5.4.10 Taxonomic Composition and Vertical Distribution of Planktonic and Micronektonic Cephalopoda in the Levantine Sea (Eastern Mediterranean)

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Introduction and Scope

Information concerning species composition and abundance of pelagic cephalopods especially of the deeper layers of the Levantine Sea is very sparse. The main purpose of the present study was to add new data concerning the taxonomic composition and vertical distribution of the poorly known planktonic and micronektonic teuthofauna of the deep-water body of the oligotrophic Levantine Sea, which is in comparison to the deep open ocean warmer and more saline (MALANOTTE-RIZZOLI and HECHT, 1988 and literature cited therein).

Material and Methods

During the cruise there were carried out 33 hauls with the $1m^2$-Double-Mocness (20 nets of 0.333 mm mesh size) and 14 hauls with the $10m^2$-Mocness (5 nets with 1.6 mm mesh size). The closing net systems were used to subsample the water column by day and night starting the deepest hauls some meters above the abyssal sea floor. Immediately after the end of each haul and before the standard fixation and preservation procedure of the plankton and micronekton samples the content of each net bucket was searched for cephalopods as carefully as time allowed it. The material sorted out was fixed and preserved in 70% ethanol.

In addition, planktonic and micronektonic animals from different depth zones of the pelagic zone and of the benthic deep-sea macro- and megafauna were photographed. If the collected animals were still alive and in good condition also digital video documentations were made. More than 60 objects belonging e. g. to the taxa Siphonophora, Crustacea, Pteropoda, Heteropoda, Cephalopoda, Tunicata and Pisces were documented for educational purposes.

First results and discussion

The superficial examination of the samples on board yielded only 17 cephalopod specimens, despite the relatively large amount of Mocness tows made at all depths.

More than one-half of the specimens (9 individuals) belonged to the genus *Heteroteuthis* GRAY, 1849 of the Decabrachia family Sepiolidae. Of these, five *Heteroteuthis* were found in a single $10m^2$-Mocness tow SE off Crete (34°18'N to 34°20'N, 26°06'E; total depth about 3200 m) at depths between 150 m and 250 m shortly after midnight. The rest of the specimens was caught with the $1m^2$-Double-Mocness: one individual SE off Crete (34°19'N, 27°30'E to 34°25'N, 27°25'E; total depth ca 2500 m) at 450-500 m in the morning, one specimen E off Crete (35°14'N, 27°27'E to 35°10'N, 27°20'E; total depth about 1600 m) at 300-350 m in the afternoon, and one specimen SE off Crete (34°17'N, 27°30'E to 34°27'N, 27°23'E; total depth ca 2500 m) at 200-250 m in the evening. The remaining *Heteroteuthis* specimen was captured SW off Cyprus (34°06'N, 32°06'E to 31°46'E; total depth ca 2500 m). It was found in an integrated haul (0-1850 m) allowing no precise determination of capture depth.

Heteroteuthis is one of the most common pelagic cephalopods in the Mediterranean Sea (NESIS, 1982/87). It inhabits the water column from a few meters to ca 500 m depth, mostly between 25 and 150 m (LU et al., 1992). The depth range of the up to the present proved *Heteroteuthis* captures of the cruise M 44/4 reaches from 150 m to 500 m, which is within the range given by the authors. Five of the eight up to now found specimens with precise depth information (62,5%) were caught at depths between 150 m and 250 m.

According to ROPER (1974) *Heteroteuthis* from the Mediterranean migrates towards the surface at night. ROPER and YOUNG (1975) reported on *Heteroteuthis* caught in that sea: During the day four specimens were taken in 150-250 m depth and 10 specimens at depths of 400-500 m, while 16 specimens were captured between 50 m and 300 m at night. Although in amount very limited, the proved *Heteroteuthis* captures of the present study also indicate a stay of the specimens in shallower depths (150-250 m) at night and in greater depths (200-500 m) during daytime.

The other cephalopods found were members of the Decabrachia families Cranchiidae (three specimens collected at 100-150 m, 550-600 m and 0-1850 m depth, respectively), Enoploteuthididae (one specimen from 0-450 m and one from 0-1850 m) and Pyroteuthididae (one individual from 0-700 m) and of the Octopoda (one specimen caught in 100-150 m depth) as well. A very small ontogenetic stage of a decabrachian from 0-1850 m depth could not yet be determined.

The Cranchiidae found were collected within the range mentioned by VOSS et al. (1992). Members of this family live in the water column from the surface to unknown depths below 2000 m. While the adults of the Enoploteuthididae and Pyroteuthididae live at mesopelagic depths, the juveniles occupy the upper 200 m. Probably all members of these families undergo extensive vertical migrations (YOUNG et al., 1992, YOUNG 15.03.1998, YOUNG et al. 15.03.1998). The depth ranges of the up to now found specimens of M 44/4 match the quoted habitat range (except the individual, which came from the deep integrated haul).

Based on the provisional examination of the material, no individual was captured for sure in the bathypelagic zone (the deepest capture excluding integrated hauls took place in 550-600 m). This matches in part the finding of WEIKERT (1990) that micronekton is absent from the deeper bathypelagic zone of the Levantine Sea.

In conclusion, the results of this preliminary study may suggest that the oligotrophic Levantine Sea does not harbour many planktonic and micronektonic cephalopods. The deeper layers seem to lack them. The findings need to be confirmed by a detailed taxonomic and quantitative examination of the samples.

Addendum to

MISKE, V. C. (2000a). Taxonomic composition and vertical distribution of planktonic and micronektonic Cephalopoda in the Levantine Sea (Eastern Mediterranean): first results. p. 206-207. In: PÄTZOLD, J.; HALBACH, P. E.; HEMPEL, G. & WEIKERT, H.: Östliches Mittelmeer – nördliches Rotes Meer 1999, Cruise No. 44, 22 January – 16 May 1999, *Meteor*-Berichte, Universität Hamburg, 00-3, 240 pp.

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The references of the publications of *Meteor-Berichte 00-3, Cruise M44* are listed therein all together. The following references belong to the publication cited above.

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