STATISTICS AND STATUS OF JAPANESE TUNA FISHERIES IN THE INDIAN OCEAN, UP TO 2001

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ABSTRACT

In this paper, recent trends of Japanese tuna fisheries in the Indian Ocean up to 2001 are summarized using most recent data available to date (data of 2000 and 2001 are preliminary). In 1999, Japanese longliners achieved 20% reduction in the number of distant water longline vessel. Total fishing effort (the number of hooks) by Japanese longliners in the Indian Oceans which was about 125 million hooks in 1997 and 1998 decreased to 100-110 million in 1999 through 2001 according to the decrease of vessels while the percentages of effort in each Ocean to total has not shown remarkable change. Longline catch for each species in 2001 (2000) was 5,201 (3,783MT) for southern bluefin, 3,009MT (2,478MT) for albacore, 12,823MT (12,956MT) for bigeye and 13,594MT (14,563MT) for yellowfin. In 2001, yellowfin catch was a little larger than that of bigeye as was the recent trend. Regarding to Japanese purse seine fishery, though more than 10 Japanese purse seiners operated in 1991-1993, it decreased year by year to only 2 vessels in 2000 and 2001. Total fishing effort (operation days + searching days) of purse seine increased from 349 days in 1989 to 2393 days in 1992, and decreased drastically to 321 days in 2000 and 262 days in 2001. Nearly 100% of operations were made on the FADs associated school recently. Total purse seine catch in weight of each species in 2001 (2000) was 1,830MT (2,332MT), 603MT (953MT) and 592MT (747MT) for skipjack, yellowfin and bigeye, respectively.

1 - INTRODUCTION

In this paper, recent trend of Japanese tuna fisheries in the Indian Ocean are summarized using most recent data available to date. The fishery statistics used in this paper were provided on the bases of the new IOTC statistical areas, i.e. WEST and EAST Indian Ocean.

In 1999, Japanese longliners achieved 20% reduction in the number of distant water longline vessel. This reduction was a significant change in the Japanese longline history and it should be carefully observed whether the reduction of fleet affects on the Japanese distant water tuna longline fishery.

2 - LONGLINE FISHERY

The latest available longline data is that of 2001 although the data of 2000 and 2001 are preliminary. All catch and effort statistics were compiled using logbook data.

2-1-1. Fishing vessels

Japanese longline fishery is classified into three categories (coastal, offshore and distant water) according to the license and boat size (coastal: less than 20 gross tonnage (GRT), offshore: 20-120GRT, and distant 120-500GRT). Basically, longline vessels of distant water category have been operated in the Indian Ocean. Although some offshore longliners are also allowed their operations in this Ocean, there is no operation by them recently. In the last fifteen years, the number of vessels operated in this Ocean was around 180-250 vessels per year (Table 1), and relatively large in number (224-251) during 1995-1998. In 1999, it decreased to 223 from 242 in 1998, and became less than 200 in 2000 and 2001. This decrease is considered to be caused by the 20% reduction of Japanese longline fleet.

2-1-2. Fishing Effort

Total fishing effort (the number of hooks) by Japanese longliners (including offshore and distant water longliners) in the Indian Oceans was higher, greater than 100 million hooks between 1983 and 1987and gradually decreased to around 60 million hooks between 1990 and 1993 (Fig. 1). Thereafter, the total effort increased again to about 125 million hooks in 1997

and 1998, and decreased to 100–110 million in 1999 through 2001 according to the decrease of vessels. Historically, 20% or less of the total fishing effort was used in the Indian Ocean until 1995 except for 22%-24% in 1983 through 1986 (Fig. 2). After 1997, that percentage exceeded 26% with the peak of 28% in 1997. This recent increase in percentage of fishing effort in the Indian Ocean seems to be attributable to the lower catch of tunas, bigeye tuna in particular, in the eastern Pacific Ocean. Although the total fishing effort decreased in the latest two years as described above, the percentages of effort in each Ocean to total seem not to have changed so much.

Yearly and quarterly distributions of the longline effort in Indian Ocean are shown in Fig. 3 and 4 for 2000 and 2001, respectively. The seasonal pattern of longline operation has been more or less the same in recent years. In the tropical and sub-tropical Indian Ocean north of 30S, the areas off Mozambique, off Somalia, off Indonesia and off West Australia are main fishing grounds. In these areas, concentrations of fishing effort appeared in the first and forth quarters although the seasonal change is not so clear. In the area south of 30S, effort concentration is observed off South Africa in the second and the third quarters, off southwest Australia in the third quarter. The seasonal changes in the distribution of Japanese logline effort in further south (south of 35S) are strongly depended on the national regulation (time/area closure and quota) on southern bluefin tuna. That is, Japanese longliners are allowed to catch southern bluefin from April (or May) to July (or August) in the fishing area off Africa and Tasmania, and from September to the time when their catches fill Japanese quota for this species in Southwest Australia (normally, November or December).

2-1-3. Catch

Information on catch in weight from 1971 to 2001 caught by Japanese longliners in the Indian Ocean was shown in Table 2 (Data of 2000 and 2001 are preliminary), and geographical distributions of catch in 2000 and 2001 for major species were shown in Fig. 5. Total catch includes the catch for southern bluefin tuna, albacore, bigeye, yellowfin, swordfish, striped marlin, blue marlin, black marlin, sailfish, shortbill spearfish, and skipjack. Total catch was kept high during 1983 to 1988 with the highest of about 50,000 MT in 1985. It declined continuously since then to about 19,000 MT in 1991. Total catch increased thereafter as corresponding to the increase in effort and reached to around 47,000MT in the 1997 and 1998, and decreased to 37,000MT in 2000 and 2001. Catch for each species in 2001 (2000) was 5,201 (3,783MT) for southern bluefin, 3,009MT (2,478MT) for albacore, 12,823MT (12,956MT) for bigeye and 13,594MT (14,563MT) for yellowfin. As pointed out by Matsumoto et al. (2000), the proportion of yellowfin in the total catch has been increasing in recent years, and exceeded that of bigeye in 1999. In 2000 also, yellowfin catch was a little larger than that of bigeye. Matsumoto et al. (2000) suggested that this increase in yellowfin catch proportion was probably due to the decrease of the catch of bigeye and shift of the target to yellowfin since comparatively higher effort of Japanese longline vessels was observed in the western Indian Ocean (from off Mozambique to off South Africa), where CPUE of yellowfin is higher than other waters.

3 - PURSE SEINE FISHERY

The latest available data for Japanese purse seine fishery are those for 2001. The catch and effort data in 2001 can be regarded as the nearly final one.

3-1-1. Fishing vessels

Japanese purse seine vessels in the Indian Ocean are 350-700 GRT class (700-1000 carrying capacity). Historical change in the number of vessel was shown in Table 1. More than 10 Japanese purse seiners operated in 1991-1993. It decreased year by year to only 2 vessels in 2000, although the number of purse seiners authorized to operate in the Indian Ocean (excluding the JAMARC research vessel) are 10. In these remained two vessels, one is the research vessel of JAMARC (Japan Marine Fishery Resources Research Center). This retreat of Japanese fleet from the Indian Ocean is related to economic reasons (high operating cost, low price of catch, loss in foreign currency exchange). As the one remained commercial vessel stopped its fishing in the Indian Ocean in 2001, only one research vessel has been operating in 2002.

3-1-2. Fishing Effort

Total fishing effort (operation days + searching days) increased from 349 days in 1989 to 2393 days in 1992, and decreased drastically to 321 days in 2000 and 262 days in 2001 (Table 3). Geographical distribution of Japanese purse seine effort in 2001 was shown in Fig. 6. In the fishing area, nearly 100% of operations were made on the FADs associated school.

3-1-3. Catch

Total catch in weight shows a similar trend as that of effort, that is, increased from about 5,000 MT in 1989 to 45,560 MT in 1992, and decreased steeply to 9,308 MT in 1998 (Table 3). Catch in weight of each species in 2001 (2000) was 1,830MT

(2,332MT), 603MT (953MT) and 592MT (747MT) for skipjack, yellowfin and bigeye, respectively.

3. REFERENCE

MATSUMOTO, T., T. NISHIDA, H. OKAMOTO (2000): Japanese tuna fisheries in the Indian Ocean, up to 1999, IOTC/WPTT/00-07, 11pp.

Table 1. Number of Japanese boats operated in the Indian Ocean. Data of 2000 for longliner and 2001 for longliner and purse seiner are preliminary.

Fleet/Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Longliner	272	235	245	216	184	181	206	206	224	251	243	242	223	191	193
Purse seiner	1	1	3	4	11	12	11	11	8	5	3	4	3	2	2

*Table 2. Fishing effort and catch in weight (MT) by the Japanese longline fishery in the Indian Ocean (IOTC statistical area), 1971-2001. **Data of 2000 and 2001 are preliminary**. Sets and hooks are in thousand. For abbreviation of each species, species codes of FAO except for SPF (shortbill spearfish) were used. SPF and SFA were combined until 1994 when they were separated. "Total" includes skipjack catch.*

Year	Sets	Hooks	Total	SBF	ALB	BET	YFT	SWO	MLS	BLZ	BLM	SPF	SFA
1971	41	96189	58037	25404	3318	11186	13370	1058	1045	952	747	823	
1972	34	80097	48035	26686	1410	8349	7884	939	760	914	341	561	
1973	44	82066	37586	24098	1982	5161	3934	817	540	566	210	251	
1974	41	86575	44796	26439	2793	6886	4949	774	1358	904	414	250	
1975	43	86567	34761	18608	1262	5525	6420	786	908	659	415	155	
1976	35	80218	32338	24682	1172	2108	2778	428	494	304	195	164	
1977	26	61657	27353	20489	405	3138	2100	287	539	252	103	38	
1978	28	65937	33318	13263	419	10904	4621	915	1795	949	360	82	
1979	27	66161	23184	12968	393	4207	3294	554	1110	410	172	74	
1980	36	90615	30977	18556	621	5899	3236	602	1106	643	239	70	
1981	35	88421	31008	14335	1186	7774	4915	753	913	805	275	45	
1982	35	88257	34832	11796	1292	11394	7280	980	618	1098	280	90	
1983	45	116626	50103	18385	1669	18332	7792	1176	621	1617	408	101	
1984	45	118289	44656	16392	1830	14022	7903	1320	990	1478	620	100	
1985	48	128438	49996	15790	2280	17239	9464	2164	966	1487	466	131	
1986	45	123252	44269	11300	2501	15757	10704	1343	977	1237	328	119	
1987	40	109892	40373	10972	2269	15509	8308	1367	673	933	278	61	
1988	34	93254	35614	10039	1311	12254	9255	1452	285	771	197	47	
1989	30	82526	24812	10050	890	7701	4592	954	134	355	109	27	
1990	19	52576	23356	6285	954	8222	6336	1022	112	315	88	22	
1991	22	62390	19214	4720	983	7768	4388	895	159	228	61	11	
1992	21	59284	21118	5660	1778	5628	5740	1728	190	298	80	15	
1993	19	52337	20160	2943	1281	8317	5713	1420	113	297	68	8	
1994	29	81547	36247	3776	1787	17483	9717	2588	199	594	71	22	4
1995	32	92014	33161	3407	2039	17210	8026	1687	216	416	95	35	22
1996	37	107630	39198	4466	2413	16454	12807	2107	270	574	63	24	16
1997	43	126031	46961	4746	3233	18805	15600	2772	350	1169	117	143	24
1998	42	123977	46930	5780	3214	17125	16803	2241	273	1173	170	131	15
1999	37	107521	38968	5032	2283	13997	14662	1538	282	794	187	124	66
2000	34	100219	36816	3783	2478	12956	14563	1519	321	886	135	145	28
2001	37	110344	36657	5201	3009	12823	13594	1237	136	451	70	105	30

Table 3. Catch and effort statistics for the Japanese purse seine fishery in the Indian Ocean. The unit of catch and effort are metric ton and days (search and operation days), respectively. ***Data of 2001 is preliminary****.*

Year	Days F.	Total	SKJ	YFT	BET
1985	45	558	315	75	168
1986	84	864	562	160	142
1987	170	1319	937	260	122
1988	175	2917	2250	389	277
1989	349	4913	3449	883	581
1990	813	15754	11187	3222	1225
1991	1343	22242	15877	5061	1269
1992	2393	45560	31573	11882	1757
1993	2161	44277	31309	10946	1959
1994	1607	29610	20090	5338	4177
1995	1661	24434	16077	4751	3599
1996	780	12281	7024	3917	1330
1997	623	10576	6713	2612	1251
1998	701	8612	5748	1949	915
1999	483	6988	4588	1501	899
2000	321	4042	2332	953	747
2001	262	3027	1830	603	592

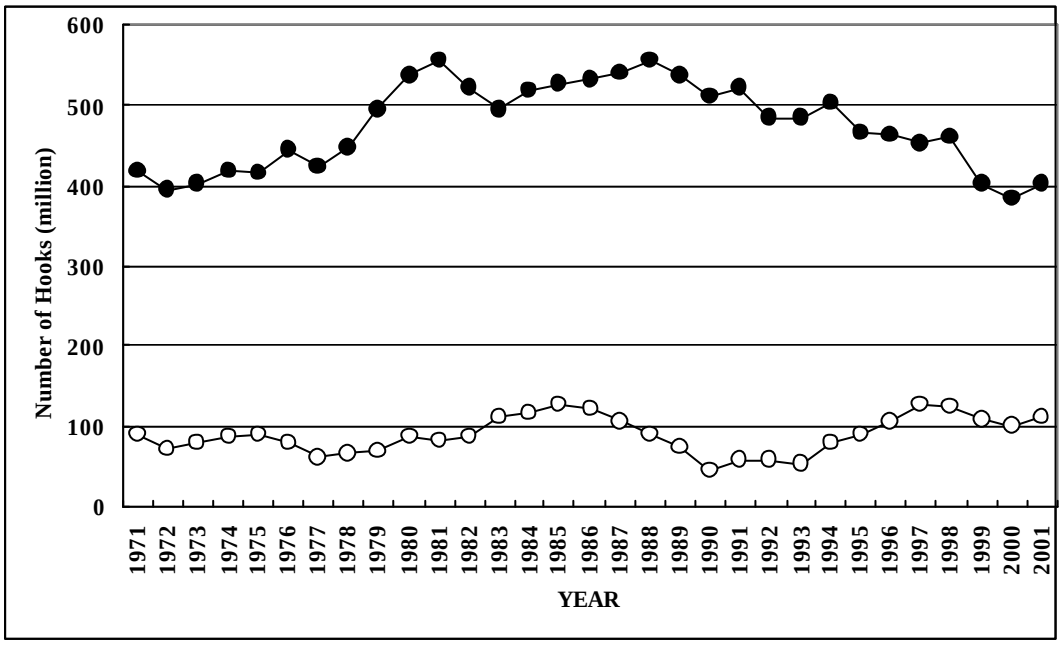


Fig. 1. Historical change in total Japanese longline effort in the all Oceans (solid circle) and the Indian Ocean (open circle)

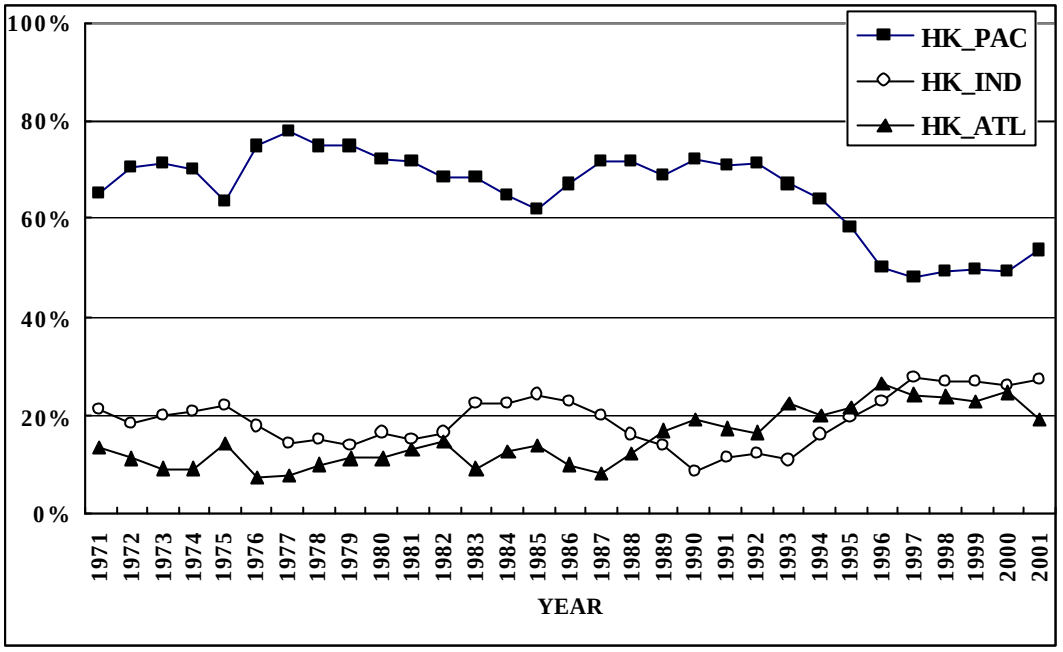


Fig.2. Historical change in the percentage of effort exerted into each Ocean basin.

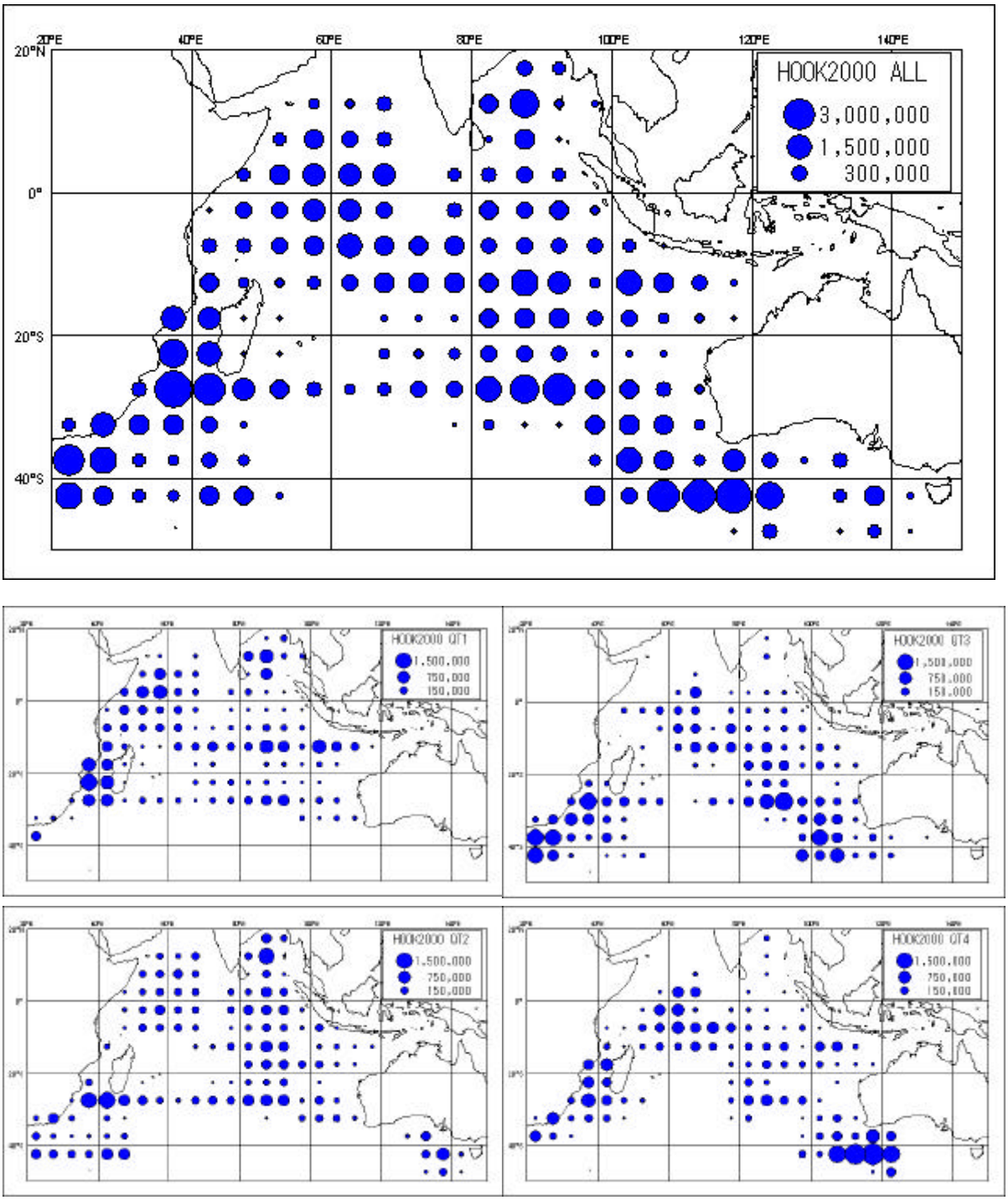


Fig. 3. Yearly and quarterly Longline effort distribution in the Indian Ocean in 2000.

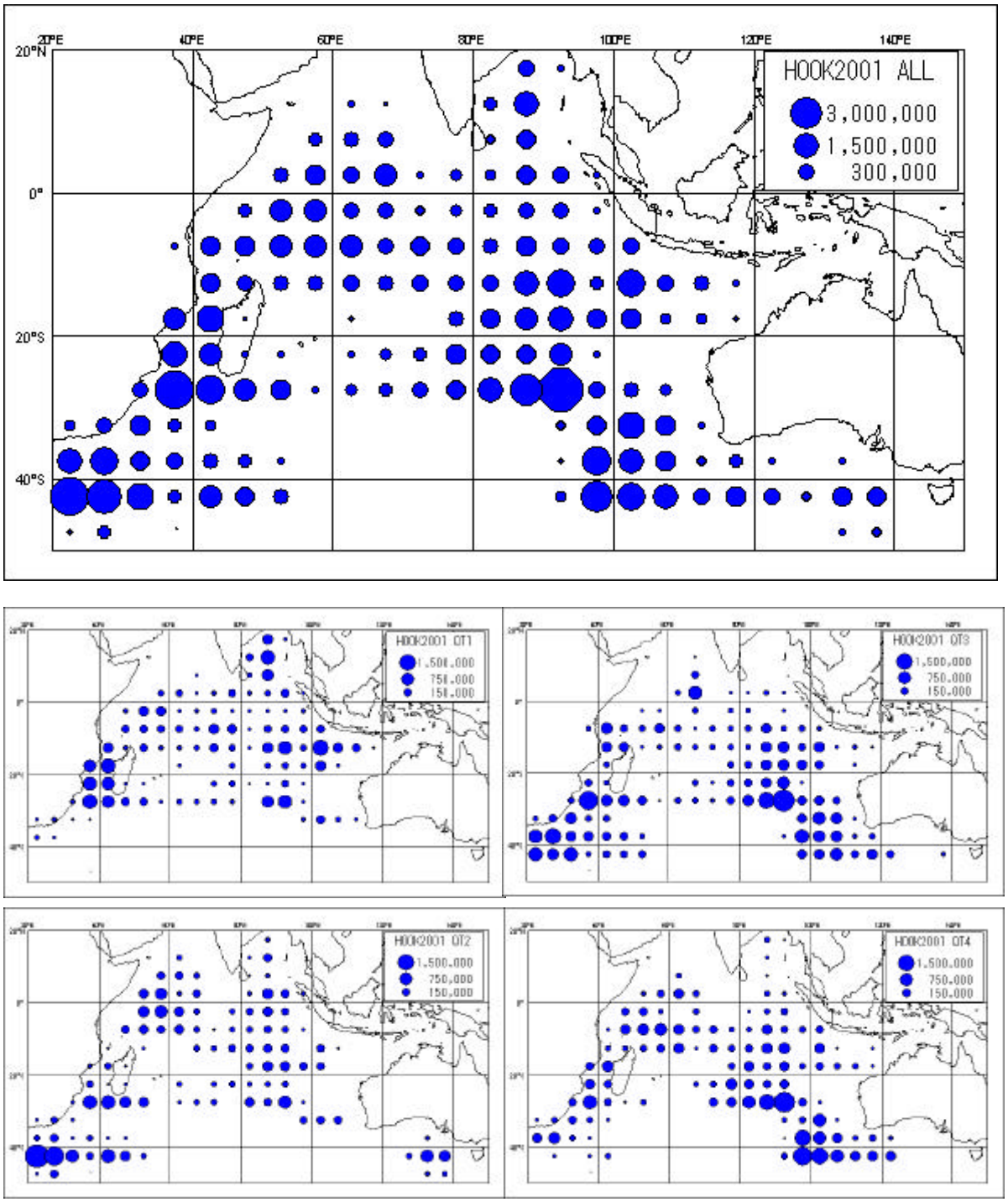
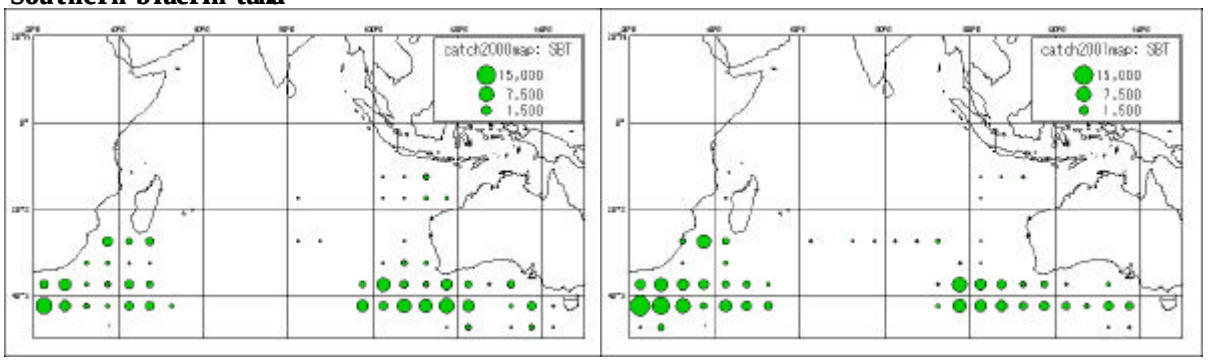
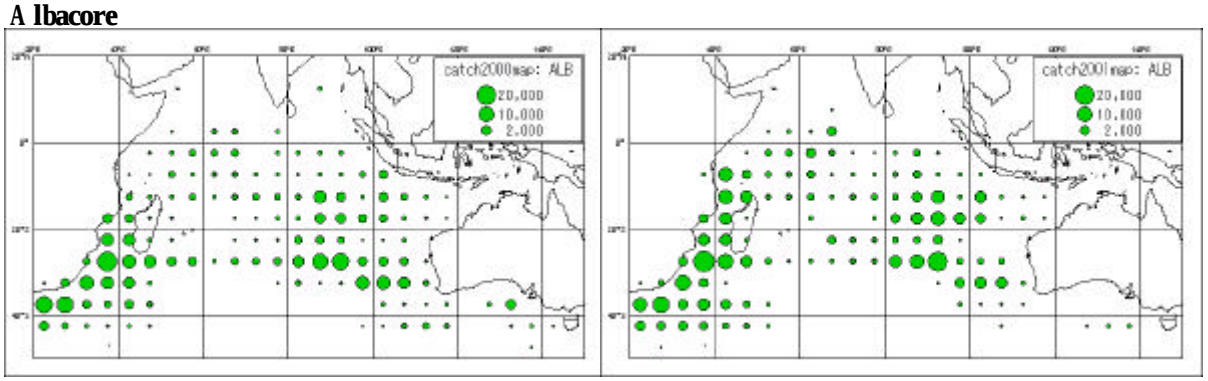


Fig. 4. Yearly and quarterly Longline effort distribution in the Indian Ocean in 2001.

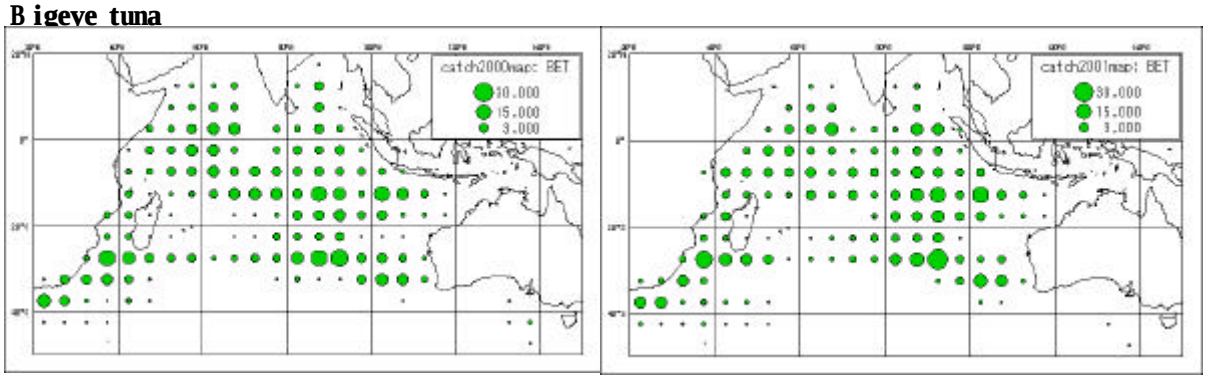
Southern bluefin tuna



Albacore



Bigeye tuna



Yellowfin tuna

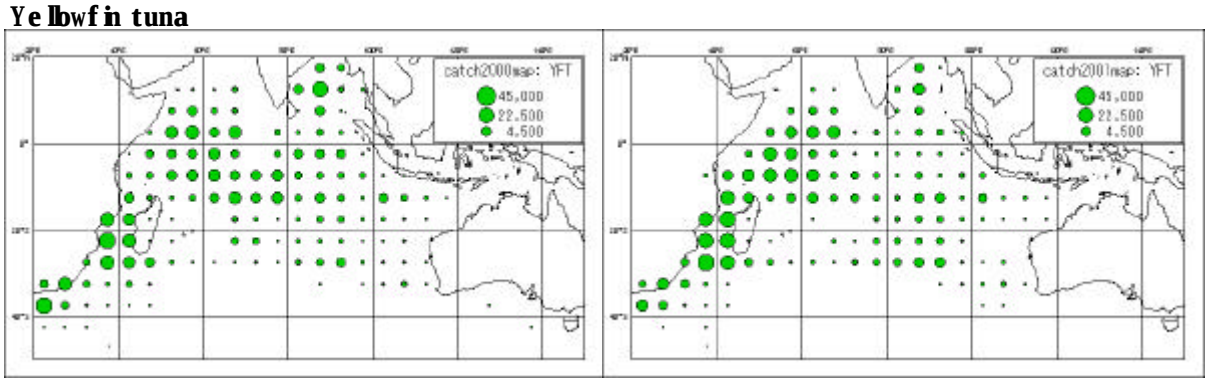
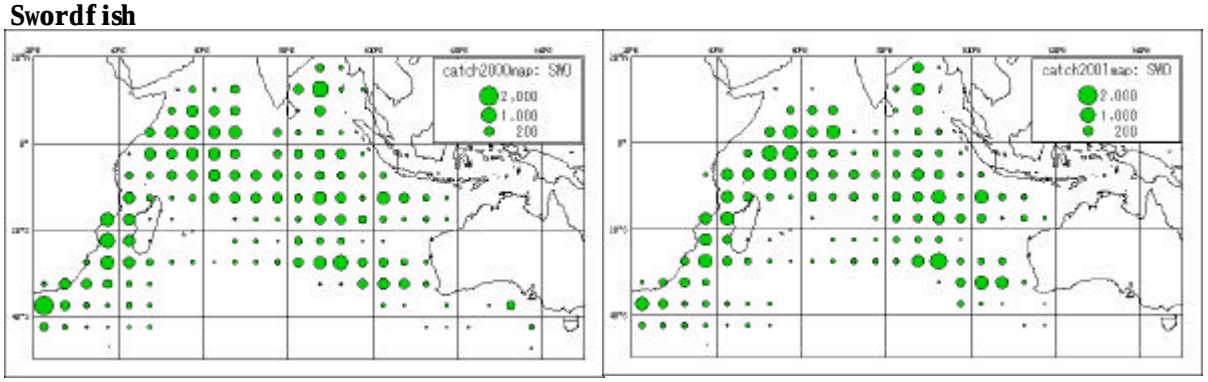
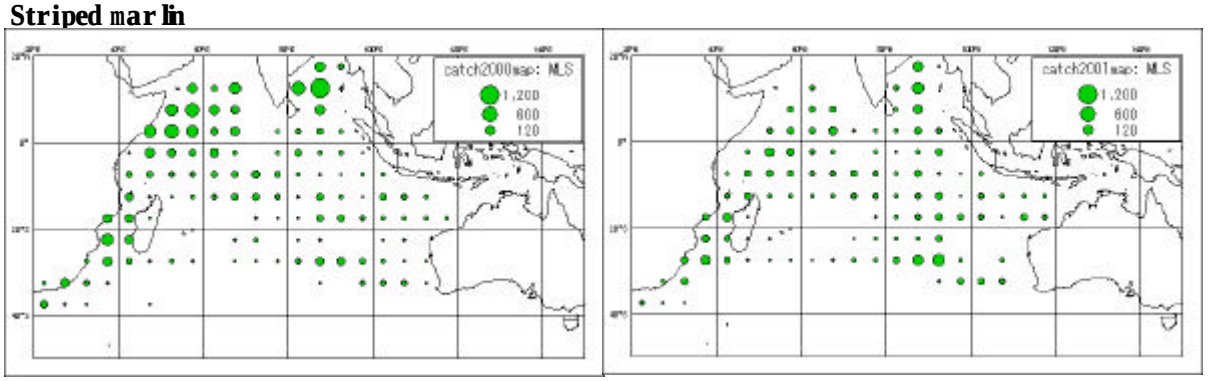


Fig. 5. Geographical distributions of catch in number of major species caught by longline fishery in 2000 (left) and 2001 (right).

Swordfish



Striped marlin



Blue marlin

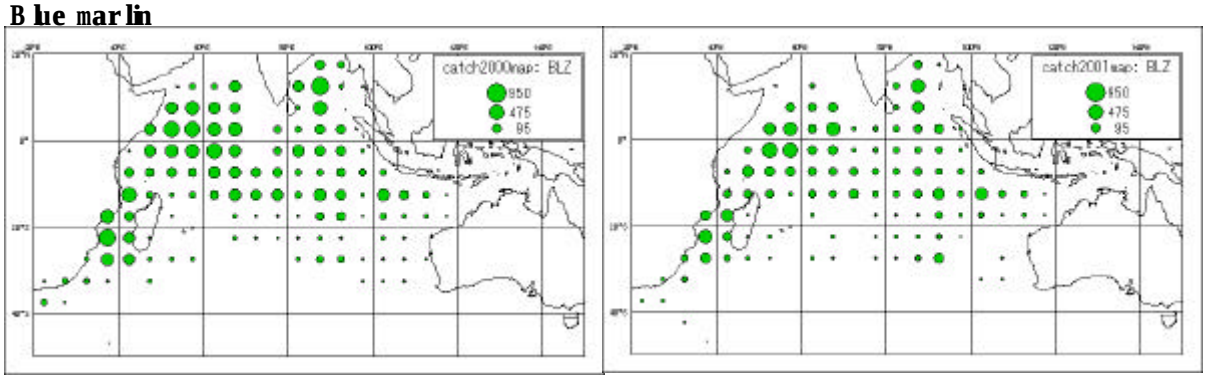


Fig. 5. continued.

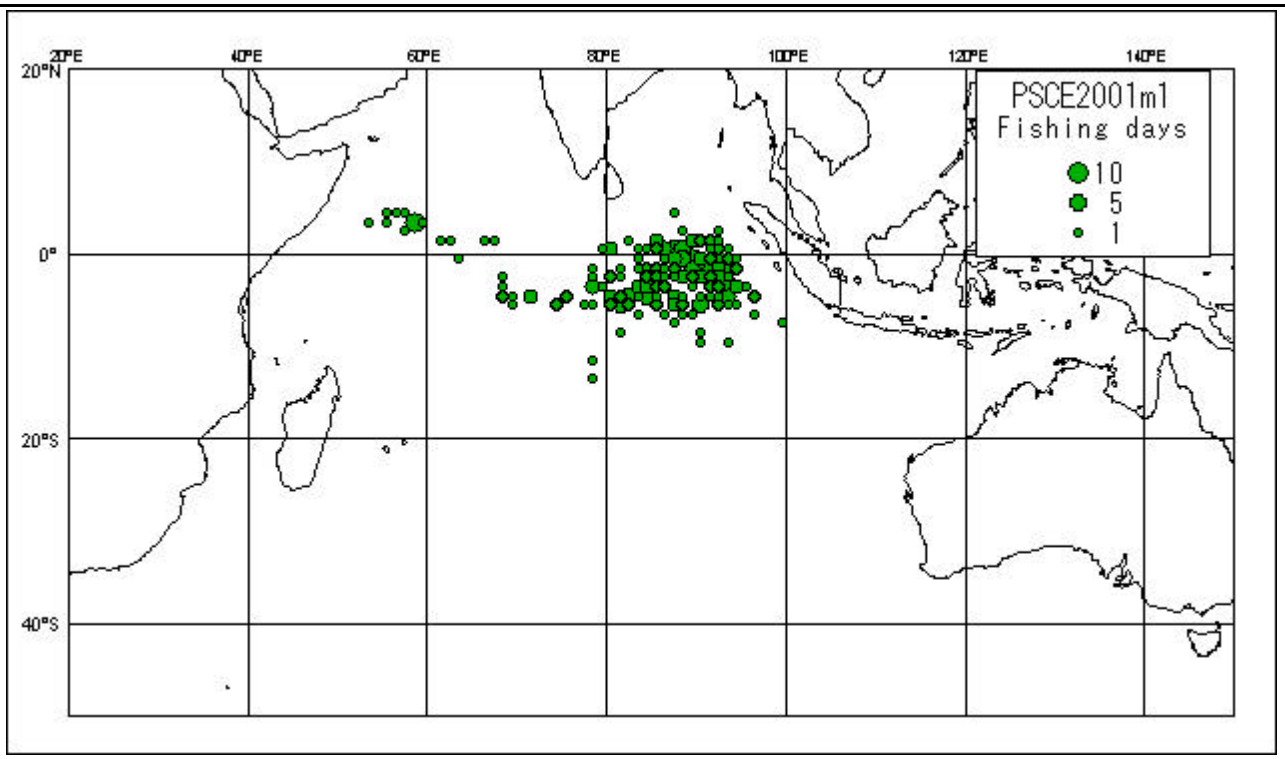


Fig. 6. Distribution of Japanese purse seine effort (days) in the Indian Ocean in 2001.