

OVERALL FISHING INTENSITY, CATCH, CATCH BY SIZE OF YELLOWFIN TUNA IN THE
ATLANTIC TUNA LONGLINE FISHERY, 1956-1978

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SUMMARY

This paper is a series on the basic catch and effort statistics of the Atlantic longline fishery up to 1978. Hook rate of yellowfin in 1978 computed from effective fishing efforts by Honma method resulted in 0.54%, higher than 0.44% in 1977 and roughly the same as in 1976. The hook rates after 1970 remained relatively constant indicating stable status of the stock exploited by the longline fishery in the recent years.

RESUME

Ce document présente une série de statistiques de base de prise et effort sur la pêcherie palangrière de l'Atlantique jusqu'à 1978. Le taux par hameçon de l'albacore pour 1978, calculé à partir de l'effort de pêche effectif selon la méthode d'Honma,

s'élève à 0,54 %, pourcentage qui dépasse les 0,44 % de 1977 et est presque le même qu'en 1976. Ce taux est resté relativement constant depuis 1970, indiquant un état stable du stock exploité par la pêcherie palangrière au cours de ces dernières années.

RESUMEN

Este documento es la continuación de una serie que trata sobre capturas básicas y estadísticas de esfuerzo de la pesquería de palangre en el Atlántico, hasta 1978.

La tasa de anzuelos del rabil, durante 1976, estimada a partir del esfuerzo de pesca efectivo, según el método Honma, resultó ser un 0,54% más alta que el 0,44% en 1977, y aproximadamente la misma que la correspondiente al año 1976. Las tasas de pesca con anzuelo permanecieron relativamente constantes después de 1970, indicando la situación estable del stock explotado por la pesquería de palangre en los últimos años.

This paper in its 9th series updates previous reports on fishing intensity, catch, catch by length of Atlantic yellowfin caught by Japanese and other longlining countries basing on the data to 1978. The data sources (ICCAT 1975-1979, Fisheries Agency of Japan 1965-1980, Shiohama et al. 1965 and unpublished length data compiled by the Far Seas Fisheries Research Laboratory), method of standardizing nominal fishing efforts and procedures extrapolating fishing intensity and catch in number of yellowfin by the Japanese fleet to those of the entire Atlantic longline fleets are the same as described in the previous report (Honma 1979) except the following points for 1978:

1. Taiwanese catch and effort data were not used because it was informed that those statistics were now under revision.
2. Therefore, overall fishing intensity of the entire Atlantic longline fleets on yellowfin and catches in number by them were both extrapolated raising a ratio of total Atlantic catch in weight to the Japanese one.

1. Catch

Total catch of yellowfin caught by the longline fleet of the entire Atlantic Ocean has fluctuated between 21,000 to 32,000 tons since 1965 (Table 1, Fig. 1). The 1978 catch was 25,000 tons, about 1,700 tons decrease from the previous year. Japanese and Taiwanese catches of this species by longline boats in the same year were 1,929 tons and 340 tons, only 7.6 % and 1.3 %, respectively, to the total longline catch. Korean, Cuban and Venezuelan catches of yellowfin by the longline boats have increased, while the Japanese and Taiwanese catches have been declining, and above all, the Korean catches share about 45 % in the total longline catch of this species (ICCAT 1979).

2. Fishing intensity and hook rate

Fishing intensity (number of effective hooks / 5° squares) of the Japanese fleet on yellowfin is on the decrease in the recent years, about 840,000 hooks in 1978 which was roughly on the same level as in 1977 (Table 1). Fishing intensity for the whole longline fleets decreased drastically in 1978 to 1110,000 hooks, half of that in 1977. Fishing intensity against hook rate, catches in number and weight for the species are shown in Figure 2. Hook rate in 1978 was 0.54 %, slightly higher than the previous year. Catch in number of the fish remained roughly in the same amount as in 1977 despite a large decrease of the fishing intensity in 1978. Similarly, catch in weight decreased only by 1,700 tons from 25,000 tons in the previous year (Fig. 2).

As mentioned previously, it could be pointed out that the catch of yellowfin taken by the longline has fluctuated between 25,000 and 32,000 tons without any clear upward or downward trend, showing no appreciable positive responses between the catch and effort despite large changes of their fishing efforts after 1969.

3. Length composition of the catch in 1978

Length composition of yellowfin tuna in the catches by the Japanese longline boats are shown, divided by Carib and Guinea Areas, in Figure 3. Appendix Table 1 shows detailed catch in number by 2 cm-fork length class and quarter of the year for both areas. Modal classes of the Carib Area are located between 112 and 120 cm and 80 % of the fish are from 100 and 140 cm classes, whereas in Guinea Area, large fish above 120 cm dominates with 90 % of the total catch falling within the range of 120-160 cm classes (Fig. 3)

References

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- Honma, M. 1980. "Overall fishing intensity, catch, catch by size and spawning indices of yellowfin tuna in the Atlantic tuna longline fishery, 1956-77", Col. Vol. Scie. Paper., 9(1), p. 209-214.
- International Commission for the Conservation of Atlantic Tunas 1975-1979. "Statistical Bulletin", Vols. 5-9.
- Shiohama, T., M. Myojin and H. Sakamoto 1965. "The catch statistic data for the Japanese tuna longline fishery in the Atlantic Ocean and some simple consideration on it". Rep. Nankai Reg. Fish. Res. Lab., No. 21, 131pp.

Appendix table 1. Catch of yellowfin tuna by length class in Japanese longline fishery, 1978.

A. CARIB AREA					
Length class	Jan. - Mar.	Apr. - June	July - Sep.	Oct. - Dec.	Total
52 - 54	-	-	-	13	13
54 - 56	-	-	-	27	27
56 - 58	-	-	-	-	-
58 - 60	-	-	-	27	27
60 - 62	-	-	-	13	13
62 - 64	-	-	-	13	13
64 - 66	-	-	-	8	8
66 - 68	-	-	-	13	21
68 - 70	-	-	-	-	8
70 - 72	-	-	-	24	37
72 - 74	3	-	-	47	87
74 - 76	10	-	-	95	105
76 - 78	3	-	-	47	50
78 - 80	47	-	-	39	86
80 - 82	44	-	-	47	91
82 - 84	7	-	-	181	188
84 - 86	47	-	-	347	394
86 - 88	17	2	-	331	350
88 - 90	51	2	-	174	240
90 - 92	54	-	-	95	176
92 - 94	30	5	-	189	251
94 - 96	91	5	-	521	617
96 - 98	30	-	-	237	280
98 - 100	47	2	-	284	346
100 - 102	14	-	-	284	325
102 - 104	-	-	-	24	40
104 - 106	17	10	-	1,262	1,336
106 - 108	19	-	-	1,215	1,679
108 - 110	14	-	-	1,278	1,874
110 - 112	61	-	-	852	1,243
112 - 114	68	-	-	655	695
114 - 116	112	27	-	371	1,604
116 - 118	162	68	-	1,215	3,395
118 - 120	278	236	-	876	1,791
120 - 122	269	321	-	1,199	2,825
122 - 124	244	511	-	1,168	2,916
124 - 126	261	704	-	1,428	2,083
126 - 128	281	408	-	307	2,700
128 - 130	315	497	-	1,176	1,865
130 - 132	156	405	-	1,460	2,285
132 - 134	179	342	-	1,057	1,645
134 - 136	142	475	-	1,286	1,539
136 - 138	102	224	-	481	1,903
138 - 140	112	282	-	473	807
140 - 142	81	164	-	395	867
142 - 144	41	159	-	268	640
144 - 146	58	205	-	458	469
146 - 148	61	174	-	331	721
148 - 150	51	176	-	489	566
150 - 152	20	125	-	213	729
152 - 154	20	104	-	150	358
154 - 156	24	63	-	110	274
156 - 158	17	34	-	55	197
158 - 160	3	34	-	71	106
160 - 162	10	19	-	-	108
162 - 164	10	7	-	-	79
164 - 166	7	7	-	-	17
166 - 168	7	7	-	-	14
-	-	-	-	8	22
174 - 176	-	2	8	-	10
176 - 178	3	-	-	-	3
Total	3,683	5,866	25,925	12,187	47,661

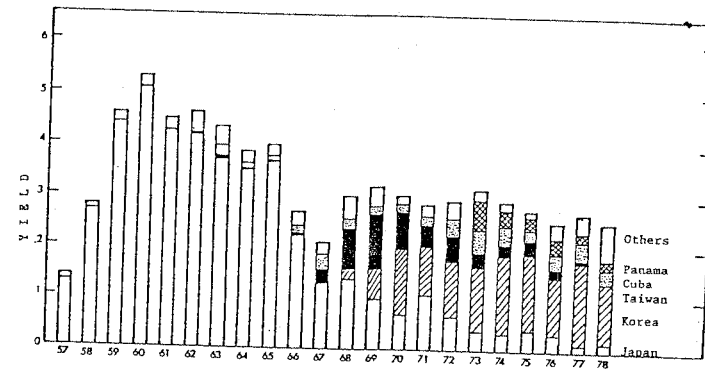
Table 1. Book rate, catch in number, yield in weight and overall fishing intensity of yellowfin tuna in Japanese and Taiwanese longline fishery, and catch, yield and overall fishing intensity in the whole longline fishery in the Atlantic Ocean, 1956 - 1978.

Year	Japanese longline fishery				Taiwanese longline fishery				Whole longline fishery		
	Book rate (Z)	Catch in number of fish	Yield in tons	Intensity in 1000 books per 5* square	Book rate (Z)	Catch in number of fish	Yield in tons	Intensity in 1000 books per 5* square	Catch in 1000 fishes	Yield in tons	Intensity in 1000 books per 5* square
1956	4.91	12,028		2.0							
1957	4.28	258,544	13,198	48.3					272	13,894	2.0
1958	4.50	746,490	27,159	132.8					775	28,203	50.9
1959	4.10	1,097,535	44,071	216.4					1,144	45,927	137.9
1960	3.38	1,158,534	50,822	279.1					1,212	53,142	225.5
1961	2.65	980,339	42,609	303.2					967	44,929	291.8
1962	1.49	990,472	41,973	543.7					1,088	46,434	319.7
1963	1.29	885,796	37,717	566.3					959	40,068	597.5
1964	0.96	879,188	35,106	749.9					1,011	43,522	646.4
1965	0.83	927,267	36,918	913.7					1,002	38,660	817.7
1966	0.72	394,538	22,354	450.8					449	26,890	987.3
1967	0.94	366,046	12,824	316.3					485	20,935	427.2
1968	0.84	274,181	13,913	264.1					762	30,111	738.8
1969	0.76	241,832	9,966	260.9	0.83	276,962	7,862	270.2	739	32,244	850.7
1970	0.65	189,569	6,809	237.4	0.66	233,743	10,798	286.9	657	30,451	938.5
1971	0.51	292,062	10,629	425.5	0.47	109,890	7,071	190.4	915	28,556	1,561.0
1972	0.48	159,010	6,497	253.8	0.58	185,008	4,705	261.5	912	29,681	1,365.1
1973	0.63	94,700	3,803	184.1	0.44	120,199	2,655	219.0	1,120	31,607	1,972.8
1974	0.40	116,319	4,192	121.9	0.43	95,629	2,327	175.3	966	29,461	1,509.3
1975	0.56	103,879	3,360	239.8	0.27	46,060	2,362	136.0	686	27,709	1,589.1
1976	0.44	41,483	1,507	76.3	0.20	21,208	1,736	85.7	620	25,282	1,178.6
1977	0.54	56,332	1,929	84.2	0.10	7,262	329	59.2	721	27,164	2,006.7
1978									728	25,478	1,112.2

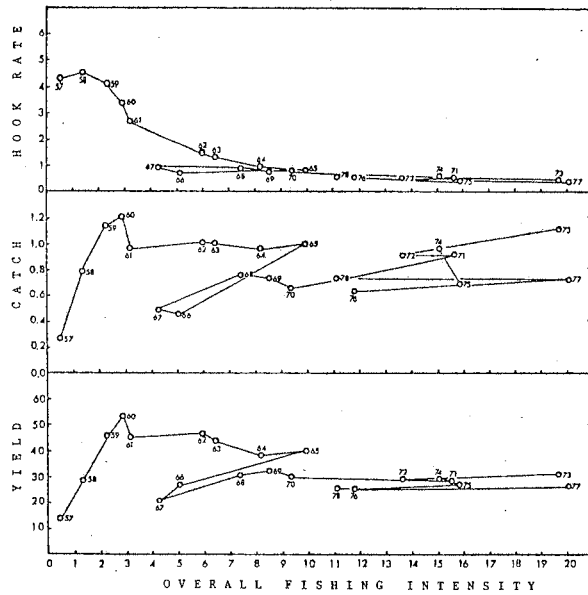
N. GUINEA AREA

Length class	Jan. - Mar.	Apr. - June	July - Sep.	Oct. - Dec.*	Total
70 - 72	1	-	-	-	1
72 - 74	1	-	-	-	1
74 - 76	2	-	-	-	2
76 - 78	1	-	-	-	1
78 - 80	1	-	-	-	1
80 - 82	-	-	-	-	-
82 - 84	2	-	-	-	2
84 - 86	-	-	-	-	-
86 - 88	1	-	-	-	1
88 - 90	2	-	-	-	2
90 - 92	1	-	-	-	1
92 - 94	2	-	-	-	2
94 - 96	2	6	31	1	40
96 - 98	-	3	-	-	3
98 - 100	-	-	-	-	-
100 - 102	1	-	-	-	1
102 - 104	1	-	-	-	1
104 - 106	1	-	-	-	1
106 - 108	2	-	-	-	2
108 - 110	1	-	-	-	1
110 - 112	2	-	31	1	33
112 - 114	8	-	-	-	8
114 - 116	4	9	-	-	13
116 - 118	11	-	61	2	74
118 - 120	9	-	-	-	9
120 - 122	12	6	122	4	144
122 - 124	26	24	31	1	82
124 - 126	14	21	153	5	193
126 - 128	12	12	133	5	162
128 - 130	3	42	367	12	424
130 - 132	2	30	92	3	127
132 - 134	8	15	61	2	86
134 - 136	2	45	184	6	237
136 - 138	3	42	184	6	235
138 - 140	-	86	245	8	339
140 - 142	4	45	92	3	144
142 - 144	1	45	-	-	46
144 - 146	3	33	306	10	352
146 - 148	2	39	122	4	172
148 - 150	1	42	398	13	455
150 - 152	2	33	122	4	160
152 - 154	1	15	92	3	112
154 - 156	3	12	122	4	139
156 - 158	-	9	92	4	138
158 - 160	-	18	92	3	104
160 - 162	1	6	-	-	18
162 - 164	1	3	-	-	7
164 - 166	1	9	-	-	4
166 - 168	1	-	-	-	10
174 - 176	-	3	-	-	3
176 - 178	1	-	-	-	1
Total	166	668	3,214	105	4,153

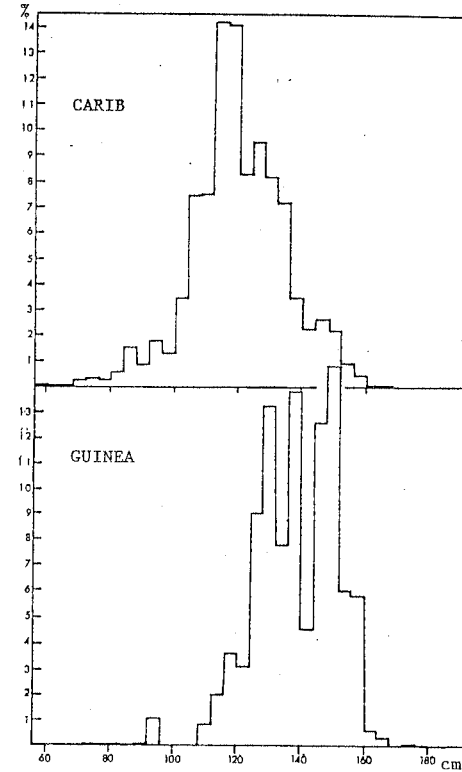
* ; Used frequency of July-Sep. data.



1. Yield in ten thousand tons of yellowfin tuna by country in the Atlantic longline fishery.



2. Hook rate in percent (upper panel), catch in million fish (central panel) and yield in thousand tons (lower panel) of yellowfin tuna against overall fishing intensity in hundred thousand hooks per 5° squares in the Atlantic longline fishery, 1957-1978.



3. Percentage length composition of yellowfin tuna caught by Japanese longline fishery in the Atlantic Ocean (CARIB and GUINEA Areas) in 1978.