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RESEARCH ARTICLE

GROWTH PATTERN AND CONDITION FACTOR OF *MONODACTYLUS SABAE* AND *CYNOGLOSSUS SENEGALENSIS* IN EPE LAGOON, LAGOS STATE

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ABSTRACT

The growth pattern of *Monodactylus sabae* and *Cynoglossus senegalensis* in Epe Lagoon Lagos State was investigated. One hundred (100) samples of each species were collected from fishermen catches at the landing site. They were transported to the Department of Zoology Laboratory of Olabisi Onabanjo University for identification, sexing morphometric measurement. The results showed that 56.0% and 58.0 % of the *M.sabae* and *C.senegalensis* were female respectively while 44.0% and 42.0% were male respectively.. The length-weight relationship of *M.sabae* showed a strong regression coefficient (r = 0.944) ($p<0.05$) for the combined sex, (r =0.903) ($p<0.05$) for female and (r=0.986) ($p<.05$) for male with *b*-value of 2.5, 3.1 and 2.8 respectively. The *C.senegalensis* also showed a regression coefficient of r=0.970; $p<0.05$ for the combined sex, r=0.953; $p<0.05$ for the female and r= 0.979; $p<0.05$ for the male with b-value of 3.4, 3.1 and 3.6 respectively. *M.sabae* showed an isometric growth pattern both in male and female. The condition factor in *M.sabae* are 1.93 and 1.95 for male and female respectively while that of *C.senegalensis* is 1.95 for both sexes. Positive allometric was observed in both species except the male *M.sabae* that showed negative allometric growth pattern. From the results of this study, the growth pattern of the two species indicated a good healthy environment.

Key words: Epe Lagoon, Length-Weight Relationship, *Monodactylus Sabae*, *Cynoglossus Senegalensis.*

INTRODUCTION

The length-weight relationship of any fish is basically known to measure its growth pattern which is an important component of biological production (Onimisi and Oniye 2010). In fish, size has been known to be more biologically relevant because several ecological and physiological factors are more size-dependent than age-dependent. Also, the length-weight relationships are more important in fisheries biology and fisheries management because they allow and ease the estimation of average weight of fish of a given length (Beyer, 1987). And also it can be used to determine the condition factor in order to express the condition factor of fish in numerical terms (Wooton, 1992). The negative changes in growth rates may result in decreased individual health and reproduction success and increased risk of predation and mortality (Wooton, 1992). When b-value is <3, fish is said to have negative allometric growth while >3 is said to be positive allometric growth (Khaironizan and Norma-Rashid, 2002). Fish is said to be ideal when it maintains its shape as it grows and such fish are said to maintained a three dimensional equality with b-value equal to 3 (isometric growth).Length-weight relationship data can notably provide important clues to climatic and environmental changes, and the change in human subsistence practices (Pauly, 1984; Luff, and Bailey, 2000). Ayoade, (2011), Onimishi and Oniye (2010) and Fafioye and Oluajo(2005) among others have reported on length weight relationship of different freshwater fish species. The condition factor (*K*) which indicates the physiological state of the fish in relation to its welfare (Le Cren, 1951) also provides information when comparing two populations living in certain feeding density, climate and other conditions (Weatherly and Gills 1987).

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Thus, condition factor is important in understanding the life cycle of fish species, a tool for their adequate management and well-being (Bagenal and Tesch, 1978). It has also been used as an index of growth and feeding intensity (Fagade, 1979); and also influences the reproductive cycle in fish (Welcome, 1979). The works of Ayoade and Ikulala (2007) and Olurin and Aderibigbe (2006) among others are good literature. This study is aim to report the health status of *Monodactylus sabae and Cynoglossus senegalensis* in Epe Lagoon, Epe of Lagos State using their length-weight relationship and condition factors.

MATERIALS AND METHODS

Epe Lagoon lies between latitudes 03050'-04010'N and longitudes 005030'-005040'E is fed by River Oshun, it has a surface area of more than 243km^2 and a maximum depth of 6m though a large area of the lagoon is relatively shallow with a minimum depth of 1m, the vegetation surrounding the lagoon is of the mangrove swampy type(Balogun, 1987). Epe lagoon is sandwiched between two other lagoons, the Lekki lagoon(fresh water) in the east and Lagos lagoon (brackish water) in the west. The lagoon opens into the Gulf of Guinea via the Lagos Harbour. The average annual temperature of the area is 26.8^{0}C with average annual rainfall of 458mm (AADIL, 2011). The fish samples were identified using Field guide to Nigeria Freshwater Fishes by Olaosebikan and Raji (2013). The collection was done weekly for a period of two months from the fishermen at the landing sites of Epe lagoon and immediately transported to the laboratory in Ice box. The total and standard lengths were measured using measuring board of 50cm range and all measurements were determined to the nearest centimetres. Body weight was measured using an Ohaus digital weighing balance (Mettler Instrument). Fish samples were differentiated into separate sexes using the gonadal differentiation.

Mean Total Length, Mean Total Weight, Length weight, Length-weight relationship parameters and condition factor of *M. sabae* and *C. senegalensis*

	Monodactylus sabae			*Cynoglossus senegalensis*		
BW(g)	Male	Female	Combined	Male	Female	Combined
TL(cm)	62.49±20.30[c]	68.49±21.29[c]	65.97±20.87[c]	76.00±28.28[c]	88.99±22.55[a]	85.28±23.90[a]
SL(cm)	14.71±1.71[a]	15.56±1.52[a]	14.23±1.7[a]	15.70±1.51[a]	16.63±1.22[a]	16.21±1.42[a]
b	11.51±1.38[a]	12.03±1.28[a]	11.81±1.32[a]	12.11±1.43[a]	12.71±0.99[a]	12.4±1.22[a]
r	2.8	3.1	2.5	3.5	3.2	3.4
k	0.986	0.903	0.904	0.979	0.953	0.970
n	1.93	1.95	1.94	1.95	1.95	1.93
	44	56	100	42	58	100

Keys: BW – Body weight; TL – Total length; SL – Standard length

The numbers of specimens in each sex were recorded. Estimation of species length-weight relationship was done using the formula $W=aL^b$ (Ricker,1975), which is transformed into natural logarithmic form logW = loga + blogL, where *W* is the total weight of fish (grams), *L* is the total length of fish(centimeters), *a* is constant (intercept) and *b* is the regression coefficient (slope) (Bagenal and Tesch, 1978).While condition factor (*K*) was computed using the formula: $K=100W/L^3$ (Pauly,1983). Means of data generated were determined using descriptive statistics while significant levels of means were compared at $p<0.05$ using One-way ANOVA. Means predictions were done using Regression equation.

RESULTS AND DISCUSSION

Table 1 showed the mean total length, mean total weight, length-weight relationship parameters and condition factor of *M.sabae* and *C.senegalensis.* The mean Total length recorded from the study was14.23±1.7cm (combined sex), 14.71±1.71 (male), 15.56±1.52 (female) and 16.21±1.42 (combined), 15.70±1.51 (male), 16.63±1.22 (female) for *M.sabae* and *C.senegalensis* respectively. The mean body weight was 65.97±20.87g (combined), 62.49±20.30 (male), 68.49±21.29 (female) and 85.28±23.90g(combined)76.00±28.28 (male), 88.99±22.55 (female) for *M.sabae* and *C.senegalens is* respectively. The length- weight relationship of *M.sabae* in Epe lagoon showed strong correlation (*r*=0.986) for male, (*r*=0.903) for female and (*r*=0.9044) for the combined sex and likewise *C.senegalensis* (*r*=0.979) for male, (*r*=0.953) for female and (*r*=0,970) for combined sex indicating an increase in weight as the length increases. The male *M.sabae* showed negative allometric growth (b=2.8) while the female showed positive allometric growth (b=3.1). The *C.senegalensis* species showed positive allometric growth both in male (b=3.5) and female (3.2)..The mean condition factor (*K*) in this study showed k-value higher than 1 which is an indication of good feeding and favorable environmental conditions as condition factor is known to describe the well-being of a species or population of species in an environment (Ikomi and Odum, 1998)

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