LENGTH - WEIGHT RELATIONSHIP OF *LETHRINUS LENTJAN* (LACEPEDE, 1802) AND *LETHRINUS NEBULOSUS* (FORSSKAL, 1775) EXPLOITED IN THOOTHUKUDI COAST, TAMIL NADU, INDIA.

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ABSTRACT

A detailed study was undertaken to assess the length - weight relationship of Lethrinus lentjan and Lethrinus nebulosus in Thoothukudi coast.The 'b' value of L.lentjan (3.027) and L.nebulosus(2.964) were analysed against '3' with 248 degrees of freedom and the 'b' values of both the species of L.lentjan and L.nebulosus were not significant at 5% and 1% level.

Keywords: Length-Weight relationship, *Lethrinus nebulous, Lethrinus lentjan*

INTRODUCTION

Indian coast is ornamented with the East coast, West coast and the coasts of Lakshadweep and Andaman and Nicobar islands, within the bounds of the tropics. The Indian coastal length measures about 8,129 km and the Exclusive Economic Zone extends up to about 2.0 million km^2(Ramani et al., 2010). In South East Asia, the Gulf of Mannar was declared as the first Marine Biosphere Reserve. In the world marine biodiversity perspective, the Gulf of Mannar is the richest region of marine fisheries resources. The area of Gulf of Mannar has an area of about 10,500 km^2. In this region, totally 3600 species of fauna and flora have been identified. With an aim to conserve the valuable fauna and flora inhabiting in this region, the Gulf of Mannar Marine Biosphere Reserve was established during the year 1989 (Venkataramani et al ., 2007). The family Lethrinidae, otherwise known as emperor fishes, contains some of the most common and economically important commercial and artisanal tropical demersal fish species. Emperor fishes are demersal carnivorous feeders. In general, emperor fishes consume a wide range of prey including polychaetes, molluscs (gastropods, bivalves, squids and octopus), echinoderms (sea urchins, sand dollars, star fish, brittle stars), crustaceans (crabs, shrimps) and small fishes. Lethrinid fishes are carnivorous bottom feeders and it actively works on feeding in day time and not active in late evening hours (Toor, 1964). Early

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studies on reproduction of lethrinids have identified several species as protogynous hermaphrodites (sex change from female to male) (Motlagh, 2010).The lethrinid fishes are utilized as good food resources from the areas of western Pacific Ocean to the Indian Ocean because of their dominance in fish catch (Ebisawa, 2009). The lethrinid fishes form year around fishery along the Thoothukudi coast. Though in depth studies were made on the length-weight relationship of the various species of lethrinid fishes by different authors throughout the Indian waters elsewhere, detailed studies on the stock assessment and management of lethrinid fishes in Thoothukudi coast were not done so far. Hence, the attempt has been made to study the length-weight relationship of the two species of emperors such *L.lentjan* and *L.nebulosus.*

MATERIALS AND METHODS

The present study was carried out for a period of 12 months from July 2011 to June 2012. The abundance of lethrinid fish species in the Thoothukudi coast triggered this study on its fishery management aspects. The major lethrinids species available along Thoothukudi coast were *Lethrinus lentjan, L.nebulosus, L.ornatus, L.elongatus, L.microdon, L.mahsena, L.harak, L.ramak. L.conchyliatus, L.rubiroperculatus, Gymnocranius robinsonii* and *G.griseus.* Among these twelve lethrinids species, *L.lentjan* and *L.nebulosus* have been selected for this study. Since sexual dimorphism was not found among these two species, sexes were treated as common to calculate the above parameters. A total of 232 specimens of *L. lentjan* and *L.nebulosus* were collected during the study period. The specimens were collected from Thoothukudi fishing harbour located along the Thoothukudi coast.

Length - weight relationship : Two hundred and thirty two specimens covering different length groups were used to study the length - weight relationship of *L.lentjan* and *L.nebulosus.* The total length of the above the species was measured nearest to the cm and the whole body weight was recorded nearest to g. To study the length - weight relationship of *L.lentjan* and *L.nebulosus,* both the sexes and the juveniles were combined and the relationship was worked out by least squares method by the following equation,

$$\text{Log } W = \log a + b \log L$$

The level of significance was tested by Student's 't' test (Snedecor and Cochran, 1967).

RESULT AND DISCUSSION

The parabolic and logarithmic equation related to length and weight for *L.lentjan* and *L.nebulosus* was done separately and their regression equation is presented in Table 1. The logarithmic relationship between the length and weight for *L.lentjan* and *L.nebulosus* is given in Fig 1 and 2.

The 'b' value of *L.lentjan* (3.027) and *L.nebulosus*(2.964) were analysed against '3' with 248 degrees of freedom and which indicated that the 'b' values of both the species of *L.lentjan* and *L.nebulosus* were not significant at 5% and 1% level (Table 2).

A critical study on the length-weight relationship of *L. lentjan* and *L. nebulosus*

employing wide range of length groups (120 numbers of *L. lentjan* and 112 numbers of *L.nebulosus*) revealed slope values of 3.027 and 2.964 respectively. The study on significance of 'b' value using t - test revealed that there was no degree of deviation (t = 0.074 and 0.084) found in the slope value of *L. lentjan* and *L. nebulosus* at 5% level. Mbaru et al., (2011) studied the slope value of *L. lentjan* as 3.08 from Kenyan waters. It was similar to the present study. According to them, the slope values for Serranidae and Lutjanidae fishes were 3.27 and 3.10 respectively which are similar to that of *L. lentjan.*

Haq et al., (2011) reported the slope values of male and female *Epinephelus malabaricus,* which belongs to the related family of *Lethrinus* species, separately, from Mandapam coastal waters as 2.0528 and 2.7852. Daliri et al., (2012) recorded a similar slope value for *L. nebulosus* of 2.683 from Northern Persian Gulf, whereas Mathews and Samuel (1991) recorded a different value and it was 3.010. Letourneur et al. (1998) also observed the b value of 2.975 for *L. nebulosus* from New Caledonia which is very similar to the present finding.

Table .1. Equation showing length-weight relationship of *L. lentjan* and *L. nebulosus*

Species	Parabolic equation	Logarithmic equation
L. lentjan	$W = 0.009\ L^{3.027}$	Log W = - 2.043 + 3.027 Log L
L.nebulosus	$W = 0.012\ L^{2.964}$	Log W = - 1.896 + 2.964 Log L

Table .2. Length-weight relationship of *L. lentjan* and *L. nebulosus* (Test of significance)

Species	Standard error (S.E)	(Slope (b) - 3)	t = (b-3/S.E)	Table 't' value	
				5%	1%
L. lentjan	0.3746	0.028	0.074*	2.000	2.66
L. nebulosus	0.4287	0.036	0.084*	2.0001	2.70

Fig.1. Length-weight relationship of *L. lentjan*

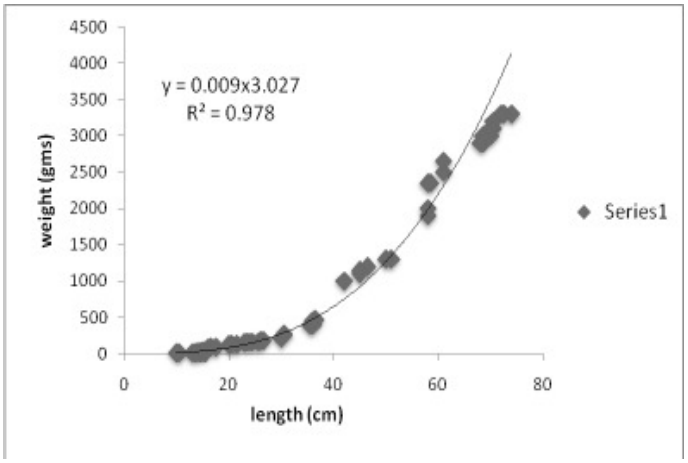
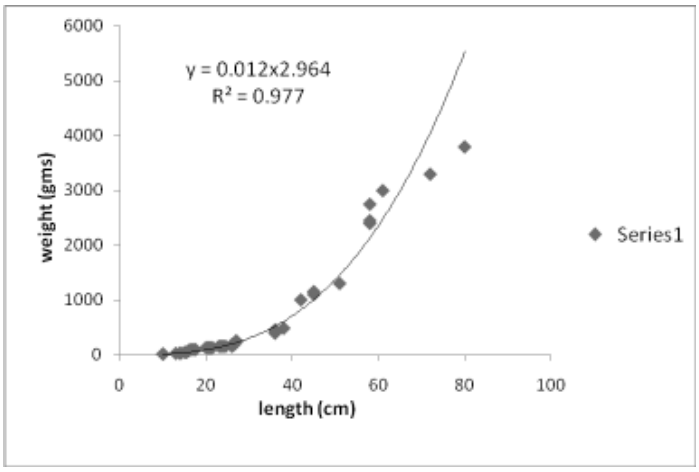


Fig.2. Length-weight relationship of *L. nebulosus*



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