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Short Communication

Length-weight Relationship of Six Fish Species from the Central and Southern South China Sea

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Key words
LWRs, China Sea, *Brama japonica, Katsuwonus pelamis, Coryphaena equiselis*

ABSTRACT

The length-weight relationships (LWRs) of six fish species from the central and southern South China Sea are presented in this study. A total of 359 specimens were collected by light falling nets (20~36 mm mesh size) in 2012. The *b* values of the LWR equations varied between 2.670 and 3.265 for the studied species. As a supplement to LWR data, it is the first time that relevant data from this sea area have been provided to fish base.

Both length and weight are the most basic and widely available information among all the biological data on fishery resources. Moreover, length-weight relationships (LWRs) can describe the growth characteristics of fishery resources (Zhan, 1995). The South China Sea is one of the sea areas with the highest marine biodiversity in the world. Fishery resources are the most important biological resource in the sea area. However, research on the fisheries in the South China Sea is overall limited. Furthermore, there is also a lack of studies and availability of length and weight composition for this sea area, especially the LWRs of some fish species that have not been recorded in FishBase database. The present study reported the LWRs of six fish species from this sea area, namely, *Brama japonica* Hilgendorf, 1878, *Katsuwonus pelamis* (Linnaeus, 1758), *Decapterus macrosoma* Bleeker, 1851, *Auxis rochei* (Risso, 1810), *Thunnus albacares* (Bonnaterre, 1788) and *Coryphaena equiselis* Linnaeus, 1758.

Materials and methods

The studied area was located in the marine area between 5°30′~16°00′N and 109°00′~117°30′E. All specimens were collected from commercial fishing boats using light falling nets (20~36 mm mesh size) operated to a depth of 50~70 m. All specimens were identified to the species level according to Cheng *et al*. (1962) and Nelson (2006). A total of 359 specimens of six fish species were collected and used to estimate their LWRs. The numbers of specimens were given in Table I and varied from 25 to 116. The standard length (SL) for each species was measured as the distance from the tip of the snout to the base of the caudal fin. SL was measured to 0.1 cm, and the total weight (TW) was measured to 1 g. The LWRs, $W = aL^b$, were log-transformed into a linear equation: log (*W*)= log (*a*)+ *b* log (*L*), where *W* is total weight (g), *L* is the standard length (cm), *a* is the intercept and *b* is the slope (Froese, 2006; Lleonart *et al*., 2000). Obvious outliers were identified and eliminated from the linear regression analyses, and the optimal regression parameters *a* and *b* were estimated by least squares estimation (Zhan, 1995; Froese, 2006).

Results and discussion

Our research provided the LWR data for six fish species from the central and southern South China Sea, and data collected from this sea area was not previously available in the Fish Base database. The SL and TW ranges and LWR parameters are given in Table I. In the present study, six fish species had coefficient of determination (r^2) values, that ranged from 0.873 to 0.978. Parameter *b* varied from 2.670 for *C. equiselis* to 3.265 for *K. pelamis.*

The *b* values of all six fish species fell within the expected range between 2.5 and 3.5, as proposed by Froese (2006). The r^2 values of the LWRs of all fish species exceeded 0.95, except *C. equiselis*, which had an r^2 value less than 0.9. This result may be attributable to the small

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Table I. Descriptive statistics and parameters of the LWRs for six fish species from the central and southern South China Sea.

			SL range (cm)		TW range (g)		Length-weight relationships (LWRs)				
Family	**Species**	***N***	**Min**	**Max**	**Min**	**Max**	***a***	***b***	r^2	**95% CI (*a*)**	**95% CI (*b*)**
Bramidae	*Brama japonica* Hilgendorf, 1878	99	13.0	34.6	47	870	0.0406	2.827	0.978	0.0315-0.0525	2.742-2.912
Coryphaenidae	*Coryphaena equiselis* Linnaeus, 1758	44	21.2	29.8	145	397	0.0425	2.670	0.873	0.0153-0.1181	2.353-2.987
Carangidae	*Decapterus macrosoma* Bleeker, 1851	48	15.3	27.5	46	287	0.0076	3.180	0.951	0.0039-0.0151	2.967-3.394
Scombridae	*Auxis rochei* (Risso, 1810)	27	22.7	25.6	172	253	0.0069	3.241	0.953	0.0027-0.0176	2.945-3.537
Scombridae	*Katsuwonus pelamis* (Linnaeus, 1758)	116	28.7	48.0	365	2240	0.0074	3.265	0.955	0.0046-0.0119	3.134-3.395
Scombridae	*Thunnus albacares* (Bonnaterre, 1788)	25	33.7	45.8	815	1880	0.0635	2.690	0.964	0.0275-0.1465	2.466-2.915

N, number of individuals; SL range, standard length range; TW range, total weight range; *a*, intercept; *b*, slope; r^2, coefficient of determination; CI, confidence interval.

to medium sample size (Kwun *et al*., 2017). Due to the limited duration of sampling, the larger size classes were missing, and the growth patterns of the specimens could not be fully reflected. In addition, gender information is lacking in the sample data, so it was difficult to describe sexual variability. We will create a more reasonable sampling plan with a lengthened sample period and increased sample size and provide a gender distinction in further research. Our results can provide basic information for the management and conservation of the investigated species.

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Statement of conflict of interest

The authors declare there is no conflict of interest.

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