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Some observations of growth and reproduction in northern shrimp (*Pandalus borealis*) on Flemish Cap (NAFO Div 3M) in 1994-96.

by

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INTRODUCTION

Several authors have reported on the growth and reproduction in the northern shrimp on Flemish Cap (Parsons & Veitch 1993, Skúladóttir & Einarsson 1993, Nicolajsen 1994). This paper presents some new material on this subject.

MATERIALS AND METHODS

The material was collected from unsorted catches by Faroese observers and fishermen in different periods in 1994-1996.

Biological samples, 14 in all, were frozen on board to be worked later in laboratory. Number of specimens sampled are shown in Tab. 1. A total of 12 samples were taken in the 4th quarter of 1995. One sample is from the 4th quarter of 1994 with 189 specimens and one from the 3rd quarter of 1996 with 199 specimens. The shrimp oblique carapace length (OCL) was measured by vernier callipers to the nearest half mm. Sex and maturity stages were determined in agreement with the categories defined by Rasmussen (1953) and Allen (1957) and conditions of sternal spines were verified in accordance with McCrary (1971). The data were grouped by quarter of year (Figs. 1 and 2).

Table 1 Number of shrimps for analysis of maturity by year and quarter.

Year	Quarter	Numbers
1994	4th	189
1995	4th	2517
1996	3rd	199
Total		*2905*

A total of 35292 specimens were measured in the period February-July 1996. Lenght measurements were made on board. Number of specimens measured are shown in Tab. 2. The shrimp OCL was measured as mentioned above. Counts were made in two groups: non-ovigerous and ovigerous. The data were group by month of year (Fig. 3).

Table 2 Number of OCL measurements by month in 1996.

Month	Non-ovigerous	Ovigerous	Total
February	323	326	649
March	8259	2231	10490
April	8846	164	*9010*
May	8909	0	8909
June	5260	0	5260
July	974	0	974
Total	*32571*	*2721*	*35292*

RESULTS

Growth Mean length in each age group was estimated by looking at modes in the

length distribution of the biological and the measured samples (Figs. 1, 2 and 3) and the results are shown in Tab. 3. A von Bertalanffy growth curve is fitted by eye to the

Table 3 Mean OCL at age (year and month) estimated by modes in length distributions.

Year	Age	May	Jun	Jul	3rd q	4th q	Feb	Mar	Apr
1994	1					12.5			
	2					18.0			
	3					22.5			
	4					24.5			
	5					26.0			
	6					27.5			
	7					28.5			
1995	1								
	2					18.0			
	3					22.5			
	4					25.5			
	5					27.0			
	6								
1996	1							13.0	13.5
	2							19.0	20.0
	3	21.0	20.5	20.5	21.0			23.5	24.5
	4	25.0	24.5	25.0	24.0		24.5	26.0	
	5				26.0		28.0		
	6								

observation in the period Feb-Jul 1996 (Fig. 4). The 1st of May is assumed to be the birthday. The parameters of the growth curve are the same as in Nicolajsen (1994).

Reproduction From Fig. 2 (4th quarter 1996) it can be seen that some shrimp change sex at age 2 in OCL range 17-21 mm but most change at age 3 in OCL range 21-24 mm. A small proportion change at 4 year old in size range 24.5-26 mm. Youngest primiparous are 3 years but most are ovigerous for the first time as 4 years.

Egg are released in Mar-Apr (Fig. 3) as reported by Nicolajsen (1994). As the shrimp are ovigerous from Jul-Aug the incubation period is still 9 month as stated by Nicolajsen (1994).

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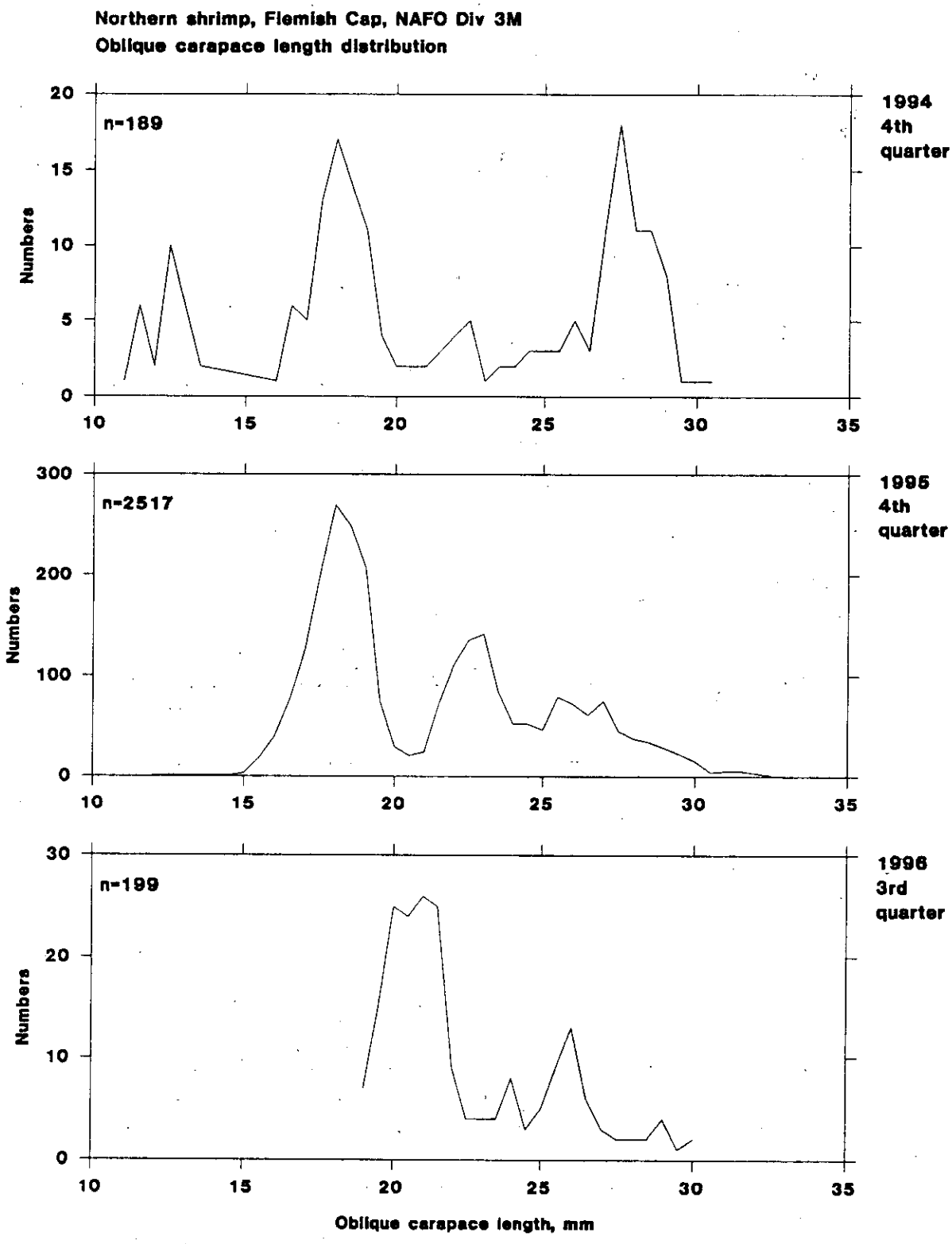

Figure 1 Total OCL distribution in NAFO Div. 3M, in the 4th quarters of 1994 and 1995 and 3rd quarter 1996.

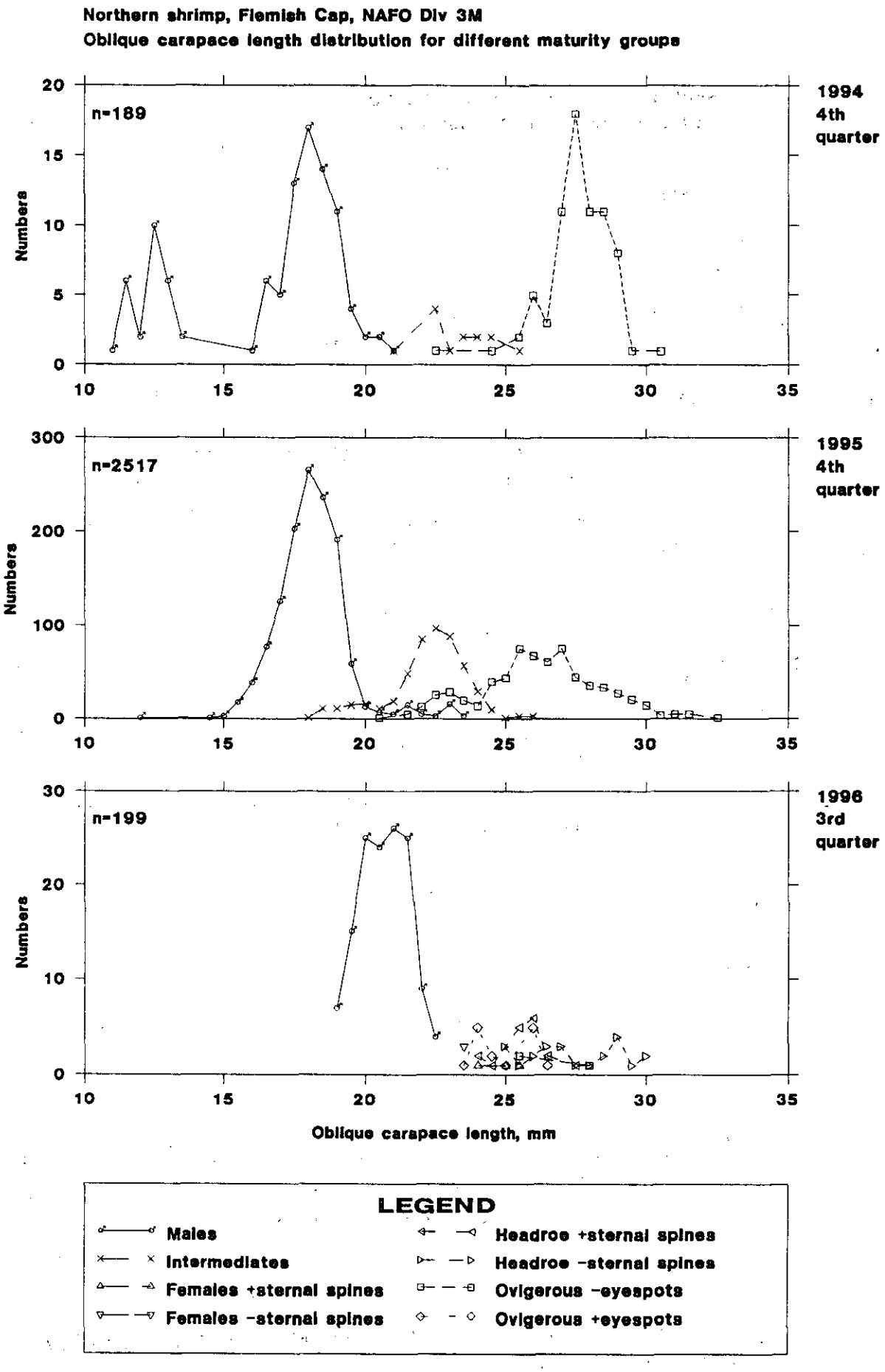

Figure 2 OCL distribution of different sex and maturity groups in NAFO Div. 3M, in the 4th quarters of 1994 and 1995 and 3rd quarter 1996.

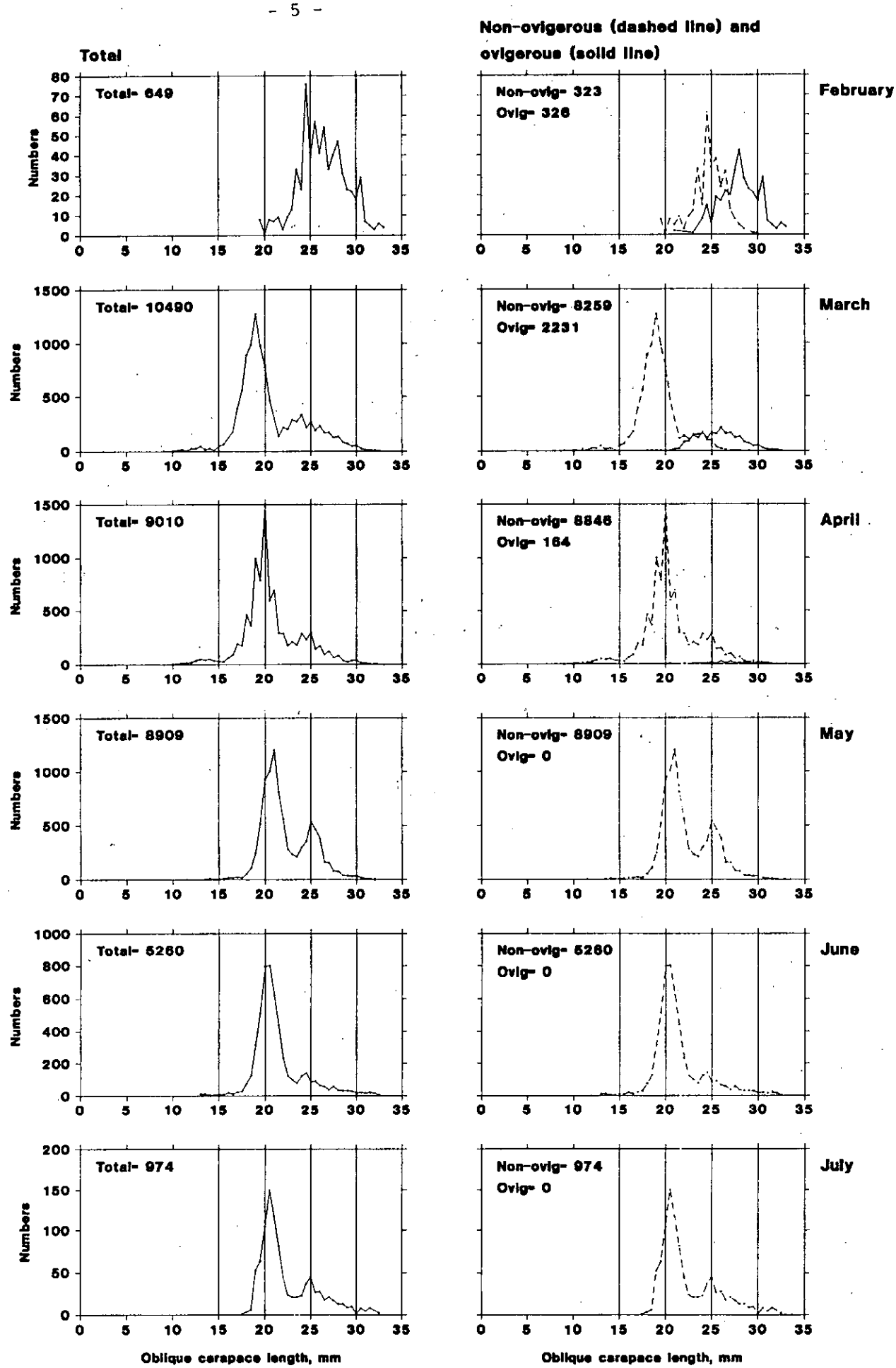

Figure 3 Total OCL distribution and seperated into non-ovigerous and ovigerous in NAFO Div. 3M, in the period Feb.Jul. 1996.

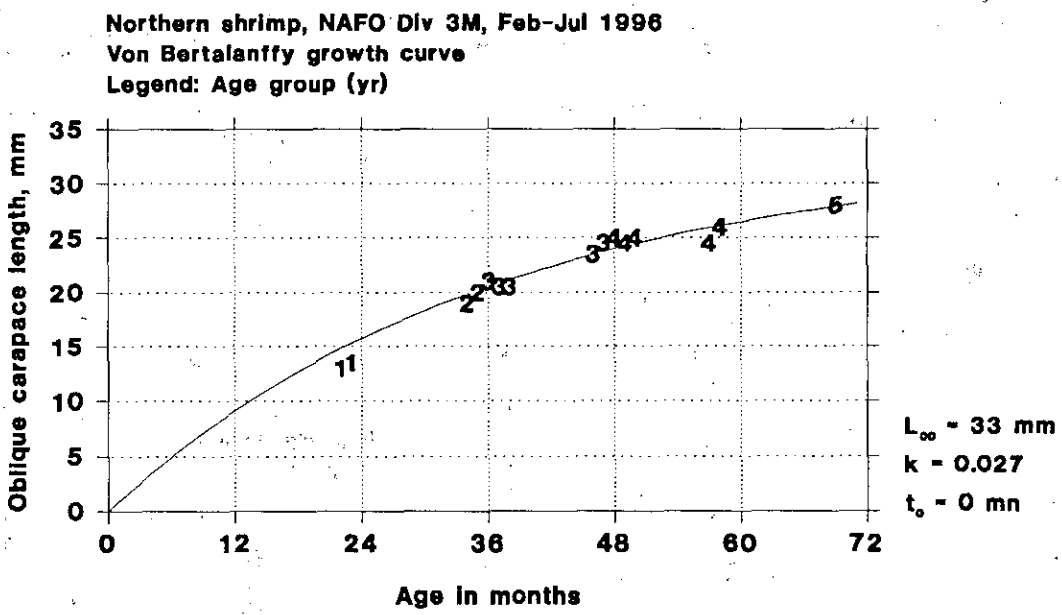

Figure 4 Scatter plot of observed OCL (mm) at age (months) with fitted von Bertalanffy growth curve.