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Research Paper

LENGTH-WEIGHT RELATIONSHIP OF THREE ORNAMENTAL FISH SPECIES [*Trichogaster labiosa* (DAY, 1877), *Psilorhynchus nudithoracicus* (TILAK & HUSSAIN, 1980) AND *Pseudolaguvia foveolata* (NG, 2005)] COLLECTED FROM THE MANAS RIVER, ASSAM, INDIA

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Abstract

This study reports the length–weight relationships (LWRs) of three fish species, *Trichogaster labiosa* (Day, 1877), *Psilorhynchus nudithoracicus* (Tilak & Hussain, 1980) and *Pseudolaguvia foveolata* (Ng, 2005) collected during June 2016 and July 2018 from the Manas River in Assam, India. There were no prior LWR data regarding these three fish species. In the study, maximum total length (TL) of 9.49 cm was recorded for *T. labiosa*. Estimated LWRs were $W = .018\ TL^{3.03}$, ($r^2 = .99$) for *T. labiosa*, $W = .011\ TL^{2.99}$, ($r^2 = .95$) for *P. nudithoracicus,* and $W = .085\ TL^{1.32}$, ($r^2 = .96$) for *P. foveolata*.

Key words: Length-weight relation, Manas, Assam, *Trichogaster, Psilorhynchus, Pseudolaguvia*.

INTRODUCTION

The Length Weight relationship of fishes is an index by which the growth, maturity, reproduction and general well being can be ascertained [1]. It also helps in the estimation of biomass and morphological comparison among the species or population of different habitats [2] (Moutopoulos and Stergiou, 2002) . The present study estimates the length-weight relationship of *Trichogaster labiosa* (Day, 1877), *Psilorhynchus nudithoracicus* (Tilak & Hussain, 1980) and *Pseudolaguvia foveolata* (Ng, 2005), three important ornamental fish species of India. This study provides the first published reference of length–weight relationships for these three species from the Manas River in Assam, India.

MATERIALS AND METHODS

Fish samples were collected from June 2016 to July 2018 from the five sampling sites — Mothanguri (26°46'9" N 90°57'42" E, 87.5 m MSL), Narayanguri (26°39'6" N 90°59'43" E, 56.7 m MSL), Bekipar (26°29'71" N, 90°55'16" E, 40.8 m MSL), Kalgachia (26°23'31.0"N
90°45'17.3"E, 29.9 m MSL) and Jogighopa (26°11'57.4"N 90°34'18.0"E, 13.4 m MSL) of the Manas River. Length and weight of the fishes were recorded immediately after collection. A digital slide calliper (Mitutoyo, CD–8"CSX) was used to measure the total length (TL) to the nearest 0.01 cm and total body weight (TW) was calculated with a digital balance (Sartorius, BS-223 S, Germany) nearest to 0.01 g. Identification of fishes was done following [3], [4], and [5]. Length-weight relationships of the fishes were calculated following the allometric growth formula, $W = aL^b$ [6], which when converted into logarithmic form as suggested by Le Cren (1951) becomes, Log W = Log a + b Log L. Log-log plots of length and weight values were performed for visual inspection of outliers [7]. All statistical analyses were done using Excel 2013.

RESULTS

Estimated parameters and descriptive statistics of the LWRs of *T. labiosa*, *P. nudithoracicus* and *P. foveolata* are given in Table 1.

Table 1. Descriptive statistics and estimated parameters of LWRs for three fish species *Trichogaster labiosa* (Day, 1877), *Psilorhynchus nudithoracicus* (Tilak & Hussain, 1980) and *Pseudolaguvia foveolata* (Ng, 2005) collected during 2016-18 from Manas River in Assam, India.

Species	N	TL (cm)		TW (g)		Regression parameters		95% CL of *a*	95% CL of *b*	r^2
		Min	Max	Min	Max	*a*	*b*			
Trichogaster labiosa	85	2.73	9.49 †	0.35	16.81	0.0176	3.03	0.0158–0.0196	2.98–3.09	0.99
Psilorhynchus nudithoracicus	45	5.07	8.3	1.49	6.75	0.0114	2.99	0.0077–0.0171	2.78–3.19	0.95
Pseudolaguvia foveolata	27	2.89	4.91	0.36	0.81	0.0906	1.32	0.0781–0.1050	1.21–1.43	0.96

n, number of individuals; TL, total length; TW, body weight; Min, minimum; Max, maximum; *a*, intercept; *b*, slope, CL, confidence limits; r^2, coefficient of determination. †New maximum Total length (TL)

The TL value recorded is higher than the previously reported value (https://www.fishbase.de/summary/Trichogaster-labiosa.html)

DISCUSSION

From the present investigation, we found that all the values of 'b' calculated for the three fish species collected from the river Manas were within the expected range of 2.5–3.5 as reported by Froese (2006). No LWRs for any of the three species were available in FishBase [8]. The value of parameter 'b' for *T. labiosa* and *P. nudithoracicus* are respectively 3.03 and 2.99 (b≈3), showing isometric growth, thus, indicating that small-size specimens in the sample have the same form as the large sized specimens. The 'b' value for *P. foveolata*, was computed to be 1.32 (b < 3), which signifies that small-sized specimens were in better nutritional condition at the time of sampling [7]. Low 'b' value of *P. foveolata* may also be due to the fact that the sample contained mostly small sized fishes. As per the data available in FishBase (2018), reported herein is a new maximum total length for *T. labiosa* (9.49 cm). Similarly, comparing the 95% CL of 'a', the shapes of *T. labiosa* is short & deep where as *P. nudithoracicus* and *P. foveolata* has an elongated body shape. (Froese *et al*., 2014).

In conclusion, this paper has provided basic data on the LWR of three ornamental fish species that would be beneficial for fishery biologist's managers to impose suitable regulations for sustainable fishery management.

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