ISSN: 2347-5129
IJFAS 2015; 2(4): 239-240

www.fisheriesjournal.com
Received: 02-01-2015
Accepted: 14-02-2015

R. K. Negi
Department of Zoology & Environmental Sciences Gurukula Kangri University, Haridwar 249404, India

Pooja Tyagi
Department of Zoology & Environmental Sciences Gurukula Kangri University, Haridwar 249404, India

Correspondence
R. K. Negi
Department of Zoology & Environmental Sciences Gurukula Kangri University, Haridwar 249404, India

Length-weight relationship of *Schistura gangeticus* (Menon) from Alaknanda River of Garhwal Himalayas of Uttarakhand State India

R.K. Negi and Pooja Tyagi

Abstract
Length - weight relationship was derived from *Schistura gangeticuus* (Menon) inhabiting Alaknanda river of Garhwal Himalaya. Sampling was done between September, 2012 to January, 2013.The result show that the 'b' is significantly more than 3.0. The species exhibit a isometric growth pattern.

Keywords: Length–weight, Schistura, Alaknanda, Garhwal

1. Introduction
Total (TL) and fork (FL) lengths are usually utilised in studies of fish growth, whereas standard length (SL) is mainly used in systematic studies. When making comparisons between populations, it is essential to use standard measures for all populations so that the results will be more reliable. This is why the length-weight relationship of species under various environmental conditions should be known. The length-weight relationship also halts in morphological comparison of species and populations [1]. In the Indian hill streams, the member of the family Balitoridae, subfamily Nemacheilinae and genus *Schistura* (McClelland) which includes the loaches, inhabiting in different water bodies, plays a significant role in maintaining the ecological balance of hill streams. A perusal of literature has revealed that no work has been carried out in this species hence, the present study presents estimate of the length- weight relationships for species of *Schistura gangeticus* from Alaknanda river of Srinagar Garhwal Himalaya of Uttarakhand, State.

2. Material and methods
Fish samples were collected from stream of Alaknanda (Latitude 30^0 07' 10.79'and 78^0 35' 13.97' longitudinal) between September, 2012 to January 2013 using different fishing gears (cast net, hand net and scoop net). A total length of each fish were measured to the nearest 0.01cm, and individual body weight was recorded to the nearest 0.01g.taken after draining water from buccal cavity and blotting out excess water on the fish. All length weight relationships were calculated using the least square fitted method to log transformed data using the function $w=aL^b$, where W is the total weight of the fish in grams, L the total length in cm, a is a coefficient related to body form, and b is an exponent indicating isometric growth. The parameters a and b were estimated by linear regression on transformed equation: LogW = loga + b logL [2].

3. Results and discussion
A total of 33 specimens of *Schistura gangeticus* (Menon) was collected and subjected for the length- weight relationships study. The curvilinear relationship was observed when original weight was plotted the respective total length of the fish. However, linear relationship was obtained when the values were converted to logarithermic values. The values of the 'b' of length weight relationship of pooled data was
W= -6.97686 + 3.92377 Log L
$W= 3.05309\ L^{3.92377}$
The value of the exponent 'b' in *Schistura gangeticus* have been found to be 3.92377 clearly indicating that the species increase in weight is much more than the cube law. The values of the exponent was significantly higher than 3.92377 exhibited a positive allometric growth.

According to Allen[3] an ideal fish which maintains a constant shape, the value of 'n' will be 3. Hile [4] and Martin [5] were of the opinion that it may vary between 2.5 to 4.0. Negi and Negi [6] reported that value of regression coefficient in *Puntius* was 3.0 from Lake of Nainital India. The result of the present study indicates that the value of 'b' is more than 3. The value of exponent 'b' is when less than 3 and more than 3 indicates that fish become lighter and heavier, respectively for the particular length as it increase in size [7] In the present study the value of exponent 'b' was observed to be well above 3. This indicates that the weight of the fish was higher as compare to the cube of its length which shows isoometric growth of hill stream loaches. Similar findings were given by Naeem *et al.* [8] who reported 3.32 value of 'b' for bighead carp. The results of present investigation will be helpful in the management and conservation of this species in typical hill stream ecology.

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