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A Contribution on the Age and Growth of Roundnose Grenadier (Coryphaenoides rupestris GUNN) at West Greenland (NAFO Subarea 1)

by

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Introduction

The roundnose grenadier is a commercially important species of fish and is found extensively in the North Atlantic. However information about its biology, age and growth is so far very limited. One significant reason for this is, that the lack of an objective method of age determination prevent so far a routine determination of age. The situation in this respect is very similar to that of the redfish species. Measuring of the length of the roundnose grenadier presents an additional problem because a large part of the tails are already broken off or regenerated when the measurement is carried out. The present paper is dedicated to this problems.

Material and Methods

The examined material consists of measurement made on scales collected by the FRV "Walther Herwig" in April 1979 on a research cruise in the waters off West Greenland. SAVVATIMSKY (1971) has already demonstrated that the scales of roundnose grenadier are more suitable for age determination than the otolites. For this purpose the scales must be read in polarised light. KOSSWIG (1971) described a method of age determination for species of redfish which was successfully used with the roundnose grenadiers (KOSSWIG 1974). KOCH (1976) describes a method for otolites, but notes that this method does not give satisfactory results as the age increases (with lengths about 70 cm). Our method of determination already in use with both species of redfish in the ICES area and

which is generally found to be satisfactory, is again briefly described here. The scale specimens are subjected to a preparatory treatment, leading to a final reading in polarised light, which takes place thus: In order to remove the organic residue, the scale specimens are treated in a 5 % solution of KOH for 20 minutes. For this purpose the individual specimens are put in small, completely porous curlers of PVC. Then they are thoroughly rinsed under running water and finally dried. The scales are then transferred to small glass jars. In these they are impregnated in darkness with a 1.5 % solution of silver nitrate for about four hours. The duration of the impregnation is generally dependent on the size of the scales. After impregnation they are spread out on plexiglass slides (approximately 10 x 8 cms) and exposed to the rays of a 60 watt UV-lamp for about 2 minutes. The scales can than be read under polarised light. It may be of interest to point out that the method described here is essentially the same as that of SAVAGE (1919). The advantage of the impregnation in silver is in the colouring of the individual growth zones up to 20 years and above, which show up clearly when observed in polarised light. There is no doubt about their identity as growth zones, as SAVVATIMSKY (1971) has already shown. Splits and other irregularities on the surface of the scales are also clearly recognizable and should be regarded as such. The sources of error in age determination of the roundnose grenadier, pointed out by SAVVATIMSKY (1971), are to a large extent eliminated by the impregnation in silver.

The difficulties encountered in the measurement of the length have already been referred to at the beginning of this paper. The total length can only be rarely determined beyond doubt. We therefore determine the total length of fish that are visibly intact and also the preanal length. The regression line thus calculated is depicted in Figure I. It is evident that the line must be supplemented on future research cruises, above all with length data of bigger fish, thereby enabling one to coordinate the measured preanal length with the total length.

Results

Scales of 364 roundnose grenadiers have been read. Of these 290 (80 %) could be dated with certainty. On the remaining 20 % of fish, the scales were regenerated.

It can be seen from Tab. I that 10 year classes were represented in the research vessel catches, of which the 9 to 13 year olds (year classes 1960-1970) amounted to 83 %. The mean lengths at age in Tab. II were derived from the regressionline in Fig. I.

The data presented here on age and growth rate of the roundnose grenadier show that this species has a long life cycle, and a many aged population structure.

References:

KOCH, H., 1976 : A contribution on the methodics of age determination in Roundnose Grenadier (Coryphaenoides rupestris Gunn). ICNAF Res. Doc. 76/IV/28 Revised

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Table I

Age-Length Key for roundnose grenadier (Coryphaenoides rupestris Gunn) at West-Greenland in 1979

Age Praenallength/ cm	1973 6	1972 7	1971 8	1970 9	1969 10	1968 11	1967 12	1966 13	1965 14	1964 15	n
6.5	1										1
7.0		1									1
7.5		2	2								4
8.0	1	2									3
8.5			3	2							5
9.0		1	5	5	1						12
9.5	1	1	5	5	3						15
10.0		2	8	9	3						22
10.5			1	11	4	2					18
11.0				6	13	3	1				23
11.5			2	2	2	5		1			12
12.0				2	4	9	5				20
12.5				1	3	5	11	5			25
13.0					2	6	20	3	1		32
13.5					1	4	7	5			17
14.0						6	13	5	1	1	26
14.5						3	7	3		1	14
15.0						4	8	5	4		21
15.5							3	2			5
16.0							3	2	1	1	7
16.5							1	2		1	4
17.0							1				1
17.5							1	1			2
n	3	9	26	43	36	47	81	34	7	4	290

Table II

Age composition (°/oo) and mean length by age of roundnose grenadier (Coryphaenoides rupestris Gunn) at West - Greenland in 1979

Year class	Age	°/oo	Mean Length
1973	6	10	38.1
1972	7	31	40.5
1971	8	90	45.1
1970	9	148	48.7
1969	10	124	52.8
1968	11	162	60.7
1967	12	280	65.1
1966	13	117	67.3
1965	14	24	69.7
1964	15	14	72.2
		1000	

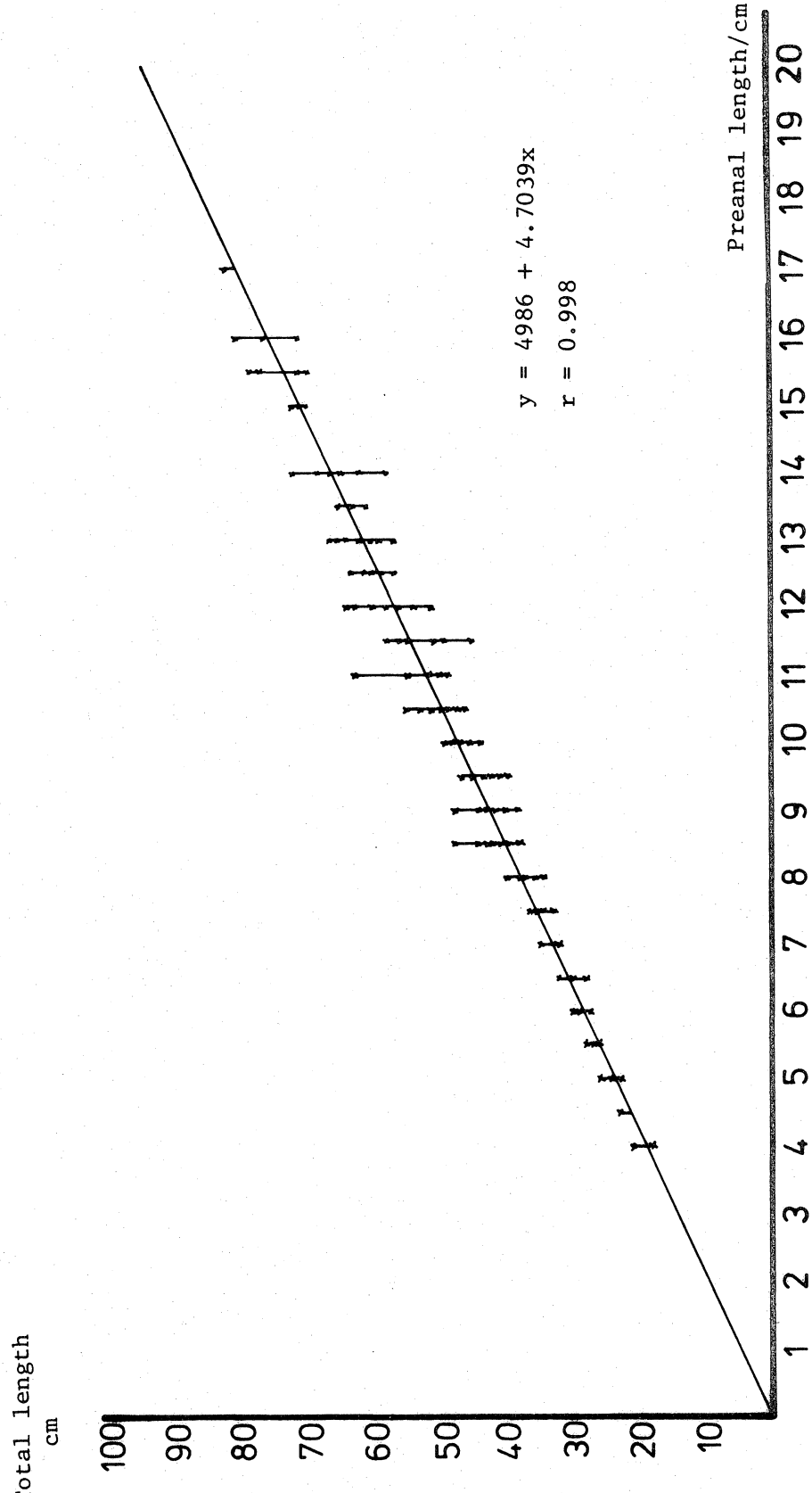

Fig. 1. Relation total length - Praenal length of roundnose grenadier (Coryphaenoides rupestris GUNN) at West Greenland.