Oceanography & Fisheries
Open access Journal
ISSN: 2476-0536

Juniper Publishers
key to the Researchers

Research Article
Volume 11 Issue 1 - October 2019
DOI: 10.19080/OFOAJ.2019.11.555801

Oceanogr Fish Open Access J

Length-Weight Relationships for Eight Caught Marine Fish Using Midwater Trawler in Chabahar Fishing Grounds, Sistan and Bluchestan (The Sea of Oman)

Ali Sepahi, Saeed Gorgin and Mojtaba Pouladi*

Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Iran

Submission: September 10, 2019; **Published:** October 21, 2019

Corresponding author: Mojtaba Pouladi, Department of Fisheries, Faculty of Fisheries and Environment Sciences, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Golestan, Iran

Abstract

The present research provides length-weight relationship (LWR) of eight fish species included *Pomadasys stridens* (Forsskål, 1775), *Epinephelus areolatus* (Forsskål, 1775), *Pristipomoides multidens* (Day, 1871), *Pomadasys maculatus* (Bloch, 1793), *Johnius borneensis* (Bleeker, 1851), *Diagrmma pictum* (Thunberg, 1792), *Epinephelus malabaricus* (Bloch & Schneider, 1801) and *Epinephelus coioides* (Hamilton, 1822) from Chabahr fishing grounds (latitude 25° 11' to 25° 12' N; longitude 60° 04' to 60° 13' E) in the Sea of Oman. All fish specimens were caught using midwater trawl net, with 65 mm mesh size in the cod-end, from April to May 2016 during the spring season. The LWRs for fish species were $W = 0.0127L^{2.874}$ for *P. stridens,* $W = 0.0153L^{2.971}$ for *E. areolatus*, $W = 0.0227L^{2.873}$ for *P. multidens,* $W = 0.0534L^{2.689}$ for *P. maculatus*, $W = 0.0023L^{3.157}$ for *J. borneensis*, $W = 0.0164L^{2.807}$ for *D. pictum*, $W = 0.0487L^{3.287}$ for *E. malabaricus*, and $W = 0.0487L^{3.287}$ for *E. coioides*, respectively.

Keywords: Marine fish; Fishing grounds; Chabahr fishing; Bluchestan province

Introduction

Length-weight relationships are fundamental information to understanding the biological parameters of fishes for fisheries management, fish stock assessment, determination of biomass using measured weights, comparison of life cycle characteristic of fish populations from different regions, and estimation of weight ranges from length ranges [1-4]. This research prepares length-weight relationships for eight fish species in Chabahr fishing grounds located in the Sea of Oman.

Materials and Methods

This study was conducted between April and May 2016 from Chabahar fishing grounds, Sistan and Bluchestan province (latitude 25° 11' to 25° 12' N; longitude 60° 04' to 60° 13' E) in the Sea of Oman. The fish specimens were collected using midwater trawler with 65 mm (STR) mesh size in the coded. Trawl duration varied from 2 to 3 hours at speeds of about 2.5 to 3 knots. For each fish specimen, the total length (TL) was measured with a digital caliper to the nearest 0.1 mm, and body weight was measured on a digital scale to 0.01 g. LWRs were estimated by linear equation [5,6]: . Where W is the whole-body weight (g) and L the total length (cm). Log-log plots of the length-weight pairs were performed to identify outliers. The optimum regression parameters were fitted by minimizing the residuals errors by the least square residuals method [7,8].

Results

Totally, 679 specimens were collected. LWRs characteristics of the trapped species are shown in Table 1.

Table 1: Length-weight relationship parameters for eight marine fish in the Chabahr fishing ground, Sistan and Bluchestan, the Sea of Oman 2016.

Species	n	Length (cm)		LWR parameters and statistics				
		Min	Max	a	a CI 95%	b	b CI 95%	r^2
Pomadasys stridens (Forsskål, 1775)	62	7.5	14.6	0.0127	0.0103-0.0157	2.845	2.526-3.182	0.966
Epinephelus areolatus (Forsskål, 1775)	76	16.2	45.6	0.0153	0.0128-0.0175	2.971	2.688-3.240	0.98
Pristipomoides multidens (Day, 1871)	84	19.5	54.2	0.0227	0.0195-0.0268	2.873	2.599-3.208	0.984
Pomadasys maculatus (Bloch, 1793)	75	34.7	58.4	0.0534	0.0489-0.0645	2.689	2.445-2.948	0.973
Johnius borneensis (Bleeker, 1851)	55	17.5	32.5	0.0023	0.0018-0.0027	3.157	2.823-3.475	0.968

Diagrmma pictum (Thunberg, 1792)	106	37.5	89.1	0.0164	0.0139-0.0188	2.807	2.431-3.204	0.977
Epinephelusmalabaricus (Bloch&Schneider,1801)	128	28.6	95.8	0.0487	0.0446-0.0524	3.287	2.902-3.578	0.992
Epinephelus coioides (Hamilton, 1822)	93	23.1	94.5	0.0389	0.0334-0.0435	3.169	2.725-3.371	0.98

N = sample size; Min = minimum; Max = maximum; a = intercept of log-log relationship; b = slope of relationship; CI 95% = confidence limits; r^2 = coefficient of determination

Discussion

Length-weight relationships in different fish species are affected by numerous factors such as gonad maturity stage, temperature, reproductive activities, food availability, gender, population dynamics, season, environment desirability, health conditions, fishing gears, sample size and preservation methods [9,10]. Based on Froese (2006) the proper ranges of b value are between 2.5 and 3.5 which the LWR slopes for eight collected species were within the estimated ranges. Nevertheless, these obtained results are valuable for fishery and biology researchers for interrelated studies and protection of fish stocks in the Sea of Oman in the next years [11].

Acknowledgment

The authors are thankful to Vice Presidency for Research and Technology of Gorgan University of Agricultural Sciences and Natural Resources (GAU) for their supports during study period.

References

1. Morato T, P Afonso, P Lourinho, JP Barreiros, RS Santos, et al. (2001) Length-weight relationships for 21 coastal fish species of the Azores, north-eastern Atlantic. Fisheries Research 50(3): 297-302.
2. Human B A, Al-Busaidi H (2008) Length and Weight Relationships for 31 Species of Fishes Caught by Trawl Off the Arabian Sea Coast of Oman. Journal of Agricultural and Marine Sciences 13: 43-52.
3. Radkhah A, Eagderi S (2015) Length-weight and length-length relationships and condition factor of six cyprinid fish species of Zarrineh River (Urmia Lake basin, Iran). Iranian Journal of Ichthyology 2(1): 61-64.
4. Saberi M, Paighambari S Y, Darvishi M, Farkhondeh Shilsar G (2017) Length–weight relationships of six fish species from the Coastal Waters of Jask, Iran. Journal of Applied Ichthyology, 33(6), 1226-1228.
5. Froese R, Tsikliras A C, Stergiou K I (2011) Editorial note on weight-length relations of fishes. Acta Ichthyologica et Piscatoria, 30(10): 261-263.
6. Froese R (2006) Cube law, condition factor and weight-length relationships: history, meta-analysis and recommendations. Journal of Applied Ichthyology 22(4): 241-253.
7. Haddon M (2011) Modelling and quantitative methods in fisheries. In: (2nd edn). CRC Press, Taylor & Francis Group, New York, Pp 449.
8. Hasankhani M, Keivany Y, Daliri M, Pouladi M, Soofiani N M (2013) Length-weight and length-length relationships of four species *Barbus lacerta* (Heckel, 1843), *Oxynoemacheilus angorae* (Steindachner, 1897), *Squalius lepidus* (Heckel, 1843) and *Pseudorasbora parva* (Temminck & Schlegel, 1846) from the Sirwan River (western Iran). Journal of Applied Ichthyology, 30(1): 206-207.
9. Stergiou K, Moutopoulos D (2001) A review of length–weight relationships of fishes from Greek marine waters. Naga, the ICLARM Quarterly 24(1–2): 23-39.
10. Salahi-gezaz M, Paighambari S Y, Abbaspour-Naderi R, Vesaghi M J (2015) Length–weight relationships for two marine fish species from the Gulf of Oman: *Uranoscopus guttatus* (Cuvier, 1829) and *Lagocephalus inermis* (Temminck & Schlegel, 1850). Journal of Applied Ichthyology 31(6): 1142–1143.
11. Parsa M, Rahnama B, Mahmoudi Khoshdarehgi M (2017) Length-weight relationships of five fish species from Carangidae family in waters of the northern Persian Gulf, Iran. Journal of Applied Ichthyology 33(5): 1055-1057.

DOI: 10.19080/OFOAJ.2019.10.555801

How to cite this article: Ali Sepahi, Saeed Gorgin, Mojtaba Pouladi. Length-Weight Relationships for Eight Caught Marine Fish Using Midwater Trawler in Chabahar Fishing Grounds, Sistan and Bluchestan (The Sea of Oman). Oceanogr Fish Open Access J. 2019; 11(1): 555801. DOI: 10.19080/OFOAJ.2019.11.555801