

VULNERABILITY OF ELASMOBRANCHS AS LONGLINE BYCATCH IN THE GULF OF GABÈS (SOUTHERN TUNISIA, CENTRAL MEDITERRANEAN SEA)

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ABSTRACT

A survey of the bottom and pelagic longlines fisheries targeting groupers and swordfish was performed in the Gulf of Gabès in 2016 and 2017 in order to evaluate the elasmobranch catches. In the benthic longline fishery, the elasmobranchs represented about 50 % of the total catch (Batoids 25,6%, Sharks 24,5%) and the main species were the blackchin guitarfish (*Glaucostegus cemiculus*) and the hound sharks (*Mustelus spp.*). In the pelagic longline fishery, the elasmobranchs represented 91% of the total catches (Batoids 2,24%, Sharks 89,57%), and the main species was the sandbar shark (*Carcharhinus plumbeus*) with 82,5% of the total catch. The frequency distributions of TL showed that the catches of these species were mostly composed of juveniles, and few mature specimens, including some gravid females.

Key Words : Longline fisheries, elasmobranchs, juveniles, Gravid females, Gulf of Gabès

RESUME

Une étude des pêcheries de palangres de fond et de surface ciblant respectivement les mérus et l'espadon a été réalisée dans le golfe de Gabès en 2016 et 2017 afin d'évaluer les captures d'élasmobranches. Dans la pêche à la palangre benthique, les élasmobranches représentaient environ 50% des captures totales (batoïdes 25,6%, requins 24,5%). Les principales espèces étaient le poisson-guitare fousseur (*Glaucostegus cemiculus*) et les émissoles (*Mustelus spp.*). Dans les palangriers pélagiques, les élasmobranches représentaient 91% des captures totales (batoïdes 2,24%, requins 89,57%), et l'espèce principale était le requin gris (*Carcharhinus plumbeus*) avec 82,5% des prises totales.

Les distributions des fréquences des tailles ont montré que les captures de ces espèces étaient principalement composées de juvéniles. Quelques spécimens matures, y compris certaines femelles gravides sont aussi pêchées.

Mots Clés : Palangre, élasmobranches, juvéniles, femelles gravides, golfe de Gabès.

INTRODUCTION

Elasmobranchs are unintentionally caught in many fisheries, and these catches can often exceed the actual targeted species catches (BONFIL, 1994; MOLINA AND COOKE, 2012). Also, they are poorly reported in some fishery records making it difficult to assess impacts (BONFIL, 1994; BARKER AND SCHLUESSEL, 2005).

Longline fisheries are among the largest sources of shark catches (CORTÉS ET AL., 2010).

This work presents the results of a survey of the impact of the bottom and pelagic longline fisheries on elasmobranch populations of the Gulf of Gabès (Southern Tunisia) and focalised mainly on the capture of pregnant females and new born.

MATERIAL AND METHODS

During summer season 2016 and 2017, a total of 162 sets with bottom longline and 96 sets with pelagic longline were made on board three commercial longliners selected randomly from among 40 active vessels attached to the port of Zarzis (South of the Gulf of Gabès) where the longline fleet is concentrated.

Throughout the fishing operations, the date, geographical coordinates, fishing depth, number of hooks... were recorded. All individuals were identified and their total length (TL) and disc width of batoids (DW) (to the nearest millimetre) were recorded. The maturity status and stage (juveniles and mature) of specimens was determined based on studies conducted in the study area (SAIDI ET AL.,

2005, 2008, 2009; ENAJJAR ET AL., 2008, 2012, 2015).

RESULTS AND DISCUSSION

A total of 325550 and 116500 hooks were deployed respectively for bottom and pelagic longlines.

Bottom longline fishery

Bottom longline targeted benthic species such as groupers and seabreams. The grouper fishing season runs from May to September. During bottom longline surveys, 2965 marines' vertebrates were captured of which elasmobranch species represent more than 50% (Fig. 1).

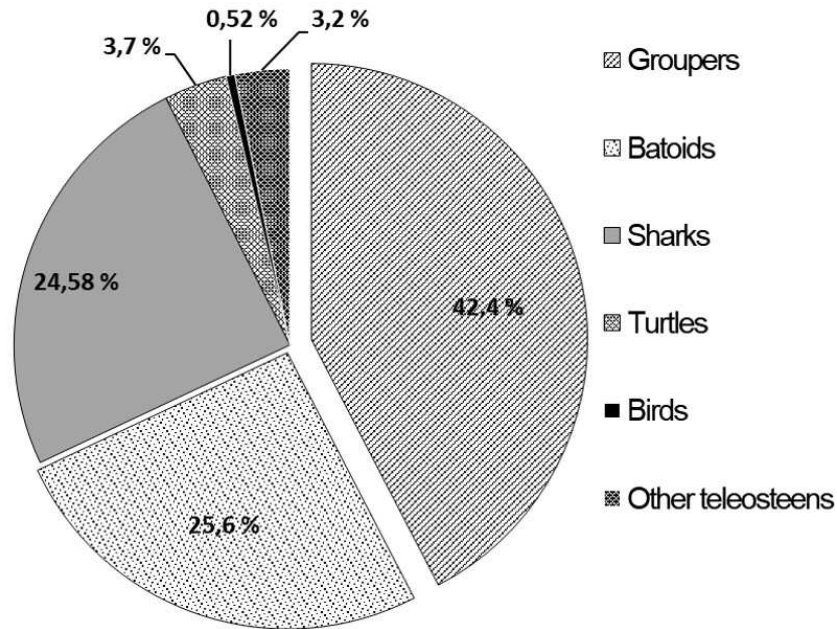


Figure 1. Composition of capture of bottom longline.

Among elasmobranchs species captured the blackchin guitarfish (*Glaucostegus cemiculus*), the sandbar shark (*Carcharhinus plumbeus*) and hound sharks (*Mustelus spp.*) were the most common. The size distribution shows that bottom longline catch mainly juveniles and sub-mature. In fact, only 20% of *carcharhinus plumbeus* captured are mature (Fig. 2). However, most of mature are pregnant females. The situation is similar for *Rhinobatos cemiculus* and

Mustelus spp.: 40 % of landed specimens were matures for both species (Fig. 2), and 10% were neonate.

The capture of neonate and young elasmobranchs in the Gulf of Gabès indicates that juveniles of these species utilize nearshore waters during their first few years of life and that fishing efforts occur in pupping or primary nursery areas (ECHWIKHI ET AL.,2014; SAIDI ET AL., 2016).

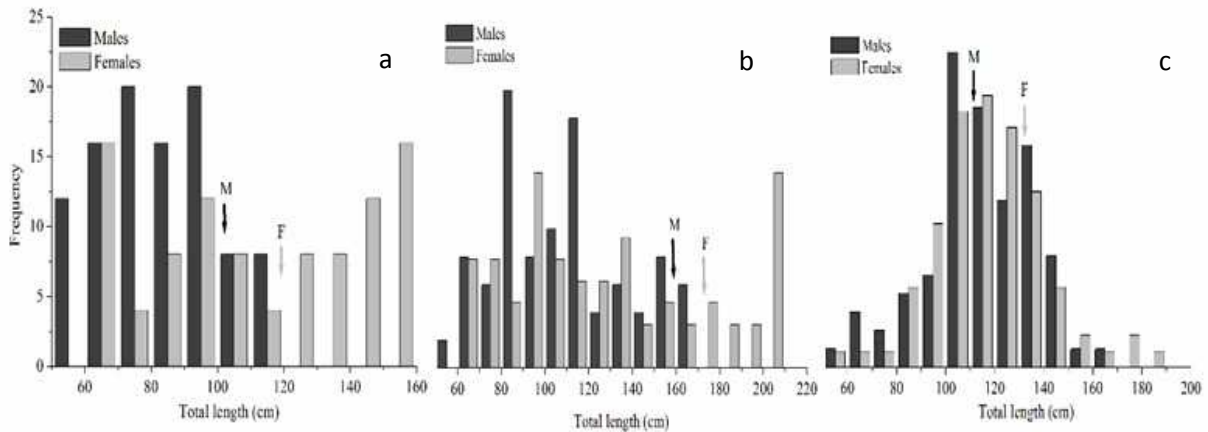


Figure 2. Size distribution of *Mustelus sp.* (a), *Carcharhinus plumbeus* (b) and *Glaucostegus cemiculus* (c) caught by bottom longline.

Pelagic longline fishery

Pelagic longline fishery operates from June to October but mainly during July and August. During this study 1251 marine vertebrates were captured by pelagic longline. Elasmobranchs represent more than 90 % of capture. Nine elasmobranch species were

captured by this gear (Sandbar shark, spinner shark, shortfin mako shark, smooth hound, pelagic stingray, blackchin guitarfish, bull rays, round stingray and thornback ray). The captures were dominated by the sandbar shark accounting about 82.5 % of capture (Fig.3).

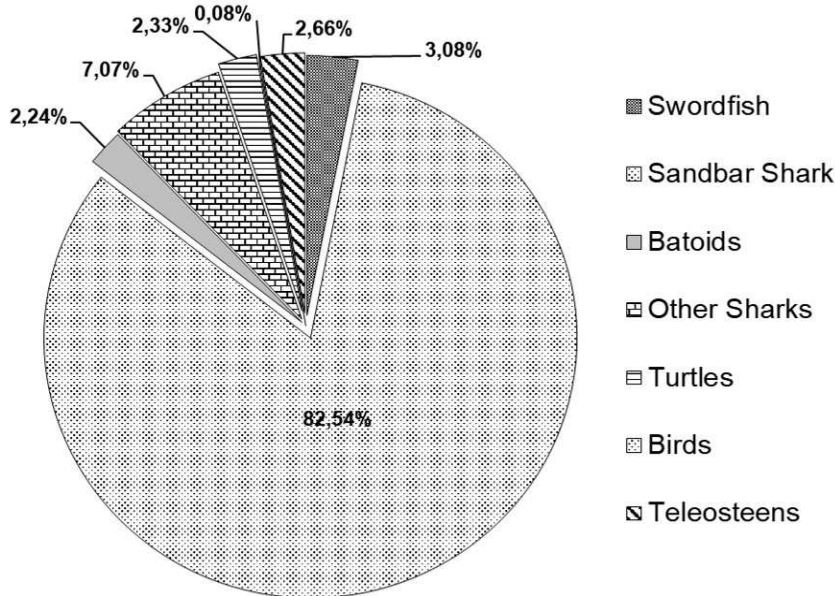


Figure 3. Composition of capture of pelagic longline.

This fishing activity reports in particular juveniles (Fig. 4). This area offers a refuge for juveniles and provide good conditions to develop (temperature, feeding...) (ENAJJAR ET AL., 2015). The catches region.

were composed of 10% of adult males and females, of which 20% were gravid. This situation threat the recruitment of shark population in the

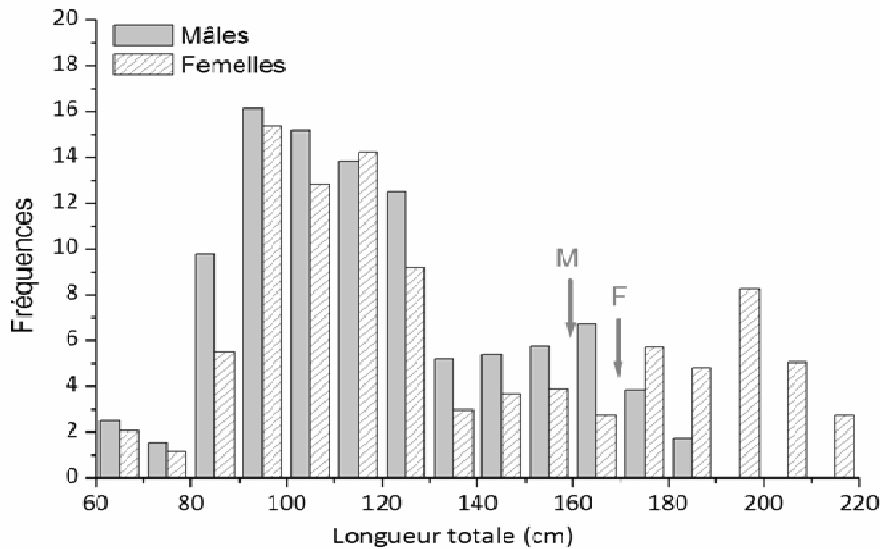


Figure 4. Size distribution of *Carcharhinus plumbeus* caught by pelagic longline.

Pregnant females of 7 elasmobranch species (Sandbar shark, smooth hound, blackchin guitarfish, shortnose spurdog, spinner shark, blue stingray, common eagle ray) were observed in the capture of the longline fisheries during this survey. These species move to nearshore water to give birth where conditions are

favourable. The capture of mature individuals of exploited species reduces their productivity and resilience and the sustainability of populations (SMITH ET AL., 2008). Management and conservation measures should be needed to protect

these vulnerable elasmobranch populations of the Gulf of Gabès.

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