Age and Morphometric Specifications Silver Pomfret Fish
(*Pampus argenteus*) in the Persian Gulf

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Abstract: This project is part of accomplished studies in Persian Gulf during 2007-2010. 2577 fish from four stations have been used for the study. Twenty six different plastic as well as merestic signs were counted and their relation with each other were calculated. The study, also, elaborates on the relationship between the age of fish and its length. *Pampus argenteus* is a very wide fish with a height of 67.96% of the standard length of fish, also, the dorsal fin length is 36.86% and the anal fin length is 48.93% of the standard length. By observing the range of changes in fish's length in relation to their age group, we can understand if the fish has an average rate of growth.

Key words: Morphometric · Age · Pomfret (*Pampus argenteus*) · Persian Gulf

INTRODUCTION

Persian Gulf is one of the most important gulfs in the world from fishing industries point of view. Iran, Iraq, Saudi A., Kuwait, Oman, Qatar, Emirates are located in the coasts of this gulf and their fishing economy is completely dependent on it. Silver pomfret fish is one of the most important and valuable fishes in this gulf [1, 2]. The maximum fishing in the gulf is 1.7 thousand tons (1668.7 ton) that has decreased gradually until reach to 114.8 ton in the year 2000 [3]. These fishes belong to the Stromatidae family and is spread in the gulf, Japan banks and in the tropic area and sub tropic of (Atlantic, Indian, Pacific)'s ocean [4]. Three kinds of this family is specified [5]; Stromateus SP. (spread in the Atlantic gulf and south Americas' banks), Perilous SP. (spread in the Atlantic and Pacific ocean, America's south banks and Florida) and Pampus SP. The type of *Pampus argenteus* are spread widely in the Persian Gulf and Japan's Bank [6, 7]. Moreover, the existence of this type of fish is reported in the China and Malaysia Banks [8-10].

MATERIALS AND METHODS

Out of 2577 samples were gathered during the period from 2007 to 2010 from 4 stations. (Most of the fishes were silver pomfret). The fishes were transferred to laboratory for studying. Their biological condition, measuring morphometric specifications and counting their meristic signs were of major concern. Twenty three plastic signs of these fishes were measured and 5 meristic signs of them were counted.

Samples were taken from the average physical and chemical condition of water in the stations. (average temperature, average salinity, average PH, average oxygen, etc.). The informations concerning these factors are presented in the Table 1.

In this project, the morphometric measuring and counting meristic signs was carried out on the basis of a method mentioned in the books Guide to the study of fishes and species identification sheets for fishery purposes [5, 11].

The plastic signs of each fish were calculated in the ratio of standard length and the lengths of their head were also calculated and are the mean. Error of proportion's mean and deviation of the measurement was calculated and shown. The measurements of all the morphometric factors of the fish were done to millimeter by caliper and the fish's organ weight and its total weight were determined to the milligram by sensitive scales.

Also, during this project, with splitting 10-15 male and female fish, their sexual situation (gonad somatic index) and the stage of sexual growth in the all months of year were studied, observing and weighting sexual organs and their ratio to the total weight [12].

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Table 1: Average of measured factors in the stations

| Month | Measurement factors | | | | | |
	Temperatur (°C)	Oxygen (mg/l)	Salinity (‰)	Conductivitt (EC)	pH	Transparentcm
January	16.8	8.6	40.0	66	7.9	21
February	15.3	8.4	41.0	65	7.8	20
March	16.0	8.3	42.0	64	7.8	22
April	22.1	7.9	39.0	64	7.8	24
May	26.2	7.7	39.5	64	8.0	20
June	28.2	7.3	41.5	63	7.9	22
July	30.2	7.1	38.0	63	7.8	23
August	31.2	6.0	39.0	64	7.9	25
September	30.1	6.1	41.0	66	7.8	26
October	29.8	7.4	40.5	65	7.9	23
November	28.3	7.8	41.0	65	8.0	26
December	26.6	8.2	40.0	64	7.8	20

Table 2: Plastic and meristic signs of *Pampus argenteus* in the Persian Gulf

Signs	M ± S.E	Min - Max
T.L. (total length), (L), mm	251.13±4.75	100-503
F.L. (fork length), (L), mm	188.82±3.59	75-377
S.L. (standard length), (L), mm	175.26±3.33	71-350
Meristic signs		
Pre D.F. Hard Ray. NO	6.64±0.05	6-7
Pre A.F. Hard Ray. NO	5.16±0.04	5-6
D.F. Ray. NO	41.24±0.08	38-43
P.F. Ray. NO	23.42±0.03	23-25
A.F. Ray. NO	38.11±0.09	34-43
The proportion to Standard length (%)		
H.L. (head length)	23.83±0.11	16.92-31.71
Pre D.L. (pre dorsal fin length)	49.19±0.12	40.00-60.00
Pre O.L. (per orbital length)	5.24±0.03	2.96-7.32
Inter O.W. (inter orbital width)	11.85±0.02	10.23-12.86
Post O.L. (post orbital length)	13.21±0.06	8.40-17.57
E.D. (eye diameter)	5.98±0.04	3.27-8.45
Pre A.L. (pre anal length)	53.93±0.20	42.00-73.33
Girth L. (girth length)	143.58±0.29	110.32-162.00
B.D. (body depth)	67.96±0.08	53.13-78.82
L.H.C.P. (lest height caudal peduncle)	10.57±0.41	8.09-13.57
H.D. (head depth)	34.62±0.08	29.62-40.65
D.F.L. (dorsal fin length)	36.86±0.19	26.67-53.33
D.F.B. (dorsal fin base)	50.31±0.14	38.78-72.29
P.F.L. (pectoral fin length)	36.66±0.09	29.71-43.43
P.F.B. (pectoral fin base)	9.08±0.03	5.64-13.21
A.F.L. (anal fin length)	48.93±0.33	33.04-68.57
A.F.B. (anal fin base)	50.59±0.09	40.33-56.67
C.F.H. (caudal fin height)	44.66±0.28	32.26-65.81
The proportion to head length (%)		
Head depth	145.74±0.34	127.3-175.0
per orbital length	21.96±0.10	15.38-28.00
post orbital length	55.49±0.18	40.38-72.73
Eye diameter	25.09±0.15	14.29-32.60
Inter orbital width	50.03±0.24	38.46-70.45

Table 3: The relationship between age *Pampus argenteus* with its standard length

Slope changes in standard length (mm)	Age group
80 - 141	0 +
141 - 227	1 +
227 - 279	2 +
279 - 311	3 +
311 - 330	4 +

Since the area from which samples are collected is categorized as 'tropic' and 'sub tropic' at the same time and also, on the other hand, the otolith bone is very delicate and thin, calculating the age through observing indicator scales and yearly signs on the otolith is a very difficult task. This study, then, employs a method which is a combination of the above mentioned methods and Von Bertalanfy's formula that is on the basis of fish standard length. To increase the accuracy of the calculations, computer software –ELFAN- was employed [13-15].

RESULTS AND DISCUSSION

The plastic and meristic sings of *Pampus argenteus* are studied according to morphometric measurement and statistical analysis. Their ratio to standard length and head length is shown in Table 2.

The relationship between the age of the fish and standard length is shown in Table 3. Observing the growth of different fishes in different stages of life and analyzing (comparing and contrasting) the recorded data, this study noticed medium growth quickness in this particular kind.

Pomfret fish (*Pampus argenteus*) is a very wide fish as its width is 67.96% of standard length. It is pressed from two sides tightly. The depth of caudal fin in this fish is comparatively low. The length of dorsal and anal fin, in comparison with the length of the fish, is much (36.86 and 48.93 %). In the front part of the anal and dorsal fin 5-10 hard rays are located which would hide within the meat and into the body as the fish grows. About 10 soft rays are in the dorsal and anal fin of this fish that are longer than others and forms the fins to sickle form (Fig. 1). This fish does not have ventral fin. It has very small cycloid scales that spill rapidly. In these fishes, the sideline is close to the back (loins) that settled in 2 sides in symmetrical form. The eyes of fish are comparatively small (5.9% standard length). There is one row of very small teeth on its jaws, 3 outgrowths on most
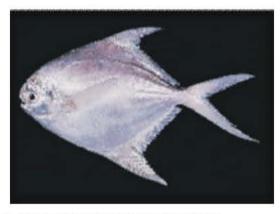

Fig. 1: Silver pomfret (*Pampus argenteus*)

of their teeth can be seen. These fishes have no teeth on palate and gorge. Its color is silvery with a bluish color on the back while dorsal, anal and caudal fins seem yellowish.

Thus obtain new and exact information from age and morphometric silver pomfret fish population in the Persian Gulf is important in the fishing management.

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