

DEPARTMENT OF AGRICULTURE [NI]
AGRICULTURAL AND ENVIRONMENTAL SCIENCE DIVISION
(Aquatic Systems Group)

CRUISE REPORT - LF17/99

NEPHROPS AND ASSOCIATED FAUNA 26-30 April 1999

PERSONNEL

Richard Briggs, *PSO (Scientist in Charge)*
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OBJECTIVES

- To collect data on spatial patterns of *Nephrops* and bycatch abundance.
- To collect live *Nephrops*, tissue samples and perform *Nephrops* holding experiments as part of a QUB postgraduate project (McQ).
- To assess the prevalence of the dinoflagellate parasite *Hematodinium* in *Nephrops* catches.
- To collect data towards an ongoing survey of marine litter.
- To perform a ring net dips in the region of the DANI moorings on behalf of the Biological Oceanography Programme.

METHODS

Hauls of 60 minutes duration were completed at each station. This gear was the same as was used in earlier cruises and is a custom made 20-fathom *Nephrops* net of nominal mesh size 50mm throughout. Catch bulk was quantified by counting baskets filled from the catch. Sample baskets of catch were sorted to provide an assessment of species composition. The *Nephrops* in each sub-sample were divided into male and female components and the ovary maturity stage of female animals noted. Carapace length frequency distributions of both male and female *Nephrops* were measured and the number of recently moulted (soft-shelled) animals counted. Whole animals were examined for the prevalence of the parasitic dinoflagellate *Hematodinium*. The contribution of finfish in catches was quantified and their length compositions measured. Stratified sampling procedures were similar to those used during DANI groundfish surveys. *Nephrops* from selected stations were retained alive in large tanks for future studies at the QUB Marine Station in Potaferry.

Sunday 25 April

Scientific staff boarded during the evening and the vessel sailed at 23h.30 towards the Northern part (station 1) of the western Irish Sea *Nephrops* grounds.

Monday 26 April

The net was shot at 07.16 at station 1 with a slight easterly breeze. This was followed by stations 209, 208, 108, 102 and 103. The night was spent drifting in the vicinity of station 200.

Tuesday 27 April

Fine weather conditions. Stations 200, 105, 104, 106, 107 and 108 were completed. Three ring net hauls were taken in the region of the AESD moorings as part of the Biological Oceanography Programme. Plankton samples were preserved for future analysis. The night was spent drifting in the region of station 8.

Wednesday 28 April

Station 8 was fished in calm weather conditions followed by stations 7, 101, 10, 20, 15 and 30. The night was spent drifting.

Thursday 29 April

Station 35 was followed by stations 17, 109 and 2, which were fished in perfect weather conditions. As this completed the planned programme for the cruise *RV Lough Foyle* set course for Belfast, docking at 17.45.

RESULTS

During this successful cruise 23 stations were sampled as indicated in Table 1 and Figure 1a. Table 2 is the mean size, catch rate, proportion of female *Nephrops* and incidence of *Hematodinium* in catches. Live *Nephrops* were retained for *in vitro* studies to be performed at the QUB Marine Laboratory in Portaferry. Infection levels of *Hematodinium* were generally lower than in 1998 with a mean level of 7.8% compared to 13.8% during April 1998. These data are summarised in Figure 1a and Figure 1b is a comparison with data from April 1998.

The predominant by-catch species was whiting (*Merlangius merlangus*) and Figure 2 is the pooled whiting size composition expressed as catch at length per nautical mile. Table 3 shows the amount of *Nephrops* and main bycatch species caught at each station.

Data on marine litter was once again collected and added to the accumulating database for this ongoing work.

Other work completed during the cruise

1. Data were collected from a series of *Nephrops* holding experiments. These comprised of (a) damp storage on deck, (b) tank storage with flowing seawater and (c) tank storage without flowing seawater.
2. Berried female *Nephrops* were preserved in 4% buffered formalin for future fecundity studies.
3. *Nephrops* larvae from the ring net sampling were retained for investigation of growth and development of larvae.
4. Whole male *Nephrops* and the reproductive systems from selected animals were preserved by freezing and by immersion in 4% buffered formalin for future studies of male morphometrics and reproductive physiology.

5. Gut and tail meat tissues of selected *Nephtrops* were fixed in liquid nitrogen for later biochemical analysis.

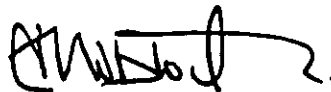
ACKNOWLEDGEMENTS

Captain Niblock, Officers and Crew of *RV Lough Foyle* are thanked for their enthusiastic co-operation throughout the cruise. The scientific personnel are congratulated on their dedication to duty, teamwork and their valuable contribution .



Richard Briggs

Scientist in Charge
29 April 1999



Andrew Niblock

Master

Table 1

Position of stations and average water depth (metres)

Tow	Stn.	lat in	long in	lat out	long out	Depth (m.)
1	1	54 17.35	5 16.13	54 14.72	5 15.18	82.0
2	209	54 6.85	5 9.19	54 9.33	5 7.03	125.0
3	208	54 7.83	5 1.06	54 5.47	5 3.51	82.0
4	108	53 52.27	5 6.28	53 49.73	5 8.17	65.5
5	102	53 47.87	5 20.69	53 45.91	5 23.46	84.5
6	103	53 40.04	5 24.67	53 37.7	5 26.95	94.5
7	200	53 36.27	5 54.88	53 34.13	5 52.16	48.0
8	105	53 30.82	5 41.71	53 29.47	5 37.7	77.0
9	104	53 36.31	5 38.81	53 38.64	5 38.54	96.5
10	106	53 38.63	5 42.9	53 35.76	5 43.26	75.5
11	107	53 46.21	5 40.97	53 48.86	5 41.81	82.5
12	207	53 56.7	5 47.25	53 59.15	5 44.69	47.5
13	8	53 51.88	5 39.33	53 54.72	5 39.54	86.5
14	7	53 52.96	5 28.26	53 55.43	5 27.28	101.5
15	101	53 55.87	5 21.22	53 53.24	5 21.43	113.0
16	10	53 56.66	5 23.39	53 59.12	5 23.72	100.0
17	20	54 0.95	5 0.09	54 0.41	5 27.51	100.0
18	15	54 4.85	5 31.21	54 7.44	5 30.74	58.5
19	30	54 5.62	5 36.81	54 7.81	5 34.72	44.5
20	35	54 14.27	5 22.59	54 11.57	5 23.76	52.5
21	17	54 9.8	5 27.2	54 7.07	5 27.59	54.0
22	109	54 2.29	5 18.73	54 7.82	5 19.4	110.0
23	2	54 12.6	5 17.91	54 15.27	5 18.67	68.0

Table 2

Nephrops data from LF1799 (no Nephrops caught at station 200)

TOW	1	2	3	4	5	6	7	8	9	10	11
STATION	1	209	208	108	102	103	200	105	104	106	107
MALE CL	23.9	25.6	25.5	28.6	26.1	30.0		26.4	25.1	25.9	24.2
FEMALE CL	21.3	21.8	21.8	23.8	21.7	24.2		26.3	22.1	23.0	21.7
No per Nm	7660	146	2364	1089	7456	129		1039	2284	348	4544
kg per Nm	69.6	1.5	24.2	17.4	78.3	2.3		13.5	23.0	4.0	41.2
% female	49.8	34.4	42.3	26.1	46.4	27.5		53.2	41.0	36.1	51.4
% Hem Males	2.1	2.7	5.2	1.2	3.6	2.0		10.0	8.7	8.9	8.1
% Hem Females	4.5	8.8	15.6	2.3	4.2	7.4		6.3	9.2	8.2	6.8
% Hem Overall	3.3	4.8	9.6	1.5	3.9	3.5		8.0	8.9	8.6	7.4

TOW	12	13	14	15	16	17	18	19	20	21	22	23
STATION	207	8	7	101	10	20	15	30	35	17	109	2
MALE CL	26.1	25.0	26.6	27.4	25.7	24.7	27.0	27.1	25.6	25.6	25.9	24.9
FEMALE CL	24.0	22.7	23.1	23.2	23.2	22.6	24.4	24.1	23.7	24.4	22.4	22.5
No per Nm	4538	794	5978	3559	7650	5150	3637	2909	5703	3073	1375	3383
kg per Nm	54.4	8.0	72.2	43.9	78.5	49.1	44.0	38.8	61.3	58.1	27.6	59.9
% female	46.2	42.8	48.9	38.8	55.5	54.3	44.5	42.4	48.9	57.8	49.3	56.8
% Hem Males	16.0	6.9	6.8	3.7	3.9	8.2	14.8	13.4	11.2	12.9	12.1	14.3
% Hem Females	17.8	8.4	6.7	5.8	2.8	6.3	16.6	18.1	8.4	9.5	7.4	11.2
% Hem Overall	16.8	7.5	6.8	4.5	3.3	7.2	15.6	15.4	9.9	10.9	9.8	12.5

Table 3

Catch (kg) per nautical mile of tow (LF1799)

Tow	Stn	Nephrops	Cod	Whiting	Hake	Haddock	Herring	Sprat	O.Fish	Total
1	1	69.6	0.0	9.5	1.4	1.2	0.0	0.0	30.5	112.1
2	209	1.5	3.7	0.9	2.0	0.0	0.0	0.2	4.7	12.9
3	208	24.2	2.2	64.1	2.1	19.3	0.8	0.0	38.0	150.6
4	108	17.4	0.7	81.2	0.1	0.9	0.7	0.0	28.1	129.2
5	102	78.3	1.1	5.1	1.5	1.3	0.1	0.0	0.0	87.5
6	103	2.4	7.1	3.6	0.0	0.5	1.3	0.0	2.9	17.9
7	200	0.0	0.4	16.6	0.1	0.5	21.7	0.0	54.5	94.0
8	105	13.5	0.1	76.6	0.0	12.4	0.6	0.0	25.8	129.1
9	104	23.0	3.1	24.6	0.1	24.0	6.0	0.0	6.4	87.2
10	106	4.0	1.3	43.3	0.6	3.7	2.7	0.0	25.1	80.5
11	107	41.2	1.3	10.0	0.9	1.6	2.4	0.2	9.0	66.5
12	207	54.4	0.0	14.0	0.2	0.6	3.7	0.9	14.4	88.3
13	8	8.0	7.4	5.9	0.8	0.6	0.6	0.0	10.3	33.6
14	7	72.2	1.3	0.6	1.3	3.0	0.4	0.1	10.8	89.6
15	101	43.9	0.5	1.6	1.9	0.0	0.4	0.1	4.1	52.5
16	10	78.5	0.4	4.0	2.0	2.5	2.7	0.0	12.3	102.3
17	20	49.1	2.2	2.1	0.7	4.9	2.1	0.1	12.7	73.8
18	15	44.0	0.0	11.1	1.1	0.5	1.1	0.0	17.7	75.6
19	30	38.8	3.5	6.7	0.6	1.0	0.8	0.4	26.8	78.6
20	35	61.3	0.4	15.7	0.0	5.5	1.6	0.0	10.2	94.7
21	17	58.1	0.4	22.6	0.4	2.7	0.1	0.0	8.9	93.3
22	109	27.6	0.3	1.3	0.7	0.2	0.4	0.1	6.6	37.3
23	2	59.9	0.0	11.2	1.8	0.1	0.0	0.0	5.5	78.6

Figure 1a

Prevalence of *Hematodinium* by station in April 1999
(No Nephrops were caught at Station 200)

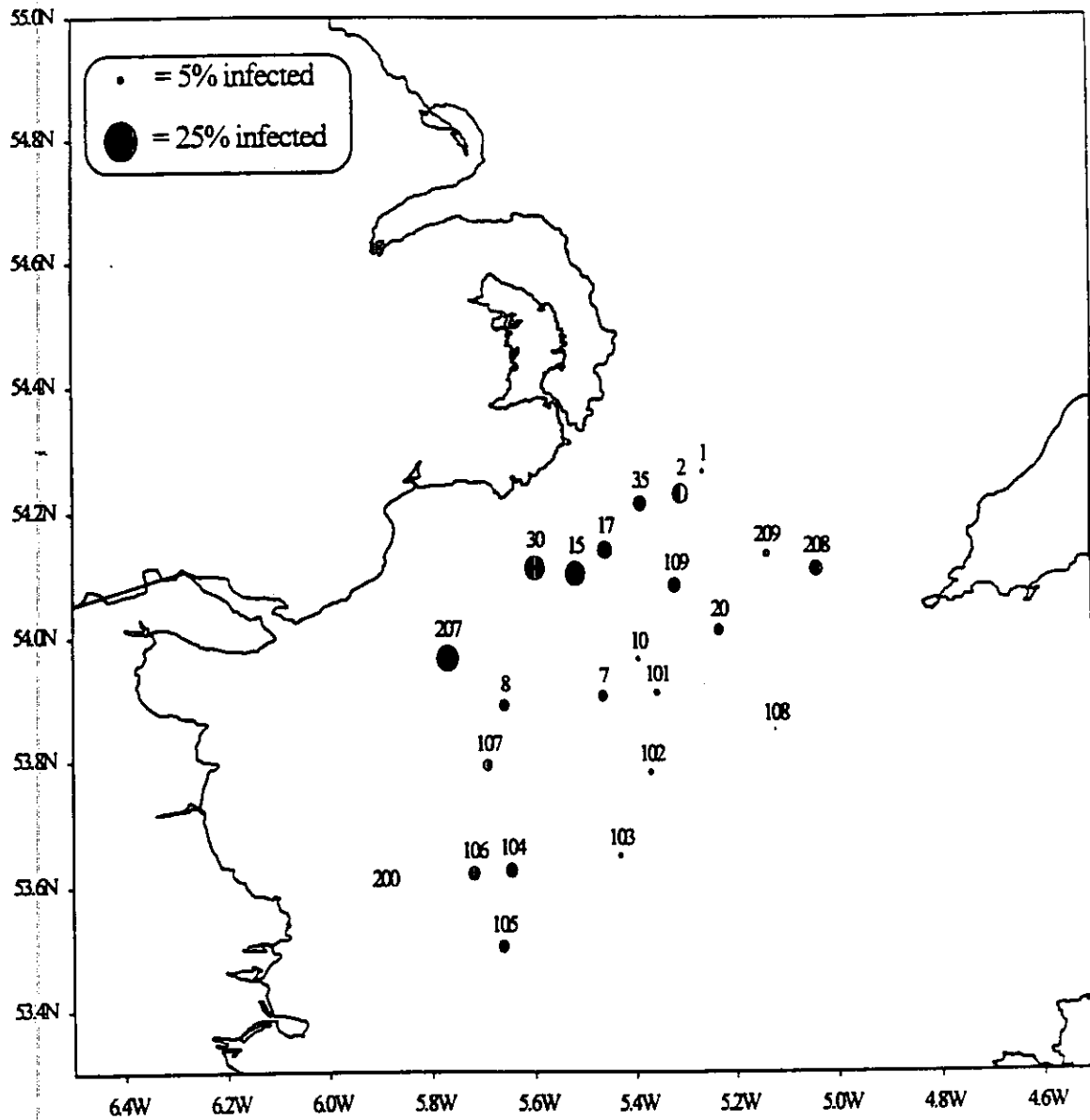


Figure 1b

Hematodinium infection during April in 1998 and 1999

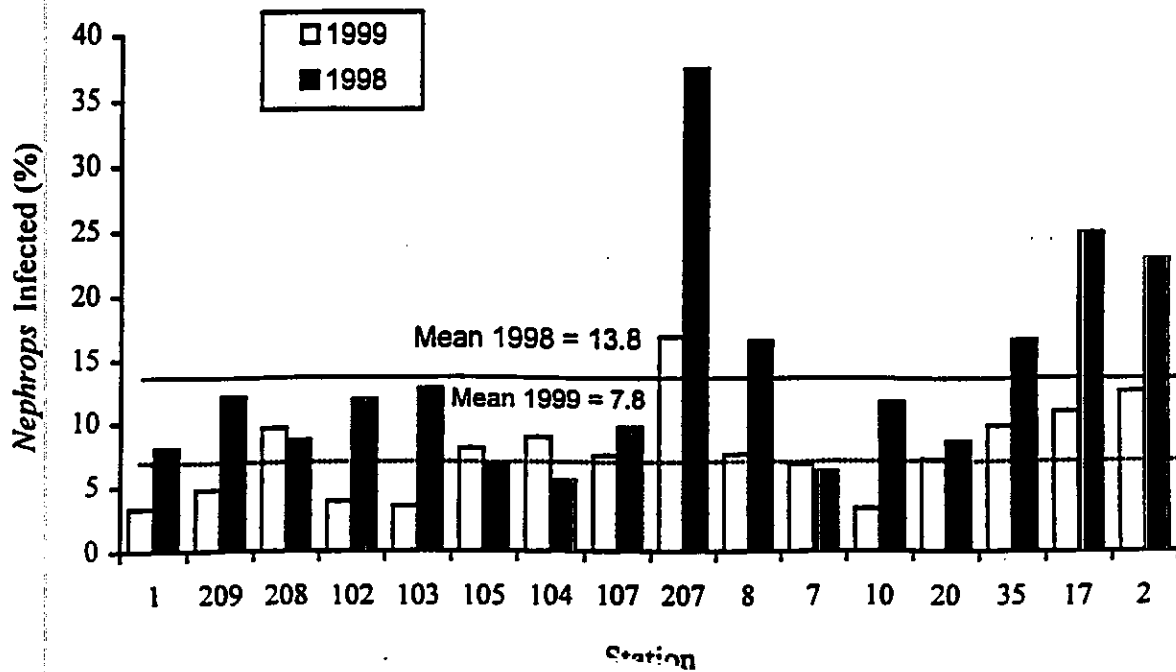


Figure 2

Mean whiting catch at length per nautical mile

