

OCCURRENCE OF THE POTENTIALLY TOXIC DIATOM *PSEUDO-NITZSCHIA* IN BIZERTE LAGOON (WESTERN MEDITERRANEAN)

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Abstract

Abundance of the potentially toxic diatoms *Pseudo-nitzschia*, temperature, salinity and dissolved nutrients were reported for the Bizerte Lagoon (Northern Tunisian coast, Western Mediterranean) from March 2004 to March 2005. Distribution of *Pseudo-nitzschia delicatissima* complex species showed a stronger seasonality and was more correlated with summer conditions than *Pseudo-nitzschia seriata* complex species, which in turn exhibited a narrow spatio-temporal distribution and appeared independent from major environmental constraints.

Keywords : *Diatoms, Lagoons, Western Mediterranean.*

Introduction

The first renewed ASP (Amnesic Shellfish Poisoning) event occurred in November 1987 in Canada. This deadly event led to the identification of the neurotoxin DA (domoic acid) as a harmful algal toxin. The causative species is a pennate diatom belonging to the genus *Pseudo-nitzschia* Pergallo [1]. This diatom is widely distributed and occurs well throughout the Mediterranean regions [2]. There are few data about their biology and ecology in the Tunisian coastal waters despite that occurrence of *Pseudo-nitzschia* spp. was well noted in several lagoons [3]. The aim of this study is to give information about incidence of *Pseudo-nitzschia* spp. in the Bizerte Lagoon, an important area of mussel production.

Material and methods

Sampling was carried out monthly from March 2004 to March 2005 at four stations in the Bizerte Lagoon. Water temperature and salinity were recorded *in situ* using a microprocessor conductivity meter (LF 196). Water samples were collected at 2m depth. Subsamples were taken for nitrate, nitrite, phosphate and silicate analyses [4]. Sub-samples for identification and enumeration of phytoplankton were analysed following the Utermöhl method [5]. and *Pseudo-nitzschia* species were separated into *Pseudo-nitzschia delicatissima* or *P. seriata* groups depending on their valve width [6]. The distribution patterns of these potentially toxic species were statistically analyzed by Spearman's correlations in order to address relationships between their dynamics and the environmental variables.

group species represented a potential component of the Italian and French coasts waters [7]. Abundances of *P. delicatissima* group were positively correlated with temperature and salinity (Table 1). They were so more associated with summer water conditions. Conversely, blooms of *P. calliantha*, frequent component of the *P. delicatissima* group in the Italian coast waters, were rather associated to winter water environment [2]. A Significant positive correlation was also found between *P. delicatissima* group species number and silicate concentrations. These species tends so to be dominant in waters of non limiting concentrations of silicate. In contrast, no significant relationship was found between abundances of the *P. seriata* group and any of the environmental factors. This group appears therefore independent from major environmental constraints.

References

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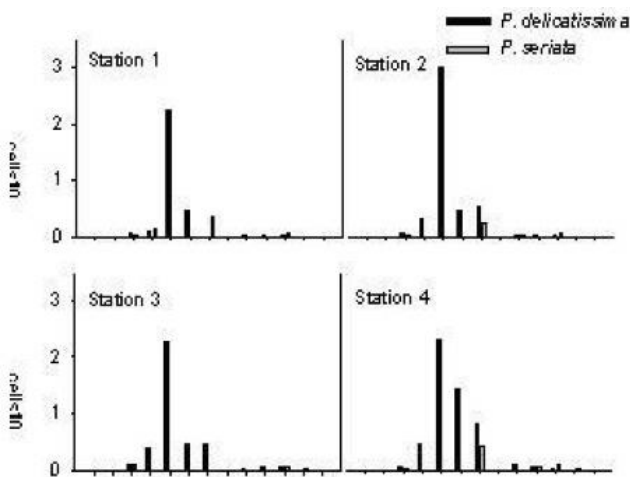


Fig. 1. Annual trends of *Pseudo-nitzschia delicatissima* and *Pseudo-nitzschia seriata* groups in the four sampling stations.

Results and discussion

Temporal distributions showed that *P. delicatissima* complex species were present during all the sampling period. Cell densities ranged between 0.034 and 3×10^5 cells l^{-1} , with the highest values in July at all the prospected stations (Fig. 1). *P. seriata* group had a narrower spatio-temporal distribution than *P. delicatissima* group. Cell densities of *P. seriata* ranged between 0.03 and 0.44×10^5 cells l^{-1} . The *P. delicatissima* group species are therefore the most frequent and abundant particularly interesting in term of their periodicity and intensity. Our results parallels those found in the Mediterranean basin, indeed the *P. delicatissima*