

LENGTH WEIGHT RELATIONSHIP AND CONDITION FACTOR IN A HILLSTREAM FISH *BOTIA DAYI* HORA FROM UTTARANCHAL

KISHOR KUMAR¹, K.L.BISHT², ANOOP K. DOBRIYAL³, P.K.BAHUGUNA³, H.K.JOSHI³ AND
S.GOSWAMI³

¹Department of Zoology, Government Degree College, Daak Patthar, Dehradun

²Department of Zoology, Government Post graduate College, Kotdwara Garhwal

³Department of Zoology, H N B Garhwal University Campus, Pauri Garhwal- 246 001, Uttarakhand

ABSTRACT

The paper deals with the study of length weight relationship and relative condition factor in the hillstream fish *Botia dayi* Hora. The study aims at the investigation of health condition and well being of the rare fish in river Khoh of Uttarakhand.

Key words: Length weight relationship, Relative condition factor, *Botia dayi* Hora

INTRODUCTION

In fish biology research, the length-weight relationship is useful for a number of purposes as to estimate the biomass from length frequency data and estimation of average weight of fish for a given length group. Generally the body parameters of a fish vary with its age. Pioneering studies on the length-weight relationship has been made by Le Cren (1951) on *Perca fluviatilis* who reviewed the cubic parabola into a general parabola as $W=aL^n$ [where, 'n' is an exponent to which the initial growth index depends. The value of 'n' may vary from 2.5 to 4.0 (Hile, 1936; Martin, 1949).

The condition factor is an expression of the condition of individual fish during certain period. The relative condition factor (K_n) is an important aspect of fishery biology, which indicates the well being of the fish. K_n is calculated as the ratio between observed weight and the expected weight from the observed length. Several factors are responsible for the maintenance of relative condition factors. The important ones are niche related ecological parameters, availability of food in the surrounding and the physiological *Botia dayi* Hora aspects like feeding and breeding of fish. Length-weight relationship of several fishes have been studied Johal & Tondon (1981), Thakre and Bapat (1984), Nautiyal (1985), Bisht (1985), Dhasmana (1990), Singh *et. al.*, (1998), Mitra (2001), Bali and Sharma (2002), Thapliyal (2002), Uniyal *et.al.*, (2004), Laskar *et. al.*, (2005).

MATERIALS AND METHODS

Fish for the present study were collected from different sections of river in a stretch of about 10 km from Dogadda to Kotadwara in the foot hills of Garhwal Himalayas during January 2002 to December 2003. As it is a very rare species, only 106 specimens were considered for the present study. Body parameters of fish were measured in fresh conditions. The relationships were calculated for fish as sex wise and pooled data and sex wise and season wise. The statistical relationship between the length and the weight of fish was established by using the parabolic equation suggested by Le Cren (1951)

$$W = aL^n$$

Where, W = Weight of the fish, L = Length of the fish,

a = Constant (intercept), n = Regression coefficient.

The linearity of the regression was tested by the analysis of variance using 'F' test. Relative condition factor (K_n) was calculated for different sexes month wise and season wise to know well being of the fish. It was calculated by the formula

$$K_n = W/W$$

Where K_n = Relative condition factor, W = Observed weight of fish in gm, W = Calculated weight

Table 1: Regression analysis and coefficient of correlation on length- weight relationship in *Botia dayi* Hora, during 2002- 2003

S.No.	Condition	Parabolic equation	Correlation coefficient "r"
1	Sex wise and Pooled data		
	Male	$W = -13.6640 L^{2.48235}$	0.75969
	Female	$W = -31.3244 L^{4.14954}$	0.80753
	Pooled data	$W = -25.03528 L^{3.56224}$	0.77130
2	Season and Sex wise		
	Male		
	Winter (Dec.- Feb.)	$W = -16.0775 L^{2.6738}$	0.78373
	Spring (Mar.- Apr.)	$W = -30.97332 L^{4.20094}$	0.86728
	Summer (May- Jun.)	$W = -13.86127 L^{2.5768}$	0.60496
	Monsoon (Jul.- Aug.)	$W = -8.01346 L^{1.80531}$	0.81584
	Autumn (Sep.- Nov.)	$W = -5.0343 L^{2.06192}$	0.8724
	Female		
	Winter (Dec.-Feb.)	$W = -10.03118 L^{2.04727}$	0.93147
	Spring (Mar.-Apr.)	$W = -51.38084 L^{5.91213}$	0.92958
	Summer (May.- Jun.)	$W = -59.2582 L^{6.51710}$	0.75743
	Monsoon (Jul.- Aug.)	$W = -37.9415 L^{4.73714}$	0.55015
Autumn (Sep.- Nov.)	$W = -33.8414 L^{4.34929}$	0.8945	

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