

**FRV Walther Herwig III
Cruise 306
30.11. – 20.12.2007**

Fish Diseases in the North Sea and Baltic Sea

Scientist in Charge: Dr. Thomas Lang

Narrative

As part of the long-term monitoring programme of the Institute for Fishery Ecology of the Federal Research Centre for Fisheries on diseases and parasites of marine fish species, studies were conducted in 8 Baltic Sea and 10 North Sea areas. In addition to the examination of dab (*Limanda limanda*), Baltic cod (*Gadus morhua*) and Baltic flounder (*Platichthys flesus*) for macroscopically visible external and internal diseases and parasites, samples were taken for studies on histopathological alterations in liver and spleen. Fish samples were frozen for the detection of contaminants in the framework of national legislation and international monitoring programmes. In addition, hydrographical measurements were carried out (water temperature, salinity, oxygen content).

There were no new trends regarding the occurrence of externally visible diseases and parasites as well as of pathological liver changes in dab from the North Sea and the prevalences recorded were in the same range as in winter 2006. The same was true for Baltic flounder. In Baltic cod, the prevalence of acute/healing skin ulcerations and skeletal deformities both in the western and the eastern stock were low and were comparable to previous years.

Participants:

Name	Function	Institution
Dr. Thomas Lang	Scientist in Charge	FOE, Cuxhaven
Thomas Tepperies	Technician	FOE, Cuxhaven
Paul Kotterba	Student	University Hamburg
Nico Geveke	Student	University Oldenburg
Melanie Erhartmaier	Biologist	Berlin
Hilke Alberts-Hubatsch	Student	University Oldenburg
Soya Kim	Biologist	Göttingen
Felix Baumgart	Biologist	University Rostock
Franziska Schade	Student	University Rostock
Petra Jantschik	Biologist	University Rostock
Andreas Brietzke	Student	University Rostock
Jasmin Ingeborg Kirchbaumer	Biologist	University Innsbruck

Objectives of the Cruise

1. Studies on the prevalence and spatial distribution of fish diseases and parasites;
2. Studies on biological effects of contaminants;
3. Sampling of fish for chemical analysis of radioactive substances, trace metals and organic contaminants (in the framework of national and OSPAR and HELCOM monitoring);
4. Hydrographic measurements (salinity, temperature, oxygen);
5. Sampling of fish organs for subsequent histological studies.

Dates of the Cruise

RV Walther Herwig III left Bremerhaven on 30.11. heading for Kiel Channel and the Baltic Sea where work started in area B12 on 01.12, followed by sampling in 7 further Baltic Sea areas. After the passage of Kiel Channel on 09.12., 10 North Sea sampling areas were visited, beginning with area N11 in the German Bight. The cruise ended according to plan on 20.12. in Bremerhaven.

The location of the sampling areas and the cruise dates are shown in Figure 1 and Tables 1a and 1b.

In 18 sampling areas (Fig. 1), a total of 75 fishing hauls was performed (towing time 1 h each) (see Table 1a). In the North Sea, the GOV was used, in the Baltic Sea a 140 ft bottom trawl with rock hoppers. Hydrographical measurements were made at 32 stations (see Table 1b).

Preliminary Results

1 Dab (*Limanda limanda*)

In total, 7,575 dab (including 1,301 in the Baltic Sea) were examined for the occurrence of externally visible diseases and parasites and 835 dab for the occurrence of liver anomalies. Results are provided in Tables 4 and 5.

The decrease in prevalence of lymphocystis recorded over the past years did not continue; the prevalence was higher in the majority of sampling areas compared to winter 2006. Maximum values of > 20 % were recorded in areas N10, N06, N05 and N04 (see Fig. 1). In the German Bight, prevalences were considerably lower with values of 7.0 % (N01) and 2.0 % (GB1), respectively. No change in prevalence was noted for epidermal hyperplasia/papilloma; values were in the range of 0.0 % to 5.6 % and were, thus, relatively low. Skin ulcers were slightly less prevalent than in winter 2006 (range: 0.0% - 3.4%). The prevalence of hyperpigmentation varied between 0.0 % and 51.5 % and was in the range of the previous years. However, compared to summer 2006, the prevalence had increased in the German Bight (N01, GB1). Hyperpigmentation was absent in the Baltic Sea. No changes occurred for the parasites *Stephanostomum baccatum*, *Acanthochondria cornuta* und *Lepeophtheirus pectoralis*.

The prevalence of liver nodules was in the same range that was observed in winter 2006; areas with elevated values still are the Dogger Bank (N04) and an area far off the Humber (N22). The prevalences of livers with green discoloration, liver nematodes or acanthocephalans did not change significantly compared to last year.

2 Cod (*Gadus morhua*)

5,229 Baltic cod were examined for the occurrence of externally visible diseases and parasites (see Table 6). Because of the small catches of cod in the North Sea (see Table 2), no investigations were carried out there. The mean prevalence of acute/healing skin ulcerations in the Baltic stock was 5.8 % and was, thus, relatively low (as in the most previous years). There was no conspicuous difference between sampling areas with a sufficient number of fish examined. Skeletal deformities were rare and the maximum prevalence recorded was 2.7 % (B03). No new trends for the parasites *Lernaocera branchialis* and *Cryptocotyle lingua*.

3 Flounder (*Platichthys flesus*)

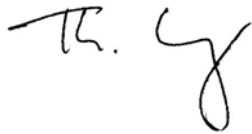
1,041 Baltic flounder were examined for externally visible diseases (Tab. 7). The prevalence of lymphocystis was slightly lower than in winter 2006 and ranged from 5.7 % (B12) to 36.1 % (B03). The prevalence of acute/healing skin ulcerations ranged from 0.0 % (B01) to 7.1 % (area B09). Only 10 (0.96 %) of all flounder examined were afflicted with liver nodules > 2 mm. This confirms earlier findings and highlights the generally low prevalence of macroscopic liver tumours in Baltic flounder.

Miscellaneous

The mean catch data of the most frequent fish species are provided in Table 2; Tables 3a and 3b give results of the hydrographical measurements.

Acknowledgements

Thanks are due to Captain Vandrei and his crew and to the scientific staff for a successful cruise, constructive and hard work and a good atmosphere on board.

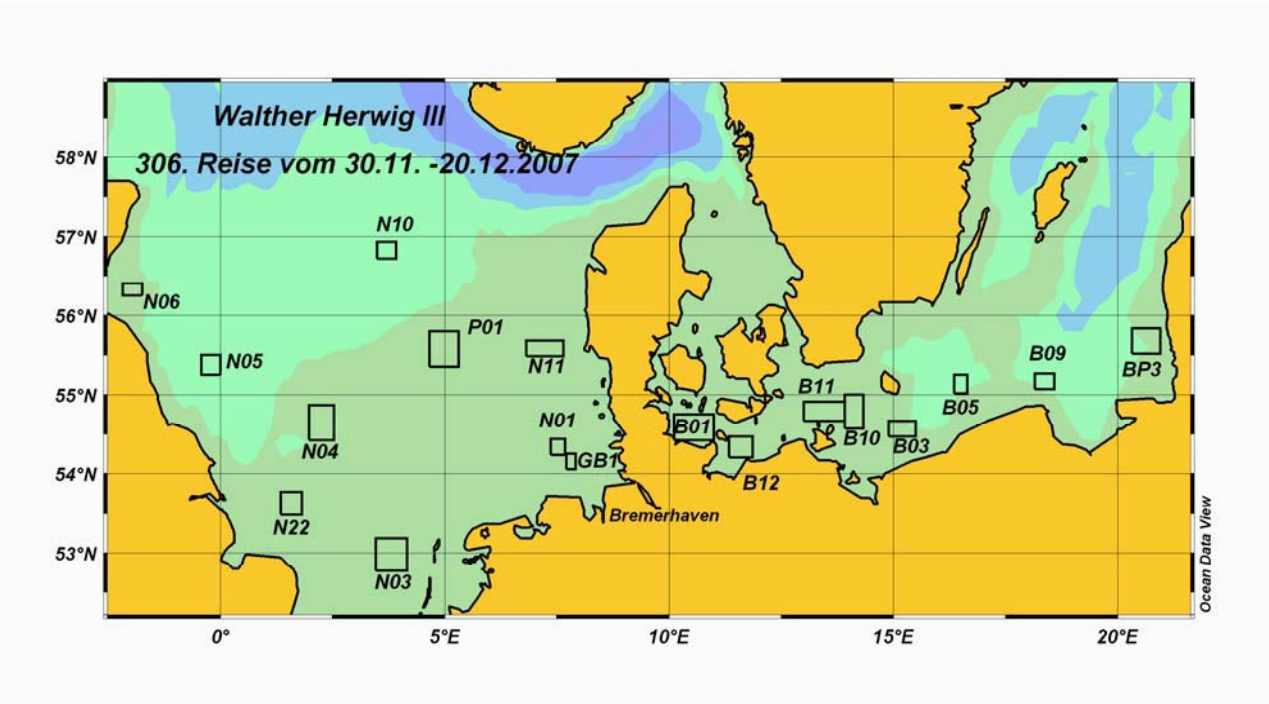


Dr. Thomas Lang
(Scientist in Charge)

Annex

1 Figure, 7 Tables

Fig. 1: Cruise 306 RV 'Walther Herwig III', 30.11. -20.12.2007:
Location of sampling sites



Tab. 1a: Cruise 306 RV 'Walther Herwig III', 30.11. –20.12.2007:
Geographical coordinates of trawling sites

DATE	STATION	AREA	ICES- RECTANGLE	LATITUDE	LONGITUDE
BALTIC SEA					
01.12.07	001	B12	37G1	54°26'49N	11°25'57E
01.12.07	002	B12	37G1	54°24'65N	11°24'16E
01.12.07	003	B12	37G1	54°13'32N	11°33'82E
01.12.07	004	B12	37G1	54°13'23N	11°42'36E
02.12.07	005	B11	38G3	54°46'59N	13°14'79E
02.12.07	006	B11	38G3	54°46'01N	13°20'07E
02.12.07	007	B11	38G3	54°46'63N	13°39'65E
02.12.07	008	B11	38G3	54°46'29N	13°46'78E
03.12.07	009	B05	39G6	55°04'34N	16°22'58E
03.12.07	010	B05	39G6	55°07'36N	16°21'87E
03.12.07	011	B05	39G6	55°06'44N	16°24'89E
03.12.07	012	B05	39G6	55°08'47N	16°26'13E
04.12.07	013	BP3	40H0	55°49'82N	20°21'18E
04.12.07	014	BP3	40H0	55°47'85N	20°27'61E
04.12.07	015	BP3	40H0	55°43'64N	20°28'49E
04.12.07	016	BP3	40H0	55°43'77N	20°29'76E
05.12.07	017	B09	39G8	55°10'17N	18°31'82E
05.12.07	018	B09	39G8	55°12'94N	18°16'68E
05.12.07	019	B09	39G8	55°13'31N	18°10'76E
05.12.07	020	B09	39G8	55°04'87N	18°21'70E
05.12.07	021	B09	39G8	55°08'07N	18°18'90E
06.12.07	022	B03	38G5	54°36'27N	15°17'27E
06.12.07	023	B03	38G5	54°39'16N	15°23'14E
06.12.07	024	B03	38G5	54°34'13N	15°08'65E
06.12.07	025	B03	38G5	54°30'51N	15°08'59E
06.12.07	026	B03	38G4	54°33'68N	14°58'75E
07.12.07	027	B10	38G4	54°38'15N	14°02'68E
07.12.07	028	B10	38G3	54°48'55N	13°55'83E
07.12.07	029	B10	38G4	54°55'08N	14°07'49E
07.12.07	030	B10	38G3	54°49'10N	13°55'25E
07.12.07	031	B10	38G3	54°47'24N	13°57'69E
08.12.07	032	B01	38G0	54°33'00N	10°39'95E
08.12.07	033	B01	38G0	54°31'87N	10°36'51E
08.12.07	034	B01	38G0	54°32'43N	10°32'33E

Tab. 1a: (cont.)

DATE	STATION	AREA	ICES-RECTANGLE	LATITUDE	LONGITUDE
NORTH SEA					
10.12.07	035	N11	40F7	55°30'67N	07°08'10E
10.12.07	036	N11	40F7	55°39'27N	07°01'02E
10.12.07	037	N11	40F7	55°31'64N	07°09'16E
10.12.07	038	N11	40F7	55°35'61N	07°00'86E
11.12.07	039	P01	39F4	55°29'99N	04°58'46E
11.12.07	040	P01	39F5	55°26'08N	05°07'78E
11.12.07	041	P01	39F5	55°23'21N	05°00'05E
11.12.07	042	P01	39F5	55°24'41N	05°13'58E
12.12.07	043	N10	42F3	56°45'41N	03°51'99E
12.12.07	044	N10	42F3	56°46'07N	03°44'12E
12.12.07	045	N10	42F3	56°51'26N	03°41'26E
13.12.07	046	N06	41E7	56°16'70N	02°04'54W
13.12.07	047	N06	41E7	56°18'02N	02°05'07W
13.12.07	048	N06	41E8	56°17'77N	01°56'10W
13.12.07	049	N06	41E7	56°18'45N	02°08'79W
13.12.07	050	N06	41E7	56°23'07N	02°08'76W
14.12.07	051	N05	39E9	55°21'90N	00°23'99W
14.12.07	052	N05	39E9	55°27'07N	00°23'34W
14.12.07	053	N05	39E9	55°25'30N	00°13'25W
14.12.07	054	N05	39E9	55°21'19N	00°14'56W
15.12.07	055	N04	38F2	54°38'43N	02°16'00E
15.12.07	056	N04	38F2	54°42'20N	02°09'56E
15.12.07	057	N04	38F2	54°47'13N	02°01'69E
15.12.07	058	N04	38F2	54°46'99N	02°16'49E
16.12.07	059	N22	36F1	53°43'07N	01°37'82E
16.12.07	060	N22	36F1	53°39'85N	01°45'03E
16.12.07	061	N22	36F1	53°38'12N	01°44'89E
16.12.07	062	N22	36F1	53°42'02N	01°38'36E
17.12.07	063	N03	34F3	52°59'58N	03°50'59E
17.12.07	064	N03	34F3	52°55'76N	03°47'19E
17.12.07	065	N03	34F3	52°58'14N	03°43'24E
17.12.07	066	N03	35F3	53°00'59N	03°41'16E
17.12.07	067	N03	35F3	53°03'87N	03°41'92E
18.12.07	068	N01	37F7	54°15'61N	07°26'36E
18.12.07	069	N01	37F7	54°23'76N	07°37'37E
18.12.07	070	N01	37F7	54°19'41N	07°30'34E
18.12.07	071	N01	37F7	54°18'72N	07°26'41E
18.12.07	072	N01	37F7	54°15'33N	07°26'53E
19.12.07	073	GB1	37F7	54°04'32N	07°54'47E
19.12.07	074	GB1	37F7	54°06'48N	07°46'63E
19.12.07	075	GB1	37F7	54°04'96N	07°51'77E

Tab. 1b: Cruise 306 RV 'Walther Herwig III', 30.11. –20.12.2007:
Geographical coordinates of hydrography stations

DATE	STATION	AREA	ICES-RECTANGLE	LATITUDE	LONGITUDE
BALTIC SEA					
01.12.07	001	B12	37G1	54°20'64N	11°26'76E
01.12.07	002	B12	37G1	54°12'08N	11°49'76E
02.12.07	003	B11	38G3	54°45'94N	13°27'69E
02.12.07	004	B11	38G3	54°49'25N	13°52'04E
03.12.07	005	B05	39G6	55°10'86N	16°27'69E
03.12.07	006	B05	39G6	55°11'75N	16°32'22E
04.12.07	007	BP3	40H0	55°46'36N	20°35'67E
04.12.07	008	BP3	40H0	55°40'32N	20°34'96E
05.12.07	009	B09	39G8	55°14'90N	18°09'76E
05.12.07	010	B09	39G8	55°06'80N	18°15'03E
06.12.07	011	B03	38G5	54°39'01N	15°15'14E
06.12.07	012	B03	38G5	54°30'52N	15°02'66E
07.12.07	013	B10	38G4	54°50'80N	14°02'12E
07.12.07	014	B10	38G4	54°50'52N	14°02'52E
08.12.07	015	B01	38G0	54°33'59N	10°47'75E
08.12.07	016	B01	38G0	54°35'70N	10°27'41E
NORTH SEA					
10.12.07	017	N11	40F7	55°35'35N	07°05'35E
10.12.07	018	N11	40F7	55°33'00N	07°06'78E
11.12.07	019	P01	39F5	55°21'46N	05°08'61E
11.12.07	020	P01	39F5	55°28'63N	05°12'21E
12.12.07	021	N10	42F3	56°49'87N	03°40'53E
12.12.07	022	N10	42F3	56°53'31N	03°33'57E
13.12.07	023	N06	41E7	56°22'52N	02°01'03W
13.12.07	024	N06	41E7	56°17'35N	02°04'32W
14.12.07	025	N05	39E9	55°28'58N	00°15'50W
14.12.07	026	N05	39E9	55°24'12N	00°08'35W
15.12.07	027	N04	38F2	54°45'06N	02°04'40E
15.12.07	028	N04	38F2	54°44'47N	02°22'59E
16.12.07	029	N22	36F1	53°36'98N	01°39'17E
16.12.07	030	N22	36F1	53°37'54N	01°40'77E
17.12.07	031	N03	34F3	52°52'28N	03°44'80E
17.12.07	032	N03	35F3	53°04'32N	03°41'37E

Tab. 2: Cruise 306 RV 'Walther Herwig III', 30.11. –20.12.2007:
Mean catches of selected abundant fish species
(n = number, kg = weight per 1 h trawling)

Area	Cod	Whiting	Haddock	Herring	Sprat	Mackerel	Dab	Plaice	Flounder
B12 n	4	45	-	19	1632	-	264	3	44
kg	10,0	3,0	-	< 0,1	20,0	-	43,0	1,0	15,0
B11 n	168	116	-	54	1222	-	7	8	121
kg	81,0	26,0	-	6,0	16,0	-	1,0	2,0	47,0
B05 n	240	-	-	-	-	-	-	55	13
kg	130,0	-	-	-	-	-	-	20,0	5,0
BP3 n	305	-	-	25	1	-	-	1	224
kg	183,0	-	-	2,0	< 0,1	-	-	< 0,1	47,0
B09 n	245	-	-	2	-	-	-	2	3
kg	142,0	-	-	< 0,1	-	-	-	< 0,1	1,0
B03 n	301	1	-	5	8	-	-	15	15
kg	107,0	< 0,1	-	< 0,1	< 0,1	-	-	4,0	5,0
B10 n	185	88	-	10	388	3	1	19	183
kg	88,0	28,0	-	1,0	6,0	1,0	< 0,1	5,0	78,0
B01 n	4	31	-	21	320	-	661	9	11
kg	15,0	6,0	-	2,0	4,0	-	55,0	3,0	6,0
N11 n	4	32	-	7294	1212	-	1899	23	2
kg	< 0,1	2,0	-	169,0	14,0	-	146,0	4,0	1,0
P01 n	1	8	-	686	24	-	610	17	-
kg	< 0,1	< 0,1	-	12,0	< 0,1	-	51,0	4,0	-
N10 n	13	185	17	20	-	2	2038	4	-
kg	< 0,1	8,0	2,0	2,0	-	1,0	193,0	1,0	-
N06 n	2	871	180	3	10	9	288	-	-
kg	< 0,1	28,0	20,0	< 0,1	< 0,1	3,0	15,0	-	-
N05 n	1	256	210	4	12	5	240	3	-
kg	< 0,1	41,0	35,0	< 0,1	< 0,1	4,0	15,0	1,0	-
N04 n	4	1410	3	734	325	-	975	4	-
kg	2,0	61,0	< 0,1	55,0	1,0	-	84,0	2,0	-
N22 n	-	579	-	513	1290	-	312	-	-
kg	-	33,0	-	8,0	7,0	-	26,0	-	-
N03 n	6	941	-	4999	33499	-	180	19	3
kg	1,0	74,0	-	105,0	371,0	-	8,0	2,0	1,0
N01 n	4	4935	-	2832	1172	-	353	2	1
kg	1,0	287,0	-	20,0	10,0	-	14,0	< 0,1	< 0,1
GB1 n	1	3494	-	961	556	-	102	-	1
kg	3,0	192,0	-	21,0	5,0	-	6,0	-	< 0,1

Tab. 3a: Cruise 306 RV 'Walther Herwig III', 30.11. –20.12.2007:
Water depth, temperature (T), salinity (S) und O₂ saturation, Baltic Sea

DATE	STATION	AREA	DEPTH (m)	T (°C)	S (PSU)	O ₂ -SATURATION
01.12.2007	001	B12	3	6,27	13,37	
			18	6,70	14,78	
	002		3	6,31	13,53	
			19	7,02	14,85	
02.12.2007	003	B11	2	7,02	8,47	91,54
			36	9,74	15,11	85,76
	004		3	7,46	8,31	93,33
			38	9,99	12,28	87,21
03.12.2007	005	B05	5	7,19	7,20	94,60
			42	7,69	7,60	96,60
	006		3	7,24	7,24	96,92
			56	9,93	10,85	53,94
04.12.2007	007	BP3	4	8,78	7,44	95,30
			43	8,78	7,44	96,31
	008		3	8,79	7,45	95,61
			51	8,80	7,46	95,05
05.12.2007	009	B09	4	7,38	7,39	94,62
			62	7,99	10,13	55,48
	010		3	7,46	7,41	95,35
			69	7,50	7,63	93,39
06.12.2007	011	B03	4	7,62	7,72	95,51
			60	10,26	12,74	20,09
	012		3	7,28	7,82	91,19
			34	6,50	8,11	90,54
07.12.2007	013	B10	3	7,15	7,64	97,86
			36	9,47	12,19	86,58
	014		3	7,19	7,68	96,77
			39	9,75	14,13	75,08
08.12.2007	015	B01	3	6,38	16,76	96,89
			19	6,38	16,79	96,31
	016		3	6,81	17,44	
			17	6,80	17,44	

Tab. 3b: Cruise 306 RV 'Walther Herwig III', 30.11. –20.12.2007:
Water depth, temperature (T), salinity (S) und O₂ saturation, North Sea

DATE	STATION	AREA	DEPTH (m)	T (°C)	S (PSU)	O ₂ -SATURATION
10.12.2007	017	N11	3	9,07	33,15	93,66
			31	9,17	33,28	93,63
	018		4	9,03	33,13	93,66
			29	9,09	33,21	92,39
11.12.2007	019	P01	5	8,68	34,88	92,49
			41	8,68	34,88	93,45
	020		4	9,00	34,92	95,86
			41	9,02	34,92	94,85
12.12.2007	021	N10	3	8,48	34,93	94,81
			56	8,49	34,93	93,52
	022					
13.12.2007	023	N06	3	9,14	34,67	94,15
			47	9,15	34,67	93,54
	024		3	9,15	34,63	94,92
			55	9,19	34,64	93,70
14.12.2007	025	N05	4	9,29	34,75	97,88
			66	9,30	34,75	95,89
	026		4	9,13	34,76	91,88
			68	9,15	34,76	94,45
15.12.2007	027	N04	3	8,44	34,77	93,63
			27	8,45	34,76	93,54
	028		5	8,21	34,80	92,48
			20	8,22	34,80	94,11
16.12.2007	029	N22	4	9,14	34,92	92,91
			27	9,13	34,92	94,16
	030		5	9,17	34,84	93,91
			27	9,19	34,84	93,71
17.12.2007	031	N03	4	9,12	35,05	94,04
			22	9,14	35,05	95,34
	032		5	8,90	34,64	93,99
			26	8,92	34,64	93,40

Tab. 4: Cruise 306 RV 'Walther Herwig III', 30.11. – 20.12.2007:
Prevalences (%) of externally visible diseases and parasites of dab (*Limanda limanda*) in the Baltic Sea and North Sea

Area	N unt	Ly	Ep Hyp/Pap	Ulc Ak/Hei	Flo Ak/Hei	KieHy	Skel Def	Hyp Pig	Steph	Acanth	Lepe
B12	627	7,0	0,6	0,8	0,0	0,0	0,8	0,0	0,0	0,0	0,0
B11	41	0,0	0,0	0,0	0,0	0,0	2,4	0,0	0,0	0,0	0,0
B01	633	3,8	0,6	0,6	0,0	0,0	0,3	0,0	0,0	0,0	0,0
N11	774	11,5	4,7	0,9	0,1	0,3	0,5	21,8	29,6	3,1	12,3
P01	787	17,9	2,3	3,4	1,0	0,1	0,9	22,4	90,3	4,1	9,4
N10	731	21,5	4,1	3,0	0,8	0,4	0,7	7,3	100,0	2,6	0,1
N06	650	21,2	3,4	1,8	1,1	2,8	0,6	41,4	77,7	4,0	0,5
N05	608	23,5	2,5	1,5	0,2	0,3	0,7	51,3	77,1	1,8	0,0
N04	765	21,8	5,6	2,6	1,0	0,3	1,0	51,5	53,6	2,5	18,6
N22	622	14,5	3,8	1,4	0,2	0,3	2,4	37,6	10,4	6,0	6,2
N03	499	2,4	3,4	0,2	0,0	0,0	1,6	6,0	2,6	2,2	2,4
N01	584	7,0	6,3	1,7	0,5	0,0	0,5	31,5	8,7	5,1	8,2
GB1	254	2,0	5,1	1,2	1,2	0,0	0,4	19,3	13,0	4,3	7,5

Tab. 5: Cruise 306 RV 'Walther Herwig III', 30.11. – 20.12.2007:
Prevalences (%) of liver anomalies in dab (*Limanda limanda*) from the Baltic Sea and North Sea

Area	Length (cm)		N unt	Liver nodules (mm)			Green Livers	Nema-todes	Acantho-ceph.
	von	bis		> 2	> 5	≥ 10			
B01	20	24	51	0,0	0,0	0,0	0,0	0,0	0,0
	25	40	51	2,0	2,0	0,0	0,0	0,0	0,0
N11	20	24	51	2,0	0,0	0,0	2,0	0,0	0,0
	25	40	51	7,8	3,9	2,0	3,9	2,0	0,0
P01	20	24	51	5,9	5,9	3,9	3,9	5,9	2,0
	25	40	50	6,0	6,0	2,0	4,0	22,0	2,0
N10	20	24	47	14,9	4,3	4,3	17,0	10,6	8,5
	25	40	25	8,0	0,0	0,0	24,0	28,0	8,0
N06	20	24	51	3,9	2,0	0,0	27,5	92,2	45,1
	25	40	7	14,3	0,0	0,0	14,3	100,0	71,4
N05	20	24	50	4,0	0,0	0,0	96,0	100,0	38,0
	25	40	2	0,0	0,0	0,0	100,0	100,0	0,0
N04	20	24	51	9,8	3,9	2,0	21,6	17,6	2,0
	25	40	50	24,0	8,0	6,0	10,0	24,0	0,0
N22	20	24	51	7,8	2,0	0,0	7,8	27,5	0,0
	25	40	54	20,4	7,4	7,4	3,7	46,3	0,0
N03	20	24	54	1,9	0,0	0,0	0,0	1,9	0,0
	25	40	21	4,8	4,8	4,8	4,8	19,0	0,0
N01	20	24	52	5,8	3,8	1,9	5,8	1,9	0,0
	25	40	50	6,0	4,0	2,0	2,0	0,0	0,0
GB1	20	24	51	0,0	0,0	0,0	2,0	0,0	0,0
	25	40	14	7,1	0,0	0,0	0,0	0,0	0,0

Tab. 6: Cruise 306 RV 'Walther Herwig III', 30.11. – 20.12.2007:
Prevalences (%) of diseases and parasites of cod (*Gadus morhua*) in the Baltic Sea

Area	N unt	Ulc Ak/Hei	Skel Def	PBT	Locera	Cryp
B12	18	22,2	0,0	0,0	0,0	55,6
B11	674	7,3	0,9	0,1	0,3	5,8
B05	807	4,5	0,5	0,0	0,0	2,4
BP3	821	2,4	1,3	0,1	0,0	0,9
B09	936	7,7	1,9	0,0	0,0	1,5
B03	1075	8,7	2,7	0,0	0,0	0,9
B10	886	3,4	2,5	0,1	0,5	0,9
B01	12	0,0	0,0	0,0	0,0	83,3

Tab. 7: Cruise 306 RV 'Walther Herwig III', 30.11. – 20.12.2007:
Prevalences (%) of diseases and parasites of flounder (*Platichthys flesus*)
from the Baltic Sea and North Sea

Area	N unt	Ly	Ulc Ak/Hei	Skel Def	Hyp Pig	Cryp	LK >2 mm
B12	141	5,7	0,7	0,7	0,0	39,0	0,0
B11	227	21,6	2,2	0,0	0,0	52,0	0,0
B05	51	19,6	2,0	0,0	0,0	51,0	2,0
BP3	250	12,0	0,4	0,4	0,0	25,6	2,8
B09	14	7,1	7,1	0,0	0,0	57,1	7,1
B03	72	36,1	1,4	0,0	0,0	55,6	0,0
B10	252	23,4	3,6	0,8	0,0	60,7	0,4
B01	34	32,4	0,0	0,0	0,0	50,0	0,0

Abbreviations:

N unt	: Number examined	PBT	: Pseudobranchial pseudotumour
Ly	: Lymphocystis	Acanthoceph.	: Acanthocephaleans, liver
Ep Hyp/Pap	: Epidermal hyperplasia/papilloma	Steph	: <i>Stephanostomum baccatum</i>
Ulc Ak/Hei	: Skin ulcerationen, acute/healing	Acanth	: <i>Acanthochondria cornuta</i>
Flo Ak/Hei	: Fin rot/erosion, acute/healing	Lepe	: <i>Lepeophtheirus pectoralis</i>
KieHy	: Gill hyperplasia, x-cell disease	Locera	: <i>Lernaecocera branchialis</i>
Hyp Pig	: Hyperpigmentation	Cryp	: <i>Cryptocotyle sp.</i>
Skel Def	: Skeletal deformities	LK >2 mm	: Liver nodules > 2 mm in diameter