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Migrations of Spotted Wolffish (<u>Anarhichas minor</u> Olafsen)

in West Greenland

by

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Abstract

During the years 1955-1964 a total of 679 spotted wolffish were tagged with Petersen disc tags along the West Greenland coast. From these experiments 53 recaptures were reported showing generally short distance migrations but few long-distance migrations were seen. Tagging experiments in the Nuuk area are discussed with the results of some longline experiments to make probably the occurence of local seasonel movements.

Introduction

Spotted wolffish (<u>Anarhichas minor</u>) is the dominant wolffish species in inshore Greenlandic waters. It is fairly abundant along the coast from south to about 73° N and is found occasionally so far north as $77^{\circ}.5$ N.

The biology of spotted wolffish in West Greenland waters is not well known. It is generally assumed that adult wolffish exhibit a southern migration counteracting the northern movement of the larvae.

In this paper the migration pattern is deducted from tagging experiments, and on catch-per-effort data from research fishery in the Nuuk area. The results are discussed in relation to the general assumption of the biology and results of taggings experiments in Barents Sea and northern Norway (Østvedt, 1963) and in the Newfoundland area (Templeman, 1984).

Materials and methods

During 1955-64 a total of 679 spotted wolffish were tagged at several localities along the West Greenland coast from 61°N to 72°N. (Fig. 1). Tagging was carried out mainly in four areas : 1) Nuuk; 2) Maniitsoq and Sisimiut; 3) Disko Island and 4) Upernavik Kujalleq. Fish for tagging were obtained from long-line catches. The fish were tagged with Petersen discs. The fish had a range of 52 - 127 cm total length.

Catches from 268 longline sets (345.000 hooks) in the Nuuk area by Greenland Fisheries Investigation during 1955-79 have been analysed. For analysis the longline sets have been grouped according to the location (offshore, inshore and fiords) (Fig. 2). The depth range of the sets was 60 - 360 m. L.

Results

Recapture of tagged fish

Table 1 summarises data on the 53 recaptures reported. The location of a relativly large part (19%) of the recaptures is unknown or un~ certain. Likewise the time of recapture of some fish is uncertain.

The time spent in the sea from time of tagging to the time of recapture varies from 1 day to 13 years. However 88% of the recaptures were caught more than half a year after tagging.

Most of the recaptures (67%) were taken within 10 n.miles of the tagging area (Table 1) . Only 5 fish migrated more than 60 n.miles, 3 in a southern, 1 in a northern and 1 in an eastern (inshore) direction. No clear relationship between distance migrated and the time spent at sea is seen (Fig. 3).

From the tagging experiments in the Nuuk area, fish have been tagged mainly in the outer Godthåb Fiord (Fig. 2). Of a total of 19 recaptures 8 were recaptured less than 10 n.miles from the tagging locality, 6 from 15 to 60 n.miles inshore in Godthåb Fiord, 4 from 15 to 20 n.miles south and west of Nuuk, and 1 was recaptured 110 n.miles north of Nuuk. The relatively many recaptures in an inshore direction could be interpreted as an occurrence of a local migration pattern.

Variation in catch-per-effort

From the tagging experiments it is not possible to detect any seasonal movement, therefore an analysis of longline experiments done in different months in the Nuuk area were performed. In the inshore area there is a marked peak in mean catch pr.100 books (CPUE) in June, and in the flords a similar peak in July (Fig 4). In the offshore area there seems to be no difference in CPUE between the months of investigation.

Discussion

Hansen (1968) puts forward the theory that adult spotted wolffish lives chiefly in the southern part of West Greenland waters from where they propagate. Hansen further suggested that the larvae in the southern area seek the surface and then are carried by the current towards north where they settle at the bottom. When reaching maturity they migrate to the southern spawning grounds. This theory was based partly on differences in length distribution observed in fishing experiments along West Greenland (Fig. 5 from Hansen, 1959) and partly on the occurence of wolffish larvae in the plankton.

The results in the present study are biased because fishing effort is not evenly distributed in the area. The fishery for the spotted wolffish in the period has been mainly an inshore longline fishery close to Cities and settlements and all recaptures were made from inshore or coastal localities.

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However the migration pattern in this study does not give support to Hansen's theory. The recaptures reported indicate that adult spotted wolffish may be considered mainly stationary, although examples of long distance migration are found. Only few fish had migrated in a southern direction.

Although the number of recaptures is small these results from West Greenland waters are similar to those reported by Østvedt (1963) from tagging experiments in the Barents Sea and Templeman (1984) from the Newfoundland area.

The tagging experiments in the outer Godthåb Fiord shows 6 recaptures in inshore direction out of a total of 19. The recaptures were taken between 8 and 121 months after tagging. These results could be taken as an indication of an inshore migration although the possibility of bias in distribution of fishing effort should be remembered.

The CPUE figures from longline experiments show peaks in June in the inshore area and in the fiords in July (Fig 3). This may be interpreted as a seasonel movement to the inner area in summer.

It is concluded that spotted wolffish are mainly stationary with only local seasonal movements, possibly related to spawning and feeding.

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Time spent in sea from time of tagging to time of recapture and distance as well as direction between location of tag- ging and location of recapture.						
Distance	Direction	Tagging locality	Length at tagging			
n.miles			Cm			
420	south	Sisimiut	68			
120	south	Upernavik Kujaleq	66			
110	north	Nuuk	110			
70	south	South of Sisimiut	94			

Time

Table 1. Tim me of recapture and cation of taggin

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*Distance probably less than 10 n.miles.

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Fig 1 : Migrations of spotted wolffish. (Circles are tagging sites with numbers of fish tagged, triangles with numbers represent fish recaptured < 10 n.miles from tagging locality and tips of arrows are location of recapture).

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<u>Fig 2</u> : Migrations of spotted wolffish in the Nuuk area. (Triangles represent fish recaptured < 10 n.miles from tagging lacality, arrows are locality of recaptures and numbers are years between tagging and recapture).

Line represent the division of the area in offshore, inshore and fiords for the analysis of catch data.







<u>Fig 4</u>: Relationship between mean CPUE and time of the year in the Nuuk area.

offshore area	• • • • • •
inshore area	
fiords	

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<u>Fig 5</u>: Length frequencies of spotted wolffish from three regions A, Div. 1A north (72 08 N); B, Div 1A south 69 28 N); C, Div 1B-1C. (from Hansen, 1959)