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LENGTH-WEIGHT RELATIONSHIP AND CONDITION FACTOR OF THE WHITEMOUTH CROAKER *Micropogonias furnieri* (ACTINOPTERYGII, SCIAENIDAE) CAPTURED IN THE NORTHEAST OF BRAZIL

Relação peso-comprimento e fator de consição da corvina *Micropogonias furnieri* (Actinopterygii, Sciaenidae) capturada na costa nordeste do Brasil

Hugo Leandro dos Santos [1], Fabricio Sa de Santana [2], Deborah Jacob Freire da Paz [1], & Fernanda Damaceno Silva Gonçalves[3]

1 Centro de Aquicultura da Unesp, Universidade Estadual Paulista

2 Estudante de Engenharia de Pesca, Universidade Federal de Sergipe

3 Mestre em Desenvolvimento e Meio Ambiente, Universidade Federal de Sergipe

*Autor Correspondente: Santos, H. L. e-amail: hugoleandobfc149@gmail.com

ABSTRACT

Length-weight relationships (LWRs) and relative condition factor are of great importance in fishery assessment studies since it provides information about the growth of the fish, its general wellbeing, and fitness in a marine habitat. This study estimated length-weight relationship and condition factor for whitemouth croaker *Micropogonias furnieri* captured in Pirambu-SE, northeast from Brazil. A total of 1333 specimens were analyzed, from March 2019 to March 2020. Whitemouth croaker showed negative allometric growth resulting in β1: 2.7697. The condition factor varied between months, such as September and between January and February, demonstrating a possible partial spawning.

RESUMO

As relações peso-comprimento (RPC) e o fator de condição relativo são de grande importância nos estudos de avaliação da pesca, uma vez que fornecem informações sobre o crescimento dos peixes, o seu bem-estar geral e a sua aptidão num habitat marinho. Este estudo estimou a relação comprimento-peso e fator de condição da corvina *Micropogonias furnieri* capturada em Pirambu, estado de Sergipe, Nordeste do Brasil. Foram analisados 1.333 espécimes, de março de 2019 a março de 2020. A corvina Whitemouth apresentou crescimento alométrico negativo resultando em β1: 2,7697. O fator de condição variou entre meses, como setembro e entre janeiro e fevereiro, demonstrando uma possível desova parcial.

INTRODUCTION

The Sciaenidae family stand out as one of the most explored fishing sources because the high demand for market (Chao *et al*., 2015). The whitemouth croaker *Micropogonis furnieri* (Desmarest, 1823) would be an example, widely captured in the side coast of Sergipe State (Northeast from Brazil). Based on the economic and social importance of this fish species, the knowledge about its wild population could be used to determine some limits for exploration and different managements.

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Studies evaluating the weight length relationship of fish are important tools from biology and statistic areas. Through this mathematical relationship, would be possible to identify some factors such as age, growth, metamorphose or sexual maturation (Santos *et al*., 2020; Santos *et al*., 2022; Jisr *et al*., 2018).

In addition, based on this mathematical relationship (weight length relationship), the condition factor arose as another parameter from biology area. This calculation can provide important information about the physiology status pointing out the higher weight for a specific length means the better condition (Santos *et al*., 2022). Thus, its variation over year could be used to determine season cycles of feeding and reproduction. For this reason, this study determined the weight length relationship and condition factor for whitemouth croaker *Micropogonias furnieri* captured in Pirambu estado de Sergipe, northeast from Brazil.

Samples were randomized collected in Pirambu SE, Brazil (10° 44′ 16″ Sul, 36° 51′ 21″ east) from the march 2019 to march 2020, by local semi-industrial fishing fleets. All collects were performed using nets with three different sizes (30, 35 and 50mm). Each animal was carefully identified (Figueiredo & Meneses, 2000) and measured the weight (0.1g) and length (0.1cm).

MATERIALS AND METHODS

For weight length relationship was applied the formula: $W = \beta_0 TL^{\beta 1}$ (LeCren, 1951) being W: weight, TL: total length, β_0: the intercept and β_1: the allometric coefficient. Values of β_0 and β_1 were determined from the minimum square method (predict model) after logarithmic transformation with neperiane base: $\ln Wt = \ln \beta_0 + \beta_1 \ln TL$. The relative condition factor was calculated using the equation: Kr= Wo/ We, (Le Cren, 1951), being Wo: observed weight, we estimated weight. To evaluate if β_1 was statistically different from an isometric growth (β_1: 3), all data were conducted to t-test (α= 0.05) (Zar, 2010). All statistical analysis were carried out in the R software (Version 4.0.5, R Development Core Team, 2021).

RESULTS

In general, in this stuty was collected 1333 corvina. The whitemouth croaker demonstrated allometric growth ($p<0.05$) (Table 1) With condition factor <1 for some months (september, octrober, january e february). Nonetheless, occurred high values of relative condition factor (>1) for some months (march, april, may, june, july, august, november e december) (Figure 1).

Table 1. Descritive statistic and parameters of weight length relationship for whitemouth croaker *Micropogonias furnieri* captured in the Pirambu, northeast from Brazil. Min-Minimum; Max-Maximum; β_0- regression intercept; β_1- regression slope; r^2 - coefficient of determination TL- Total length; W- Weigth; LWR: Length-Weight relationship; Cl-confidence limit.

TL (cm) (Min-Max)	W(g) (Min- Max)	β_0	95 % CL of β_0	β_1	95 % CL of β_1	r^2
28.5-57.7	246-1936	0.0253	0.0219-0.0292	2.7697	2.7317-2.8077	.9388

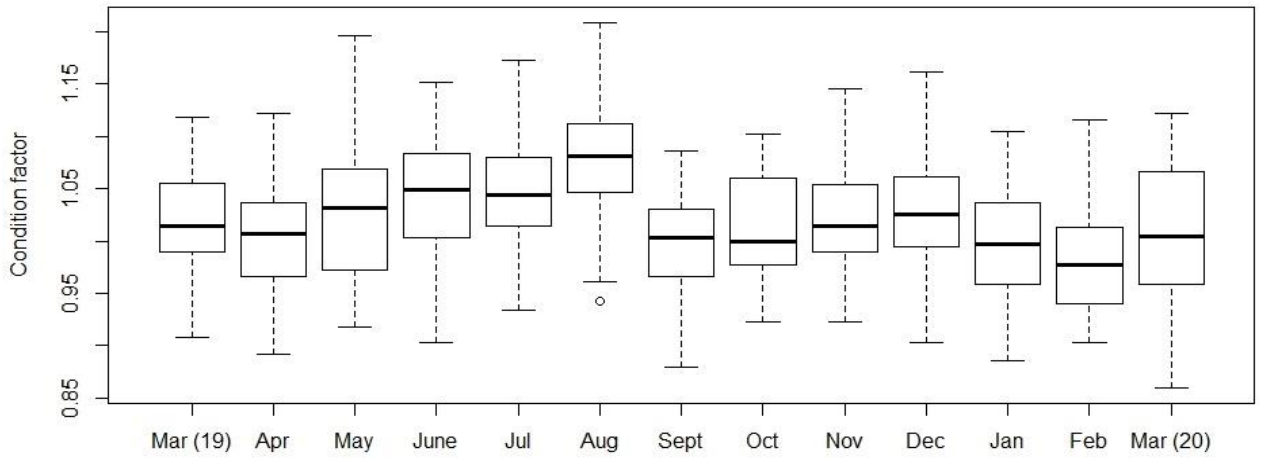

Figure 1. Condition factor of the whitemouth croaker (*Micropogonias furnieri*) captured in the Sergipe State, Northeast from Brazil.

DISCUSSION

The found β1 coefficient falls within the range recommended by Froese (2006) for aquatic organisms (2.5 to 3.5). In this study, allometric growth was observed in other studies conducted in Maranhão (2.37) (Azevedo et al., 2017) and in Pernambuco (females 2.80 and males 2.86) (Viana et al., 2016). However, Robert and Chaves (2001) obtained a positive allometric growth for the same fish species *Micropogonias furnieri* captured in the state of Paraná. These variations can occur due to differences in samples among studies, fishing equipment, natural habitats, diets, sex, health, or season (Schneider et al., 2000; Haimovici and Canziani, 2000; Imam et al., 2021). The variation of the condition factor indicated two different spawning periods, in September and between January and February.

According to Isaac-Nahum and Vazzoler (1983), condition factor values above 1 would be related to the reproductive season, indicating mature species with higher weight due to the gonads. This could be used to explain the lower values for some months, indicating immature gonads (representing a stationary period of the gonads; these are translucent and occupy less than half of the abdominal cavity) (Isaac-Nahum and Vazzoler, 1983). In addition, fish commonly reduce their feeding behavior and use lipid energy during reproduction resulting in lower body weight (Lizama and Ambrosio, 2002). Thus, this study provides biological data on fishing sources from the northeast region in Brazil for future studies. However, studies on the reproductive biology of this fish species should be carried out in the Brazilian northeast, corroborating with the present study.

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