



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2020; 8(1): 1516-1518

© 2020 JEZS

Received: 01-11-2019

Accepted: 05-12-2019

Dhaval N JungiCollege of Fisheries, J.A.U.
Veraval, Gujarat, India**AJ Bhatt**College of Fisheries, J.A.U.
Veraval, Gujarat, India**Fofandi Mahendrakumar D**Central Marine Fisheries
Research Institute, Veraval
Regional Centre of ICAR-
CMFRI, Matsyabhavan,
Veraval, Gujarat, India

Length-weight relationship of Bull's Eye (*Priacanthus hamrur*) landed along the Veraval coast of Saurashtra region

Dhaval N Jungi, AJ Bhatt and Fofandi Mahendrakumar D

Abstract

The study of Length-weight relationships (LWRs) plays a significant role in fishery assessment studies as it provides information about its general wellbeing, the growth of the fish, and fitness in the marine habitats. The present paper describes LWRs for *Priacanthus hamrur* collected from the marine area of the Veraval coast from the Saurashtra region were established, and their growth condition was evaluated during the august 2017- July 2018. The investigation dealt along with insight into certain aspects of biology and stock status of the dominant species *P. hamrur* forms 15.57% landing in Gujarat during this period. About 448 random samples collected for LWRs and the results indicated that almost all the collected specimen exhibits isometry growth patterns indicate no significant difference in males and female ($p>0.05$). The current result provides baseline data for the LWRs of *P. hamrur* from the Saurashtra coast. Such a valuable database used for establishing management and monitoring systems for such species resource conservation management aspects.

Keywords: Length-weight relationship, *P. hamrur*, Veraval

Introduction

The continental shelf area of Indian EEZ stretches up to 200-meter depth, most abundant in various demersal fishery resources contributing significantly to the total marine fish production in India. The significant demersal fishery resources namely elasmobranchs, catfishes, perches, silver bellies, threadfin breams, lizardfishes, pomfret, bull's eye, goatfish and white fish^[1]. In connection with the diversity of fish species in the coastal regions, the demersal fisheries resources in the outer slope and shelf comprised with some of non-conventional species. Among them, Priacanthids represents the potential marine fisheries resources located all along the south-west and east coasts with depth range zone from 50 – 400m^[2].

The bull's eye (*Priacanthus hamrur*) belongs to family Priacanthidae represents emerging non-conventional demersal fishery resources. The annual estimated bull's eye fish landing in 2017-18 reported 1,43,451 tonnes in India whereas its landing forms 15.57% for Gujarat State^[3]. Present scenario, high demand for bull's eye observed in Thailand, Singapore, Hong Kong, China and Taiwan due to its meat used by various seafood procession companies like surimi plants. In the contrast way, due to adversely affecting the production of bull's eye resources such as growth overfishing, increasing operation of units through multiday fishing, recruitment overfishing needs to examine the biological aspects of *P. hamrur*.

Various authors studied the length-weight relationship of *P. hamrur* from Indian waters as from the southern coast of Karnataka waters^[4, 5], off Saurashtra coast^[6], north-western part of Indian EEZ^[7, 8], south-west coast of India^[2], west coast of India^[9, 11]. The present paper describes the length-weight relationship and condition factor for the *P. hamrur* fishery management along the Saurashtra coast.

Materials and Methods

The sampling for the present investigation was carried out along the Veraval coast (Lat. N 20°34'613" and Long. E70°12'340"), situated along the western coast of Gujarat, India. Which is the most productive part of the Saurashtra coast, especially for the trawl fishing sector of Gujarat. The fresh samples of *P. hamrur* were collected randomly from the commercial fisherman from August 2017 to July 2018.

Corresponding Author:**Dhaval N Jungi**College of Fisheries, J.A.U.
Veraval, Gujarat, India

A total of 448 specimens ranging its length from 140 to 345 mm were used for the analysis. The length of fish measured from the tip of snout to the farthest tip of the caudal fin termed as the total length (TL) of the fish. The rounded weight nearest to grams referred to as total weight (TW) of the fish.

The length-weight relationship expressed as $W = aL^b$; for fitting the general exponential equation $W = aL^b$, least square method of estimation was made using $\text{Log (TL)} = X$ and $\text{Log (TW)} = Y$ [12]. This relationship considers that the relative body proportions of the fishes increase based on the coefficient of proportionality (a) and by the allometry coefficient (b).

The regression analysis examination, ANOVA on the relapse conditions, 't' test on 'b,' and 'r' esteem completed after standard measurable systems [13, 14].

Results and Discussion

Length composition

The length ranges of *P. hamrur* caught off Veraval coast of Gujarat by the trawl net during the study period was 140-345 mm, with the annual mean length of 221 mm during 2017-18 shown in Table 1. The mean length highest observed in September (250 mm) and least in December (196 mm) due to the random size of the catch landed by the trawlers of the Veraval coast (Fig. 1). Based on similar length ranges observed earlier and reported from Saurashtra coast as 140 – 345 mm [6]. Sivakami *et al.*, (2001) reported 214 mm mean length for *P. hamrur* caught off the Veraval coast of Gujarat represents acceptance in the present result.

Table 1: Summary statistics of length-weight data for *P. hamrur*.

Month	Body length (mm)				
	Range (mm)	Mean (mm)	Mode (mm)	Standard deviation	Coefficient of Variation
August	165-290	221.92	225	26.16	0.11
September	144-296	249.96	250	22.66	0.09
October	165-292	217.01	175	34.98	0.16
November	165-300	228.53	220	30.29	0.13
December	144-285	195.53	212	33.08	0.16
January	140-312	196.43	155	45.26	0.23
February	178-345	223.55	210	31.36	0.14
March	159-309	238.25	220	27.85	0.11

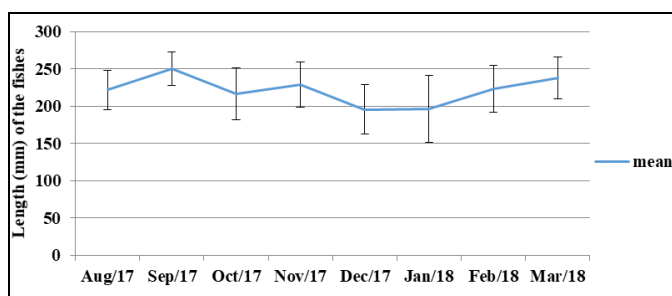


Fig 1: Monthly variations in mean length range of *P. hamrur* landed at Veraval.

Length-weight relationships

A total of 348 fish samples with a length range of 140 -345 mm, including 64 males and 384 females, were used for the length-weight relationship study. The regression equation for the length-weight relationship for males, females and pooled samples was calculated that represents probability >0.05 ($p > 0.05$) and illustration are given in Fig. 2 and 3.

Pooled: $\text{Log } W = -4.0055 + 2.6217 \text{ Log } L$ ($r = 0.95983$) The

present investigation for LWRs represents no significant difference between the total length (TL) and total weight (WT) for males and females specimens of *P. hamrur* as found ($p > 0.05$). Based on the results, the regression slope for equations indicates isometry growth in both sexes. The average slope (b) values observed in males (2.677527) and females (2.68983) for *P. hamrur*.

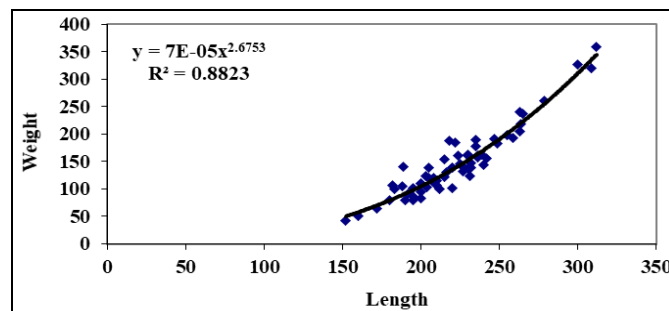


Fig 2: Length - weight relationship of *P. hamrur* (Males)

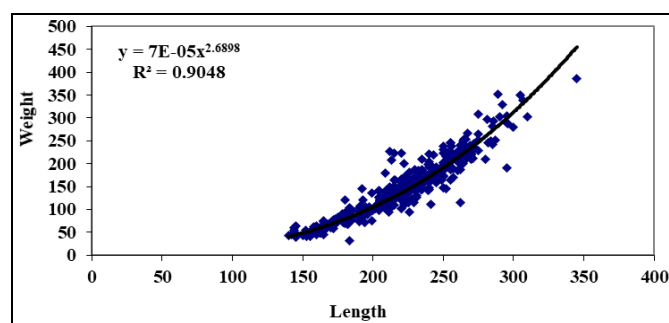


Fig 3: Length - weight relationship of *P. hamrur* (Females)

The present study results Ina resemblance to the earlier study from the western coast of India. Kizhakudan *et al.*, (2006) reported 'b' values for *P. hamrur* from the Saurashtra coast as 2.84. While from Bombay waters, 'b' values of *P. hamrur* as 2.7715 [15]. The length-weight relationship of *P. hamrur* along the west coast found as $W = -1.757 + 2.856 \log L$ and the same depends on the condition of fish caught during different fishing seasons, geographical locations, time of capture, sex, size, length rage, etc. [11]. As earlier studies with LWRs observed by Fulton, (1904), and by other current observation [6, 10, 11], the growth pattern (b) within the same species of fish can be changeable due to depending upon the seasons, populations, food availability, sex, physiology or environmental conditions.

Conclusions

The priacanthids landing along the Veraval coast show upward trends after the surimi plants and fish processing plant demands. Maximum landings take place in the august by trawlers as after the monsoon ban periods into the sea when fishes available in plenty in the mid-shelf region brought along with the other demersal resources like threadfin breams. Since each place of observation has its environmental peculiarity and the consistent fauna, its study emphasizes the significance of amplifying the biological knowledge of the species habitat, distributions, improvement of conservation actions and the management plans.

Finally, this research paper emphasizes the importance of LWR studies along the Veraval coast of Saurashtra, may allow more sustainable fishery exploitation and increase the probability of non-utilization of natural populations resources

of the fishes in the region.

References

1. Sivakami S. Demersal fishery resources of India – an update- Winter School on Towards Ecosystem Based Management of Marine Fisheries-Building Mass Balance Trophic and Simulation Models, 2004.
2. Premalatha P. On the fishery and biology of *Priacanthus hamrur* (Forsk.) along south west coast of India. Indian J Fish. 1997; 44(3):265-270.
3. CMFRI. CMFRI Annual Report 2017-2018, 2018.
4. Abdurahiman KP, Harishnayak T, Zacharia PU, Mohhamad KS. Length weight relationship of commercially important marine fishes and shellfishes of the southern coast of Karnataka. NAGA World Fish Cent. 2004; 27(1-2):9-14.
5. Zacharia PU, Mohammad KS, Pillai PP, Purantharan C. Bulls eye: An emerging trawl fishery resources along Dakshina Kannada coast. Mar Fish Inf. Serv (T E Ser). 1991; 14:29-31.
6. Kizhakudan J, Shoba J, Zala MS. Dynamics of *Priacanthus hamrur* (Forsskal) exploited off Saurashtra coast. Indian J Fish. 2006; 53(4):409-416.
7. Philip KP, Mathew K. Length-weight relationship of *P. hamrur* occurring along the north western Indian EEZ. Fish Technol. 1996; 33(2):79-83.
8. Varghese S. Length-weight relationship of *P. hamrur* occurring along the north western Indian EEZ. Bull Fish Surv India. 1998; 26:50-54.
9. Sivakami S, Raje SG, Nair KVS, Manojkumar PP, Ramani K. Fishery potential of Bulls eye along the west coast of India. J Mar Biol Ass India. 2005; 47(2):185-192.
10. Sivakami S, Raje SG, Khan MF, Sobha JK, Vivekanandan E, Raj K *et al.* Fishery and biology of *Priacanthus hamrur* (Forsk.) along the India coast. Indian J Fish. 2001; 48(3):277-289.
11. Thomas J, Venus S, Kurup BM. Length-weight relationship of some deep-sea fish inhabiting the continental slope beyond 250 m. depth along the west coast of India. NAGA World Fish Cent. 2003; 26(2):17-21.
12. Le cren DC. The length-weight relationship and seasonal cycle in Goand weights and condition in perch, *Perca fluviatilis*. J Anim Ecol. 1951; 20:201-209.
13. Snedecor GW, Cochran W. Statistical Methods Applied to Experiments In agriculture and Biology. Bombay: Allied Pacific Private Limited, 1961.
14. Snedecor GW, Cochran WG. Statistical Methods Applied to Experiments In agriculture and Biology. 6th ed. Bombay/New Delhi: Oxford & IBH Co, 1967.
15. Chakraborty SK, Vidyasagar KD. Growth, mortality and stock assessment of two perches, moon tail bull's eye *Priacanthus hamrur* (Perciformes/Priacanthidae) and thorny cheek grouper (*Epinephelus diacanthus*) (Perciformes/Serranidae) from Bombay waters. Indian J Mar Sci. 1996; 25(4):312-315.
16. Fulton TW. The Rate of Growth of Fishes. (Reports 22nd Annual, ed.). Fishery Board of Scotland, 1904.