

Length–weight relationships of some fish from the Ganga River, India

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Abstract

Length–weight relationships (LWRs) were determined for seven riverine fish species from the river Ganga, India. Specimens were collected on a bi-monthly basis from April 2017 to December 2018 using gill nets (mesh size 22–34 mm), cast nets (mesh size 16 mm) and bag nets (mesh size 14–22 mm). Total length was measured to the nearest 0.1 cm using a digital caliper and weight was recorded to the nearest 0.01 g on an electronic balance. From estimated length–weight relationships, the values for parameter ‘a’ ranged from 0.004 (*Bregmaceros maclellandi* and *Setipinna tenuifila*) to 0.014 (*Brachirus pon*). Likewise, the values for the parameter ‘b’ of the equation ranged from 2.958 (*Bogarius bogarius*) to 3.124 (*Bregmaceros maclellandi*) and r^2 from 0.978 (*Goniaosa monima*) to 0.996 (*Brachirus pon*).

1 | INTRODUCTION

Length–weight relationship (LWR) is a common study in fisheries, used to estimate fish biomass at a given length and also to convert length measures into weight and vice-versa (Froese, 2006; Froese, Takinas, & Stepiou, 2011; Karna, 2017). LWRs can be useful when collected together with a number of other critical population parameters to develop predictive populations models, provided these data are obtained by a standardized sampling methods, where all investigators use—over the years—the same fishing methodology, including type of gear and sampling frequency.

In view of the importance of LWR information in fisheries management studies, many reports on this line from River Ganga have been published recently (Baitha, Karna et al., 2018; Baitha, Ray et al., 2018; Karna et al., 2018; Khan, Khan, & Miyan, 2012; Sarkar, Deepak, & Negi, 2009). But, LWR information for many important fish species from the river Ganga is not reported so far. Thus, the present study reports LWRs for additional species from the Ganga River system.

2 | MATERIALS AND METHODS

Sampling was conducted in the Ganga River from April 2017 to December 2018. Fishes were collected from Buxar (25°33'43.90"N

& 83°56'3.10"E), Patna (25°36'51.66"N & 85°12'7.02"E), Bhagalpur (25°15'38.338"N & 86°58'53.890"E), Farakka (24°47'38.478"N & 87°55'26.413"E) and Freserganj (21°35'40.58"N & 88°15'28.92"E) using mono-filament gill nets (mesh size 22–34 mm), cast nets (mesh size 16 mm) and bag nets (mesh size 14–22 mm). Species identity was confirmed using standard literatures for taxonomy (Jayaram, 1999; Talwar & Jhingran, 1991). Scientific names were checked in FishBase (Froese & Pauly, 2018). Total length (TL) was measured to the nearest 0.1 cm using a digital caliper and wet weight (W) was recorded to the nearest 0.01 g on an electronic balance.

The relationship between total length and body weight was determined by the linear regression analysis, $\text{Log } W = \text{Log } a + b \text{ Log } L$, where W is the wet weight (g), L is the total length (cm), a is the intercept and b is the slope of the linear regression on the log-transformed weight and length data. Extreme outliers from the estimation were removed before analysis (Froese, 2006).

3 | RESULTS

Estimated parameters of length–weight relationship for the seven fish species are described in Table 1. All regression values were