

REVIEW OF THE CATCH COMPOSITION BY SPECIES CAUGHT BY KOREAN BAITBOAT FISHERY
BASED IN TEMA FOR 1977-1979

Y. Gong, J. U. Lee, W. S. Yang

SUMMARY

The proportion of catch and size composition by species and estimates of proportion of undersized yellowfin and bigeye caught by Korean baitboats for 1977-1979 are analyzed, and some incidental results have been reviewed based on the above data. The results obtained are summarized as follows: Main target species of this fishery is skipjack, occupying over 70% of total catch and its catch per unit of pole has appeared to be increased but that for yellowfin and bigeye stayed at lower level. The fishing grounds of Korean baitboats were expanded up to the "Sherbro offshore" and especially "Ascension area" (of ICCAT skipjack areas).

Length and weight composition of all species taken by this fishery showed a shift toward larger size. The proportion of undersized fish less than 55 cm and 3.2 kg of yellowfin and bigeye have shown the decreasing trend from year to year although it is difficult to estimate the proportion accurately.

RESUME

On a analysé le pourcentage de capture et la composition par taille, par espèce, et les estimations du pourcentage d'albacore et de thon obèse hors taille pris par les canneurs coréens en 1977-79; quelques conclusions fortuites ont été vérifiées au moyen de ces données. Les résultats obtenus peuvent être récapitulés comme suit: l'espèce cible est le listao, qui constitue 70 % de la prise totale et dont la prise par unité-canne semble s'être accrue, alors que celle de l'albacore et du thon obèse est demeurée plus faible. Les lieux de pêche des canneurs coréens se sont étendus jusqu'aux secteurs "Sherbro-large" et en particulier "Ascension" (zones listao ICCAT).

La composition par taille et par poids de toutes les espèces capturées dans cette pêcherie montre un déplacement vers de plus grandes tailles. Le pourcentage de poisson hors taille, albacore et thon obèse, de moins de 55 cm ou 3,2 kg, montre une tendance à la baisse d'année en année, bien que ce pourcentage soit difficile à estimer avec précision.

RESUMEN

Se analizan la proporción de la captura y la composición por talla por especies, así como las estimaciones de la proporción de rabil y patudo pequeño capturado por los barcos de cebo coreanos en el periodo 1977-79. Se revisan algunos resultados incidentales en base a todos estos datos. Las conclusiones se resumen como sigue: esta pesquería está dirigida principalmente hacia el listado que compone el 70% de la captura total y su captura por unidad-caña parece haber aumentado, si bien la correspondiente al rabil y al patudo permaneció mas baja. La

zona de pesca de los barcos de cebo coreanos se extendió hasta las zonas ICCAT para listado "Sherbro off shore" y especialmente "Ascension area".

La composición por talla y peso de todas las especies capturadas por esta pesquería mostraba un desplazamiento hacia tallas mayores. La proporción de rabil y patudo de menos de 55 cm y 3, 2 kg ha venido mostrando un descenso progresivo año tras año, si bien este es un dato difícil de estimar.

INTRODUCTION

International Commission for the Conservation of Atlantic Tunas (ICCAT) has conducted the size regulation (less than 3.2 Kg) for yellowfin since 1973 and for bigeye in September of 1980 with a 15 % tolerance for incidental catches of undersized fish respectively.

However, ICCAT and some of reporters on this matter point out these are still a higher proportion of undersized fish in surface fishery, especially in bait-boat catch rather than other fishery and also stress that the catch of small size fish from this fishery should be avoided for the future conservation of resource concerned.

On the other hand, International Skipjack Year Program (ISYP) of ICCAT is scheduled to provide the information on reasonable increase of catch, new stock assessment and management implication of the current and future fishery for 1979 - 1982, which comprises a total of nine activity teams for investigation including tagging experiment and improved fishery statistics etc.

In accordance with these above described, this report deals with the catch and size composition by species and particularly estimates of the proportion of undersized yellowfin and bigeye sampled by Korean bait-boats in the east tropic Atlantic ocean for 1977 - 1979, and also there are some incidental results that have been reviewed for this fishery based on the above data.

DATA AND METHOD

The data used here is the catch and effort data sampled by Korean bait-boats and fish length and weight composition which is measured on-shipboard by month and area ($5 \times 5^\circ$), mainly in the east tropic Atlantic; by species for 1977 - 1979. To know the status and stability of this fishery, the catch per unit of pole (CPUP) and standard deviation and coefficient of variation are calculated using those data and then the proportion of small size fishes less than 3.2 Kg of yellowfin and bigeye from the results of investigation of size

composition is analyzed by year.

ASPECTS OF CATCH AND EFFORT

The proportion of catch and quarterly catch per unit of pole (CPUP) in number by species taken from this fishery for 1977 - 1979 are shown in Table 1 and Fig. 1. Main target species of this fishery is skipjack, occupying over 70 % of total catch on a while (Table 1). CPUP of skipjack in the same periods showed the tendency of increase and admittedly has shown higher level in the season of second quarter than any other ones. Kume (1978) points out that it seems there is no definite annual decreasing trend in the level of skipjack CPUE in tons caught by Japanese pole and line fishery in the Gulf of Guinea for 1969 - 1976.

Yellowfin falls down gradually but bigeye shows the state of increase slowly. However, both species stay continuously at lower level compared to skipjack. This phenomenon is also presented in the index of concentration (Fig. 2) which implies whether the fishing effort exerted on fishing ground is adequate or not. In this figure, the fishing effort for skipjack is higher than that for yellowfin and bigeye in any years but its tendency is being appeared to be concentrated for both species more and more.

The geographical distribution of CPUP by species and by year was plotted in Fig. 3 respectively. The fishing ground of Korean bait-boats was mainly limited within the "Annonbon" area for 1977 - 1978 but in 1979 the fishing area was expanded up to the "Sherbro off shore" area and especially "Ascension" area (of ICCAT skipjack areas).

The monthly values of CPUP between all species and skipjack are plotted against centripetal point where the average CPUP by species intersects each other (Fig. 4). These values are distributed on the diagonal persisting 45° nearly and are distributed on the first and third quadrant together in any year. In other words, this means that Korean bait-boats have operated mainly for

skipjack and total catch by this fishery depends upon greatly the catch of skipjack. In order to know the stability of Korean bait-boat fishery at the same time the standard deviation and coefficient of variation of CPUP on all species and skipjack caught were calculated as shown in Table 2. There are no considerable changes in their values. This means that this fishery in the ocean maintains a steady state although their values are high.

SIZE COMPOSITION BY SPECIES AND PROPORTION OF UNDERSIZED FISH

The length and weight composition by species sampled by Korean bait-boats for 1977 - 1979 are illustrated in Fig. 5, 6 and 7 respectively. These raw data are mainly collected in the "Annonbon" area. In these figures, the fork length of skipjack ranged in general from 25 to 75 Cm with an average value of about 50 Cm and corresponded to about 2.7 Kg in round weight (Fig. 5). This is very similar to Choo's result (1977) that the fork length of skipjack ranged from 31 to 75 Cm with a mean value of 47.6 Cm. Yellowfin showed a shift toward larger size, that is: from average of 59.0 Cm in 1977 to 71.3 Cm in 1979 and 3.9 Kg in 1977 to 5.1 Kg in 1979. The size of bigeye also was enlarged to 67.4 Cm in 1979 from 58.6 Cm in 1978 and to 5.6 Kg in 1979 from 3.5 Kg in 1978.

The estimate of proportion of undersized fish has been worked out using the above data (Table 3). The proportion of yellowfin less than 55 Cm and 3.2 Kg in Korean bait-boats catch were estimated to be 37.7 % in 1977, 31.6 % in 1978 and 5.2 % in 1979 from the distribution of length frequency and 41.4 % in 1977, 35.5 % in 1978 and 11.3 % in 1979 from the weight composition respectively (Fig. 5). Coan (1978) reported that catches of Ghana - based bait-boats had the highest proportion of undersized yellowfin and there is an increasing trend for 1973 - 1976, in the proportion of yellowfin less than 3.2 Kg in the surface fishery catches.

The proportion of bigeye showed 57.3 % in 1978 and 28.0 % in 1979 from the length composition and 54.8 % in 1978 and 35.1 % in 1979 from the weight composition. According to Bartoo and Sakagawa's report (1978), the percentage of

bigeye less than 55 Cm in the Atlantic surface fishery for 1972 - 1975 was 30 % in 1972, 98 % in 1973, 70 % in 1974 and 93 % in 1975, and on the other hand, Kim (1978) reported that the catch proportions of undersized fishes by Korean bait-boats for 1974 - 1977 were being decreased for both yellowfin and bigeye same as in this report.

The results (Table 3) indicate that the catches of undersized fishes by Korean bait-boats have decreased from year to year although the incidental catches of undersized fish is exceeded a little the tolerance limit. In other words, this implies that Korean bait-boats in this ocean have been trying to avoid catching for small size fish if possible. However authors suggest that it is difficult to estimate the proportion of undersized fish accurately.

LITERATURE CITED

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Table 1. Catch composition in number by species caught by Korean bait-boats in the Atlantic Ocean, 1977 - 1979.

Year	All species	Skipjack	Yellowfin	Bigeye	Others	Remark
1977	2,037,276 100(%)	1,404,496 68.9	508,901 25.0	83,881 4.1	39,998 2.0	Sampling vessels: 12 out of 15
1978	1,596,291 100(%)	1,297,324 81.2	152,672 9.6	139,991 8.8	6,304 0.4	8 vessels out of 20
1979	3,442,586 100(%)	2,710,158 78.7	276,816 8.0	455,612 13.2	-	6 vessels out of 18

Table 2. Standard deviation (SD) and Coefficient of variation (CV) of CPUP by year.

Year	All species		Skipjack	
	SD	CV(%)	SD	CV(%)
1977	9.3	12.4	10.8	21.5
1978	14.8	17.4	14.4	20.7
1979	17.1	14.6	17.4	18.9

Table 3. Percentage of undersized fish in length (Cm) and in weight (Kg) by species.

Year	Yellowfin		Bigeye	
	< 55 Cm	< 3.2 Kg	< 55 Cm	< 3.2 Kg
1977	37.7	41.4	-	-
1978	31.6	35.5	57.3	54.8
1979	5.2	11.3	28.0	35.1

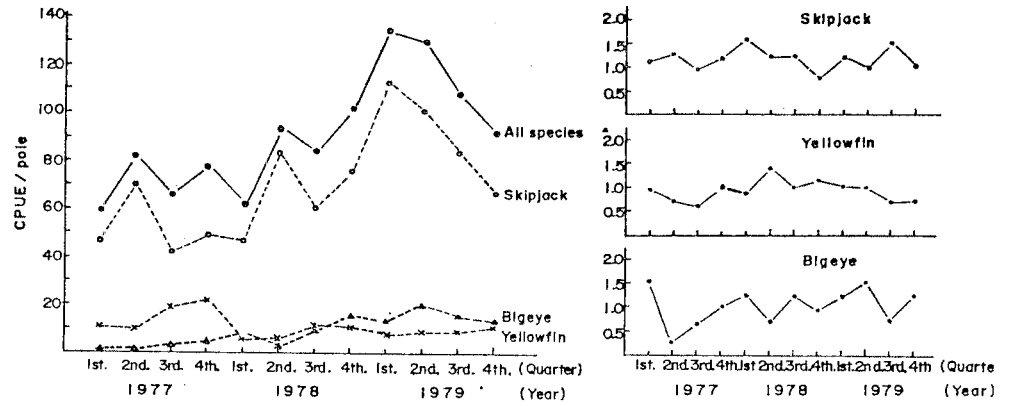


Fig. 1. Quarterly fluctuation of catch per pole by species in the Atlantic Ocean, 1977-1979.

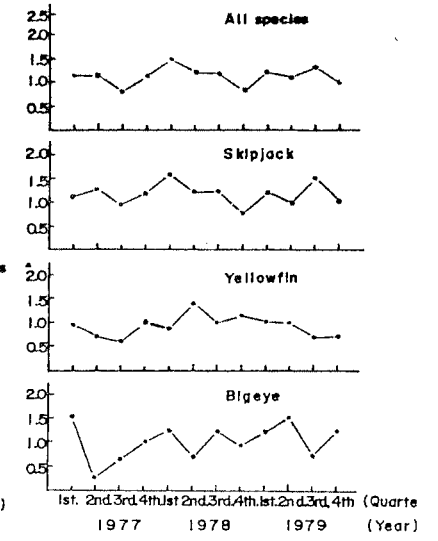


Fig. 2. Quarterly index of concentration of fishing effort by species in the Atlantic Ocean, 1977-1979.

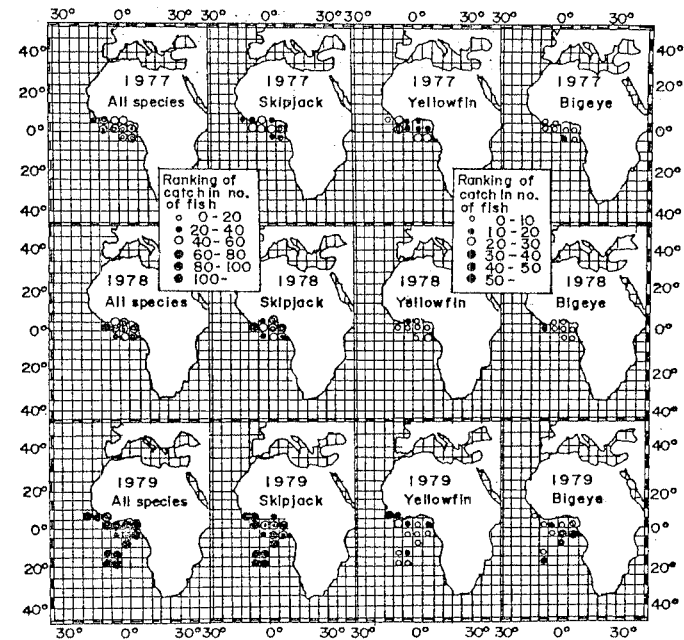


Fig. 3. Distribution of catch per pole by species taken by Korean bait boat fishery in the Atlantic Ocean, 1977-1979.

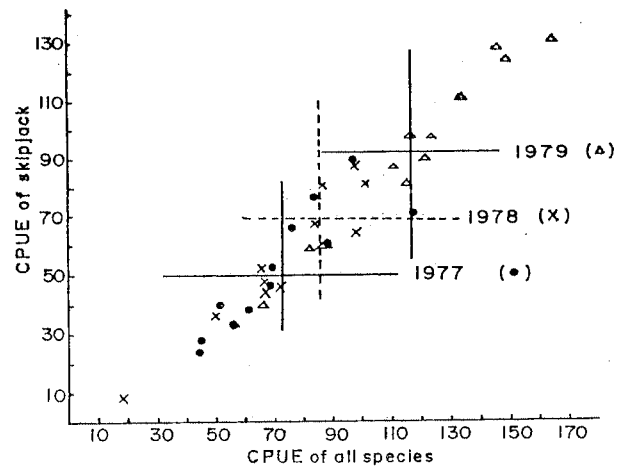


Fig. 4. Distribution of CPUE between all species and skipjack in the Atlantic Ocean, 1977-1979.

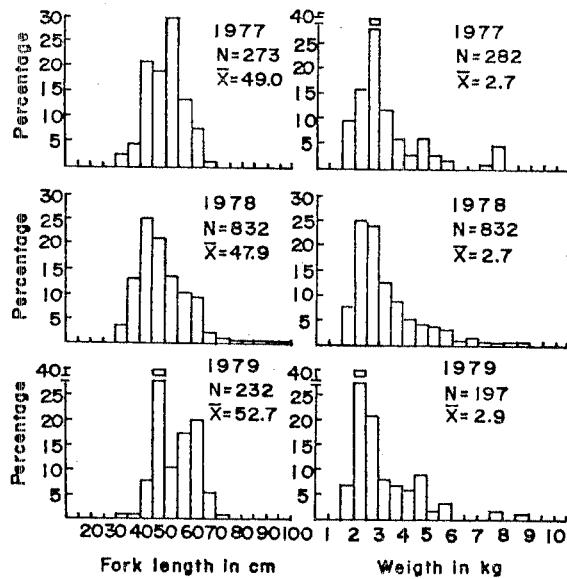


Fig. 5. Length and Weight composition of Skipjack tuna caught by Korean bait boat in the Atlantic Ocean, 1977-1979.

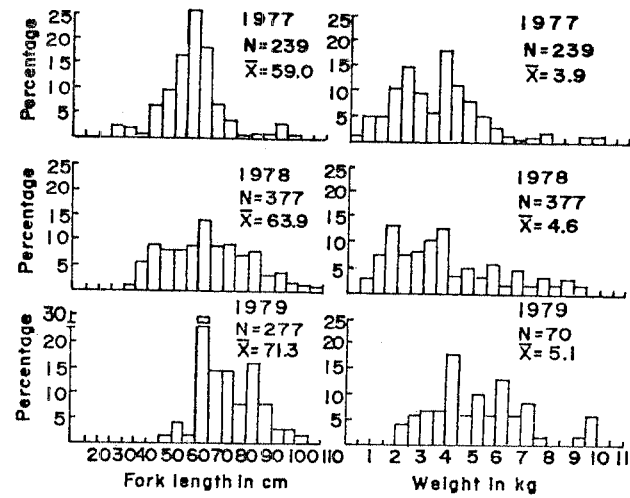


Fig. 6. Length and weight composition of Yellowfin tuna caught by Korean bait boat in the Atlantic Ocean, 1977 - 1979.

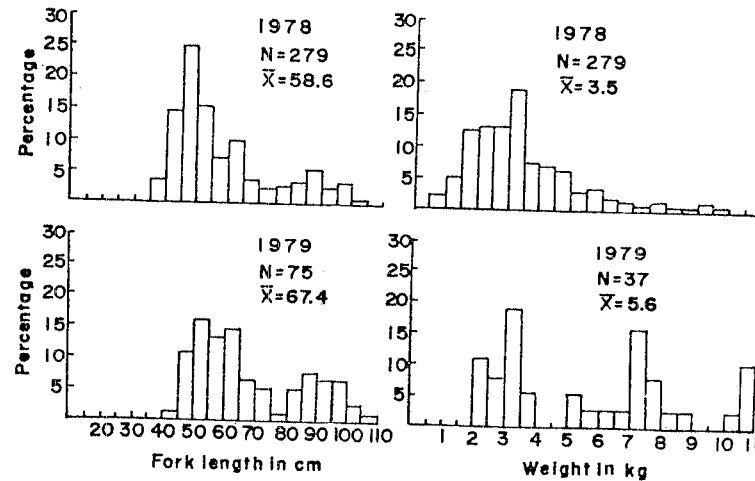


Fig. 7. Length and weight composition of Bigeye tuna caught by Korean bait boat in the Atlantic Ocean, 1978-1979.