



Larval Distribution of *Nephrops norvegicus* (L)
in the Irish Sea and North Channel

by

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ABSTRACT

Findings of a larval survey of *Nephrops norvegicus* in the Irish Sea and North Channel made during May and June, 1966 are given and compared with similar findings from the Irish Sea *Nephrops* fishing grounds of 1961 and 1962. The greatest concentrations of larvae were found in and near deep water east of these fishing grounds, there being some evidence of progressive increase in age going eastwards.

1. Introduction

The survey was carried out during the late spring of 1966 aboard the research vessel L.T. "Cú Feasa", using a modified Gulf III tin-tow net making oblique hauls to sample all depths of water at each station, the length of haul being directly correlated with the depth of water, to eliminate diurnal variations in the occurrence of organisms due to vertical migration. The area surveyed was the Irish Sea (excluding the extreme south), and the North Channel including its north-western approaches, but only the outer reaches of the Firth of Clyde so that the Stations, on a grid of 15 minutes of latitude and longitude, extended from 55°30'N - 6°15'W (between Rathlin and Islay) southwards covering the entire east-west breadth of the Irish Sea to 53°00'N (approximately between the towns of Wicklow and Caernarvon). Slight breaks were caused by the weather, the work being completed in three periods, as shown in Table 1. The positions of the hauls in detail are shown together with the catch, in Table 2.

2. Results

Table 2 shows the catch of larvae both per haul and per cubic metre of water filtered and the depth at each station. The numbers of larvae per haul are considered to be the more reliable data, as each haul covers all depths, and the depth range of larva bearing layers of water must be expected to be similar in deep and shallow areas. However, as shortness of hauls in very shallow areas may conceal the true strength of the larval population, and for comparison with other Irish data (O'Riordan, 1964 unpublished) the catch-per-unit quantity of water filtered is also given.

The area of maximum larval concentration was found to lie between latitudes 53°30' and 54°15'N, along the line of the 92 metre (50 fm) trench in the western Irish Sea in the southern part, and on its eastern edge further north, with an isolated high density station midway between the Calf of Man and Holyhead Island (4°45'W 53°45'N). Small numbers occurred between this and the main concentration, south-east of the Isle of Man, and from the main concentration northwards to the southern end of the North Channel. Isolated from the Irish Sea catches, larvae presumably belonging to the Clyde *Nephrops* population were taken three stations close to the mouth of the Firth of Clyde. The larvae were classified by stages, and with two exceptions (at stage 2), as indicated, in the Clyde area, all larvae caught in Areas A and B were at stage 1. In Area C, all three stages are present in roughly equal proportions (20-20-17) which suggests the effect of the date of sampling on the stages found. Their distribution is given in Table 3, in which the most obvious trend is the tendency for the stage 1 larvae to be more confined to the western part of the area than the older stages, stage 2 especially being widely dispersed.

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DISCUSSION

Data on Nephrops larvae in the Irish Sea are not numerous. O'Riordan surveyed part of the Irish Nephrops fishing grounds, and his stations and findings (unpublished) are shown in Tables 4, A and B. He found the following stage compositions:-

Year	S t a g e				Total
	1	1/2	2	3	
1961	98	2	15	0	115
1962	104	0	1	0	105

These are summarised in O'Riordan (1964) which records also a haul on 29th May, 1962 yielding 7 stage 1 and 2 stage 2 larvae. Earlier hatching in 1961 than 1962 is postulated, and the densities encountered in 1961 were also greater. The 1962 densities are more comparable to those found in the present work where, however, the greatest densities were encountered somewhat to the east of the areas O'Riordan surveyed.

The absence of stages 2 and 3 in area A in the present work would suggest that 1966 was a year of late hatching, but in area C there were both later sampling and older larvae than in 1961 and 1962, so conclusions concerning the relative dates of hatching in the different years cannot be drawn. Given that the larval cycle takes 2-3 weeks (Poulsen, 1946), the difference in stage composition of the larval populations between areas A and C due to date of sampling seems quite likely, provided that hatching was concentrated into a very short period. It seems, however, more reasonable to postulate this difference as being due to the difference in date of sampling and the geographical difference combined. The absence of stage 3 larvae noted by O'Riordan on the Irish Nephrops grounds might be due to the date of sampling but would also appear to result from the more easterly distribution of the older larvae.

REFERENCES

O'Riordan, C.E.	1964	" <u>Nephrops norvegicus</u> , the Dublin Bay prawn in Irish Waters". Sci.Proc.R.Dublin Soc., Ser. B.1. 131-157 pp.
Poulsen, E.M.	1946	"Investigation on the Danish fishery for and the biology of the Norway lobster and the deep-sea prawn". Rep.Dan.biol.Stn. 48. 27-49 pp.

Table 1. Dates and areas of different sections of Cruise.

Area	Dates	Region covered
A	17-30 May	North, extending southwards in inshore waters on west and east
B	24-26 May	South and South-east
C	1-2 June	Central

Table 2. Stations and catches of larvae. For each station, top line = Number of larvae per haul, middle line = Number of larvae per unit volume ('000 m³) of water filtered (0 = no larvae, X = no haul), bottom line = depth in metres (in brackets). Divisions between Areas A, B, and C of Table 1 are shown in double solid lines. Larvae of stage 2 in areas A and; all other stages 1; for stages in area C see Table 3.

°W Long.	6°			5°			4°			3°					
	°N Lat.	15'	00'	45'	30'	15'	00'	45'	30'	15'	00'	45'	30'	15'	
	30'	0 (118)	0 (114)	0 (33)	SCOTLAND		X	X							
	15'	0 (61)	1* 0.2 (143)	0 (110)	0 (55)	1* 0.3 (44)	2* 1.0 (40)								
	55°00'			0 (83)	0 (86)	0 (59)	SCOTLAND								
	45'			0 (84)	0 (264)	1 0.7 (29)	X	0 (18)	0 (22)	X	X				
	30'	IRELAND				1 0.2 (99)	1 0.2 (130)	0 (35)	0 (39)	0 (51)	0 (44)	0 (26)	ENGLAND		
	15'			0 (39)	1 0.2 (90)	7 1.5 (110)	2 2.2 (18)	Isle of Man	0 (31)	0 (18)	0 (35)	0 (20)			
	54°00'	0 (30)	1 0.4 (42)	4 0.9 (103)	5 1.4 (77)	7 3.1 (57)	0 (50)	1 0.5 (40)	1 0.6 (40)	1 0 (44)	1 0.6 (37)	0 (24)	0 (13)		
	45'	X	0.8 (31)	0.8 (62)	2.7 (101)	0.3 (73)	10 0.6 (77)	2 2.0 (66)	6 0 (64)	0.5 (50)	1 0 (40)	0 (37)	0 (29)	X	
	30'	IRE.		0 (31)	5 1.7 (68)	11 2.9 (108)	0 (73)	0 (92)	0 (50)	0 (46)	0 (42)	0 (39)	0 (37)	0 (35)	X
	15'			0 (26)	0 (37)	0 (101)	0 (114)	0 (51)	0 (42)	WALES					
	53°00'			0 (11)	0 (22)	0 (95)	0 (95)	0 (51)	0 (51)	0 (17)					

Table 3. Distribution of larval stages in area C.

Lat. °N	Stage	Long. °W						
		45'	30'	15'	5° 00'	45'	30'	4° 15'
54° 00'	1	1	0	2	2	0	0	0
	2	0	3	1	1	0	1	1
	3	0	1	2	4	0	0	0
	total	1	4	5	7	0	1	1
53° 45'	1	1	5	0	2	0	0	0
	2	1	2	1	0	3	0	1
	3	0	3	0	0	3	0	0
	total	2	10	1	2	6	0	1
53° 30'	1	3	4					
	2	1	4					
	3	1	3					
	total	5	11					

Table 4. Stations and catches of larvae, (A) 21 April, 1961 (B) 25-27 April, 1962. For each station data on top, middle and bottom lines as in Table 2. (0= no larvae, X = no sample, I = position on grid falls onshore in Ireland).

Lat. °N	Long. °W		
	6° 00'	5° 55'	5° 49'
53° 46'	3 1.5 (19)	X	23 7.1 (33)
53° 40'	X	32 10.0 (25)	18 6.0 (33)
53° 36'	X	X	26 6.9 (36)
53°	X	X	13 4.0 (35)

Table 4B.

Lat. °N	Long. °W					
	6° 14'	6° 09'	6° 04'	5° 59'	5° 54'	5° 49'
54° 00'	1	X	X	0 (16)	0 (22)	0 (24)
53° 57'	0 (8)	X	X	0 (19)	1 0.3 (23)	3 0.7 (28)
53° 54'	X	X	0 (15)	1 0.3 (22)	5 1.3 (26)	7 1.2 (36)
53° 51'	X	X	2 0.8 (17)	2 0.6 (24)	1 0.2 (30)	0 (39)
53° 48'	X	X	3 1.4 (16)	4 1.3 (20)	5 1.4 (24)	5 1.2 (30)
53° 45'	X	X	1 0.5 (15)	1 0.3 (20)	3 0.7 (26)	2 0.4 (32)
53° 42'	X	X	X	3 1.1 (19)	9 2.7 (26)	13 2.6 (31)
53° 39'	1	X	X	5 [‡] 2.5 (19)	4 1.0 (28)	13 3.0 (33)
53° 36'	1	X	X	2 0.7 (19)	3 1.1 (27)	6 1.1 (35)

[‡] = One larva at this station at stage 2; all others in Table 4B stage 1.