

## **Swordfish caught in longline fishery of southern Mozambique**

### **Preliminary fishery and biological information based on observer onboard sampling**

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### **ABSTRACT**

Preliminary results of the implementation of on-board observer sampling program on Mozambique longline fleet indicated swordfish as one of the most common target species in southern Mozambique, besides of bigeye and yellowfin tuna. Together these three species represented 70% of the fish caught in numbers and approximately 85% of the total retained catch in weight. Particularly swordfish represented 29% of the catch in numbers and approximately 25% of the total retained catch in weight.

From the total number of swordfish specimens sampled to assess their biological attributes during April to June (n=126), 82% were female and the remaining 18% were male fish (ratio<sub>M:F</sub>=1:4). The majority were fish with active gonads (stage II), 56% of female fish and 95% of males. Ripe females were also significant in the catches, 36% of total female swordfish sampled. The average fork length ( $\pm$ SD) for swordfish was 118 cm ( $\pm$ 40), with an average size for males of 125 cm ( $\pm$ 24) and 117 cm ( $\pm$ 42) for females. Size frequency distribution showed the majority of swordfish caught (80%) ranging from 70 to 140 cm.

## **1. Introduction**

For many years, commercial fleet targeting tuna and billfish in Mozambique EEZ were composed only by foreign distant waters fishing vessels. However, in 2014 as part of the national tuna fishery development plan, five Mozambique flag longliners (23,3 m LOA) were introduced to the tuna fishery and started operating late December in the southern coast of Mozambique. In 2015 all five vessels (the national longline fleet) were operational. In General, each longline vessel performs two trips (or one) per month. The total number of fishing days per trip is less than 10 (average of 7 days) and only one longline set is performed daily. A longline set is composed by 800 -1200 hooks (average 1000) baited with squids and an emersion time of about 7 to10 hours.

During the second trimester (April- June) Mozambique started deploying observers to collect fishery and biological data (size, sex and development stage of the gonads) of exploited species.

## **2. Methods**

Three trips were covered, one trip per month, which gives a sampling coverage of 5-10% of vessel activity. Fishing operations took place between 20° S to 26° S and between 35°E to 37°E.

Catch composition was assessed both in terms of numbers and weight, by indentifying all fish caught at species level (no sub-samples). Weights of fish were estimated based on length by using a conversion table provided by captains of the vessels. Fork lengths of target species were measured with precision of 1cm, however for the analysis lengths were aggregated by 10cm class interval.

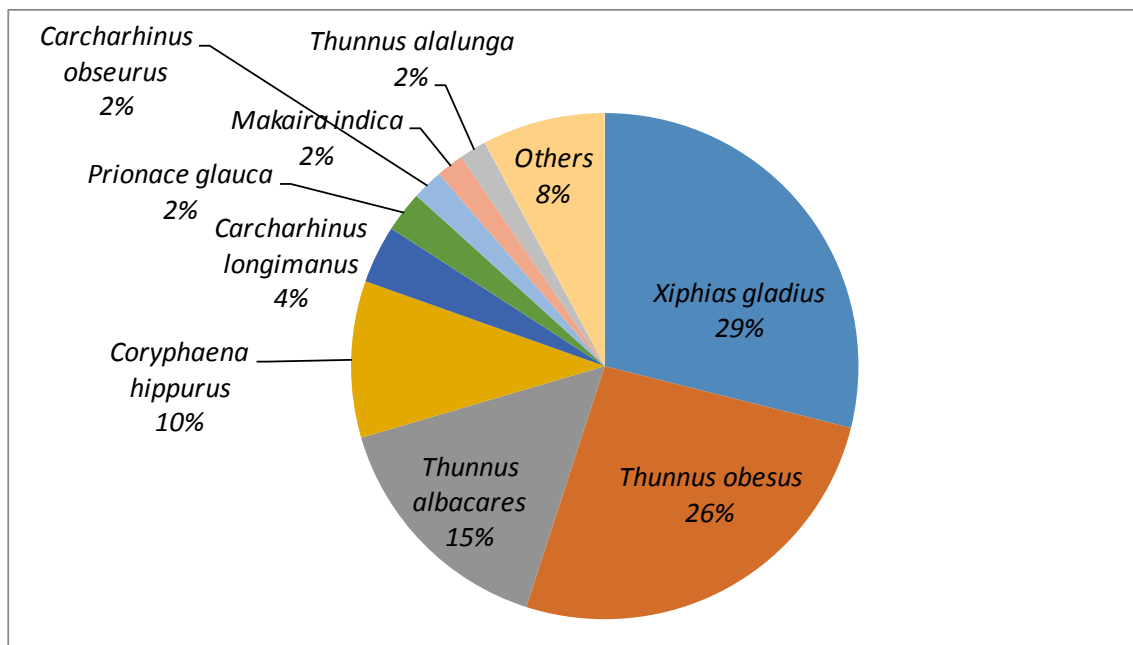
### 3. Results

#### 3.1. Catch composition

A total of 460 fish of 16 species were sampled during the trips observed on-board of Mozambique flagged longliners operating in the southern coast of Mozambique EEZ.

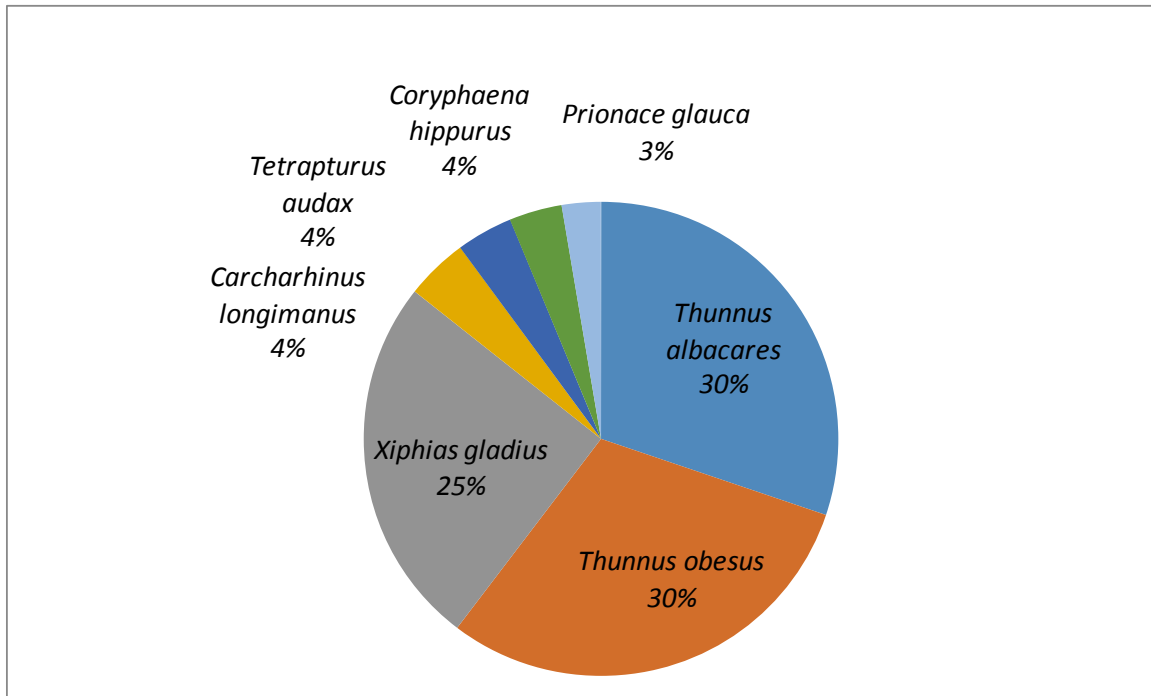
Catches were mainly composed by swordfish (*Xiphias gladius*), bigeye (*Thunnus obesus*), yellowfin (*Thunnus albacares*) and common dolphinfish (*Coryphaena hippurus*) (Figure 1).

The longline target species, swordfish, bigeye and yellowfin represented 70% of the total species caught in numbers with swordfish being the most captured species (Figure 1).



**Figure 1. Composition (in numbers) of the total catch observed on board of Mozambique flagged longline vessels in southern Mozambique.**

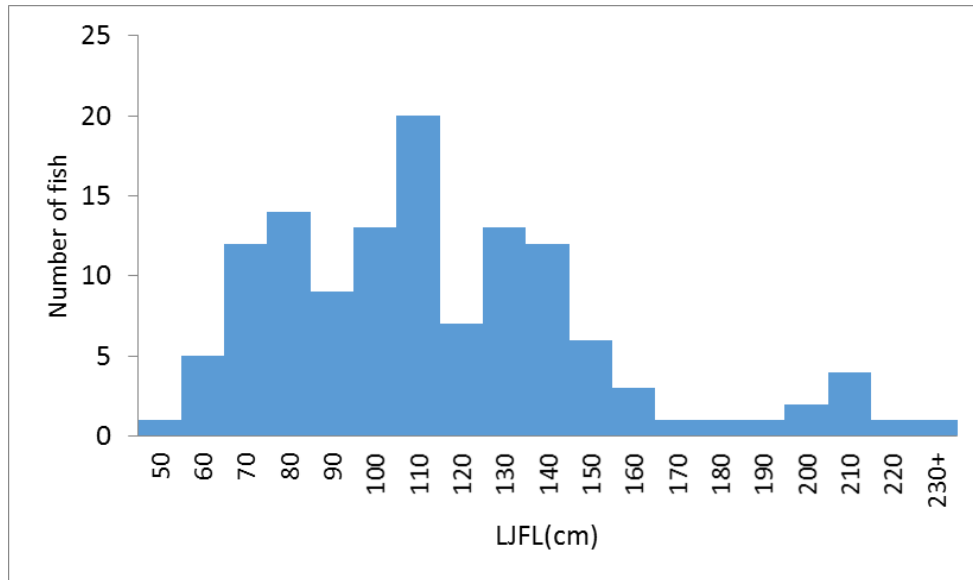
In terms of weight these three target species represented about 85% of all retained catches with swordfish contributing with approximately 25% (Figure 2).



**Figure 2. Composition (in weight) of the retained catch observed on board of longline vessels in southern Mozambique.**

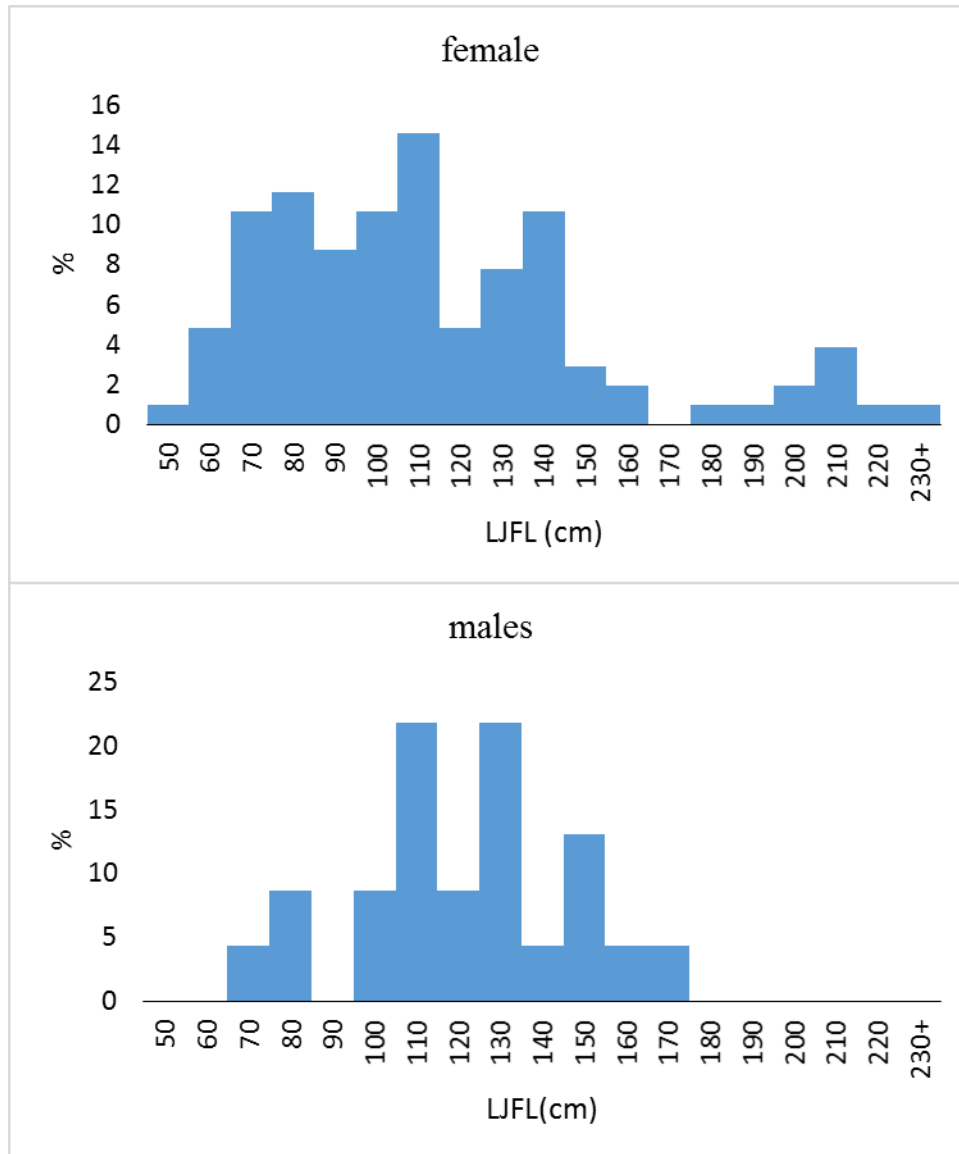
### 3.2. Size frequency of retained swordfish

The average fork length ( $\pm$ SD) for swordfish during the sampling period (Abril-June) was 118 cm ( $\pm$ 40). The Size frequency distribution showed the majority (80%) of captured swordfish ranging from 70 cm to 140 cm.



**Figure 3. Size frequency of swordfish observed on-board of longline vessels in southern Mozambique, during April to June 2015 (n=126).**

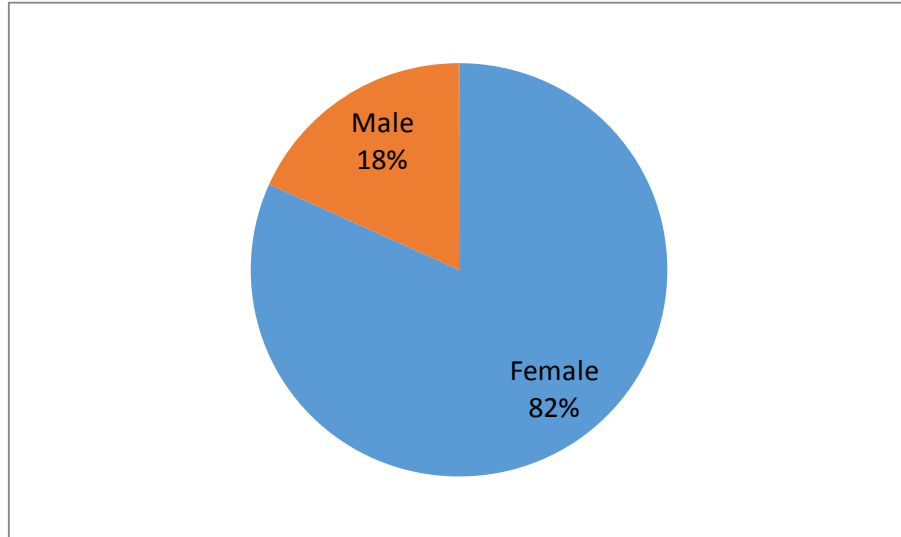
Average size for males was 125 cm ( $\pm$ 24) while for females was 117 cm ( $\pm$ 42). Females presented a distribution relatively broader than males, presenting some specimens longer than 170 cm (Figure 4).



**Figure 4. Size frequency of females (n=103) and males (n=23) of swordfish observed on-board of longline vessels in southern Mozambique, during April to June 2015.**

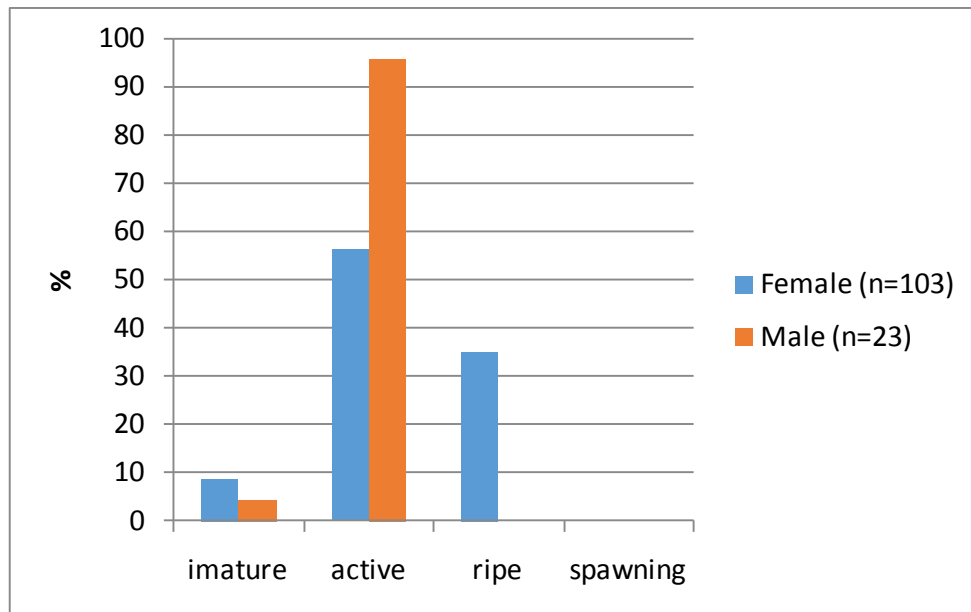
### 3.3. Sex ratio and maturation of retained swordfish

The swordfish found during the sampling period of April to June were dominated by females (Figure 5). The sexual ratio was one male for four females (ratio<sub>M:F</sub>=1:4).



**Figure 5. Sex of swordfish observed on-board of longline vessels in southern Mozambique, during April to June 2015 (n=126).**

During the period of April to June, the majority of males of swordfish (95%) presented active gonads (stage II) (Figure 6). Females gonads were both active (56%) and ripe (36%) during the same period (Figure 6).



**Figure 6. Occurrence of gonads maturing stages of swordfish observed on-board of longline vessels in southern Mozambique, during April to June 2015 (n=126).**