A REVIEW OF AVAILABLE BLUEFIN TUNA INFORMATION FOR CHINA: 1994-2001

DAI Xiaojie[1], ZHAO Liling[2], XU Liuxiong[1]

SUMMARY

Information is presented on the bluefin longline fishery for the period of 1994-2001 in the northern Atlantic Ocean (50º00'N~60º00'N, 15º00'W~30º00'W). In addition, some biological information from the observer program is provided for the Mediterranean Sea for the 1995-1996 fishing seasons. Since 1998, the Chinese tuna fleet has withdrawn from the Mediterranean Sea and shifted to the northern Atlantic Ocean. The highest nominal catch record was 137 t in 1995 in the Mediterranean Sea with the fishing effort 413 thousand hooks. There were 68.2 t of nominal catch in 2001 in the northern Atlantic Ocean, with a fishing effort of 633 thousand hooks. Nominal CPUE for 1995 and 1996 fishing seasons are 2.342 (number) and 1.3109 (number) per thousand hooks respectively. Size data show that average fork length in the catch in 1995 and 1996 fishing seasons (May and June) exceeded 200 cm.

RÉSUMÉ

Des informations sont présentées sur la pêcherie palangrière de thon rouge pour la période 1994-2001 dans l'Atlantique nord (50º00'N~60º00'N, 15º00'W~30º00'W). En outre, certaines informations biologiques du programme d'observateurs sont fournies pour la mer Méditerranée au titre des saisons de pêche 1995-1996. Depuis 1998, la flottille thonière chinoise n'opère plus en Méditerranée, s'étant déplacée vers l'Atlantique nord. En 1995, les captures nominales ont atteint le chiffre record de 137 t, avec un effort de pêche de 413 mille hameçons. En 2001, les captures nominales se sont élevées à 68,2t dans l'Atlantique nord, avec un effort de pêche de 633 mille hameçons. Les CPUE nominales pour les saisons de pêche de 1995 et 1996 se situaient à 2,342 poissons et 1,3109 poisson pour mille hameçons respectivement. Les données de taille indiquent que la longueur à la fourche moyenne des captures réalisées au cours des saisons de pêche de 1995 et 1996 (mai et juin) a dépassé 200 cm.

RESUMEN

Se presenta información sobre la pesquería de palangre de atún rojo para el período 1994-2001, en el océano Atlántico septentrional (50º00'N-60º00'N; 15º00'W-30º00'W). Además, se proporciona cierta información biológica del programa de observadores desarrollado en el mar Mediterráneo para las temporadas de pesca de 1995-1996. Desde 1998, la flota atunera china se ha retirado del Mediterráneo y se ha dirigido al Atlántico norte. El registro más alto de captura nominal ascendió a 137 t en 1995 en el mar Mediterráneo, con un esfuerzo de pesca de 413 anzuelos. En 2001 se registró una captura nominal de 68,2 t en el océano Atlántico septentrional, con un esfuerzo de pesca de 633 anzuelos. La CPUE nominal para las temporadas de pesca de 1995 y 1996 fue de 2.342 (número) y 1,3109 (número) por mil anzuelos, respectivamente. Los datos de talla muestran que la longitud media a horquilla de la captura de las temporadas de pesca (mayo y junio) de 1995 y 1996 superaba los 200 cm.

[1] College of Oceanography, Shanghai Fisheries University, 334 Jungong Road, Shanghai, China(P. R.). xjdai@shfu.edu.cn
2 Division of Distant Water Fisheries, bureau of Fisheries, Ministry of Agriculture, No. 11 Nongzhanaguan nanli, Beijing 100032, China(P. R.)

KEY WORDS

Chinese bluefin tuna fishery, catch statistics, fishing effort, size composition, Atlantic Ocean, Mediterranean Sea

1. INTRODUCTION

Since 1993, the Chinese longline fleet began to operate in the high seas of tropical Atlantic ocean targeting bigeye tuna. After 1993, there are two or three longliners shifting to Mediterranean Sea targeting bluefin tuna. After 1997, Chinese longliners had withdrawn from the fishing grounds of Mediterranean Sea and shifted to the North Atlantic Ocean.

The main spawning grounds of the species in the Mediterranean are located off the Balearic Islands and off the Tyrrhenian coasts (Garcia, *et al.* 2001). Because the Chinese tuna fleet had operated in these spawning grounds, the report of the Chinese bluefin tuna fishery in these areas is essential for eastern bluefin tuna stock assessment.

The document presents information on the Chinese bluefin tuna fishery for the period 1994-2001 and also some biological data by the observer program conducted in 1995-1996 in the Mediterranean Sea.

2. MATERIALS AND METHODS

The Chinese longline catch and effort data for bluefin tuna were used in this study. JIN FENG No. 1 was monitored by observer in the 1995 and 1996 fishing seasons. Catch and fishing effort are recorded in the logbook. There are four branch lines per baskets. Squid is used as the main bait in the longline operation, but occasionally common mackerel. Hooks per set are around 2000~2200.

All the species caught by longline fishing were recorded. Length was measured as fork length(FL) for bluefin tuna, to the lower 1 cm.

3. RESULTS AND DISCUSSION

3.1 Fishing grounds and fishing seasons

From 1994 to 1997, fishing grounds of Chinese bluefin tuna are located at the western Mediterranean Sea, waters of 37°50'N~39° 00'N, 00°00'E~10°00'E **(Figure 1)**. The fishing seasons ranged from April to early July.

Since 1998, fishing grounds for bluefin tuna shifted to northern Atlantic Ocean, waters of 50°00'N~60° 00'N, 15°00'W~30°00'W. **Table 3** shows monthly fishing grounds in 2000 and 2001. Fishing season generally ranged from September to February.

3.2 Catch and fishing effort

Table 2 shows the nominal catch and fishing effort by Chinese longline fishery targeting bluefin tuna during 1994 and 2001. The highest record was 137 t (in round weight) in 1995 in the Mediterranean Sea. During recent two years, the total catch by Chinese l;ongliners maintained around 70-80 t because China fishing company strictly comply with the quota set by ICCAT. Fishing effort stabilized around 630 thousand hooks in 2000 and 2001.

3.3 Nominal CPUE by observer program

The total number of fish caught in the 1995 fishing season (May and June) is 183, and 156 in the 1996 fishing season. Nominal CPUE for 1995 and 1996 fishing seasons are 2.342(number) per thousand hooks and 1.3109 (number) per thousand hooks respectively.

3.4 Dressed weight and size composition by observer sampling

The average dressed weight of individual in 1995 and 1996 fishing seasons were listed in **Table 1**. Average dressed weight of individual in May was heavier than that in June. Actually, these fish belonged to spawning population and a large number of individual are conducting spawning in May in the western Mediterranean Sea according to sampling observation. Obviously, some fish had almost completed spawning process in the late June and early July.

Figures 2-5 shows monthly dressed weight composition during 1995 and 1996 fishing seasons. Dominant groups of dressed weight in May 1995 were 140kg-160kg and 160kg-180kg, accounting for 20% and 23% of sampled catch, respectively. And in June, 1995, there are four dominant groups, 100kg-120kg, 120kg-140kg, 140kg-160kg and 160kg-180kg, accounting for 26%, 10%, 15% and 15% of sampled catch, respectively. The dressed weight composition for 1996 fishing season showed similar trend. Dominant groups are 120kg-140kg, 140kg-160kg and 160kg-180kg.

Figures 6-9 shows monthly size composition during 1995 and 1996 fishing seasons. The average fork lengths in May and June 1995 were 219.3 cm and 203.7 cm, respectively. The dominant size groups in May, 1995 were 210-220 cm(17.9%), 220-230 cm(19.6%), 230-240 cm(16.1%). The dominant size groups in June, 1995 were 190-200 cm(16.0%), 200-210 cm(15.3%), 210-220 cm(20.6%), 220-230 cm(10.0%).

The average fork lengths in May and June 1996, were 214.1 cm and 215.4 cm, respectively. The dominant size groups in May, 1996 were 200-210 cm(15.5%), 210-220 cm(25.9%), 220-230 cm(12.1%). The dominant size groups in June, 1996 were 200-210 cm(14.3%), 210-220 cm(15.4%), 220-230 cm(18.7%), 230-240 cm(17.6%).

Some research indicates that the longline fishery for eastern bluefin tuna stock targeted adult fish mostly over 160 cm in fork length (FL) and age 8 can reach 180 cm in FL (Miyabe, N. 1993). Our observation shows that the average FL exceed the 160 cm and considerable percentage of age composition in catch reached or exceeded age 8. Unfortunately, no size frequency information was obtained with regard to Chinese bluefin tuna fishery in the northern Atlantic Ocean during recent years.

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Table 1 Information from observer sampling in boat (JIN FENG No. 1) targeting bluefin tuna in the Meditteranean Sea in 1995 and 1996 fishing seasons

	1995		1996	
	May	June	May	June
Number of set	11	27	27	26
Hooks	22100	56030	62000	57000
Number of fish	56	127	58	98
Total dressed weight	9380	17725	9100	14013
Average dressed weight of individual(kg)	167.5 (61.99)*	139.57 (54.51)	156.90 (74.60)	142.99 (68.53)
Sex ratio(F: M)	27:16	50:28	26:27	49:34

* The number in bracket is Standard Error(SD)

Table 2 Nominal catch and fishing effort deployed by Chinese longline boats targeting bluefin tuna from 1994 to 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
Nominal catch (MT)	97	137	93	49	85	103	79.6	68.2
Fishing effort ×1000 hooks	**110**	**160**	**180**	**100**	**300**	413	629	633
Number of fishing boats	2	2	2	2	2	2	2	2
Fishing areas	Med.	Med.	Med.	Med.	N. Alt.	N. Alt.	N. Alt.	N. Alt.
	-	Obs.	Obs.	-	-	-	-	-

Note:
1. Med. stands for Mediterranean Sea; N. Alt. stands for northern Atlantic Ocean
2. Obs. stands for observer program

Table 3. Monthly nominal catch and fishing effort by Chinese bluefin tuna fishery in northern Atlantic Ocean in 2000 and 2001 fishing seasons

Fishing season		Jan.	Feb.	Sept.	Oct.	Nov.r	Dec.	Total
2000	Catch (MT)	0	0	17.6	22.6	21.7	17.7	79.6
	Fishing effort (1000 hooks)	0	0	156	156	156	161	629
	Fishing grounds	/	/	A	A	A	A	A
2001	Catch (MT)	31.3	5.3	4.4	14.6	6.5	6.1	68.2
	Fishing effort (1000 hooks)	92	101	108	112	108	112	633
	Fishing grounds	B	B	C	C	D	B	

A stands for the fishing grounds of 55° ~60° N, 25° ~30° W;
B stands for the fishing grounds of 50° ~55° N, 25° ~30° W;
C stands for the fishing grounds of 55° ~60° N, 15° ~20° W;
D stands for the fishing grounds of 50° ~55° N, 20° ~25° W;

Figure 1. Fishing grounds of Chinese longline fishing in the Mediterranean Sea in 1995 and 1996 fishing season.

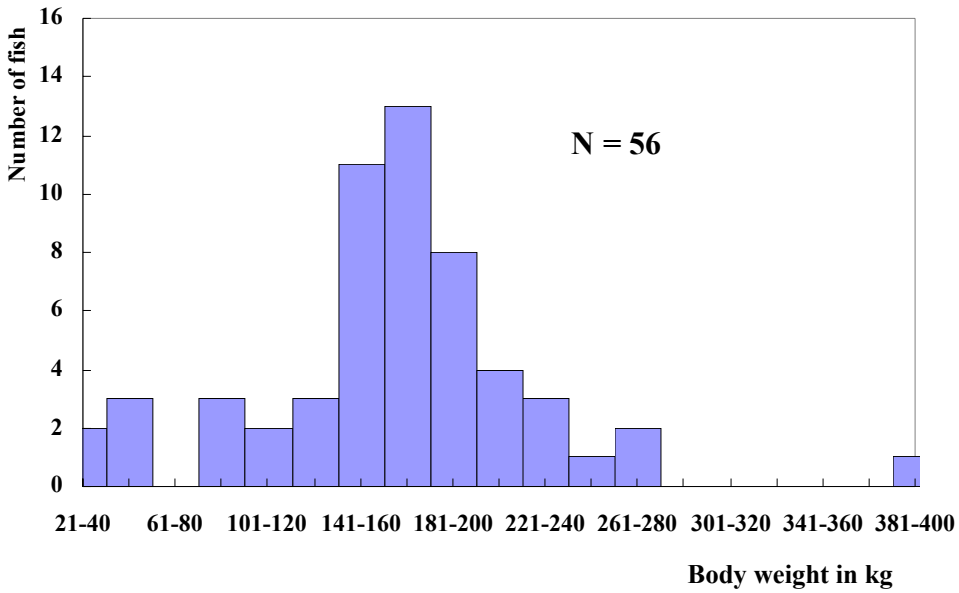

Figure 2. Dressed weight composition of bluefin tuna caught by Chinese longline boat in the Mediterranean Sea in May 1995.

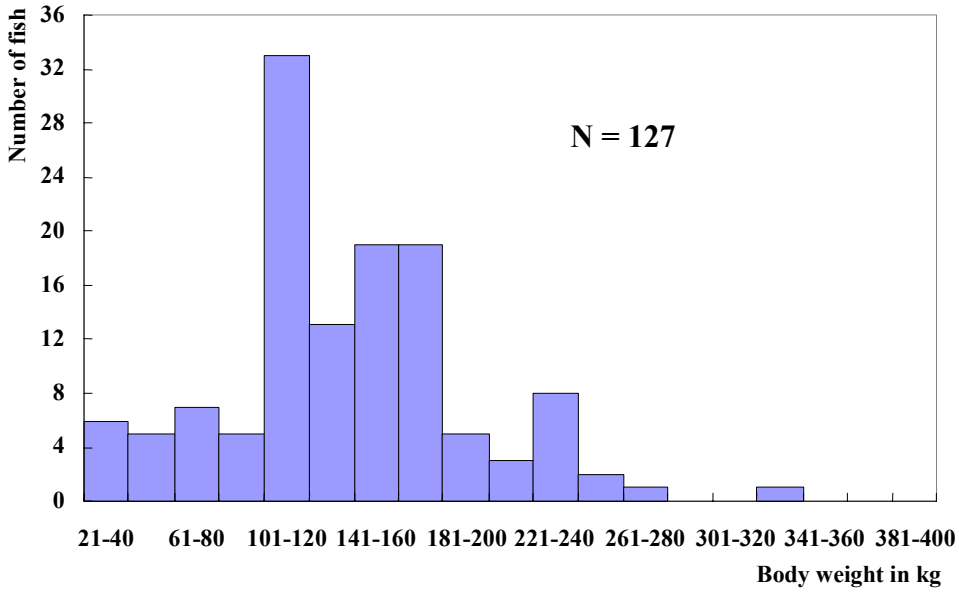

Fig. 3 Dressed weight composition of bluefin tuna caught by Chinese longline boat in the Mediterranean Sea in June, 1995

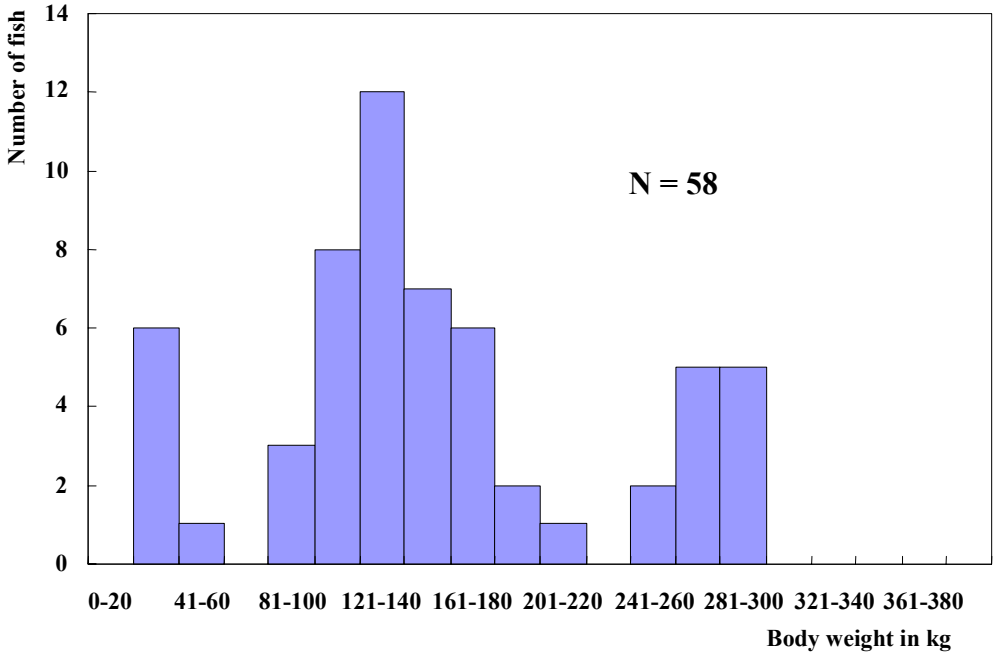

Fig. 4 Dressed weight composition of bluefin tuna caught by Chinese longline boat in the mediterranean Sea in May, 1996

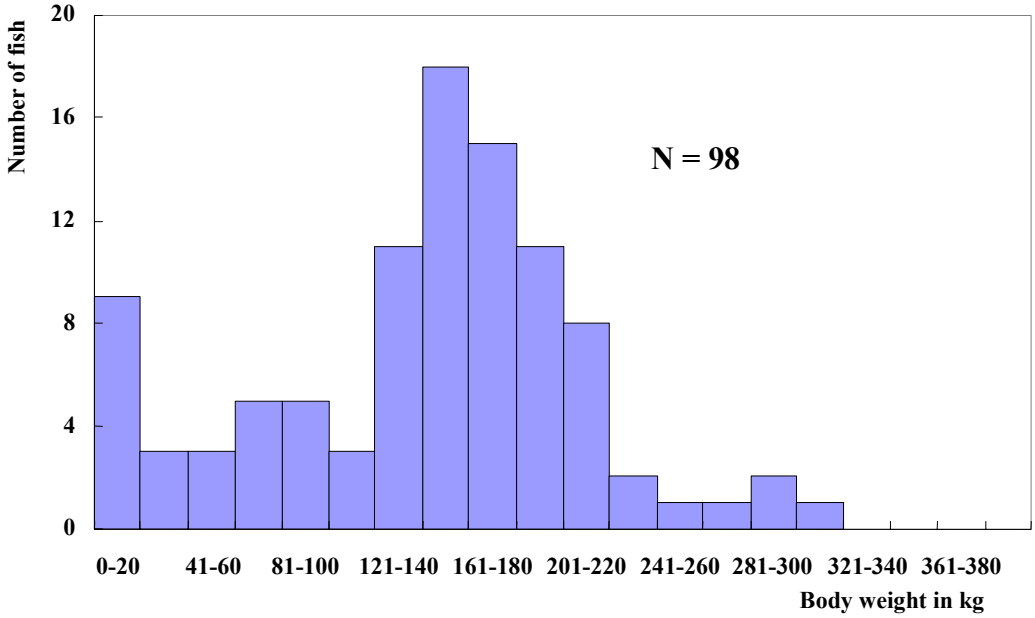

Fig. 5 Dressed weight composition of bluefin tuna by Chinese longline boat in the Mediterranean Sea in June, 1996

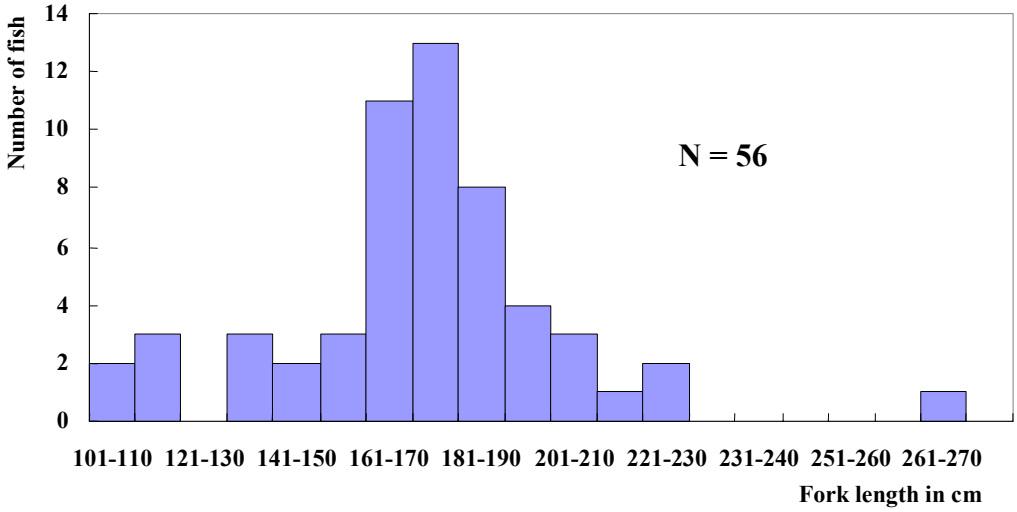

Fig. 6 Fork length composition of bluefin tuna caught by Chinese longline boat in the Mediterranean Sea in May, 1995

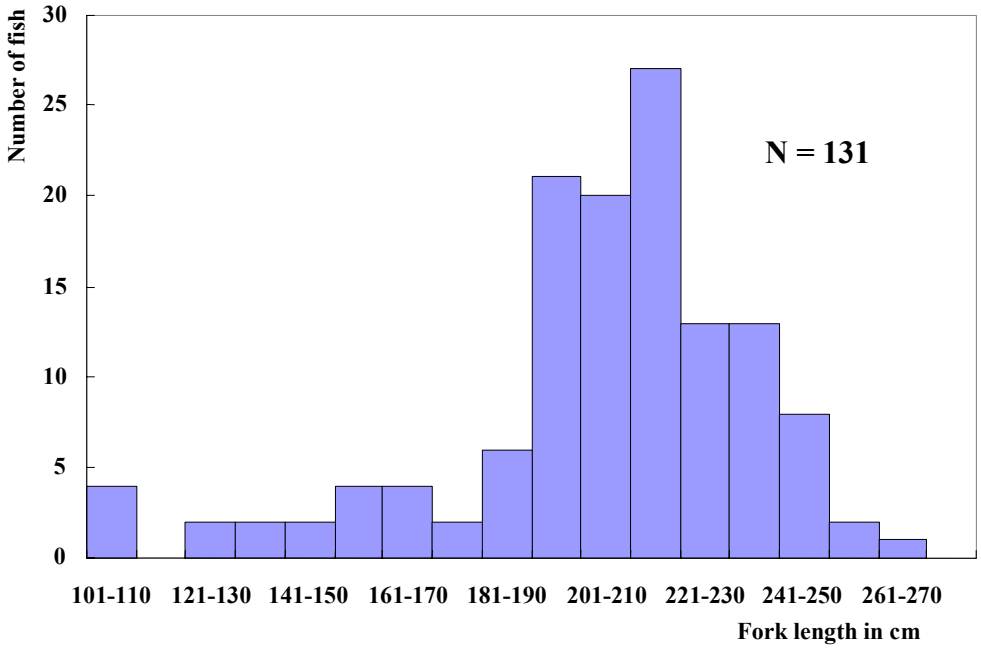

Fig. 7 Fork length composition of bluefin tuna caught by Chinese longline boat in the Mediterranean Sea in June, 1995

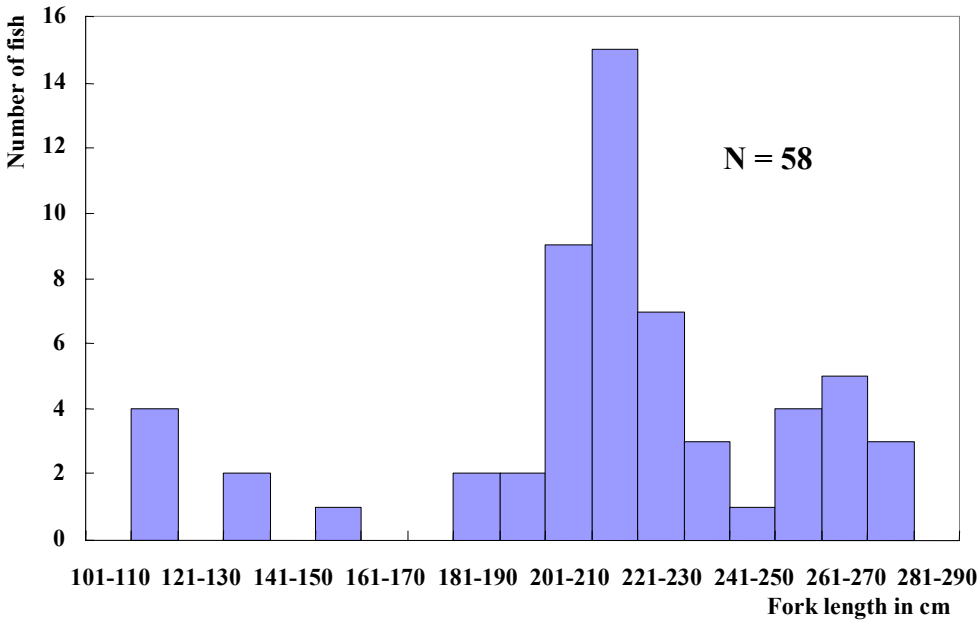

Fig. 8 Fork length composition of bluefin tuna caught by Chinese longline boat in the Mediterranean sea in May, 1996

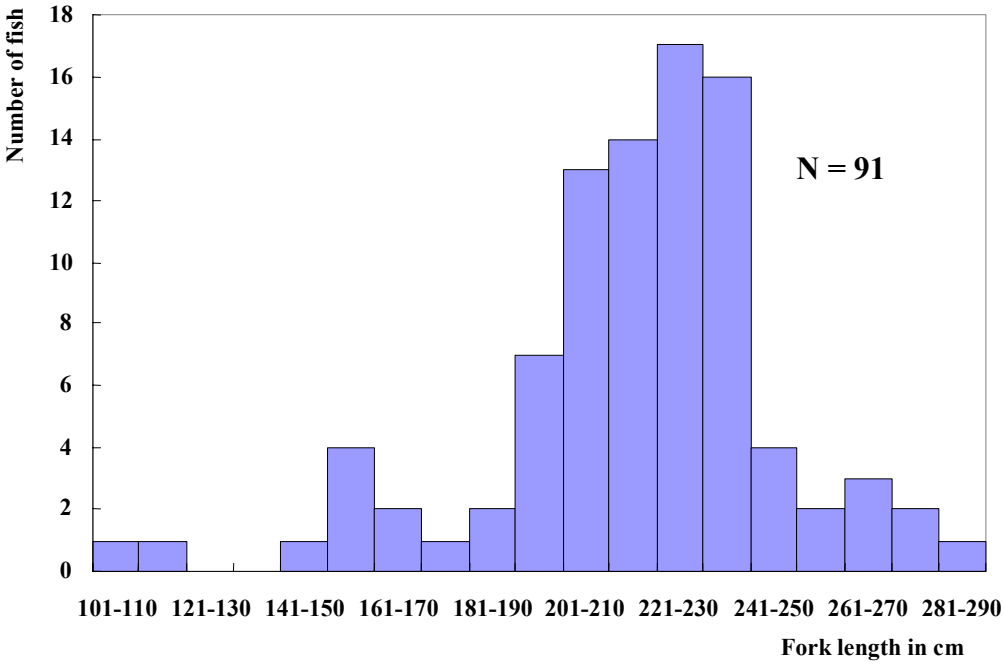

Fig. 9 Fork length composition of bluefin tuna caught by Chinese longline boat in the Mediterranean Sea in June, 1996