Northwest Atlantic Fisheries Organization

Serial No. N4491 **NAFO SCR Doc. 01/103**

SCIENTIFIC COUNCIL MEETING – SEPTEMBER 2001
(Deep-sea Fisheries Symposium – Poster)

Historical Overview of the Black Scabbardfish (*Aphanopus carbo* Lowe, 1839) Fishery in Madeira Island

by

S. Reis [1], D. Sena-Carvalho[1], J. H. Delgado[1] and M. Afonso-Dias[2]

[1] Direcção de Serviços de Investigação das Pescas, Direcção Regional de Pescas, Estrada da Pontinha, 9000-017 Funchal, Madeira – Portugal, e-mail: sarareis@hotmail.com
[2] Faculdade de Ciências do Mar e do Ambiente, Universidade do Algarve, Campus de Gambelas, 8000-810 Faro, Portugal

Abstract

The black scabbardfish (*Aphanopus carbo* Lowe, 1839) is the most important resource exploited in Madeira Island (30º00'-33º10'N; 15º50'-17º20'W, in the North Eastern Atlantic). In the year 2000, around 4 200 tons of *A. carbo* were landed in Madeira. About 40 small traditional boats are now involved in this fishery, operating with horizontal drifting longlines. The main fishing grounds are located in the south coast of the island, from *ca* 800 to 1,200 meters deep. This poster describes the development of this fishery in Madeira and presents data on annual landings over a 60-year period. The annual catch size composition and the fishing effort employed in recent years (1998-2000) are analyzed. The technical characteristics of the fleet and the description of the fishing gear are also presented.

Introduction

The black scabbardfish (*Aphanopus carbo* Lowe, 1839) (Fig. 1) is a benthopelagic fish (family TRICHIURIDAE) with an extremely elongate and compressed body, living over continental slopes or underwater rises at about 200-1 600 m deep (Parin, 1986). It has a wide geographical distribution in the North Eastern Atlantic being present from Iceland (66ºN) (Magnússon and Magnússon, 1995) to the Canaries islands (28ºN) (Franquet and Brito, 1995).

The fishery of this species in Madeira ("Espada" fishery) dates back to 19th century, representing, as far as we know, the first intensive exploitation of a fishing resource captured from the meso-bathypelagic regions. The black scabbardfish is an important part of the diet of madeiran people and nowadays, is the most important fishing resource caught by the commercial fishing fleet in this island (Fig. 2).

The objective of this work is to present some background information on the Madeira island black scabbardfish fishery and to present recent data (1998-2000) on the catch size composition, fishing effort and catch per unit effort (CPUE) for this fishery.

Material and Methods

Landings by year (1940-2000) and data on the technical characteristics of the fishing vessels were available from the Madeira Fisheries Directorate databases. Landings for the period 1998-2000 were also available by vessel.

During the period of 1998-2000, a total of 17 192 fishes from commercial vessels were measured (total length, TL) by the Madeira Fisheries Laboratory (DSIP) in the fishing market of Funchal. All individuals were measured to

the centimeter below and grouped in 1 cm TL classes. The total weight of the sample was recorded to the nearest 1 kg. The number of hooks used by fishing set was recorded during a questionnaire made to the fishermen of each vessel sampled. This information was used to estimate fishing effort.

Results and Discussion

The annual landings of black scabbardfish during the last 60 years (Fig. 3) showed an increasing trend, particularly in the last twenty years. This evolution resulted from the improvements in the fishing gear and methods during the 1980s, with the replacement of the vertical drop-lines used earlier (Fig. 4) by the horizontal drifting long-lines, known as "espinhel de espada", still in use nowadays (Fig. 5). These gears are set *ca* 800-1 200 m deep in the water column. Another important factor contributing to the increase of the fishing efficiency was the improvement of the fishing vessels capacities namely their propulsion, auxiliary fishing and detection equipment, security conditions and the capacity of conservation of the catch onboard.

Since 1980 the madeiran black scabbardfish fleet decreased. In 1988 there were 95 traditional boats, most of them very small (around 6 m length) (Fig. 6). Nowadays, the fleet comprises *ca* 40 boats still with artisanal characteristics – in average with 13 m length, 19 tons and 150 Hp (Fig. 7) - operating with a crew of about nine men.

In the most recent years (1998-2000), the fishing effort increased from 14 003 to 17 379 thousand hooks while the total catch and CPUE decreased, from 4 430 to 4 203 tons and from 316 to 242 kg per thousand hooks, respectively. In this period, the annual catch size compositions were very similar (Fig. 8), with specimens ranging from 90 to 151 cm TL and presenting median values around 116 and 117 cm TL.

Final Considerations

The black scabbardfish fishery has a great economic and social importance in Madeira Island. In this very old fishery, traditional boats and a selective fishing gear are used to catch only adult specimens (larger than 90 cm TL).

The annual fishing effort increased in recent years (1998-2000), while the total annual catch and CPUE decreased. However, data for the previous years are needed before firm conclusions on trends can be reached.

At the present, it is necessary to understand the distribution of the black scabbardfish, particularly the migration patterns and stock discrimination, within the NE Atlantic. It is necessary to know if the black scabbardfish captured off Madeira island is part of a single population or not. This can be achieved by continuing the work initiated by an international team during a two year project " Study Project 97/0084 – Environment and Biology of Deep Water Species *Aphanopus carbo* in the NE Atlantic: Basis for its Management (BASBLACK)".

Acknowledgements

This work was sponsored by DG XIV of the European Commission through Study project 97/0084 entitled "Environment and biology of deep-water species *Aphanopus carbo* in NE Atlantic: basis for its management (BASBLACK)". Authors wish to thanks Mrs. Samantha Hughes and Dr Isabel Afonso-Dias for the English revision of the manuscript.

References

FRANQUET, F. and A. BRITO. 1995. Especies de Interés Pesquero de Canarias. Las Palmas GC: Gobierno de Canarias. Cosejería de Pesca y Transporte. 59 pp.

MAGNÚSSON, J.V. and J. MAGNÚSSON. 1995. The distribution, relative abundance, and biology of the deep-sea fishes of the Icelandic slope and Reykjanes Ridge. *In*: Deep-Water Fisheries of the North Atlantic Oceanic Slope. Hopper A. G. (Ed.). *NATO ASI Series. Serie E: Applied Sciences* – Vol. 296. 161-199.

PARIN, N. V. 1986. Trichiuridae. *In*: Fiches of the North-east Atlantic and the Mediterranean. Whitehead, P. J., M.-L. bauchot, J.-C. Hureau, J. Nielsen, E. Tortonese (Eds.). Vol. II. UNESCO, Paris. 977 pp.

Fig.1. Black scabbardfish (*Aphanopus carbo* Lowe, 1839).

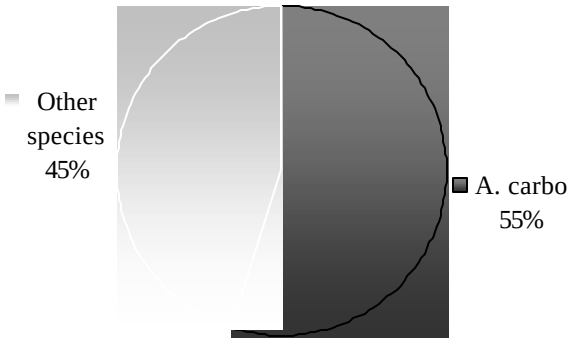

Fig.2. Percentage of *A. carbo* landed in Madeira during the period 1998-2000 *vs* all other species landed.

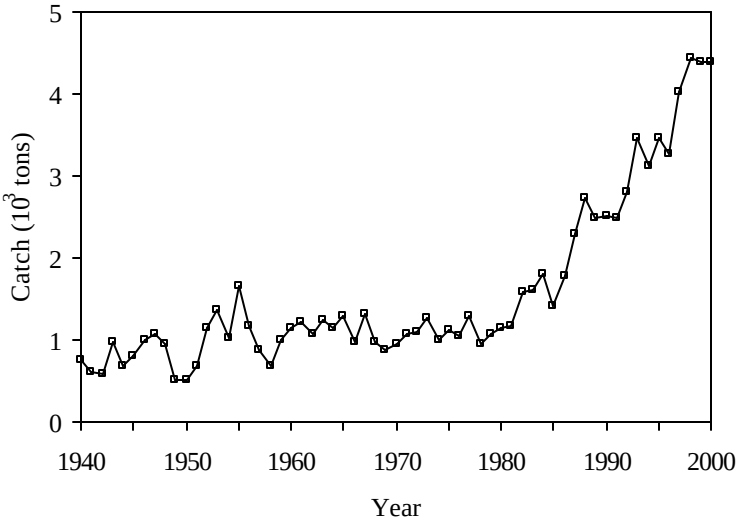

Fig.3. Black scabbardfish landings from Madeira, by year.

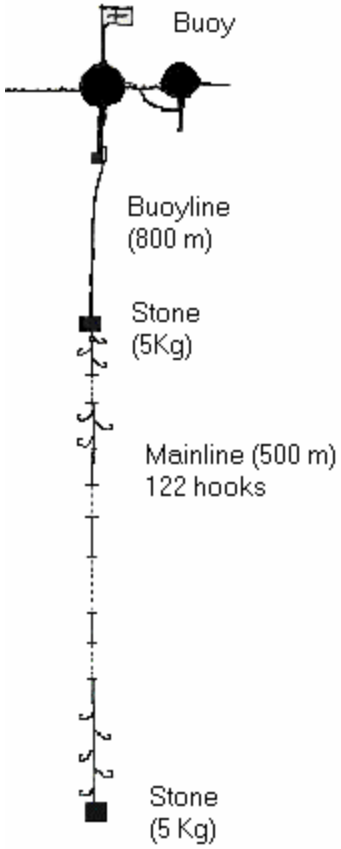

Fig.4. Drifting vertical drop-lines used until the 1980´s to capture A. carbo in Madeira. The lines of this gear were entirely manufactured with vegetable fibers like hemp in the village of Câmara de Lobos the principal center of the fishery of this species.

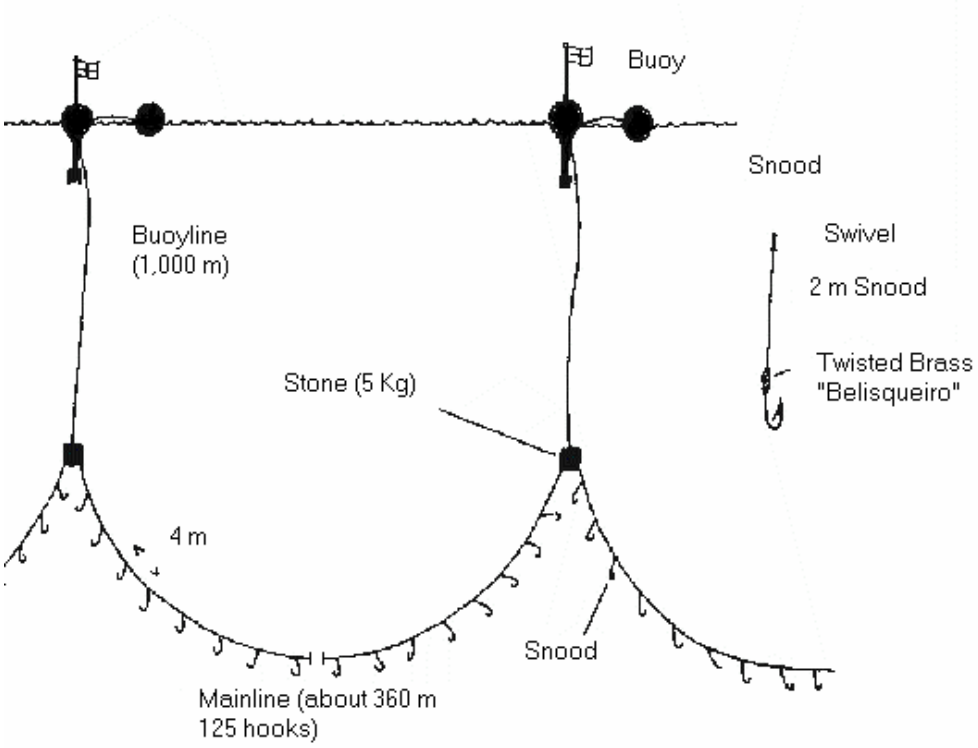

Fig.5. Drifting horizontal long-line used nowadays to capture A. carbo in Madeira. The setting of the gear in this way increased the yields allowing to allocate a large number of hooks, (3 000-4 000) in each fishing set, within the exact depth layer where this species is more abundant.

Fig.6. Typical boats from 1980s.

Fig.7. Typical boat from nowadays.

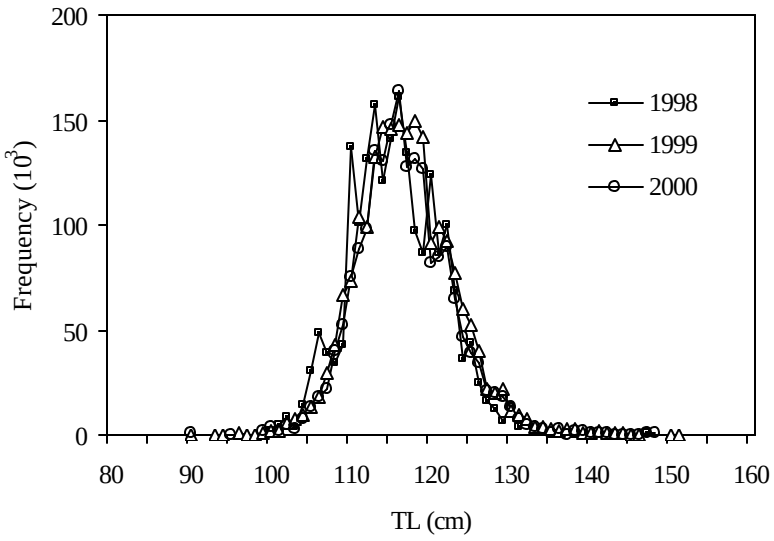

Fig.8. Black scabbardfish annual catch size composition during the period 1998-2000.