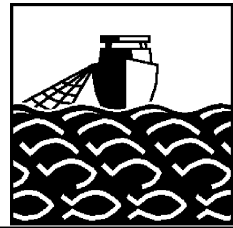


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Hamburg, 17.12.2002

Report

of the 256. Cruise of "FFS Walther Herwig III"
16.9.-12.10.2003

Chief Scientists: Hans-Jürgen Kellermann (IFÖ)
Ines Lehmann (IFF)

Sampling to study the pollutant state in fish and water as well as quality tests with fish in the Barents Sea.

1. Summary

Within cruise No. 256 on several fishing grounds extensive samples of fillet from the target fish species cod and large volume seawater samples were collected for radioactivity analysis later on in the laboratory.

Ice-storage experiments with cod and shrimp (*Pandalus borealis*) were carried out for studying various parameters influencing quality. After 17 days the limit of edibility of the cod was reached. The change of quality was simultaneously measured with micro waves (EU-Project SEQUID 8970/4000).

Various fish samples were collected for analysis for fatty acids and cholesterol, organic and inorganic contaminants and for the data bank for species identification (Project 8860/4000 DNAIQ))

2. Tasks

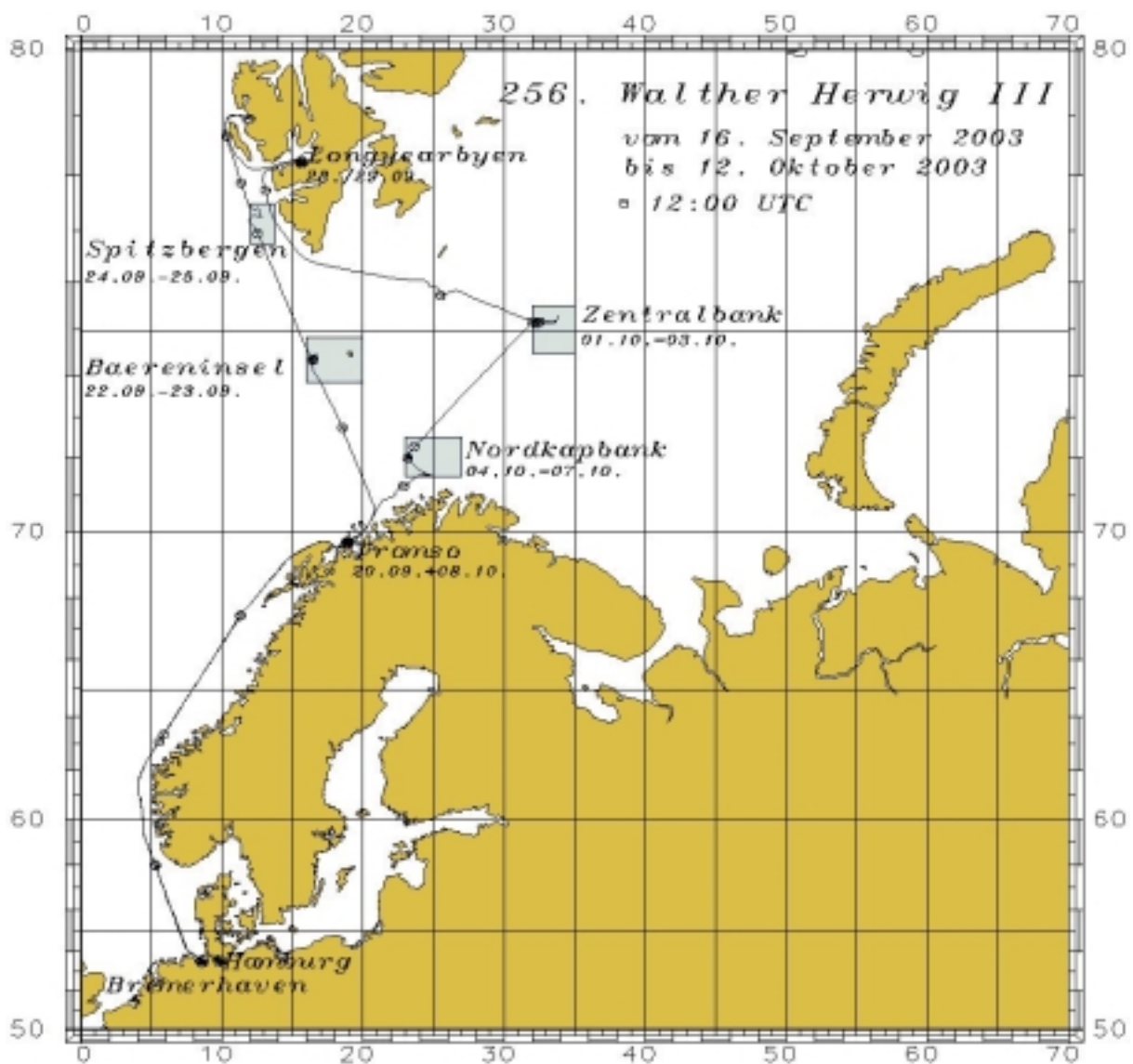
The IFÖ fishing strategy was to sample fillet from cod of selected length groups. Water samples were given to the Marine Environmental Laboratory (MEL-Monaco, IAEA) for further treatment.

The IFF made sensory, physical, chemical and microbiological investigations on cod and *Pandalus borealis* and did sampling for organic and inorganic trace analysis, analysis on cholesterol and fatty acid composition, sampling of cod in the frame of the EU-project "A new method for measurement of the quality of seafood (SEQUID)" and sampling for completion of the DNA-data bank.

3. Cruiseplan

16.09.03 Departure Bremerhaven 15°°
20.09.03 Arrival Tromsø 11°°
20.09.03 Departure Tromsø 19°°

- 22.09.03 Arrival Bear Island 4°°
- 23.09.03 Departure Bear Island 19°° (2 days working)
- 24.09.03 Arrival Spitzbergen 8°°
- 25.09.03 Departure Spitzbergen 18°° (2 days working)
- 26.09.03 Arrival Ny Ålesund 8³⁰
- 27.09.03 Departure Ny Ålesund 8°°
- 28.09.03 Arrival Longyearbyen 07°°
- 29.09.03 Departure Longyearbyen 09°°
- 30.09.03 Arrival Hope Island 09°°
- 01.10.03 Arrival Central bank 6°°
- 03.10.03 Departure Central bank 14°° (3 days working)
- 04.10.03 Arrival North cap bank 8°°
- 07.10.03 Departure North cap bank 9°° (3 days working)
- 08.10.03 Arrival Tromsø 7³⁰
- 08.10.03 Departure Tromsø 18³⁰
- 12.10.03 Arrival Bremerhaven 16°°



Map of cruise No. 256 FRV "Walther Herwig III" september/october 2003

4. Sampling summary

Altogether 58 stations could be finished. A differentiated summary is given below. (NR: Norwegian Coast, NB: North-Cape bank, CB: Central bank, BI: Bear Island, SB: Spitzbergen)

Device summary

Device	Number	NR	NB	CB	BI	SB
Ships pump	11	3	2	2	2	2
Water sampler	9	0	3	3	0	3
CTD-Probe	11	0	4	3	2	2
GOV-Trawl	27	0	9	11	4	3
Totalling	58	3	18	19	8	10

For different working groups of the IFF for later analysis at land the following samples were collected:

Fatty acid analysis	– 13 samples
Vitamin determination	– 24 samples
Samples for DSC	– 15 samples
Species differentiation	– 29 samples
Samples for SEQUID	– 26 samples – 4 blocks
Organic contaminant analysis	– 4 samples
Heavy metal and cholesterol analysis	– 59 samples

5. First Results

Scientific samples with a total weight of 1045 kg cod, 79 kg redfish, 20 kg haddock and 88 kg roughback were caught.

Samples for later analysis at land were collected for analysis for fatty acids and cholesterol, radioactiv, organic and inorganic contaminants and for the data bank for species identification.

5.1 Ice-storage experiments with cod

An ice storage experiment was carried out with cod. Sensory assessment, pH-level, fish tester and biochemical investigations were carried out. As a result it was shown that after 17 days the limit of edibility of the cod was reached, in other storage experiments this limit was only reached after 24 days. The change of quality was simultaneously measured with micro waves.

5.2 Ice-storage experiments with *Pandalus borealis*

Because not enough shrimp were available only two sensory experiments could be done, with cooked and raw shrimp. The changes in quality were compared to an

existing scheme for quality changes for shrimp. It could be shown that the investigated shrimp show different changes as described in the scheme.

Both ice storage experiments were documented by digital pictures.

5.3 Investigation of fish muscle

For determination of quality the changes of fish muscle of different species were measured in minced fish and on the surface. Fish stored at different temperatures and periods were investigated with micro waves of different wave lengths. Totally over 350 samples were investigated.

6. Scientific crew

Dipl.-Phys. Hans-Jürgen Kellermann, BFA-IFÖ

Chief scientist 1. leg

Leb. Chem. Ines Lehmann, BFA-IFF

Chief scientist 2. leg

TA Tanja Pieplow, BFA-IFF

TA Hans-Jürgen Knaack, BFA-IFF

TA Horst Haidn, BFA-IFS

Dipl.-Phys. Michael Kroeger, BFA-ITK

Ove Schimmer, Uni Kiel (1. Leg)

Frank Daschner, Uni Kiel (2. Leg)

Isabelle Levy, MEL

Beniamino Oregioni, MEL

Stud. Sönke Jäger, Uni Hamburg

Stud. Lydia Peters, Uni Oldenburg

Stud. Jana Bressling, Uni Oldenburg

7. Acknowledgement

All planed activities could be carried out successfully. Thanks to captain Hartmann and his crew. In the same way thanks to the scientific staff for engaged help.

Hamburg, 19.12.2003

Hans-Jürgen Kellermann

Ines Lehmann