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ON THE LENGTH AND WEIGHT OF THUNNUS ATLANTICUS (LESSON) FROM NORTHEASTERN BRAZIL

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During 1965 - 1966 (October-January) fishing season of the Atlantic blackfin tuna, *Thunnus atlanticus* (Lesson), 611 specimens caught with trolling line thrown from sailing boats near the waters bordering Rio Grande do Norte and Paraíba States (Brazil), were measured and weighted at the fishing center of Baía Formosa (Rio Grande do Norte).

Fork length measurements were taken in millimeters, but in the analysis they were grouped into classes of 1 cm interval, ranging from 45 to 79 cm. The fishes were weighted on the beaches, with a balance having a precision of 50 g. They were already eviscerated and hence no sexes could be considered.

Length-weight relationship allows the determination of the growth rate of a species if the increase in weight in function of increase in lenght is known. If the relation is known, it is also possible to find the weight at any length, and vice-versa.

Considerations on the fork length and eviscerated weight of the Atlantic blackfin tuna were presented by Cruz & Paiva (1964), but they have not calculated the relationship between both parameters. Length-weight relationship for the same species occurring in Cuban waters was calculated by Suarez Caabro & Duarte Bello (1961), using total weight instead of eviscerated weight; their equation is:

$$P = 1.375 \times 10^{-2} L^{3.10404}$$

The equation that represents the length-weight relationship is:

$$W = a L^{b}$$

where: W = eviscerated weight in grams; L = fork length in centimeters; a = constant, and b = an expoent. The parameters a and b were calculated through a regression fitted by least squares of the logarithmic transformation:

$$\log W = \log a + b \log L$$

The length-weight equation found for 611 unsexed blackfin tuna is:

$$\log W = -2.183 + 3.248 \log L$$

The observed and calculated eviscerated weights, as well as the total weight observed by Suarez Caabro & Duarte Bello (1961), in classes of 1 cm interval, are presented in table I. Figure 1 shows the fork lengths and observed eviscerated weights, and the calculated curve derived by fitting a regression line by least squares to the logarithms of the average lengths and weights.

Table I shows that agreement of calculated and observed eviscerated weights varied considerably according to the fork length and number of fish examined. For 19 lengths the calculated eviscerated weights were greater than the observed ones, and for 11 were less.

No local data on total weight are available. Assuming that the same species from Cuban waters has similar rate of growth with that of northeastern Brazil, the authors used their data on observed eviscerated weight of fork lengths from 45 to 60 cm and the observed total weight of the same fork lengths range presented by Suarez Caabro & Duarte Bello (1961), already shown in table I, and calculated the regression coefficients of eviscerated weight on total weight. The equation found is:

$$Y = 37.681 + 0.836 X \quad (r = 0.985)$$

where: Y is the eviscerated weight and X is the total weight, both in grams, and r is Pearson's linear correlation coefficient (figure 2).

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TABLE I

Data on fork length (cm), number of fish (n) examined, observed eviscerated weight (g), calculated eviscerated weight (g), as well as the difference between both, of 611 unsexed specimens of Atlantic blackfin tuna, *Thunnus atlanticus* (Lesson), from northeastern Brazil; observed total weigth (g) refers to data from Cuba.

Fork length (cm)	Number of fish (n)	Observed eviscerated weight (g)	Calculated eviscerated weight (g)	Difference (Calculated — Observed weight) (g)	Observed total weight (1) (g)
45	1	1,500	1,535	+ 0.035	1,878
46	1	1,600	1,652	+ 0,052	1,973
47	...	...	1,770	...	2,064
48	1	1,750	1,892	+ 0,142	2,268
49	1	2,000	2,023	+ 0,023	2,386
50	1	2,050	2,163	+ 0,113	2,458
51	2	2,500	2,296	— 0,204	2,735
52	1	2,700	2,461	— 0,239	2,948
53	7	2,778	2,612	— 0,166	3,175
54	18	2,880	2,774	— 0,106	3,352
55	55	3,057	2,945	— 0,112	3,366
56	67	3,169	3,126	— 0,043	3,783
57	91	3,300	3,311	+ 0,011	3,819
58	83	3,422	3,492	+ 0,070	4,023
59	65	3,574	3,707	+ 0,133	4,423
60	42	3,870	3,908	+ 0,038	4,763
61	39	4,076	4,121	+ 0,045	...
62	26	4,204	4,335	+ 0,131	...
63	15	4,423	4,571	+ 0,148	...
64	16	4,756	4,819	+ 0,063	...
65	9	5,106	5,082	— 0,024	...
66	14	5,296	5,300	+ 0,004	...
67	13	5,542	5,598	+ 0,056	...
68	13	5,827	5,858	+ 0,031	...
69	5	5,860	6,166	+ 0,306	...
70	9	6,700	6,457	— 0,243	...
71	5	6,810	6,745	— 0,065	...
72	4	7,588	7,063	— 0,525	...
73	4	7,625	7,379	— 0,246	...
74	...	...	7,727	...	...
75	...	...	8,072	...	...
76	...	...	8,433	...	...
77	...	...	8,770	...	...
78	2	9,150	9,162	+ 0,012	...
79	1	9,350	9,594	+ 0,244	...

(1) Source: Suarez Caabro & Duarte Bello (1961).

RESUMO

A relação comprimento zoológico (cm) — pêso eviscerado (g) da albacorinha, *Thunnus atlanticus* (Lesson), do nordeste do Brasil, foi calculada utilizando-se dados de 611 exemplares, cujos comprimentos zoológicos variaram de 45 a 79 cm, sem considerar os sexos.

Essa relação foi calculada pelo método dos mínimos quadrados, resultando na equação:

$$\log W = -2{,}183 + 3{,}248 \log L$$

onde W é o pêso eviscerado em gramas e L é o comprimento zoológico em centímetros.

Utilizando dados de pêso total da mesma espécie, estudada em Cuba por outros autores, abrangendo os comprimentos zoológicos de 45 a 60 cm, foram calculados os coeficientes de regressão do pêso eviscerado em relação ao pêso total, resultando na equação:

$$Y = 37{,}681 + 0{,}836\ X \quad (r = 0{,}985)$$

onde Y é o pêso eviscerado e X é o pêso total, ambos em gramas, e *r* é o coeficiente de correlação linear de Pearson.

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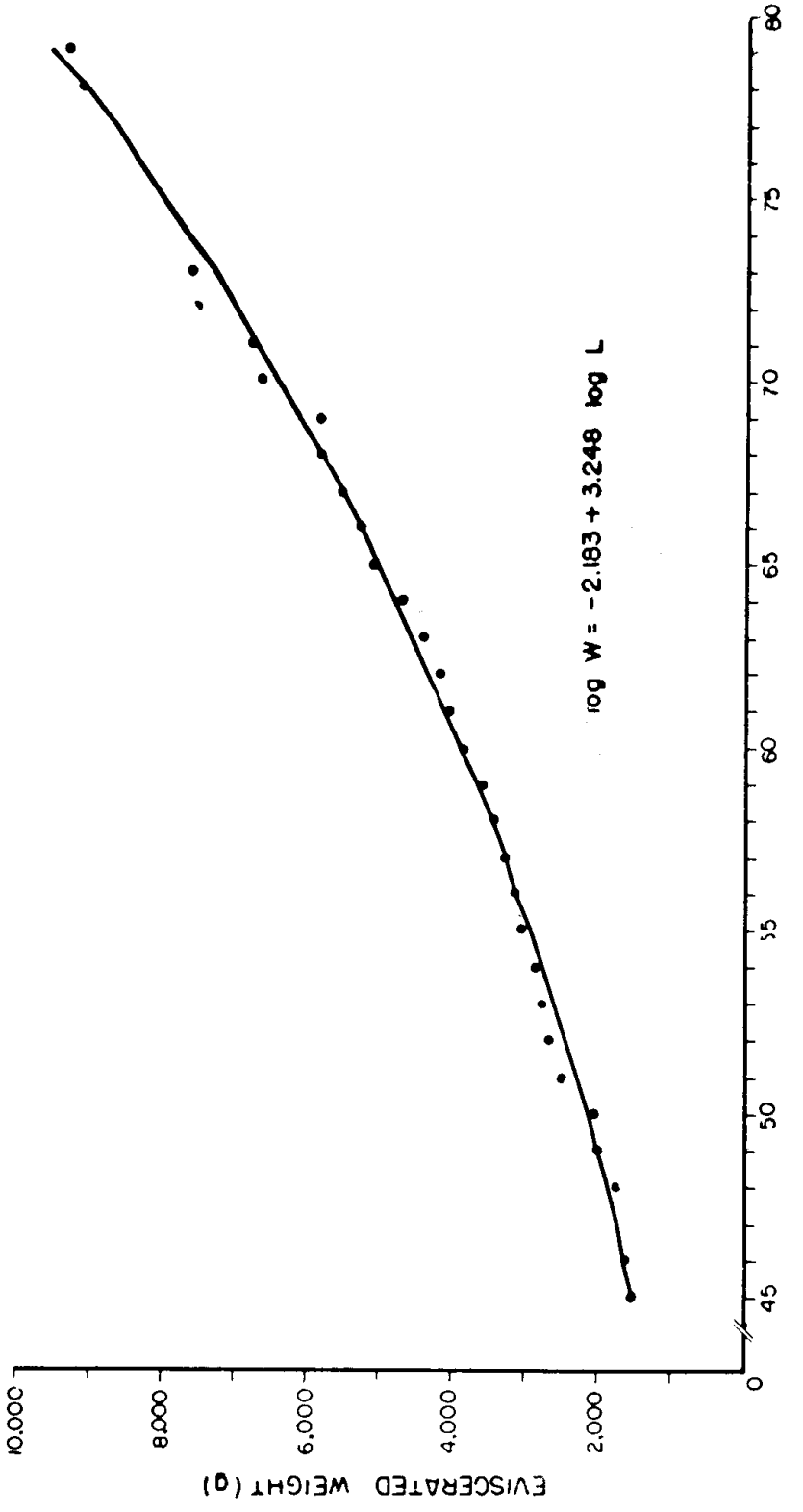

Figure 1 — Fork length (cm) — eviscerated weight (g) relationship of *Thunnus atlanticus* (Lesson) from northeastern Brazil.

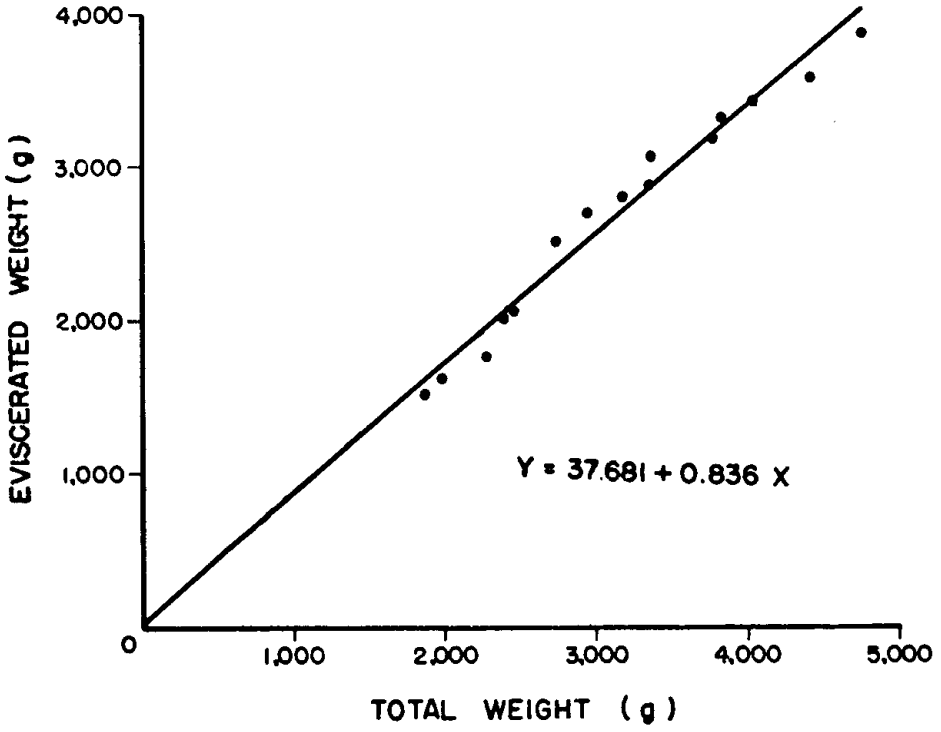

Figure 2 — Regression of eviscerated weight (g) on total weight (g) of *Thunnus atlanticus* (Lesson) from northeastern Brazil.