

**Research Article**

Some aspects of biology of *Selene dorsalis* from Forcados river estuary, Niger delta, Nigeria

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ABSTRACT

The growth characteristics of *Selene dorsalis* in Forcados River estuary, Delta State, Nigeria was studied from April 2012 to March, 2014. The Length-weight relationship (LWR) of the fish was evaluated using the equation: $W = a L^b$ while determine the condition factor of the fish using the equation; $K = 100W L^{-b}$. The intercept (a) ranged from 1.74-1.82 showing high heterogeneity among the species. The growth exponent (b) ranged from 2.59-3.01 indicating negative allometric to isometric growth. The r value ranged from 0.7013 - 0.8240 for the three different categories showing good relationship between length and weight. The condition factor ranged from 1.39-2.83. The male recorded the highest value. The research findings indicated that the fish were in good condition. Thus, their seeds can be used for aquaculture purpose.

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INTRODUCTION

Over the years there have been complains in fish catch decline in the Niger Delta region of Nigeria due to crude oil spillage. As a result of this, there have been over exploitation and mismanagement of relatively unpolluted water bodies. The knowledge of aspects of biology of economic fishes of this region has become very urgent for better and sustainable management of its resources and for aquaculture purpose. *Selene dorsalis* known as the African moon fish is an economic fish native to the Atlantic Ocean. This fish belongs to the family Carangidae, Order, Perciformes with a short silver body. The head has a typical hump above its eyes and a steep frontal profile which is slightly concave in front of the eyes and possesses a lower prominent jaw (Smith-Vaniz, 1986). This fish exhibit increase in length and gain in weight which are developmental activities during its lifetime.

According to Lawson (2011), the Information on the length-weight relationship is vital in the management and conservation of fish species in its habitat. The "condition" factor is denoted by 'K' and can be used to determine the physiological condition of fish in terms of its interaction to the abiotic and biotic factors (Kachariet *et al.*, 2017). Condition factor measures the deviation from a hypothetical ideal fish where as a relative condition factor measures the deviation from the average weight or length of fish.

Previous studies have been documented on the biology of this genus. Community dynamics of the fishes and some aspects of the limnology of West African reservoirs were

studied by Ali *et al.*, (2017). Arra *et al.* (2018) worked on the reproductive biology of the African moonfish, *S. dorsalis* in continental shelf of Côte d'Ivoire fishery (West Africa) while Cordeiro and Luque(2004) studied the community ecology of the metazoan parasites of Atlantic Moonfish, *Selene setapinnis* (Osteichthyes: Carangidae) from the coastal zone of the state of Rio de Janeiro, Brazil.

Published work on the length-weight relationship and condition factor of *S. dorsalis* in Forcados River estuary is scarce, hence this study. The study was carried out to determine the length-weight relationship and condition factor of *S. dorsalis* in Forcados River estuary. The study will fill in gaps in knowledge of this economic fish species.

MATERIALS AND METHODS

The study was conducted in Forcados River estuary which lies between latitude 5° 35' - 5°35'N and longitude 5° 50' - 5°37' E. The area is a typical tropical climate region, with well demarcated rainy and dry seasons. The dry season is usually from November to April while the rainy season spans from May to October (Opute, 2000). The vegetation covers here include *Eichhornia crassipes*, *Pistia*, *Nymphaea spp*, *Trapaspp*, *Ceratophyllum spp*. Human activities includes bathing, fishing, washing, swimming, sand drenching and wood/human transportation. *S. dorsalis* samples were collected monthly between April 2012 and March 2014 from artisanal fisher folks and taken to the laboratory for analysis. The fish were sorted and

identified to the species level using the keys of Fischer *et al.* (1981); Schneider (1990); Paugy *et al.* (2003). The body weights of the fish were measured to the nearest 0.1g using a sensitive Sartorius top loading balance (Model 1106) while the standard lengths and total lengths were measured to the accuracy of 0.1cm using a measuring board. The length-weight relationship was calculated using the least square regression on log transformation given the equation: $\log W = \log a + b \log L$ and the Condition factor, k was calculated using this formula- $K=100W/L^b$

RESULTS AND DISCUSSION

A total of 583 *S. dorsalis* were investigated. The length-weight relationship, coefficient of correlation (r) and condition factor (k) for the immature, female and male are shown in Table 1. The intercept (a) ranged from 1.74-1.82 showing high heterogeneity among the species. The growth exponent (b) ranged from 2.59-3.01 indicating negative allometric to isometric growth. The r value ranged from 0.7012 - 0.8240 for the three different categories showing good relationship between length and weight. The condition

factor ranged from 1.39-2.83. The male recorded the highest value.

The “ b ” value recorded for the immature, male and female species during the study were closed to the value 3. The value 3 indicates isometric growth pattern reflecting symmetrical growth. Thus, the fish were neither too light nor heavy for their size. This record was in line with reports from the continental shelf of Côte d’Ivoire fishery (West Africa). The coefficient “ b ” in fish may be influenced by the following factors; habitat, season, gonad maturity, diet, sex, stomach fullness, preservation techniques, health, annual differences in environmental conditions amongst others (Bagenal and Tesch, 1978).

The “ r ” value was high and was consistent with reports by Ara *et al.* (2018) for this species. The condition factor recorded in this study indicated that the fish were in good condition. However, males recorded higher “ K ” than the females. This was in contrast with reports by Ara (2018) in the continental shelf of Côte d’Ivoire fishery (West Africa). The difference may be due to location, availability of resources, feeding intensity, season and reproductive state.

Table 1: Parameters of length-weight relationship of *S. dorsalis*

Sex	Numbers examined (n)	Length range (cm)			Weight range (g)			Mean	Intercept (a)	Slope (b)	Correlation coefficient (r)	Condition factor (k)
		Min	Max	Mean	Min	Max						
Immature	257	4.5	8.50	7.05	5.01	8.5	7.01	1.82	3.01	0.8240	2.00	
Female	110	4.7	18.00	9.50	7.20	34	11.90	1.74	2.94	0.8101	1.39	
Male	216	6.5	19..00	8.00	7.50	32	14.05	1.80	2.59	0.7012	2.83	

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