

Some Aspects of the Biology of Norway Lobster, *Nephrops norvegicus*, in the N. Euvoikos Gulf (Greece)

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INTRODUCTION

Norway lobster (*Nephrops norvegicus*) is one of the most important species of Crustacea, with a high commercial value. However, no information is available about its biology in the Greek Seas. Various topics of the life history of the species have been studied, but only few references are cited for the Mediterranean Sea. This work deals with the length-frequency distribution, the age determination, the growth, the mortality and the reproduction of Norway lobster in the N. Euvoikos Gulf.

MATERIAL AND METHODS

A total of 3649 individuals of Norway lobster (1912 females, 1745 males) was collected at three month intervals, between September 1987 and June 1988, by a 400HP fishing trawler with a cod-end mesh size of 14mm between stretched knots, in the N. Euvoikos Gulf. Total and carapace length to the nearest mm, weight to the nearest g, sex and berried females, were recorded. All analyses have been made separately for each sex. Age was determined from length-frequency distribution, using the method of BHATTACHARYA (1967). Growth parameters from length distribution and mortality from catch curve, have been estimated using respectively the Elefan I and II computer programs (GAYANILO *et al.*, 1988).

RESULTS

The length-frequency diagram of Norway lobster was based on the carapace length separately for each sex (Fig. 1). The female carapace length range was 17-63mm, and the male 16-72mm. Young-of-the-year, of both sexes appeared as recruits in February and remained present till September. The September length frequency distribution of females was used for age determination, according to the Bhattacharya method and applying the Compleat Elefan computer program. The above identified year classes could be considered as age groups. Table I shows the age groups of female and male Norway lobster, their mean length and the separation index, necessary to indicate that the groups are meaningfully different. Eight and nine age groups respectively for females and males were identified.

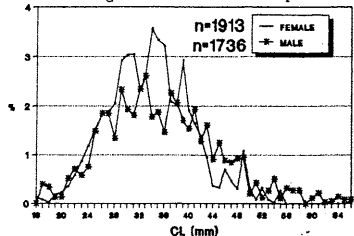


Fig. 1 Length-frequency distribution of Norway lobster in N. Euvoikos Gulf between September 1987 and June 1988.

The carapace (CL) and total length (TL) relationship was found for female: $CL = 0.11 + 0.3XTL$ and male: $CL = -1.88 + 0.32XTL$. The length-weight relationship was calculated for female: $W = 0.00083XCL^{2.962}$ and male: $W = 0.00052XCL^{3.005}$, (where W in g). The growth parameters of the von BERTALANFFY equation, estimated by the Elefan I computer program were:

Female: $L_{\infty} = 71/258^* \text{ mm}$, $k = 0.13/0.11^*$, $t_0 = -1.39/-1.6^*$, $R_n = 0.27/0.36^*$
 Male: $L_{\infty} = 84/317^* \text{ mm}$, $k = 0.06/0.1^*$, $t_0 = -2.98/-0.88^*$, $R_n = 0.26/0.42^*$
 where R_n is the goodness of fit index ranging between $0 < R_n < 1$, (*): estimation has been done in TL. The GULLAND (1969) formula was used to calculate t_0 . The estimation of total (Z), natural (M) and fishing (F) mortality, based on TL, gave for female: $Z = 0.904$, $M = 0.293$, $F = 0.611$ and for male: $Z = 0.928$, $M = 0.263$, $F = 0.665$. The mortality estimations, based on CL, did not provide representative values of the fisheries status of the area.

TABLE I. Age groups of female and male Norway lobster determined by the BHATTACHARYA method.

Group	Female		Male	
	Separation index	Mean length (mm)	Separation index	Mean length (mm)
1	-	20.17	-	16.50
2	2.79	25.39	4.11	21.87
3	3.37	29.81	4.04	26.34
4	3.71	34.16	3.00	29.77
5	3.64	37.74	3.43	32.94
6	3.21	40.86	4.37	37.91
7	5.79	46.19	3.17	42.69
8	2.70	49.64	2.63	46.70
9			3.87	50.88

Norway lobster in the N. Euvoikos Gulf, appearing in waters deeper than 60m, showed its maximum presence in 100-200m depth range. The analyses of the sex ratio in the total sample of the Norway lobster, showed that female had almost the same proportions with male ($\sigma: \phi = 1:1.01$). However, the above sex ratio presented seasonal fluctuations. The distribution of sex ratio related with length showed that the proportion of both sexes remained about 1:1. After 42 mm (CL) the percentage increase in favor of the male, while after 56mm the female disappeared. The maximum percentage of berried females was observed in September and December, while the minimum in June. Berried females appeared from 29mm and the length at first maturity was 39mm (CL).

CONCLUSIONS

The Norway lobster sampled in the N. Euvoikos Gulf presented a slow growth pattern. Furthermore, differences between sexes were observed. Eight age groups for female and nine for male were determined. During the first year of life, females reached greater lengths than males. Males presented a higher longevity than females, as proved by the larger observed lengths, as well as the estimated asymptotic length.

REFERENCES

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