Investigation of length-weight relationships and condition factor (k) of fish species cultured in Victoria reservoir in Sri Lanka

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Abstract

Length–weight relationships and condition factor (K) of fish species provide crucial information on fisheries biology, and well-being of the fish species in the dynamic environment of an aquatic resource. Hence, the present study was carried out to determine the length-weight relationships and Fulton's Condition Factor of fish species in Victoria Reservoir, having 2300 ha at full supply level in Sri Lanka. A total of 310 random individuals belonging to *Oreochromis niloticus* (N=122), *Catla catla* (N=60), *Labeo rohita* (N=58), *Cirrhinus mrigala* (N=35) and *Macrobrachium rosenbergii* (N=35) were collected by gill nets on monthly basis from the reservoir over a period of 24 months (January, 2014 to December, 2015) and their wet weight (W) and total length (L) to the nearest g and cm were recorded respectively. Nonlinear regression analysis procedure in *SAS* software was carried out to estimate the parameters a and b (=allometric coefficient) in the nonlinear weight-length relationship model $W = aL^b$ and its logarithmic form: log W = log a + b log L for individual species separately. All five species showed significant weight-length relationships ($P<0.05$). This was partly because of significant Pearson correlation coefficient estimates ($P<0.05$) found between W and L in all species except *M. rosenbergii* (0.72, 0.86, 0.91, 0.91, 0.17, respectively). Estimates of allometric coefficients (b) for the five species were 1.564, 3.770, 2.030, 2.105 and 0.214, respectively. Thus, four species showed negative allometric growth ($b<3$) while only *C. catla* exhibited positive allometric growth ($b>3$) since they become relatively deeper-bodied when increased in length. Mean value (± standard error) of K (estimated as $K=100W/L^3$) for *O. niloticus* was 2.079 ±0.112, while it was 1.475±0.053, 1.292±0.057, 1.135±0.054 and 2.090±0.103 for the other four species, respectively. Majority of the species exhibited negative allometric growth and condition factor was greater than one for all species which indicates relatively favorable physiological conditions of the fishes specially for *O.niloticus* and *M. rosenbergii* in Victoria Reservoir. Further research is recommended on the seasonal fluctuations and other factors affecting b and K parameters of fish species in the reservoir.

Keywords: *Allometric growth, Condition factor, Fish species, Length- weight relationship, Victoria reservoir*

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