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On the method and results of age determination of redfish in Subarea 1

by

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### Introduction

Although the slow growth rate and the great age of commercial sized redfish is accepted as a matter of fact by most experts, there is no perfect method of ageing redfish as yet. The difficulties of scale and otolith interpretations arise from the unusual great age at relative small size. Meanwhile, most of the authors concerned with ageing redfish, agree that the scales are more suitable for age determination than otoliths (CHEKHOVA, 1971, HAUNSCHILD 1978, KOSSWIG 1971, SURKOVA 1961). The method of ageing redfish developed as a routine method in the Institute for Sea Fishery and applied to both species (*S. marinus* L. and *S. mentella* TRAVIN) in the ICES area is generally found to give satisfactory results. This paper describes briefly the method used and its results.

### Material and methods

The material was collected on a research cruise of FRV "Walther Herwig" to West Greenland in April 1979. The scale samples were obtained in the normal manner and conserved for later evaluation in small paper bags. 30 to 50 scales were taken from each fish. In the laboratory they are subjected to a preparatory treatment, leading to a final reading in polarised light, which takes place as follows:

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 10x8 cms) and exposed to the rays of a 60 watt UV-lamp for about 2 minutes. The scales can then 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 more distinct illustration of the growth zones in polarised light is due to the double refracting properties of the scales which are still intensified by the optical orientated storage of silver compounds during the described treatment. For the examination of redfish scales at polarised light a stereomicroscope normally used for age determinations was fitted with a polarisation equipment by mounting the polarisator underneath the object-table and placing one analysator in each ocular.

#### Results

The results of the age determinations are given in Tab. I and II as age length keys. In fig. I the Bertalanffy growth curves are given for *S. marinus* and *S. mentella* respectively. The mean lengths obtained from the age readings in Tab. I and Tab. II do satisfactorily fit in the calculated growth curves.

#### References

- CHEKHOVA, V. A., 1971 : On methods for the determination of age and growth rate in redfish. ICNAF Res. Doc. 71/90
- HAUNSCHILD, G., 1978 : Method of age determination of redfish used in G.D.R. and results. C.M. 1978/G:44 Demersal Fish Committee.
- KOSSWIG, K., 1971 : Investigations into age determination of redfish (*S. marinus* L. and *S. mentella* TRAVIN) by means of polarised light. ICNAF Res.Doc. 71/127
- SAVAGE, R. E., 1919 : Report on age determination from scales of young herrings with special reference to the use of polarised light. Fishery Investigations, Series II, Vol. IV, No. I
- SURKOVA, E. I., 1961 : Redfish Growth and Age ICNAF Spec. Publ. No. 3, ICES/ICNAF Redfish Symposium

Table 1. *Sebastes marinus* - Age Length Key - Greenland West - 1979

Age/ Length	1972 7	1971 8	1970 9	1969 10	1968 11	1967 12	1966 13	1965 14	1964 15	1963 16	1962 17	1961 18	1960 19	1959 20	1958 21	n
17	1															1
18																2
19	2															2
20	2															2
21	1	1														2
22	2	17	1													20
23		16	4													20
24		29	4													33
25		20	21	1												42
26		3	23	4												30
27			21	19	1											43
28			6	16	15	2										43
29			1	11	18	6										38
30				8	17	8		1								36
31				1	9	25	2									34
32					6	45	6	1								37
33					2	25	8	9								58
34						22	16	11								44
35						2	13	23	2							51
36							3	12	3	1						42
37							1	6	11	4						27
38							3	8	16	8						27
39								1	11	8	3					22
40									8	2				1		24
41												3		3		9
42												3		5		7
43												3		3		7
44												1		3	2	6
45													1	3	2	4
n	8	86	81	60	68	136	49	67	51	24	4	15	13	8	6	676
Mean/ Length	20.50	24.19	26.39	28.50	30.15	32.54	34.42	35.50	37.58	38.63	40.25	41.17	42.27	43.13	43.83	

Table 2. *Sebastes mentella* - Age Length Key - Greenland West - 1979

Age/ Length	1973 6	1972 7	1971 8	1970 9	1969 10	1968 11	1967 12	1966 13	1965 14	1964 15	1963 16	1962 17	1961 18	1960 19	1959 20	1958 21	1957 22	n
18	2																	2
19	4																	4
20	2																	2
21	1	2	1															4
22	1	1	5															7
23		1	7	1														9
24			11	2														13
25			11	9														20
26				14	2													16
27				12	13	2												28
28					5	8	1											16
29				1	6	15	3											30
30					1	4	21	4										31
31						6	11	6	1									24
32						3	8	7	1									19
33							3	5	1									14
34							1	6	7	2								14
35							3	7	3	2	2							13
36							2	3	3	3	6							11
37											6							16
38											7	2						11
39											2	5						11
40											4	4						7
41											2		1					8
42													2					1
43														4				3
44														1		2	1	3
45																	2	3
n	10	5	35	39	27	38	56	24	24	19	16	15	3	5	2	6	3	327
Mean/ Length	19.10	21.70	24.21	26.47	28.17	29.84	30.91	32.29	34.50	36.39	37.38	38.03	40.17	40.70	40.50	43.50	43.50	

Fig. I  
Bertalanffy growth curves  
Of *S. marinus* and *S. mentella*  
in Sub - Area I.

