Shallow water shrimp bycatch in Sofala Bank - Mozambique: Total catch estimates, discards and biology of main species

by
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Abstract

Penaeus indicus (white shrimp) and Metapenaeus monoceros (brown shrimp) are the main shrimp species caught in Mozambican coast in Sofala Bank making up 80% of total catch. The other fish species namely Otolithus ruber (croaker), Johnius amblycephalus (croaker), Johnius davissum (croaker), Pomadasys maculatus (grunts), Ychiurus lepturus (largehead hairtail), Pellona diglottus (indian sandeel), Thyasira vitrinosa (orangemouth thyasira) and Arius dussumieri (blacklip sea catfish), other crustaceans (small shrimps and Brachyura) (shrimp), cephalopods such as Loligo sp. (squids) and Sepia sp. (cuttlefish) form the shallow water shrimp bycatch (Palha de Sousa, 2002; Palha de Sousa, 2003; Palha de Sousa, 2004). Shallow water shrimp is caught by three different sectors: an artisanal fishery and semi-industrial and industrial fleets which operate until 70 m depth. The three sectors explore the stocks of the two main species, P. indicus and M. monoceros. The less abundant shrimp species such as P. otopus, P. monodon and P. leucostomus are caught by the industrial fleet when they fish at deeper waters (Palha de Sousa et al., 2009). The fleets operating in shallow water shrimp fishery are national and joint venture. The semi-industrial fleet works in two areas, one near Angra do and the other south of Beira (Ando and Machanga), both of them composed by national companies. During 2012, 14 ice semi-industrial vessels operated south of Beira. The number of vessels of the industrial fleet (including the semi-industrial with freezer) in the shrimp fishery was 57 in 2012 compared with 50 in 2011.

This paper summarizes the available knowledge of shallow water shrimp bycatch regarding to species composition, total catch and discards estimates and biological characteristics of the main species.

Introduction

Shallow water shrimp occurs mainly in Sofala Bank, which is located in the central part of Mozambique between 16°00’S and 21°00’S, at depths between 5 and 70 meters (Palha de Sousa, 2004a). The shallow water shrimp occurs along the coast mainly in mangrove areas where the juveniles grow. North of 3°30’S, the continental shelf is narrow with coral reefs and seaweed is difficult in these areas. Sofala Bank bottom is mostly sand/mud and the coastline is crossed by rivers, including the delta of the Zambezi with large areas of mangrove forests. The Sofala Bank features large amounts of fishery resources, on which some fisheries developed. Shallow water shrimp by catch species are composed of fish, other crustaceans and cephalopods (Palha de Sousa, 2002; Palha de Sousa, 2003; Palha de Sousa, 2004).

The climate of the provinces of Sofala, Zambezia and Nampula where the Sofala Bank is located is tropical and humid, with air temperatures ranging between 18°C and 35°C (Massingila and Hatton, 1997). This region experiences high rainfall with an annual average of 1400 mm at Beira. Rain falls throughout the year, but particularly in the summer (November to March). The winds are predominantly easterly/south-easterly (Dutton and Zolho, 1990).

The semi-industrial fleet work in two areas, one near Angra and the other south of Beira. During 2012, 14 ice semi-industrial vessels operated in Beira fishing ground. In the industrial fleet, the number of vessels (including the semi-industrial with freezer) in shrimp fishery was 57 in 2012. All vessels are trawlers. Shallow water shrimp total catch for industrial fleet was 2.129 tonnes and 122 tonnes for ice semi-industrial fleet (Palha de Sousa et al., 2013).

Aims

The general aims of on board data collection are to estimate total catch, retained and discards.

The specific aims of on board and at landings are to study catch species composition and size composition of the main fish species.

Methodology

During on board sampling program, three trawls were analyzed per day. Estimate of the total catch was done in two trawls and estimate of discards in the third trawl. It was considered as total catch, everything that was included in the net, such as all the marine organisms, stones, mud, old cans and as discards everything that was rejected to the sea. Retained catch was the catch retained on board for human consumption or for sale.

A sample of 20 to 30 kg, in the trawls selected from total catch and from discards, was collected to be analysed to get information on species composition, size frequency distribution for the main fish species.

During sampling at landings, information was collected from a sample of 20 to 30 kg of the total catch to get data on species composition and size frequency distribution for the main fish species in the trawls.

The fishing company provides information regarding position, depth and date where the samples were collected.

Results

Species composition

Bycatch data collection

Study area and description of the fishery

The covered area was from 16°00’S (Nampula province) to 21°00’S (Sofala province) at depths between 5 to 70 meters.

By catch is caught by artisanal, semi-industrial and industrial fisheries (including freezers semi-industrial).

Data presented in this study was collected on industrial fishery.

Otolithes rubber size composition

Total length varies between 6 and 10 cm with a mean of 8 cm. Most of the catch is discarded.

Smaller specimens found in north (Angra). Size increases from north to south. The largest sizes found near Beira.

Size composition of Johnius amblycephalus and J. dussumieri

Total length varies from 6 to 21 cm with a mean of 13 cm. Most of the catch is discarded.

Total length varies between 6 and 21 cm with a mean of 12 cm. Most of the catch is discarded.

Catch estimates

Estimates of shallow water shrimp by catch varied between 8512 and 13072 t in 2012. Shallow water shrimp by catch accounts for 81% of total catch, based on survey and on board data. Retained catch represents 41% total catch. Discards represents 40% total catch.

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References

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