

CATCH PER UNIT OF EFFORT OF XIPHIIDAE AND ISTIOPHORIDAE FROM BRAZILIAN LONGLINERS (1971-1982)

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SUMMARY

The Brazilian longliners operating out of Santos-SP caught Xiphias gladius, Istiophorus platypterus, Tetrapturus albidus and Makaira nigricans off South and Southeast Brazil (20° - 33° S and 039° - 050° W) in the period 1971-82. They represented about 30 percent of the total catch of this fleet. The catch per unit of effort of these species was presented by month and year. The annual values of CPUE for swordfish kept almost the same level in successive years; for white marlin and blue marlin it showed a slightly decreasing trend; and for sailfish kept the same level from 1971-72 to 1977-78, a decrease of about 50 percent in 1978-79 and a stabilization through 1981-82.

RESUME

Les palangriers brésiliens basés à Santos, état de Sao Paulo, ont capturé entre 1971 et 1982 du Xiphias gladius, de l'Istiophorus platypterus, du Tetrapturus albidus et du Makaira nigricans au large du sud et sud-est du Brésil (20° - 33° S et 039° - 050° W). Ceci représente environ 30 % de la prise totale de cette flottille. La capture par unité d'effort de ces espèces est fournie par mois et par année. Les valeurs annuelles de la CPUE de l'espadon sont pratiquement restées au même niveau d'une année sur l'autre; elles montrent une légère tendance à la baisse dans le cas du makaira blanc et du makaira bleu; pour ce qui est du voilier, elles sont demeurées au même niveau de 1971-72 à 1977-78, puis ont montré une baisse d'environ 50 % en 1978-79 et une stabilisation jusqu'à 1981-82.

RESUMEN

Durante el período 1971-1982, los palangreros brasileños con base en Santos-SP, capturaron Xiphias gladius, Istiophorus platypterus, Tetrapturus albidus y Makaira nigricans frente a las costas Sur y Sudeste de Brasil (20° - 33° S y 039° - 050° W). Representaron aproximadamente el 30% de la captura total de esta flota. Se presentó la captura por unidad de esfuerzo para estas especies, por mes y año. Los valores anuales de CPUE para pez espada se mantuvieron prácticamente al mismo nivel en los años sucesivos; la aguja blanca y la aguja azul, mostraron una tendencia ligeramente decreciente, y el pez vela se mantuvo al mismo nivel desde 1971-72 a 1977-78, disminuyó en un 50% en 1978-79 y se estabilizó durante 1981-82.

1. INTRODUCTION

The Xiphiidae and Istiophoridae represented about 30% of the total catch of the Brazilian longliners, established in Santos-SP in the 1971-82 period. These boats operated in the area 20°-33°S and 039°-050°W and aiming at more productivity, directed their fisheries to determined areas, according to the season of the year (ARFELLI and AMORIM, 1983).

In this paper, the authors analyze the catch per unit of effort of:

<u>Xiphias gladius</u>	"espadarte"-swordfish
<u>Istiophorus platypterus</u>	"agulhão-vela"-sailfish
<u>Tetrapturus albidus</u>	"agulhão-branco"-white marlin
<u>Makaira nigricans</u>	"agulhão-negro"-blue marlin

The catch per unit of effort of these species in the studied area, was mentioned by MATHER, JONES and BEARDSLEY (1972); MATHER, CLARK and MASON (1975); Sakagawa and Bell (1968) apud PALKO, BEARDSLEY and RICHARDS (1981); and WISE and DAVIS (1973).

2. MATERIAL AND METHODS

The data utilized in this study were obtained from Brazilian longliners, settled in Santos-SP.

The numbers of fish were obtained from log commercial sheets of fisheries companies (Cooperativa Mista de Pesca Nipo-Brasileira and Companhias Irmãos Onó, Akama Comércio de Pescados Ltda., Imaipisca Indústria e Comércio de Pescados Ltda. and Taiyo Indústria de Pesca S/A). From 1971 to 1977 some companies united I. platypterus and I. albidus. Thus far the proportion of each species was estimated based on data collected from 1971 to 1982 of companies that made distinction between the two species.

The fishing effort (number of hooks) was obtained from "Seção de Controle da Produção Pesqueira, Divisão de Pesca Marítima, Instituto de Pesca", except for the period from 1971 to 1973, which was estimated on the basis of the effective fishing days to an average of 1,200 hooks per day.

The catch per unit of effort (CPUE) is presented by month and year, from 1971 to 1982. The unit of effort considered for X. gladius, I. platypterus and I. albidus, was 1,000 hooks, and for M. nigricans was 10,000 hooks.

The criterion of considering the arrivals of boats in the beginning of a month, was adopted as belonging to the previous month, when most of the catch had really been effected.

RESULTS AND DISCUSSION

The annual fishing effort has shown an increasing trend in the 1971-81 period ranging from 432,000 to 1,400,000 hooks (ARFELLI and AMORIM, 1983), and continued increasing to 1,573,000 hooks in 1982.

Figure 1 and 2 show the monthly and yearly CPUE data for billfish in the 1971-82 period. Observing these figures it is possible to state that:

Swordfish

The monthly and quarterly analyses of CPUE, from the period of 1971 to 1981, were presented in ARFELLI and AMORIM (1983).

The highest CPUE value (43.1 fish per 1,000 hooks) occurred in September 1980 and the lowest (0.9) in November 1973. The monthly values of CPUE presented the same cyclical fluctuations in almost all years. The annual values of CPUE kept almost the same level in the successive years, except in 1974, 1975 and 1980, when there was an increase, and 1978 a decrease.

According to BEARDSLEY (1978), the CPUE of swordfish in the Japanese longline fishery for the total Atlantic increased steadily from 1959 to 1968 and then stabilized through 1975.

Sailfish

Sailfish is caught from October (occasionally September) to March (sailfish fishing season), and has great importance from November to February (ARFELLI and AMORIM, 1981). The highest value of CPUE for each season usually occurred in December. In this month, in the year of 1975, occurred the highest CPUE of the whole period (27 fish per 1,000 hooks). The lowest value of CPUE always occurred in the beginning or end of the season (September/October and March, respectively). Seldom any specimen was caught off this season (just 3 specimens: in May 1980, April and June 1982).

The 1976/77 fishing season, as a whole, presented the highest value of CPUE (somatory of monthly CPUE values) of the period, and the seasons of 1978/79 and 1981/82 the lowest values.

The monthly values of CPUE presented the same cyclical fluctuations in almost all seasons. The values of CPUE for each month kept almost the same level from the beginning through 1977/78. In the next season a decrease of about 53% was observed, then the values were stabilized through 1982.

White Marlin

White marlin is caught all year long. The highest values of CPUE usually occur in November and December, and the lowest in July and September (winter).

The highest monthly CPUE was recorded in October 1972 (7.4 fish per 1,000 hooks), and the lowest in August 1978 (0.06).

In the annual values of CPUE slight decreasing trend was observed; presenting the highest CPUE (2.7 fish per 1,000 hooks) in 1972 and the lowest (0.4) in 1979 and 1982. A decrease in the values of CPUE, in the previous period, was already mentioned by MATHER, CLARK and MASON (1975): the apparent relative abundance of white marlin, as indicated by catch rates of the Japanese longline fishery in 1958 - 66 (Ueyanagi et al., 1970, Fig. 26), declined slightly after reaching a peak in 1962. More recent information (Table 6), how

ever, shows that this distinct downward trend has continued through 1970, resulting in a decline from a maximum of 2.06 fish per 1,000 hooks in 1962 to 0.80 in 1970. Important declines have occurred in the areas (Fig 13) in which the largest catches were taken: from 10.77 fish per 1,000 hooks in 1967 to 1.20 in 1970 in RIO.

Blue Marlin

This species is sporadically caught, in low numbers, during the year. The largest specimen caught by Brazilian longliners weighed 557 kg (Abril/1977), and the smallest 40 kg (December/1980), gilled and gutted.

The highest CPUE, 5.9 fish per 10,000 hooks, was recorded in June 1972.

The highest annual value of CPUE, 1.57 fish, occurred in 1972, and the lowest in 1980 (0.06 fish per 10,000 hooks). In this period the CPUE presented a slight decreasing trend, almost always less than one fish per 10,000 hooks.

In the Atlantic Ocean, according to WISE and DAVIS (1973), the catch rates in the areas where most of the blue marlin have been caught have decreased markedly (Fig. 2), with rates near or above 20 fish per 10,000 hooks in 1956-63, but only 6 or less in 1965-68.

Ueyanagi et alii (1970) apud MATHER, JONES and BEARDSLEY (1972), also reported a drastic decline in the apparent abundance of blue marlin in the Atlantic with the level in 1965 only about one-fourth of that of 1962.

Longbill Spearfish

The "agulhão-estilote" longbill spearfish, Tetrapturus pfluegeri seldom occurs in the studied area. Just four fish have been observed from 1974 to 1977 (AMORIM and ARFELLI, 1977), and after that there is no further register.

CONCLUSIONS

The annual CPUE values of swordfish kept almost the same level in the successive years.

The seasonal CPUE values of sailfish kept almost on the same level from 1971/72 to 1977/78, and decreased by about 50% in 1978/79, then stabilized through 1981/82.

The annual CPUE values of white marlin and blue marlin showed a slight decreasing trend during the 1971-82 period.

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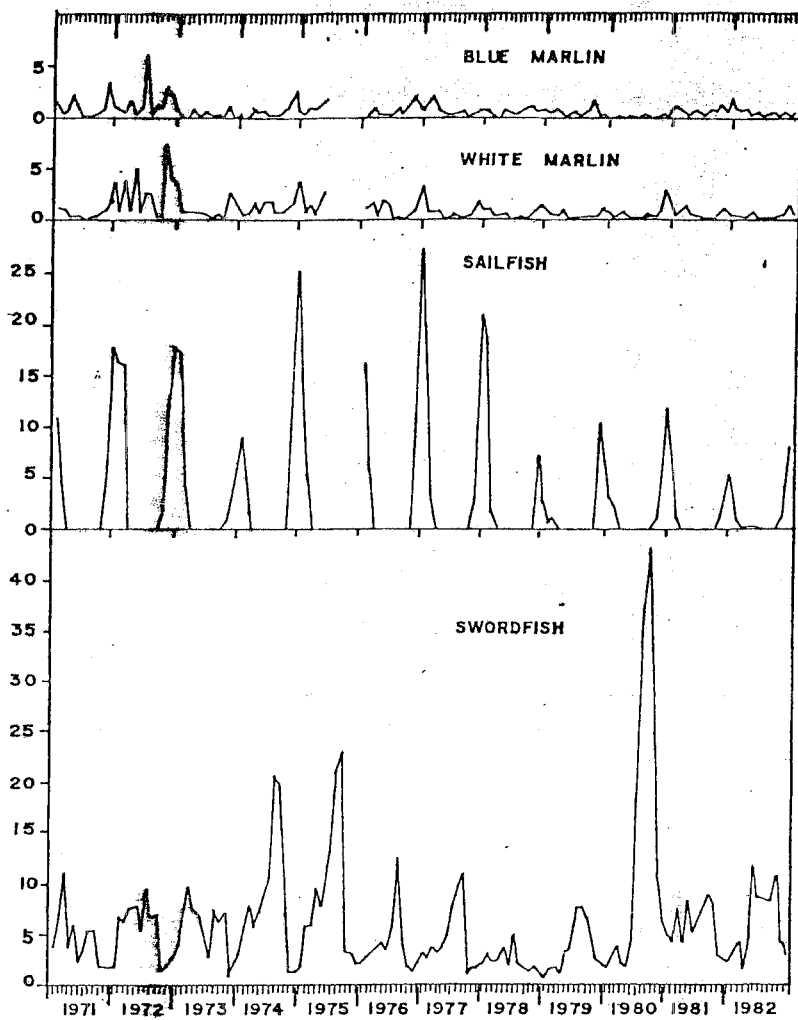


Figure 1 - Monthly catch per unit of effort, 1971-82, for swordfish, sailfish and white marlin (per 1,000 hooks), and blue marlin (per 10,000 hooks) in the South and Southeast of Brazil.

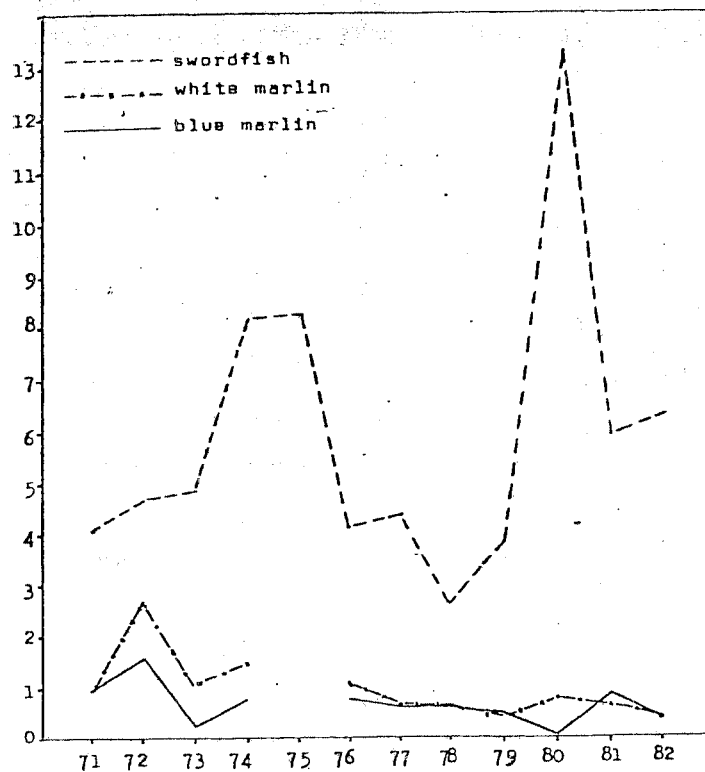


Figure 2 - Annual catch per unit of effort, 1971-82 for swordfish and white marlin (per 1,000 hooks), and blue marlin (per 10,000 hooks) in the South and Southeast of Brazil.