

LENGTH-WEIGHT RELATIONSHIP OF TWO SPECIES OF SCOMBRIDAE FISHES FROM NORTHEASTERN BRAZIL

Hitoshi Nomura (1) — Raimundo Saraiva da Costa (2)

King mackerel, *Scomberomorus cavalla* (Cuvier), and Spanish mackerel, *Scomberomorus maculatus* (Mitchill), are two commercially important species of fishes from Northeastern Brazil.

In a previous paper (Nomura & Costa, 1966), the authors presented the length-weight relationship of the two above mentioned species, but in 1965 the fishermen did not allow dissections of fishes, and so the data made no reference to sex. In 1966 (Nomura, 1967; Nomura & Rodrigues, 1967), due to lack of a balance, the weights were not recorded.

From January to December 1967 it was possible to collect length-weight data by sex, which are presented in this paper. The data comprise 338 males and 355 females specimens of king mackerel, and 104 males and 90 females specimens of Spanish mackerel, measured in millimeters and later on grouped into classes of 1.0 cm interval. The weights were taken in grams.

The specimens were caught with trolling line in front of Fortaleza County (Ceará — Brazil).

Length-weight relationships for both species were calculated by least squares of logarithms, resulting in the equations:

$$\begin{aligned} \text{king mackerel — males: } \log W &= -2.042 + 2.962 \log L \quad (r = 1.00) \\ \text{females: } \log W &= -1.989 + 2.933 \log L \quad (r = 1.00) \end{aligned}$$

$$\begin{aligned} \text{Spanish mackerel — males: } \log W &= -2.051 + 2.973 \log L \quad (r = 0.99) \\ \text{females: } \log W &= -2.154 + 3.035 \log L \quad (r = 1.00) \end{aligned}$$

Table I shows the fork lengths grouped into classes of 1.0 cm interval; the number of fish examined; observed and calculated weights in grams for both males and females of king mackerel. The data are plotted in figure 1, which shows that up to 97.5 cm the calculated male weights are similar to the ones for females. Only few male specimens above 84.5 cm, and female's above 90.5 cm, were available. It is expected that female increases more than male in the same period of time, but it is not evident here, due to the fact mentioned above.

Table II shows the fork lengths grouped into classes of 1.0 cm interval; the number of fish examined; observed and calculated

weights in grams for both males and females of Spanish mackerel. The data are plotted in figure 2, which shows that up to 56.5 cm males increase in weight is similar to the ones for females, and from that on it is evident that females increase more than males, as expected.

RESUMO

O presente trabalho apresenta a relação pêso-comprimento da cavala, *Scomberomorus cavalla* (Cuvier), e da serra, *Scomberomorus maculatus* (Mitchill) do nordeste brasileiro, por sexos, seguida das tabelas correspondentes.

As relações encontradas foram as seguintes:

$$\begin{aligned} \text{cavala — machos: } \log W &= -2,042 + 2,962 \log L \quad (r = 1,00) \\ \text{fêmeas: } \log W &= -1,989 + 2,933 \log L \quad (r = 1,00) \end{aligned}$$

$$\begin{aligned} \text{serra — machos: } \log W &= -2,051 + 2,973 \log L \quad (r = 0,99) \\ \text{fêmeas: } \log W &= -2,154 + 3,035 \log L \quad (r = 1,00) \end{aligned}$$

(1) — Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto — Ribeirão Preto — São Paulo — Brasil.

(2) — Estação de Biologia Marinha — Universidade Federal do Ceará — Fortaleza — Ceará — Brasil.

TABLE I

Length-weight table (fork lengths grouped into classes of 1.0 cm interval) of king mackerel, *Scomberomorus cavalla* (Cuvier), by sex, from Northeastern Brazil.

Fork length (cm)	Males			Females		
	Fish examined (n)	Mean observed weight (g)	Calculated weight (g)	Fish examined (n)	Mean observed weight (g)	Calculated weight (g)
42.5	...	...	...	1	570	610
44.5	...	...	...	1	700	698
46.5	1	770	787	...	...	...
47.5	2	855	841	...	...	...
48.5	2	885	895	2	935	904
49.5	5	994	951	4	963	959
50.5	6	1,040	1,005	5	1,000	1,014
51.5	2	1,110	1,070	4	1,068	1,077
52.5	6	1,130	1,130	6	1,112	1,138
53.5	8	1,204	1,191	2	1,200	1,200
54.5	6	1,308	1,259	3	1,293	1,268
55.5	8	1,338	1,331	6	1,393	1,337
56.5	8	1,401	1,403	3	1,403	1,413
57.5	...	...	1,483	5	1,490	1,490
58.5	2	1,525	1,556	2	1,580	1,563
59.5	5	1,680	1,641	1	1,610	1,648
60.5	10	1,708	1,722	10	1,661	1,730
61.5	11	1,775	1,807	7	1,814	1,812
62.5	10	1,854	1,897	12	1,838	1,901
63.5	20	1,975	1,986	11	1,869	1,991
64.5	11	2,132	2,085	9	2,116	2,075
65.5	13	2,241	2,173	9	2,127	2,173
66.5	19	2,365	2,281	8	2,316	2,281
67.5	11	2,411	2,372	11	2,378	2,372
68.5	11	2,457	2,489	5	2,434	2,489
69.5	13	2,463	2,594	9	2,442	2,589
70.5	9	2,788	2,704	7	2,821	2,698
71.5	12	2,817	2,812	16	2,956	2,812
72.5	15	3,098	2,931	15	2,971	2,924
73.5	12	3,277	3,055	17	3,060	3,048
74.5	10	3,238	3,184	17	3,081	3,170
75.5	15	3,327	3,319	11	3,472	3,304
76.5	11	3,507	3,532	15	3,421	3,444
77.5	2	3,535	3,573	11	3,604	3,557
78.5	8	3,571	3,724	12	3,719	3,707
79.5	9	3,760	3,855	12	3,816	3,846
80.5	4	4,305	4,009	5	3,952	3,991
81.5	6	4,293	4,150	3	4,240	4,131
82.5	6	4,237	4,295	7	4,319	4,276
83.5	4	4,600	4,477	8	4,499	4,447
84.5	2	4,520	4,634	1	4,770	4,603
85.5	3	4,750	4,787	13	4,852	4,754
86.5	4	4,783	4,955	6	5,065	4,921
87.5	3	4,737	5,129	7	5,106	5,094
88.5	2	4,805	5,309	3	5,273	5,260
89.5	...	...	...	6	5,431	5,445
90.5	...	...	...	1	5,700	5,637
91.5	...	...	...	3	6,186	5,794
92.5	1	6,200	6,040	2	6,125	5,984
94.5	1	6,580	6,427	3	6,570	6,368
95.5	1	6,600	6,653	3	6,600	6,577
96.5	...	...	...	2	7,245	6,761
97.5	1	7,000	7,063	4	7,260	6,999
98.5	2	7,295	7,261	...	...	...
99.5	...	...	...	1	7,350	7,431
100.5	3	7,660	7,727	...	...	...
101.5	...	...	...	4	7,375	7,835
103.5	...	...	...	1	8,000	8,337
104.5	...	...	...	1	7,790	8,571
105.5	1	7,800	8,913	...	...	...
113.5	...	...	...	1	8,420	10,920
123.5	...	...	...	1	14,010	14,030
Total (N)	338	—	—	355	—	—

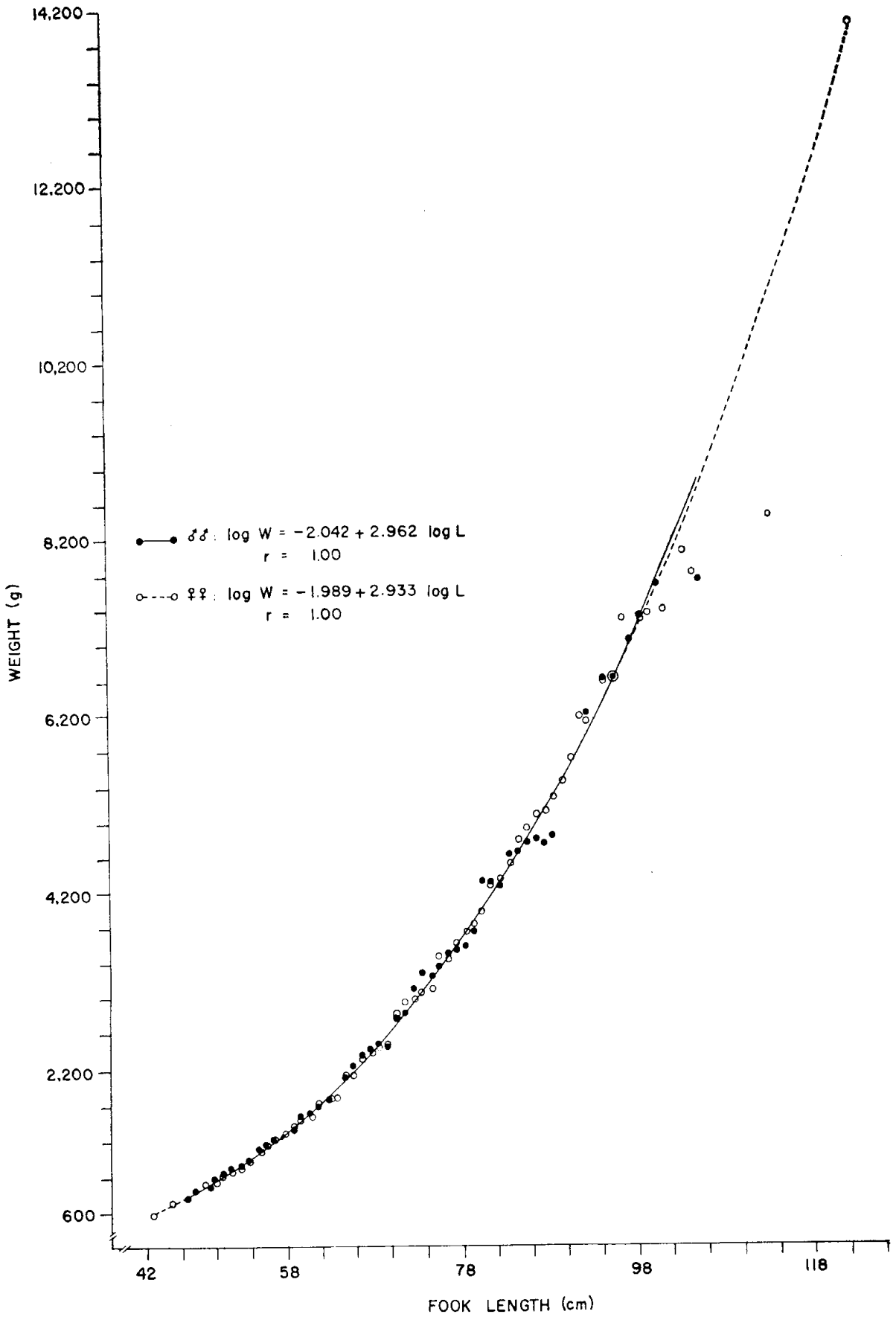


Figure 1 — Length-weight relationship of male and female king mackerel, *Scomberomorus cavalla* (Cuvier) from Northeastern Brazil.

TABLE II

Length-weight table (fork lengths grouped into classes of 1.0 cm interval) of Spanish mackerel, *Scomberomorus maculatus* (Mitchill), by sex, from Northeastern Brazil.

Fork length (cm)	Males			Females		
	Fish examined (n)	Mean observed weight (g)	Calculated weight (g)	Fish examined (n)	Mean observed weight (g)	Calculated weight (g)
36.5	1	430	392	...	...	...
38.5	1	470	458	...	...	...
39.5	3	520	498	...	...	...
40.5	1	550	533	1	540	528
41.5	3	567	574	1	600	571
42.5	3	630	615	...	...	...
43.5	3	627	659	2	670	656
44.5	10	717	705	2	680	705
45.5	9	729	755	6	750	755
46.5	7	791	804	2	875	803
47.5	8	859	861	3	883	863
48.5	4	872	914	4	925	918
49.5	3	863	973	2	935	977
50.5	8	985	1,028	2	1,000	1,035
51.5	4	1,070	1,094	3	987	1,102
52.5	5	1,090	1,154	2	1,075	1,165
53.5	...	...	...	3	1,246	1,230
54.5	3	1,243	1,289	3	1,306	1,304
55.5	2	1,265	1,362	2	1,395	1,378
56.5	1	1,430	1,439	6	1,433	1,456
57.5	...	...	...	5	1,492	1,542
58.5	1	1,720	1,593	...	...	...
59.5	...	...	...	2	1,720	1,699
60.5	4	1,735	1,766	4	1,882	1,795
61.5	1	1,900	1,854	1	1,960	1,888
62.5	5	1,906	1,941	3	1,996	1,982
63.5	4	1,970	2,037	3	2,010	2,080
64.5	5	2,360	2,124	6	2,171	2,183
65.5	1	2,470	2,229	6	2,383	2,275
66.5	...	...	...	1	2,450	2,394
67.5	1	2,460	2,438	3	2,560	2,495
68.5	...	...	...	3	2,696	2,619
69.5	1	2,480	2,661	2	2,690	2,729
70.5	...	...	...	1	2,750	2,851
71.5	...	...	...	2	3,035	2,972
72.5	...	...	...	1	3,080	3,098
73.5	1	3,200	3,141	...	...	...
74.5	1	3,290	3,266	2	3,120	3,365
75.5	...	...	...	1	3,300	3,516
Total (N)	104	—	—	90	—	—

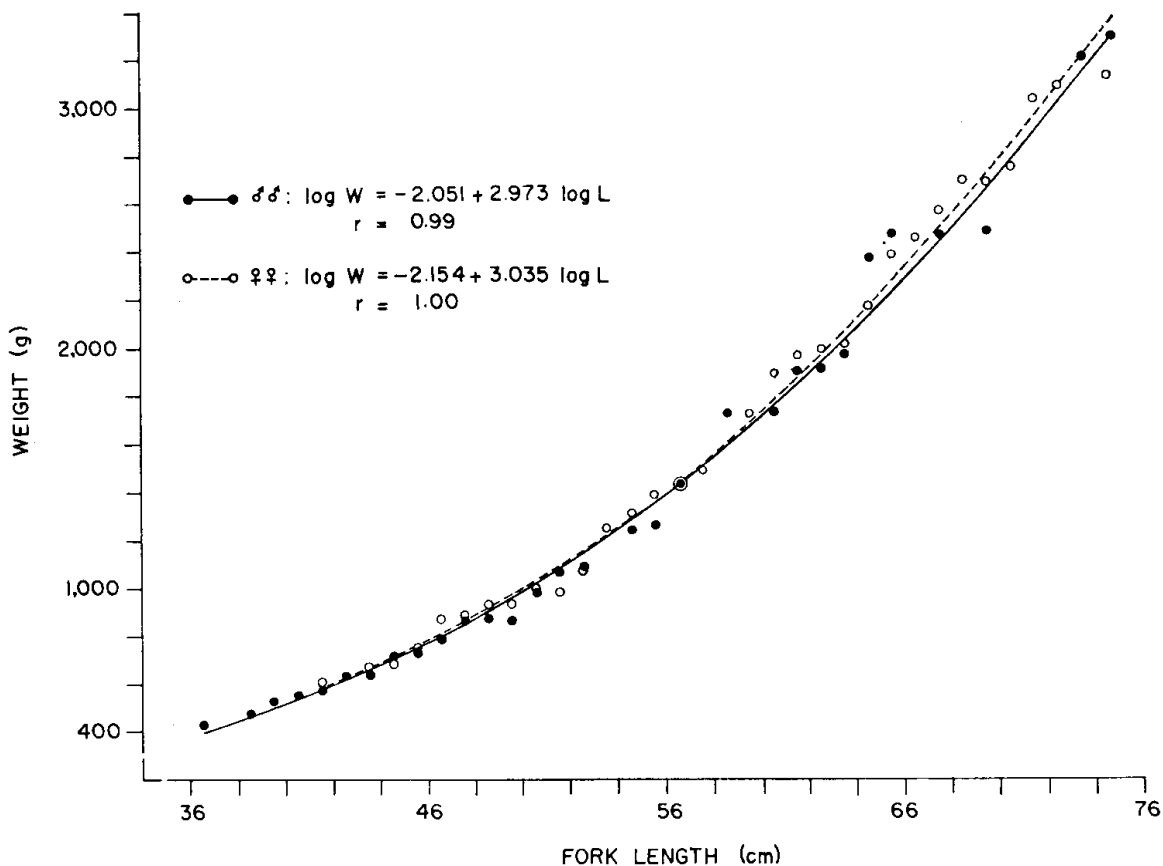


Figure 2 — Length-weight relationship of male and female Spanish mackerel, *Scomberomorus maculatus* (Mitchill), from Northeastern Brazil.

REFERENCES

Nomura, H. & Costa, R. S. — 1966 — Sobre o comprimento e o peso da cavala e da serra das águas cearenses. *Arq. Est. Biol. Mar. Univ. Fed. Ceará*, Fortaleza, 6 (1) : 11-13.

Nomura, H. — 1967 — Dados biológicos sobre a serra, *Scomberomorus maculatus* (Mitchill), das

águas cearenses. *Arq. Est. Biol. Mar. Univ. Fed. Ceará*, Fortaleza, 7 (1) : 29-39, 4 figs.

Nomura, H. & Rodrigues, M. S. S. — 1967 — Biological notes on king mackerel, *Scomberomorus cavalla* (Cuvier), from northeastern Brazil. *Arq. Est. Biol. Mar. Univ. Fed. Ceará*, Fortaleza, 7 (1) : 79-85, 4 figs.