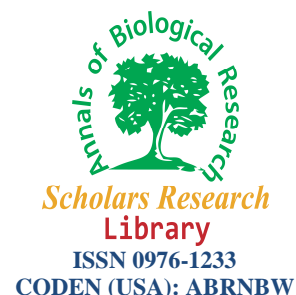




Scholars Research Library

Annals of Biological Research, 2014, 5 (12):46-50
(<http://scholarsresearchlibrary.com/archive.html>)



Preliminary assessment of the impact of the planning of Stora's fishing port (Skikda-Northeastern Algeria) on the marine environment.

Doria Gueddah^{1,2}, Mohamed Bouglouf² and Abdallah Borhane Djebbar³

¹Department of Biology, University 20 Août 1955, Route El Hadaïek BP 26, Skikda 21000, Algeria

^{2&3}Laboratory of Ecobiology of the Marine and Coastal Surroundings, Department of Sciences of the sea, University Badji-Mokhtar BP 12 - Annaba 32000, Algeria

ABSTRACT

In some countries of the Mediterranean as Algeria, the studies of impacts on the environment, amenities of the pleasure ports have been instituted by the slant of a law (Decree ministerial n° 90-78 of the 27/02/1990 relative to the studies of impact on the environment) on the coastline and they constitute a real tool of hold in account of the environment. In this context we valued in a preliminary way the impact of the extension works of the fishing port of Stora on the marine environment. And it through the analysis of the degree and the nature of pollution of the port's waters and to the neighborhood of the main beaches of our survey zone.

Keywords: fishing port - dredging - pollution - heavy metals - hydrocarbons.

INTRODUCTION

The necessity to value the environmental impacts has clearly been recognized in 1972 to the conference of Stockholm on the environment. In the Declaration of Genoa of September 1985, the contracting parts to the convention for the protection of the Mediterranean Sea against the pollution adopted the decision to apply the assessment of the environmental impacts as instrument to assure activities of suitable development. The survey of impact on the environment is a scientific document and a legal procedure of assessment of the effects due to some activities and projects of the man on the environment [1]. As scientific instrument, she/it permits to identify, to foresee and to value the prejudicial consequences on the environment of the development projects, constructions Etc [2]. The fishing port of Stora is in the center of the city of Skikda that is it even situated to the East of the coastal Algerian, between the latitudes 36°5' N and 36°15' N and the longitudes 7°15' E and 7°30' E, spreading on a surface of 4 137,68 km² with 140 km of coasts. It is limited at the North by the Mediterranean Sea and adjoins the wilayas of Annaba, Constantine, Guelma and Jijel (Fig. 1). The project of extension of the port of Stora concerns the activities of fishing and pleasure (Marina). It has been implanted to the East of the former port and covered a plan with water of the order of 3,52 ha and roadbeds of the order of 2,02 ha. A project of this importance requires the realization of an impact assessment, containing a relative shutter to its consequences on the marine environment that is the object of the present survey. In this context we valued in a preliminary way the effects of the works of extension of Stora's port on the marine environment through the analysis of the levels of pollution of the superficial waters of the port and the main neighboring beaches. Notably by the determination of the contents in total hydrocarbons and in 5 heavy metals.

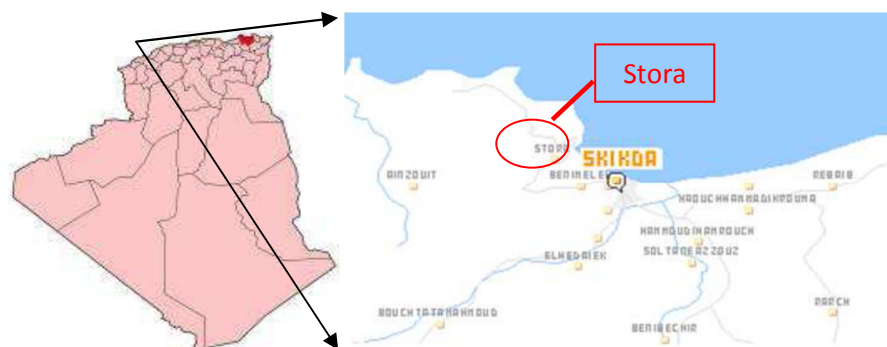


Figure 1: Geographical situation of Skikda city.

MATERIALS AND METHODS

1. Presentation of the survey zone:

The present study takes in consideration the site of Stora that is situated to 2500 m about Skikda city and concern the fishing port of Stora and two beaches; The beach of Mollo at East of the port and the beach of Stora at West (gone touched by the extension of the port). 5 stations of samplings has been taken in consideration by our study; 3 stations situated in the fishing port (S2, S3 and S4), and 2 stations situated in the beaches; Mollo beach (S1) and Stora beach (S5) (Fig.2).



Figure 2: Study area and sampling locations (fishing port of Stora).
(Google earth modified).

1.1. The fishing port of Stora:

The port concerned by the present study is at the West North of the commercial port of Skikda to a few 1800 m of this last. It is protected from the surges of the North-North sector at West because of the orientation of its southbound entry pass. It is exposed to the surges and the winds of sector East. The port is protected currently by two piers East and West having a right shape. The main pier is oriented North-South and the secondary pier West-East. The inside of the port is composed of only one basin composed of landing stage for the belaying for the traditional fishing.

1.2. The beaches:

Stora beach (S5):

Situated to the East of the port of Stora and delimited at the East by blocks in enrockment. This beach to middle sand spreads on a length of 150 m and a width of 6m (The beach concerned by the extension) (Fig.3).

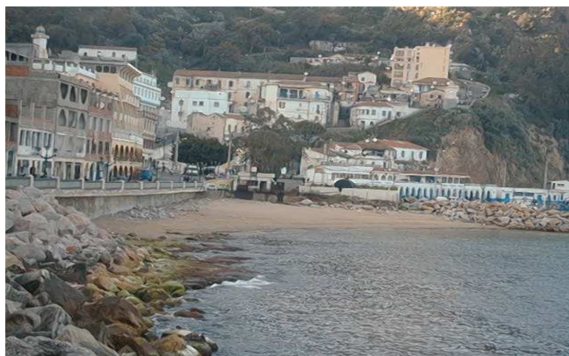


Figure 3: Photography of Stora beach.

Mollo beach (S1):

Mollo beach is situated to the West of the port of Stora and spreads on a length of 150 m and a width that don't reach 5m, its sediment is represented by the thin sand with presence of scattered some pebbles (Fig. 4).



Figure 4: Photography of Mollo beach.

2. Sampling and analyses:

The samples of water are distributed in small bottles in glass borosilicate of one liter each in accordance with the recommendations of Rodier [3]. During the sampling these bottles are rinsed two times with water to analyze before the withdrawal according to the recommendations of Aminot [4]. Once the sample appropriated the bottle is labeled and placed in an icebox a shelter from light and to a temperature of 4°C according to the recommendations recommended by the OMS / PNUE [5,6] for the surveillance of the inshore waters. They are directed then now at the laboratory in a state the quality of origin of water to analyze it in less 4h [4]. In the laboratory the content in total hydrocarbons is valued by infrared spectrophotometer and four heavy metals; iron, copper, zinc and lead are measured out for every station by atomic absorption spectrophotometer to flame in addition to the dosage of mercury by the mercurimeter.

RESULTS AND DISCUSSION

The spatio-temporal variation of the total hydrocarbons (HCT) is marked by a maximal content of 19,7 mg/l for the station 2 during the month of May and a hopeless value for the station 5 all along our study. The presence of the HCT in water is bound to the use of these last as fuel for the trawlers (the flights to the level of the reservoirs permit the scattering of the HCT in surface).

The figure 5 puts in evidence the middle values of the total hydrocarbons during this survey. These values vary between a maximal average of 7,5 mg/l for the station 2 and a total absence in the waters of the station 5. These contents remain well below the value limits guideline that is of 10 mg/l and the value limits admissible for the old facilities (15 mg/l) fixed by the decree 06-141 [7].

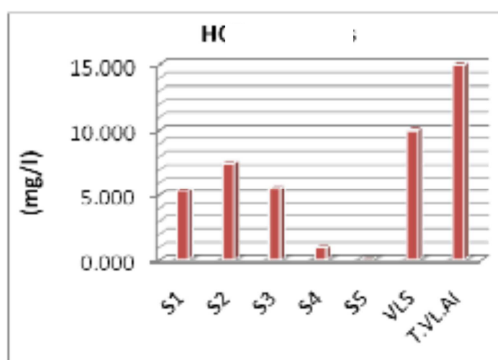


Figure 5: Spatial variation of the middle contents in total hydrocarbons.
(VLS: Value limits guideline, T.VLAI: Value limits admissible for the old facilities).

The comparative study of the table 1 allows us to note a light increase of the content in HCT recorded to the level of the port of Stora during our survey compared to those observed by other authors [8,9] but this value remains well below the value limits fixed by the regulation in force (Algerian).

Table 1: Comparison of the results of content in total hydrocarbons (HCT) in waters of fishing port of Stora with those of different authors.

	HCT (mg/l)	References
Fishing port of Stora	3,91	[8]
	2,07	[9]
	4,67	Present study
Norms	10	[7]

For what is heavy metals, the gotten results allow us to note that the superficial waters of the fishing port of Stora present a transient metallic pollution (period of dredging) notably for the copper and mercury (Figure 6).

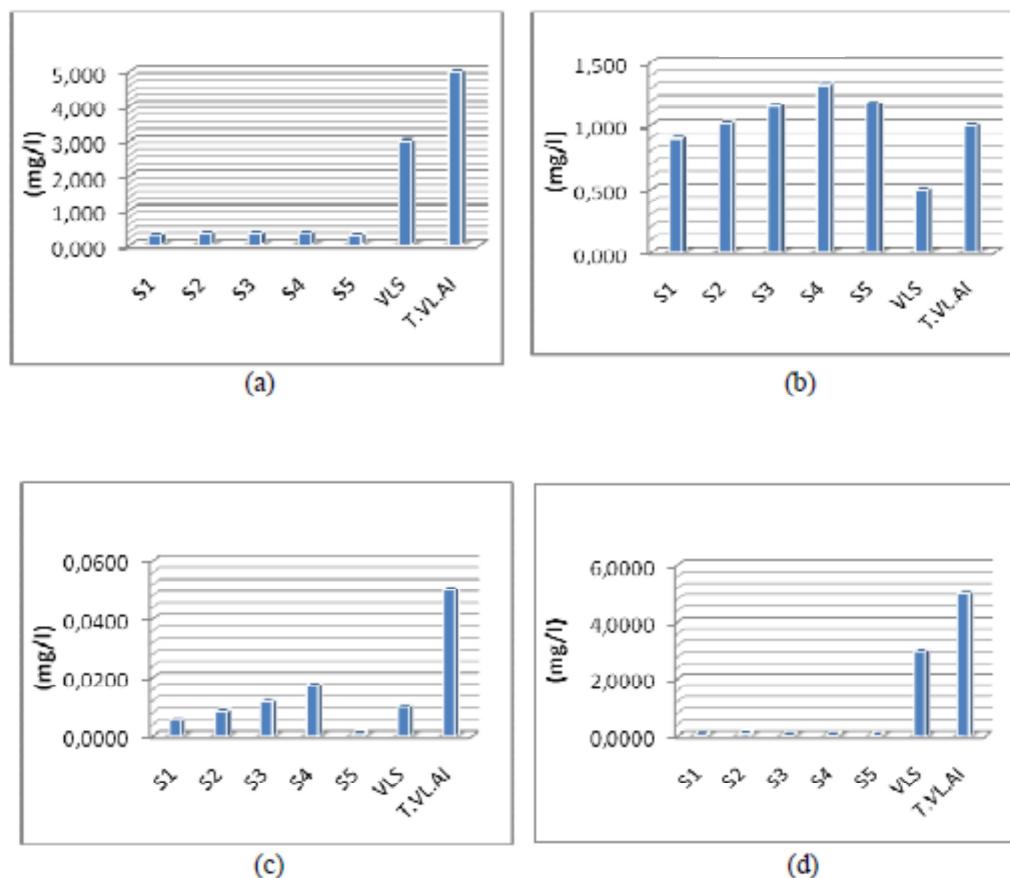


Figure 6: Spatial variation of the heavy metals (averages);
(a): Iron (b): Copper (c): Mercury (d): Zinc

The presence of the copper is bound to the corrosion of some facilities (hoses) and the materials manufactured in copper [1]. The contents raised in copper recorded during the month of april also find their explanation by the operation of dredging in the port, in the same way for mercury. For the metallic elements remaining the overtaking of the norms in force [3] is not relatively audible. The presence of mercury can be bound to a contamination by the hydrocarbons [10,11] on the one hand, and on the other hand, the elevated contents recorded during the month of april are due to the operation of dredging in the port. All along the study, we also noted the absence of lead.

This being, it would be necessary to signal that Mollo beach (S1) presented notably levels of abnormal pollution of organic origin (DCO/DBO5 >3) what indicates a direct negative impact of the planning of the port as confirmed by previous studies [11,12].

CONCLUSION

The results of analysis gotten, show that the works of the planning (the clearing of the land, the works of terracing and the works of construction.etc.) have negative effects on the superficial waters. Indeed, in addition to the accentuated organic pollution relatively permanent along our survey, the superficial waters of fishing port of Stora presented a transient metallic pollution (period of dredging). This being, it would be necessary to signal that Mollo beach presented levels of abnormal pollution generated by the activities of planning of the port of Stora.

To reduce the negative effects of the planning works, it is necessary to forbid the fishing on the outskirts of the port and the trawling in areas of immersion, also limit the number of areas of immersion and finally achieve the operation of immersions when the sea is calm.

REFERENCES

- [1] JORA., **1990**. Journal Officiel de la République Algérienne. Décret ministériel n°010 ; Décret exécutif n° 90-78 du 27 février **1990** relatif aux études d'impact sur l'environnement : 2p.
- [2] J.L Mauvais., **1991**. Les ports de plaisance, impact sur le littoral, Editions IFREMER: p165
- [3] J Rodier., **2009**. L'Analyse de l'eau. DUNOD. 9^{ème} Edition. 1579 p.
- [4] A. Aminot ; M. Chaussepied., **1983**. Manuel des analyses chimiques en milieu marin. Centre National pour l'exploitation des Océans, 396 p.
- [5] PNUE., **1992**. Programme des Nations Unies pour l'Environnement. Etude d'impact sur l'environnement du port de plaisance de Kabila : 19p.
- [6] J. Rodier., **1996**. Analyse de l'eau naturelles, eaux résiduaires et eau de mer. Edition Duno.
- [7] JORA., **2006**. Journal Officiel de la République Algérienne. Décret exécutif n° 06-141 du 19 avril 2006 définissant les valeurs limites des rejets d'effluents liquides.
- [8] LEM., **1998**. Laboratoire d'Etude Maritime. Etude d'impact sur l'environnement du dragage de l'ancien port de Skikda. Entreprise Portuaire Skikda : 37p
- [9] D Gueddah., **2003**. Thèse de Magister. Université d'Annaba/ Algérie.114p.
- [10] J RODIER., **2005**. L'Analyse de l'eau. DUNOD. 8^{ème} Edition.
- [11] S Grimes., **2003**. Bilan et Diagnostique National de la pollution marine de la côte Algérienne liée à des activités menées à terre. Programme d'Action Stratégique (PAS) destiné à combattre la pollution due à des activités menées à terre et de sa stratégie opérationnelle. *Rapport PAM/PAS MED/MEDPOL*.
- [12] S Grimes., T Ruellet., J.D Dauvin. and Z Boutiba., **2010**. *Mar.Pollut.Bull.* 60, 1969-1977.