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Billfish caught in Mozambican waters

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ABSTRACT

This report is based on swordfish production and on board data collected from foreign flagged vessels and since 2012 from a national flagged longliner. Data collected in Mozambican coast by the national longliner refers to fishing carried out mainly in Sofala Bank between 17^0 and 19^0 30. The catch composition was comprised mainly by shark followed by tuna, dolphinfish, marlin, sailfish and the remained percentage by other species. Swordfish size composition as a whole varied from 100 to 280 cm with two modes on 140 and 160 cm. The most abundant species in the three provinces namely Maputo, Inhambane and Sofala covered by game fish was kingfish. Black marlin was the most abundant species in Inhambane province. Black and blue marlin were the species caught in the provinces covered by the artisanal data collection system from 2006 to 2010.

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1. INTRODUCTION

Between 1976 and 1979, several programmes were implemented to develop the tuna fishery using the longline and pole and line fishing techniques. The results of those programmes are described by (Simões 1984). Several attempts were made at developing a national tuna fishery, which involved experimental fishing to determine catch rates for both longline and pole and line gears .Between 1976 and 1979, experimental longline fishing was carried out using seven research vessels from the Soviet Union (Simões, 1984). Catch rates were generally good and higher in the north of Quelimane and during the winter, except in the central region. Overall, billfishes contributed with about eight percent of the catches.
Experimental fishing with baitboat was carried out in 1983 and 1984, involving a chartered vessel from Cape Verde.
Since 2000, with the development of the tourism industry, sport fishing has also developed, targeting billfish, mainly marlin and sailfish. Sport fishermen keeping trophy of billfish are subject to pay an additional taxes. Actually, the catch reporting system for the sport fishery is not operational; consequently catches are not reported to the fisheries administration.

Every year the Ministry of Fisheries issue licenses for foreign longliners and purse seiners for tuna and tuna like species. These vessels fish in the Mozambican EEZ. As tuna is a migratory species the vessels fish some months during the year.

Mozambique does not have a tuna national fleet but since the end of 2011 a longliner belonging to a Mozambican fishing company started fishing swordfish and other species in the Mozambican coast. Data began to be collected this year regarding species composition and length frequency distribution for the most abundant species, including swordfish. This species is also caught by foreign flagged vessels in the Mozambican EEZ.

The covered area was from 17^0 00´S (Nampula province) to $19^0$30’ (Sofala province) (Figure 1).

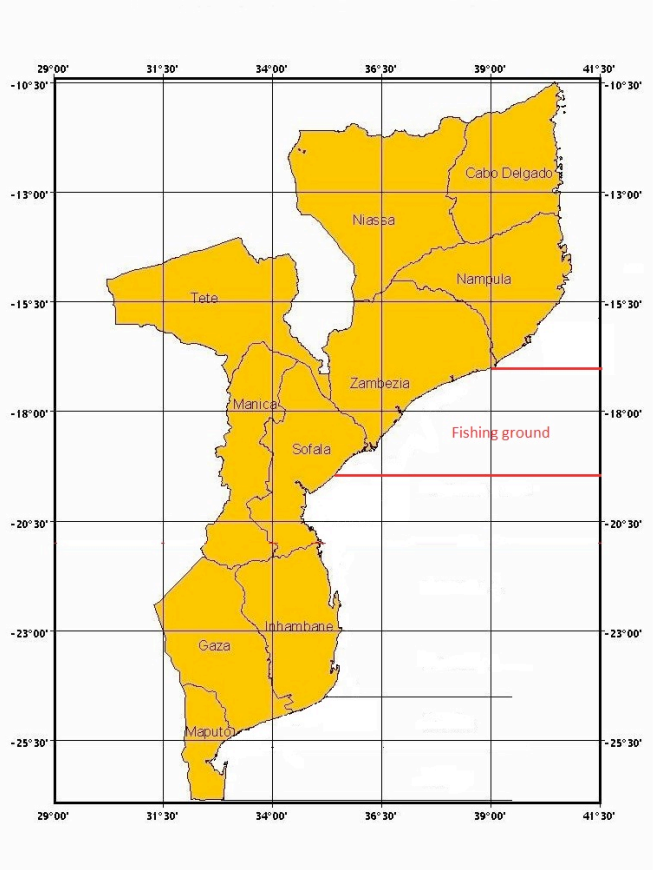


Fig. 1. Mozambique map showing main fishing ground.

2. Material and methods

There are two different sources of information used in this work, namely the data production from Fisheries Administration received every 10 days regarding catch by species and number of days, and on board sampling from Fisheries Research Institute started in 2012, on the national flagged longliner vessel. This sampling was carried out by an observer from the Fisheries Research Institute. The observer filled the IOTC sheets, species and length composition and total weight for the main species caught. The main characteristics of this national vessel are: 32.95 m total length, 406.47 GRT.

All the data from the production and on board sampling sheets were organized in spreadsheets.

3. Results and Discussion

3.1 Licenses

From 2005 to 2012, the number of fishing licenses issued to purse seine vessels operating in Mozambican waters ranged from 27 to 51. For the longliner vessels, the number of fishing licenses varied from 34 to 110. The number of licenses for both fleets has been decreasing since 2008.

Table 1. Number of fishing licenses issued per year , for the Mozambique EEZ from 2005 to 2012 (Source ADNAP annual reports).

Year	Number licenses purse seine	Number of licenses Longline	
	Foreign	Foreign	National
2005	44	99	
2006	47	95	
2007	51	110	
2008	47	75	
2009	41	70	
2010	34	37	
2011	34	38	1
2012	27	34	1

3.2 Catch and effort

All fishing vessels- foreign fleet

Table 2 shows number of fishing vessels and annual catch per primary species . The bulk of the catch (24.5%) is composed by skipjack, followed by yellow fin tuna (13.5%) and swordfish (7.5%) for the 2007-2010 period.

Table 2. Number of fishing vessels and annual catch per primary species, for the Mozambican waters from 2004 to 2012 (Source :ADNAP annual reports).

Year	No vessels	Skipjack	Albacore tuna	Bigeye tuna	Yellowfin tuna	Swordfish	Black marlin	Tuna	Total
2004									17470
2005	143								5629
2006	142								6668
2007	161	641	541	350	3402	218	1	428	5581
2008	122	2550	341	322	2647	209	9	471	6549
2009	111	1942	106	173	824	721	9	538	4313
2010	71	764	99	166	1267	600	27	603	3811
2011	73								
2012	62								

Based on swordfish data production for 2010 and 2011 from foreign flagged vessels, catch rates were plotted on a monthly basis. Annual total catches for 2010 ranged from 2 to 52 tons and 2.5 to 54.3 tons in 2011 while annual total effort varied from 79 to 241 days in 2010 and from 69 to 327 days in 2011. Catch rates showed peaks on July - August and September. (Figures 2, 3).

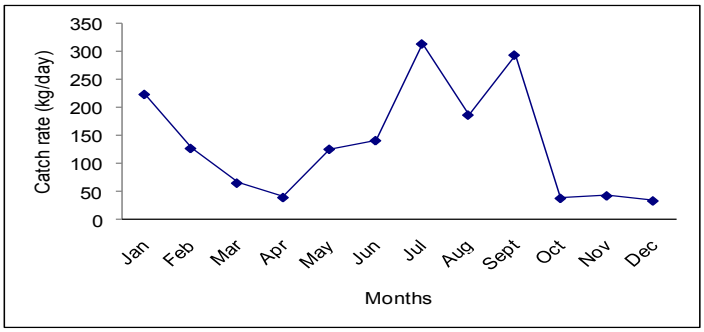


Figure 2. Catch rate by month from 2010 from foreign fleet.

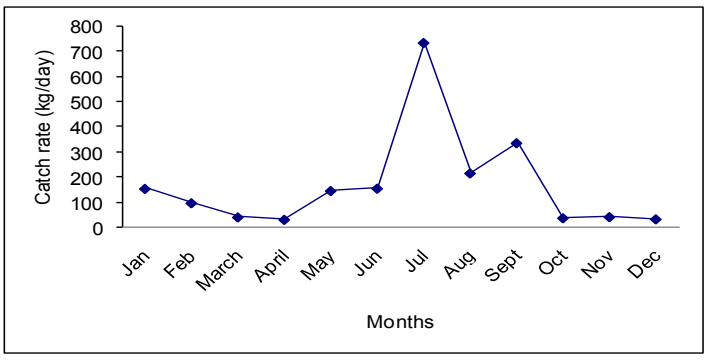
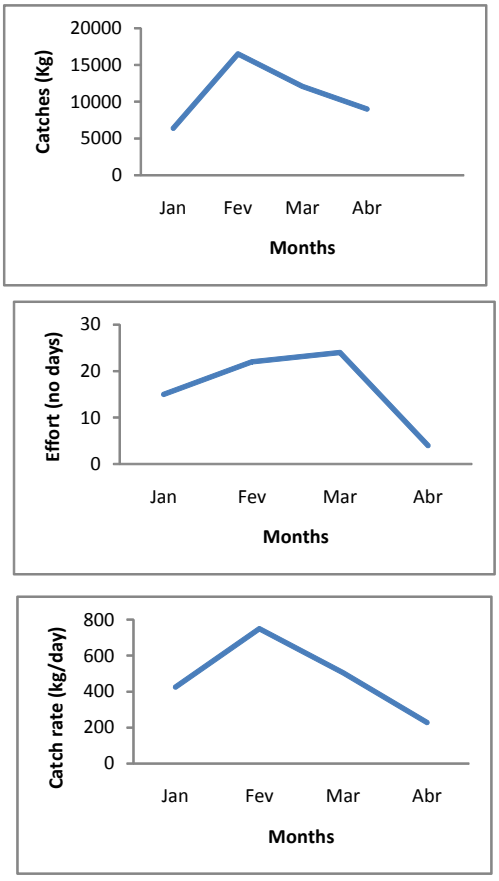


Figure 3. Catch rate by month from 2011 from foreign fleet.

From longliner swordfish data production catch, effort and catch rates were plotted on monthly basis. The catches increased from January to March and decreased in April due to reduced number of fishing days. Same happened to the catch rates.



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Figures 4,5,6 Catch, (Kg) effort(no days) and catch rate (Kg/day) for national longliner during 2012.

3.3 Catch composition

Based on data collected from on board sampling on the longliner, catch composition and swordfish length frequency distribution were determined. Most of the fishing was undertaken around 19^0 and the best catches were between 17^0 and 19^0.

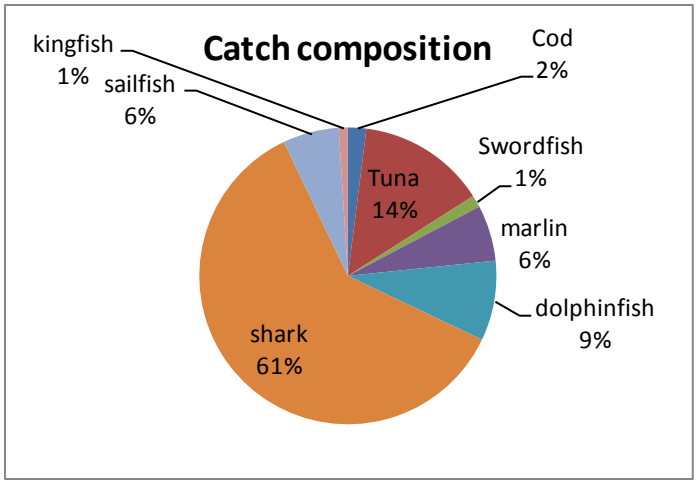

Figure 7 Catch composition of national longliner .

The catch composition was comprised by shark (61%) followed by tuna (14%), dolphinfish (9%), marlin (6%), sailfish (6%) and the remained percentage by other species. Tuna was composed by yellowfin (8%), bigeye (4%) and albacore (2%).

3.4 Size composition

As it was mentioned above the other source of information was on board sampling. Size composition was produced for swordfish for all fishing grounds (north and centre).

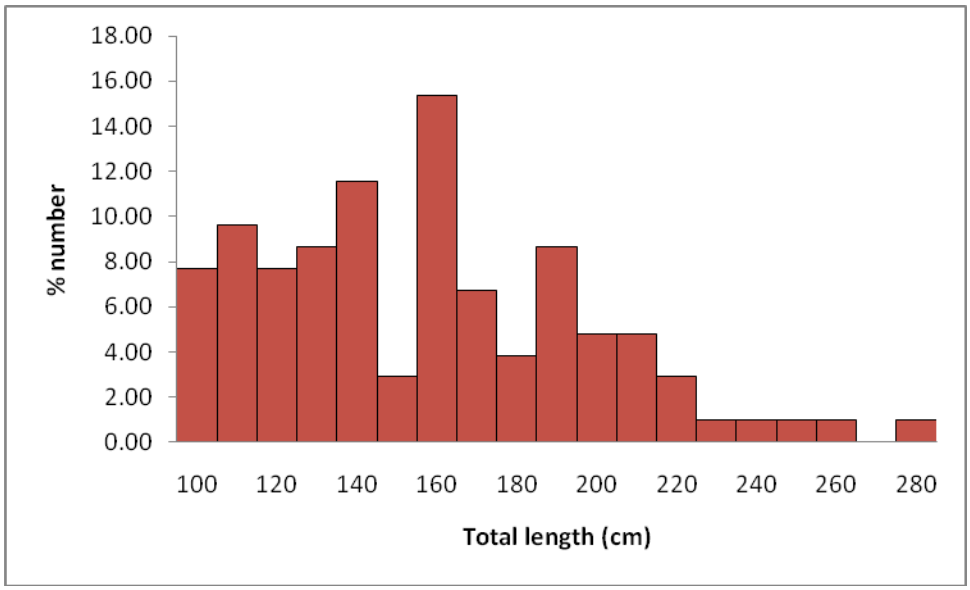

Figure 8 Size composition of *Xiphias gladius*.

Size composition as a whole varied from 100 to 280 cm with two modes on 140 and 160 cm. Mean total length was 161.83 cm.

3.5 Length-weight relationship

Length-weight relationship was also studied for 102 individuals sampled during the trip.

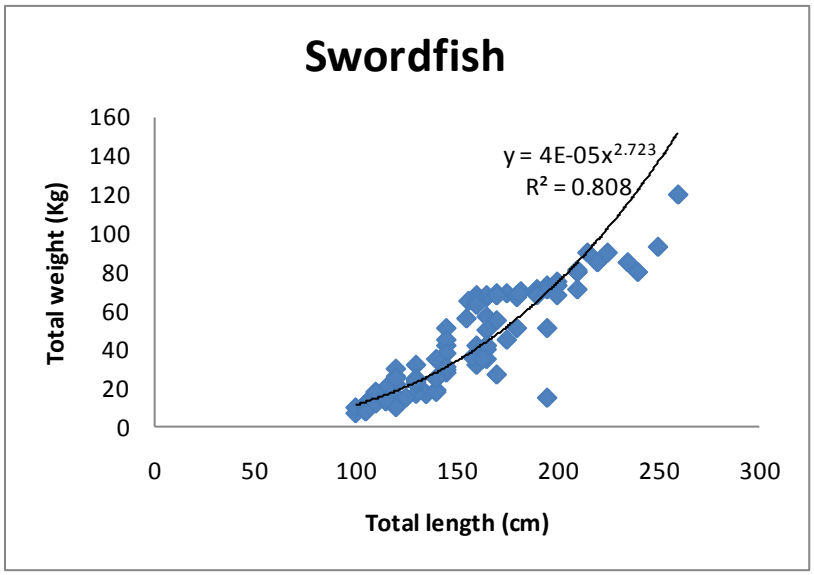

Figure 9. Length weight relationships for *Xiphias gladius*.

4. SPORT FISHING

During 2010, Fisheries Research Institute continued to collect data on game fish in different provinces, namely Maputo, Inhambane and Sofala. Kingfish was the species most caught in Maputo, Inhambane and Sofala province followed by yellowfin and kawakawa (Anon, 2010). Sofala province recorded the highest catch of kingfish followed by Inhambane province. In 2011, the most abundant species in the three provinces was kingfish (*Scomberomorus comerson*). *Makaira indica* (black marlin) was the most abundant species in Inhambane province (Table3).

Table 3. Main species caught (kg) in sport fishing in 2011 at Maputo city, Inhambane and Sofala province

Scientific name	Common name	Maputo city	Inhambane province	Sofala province
Acanthocybium solandri	Wahoo	235.5	171.2	
Auxis thazard	Frigate tuna		2.0	
Carcharhinus leucas	Shark	7		
Coryphaena hippurus	Dolphinfish	96.3	77.6	
Euthynnus affinis	Kawakawa	113.7	255	35.7
Istiophorus platypterus	Sailfish			8
Makaira indica	Marlin	90.0	2066.0	
Rachycentron canadum	Cod	18.2	15.2	20.9
Scomberomorus commerson	Kingfish	1566.8	618.9	329.7
Tetrapturus angustirostris	Shortbill spearfish		13.0	
Thunnus albacares	Yellowfin tuna	171.5	298.7	
TOTAL		2408.1	4403.6	685.4

5. ARTISANAL FISHING

Table 4 Artisanal fishing catches in tons

Common name	Species	Year	Maputo	Gaza	l'bane	Sofala	Zambezia	Nampula	C. Delgado
Marlim	Makaira indica	2006	0	0	0.05	0	0	0	0
Marlim	Makaira indica	2007	0	0	0	0	0	0	0
Marlim	Makaira indica	2008	0	0	7.92	0	0	0	4.77
Marlim	Makaira indica	2009	0	0	2.47	0	0	0	3.75
Marlim	Makaira indica	2010	0.17	0	0	0	0	0	0
Marlim	Makaira mazara	2006	0	0	0	0	0	0	0
Marlim	Makaira mazara	2007	0	0	0	0	0	0	0
Marlim	Makaira mazara	2008	0	0	0	0	0	0	0
Marlim	Makaira mazara	2009	0	0	0	0	0	0	4.13
Marlim	Makaira mazara	2010	0	0	0	0	0	0	27.55
Total tuna like Spp. (Billfish)			0.17	0	10.44	0	0	0	40.20

6. Recommendations

- The observer program should continue in order to collect information on catch and effort, species composition and biological characteristics of the main species to have a better knowledge of the resource.

7. References

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