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Morphometric Characteristics of Silver Pomfret, *Pampus argenteus* of Family Stromateidae Collected from Fish Market of Quetta City of Pakistan

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Abstract: The current study was conducted to analyze some useful morphometric parameters of different specimen of *Pampus argenteus* of family Stromateidae in order to analyze their significance in systematics. A total of 160 samples of this species were collected from the fish market of Quetta city during the period from August 2014 to March 2015. This species is very important from consumption and commercial point of view as it is greatly being famous as food. About 14 morphometric characters were analyzed during this study. As morphometric characters have key consequence in systematic classification of fishes as well as helpful in sexual differentiation, hence, our present work would be valuable in observing the phenotypic variation between *Pampus argenteus*.

Key words: Silver pomfret · *Pampus argenteus* · Stromateidae · Morphometric Characters

INTRODUCTION

Pampus argenteus or silver pomfret is known locally by the name of 'zobaidy', which is belongs to family the Stromateidae. It is extensively distributed in many regions of Japan, Indo-West Pacific, Southwest and west of Korea and China Eastern [1]. Silver pomfret is well known from commercial point of view and it is chief fish utilized in the vicinity of North Persian Gulf even its stockpile is borrowed by the countries of Iraq, Kuwait and Iran [2]. Exterior morphological dimension is major investigation approach utilized until now in the fields of aquaculture and ichthyology frequently owing to simplicity and practice of its application. In several situations, it seems to be adequate and match to the aim of requirement. For comparison of variety of fish species, mostly biometrical characters are applied as well as for defining unevenness among the species between distinct breeds, population or line ages. Morphometric characteristics are generally represented as indexes because of its soaring association to size as compare to meristic ones that are represented precisely. The main index is represented often in relative to head length or length of body. According to Talwar and Jhingran [3], the exterior measurements of organism is known as morphometric, while consecutive count of body element of organism can be indicate using meristic calculations. Lindsey [4] reported that morphological characteristics, body size and meristic counts frequently vary clinically depending upon the geographical ascent. The significance of meristic and morphometric characters was described precisely by Zubia *et al*. [5] who used four meristic and thirty-one morphometric researches during the proper recognition of four species of Mugilidae family that were morphologically indistinguishable and collected from the vicinity of coast of Karachi. The variations among morphometric characters of stockpile can endow with the vital knowledge regarding foundation of structure of stock as well as it might be more helpful and practicable for analyzing temporary environment provoked variation possibly more appropriate in management of fisheries [6]. Therefore, the present study was conducted to observe the some important morphometric characters that could be valuable in the identification of Silver pomfret, *Pampus argenteus* from the other species.

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Table 1: Shows morphometric characters and their acronyms

Variable in mm.	Acronyms
Total length	TL
Weight	Wt
Standard length	SL
Body depth	BD
Dorsal fin height	DFH
Dorsal fin length	DFL
Pelvic fin height	PeFH
Pelvic fin length	PeFL
Pectoral fin height	PFH
Pectoral fin length	PFL
Head length	HL
Pre orbit length	PreOL
Post orbit length	PostOL
Eye diameter	ED

MATERIALS AND METHODS

Sample Compilation: During the present investigation, a total of 160 samples of silver pomfret, *Pampus argenteus* were collected from local fish market of Quetta city in the month from August 2014 to March 2015. Fish samples were elated to laboratory of zoology department of Sardar Bahadur Khan Women University, Quetta. In laboratory, fish samples were identified properly as well as macroscopically sexed, measured in millimeters and weighed in grams by digital balance. After that fish samples were preserved instantly utilizing 10% solution of formaldehyde for the purpose of meticulous assessment.

Morphometric Analysis: In the present study, we have used the methodology specified for the measurements of morphometric characters by Zubia *et al*. [5], Dars *et al*. [7] and Wajeeha *et al*. [8]. Digital calipers and dials were used to make morphometric measurements. During morphometric analysis, about fourteen morphometric characters were measured as shown in Table 1. All the measurements including Total length (TL) were deliberated in millimeters.

Statistical Analysis of Data: All statistical analysis of the data was calculated by Minitab 14.1 computer software and MS Excel 2010 version.

RESULTS AND DISCUSSION

During this study total 160 specimens of silver pomfret were collected from the local market of Quetta during the period from August 2014-March 2015. All specimens were examined for estimating the length, weight relationship and morphometric measurements.

Morphometric Analysis: The obtained results of morphometric measurements were calculated and expressed from Tables 1&2, respectively. All morphometric measurements were taken in mm. The body length for combined sexes was ranged from 186 to 151mm. In order to determine the linear regression relationships between whole body growth (TL) and various morphometric characteristics, the total length was taken as X (Independent variable) and all selected morphometric measurements were taken as Y (dependent variables). The obtained results revealed that though most relationship between total length and morphometric characters were found to be weakly positive

Table 2: Linear relationship between total body length (TL) and various morphometric characters for the *Pampus argenteus*. Total length and all other measurements are in mm

Morphometric characters		Range			Regression coefficients			Correlation Type	
X	Y	Min.	Max.	Mean±SD	a	b	r	p-value	CT
TL	SL	102.0	135.0	120.33±8.9	-33.67	0.89	0.85	0.0^{a}	***
TL	BD	70.0	90.0	78.56±4.17	44.56	0.19	0.41	0.0^{a}	*
TL	DFH	35.0	57.0	41.67±3.89	2.95	0.22	0.49	0.0^{a}	*
TL	DFL	52.0	73.0	64.87±4.87	-7.36	0.42	0.74	0.0^{a}	***
TL	PeFH	40.0	62.0	51.27±5.34	0.89	0.29	0.47	0.0^{a}	*
TL	PeFL	60.0	70.0	65.85±2.50	36.40	0.17	0.58	0.0^{a}	**
TL	PFH	42.0	53.0	44.58±1.54	34.14	0.06	0.33	0.0^{a}	*
TL	PFL	10.0	67.0	12.91±6.18	16.22	-0.012	-0.03	0.81^{NS}	*
TL	HL	24.0	33.0	29.06±1.97	31.52	-0.01	-0.06	0.58^{NS}	*
TL	PreOL	5.0	9.0	6.25±1.24	2.66	0.02	0.14	0.20^{NS}	*
TL	PostOL	12.0	19.0	14.86±1.64	3.07	0.06	0.36	0.0^{a}	*
TL	ED	8.0	10.0	9.123±0.713	4.45	0.03	0.33	0.0^{a}	*

Note: *** shows strong correlations when r>0.70; ** shows correlation moderate when r>0.50; * shows correlation weak when r<0.50; S.D = standard deviation; N=sample size; [a] shows relationship was highly significant when $p \leq 0.05$.[NS] shows insignificant correlations when p>0.05.

Table 3: Regression coefficients of Length weight relationship ($W=aL^b$) of the species

		Total length Range			Weight Range			Standard Error	Regression coefficients					
Total length (mm)	Weight (grams)	Min.	Max.	Mean±S.D	Min.	Max.	Mean±S.D	S.E (b)	a	b	r	t-test	p-value	CT
TL	Wt	151.0	186.0	172±8.58	59.0	96.0	80.78±9.58	0.07	-75.8	0.91	0.81	12.4	0.0[a]	***
Log TL	Log Wt	2.17	2.26	2.23±0.02	1.98	0.20	1.90±0.05	0.16	-2.72	2.07^{GA}	0.82	11.8	0.0[a]	***

Note: TL= total length; Wt= weight; t= test statistics; CT= Correlation type; [a]t-test is significant When $p \leq 0.05$; *** shows strong correlation, when $r \geq 0.70$, [GA] shows growth is positive allometric type when $b<3.0$.

(When r<0.50), except the pectoral fin length and head length that shows negative types of relationship (When r<0.0) with whole body growth. Results also show moderate correlation between total length and pelvic fin length when r> 0.50. Furthermore, strong correlations were also observed between total length (TL) *vs.* Standard length (SL) and total length *vs.* length of the dorsal fin (DFL) when r> 0.70. In additions, analysis of t-test at 5% level revealed that most relationships between whole body growth and various selected morphometric parameters were found to be highly significant (p<0.05) except PFL, HL and PreOL, hence, these characters are useful in the systematic classifications of this species as shown in Table 2, respectively.

Length Weight Relationship Data: The results of length weight data for silver pomfret (*Pampus argenteus*) were presented and recorded in the Table 3, respectively. The obtained results of length weight data revealed that highly significant correlation was found between length and weight of this species. Further, as regression coefficient *b* value was found to be less than the ideal value that is *b*=3.0, so growth was positively allometric. Hence, the conditions of the environment were suitable for the growth of silver pomfret. Similarly, Quratulan and Benzer [9] also reported *b*<3.0 for *Pampus chinensis* from Karachi coast, while Zubia and Rehana [10] reported the *b*>3.0 for two gobiid species, *Gobius biocellatus* and *Glossogobius giuris* from Karachi coast. Whereas Masooma *et al.* [11] observed the negative allometric growth pattern fora mullet species, *Mugil incilis* on Sindh coast.

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