepwise Multiple regression.

The regression equation is given as:

$$WT = -62.47+4.92\ TL+25.87\ OH+7\ CL$$

This implies that the contributions of these 3 parameters are best used in predicting the age of *Schilbe mystus* in Asejire Reservoir. The SL, WT and OPH can best be used in predicting the total length of *Schilbe mystus* in Asejire Reservoir with multiple regression equation given as:

TL = 0.37+0.57 SL+0.13 WT+0.01 OPH

with high positive correlation coefficient of 0.86, 0.91 and 0.91, respectively.

Length frequency distribution and length-weight relationship: The total length recorded for *Schilbe mystus* from Asejire Reservoir varies from 11.0 to 22.0 cm while the Standard-length ranges from 10.0 and 18.9 cm, respectively. The length frequency distribution of this species is presented in Fig. 1. The weight of 306 samples of *Schilbe mystus* ranges from 8.1 to 74.0 g. The length, as independent variable (X) was regressed over the weight as dependent variable (Y) to calculate the values of "a" and "b" forming the regression equation (Fig. 2-3). The values of "a" and "b" recorded were -1.5836 and 2.7015, respectively. The regression equation obtained was:

Log W = -1.583+2.701 Log SL

The coefficient of determination and correlation coefficient was calculated to measure the degree of relationship between length and weight of *Schilbe mystus*. The value of 0.7123 was recorded as coefficient

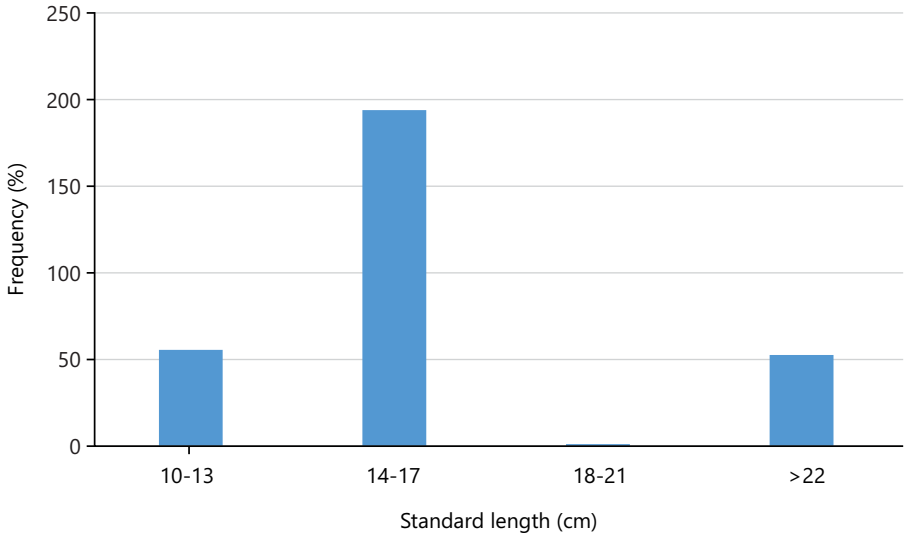

Fig. 1: Length-frequency distribution of mixed sexes of *Schilbe mystus* in Asejire Reservoir

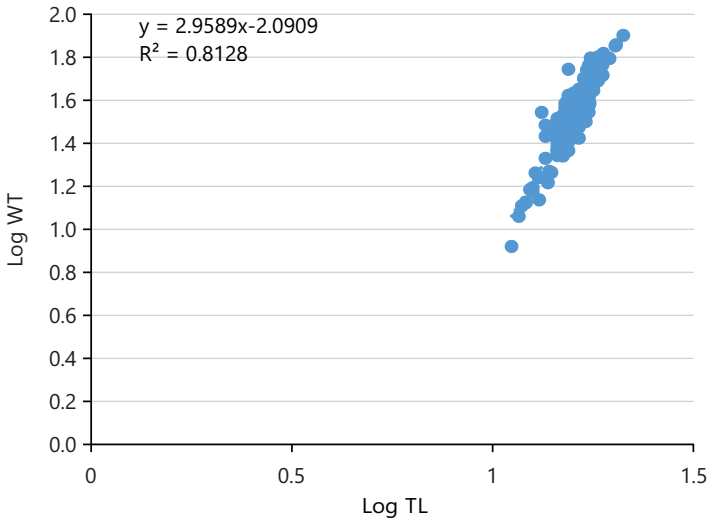

Fig. 2: Regression curve for combined sexes of *Schilbe mystus*
WT: Weigth and TL: Total length

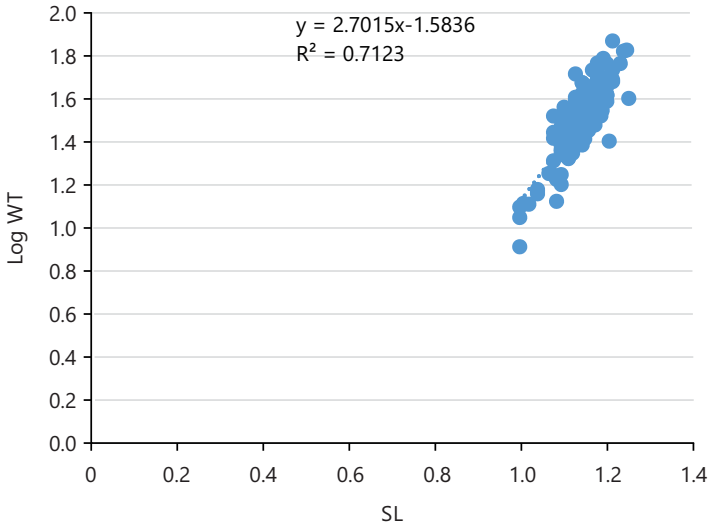

Fig. 3: Regression curve for combined sexes of *Schilbe mystus*
WT: Weight and SL: Standard length

Table 4: Growth parameters of *Schilbe mystus* from Asejire Reservoir

Variable	Male	Female	Combined sex
L_{max}	19.3	22.0	22
L_{opt}	12.3	14.1	14.1
L_m	12.5	14.0	14.0
N_{ms}	32	274	287
L′	0	0	17
L_{mean}	16.89±0.18	16.65±0.09	16.68±1.41
L_∞	20.4	23.2	23.2
L_1	16.0	12.5	16.5
L_2	17.0	13.0	18.5
t_0	1	1	1
K	0.26	0.05	0.35
Ø	2.03	1.43	2.30

L_{max}: Maximum length, L_{opt}: Length with optimum yield, L_m: Length at first maturity, N_{ms}: Number of mature specimens, L′Smallest fully selected length class, L_{mean}: Mean length in the sample, L_∞: Asymptotic length, L_1: Length associated with first peak, L_2: Length associated with first peak, t_0: Time difference between L_1 and L_2 and growth coefficient (K) and Ø: Overall growth performance index

of determination (r^2) and 0.81 was recorded as correlation (r). The marked correlation was significant ($p<0.05$) as shown in Table 3.

Growth parameters of *Schilbe mystus* from Asejire Reservoir: Table 4 contains growth parameters of *Schilbe mystus* in Asejire Lake. Length at first maturity (L_m) was 14 cm and length with optimum yield (L_{opt}) was within the range of 11.5 and 14.1, respectively. The growth parameters obtained with length frequency analysis wizard were:

L_m = 12.5, 14.0 and 14.0
L_{opt} = 12.3, 14.1 and 14.1
$L\infty$ = 20.4, 23.2 and 23.2
K = 0.26, 0.05 and 0.35

for male, female and combined sex, respectively (Table 4). Also, the value for the hypothetical age was one year. The von Bertalanffy growth model for the species is described as:

$$Lt = 23.2\ (1\text{-}exp\ (\text{-}0.35\ (t\text{-}1))$$

Overall growth performance index (Ø) was found to be 2.30, 2.03 and 1.43 total length for combined sex, male and female, respectively.

DISCUSSION

In the present study, the length-weight distributions of *Schilbe mystus* from Asejire Lake showed considerably large variations in fish sizes indicating an efficient gill net operation. The 306 specimens collected were mostly comprises of large samples and thus were considered reasonably representative and reliable. The smallest sample size corresponded to the infrequent species and the largest samples belonged to those which were frequently encountered in large numbers. Similar observation was reported by Olanrewaju *et al*.[22] for seven commercially important freshwater fishes in Asejire Lake, Nigeria. McCravy[23], however, noted that species diversity is highly determined by sampling size and sampling methods including type of gear, screen size and sorting technique. The sample size obtained from this study was like that of Khan *et al*.[24], who studied the length-weight relationships (LWR) and condition factors six fish species in Atbara River and Khash el-Girba Reservoir, respectively. The overall species sampled had more females (274) than males (32), an indication of female dominant population. This was consistent with work of Kareem *et al*.[25] and Dan-Kishiya[26], who reported the female dominance population in Erelu Lake, Oyo and Lower Usuma Reservoir in Abuja, respectively. The result showed that females were longer and heavier than males for all sampled species. Kareem *et al*.[25] also reported longer and heavier females in the sample population of *Chrysichythys nigrodigitatus* and *Schilbe mystus*. Le Cren[14] however, implied that females are heavier than males of the same length probably because of difference in fatness and gonadal development.

The growth exponential value "b" in combined sexes of *S. mystus* was 2.7 indicating negative allometric growth. Growth is said to be isometric when there is no change in body proportion and specific gravity, while allometric growth is characterized with dimensional change with growth. The "b" value calculated for *S. mystus* suggested that a unit increase in log of weight will correspond to about three times increase in log of Standard length. Famoofo and Abdul[27] reported positive allometric growth (3.012±0.14) pattern for *Schilbe uranoscopus* in Lekki Lagoon, which contrasts with present findings. Results in this study, however, showed similar trend with earlier studies involving *S. mystus* from different water bodies in Nigeria as reported by Dan-kishiya[26] in Lower Usuma Reservoir and Kareem *et al*.[25] in Erelu Lake. The condition factor (2.11±0.59) in combined sexes of *S. mystus* corresponded with the findings of Dan-Kishiya[26] in lower Usuma Reservoir and Kareem *et al*.[25] in Erelu Reservoir, Nigeria. This result indicates good environmental condition for the fish well-being, growth and survival in Asejire Reservoir.

The findings revealed that otolith dimensions' increase as fish length increases, therefore otolith growth can be correlated with fish growth. However, the otolith length had more correlation to the fish length than otolith height and other parameters. These results coincided with the report of Gaughan *et al*.[28] on *Sardinops sagax* from the South Coast of Western Australia. In this study, Otolith dimensions, Opercula dimension and Cleithra length was linearly correlated to total fish length. Moreover, relationship between Total length of fish and Standard length (SL), Weight (WT), Otolith length (OL) and Cleithra Length (CL) showed highest positive correlation. This implies that increase in Otolith Length, Weight of the fish (WT) and Cleithra length results in increasing total length of the fish with Total length as a dependent variable. This was similar to the reports on *Sardina pilchardus* from Adriatic Sea, Croatia[29], *Sardinops sagax* from North America[18] and *S. sagax* from Australia. Campana and Casselman[30] also identified significant relationship between growth rates and otolith shape in Icelandic cod, *Gadus morhua*. Otolith morphology has become an essential mechanism regularly applied to ascertain fish population structure and yearly changes. Further, Kristoffersen[31] revealed that rapid growth rates are correlated to smaller otolith sizes corresponding to fish length in various species. One of the factors considered to be affecting growth and otolith morphology is feeding condition[32]. In addition, Høie *et al*.[33], who studied maternal, paternal and temperature effects on otolith size of young herring (*Clupea harengus* L.) larvae found out that temperature affect otolith size in cultured fish. However, Begg and Brown[34] contemplate that temperature have effect on otolith growth in haddock fishery.

Fitting the seasonalised von Bertalanffy growth function to our length/frequency data gives the biological date needed for growth parameters estimation. Length frequency data offer an important record from which invaluable information concerning the recent life history of the fish could be extracted[35]. The computed value of L_∞ (23.2 cm) for combined sex of *Schilbe mystus* in Asejire Reservoir differ from values of 28.5cm and 28.7cm in Asejire and Eleyele Reservoir, respectively[12]. Also, Abdellatif *et al.*[36] obtained L_∞ = 27.5 crn for *Schilbe intermedius* in Cross River. However, larger sizes (L_∞ = 35.43cm) were obtained for *Chrysichthys auratus* in Lake Nasser, Egypt[36]. The modal class is 14-17 which had the highest frequency and accounted for 64.05% of total specimen examined indicating that most of the catches are above the size at first maturity. The overall growth performance (Ø) for *Schilbe mystus* (2.30) in this study correspond to the value reported by Ayoade[12] for the same species in Asejire (2.62) and Oyan (2.51) Lakes in Southwestern Nigeria. El-Kasheif *et al.*[37] however, obtained higher growth performance indices in males (2.689), females (2.692) and combined sexes (2.709) of *Synodontis schall* in River Nile, Gizza sector in Egypt. El-Kasheif *et al.*[37] also recorded somewhat higher growth performance index of 2.55 in *Chrysichthys auratus* from Lake Nasser, Egypt. Growth performance indices are indicators to evaluate and compare fish species from the same and/or different waterbodies.

This study revealed that the size at first maturity (L_{50}) for *Schilbe mystus* in Asejire Lake is 14.0 cm, which implies that the fish below this size should not be harvested for good reproductive cycles and recruitment of the stock. Similarly, the condition factor of the species reveals good general wellbeing and fitness in Asejire Lake, which is an indication of good environmental condition. The information became highly helpful for managing the *S. mystus* stock for sustainable use, which enhanced the economic and social status of those who depended on the stock. The limitation of this study is essentially low sample size due to shortage of funds. Thus, more fund to pursue fisheries management research in inland water for sustainable fish supply and robust livelihood for artisanal fisher folks in the areas.

CONCLUSION

The current study suggested that otolith growth is correlated with fish growth, since otolith dimensions increase as fish length increases. African Butterfish *Schilbe mystus* exhibited negative allometric growth while the length at first maturity, optimum length and length at infinity and total length, for males and females, respectively. The growth model indicated that *Schilbe mystus* belongs to one size group (14-17 cm). The female *S. mystus* grows bigger and is more preponderance in Asejire Reservoir than male. The information becomes very useful for *S. mystus* stock management for sustainable utilization, which strengthens the social and economic standard of the people depending on the stock.

SIGNIFICANCE STATEMENT

The study is significant for effective management of *Schilbe mystus* populations in Asejire Reservoir, Nigeria. The study revealed the relationship between the otolith growth and the size of *S. mystus*, which is important for the rational exploitation of this fish stock. It also provides information on length-weight relationship and condition factor to describe the present status of the stock. The study has therefore provided crucial growth parameters insight for managing *S. mystus*.

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