

Length-weight relationships of eighteen species of freshwater fishes from Panchet Reservoir in Ganges basin, Jharkhand, India

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ABSTRACT

The present study describes the length-weight relationships (LWRs) of 18 fish species from a large tropical reservoir, Panchet, in the Damodar River basin, one of the main tributary of the largest river Ganga in India. A total of 2419 individuals represented by 18 species belonging to 9 families were sampled between November 2014 and June 2016. The b values ranged from 2.469 for Trichogaster chuna to 3.428 for Ailia coila. All the regressions were highly significant (p<0.001). The results revealed positive allometric growth for seven species (b>3, p<0.05), negative allometric growth for seven species (b<3, p<0.05) and isometric growth for four species (b=3, p>0.05). This study represents the first reference on the lengthweight relationship of *Trichogaster chuna* from a reservoir ecosystem. This is the first report on LWRs of five fish species viz., Puntius terio, Pethia conchonius, Sperata seenghala, Ailia coila and Trichogaster chuna from an Indian reservoir. This study provides basic data for future stock assessment studies and management programmes from Panchet Reservoir as well as for complementing the comparisons of LWRs from other ecosystems.

Keywords: Growth, Length-weight relationships, Panchet, Reservoir, Stock assessment

Introduction

Length-weight relationship (LWRs) has extensively been used in fisheries research as this enables the conversion of weight of fishes when only their size is known; indicate the type of weight gain and helps formulating management programmes for exploitation of commercial species (Le Cren, 1951; Bolger and Connolly, 1989; Pinheiro and Fiscarelli, 2009). Moreover, this tool also facilitates morphometric comparison between species and populations and life history comparisons between regions (Weatherley and Gill, 1987; Petrakis and Stergeou, 1995; King, 1996; Goncalves et al., 1997). The LWR is also used to define a population, where fish length is measured and the predicted average weight is assigned to all fish in a given length group (Oscoz et al., 2005). This is faster and more convenient than weighing fish individually, especially when large numbers of live fishes are sampled. In fishery biology studies, LWRs are required for conversion of growth-in-length equations to growth-in-weight for using in stock assessment models and to estimate stock biomass from limited sample sizes (Basusta et al., 2013). It is frequently used to track seasonal changes in fish growth (Richter et al., 2000).

Most of the studies in Indian reservoirs are mainly restricted to ecological aspects and fisheries management strategies through fingerling stocking (Sarkar et al., 2018; Lianthuamluaia et al., 2019). LWR studies from tropical inland waters are reported mostly from rivers. Such studies are scarce from Indian reservoirs which form an important inland fisheries resource in the country (Hassan et al., 2017; Sarkar and Mishal, 2017). Present study describes the length-weight relationships of 18 fish species from a tropical large reservoir, Panchet in India comprising commercially important species as well as some of the small indigenous fishes. Only a few fish faunal studies have been reported from this reservoir; mostly limited to catch, fish diversity and LWRs of very few species (Sarkar and Banerjee, 2010; Sandhya et al., 2016, 2017, 2019; Suman et al., 2018). Information on the lengthweight relationship of Puntius terio, Pethia conchonius, Sperata seenghala, Ailia coila and Trichogaster chuna from Indian reservoirs is lacking. Hence the results from this study will provide basic data which would be useful for stock assessment and fisheries management of the species studied as well as for comparisons of LWRs from other ecosystems.

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K. M. Sandhya *et al.* 48

Materials and methods

Panchet, a large tropical reservoir along the basin of the river Damodar, one of the main tributary of river Ganga, the largest river in India. Data were collected between November 2014 and June 2016 from Panchet Reservoir (23° 41' 04"N and 86° 44' 56"E), situated in Dhanbad District in Jharkhand. Fish samples were collected bimonthly using gillnets of mesh size ranging from 25-120 mm and seine nets of mesh size 10-20 mm from various landing sites including upstream, middle and downstream zones of the reservoir. Fishes were identified to the species level and total length was measured to the nearest 0.1 cm and weighed individually with an accuracy of 0.01 g. The length-weight relationship was derived using the equation $W = aL^b$ where W = weight of fish in g; L = length of fish in cm; 'a' and 'b' are intercept and slope of the regression line respectively (Ricker, 1973). The log-log plots of length and weight of all fishes were made before regression analysis and outliers were removed following the recommendations of Froese (2006). Values of a and b were estimated by regression analysis based on log values: log W = log a + b log L. Box-Whiskers plots were prepared to describe the distribution of bvalues. The degree of association between the variables was computed by the determination coefficient, r². The Student's t test was used to test whether the estimated b value was significantly different from the isometric value of 3 at 5% significance level (p<0.05) (Sokal and Rohlf, 1987). Comparison between the estimated values of b and respective critical values allowed the determination of statistical significance of b values and their inclusion in the isometric range (b=3) or allometric ranges, i.e., positive allometric (b>3) or negative allometric (b<3).

Results

The sample size, minimum and maximum lengths and weights, parameters of length-weight relationships, standard error of b values, coefficient of determination (r^2) and growth type are shown in Table 1. Box-Whiskers plot showing distribution of b values is given in Fig. 1. A total of 2419 individuals represented by 18 species belonging to 9 families were sampled. The most diverse family was Cyprinidae with 6 species. The b values ranged from 2.469 for Trichogaster chuna to 3.428 for Ailia coila. The median value of b was 3.996 and 50% of b values ranged between 2.832 and 3.130 (Fig. 1). All regressions were highly significant (p<0.001) with the co-efficient of determination (r²) ranging from 0.908 for *Parambassis* lala to 0.998 for Oreochromis niloticus. The coefficient of determination was greater than 0.95 for 17 species and the remaining one species had r² of the order of 0.90. The results revealed positive allometric growth for seven species (b>3, p<0.05), negative allometric growth for

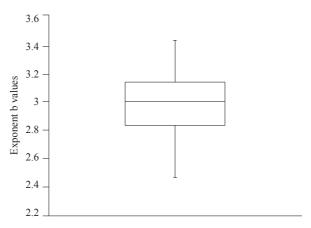


Fig. 1. Box-Whiskers plot of the exponent b values in the length-weight relationships of 18 species from Panchet Reservoir. Central box covers 50% of data values, the horizontal lines show the median values and vertical lines show the range of values

seven species (b<3, p<0.05) and isometric growth for four species (b=3, p>0.05).

Discussion

This is the first report on the length-weight relationship of the species *Trichogaster chuna* from a reservoir ecosystem. The findings from this study also form first report on length-weight relationship parameters for 5 fish species *viz.*, *Puntius terio*, *Pethia conchonius*, *Sperata seenghala*, *Ailia coila* and *Trichogaster chuna* from an Indian reservoir as most of the reports are from rivers and wetlands (Table 2). Of these, *A. coila* is in Near Threatened category (IUCN, 2017) which further highlights the importance of the study with respect to conservation aspects.

The b values in LWRs determine the growth pattern of the fish species. When b is equal to 3 or close to 3, growth in the fish is said to be isometric *i.e.*, fish maintain their form with increasing length (Froese, 2006). Similarly when b is far less or greater than 3, growth in the fish is allometric i.e., the fish becomes thinner or fatter with increase in length (Froese, 2006). In our study, all species had b values within the expected range of 2.50-3.50 (Pauly and Gayanilo, 1997; Froese, 2006). All LWRs reported were highly significant with all r² values >0.900 and they were compared with the available literatures from various ecosystems. When comparing with studies from reservoir, for species such as Labeo calbasu, Puntius sophore, Pethia phutunio, Chanda nama, Parambassis lala, Parambassis ranga, Notopterus notopterus and Channa punctata, the growth type reported in the present study is similar to the findings from Hirakud Reservoir in Odisha, India (Subodh et al., 2018). Similarly, growth pattern of Oroechromis niloticus

Table 1. Descriptive statistics and estimated parameters of length-weight relationship of 18 fish species from Panchet Reservoir

									Growth type
N	Min	Max	Min	Max	a	b	S.E. (b)	\mathbf{r}^2	Growth type
84	2.5	9.4	0.19	8.03	0.0120	2.950	0.048	0.983	I
92	4.8	48.5	2	1387.2	0.0122	3.009	0.077	0.986	I
55	2.6	5.8	0.3	3.01	0.0115	3.147	0.054	0.974	A+
138	3.4	10.5	0.5	19.2	0.0094	3.223	0.033	0.987	A+
145	3.6	6.7	0.6	4.5	0.013	3.077	0.033	0.977	A +
147	1.8	3.6	0.12	0.64	0.0219	2.677	0.036	0.950	A -
454	2.2	6.7	0.1	2.9	0.0114	2.827	0.052	0.960	A -
330	1.7	3.7	0.12	0.78	0.0276	2.526	0.041	0.908	A -
305	1.6	8.9	0.1	10.9	0.0179	2.946	0.017	0.990	A -
85	12.1	85.8	9.84	1250	0.0078	2.848	0.056	0.988	A -
63	8.5	65	4	1231	0.0124	2.743	0.049	0.995	A -
158	2.4	13.8	0.16	25.14	0.0091	2.983	0.065	0.989	I
121	7.2	15.8	0.86	14	0.0012	3.428	0.039	0.968	A +
57	10	44	17	1784	0.0146	3.130	0.039	0.998	A +
60	4.5	31	0.79	283.3	0.0046	3.202	0.064	0.989	A +
55	2.5	13.7	0.2	25.4	0.0387	2.469	0.082	0.986	A -
62	11.6	31.7	9.1	170.5	0.0038	3.131	0.042	0.982	A +
68	3.6	23.1	0.5	135.9	0.0103	3.025	0.035	0.992	I
	92 55 138 145 147 454 330 305 85 63 158 121 57	N Min 84 2.5 92 4.8 55 2.6 138 3.4 145 3.6 147 1.8 454 2.2 330 1.7 305 1.6 85 12.1 63 8.5 158 2.4 121 7.2 57 10 60 4.5 55 2.5 62 11.6	84 2.5 9.4 92 4.8 48.5 55 2.6 5.8 138 3.4 10.5 145 3.6 6.7 147 1.8 3.6 454 2.2 6.7 330 1.7 3.7 305 1.6 8.9 85 12.1 85.8 63 8.5 65 158 2.4 13.8 57 10 44 60 4.5 31 55 2.5 13.7 62 11.6 31.7	N Min Max Min 84 2.5 9.4 0.19 92 4.8 48.5 2 55 2.6 5.8 0.3 138 3.4 10.5 0.5 145 3.6 6.7 0.6 147 1.8 3.6 0.12 454 2.2 6.7 0.1 330 1.7 3.7 0.12 305 1.6 8.9 0.1 85 12.1 85.8 9.84 63 8.5 65 4 158 2.4 13.8 0.16 121 7.2 15.8 0.86 57 10 44 17 60 4.5 31 0.79 55 2.5 13.7 0.2 62 11.6 31.7 9.1	N Min Max Min Max 84 2.5 9.4 0.19 8.03 92 4.8 48.5 2 1387.2 55 2.6 5.8 0.3 3.01 138 3.4 10.5 0.5 19.2 145 3.6 6.7 0.6 4.5 147 1.8 3.6 0.12 0.64 454 2.2 6.7 0.1 2.9 330 1.7 3.7 0.12 0.78 305 1.6 8.9 0.1 10.9 85 12.1 85.8 9.84 1250 63 8.5 65 4 1231 158 2.4 13.8 0.16 25.14 121 7.2 15.8 0.86 14 57 10 44 17 1784 60 4.5 31 0.79 283.3 55 2.5	N Min Max Min Max a 84 2.5 9.4 0.19 8.03 0.0120 92 4.8 48.5 2 1387.2 0.0122 55 2.6 5.8 0.3 3.01 0.0115 138 3.4 10.5 0.5 19.2 0.0094 145 3.6 6.7 0.6 4.5 0.013 147 1.8 3.6 0.12 0.64 0.0219 454 2.2 6.7 0.1 2.9 0.0114 330 1.7 3.7 0.12 0.78 0.0276 305 1.6 8.9 0.1 10.9 0.0179 85 12.1 85.8 9.84 1250 0.0078 63 8.5 65 4 1231 0.0124 158 2.4 13.8 0.16 25.14 0.0091 121 7.2 15.8 0.86 14	N Min Max Min Max a b 84 2.5 9.4 0.19 8.03 0.0120 2.950 92 4.8 48.5 2 1387.2 0.0122 3.009 55 2.6 5.8 0.3 3.01 0.0115 3.147 138 3.4 10.5 0.5 19.2 0.0094 3.223 145 3.6 6.7 0.6 4.5 0.013 3.077 147 1.8 3.6 0.12 0.64 0.0219 2.677 454 2.2 6.7 0.1 2.9 0.0114 2.827 330 1.7 3.7 0.12 0.78 0.0276 2.526 305 1.6 8.9 0.1 10.9 0.0179 2.946 85 12.1 85.8 9.84 1250 0.0078 2.848 63 8.5 65 4 1231 0.0124 2.743 <	N Min Max Min Max a b S.E. (b) 84 2.5 9.4 0.19 8.03 0.0120 2.950 0.048 92 4.8 48.5 2 1387.2 0.0122 3.009 0.077 55 2.6 5.8 0.3 3.01 0.0115 3.147 0.054 138 3.4 10.5 0.5 19.2 0.0094 3.223 0.033 145 3.6 6.7 0.6 4.5 0.013 3.077 0.033 147 1.8 3.6 0.12 0.64 0.0219 2.677 0.036 454 2.2 6.7 0.1 2.9 0.0114 2.827 0.052 330 1.7 3.7 0.12 0.78 0.0276 2.526 0.041 305 1.6 8.9 0.1 10.9 0.0179 2.946 0.017 85 12.1 85.8 9.84 <	N Min Max Min Max a b S.E. (b) r² 84 2.5 9.4 0.19 8.03 0.0120 2.950 0.048 0.983 92 4.8 48.5 2 1387.2 0.0122 3.009 0.077 0.986 55 2.6 5.8 0.3 3.01 0.0115 3.147 0.054 0.974 138 3.4 10.5 0.5 19.2 0.0094 3.223 0.033 0.987 145 3.6 6.7 0.6 4.5 0.013 3.077 0.033 0.977 147 1.8 3.6 0.12 0.64 0.0219 2.677 0.036 0.950 454 2.2 6.7 0.1 2.9 0.0114 2.827 0.052 0.960 330 1.7 3.7 0.12 0.78 0.0276 2.526 0.041 0.908 85 12.1 85.8 9.84

N=sample size; a and b= parameters of length-weight relationship; S.E. = Standard error; r^2 = Co efficient of determination; I = Isometry; A^+ = Positive allometry; A^- = Negative allometry

reported from Ero Reservoir, Nigeria is in conformity with the present study (Adebola et al., 2016). In contrary, the species like Amblypharyngodon mola and Glossogobius giuris showed isometric growth in the present study whereas it was reported as negative allometric growth from Hirakud Reservoir. Also in our study, we observed positive allometry for Ompok bimaculatus whereas it was isometric growth from Hirakud Reservoir (Subodh et al., 2018). Some variations could be attributed to the combination of one or more factors such as number of specimens examined, area/seasonal effect, habitat, degree of stomach fullness, gonadal maturity, sex, health and general fish condition, preservation technique and differences in the observed length ranges of the specimens caught, ecological conditions of the habits or the physiology of animals (Le Cren, 1951; Wootton, 1999). Similarly, the parameter a may vary seasonally, daily and/or between different habitats whereas the parameter b which is characteristic of species usually does not vary significantly throughout the year (Bagenel and Tesch, 1978). Since samples have been collected over an extended period of time, these data are not representative of a particular season or time of the year and should be considered as mean annual values for comparisons as suggested by Goncalves *et al.* (1997).

The present study is the first to report on the length-weight relationship of *Trichogaster chuna* from a reservoir ecosystem as the previous report is from a wetland ecosystem (Borah *et al.*, 2017). Most of the previous studies on the LWRs of the 18 species studied are from rivers, wetlands and a few from reservoirs. Hence the results in this study represented additional contribution to the available LWR data from other geographical areas and will be useful for the comparisons of LWRs from different ecosystems. To the best of our knowledge, this study presents the preliminary references on the LWR of 18 fish species from Panchet Reservoir in India. Information of individual body length-weight relationships in the

K. M. Sandhya et al. 50

Table 2. Length-weight relationships of freshwater fish species from previous studies

Species	N	Total length range (cm)	Max. known length (Froese and Pauly, 2019)	b	Locality	r^2	Reference	Growth type
Cyprinidae								
Amblypharyngodon mola	184	4-8-7.4	20	3.758	Padma River, Bangladesh	0.951	Hossain (2010)	A+
	366	2.8-7.0		3.397	Mathabhanga River, Bangladesh	0.947	Hossain et al. (2006)	A+
	297	2.5-9		3.115	Saguna Wetland, West Bengal, India	0.9236	Suresh et al. (2007)	I
	305	2.5-7.2		2.821	Hirakud Reservoir, Odisha, India	0.942	Subodh <i>et al.</i> (2018)	A -
	210	3.7-5.9		3.34	Ganga River, North-west Bangladseh	0.975	Hossain et al. (2009)	A+
	367	4.8-8.9		3.25	Balarampur Wetland, West Bengal, India	0.923	Gupta and Banerjee (2015)	A +
Labeo calbasu	32	9.5-40.0	90.0	3.084	Godavari River, India	0.98	Lal et al. (2016)	A+
	188	12.7-79		2.831	Brahmaputra River, Assam, India	0.941	Choudhury <i>et al</i> . (1982)	
	30	12.5-37		2.940	Betwa River, India	0.95	Sani et al. (2010)	A+
	283	1 1 26 9		3.169	Kali River, India	0.893	Chatterji <i>et al.</i> (1980)	т
	52	4.4-36.8		3.013	Hirakud Reservoir, Odisha, India	0.993	Subodh <i>et al.</i> (2018)	1
	1212	20.5-64		3.132	Kapati Lake, Bangladesh	0.904	Ahmed and Saha (1996)	
Puntius terio	317	2.7-8.7	10	3.039	Khlasi Wetland, West Bengal, India	0.9212	Sandhya <i>et al.</i> (2016)	
	16	4.3-9.4		3.2	Indus River, Pakistan	0.81	Muhammad <i>et al</i> . (2016)	A+
Puntius sophore	441	3.1-10.2	20.0	3.05	Mathabhanga River Bangladesh	0.966	Hossain <i>et al.</i> (2006)	
	372 119	4.0-10.2 4.4-12.2		3.027 2.951	Rupsha River, Bangladesh Ganga River, India	0.927 0.926	Hossain <i>et al.</i> (2013) Gupta and Tripathi (2017)	I A -
	90	4-10.9		3.215	Gomti River, India	0.955	Gupta and Tripathi (2017)	A+
	91	5-12.1		3.231	Sai River, Uttar Pradesh, India	0.941	Gupta and Tripathi (2017)	A+
	29	6-10.7		3.104	Som River and Jaisamand Lake, India	0.91	Lal et al. (2016)	
	301	2.5-10.8		3.2	Hirakud Reservoir, Odisha, India	0.982	Subodh <i>et al.</i> (2018)	A +
	132	3-8.5		3.18	Indus River, Pakistan	0.84	Muhammad <i>et al.</i> (2016)	
	185	3.62-9.02		3.396	Chalan Wetland, North Central Bangladesh	0.945	Rahman <i>et al.</i> (2012)	A +
Pethia conchonius	175	7-11.1	14	3.33	Tetulia River, Southern Bangladesh	0.969	Hossain et al. (2015)	
	50	3.8-11		2.548	Ganga River, India	0.971	Gupta and Tripathi (2017)	A -
	69	4.1-10.2		2.636	Gomti River, India	0.912	Gupta and Tripathi (2017)	A -
		3.8-8.4		2.94	Dal Lake, Jammu and Kashmir India	0.87	Shafi and Yousuf (2012)	
	38	4.5-10.2		2.665	Sai River, Uttar Pradesh, India	0.933	Gupta and Tripathi (2017)	A -

Species	N	Total length Range (cm)		b	Locality	r^2	Reference	Growth type
Pethia phutunio	30	1.8-3.9	3.9	2.82	Gajner Floodplain Wetland, Bangladesh	0.98	Hossen et al. (2017)	
	117	1.98-3.3		2.8512	Khalsi Wetlnd, India	0.9220	Sandhya et al. (2016)	
	96	1.9-3.7		2.623	Hirakud Reservoir, Odisha, India	0.937	Subodh et al. (2018)	A -
Ambassidae Chanda nama	443	1.6-10.10		2.858	Hirakud Reservoir, Odisha, India	0.98	Subodh <i>et al.</i> (2018)	A -
		4.5-6.8		2.845	Pagla River, Bangladesh	0.933	Alam et al. (2013)	
	146	2.5-7		2.799	Deepor Wetland, Assam, India	0.94	Borah et al. (2017)	
	43	4-7.4		2.869	Bhramaputra River, Bangladesh	0.963	Islam et al. (2017)	
Parambassis lala	193	1.6-3.5		2.864	Hirakud Reservoir, Odisha, India	0.918	Subodh et al. (2018)	A -
ши	148	2.23-3.55		2.7026	Khalsi Wetland, West Bengal, India	.9013	Sandhya et al. (2016)	
	101	2.5-4		3.020	Deepor Wetland, Assam, India	0.88	Borah et al. (2017)	
Parambassis ranga	330	1.6-8.2		2.794	Hirakud Reservoir, Odisha, India	0.973	Subodh et al. (2018)	A -
	148	2.23-3.55		2.7026	Khalsi Wetland, India	0.9013	Sandhya et al. (2016)	
	595	2-5.2		2.67	East Kolkata Wetlands, West Bengal, India	0.857	Mahaptra et al. (2014)	A -
Bagridae Sperata seenghala	131	46-113		3.05	Indus River, Pakistan	0.99	Jatoi et al. (2013)	I
	205	40-115		2.866	Ganga River, India	0.95	Khan et al. (2011)	A -
	20	21.0-68.0	150.0	3.302	Som River and J aisamand Lake, India	0.99	Lal et al. (2016)	
	92	20-67		3.07	Gomti River, India	0.93	Sarkar et al. (2013)	
Sperata aor	184 300	72-95 29-68	180	3.249 3.006	Ganga River, India Nagarjuna Sagar, Andhra Pradesh, India	0.98	Khan <i>et al.</i> (2011) Ramkrishniah (1998)	A+
Glossogobius giuris	30 159	12.4-45 8.7-17.9		2.98 3.03	Betwa River, India Ganga River, North-west Bangladesh	0.97 0.958	Sani <i>et al.</i> (2010) Hossain <i>et al.</i> (2009)	
	129	2.3-22.5		2.914	Hirakud Reservoir, Odisha, India	0.98	Subodh <i>et al.</i> (2018)	A -
	31 49	8.4-27.0 5.5-9.7	50.0	2.974 2.682	Betwa River, India Bhramaputra River, Bangladesh	0.98 0.867	Lal <i>et al.</i> (2016) Islam <i>et al.</i> (2017)	A -
Schilbeidae								
Ailia coila	103	6.6-13		3.01	Ganga, North-west Bangladesh	0.981	Hossain et al. (2009)	
	105	8.1-15.6		3.076	Padma River, North-west Bangladesh	0.986	Hossain (2010)	I

Species	N	Total length Range (cm)	Max known length (Froese and Pauly, 2019)	b	Locality	r^2	Reference	Growth type
Cichlidae								
Oreochromis	189	9.7-16		2.313	Barur Reservoir, Tamil Nadu, India		Marx et al. (2014)	
niloticus	240			3.073	White Nile River, Sudan	0.9626	Karrar <i>et al.</i> (2016)	A +
	575	6.9-27.3		3.08	Wadi Hanifah Valley,	0.96	Mortuza and Misned	A+
					Saudi Arabia		(2013)	
	4676	4.1-26.1		3.43 2.8006	ERO Reservoir, Nigeria	0.83 0.956	Adebola <i>et al.</i> (2016) El- Kashief	A +
				2.8000	El-Faraouny Canal, Al-Minufiya Province,	0.930	et al. (2015)	A -
					Egypt		ci ui. (2013)	
Notopteridae					26) Pr			
Notopterus	300	8.1 -36.0	60.0	2.9015	Tilaiya Reservoir,	0.93	Khan (2003)	
notopterus	<i>(5</i>	12.22		2.226	Jharkhand, India	0.00	1.1 (1 (2010)	
	65 76	12-33 7.8-30.1		3.326 3.368	Godavari River, India Hirakud Reservoir,	0.98 0.98	Lal <i>et al.</i> (2016) Subodh <i>et al.</i> (2018)	A +
	70	7.0 30.1		3.300	Odisha, India	0.70	5400411 ct at. (2010)	11.
Osphronemida	e							
Trichogaster	115	2.6-6.3		3.215	Deepor Wetland,	0.96	Borah et al. (2017)	
chuna					Assam, India			
Siluridae <i>Ompok</i>	70	10.5-31.5	45.0	3.218	Godavari River, India	0.98	Lal et al. (2016)	
bimaculatus	70	10.5-51.5	43.0	3.210	Godavari Kiver, mara	0.96	Lai et at. (2010)	
omacmans.	44	16.0-43.0	45.0	3.027	Sonriver and Jaisalmer	0.94	Lal et al. (2016)	
					Lake, India			
	314	21.1-31.5		2.778	Bhavanisagar Reservoir,	0.989	Sivakami (1987)	A -
	42	13-34.7		3.117	Tamil Nadu, India Hirakud Reservoir,	0.98	Subodh <i>et al.</i> (2018)	Ι
	72	13-34.7		3.117	Odisha, India	0.76	5000011 et at. (2016)	1
Channidae					o dibila, mala			
Channa	284	16.8-29.8		3.12	Ganga River, India	0.94	Khan et al. (2011)	A +
punctata								
	355	6-18.90		3.037	Mathabhanga River,	0.979	Hossain et al. (2006)	A+
	200	15-30		2.621	Bangladesh Hussain Sagar Lake,	0.991	Kumari and Kumar	
	200	13-30		2.021	Andhra Pradesh, India	0.771	(2015)	
	140			3.01	Gomti River, Lucknow,	0.95	Kashyap <i>et al.</i> (2014)	I
					India			
	17	12.0-21.5	31.0	2.786	Som River and Jaisamand	0.91	Lal et al. (2016)	
	42	13-34.7		3.117	Lake, India Hirakud Reservoir,	0.98	Subodh et al. (2018)	I
	42	13-34./		5.11/	Odisha, India	0.70	5000011 et at. (2018)	1

N=Sample size; b = Growth parameters of length-weight relationship; r^2 = Co-efficient of determination; I = Isometry; A^* = Positive allometry; A^* = Negative allometry

population is often required for estimation of population size of a fish stock for the purpose of its rational exploitation (Dulcic and Kraljevic, 1996). Therefore the results from the present study could contribute to the knowledge of fish populations in this area and provide an important baseline for future studies in Panchet Reservoir in the Damodar River basin. The information generated from the study will be useful for formulating effective fisheries management strategies and in implementing regulations for conservation of the native fish stock.

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