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Technical contribution

Length-weight relationship of freshwater fish, *Puntius shalynius* Yazdani and Talukdar (Cypriniformes: Cyprinidae), in Meghalaya, India

By M. Manorama and S. N. Ramanujam

Fish Biology Laboratory, Department of Zoology, School of Life Sciences, North Eastern Hill University, Shillong, India

Summary

The present investigation gives the length-weight relationship (LWR) of *Puntius shalynius* in Meghalaya, India. The samples for the study were collected from Umiam river. The value of the exponent 'b' in the LWR was less than 3, with 0.885 for males and 1.616 in females. This shows that the species exhibit allometric growth pattern. There was no difference in LWR between sexes and seasons.

Introduction

The present investigation gives the length-weight relationship of *Puntius shalynius* in Meghalaya, India. *P. shalynius* Yazdani and Talukdar, 1975 is a small, indigenous as well as ornamental fish, commonly called 'Shalynai' in the local Khasi language. It is an important hill stream fish found in almost all streams and rivers of the Khasi and Jaintia hills, and which feeds on animal matter, detritus and algae. Of late, the population of this species has declined due to destruction of the natural habitat and other anthropogenic factors to such an extent that they have been identified as a vulnerable species (Sen, 2003).

Length-weight relationships (LWR) are useful in fishery management for both applied and basic uses (Pitcher and Hart, 1982). Studies on LWRs are still scarce for most tropical and sub-tropical fish species (Harrison, 2001; Ecoutin et al., 2005). The main objective of this work was to present the length-weight relationship of *P. shalynius*.

Materials and methods

Samples of *P. shalynius* were collected during daytime on a seasonal basis with the help of the fishermen from the Umiam River, Ribhoi district, from February 2009 to January 2010. The study area is situated at an altitude of 1020 m (Mean Sea Level) at 25°40′00″N and 91°54′20″E. Collection of fish was done using cage nets and other locally made traps. The samples were transported to the fish laboratory of the Department of Zoology, North Eastern Hill University, Shillong. Fish samples were preserved in 5% formalin and washed with water and dried before measuring. The collected fishes were classified under four seasons representing pre-monsoon, monsoon, autumn and winter. Total length (cm) of individual fish was taken from the tip of the snout to the extended tip of the caudal fin using Vernier calipers. Body weight (g) of each fish was taken to the nearest gram using a top Mark Electronic Balance after blot-drying excess water from the body. Sexes could be differentiated only in mature specimens. Males were usually coloured red near the caudal fin as compared to the colourless female. The sexes of the young specimens were determined by dissecting the gonads.

Table 1
Seasonal descriptive statistics and estimated parameters of length-weight relationships for male, female and combined sexes of *Puntius shalynius*, Umiam River, Ribhoi District, Meghalaya, India

			Total length (cm)		Regression parameters				
Seasons	Sex	n	Minimum	Maximum	a	95% CI of a	b	95% CI of b	r^2
Pre-monsoon	M	25	4.10	6.50	9.462E-06	1.778E-08–4.989E-03	1.371	0.882–1.859	0.796
	F	22	5.40	6.50	2.143E-07	1.622E-11–2.838E-03	1.616	0.920–2.312	0.781
	C	47	4.10	6.50	2.178E-05	2.630E-07–1.807E-03	1.304	0.965–1.643	0.841
Monsoon	M	20	4.20	6.70	2.710E-06	3.673E-09–1.963E-03	1.433	0.932–1.933	0.823
	F	25	5.00	6.50	6.209E-05	1.069E-06–3.614E-03	1.218	0.914–1.521	0.876
	C	45	4.20	6.70	5.929E-07	2.032E-07–1.726E-04	1.385	1.130–1.640	0.892
Autumn	M	31	4.30	6.10	1.762E-04	1.239E-05–2.500E-03	1.097	0.880–1.313	0.902
	F	39	4.00	6.50	2.307E-04	1.318E-05–4.111E-03	1.059	0.831–1.287	0.876
	C	70	4.00	6.50	3.155E-04	5.794E-05–1.714E-03	1.043	0.905–1.181	0.929
Winter	M	26	5.10	6.20	2.642E-03	2.344E-05–2.992E-01	0.885	0.522–1.248	0.798
	F	27	4.90	7.00	1.268E-05	1.892E-08–8.395E-03	1.282	0.806–1.758	0.762
	C	53	4.90	7.00	4.977E-05	3.304E-07–7.482E-03	1.189	0.815–1.562	0.754

M, male; F, female; C, combined; n, sample size; a, intercept; b, slope; CI, confidence intervals; r^2, coefficient of determination.

A logarithmic transformation was used to estimate LWR parameter (Bagenal and Tesch, 1978): Log W = Log a + b Log TL

Results and discussion

P. shalynius is a benthopelagic fish which inhabits medium to large rivers, brooks, rapid running mountain streams and stagnant water bodies where the substratum is muddy.

From the total of 215 specimens of *P. shalynius* collected during the study period, 102 (47%) were males and 113 (53%) were females (Table 1). LWRs indicated negative allometric growth both in males and females ($b < 3$). Length-weight relationships may present spatial and temporal variations due to water temperature, food availability and reproductive activities (Weatherley and Gill, 1987; Wootton, 1990). However, no differences were found between sexes and seasons in the present study.

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Author's address: Sunkam Narayaniyengar Ramanujam, Fish Biology Laboratory, Department of Zoology, School of Life Sciences, North Eastern Hill University, Shillong 793022, India.
E-mail: ramanujamsunkam@gmail.com