At the end I would like to add that the decorative function of the green spaces has not only esthetic but psychological significance as well. The set of colours and flower smells influence people's emotions.

OSTREOPSIS OVATA FUKUYO (1981): MONITORING

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Abstract

9 species belong to the genus *Ostreopsis* Schmidt, all of these are toxic, and *Ostreopsis ovata* Fukuyo is one of these.

O. ovata is different from *O. siamensis* [5] Schmidt and *O. lenticularis* Fukuyo because it is smaller, it has more breakable thecal plates and it has a straight and short apical pore.

Keywords: *Ostreopsis ovata*, monitoring.

Introduction

Under the light microscope *Ostreopsis ovata* appears flat and tear-like shaped. Furthermore, this unicellular alga has a biconvex theca with the hypotheca and the epitheca of the same size; both have fragile, fine and smooth thecal plates. It is back-forward pressed and dorsal-ventral warped also. The morphometry is variable [9], but the plate 1' of the epitheca is long and hexagonal, while the back intercalar plate (1p) of the hypotheca is long and narrow. The apical pore is eccentric on the left side of the epitheca.

O. ovata is a benthonic and epiphytic stripe typical of tropical and subtropical seas, but in later 10 years it was observed in North-West Mediterranean Sea and in Italy also [2, 10, 12]. It is gone with ballast waters.

O. ovata likes hight lighting and heat waters. Also it prefers calm coastal areas characterized by low hydrodynamism and with rocky and pebbly primary substratum or man-made substratum and macroalgae [20]. When *O. ovata* develops consistent bloom, the water surface seems opalescent, with foaming and jelly-like materials. Cells excrete exopolymeric substances.

O. ovata produces functionally active and toxic palytoxin-like compounds. Both humans [6] and marine organisms [3] are poisoned by these toxins. The total amount of toxin is not constant and it is closely related to the abundance of *Ostreopsis ovata*. The red-brown mucilaginous cover develops hypoxia or anoxia, while at the end of the bloom cellular

necrosis produces H_2S and NH_3. These are the causes of the death of Cephalopods, Echinoderms and fishes. The main compounds of the toxin of *O. ovata* are ovatoxin-a (54%) and palytoxin [4]. These toxins will join in the food chain up to the human level.

Materials and methods

In this study we chose 2 sites: the former is in the Northern Bari's hinterland, the latter is in the South of Bari; these are «Hotel Riva del Sole» in Giovinazzo and «Ditta IOM-Ex Sansolive» in Mola di Bari respecteively. Samples were collected from the bottom water, from the water column and on macrophytes.

For the water sampling we use the experimental method performed by Dr. Marinella Abbate of «ENEA» from La Spezia [1]. This method is less quantitative, but it is faster and more practical than the standard procedure [7, 8, 11]. We took water samples using a syringe with a cutted adaptor. For each site, the first sample derives from the bottom; the second was taken from the surface. We sampled from 200 ml to 250 ml of water, then samples were carried to the lab. In the same area of the previous water sampling, with a lancet we picked up all the attended macroalgal species up to collect at least 70g of fresh weight. These are preserved, water covered and carried to the lab. We collected 1l sample of marine water from the same area as well.

First of all we evaluated the presence of *Ostreopsis ovata* under the binocular microscope (25-40X). Both the water samples are fixed with Lugol's Iodine Solution reaching a yellow-orange colour and mixing in by inversion. Therefore we poured each sample of water into a settling chamber. Afterwards can begin the overnight sedimentation along an horizontal plane at room temperature. Then we have analyzed the three samples of each site under the inverted-microscope with Uthermöl method for estimating *O. ovata* number. Moreover, algal samples were shaked, so dinoflagellates detach from the macrophytes. Then this water is concentrated in a plastic container capacity for 1l. Marine water is sieved with a Membrane Vacuum Filtration Equipment using Whatman filter paper with a weft of 0,45µm; so pure sea water is employed to wash every macrophytic sample. Each one of the three macroalgal wash water is added in the related plastic container. Therefore, at least it is added on 5ml Lugol's Iodine Solution and the sample is poured in a settling chamber. Instead , macrophytes are dried with blotting paper and weighted (fresh weight).

Results and discussion

Learned research results are recorded, so we have both qualitative outcomes (presence/absence) and quantitative results comparing these with the ranges of the Board of Health.

Table 1

Ranges of the Board of Health

Ranges of sea bottom	*Ranges of surface*	
<5000 cell/l	<1000 cell/l	Very poor
5000 < cell/l < 50000	1000 < cell/l < 5000	Poor
50000 < cell/l < 100000	5000 < cell/l < 10000	Moderate
100000 < cell/l < 300000	10000 < cell/l < 20000	Abundant
>300000 cell/l	>20000 cell/l	Very abundant

Conclusions

In order to prevent the toxicity of *Ostreopsis ovata*, the Board of Health establish the limit concentration of 10000 cell/l in the water column. Reaching this extreme limit, begin the precautionary measures like no bathing and no fishing; even if an other research establish the limit concentration of 15000-20000 cell/l in the water column [13].

Within this context, it is important the association of *O. ovate* with *Coolia monotis* Meunier and *Prorocentrum lima* (Ehrenberg) Dodge, although these last species of Dinophyta become negligible during the *O. ovata*'s bloom.

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