

Vertical and horizontal distribution of species *Temora stylifera* (Dana) and *Temora longicornis* (Müller) in Southern Adriatic

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Abstract

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In last several decades studies were performed on horizontal and vertical distribution of Copepoda in coastal and off-shore waters of Adriatic. This paper presents data on distribution and abundance of species *Temora stylifera* (Dana) and *Temora longicornis* (Müller) at Boka Kotorska Bay, estuary of River Bojana and open waters of southern Adriatic. Data for Kotorska Bay were collected before the red tide (1971-1976) as well as during the most recent studies in 2002. Data for off-shore deep waters of Southern Adriatic and estuary of River Bojana were collected in studies in period 1983-1990.

Key words: Adriatic sea, Copepoda, vertical migration, zooplankton.

Introduction

This abstract presents data on spatial and seasonal distribution and abundance of species *Temora longicornis* and *Temora stylifera* in both coastal and offshore waters of the southeastern part of Southern Adriatic. During the studies in 2002 in Boka Kotorska Bay we have recorded occurrence of species *Temora longicornis* in the period February-July, this being the first significant record of this species in this area. *Temora longicornis* is a characteristic species of copepod fauna in the estuary of river Po as well as in North Adriatic (Hure, 1961).

Materijals and methods

Our observations were based on the analysis of zooplankton samples collected monthly and seasonal during 1971/76, 1983/90, 2002. Plankton was collected with plankton nets of Nansen type of two sizes: diameter 1m / length 3m and diameter 0.57m / length 2.5m. The diameter of openings in the nets was 150µm and 200µm for vertical collecting and 250 µm for horizontal collecting. The seasonal vertical distribution and day-night

migrations were performed according to methods (Moore, 1949) and (Vinogradov, 1968) in 24-hour series. In the same time, other factors were measured: T°C, Sal‰, pH, O₂, transparency by Secchi plate, color of the sea with Forel scale I–XXI.

Results and discussion

Temperature – Boka Kotorska Bay is not a homogenous area in thermic sense, so the temperatures varied from 8.0°C in winter months to 25°C in summer months. In the estuary of River Bojana, temperature varied from 12.7°C in January to 20.91°C in July. Temperature of the surface layer of epipelagic and bathypelagic waters of Southern Adriatic varied from 12.0°C in the winter season to 27.0°C in summer season.

Salinity- At Boka Kotorska Bay it varies from 2.3‰ at the surface of Bay of Kotor in September to 38.0‰ in the bottom layers in summer. At the estuary of River Bojana it varies from 12.7‰ at the surface in January to 37.28‰ in the bottom layer. At the epipelagic and bathypelagic waters of Southern Adriatic, salinity varies from 38.0‰ to 39.0‰.

Temora longicornis is a characteristic representative of neritic area, especially the estuary waters of Southern Adriatic. *Temora longicornis* was recorded in period February-July 2002 at the stations closer to the open sea at Boka Kotorska Bay. Vukanić (1979b) recorded it for the first time in waters of Boka Kotorska Bay near Kotor in 1975. In the winter season of 1983 this species represented 9.9% of Copepoda population at the profile of estuary of R Bojana. In July 1975 at Boka Kotorska Bay during the period of Dinoflagelata bloom and cooling of the biotope by northern wind, *T. longicornis* had a greater abundance than *T. stylifera* (Vukanić, 1979b).

Temora stylifera is a surface tropical species, permanently present in plankton of Boka Kotorska Bay. At the inner waters of the Bay it is almost completely absent from late winter to late spring and has no quantitative value. At the outer part of the Bay it is more common and abundant from June to December. Abundance maximum was recorded in summer. The percent participation in total copepods in plankton ranges from 0.65% at Bay of Tivat to 1.13% at Bay of Hercegnovi.

According to the earlier data for Boka Kotorska Bay (Vukanić, 1971, 1979b) percent participation in total copepods in plankton ranged from 3.5% at Bay of Kotor to 9.6% at Bay of Hercegnovi. At the epipelagial of the open sea outside the Bay, the same author cites participation of 4.75%, while data from seasonal studies show smaller values, 0.85%. Percent participation of this species in Copepoda community at the estuary of R Bojana is 2%. For the open Southern Adriatic (Hure et al., 1968) cite participation of 7.6%.

Temora stylifera is recorded in the surface layer throughout the year, while below 30m it is

usually recorded as single individuals (Hure, 1961, Vukanić, 2002). Moore (1949) recorded it from 0m to 400m of depth. Our data show appearance of this species from the surface to 150 m of depth, with medium yearly maximum of abundance at depth of 25m. Below 50m of depth it is usually recorded as single specimens. Both seasonal and day-night migration was poorly developed.

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