



SCIENTIFIC COUNCIL MEETING – JUNE 2009

Size-age and sex composition of Greenland halibut *Reinhardtius hippoglossoides* from commercial catches in the area off West Greenland in 2008

by

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Abstract

Data on biology of Greenland halibut collected by Russian observers from commercial catches in October-November 2008 in NAFO Division 1AD are presented. Fishery was conducted by bottom trawls with minimum mesh size 140 mm at depths of 920-1545 m. Halibut 26-98 cm in length, mainly 46-54 cm, aged 5-8 was harvested. Sex ratio was 1.5:1.0. In Division 1A the bulk of catches was made up of immature fish, while in Division 1D of mature specimens.

Introduction

Since 1992 the Russian Federation has been allocated a catch quota for Greenland halibut off West Greenland. Biological samples have been collected by PINRO observers in this area since 1999.

In 2008 Russian observers carried on studies in West Greenland area and obtained new information on biology, distribution and fishery of Greenland halibut. The aim of this paper is to present main results of these studies to the NAFO Scientific Council.

Material and methods

Data on Greenland halibut were collected by PINRO observers on Russian fishing vessels in October-November 2008 in NAFO Division 1AD (Fig. 1). Halibut was harvested by bottom trawls with minimum mesh size of 140 mm in Division 1A (68°50'-69°49' N, 58°58'-60°14'W, 1000-1250 m in depth) and 1D (63°37'-63°54' N, 57°01'-57°56'W, 1000-1499 m in depth). Trawlings were most often made at depths of 1000-1300 m (78% of fishing efforts) with 76% of harvested fish from the total catch.

Collection and preliminary processing of biological material were conducted according to PINRO methods (Anon., 2004). Maturity of Greenland halibut was estimated by the following scale: 1 – immature fish (sex is hardly defined), 2 - immature (sex can be defined), 3 - maturing, 4 - pre-spawning, 5 – spawning, 6 - post-spawning fish. Stages 6-2 and 6-3 imply post-spawning recovery for males and females, correspondingly.

The age of Greenland halibut was estimated from intact scales reading under a binocular and according to the procedure suggested by T.M. Igashov. (Treble and Dwyer, 2008).

Studies made during all period:

- measurements of the body length - 14405;
- sex and maturity determinations - 3227;
- age readings - 455.

Results

Size-age composition

In Division 1A catches were made up of halibut 28-82 cm in length; males 42-51 cm and females 46-50 cm were prevalent (Fig. 2A). Most large fish distributed at 1100-1199 m depths, in deeper and shallower depths smaller halibut were caught (Fig. 3).

In Division 1D the size composition of halibut comprised fish 26-98 cm in length. Males 49-53 cm and females 50-55 cm in length were predominant (Fig. 2B). Fish trended to have a decreased length with increase in depth of trawling (Fig. 4).

In the area off West Greenland as a whole halibut 26-98 cm in length were caught. The most numerous size group of males was 48-52 cm, one of females – 48-55 cm (Fig. 2C).

In Division 1A catches were made up of males aged 3-14 mostly 5-6 year-olds and females aged 4-16 mostly 5-7 year-olds (Fig. 5A).

In Division 1D males aged 3-12 were fished with prevalent specimens aged 8-9. The age of females was 3-21 years with 12-13 year-olds being predominant (Fig. 5B).

In West Greenland, as a whole, males aged 5-8 were prevalent in catches as well as females aged 6-9 and 12-13 (Fig. 5C).

Size composition and maturity

In Division 1A and 1D sex ratio was 1.2:1 and 1.8:1, correspondingly, the total males-females ratio in the area studied was 1.5:1 (Fig. 6).

In Division 1A the bulk of catches was formed by immature specimens: 79.3% of males and 93.2% of females (Fig. 7A). In Division 1D the portion of immature fishes was lower: 21.7% for males and 68.8% for females (Fig. 7B).

In both Divisions 1A and 1D most of mature specimens had ripening gonads (Fig. 8). Moreover, pre-spawning specimens were observed to a small extent (1,3%) in Division 1D (Fig. 8).

References

- Anon. 2004. Instructions and methodical guidelines on collection and processing of biological information in the seas of the European North and North Atlantic. 2nd edition. Moscow, VNIRO Press. 300 pp.
- Treble, M.A., and Dwyer. K.S. 2008. Report of the Greenland Halibut (*Reinhardtius hippoglassoides*). Age Determination Workshop. NAFO Scientific Council Studies. No. 41. 90 pp.

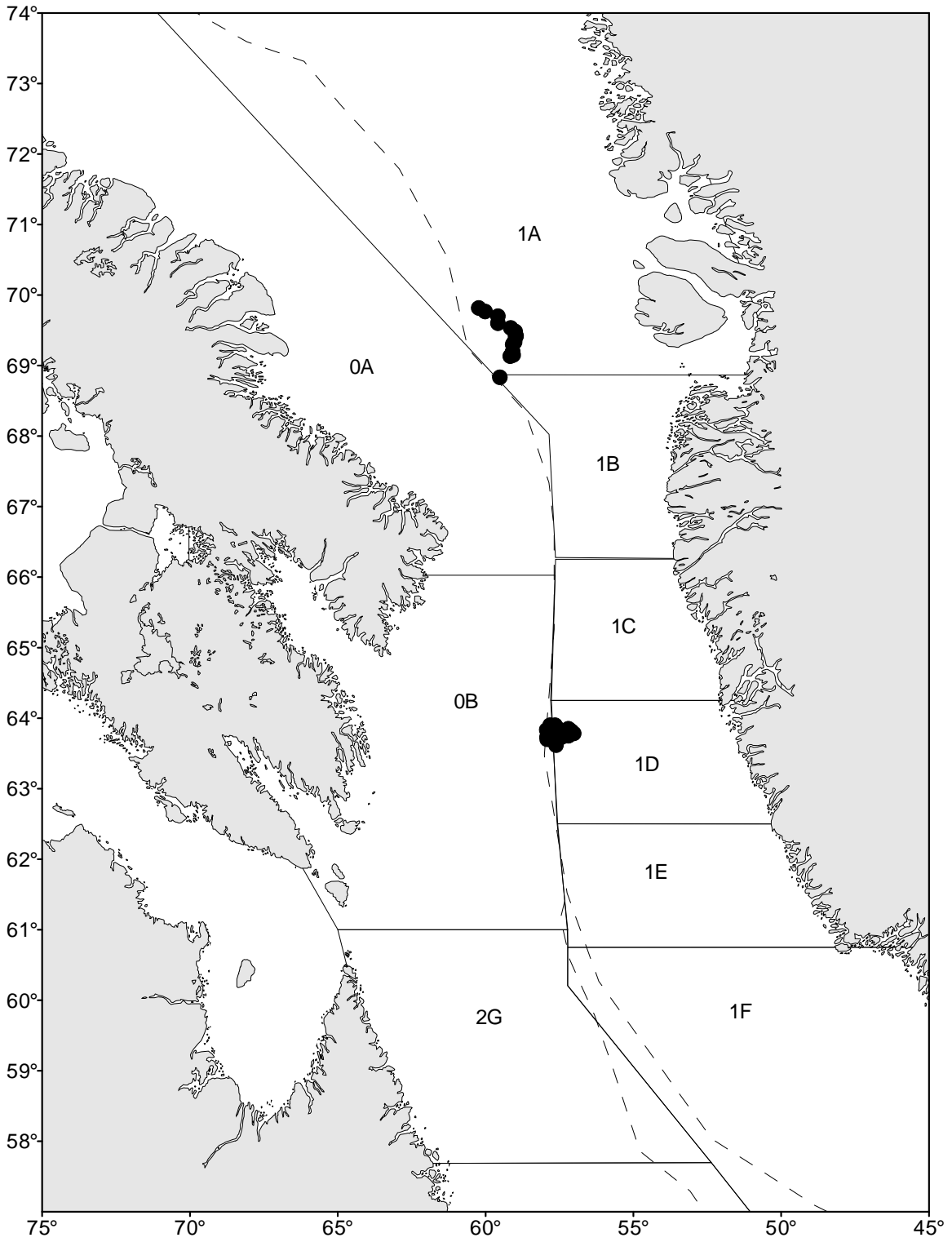


Fig. 1. Location of Russian trawlers during Greenland halibut target fishery in the West Greenland in 2008.

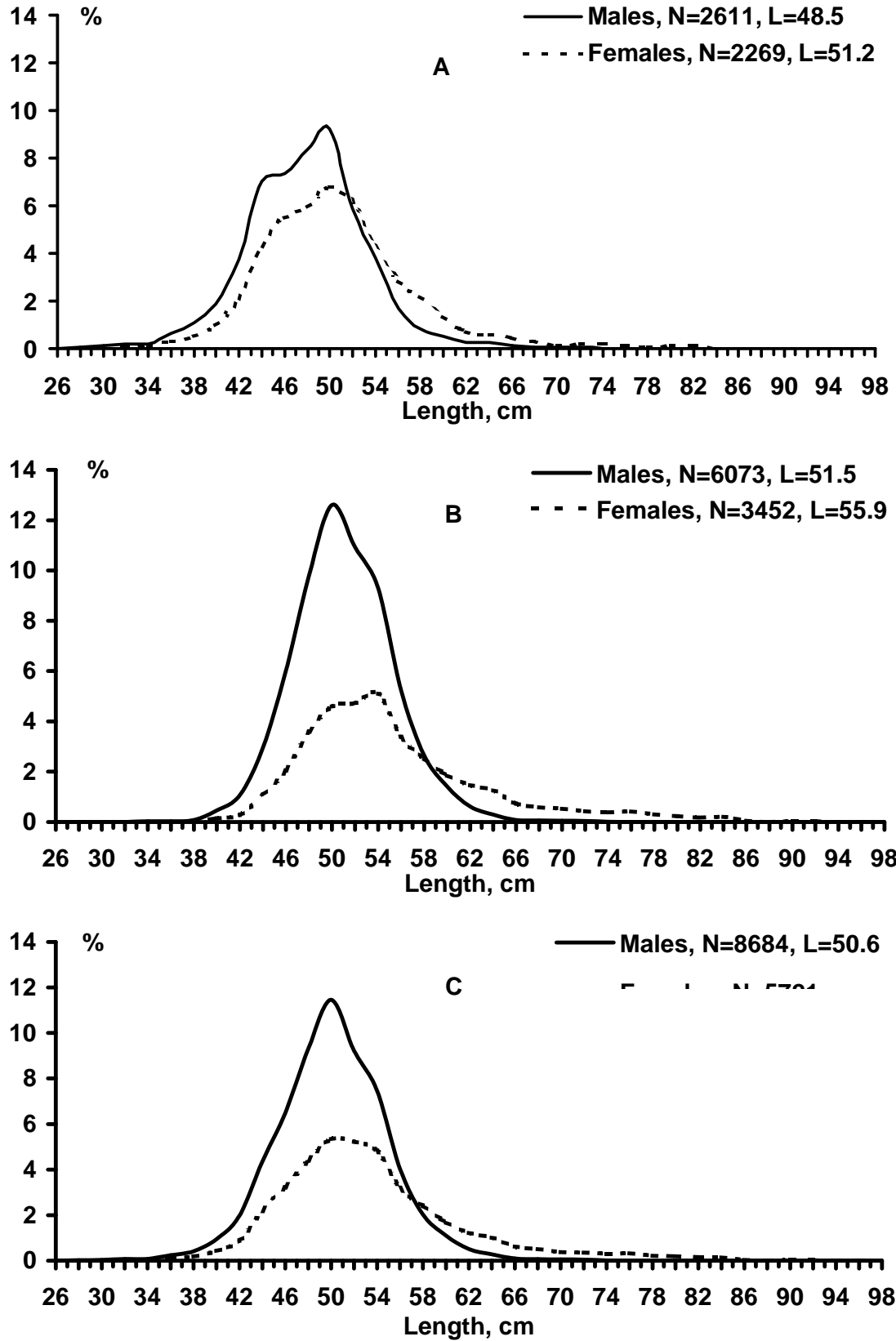


Fig. 2. Length distribution of Greenland halibut in Divs. 1AD in October-November 2008:
 A - Div. 1A, B - Div. 1D, C - Divs. 1AD.

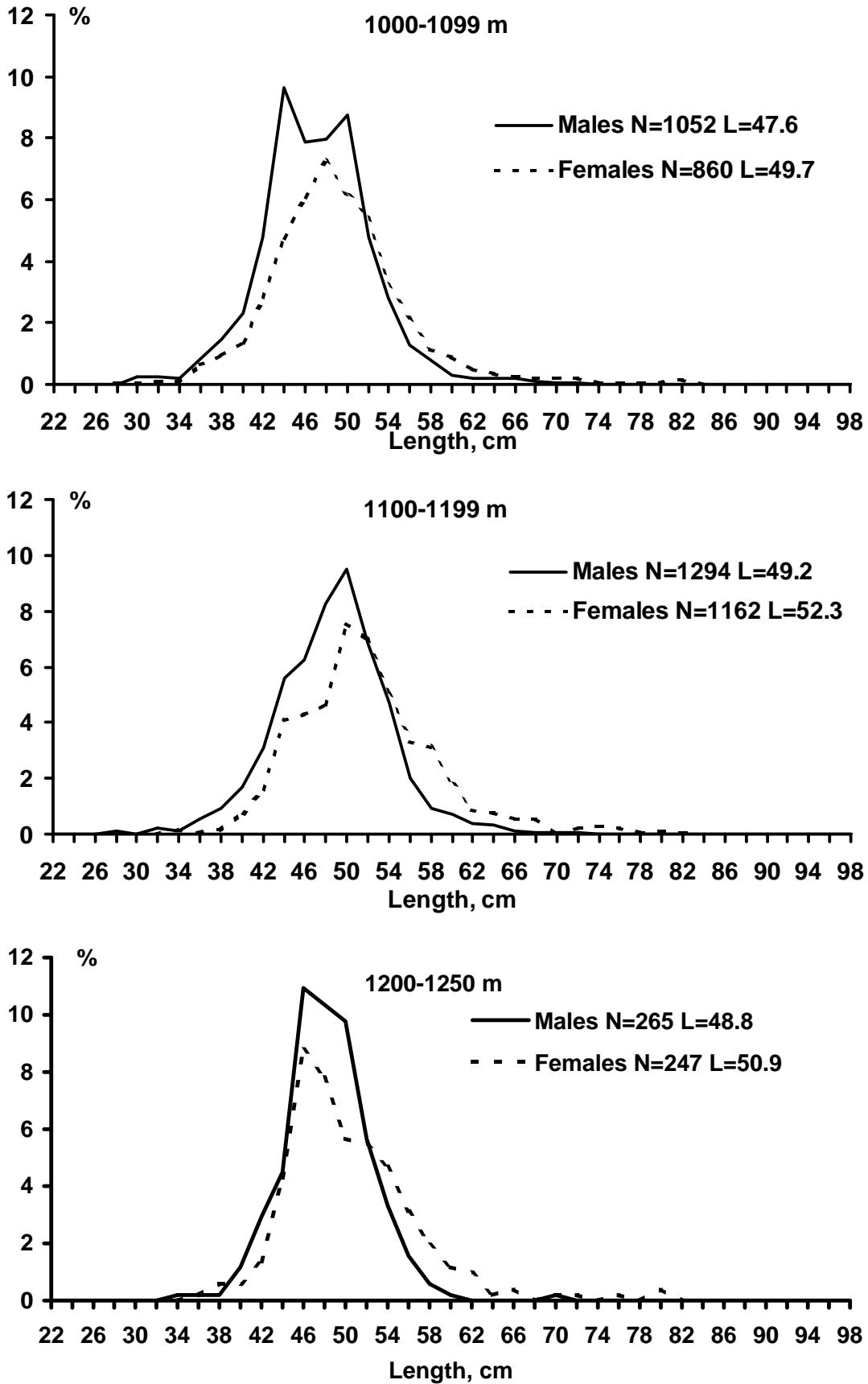


Fig. 3. Length distribution of Greenland halibut in Div. 1A by depth in October 2008.

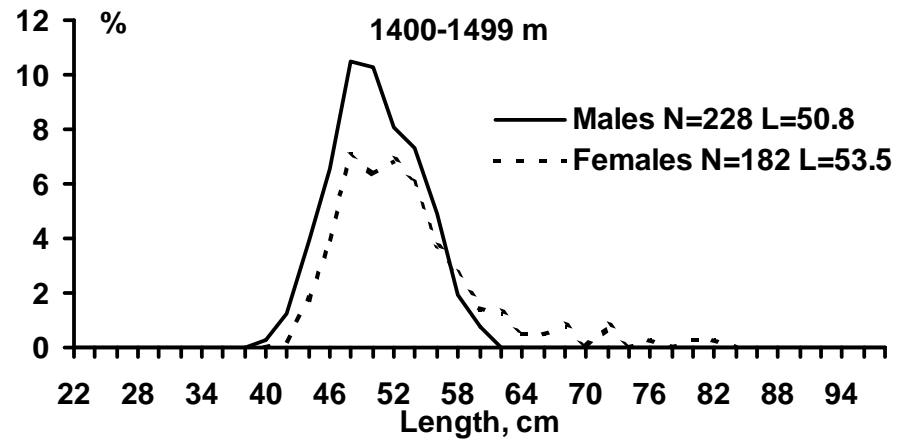
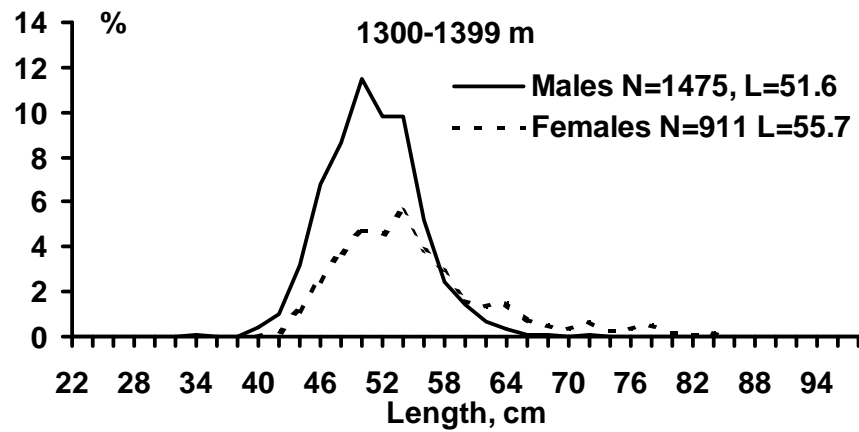
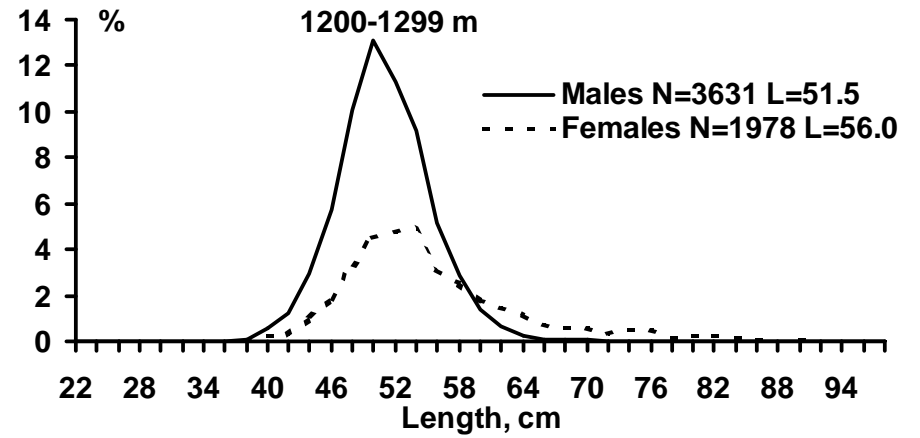
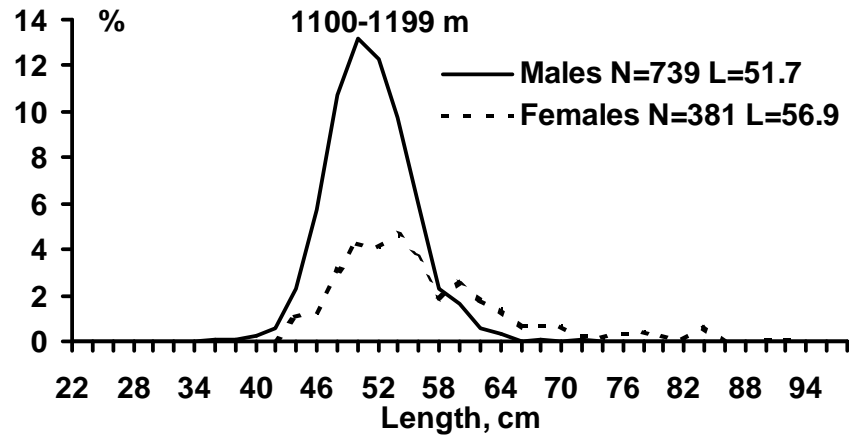


Fig. 4. Length distribution of Greenland halibut in Div. 1D by depth in October-November 2008.

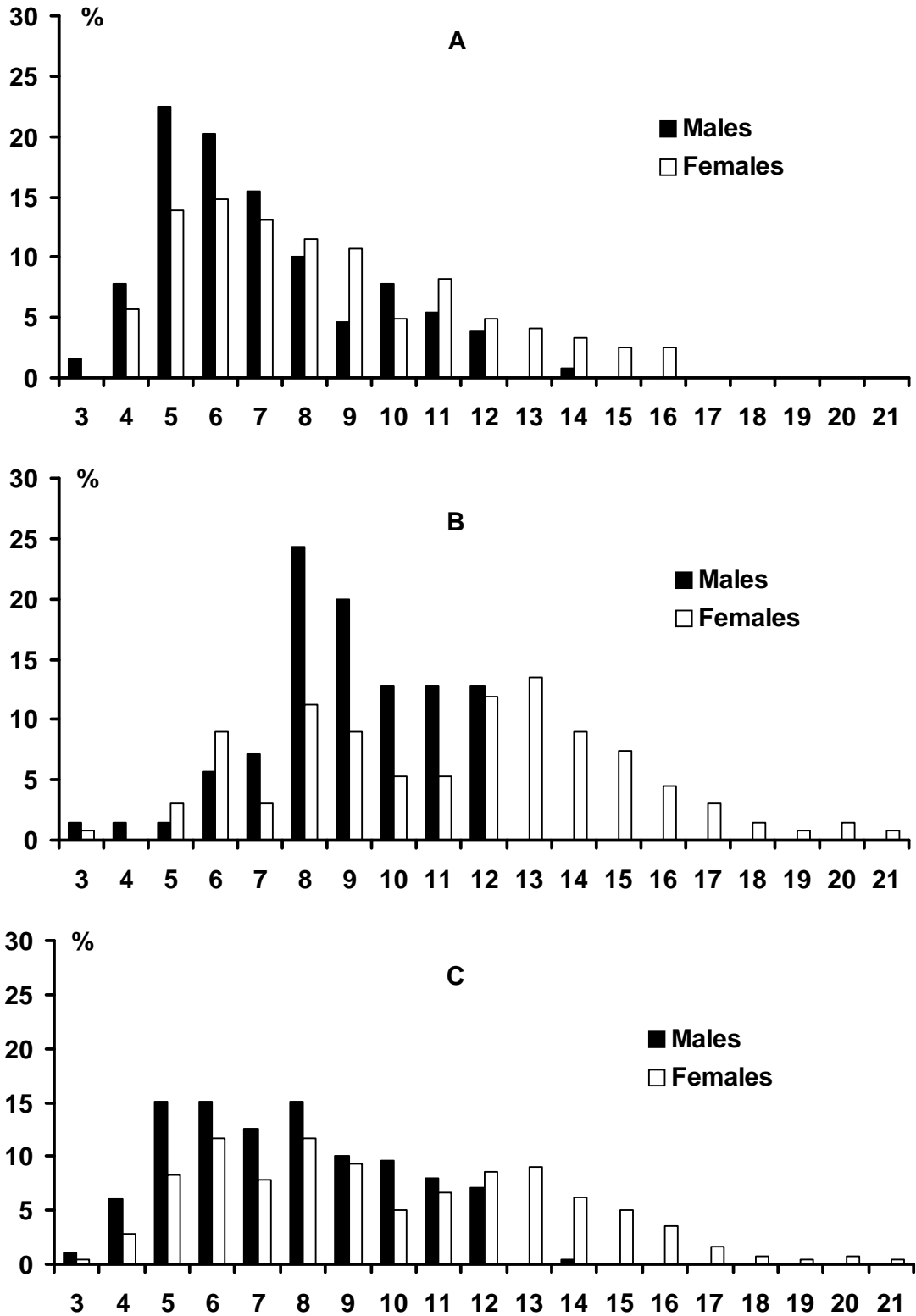


Fig. 5. Greenland halibut age composition from trawl catches in Divs. 1AD in October-November 2008: A - Div. 1A, B - Div. 1D, C - Divs. 1AD.

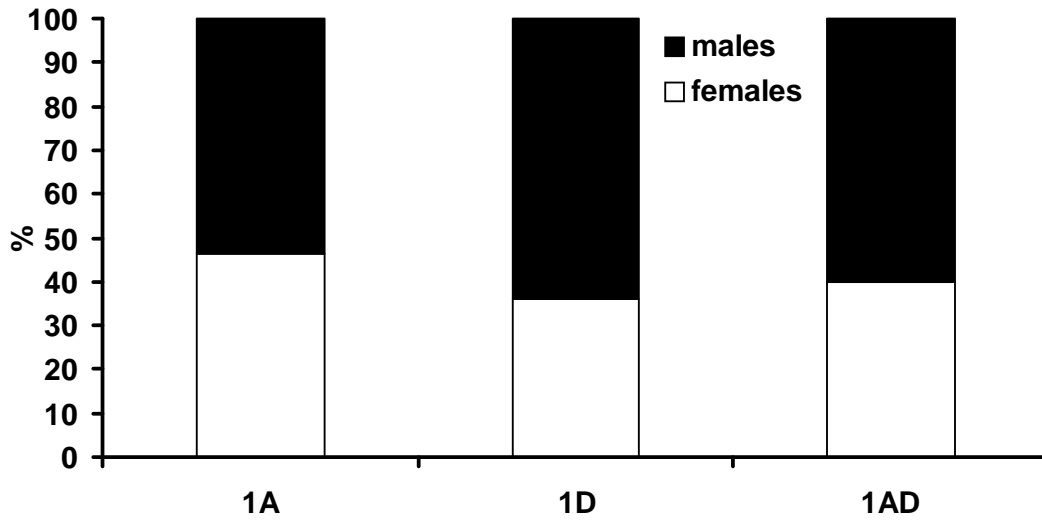


Fig. 6. Sex ratio of Greenland halibut in catches in Divs. 1AD in 2008.

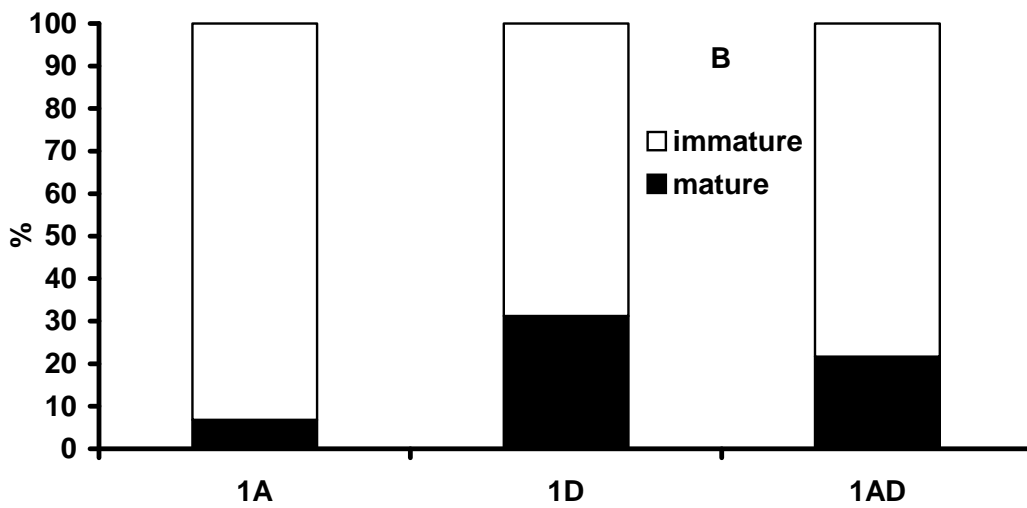
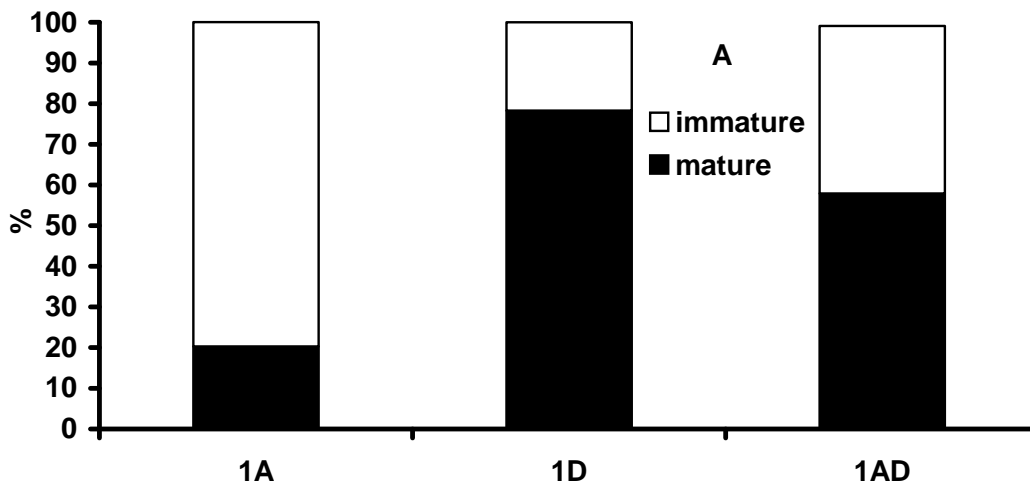


Fig. 7. Percentage of mature Greenland halibut in Divs. 1AD in October-November 2008.
A – males, B – females.

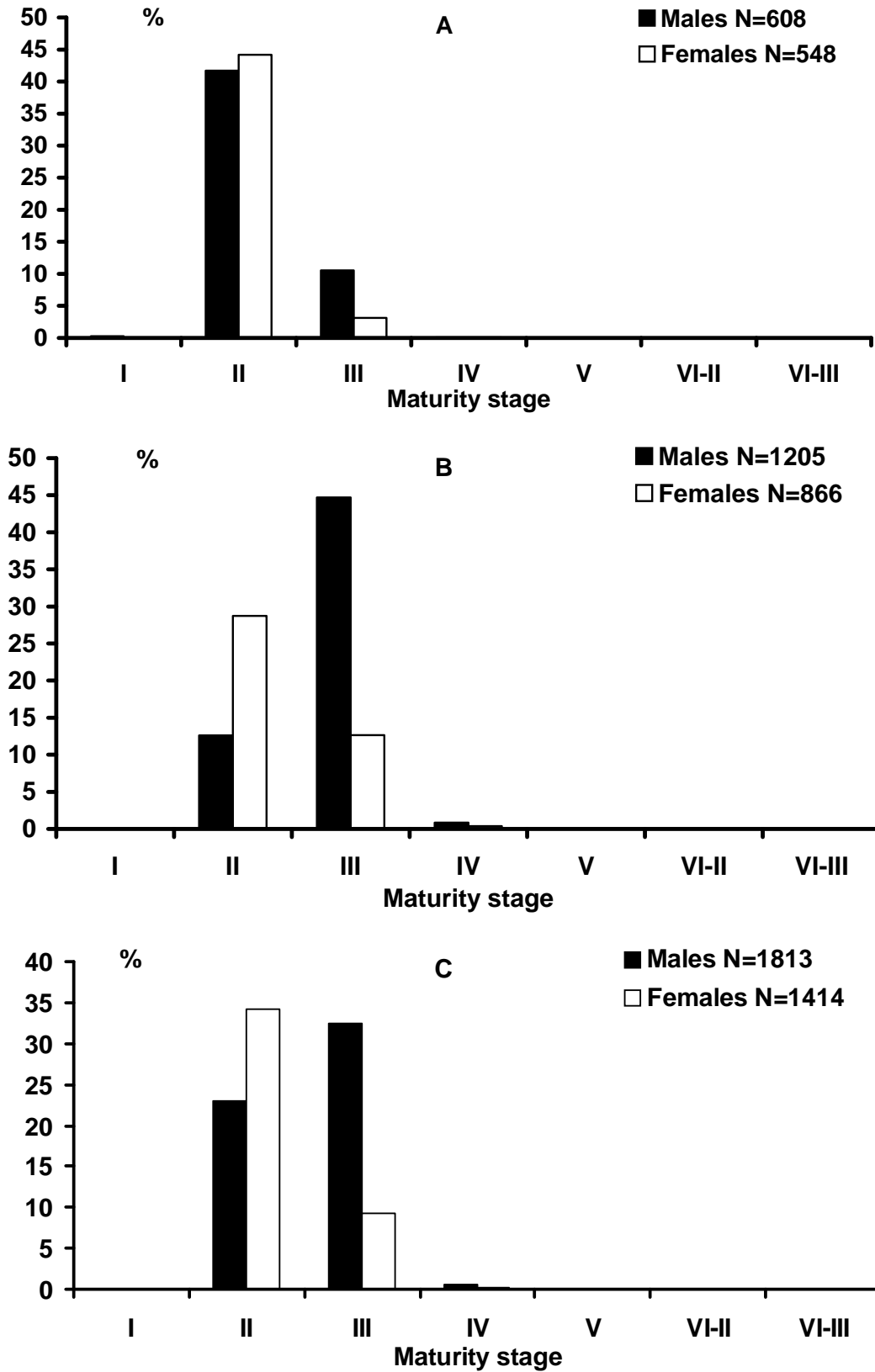


Fig. 8. Maturity of Greenland halibut by division in October-November 2008:

A – Div. 1A, B – Div. 1D, C – Divs. 1AD.