

MEGANYCTIPHANES NORVEGICA (CRUSTACEA, EUPHAUSIACEA) IN THE LIGURIAN-PROVENÇAL BASIN: NOTES ON POPULATION SIZE STRUCTURES AND GROWTH

L. Orsi Relini, G. Relini, G. Palandri, M. Relini, F. Garibaldi, C. Cima, G. Torchia, C. Costa

Istituto di Zoologia, Laboratori di Biologia Marina ed Ecologia Animale, Università di Genova, Via Balbi, 5, 16126 Genova, Italia

Abstract

In the period 1990 - 1994, by several R/V surveys, a large scale sampling of *Meganyctiphanes norvegica* was performed in the Ligurian-Provençal basin. Seasonal patterns of the size structure of the catches were described. The distribution of age groups in the Ligurian-Provençal stock appears to be related to the general circulation of the basin. The growth resulted similar to those registered in the NE Atlantic.

Key-words: crustacea, population dynamics, circulation, Ligurian Sea

Introduction

The Euphausiid *Meganyctiphanes norvegica*, the North Atlantic and Mediterranean krill, is a key species in the food webs of the Ligurian-Provençal basin, both in pelagic and demersal environments (1, 2). Recent studies about morphology and reproduction of the species were conducted in the area (3, 4); however, at the best of our knowledge, the growth has never been investigated. Since 1990 we have planned a large scale collection of data in the Ligurian-Provençal basin to investigate the dynamics of the stock. In this study we report some preliminary results, obtained from the surveys 1990 - 1994.

Material and methods

Since 1990 we have established a sampling grid for IKMT hauls, covering an area of 8600 square nautical miles, between the Ligurian coast and the isle of Corsica. The sampling stations were located along four transects: A, Genoa-Calvi; B, Monaco-Calvi; C, Marseille-Gulf of Porto; D, perpendicular to B. The long term target was to repeat the sampling along the transects once or several times in the four seasons, but, given times and costs of work at sea, the sampling is still in progress. In this study we refer on a total of 70 hauls, in which spring and summer samples were abundant (respectively 26 and 35) and autumn and winter samples scarce (8 and 1).

In each station the main hydrological characteristics were measured by CTD profiles and the macroplankton-micronecton was sampled with an open IKMT (15 feet, 2x2 mm mesh size). Oblique tows, 750 m to the surface, were performed. Each haul lasted two hours at a ship speed of 3 knots. The catches were sorted in the following main subdivisions: Fish, Cephalopods, Crustacean Decapods, *Meganyctiphanes norvegica*, other Euphausiids, other Crustaceans, Pteropods, jelly macroplankton, which were measured in terms of volume. *M. norvegica* individuals in the total catch or subsamples were counted. A total of about 15.000 specimens was measured in terms of total length, from eye to telson. In subsamples, sex was determined in specimens >23 mm long.

Results

Some information about hydrological characteristics and total catches of *Meganyctiphanes norvegica* and other macroplankton in terms of volumes per haul have been previously reported (5, 6, 7).

Size structure of the IKMT catches during the year

The seasonal size composition of the catches gives clear indications of the growth of *M. norvegica* in the study area (fig. 1). Recruits appear in late spring (fig. 1a), in accordance with the times of maturation and spawning in the Ligurian Sea, i.e. from March to May (4). The frequency distribution of juvenile total length in June shows a bimodal pattern (fig. 1a). Considering stations along a single transect (fig. 2), juvenile sizes increase from the coast to the offshore waters. The smallest individuals were found in the stations close to the slope.

The summer samples give indication of the rapid growth of the young euphausiids (fig. 1b represents the sum of 20 stations sampled in August) and in the same time show a group of "old" individuals in the same length range of those observed in late spring. Considering frequency distribution of length recorded in August at single stations (fig. 3), it can be noted that the relative importance of the two age groups, juveniles and adults, changed from North to South: young euphausiids dominated at stations C4, C6, C8, B4, B5, B6, B7, A7 and A9.

In autumn young specimens were close to merge with the old group (fig. 1c). In winter the distribution appears unimodal (fig. 1d). This last distribution, recorded in February at station A1 over the slope coincided, in terms of size range, with those of stranded shoals of the same month.

Stranded animals are mature adults, the majority of which, both males and females, are bearing spermatophores. Identical reproductive patterns have been observed in the winter IKMT hauls (fig. 1d).

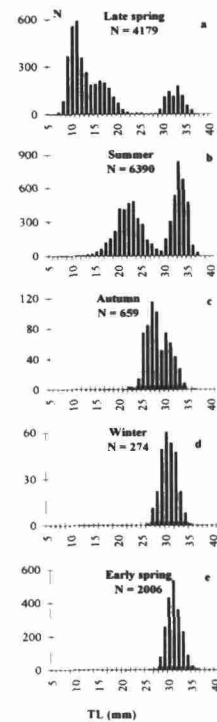


Fig. 1 Frequency distribution of total length (TL) of *Meganyctiphanes norvegica* in different seasons.

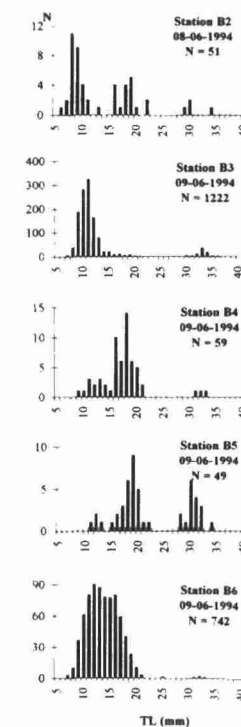


Fig. 2. Size gradients of juveniles in June along the transect B.