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Age and Growth of Redfish (Sebastes marinus L and S. mentella TRAVIN) off SW-Iceland

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Introduction

Apart from CHEKHOVA (1971) and KOSSWIG (1971) the age determination of the redfish is a problem scarcely discussed in recent literuature. This fact is to be attributed on the one hand to the hitherto completely insufficient ageing methods on the other hand to the remarkably slow growth rate of redfish which makes age determination significantly more difficult. This is also one of the essential reasons why this commercially important fish has been so neglected. Very sparse age determinations prove this. We are of the opinion that the method of age determination, which was described by us and brought to discussion in 1971 more or less without success, gives sufficiently objective results. In this way the population analyses of the various redfish stocks in the North Atlantic can be in our view taken up and supported. It may be pointed out that the same method with other slow-growing types as for example the grenadierfish (Macrurus rupestris GUNN.), whose otoliths are similarly not suited to age determination, gives good results. We are further of the opinion that the age determination of the scales in polarized light which is preceded by an impregnation of silver can be very valuable in those cases where there is lack of clarity in the age determination of the otoliths. This has already been tried successfully by SAVAGE (1919).

In this report the first more extensive German age determinations by this method of both types of redfish off SW-Iceland are given.

Material and Methods

The material comes from landings of German and Icelandic trawlers at Bremerhaven. The samples were taken between October 1972 and May 1973. From each fish 30 - 40, or sometimes even more, scales were taken from various parts of the body. The large number of scales is dependent on the great rate of regeneration in all regions of the body. The original method described by us (ICNAF Res. Doc. 71/90) has essentially remained the same. However, it does vary in some points. The scales are now treated in a 2 % solution of KOH to clean off foreign bodies and mucus clinging to them. Otherwise they would

produce a strong reaction with the silver nitrate, which is shown by a complete blackening of the scalesand obscuring the zone formation on the surface. The scales are then thoroughly washed in water and put into a bath of 1 % silver nitrate. The scales are kept in the dark until completely impregnated. Before the age determination they are exposed to the light of a 500 watt lamp for two minutes. On the scales treated in this way the process of age determination is finally carried out.

Results

In table I and II the slow growth rate of redfish is again clearly confirmed. This fact can be seen also from the number of age groups which are taken by the fishery. Age determinations by other authors from Icelandic waters were not available to us, so that comparisons could not be made. If one compares the average length of S. marinus and S. mentella it becomes clear that S. marinus grows at least in some stages of life more quickly than S. mentella. We do not yet want to draw any further conclusions from these age determinations. They should be left to more thorough investigations in the near future.

We are in agreement with the Russian authors that scales of the redfish are better suited for age determination than otoliths. The age determinations of otoliths cannot be accurately carried out, because of the numerous secondary rings, particularly with older specimen.

References

1) CHEKHOVA, V.A.; 1971: On the method for the determination of age and growth rate in redfish. ICNAF Res. Doc. 71/90

2) KOSSWIG, K., 1971: Polarisationsoptische Untersuchungen an den Schuppen des Rotbarsches (Sebastes marinus L. und S. mentella TRAVIN) Ber. Dt. wiss. Komm. Meeresforsch. 22 : 219-225

3) KOSSWIG, K., 1971: Investigations into Age Determination of Redfish (Sebastes marinus L. and S. mentella TRAVIN) ICNAF Res. Doc. 71/127

4) SAVAGE, R.E., 1919: Report on Age Determination from scales of young Herrings with special reference to the use of polarized light.
Fish. Invest. Ser. II, Vol. IV, No.I, pp. 1-27.

Tab. I

Age Length Key of Redfish (Sebastes mentella TRAVIN)
off SW - Iceland in 1972

Age / Length in cm	1960 12	'59 13	'58 14	'57 15	'56 16	'55 17	54 18	'53 19	'52 20	'51 21	'50 22	'49 23	'48 24	'47 25	'46 26	'45 27	'44 28	'43 29	n
30	1		2																3
1		1	2																3
2				1															1
3	1			2															3
4			1																1
35				4	1	2													7
6				1	3	1	1												6
7					1	1	4	7											13
8						3	5	13	1	1									23
9					1	1	6	16	3	6	1	1							35
40						1		18	9	18	6	2							54
1								14	7	23	10	2							56
2								4	5	20	27	15	5						76
3										10	13	32	10						65
4										5	15	41	20	3	1				85
45									1	1	7	37	21	6	2		1		76
6											1	18	15	7	5	1			47
7												13	11	3	7	2			36
8												2	5	4	20	1	2		34
9													1	5	4		1	2	13
50														1	3	2	3		9
1													1		1				2
2																			-
3																			-
4																			-
n	2	1	5	8	6	9	16	72	26	84	80	163	89	29	43	6	7	2	648
Mean Length	32.0	31.5	31.7	34.7	37.0	37.8	38.5	40.4	41.1	41.8	42.5	44.7	45.4	47.1	48.1	48.5	49.0	49.5	

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Tab. II

Age Length Key of Redfish (Sebastes marinus L.)
off SW-Iceland in 1972

Age / Length in cm	1960 12	'59 13	'58 14	'57 15	'56 16	'55 17	'54 18	'53 19	'52 20	'51 21	'50 22	'49 23	'48 24	'47 25	'46 26	'45 27	'44 28	'43 29	– n
30	1																		1
1																			-
2	3	1																	4
3																			-
4			4	2															6
35			5	7	1		1												14
6		1	5	6	4	1													17
7			3	4	5	4	1	1	1										19
8			2	1	8	3	7	2											24
9				1	4	3	4	7	2			1							22
40					1	4	5	12		2									24
1						3	3	9	2	2									19
2							7	7		4		1							19
3								5	1	2	1	1							10
4								2			2	5							9
45											3	4	1						8
6												2	2	1					5
7												7			1				8
8												5	4		4	1			14
9												2	5	4					11
50												1		3	4				8
1													1	2	3		1		7
2												1	1		5	1	1		9
3												2	1	1	1	1	1		7
4															1				1
55															1				1
6																			-
7																		1	1
8																			-
9																			-
	4	2	19	21	23	18	28	45	6	10	7	32	15	11	20	3	3	1	268
Mean Length	32.0	34.5	36.2	36.4	38.1	39.3	40.2	41.2	40.5	42.1	43.8	47.1	49.2	50.2	51.2	51.5	52.5	57.5	