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Vertical distribution of Zooplankton and Micronekton in the deep Levantine Sea

Horst WEIKERT

Institut für Hydrobiologie und Fischereiwissenschaft, Universität Hamburg, D - 2000 Hamburg 50 (F.R.G.)

In January 1987, oblique stratified tows from 4000 m to the surface were made in the Levantine Sea southeast of Crete using a 1 m^2 Mocness. The device was equipped with nine black 333 µm nets. Zooplankton (<0.5 cm) and micronekton (>0.5 cm) from two profiles were arbitrarily distinguished on the basis of their total lengths. In addition, a larger, >1.0 cm group was established (Fig. 1). This is commonly defined as micronekton or macrozooplankton (BLACKBURN, 1977).

Maximum concentrations of zooplankton (68,000 specimens/10^3m^3) were found in the 0-100 m surface layer. A secondary maximum (11,000 specimens/10^3m^3) was found at 600 to 750 m. Below this layer, the numbers decreased exponentially to 30 specimens/10^3m^3 or less at depths greater than 2750 m. Copepods were predominant, accounting for 56 to 96 % of the animals. Ostracods were abundant (16 - 23 %) at 1450 to 3000 m, displacing the copepods that decreased to 75 % and less. In the deep-sea, the copepod plankton was largely monogeneric. The genus Haloptilus constituted 83 to 93 % of the calanoids at 100 to 300 m. Eucalanus (75 - 90 %) abounded at 450 to 1250 m, and Lucicutia was predominant (up to 94 %) below 1850 m (WEIKERT and TRINKAUS, in press).

The profiles for the micronekton were similar to those for the zooplankton, but the numbers were 1.5 to 2 orders of magnitude lower than those of zooplankton. There was no secondary maximum in the >0.5 cm group, which outnumbered the >1.0 cm group in the upper 900 m and below 1650 m. Below 2250 m, no organisms >1.0 cm were caught, and the smaller micronekton rapidly decreased from 10 to 1 animal/10^3m^3 and less. The organisms found at these greatest depths are small chaetognaths, which may have been contaminants from the upper layers. In the top 600 m, chaetognaths were predominant, accounting for 72 to 100 % of the individuals caught. In the >0.5 cm group, which seems to reflect the abundance of carnivores in the net samples best (WEIKERT, in preparation), remarkable abundances of about 40 % of the total were also found down to 750 m. Between 450 and 1450 m, fishes numerically increased in importance to between 35 and 75 %, and at 1050 to 1650 m, decapods became abundant (16 - 36 %). Mysids were predominant below 1450 m, constituting 20 to 40 % of the total.

In summary, among the mesopelagic and bathypelagic faunas, there was a clear depth distribution of taxa. In the micronekton, a spatial segregation pattern was indicated among the major groups, whereas in the zooplankton, this was observed only at the genus level. Below about 2000 m, the numbers of zooplankton and micronekton specimens were strongly reduced in comparison with other seas. The overall bathymetric decrease in zooplankton is significantly stronger than in the great oceans (WEIKERT and TRINKAUS, in press). Also, the vertical distribution of micronekton in the Levantine Sea differs from that in the open ocean at similar latitudes. For example, ANGEL and BAKER (1982) collecting micronekton in a net with a 4.5 mm mesh size reported groups at depths of at least 4500 m in the northeastern Atlantic Ocean. Obviously, the zooplankton and micronekton are poorly adapted to the ecological conditions in the Levantine Sea caused by the increased temperatures of its intermediate and deep water masses.

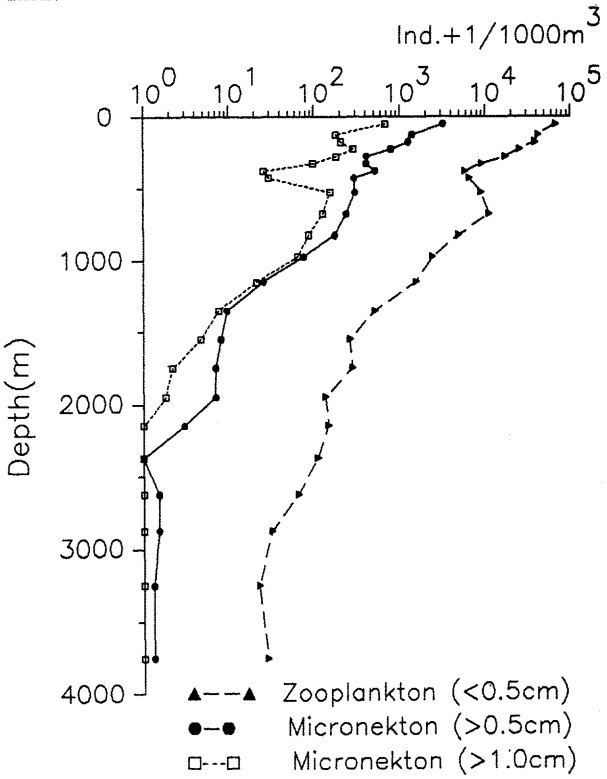

Figure 1: Numerical zooplankton and micronekton profiles from southeast of Crete (day, log-linear scale). Siphonophores omitted.

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