

**DISTRIBUTION OF SAILFISH AND LONGBILL SPEARFISH IN THE ATLANTIC OCEAN  
DURING 1994-1996 BASED ON THE LOGBOOK DATABASE  
OF THE JAPANESE LONGLINE FISHERY**

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**SUMMARY**

Distributions of sailfish and longbill spearfish during 1994 to 1996 are described based on the new format logbook data in which catches of these two species are reported separately. The information of catch and CPUE was mainly obtained from the eastern Atlantic Japanese longline fishery active in recent years. Distribution patterns of the two species were similar to those in the 1960s shown by Kikawa and Honma (1982). Sailfish are mainly distributed in the coastal waters off tropical Africa, while longbill spearfish are distributed in the higher latitudinal waters and relatively offshore waters than sailfish. Longbill spearfish are distributed more uniformly and more widely than sailfish. Mixed ratios of sailfish and spearfish by 5x5 blocks were analyzed. The present results clearly show that longbill spearfish are rare in the coastal waters off Africa, especially in the Gulf of Guinea.

**RÉSUMÉ**

La distribution du voilier et celle "longbill spearfish" de 1994 à 1996 sont décrites sur le fondement des données des carnets de pêche de nouveau format, dans lesquels les prises de ces deux espèces sont déclarées séparément. Les informations de capture et de CPUE ont été principalement obtenues à partir de la pêcherie palangrière japonaise active dans l'Atlantique Est au cours des dernières années. Les modes de distribution des deux espèces ont été similaires à ceux des années 60 présentés par Kikawa et Honma (1982). On trouve principalement le voilier dans les eaux côtières de l'Afrique tropicale, alors qu'on trouve le "longbill spearfish" dans des eaux de latitudes plus hautes et relativement plus éloignées de la côte. Le "longbill spearfish" est distribué de manière plus uniforme et plus étendue que le voilier. On a analysé la proportion du mélange de voilier et de "longbill spearfish" par blocs de 5x5. Ces résultats montrent clairement que le "longbill spearfish" est rare dans les eaux côtières de l'Afrique, en particulier dans le Golfe de Guinée.

**RESUMEN**

Se describen distribuciones de pez vela y *Tetrapturus pfluegeri* de 1994 a 1996, basadas en los datos de los cuadernos de pesca de nuevo formato, en los cuales las capturas de estas dos especies se informan por separado. La información de captura y CPUE se obtuvo sobre todo de la pesquería palangrera japonesa activa en el Atlántico este en los últimos años. La distribución de estas dos especies era similar a la de los años 60 presentada por Kikawa y Honma (1982). El pez vela se encuentra sobre todo en aguas costeras del Africa tropical, mientras que el *Tetrapturus pfluegeri* se encuentra en aguas de latitudes relativamente más altas y más lejanas de la costa. Su distribución es más uniforme y amplia que la del pez vela. Se analizó la ratio mezclada de pez vela y *Tetrapturus* por bloques de 5 x 5. Estos resultados muestran con claridad que el *Tetrapturus pfluegeri* es raro en aguas costeras de Africa, sobre todo en el Golfo de Guinea.

**Introduction**

The species combined catch record of sailfish (*Istiophorus platypterus*) and longbill spearfish (*Tetrapturus pfluegeri*) in the Japanese catch reporting system on the tuna longline fishery has made it difficult to use commercial data on these two species for the scientific analyses. Kikawa and Honma (1982) used the catch data by species obtained by the survey cruises from 1957 to 1970 for the partition of commercial catch statistics from 1956 to 1980, assuming that the mixture rate of the two species in 5x5 blocks remained nearly constant even if the level of abundance changed. After 1970, there was no survey cruise by the Japanese research vessels in the Atlantic Ocean and no new information on the distributions of these two species was obtained.

In 1993 the new catch reporting system was introduced in the Japanese longline fishery. In the new system the catch of sailfish and longbill spearfish are reported separately. Uozumi (1995) reviewed the distribution pattern of these two species based on the preliminary data for the longline catch and effort data in 1993 when the coverage of the new reporting system had not yet been high enough to observe the distribution pattern of these species in detail.

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In this report, the distribution of the two species and rate of mixing are described based on the new format database during 1994 to 1996.

## Materials and methods

The logbook database in new reporting system during 1994 to 1996 were used, though the data in 1996 is still preliminary. The coverage ratio of database used in the present analysis was more than 90% in 1994 and 95. In the new database format the catch (number and weight) of sailfish and longbill spearfish are recorded separately. The catch records were raised to 100% of operations and aggregated by 5x5 degree blocks and by month.

## Results and discussions

### 1) Catch of sailfish and longbill spearfish in east and west Atlantic

Table 1 shows the annual catch in tons of sailfish and spearfish in east and west Atlantic, and fishing effort (thousand hooks). The catches of sailfish and longbill spearfish have been stable at around 50 tons and 30 tons in the recent three years. The major part of these catch was obtained from the eastern Atlantic Ocean, because about 80% of the fishing effort was expanded in the eastern Atlantic. The Japanese catch of sailfish and spearfish occupied only 2-3% of the total eastern Atlantic catch and less than 1% of the western Atlantic catch in recent years.

### 2) Geographical distribution of catch and effort during 1994 to 1996

Fig. 1 shows the geographic distribution of mean annual catches of sailfish and longbill spearfish during 1994 to 1996. The catch of sailfish was mainly obtained from the tropical waters between 10 degree north and south in the eastern Atlantic. The catch of longbill spearfish was mainly obtained from the higher latitudinal waters than sailfish and little catch was obtained from the tropical waters between 5 degree north and south. Furthermore the catch of longbill spearfish was obtained from more offshore area than sailfish.

Fig. 2 shows the geographical distribution of mean annual fishing effort during 1994 to 1996. This figure shows clearly that the fishing effort was concentrated in the eastern Atlantic. There was few fishing effort in the tropical waters in the western Atlantic, especially in the coastal waters where the high CPUE of sailfish and spearfish was observed in the 1960s (Kikawa and Honma, 1982). It is clear that the Japanese longline fishery did not cover the main distribution area of sailfish and spearfish in the western Atlantic in the recent years.

### 3) Geographical distribution of CPUEs for sailfish and longbill spearfish

Fig. 3 shows the geographic distribution of mean annual CPUEs for sailfish and longbill spearfish during 1994 to 1996 in the Atlantic Ocean. The high CPUE of sailfish was observed in the tropical waters between 10 degree north and south and the CPUE was higher in the coastal waters than offshore waters. There were some high CPUE of sailfish were observed in the western Atlantic, but the amount of fishing effort was not enough to make some conclusion on the sailfish distribution (see Fig. 2). The CPUE of longbill spearfish was distributed more uniformly and more widely than those of sailfish and occurred in higher latitudinal waters.

### 4) Geographical pattern of mixing ratio of sailfish and longbill spearfish

Fig. 4 shows the percentage of sailfish catch in the total of sailfish and longbill spearfish catch. High percentage of sailfish was observed in the coastal waters in the eastern Atlantic. The percentage decrease gradually from coastal to offshore waters and from tropical to temperate waters. Ueyanagi et al. (1970) pointed out that the longbill spearfish is distributed in the offshore waters and sailfish is distributed in the coastal waters in the Atlantic Ocean and this phenomenon is also observed in the Pacific Ocean, though the species of sailfish and spearfish are different between the Pacific and Atlantic Oceans. Kikawa and Honma (1982) showed the species composition of these two species in the period of 1956 to 1970. They also pointed out that the high percentage of sailfish was observed in the coastal waters of Africa, especially in the Gulf of Guinea. The percentage of sailfish in the coastal waters off Africa was nearly 100% as shown in Fig. 4. Based on the present and previous results (Kikawa and Honma, 1982), it seems that longbill spearfish is rarely distributed in the coastal waters off tropical Africa.

## Literature cited

- Kikawa, S. and M. Honma 1982: Trends in the Japanese sailfish/longbill spearfish catches in the Atlantic Ocean as apportioned into separate species. *ICCAT Coll. Vol. Sci. Pap.* XVIII (3), 645-649.
- Ueyanagi, S., S. Kikawa, M. Uto, and Y. Nishikawa 1970: Distribution, spawning, and relative abundance of billfishes in the Atlantic Ocean. *Bull. Far Seas Fish. Res. Lab.* 3, 15-55. (In Japanese with English summary).
- Uozumi, Y. 1995: Preliminary analysis on the distribution of sailfish and longbill spearfish in the Atlantic Ocean in 1993 based on the logbook data. *ICCAT Coll. Vol. Sci. Pap.* XLIV (3), 26-29.

Table 1. Catch of sailfish and longbill spearfish by the Japanese longline fishery in the Atlantic Ocean during 1994 to 1996 based on the new reporting system. The catch and effort data in 1996 are still preliminary.

Year	Hooks in thousand		Catch of Sailfish (tons)		Catch of Longbill spearfish (tons)	
	East	West	East	West	East	West
1994	79,526 (80%)	20,263 (20%)	44 (83%)	9 (17%)	26 (68%)	12 (32%)
1995	86,452 (86%)	13,873 (14%)	50 (93%)	4 ( 7%)	24 (83%)	5 (17%)
1996	95,222 (74%)	33,007 (26%)	42 (93%)	3 ( 7%)	28 (88%)	4 (12%)
Mean	87,067 (80%)	22,381 (20%)	45 (90%)	5 (10%)	26 (79%)	7 (21%)

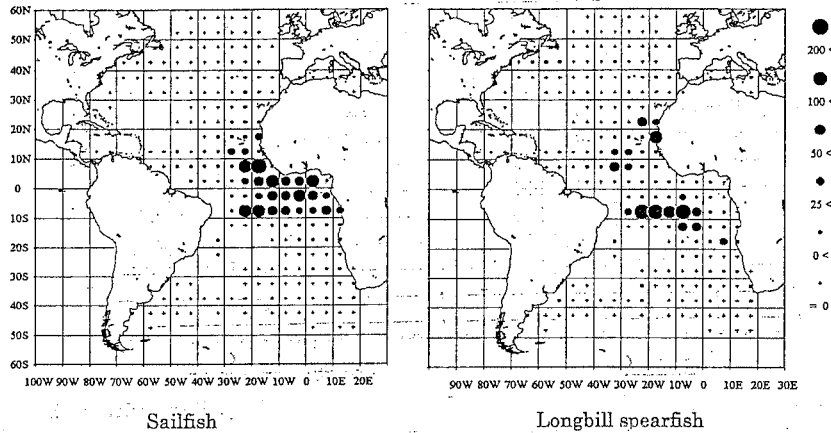


Fig. 1. Geographic distribution of the Japanese longline catch of sailfish and longbill spearfish in the Atlantic Ocean during 1994 to 1996. The mean annual catch in number for the three years is shown by 5x5 degree basis.

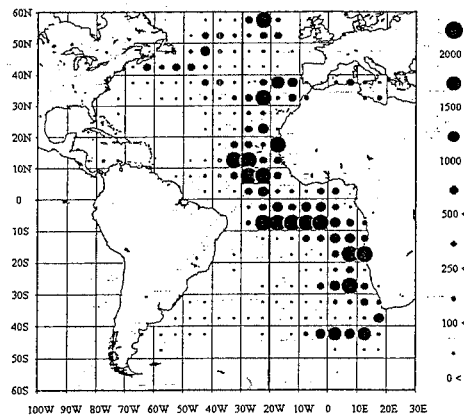


Fig. 2. Geographic distribution of fishing effort of the Japanese longline fishery in the Atlantic Ocean during 1994 to 1996. The mean annual fishing effort in thousand hooks is shown by 5x5 degree basis.

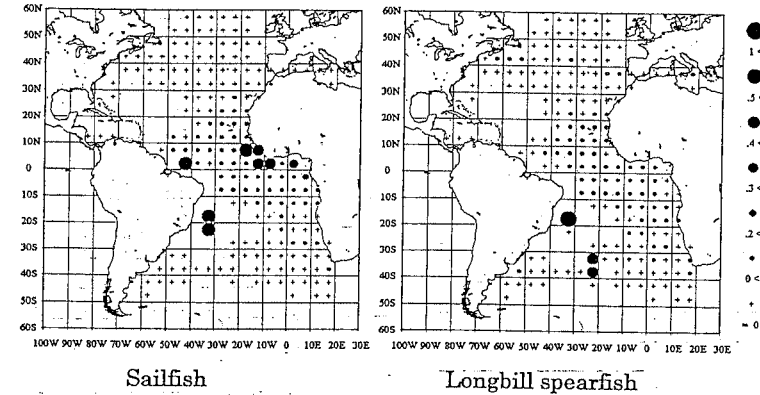


Fig. 3. Geographical distribution of CPUEs for sailfish and longbill spearfish in the Atlantic Ocean during 1994 to 1996. The mean annual CPUE (number/1000 hooks) is shown by 5x5 degree basis

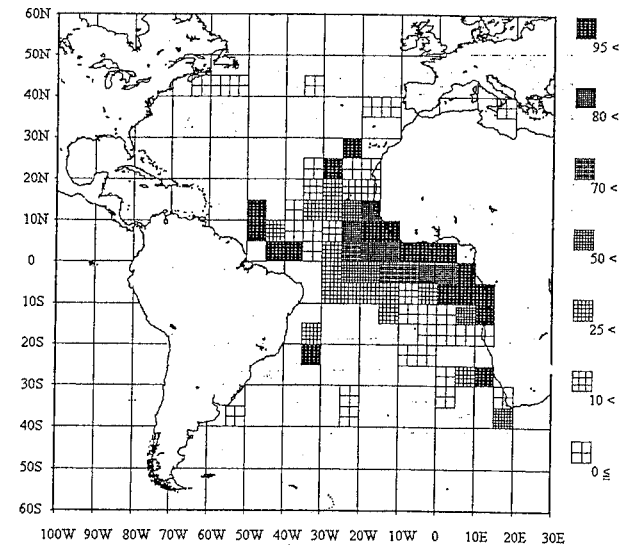


Fig. 4. Percentage of sailfish catch in the total of sailfish and longbill spearfish catch by the Japanese longline fishery during 1994 to 1996.