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General description of Japanese longline fishery in the Mediterranean and some information on the size of bluefin imported into Japan from the Mediterranean countries.

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1. GENERAL DESCRIPTION OF LONGLINE FISHERY.

1.1 History of its fishery

There has been only one Japanese fishery operating in the Mediterranean Sea, that is longlining. In 1956, the Japanese longline fishery initiated its operations in the Atlantic (Hayasi et al. 1970). Fishing was located in the equatorial waters off Brazil and targeted mainly on yellowfin. Since then, the fishery has widened its fishing area eastward and toward temperate waters in both hemispheres year after year. Target species have also changed from yellowfin and albacore to bigeye, southern bluefin and northern bluefin, in the course of development of the fishery.

The Japanese longliners first entered into the Mediterranean in 1972. There the catch was predominantly composed of bluefin tuna accompanied by a very minor amount of swordfish and albacore.

1.2 Catch trend

Figure 1 shows the annual Japanese catch in the eastern Atlantic and Mediterranean. During the early 1960s the catch was made in equatorial to subtropical waters in the eastern Atlantic, but it was not until 1974 that the catch became significant. It reached the highest level in 1974 in the Mediterranean (2,300 tons) and in 1975 in the eastern Atlantic (3,000 tons). Catches in both areas showed similar trends; i.e., high during 1974-77 and 1982-84, low during 1978-81. It differed, however, in recent years; i. e., the catch in the eastern Atlantic continued to increase, whereas it has been declining in the Mediterranean.

1.3 Description of the fishery

The longline operation is made in one set per day. The line setting starts in the early morning (approximately 4:00 am) and takes about 4-5 hours. The hauling starts at around noon and lasts more than 10 hours. Usually about 2500 hooks are used a day. The standard gear has the following characteristics: the number of branch lines between floats, 5-7; length of main line between neighbouring branch lines, 50 m; float line length, 25-30 m; branch line length, 20-30 m. As a bait, squid is most preferable for bluefin, though other fish such as mackerel, horse mackerel and saury are used as well.

The fishing season for bluefin in the eastern Atlantic starts in March in the waters (25°N-40°N, 5°W-20°W) off Morocco and mainland Portugal (Figures 2 and 3). It is thought that these longliners are aimed at bluefin entering the Mediterranean for spawning. The fleets move east through the strait of Gibraltar, and reach waters off Sicily and Tunisia in mid-May apparently following the migrating schools (Figure 3). During June and July, although sporadic catches were observed in the Mediterranean, the fishing season is nearing its end (as later mentioned, fishing is prohibited from May 21 to June 30). Fishermen avoid catching the post-spawners because of their low commercial value.

The size of fish caught by this fishery is shown in Figure 5. The Japanese longline fishery caught adult bluefin mostly over 150 cm in the eastern Atlantic and over 180 cm in the Mediterranean.

The longline boats now operating in the Mediterranean have 300-400 tons of carrying capacity and crews of about 20. Among the 400 or so boats of this size which are registered, 50 operate in the north-eastern Atlantic and in the Mediterranean as a rule. Pursuant to Japanese domestic regulations on fishing for the Mediterranean bluefin tuna, fishing in the Mediterranean between May 21 and June 30 has been prohibited since-1975; also, the number of boats licensed to operate in the Mediterranean has been limited to 35 since 1985, for the protection of the spawning adult in the same area.

2. SOME INFORMATION ON THE SIZE OF BLUEFIN IMPORTED INTO JAPAN FROM MEDITERRANEAN COUNTRIES.

Japan has been the largest bluefin-importing country in recent years. Bluefin tuna are flown and shipped to Japan from almost all the countries that catch this species.

The amount of bluefin imported from Mediterranean countries has increased markedly during the last 5 years, as shown in Table 1 (Anon.) and Figure 6. Imports of bluefin other than those from Mediterranean countries, and southern bluefin tuna, are also shown in Figure 6 to show the relative importance of imports from the Mediterranean countries. For 1989 and 1990, imports are shown on a monthly basis (Table 2). The main exporters are Spain, which has the largest share, Turkey, Greece, Morocco and Tunisia. It should be noted that the last two countries are new exporters of tuna, and so far the amount being flown from Tunisia to Japan this year is quite large.

Size data with some brief information on the fisheries were collected through the courtesy of Japanese traders. Dressed weights (i.e., headed, gilled, gutted and tailed) in kilograms were provided by traders at the domestic markets in Japan. Data are available by country and gear, although countries and gears are mixed in some cases.

These data may give us useful information on each fishery, in particular when we consider substitution between available data to construct the length or age composition of the catch. In some cases, it may be possible to utilize these data as an observed length-frequency sample. It should be kept in mind, however, that those fishes sent to Japan were selected for size and quality so that these length frequencies might not match the original ones. It appears that 50 % of the fish caught are exported to Japan, but this percentage may have declined in the current year.

Figure 6 shows dressed weight frequencies by month, gear and country. Spain and Morocco, and Turkey and Greece, respectively, were often combined together. Information on fisheries and size of fish are summarized as below.

Spain and Morocco : Fishing gears are trap, purse seine and hand line. Fish are exported throughout the year. From April to June fish are directly sent to Japan. On the other hand, those caught in July are cultivated in net pens for 3-6 months to improve meat quality which is supposed to be lost in the spawning; then they are sent to Japan. The size of fish caught by trap ranges widely from 25 kg to more than 300 kg. In the hand-line fishery, fish are smaller (30-150 kg) with modes less than 100 kg.

Turkey and Greece : Purse seining and possibly hand-lining are bused to catch bluefin. The fishing area is located in the Sea of Marmara (Kizil Adalar Islands, about 20 miles southeast of Istanbul) and around Thasos Island in the Aegean Sea. Fish are exported to Japan almost all year round in recent years. The size of fish was between 100 and 400 kg in January 1987. Since then, it has become smaller, in the range 20-200 kg, with 2 modes, one at 25 kg and the other at 100 kg.

Tunisia : Purse seines and traps are used; purse seine account for most of the catch. Fish is exported during the first half of the year. The size is small to medium for the fish caught by purse seine; the weights range 20 to 125 kg, but the majority are in the 25-75 kg range. It is observed from the dressed weight frequency distribution that the fish become larger as the season progresses. It is inferred that fishing takes place while fishes are migrating from north to southeast along the Tunisian coast.

France : Not many data are available. The gear is exclusively purse seine. Fish are small with a mode at around 25 kg.

References

Anonymous. Imports of Marine Products by Country. Japan Marine Products Importers Association.

Hayasi, S., T. Koto, C. Shingu, S. Kume and Y. Morita. 1970. Status of the tuna fisheries resources in the Atlantic Ocean, 1956-1967. In Resources and fisheries of tunas and related fishes in the Atlantic Ocean. Far Seas Fisheries Research Laboratory, S series 3, 1-72pp.

Table 1. Annual imports of bluefin tuna from Mediterranean countries for 1982-1989.

(unit:MT)

Year	FRANCE		SPAIN		GREECE		TURKEY		MOROCCO		TUNISIA	PORTUGAL	ITALY		Total
	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen	Fresh	Fresh	Fresh	Frozen	Medit
1982	-	-	6.2	36.9	-	-	-	-	-	-	-	-	1.5	40.6	85.2
1983	3.3	-	-	228.7	-	-	-	142.2	-	-	-	-	-	252.7	626.9
1984	-	16.7	53.8	97.2	-	-	0.7	126.4	-	-	-	-	-	0.9	295.7
1985	-	167.3	145.1	53.9	5.8	-	98.7	-	-	-	-	-	-	25.6	496.4
1986	0.8	-	104.2	49.8	70.9	0.9	668.9	-	-	-	-	0.3	-	24.6	920.4
1987	6.2	-	171.4	95.3	54.2	-	243.4	6.4	21.3	6.3	-	0.3	-	13.5	618.3
1988	0.1	-	388.5	773.3	55.9	-	103.8	-	59.1	6.1	95.2	0.1	14.1	5.6	1501.8
1989	4.3	-	249.6	378.5	71.9	-	157.1	116.4	170.4	0.6	224.1	4.4	8.1	1.0	1386.4

Table 2. Monthly imports of bluefin tuna from Mediterranean countries in 1989 and 1990.

(unit:MT)

Year/Country	FRANCE		SPAIN		GREECE		TURKEY		MOROCCO		TUNISIA	PORTUGAL	ITALY		Total
Month	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen	Fresh	Fresh	Fresh	Frozen	Medit
1989 Jan	-	-	10.1	-	10.8	-	35.7	-	-	-	-	-	-	-	
Feb	-	-	---	-	1.5	-	28.7	-	-	-	16.5	-	-	-	
Mar	0.1	-	1.0	-	8.4	-	17.9	1.9	-	-	38.7	-	-	-	
Apr	-	-	8.2	-	6.3	-	24.8	-	-	-	42.4	0.2	-	-	
May	3.2	-	65.2	-	0.7	-	0.4	-	47.9	-	88.1	0.2	2.5	-	
Jun	0.7	-	33.0	-	0.4	-	-	-	8.6	-	37.0	-	4.2	-	
Jul	-	-	0.4	-	-	-	-	-	-	-	-	0.2	0.3	-	
Aug	0.04	-	-	134.7	-	-	4.6	-	-	0.6	-	-	1.1	1.0	
Sept	-	-	-	173.9	2.1	-	5.1	114.1	-	-	-	3.8	-	-	
Oct	0.3	-	24.5	22.6	9.9	-	19.3	0.4	24.9	-	0.5	-	-	-	
Nov	-	-	31.1	47.3	16.5	-	6.2	-	40.0	-	0.3	-	-	-	
Dec	-	-	54.1	-	15.3	-	14.4	-	49.0	-	0.6	-	-	-	
Total	4.3	-	249.6	378.5	71.9	-	157.1	116.4	170.4	0.6	224.1	4.4	8.1	1.0	1386.4
1990 Jan	-	-	43.3	-	3.4	-	33.3	-	29.5	-	16.8	-	-	-	
Feb	-	-	33.0	-	2.7	-	10.2	-	-	-	64.2	-	-	-	
Mar	5.6	-	2.4	-	17.1	-	8.5	-	-	-	90.9	-	-	-	
Apr	14.5	-	34.9	-	1.2	-	43.0	-	-	-	28.4	-	-	-	
Total	20.1	-	113.6	-	26.4	-	95.0	-	29.5	-	200.3	-	-	-	484.9

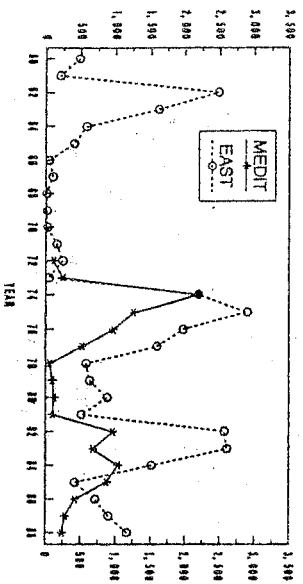

Fig. 1. Japanese annual catch of bluefin tuna in the eastern Atlantic and Mediterranean.

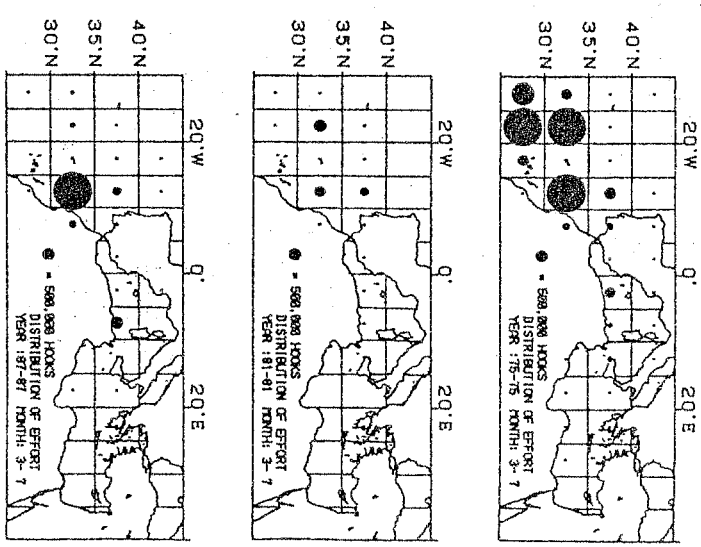

Fig. 2. Distribution of fishing effort (in number of hook) for the Japanese longline fishery by 5-degree square during bluefin fishing season (March - July).

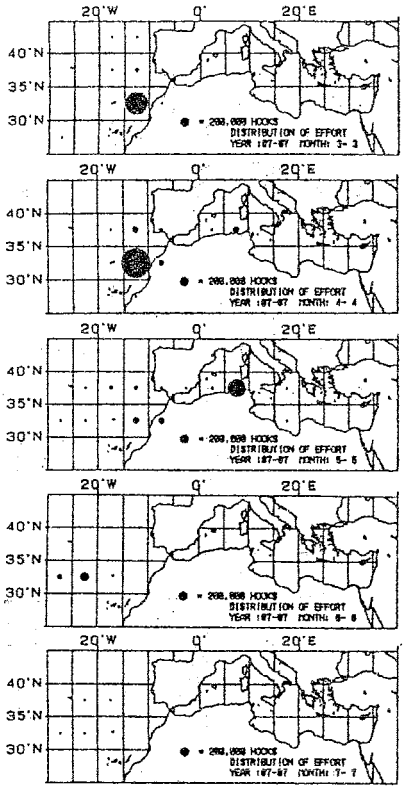

Fig. 3. Distribution of fishing effort (in number of hook) for the Japanese longline fishery by 5-degree square and month in 1987.

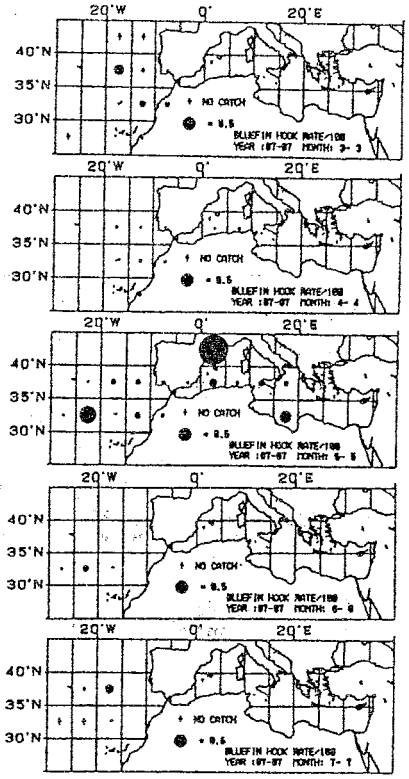

Fig. 4. Distribution of bluefin CPUE (catch in number per 100 hooks) for the Japanese longline fishery by 5-degree square and month in 1987.

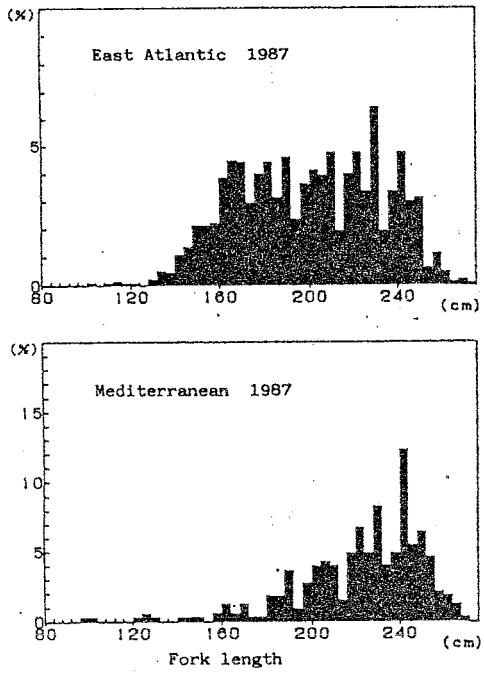

Fig. 5. Length frequency of bluefin tuna caught by the Japanese longline fishery.

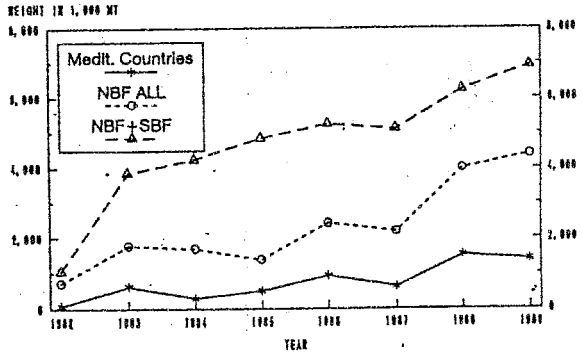

Fig. 6. Imports of bluefin tuna to Japan.

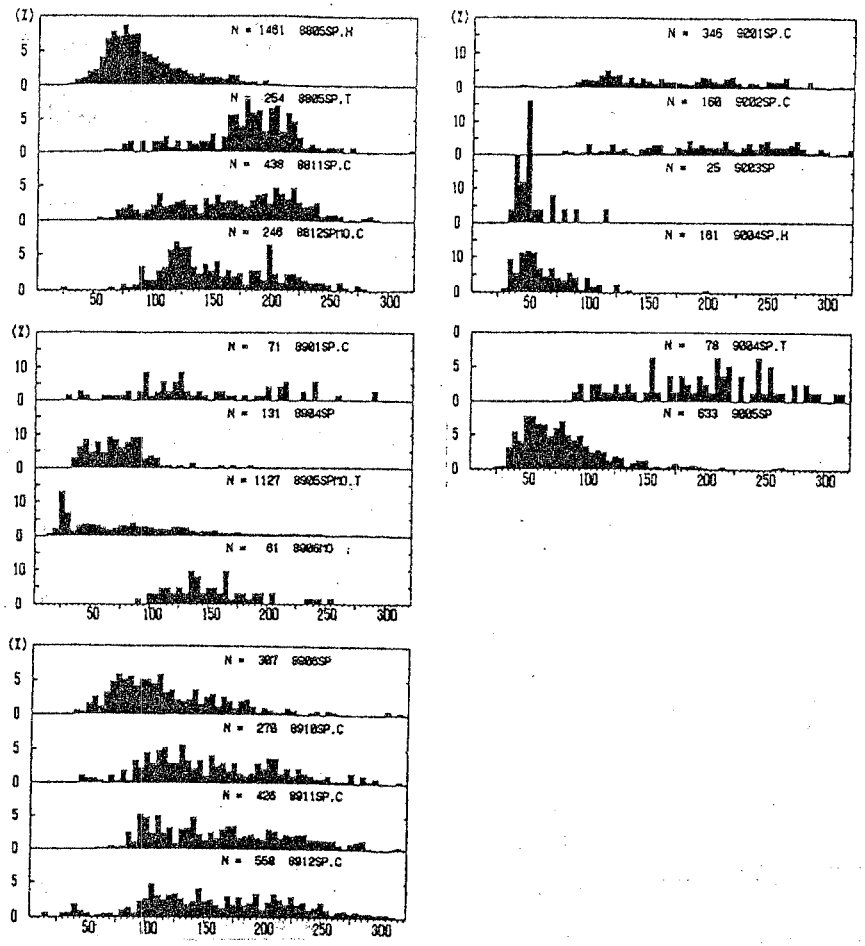

Fig. 7-1. Dressed-weight (kg) frequency of bluefin tuna imported into Japan from Spain and Morocco. "N" means the number of samples and right-hand-side letters show year (first 2 digits), month (second 2 digits), country (3rd and 4th letters before ".") and gear(1 letter after "."). Abbreviations for country and gear are as follow: SP=Spain, MO=Morocco, TR=Turkey, GR=Greece, TN=Tunisia, FR=France; P=purse seine, T=trap, C=cultivated, H=hand line.

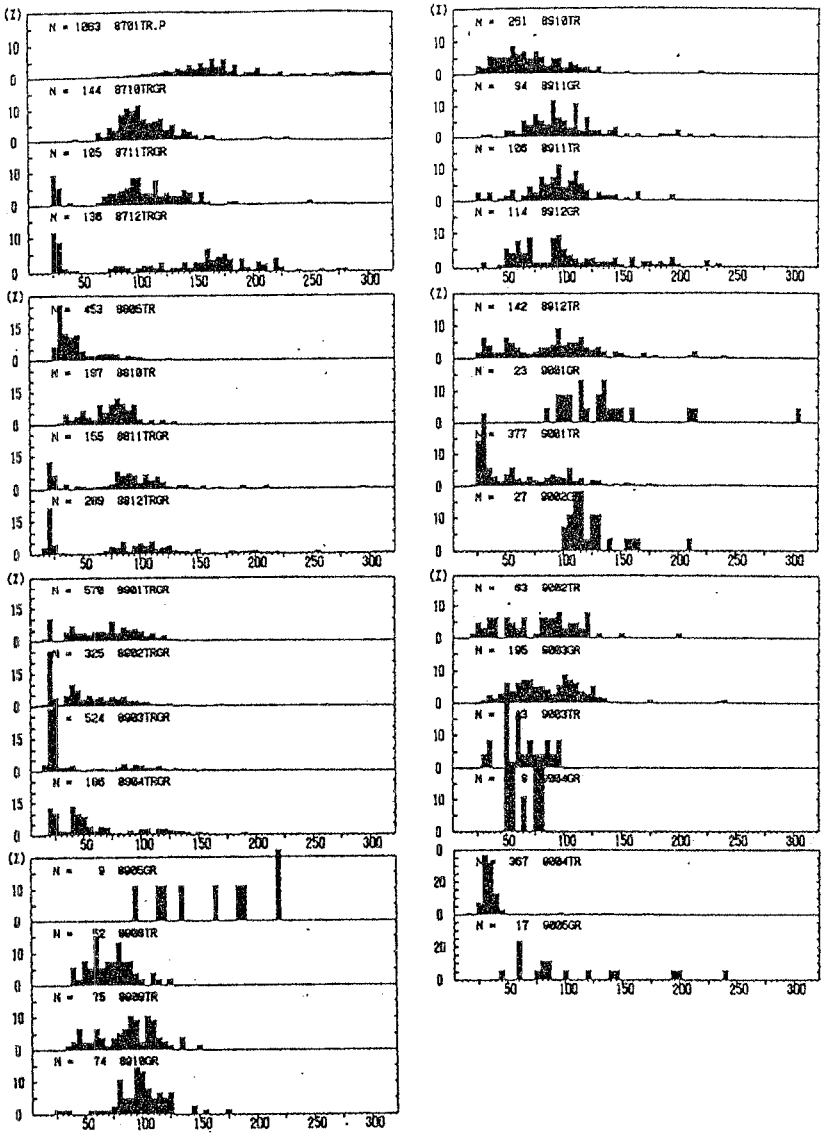

Fig. 7-2. Dressed-weight (kg) frequency of bluefin tuna imported into Japan from Turkey and Greece.

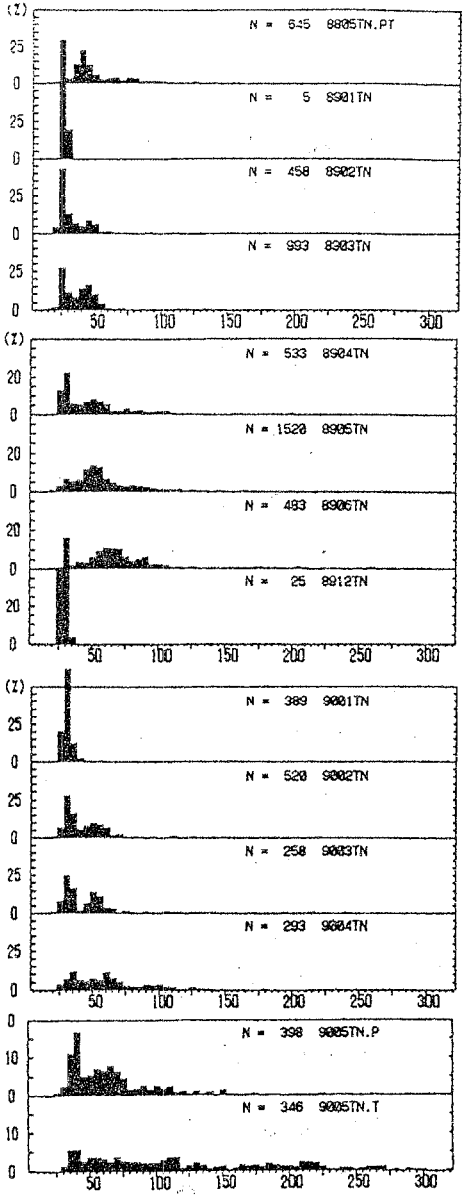

Fig. 7-3. Dressed-weight (kg) frequency of bluefin tuna imported into Japan from Tunisia.

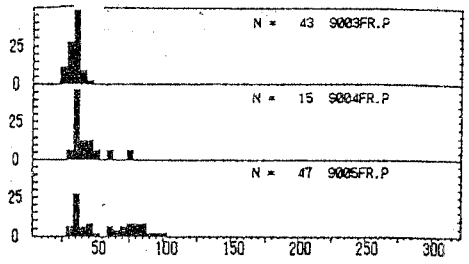

Fig. 7-4. Dressed-weight (kg) frequency of bluefin tuna imported into Japan from France.