

GROWTH STATUS OF *SCATOPHAGUS ARGUS* (LINNAEUS, 1766) ALONG KARACHI COAST, PAKISTAN

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خلاصہ

موجودہ تحقیق میں *Scatophagus argus* (Linnaeus, 1766) کی نشوونما کا درجہ معلوم کیا گیا۔ اس عمل کے لیے *S. argus* کی حالت کے عوامل (condition factor) اور اضافی حالت کے عوامل (relative condition factor) کو نابالغ، بالغ اور مشترکہ نمونوں میں معلوم کیا گیا۔ مختلف جسامت کے کل 282 نمونوں کو ویسٹ ہارف اور کورنگی کریک کی مچھلی کی بندرگاہ، کراچی پاکستان سے جمع کیا گیا۔ حالت کے عوامل کے لیے حاصل کیے گئے اعداد نابالغ کے لیے 1.95 سے لیکر 3.70، بالغ کے لیے 2.08 سے 2.66 جبکہ مشترکہ نمونوں کے لیے 1.95 سے 3.70 تھے۔ حالت کے عوامل کے اوسط اعداد بالترتیب 177 2.34±0.05 177 2.80±0.03 اور 177 2.59±0.04 نابالغ، بالغ اور مشترکہ نمونوں کے لیے مشاہدہ کیے گئے۔ البتہ اضافی حالت کے عوامل کے لیے اعداد 0.90 سے 1.84 نابالغ کے لیے، 0.79 سے 1.17 تک بالغ کے لیے اور 0.79 سے 1.84 تک مشترکہ نمونوں کے لیے تھے۔ جبکہ اضافی حالت کے عوامل کے اوسط اعداد 177 1.10±0.03 177 0.98±0.02 اور 177 1.05±0.02 برائے نابالغ، بالغ اور مشترکہ نمونوں کے لیے بالترتیب حاصل کیے گئے۔ K اور K_n کے اعداد مثالی اعداد سے زیادہ تھے۔ یہ ظاہر کرتے ہیں کہ *S. argus* کراچی کے ساحل، پاکستان میں اچھی حالت میں ہیں۔

Abstract

Growth status of *Scatophagus argus* (Linnaeus, 1766) was investigated in present the study. For this purpose, condition factor (K) and relative condition factor (K_n) was investigated for juvenile, adult and combined specimens of *S. argus*. A total of 282 specimens of different sizes were collected from the fish harbours of West Wharf and Korangi creek, Karachi Pakistan. The values obtained for condition factor ranged from 1.95 to 3.70 for juveniles and from 2.08 to 2.66 for adults while, 1.95 to 3.70 for combined specimens. The mean values of condition factor were observed as 2.80 ± 0.05 , 2.34 ± 0.03 and 2.59 ± 0.04 for juvenile, adult and combined specimens, respectively. However, the values of relative condition factor (K_n) fell between 0.90 to 1.84 for juveniles, from 0.79 to 1.17 for adults and from 0.79 to 1.84 for combined specimens. Whereas, the mean relative condition factor was obtained as 1.10 ± 0.03 , 0.98 ± 0.02 and 1.05 ± 0.02 for juvenile, adult and combined specimens, respectively. The values of K and K_n were greater than ideal values. It indicated that *S. argus* may be in good condition at Karachi coast, Pakistan.

Introduction

The condition factor (K) explains the changes of health or wellbeing of a fish in relation to its physical state (Lizama and Ambrosio, 2002). According to Kumar *et al.* (2013), condition factor (K) indicates the health of fish during its different stages of life and helps to estimate the wellbeing or physical state of fish from its weight at different lengths. Sarkar *et al.* (2013) described the variation in values of condition factor (K) of fish designates the state of food availability and sexual maturity of fish. Mahapatra *et al.* (2014) suggested that condition factor (K) is widely used to compare the health, condition or wellbeing of fish. According to Gerami *et al.* (2013), if the value of condition factor (K) for a fish is 1.60, it's thought to be an excellent condition of fish. While, the value 1.40 of condition factor (K) shows the good health of fish. Further, 1.20 specifies a fair health; 1.00 illustrates a poor condition and value of condition factor (K) less than 0.80 shows the very poor health of fish.

Materials and Methods

This research work was conducted from January 2015 to December 2015. Fish samples of different sizes were collected randomly from the harbours of West Wharf and Korangi creek, Karachi-Pakistan. The sample size of this study comprised of 145 juveniles and 137 adults (total 282 specimens). Sample's identification was carried out with the help of FAO field guide (Bianchi, 1985). In the laboratory, all samples were analyzed in fresh condition. Length of fish in millimeter (mm) and weight in grams (g) were recorded.

The following equation (Mong *et al.*, 2007) was used for the assessment of condition factor (K) of *Scatophagus argus*;

$$K = W \times 100 / L^3$$

Where, K is the condition factor of fish; W is the weight of fish (g); L is the fish total length (mm).

Relative condition factor (K_n) of *Scatophagus argus* was estimated with the help of following equation of Narejo (2006);

$$K_n = W / W_e$$

Where, W is the observed weight in g and W_e is the calculated weight (from aL^b) in g. In this equation, a is constant, b is exponent and L is total length of fish (Le Cren, 1951).

Statistical Analysis

For the estimation of condition factor (K) and relative condition factor (K_n), computer packages such as; MS Excel 2013 and Minitab version 17 were used.

Results and Discussion

The results for condition factor (K) and relative condition factor (K_n) for *Scatophagus argus* are presented in Table 1. The results of the present investigation showed that values of condition factor (K) ranged between 1.95-3.70 for juveniles; 2.08-2.66 for adults and 1.95-3.70 for combined specimens. Whereas, the values of relative condition factor (K_n) ranged between 0.90-1.84 for juveniles; 0.79-1.17 for adults and 0.79-1.84 for combined specimens. In general, the results indicated that the *S. argus* is in good condition in juvenile, adult and as well as in combined specimens along the Karachi coast, Pakistan.

Table 1. Condition factor (K) and Relative condition factor (K_n) of *Scatophagus argus* from Karachi coast, Pakistan.

					N	Condition factor (K)		K values	Relative condition factor (K _n)		K _n values
	Length (cm)		Weight (g)			Range			Mean ± SE	Range	
	Max	Min	Max	Min		Max	Min	Max		Min	
Juvenile	11.00	4.20	35.00	2.00	145	3.70	1.95	2.80 ± 0.05	1.84	0.90	1.10 ± 0.03
Adult	29.00	15.90	648.0	84.00	137	2.66	2.08	2.34 ± 0.03	1.17	0.79	0.98 ± 0.02
Combined	4.20	29.00	2.00	648.00	282	3.70	1.95	2.59 ± 0.04	1.84	0.79	1.05 ± 0.02

Samat *et al.* (2008) observed the values of condition factor (K) ranging between 1.125 and 8.802 hence, shows the good condition of *Pterygoplichthys pardalis* from Malaysia. Abowei (2009) had examined the condition factor as 0.5-1.5 with mean value of 1 which also shows the good condition of *Cynoglossus senegalensis* from Nigeria. Whereas, Ambily and Nandan (2010) from India investigated the values of relative condition factor (K_n) as 0.75 to 1.07 for males, 0.944 to 1.407 for females and 0.96 to 1.196 for combined sexes of *Arius subrostratus* showing the good health of each sex. Omogoriola *et al.* (2011) observed the values of condition factor (K) ranging from 0.86-8.04 with mean value of 2.48 ± 0.58 for *Dentex congoensis* and 2.06-6.13 with mean value of 2.79 ± 0.42 for *D. angolensis*. While, the values of relative condition factor (K_n) were investigated as 1.28 ± 1.09 for *D. congoensis* and 1.66 ± 2.44 *D. anoglenis* from coastal waters of Nigeria. However, Mahapatra *et al.* (2014) have reported the poor condition of *Pseudambassis ranga* from India. Similarly, Ahmed *et al.* (2014a) reported poor growth (negative allometry) between length and weight relationship in *Pomadasys stridens* from Karachi coast with K_n varying only 1.7% (0.9254-1.044). Also, *Scomberomonus guttatus* from Karachi coast exhibited poor growth (Ahmed *et al.*, 2014b). Zafar *et al.* (2003) observed condition factor of *Catla catla* as remains same with increase in its length or weight. Sarkar *et al.* (2008) had reported condition factor (K) ranging between 0.34 to 0.67 for *Sperata sarwari*. Ahmed *et al.* (2013) recorded maximum condition factor as 1.192 and lowest condition factor as 0.500 for *Magalaspis cordyla*. Muhammad *et al.* (2016) reported condition factor from 0.645 to 1.836 for fishes of family Cyprinidae.

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