

# Study of Some Morphometric and Meristic Characters of Saddle Grunt Fish, *Pomadasys maculatus* (Bloch, 1793), off Karachi Coast, Pakistan

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**Abstract** In morphometry of *Pomadasys maculatus*, the total length was recorded as 79 mm to 220 mm while mean total length was 162.72 mm in male, whereas total body length in female recorded as 82 mm to 219 mm while mean total length was 173.36. Mean body weight in male was 69.88g, while mean body weight in female was 84.52g. Mean value of Head length in percentage of total body length was found to be 25.32 and snout length was found to be 7.92, Mean value of eye diameter was found as 7.51 and mean value of caudal peduncle length was recorded as 10.07 in male. In female specimens the mean value of Head length in percentage of total body length was found to be 25.87 and snout length was found to be 8.26, mean eye diameter was found as 7.94 and mean value of caudal peduncle length was recorded as 10.49. The meristic characters like dorsal fin rays, anal fin rays, Lateral line scales, gill rakers on lower arm and scales in transversal line were counted. No sexual dimorphism was found in *Pomadasys maculatus*. In the present study the average total length of females were 152.47 mm TL and the average total length of males were 151.95 mm TL.

**Keywords:** morphometric, meristic characters, *Pomadasys maculatus*, Karachi coast, Pakistan

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## 1. Introduction

Grunters (Family: Haemulidae) are small to medium sized fishes, usually inhabiting shallow coastal waters. They occur in coral reef areas, as well as in muddy or weedy waters. Grunts are commonly found in marine and brackish water (Indian, Pacific and Atlantic) rarely in fresh water. Several of the species belonging to this family are rather common in Pakistan. Genus *Pomadasys* consist of 25 species. *Pomadasys maculatus* (Figure 1) is one of the important Grunt fish of Karachi coast, found in coastal waters over sand near reefs. Indo-West Pacific: throughout the Indian Ocean (Figure 2) and the western Pacific, north to China, south to Australia.

*Pomadasys maculatus* (Blotched-grunt, saddle grunter), commonly known as "Dhoter" is an important commercial species off the coast of Indo-Pak. Their flesh is said to be of excellent quality, which keep for a fairly long time without spoiling, and thus it is much excellent as food, marketed fresh also dry salted [1]. *Pomadasys maculatus* has many Synonymised names like; *Anthias maculatus*, *Lutjanus maculatus*, *Pomadasys maculata*, *Pomadasys maculatum*, *Pristipoma caripa*.

From Pakistan only few reports on different *Pomadasys* species have been made [2-14]. Practically, no work has

been under taken on Morphometric and meristic characteristics of *Pomadasys maculatum* from Pakistan. Since these information are vital for the proper management of the fisheries and for optimum utilization of the resources, the present study was therefore, under taken.

## 2. Materials and Methods

### 2.1. Study Area

The Karachi coast was the study area for this research. The Karachi coastline is between latitude 24°53'N and longitude 67°00'E, and lies in the Northern boundary of Arabian Sea.

### 2.2. Collection of Specimens and Sampling

Samples of *Pomadasys maculatus* (Figure 1) were collected fortnightly from fish harbors of West Wharf and Korangi Creek of Karachi coast. The fish was identified by using the Bianchi, [1]. Simple random sampling technique was used. A total of 408 samples collected during the study period. The samples were transported to the laboratory and preserved in a deep freezer at -20°C until examination and analysis.



Figure 1. Image of *Pomadasys maculatus*

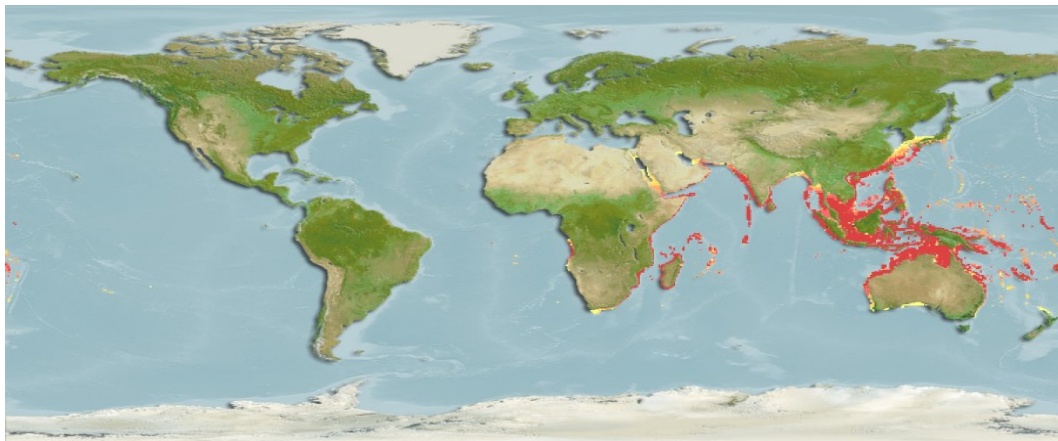


Figure 2. Distribution map of *Pomadasys maculatus* (Courtesy by: www.aquamaps.org)

### 2.3. Body Measurements

The specimens were brought out of the deep freezer and allowed to thaw and the body length was measured using a one-meter measuring board graduated in mm. Morphometric characters like total body length (TL), Head length (HL), snout length (Sn. L), Eye diameter (E.D) and Length of Caudal peduncle (CPL) were measured. For precision of measurement, divider and measuring board having graduation in mm was used. The morphometric parameters were measured from left side of each specimen. The morphometric characters were studied following Saikia [15]. The following morphometric measurements were recorded:

- (a) **Total length:** - Total body length has been measured from tip of the pre-maxilla to the tip of the tail to the nearest mm.
- (b) **Head length:** - Distance from the tip of the pre-maxilla to the posterior most edge of opercular bone.
- (c) **Eye diameter:** - Distance from the anterior to the posterior rims of the eye in the longitudinal axis.
- (d) **Snout length:** - Distance from the most anterior point on the snout or upper lip to the front margin of the orbit.
- (e) **Caudal peduncle length:** - Oblique distance between the end of the anal base and the hidden base of the middle caudal ray.

Meristic characters like dorsal fin rays, anal fin rays, Lateral line scales, scales rows above lateral line, gill rakers and scales in transversal line were counted.

Table 1. Meristic Counts of *Pomadasys maculatus*

Sex	Scale rows above lateral line	Gill Rakers	Anal fin rays	Dorsal fin rays	Lateral line scales
Male	5	5-6 + 13-16	3, 7	12, 14	48-52
Female	5	5-6 + 13-16	3, 7	12, 14	48-52

## 3. Results and Discussion

### 3.1. Morphometric Characters

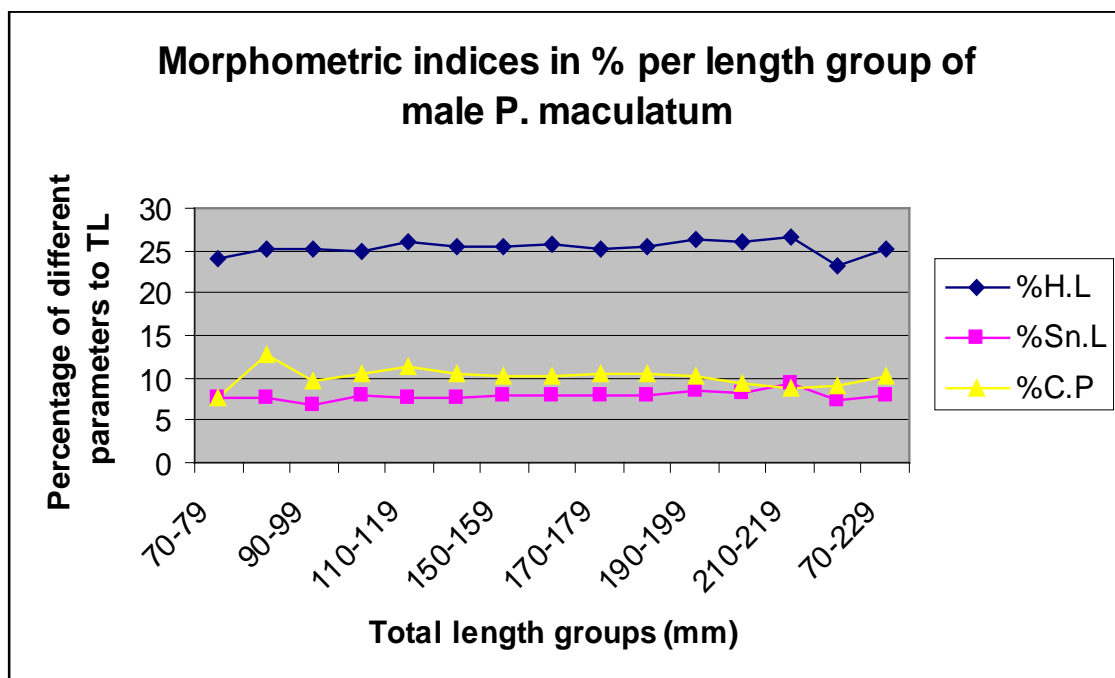
Average linear morphometric measurements of *Pomadasys maculatus* have been given in Table 2; Figure 3 & Figure 4. The total length was recorded as 79 mm to 220 mm whereas, the mean value of head length in percentage of total length was found to be 25.87 and the

mean value of snout length was found to be 8.26. Mean value of length of caudal peduncle as percentage of total length was 10.49 and the mean value of eye diameter in percentage of head length was 7.94.

The linear relationship of various morphometric characters and total length was reported by Khumar and Siddiqui [16], Rizkalla [17], Pandey *et al.* [18], Jaiswar *et al.* [19] in various fish species. Again, it was observed that all the body parameters show higher values of correlation co-efficient with total length.

**Table 2. Morphometric indices in % per length group of *Pomadasys maculatum***

Groups (TL)	Sex	N	Mean TL	Mean H.L	%H.L	Mean Sn.L	%Sn.L	Mean ED	%E.D	Mean CP	%C.P
70-79	M	1	79	19	24.05	6	7.59	6	7.59	6	7.59
	F	0	-	-	-	-	-	-	-	-	-
80-89	M	12	86.75	21.75	25.07	6.67	7.68	6	6.92	11.08	12.78
	F	6	84.67	22.33	26.38	6.67	7.87	6.33	7.48	10.33	12.2
90-99	M	5	94.2	23.6	25.05	6.4	6.79	6.8	7.22	9	9.55
	F	2	92	24	26.09	7	7.61	8	8.7	8	8.7
100-109	M	9	102.56	25.67	25.03	8.22	8.02	8	7.8	10.78	10.51
	F	3	105.33	26	24.68	8	7.59	8.33	7.91	11.33	10.76
110-119	M	5	113.4	29.4	25.93	8.8	7.76	10	8.82	12.8	11.29
	F	1	110	28	25.45	10	9.09	10	9.09	13	11.82
140-149	M	10	145.2	37	25.48	11.3	7.78	11.5	7.92	15.1	10.4
	F	2	146.5	39	26.62	13	8.87	12.5	8.53	15.5	10.58
150-159	M	24	155.17	39.33	25.35	12.29	7.92	12.25	7.89	15.67	10.1
	F	17	155.71	40	25.69	12.71	8.16	12.41	7.97	16.65	10.69
160-169	M	37	164.49	42.38	25.76	12.95	7.87	12.81	7.79	16.97	10.32
	F	57	164.7	42.46	25.78	13.61	8.27	12.84	7.98	17.35	10.53
170-179	M	27	173.96	44.04	25.31	13.81	7.94	13.07	7.52	18.33	10.54
	F	44	174.48	44.87	25.73	14.18	8.13	13.23	7.58	18.25	10.46
180-189	M	24	181.63	46.21	25.44	14.58	8.03	13.33	7.34	19.17	10.55
	F	65	183.69	47.26	25.73	15.08	8.21	13.92	7.58	18.4	10.02
190-199	M	12	192.17	50.5	26.28	16.42	8.54	14.25	7.42	19.33	10.06
	F	18	194	50.89	26.23	16.39	8.45	14.33	7.39	20	10.31
200-209	M	5	203.8	53.2	26.1	17	8.34	15.4	7.56	19.2	9.42
	F	10	204.6	53.2	26	17	8.31	16.1	7.87	19.9	9.73
210-219	M	1	215	57	26.51	20	9.3	14	6.51	19	8.84
	F	10	214	55.7	26.03	18.2	8.5	15.4	7.2	21.5	10.05
220-229	M	1	220	51	23.18	16	7.27	15	6.82	20	9.09
	F	0	-	-	-	-	-	-	-	-	-
70-229	M	173	151.95	38.58	25.32	12.17	7.92	11.32	7.51	15.17	10.07
	F	235	152.47	39.48	25.87	12.65	8.26	11.95	7.94	15.85	10.49



**Figure 3.** Index value of male *P. maculatum* for (a) Head length; (b) Snout length; (c) Caudal peduncle length

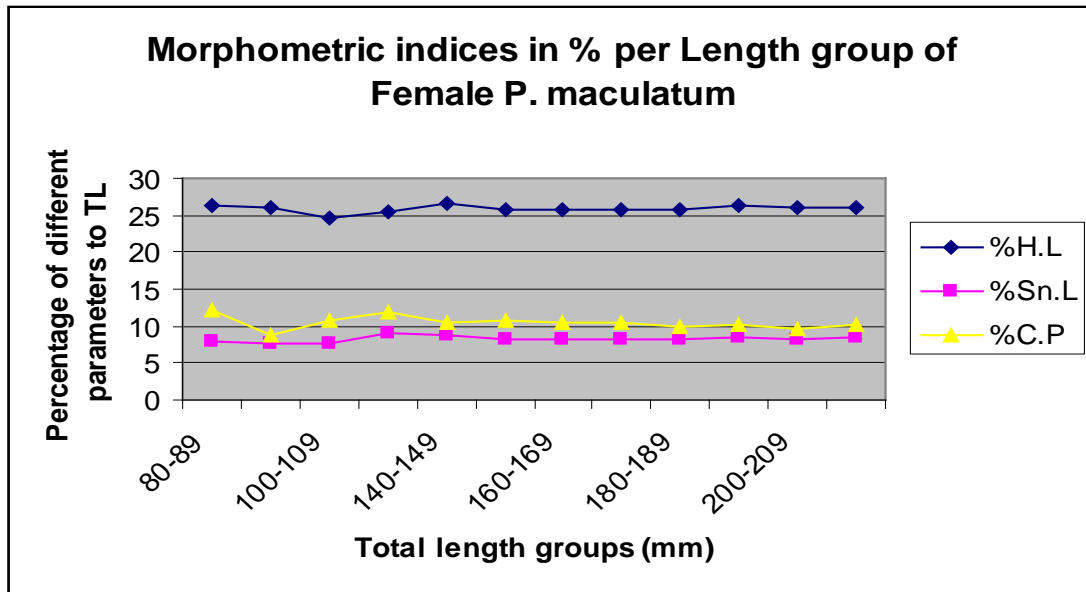


Figure 4. Index value of female *P. maculatum* for (a) Head length; (b) Snout length; (c) Caudal peduncle length

The morphometric indices of linear measurements (head length, snout length, eye diameter, and Length of caudal peduncle) have been expressed as indices (%) with reference to total length (Table 2; Figure 3 & Figure 4). The linear measurements have been expressed as indices with reference to total length. The indices show the same values in both sexes, which show that there is no sexual dimorphism in both sexes.

In the present study the average total length of females were 152.47 mm TL and the average total length of males were 151.95 mm TL. It clearly shows that there is no sexual dimorphism in *P. maculatus*.

In fish, morphometric characters represent one of the most important tools for studying their systematic ontogeny, growth variability, ontogenetic study and/or various demographic parameters [20].

Kaparis *et al.*, [21] studied *Pomadasys incisus* and found that most body parts grew isometrically to total length.

Agbugui and Oniye [22] studied the morphometric parameters of *Pomadasys jubelini* and found that relationship between different parameters were linear.

It was observed that all the body parameters show higher values of linear correlation with total length and head length. This indicates that the growth of fish in one area of the body is co-related to growth in another area of the body. Oniye *et al.* [23], in their study of biology of *Protopterus annectens* in Jachi Dam stated that the high regression coefficient obtained for the relationship between pectoral and pelvic fins length should be taken that the pectoral fin grows at approximately the same rate as the pelvic fin though the pectoral fin is longer than the pelvic fin. The correlation coefficient of the pectoral/pelvic fins with the total length shows that they all increase at the same rate.

These characters could be used in future taxonomic or comparative studies with other populations of the same species.

### 3.2. Meristic Characters

**Meristic formula:** D, XII + 14; A, III + 7; LL, 48-52; GR, 5-6 + 13-16; scle rows above lateral line, 5 (Table 1).

**Diagnosis;** Body oblong, compressed, dorsal and ventral profiles equally convex; Small-sized fish of moderately deep body. Isthmus narrow, forming a groove. Chin with 2 pairs or small pores. This species is characterized by several dark large elongate blotches on the upper back, one forming a saddle on the nape. Lips not thick; dorsal-fin spines long; dorsal fin notched between spinous and soft portions; caudal fin emarginate.

**Color:** Body silvery gray with a series of dark vertical bands dorso-laterally, the band on nape curved and most conspicuous; a large black spot on in dorsal fin between third and sixth or seventh spines.

## 4. Conclusion

The morphometric measurements and meristic counts confirmed that the test organism is *Pomadasys maculatus* and it predominantly exists in Karachi coast.

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