Length-weight Relationship in *Nandus nandus* (Hamilton) (Perciformes-Teleostei)

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Length-weight relationship of the freshwater fish of Pamba river, *Nandus nandus* (Ham) has been worked out. The results showed that the slope values and elevations were not significant and hence a combined regression equation has been calculated for both the sexes (Log W = 2.4130 Log L — 0.3306). The 't' test analyses were conducted and found that the growth departs significantly from the isometric growth. Thus the formula $W = aL^n$ has to be applied in calculating the length-weight relationship of this species.

The length-weight relationship is calculated to determine a mathematical relationship between length and weight and their interconversions and to measure the variations from the expected weight for length of individual fish or group of fish which is indicative of the fatness, general well-being or gonad development (Le Cren, 1951). The length-weight relationship in fishes can also be used in setting up yield equations (Ricker, 1958), in estimating the number of fish landed and in comparing populations in space and time (Sekharan, 1968), growth studies and for comparison of body form of different groups of fishes.

The weight of a fish is a function of its length and the general expectation is that the weight of fishes would vary as the cube length (Brown, 1957) and that can be expressed as:

$$W = CL^3$$

where 'W' represents the weight of the fish, 'L' its length and 'C' a constant. But the actual relationship may depart significantly from this (Le Cren, 1951) as the fishes normally change in body form or shape and specific gravity of tissues throughout life span. In such cases it is better to fit a general parabolic equation of the form:

$$W = aL^n$$

where 'a' a constant equivalent to 'C' and 'n' a constant to be determined empirically from the data.

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Nandus nandus is an edible species in the Pamba river and practically no information on its biology and growth rates is available. Hence an attempt has been made here to understand the length-weight relationship of this species.

Materials and Methods

152 females(ranging from 45mm to 130mm in standard length) and 90 males (ranging from 57 mm to 98 mm in standard length) were collected from Pamba river at Paippadu, Alleppey District, Kerala, South India (Long. 76° and 77°E and Lat. 9° and 10°N) from April 1981 to March 1982. The standard length (correct to 0.5 mm) and weight (correct to 1 mg) were taken for each specimen and the data were analysed using analysis of covariance method (Snedecor & Cochran, 1975).

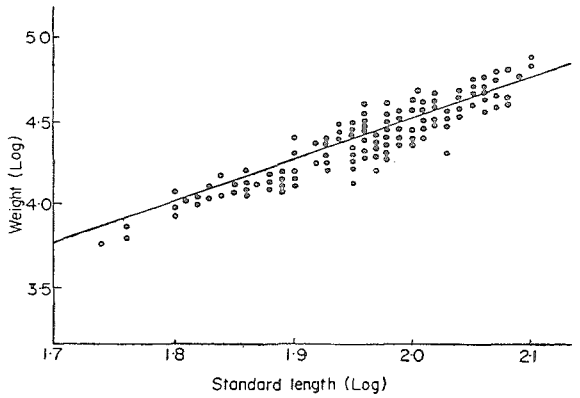

Fig 1. Length-weight relationship of *Nandus nandus*

Table 1. *Analysis of covariance for testing difference in regression coefficients between males and females of N. nandus (Compared the slopes and elevation)*

Source of variation	df	Deviation from regression SS	MSS
Within			
Male	88	18.7438	0.2130
Female	150	3.8452	0.2560
	238	22.5890	0.0949
Pooled within	239	22.7088	0.0950
Difference between slopes	1	0.1198	0.1198
Between and within	240	22.7369	0.0947
Between adjusted means	1	0.0281	0.0281
For comparison of slopes		PS = 1.2620 (Not significant)	
For comparison of elevation		Fe = 0.2957 (Not significant)	

Results and Discussion

The results of the analysis of covariance are presented in Table 1 and graphically represented in Fig. 1. The comparison of slope (growth rate) and elevation (the average size) of males and females show that there is no significant differences in both. This shows that the growth rate and average size in males and females are similar. From the figure it can be seen that the points are close to the line and hence it can be inferred that the regression coefficient equation best represent the length-weight relationship in males and females. Therefore a combined equation has been calculated for establishing the length-weight relationship (Fig. 1) which may be represented as:

$$\text{Log } W = 2.4130.\ \text{Log } L - 0.3306$$

Though the above formula holds good for length-weight relationship of *N. nandus,* it appears advisable to test the regression coefficient against the isometric growth value of 3.0 to find whether there is any significant departures from the above value. For this 't' test was carried out using the formula:

$$t = \frac{|\ 3.0 - n\ |}{S_B}$$

where S_B is the standard error of corresponding regression coefficient 'n'.

The values of 't' test for males and females were found to be 6.1988 and 6.3437 respectively. Hence the cubic formula $W = CL^3$ will not be a proper representation of the length-weight relationship of this species.

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