

UNUSUAL OCCURRENCE OF THE MICROFLAGELLATE HERMESINUM ADRIATICUM ZACH. IN THE NORTHERN ADRIATIC SEA IN 1998 AND 1999

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Abstract

Hermesinum adriaticum Zacharias (Incertae sedis) is a rare heterotrophic microflagellate that has been described for the first time in the northern Adriatic in 1906, but since then it wasn't recorded in this region until the summer of 1998 and summer and autumn of 1999.

Keywords : plankton, Adriatic Sea

Hermesinum adriaticum Zach. species has uncertain taxonomic position (Incertae sedis; 1) due to the presence of a siliceous skeleton inside its cells, two unequal flagella and a nucleus with condensed chromosomes similar to that of Euglenophyceae.

H. adriaticum is known both as a tropical and temperate species. Highest known concentrations (up to 380,000 cells/L) were associated with a marked chemocline at the H₂S boundary in the Narragansett Bay (USA; 2) and in the Lake Rogoznica (small salty lake on the central eastern Adriatic coast; 3) in summer. In the northern Adriatic Sea, since 1906 (4), *H. adriaticum* has not been reported, although the Centre for Marine Research in Rovinj continuously collected phytoplankton data since 1972. The *Hermesinum* species was found only in the western coastal part of the Otranto Strait (5) and in the offshore southern Adriatic along "profile" Dubrovnik-1000m isobath (3), when its appearance was correlated with the inflow of eastern Mediterranean waters with temperatures above 13.8°C and salinity above 38.6‰, providing evidence of subtropical microplankton winter migration into Adriatic. Immigration brought by natural anomalies in the current transport is a frequent reason for the appearance of new species in plankton communities, as already observed in the northern Adriatic (6).

Seawater samples for analysis of microphytoplankton composition were collected from 1/1/1998 to 31/12/1999 on 11 stations, using Van-Dohrn bottles, and preserved with Lugol solution (neutralised with sodium-acetate). On 7 stations additional samples were taken and preserved with 2% neutralised formaldehyde solution. Cell counts were performed by the Utermöhl method (7). The investigated region included open waters as well as coastal belt of the northern Adriatic including Limski kanal (Fig. 1).

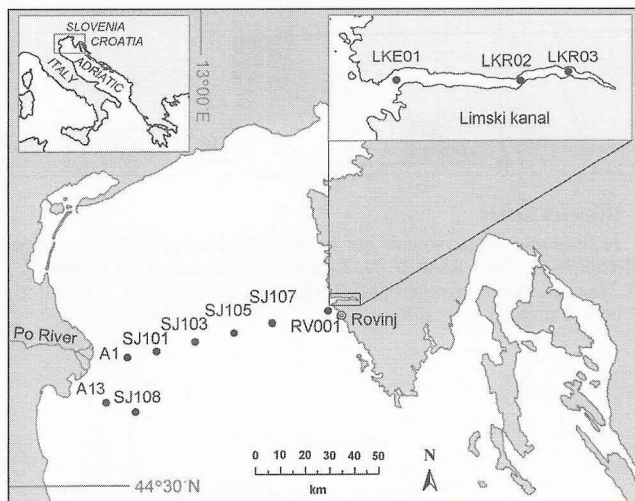


Figure 1. Map of the study area with sampling stations.

H. adriaticum species was found in summer and autumn months (Tab. 1), mostly in the 0-10 m layer, in low concentrations, ranging generally from 40-800 cells/L. Higher values (up to 6400 cells/L) were found on August 24th, 1999 in the surface layer of the area 22 km south-east off the river Po delta.

Table 1. Records of *Hermesinum adriaticum* in the Northern Adriatic in 1998 and 1999.

Date	Station	depth/m	cells/L
09/06/98	SJ107	10	200
17/08/98	SJ108	10	400
10/06/99	SJ107	0	740
24/08/99	SJ108	0	800
24/08/99	SJ108	5	6400
24/08/99	SJ108	10	3200
24/08/99	SJ108	20	800
01/09/99	LKE01	10	400
01/09/99	LKE03	10	40
01/09/99	LKE03	16	200
08/09/99	SJ107	20	200
18/12/99	A13	24	370

The hypothesis that the appearance of *H. adriaticum* in the northern Adriatic in 1998 and 1999 was due to higher than usual northward advective transport of oligotrophic southern Adriatic waters was verified principally from higher salinity and transparency, as well as minimum values of plankton abundance and oxygen production and consumption in 1998 and 1999. It may also indicate an intrusion of eastern Mediterranean water masses into Adriatic. This inflow appeared to be more intensive in 1999 than in 1998.

Assuming that the origin of the observed *H. adriaticum* are coastal environments in the warmer and saltier eastern Mediterranean (3), this species could be used as an indicator of enhanced intrusions of these waters in the Adriatic, up to its northernmost part.

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