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LENGTH-WEIGHT RELATIONSHIP OF THE SPINNER SHARK (*Carcharhinus brevipinna*) ON THE CONTINENTAL SHELF OF SOUTHERN BRAZIL

Relação peso-comprimento do tubarão rotador (*Carcharhinus brevipinna*) na plataforma continental do sul do Brasil

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ABSTRACT

*Here we present the weight-length relationship of the spinner shark (*Carcharhinus brevipinna*) on the continental shelf of southern Brazil, estimated from an analysis of 125 specimens. No significant differences between males and females, so the data were grouped in equation* $W = 0{,}003L^{3.1534}$*. The results presented here are the first to approach sharks above 75 cm and confirm the positive allometric growth of the species.*

Keywords: *Allometric growth, Morphometric relationship, Shark fishing, Shark nursery.*

RESUMO

Aqui apresentamos, a relação peso-comprimento do tubarão-rotador (*Carcharhinus brevipinna*) na plataforma continental do sul do Brasil, estimada a partir de análise de 125 exemplares. Não houve diferenças significativas entre machos e fêmeas, portanto os dados foram agrupados na equação $W = 0{,}003L^{3.1534}$. Os resultados aqui apresentados são os primeiros a abordarem tubarões acima de 75 cm e confirmam o crescimento alométrico positivo da espécie.

Palavras-chave: Berçário de tubarões, Crescimento alométrico, Pesca de tubarões, Relações morfométricas.

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INTRODUCTION

Studies of length-weight relationships are widely used to produce information about biology of various species, helping in the analysis of growth rates, by length or weight increase, of a species or stage of development (Kohler *et al.*, 1996). In turn, this information is fundamental for fisheries yield studies (Wang *et al.*, 2012).

The spinner-shark, *Carcharhinus brevipinna* is a coastal pelagic species, inhabitant of warm-temperate, subtropical and tropical areas (Compagno, 1984). It has a worldwide distribution occurring in the Atlantic, Mediterranean, Red Sea, Indian and Western Pacific Oceans (Garrick, 1982). In the South Atlantic, it is common in south eastern and southern coast of Brazil and frequently caught by its artisanal fishery in summer months (Gadig, 2001). Despite this, there are few studies on these populations and their biology is poorly known (Vooren & Klippel, 2005). This work provides length-weight relationship data aiming to contribute to the knowledge of the species.

MATERIALS AND METHODS

The sharks were captured by the artisanal and industrial fleet of gill nets from the port of Rio Grande, between latitudes 29° and 34°S. Sampling occurred on nine fishing trips, between October 2014 and July 2016. All fish were, sexed, weighted (W - Kg), with a precision balance (0.05 Kg), and measured in total length (L - cm) - maximum distance between the extremity of the muzzle and caudal fin, in the natural position. The relationships W-L were calculated using the equation $W = aL^b$, where *a* is the intercept on the *Y* axis of the regression curve and *b* is the regression coefficient (Ricker, 1975). To test for possible differences between sexes, the estimated regressions were compared by a Covariance Analysis (ANCOVA, with L as covariate).

RESULTS

A total of 125 fishes were sampled, of which 69 were females (28.0 - 157.0 cm / 0.1 - 23.0 Kg) and 56 were males (32.5 - 148.0 cm / 0.1 - 16.5 Kg). No significant differences were found between males and females (F= 0.561, p= 0.455), therefore, the way that data were grouped and the final equation was: $W=0.003L^{3.1534}$ (Table 1).

Table 1 - Estimated parameters of length-weight of the spinner shark *Carcharhinus brevipinna*, on the continental shelf of southern Brazil.

	n	A	CI 95% a	b	CI 95% b	r^2
W-L	125	0.003	0.0025 - 0.0039	3.1534	2.8752 - 3.2007	0.9881

n, number of samples; *a* and *b*, parameters of the equation; Cl 95%, confidence limits; r^2, coefficient of determination.

DISCUSSION

The continental shelf of southern Brazil may be a nursery area for *C. brevipinna*, because both sharks captured in this study and by Galina (2006) are neonates or juveniles, with smaller length than the suggested first sexual maturation size by Jeng Joung *et al.* (2005), which raises the importance of the study. The calculated values of *a* and *b* are estimated to be within the expected range and next of values found by Galina (2006) (a = 0.002; b = 3.2004; r^2 = 07416), for 75 fishes, concluding that the species has positive allometric

growth, with a greater gain in weight than in length (Casselman, 1990). The larger number of sharks captured in this study may explain the higher value of r^2.

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