

GROWTH OF 'GOETE' : QUANTITATIVE ASPECTS

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INTRODUCTION

One of the important commercial fishes landed in Santos is the 'goete', *Cynoscion petranus* (Miranda Ribeiro), caught mainly along the southern coast of Brazil.

The purpose of this work is to correlate the total length with the age and weight of the fish.

METHODS

Five samples were collected from catches made between Santos (23° S) and São Francisco Island (26° S) :

- (I) October, 1961
- (II) February, 1962
- (III) May, 1962
- (IV) August, 1962
- (V) October, 1962

each with 100 fishes approximately, ranging from 5 to 30 cm and about 2000 were measured (grouped to the nearest 0.5 cm) in order to determine the total length distribution.

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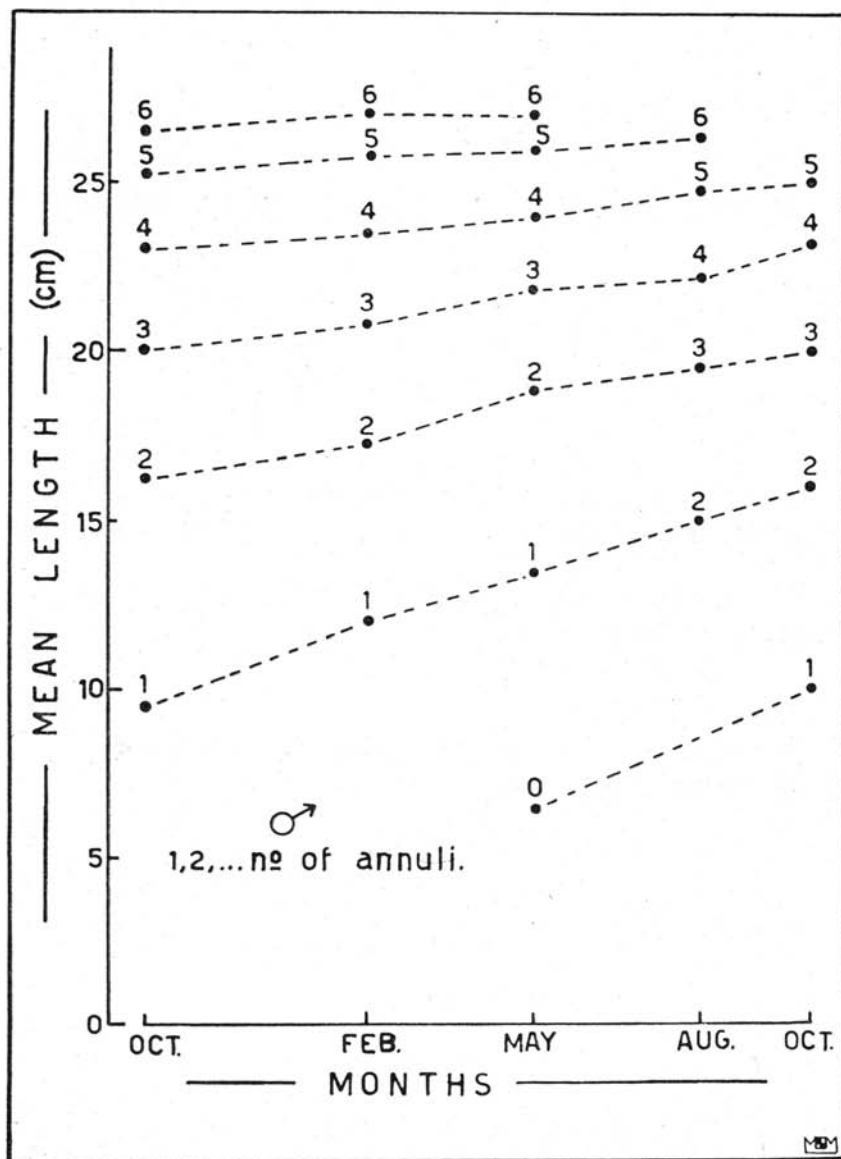


Fig. 1

TABLE I

Number of annuli	Total mean length (cm)									
	Sample I		II		III		IV		V	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
0	—	—	—	—	6.5	6.5	—	—	—	—
1	9.5	10.5	12.0	12.8	13.5	14.2	—	—	10.0	11.0
2	16.2	17.5	17.2	19.0	18.8	20.0	15.0	16.0	16.0	17.2
3	20.0	21.0	20.8	22.0	21.8	23.2	19.5	20.8	20.0	20.5
4	23.0	24.2	23.5	24.5	24.0	26.0	22.2	23.8	23.2	24.2
5	25.2	27.0	25.8	27.5	26.0	27.8	24.8	26.5	25.0	26.5
6	26.5	28.6	27.0	28.2	27.0	—	26.5	—	—	—

TABLE II

Number of annuli	Mean weight (g)									
	Sample I		II		III		IV		V	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
1	—	—	—	—	—	—	—	—	—	—
2	53	63	71	77	82	86	47	52	51	57
3	101	110	109	126	122	142	92	98	94	109
4	143	177	157	194	171	209	134	165	152	168
5	198	228	215	240	230	251	188	221	210	230
6	245	273	248	278	250	—	240	—	—	—

TABLE III

Modes (cm)									
Sample I		II		III		IV		V	
♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
20.2	20.5	21.0	19.2	18.2	19.5	19.2	21.0	19.5	17.5
23.2	24.2	23.2	21.2	21.2	23.2	22.2	24.0	23.0	20.5
25.2	—	25.5	24.0	24.2	26.2	24.2	26.2	25.2	24.0
—	—	—	—	—	—	26.2	—	—	26.8

The age of the fish was determined by means of the number of translucent annuli of the otoliths, after verifying a linear correlation ($T = 0.049 L + 0.63$) between the total length (L) of the fish and the maximum length (T) of the otolith, both in centimetres (correlation coefficient, $p < 1\%$).

The means of total lengths and of weights for each class of fish with the same number of rings obtained from the five samples are presented in Table I and II. Plotting these values, it may be seen that the annuli are formed annually, during June and July, so they can be used as age indicators (Fig. 1 — ♂ of Table I).

The modes of total length frequency (Table III) correspond to the lengths shown in Table I, which permits the supposition that the classes are constituted of fishes from the same spawning (Petersen method — see Graham 1956, p. 285).

I used the Bertalanffy expression $L_t = L_\infty [1 - e^{-K(t-t_0)}]$ adjusted through the method presented by Beverton & Holt (1957), in order to correlate the total length to age (t) in years, to Table I data. The analysis of variance applied to $L_{t+1} = f(L_t)$ correlation, from samples, demonstrates that there is no significant difference for separate sexes ($F_\sigma = 1.07$, and $F_\varphi = 0.21$ for the regression coefficient and $F_\sigma = 1.12$ and $F_\varphi = 1.26$ for the independent term, $p > 5\%$) permitting combination of the data.

I used the expression $W = aL^b$, adjusted by the least squares method, in order to correlate the weight (W) in grams of a fish with its total length (L), to the Table I and III data, in logarithms. Analysis of variance applied to the expression, in logarithmic form, from samples, for both sexes, demonstrates that there is no significant difference ($F = 1.24$ for regression coefficient and $F = 2.10$ for independent terms, $p > 5\%$).

CONCLUSIONS

The expressions used to correlate the total length (L) in centimetres with the age (t) in years and with the weight (W) in grams, of 'goete' caught from Santos to São Francisco Island, from October 1961 to October 1962, are (Fig. 2):

$$\begin{aligned} \sigma \quad L_t &= 30.3 (1 - e^{-0.342 t}) \\ \varphi \quad L_t &= 32.1 (1 - e^{-0.345 t}) \end{aligned} \quad (\text{for August})$$

$$\sigma \quad \text{and} \quad \varphi \quad W = 0.0130 L^{2.98}$$

The correlation parameters do not present significant variations which could be analysed by these methods, during the mentioned sampling period.

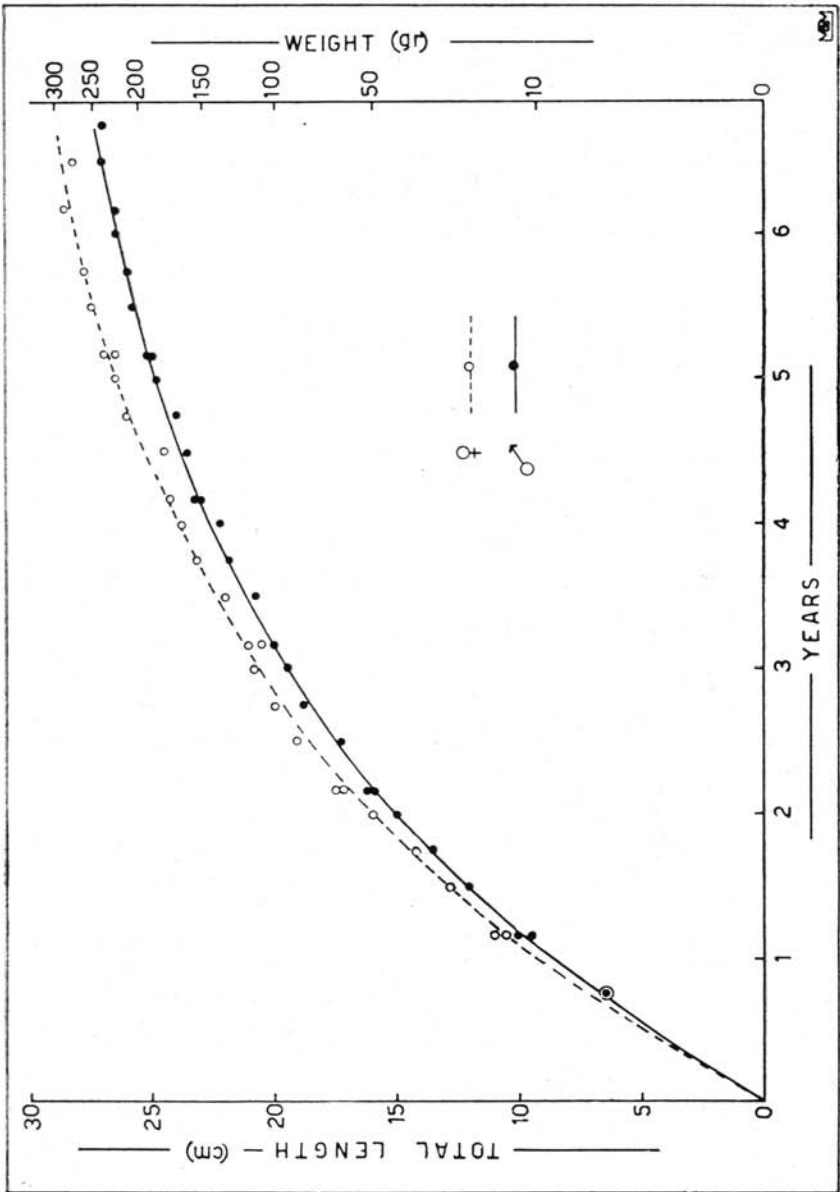


Fig. 2

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