

Length-Weight Relationship of Fishes from a Seagrass Meadow in Negros Oriental, Philippines

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Abstract

The parameters a and b of the length-weight relationship of the form $W=aL^b$ were estimated for 13 fish species sampled in a seagrass meadow in Negros Oriental, Philippines. Also, to facilitate conversions, the relationship between total length and standard length for the 13 species is given.

Introduction

Length-weight (L/W) relationship data are important for fish stock assessment, especially to estimate coral reef fish biomass

from visual census data. L/W and total length-standard length (TL/SL) relationships were computed to contribute such information in a format suitable for inclusion in FishBase (Froese and Pauly 1996).

Data for 13 species belonging to 6 families were collected during a study in 1995 of the seagrass meadow and coral reef ichthyofauna in Malatapay, southern Negros Oriental. The study was part of the project "Establishment of Marine Reserves in Negros Oriental", supported by the European Union and implemented by the "Center for Tropical Marine Ecology" in Bremen, Germany.

Materials and Methods

The study site at Malatapay (Fig. 1) is located in the southern part of Negros Oriental (latitude $09^{\circ}07'N$, longitude $123^{\circ}12'E$) bordering the Mindanao Sea in the Central Visayas Region, Philippines. The seagrass meadow studied was situated between two coral communities. Water depth ranged from 1 to 10 m, with an average depth of 3 to 4 m.

Sampling was conducted from July to September 1995 with a beach seine of 30 m length, 1.5-2.5 m height and with a mesh size of 2 mm. The length (TL and SL) of each specimen was measured to the nearest mm and weight to the nearest 0.1 g. Species identification was based on Gloerfelt-

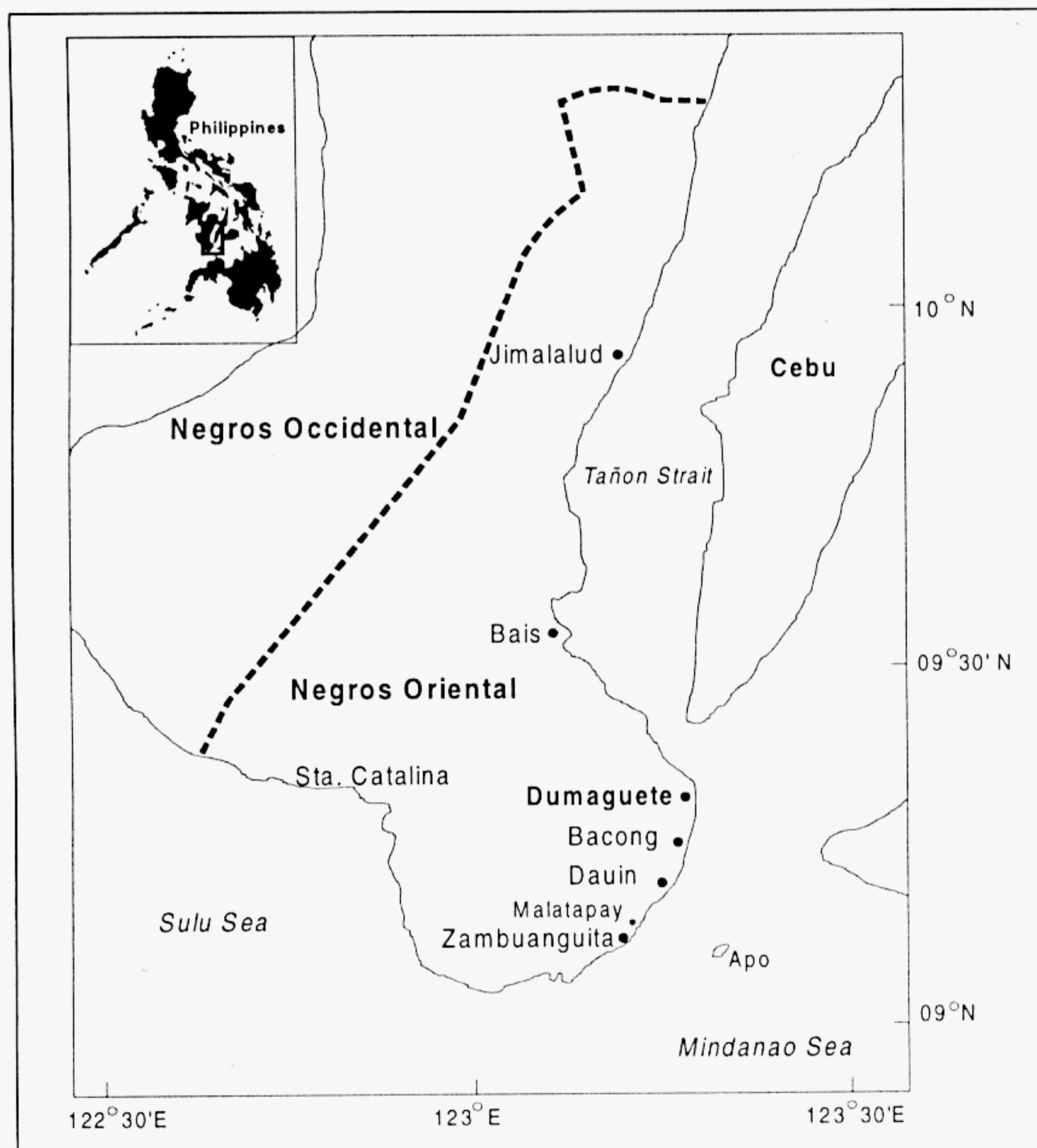


Fig. 1. Map of central Philippines showing the location of the study area off Malatapay, Negros Oriental.

Table 1. Length-weight and total-standard length regression statistics for 13 fish species from a seagrass meadow in Negros Oriental, Philippines.

	L/W relationship*			TL/SL relationship				TL range (cm)	TL max. (cm)**
	a	b	r	c	d	r	n		
Apogonidae									
<i>Apogon aureus</i>	0.017	2.95	0.966	0.220	0.744	0.975	166	5.1 - 12.8	12
<i>Apogon cyanosoma</i>	0.011	3.24	0.958	0.045	0.779	0.974	281	1.4 - 6.8	10
<i>Cheilodipterus quinquelineatus</i>	0.010	3.11	0.981	-0.058	0.793	0.995	122	2.3 - 11.2	12
Diodontidae									
<i>Diodon holocanthus</i>	0.0352	2.19	0.850	0.138	0.836	0.749	78	9.3 - 21.5	29
Labridae									
<i>Oxycheilinus bimaculatus</i>	0.020	2.83	0.987	0.429	0.706	0.989	300	2.1 - 16.4	15
<i>Cheilio inermis</i>	0.004	3.01	0.992	-0.010	0.874	0.910	197	2.3 - 37.0	50
<i>Halichoeres chloropterus</i>	0.016	2.87	0.937	-0.114	0.854	0.986	171	1.9 - 12.6	19
<i>Novaculichthys macrolepidotus</i>	0.013	2.91	0.979	-0.318	0.877	0.992	245	2.2 - 16.2	15
<i>Stethojulis interrupta</i>	0.011	3.06	0.910	1.511			46	2.6 - 12.0	13
Plotosidae									
<i>Plotosus lineatus</i>	0.008	2.95	0.968	-0.378	0.956	0.997	78	10.0 - 25.2	32
Pomacentridae									
<i>Abudefduf vaigiensis</i>	0.030	2.80	0.979	0.207	0.714	0.978	166	3.0 - 8.4	20
<i>Pomacentrus coelestis</i>	0.037	2.63	0.973	-0.012	0.784	0.987	133	1.8 - 7.9	10
Scaridae									
<i>Calotomus spinidens</i>	0.014	3.15	0.991	-0.135	0.862	0.997	188	2.0 - 15.9	19

* L in TL units

** Lieske and Myers (1994)

Tarp and Kailola (1984), Lieske and Myers (1994), Randall et al. (1990) and Rau and Rau (1980).

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

$$W = aL^b \quad \dots 1)$$

were estimated through logarithmic transformation, with *a* and *b* estimated using the Microsoft EXCEL linear regression routine. The parameters *c* and *d* of the TL/SL relationship of the form

$$SL = c + d \cdot TL \quad \dots 2)$$

were also estimated by the Microsoft EXCEL linear regression routine.

Results

Results of the linear regression are summarized in Table 1. The estimated values of *b* were close to 3 for most species, indicating isomet-

ric growth. Two notable exceptions are *Diodon holocanthus* (2.2) and *Pomacentrus coelestis* (2.6), which change their width and height, respectively, as they grow.

Acknowledgments

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References

Froese, R. and D. Pauly, Editors. 1996. FishBase 96: concepts, design and data sources. ICLARM, Manila, Philippines.

Gloerfelt-Tarp, T. and P.J. Kailola. 1984. Trawled fishes of southern Indonesia and northwestern Australia. Australian Development Assistance Bureau; Directorate General of Fisheries, Indonesia; German Agency for Technical Cooperation. 407 p.

Lieske, E. and R. Myers. 1994. Collins pocket guide: coral reef fishes. Harper Collins Publishers, London.

Randall, J.E., G.R. Allen and R. Steene. 1990. Fishes of the Great Barrier Reef and Coral Sea. Crawford House Press, Bathurst, Australia. 506 p.

Rau, N. and A. Rau. 1980. Commercial fishes of the Philippines. GTZ (German Agency for Technical Cooperation), Eschborn, Germany. 623 p.

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