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Bottom Long-Line Fishing for Deepwater Sharks on Sea-Mounts in the International Waters of the North Atlantic
(Elasmobranch Fisheries – Poster)

by

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Abstract

Deepwater sharks were fished with bottom long-lines during research fishing in the international waters of the North Atlantic, from the Icelandic Economic Zone to South Azores banks, in 1984-1997. List of sharks, areas of operation, fishing depth, data on sex and size composition of fish and catch per fishing effort are given.

Introduction

Many sea-mounts are found in the mid-oceanic North Atlantic (in international waters outside the 200-mile Economic Zones of coastal states). Fish fauna on these sea-mounts is poorly known. The PINRO research on several sea-mounts revealed aggregations of deepwater sharks which catches taken by long-lines were as large as commercial ones.

Results of research suggested possibilities for food and industrial fishing of sharks in international waters of the North Atlantic. Up to now no directed fishing on sharks on sea-mounts was conducted.

Materials and Methods

The paper presents data on Russian research fishing conducted onboard bottom long-liners in the area between 29°N and 61° N in January-April, August-September 1984-1997. Sea-mounts Amper and Josephine, South Azores banks, Mid-Atlantic Ridge, Reykjanes Ridge, Hatton and Rockall banks were surveyed in depth interval from 150 to 1683 m (Fig. 1).

Catches were found to contain 16 species of sharks from 7 families (Table 1).

Hepranchias perlo occurred in catch from depth 250-565 m on 5 banks of the South Azores in February-March. Males prevailed, sex ratio was 2:1. Their length (here and further the length was measured from the end of rostrum to the tip of caudal fin) varied from 86 to 120 cm, modal length was 111-115 cm, mean weight 3.6 kg. The length of females was from 84 to 126 cm, modal length 96-100 cm, mean weight 4.5 kg.

Stomachs of sharks of this species contained squid, horse mackerel, moray, longfin cod, mora, shrimp, blue-mouth, octopus, conger eel, greater forkbeard.

The average catch was 13 sharks per 1000 hooks, maximum catch was 63 fish. Their proportion in the total long-line catch was, on the average, 70%.

Carharius taurus also occurred in catch in February-March, however, only on two banks of the South Azores, in depth 270-440 m. Only one fish was examined with the length of 272 cm and weight 120 kg.

The catch of this species per 1000 hooks was about 0.5 fish, the average proportion in the long-line catch was 23%.

Galeorhinus galeus was found in February on 2 banks of the South Azores and Josephine bank in depth 270-500 m. The length of males in catch was 125-148 cm, females 130-145 cm. Mean weight of males and females was 9.5-10.0 kg. It fed on squid.

On the average the catch of this species per 1000 hooks was 1.3 fish. The proportion in the total long-line catch varied from 7 to 38%.

Galeus melastomus was found in long-line catch taken on the Josephine bank from depth 150-390 m in February and on the Reykjanes Ridge in August. Females were more plentiful than males, sex ratio 2:1. Their length varied from 28 to 85 cm, males had the length of 50-80 cm. On the Reykjanes Ridge the mean length of fish was 51.3 cm. Mean weight of males was 0.9 kg, females 0.7 kg. Fish stomachs contained conger eel, shrimp, squid.

The average catch of this species per 1000 hooks was 14 fish, maximum 24 fish. Its proportion in the total long-line catch was about 28%.

Apristus profundorum was represented in catch by single individuals and fished in depth 720-790 m on the Mid-Atlantic Ridge in February-April. Length of fish varied from 47 to 51 cm, mean weight was 0.4 kg.

Pseudotriakis microdon, like *Apristus profundorum*, was found in catch only as single individuals in depth 630-690 m on the Mid-Atlantic Ridge in February-April. Length of fish was 195-202 cm, weight 35-42 kg.

Average catch per 1000 hooks was about 3 fish, average percentage in the total long-line catch was about 50%.

Centrophorus squamosus occurred in long-line catch fished on the Mid-Atlantic Ridge, Rockall bank, Hatton Bank in depth 630-840 m in March-April. Length was 101-128 cm, mean weight of males 7.3 kg, females 8.1 kg.

On the Reykjanes Ridge it was found in long-line catch in August. The mean length of fish there was 118.3 cm, mean weight 13.3 kg.

The average catch per 1000 hooks was 8.2 fish. The proportion of this species in the total long-line catch varied from 8 to 13%.

Centrophorus granulosus Single individuals of this species were found in catch fished in 335-500 m depth on one of the banks of the South Azores. The length of one examined female was 155 cm, 28 kg.

Deania calcea occurred frequently in long-line catch from depth 335-840 m fished on the Josephina and Amper banks, banks of the South Azores and Mid-Atlantic Ridge, Reykjanes Ridge in January-April. It was most plentiful on Hatton and Rockall banks in depth 635-840 m. Catches contained males of 55-115 cm and females of 75-107 cm, weight of fish varied from 2.2 to 7.0 kg. Squid was found in stomach of one shark.

Catch per 1000 hooks varied from 2.6 to 26.2 fish, the proportion of this species in the total catch was as large as 66%.

Centroscymnus coelolepis was fished with bottom long-line in depth 560-940 m on banks of the Mid-Atlantic Ridge, Reykjanes Ridge, Hatton and Rockall Banks in January-April, August-September. The length of fish varied from 87 to 114 cm, weight from 5.2 to 15.0 kg. Mean weight was 10.1 kg.

Catch per 1000 hooks was 2-5 fish, occasionally as large as 12 fish. The proportion of this species in the total catch varied from 9 to 44%.

Centroscymnus crepidater was fished with bottom long-line in depth 635-840 m on banks of the Mid-Atlantic Ridge, Reykjanes Ridge and Hatton and Rockall Banks in January-April, August-September. The length of sharks varied from 55 to 135 cm, weight from 2.0 to 12.5 kg. Stomachs contained squid, viperfish, deep-sea eel and lantern fish.

The average catch was 6.9-13.8 fish per 1000 hooks, the largest catch was 25.7 fish, the proportion in the total catch being 7-23%.

Centroscyllium fabricii was rather plentiful in catch fished in depth 635-840 m on banks of the Reykjanes Ridge and Rockall bank in January-February. The length of fish was 63-129 cm, weight 8.0-10.1 kg.

Catch per 1000 hooks was 7.8-14.3 fish, their proportion in the total catch was 15-28%.

Etmopterus hillianus was most plentiful in long-line catch fished in depth 520-1050 m on banks of the Mid-Atlantic Ridge, Reykjanes Ridge, Hatton Bank in February-April and August. Males and females were equally represented in catch in number. The length of fish varied from 48 to 80 cm. Mean weight of males was 1.3 kg, females were somewhat larger - 1.9 kg.

Catch per 1000 hooks was up to 114 fish, average catch was 62.7 fish. The proportion of this species was as large as 98%.

Etmopterus spinax was quite frequently caught by long-lines in depth 560-960 m on the Josephine Bank, banks of the Mid-Atlantic Ridge, Reykjanes Ridge, Hatton and Rockall Banks in January-February, August-September. The length of fish was 40-83 cm. Weight varied from 0.3 to 3.7 kg, mean weight was 2.3 kg.

Catch per 1000 hooks was 33-151 fish, their proportion in catch was 10% and more, sometimes reaching 100% in individual catches by long-line.

Etmopterus princeps was most plentiful of all shark species in catch fished on the Reykjanes Ridge in August. Its proportion in catch was 29%. Their mean length was 82.1 cm, mean weight 3.2 kg.

Dalatias licha was fished in depth 160-680 m on the Josephine bank and 4 banks of the South Azores in February-March. It was represented in catch with individuals of 106-150 cm in length, mean weight 8.2 kg. Stomach of one of the examined sharks contained lantern fish.

Catch per 1000 hooks was 2-16 fish, their proportion in the total long-line catch was 7-70%.

Discussion

Information derived by us on the distribution and catch of deep-sea sharks in the international waters of the North Atlantic tells about the possibility of conducting a long-line fishery targeting these species. Simultaneously several species of sharks were captured by long-lines, their total catch was as large as 800-1000 kg per 1000 hooks. During research fishing only 40-60% of hooks were baited, therefore, increased level of baiting should be anticipated to enhance fishing efficiency.

Along with sharks other fish species (up to 30 species from various families) were found in long-line catch, some of them are currently commercially-important species.

So far status of stocks of fish, and sharks in particular, in the areas covered by research fishing remains unknown, therefore in the future the fishery should be conducted with collecting the information on biology of fish and data for stock assessment.

Table 1. Catches were found to contain 16 species of sharks from 7 families.

Family	Fish species	
	Scientific name	English name
<i>Hexanchidae</i>	<i>Heptranchias perlo</i>	Seven-gilled shark, Perlon
<i>Carchariidae</i>	<i>Carharias taurus</i>	Brown shark, Grey nurse shark
<i>Carcharhinidae</i>	<i>Galeorhinus galeus</i>	Tope, Sweet William tope shark, Penny's dog
<i>Scyliorhinidae</i>	<i>Galeus melastomus</i>	Black-mouthed dogfish
<i>Pseudotriaktidae</i>	<i>Apristus profundorum</i>	Deep-water shark
<i>Pseudotriaktidae</i>	<i>Pseudotriakis microdon</i>	False cat shark
<i>Squalidae</i>	<i>Centrophorus squamosus</i>	
<i>Squalidae</i>	<i>Centrophorus granulosus</i>	Black dogfish
<i>Squalidae</i>	<i>Deania calcea</i>	Shovel-nosed dogfish
<i>Squalidae</i>	<i>Centroscymnus coelolepis</i>	Portuguese shark
<i>Squalidae</i>	<i>Centroscyllium crepidater</i>	
<i>Squalidae</i>	<i>Centroscyllium fabricii</i>	Black dogfish
<i>Squalidae</i>	<i>Etmopterus hillianus</i>	
<i>Squalidae</i>	<i>Etmopterus spinax</i>	Black centrina, Lantern fish, Velvet belly
<i>Squalidae</i>	<i>Etmopterus princeps</i>	
<i>Dalatiidae</i>	<i>Dalati's licha</i>	Armor shark, Charlie's darkie

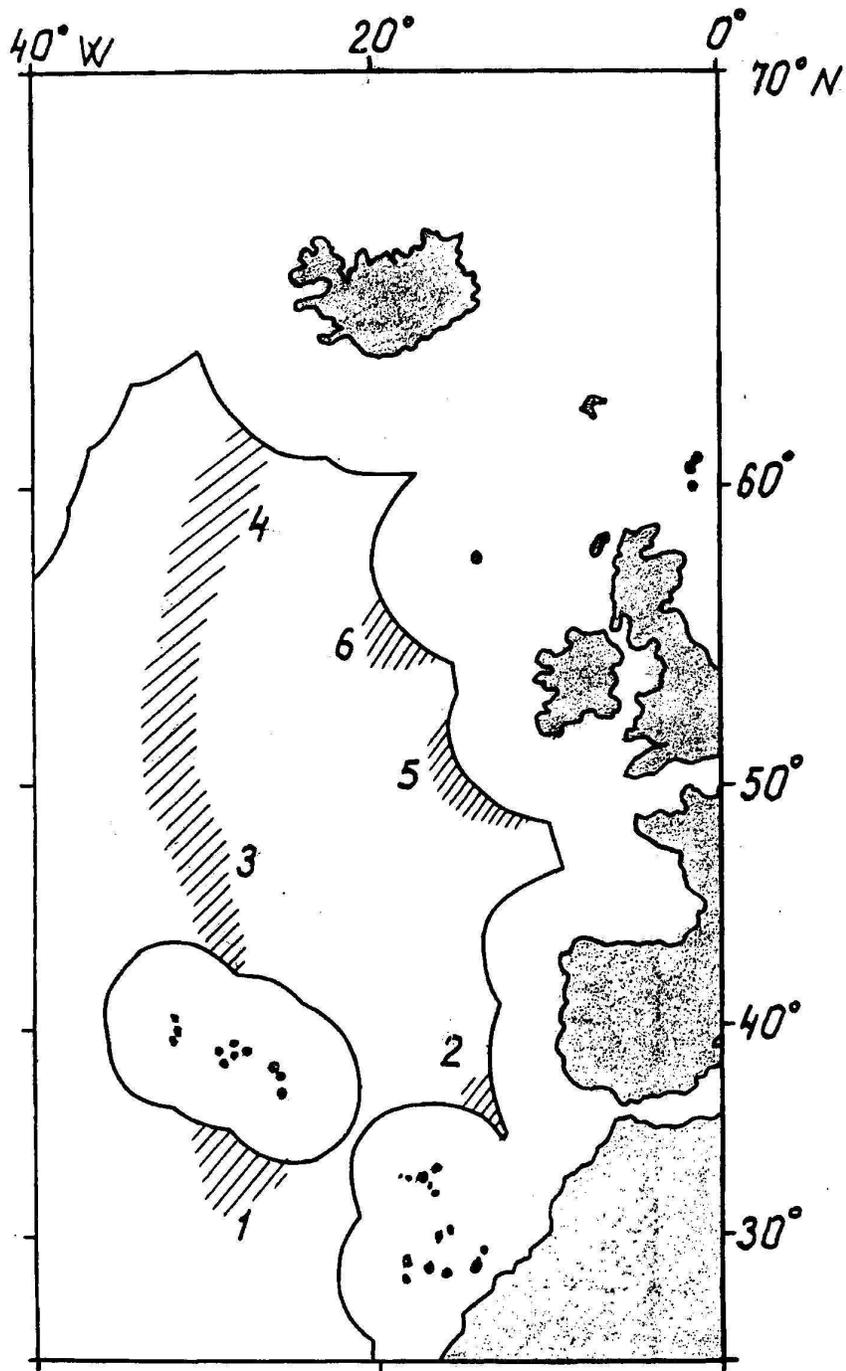


Fig. 1. Distribution of catch:
 1 - South Azores banks; 2 - Josephine sea-mount; 3 - Mid-Atlantic Ridge; 4 - Reykjanes Ridge; 5 - Hatton bank, 6 - Rockall bank.