

# The role of *Noctiluca scintillans* in the trophic dynamics of the Black Sea plankton community

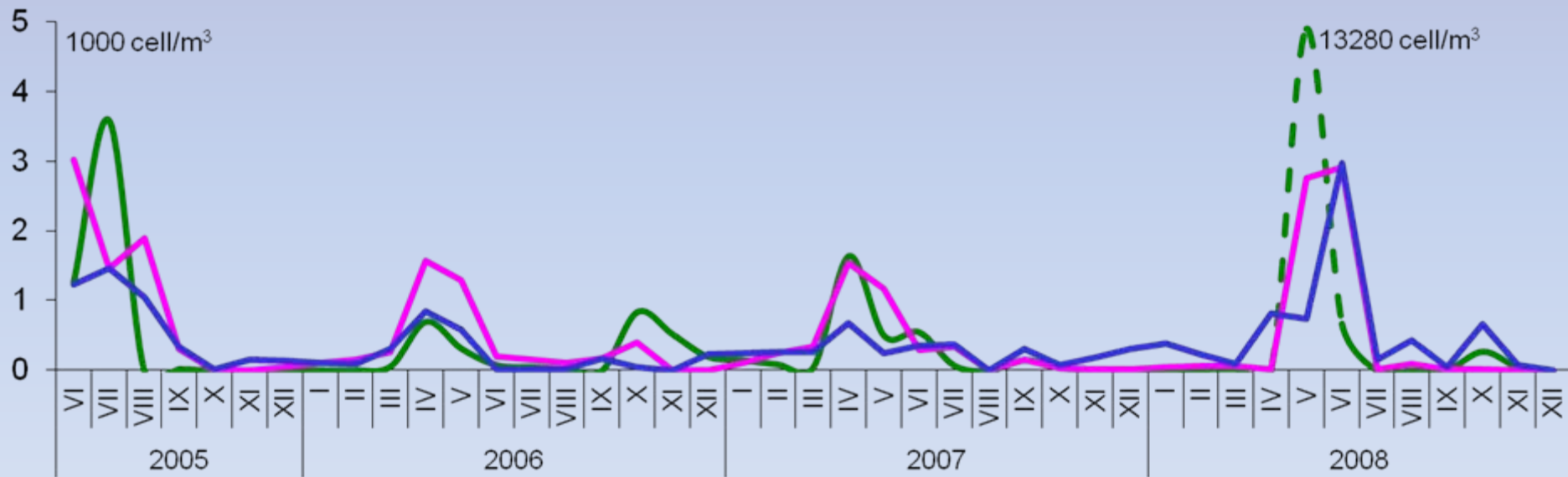
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*N.scintillans* is a common member of the Black Sea zooplankton community.

The development of population starts in March and by the end of May *N.scintillans* reaches the maximum of abundance.



Due to the wide food spectrum *N.scintillans* can affect the plankton community in different ways:

- grazing the phytoplankton & microzooplankton
- consuming copepod eggs and nauplii
- feeding on marine snow

The aim of our research was to estimate the role of *N.scintillans* in the trophic dynamics of the zooplankton community in the Black Sea in the spring period

# Materials & methods

- The material was collected during the four cruises in the NE Black Sea: May 2001, April 2008, March 2009 and June 2010
- Zooplankton samples were collected with the Juday net (180 $\mu$ m mesh) and fixed with formaldehyde. The content of Noctiluca cells was examined under the dissecting microscope.
- The fluorescence of Noctiluca cells was measured with the Turner Designs fluorometer.
- The laboratory experiments were performed to study the digestion time of *N.scintillans* on different types of food.
- The carbon content of noctiluca cells was measured on the CHN analyzer.

# Different food particles in *N.scintillans* cells



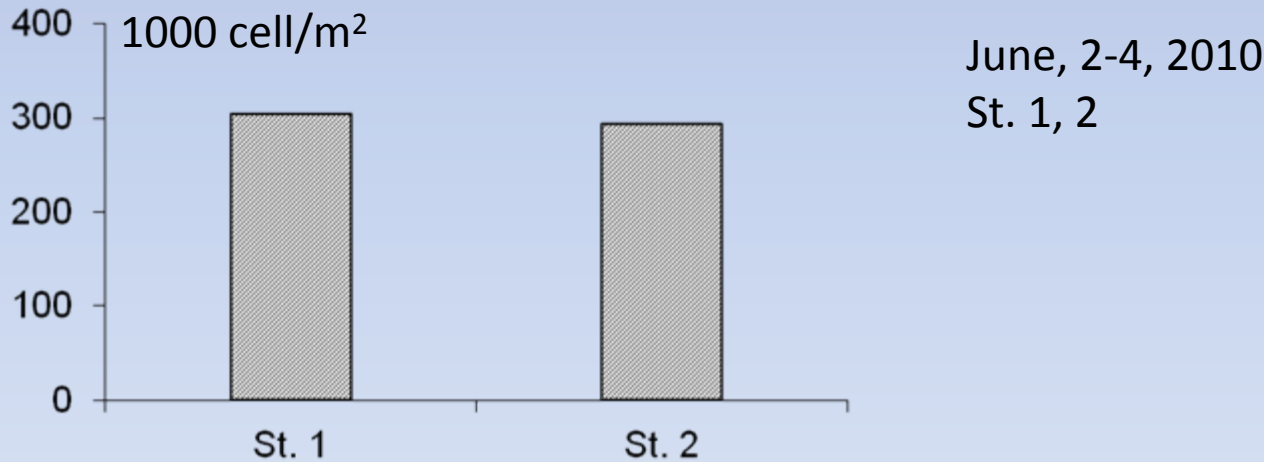
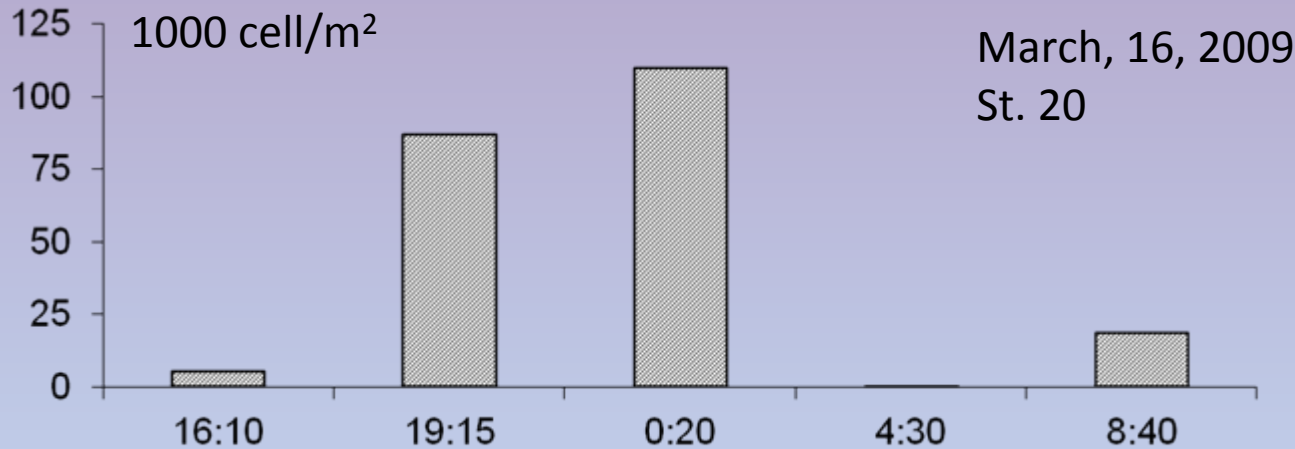
## The digestion time

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| Food type                          | Number of experiments | Digestion time, hours |
|------------------------------------|-----------------------|-----------------------|
| <i>Thalassiosira weissflogii</i>   | 10                    | 7,1 ± 1,55            |
| Tetraselmis sp.                    | 12                    | 9,0 ± 1,5             |
| Eggs of <i>C.euxinus</i>           | 10                    | 36,8 ± 5              |
| Faecal pellets of <i>C.euxinus</i> | 10                    | 15,0 ± 2,5            |

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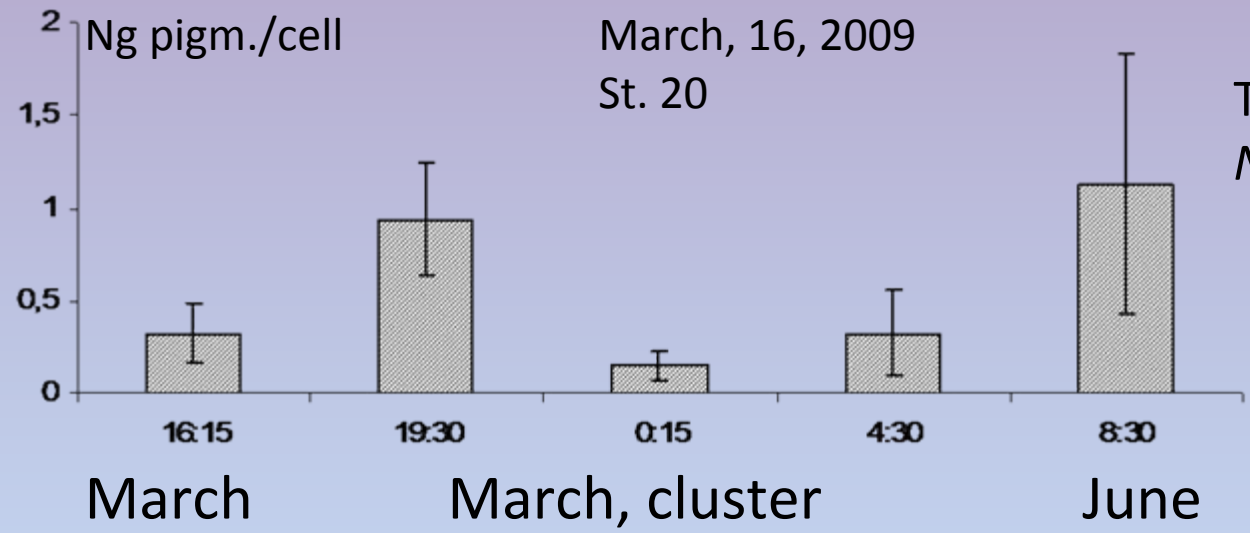
# Spatial distribution



Due to hydrophysical influence *N.scintillans* can form the clusters at the periods of its low abundance.

At the periods of population mass development the spatial distribution is more even.

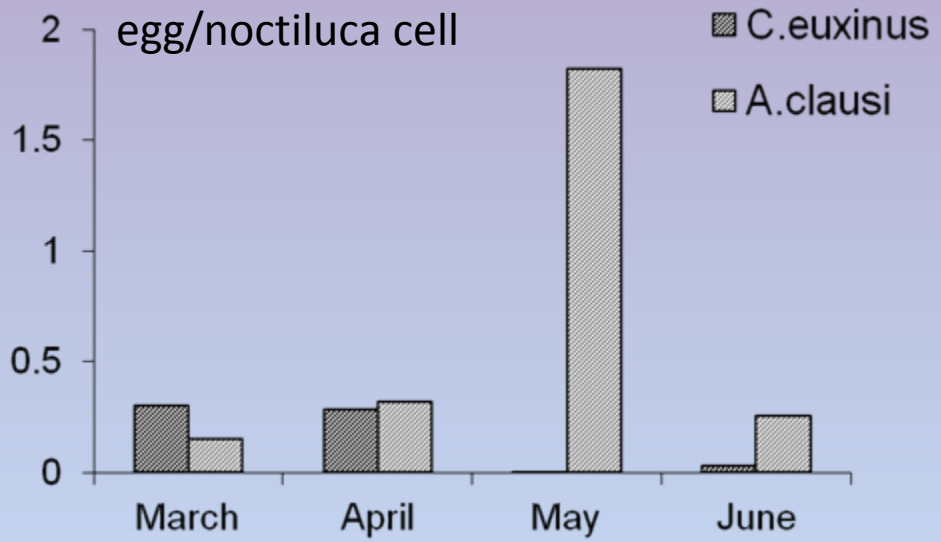
# Feeding on phytoplankton



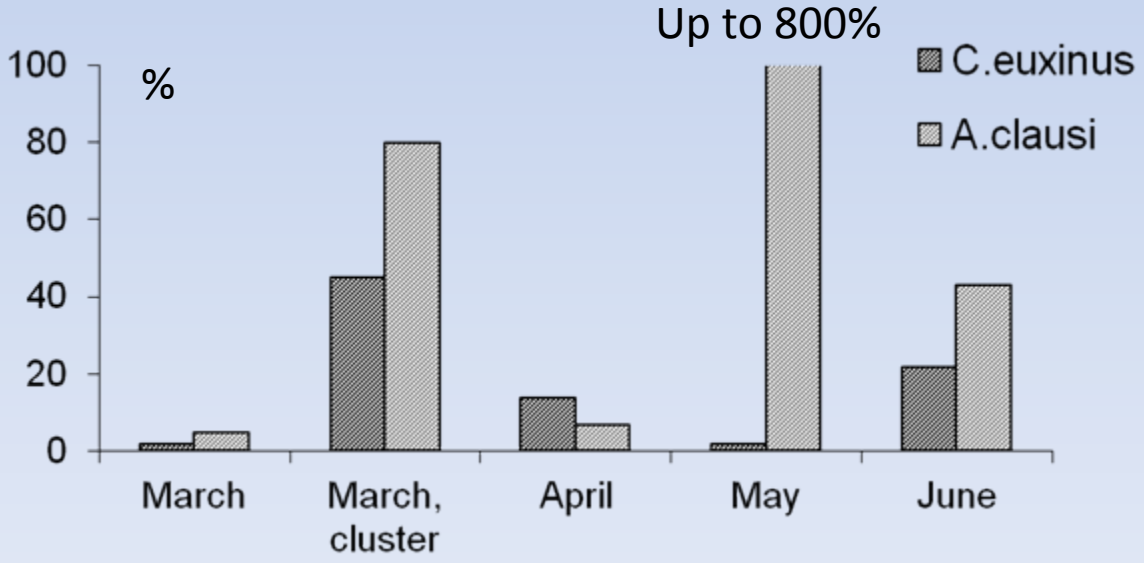
■ Phytoplankton 
 ■ C.euxinus 
 ■ P.elongatus 
 ■ A. clausi 
 ■ N. scintillans



# Feeding on copepod eggs

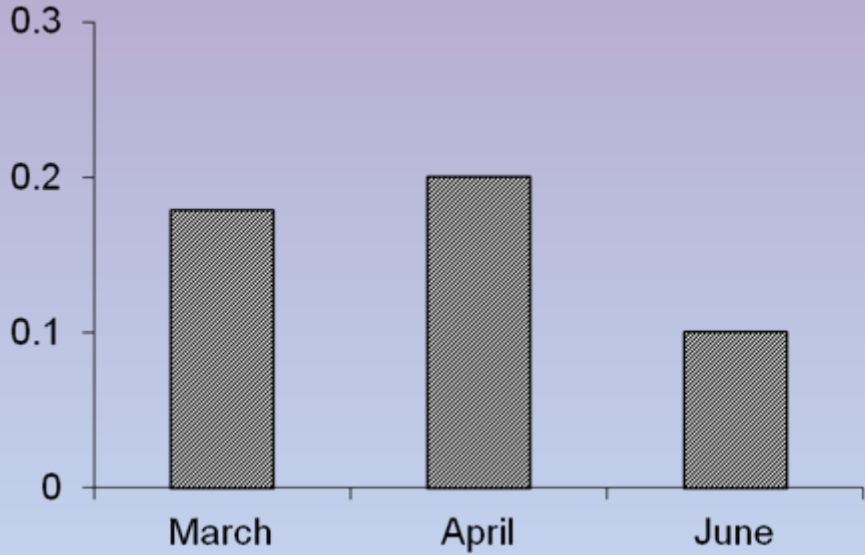


The mean amount of eggs in *N.scintillans* cell

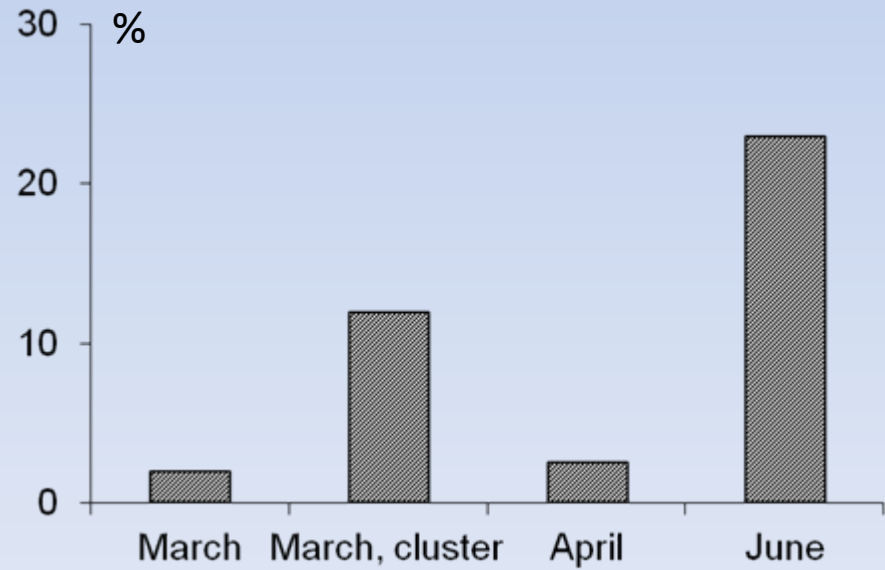


The daily mortality of eggs due to the predation of *N.scintillans*

# Feeding on *C.euxinus* faecal pellets

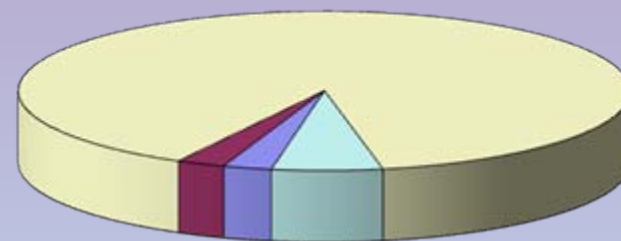
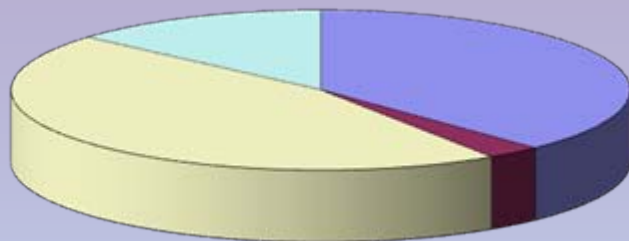


The mean amount of *C.euxinus* faecal pellets in *N.scintillans* cell



The daily consumption of *C.euxinus* faecal pellets by the population of *N.scintillans*

# The daily ration of *N.scintillans*



■ *C. euxinus* eggs

■ *A. clausi* eggs

■ phytoplankton and microzooplankton

■ Faecal pellets of *C. euxinus*

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|                                    | <b>March</b> | <b>June</b> |
|------------------------------------|--------------|-------------|
| Daily ration, $\mu\text{g}$ Carbon | 0.14         | 0.27        |
| Specific daily ration, %           | 47%          | 90%         |
| specific growth rate               | 0.21         | 0.28        |

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**Thank You!**