Indian J. Fish., 67(2): 130-133, 2020
DOI: 10.21077/ijf.2019.67.2.88546-19

Note

Length-weight relationship of a newly described catfish *Pangasius silasi* Dwivedi *et al*., 2017 from Nagarjuna Sagar Dam, Telengana, India

T. T. AJITH KUMAR, SANTOSH KUMAR AND KULDEEP K. LAL
ICAR-National Bureau of Fish Genetic Resources, Canal ring road, Telibagh, Lucknow-226 002, Uttar Pradesh, India
e-mail: kuldeepklal@gmail.com

ABSTRACT

The length-weight relationship of a newly described catfish *Pangasius silasi* Dwivedi *et. al.*, 2017 was studied from 88 specimens collected from the native distribution range of the species *i.e*. Nagarjuna Sagar Dam, Telengana, India. The total length and weight of the sampled fishes ranged from 290 to 590 mm and 240 to 2300 g respectively. Results of regression analysis showed that the regression coefficient (r^2) values varied from 0.985 to 0.989. The average condition factor observed was 1.04 and 0.98 for males and females respectively. Positive allometric growth and condition factor of the species indicated the potential of the species for aquaculture. The information generated will also be useful in sustainable management and conservation of the species in natural waters.

Keywords: Condition factor, Length-weight relationship, *Pangasius silasi*

Catfishes belonging to family Pangasiidae have evinced great attention among fishery scientists in recent times in view of their commercial importance and impact on the economy of the local people of south and south-east Asia through aquaculture and capture fisheries, with a market value of ₹100-160 per kg (approx. $2 per kg). Pangasiidae has four distinct genera *viz., Pangasianodon, Helicophagus, Pangasius* and *Pseudolais* with 29 species. Of these four genera, *Pangasius* is dominant with 22 species reported worldwide (Pouyaud *et al.,* 2000, 2004; Karinthanyakit and Jondeung, 2012), while in India only two species are known. *Pangasius pangasius,* which is widely distributed in India, Bangladesh and Nepal (Talwar and Jhingran, 1991; Shrestha, 2008; Jayaram, 2010) and *Pangasius silasi* Dwivedi *et al.*, 2017 (Fig. 1), recently described from the Nagarjuna Sagar Dam (Dwivedi *et al*., 2017). While *P. pangasius* has been reported in India from Ganga, Brahmaputra and the east flowing rivers, Mahanadi, Godavari, Krishna and Cauvery (Silas, 1952; Jayaram, 2010), *P. silasi* is reportedly endemic to Nagarjuna Sagar Dam, in the Krishna River region.

Fig. 1. *Pangasius silasi* Dwivedi *et al.*, 2017

Growth of any fish can be assessed based on its length-weight relationship and such study in riverine fish also reveals many ecological and life-history traits like health of the river, stock conditions and breeding season (Jha *et al*., 2005). Data on length-weight relationship of fishes are useful for biologists in fish stock assessment and proper management of their population, to make morphometric comparisons between species and populations and to assess life history pattern between regions, which in turn, will help in species conservation (Martin-Smith, 1996; Thomas *et al*., 2003; Ozaydin *et al*., 2007). Condition factor (K) is another quantitative parameter indicating the state of well-being of the fish (Bagenal and Tesch, 1978) and it is a useful index for monitoring feeding intensity and growth rate of fishes. Considering the immense potential of the Pangasidae fish group, the present study was aimed to provide information on the length-weight relationship as well as condition factor (K) of *P. silasi*.

Samples were collected at monthly intervals for a period of 12 months from December, 2016 to November, 2017 from Nagarjuna Sagar Dam (16º53´ N; 79º26´E), which receives water from Krishna River and located in Telengana, India. The samples were caught using drift net and coracle. A total of 88 specimens (38 males and 50 females) were sampled which were measured for length and weight. Total length (TL) was measured to the nearest millimeter (from tip of snout to tip of the lower caudal lobe) and weight was taken with an accuracy of 0.01 g

using a top pan digital weighing balance. Weight was measured after draining water from the buccal cavity and wiping the moisture content on the body of fish (King, 1996).

The relationship between length and weight was determined according to linear regression model using the formula (Beckman, 1948): $W = aL^b$ where, W = weight of fish; L = total length of fish; a = intercept of regression curve or slope (coefficient related to body form) and b = growth coefficient. The constants 'a' and 'b' were estimated using the methods of least squares using log transformation: log W = log a + b*log L.

The condition factor (K) was calculated as $K = W / L^3$ (Fulton, 1902), where, K = condition factor; W = weight of the fish in g; L = total length of the fish in mm.

The total length and weight of *P. silasi* recorded during the study ranged from 290 to 590 mm and 240 to 2300 g respectively. The results of regression analysis showed that the regression coefficient (r^2) values varied from 0.985 to 0.989 in male, female and sexes pooled (Table 1), suggesting a high degree of positive correlation between total body length and weight of *P. silasi.* The regression coefficient value did not vary significantly between the sexes. Based on the results obtained, there exists a linear relationship between length and weight (Table 1; Fig. 2-3). The 'b' value was found to be greater than 3, indicating positive allometric growth pattern in *P. silasi*. Similar result was found in *P. pangasius*, where positive allometric growth b=3.43 was reported (Deka and Gohain, 2015). The 'b' values of the length-weight relationship are the most important parameter depicting the growth pattern of fishes (Froese, 2006). Similar range of b value was also observed in male (3.837) and female (3.168) loach *Cobitis taenia* (Boron *et al*., 2008).

The average condition factor values recorded during the present study was 1.04 for males and 0.98 for females, indicating good health condition of this fish in the reservoir (Beckman, 1948). Both length-weight relationship and condition factor of the fish may be influenced by many factors such as feeding intensity, availability of food,

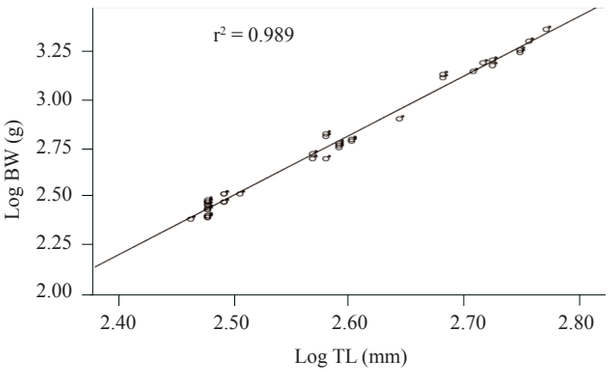

Fig. 2. Length-weight relationship in male *P. silasi*

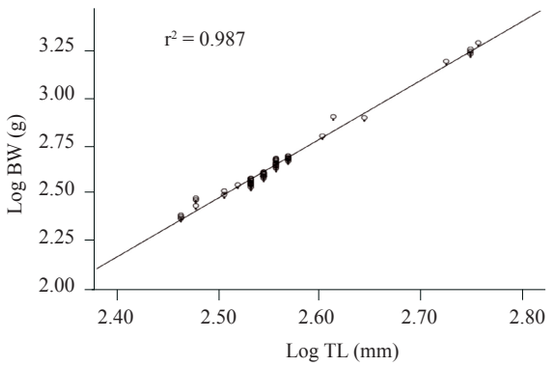

Fig. 3. Length-weight relationship in female *P. silasi*

fish size, age, sex, season, stage of maturation, fullness of the gut, degree of muscular development, amount of reserved fat and life history (Ujjania *et al.,* 2012; Gupta and Banerjee, 2015). Preliminary analysis of diet composition and feeding habits of this fish was also done. The observations indicated that *P. silasi* is omnivorous, but predominantly feeds on molluscs (70%) while the rest of the food were constituted by fish scales and debris. Higher feeding proficiencies and availability of food and other associated factors might be the probable reasons for positive allometric growth in different stages as reported by Saikia *et al*. (2011) and Bura and Goswami (2013).

The information on length-weight relationships and condition factor of *P. silasi* presented in this study is the

Table 1. Parameters of length-weight relationship in *P. silasi* sampled from Nagarjuna Sagar Reservoir during December 2016 to November 2017

Sex	Sample	Total length (mm)		Total weight (g)		Regression parameters		
		Min.	Max.	Min.	Max.	b	a	r^2
Male	38	290	590	245	2300	3.034	0.0062	0.989
Female	50	290	570	240	2000	3.084	0.0054	0.987
Sexes pooled	88	290	590	240	2300	3.123	0.0049	0.987

a = Intercept of regression curve, b = Growth coefficient, r^2 = Coefficient of determination.

first of its kind. Even though it is preliminary in nature, it can be a bench mark data for fisheries management and population dynamics studies of this species. It would also be useful for fishery biologists and managers in devising management strategies and in imposing adequate regulations for sustainable fishery in the Nagarjuna Sagar Reservoir.

Acknowledgements

Authors thank the Director, ICAR-NBFGR, Lucknow for support. The study was carried out as part of ICAR-CRP on Agrobodiversity (Fisheries Component: On Farm Evaluation of Prioritised Fish Genetic Resources for Conservation Aquaculture; Project Code FISHNBFGRCIP201500700172).

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Date of Receipt : 03.04.2019
Date of Acceptance : 16.04.2020