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## Study of some morphometric and meristic characters of striped piggy fish, *Pomadasys stridens* (Forsskal, 1775) from Karachi Coast, Pakistan

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### Abstract

In the present study 391 fish samples (155 male and 236 female) of *Pomadasys stridens* of variable sizes ranging from 3.5- 106 g weight in male; 14-130g weight in female and 56- 198 mm in total length (TL) in male while 99-210 mm (TL) in female were sampled from Karachi coast. This fish showed constant meristic characters. Statistical interpretation of Metric data indicated that there is direct relationship between total body length with Head length (HL), snout length (Sn. L), Eye diameter (E.D) and Length of Caudal peduncle (CPL). 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 stridens*.

**Keywords:** Morphometric, meristic characters, *Pomadasys stridens*, Karachi coast, Pakistan

### 1. Introduction

Commercial quantities of large numbers of finfish and shellfish are present in the Pakistani coastal waters<sup>[1]</sup>. The striped piggy, *Pomadasys stridens* is among the fish species of economic importance in the Pakistani coastal waters. It belongs to the family Haemulidae and can be found at depths between 30 -68m depth in Benthopelagic and reef associated tropical areas of Western Indian Ocean, Red Sea, and east Africa to Mozambique to the Arabian Gulf (Fig. 1). Some works have been reported on different aspects of different species of family Pomadasyidae (Grunt fishes) From Pakistan [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 & 13]. Historically, the morphology of fishes has been the primary source of information for taxonomic and evolutionary studies. There are numerous characters available for morphological study. These characters are most commonly divided in to two categories:

- **Morphometric:** characters refer to measureable structures such as fin length, head length, eye diameter, or ratios between such measurements.
- **Meristic** characters include almost any countable structure, including fin rays, scales, gill rakers, and so on.

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Some works on different aspects of *Pomadasys stridens* are available like: <sup>[5, 6, 8, 14, & 15]</sup>, but practically, no work has been under taken on Morphometry of *Pomadasys stridens* from Pakistan or elsewhere in the world. 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 stridens* (Fig. 2) were collected fortnightly from fish harbors of West Wharf and Korangi Creek of Karachi coast. The fish was identified by using the Bianchi, <sup>[2]</sup>. Simple random sampling technique was used. A total of 391 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.

### 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.

Meristic characters like dorsal fin rays, anal fin rays, Lateral line scales, gill rakers on lower arm and scales in transversal line were counted.



**Fig 1:** Geographical distributional area of *Pomadasys stridens* (Courtesy by: [www.fishbase.org](http://www.fishbase.org))



**Fig 2:** Image of *Pomadasys stridens* (Courtesy by: [www.fishwisepro.com](http://www.fishwisepro.com))

## 3. Results and Discussion

### 3.1 Morphometric Characters

The morphometric indices of linear measurements (head length, snout length, eye diameter, and caudal peduncle) have been expressed as indices (%) with reference to total length (Table 2, Fig. 3 & 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.

The variety of morphometric parameters taken for the fish sampled are given in table 2. The total body length of fish had a range of 56mm to 219mm, Head length (HL) had a range of 14mm to 55mm, snout length (Sn. L) was 4.5mm to 19mm, Eye diameter (ED) was 4.5mm to 14.16mm and the Length of caudal peduncle (CPL) was 5.5mm to 21mm.

The linear relationship of various morphometric characters and total length was reported by Khumar and Siddiqui <sup>[16]</sup>, Rizkalla <sup>[17]</sup>, Pandey *et al.* <sup>[18]</sup>, Jaiswar *et al.* <sup>[19]</sup> in various fish species.

Again, 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.* <sup>[20]</sup>, 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.

**Table 1:** Meristic Counts of *Pomadasys stridens*

Sex	Scales in transversal line	Gill Rakers on lower arm	Anal fin rays	Dorsal fin rays	Lateral line scales
Male	9-10 (1) 23-26	15 - 16	3, 9	12, 14-16	57-60
Female	9-10 (1) 23-26	15 - 16	3, 9	12, 14-16	57-60

**Table 2:** Morphometric indices in % per length group of *P. stridens*.

Groups (TL)mm	Sex	N	Mean TL	Mean H.L	%H.L	Mn. Sn.L	%Sn.L	Mn. ED	%E.D	Mn. CP	%C.P
50-59	M	1	56	14	25	4.5	8.035	4.5	8.035	5.5	9.821
	F	0	-	-	-	-	-	-	-	-	-
90-99	M	4	96	24.75	25.78	8.5	8.854	7.25	7.552	10.25	10.68
	F	1	99	25	25.25	8	8.081	8.2	8.28	11	11.11
100-109	M	3	105	26.667	25.4	9	8.571	8.333	7.937	10.667	10.16
	F	5	106	27	25.47	9.6	9.07	8.2	7.736	11.6	10.94
110-119	M	3	114	29	25.44	9.667	8.48	8.333	7.31	13.333	11.7
	F	6	116.667	29.833	25.57	10	8.571	8.667	7.429	11.833	10.14
120-129	M	10	123.7	31.2	25.22	10.8	8.731	8.9	7.195	12.2	9.863
	F	8	124	30.875	24.9	10.75	8.669	9.125	7.359	12.875	10.38
130-139	M	0	-	-	-	-	-	-	-	-	-
	F	2	136	36	26.47	12	8.824	10	7.353	13	9.559
140-149	M	9	146.333	37	25.29	12.444	8.504	11.333	7.745	16.222	11.09
	F	14	145.857	37.071	25.42	11.571	7.933	10.714	7.346	15.786	10.82
150-159	M	17	155.824	39.059	25.07	13.059	8.381	11.353	7.286	17.059	10.95
	F	23	154.174	39	25.3	12.87	8.347	11.174	7.248	16.522	10.72
160-169	M	17	165.765	41.765	25.2	14.647	8.836	11.882	7.168	16.882	10.19
	F	38	164.553	42.553	25.86	14.237	8.652	12.132	7.372	16.868	10.25
170-179	M	37	174.081	44.784	25.78	15.054	8.648	12.73	7.313	18.486	10.62
	F	54	174.463	45.37	26.01	14.926	8.556	12.426	7.122	18.056	10.35
180-189	M	38	183.737	48.579	26.44	16.395	8.923	13.474	7.333	19.211	10.46
	F	39	184.462	47.974	26.01	16.103	8.729	13.282	7.2	19.615	10.63
190-199	M	16	192.875	50.188	26.02	16.813	8.717	13.5	7	19.75	10.24
	F	38	193.553	50.211	25.94	16.842	8.702	12.947	6.689	19.053	9.844
200-209	M	0	-	-	-	-	-	-	-	-	-
	F	6	200.667	53	26.41	17.5	8.721	14.167	7.06	19.333	9.635
210-219	M	0	-	-	-	-	-	-	-	-	-
	F	2	210	55	26.19	19	9.048	14	6.66	21	10
50-219	M	155	165.336	42.613	25.77	14.413	8.717	12.052	7.289	17.374	10.51
	F	236	169.61	43.881	25.87	14.585	8.599	12.097	7.133	17.513	10.33

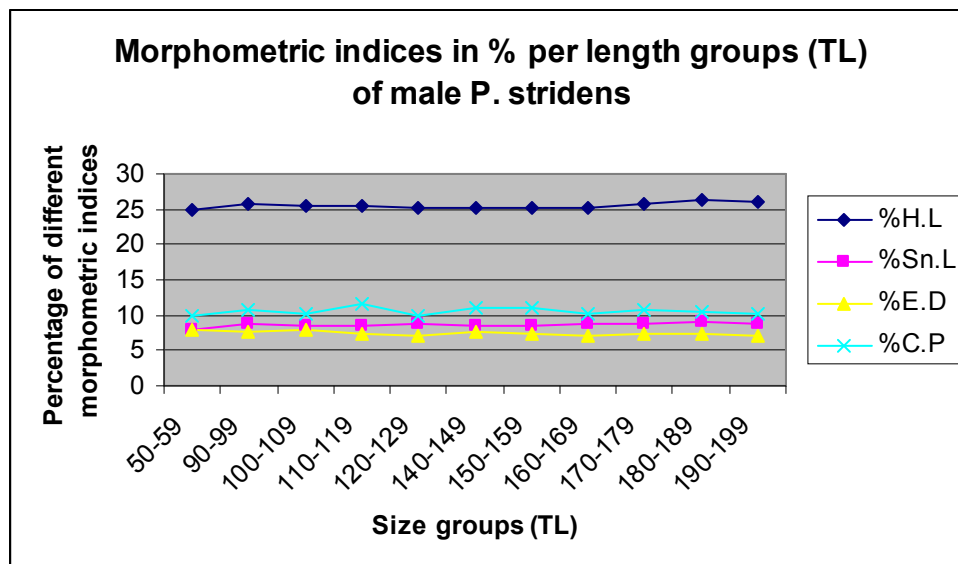


Fig 3: Index value of male *P. stridens* for (a) Head length (b) Snout length (c) Eye diameter (d) Length of Caudal peduncle.

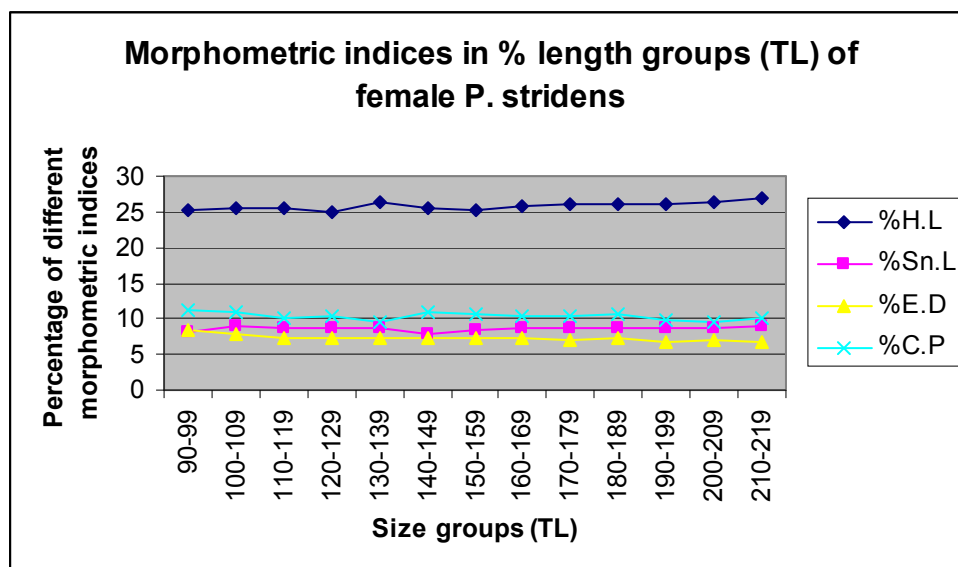


Fig 4: Index value of male *P. stridens* for (a) Head length (b) Snout length (c) Eye diameter (d) Length of Caudal peduncle.

### 3.2 Meristic Characters

Meristic formula: D, XII + 14-16; A, III + 9; STL, 9-10 (1) 23-26; LL, 57-60; GR, 15-16

Diagnosis: Dorsal spines (total): 12; Dorsal soft rays (total): 14-16; Anal spines: 3; Anal soft rays: 9; Lateral lines scales 57-60. (Tab. 1).

Silvery, darker above, with 4 stripes along body. Upper opercle with a dark blotch and a stripe. Pectoral fin tip when vented, equal or reaching past the pelvic fin tip.

Body oblong and compressed. Dorsal fin deeply notched its origin on vertical line of pectoral fin base. Penultimate dorsal spine much smaller than ultimate. Second anal spine larger and thicker than first and third spines. Caudal fin moderately forked. Two pores and a median pit on the chin. Small ctenoid scales. Body - yellowish silvery-gray with white belly. Three longitudinal brown yellow-gold stripes. Black spot on the upper margin of operculum.

#### 4. Conclusion

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

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