

Length-weight relationship of fishes from coral reefs along the coastline of Jordan (Gulf of Aqaba)

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Abstract

The parameters **a** and **b** of the length-weight relationship of the form $W = a \cdot L^b$ were estimated for 15 fish species caught along the coastline of Jordan in the Gulf of Aqaba. The sampling was carried out between July 1999 and January 2001. Data from 1 000 fish individuals (identified to eight families and 15 species) were used for this purpose.

Introduction

The length-weight relationship has a number of important applications in fish stock assessment. Among these applications are estimating the standing stock biomass, calculating condition indices and comparing the ontogeny of fish population from different regions (Patrakis and Stergiou 1995). Amongst other biological and statistical data, length and weight of fishes are required in order to estimate the fish biomass in Jordanian water. The purpose of this study is thus to report information about the length-weight relationships of some fishes collected during a study aimed to assess the artisanal fisheries in Jordan. The study was conducted within the framework of the "Red Sea Program" for marine ecology. The program is implemented by the Center for Marine Ecology in Germany and funded by the German Federal Ministry of Education and Research (BMBF).

Materials and Methods

The study site is the Jordanian coastline of the Gulf of Aqaba. The Gulf of Aqaba is the eastern segment of the V-shaped northern extension of the Red Sea and it is shared by Egypt, Saudi Arabia, Israel and Jordan (Figure 1). Length and weight data were collected between the period from July 1999 to January 2001. Fish were caught using gill nets, hook and line and fish traps. Fish identification was based on Khalaf and Disi (1997) and Randall (1995). The total length was measured to the nearest cm and the weight was taken to

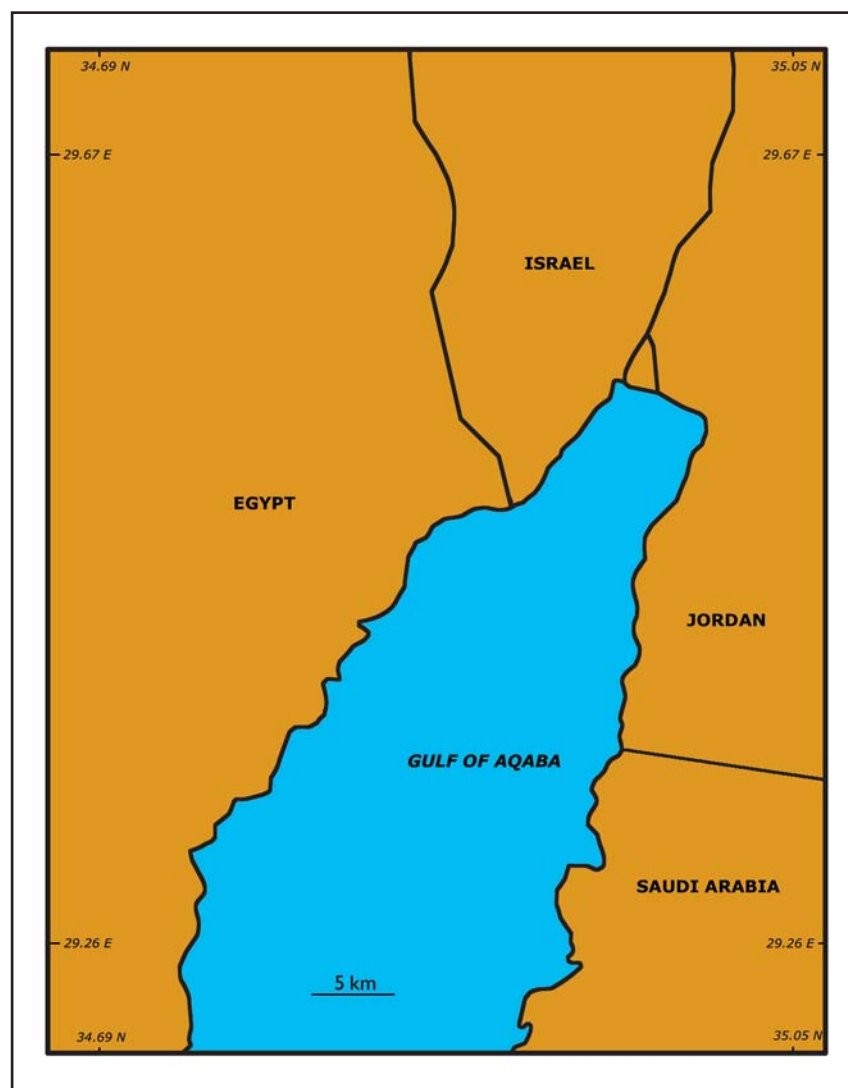


Fig. 1. The sampling site along the Jordanian coastline in the Gulf of Aqaba.

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The parameters **a** and **b** of the L-W relationship of the form

$$W = a \cdot L^b \quad \dots 1)$$

were estimated through a logarithmic transformation, i.e.,

$$\ln W = \ln a + b \ln L \quad \dots 2)$$

with **a** and **b** estimated by ordinary least squares regression.

Results and Discussion

The results are presented in Table 1. The families are arranged according to Khalaf and Disi (1997) and the species within each family are presented alphabetically. The estimated values of **b** are close to three for all the species indicating isometric growth. Fifteen species have been covered in the present study. The ichthyofauna of the coastline of Jordan however, includes about 348 fish species (Khalaf and Disi 1997). Other L-W data are needed, to include other species.

Acknowledgments

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References

- Khalaf, M.A. and A. Disi. 1997. Fishes of the Gulf of Aqaba. The Marine Science Station, Aqaba, Jordan. 252 p.
- Petrakis, G. and K. I. Stergiou. 1995. Weight-length relationships for 33 species in Greek water. Fish. Res., 21: 456-469.
- Randall, J. E. 1995. Coastal fishes of Oman. Crawford House Press, Bathurst, Australia. 439 p.

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Table 1. Length-weight relationships and related parameters of 15 species sampled along the Jordanian coastline.

Family/Species	a	b	r ²	n	Length range (cm)
Fistulariidae					
<i>Fistularia commersonii</i>	0.019	2.73	0.959	22	22.7 - 43.1
Serranidae					
<i>Cephalopholis hemistiktos</i>	0.054	2.80	0.964	57	11.6 - 19.9
<i>Epinephelus fasciatus</i>	0.013	3.09	0.818	17	15.0 - 31.2
Caesionidae					
<i>Caesio lunaris</i>	0.025	2.73	0.877	104	18.0 - 27.3
<i>Caesio suevica</i>	0.001	3.74	0.943	74	19.5 - 26.2
<i>Caesio varilineata</i>	0.027	2.76	0.856	23	17.0 - 27.8
Lethrinidae					
<i>Lethrinus borbonicus</i>	0.003	3.79	0.950	8	15.6 - 24.6
Mullidae					
<i>Mulloidichthys flavolineatus</i>	0.022	2.82	0.946	21	17.6 - 35.3
<i>Mulloidichthys vanicolensis</i>	0.006	3.24	0.952	13	18.6 - 28.4
Scaridae					
<i>Scarus ghobban</i>	0.023	3.46	0.956	19	11.5 - 15.9
Siganidae					
<i>Siganus argenteus</i>	0.011	3.09	0.952	204	10.0 - 30.3
<i>Siganus rivulatus</i>	0.009	3.11	0.962	72	13.5 - 35.3
<i>Siganus luridus</i>	0.021	2.94	0.955	37	10.5 - 17.6
Scombridae					
<i>Euthynnus affinis</i>	0.016	2.97	0.812	225	56.0 - 75.0
<i>Katsuwonus pelamis</i>	0.008	3.14	0.899	104	45.6 - 63.5