

## Length-Weight Relationship (LWR) in *Notopterus notopterus* (Pallas) from Sukhna Lake, Chandigarh

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**Abstract:** Length-Weight relationship (LWR) of *Notopterus notopterus* (Pallas), an important food fish has been conducted from Sukhna Lake, Chandigarh. 45 fish samples were collected during different months of study period i.e. June 2012- May 2014. The value of correlation coefficient between Total length (cm) and Total Weight (gm) has been found to be 0.657 significant at  $P \leq 0.01$ . The 'b' value between Total Length and Total Weight was found to be 3.57 which showed significant positive allometric growth. This is the first report on Length-Weight Relationship of *Notopterus notopterus* (Pallas) from Sukhna Lake, Chandigarh.

**Keywords:** *Notopterus notopterus* (Pallas), Length-Weight Relationship (LWR), Allometric growth, Sukhna Lake.

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### I. Introduction

Length-weight relationships (LWR) are standard data used in fish programs to estimate growth rates [1,2]. The length-weight relationships in fish are important tools in aquaculture management as it can give information on the life span, mortality, growth as well as total production [3]. Length-weight relationships allow us to convert growth-in length equations to growth-in-weight equations in stock assessment models [4]. In addition, it is important in estimating the average weight at a given length group [5] and for assessing the relative well being of a fish population [6,7]. In the present investigation, LWR has been studied on *Notopterus notopterus* (Pallas) from Sukhna Lake, Chandigarh as no previous studies have been done on this fish from this important manmade lake.

### I.2 Study Area

Sukhna Lake, Chandigarh is an artificial lake created at the foothills of the Himalayas, the Shiwalik hills in 1958 by damming the Sukhna Choe, a seasonal stream coming down from the Shiwalik Hills. The Lake is 1.52 km long and 1.49 km wide with initial storage capacity of 1,074 ha-m of water. It is one of the most visited tourist spots of Chandigarh city and this water body meets the civic and aesthetic requirement of the City.

### II. Material And Methods

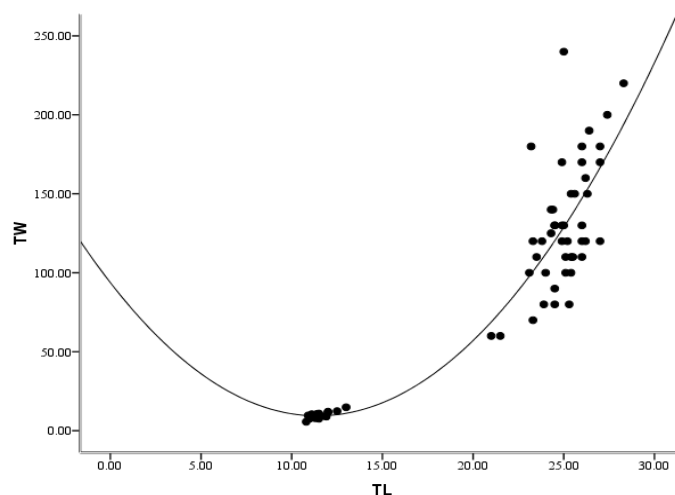
The data for length-weight analysis of *Notopterus notopterus* (Pallas) was collected during the different months of study period i.e. June 2012-May 2014 from Sukhna Lake, Chandigarh. A total of 45 specimens of *Notopterus notopterus* (Pallas) have been analysed. Fishes were caught by using cast and gill net with hired help of fisherman from Ropar and Mohali through permission of Department of Animal Husbandry and Fisheries, U.T. Chandigarh. The data was measured by a single person so as to avoid handling errors of any kind and up to an accuracy of 0.1 cm and 0.1 gm [8]. The length-weight relationships were calculated by using Le Cren equation [9]. Linear transformation was made by using the natural logarithm of the observed lengths and weights [10].

### III. Results

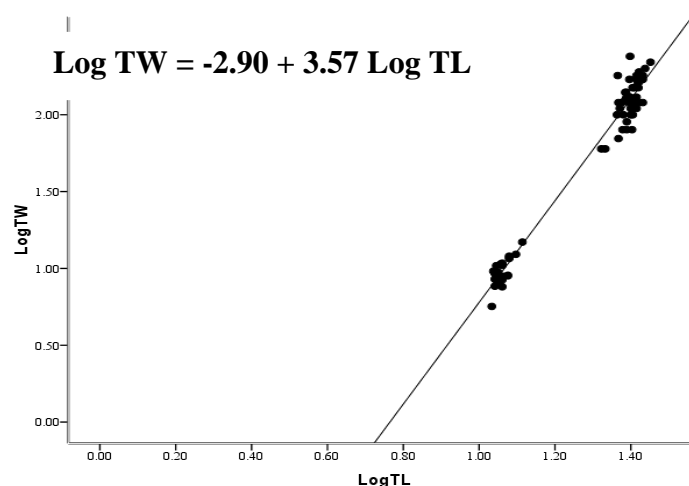
The study of LWR data is helpful in fishery assessments [11] and it also helps in estimating possible differences between separate stocks of same species.

Name of the fish	Range of Total Length (cm)	N	Range of Total Weight (gm)	'r'	Regression Equation	W=aL <sup>n</sup>
<i>N.notopterus</i> (Pallas)	21.00-28.30	45	60.00-240.00	0.657**	Log TW = -2.90 +3.57 Log TL	=0.00125 <sup>3.57</sup>

Significant positive moderate correlation coefficient (0.657) has been observed between Total length and Total Weight of *N.notopterus* (Pallas) and the regression equation for the same has also been calculated (Table 1). A curvilinear relationship has been observed between total length and total weight for *Notopterus notopterus* (Pallas). The total length and total weight values have been converted to logarithmic scale in order to simplify data interpretation (Figs.1&2).



**Fig.1** Relationship between Total Length (TL) (cm) and Total Weight (TW) (gm) of *N. notopterus* (Pallas) from Sukhna Lake, Chandigarh.



**Fig.2** Relationship between Log Total Length (Log TL) and Log Total Weight (Log TW) of *N.notopterus* (Pallas) from Sukhna Lake, Chandigarh.

#### IV. Discussion

Length-weight relationship has an eminent role in fishery biology involving with the various trends with the life history of fishes [12]. The length-weight relationships yield data which is used to interpret the biomass, condition and growth in fishes. In length-weight relationship weight can be forecasted by length which can be used for assessment of biomass offering as a beneficial technique in the fishery biological studies [13]. The value of constant “b” is a measure of robustness of the fish [14]. Length-weight relationship may help to determine whether growth is isometric “b”=3 or allometric (negative allometric: “b”<3 or positive allometric: “b”>3) [15-16]. Present observations show positive allometric growth (b=3.57) for *Notopterus notopterus* (Pallas) in Sukhna Lake. Similarly positive allometric growth (b=3.25) was observed for *Notopterus notopterus* (Pallas) in Pedu Lake, Kedah [17]. A positive allometric growth (b=3.27) was also observed for 22 specimens of male *Notopterus notopterus* (Pallas) in Jannapura pond, Karnataka, India along with significant positive correlation coefficient between length and weight i.e. 0.804 [18]. In addition, negative allometric growth (b=2.84) has also been reported in 31 female specimens of *Notopterus notopterus* (Pallas) in Jannapura pond, Karnataka, India [18]. In another study conducted on Gomti River, Lucknow on *N. notopterus*, negative

allometric growth (b-2.67) was observed [19]. Negative allometric growth was indicated in *Notopterus notopterus* (Pallas) in Indus River, Southern Punjab, Pakistan [20]. The variations in fish growth in terms of length and weight can be explained as an adaptive response to different ecological conditions [21]. These variations could be attributed to differences in number of specimens examined, seasonal health, general fish condition, age, maturity, habitat, health, stomach fullness and preservation techniques [22].

## V. Conclusion

This preliminary study on *Notopterus notopterus* (Pallas) from Sukhna Lake, Chandigarh shows positive allometric growth pattern as indicated by value of 'b'. The correlation coefficient of the LWR indicated significantly positive correlation. This study provides baseline data on LWR of *Notopterus notopterus* (Pallas) from Sukhna Lake, Chandigarh that would be beneficial to take necessary steps for management of this fish in Sukhna Lake, Chandigarh.

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