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FOUR CHONDRICHTHYES NEW FOR THE ARCHIPELAGO OF MADEIRA AND ADJACENT SEAMOUNTS (NE ATLANTIC OCEAN)*

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With 5 figures

RESUMO. Em 2004 realizou-se o cruzeiro de investigação RECPROFMAD-1 para prospecção da fauna demersal entre os 1.000 m e os 2.500 metros de profundiade, ao longo das vertentes da Ilha da Madeira e dos montes submarinos adjacentes. Como consequência deste estudo pioneiro, quatro espécies de condríctios são assinaladas pela primeira vez para o arquipélago da Madeira (Oceano Atlântico nordeste): *Etmopterus princeps* Collett, 1904, *Centrophorus niaukang* Teng, 1959, *Deania profundorum* (Smith & Radcliffe, 1912) e *Somniosus microcephalus* (Bloch & Schneider, 1801).

PALAVRAS-CHAVE: Chondrichthyes, *Etmopterus princeps*, *Centrophorus niaukang*, *Deania profundorum*, *Somniosus microcephalus*, Madeira, NE Atlantic, primeiro assinalamento.

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ABSTRACT. The slopes of Madeira and Seine and Unicorn Seamounts were surveyed between depths of 1,000 and 2,500 m of depth with bottom long-lines and baited fish traps, during a cruise by RECPROFMAD in October, 2004. The main object of this cruise was to identify new, potentially commercial species of fish and crustaceans and as a result of this pioneering effort, four chondrichthyes species were found, which were new to the area: *Etmopterus princeps* Collett, 1904, *Centrophorus niaukang* Teng, 1959, *Deania profundorum* (Smith & Radcliffe, 1912) and *Somniosus microcephalus* (Bloch & Schneider, 1801). Moreover, specimens of some of the above species previously deposited in the collection of the Museu Municipal do Funchal (História Natural) and not yet recorded, were also studied and are reported herein.

KEY WORDS: Chondrichthyes, *Etmopterus princeps*, *Centrophorus niaukang*, *Deania profundorum*, *Somniosus microcephalus*, Madeira, NE Atlantic, first record.

INTRODUCTION

There has been fishing activity in Madeira ever since the early days of the discovery, starting with the deep-sea shark fishery, which later gave rise to the black scabbard fish *Aphanopus carbo* fishery, one of the most important fisheries nowadays in Madeira. In fact the first specimen of *A. carbo* was caught by accident in 1839, when a drifting longline for deep-sea sharks was set out a little further from the coast, at a greater depth (MAUL, 1969; LEITE, 1988). This fishery using drifting longlines, takes place between 800 and 1,200 m of depth, on the slopes of Madeira proper and adjacent islands and seamounts. Apart from this well established commercial fishery, few attempts of deep-sea fisheries, at experimental and scientific level, were done and very scarce information on the fish fauna occurring on the islands' slopes is available.

The deep-sea fish fauna of Madeira (NE Atlantic) has been the object of a study by several ichthyologists over the last 150 years, *e. g.* R. T. Lowe (1802-1874), J. Y. Johnson (1820-1900) and G. E. Maul (1909-1997), who were responsible for the description of many new or little known deep-sea species, mostly caught in the stomachs of black-scabbard fish. Although the meso- and bathypelagic fish fauna has been surveyed during several research cruises, almost none has dealt with the deep demersal fish fauna, mostly because the rugged nature of the islands' sea floor makes bottom trawling a very tricky collecting method.

The Pescoprof-1 (Deep-water Fishing Resources of the Easter Central Atlantic) project was carried out to increase the knowledge about the deep-sea fauna and to search for new species of potentially commercial interest between 1,000 and 2,500 m. The new records of Chondrichthyes found during this project are reported herein.

MATERIAL AND METHODS

Between October 11th and November 9th, 2004, a research cruise named RECPROFMAD-1, took place along the slopes off the archipelago of Madeira and nearby seamounts (Fig. 1), on board R/V "Arquipélago". During this cruise the deep, demersal megafauna between 1,000 and 2,500m of depth was surveyed.

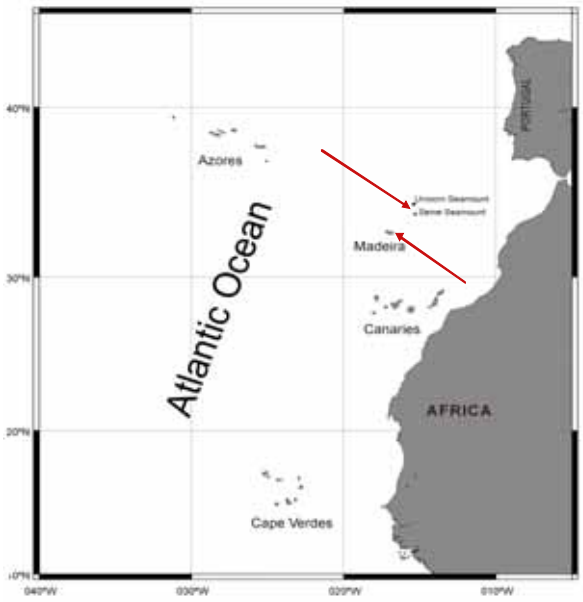

Fig. 1 - Areas surveyed during RECPROFMAD-1 cruise.

In Funchal Bay (32º 33' N, 16º 50' W) and Unicorn (34º 35' N, 14º 28' W) seamount, four longline hauls (1,128 hooks per haul) and four baited fish trap hauls (three traps per haul) were done, one haul in each depth strata (1,000; 1,500; 2,000 and 2,500m). In Seine Seamount (33º 45' N, 14º 22' W), two radial transects covering the two sides of the seamount were done, in a total of seven longline hauls (1,128 hooks per haul) and eight baited fish trap hauls (three traps per haul).

All specimens were measured to the nearest millimetre following YANO & TANAKA (1983) and total length (TL) was recorded. Unreported additional material from the collection of the Museu Municipal do Funchal (História Natural) (MMF) was also used in the present account.

All specimens reported herein are deposited in the collections of the MMF.

***Etmopterus princeps* Collett, 1904** (Fig. 2)

Fig. 2 - *Etmopterus princeps* MMF36113, 671 TL.

Material examined: MMF 23656, 22-08-1984; 709 mm TL female caught with bottom longline at 1,620 m depth in Funchal Bay; MMF 23657, 14-08-1984, two specimens, 654-702 mm TL, females caught with bottom longline ca. 1,200-1,500 m depth in Funchal Bay; MMF 23658, 23-08-1984, two specimens, 695-706 mm TL, females caught with bottom longline ca. 1,700 m depth in Funchal Bay; MMF 36086, 655 mm TL; MMF 36099, 472 mm TL; MMF 36101, 460 mm TL, all females caught with bottom longline at 2,000 m depth in Funchal Bay; MMF 36088, 543 mm TL; MMF 36138, 565 mm TL; MMF 36143, 576 mm TL, all males caught with bottom longline at 1,500 m depth in Seine Seamount; MMF 36093, 622 mm TL; MMF 36103, 570 mm TL, both males; MMF 36096, 620 mm TL, female, caught with bottom longline at 1,500 m depth in Unicorn Seamount; MMF 36113, 671 mm TL; MMF 36114, 493 mm TL, both females caught with bottom longline at 2,000 m depth in Unicorn Seamount; MMF 36125, 487 mm TL, female caught with baited fish traps at 2,000 m depth in Unicorn Seamount.

Remarks: This is the largest species of *Etmopterus* and can be distinguished from all other species of the genus by its lateral trunk denticles with fairly thick cups. This is a lanternshark of the continental slopes, usually living on or near the bottom at depths of 350 to 2,213 m (on the North Atlantic lower rise, between 3,750 and 4,500 m). It has been recorded from both sides of the North Atlantic. In the NE Atlantic it occurs from Greenland and Iceland to northwest Africa and Azores. Occurrences in the south Atlantic and western Pacific are uncertain (Compagno *et al*., 2005). This is the first record of this species from the archipelago of Madeira.

***Centrophorus niaukang* Teng, 1959** (Fig. 3)

Fig. 3 - *Centrophorus niaukang* MMF36027, 1,327 mm TL.

Material examined: MMF 36027, 1,327 mm TL, 25-10-2004, female caught with bottom longline at 1,000 m depth in Unicorn Seamount.

Remarks: Until recently in Madeira, this species has most probably been misidentified as *C. granulosus* (Bloch & Schneider, 1801). *C. niaukang* is one of the largest species of the genus and can be separated from *C. granulosus* by its snout (broader in this species), pectoral fin tips (shorter than in *C. granulosus*) and by its dorsal fins (second almost as large and as high as the first). It is usually found in outer continental shelves and upper slopes up to depths of 1,000 m in the Atlantic and Indo-Pacific oceans. (Compagno, 1984; Compagno *et al*., 2005). This is the first record of this species from the waters of Madeira.

***Deania profundorum* (Smith & Radcliffe, 1912)** (Fig. 4)

Fig. 4 - *Deania profundorum* MMF36063, 551 mm TL (Drawing by Helena Encarnação).

Material examined: MMF 22453, 26-07-1968, 587 mm TL, female caught with bottom longline at 400 m depth in Funchal Bay; MMF 25325, 28-01-1993, 891 mm TL, female caught with bottom longline at 900 m depth in Funchal Bay; MMF 25533, 01-02-1994, 990 mm TL, female caught with bottom longline at 1,000 m depth in Funchal Bay; MMF 25535, 02-02-1994, 1,017 mm TL, female caught with bottom longline at 600 m depth in Funchal Bay; MMF 25587, 23-03-1994, 588 mm TL, male caught with bottom longline in Funchal Bay; MMF 35993, 958 mm TL; MMF 35994, 730 mm TL; MMF 36008, 986 mm, TL, all females caught with bottom longline at 1,000 m depth in Funchal Bay; MMF 36115, 983 mm TL, female caught with bottom longline at 1,000 m depth in Seine Seamount; MMF 36063, 551 mm TL, female; MMF 36065, 699 mm TL, male caught with bottom longline at 1,000 m depth in Unicorn Seamount.

Remarks: This is the only species of *Deania* with a subcaudal keel beneath the caudal peduncle. It is a little-known dogfish of the upper continental and insular slopes, found on or near the bottom at depths of between 275 and 1,785 m in west and east Atlantic and Indo-west Pacific Oceans (Compagno *et al*., 2005). This is the first record of this species from the waters of Madeira.

***Somniosus microcephalus* (Bloch & Schneider, 1801)** (Fig. 5)

Fig. 5 - *Somniosus microcephalus* (MMF36218, 3,140 mm TL) at the wet laboratory of the Marine Biology Station of Funchal.

Material examined: MMF 23429, 19-10-1983, just the head, caught by R/V Challenger in Funchal Bay; MMF 36218, 13-07-2005, 3,140 mm TL, male caught with bottom longline at 1,000 m depth in Funchal Bay.

Remarks: This is the only species of *Somniosus* with a lateral keel present at the base of the caudal fin. It is a gigantic sleeper shark from the continental and insular shelves

and upper slopes to at least 2,000 m in the Arctic and North Atlantic. Rare in the Azores and the Canary Islands (Brito *et al*., 2002; Compagno *et al*., 2005), this is the first record of this species from the waters of Madeira.

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