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Length-Weight Relationships of Indigenous Fish Species *Pterygoplichthys pardalis* (Castelnau, 1855) (Siluriformes: Loricariidae) from Ujani Wetland, India

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Abstract: The *Pterygoplichthys pardalis* in the Ujani wetland of Maharashtra, India was studied for its length-weight relationships (LWRs) for the period of March 2021 to February 2022. It was revealed that *P. pardalis* has the allometric growth with $b = 2.974$ and $a = 0.0293$ ($n = 126$). The standard length for *P. pardalis* ranged between 10.483 cm and 14.813 cm. There was no clear pattern showed in both growth parameters for the period of the study. The LWRs analysis of the species revealed that *P. pardalis* has b value less than 3 indicating negative allometry, while these values in expected range is 2.5 to 3.5. The r^2 value in the present study was found to be greater than 0.84 for the species, which indicates the proper fitness of the model for growth and good health status.

Keywords: Length-weight relations, Ujani Wetland, *Pterygoplichthys pardalis*, Conservation, Sucker fish, Growth Parameters

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Introduction

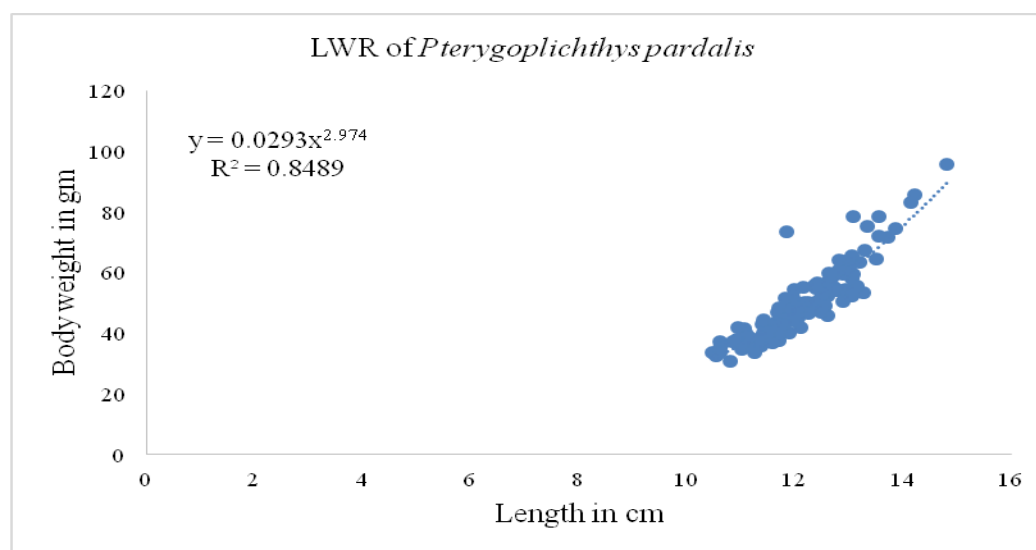
Accurate data on recruitment, growth, and mortality are necessary for managing fisheries resources or fish populations in any body of water. The morphological parameters, such as length and weight, are crucial characteristics both for the individual fish and for the population as a whole in fish biology (Karna *et al.*, 2018). From measurements of the length and weight of each fish, weight-length correlations are produced. For ecological investigations, these connections are frequently employed to compute body condition

indicators and estimate biomass from length measurements. (Hayes, 1995). It is worthwhile in field data enumeration where data conversion from length to weight is required since it is exceedingly challenging and time-consuming to measure both length and weight data at the same time in a fishing site (Ranjit *et al.*, 2020). Bhima river is tributary of Krishna River system, flows for 681 km before entering Krishna. Bhima is a major river in western and southern India which flows through Maharashtra, Karnataka, and

Table 1: Descriptive statistics, estimated parameters of LWRs ($W = a \times L^b$) for *Pterygoplichthys pardalis*

Fish Name	Standard length (cm)			Weight		LWR regression parameter			
	N	Min	Max	Min	Max	a	b	r ²	P
<i>Pterygoplichthys pardalis</i>	126	10.48	14.81	30.95	95.7	0.029	2.974	0.8489	<0.0001

N: No. of fish sample; TL: Total Length; W: Weight; Min: Minimum; Max: Maximum; a: intercept; b: slope; r²: coefficient of determination; P: level of significance

Fig. 1: Graphical representation of LWRs for *Pterygoplichthys pardalis*.

Telangana states. However, no study on fisheries aspects has been undertaken from the river so far. In order to close the gap, we first tried to study the fish variety of the river according to the Sarwade and More (2018), 80 fishes are recorded in Pune district. We discovered that many fish species that live in the system had either little or no information on their morphometry available in scientific literatures. The *Pterygoplichthys pardalis* was recorded in 2010 in Ujani reservoir (More *et al.*, 2020). Therefore, the present study reports length-weight relationship (LWR) of *Pterygoplichthys pardalis* from Ujani wetland, India.

Materials and Methods

A total of 126 samples of *Pterygoplichthys pardalis* of fish were studied from Ujani wetland, India. Specimens were collected early morning with the help of local fishermen from March 2021 to February 2022. After collection, specimens

were preserved in 10% formalin solution and brought to the research laboratory for identification and measurements. Fishes were identified based on Talwar and Jhingran (1991), Fricke *et al.* (2018) and Froese and Pauly (2020). Measurements of total length (TL) were done by using digital caliper (Mitutoyo, Japan) to the nearest 0.1 cm and body weight (W) were measured using weighing machine closest 0.01 g (CONTECH - CB Series). Length-weight relationships were estimated by formula: $W = aL^b$, where 'L' denotes total length (cm), 'W' represents body weight (g), 'a' is intercept and 'b' denotes the slope of log-transformed linear regression (Le Cren, 1951).

Results and Discussion

Estimated parameters of LWR, i.e., sample size (N), length range, weight range, a, b, r² of the *Pterygoplichthys pardalis* are described in Table 1. The r² value for *P. pardalis* was 0.848, regression

values were highly significant ($p < 0.001$). The calculated growth coefficients (b) were 2.974 (Fig. 1). The estimated b values of the regression for species are within the range of 2.5 – 3.5 as per Carlander (1969) and Froese (1998). The observed confidence limits were well within the range and overlapped with the Bayesian confidence limits in FishBase (Froese and Pauly, 2022). The results of the present study can be useful for conservation and management of the investigated species.

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