



Research Note

Length-Weight Relationship of *Channa punctata* (Bloch, 1793) and *Channa striata* (Bloch, 1793) in Ukkadam Lake, Coimbatore, Tamil Nadu, India

M. Senguttuvan^{1*} and A.A. Sivakumar²

¹Department of Zoology, PSG College of Arts & Science, Coimbatore - 641 014, India

²Department of Zoology, Kongunadu Arts & Science College, Coimbatore - 641 029, India

Ukkadam lake is a major freshwater body in Coimbatore city where murrels form the major fishery next to major carps. The length-weight relationship of *Channa punctata* of Guntur waters was reported as curvilinear and the difference between the regression coefficients of the two sexes as significant (Reddy, 1981). The length-weight relationship and fecundity of *Channa striata* of Gaighata, West Bengal, were studied by Sarkar (1989) and the slopes of male and female were reported to be significant while their elevation was found to exhibit non-significant difference. Sarkar (1996) estimated the length-weight relationship and fecundity of *Channa punctata* collected from freshwater bodies near Calcutta. The slopes of male and female were significant while their elevation exhibited non-significant difference. There is no report on the length-weight relationship of these species from Ukkadam lake of Coimbatore region and hence the present study was carried out.

A total of 635 specimens of *C. punctata* (147 juveniles, 191 males and 297 females) ranging from 80 to 310 mm in total length (body weight ranging from 6.5 to 2250 g) and 1661 specimens of *C. striata* (461 juveniles, 465 males and 735 females) ranging from 135 to 620 mm in total length (body weight ranging from 10 to 4500 g) were collected from the freshwater lake located in Ukkadam in Coimbatore. Length-weight relationship was worked out follow-

ing the method adopted by Le Cren (1951). Total length of the fish was measured to the nearest mm, from the tip of the snout to the distal end of the caudal fin and the weight of the fish was measured to the nearest mg.

Parabolic equation $W = aL^n$ can be expressed in the logarithmic form as:

$$\log W = \log a + n \log L$$

Linear equation was fitted for juveniles, males and females separately for both the species and the estimates of parameters 'a' and 'b' for each category were obtained by the method of least squares. With a view to know the differences between regression coefficients of juveniles, males and females, analysis of covariance was employed following the method of Sarkar (1996).

The correlation coefficient values for juveniles, males and females of *C. punctata* were 0.970, 0.927 and 0.964, respectively whereas in *C. striata* the values were 0.971, 0.975 and 0.971 respectively. In both the species, the 'r' values were found to be highly significant ($P < 0.001$).

In *C. punctata* no significant differences could be found in juveniles, males and females and the data were therefore, pooled together and the length-weight equation was derived commonly as follows:

$$\log W = -1.9613 + 2.9873 \log L$$

In *C. striata*, significant value (at 5% level) was obtained on comparing juveniles, males and females. The regression equations for juveniles, males and females of *C. striata* can, therefore, be expressed as follows:

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* E-mail: senguttuvan_cbe@yahoo.co.in

Juveniles : $\log W = - 3.5387 + 3.6107 \log L$

Males : $\log W = - 1.6827 + 2.9131 \log L$

Females : $\log W = - 0.7858 + 2.5429 \log L$

Regression lines fitted to the pooled data, collected on juveniles, males and females of *C. punctata* (Fig.1) and for juveniles, males and females of *C. striata* (Fig. 2, 3 & 4), showed a linear and close relationship between the variables, length and weight.

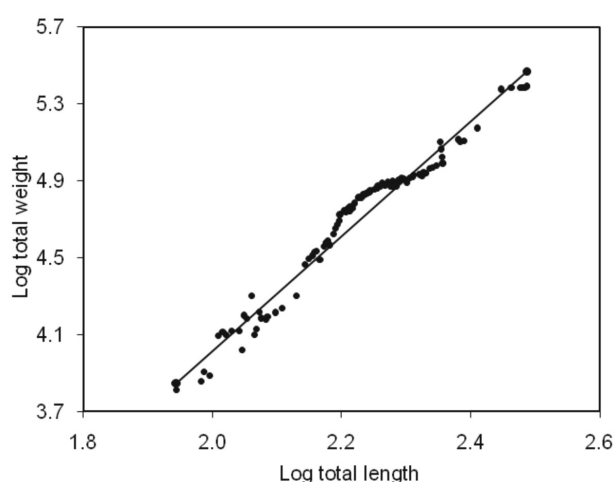


Fig. 1. Length-weight relationship in *Channa punctata* (pooled data)

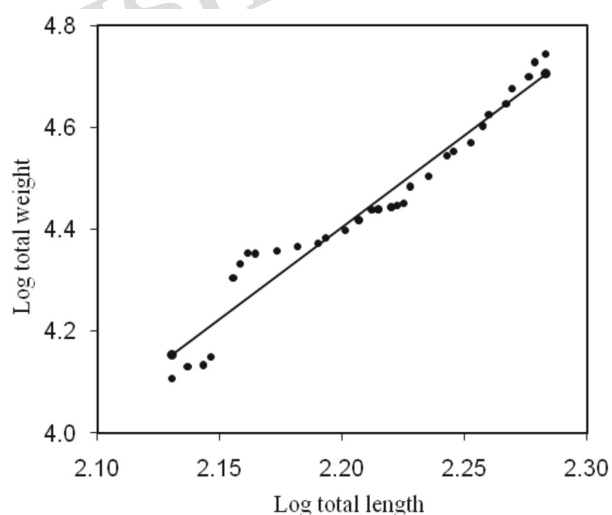


Fig. 2. Length-weight relationship in *Channa striata* (juvenile)

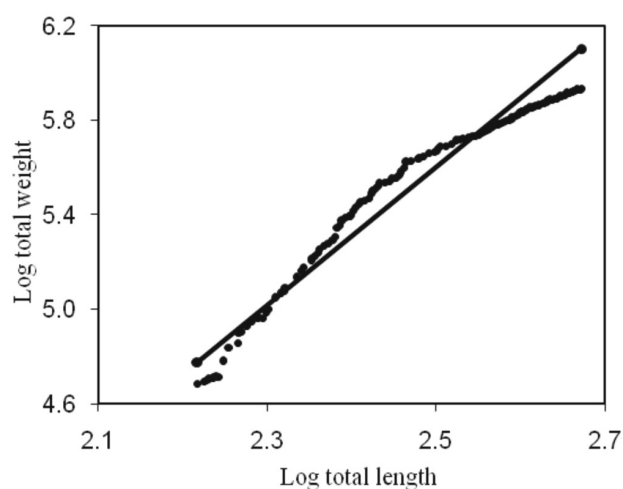


Fig. 3. Length-weight relationship in *Channa striata* (male)

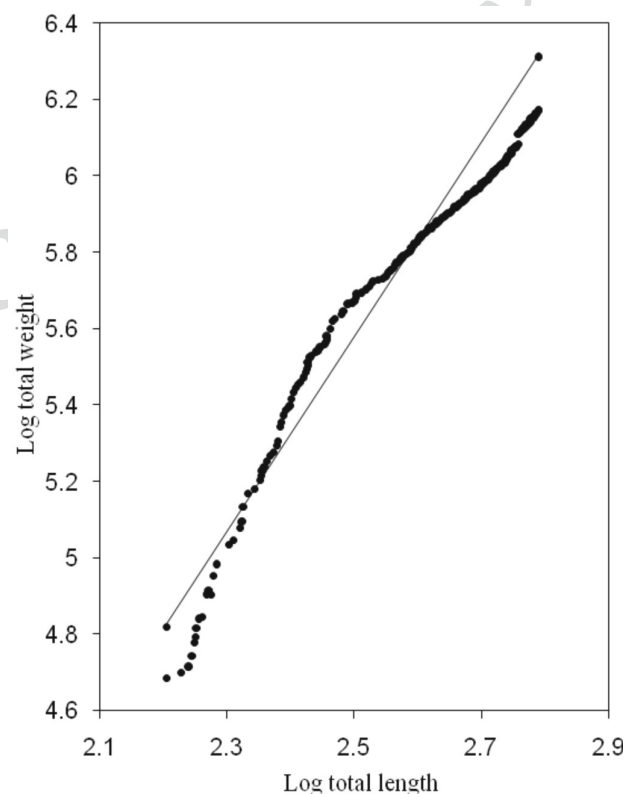


Fig. 4. Length-weight relationship in *Channa striata* (female)

In *C. punctata*, the exponent values for males and females were less than 3 indicating that increase in weight was less compared to the length, while in juveniles, the exponent value was more than 3 indicating that weight increased more than the length. Similar trend was observed in *C. striata* also.

Theoretical value of 'b' in length-weight relationship was reported as '3' (Cube law) when the form of the fish remains constant at different lengths *viz.*, the growth is isometric (Allen, 1938). A value less than '3' indicates that the fish becomes slender with increase in length while a value greater than '3' indicates the reverse *viz.*, growth is allometric (Grover & Rogelio, 1976). In the present study, 'b' value ranged from 2.82 to 3.0 for *C. punctata* and from 2.54 to 3.61 for *C. striata*.

Regression coefficients for *C. punctata* against the isometric growth value of 3 showed significant difference at 1% level ($t = 31.96$, $df = 634$). Hence the cubic formula will be a proper representation of the length-weight relationship of *C. punctata viz.*, the growth in this case was not different from isometric growth of fish.

Analysis of 't' test for males and females of *C. striata* can be presented as follows:

Males: $t = 35.0798$ ($df = 464$) significant at 1% level

Females: $t = 98.0512$ ($df = 734$) significant at 1% level

In this case also, it was seen that for both males and females, growth was not found to be significantly different from isometric growth.

Significant differences in the juveniles, males and females of *C. striata* could be attributed to the reason that most of the fishes change their shape or form

as they grow in length and in such cases, the exponent value may be altered, as stated by Martin (1949). In the present study, in both the species, the increase in length and weight was consistent and deviate from isometric growth.

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