

Length-Weight Relationship of Small Pelagic Fish Species of the Southeast and South Brazilian Exclusive Economic Zone

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Abstract

The length-weight relationship (LWR) parameters of 23 small pelagic fish species (belonging to 13 families) from the South-Southeast Brazilian Exclusive Economic Zone in 1996 and 1997 are presented. The b values varied between 2.72 and 3.53. The samples for this study were collected during hydroacoustic surveys covering an area of 700 000 km²

Introduction

This work is based on data gathered during an assessment of the composition and fishery potential of pelagic resources in the South and Southeast Brazilian Economic Exclusive Zone (EEZ). In spite of good knowledge of the pelagic ichthyofauna in the coastal area, there is little information about species inhabiting the continental shelf and slope below 100 m depth. Three hydroacoustic surveys were conducted between depths of 100 and 1 500m during 1996 and 1997 and covered an area of about 700 000 km² (Fig. 1). A total of 140 species of fish belonging to 18 genera and 60 families were reported during these surveys (Yamaguti et al. 1999). This contribution presents the LWR parameters for 23 of the most abundant species caught.

Materials and methods

The area under investigation comprises the EEZ between the 100

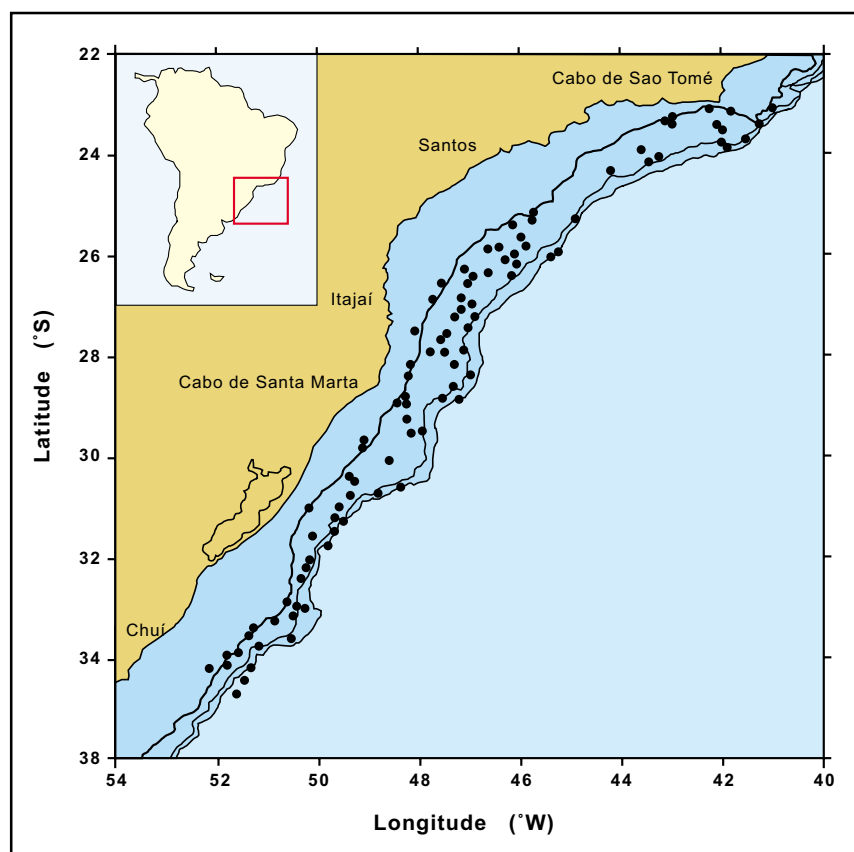


Fig.1. Map of Southeast South Coast of Brazil showing study area and sampling sites.

and 1500 m isobaths, with the northern limit at Cabo Sao Tomez (22°S-041°W) and the southern limit near Chui (34°S-52°W) (Fig. 1).

A total of 107 samples were taken during the three hydroacoustic surveys (winter/1996, summer/1997, autumn/1997) using midwater

Table 1. Length-weight relationship parameters and related statistics for 23 small pelagic fishes caught in the EEZ of Brazil.

Family/species	a	b	s.e.(b)	n	r ²	Total Length (mm)	
						min	max
<i>Engraulidae</i>							
<i>Engraulis anchoita</i>	3.0E-06	3.200	0.027	1690	0.900	84	170
<i>Paralepididae</i>							
<i>Lestroleps intermedia</i>	2.0E-06	2.824	0.059	104	0.957	70	225
<i>Synodontidae</i>							
<i>Saurida caribbaea</i>	4.0E-06	3.027	0.052	306	0.941	54	127
<i>Saurida brasiliensis</i>	4.0E-06	3.256	0.043	316	0.950	42	117
<i>Merlucciidae</i>							
<i>Merluccius hubbsi</i>	3.0E-06	3.158	0.014	677	0.987	24	325
<i>Myctophidae</i>							
<i>Diaphus dumerilii</i>	3.0E-06	3.181	0.023	1005	0.960	25	95
<i>Diaphus garmani</i>	2.0E-05	2.720	0.226	15	0.917	26	50
<i>Diaphus perspicillatus</i>	4.0E-06	3.195	0.053	135	0.966	47	104
<i>Hygophum hygomii</i>	4.0E-06	3.210	0.035	404	0.954	34	77
<i>Lepidophanes guentheri</i>	2.0E-06	3.218	0.050	577	0.879	25	80
<i>Myctophum affine</i>	3.0E-06	3.178	0.090	132	0.906	24	60
<i>Notoscopelus caudispinosus</i>	3.0E-06	3.213	0.129	72	0.906	27	70
<i>Scolopsis multipunctatus</i>	7.0E-07	3.534	0.033	262	0.978	34	91
<i>Bregmacerotidae</i>							
<i>Bregmacerus atlanticus</i>	2.0E-06	3.235	0.100	64	0.945	39	78
<i>Bregmacerus cantori</i>	3.0E-06	3.137	0.047	1299	0.785	27	68
<i>Triglidae</i>							
<i>Peristedium altipinne</i>	3.0E-05	2.794	0.070	87	0.950	17	59
<i>Acropomatidae</i>							
<i>Synagrops spinosus</i>	7.0E-07	2.985	0.027	219	0.983	36	119
<i>Synagrops bellus</i>	2.0E-06	3.374	0.128	19	0.976	59	146
<i>Carangidae</i>							
<i>Trachurus lathami</i>	8.0E-06	3.027	0.021	859	0.969	15	207
<i>Pomatomidae</i>							
<i>Pomatomus saltatrix</i>	6.0E-06	3.053	0.040	92	0.912	24	48
<i>Trichiuridae</i>							
<i>Trichiurus lepturus</i>	1.0E-07	3.220	0.009	2471	0.986	38	1566
<i>Gempylidae</i>							
<i>Thyrsitops lepidopoides</i>	8.0E-06	2.886	0.023	383	0.976	18	290
<i>Ariommidae</i>							
<i>Ariomma bondi</i>	2.0E-05	2.879	0.012	753	0.986	12	202

trawls whenever shoals were detected. The species were identified according to species level whenever possible, measured (mm, total length), and weighed (g, fresh weight).

The L-W pairs were first plotted in order to identify and delete obvious outliers. The parameters and related statistics of the log-transformed LWR ($\ln W = \ln a + \ln L$) were obtained via ordinary least squares regression.

Results and Discussion

During the winter/1996 survey a total of 57 425 individual fishes belonging to 46 species were captured. In autumn/1997 the number of individuals was 850 308 belonging to 91 species; while during summer/1997 100 species were identified from 696 777 individuals caught.

Table 1 summarizes the LWR

parameters and related statistics of 23 species (which correspond to 99.8 % in number and 99.9 % in weight of the total catch during the surveys). The number of individuals varied from 15 in the case of *Diaphus garmani* to 2 471 for *Trichiurus lepturus*. Values of r^2 ranged from 0.78 for *Bregmacerus cantori* to 0.98 in the case of *Merluccius hubbsi* and *Ariomma bondi*, with all regressions highly significant ($p < 0.001$).

The **b** values ranged from 2.72 for *Diaphus garmani* to 3.53 for *Scolopsis multipunctatus* and these values are within the limits reported by Carlander (1969), Royce (1972) and Lagler et al. (1977) for most fishes. In general, **b** values of fish are closer to 3, despite the many variations of fish forms (Cinco 1982, King 1996). According to Jones (1976) the LWR may change seasonally; thus, the length-weight parameters presented here may be considered as average values.

The results in Table 1 should be useful for anyone studying any of the 23 species and specially for biomass evaluation of these pelagic fishes. Despite the number of species for which LWR are now available, much needs to be known about the other species that are probably not major contributors to total biomass and stocks, but may play a significant role in trophodynamic (ecosystem) processes and fish production. Additional sampling is under way to complete this first data set.

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