

# TROPICAL HARMFUL PHYTOPLANKTON SPECIES ALONG ABRUZZO COAST (W ADRIATIC)

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## Abstract

The presence of tropical harmful species along the Abruzzo coast (Western Adriatic Sea) belong to 2007 when it was revealed the first appearance of *Prorocentrum lima* species. After that summer, other tropical toxic species such as *Ostreopsis ovata*, *Coolia monotis* and *Prorocentrum concavum* were observed. Besides, the ichthyotoxic species from Japan sea (*Fibrocapsa japonica*) has been detected before 2007. These species are known to produce toxins that could be dangerous for human health. In this study four coastal rocky points have been monitored during the summers 2007, 2008 and 2009. Chemical - physical parameters of sea water have been measured in order to understand their relationship with the presence/absence of tropical harmful species.

**Keywords:** *Algae, Toxic Blooms, Toxins, Phytoplankton, Species Introduction*

## Introduction

*O. ovata* is a common species of tropical areas. Its occurrence in coastal areas of the Adriatic Sea (Gulf of Trieste, Conero Riviera and Abruzzo coast) has probably been favoured by the increased water temperatures of the last decade [1]. It clearly poses increasing risks for human health and effects on benthic communities. In most cases *O. ovata* was present in association with other potentially toxic dinoflagellates such as *P. lima* and *C. monotis*, belonging itself from tropical areas [2]. Blooms of *F. japonica* in the Adriatic Sea, instead, have been regularly observed since 1997, above all in summer periods (July - August). Among the 5000 species of marine phytoplankton, almost 300 species can occur in such high numbers that they obviously discolour the surface of the sea, while only 80 species have the capacity to produce potent toxins dangerous for humans [3].

## Methods

This work underlines the presence of tropical harmful species of the Abruzzo coast. The investigations were carried out in four confined areas such as harbors and rocky banks during the periods of June, July, August and September of 2007, 2008 and 2009 years. These stations have been selected above all to localize epiphytic species like *P. lima*, *C. monotis*, *O. ovata* and *P. concavum* due to their behavior to live on macroalgae, on sediments and inside stagnant environment with absence of water movements. At each station, one seawater sample was taken at 0.5 m from the surface by means of a pump. Algae observations were effected by the use of the light microscope (ausJENA Telaval 3) at 200x, 400x and 1000x magnification (Fig 1). Cells abundance concentrations were all expressed as cells · L<sup>-1</sup>, reading the entire well using a volume of 50 ml. Chemical - physical parameters of seawater were measured by a multiparametric probe.

(June, July, August and September) with a mean concentration of  $1.9 \times 10^5$  cells · L<sup>-1</sup>. The first appearance of *O. ovata*, instead, was at the end of August 2008, at Ortona harbor and Fossacesia rocky bank. Its mean abundance was  $3.4 \times 10^5$  cells · L<sup>-1</sup>. *P. concavum* and *C. monotis* have been detected for the first time during this last summer (August and September 2009) always at Ortona harbor, with  $1.5 \times 10^3$  and  $3.0 \times 10^2$  cells · L<sup>-1</sup> mean concentrations respectively. *F. japonica*, at last, has always been detected for the entire period of monitoring, with a bloom phenomenon on August 2009 along the entire coast of study ( $6.8 \times 10^4$  cells · L<sup>-1</sup> mean abundance).

## Discussion and Conclusions

The increase of sea water temperature and the expand of ships traffic and their ballast waters have caused the entry of several tropical harmful microalgae. In fact, the Ortona harbor point, characterized by a major ship traffic, has revealed the entire community of the species in study among the four sampling stations. Besides, the highest temperature values of the three years of monitoring were always measured on August. During these periods, the contemporary presence of the 5 tropical harmful species has been registered.

## References

- 1 - Russo, A., Rabitti, S., Bastianini, M., 2002. Decadal climatic anomalies in the Northern Adriatic Sea inferred from a new oceanographic data set. *P.S. Z.N.: Marine Ecology*, 23 (Suppl. 1): 340-351.
- 2 - Sansoni, G., Borghini, B., Camici, G., Gasotti, M., Righini, P., Fustighi, C., 2003. Fioriture algali di *Ostreopsis ovata* (Gonyaulacales: Dinophyceae): un problema emergente. *Biol. Amb.* 17: 17-23.
- 3 - Hallegraeff, G.M., 2003. Harmful algal blooms: a global overview. In: Hallegraeff, G.M., Anderson, D.M., Cembella, A. (Eds.), *Manual on Harmful Marine Microalgae*. UNESCO Publishing, Paris, pp. 25-49.

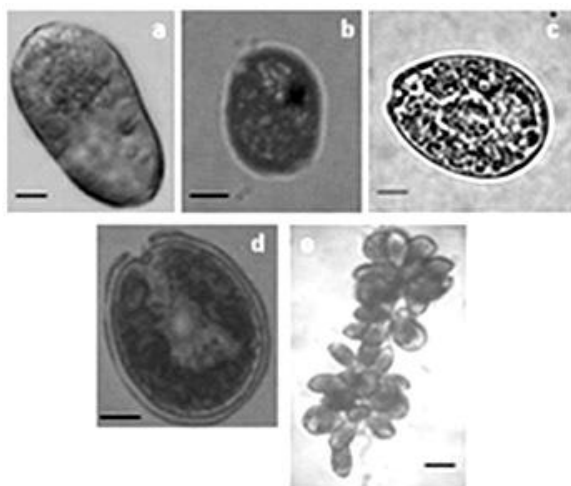


Fig. 1. 1000x magnification, scale bar 10 µm: a) *F. japonica*; b) *C. monotis*; c) *P. lima*; d) *P. concavum*. 200x magnification, scale bar 50 µm: e) *O. ovata*

## Results

The first appearance of *P. lima* was recorded on summer 2007 only inside Ortona harbor. Its cellular abundance has been detected for the entire season