Length-Weight Relationships of Soft-Bottom Demersal Fishes from Jalisco and Colima States, Mexico

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Abstract

The parameters *a* and *b* of the length-weight relationship of the form $W=aL^b$ were estimated for 24 species of soft-bottom demersal fishes caught on the continental shelf off Jalisco and Colima states, Mexico. The estimates of *b* ranged from 2.74 to 3.33. The mean of the *b* values is 3.02 with a standard deviation of 0.15.

Introduction

The length-weight relationship (LWR) of fish is an important piece of information in fisheries biology, but often not available when needed (King 1996). This work is based on data gathered during a sampling program by the staff of the Coastal Ecology Center (CEC) of the University of Guadalajara, devoted principally to assessment of the composition and fishery potential of demersal resources in the region. A preliminary study in this area reported 140 species of fish belonging to 98 genera and 54 families (Aguilar-Palomina et al. 1996). This contribution presents the parameters of LWR of soft-bottom demersal fishes sampled on the continental shelf off Jalisco and Colima states, Mexico.

Materials and Methods

The study area (Fig. 1) is the strip of continental shelf between the 20 and 80 m isobaths, from the Cuitzmala River in the state of Jalisco (northern limit) to the marine area off the Cuyutlán Lagoon, in the state of Colima, (southern limit). Trawl hauls were done using twin 'semi-portuguese' shrimp trawl nets at four depth ranges in seven sites distributed along this zone. Samples were taken from May 1995 to December 1996. The duration of each trawl was 30 minutes. All specimens collected were brought to the CEC laboratory, for species identification and measurement. The total length (TL) of each fish was measured to the nearest mm from the tip of the snout to the tip of the longest caudal fin. The weight (W) of the fishes was measured to the nearest 0.1 g. The data were analyzed using a commercial spreadsheet software (Borland Quattro Pro). Least-squares regression of weight on length was derived after log transformation of the two variables (log $W=\log a + b \log L$). Representative specimens of all species studied were deposited in the CEC fish collection.

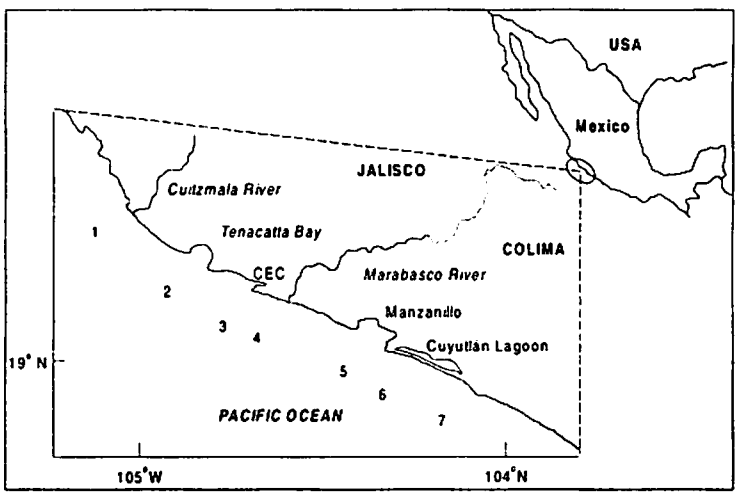

Fig. 1. Map showing study area and sampling sites in the Central Pacific off Mexico.

Results and Discussion

The LWR parameters for 24 soft-bottom demersal fishes are summarized in

Table 1. Most of the parameters were based on relatively large samples and thus may be considered reasonably representative and reliable. All correlations were highly significant ($P<0.05$) and ranged from 0.97 to 0.99.

Interspecies variability in the values of *a* was high (coefficient of variation = 61%) and ranged from 3.1×10^{-3} in *Ophidion* sp. to 3.72×10^{-2} in *Sphoeroides lobatus*. Conversely, interspecies variability in *b* was low (CV = 5.1%), ranging from 2.74 in *Eucinostomus currani* to 3.33 in *Eucinostomus gracilis*. The mean of the *b* values of 3.02 (Fig. 2) is not significantly different from 3 ($t=0.7$, $df=23$, $P>0.2$). These values fall within the limits reported by Carlander (1969) as typical of most fishes.

Acknowledgments

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References

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Table 1. Length-weight relationship parameters and related statistics for 24 soft-bottom demersal fishes from Jalisco and Colima states, Mexico.

Family/Species	n	Length (TL, cm) min	Length (TL, cm) max	a	b	r
Sciaenidae						
Cynoscion nannus	1726	5.4	18.0	0.0133	2.92	0.979
Bairdiella macrops	24	14.7	21.4	0.0095	3.16	0.977
Serranidae						
Diplectrum eumelum	98	5.9	17.9	0.0067	3.25	0.998
Diplectrum euryplectrum	1624	5.6	16.9	0.0110	3.05	0.993
Diplectrum labarum	128	9.1	22.0	0.0141	2.97	0.995
Diplectrum rostrum	277	6.8	19.5	0.0090	3.10	0.991
Gerreidae						
Eucinostomus currani	55	9.8	20.9	0.0268	2.75	0.986
Eucinostomus gracilis	23	9.6	19.0	0.0051	3.33	0.996
Haemulidae						
Haemulopsis axillaris	588	5.5	21.0	0.0131	3.03	0.994
Haemulon maculicauda	385	8.2	21.7	0.0089	3.16	0.981
Microlepidotus inornatus	326	11.7	20.9	0.0151	2.93	0.974
Xenichthys xanti	138	8.6	20.4	0.0098	3.10	0.990
Ophidiidae						
Ophidion sp.	94	9.5	14.5	0.0031	3.12	0.955
Polynemidae						
Polydactylus approximans	47	13.3	27.2	0.0052	3.18	0.991
Scorpaenidae						
Scorpaena russula	548	5.0	15.0	0.0188	2.95	0.989
Pontinus sierra	256	3.9	11.0	0.0178	2.84	0.971
Batrachoididae						
Porichthys margaritatus	898	4.8	16.2	0.0069	3.19	0.989
Triglidae						
Prionotus ruscarius	344	6.0	39.5	0.0155	2.93	0.996
Prionotus stephanophrys	647	3.9	27.5	0.0152	2.84	0.988
Mullidae						
Pseudupeneus grandisquamis	354	6.5	23.2	0.0080	3.18	0.998
Tetraodontidae						
Sphoeroides annulatus	72	8.6	33.0	0.0180	3.05	0.996
Sphoeroides lobatus	614	3.8	26.0	0.0372	2.77	0.986
Sphoeroides sechurae	911	4.5	18.1	0.0294	2.82	0.973
Synodontidae						
Synodus sechurae	164	15.5	43.9	0.0065	2.99	0.981

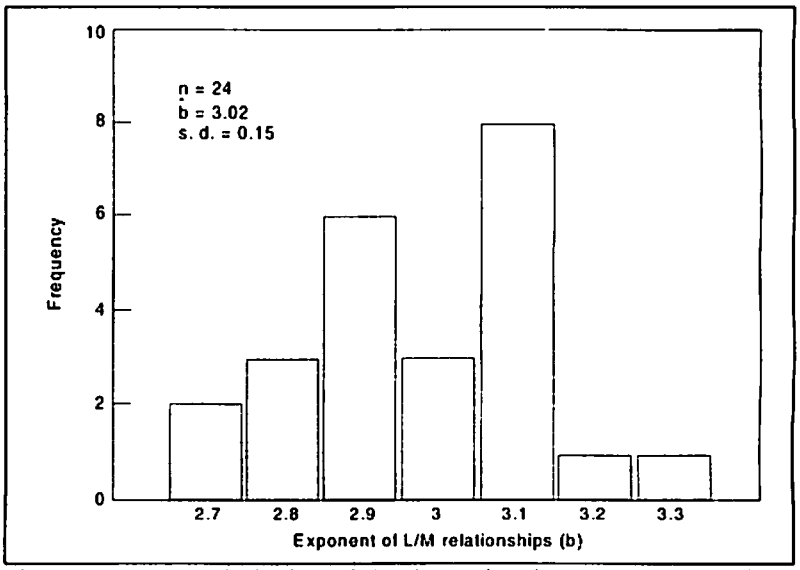

Fig. 2. Frequency distribution of b-values of soft-bottom demersal fishes from Jalisco and Colima states, México.

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