



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

International Conference
on
Aquatic Resources: Needs and Benefits

NIOF 2006
18-21st September 2006
Alexandria, Egypt

ABSTRACTS

Edited by:

Professor Fatma Aly Abd El-Razek
Professor Makram Amin Gerges
Professor Abdou Al Sayes
Associate Professor Ahmed El Nemr
Dr. Amr Moneer Helal

ISSN: 1687-580X



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

CONTENTS

	Page
Preface	2
Welcome note	3
Acknowledgement	4
Scientific and Organizing Committees	5
Framework Program	6
Keynote Speakers	8
Session (1): Aquatic pollution by oil and pesticides	13
Session (2): Aquaculture	20
Session (3): Aquatic pollution by heavy metals	29
Session (4): Poster presentation on Aquaculture and Fisheries	39
Session (5): Aquatic pollution: Waste treatment	51
Session (6): Marine Chemistry and Physical Oceanography	60
Session (7): Aquatic pollution by heavy metals	68
Session (8): Marine Chemistry and Physical Oceanography	75
Session (9): Aquatic pollution: Waste treatment	83
Session (10): Aquaculture	91
Session (11): Poster presentation	100
Session (12): Fish biology and Fisheries	109
Session (13): Coral Reef Ecology	117
Session (14): Hydrobiology	126
Session (15): Coral Reef Ecology (<i>continued</i>)	133
Session (16): Environmental evaluation	140
Session (17): Hydrobiology (<i>continued</i>)	146
Session (18): Poster presentation	151
Keynote Speaker	161
Workshop on Operational Oceanography and National Security	162
Announcement: 2 nd NIOF International Conference	163
Index	166



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

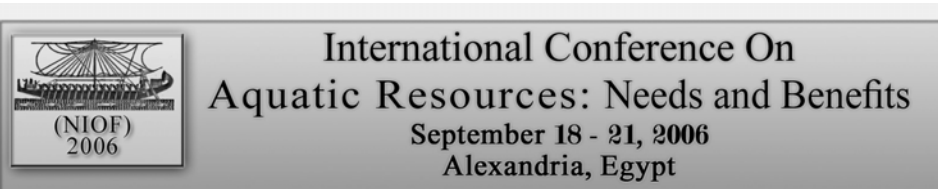
Preface

The “International Conference on Aquatic Resources: Needs and Benefits” is being organized in Alexandria, Egypt, 18-21 September 2006 by the National Institute of Oceanography and Fisheries of Egypt.

A wide range of interrelated topics are covered in over 100 papers that will be presented in about 18 oral and poster sessions and a Round Table Discussion, addressing several important issues of direct relevance to the general interest of the Conference. The themes of these scientific sessions range from basic oceanographic research to experimental work and practical applications of new methodologies and state-of-the art technologies that would enable the better understanding of the aquatic environments, assessing their needs and potential benefits, and hence lead to improving the management and utilization of the aquatic resources in a sustainable manner.

It is hoped that the Conference will contribute to furthering cooperation between scientists working in different disciplines of aquatic sciences and in different geographic areas, and among scientists, professionals and decision-makers that the conference is bringing together for 4 days of intensive work and stimulating discussions. By achieving this goal, the Conference would have fulfilled its objectives, for which it has been convened.

Editors



Welcome note

The National Institute of Oceanography and Fisheries of Egypt is pleased to organize and convene the “International Conference on Aquatic Resources: Needs and Benefits”, which is being held in Alexandria, Egypt, 18-21 September 2006.

The Conference is one of a series of conferences being organized yearly by the Institute under the general topic of “Aquatic Resources”, with a more specific scope selected for the conference every year.

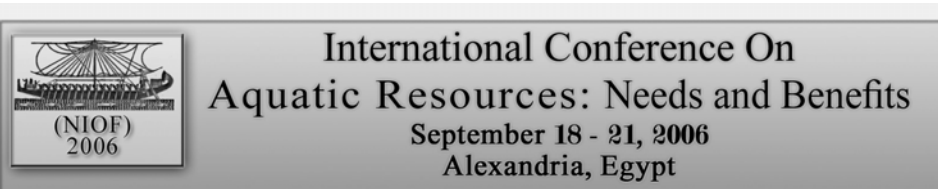
It is our great pleasure, as a host of the Conference, to welcome all participants that expressed keen interest in attending and actively participating in the Conference proceedings. The gathering of such a large number of participants, working on different disciplines of aquatic sciences from several countries of the world is in itself a witness of the great importance that they attach to the aquatic environments and their resources.

We cordially invite all those with an interest and/or participatory role in basic scientific or applied research in the fields related to “Aquatic Resources”, their study, management and sustainable utilization to share their knowledge and expertise through taking an active part in the conference.

In addition to the participation in the Conference, this is an excellent opportunity for the international guests to visit the glorious city of Alexandria, the “Pearl of the Mediterranean”, with all its historical sites and modern points of attraction, including the famous “Library of Alexandria”

We look forward to seeing you at the Conference.

The Organizing Committee



Acknowledgement

The organizers of the “International Conference on Aquatic Resources: Needs and Benefits”, Alexandria, Egypt, 18-21 September 2006, recognizing the formidable task of organizing and convening this International Conference, wish to acknowledge with appreciation the efforts and contributions made by several authorities, institutions and individual.

The Conference Chairman wishes to extend a deep appreciation to the members of both the Organizing Committee and the Scientific Committee for their tireless efforts and dedication since the early stage of preparation for the Conference. Special thanks are extended to those members, who spared no effort in selecting and editing the papers submitted for this Conference.

It is a great pleasure also, to extend a word of appreciation to the keynote speakers, and to those who participated in the discussions and provided valuable input for the success of this Conference, especially at the Round Table Discussion.

The important role played by the members of the Conference Secretariat, in collecting, arranging and typing the book of the abstracts and other documents of the Conference is hereby acknowledged and appreciated.

Finally, but most importantly, the financial support received from the Conference sponsors, particularly from UNESCO, and GAFRD is to be noted with many thanks and great appreciation.

The Conference Organizers



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Scientific and Organizing Committees

Honorary Chairman

Prof. Soliman Hamed Abdel Rahman

Chairman

Prof. Mohamed Attia Shreadah

Secretary General

Prof. Morad Bacily Awad

Scientific Committee

Prof. Fatma Aly Abd El-Razek

Prof. Makram Amin Gerges

Prof. Abdou Al Sayes

Prof. Sawsan Abou Elez

Associate Prof. Ahmed El Nemr

Organizing Committee

Prof. Mohamed Aly Shata

Prof. Mohamed Ahmed El-Shennawy

Dr. Sozan Abd-El-Aal Hassanien

Dr. Amr Moneer Helal

Dr. Nevine M. Abu Shabana

Secretary of the Scientific Committee

Mr. Hassan Tawfeg

Miss Walaa Abuel Fotoh

Mr. Mohamed Y. M. Salah Eldin

Miss Marwa Mohamed Mostafa

Secretary of the Organizing Committee

Mr. Abdel Khalek Ahmed Abdel Khalek

Mr. Ismail Abd Allah

Mrs. Hala El Baltemy

Mrs. Amal Aly Hassan

Mr. Aly Hassan

Mr. Farag Mohamed Attia



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Framework Program

Day 1: 18 September 2006

08.30 – 10.00	Registration
10.00 – 11.00	Opening Ceremony and Reception
11.00 – 11.30	Break
11.30 – 12.30	Keynote Speaker: Prof. Vladimir G. Koutitonsky
12.30 – 14.00	Session (1) in Room (A): Aquatic pollution by oil and pesticides
12.30 – 14.00	Session (2) in Room (B): Aquaculture
14.00 – 15.00	Lunch
15.00 – 16.30	Session (3) in Room (A): Aquatic pollution by heavy metals
15.00 – 16.30	Session (4) in Room (B): Poster presentation on Aquaculture and Fisheries
16.30 – 17.00	Break
17.00 – 19.00	Session (5) in Room (A): Aquatic pollution: Waste treatment
17.00 – 19.00	Session (6) in Room (B): Marine Chemistry and Physical Oceanography
19.00 – 20.00	Dinner

Day 2: 19 September 2006

09.00 – 10.00	Keynote Speaker: Prof. Mohammed Ramdani
10.00 – 12.00	Session (7) in Room (A): Aquatic pollution by heavy metals
10.00 – 12.00	Session (8) in Room (B): Marine Chemistry and Physical Oceanography
12.00 – 12.30	Break
12.30 – 14.30	Session (9) in Room (A): Aquatic pollution: Waste treatment
12.30 – 14.30	Session (10) in Room (B): Aquaculture
14.30 – 15.30	Lunch
15.30 – 16.30	Session (11) in Room (A): Poster presentation
16.30 – 17.00	Break
17.00 – 18.30	Session (12) in Room (A): Fish biology and Fisheries



**International Conference On
Aquatic Resources: Needs and Benefits**
September 18 - 21, 2006
Alexandria, Egypt

Day 3: 20 September 2006

09.00 – 10.00	Keynote Speaker:
10.00 – 11.30	Session (13) in Room (A): Coral Reef Ecology
10.00 – 11.30	Session (14) in Room (B): Hydrobiology
11.30 – 12.00	Break
12.00 – 13.30	Session (15) in Room (A): Coral Reef Ecology
13.45 – 14.30	Session (16) in Room (A): Environmental evaluation
12.00 – 14.30	Session (17) in Room (B): Hydrobiology
14.30 – 15.30	Lunch
15.30 – 16.30	Session (18) in Room (A): Poster presentation
16.30	Free time

Day 4: 21 September 2006

09.00 – 10.00	Keynote Speaker: Mr. Aly Adam Aly Hassan
10.00 – 11.00	Conference Recommendations
11.00 – 11.30	Break
11.30 – 13.30	Round Table Discussion Operational Oceanography and National Security



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Keynote Speakers



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Keynote Speaker (18 September 2006)

Hydraulic management and water renewal in coastal lagoons

Professor Vladimir G. Koutitonsky
Coastal oceanography Professor

Institut des sciences de la mer de Rimousk (ISMER), Rimouski, QC, Canada,
G5L-3A1
E-mail: VGK@uqar.qc.ca

Coastal lagoons are shallow bodies of water, wholly or partially separated from the sea by sandbanks, shingle, or reefs, where the salinity can vary from brackish as a result of dilution by freshwater inflow to hypersaline as a result of sea water evaporation within the lagoon. Lagoons have traditionally been used for aquaculture, tourism, fishing and other activities, all implicitly relying on adequate water renewal by coastal waters through physical processes at work within the lagoon and in the adjacent coastal ocean. These processes are essentially advective and diffusive processes that transport water from one location to another, each acting at particular time scales. Understanding these processes will contribute to improved water renewal estimates, and through hydraulic management actions, to sustainable development of the lagoon resources.

Physical processes in lagoons, and in coastal waters, occur in response to astronomical, meteorological and buoyancy forcing. In some cases, the motion is deflected by earth rotation, depending on the lagoon horizontal scales and latitude. One way of discussing these processes is to treat a lagoon as a system, where the inputs are the forcing functions and the output is the integrated response to the forcing functions. When significant fresh water inflow is present, lagoons become synonymous to barrier estuaries and estuarine physics applies. However, unlike processes in coastal waters, physical processes in lagoons are subjected to geomorphologic constraints such as inlet dimensions and numbers, lagoon surface area and mean depth, their orientation with respect to prevailing winds, and others. As a result, the response of a lagoon to each of the forcing functions will differ from one lagoon to another depending on its geomorphologic features. This presentation discusses some of the physical processes occurring in response to the above forcing functions and how they each contribute to water renewal in the lagoon. Examples are drawn from several lagoon studies (Grande-Entrée in Canada, Mar Menor in
ISSN: 1687-580X



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Spain, Nador and Oualidia in Morocco, Bizerte in Tunisia) and 2D or 3D numerical models are used to illustrate some of the processes discussed.

Astronomical forcing in lagoons occurs in the form of deterministic tidal oscillations at the lagoon-ocean boundary. Tidal propagation and its contribution to water renewal strongly depends on inlet shapes and dimensions. Tidally-induced water exchange with the coastal ocean is discussed in terms of inlet dynamics principles and volume continuity. For instance, large entrances will allow tides to propagate freely into lagoons, and remain almost in phase with the ocean tide. On the other hand, restricted entrances will retard tidal propagation and, in most cases, damp their amplitudes and the tidal contribution to water renewal remains confined near the entrance. In some instances, lagoon length scales are such that tidal amplitudes are slightly amplified through resonance. Inlet dimensions will filter tidal frequencies at the entrance, through non-linear interactions of principal constituents with their higher order harmonics, affecting the nature of residual transports at the entrance (flood or ebb dominance). The non-linear interactions between tides and tidal currents, or between tidal currents and bathymetry, will induce residual currents that act at lower frequencies. These currents are proportional to the ratio of tidal amplitude to water depth. The presence of a second (or more) inlet will contribute to efficient water renewal by tides when tidal phases are different at the inlets. Finally, small and long inlets will choke tides at entrance and prevent their contribution to water renewal. In this case, water circulation and mixing are mainly forced by local winds.

Meteorological forcing is ubiquitous and occurs in two distinct forms: (i) local forcing through wind-stress acting at the lagoon surface and (ii) non-local forcing through low-frequency wind-induced sea level fluctuations acting at the lagoon-ocean boundary. A wind stress oriented along the lagoon axis produces downwind drift currents in the shallower nearshore areas, and gradient currents, directed upwind somewhere in deeper waters between the drift currents. Water piles up at the lagoon downwind end, sinks there and returns, preferentially away from the surface, towards the other lagoon end where it upwells. This three-dimensional circulation cell will contribute to deeper water renewal and will supply oxygen to the benthic communities. Also, depending on their direction, local winds may contribute to lagoon flushing by removing flood-tide waters from the captive regions near the entrance. Non-local wind forcing is difficult to characterize as it can occur either through an Ekman-like response of sea level along the lagoon barrier or through larger scale sea-level response to

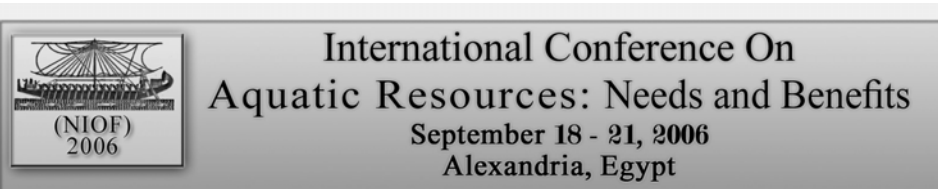


International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

geostrophic winds and barometric pressure. In both cases, low frequency sea level oscillations at the lagoon inlet will contribute to water renewal at longer time scales (days or longer).

Buoyancy forcing in lagoons occurs from two sources: (i) surface heating and (ii) fresh water inputs. Both decrease water density, produce density gradients and baroclinic circulations and some flushing potential. For instance, heating at the surface will create, in the absence of winds, a thermocline in the water column. In a leaky lagoon, this can provide for an efficient flushing mechanism of the surface layer toward the ocean. Excess heating on the other hand will provoke evaporation at the surface, sinking of saltier waters to the bottom and the generation of a negative estuary-like circulation. In this case, bottom waters are flushed away while surface waters are trapped at the head of the lagoon. Fresh water is normally added to a lagoon by precipitation, river discharge and underground seepage. In this case, the vertical and horizontal density gradients induce estuarine-like circulations that may also contribute to water renewal at the inlet. The stratifying versus mixing influences of tides, winds and shear stresses are briefly reviewed.

Finally, water renewal in lagoons can be quantified by a water renewal time (RT). When a lagoon is mainly flushed by river discharge, the renewal time can be estimated by the fresh water fraction approach. In several lagoons however, fresh water inputs are small compared to lagoon-ocean exchange volumes. In this case, water renewal has traditionally been estimated using some form of the tidal prism approach. However, having established that water renewal results from the integration of all physical processes, each acting at specific spatial and temporal scales, it seems more appropriate to estimate the RT using some approach that integrates contributions from all physical processes. One such approach involves the use of numerical models to monitor the dilution of initial lagoon waters by ocean waters, over time and space. This so-called conservative tracer approach yields a distribution of local renewal times (LRT) as a function of space in the lagoon, which when averaged over space yields the integral renewal time (IRT). Examples of LRT and IRT are given for choked, restricted and leaky lagoons. It is shown for example that shellfish at aquaculture sites located in areas of faster LRT exhibit faster growth rates.



Keynote Speaker (19 September 2006)

Environment Assessment in North African Lagoons: Biology and Monitoring

Professor Mohammed Ramdani

Scientific Institute, Zoology & Ecology Department, Mohammed V University,
Agdal-Rabat, Morocco
E-mail: mramdani@israbat.ac.ma

Sustainable development of natural ecosystems needs a balance approach using three principal Parameters: environment, social/cultural aspects and economic aspects. The natural resource sectors (and allied industries) have been an engine of economic growth and job creation for generations. Today, many people in rural or remote areas depend on the SE natural resource sectors for their livelihoods. The fishery activities in North African lagoons are vital components of our overall economy and society. Our landscape supplies us with the resources that are the foundation of a significant portion of our economic activity; it also provides essential ecological services, such as clean air and water, which are essential to our economy, environment and quality of human life. Each lagoon represents a suite of specific problems that are mainly related to climate change, the human activities, erosion, and over-exploitation, etc.

Historically, the principal fish species resources in North African lagoons have been: eel *Anguilla anguilla*; various species of mullets: *Chelon labrosus*, *Liza ramada*, *Liza aurata*, *Liza saliens*, *Mugil cephalus* and other species such as: *Solea senegalensis*; *Solea vulgaris*; *Dicentrarchus punctatus* and *Dicentrarchus labrax*.

The Eel: *Anguilla anguilla* is mainly localized in the Channels of the lagoons. The gears used for fishing are: Capétchade, Zouada, Harpon and the fishing rod. The fishing period is from September to May. Sizes captured vary from 10 to 100 cm but records about catch size are often inadequate.

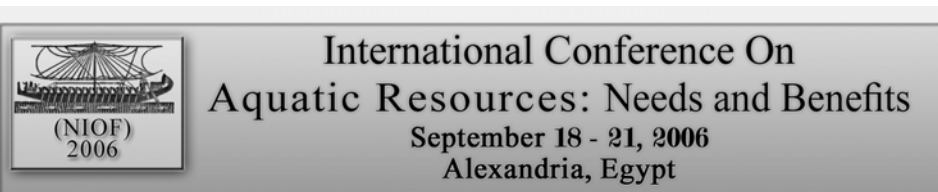
Shellfish are mainly represented by the clam *Ruditapes decussatus*, with high economic value in 'black' markets which explains the high activity to collect this species in the lagoons using illegal gear. Many countries need serious regulations so that collection of wild populations can be managed. A major aim of management should be the establishment of environmental equilibrium so that lagoon fisheries are sustainable and threaten species are conserved.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 1

Aquatic Pollution by oil and pesticides



Session (1): Aquatic Pollution by Oil and Pesticides

Oral Presentation

Ecotoxicological evaluation of chlorinated pesticides (OCPs) and Poly chlorinated Biphenyls (PCBs) in various fish species from Karachi coast of the Arabian Sea

Alia B. Munshi*; Hina A Siddiqi and Fayyaz A Ansari

Pakistan Council of Scientific and Industrial Research, Center of Environmental studies, Karachi Lab.

*E-mail: munshi5@cyber.net.pk

Concentrations of polychlorinated biphenyls (PCBs), DDTs, chlordanes, BHCs, dieldrin, heptachlor epoxide, and other OCPs were measured in the tissue of different edible fishes collected from Karachi coast of the Arabian Sea. BHCs were the most predominant contaminants, followed by PCBs, chlordanes, dieldrin, and other OCPs. The determined concentrations of OCPs have shown a declined order in magnitude over the last decades in this region.

It was observed that all concentrations of organochlorines were significantly closed to each other and all fall within same range (low-range). The concentration values were in the range of a few to several ng/g on a wet weight basis.

In the tissues of fishes, the sum of OCPs ranged between 5.40-201 ng/g ww with BHC (275.1 ng/g ww) and heptachlor epoxide (200 ng/g ww) collectively in all fishes. Similarly PCB having an overall range 8.18-280.16 ng/g ww predominated by Aroclor 1221 and Aroclor 1242.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (1): Aquatic Pollution by Oil and Pesticides

Oral Presentation

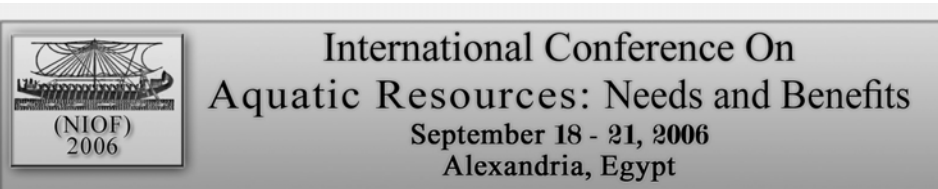
Concentration of Petroleum Hydrocarbons in Coastal Water and Some Marine Organisms from the Gulf of Suez, Red Sea

N. El-Agrody*; H. Abd El-Azim; Y. Soliman, Tarek O. Said and El-Kh. M. Moselhy

National Institute of Oceanography and Fisheries, Egypt,

*E-mail: n_elagrody@yahoo.com

Total dissolved/dispersed petroleum hydrocarbons (TDDPHs) were determined in coastal water, algae (*Ulva lactuca*, *Enteromorpha compressa* and *Cystosira* sp.) and fish (*Rhabdosargus haffara* and *Liza carinata*) samples, collected from the Gulf of Suez (GOS) during 2004-2005. In addition, the samples were analyzed by gas chromatography (GC) to determine the concentration of polyaromatic hydrocarbons (PAHs). The data showed that the values of the TDDPHs in water range from 3.92 to 363.77 µg/L, with high concentrations during winter season. The green algae, *Ulva lactuca*, recorded the highest level of TDDPHs (20.50 – 42.30 µg/g dry wt), as compared to other algal species. Fish gills exhibited higher concentrations of TDDPHs than muscles. Generally, concentrations of TDDPHs in water, algae and fish collected from the Suez Bay are higher than those from the GOS. Gas chromatographic analyses revealed the presence of naphthalene, flourene, phenanthrene, anthracene, benzo (a), (b) pyrene and benzo (b), (k) flouranthene constituents of PAHs. The dominant compounds of PAHs were phenanthrene in water and benzo (b), (k) flouranthene in the marine organisms.



Session (1): Aquatic Pollution by Oil and Pesticides

Oral Presentation

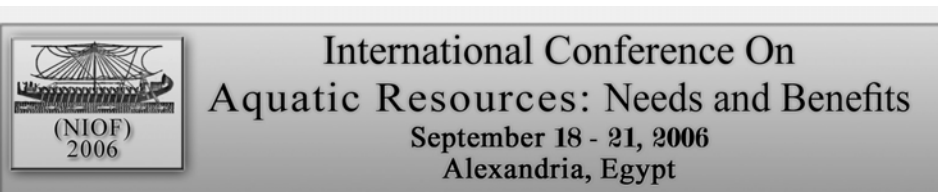
Assessment of Pesticides and PCB Contamination in Surface Sediments and Fish from Egyptian Mediterranean Coast

Amany El-Sikaily, Ahmed El Nemr*, Tarek O. Said and Azza Khaled

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

Analyses of persistent organic pollution (POPs), such as polychlorinated biphenyls (PCBs), hexachlorocyclohexane (HCH) isomers, and dichlorodiphenyltrichloroethane (DDT) and its metabolites in seawater, sediment and fish samples, collected from six locations along the north coast of Egypt during January-April 2005, were carried out using Gas Chromatography with Mass Spectrometer (GC-MS). Sediment and fish samples showed the presence of a wide variety of organochlorines, including α , β - and γ -HCH, dieldrin, aldrin, heptachlor, DDT and the metabolites of DDT as well as PCBs. Concentrations of pesticides in sediment were low in the studied area. The concentrations of organochlorines in fish tissues decreased, giving values of PCBs > cyclodienes > DDTs > HCHs for most of the fish samples. Concentrations of *p,p*-DDT in sediment samples were in the range of 0.09-1.20 ng/g with an average of 0.35 ng/g (dry weight). Among DDT metabolites, *p,p*-DDE ranged from 0.96-8.27 ng/g (dry weight) in all sediments samples. Higher concentrations of *p,p*-DDE and *p,p*-DDT were found in the Burullus area, and the lowest concentrations of *p,p*-DDT were found at El-Sallom station. Average concentrations of HCHs in the fish tissues ranged between 0.12 to 19.0 ng/g with mean value of 7.84 ng/g (dry weight). This investigation reveals the declining trend on the environmental burden of persistent pesticides in the Egyptian marine environment. Data on the organochlorine concentrations found in this survey can be used as reference levels for future POPs monitoring program.



Session (1): Aquatic Pollution by Oil and Pesticides

Oral Presentation

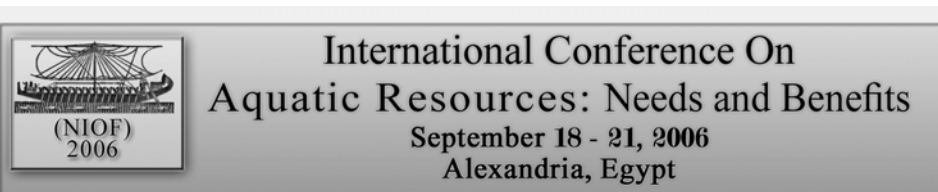
Evaluation of the concentration of some persistent organic pollutants (POPs) in surface sediments of Lake Bardwell, northeast Egypt

Ahmed El Nemr*, Amany El-Sikaily, Tarek O. Said and Azza Khaled

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt,

*E-mail: ahmedmoustafaelnemr@yahoo.com

Detailed analyses of persistent organic pollutants (POPs) such as hexachlorocyclohexane isomers (HCHs), dichlorodiphenyltrichloroethane (DDT) and its metabolites (DDTs), hexachlorobenzene (HCB) and congeners of polychlorinated biphenyls (PCBs) in surface sediments from Lake Bardwell, northeast Egypt allowed the evaluation of the contamination status, distribution and possible pollution sources. HCH, DDT, HCB and PCB compounds were identified in all the samples. The pesticides did demonstrate markedly different distributions reflecting different agricultural and domestic usage in the region. Overall elevated levels of HCB, DDT and PCB were recorded in the Lake. Among the isomers and metabolites of HCH, DDT and PCB, α -HCH, *pp'*-DDT and PCB₂₈ PCB₅₂ and PCB₁₈₀ were found to be dominant. High ratios of metabolites of DDT to DDTs revealed recent use of DDT in this coastal environment. The sources of contamination are closely related to human land-based activities such as domestic and industrial discharge and agricultural chemicals. This study is compared to other coastal and estuarine environments in Egypt and abroad. The baseline data can be used for regular ecological monitoring, taking into consideration the industrial and agricultural growth around this important estuarine ecosystem.



Session (1): Aquatic Pollution by Oil and Pesticides

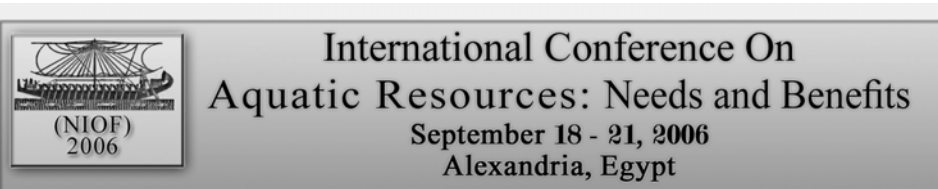
Oral Presentation

Assessment and Distribution of Organochlorine Pesticides (HCHs) and (DDTs) in marine environment of the Eastern Harbour, Alexandria, Egypt

Amal M. H. Morsy and Aly M. A. Abd Allah

Marine Pollution Lab., National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt, E-mail: abdallah@wwwsol.com

The results of multi-compartment monitoring of residue levels of organochlorines (OCs) in the coastal waters of Alexandria during the month of March 2005 were studied. The concentration of total HCHs in seawater varied from 0.16 to 15.92 ng/L and the concentrations of total DDT varied from 3.01 to 33.2 ng/L. The total HCH concentration in the sediments samples was in the range of 3.8 to 16.2 ng/g. γ -HCH contributed almost 55% to the total HCH. In sediments samples, the DDT showed higher mean concentrations in comparison to its metabolite DDE and DDD. The concentrations of total HCHs in different marine species (Mullet, Bouge, Solea and Mussel) varied from 0.87 to 33.73 ng/g, while the concentrations of total DDT varied from 0.38 to 34.1 ng/g. The variation in the δ -HCH in different compartments is not significant and his could be due to the high persistence and metabolically inactive nature of this isomer. The α -HCH is found to be more dominant in fish samples, whereas the γ -HCH is a major contributor in the sediment samples.



Session (1): Aquatic Pollution by Oil and Pesticides

Oral Presentation

Crude oil sorption from polluted waters by locally produced materials

Abdulwahid Al-Hajjaj, Aziz H. Al-Hlifi, Hamza A. Kadhim*

Marine Engineering Department, College of Engineering; Geology Department,
College of Science, University of Basrah, Basrah, Iraq

*E-mail: hamza_kadhim@yahoo.com

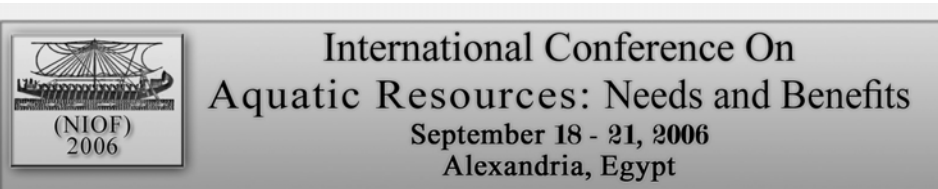
This paper covers the study of using local wood sawdust and polyurethane type of polyester, which is prepared locally, and their capability as a sorbing substance for treating oil pollution of polluted Iraqi waters. The study points directly to the high efficiency of the sorbing substance in treating the oil pollution due to the absence of its hazardous effects on the environment in addition to its economical value. Some of these materials are being extracted from the sorbent and the spilled oil. The paper also includes data about the effect of crude oil API gravity and that of temperature on the oil solubility in Iraqi waters plus the loading capacity and the efficiency of the sorbent. The paper stresses on the necessity of treating polluted waters during the early hours of oil leakage or spillage especially when the pollutant are light oils.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 2

Aquaculture



Session (2): Aquaculture

Oral Presentation

Experimental Larval Development of *Penaedae* Shrimp, *Trachypenaeus Curvirostris* (Stimpson, 1860) from Egyptian Mediterranean Coastal Water

Fatma Aly Abd El-Razek * and S. M. Taha

National Institute of Oceanography and Fisheries, Kayed Bey, Alexandria, Egypt
*E-mail: fatma_abdelrazek@gawab.com

Gravid females of *Trachypenaeus Curvirostris* collected from Abu-Qir fishing area, near Alexandria city, and spawned in NIOF hatchery by natural means and the larvae were reared from hatching to postlarval stage at 27° C temperature and 40 psu. The complete larval development and metamorphosed into post larvae was described. The larvae were reared in a fiberglass tanks (280L). Larvae from the first zoeal stages to the third zoeal stage were fed algae; a mixture of *Nannochloropsis oculata*, *cheatoceros gracilis* and *Tetraselmis chii*. From mysis stage to first post larval stage were fed Rotifers and newly hatched nauplii of Artemia. Two from naupliar stage, three from protozoeal stages, three from mysis stages and one from post larval stage were described and illustrated with measuring the body length of each stage and substages. After about 24 days following hatching on the basis of morphological characteristics, larval stages of *T. curvirostris* could be distinguished from similar stages of the similar closely related species in the family Penaeidae. The shape of the growth curve, depending on the increase in body length of different stages and substages during the rearing period was examined. Preliminary rearing trails during the nursery phase, for a period of 60 days, were observed.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (2): Aquaculture

Oral Presentation

Experiments on asexual reproduction of *Holothuria atra* (Echinodermata) Red Sea, Egypt

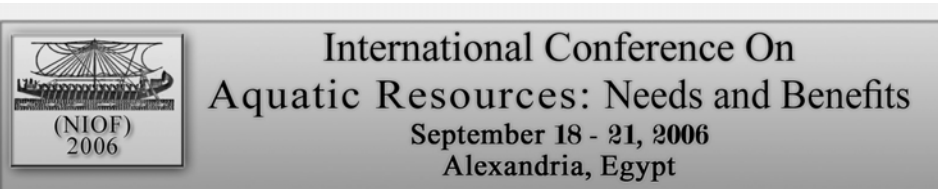
Fatma Aly Abd El-Razek^{1*}; N.A El Shimy²; S. H. Abdel Rahman¹ and H. A. Omar¹

¹National Institute of Oceanography and Fisheries, Kayed Bey, Alexandria, Egypt

²Faculty of Science, Assiut University, Egypt

*E-mail: fatma_abdelrazek@gawab.com

While commercially important species of sea cucumber reproduce primarily sexually some species can also reproduce asexually 30 small individuals of *Holothuria atra* (from 8.0 to 18.2 cm) were collected from a sandy site with some patches of algae *Sargassum sp.* In Hurgada area, Red Sea. Animal length was measured after relaxation of in 2.5% Mg Cl₂ (w/v) in plastic container. This was found to overcome the error resulting from contraction and relaxation of the animals' body. The experiments were done during October 2003 four weeks, using the NIOF facilities in Hurgada city. Glass tanks (100x50x50 cm) were used with thin layer of sand with the animals Survival rate for the whole and divided animals were recorded with change of water daily and the sand was changed weekly. In order to force asexual fission, each animal was fitted at the mid-body with rubber bands. After the, 1st week of experiments about 89.9% of individuals fissioned were divided into two parts actively, while 11.1% of the stated individuals died before fission. After four weeks, at the end of experiments the S.R of fissioned parts (anterior and posterior protean) was 74.1%. The mortality rate of the divided parts was 37% of the anterior part and 14.8% of posterior part animals. Almost 85.2% of the posterior part individuals stayed alive and were kept for further investigations while only 62.9% of the anterior protein individuals remained alive after fission. The overall trend was that posterior parts had survived the fission and regenerated the organs that were lost during the process more than the anterior parts. This method indicted an effective yet simple technique to induce transverse fission. *H. atra* had the ability to regenerate both anterior and posterior parts into whole animals. Rates of successful fission reached 88.9% (after one week), supporting that this technique is an easy and cheap method for artificial propagation.



Session (2): Aquaculture

Oral Presentation

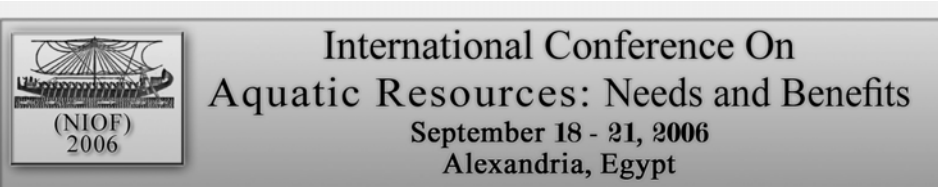
Evaluation of Various Probiotic Bacteria for the Survival of *Penaeus Japonicus* Larvae

Nermeen A. El Sersy¹, Fatma Aly Abd El-Razek² and Somaya M. Taha²

¹National Institute of Oceanography and Fisheries, Microbiology Laboratory, Kayed Bey, Alexandria

²National Institute of Oceanography and Fisheries, Aquaculture Laboratory, Kayed Bey, Alexandria.

Probiotics or their products which are micro-organisms with health benefit to the host, have found good use in aquaculture as a means of disease control, supplementing or even, in some cases, replacing the use of antimicrobial compounds. In the present study, evaluations of three different probiotics were tested on the survival of *Penaeus Japonicus* larvae. Dry powder of commercial product Bacillogen-Zinc, together with two alive pure bacterial cultures *Bacillus pumilus* and *Vibrio fluvialis* were studied. Neural net-work statistical analysis revealed that, both *Bacillus pumilus* and *Vibrio fluvialis* can be considered as powerful probiotics. They produced 94.9% larval survival increase than the control after a critical period of seven days. Although Bacillogen-Zinc showed a higher larval rate of 97.1%, its critical period of experiment was only five days.



Session (2): Aquaculture

Oral Presentation

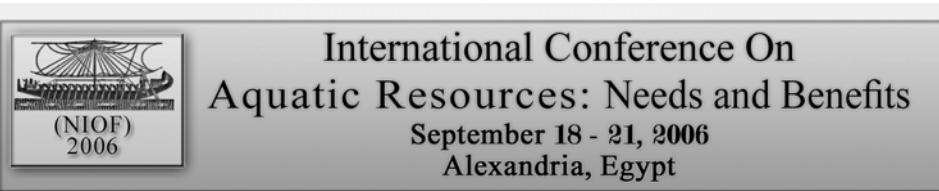
Comparative Study on Reproduction of *Liza Carinata* in the Bitter Lakes and Lake Timsah, Suez Canal

Kamal Fathy El-Boray* and Aml Mohamed Ramadan

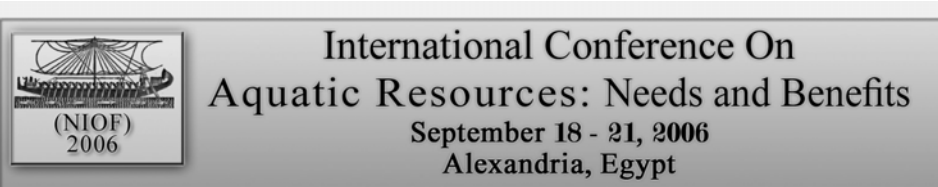
National Institute of Oceanography and Fisheries, Aquaculture Division, Reproduction and Hatchery Laboratory, Red Sea and Suez & Aqaba Gulfs Branch, Suez, Egypt.

*E-mail: elboraykf@yahoo.com

Liza Carinata is endemic in the northern Red Sea (Gulf of Suez). It migrates through the Suez Canal and is recorded in Lake Timsah and Bitter Lakes. Also it was recorded in the Mediterranean Sea and the Arabian Gulf. This study was carried out to compare between the reproduction of *Liza Carinata* in both the Bitter Lakes and Lake Timsah. The previous studies showed that there were difference in the salinity, temperature and productivity in the two lakes. Also, they showed that Lake Timsah was contaminated by pollutants from different sources. The specimens of *Liza Carinata* were collected from the landing sites of the Bitter Lakes and Lake Timsah during the period from October 2002 to September 2003. the present study showed that the measurements of oocytes and spermatic cells of *L. Carinata* in Lake Timsah were greater than in Bitter Lakes, which could be attributed to the difference in salinity between the two lakes. The length at first sexual maturity (L_{50}) of *L. Carinata* in Bitter Lakes was longer than in Lake Timsah. Also the average values of gonadosomatic (GSI) in Bitter Lakes were higher than in Lake Timsah. Although Lake Timsah was higher than the Bitter Lakes in the productivity the variations in the biological parameters of *L. Carinata* such as L_{50} and values of GSI are still good in the Bitter Lakes. This may be due to the high contamination of Lake Timsah as compared to the Bitter Lakes, as well as the variations in salinity of Lake Timsah. The monthly distribution of maturity stages showed that spawning of *L. Carinata* occurred in winter. But spawning season of *L. Carinata* in Lake Timsah started 1 month earlier than in the Bitter Lakes. This may be due to the differences that exist in the temperature between the two lakes. So the temperature may be identified as an important factor for controlling production of *L. Carinata*. The difference in the sex ratio increased in



favor of female in the Bitter Lakes during the spawning period. The situation was different in Lake Timsah, where the difference in the ratio increased in favor of male. Thus it can be concluded that Bitter Lakes may be a spawning ground for *L. Carinata* in the Suez Canal.



Session (2): Aquaculture

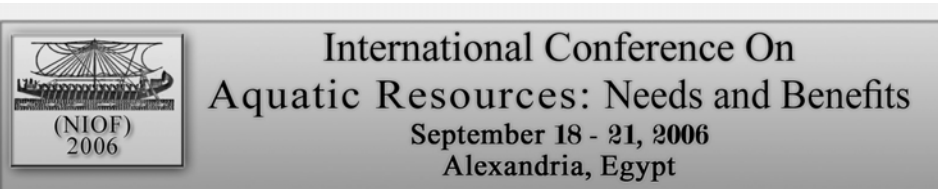
Oral Presentation

Biological and Histological Studies on the Oogenesis of Females, *Bagrus Bayad* (Forsk., 1775) from the Northern Region of River Nile

Abd El-Hakim E. El-Gamal

National Institute of Oceanography and Fisheries, Kayed Bey, Alexandria, Egypt

Bagrus Bayada is asynchronous fish which is characterized by having a low spawning season extends from April to August. The atretic oocytes are dominant in September, beside the small size of oocytes embedded in the connective tissues of ovigerous lamellae. The morphological appearance in the ovaries during the different development stages are described into five stages, namely immature, maturation, nearly ripe, ripe and atretic. The monthly variation of maturity stages revealed that the maturation started to appear in late January and become dominant in March (41%). The ripe stage started to appear in early March (16.17%) and reached its maximum value in late April (53.33%). All females over than 36 cm in length were sexually mature. The gonadosomatic index increased progressively and reached its maximum value in June 7.47 ± 0.95 . During this period, the water temperature fluctuated between 25.5°C and 27.5°C. The annual cycle of ovary undergoes three successive developmental phases. The primary growth phase includes, chromatin nucleolus stage, early perinucleolus stage and late perinucleolus stage. The second growth phase includes primary yolk granules stage, secondly yolk granules and tertiary yolk granules stage. The third growth phase includes ripe stage. The fully ripe ova size reaches about 840 micron in diameter. By using histochemical techniques, the yolk granules are mainly composed of protein and carbohydrate. The inner layer of egg membrane is moderately composed of protein and strongly stained after application with PAS reaction, indicating that its contents are mainly composed of carbohydrate. The middle layer of egg membrane (i.e. granulose) is mainly composed of lipid and weakly composed of protein, lipid and negatively stained after application with PAS reaction, indicating that the carbohydrate materials is absent as histochemical studies demonstrated.



Session (2): Aquaculture

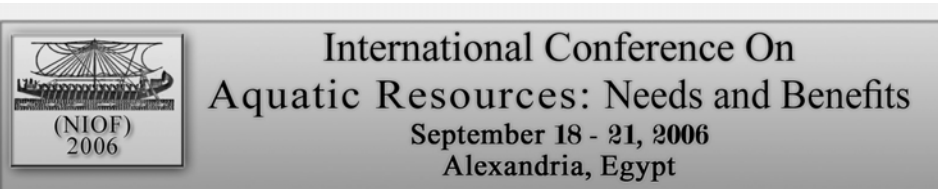
Oral Presentation

The influence of Dietary Protein Level on Fry Production of Broodstock Swordtail *Xiphophorus Helleri* (Pisces: Poeciliidae)

Amal M. Ramadan; Waheed F. Mohmoud*; Magdy M. El-Halfawy; Kamal Fathy El-Boray and Aly Y. El Sayed

National Institute of Oceanography and Fisheries, Red Sea, Suez and Aqaba Gulfs Branch, Suez, Egypt

The ornamental fish swordtail, *Xiphophorus helleri* is economically prosperous as aquaculture industry in many countries in North, Central and South America, Africa and Asia. There is strong interest to develop and establish such industry in Egypt. Studying nutrition is one of the important factors influencing reproduction of the fish broodstock. An experiment to test three dietary protein levels 25, 30 and 35% was conducted for a period of sixteen weeks to investigate the best dietary that would produce the highest rate of fry. In addition, the relationship between water temperature and production of fry in each treatment was studied. Results showed that the highest fry production has resulted from fed protein 30%, followed by protein 35%, while the diet containing 25% protein produced the lowest number of fry. Statistically, the method of contingency tables with one margin fixed (test of homogeneity, χ^2 test) was used and confirmed that 30% dietary protein level is the best rate. The observation indicated that the optimum temperature for hatching ranged from 19 to 26° C during the period of study. The fry production ceased below water temperature of 18°C. The produced fry from broods tock fed on protein 30% had the highest weight.



Session (2): Aquaculture

Oral Presentation

Influence of Organic Matter, Nutrients and Type of Sediment on Macrobenthos Structure in Some Fish Farms at El-Fayoum Province, Egypt

Gamal M. El-Shabrawy* and Mohamed, E. Gohar

National Institute of Oceanography and Fisheries, Fish Research Station, El-Kanter El-Khyria, Cairo, Egypt

* E-mail: Elshabrawy_gamal@yahoo.com

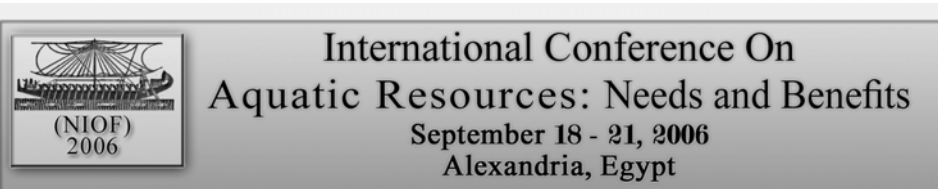
Nutrients, organic matter and macrobenthos structure were determined monthly for four fish Ponds and two Drains in El-Fayoum province in 2004. The sediment of Pond 2 confined the maximum average of NO₂-N and NO₃-N, (4.3 and 7.17 mg/g) while Pond 4 maintained the highest average of PO₄-P and total phosphorus (1.72 and 3.96 mg/g respectively). Dair El-Berka Drain maintained the highest percentage of organic matter (21.96%), while pond 4 sustained the lowest percentage of 12.04%. The nature of sediments was silty sand and silty clay in the ponds and the drains respectively. A total of 23 macrobenthic species belong to Arthropoda (7 species), Annelida (8 species), and Mollusca (8 species) were identified. There are two density peaks of 6960 and 6720 org.m⁻² in Pond 1 in February and in El-Wadi Drain in November. Arthropoda dominated the other macrobenthic groups at Pond 1, 2, 3 and El-Wadi Drain and came next Annelida at Pond 4 and Dair El-Berka Drain. *Corophium Orientale* (Amphipoda) and Chironomide larvae (Diptera) were the dominant taxa. Statistical analysis showed that the highest species and richness values of 18 and 2.15 were in El-Wadi Drain, while Pond 3 had the lowest species number (6 species) and richness (0.76). Cluster analysis of macrobenthos diversity measures indicated two main groups including, El-Wadi Drain, Dair El-Berka Drain, Ponds 4 and Ponds 1, 2 and 3. The highest similarity (72.5%) was recorded within the 2nd group, (Ponds 2 & 3).



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 3

Aquatic Pollution by Heavy Metals



Session (3): Aquatic Pollution by Heavy Metals

Oral Presentation

Concentrations of Mercury and Selenium in Some Marine Invertebrates from the Gulf of Suez, Egypt

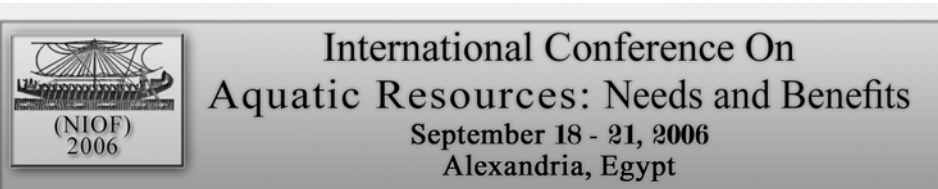
Khaled M. El-Moselhy^{1*}, Lamiaa I. Mohamedein¹, Wafaa S. Sallam² and Saad Z. Mohammad²

¹Department of Marine Pollution, National Institute of Oceanography and Fisheries, Suez

²Departement of Marine Science, Faculty of Science, Suez Canal University, Ismailia

*E-mail: khalid19670@yahoo.com

The present study aimed to determine the levels of mercury and selenium and to illustrate the relationship between them in some selected marine invertebrates. The shrimp *Penaeus japonicus*, the blue crab *Portunus pelagicus*, the bivalves *Brachidontes variabilis*, *Gafrarium pectinatum*, *Trachycardium* sp., *Macra olorina* and the polychaete worm *Perinereis* sp. were collected from the northern part of the Gulf of Suez and the Suez Bay. Samples were analyzed using hydride system conducted with atomic absorption spectrophotometry. Muscles of the blue crab *Portunus pelagicus* accumulated the highest concentration of mercury (27.72 and 22.67 ng/g for the Bay and Gulf crabs, respectively) followed by shrimp, bivalves and polychaete. On the other hand, bivalves showed the maximum concentration of selenium (1.03 and 2.96 µg/g for the Bay and Gulf bivalves, respectively) followed by the polychaete, the crab and the shrimp. ANOVA was used to estimate the variation in accumulation levels of the two elements between the species and sampling sites. Relationship between the concentrations of the two elements in all studied animals showed a negative correlation ($r = -0.673$)



Session (3): Aquatic Pollution by Heavy Metals

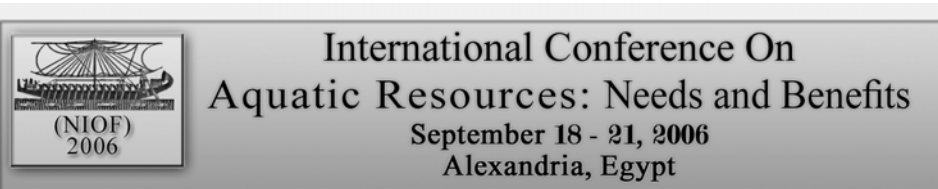
Oral Presentation

Phosphorus Species in Sediment Cores of Lake Burollus, Egypt

Mohamed A. Okbah and Hayat M. Faragallah

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayed Bey, Alexandria, Egypt

In January 2006, undisturbed sediment cores were collected to a depth of 25 cm from six sites in Lake Burollus, representing the different regions of the Lake. The cores were analyzed and studied at 5 cm depth intervals. The vertical distribution of total phosphorus (TP) indicated that the concentration is mostly decreasing with increasing depth. It ranged from 992 to 264 $\mu\text{g/g}$. The results revealed that the inorganic phosphorus (IP) was the dominant fraction of TP, where it constituted 88.6 % of TP. Organic phosphorus (OP) concentration was much lower (11 % of TP) than their corresponding values of IP. Sequential extraction procedures were studied to distinguish the phases to which phosphorus is associated; these represent exchangeable, carbonates plus porewater (P_{ex}), iron, aluminum and Organic matter phosphate (P_{OH}) as well as calcium phosphate (P_{HCL}) and residual phosphate (P_{R}). The absolute value of P_{ex} showed wide variation in the concentration of the core sediments, ranging from 4.6 to 50.6 $\mu\text{g/g}$. Its average percentage represented 3.4% of the P_{sum} . The vertical distribution of P_{OH} was similar to that of TP; the relative percentage of P_{OH} was between 0.8% and 15.6% for the study area, with an average of 6.10% of P_{sum} . The values of P_{HCL} showed wide variation within the studied core sediments. It ranged from 196.2 to 368.0 $\mu\text{g/g}$; with a relative percentage of the fraction ranging from 47.8 to 72.6% and on average, 57.2% of the P_{sum} . Residual phosphate (P_{R}) was the second dominant PO_4 part (33.40%) after the fraction of P_{HCL} (57.20%). The distribution of phosphorus in the core sediments of Lake Burollus was controlled by the association of phosphorus with the different constituents of the sediments. The order of phosphorus abundance in the core sediments of the Lake was as following: $P_{\text{HCL}} > P_{\text{R}} > P_{\text{OH}} > P_{\text{ex}}$.



Session (3): Aquatic Pollution by Heavy Metals

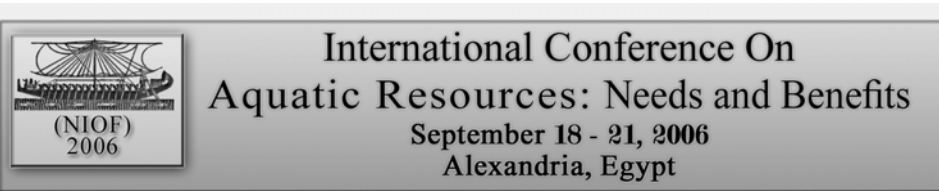
Oral Presentation

Recycling and Retention of Some Trace Metals in the Mangrove Sediments, Red Sea, Egypt

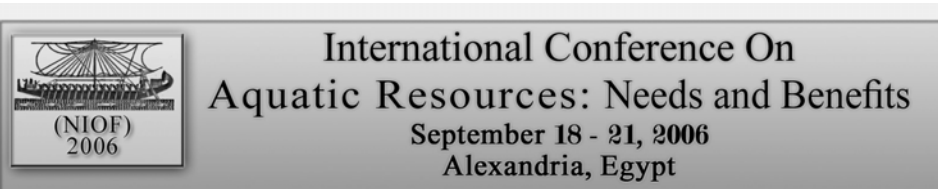
Mahmoud A. Dar¹ and Abeer A. El-Saharty²

¹National Institute of Oceanography and Fisheries, Hurghada; ²National Institute of Oceanography and Fisheries, El-Anfoushy, Kayed Bey, Alexandria, Egypt

The recycling and retention of Fe, Mn, Cu, Zn, Pb and Cd were studied in the fine fraction sediments (Ø_3 , Ø_4 and Ø_5) of three mangrove forests, representing different natural and anthropogenic settings in the area between Hurghada and Qusier cities. The average total percentage of these fractions is fluctuating between 36.92% at Abu Minqar Island and 55.24% at Abu Hamra Downstream of the total sediment percentage. In the different localities, iron content shows subequal values in the three fractions, the total average varied between 2489.49 ppm at Safaga Island and 3076.07 ppm at Abu Hamra Downstream. Mn, Zn, Cu and Pb are mainly concentrated in Ø_5 , which means that the trace metals occurrence is related to the finest sediments much more than the coarsest. Abu Hamra Downstream recorded the highest total average Mn (574.88 ppm) followed by Abu Minqar (479.62 ppm). Safaga Island recorded the highest total average contents of; Cu (67.49 ppm), Zn (49.54 ppm) and Pb (28.36 ppm). This is obviously due to the presence of continuous supply from anthropogenic sources strictly related to the navigation activities, mainly shipping operations and the shipyards. Cd was insignificant in different localities, it recorded very low concentrations (<1 ppm). Metal retention in the mangrove sediments is probably controlled by finest sediment accumulation, iron and manganese concentrations and the organic matter decomposition. In the anoxic conditions, sulphate and hydroxides reduction produce metal sulfides which are the more stable forms. Conversely, metal recycling in these ecosystems is attributed to oxic conditions providing. The burrowing operations by the living organisms and the tidal duration as well as the mangrove roots are oxygenating the surrounding sediment bed; subsequently large amounts of sedimentary sulphides are converting to metal mobile forms. The present study indicates that the mangrove forests of Egypt are not threatened by the



heavy metal pollution. The recorded concentrations are mostly less than those recorded in many mangrove localities around the world.



Session (3): Aquatic Pollution by Heavy Metals

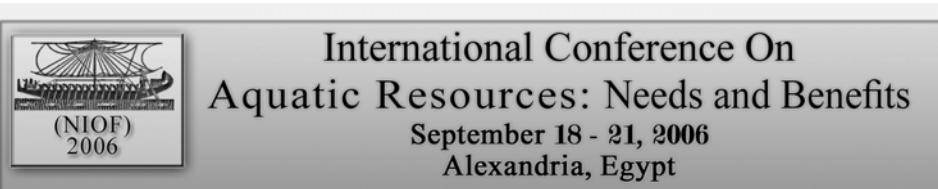
Oral Presentation

Distribution of Ni, Fe, Mn, Zn, Cr, Pb, Cd, Co and Organic Matter in Recent Sediments of Abu Za'baal Ponds, Egypt

Mohamed H. Abdo

National Institute of Oceanography and Fisheries, El-Kanater El-Khyria
Research Station, Cairo
E-mail: abdo122006@yahoo.com

Present study revealed that concentrations of Ni, Fe, Mn, Zn, Cr, Pb, Cd and Co have irregular distribution patterns in the sediment of Abu Za'baal ponds. Such irregular distribution patterns occur as a result of interference between several factors such as surrounding environmental conditions and the basaltic rocks present in the sediment of Abu Za'baal Ponds. The result of the studied trace metals showed that they occur in the following descending order: Ni>Fe>Mn>Zn>Cr>Co>Cd then Pb. Organic matter was found to be low at most of the stations during the different seasons. In addition, the results revealed that the concentration value of Ni, Cd, Pb and Zn are higher than the sediment quality guidelines at most stations during some seasons.



Session (3): Aquatic Pollution by Heavy Metals

Oral Presentation

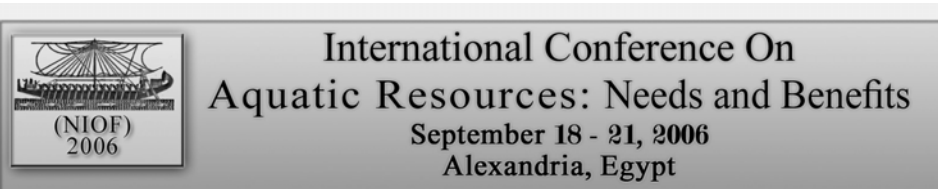
Levels of trace metals in Marine Macroalgae from the Bitter Lakes, Suez Canal

Adel Amer and H. Abd El-Azim*

National Institute of Oceanography and Fisheries, Suez

*E-mail: aa682000@yahoo.com

The levels of trace metals (Ni, Co, Cu, Fe, Zn, Cd and Pb) were determined in ten macroalgal species (green algae: *Enteromorpha compressa* and *Cladophora albida*; brown algae: *Sargassum dentifolium*, *Cystoseira myrica*, *padina pavonia*; red algae: *Acanthophora najadiformis*, *Laurencia papillosa*, *Ceramium tenuissima*, *Polysiphonia figariana*, *Hypnea cornuta*), collected from six sites along the Bitter Lakes in Suez Canal. The relative abundance of trace metals in algal species decreased in the order (Fe > Zn > Ni > Cu > Pb > Co > Cd). The highest concentrations of (Co 1.17 µg/g) and (Pb 8.00 µg/g) were found in brown algae *C. myrica*, while Cd 1.00 µg/g and Cu 16.92 µg/g were recorded in *p. pavonia* and *S. dentifolium*, respectively. In red algae, the highest values of Ni (9.28 µg/g), Zn (36.50 µg/g) and Fe (502.20 µg/g) were observed in *A. najadiformis*, *P. figariana* and *H. cornuta*, respectively. According to the local variation of metals in the investigated area, the highest values for most (Ni, Cu, Fe, Zn and Pb) were recorded in front of Fayed, which is the biggest village in the Bitter Lakes area receiving agricultural and domestic drains in addition to the discharges from the vessels crossing the Suez Canal. Inter-elemental relationships were studied and showed positive significant correlation ($p < 0.05$) between Ni – Fe ($r = 0.63$), Ni – Zn ($r = 0.47$), Co – Fe ($r = 0.52$), Zn – Cd ($r = 0.41$) and between Zn – Pb ($r = 0.49$). The present study recommended that the pollution sources at Fayed, which is considered as fishing and recreational marine area, must be controlled. In this context, some algal species could effectively be used as good reference materials for monitoring heavy metals contamination in Bitter Lakes.



Session (3): Aquatic Pollution by Heavy Metals

Oral Presentation

Oxidative Stress and DNA Damage in Relation to Heavy Metals Pollution in Marine Environment

Haiam M. Aboul-Ela¹, Amany El-Sikaily¹, Abir A. Saad², Taha Zaghloul²

¹Department of Marine pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria;

²Department of Biotechnology, Institute of Graduate Studies and Research, University of Alexandria

The aim of the present study is to evaluate the relationships between heavy metals pollution and several biomarkers of oxidative such as levels of Catalase and lipid peroxidation (measured as malondialdehyde [MDA] concentration) as well as oxidative DNA damage (measured as number of Apurinic/apyrimidinic [AP] sites/ 1×10^5 bp). In order to monitor the presence of these pollutants, grey mullet (*Mugil cephalus*) samples were captured from two different coastal areas of Alexandria varying in pollution degrees (one is a hot spot "Abu-Qir Bay", and the other is a reference area "Sidi-Barrani"). The levels of Fe and Cu in fish liver tissues were significantly higher in samples from the polluted area as compared to samples from the reference area: (Fe: 407.2 ± 188.58 $\mu\text{g/g}$ wet wt vs. 216.11 ± 68.95 $\mu\text{g/g}$ wet wt; $p=0.01$, Cu: 54.03 ± 20.20 $\mu\text{g/g}$ wet wt vs. 17.77 ± 13.84 $\mu\text{g/g}$ wet wt; $p<0.001$). This increase could account for the observed increase in MDA concentration (15.77 ± 18.31 vs. 2.5 ± 1.6 U/gm; $p=0.035$) as a measure of lipid peroxidation, and the elevated number of AP sites representing the DNA damage (13.98 ± 7.37 vs. 0.3718 ± 0.5683 AP site/ 1×10^5 bp; $p=0.001$). Similarly, the activity of Catalase enzyme implicated in the cellular defense was also significantly elevated (15.77 ± 18.31 vs. 2.53 ± 1.6 U/gm; $p=0.042$) to protect fishes from oxidative stress. In addition, there was a significant positive correlation between iron concentration and both DNA damage ($p=0.02$) and Catalase activity ($p=0.004$). On the other hand, Cu was not significantly correlated with the measure parameters. The concentrations of both metals were measured also in gills and muscle tissues of the samples from both areas. The metal concentration was in the following order: (Liver > Gills > Muscles) in the samples of each area. There was also a statistically significant difference between the levels of Fe in muscle and gills in the samples from the two different areas as well as levels of



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Cu in muscles tissues but not in gills ($p=0.005, 0.021, 0.008, 0.177$; respectively). In general, the results of this study indicated a clear relationship between the degree of pollution of the marine environment and both biochemical (lipid peroxidation; level of MDA, and Catalase activity) and molecular (DNA damage) responses of the piscine system, which in turn reflects an important role of pollution by heavy metals (Fe & Cu) in marine toxicology.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (3): Aquatic Pollution by Heavy Metals

Oral Presentation

Heavy Metals Distribution in the Coral Reef Ecosystems of the Northern Red Sea

Abd El-Hamid A. M. Ali, Mohamed A. Hamed and Hoda Abd El-Azim

National Institute of Oceanography and Fisheries, Suez, Egypt

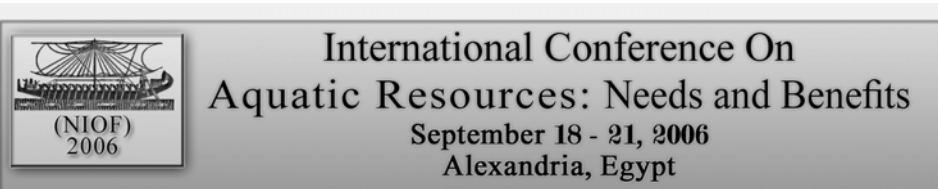
Concentrations of seven heavy metals (Cu, Zn, Pb, Cd, Ni, Co and Fe) were measured in the seawater, sediments, common scleractinian reef-building corals and soft corals (Octocorallia: Alcyonacea) at seven reef sites in the northern Red Sea. Levels of heavy metals were considerably elevated in seawater, sediments and corals collected from reef sites exposed to increased environmental contamination, as a result of diversified natural and anthropogenic inputs. Soft corals of genera *Lithophyton*, *Sarcophyton* and *Sinularia* showed higher concentrations of Zn, Pb, Cd and Ni than hard coral genera *Acropora* and *Stylophora*. Soft coral *Sarcophyton trocheliophorum* collected from El-Ain Al-Sukhna (Gulf of Suez) had greater concentration of Cu, followed by hard corals *Acropora pharaonis* and *Acropora hemprichi*. The elevated levels of Zn, Cd and Ni were reported in the dry tissue of soft coral *Sinularia* spp. On the other hand, the soft coral *Lithophyton arboretum* displayed the highest concentration of Pb at Sha'b Rashdan (Gulf of Suez) and elevated concentration of Zn at Sharm El-Sheikh. Sediments showed significantly higher concentration of Fe than corals. The higher levels of Fe in hard corals, as compared to soft corals, reflected the incorporation of Fe into the aragonite and the chelation with the organic matrix of the skeleton. The greater abundance of soft corals in metal-contaminated reef sites and the elevated levels of metals in their tissue suggest that the soft corals could develop some tolerance to the metals. Although the effects of heavy metals on reef corals were not isolated from the possible effects of other stresses, the percentage cover of dead corals were significantly higher as the concentrations of heavy metals increased.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 4

Poster Presentation on Aquaculture and Fisheries



Session (4) Poster Presentation on Aquaculture and Fisheries

Data on the Reproduction of the Clam *Venus Verrucosa* Collected in the Channel of Bizerte (Tunisia)

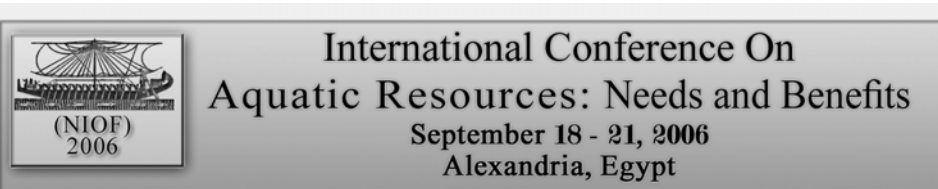
Trigul El-Menif Najoua^{1*}, Guezzi Youssef¹, Le Pennec Marcel² and Boumaiza Moneef¹

¹Université de Carthage, Faculté des Sciences, Département de Biologie, Laboratoire de Biosurveillance de l'Environnement, Bizerte, Tunisie

²Institut Universitaire Européen de la Mer, Université de Bretagne Occidentale, Technopôle Brest Iroise, 29280-Plouzané, France

*E-mail: Najoua.TriguiElMenif@fsb.rnu.tn

Several studies related to the production of the clams *Venus verrucosa* were common over the world. These studies dealt with biological aspects, sexuality, reproduction cycle and the larval development. In Tunisia, studies related to this species were lacking. In the present study, more clarification about the reproduction cycle of *V.verrucosa* are proposed. 100 – 120 individual are collected monthly for the period from September 2002 to August 2003, from the canal of Bizerta lagoon (Canal separating the lagoon from the Mediterranean Sea). Besides, we measured monthly the physicochemical parameters in the sampling station. Biological parameters followed were: (i) the sex ratio (ii) the gonadic state (iii) the condition indices [$IC = W_{\text{dried flesh}} \times 100 / W_{\text{dried shell}}$] were calculated from December to August. Results obtained showed that the undifferentiated rate of individuals did not exceed 4.12%. Otherwise, no variations were signaled between the males and the females (X_2 test). The reproduction cycle of the clam was layer throughout the year with two emission periods: September-November and March-August considering the reduction in flesh weight is gonadic. Furthermore, a gonadic restoration was recorded between May and June. Summer emission was more important than the autumn ones according to the variations of values of the condition index obtained between maximum and minimal values. Considering other indices, results signaled that visceral mass of the clams decreases more in the period of June to July than the period of July to August. Furthermore, the reproductive cycle of the clam seems to be influenced by water temperature (the gametic emission periods coincide with increase or decrease in water temperature values).



Session (4) Poster Presentation on Aquaculture and Fisheries

The Opecoelidae (Digenea) of *Macvicaria* Genus Parasite of Sparid Fishes from Tunisia

Lamia Gargouri Ben Abd Allah*, Soumaya Khaldi and Fadhila Maamouri

Faculté des Sciences de Tunis, Laboratoire de Biologie animale, Département de Biologie, Tunisia

*E-mail: Lamiagargouri@yahoo.com

The Sparid fishes coming from three stations of Tunisian Mediterranean coast (Bizerte, Tunis, Sfax) are examined for the trematodes parasites. This examination reveals, in the alimentary tract, the presence of five species of *Macvicaria* belonging to the Opecoelidae family (*Macvicaria obovata*, *M. maillardi*, *M. crassigula*, *M. dubia* and *M. mormyri*). The closely related forms of *Macvicaria* can be distinguished on morphological criteria. *M. obovata* is mainly characterized by the presence of vitelline fields in the anterior part of the body. *M. maillardi* has an uterus that does not interject between the ovary and the anterior testis and the vitelline fields are confluent and reach to pharynx. *M. crassigula* is similar to *M. maillardi* but differs in being smaller, having a ventral sucker much greater than the oral sucker and a larger pharynx. *M. dubia* is discerned by the small ovary; smallest diameter is often not much greater than egg length. *M. mormyri* can be distinguished from the other species by the ventral sucker that is borne on a distinct eminence.

The survey of the parasite distribution according to the host shows that *M. crassigula* is specific of *Diplodus vulgaris*. However, *M. obovata* and *M. maillardi* are collected only from *Sparus aurata*. *M. dubia* and *M. mormyri* are limited to *Lithognathus mormyrus*. *M. obovata* colonized the posterior part of intestine of *S. aurata*. The other parasites occupy essentially the anterior part of the intestine and occasionally the mid intestine.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (4) Poster Presentation on Aquaculture and Fisheries

Impacts of Mobile Fishing Gear on Macrobenthic Communities of the Gulf of Gabès, Southern Tunisia (Central Mediterranean)

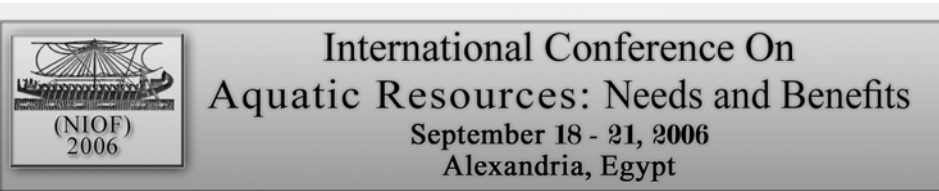
Jamila Ben Souissi^{1*}, Mohamed Saah Mahjoub¹, Mohamed Ben Salem² and Jeanne Zaouali¹

¹Institut National Agronomique de Tunisie, 43 Avenue Charles Nicolle, Cité Mahrajène 1082, Tunis, Tunisie

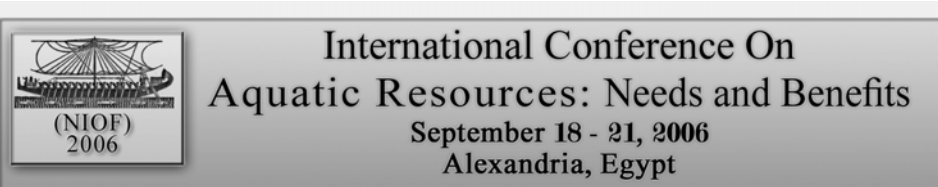
*E-mail: bensouissi.jamila@inat.agrinet.tn

²Département des Sciences Biologiques, Faculté des Sciences de Tunis, Campus universitaire 1060 Tunis, Tunisie

Commercial fishing is one of the most important human impacts on the marine benthic environment. Bottom trawling is especially the most disruptive and widespread human induced physical disturbances to seagrass beds communities, and has become a global environmental concern. In order to estimate the effects induced to marine organisms by mechanical fishing gear such as (trawling and dredging) survey have been carried out in the Gulf of Gabès (Southern Tunisia) since 2001 and results have been compared with anterior studies conducted in 1934 and 1973 respectively in the same area. The Gulf of Gabès is characterized by a relatively high degree of biological diversity. The fauna includes many endemic and endangered species. The area is exploited by a large number of trawling fleet (more than 400 vessels) as well as by small-scale fleet using various illegal gears especially illegal small trawling named "kiss" in Arabic. The Gulf of Gabès is one of the most zones in the Mediterranean Sea that witness intensive fishing efforts. Historical data from both bottom trawl surveys and commercial landing statistics in the Gulf of Gabès point to the clear decline of demersal fish species due to the high by-catches caused by the low selectivity collecting practices. The survey conducted in the area by using bottom grab samples and experimental trawling to compare the evolution of biological parameters, enabled the evaluation of the heavy repercussion on benthic community of such great exploitation activity, carried out generally with forbidden fishing methods. In addition to the direct loss of the exploited species, bottom trawling destroys habitat complexity, induces the regression and degradation of the seagrass beds mostly constituted by the endemic angiosperm species *Posidonia oceanica* and its substitution with invasive species such as *Caulerpa racemosa*, which cause loss of diversity, and



increases the abundance of opportunistic species. Valid research in the Gulf of Gabès will require marine reserves in which fishing efforts and methods can be made on the bases of collaborative studies involving fishermen, scientists and policy makers.



Session (4) Poster Presentation on Aquaculture and Fisheries

Stock Assessment and Management of Musky Octopus *Eledone Moschata* (Cephalopoda, Octopoda) from Tunisian South-Eastern Coasts (Central Mediterranean)

Soufia Ezzeddine* and Bachra Chemmam

INSTM, 2025 Salammbô (Tunisie)

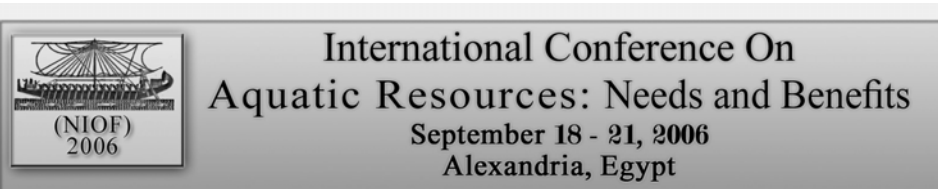
*E-mail: soufia.ezzeddine@instm.rnrt.tn

In Tunisia, since about ten years, a particular interest has been directed towards the consumption of the musky octopus, *Octopus vulgaris*, of which the price became very expensive. Such situation has led to the increasing of the eledone fish. So, according to the official statistics data, the product which was equal to 398 tons in 1996 came up to the level of 720 tons in 2001 with 91% provided from the Gulf of Gabès in southern Tunisian waters. The musky octopus, a coastal and endemic species in the Mediterranean, is not studied enough anywhere and particularly, concerning the level of its exploited stock in the countries where the capture of musky octopus is important enough (around western Mediterranean coasts). So, the present work is, as far as we know, the first estimate study achieved on the Eledone assessment stock. The virtual population Analysis method was applied to assess the population stock from the Tunisian southeastern waters (Central Mediterranean). The length frequencies are collected from samples taken from trawling landings during the experimental survey for the period of 4 years. The resulted pointed out that the profits provided to the stocks came from recruitment with a contribution estimated at 12.10%, but the main benefits were obtained from growth rate of 87.9%. This result corroborates with the biological characteristics of this species as well as the whole of cephalopods namely fast growth and short life-span. These characteristics would have attributed to the stock a very rapid potential of regeneration. Indeed, the rate corresponding to the renewal speed of the stock was estimated to about 212%. Nevertheless, the losses of the stock were due to the natural morality and equally to mortality by fishing respectively estimated at 54% and 46% respectively. The high rate of losses due to natural mortality is justified by the short longevity of the musky octopus which, according to our biological study, is not extending beyond one and half year, and it reflects the underfishing situation of the Tunisian



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

southeastern waters stock. Indeed, the variation of the yield by recruitment in relationship to the fishing effort factor showed that the actual stock is underexploited. In order to attain optimum situation, the actual fishing effort should be doubled. In considering the multispecific aspect in the southeastern fishery, appropriate recommendations are proposed, on the other hand to rationally exploit *Eledone moschata* stock, and on the other hand, to preserve the overfished species.



Session (4) Poster Presentation on Aquaculture and Fisheries

The Stock Assessment of *Sphyreana Sphyreana* from Tunisian Coasts

Bachra Chemman Abd El-Kader¹, Soufia Ezzeddine² and Scander Ben Salem³

INSTM 28, rue 2 Mars 1934, Salammbô 2025, Tunisie

¹E-mail: bachra_chem@yahoo.fr,

²E-mail: soufia.ezzeddine@instm.rnrt.tn

³E-mail: scander.bensalel@instm.rnrt.tn

This study consists of the stock assessment of the fish *Sphyreana sphyreana* exploited on the Tunisian coast of the Mediterranean Sea. Two stocks are separately dealt with the northern Mediterranean and eastern Mediterranean stocks. In total, 2345 individuals were collected from May 2000 to November 2001, from the coastal fishing and purse seine along the Tunisian coasts. The total lengths of the monthly sampled animals were arranged by size classes of one centimeter intervals and the size structure are pondered to the respective monthly landings, and then transposed on the yearly captures. The database so obtained is accessible for cohort analysis according to Vit Program. In the North, the yield by recruit values is below the optimal level; the stock seems to be under-exploited. In order to reach the best exploitation rate, the actual effort by catch should be dispelled. Nevertheless, the exploited profile for the eastern region shows that the stock in the eastern Tunisian Mediterranean waters is highly overexploited. In order to return to the optimal conditions, the actual effort by catch in this region should be reduced to the half.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (4) Poster Presentation on Aquaculture and Fisheries

Steroid hormone in Serum of Female *Mugil Cephalus* in Relation to Steroidogenic Secreting Tissue (Ultrastructure) in Lake Quaron

Meseda M. El-Gharabawy, Samira S. Assem and Rania F. Ismail

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

The grey mullet or *Mugil cephalus* L. is one of the most common fish species in the Mediterranean Sea. An increase attention has been given to its propagation and productivity facing the marked deficiency of its fries. However, seemingly, no information is so far available regarding the concentration of steroid hormone "estradiol, testosterone and progesterone" in serum of female *Mugil cephalus* in Lake Quaron throughout the year. In addition, the distribution of the steroidogenic endocrine tissue in ovary of female using electron microscope was studied to permit the accurate determination of the sites of steroid synthesis. These two items of study are very essential to give a brief account about disfunction of reproduction in *Mugil cephalus* in Lake Quaron. The morphological and histological findings have indicated that the ovaries pass through six successive stages or periods. Concentration of serum steroid hormone in female *Mugil cephalus* revealed a significant increase in testosterone and progesterone concentration at late vitellogenic stage "ripe" at $P < 0.01$ with surge of estradiol concentration at the same stage. Dramatic decrease in the three hormones at the resorbed and spent stage was noticed. Ultrastructure examination of the oocytes showed the following:

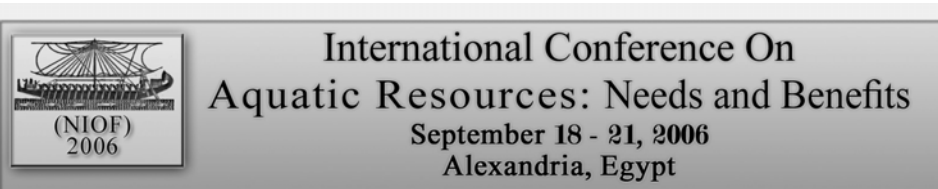
- 1- Small spherical cells for immaturation period.
- 2- Appearance of isolated follicular epithelial layer around the oocytes and formation of yolky nuclei for maturation period "early vitellogenesis"
- 3- Appearance of vacuoles and four different layers in vacuolized and ripe stage "mid and late vitellogenesis", in which the outer most layer is theca layer, the second is the follicular epithelial layer, then the third and fourth are zona radiata external and zona radiata internal. Absence of cortical alveoli.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

- 4- Appearance of hypertrophy zona radata and atretic follicular epithelial layer with absence of theca layer in resorbed stage. All layers of the oocytes were considered as steroidogenic andocrine tissue in the ovary.

These were presently noticed during the oogenesis process, suspected steroidogenic activities were indicated in the thecal and granulose layers forming the follicular oocytes envelopes. The present study indicated a positive correlation between oocyte dimensions and their concentration of steroid hormones.



Session (4) Poster Presentation on Aquaculture and Fisheries

Seaweed Cultivation, Product Development and Integrated Aquaculture Studies in Egypt

Yasser Mostafa Thabet¹ and Fatma Aly Abd El-Razek^{2*}

¹Central Lab. for Aquaculture Res., Agric. Research Center, Ministry of Agriculture, Egypt

²National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

The green algae *Ulva lactuca* is one of the aquatic plants suitable for the reduction of eutrophication in the culture season and to maintain the balance of the ecosystem in the sea, because the growth season of the *Ulva sp.* with the active season of the cultured fish and shrimps. The use of seaweed as nutrient extracting organisms have been demonstrated to be biologically, technically and economically feasible. If algae tank culture is integrated into shrimp farm, it is possible to reduce the negative impact of shrimp waste, and most of the costs for cultivating the algae are covered by the operational costs of shrimp farm, which makes the whole system profitable and ecologically friendly. A further advantage is that algae cultivated with shrimp waste waters have a higher agar quality and nutrients content. Similar to tank cultural cultivation, floating culture of algae can also be integrated with shrimp, helping to reduce nutrient load in the surrounding water. This system increased the biomass productivity and nitrogen content by 30 percent in comparison to *Ulva* monoculture. In the present study, several experimental trials were adopted during winter and summer seasons of 2005 & 2006 to study the different techniques for biomass productivity of green algae *Ulva lactuca* integrated with shrimp culture comparison to its monoculture technique. Shrimp culture tanks in NIOF shrimp hatchery were used during the nursery and green out periods as well as the open water system in the area around NIOF shrimp hatchery of the Eastern Harbor of Alexandria. Preliminary observations on the use of different techniques such as floating ropes, harden plastic stripes (with smooth surface), net-tubing culture bags and plastic baskets (30 x 40 cm) were tried. Also some observations on the effect of depth of water column on mass production with growth of algae were collected. The results of culturing algae in shrimp tanks were very promising. It is most important to note that algae grew at surface water more than those fixed at 70 cm



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

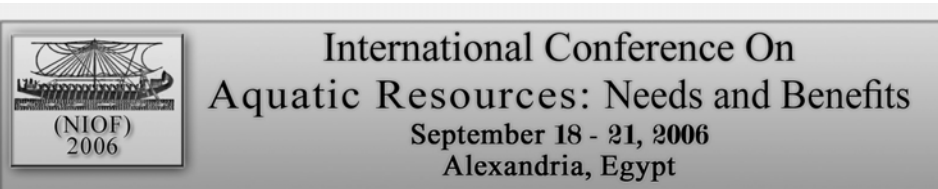
depth in the tanks. The disadvantage observed in this integrated culture was the use of net tubing culture bags whether at surface or immersed in the water. On the other hand, when plastic baskets used under the same culture conditions, good results with highest net weight gain in the algae biomass was achieved as 251-693% during 21 days in June and 93-270% during 14 days in July, 2006. In the other technique that uses different types of ropes (nylon ropes, synthetic fiber ropes and coconut fiber ropes), the results were also promising. The sea weed covered all the ropes and some attached to wooden frames which indicate that the spores of the *Ulva lactuca* can attach to the ropes. The highest net gain in weight was noticed on the coconut fiber rope with about 156% in 21 days, followed by the nylon rope with about 70% in comparison with other types of ropes. Plastic stripes and nylon tubular net failed to keep the algae alive.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 5

Aquatic Pollution: Water Treatment



Session (5): Aquatic Pollution: Waste Treatment

Oral Presentations

Nitrate Removal with Bacterial Cells Attached to Quartz Sand and Zeolite from Highly Salty Solutions

Lucija Foglar^{1*} and Nenad Bolf²

¹Division of Industrial Ecology, ²Division of Measurement and Process Control, Faculty of Chemical Engineering and Technology, University of Zagreb, Marulićev trg 19, HR-10000 Zagreb, Croatia.

*E-mail: ifoglar@pierre.fkit.hr

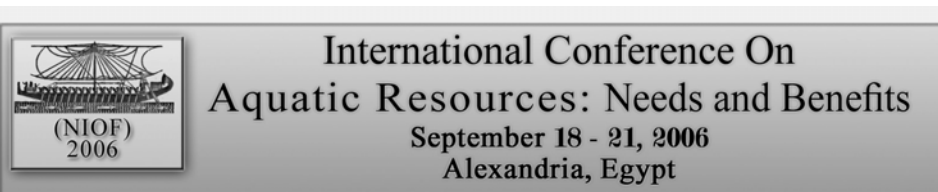
A mixed bacterial culture was acclimated to the removal of high nitrate-N concentrations (100-750 mg NO₃ – N/l) from highly salty conditions. The experiments were carried out under anoxic conditions in the presence of 0.5, 1.5 and 3% NaCl at different temperatures. The acclimated mixed bacterial culture was attached to quartz sand and zeolite. Microscopic examinations indicated that only 5 different types of bacteria were dominant in the acclimated culture. Three types were rod-shaped, and one was a short coccobacillus. Gram staining showed that they were Gram-negative. The mixed bacterial culture contained one Gram-positive long rod-shaped bacterium, too. The identified species belonging to genera *Pseudomonas* and *Paracoccus* were the only true denitrifiers. So, their presence in mixed culture obviously accomplished complete nitrate removal with minimum nitrite accumulation. Removal of nitrate in the continuous-flow bioreactor cells attached to the quartz sand and zeolite was investigated at different HRT and at different nitrate loading rates. The aim was to determine the reactor's stability and denitrification potentials.

Nitrate removal with cells attached to quartz sand and zeolite was completed at HRT of 167 h and 25 h respectively. The comparison of nitrate-N and nitrite-N concentrations at the steady state during the experiments with bacterial cells attached to quartz sand and zeolite showed that in our work zeolite was the preferred carrier of microorganisms. Then nitrate removal with bacterial cells attached to zeolite from highly salty solutions was monitored for 85 days. During first 30 days volumetric denitrification rates was 3.96 ± 0.48 mg NO₃- N/l h and until day 42, when it was raised to 7.61 ± 0.25 mg NO₃- N/l h. On day 43, the initial nitrate concentration went up to 300 mg NO₃- N/l and then



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

reached steady state at 500 mg NO₃⁻ N/l. Consequently, volumetric denitrification rate was raised to 11.79 ± 0.15 mg NO₃⁻ N/l h and 19.36 ± 0.90 mg NO₃⁻ N/l h, respectively. Finally, on day 66 the initial nitrate concentrations went up again to 700 mg NO₃⁻ N/l and denitrification rates to 28.43 ± 0.35 mg NO₃⁻ N/l h. The fact that the volumetric denitrification rate increase in the influent nitrate concentration was supported by the fact that denitrification rates is the influent nitrate concentration was supported by the fact that denitrification rates is dependent on nitrate concentration. That was clearly demonstrated by the presented results which ranged between 3.96 ± 0.48 mg NO₃⁻ N/l h and 28.43 ± 0.35 mg NO₃⁻ N/l h. Under the increased nitrate loading rate, nitrate removal was above 90%. Furthermore, during denitrification, not more than 0.5 mg NO₂⁻ N/l could be produced. It can be concluded that nitrate removal with the cells attached to zeolite is economically viable and operationally promising solution to denitrification of saline wastewaters.



Session (5): Aquatic Pollution: Waste Treatment

Oral Presentations

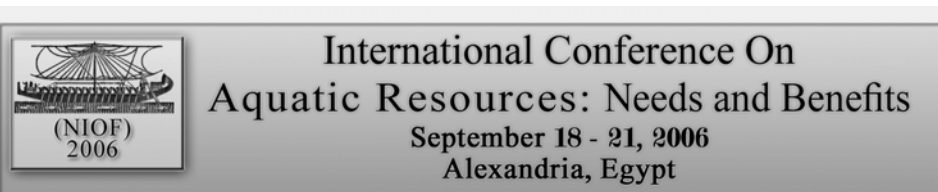
Biosorption of Toxic Chromium from Aqueous Solutions, Saline Water and Wastewater by Inactivated Biomass of Green Alga *Ulva Lactuca* and its Activated Carbon

Ola Abdelwehab, Amany El-Sikaily, Ahmed El Nemr* and Azza Khaled

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

Biosorption of heavy metals can be an effective process for the removal of toxic chromium ions from wastewater. In this study, the batch removal of hexavalent chromium ions from aqueous solution, saline water and wastewater using marine green alga *Ulva Lactuca* was investigated. The chromium uptake was dependent on the initial pH and the initial chromium concentration, with pH~1.1, being the optimum pH value. Activated carbon prepared from *Ulva Lactuca* by acid decomposition was also used for the removal of chromium from aqueous solution, saline water and wastewater. Langmuir and Freundlich isotherm models were fitted the equilibrium data. The maximum efficiencies of chromium removal were 92 and 98% for *Ulva Lactuca* and its activated carbon, respectively. The adsorption capacities of *Ulva Lactuca* and its activated carbon were independent on the type of solution containing toxic chromium and the efficiency of removal was not affected by the replacing of aqueous solution by saline water or wastewater containing the same chromium concentration. Two hours were necessary to reach the sorption equilibrium. The chromium uptake by *Ulva Lactuca* and its carbon form were best described by pseudo-second order rate model. This study verifies the possibility of using inactivated marine green alga *Ulva Lactuca* and its activated carbon as valuable material for the removal of chromium from aqueous solutions, saline water or wastewater.



Session (5): Aquatic Pollution: Waste Treatment

Oral Presentations

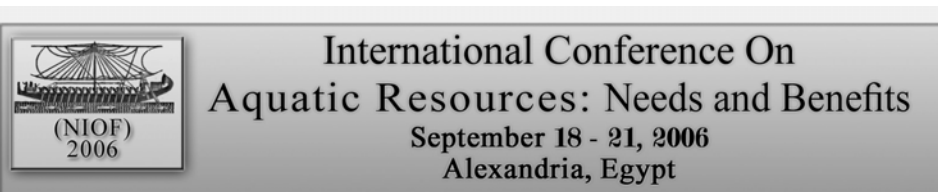
Adsorption Kinetics for the Removal of Toxic Chromium from Aqueous Solution on the Pomegranate Husk and its Activated Carbon

Ola Abdelwehab, Azza Khaled, Ahmed El Nemr* and Amany El-Sikaily

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

The kinetics and mechanism of toxic hexavalent chromium removal from aqueous solutions by inactivated Pomegranate husk and its development activated carbon has been investigated in terms of equilibrium and rate studies. The effects of various experimental parameters have been examined using batch adsorption technique to obtain information on treating industrial effluents. The effects of initial chromium concentration (25, 50, 75, 100, 150 and 150 mg/l), pH, contact time and concentration of Pomegranate husk and its development activated carbon (2.0, 3.0, 4.0, 5.0 and 6.0 g/l) have been studied at 25 °C. The effects of chromium concentration, Pomegranate husk dose, activated carbon dose and pH on the capacity were studied. Acidic medium (pH = 1.0~1.5) was found to be highly important parameter in the removal of toxic chromium. The rate of removal was greater at the beginning, decreasing towards the end of the treatment. The maximum efficiencies of chromium removal were 93 and 100% for Pomegranate husk and its activated carbon, respectively. Adsorption data were modeled using the Langmuir and Freundlich adsorption isotherm models and first and second order kinetic equations. The kinetic of adsorption was found to be pseudo-second order ($R > 0.99$). The adsorption capacities of indigenous Pomegranate husk and its activated carbon have been compared with that reported in the literature for the commercial activated carbons. The results indicated that the biomass of Pomegranate husk and its carbon are suitable for the development of efficient low-cost materials as alternatives to commercial activated carbons and could be effectively employed in wastewater treatment for the removal of toxic hexavalent chromium from wastewater.



Session (5): Aquatic Pollution: Waste Treatment

Oral Presentations

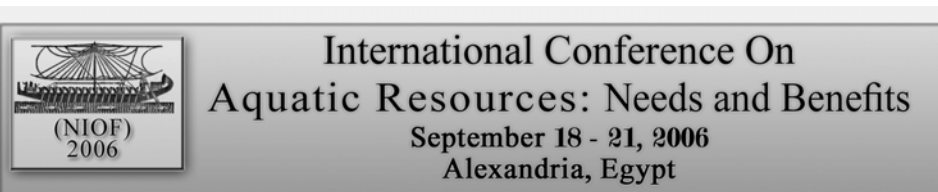
Direct Yellow 12 Removal from Artificial Textile Dye Effluent by Activated Carbon Developed from Orange Peel

Ola Abdelwehab, Amany El-Sikaily, Azza Khaled and Ahmed El Nemr*

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

The use of low-cost and ecofriendly adsorbents has been investigated as an ideal alternative to the current expensive methods of removing dyes from wastewater. Orange peel was collected from the fields of orange trees in northern Egypt, and converted into a low-cost adsorbent. The present study deals with the removal of textile dyes from artificial textile dye effluent by activated carbons developed from orange peel. Direct yellow 12 (DY-12) was used as model compounds. The maximum removal capacity was 95% for 100 mg/l DY-12 concentration and 5 g/l carbon concentration. The effect of initial dye concentration (25, 50, 75, 100 and 125 mg/l), pH, contact time, and concentration of orange peel carbon (2.5, 5.0, 7.5 and 10.0 g/l) have been studied at 25 °C. The Langmuir and Freundlich models were used for this study. It was found that both Langmuir and Freundlich equations are fitting well with the experimental results. The results indicate that acidic pH (1.2~1.7) supported the adsorption of DY-12 on activated carbon developed from orange peel. Furthermore, adsorption kinetics of DY-12 was studied and the rate of sorption was found to conform to pseudo-second order kinetics with a good correlation ($R^2 > 0.99$). The activated carbon obtained from orange peel via acid decomposition has been found to be an efficient material for dye removal from artificial textile dye effluent owing to their very low-cost.



Session (5): Aquatic Pollution: Waste Treatment

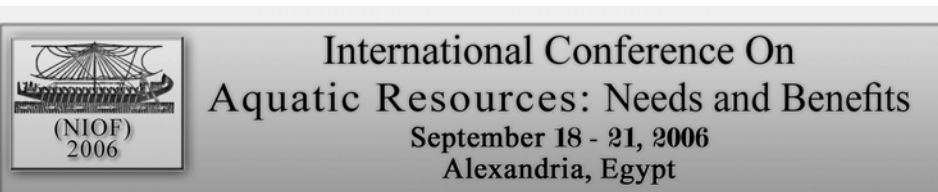
Oral Presentation

Ozone Treatment of Textile Wastewater Relevant to Toxic Effect Elimination in Marine Environment

Hoda Roushdy Guendy

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

Ozone is a powerful oxidizing agent. The reaction of ozone with organic compounds in aqueous media has achieved a variety of treatment goals; the advantage of ozonation over the other oxidants is that the degradable products of ozonation are generally non toxic. Its final products are CO₂ and H₂O, also the residual O₃ in the system changes in few minutes to O₂. In the present study many variables were selected. These were: the rate of ozone generation, ozone dose, current, temperature and the initial concentration of waste. The total quantity of ozone generated is determined from the calibration curve of the ozoniser performance, while the unused ozone is determined from the titration of iodine liberated, the difference being the amount of ozone actually used in the reaction. It was found that 98% decolorization occurs in few minutes. When concentration of the dye increases, the time required for decolorization increases. While the current increases, the time of ozonation decreases sharply. For the Direct dye, the suitable pH was found to be from 7 to 10, where both the amount of reacted ozone and the time of ozonation are lower than in the acidic medium, while for the Reactive dye the suitable pH ranged from 3 to 5, i.e., acidic medium was preferred. In case of Direct dye the suitable ozone-air flow was found to be 200 l/h, while for the Reactive dye, it was found that as the rate increases both the amount of reacted ozone and the time of ozonation decreases slightly. The temperature must not exceed 30° C as it affects the ozone solubility in aqueous dye mixture. This research demonstrated the success of this method for treatment of dye wastewater with wide range of concentration (100-1000 ppm), thus overcoming the problems of textile wastewater treatment.



Session (5): Aquatic Pollution: Waste Treatment

Oral Presentation

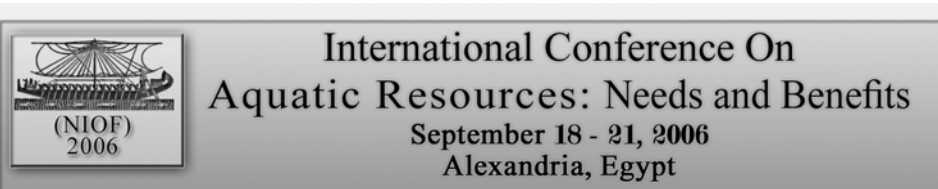
Removal of Hexavalent Chromium from Aqueous Solution, Wastewater and Saline Water by Inactivated Red Alga *Pterocladia Capillacea* and Its Activated Carbon

Ahmed El Nemr*, Amany El-Sikaily, Azza Khaled and Ola Abdelwehab

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

Pterocladia Capillacea, a red marine alga, was tested for its ability to remove toxic hexavalent chromium from aqueous solution. An activated carbon obtained from *Pterocladia Capillacea* via acid decomposition was also investigated as an adsorbent for toxic chromium. The experiments were conducted to study the effect of important parameters such as pH, Chromium concentration and adsorbent weight. Batch equilibrium tests at different pH conditions showed that at pH ~ 1.2, a maximum chromium uptake was observed for both inactivated *Pterocladia Capillacea* and its activated carbon. A solution of 0.1 M NaOH performed well in eluting chromium from chromium-loaded biomass and caused no damage to the biosorbent. The ability of inactivated *Pterocladia Capillacea* and its activated carbon to remove chromium from synthetic sea water, natural sea water and wastewater was investigated as well. Langmuir and Freundlich models were used to analyze the experimental data and the models parameters were evaluated. In regeneration experiments, a loss of sorption performance was observed during the sorption-desorption indicated by a shortened breakthrough time and a broadened mass transfer zone. The pH value play the key factor for sorption-desorption process. This study showed that the removal of toxic chromium by activated carbon developed from Red alga *Pterocladia Capillacea* is comparable to that of commercially available activated carbon.



Session (5): Aquatic Pollution: Waste Treatment

Oral Presentations

Bioremediation of Anthracene by Free and Immobilized Marine *Pseudomonas Fluorescens*

Manal M. A. El-Naggar^{1*} and Tarek O. Said²

¹Microbiology Lab. and ²Chemistry Lab., Marine Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: melnaggar66@yahoo.com

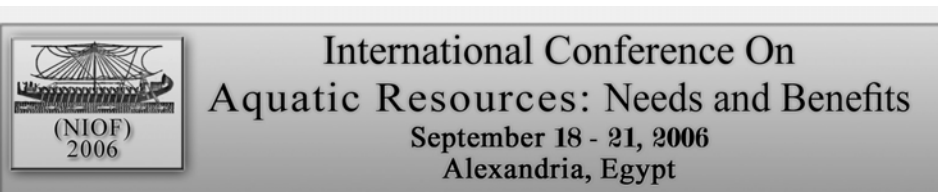
Anthracene is a polycyclic aromatic hydrocarbon (PAH) with high pollution potential and health hazard. It has been used as a model for degradation studies on PAHs, because of its relative toxicity. The aim of the present study is to evaluate the degradation of anthracene by *Pseudomonas Fluorescens* isolated from Abu Qir Bay, where many industrial effluents are discharged. The identification was performed using API E20 kits. The physiological conditions for the free and immobilized bacterial cultures were optimized (pH 7.5, 35°C and 3ml.100ml⁻¹ inoculums with 1.0 x 10⁷ cell/ml). The anthracene (200, 400, 800 and 1200 ppm) were applied in the medium as a sole sources for carbon and energy. The degradation of anthracene was carried out by free and immobilized cells of *P. fluorescens*. A glass column (50 cm) was used for the immobilization process, it was packed with a sterilized solid supporter (pumous granules; 25-30 g) and aerated with sterilized air pumped through the column (1.2 litter/min). The detection for anthracene degradation was done using gas chromatograph (Hewlett Packard 5890 Series II Gas Chromatography) equipped with an FID and capillary column HP-5 (30 m x 0.32 mm r.d. x 0.25 µm). the results indicated that this bacterial isolate has a specific and selective action towards the anthracene. The free cells of *P. fluorescens* degraded 400 and 800 ppm anthracene in 4.5 dars with a rate of 3.59 and 5.42 mg.l-1.h-1, respectively, while the immobilized cells showed to be more efficient and applicable in degrading 400 ppm anthracene in absence and/or in presence of other PAHs (naphthalene and chrysene). The efficiency % of the system was 97.35% (after 48 hrs) and 97.8% (after 120 hrs).



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 6

Marine Chemistry and Physical Oceanography



Session (6): Marine Chemistry and Physical Oceanography
Oral Presentation

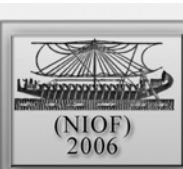
Trophic Status and Physico-Chemical Parameters of Three Reservoirs in Osun State Nigeria

A.O. Ogunfowokan*, M. S. Akanni and O. R. Ajibola

Department of Chemistry, Obafemi Awolowo University, Ile-Ife, 22005, Osun State,

*E-mail: aogunfow@oauife.edu.ng

The chlorophyll 'a' levels of three reservoirs in Osun State, Nigeria-Asejire, Ede and Opa reservoirs that serve as sources of municipal water to various communities in the state, were monitored for a period of one year in this study to establish the current trophic status of the reservoirs. Physico-chemical qualities of the reservoirs were also assessed for the same period of time to establish their pollution levels. The annual mean chlorophyll-a concentration in Asejire, Ede and Opa reservoirs were 17.78 g/l, 11.36 g/l and 11.64 g/l respectively, thus conferring mesotrophic status on the three reservoirs, indicating intermediate levels of nutrients, fair productivity in terms of aquatic plants and animals and emerging signs of water quality problems. The limiting nutrient in the three reservoirs was nitrogen; this unfortunately is non-desirable from eutrophication management point of view as nitrogen limitation may encourage pollution by nitrogen fixing cyanobacteria. The annual concentrations of phosphate-phosphorus ($\text{PO}_4\text{-P}$) of water from the three reservoirs respectively were 1.50 mg/l, 1.84 mg/l and 0.89 mg/l. These levels grossly exceeded the South African guideline of 5 $\mu\text{g/l}$ for phosphorus that will reduce the likelihood of algal and other plant growth in all the reservoirs and give cause for concern. Other parameters however, such as temperatures, pH and electrical conductivity; oxygen demanding substance, biochemical oxygen demand (BOD_5) values and solids in the three reservoirs were within safe limits for drinking water and aquatic life survival.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

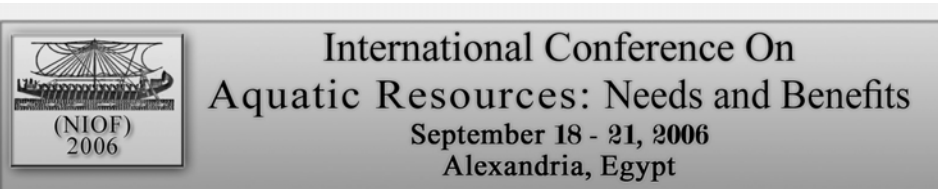
Session (6): Marine Chemistry and Physical Oceanography
Oral Presentation

The Hydrographic Structure of Alexandria Eastern Harbor

Tarek M. El-Geziry and Ibrahim A. Maiyza

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayed Bey,
Alexandria, Egypt

Alexandria Eastern Harbor is a shallow, protected, semi-enclosed, circular basin. It is connected to the Mediterranean Sea through two openings: El-Boughaz (main) and El-Silsila. The hydrography of Alexandria eastern Harbor is presented seasonally based on one-year cycle of hydrographic data (temperature and salinity) recorded on monthly basis from October 2004 to October 2005. In autumn, the bottom water temperature varies between 25.0 °C and 27.5 °C (October 2005). During winter, it reaches its lowest values ranging between 14.50 °C and 16.18 °C (February). In spring, the bottom water temperature varies between 17.8 °C (March) and 30.0 °C (May), while in summer it ranges between 25.0 °C (June) and 30.5 °C (August). The bottom water salinity ranges between 38.04 psu (October 2005) and 39.18 (October 2004). It then increases in winter to 38.17 (February) and 39.57 (January). During spring season, the bottom water salinity fluctuates between 36.14 (May) and 39.53 (April), while in summer it ranges between 36.75 and 38.97 (August). On the other hand, the surface water salinity varies between 37.89 psu and 38.93 in October 2004. During winter, it fluctuates between 38.21 (January) and 38.79 (February). In spring, it varies between 36.18 (May) and 38.39 (April), while it ranges in summer between 36.62 (August) and 38.48 (June). The present study reveals that the volume of Alexandria Eastern Harbor water body is stabilized by two flows: an inward flow near bottom and an outward surface one through the two openings. This system is nearly constant all the year around, which is in agreement with previous conclusions. This dynamic system made the water body of the Harbor to be an ideal system for self-recovery against domestic sewage and the adverse impacts of tourism and fisheries wastes, particularly in the case of lower amount than the upload capacity of the Harbor.



Session (6): Marine Chemistry and Physical Oceanography
Oral Presentation

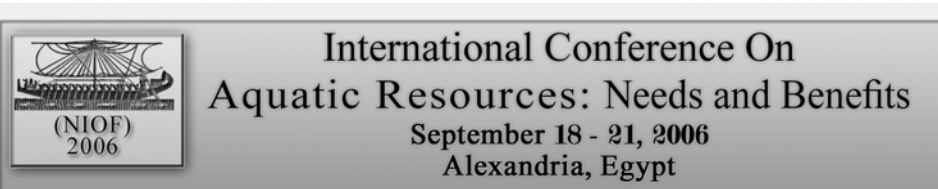
Bathymetric Chart of Alexandria Eastern harbor

Tarek M. El-Geziry¹, Radwan G. Abd Ellah² and Ibrahim A. Maiyza¹

¹Physical Oceanography Lab., Marine Environment Division National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Physics and Geology Lab., Fresh water and Lakes Division, National Institute of Oceanography and Fisheries, Cairo, Egypt

Alexandria Eastern Harbor is a shallow, protected, semi-closed, circular basin. It is connected to the Mediterranean Sea through two openings: El-Boughaz (main) and El-Silsila. New recorded data, from a recent bathymetric survey of the Harbor, was used to build up a new bathymetric chart for the Harbor. The bottom of the Harbor, with an average depth of 5 m, slopes gradually sea-wards. The obtained new chart is a full tool for many applications and provides essential information to follow-up on various problems of the Harbor and could, therefore, help to propose suitable solutions. The paper offers some recommendations in this respect, and suggests the activation of the self recovery of the Harbor (by the Harbor water body) to remedy the present situation of the Harbor.



Session (6): Marine Chemistry and Physical Oceanography

Oral Presentation

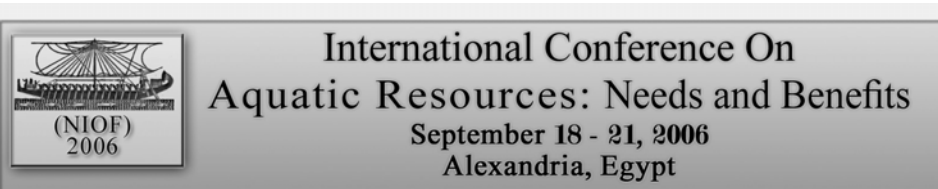
Estimation of Evaporation from Lake Qarun Using Standard Meteorological Measurements

Maged M. A. M. Hussain¹ and Radwan G. Abd Ellah²

¹Physical Oceanography Lab., Marine Environment Division National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Physics and Geology Lab., Fresh water and Lakes Division, National Institute of Oceanography and Fisheries, Cairo, Egypt

Lake Qarun is an inland close basin (44 m below MSL), located in the deepest part of Fayoum depression (Egypt). Evaporation from Lake Qarun is an essential factor in its water budget and one of prime causes of the water salinity variations. Monthly evaporation rates are calculated by several methods. Net heat model is presented for estimating monthly evaporation from the lake, using the penman formulation with standard meteorological data: air-surface water temperature, relative humidity, pressure, prevailing wind, precipitation and sunshine hours. The model comprises simple expressions for net solar and terrestrial radiation fluxes (the net total wave flux at water surface) and for heat storage. The net heat model was used with the Priestley-Taylor formulation. There is a good agreement between the two methods, except during June, when the highest evaporation rate is observed, which represents the highest wind speed during the year. It is also due to the fact that Priestley-Taylor formulation does not require wind measurements. In general, the low evaporation rate is in January, while the high evaporation rate is in June.



Session (6): Marine Chemistry and Physical Oceanography

Oral Presentation

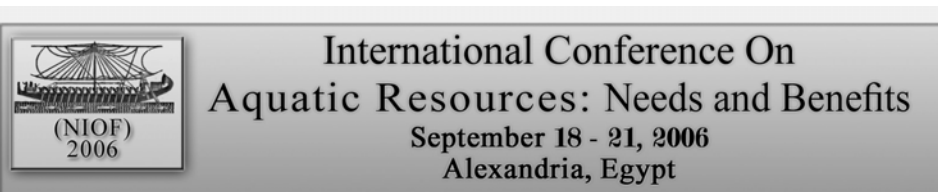
Physico-Chemical Characteristics of the Semi-Closed Areas along the Mediterranean Coast of Alexandria, Egypt

Tarek O. Said¹, Rabie S. Farag², Alaa M. Younis¹ and Mohamed A. Shreadah¹

¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Chemistry Department, Faculty of Science, El-Azhar University, Egypt

The physico-chemical characteristics were investigated during winter 2004 as a comparative study for the semi-closed areas of Alexandria i.e. Abu Qir Bay, Eastern Harbor, Western Harbor and El-Max Bay. Nearly similar values of temperature were observed for surface and bottom layers, average values amount to 15.07-15.50 °C, indicating homo-thermal conditions. The average values of water salinity were 34.1, 36.7, 34.58 and 25.73 psu for surface water and 37.19, 36.88, 35.25 and 35.53 psu for bottom water of Abu Qir Bay, Eastern Harbor, Western Harbor and El-Max Bay, respectively. This order is mostly related to the amount of fresh waters discharged to each area. The average pH values were decreased in the order: Eastern Harbor > Abu Qir Bay > El-Max Bay > Western Harbor. This is clearly due to the effect of waste waters discharged into the Western Harbor from El-Noubaria canal. The results indicated that the specific alkalinity is higher in waters of Abu Qir Bay than that of the normal seawater as a result of discharging polluted waters into this area. El-Max Bay exhibited the lowest content of dissolved oxygen with an average of 4.29 mgO₂/L, reflecting the great amounts of wastewaters discharged from El-Umum drain loaded with huge contents of organic matter. OOM in El-Max Bay were high dependent on mixing of inflowing Mediterranean water with the out flowing runoff discharge into the area from El-Umum drain (28.6 x 10⁸ m³/year). Generally, the measured physico-chemical parameters were higher in surface than bottom waters in the area of study, reflecting the effects of land-based activities.



Session (6): Marine Chemistry and Physical Oceanography

Oral Presentation

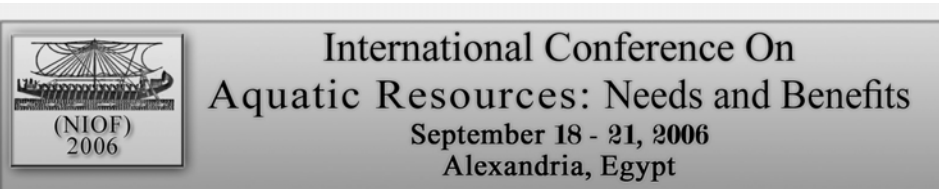
An Assessment of the Pollution Status of Abu Qir Bay with Polycyclic Aromatic Hydrocarbons (PAHs) and their Possible Origins

Mohamed Kamal Z. El Deeb*, Tarek O. Said, Mohamed H. El Naggar and Mohamed A. Shreadah

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: KamalelDeeb@hotmail.com

Polycyclic aromatic hydrocarbons (PAHs) were detected and quantified in seawater, recent marine sediments and selected species of fishes, bivalves and crustaceans of Abu Qir Bay during the period January – October 2004. Nineteen sampling stations were chosen to collect seawater samples exhibited total PAH concentrations varying between 1 and 2514 ng/l, representing Σ 23 PAH. Variations in the values of polycyclic aromatic hydrocarbons' concentrations in seawater were not following seasonal changes. The values were mainly arised from different sources of petrogenic and pyrogenic petroleum hydrocarbon pollution. Di, tri- and tetracyclic aromatic hydrocarbons were found in low levels, while the potential fish carcinogenic aromatic hydrocarbons containing five or more rings were detected in considerably moderate to high concentrations (5.5 – 322 ng/l), particularly benzo (a) pyrene and dibenz (a,h) anthracene. The alkylated derivatives of aromatic hydrocarbons were detected in seawater at extremely trace levels, suggesting that PAHs may be originated from mixed pyrolysis and combustion of various petroleum and non petroleum products. Total PAHs found in the surficial bottom sediments of the Bay were identified in moderate values ranging between 69 and 1464 ng/g dry weight. The distribution pattern of these compounds showed the availability of most di, tri and tetra aromatics in the whole Bay area in addition to their alkylated derivatives. High molecular weight aromatic hydrocarbons of five or more rings were detected everywhere in the Bay sediments. Certain number of pairs of isomer PAH concentrations are used for five origin molecular indices to identify the PAH concentration sources in the sediments of the Bay: Fluo/Py, Fluo/ [Fluo + Py], LMW/HMW, BbF/BaP and BKF/BaP. Abu Qir Bay sediment samples were contaminated mainly by pyrolytic and petrogenic contaminations with strong pyrolytic input in the southwestern basin, while the northeastern



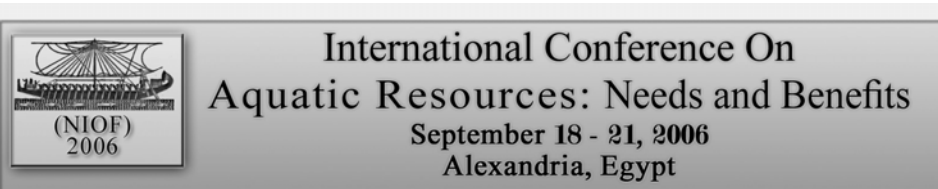
area of the Bay is contaminated mainly by petrogenic PAHs. The studied biota samples of the Bay revealed levels of moderately contaminated specimens with total PAHs, while the carcinogenic PAH, benzo (a) pyrene were detected in most biological samples in levels that ranged between 30.3 and 358 ng/g, with an average of 152.4 ng/g that should be taken into consideration.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 7

Aquatic Pollution by Heavy Metals



Session (7): Aquatic Pollution by Heavy Metals

Oral Presentation

Heavy Metals in the Core Sediments of Lake Mariut and Nozha Hydrodrome

Hoda H. H. Ahdy¹ and Massoud A. H. Saad^{2*}

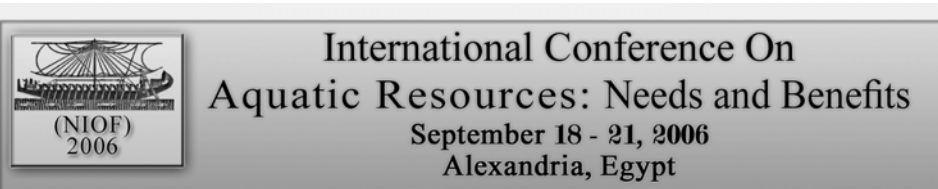
¹Marine Pollution Lab., National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

E-mail: threehal@yahoo.com

²Oceanography Department, Faculty of Science, Alexandria University

*E-mail: Saad1935@yahoo.com

Cadmium, lead, zinc, copper, manganese and iron concentrations were investigated in the core sediments of the heavily polluted Lake Mariut as well as in the core sediments of Nozha Hydrodrome. The latter is taken as a reference to evaluate the levels of metal pollution in Lake Mariut. The vertical variations of all metals did not show definite patterns; some metals showed an increase with depth along some cores, while other metals showed the opposite pattern. This reflects the different factors affecting the levels of accumulating metals in the core sediments of Lake Mariut, such as the quantities and qualities of the different domestic and industrial wastes discharged into the Lake in the past. The data suggest that Lake Mariut can be divided into two regions; The eastern region, receiving different types of pollutants from the anoxic Qalaa Drain and industrial wastes of several factories in the area, thus showing noticeable higher average concentrations of all metals compared with the western lake region, receiving oxic water from Umum Drain. The highest average concentrations of all metals are calculated from the core sediments in the western lake region. The levels of the average values of copper, zinc, iron and manganese were noticeably higher than the corresponding levels in the core sediments of the comparatively less polluted Nozha Hydrodrome (275.83, 441.69, 13257.85, 561.54 µg/g in Lake Mariut, respectively, compared to 121.38, 228.57, 8392.91, 127.50 µg/g respectively in Nozha Hydrodrome). However, lead and cadmium showed the opposite pattern; giving higher average value in Hydrodrome core sediments compared to those in Lake Mariut core sediments (183.32, 22.58 and 221.15, 31.57 µg/g in Lake Mariut and Nozha Hydrodrome, respectively).



Session (7): Aquatic Pollution by Heavy Metals

Oral Presentation

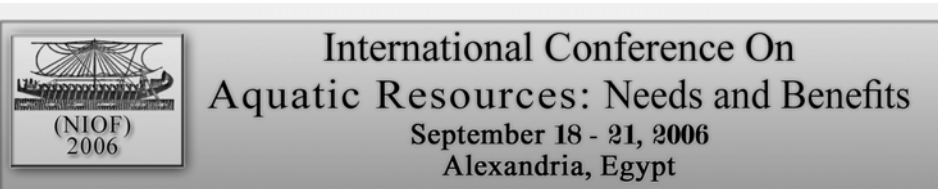
Assessment of Cu, Co, Zn, Cd, Pb, Fe, Ni, Cr and Mn in Surface Sediments of the Egyptian Mediterranean Coast

Azza Khaled, Ahmed El Nemr* and Amany El-Sikaily

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

The distribution of heavy metals (Cu, Co, Zn, Cd, Pb, Fe, Ni, Cr and Mn) with major sedimentary phase (acid-soluble and residual) in samples from the north coast of Egypt were investigated. The total metal content was also determined. The results showed that an extensive area along the coast contains sediments with high concentrations of metals. The values found for Cr, Ni and Mn are comparable to those in unpolluted areas. Based on the chemical distribution of metals, it was found that Zn is the most mobile (i.e., it can pass easily into the water under changing environmental conditions). This metal showed the highest percentages in the acid-soluble fraction (the most labile), especially in the central coast area, where the samples contained over 50% of the element associated with this fraction. These areas close to the Nile river mouths show a significant increase in the mobility of metal. In both cases, the amount present in the residual fraction is lower and the acid-soluble fraction on the increase for Cd, Co, Pb, Ni and Cu. The results of spearman correlation, factor and cluster analysis of the heavy metals analyzed in the collected sediment were discussed. The main source of contamination is the industrial wastes, which arise due to illegal discharges and the lack of supervision, absence of strict control and legal prosecution of offenders.



Session (7): Aquatic Pollution by Heavy Metals

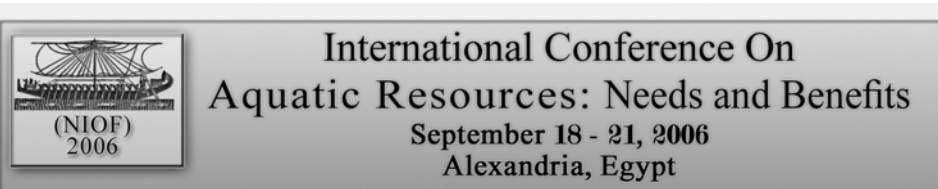
Oral Presentation

Comparative Assessment of Heavy Metals levels in Biota and Sediments in Two Bays in the Southern Coast of the Mediterranean Sea

Aly M. A. Abd Allah and Maha A. Abd Allah

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey,
Alexandria, Egypt

Concentration of Cd, Co, Cu, Zn, Mn and Fe were determined in biota and sediment samples collected from the Eastern Harbor and El-Mex Bay in the Mediterranean Sea, Egypt. The levels of Zn, Fe, Mn, Cu and Co in the macroalgae are significantly higher than in the Red Sea except for Cd. The order of heavy metal concentrations in the mussel samples was: $Fe > Zn > Mn > Cu > Co > Cd$. The metals concentrations are generally lower as compared to corresponding values in Pearl River estuary south China mussels. The ranges of Co and Cd in the investigated fish samples are higher than those obtained for samples from the Marmara Sea (Turkey), while Cu, Zn, Mn and Fe concentrations are lower. El-Mex Bay showed the highest metals concentrations in sediments as follow: $Fe > Zn > Mn > Cu > Cd > Co$. the heavy metals in the sediment samples are lower than for other areas in the Mediterranean Sea. Nevertheless, a high variability of the metal levels occurs among the studied algae and other studied biota and also between the investigated harbors. Moreover, Fe was the most predominant metals in the seaweeds.



Session (7): Aquatic Pollution by Heavy Metals

Oral Presentation

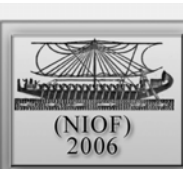
Assessment of the Essential and Heavy Metals' Contents of Some Edible and Soft Tissues

Hoda H. H. Ahdy*, Aly M. A. Abd Allah and Fathy T. Tayel

Marine pollution Lab., National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: threehal@yahoo.com

The level concentrations of heavy metals (essential and non essential) were measured in different marine biota including *bivalve*, *crustacean* and *fish*. The results revealed that these organisms show more or less the same order of distribution for each of the metals studied. The average concentrations of heavy metals exhibited the following decreasing order: cephalopod > bivalve > crustacean > fish. The levels of metals in all studied samples are still comparable to those in their corresponding species in the Mediterranean Sea. K (550-1310 mg/kg) and Ca (547-1472 mg/kg) were present at the highest concentrations in all investigated samples. However, *Octopus* and *Sepia* do not follow the general pattern. The highest value of Metal Pollution Index (MPI) in cephalopod was recorded in *octopus* (7.7) followed by *sepia* (6.2). Among investigated bivalves, the highest values of MPI were recorded in *Mactra coralline* (2.3).



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (7): Aquatic Pollution by Heavy Metals

Oral Presentation

Bioaccumulation and Biosorption of Stable Strontium and Strontium-90 by *Oscillatoria Homogena* Cyanobacterium

R. Dabbagh^{1,2}, H. Ghafourian², A. Baghvand¹, G. R. Nabil¹, H. Riahi³, M. A. Ahmedi Faghieh²

¹ Tehran University, Tehran, Iran

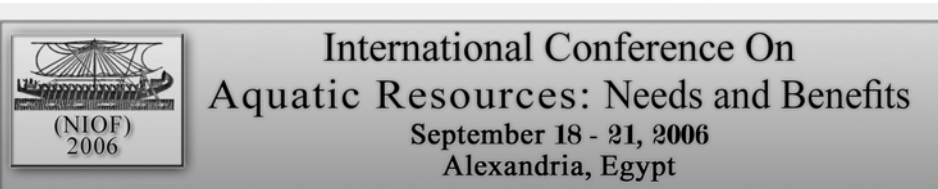
² Nuclear Research Center, Atomic Energy Organization of Iran

³ Shahid Beheshti University, Tehran, Iran

*P.O.B: 11365-3486, Fax: 0098-21-88021412, Tel.: 0098-21-82063438

E-mail: rdabbagh@aeoi.org.ir, rdabbagh@yahoo.com

The ability of living filamentous cells of *Oscillatoria homogena* cyanobacterium to the removal of stable strontium and strontium-90 is demonstrated in this study. The removal levels were, $37.9 \text{ nM.mL}(\text{mm}^3)^{-1}$ and $3129.48 \text{ mBq.mL}(\text{mm}^3)^{-1}$ as filamentous cells biovolume after 240 hour incubation time respectively. The optimum pH for strontium uptake lies in the range between 9-10. Blue-green algae biovolume increasing cause to elevate sorption. The maximum value of strontium removal efficiency in the liquid culture containing $21.2 \text{ mm}^3.\text{mL}^{-1}$ filamentous cells biovolume with 866 nM.mL^{-1} initial strontium concentration was 471.4 nM.mL^{-1} . At 1200 Lux illumination, maximum removal value was $51.4 \text{ nM.mL}(\text{mm}^3)^{-1}$ and at the presence of 6590 nM, as maximum initial strontium concentration, $235.4 \text{ nM.mL}(\text{mm}^3)^{-1}$ removal was observed. Sorption of strontium fitted to Langmuir isotherm and parameters are $q_{\text{max}} = 7142 \text{ }\mu\text{g}(\text{cm}^3)^{-1}$ and $b=0.0017$ respectively.



Session (7): Aquatic Pollution by Heavy Metals

Oral Presentation

Heavy Metals in Some Marine Economic Fishes from the Red Sea, Egypt

Amal M. H. Morsy and Fathy T. Tayel

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey,
Alexandra, Egypt

Heavy metals (Pb, Cu, Zn, Fe and Mn) were determined in muscles Liver, gonads, gills and intestine of six marine species (*Agryops spinfer*, *Acanthopagrus bfaciatus*, *Rhabdosargus sarba*, *Siganus rivulatus*, *Siganus argenteus* and *Sigcinus luridus*).

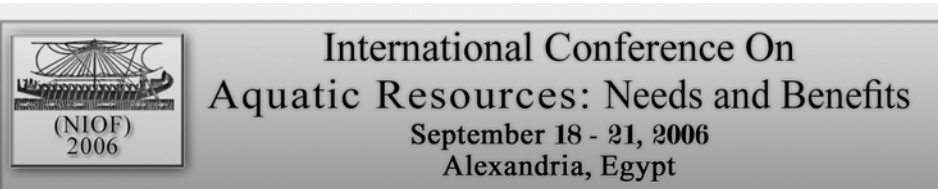
The level of heavy metals varied slightly among fish species. There were minor concentrations of trace metals in the tissues of the different foish species (0.672. 17 mg/kg Pb, 1 .67-7.38 mg/kg Cu, 2.5-11 .5 mg/kg Zn, 6.01-20.1 mg/kg for Fe and 0.4-1.49 mg/kg Mn, while high levels of accumulation of these elements were found in their organs (Liver, gonads, gills and intestine). Pb showed higher values (2.17 mg/kg) in herbivorous fish (*Siganus spp.*) as compared to 1.49 mg/kg in carnivorous fish (*Acanthopagrus bifaciatus*). The comparison of metal intake from consumption rate of fish with a Provisional Tolerable Weakly Intake demonstrated that, there is no risk for the human consumption of those fishes as food.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 8

Marine Chemistry and Physical Oceanography



Session (8): Marine Chemistry and Physical Oceanography

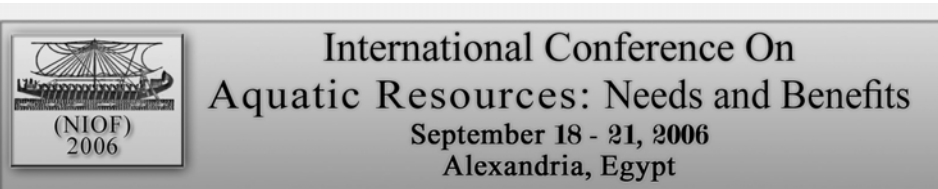
Oral Presentation

The Correlation Coefficients between Some Hydrographic Parameters, Nutrient salts and Bacteria in the Eastern Harbor, Alexandria, Egypt

Thanaa H. Mahmoud, Manal M. A. El-Nagar, Ahmed M. Abd El-Halim and Mohamed A. El-Shenawy

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

Nutrient salts, pH, dissolved oxygen, calcium and magnesium were measured in the Eastern Harbor. Correlation coefficients between all these variables and three species of bacteria, *Clostridia* spp., and *Thiobacillus thioparus* in winter and summer ($r = -0.66$ and -0.53 , respectively). In spring, *Desulfovibrio* spp. and *Thiobacillus thioparus* were positively correlated with temperature ($r = 0.99$ and 0.96 , respectively). pH was negatively correlated in both surface water and sediments in most seasons. In winter, the three measured bacteria were negatively correlated with dissolved oxygen due to increase in its content at both surface and bottom sediments ($r = -0.93$, -0.89 and -0.82 , respectively). Nitrate was correlated with the measured bacteria in most seasons at both surface water and sediments in winter, spring, summer and autumn. Calcium and magnesium in the bottom sediments was highly negative correlated with the three measured bacteria species *Clostridia* spp. ($r = -0.92$), *Desulfovibrio* spp. ($r = -0.96$) and *Thiobacillus thioparus* ($r = -0.95$). Statistical quantitative analyses of bacteria showed the existence of strong relation between the numbers of bacteria and the environmental variables in all seasons.



Session (8): Marine Chemistry and Physical Oceanography

Oral Presentation

Evaluation of Carbon Cycle in El-Mex Bay, Alexandria, Egypt
I. Distribution of Total Carbon

Thanaa H. Mahmoud¹, Mamdouh S. Masoud² and Nayrah A. Shaltout^{1*}

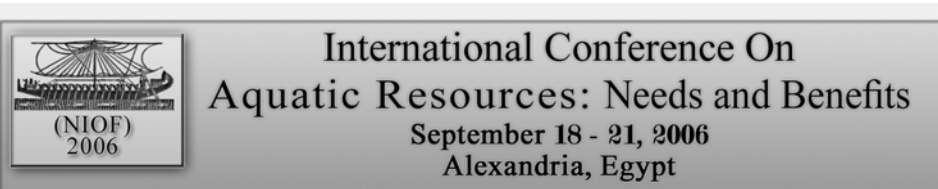
¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Chemistry Department, Faculty of Science, Alexandria University

El-Mex Bay is a shallow small sheltered Estuary to the west of Alexandria. It receives heavy load of wastewater both directly from industrial out falls and indirectly from Lake Mariut via El-Umum Drain.

Total carbon concentrations were evaluated monthly at 12 stations that represent El-Mex Bay area during 2003-2004. Total Carbon (TC) exhibits concentrations ranging from 87.78 to 20.97 mgCl⁻¹ in surface water and 56.56 to 14.16 mgCl⁻¹ in bottom water with surface annual average of 42.18 ± 3.9 mgC/l and bottom annual average of 27.86 ± 5.94 mgC/l. Horizontal distribution of TC in surface layer showed higher TC contents in front of El-Umum Drain (in water type L) and lowest contents far from the Drain (in water type D "diluted sea water"). The extent of dispersion of each water type was found to be depending on the volume of brackish water discharged from El-Umum Drain and on the prevailing wind speed and direction. Horizontal and vertical distribution of total carbon indicated a net decrease horizontally seawards, with increasing salinity by increasing distance from El-Umum Drain and vertically with increasing depth. Total carbon was found to be inversely correlated with salinity with correlation coefficient $r = -0.89$.

*Abstracted from her Ph.D. Thesis



Session (8): Marine Chemistry and Physical Oceanography

Oral Presentation

Impact of Coatings Containing Algae on Some Seawater Parameters and Epiphytes Plankton

Aida B. Tadros, Fatma A. Zaghoul, Hermine R. Zaki, Amaal Eid Abbas and Ma'moun M. Kandeel

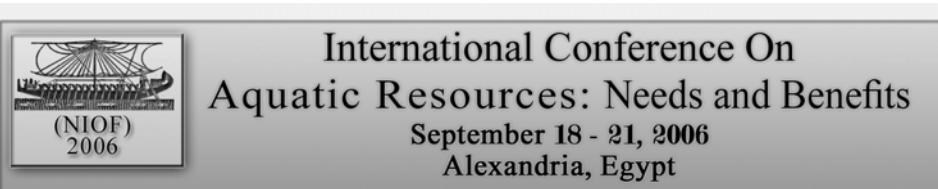
National Institute of Oceanography and Fisheries, El-Anfoushy, Alexandria, Egypt

Green algae and algae free lipid were mixed individually as sole pigment with binder materials and applied on glass panels. Different concentrations of each of algae and algae free lipids were incorporated with the binder materials. Each of the glass coated surface with binder and/or binder with algae was immersed in natural seawater after analysis. The effect of leaching components of algae and algae free lipid containing varnish on the characteristics of their sea water media was recorded at different time intervals. The total phytoplankton counts and the epiphytes formed on the coated glass slides were inspected at the same times. The glass coated panels with algae containing binder together with their blank (binder coated glass) were immersed in seawater on laboratory scale during the period; 16/01-16/02/2005, 27/03-11/05/2005 and 5/10-21/10/2005. Generally, the analysis of the seawater media in contact with the coated panels showed decrease in pH, temperature and nutrient salts (ammonia, phosphate, nitrite and the reactive silicate) than their analogue of the control seawater (seawater free panels), while increase of dissolved oxygen concentration, total dissolved salts and conductivity in seawater media containing the same coated panels was observed. The medium in contact with coated panel with binder was higher in pH, TDS and conductivity, and lower in three nutrient salts $\text{NH}_3\text{-N}$, $\text{NO}_2\text{-N}$ and SiO_2 than that in media containing algae. During the first period (cold water), after a month of immersion, the coated surface with 2% algae in the dry paint film showed the lowest epiphytes growth on its surface, also no primary stages of macro algae was detected, while the binder surface was attached with. During the second time of immersion, and after 22 days, the coated surface containing algae showed no epiphytes growth. On the other hand, the binder coated surface is attached with *Nitzschia* as a dominant form and *Navicula* as a rare form. The inspection of the coated surfaces during the third immersion in seawater showed better performance of



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

coated surfaces with algae and algae free lipids in which no epiphytes was attached. The binder coated glass was covered with both *Nitzschia* and *Navicula* as dominant forms.



Session (8): Marine Chemistry and Physical Oceanography

Oral Presentation

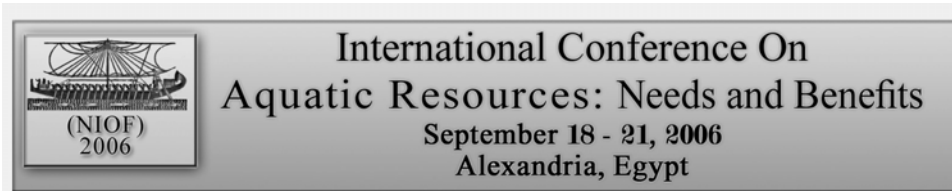
Environmental Assessment of the Gulf of Aqaba Coastal Waters, Red Sea, Egypt

Ahmed M. Abd El-Halim¹, E. M. Abo El-Khair¹, M. A. Fahmy¹, Mohamed A. Shreadah¹, E. Abd El-Mola¹, A. Abo El-Soud², S. M. Abdel Rahman², M. and Shindy²

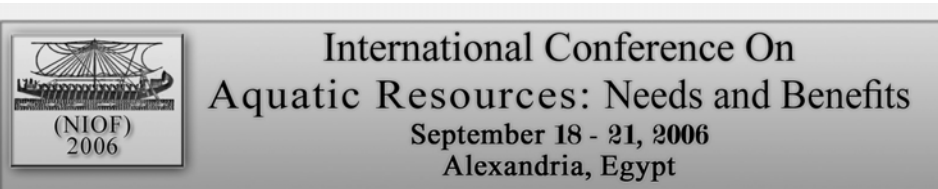
¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Egyptian Environmental Affairs Agency, Cairo, Egypt

Environmental Information and Monitoring Programme (EIMP) for the Egyptian coastal waters of the Gulf of Aqaba was established to initiate national monitoring and data base system, by applying quality assurance (QA) and quality control (QC) assessments in order to evaluate, the sustainable use of different and coastal regions. Within the framework of this programme, five to six bimonthly field campaigns were carried out annually during 1998-2004. A total of 11 coastal stations were selected to cover different locations of the Gulf. The surface distribution pattern of hydrographical conditions (water temperature, salinity, dissolved oxygen and pH) and eutrophication parameters (Chlorophyll-a, total suspended matter, transparency, nitrogen and phosphorus forms as well as reactive silicate) were investigated. The obtained data of seven years survey indicated that there is no thermocline or thermal pollution and that the variations in the pH and salinity values were insignificant and the water was well-oxygenated. The concentration of nitrogen and phosphorus in the dissolved and total forms as well as reactive silicate were found quite low. The abundance of inorganic nitrogen forms were found in the order $\text{NH}_4\text{-N} > \text{NO}_3\text{-N} \geq \text{NO}_2\text{-N}$, reflecting the increasing rate of $\text{NH}_4\text{-N}$ production than its uptake rate as compared to the other inorganic nitrogen forms. Based on the calculations, nitrogen and phosphorus were found in the Gulf of Aqaba coastal waters, principally, in organic forms. The low levels obtained during the present study for each of Chl-a, TSM, $\text{NH}_4\text{-N}$, $\text{NO}_3\text{-N}$, TN, $\text{PO}_4\text{-P}$ and TP signified that the state of the coastal waters of the Gulf could be classified as ranging between oligotrophes to mesotrophic. Accordingly, it is safe to conclude that the main body of the Gulf of Aqaba coastal waters is not yet seriously threatened, inspite of the rapid



recreational activities and coastal developments that have taken place in this area during the previous ten years.



Session (8): Marine Chemistry and Physical Oceanography

Oral Presentation

Environmental Conditions of the Red Sea Coastal Waters, Egypt

E. M. Abo El-Khair¹, A. M. Abdel Halim¹, Mohamed A. Shreadah¹, M. A. Fahmy¹, E. Abd El-Mola¹, A. Abo El-Soud², S. M. Abdel Rahman² and M. Shindy²

¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Egyptian Environmental Affairs Agency, Cairo, Egypt

The Environmental information and Monitoring programme (EIMP) was established to provide and evaluate the background picture of the water quality for Red Sea coastal regions, extending for about 600 km between Hurgada in the north to Beer Shalatin cities in the south. This area is apparently subjected to the rapid and increasing levels of human activities due to the recreational (swimming and diving), industrial (mainly phosphate shipping and industry) and fishing activities. Within the framework of this programme, five to six field campaigns were carried out annually during the period of 1998-2004. Fifteen stations were selected to represent the impacts of spatial and temporal activities existing in these regions. Physico-chemical characteristics and nutrient salts were used as indicators to evaluate the quality of Red Sea coastal waters. The results indicated that the changes in salinity and pH values were insignificant with highly oxygenated seawaters. The levels of total suspended matter and chlorophyll-a were generally low and showed a homogeneous distribution in the study region. Moreover, nitrogen, phosphorus and reactive silicate registered low concentrations to the extent that the stage of the Egyptian Red Sea coastal waters could be classified as oligotrophic to mesotrophic. The middle region located between Safaga and Quseir displayed relatively high phosphate contents, especially during the first five years of investigation, as compared with the other coastal regions. With the exception of this area, the high values of N:P ratios indicated that PO₄-P is the limiting nutrient for phytoplankton growth in the Red Sea coastal waters. Based on the present study, it is concluded that the Red Sea waters along the Egyptian Coast is still free from eutrophication problems inspite of the rapid developments that have taken place in this area during the previous ten years.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 9

Aquatic Pollution: Water Treatment



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (9): Aquatic Pollution: Waste Treatment

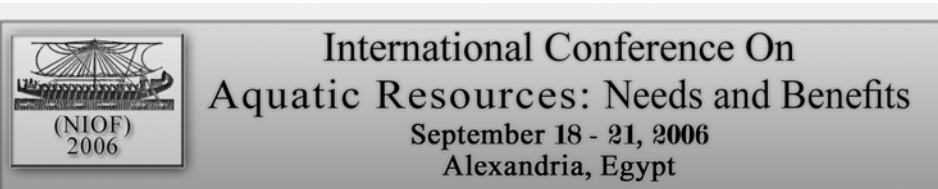
Oral Presentation

Removal of Cd, Co, Fe and Sr from the Wastewater by Treated *Azolla filiculoides* with H₂O₂/ MgCl₂: New Biosorbents for Biotechnology Applications

Parisa Tajer Mohammad Ghazvini*, Saeid Ghorbanzadeh Mashkani,
Hossain Ghafourian

Department of nuclear biotechnology, Nuclear Research Center, Atomic Energy
Organization of Iran, North Karegar St., Tehran, Iran, P.O.Box: 11365-3486,
E-mail: parisa_tajer@yahoo.com

The accumulation of heavy metals contaminants in the environment has become a concern due to growing health risks to the public. Although strict control is necessary to prevent any further discharge of contaminated wastes into the environment, a technology needs to be developed that is cost effective for industry to use. There has been a tremendous amount of attention given to the use of biological systems for removal of heavy metal ions from contaminated areas. More recently, phytoremediation has emerged as one of the alternative technologies for removing pollutants from the environment. Interest in using plants for environmental remediation is increasing due to their natural capacity to accumulate heavy metals and degrade organic compounds. In this study, we have developed an innovative, patented biological process for the removal of heavy metals from effluents by means of the floating fern, *Azolla*, suitable for the removal and possible recovery of heavy metals. The adsorption of heavy metals onto treated *Azolla Filiculoides* by H₂O₂/MgCl₂, as a cosmopolitan free-floating water fern, was investigated from aqueous solutions in the batch biosorption experiments. The maximum uptake capacities of the collected *Azolla* from rice field at the optimal conditions for Cd, Co, Fe and Sr ions were approximately 120.95, 88 and 73 mg/g (dry *Azolla*), respectively. On the other hand, the maximum uptake capacities of the collected *Azolla* from the Anzali International Wetland in the northern part of Iran at the same conditions for these heavy metals were about 98, 73, 64 and 51 mg/g (dry *Azolla*), respectively. Such decrease of uptakes is due to the pollution of Anzali International Wetland, which reduces the capacity uptake of metals. The recovery of biosorbed heavy metals from the rice field *Azolla* was carried out by HCl and NaCl desorbents that the recovery rates of 80-90% and 65-77% respectively were obtained.



Session (9): Aquatic Pollution: Waste Treatment

Oral Presentations

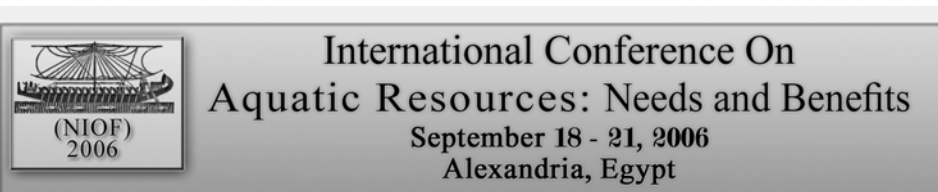
Activated Carbon from Date Seeds and its Application to Adsorb Toxic Chromium from Aqueous Solution

Amany El-Sikaily, Ola Abdelwehab, Azza Khaled and Ahmed El Nemr*

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

This study records experiments undertaken to determine the suitable conditions for the use of activated carbon developed from low-cost agriculture waste (date seeds) as an adsorbent for the removal of toxic chromium ions from liquid wastes. The adsorption of chromium ion from solutions containing different initial chromium concentrations (25, 50, 75, 100 and 125 mg/l chromium) at different pHs (1.0, 2.2, 3.1, 4.4, 6.4 and 8.2) and different adsorption times was examined. The results revealed that the studied carbon showed the maximum adsorption capacity at pH~1.0. The adsorption data of toxic chromium ion (Cr^{6+}) was also analyzed with the help of the Langmuir and Freundlich models to evaluate the mechanistic parameters associated with adsorption process. The adsorption isotherms obtained from the Langmuir and Freundlich equations were generally linear and the adsorption of toxic chromium by the studied carbon was correlated with the maximum adsorption and binding energy constant of the Langmuir equation and the equilibrium partition constant and the building partition coefficient of the Freundlich equation. It was concluded that the equilibrium time of adsorption was 180 min and optimum pH ranged from 1.0 to 1.5. This technique might be successfully used for the removal of toxic chromium ions (Cr^{6+}) from liquid industrial wastes.



Session (9): Aquatic Pollution: Waste Treatment

Oral Presentation

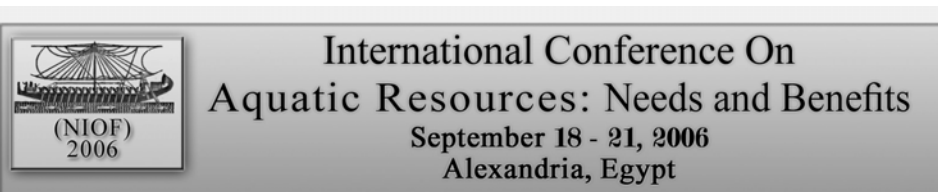
Direct Dye (DB-86) Removal from Aqueous Solution by Adsorption Using Activated Carbon from Orange Peel

Ahmed El Nemr*, Amany El-Sikaily, Ola Abdelwehab and Azza Khaled

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

Dyes are usually present in trace quantities in the treated effluents of textile factory and of many other industries. The effectiveness of adsorption for dye removal from wastewaters has made it an ideal alternative to other expensive treatment methods. This study investigates the potential use of activated carbon prepared from Orange Peel for the removal of direct blue 86 dye from simulated wastewater. The effects of different system variables, adsorbent dosage, initial dye concentration, pH and contact time were studied. The results showed that as the amount of the adsorbent increased, the percentage of dye removal increased accordingly. Optimum pH value for dye adsorption was determined as 1.5 ~ 2.0. Maximum dye was sequestered within 45 min after the beginning for every experiment. The adsorption of direct blue 86 followed a pseudo-second order rate equation and fit the Langmuir and Freundlich models well. The maximum removal of direct dye 86 was obtained at pH 1.5 as 92% for adsorbent dose of 6 g/l and 100 mg/l initial dye concentration at room temperature. Acid treated orange peel can be attractive options for dye removal from diluted industrial effluents.



Session (9): Aquatic Pollution: Waste Treatment

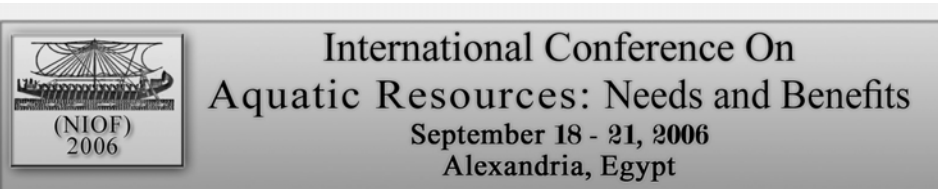
Oral Presentation

Removal of Dyestuffs from Wastewater by Activated Carbon

Hoda Roushdy Guendy

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

Over the last few decades, activated carbon adsorption has gained importance as an alternative tertiary wastewater treatment and purification process. Decolorization of two types of dyes; Direct Pink 3B and reactive violet SH-2R by adsorption, using activated carbon in aqueous medium was studied in presence of some effective variables. These were: the dye concentration, pH and sodium chloride concentration (which enhances the adsorption on the activated carbon. In the present study, granular activated carbon (GAC) adsorption was evaluated for removal of dyestuffs from wastewater. This study provides details on adsorption experiments conducted on synthetic wastewater to develop suitable adsorption isotherms. The adsorption isotherms for both dyes at different conditions were studied. The adsorption isotherm curves for each dye at the different conditions were made separately to determine the suitable mathematical equation to be applied. This lead to assign the appropriate conditions of adsorption as a technique for wastewater treatment. Isotherms studies have been undertaken to determine the maximum adsorption capacity of activated carbon for dyestuffs. The equilibrium data fit well in the Langmuir model of adsorption. Throughout this study; the adsorption could be achieved at low concentration of dyes (10-100 ppm.) and at different pH values (2-11), the dye solution was taken as an example of wastewater conditions. In case of Reactive Violet dye, increasing the concentration of sodium chloride in the dye solution and lowering the pH of the dye solution, made the adsorption process more efficient. However, in case of Direct Pink dye, decreasing sodium chloride concentration, and lowering the pH value, gave the most favorable conditions for adsorption by activated carbon.



Session (9): Aquatic Pollution: Waste Treatment

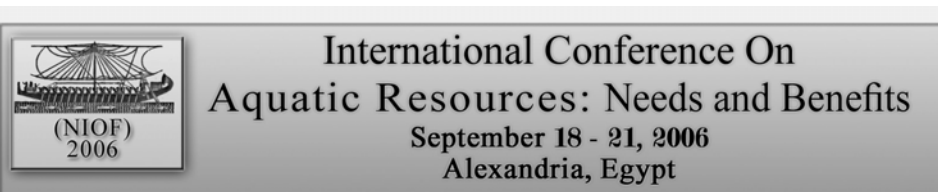
Oral Presentation

Diversity in *Desulfovibrio* Sp. and *Thiobacillus Ferrooxidans* indicate the Anoxic/Oxic Conditions in Marine Environments

Manal M. A. El-Naggar

Microbiology Lab., Environmental Division, National Institute of Oceanography & Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt
E-mail: melnaggar66@yahoo.com

This study aimed to follow up the anoxic/oxic geochemical conditions in two different harbors in Alexandria during 2004-2005 (Abu-Qir Bay and the Eastern Harbor), using the diversity of the sulfate reducing bacteria (SBR) such as *Desulfovibrio sp.*, which has important role in detecting the anoxic conditions in the marine environments. In addition, the study examined the detection of the iron oxidizing bacteria *Thiobacillus ferrooxidans*, which is highly aerobic bacteria and could be used for confirming the absence of the anaerobic conditions in such examined areas. Both bacterial species were grown on selective media and quantitatively detected using the most probable number technique (MPN). The data indicated that the maximum diversity of *Desulfovibrio sp.* was observed in summer at both harbors, where the MPN ranged from 468×10^6 to 1894×10^6 and from 468×10^6 to 1894×10^6 per g sediment at Abu-Qir Bay and the Eastern Harbor, respectively. On the other hand, *Thiobacillus ferrooxidans* showed confirmed presentation, where its highest diversity was obtained in winter, ranging from 1044×10^6 to 2593×10^6 per g sediment (in the Eastern Harbor) and from 721×10^6 to 1096×10^6 per g sediment (in Abu-Qir Bay).



Session (9): Aquatic Pollution: Waste Treatment

Oral Presentation

Physical and Bio-Treatments of some Biodegradable Plastics Using UV-Radiation and a Thermostable Enzyme

Manal M. A. El-Naggar^{1*} and Magdy Gh. Farag²

¹Microbiology lab., National Institute of Oceanography & Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Development Plastic Center., Victoria. Alexandria, Egypt.

*E-mail: melnaggar66@yahoo.com

Bacillus amyloliquefaciens was isolated from marine sediment for the production of amylase enzyme. The effect of different pH values and temperatures on the enzyme production was estimated the maximum amylase production and the maximum bacterial growth was obtained at pH 7.0 and 50 °C temperature. Some biodegradable plastic films were manufactured in the Development Plastic Center, Alexandria; different concentrations of rice starch (0, 2.5, 5, 7.5 and 10%) were added to the polyethylene forming polyethylene-rice starch plastic films. The biodegradability of these produced plastics was estimated according to the changes in their mechanical properties (reduction in the elongation %). A physical treatment was carried out using UV radiation (intensity of about 1000 w/m² at $\lambda_{300-400}$ nm) for time intervals (20-150h). This lead to a significant reduction in the elongation % of these bio-plastics specially with the use of 10% rice starch, where the elongation % became 26% after 150h of the exposure. While in using the thermo-stable α - amylase produced by the isolated *B. amyloliquefaciens* the reduction in the elongation % of these bio-plastics showed to be starch dependant and the elongation % was reduced to 20% when 10% polyethylene-rice starch plastic strips were treated at 50 °C for 30 days compared to the untreated plastic strips (175%).



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (9): Aquatic Pollution: Waste Treatment

Oral Presentation

***Aeromonas* Species in the Coastal Environments of the Gulf of Aqaba, Gulf of Suez and the Red Sea, Egypt**

Aida Farag¹, Mohamed El-Shenawy^{1*}, and Moustafa El-Shenawy²

¹National Institute of Oceanography & Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²National Research Center, Dokki, Cairo 12311, Egypt

*E-mail: dr_elshenawy@hotmail.com

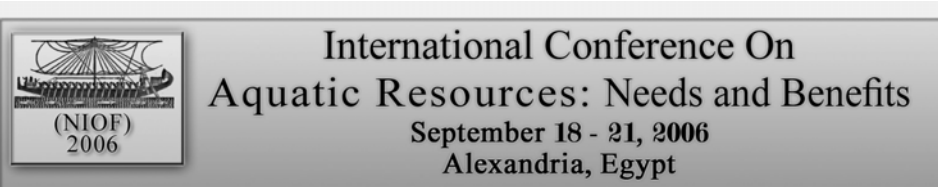
Aeromonas species has received particular attention because of its association with human diseases. They are widely distributed in aqueous environments and various types of food, including seafood. To investigate the prevalence of this pathogen in coastal water of three areas including the Gulf of Aqaba (12 sites), Gulf of Suez (14 sites) and the Red Sea (14 sites), 200 water samples were collected during five sampling cruises in 2004. Also fresh fish (25 samples) and shellfish (12 muscles and 16 shrimp) samples were collected from local fish markets. All samples were examined for the prevalence of *Aeromonas spp* as well as for the presence of haemolysin producing aeromonads. All examined samples were investigated for the presence of the fecal pollution indicators including *Escherichia coli* and fecal streptococci. In addition, some environmental parameters including temperature, salinity, pH and dissolved oxygen were measured in the coastal water samples. The incidence of *Aeromonas spp.* in the examined water samples ranged from 80 to 89%, depending on the investigated area, with counts that ranged from 2.0×10 to 5.0×10^5 cfu/100ml. In fish, 72% of the examined samples harbored the bacterium with densities that fluctuated between 1.0×10^2 and 5.0×10^3 /100g. However, 50% of muscles samples were contaminated by the bacterium with counts ranging from 5.0×10 to 6.0×10^3 / 100g. At the same time, 44% of the shrimp samples carried out the pathogen with numbers ranging between 5.0×10 and 3.0×10^3 cfu / 100g. The haemolysin producing *Aeromonas spp.* were detected in 17 to 22% of the examined water samples. However, 48% of fish, 33% of the muscles and about 13% of the shrimp samples harbored the haemolytic bacterium. Strong positive correlations were observed between the presence of *Aeromonas spp.* and both of *E.coli* and fecal streptococci. These results should be carefully taken into consideration from the public health point of view.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 10

Aquaculture



Session (10): Aquaculture

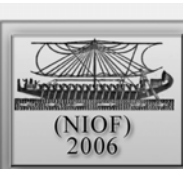
Oral Presentation

**Enhancing Sustainability of Marine Finfish Culture in Canada:
A Socio-Economic Analysis of Multitrophic Aquaculture**

Neil Ridler*, Kelly Barrington, Michael Wowchuk, Thierry Chopin and
Shawn Robinson

Department of Fisheries and Oceans, Canada and the Centre for Coastal Studies
and Aquaculture, University of New Brunswick, Saint John, New Brunswick,
Canada E2L4L5. * E-mail: ridler@unb.ca

There is concern about the long-run sustainability of salmon aquaculture in Canada. On the west coast, there is mistrust and generally negative attitudes towards the industry, and on both coasts there is concern about environmental impacts. There is also a question whether salmon farming is economically viable if prices fall. One strategy to enhance sustainability is to complement salmon cultivation with the cultivation of additional species at the same site. Not only might profitability be increased and risks reduced but social perceptions improved. In addition remediation of organic and inorganic waste from salmon may occur. This paper examines the sustainability of a multi-trophic operation in eastern Canada, where salmon are grown with mussel and with seaweed. The paper presents a bio-economic model which suggests that profitability, when compared with salmon monoculture, increases because additional costs are more than offset by additional revenues. Risks are reduced. In addition, focus groups indicate that multi-trophic aquaculture is well-perceived by the general public and stakeholder, which should lessen mistrust towards the industry. An estimate is made of remediation effects of mussels and seaweed to determine whether environmental impacts of salmon farming are mitigated.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (10): Aquaculture

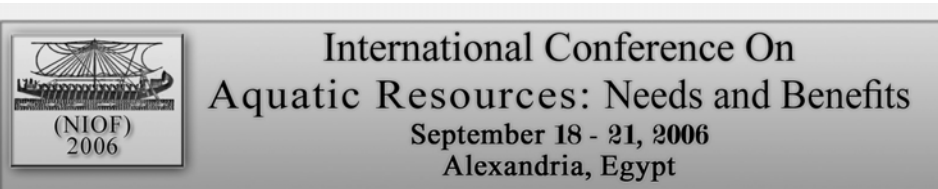
Oral Presentation

Small-Scale Fish/Crop Industry Integration: A Preliminary Study in Optimal Utilization and Management of Fresh Water Reservoirs, Beheira Governorate, Egypt

Mohamed A. Essa, Amr M. Helal and Mona A. Abo El-Wafa

Aquaculture Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

El-Tahrir Sector, Beheira Governorate, is said to possess approximately 60,000 feddans of agriculture lands which depend mainly on fresh underground water for irrigation, using some artificial concrete reservoirs (6-200 m³ each). The present study was conducted in 2005 to establish the scientific bases for small-scale fish/crop industry integration. Thereby, 12 concrete reservoirs of the same size and volume (24 m³ each) were selected, each containing 50, 75 and 100 Nile tilapia *Oreochromis niloticus* fingerlings (9.35 g) per m³. The water flow rates varied between 5 and 10 l/min in order to study the relationship between water flow rate, stock density, fish growth and production performances. Each treatment was replicated twice throughout the study period. The experimental reservoir was equipped with a surface spray, sloped bottom ending with standpipe outlet. Fish were fed with demand feeders using a ration of 25% protein during day time (7:30 a.m. to 5:00 p.m.). Results of the present study showed that: 1) fish growth rate was inversely proportional to stocking rate. The lowest fish density (50/m³) put on more than 50% more weight than those of 100/m³ density. A clear insignificant difference was reported between 50 and 75 fish/m³ (densities: 2) growth and production performances were positively correlated to the water flow rate. It was clear that at 5 l/min, the average increase in weight was 1436.58%, while the average increase in weight at 10 l/min was 1530.48%. The best recorded production was detected at 75 fish/m³ with 10 l/min water flow rate, showing an increase reaching 11.13 Kg/m³ in 5 months, 3) the yield of crops increased by about 10-15% due to the excreta of fish, indicating that remnants of artificial food and algae increase fertility of agricultural soil. In summary, the results of this study prove that, the best utilization of underground fresh water and land was achieved by using integrated farming system in the desert. Consequently, the average income from small-scale fish/crop industry has increased, thus raising the standard of living of all concerned.



Session (10): Aquaculture

Oral Presentation

Technical and Environmental Evaluations of Fish Cage Culture in the River Nile of Egypt

M. A. Essa¹, A. M. Nour,² H. A. Mabrouk¹, Z. M. El-Sherif³, M. A. Zaki², S. M. Aboul-Ezz¹ and E. A. Omar⁴

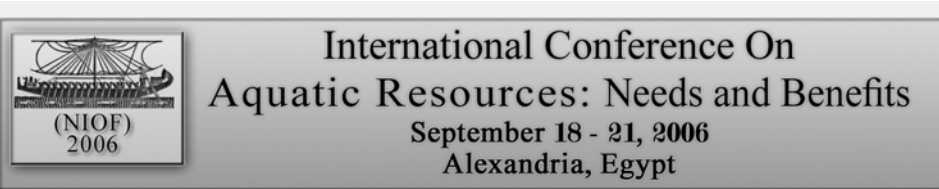
¹Aquaculture Division, National Institute of Oceanography and Fisheries, Alexandria, Egypt

²Department of Animal and Fish Production, Faculty of Agriculture, Alexandria University, Alexandria, Egypt

³Marine Ecology Division, National Institute of Oceanography and Fisheries, Alexandria, Egypt

⁴Department of Animal and Fish Production, Faculty of Agriculture, Alexandria University, Alexandria, Egypt

Trials were performed at El-Horani and El-Bostan, Damietta Branch as well as at Desouk and El-Mahmodia, Rashid Branch of the River Nile of Egypt to evaluate fish cage culture from both technical and environmental points of view; during 2004 – 2006. Fish cage production in Egypt has grown steadily over recent years, raising from 80 tonnes in 1988 to 50403 tonnes in 2004. Nile tilapia, *Oreochromis niloticus*, silver carp, *Hypophthalmichthys molitrix* and mullet, *Mugil cephalus* or *Mugil capito*, are the main species produced. Feeding is still mostly manual in Rashid Branch, but demand feeders have been used in the largest cages in Damietta Branch. Intensive Nile tilapia and semi-intensive silver carp or mullet rearing are still mostly undertaken in Damietta and Rashid Branches, respectively. In 2005, there were 2150 and 5640 cages in Damietta and Rashid Branches, respectively. It appears that only no more than 31% of the cages in Damietta and 26% of the cages in Rashid Branch are licensed. The optimum biomass levels showed an average of 18 Kg of Nile tilapia/m³ and 14.79 Kg silver carp/m³ for cage culture. On growing to commercial size (~250 g/fish) normally takes about 6 months for Nile tilapia fed 25 – 30% protein floating or submerged pellets and 12 months (~1000 g/fish) for silver carp (without artificial feeding). The water in silver carp cages area in Rashid Nile Branch is relatively clean without serious pollution problems because carp feeds mainly on natural food (green and blue green algae, diatoms and detritus), as well as small



zooplankton rotifers (4.6%), thereby prevents eutrophication caused by nutrients loading. Tilapia cages area in Damietta Nile Branch were influenced mainly by the Higher El-serrow Drain (industrial and sewage wastes) as well as by effluents from Kafr El-Batikh Electric Power Station. Therefore, the need is now emerging for the adoption of environmentally friendly cage design, diet and fish species such as mixed culture of Nile tilapia and silver carp to protect the River Nile waters and maintain a balance between cage aquaculture activities and environmental considerations.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (10): Aquaculture

Oral Presentation

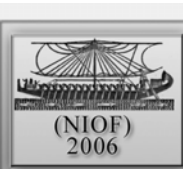
**Swim bladder Infections by Coccidian Parasites (*Apicomplexa*,
Eimeriidae) in Cichlid Fishes from Different Locations in Egypt**

Amina El-Mansy

National Institute of Oceanography and Fisheries, El-Kanater Fish Research
Station, Egypt

E-mail: el_mansy@hotmail.com

Specimens of *Oreochromis niloticus*, *O. aureus* and *Tilapia Zillii* were surveyed for coccidian infections. Some fishes proved to be infected with several eimeriid species. Most of these parasites, belonging to the genus *Goussia*, were detected from the inflamed tissues of swimbladder. Tissues containing oocysts and sporozoites occurred externally *in vitro* and completed within 48-72 hours. Fully developed sporocysts were measured, sketched and described. The effect of gamonts on the epithelial lining cells was histologically proved.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (10): Aquaculture

Oral Presentation

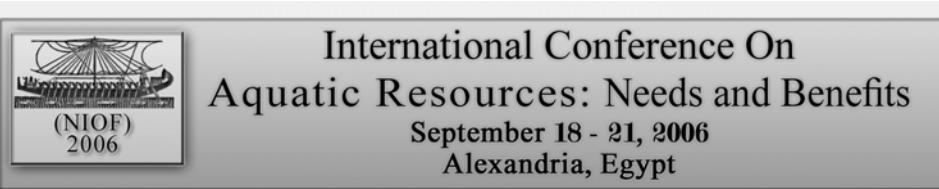
Pathological Studies on Nile Tilapia Fingerlings Fed on Diets Contaminated with Aflatoxin B₁ and/or *Aspergillus Parasiticus* and Overcoming their Effects by Vitamin C

Manal I. El-Barbary¹ and Ahmed F. El-Shaieb²

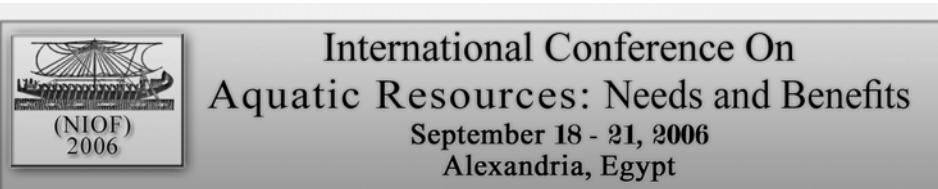
¹Aquatic Pathology Lab., National Institute of Oceanography and Fisheries, Egypt

²Department of Pathology, Faculty of Vet. Med., Mansoura University, Egypt

The present work was carried out to study the pathological effect of diets contaminated with aflatoxin B₁ (AFB₁, 380 µg/kg) and/or *Aspergillus parasiticus* (3.5 x 10³ spores/kg) on some growth parameters, mortality rate (MR%), whole body composition, some blood parameters and histopathological examination for liver, gills, muscles, intestine and kidney. In addition, the ability of vitamin C (1 g/kg diet) to counteract these pathological effects on *Oreochromis niloticus* was evaluated. A total number of 288 healthy fish were assigned to 8 groups (G₁ – G₈) with 3 replicates, the groups of G₁ to G₄ were fed free AFB₁ diets (G₁ kept as a control group) while the other groups of G₅ to G₈ were fed diets contaminated with AFB₁, where as (G₂ and G₆), (G₃ and G₇) and (G₄ and G₈) groups were fed diets supplemented with vitamin C, spores and both of them, respectively for 8 weeks. The obtained results showed that AFB₁, spores and vitamin C individuals or together didn't have significant effects on all growth parameters except for condition factor (KF), where AFB₁ (G₅) reflected highest significant decrease in KF among all groups, while G₂, G₅ and G₇ groups reflected significant increases in MR% of the order of 45.1, 81.9 and 58.5% respectively, as compared to G₁ group. On the other hand, vitamin C led to significant decrease in MR% in G₂, G₆ and G₈ groups, respectively. Concerning the body composition, AFB₁ led to significant decrease and increase in both of crude protein (CP%) and Fat% respectively, ranging from 9.2, 9.7 at 7.7% for the CP% and 35.6, 37.3, 12.4 to 28.3% for Fat% as compared to the control (G₁). However, vitamin C reflected the highest CP% among all groups associated with the decrease in ash%. Generally, AFB₁, spores and both of them had significant negative effects on hemoglobin, total protein, albumin and globulin concentrations. The activity of ALT and AST in groups of G₂ to G₇ significant increased as compared to the control group.



Microscopically, the gills showed fusion of the lamellae, congested blood vessels and round cell infiltration. The livers showed degenerative changes and congestion of the hepatocytes. The kidneys were congested and showed degenerative changes of the renal epithelium.



Session (10): Aquaculture

Oral Presentation

**Captive Reproduction and Embryology of the Anemone Fish
Amphiprion bicinctus Inhabiting the Red Sea**

Nevine M. A. Shabana and Amr M. Helal

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey,
Alexandria, Egypt

Amphiprion bicinctus needs to stay for a period of time extending to four months in the same breeding tank before spawning takes place. The average survival rates of breeding pairs were 6.94 % and 5.91 % for females and males respectively, while the final average body length and weight for females and males were 14.25 cm, 12.5 cm, 35.42 gm and 24.5 gm respectively. Spawning occurred from September to March at 25 °C and pH 8.8. The successful clutch was the 5th which was obtained in December 17th. After 10 days of fertilization, the clutch hatched sequentially. The blastodisc was formed thirty minutes after fertilization and cleavage took place in the first 15 hours, while blastulation and gastrulation took place at 24 and 36 hrs after fertilization. Organogenesis extended from the 80th hrs after fertilization, starting with head information, eye cup and body somites, then the notochord was evident at 120 hrs. Myotomes and eye pigmentation took place at 150 hrs after fertilization in parallel to heart development. The heart was in the shape of an Isosceles triangle, the 2 equal sides measured 22.4 μ, while the base measured 28.8 μ. The eye cup measured between 16 and 19 μ along its short and long axes. The larvae emerged from the chorion after 240 hrs of fertilization. The fully formed larval length measured 130.6 μ, the larva started to manipulate food few hours after hatching from the surrounding media. *A. bicinctus* can actually be reared successfully in captivity, as long as the chemical, physical and biological conditions are optimized. This result is very promising for captive production of ornamental fish and it can be applied on large scale in aquaculture industry.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 11

Poster Presentation



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

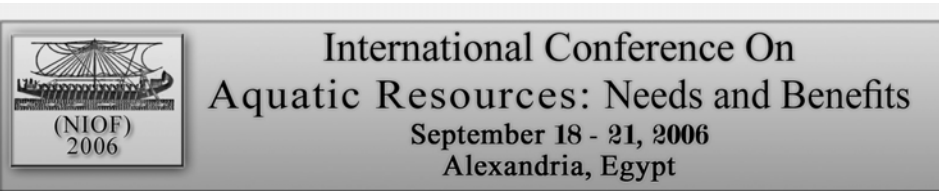
Session (11): Poster Presentation

**Bioaccumulation of Some Elements in Highly Diluted Cheese-
whey Wastewater by *Elodea Canadensis***

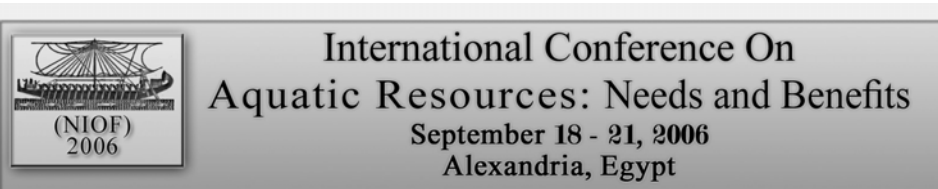
Mary Guendy Ghobrial

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey,
Alexandra, Egypt
Tel: +203 5434347, Fax: +203 801174, E-mail: mary_ghobrial@hotmail.com

Whey is the liquid byproduct that is left during cheese or casein production. From 6 tons of milk processed, there is approximately 5 tons of whey for each 1 ton of hard cheese. It is a quite problematic substance to treat, and small factories dispose its whey effluent into the cities' sewage system, without treatment. Analysis of whey in the final effluent into aquatic environment is equivalent to daily domestic waste produced by 18.000 people. There, it causes a severe pollution problem, mainly because its microbial degradation is accompanied by removal of oxygen from the receiving water body, hence rendering the water incapable of supporting other forms of aquatic life such as plants and fish. The present research aims to elucidate what possible nutrient elements such as Nitrogen, Calcium, Potassium and Sodium in diluted whey wastewater could mean to aquatic environment and the resultant submerged vegetation. Submerged macrophytes are major component of freshwater ecosystems; they are crucial for the stabilization of the clear water state in shallow eutrophic lakes. *Elodea Canadensis* Michx. is a widespread eutrophic species, with a large ecological amplitude. It was used to test the impact of diluted whey effluent and estimate its accumulating ability of the elements, nitrogen (N), potassium (K^+), calcium (Ca^{++}) and sodium (Na^+). Experiments were conducted to evaluate the uptake trend by exposing the submerged macrophyte *E.canadensis* to different whey dilutions. Preliminary experiments showed that raw whey dilutions from 5 to 20% were lethal to the macrophyte. Dilutions of 1.27 and 2.56% whey enhanced the uptake of the considered elements, with high affinity towards K^+ and high concentration factors (C.F.) for N and K^+ . Significantly increases of K^+ ($p < 0.01$) and Total Kjeldahl Nitrogen TKN ($p < 0.05$) were detected in the plant dry matter after treatment with 1.27% whey. This was accompanied by increases in *Elodea* fresh weight (growth of apical tips) and in pH of the medium. Therefore, finding an alternative



solution to use the whey could reduce the environmental risk, costs and difficulties associated with end of pipes treatment.



Session (11): Poster Presentation

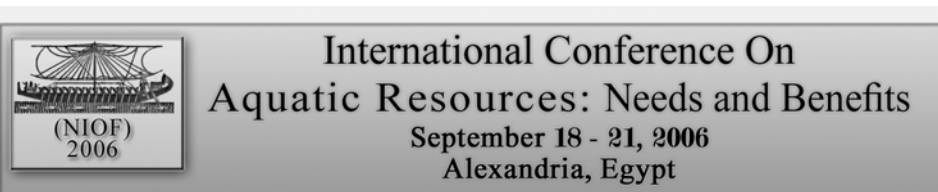
Accumulation of Heavy Metals in Water Plants and Sediments in Porsuk Stream

A. Çiçek¹, A. Ocak², A. S. Koparal¹

¹Applied Research Center for Environmental Problems, Anadolu University, 26480, Eskişehir, Türkiye

²Faculty of Science and Art, Biology Department, Osmangazi University, 26480, Eskişehir, Türkiye

Accumulations of pollutants originating from different sources in plants and sediments causes the decreasing in efficiency. Then with a bioaccumulation, contaminants, such as heavy metals, have toxic effect n the elements of food chain. In this study, leaf, root, stem of water plants, which live in the Porsuk Stream, and levels of iron, lead, nickel, zinc, chromium, copper and cadmium, the heavy metals in the stream have been investigated. All parameters were also examined in sediments. In addition, nutritional elements such as calcium, sodium and potassium were analyzed in the plant samples. The results showed high concentrations of heavy metals in plants and sediments. On the other hand, the results confirm that plant samples taken from the industrial areas are poor in nutrients and the metal levels are rather high.



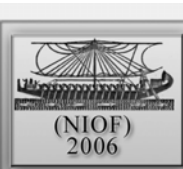
Session (11): Poster Presentation

Seasonal Distribution of V, Au, Pt, Pd and Mo in River Nile Sediment

Mohamed E. F. Toufeek and Mostafa A. Korium

National Institute of Oceanography and Fisheries, Aswan, Egypt

Concentrations of V, Au, Pt, Pd and Mo in River Nile sediment were examined. The correlation coefficient matrix between these metals against carbonate, pH value, organic matter and electrical conductivity of sediment were estimated and discussed. The results revealed that the distributions of these metals depend upon the type and amount of industrial and domestic wastes discharged along the river basin at Aswan. Statistically, heavy metals under study have low negative correlations with both electrical conductivity and pH values, while they have positive correlations with carbonate and organic matter contents. Molybdenum has positive significance with both vanadium and platinum and it was present as carbonate form or formation of chelates with organic compounds. This is achieved from the positive significance between Mo with both carbonate and organic matter. The distributions of V and Mo depend principally on the physicochemical conditions of the River Nile environment. While the distributions of Au, Pt and Pd are mainly related to the absorption processes and the amount and type of wastewater discharged into the river water body and to the nature of local sediments.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

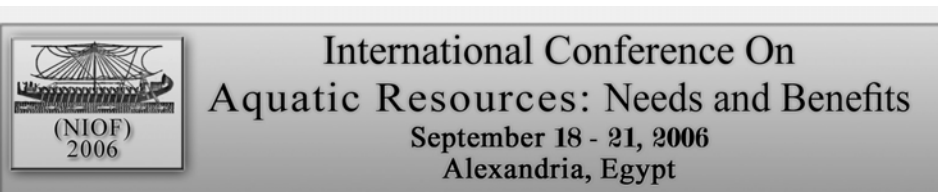
Session (11): Poster Presentation

An Investigation of the Effect of Chemical Treatment on Continuous Biosorption by Brown Algae *Sargassum glaucescens* and *Cystoseria indica*

R. Jalali-Rad*, M. Ebrahimi, H. Ghafourian, R. Dabbagh, F. Aflaki and M.H. Sahafipour

Nuclear Research Center, Atomic Energy Organization of Iran
P.O.Box: 11365-3486

Environmental contamination by toxic metals is of great significance. Among these pollutants, cesium is a critical waste effluent from power reactors because of its long half life. Different remediation methods have been used. Amongst these methods use of the biosorbents is more economic. Brown algae have suitable biosorption capacity due to specific cell wall composition. Some attempts have been used to improve algal biosorption by chemical treatment. In this study, biosorption of cesium by *Sargassum glaucescens* and *Cystoseria indica* isolated from Oman sea was investigated after chemical treatment. The biomass was washed, sun-dried, grinded and sieved to 1-2 mm particles. Each alga was cross linked with either formaldehyde (FA) or glutaraldehyde (GA). The crosslinked and not crosslinked algae were also treated with hexacyanoferrate (HCF). Consequently 10 types of modified biosorbents were obtained which grinded again to achieve less than 4 mm particles. Adsorption breakthrough curves were obtained in packed-bed column system with the residence time of 2 minutes. Among the different types of biosorbents, *Cystoseria* crosslinked with FA (CF) and *Sargassum* treated with FA as well as HCF (SFH) showed the highest dynamic capacity (DC) of 70.5 mg/g and 68.8 mg/g respectively. The CF and SFH biosorbents were prepared again with the difference of sieving to 1-2 mm particles after treatment. The result showed 1.5 times decrease in the Dynamic Capacity (DC), but was still higher than the untreated *Sargassum* and *Cystoseria* with the DC of 3.87 mg/g and 4.2 mg/g respectively. Optimization of chemical treatment to obtain the highest DC with the least used chemical showed no acceptable results for CF. In contrast, the DC of SFH increased about 5.8 times in response to decreasing HCF concentration. These results show that although algae are good biosorbents, chemical treatment and optimization of biosorption process to obtain results is promising.



Session (11): Poster Presentation

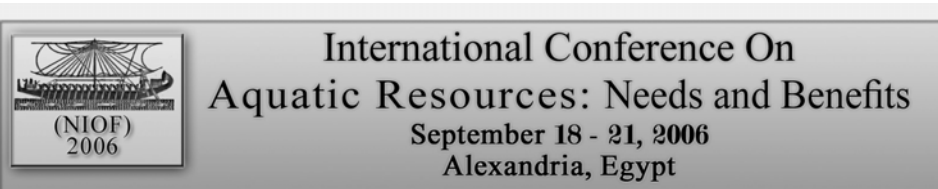
Chemistry of the Gulf of Suez Coastal Waters, Red Sea, Egypt

Mamdouh A. Fahmy¹, Mohamed A. Shreadah¹, E. M. Abo El-Khair¹, A. M. Abdel Halim¹, A. Abo El-Soud², S. M. Abdel Rahman²

¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Egyptian Environmental Affair Agency, Cairo, Egypt

The Gulf of Suez is of about 250 Km length, 32 Km width and 55-73 m average depth. The northern side is receiving heavy load of waste water from industrial sources (mainly petrochemicals, fertilizers, power station, etc.) and sewage effluents. The Midwestern side is locating under the direct effect of sewage and petrochemical effluents of Ras Gharib City. Whereas, the human impact on the eastern (Sinai peninsular) and the southern (El-Tour city) sides are still insignificant due to the low population there. However, great and rapid recreational developments have been taken in place on these two sides in addition to El-Sukhna new Harbor, recently established in the northwestern side of the Gulf. Accordingly, Environmental Information and Monitoring Programme (EIMP) has been established to assess the aesthetic quality of the Gulf of Suez Coastal waters to initiate monitoring and data base system using quality control and quality assurance work and for sustainable use and development of Suez Gulf coastline. Within the framework of this programme 5 to 6 field campaigns were performed annually during 1998-2004. A total of 13 or 4 stations were selected to represent the different conditions prevailed on the Gulf. Hydrochemical parameters (water temperature, salinity, dissolved oxygen, pH, chlorophyll-a, total suspended matter and transparency) and nutrient salts (nitrogen, phosphorus and reactive silicate) were investigated as indicators for water quality criteria of the Gulf. The obtained data signified that, the northern side of the Gulf is located under stress due to the relative high concentrations of ammonium, nitrate, nitrate total suspended matter and chlorophyll-a. The condition at this part is highly eutrophic. This is completely different from that found in the other parts of the Gulf which is fluctuating between oligotrophic to mesotrophic state like that of the proper Red Sea waters. Accordingly, the northern and other parts must be considered separately.



Session (11): Poster Presentation

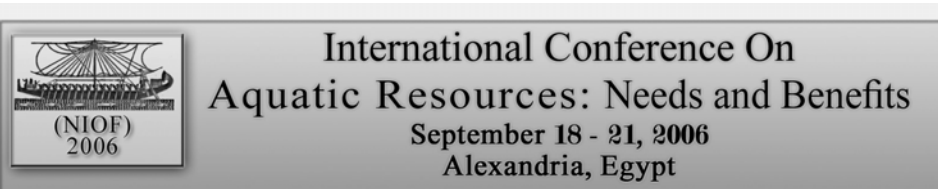
Multi-elements Content in Marine algae from the Egyptian Red Sea Coast

Hoda H. H. Ahdy*¹, Tarek A. Mohammed² and Aly M. A. Abdallah¹

¹Marine Pollution Lab., National Institute of Oceanography and Fisheries, El-Afoushy, Kayet Bey, Alexandria, Egypt; ²National Institute of Oceanography and Fisheries, Red Sea Branch, Hurghada

*E-mail: threehal@yahoo.com

Seaweeds belonging to fourteen different genera of Phaeophyta and Rhodophyta were analyzed to determine the levels of heavy metals in two areas of the Egyptian Red Sea Coast. Among the ten trace elements analyzed, Fe and Al showed the highest mass concentrations in the surface seawaters of Hurghada (29.8 and 11.3 ng/ml) and Shalteen (18.7 and 6.0 ng/ml), respectively. However, algae obtained from Hurghada area had the highest concentrations of all the investigated ten heavy metals than those collected in Shalteen area. Nevertheless, a high variability of the metal levels occurs among the studied algae and also between the investigated areas. Moreover, Fe and Al were the most predominant metals in the seaweeds of the Hurghada and Shalteen in all studied algae. *Liagora farinose* had the highest average concentration factor of Fe in Shalteen (83804 fold). The highest value of Metal Pollution Index (MPI) was recorded in *Liagora farinose* (32.7) at Hurghada. Among brown in Hurghada, the highest values of MPI were recorded in *Padina pavonia* (25); while at Shalteen, they were recorded in the same algal species with same sequence 9.0 and 11.0.



Session (11): Poster Presentation

The Optimum Dietary Protein Requirements of the Teleost *Oreochromis Niloticus* at Optimum Salinity

H. Assem^{1*}, M. El Salhia¹, and S. Abo Hegab²

¹National Institute of Oceanography and Fisheries, (NIOF), Egypt

²Department of Zoology, Faculty of Science, Cairo University, Egypt

*E-mail: Hanaa_eldin@yahoo.com

To select the optimum salinity that produces the highest rate of growth in *O. niloticus*, eleven salinities were tested (0, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0, 27.5, and 30.0 psu). The results suggested that the peak growth performance of *O. niloticus* attained a salinity of 20.0 psu. Plasma protein level was shown to be a function of salinity when the data were fitted to the saturation kinetic model for physiological responses. Optimal salinity for growth could be predicted by the application of the mathematical model. To measure the optimum dietary protein requirements at the optimum salinity, seven diets containing protein levels that varied incrementally by 5% (20, 25, 30, 35, 40, 45, and 50%) were tested. From the efficiency characteristics and the parameters of the mathematical model, and for the sake of simplicity, the optimum protein level for saltwater fish would be 29.0% in terms of protein gain, 36.3% in terms of weight gain and 41.0% in terms of energy gain. For freshwater fish the optimum protein level would be 37.8% in terms of protein gain; 32.7% in terms of weight gain and 40.5% in terms of energy gain. In blood hemoglobin the I_{me} value indicated that the optimal protein level was 34% dietary protein.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 12

Fish Biology and Fisheries



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (12): Fish biology and Fisheries

Oral Presentation

Community structure of the Molluscan bivalvia in a Mediterranean lagoon (Nador Lagoon, Morocco)

Mohammed Ramdani¹, Abd El-Latif Berraho² and Roger Flower³

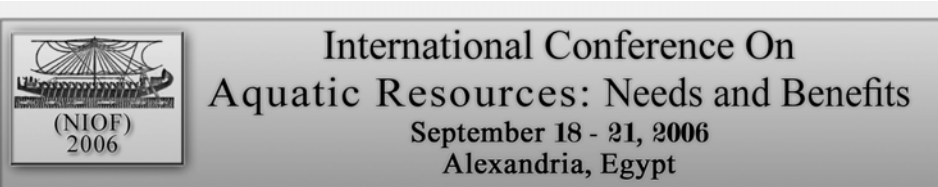
¹Institut Scientifique, Department of Zoology & Animal Ecology, BP. 703, Rabat, Morocco

²Institut National de Recherche Halieutique, 2, Rue Tiznit, Casablanca Morocco

³University College London, ECRC, 26, Bedford Way, London, UK

E-mail: berraho@inrh.org.ma

Nador Lagoon, covering an area of 11 500 ha, lies along Morocco's Mediterranean coast. It has been the focus of several national and international programmes mainly because of its aquacultural potential. As a consequence of the location between land and open sea, Nador lagoon is characterized by large fluctuations in meteorological, physical and chemical conditions, including highly variable freshwater inputs rich in organic and mineral nutrients derived from urban, agricultural and industrial effluents and domestic sewage. The sediment is mixed with various proportions of sand and clay, depending on the location. The clay fraction of the lagoon is composed, in decreasing order, of illite, kaolinite, smectite and chlorite. Smectite prevails in the northeast part and chlorite dominates in the southwest area. Two main zones with different faunal composition can be distinguished: The narrow zone close to the channel of communication with the sea and the innermost part of the lagoon. The distribution pattern of the molluscan community is governed by a different set of environmental variables in each season. The molluscan community of the Moroccan Mediterranean lagoon (Nador lagoon) was studied on a seasonal basis during 2004 in 90 stations covering the whole area of the lagoon. A total of 17 species of Bivalvia were recorded from this ecosystem. The dominant species are: *Cerastoderma glaucum* (70-900 ind./m²), *Mytilus galloprovincialis* (50-850 ind./m²), *Ruditapes decussates* (10-480 ind./m²) and *Corbula gibba* (55-1800 ind./m²) 13 species are very common: *Ostrea edulis* (5-30 ind./m²), *Loripes lucinalis* (80-1200 ind./m²), *Scrobicularia plana* (20-1200 ind./m²), *Gastrana fragilis* (10-350 ind./m²), *Tellina albicans* (5-40 ind./m²), *Tellina pulchella* (70-350 ind./m²), *Macoma cumana* (10-180 ind./m²), *Acanthocardia echinata* (5-80 ind./m²), *Nucula nucleus* (4-50 ind./m²), *Dosinia exoleta* (5-85 ind./m²), *Dosinia lupines* (2-40 ind./m²), and *Pitaria rudis* (2-50 ind./m²).



Session (12): Fish biology and Fisheries

Oral Presentation

Population Structure of Two Endangered Holothurian Species from the Gulf of Aqaba, Red Sea, Egypt

Azza A. El-Ganainy*; Mohamed, H. Hassan and Mohamed H. Yassien

National Institute of Oceanography and Fisheries, Suez, Egypt

*E-mail: azzaelgan@yahoo.com

Sea cucumbers are of increase global interest; their fishery in Egypt has begun in late 1996. During the past ten years, populations of sea cucumber in the Red Sea have suffered from a rapid decline due to intensive collection in response to the high demand for "beche-de-mer" on the international markets. An underwater visual census survey was conducted during August 2005 to evaluate the current standing stock population of two commercially harvested species *Holothuria atra* and *H. leucospilota* in the Gulf of Aqaba. The data of the survey were compared with a previous one collected during 1999. the population structure including growth, natural and fishing mortality rates, probability of capture and exploitation rates of the two species were investigated. The results showed that the mean size of *H. atra* population decreased from 22.39 ± 6.24 cm in 1999 to 15.3 ± 5.19 cm in 2005, while that of *H. leucospilota* decreased from 38.18 ± 11.30 to 35.73 ± 8.58 in the same period. Estimated nature mortality (M) was 0.418 y^{-1} for *H. atra* and 0.329 y^{-1} for *H. leucospilota*. The probability of capture curve of *H. atra* showed that 50% of the population reaching 21.5 cm (3 years old) was susceptible for exploitation during 1999 while the same length was 13.7 cm (1 year old) in 2005. The estimated L_c for *H. leucospilota* was 36.4 cm (4 years old) in 1999 and reached 33.2 cm (3 years old) in 2005. The exploitation ratio of *H. atra* increased by about 31.14% during the period from 1999 to 2005, while that of *H. leucospilota* has increased by about 15% in the same period. The recommended management strategy includes banning of the fishery, study of the biology and life history of the most valuable species; prevent harvesting of undersize individuals and increase the investments on their mariculture. On the other hand, restocking is an option to be considered.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (12): Fish biology and Fisheries

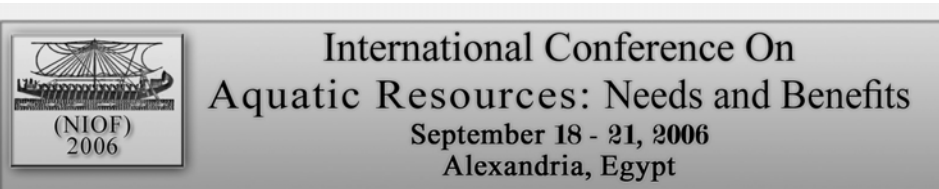
Oral Presentation

Effect of Olfactory Receptors of Mullet on Feeding and Detection of Some Pollutants

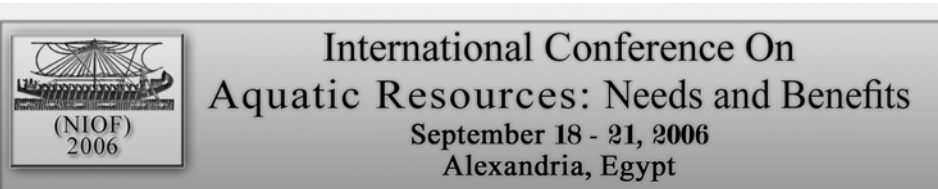
Amal M. H. Morsy and Fathy T. Tayel

Marine Pollution Lab., National Institute of Oceanography and Fisheries, El-Anfoushy, Kayed Bey, Alexandria, Egypt

Experiments were applied to study the effect of presence and absence of olfactory organ on the feeding and pollution assessment. In this experiment Mullet fish (Length 7-10 cm) were used. The fish were divided in three groups: Group I – Control fish, Group II – fish with olfactory receptors and Group III – fish with cut olfactory receptors. Fish were anesthesized with benzocaine (45 gml/L), then epithelial cells of olfactory tract were removed surgically. Chrinomoid larvae were used as natural food odour injected in aquarium. 75 gm Chrinomoid larvae were minced in homogenezier completed to 1 liter distilled water; 1 ml of this solution was taken, put in 2 gm agar agar + 100 ml cold distilled water stirred well then heated gently 70-90°C until gel is formed then poured in pettri dish put in refrigerator 4-5°C pellets of this food 2.5 x 1.5 mm were thrown to fish by pipette. It was observed that the fish, after removal of olfactory receptors, stand stagnant, do not respond to food, no biting, no chewing and did not show any preferability to food. After 3-6 hours handled any food appear with the same order no differentiation. Records of biting, chewing and rejecting were recorded after 1, 3, 6, 24, 48 and 72 hours from exposure. Food was prepared from 6 amino acids (alanine, aspragine, glycine, glutamine, cystine and praline) with concentrations of 0.1, 0.01 and 0.001 Mole in agar agar pellets and was offered 2.5 x 1.5 mm by pipet. Experiments showed that cystine had the most palatability for mullet, 98% of pellets were swallowed after first gasp the 6 amino acids stimulated the appetite. Consumption preference was praline > glutamine > aspragine > alanine > glycine. This prove that fish olfactory receptors ca be used to differentiate preferable food. Fish were exposed to heavy metals (HgCl₂ concentration 1, 0.01, 0.001, 0.0001 micromole) CuSO₄ and CdSO₄ PbN(O₃)₂, ZnSO₄ with concentrations 1, 0.1, 0.01 micromole respectively. Results of this experiment show those olfactory receptors in fish response positively to heavy metal exposure. The metal with the highest toxicity after 1 hour was Hg while that with the lowest toxicity



was Zn. At 72 hrs the toxicity to all heavy metals at concentrations of 0.01 were Hg > Cd > Pb > Cu > Zn. This proves that the fish responds positively to heavy metals. Group III with cut olfactory receptors after 1 hour negative response (stagnant), after 3-6 hours showed very weak response, and at 24-48 hrs moderate response, while at 72 hrs start to respond gradually. After 21 days full recovery at 25 days behaved normally and the response was similar to group II. The goal of this research is to investigate the possibility of using the fish as pollution detector by their olfactory receptors.



Session (12): Fish biology and Fisheries

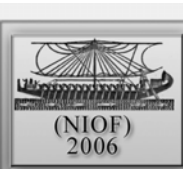
Oral Presentation

Study on the Common Fishing Gears and Methods in Lake Manzalah, Egypt

Kariman A. Sh. Shalloof and El-Azab E. B. El-Bokhty

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

Fishing gears and methods in Lake Manzalah are so numerous, to the extent that it would be difficult to include all localized types. The present study deals with the important and abundant fishing gears and methods in the lake and the effect of their selective action on the fish population in the lake. Trammel net is the most common fishing gear in the lake. It is used with various mesh sizes. The most common of which are 2.78, 2.63 and 2.50 cm mesh sizes expressed as mesh bar. The average lengths of *Tilapia* species caught by these three meshes were 13.8, 14.13 and 13.34; 13.94, 13.94 and 13.06; 14.26, 13.76 and 11.9; 12.65, 11.77 and 12.39 cm for *O. niloticus*, *O. aureus*, *S. galilaeus* and *T. zillii*, respectively. Other mesh sizes of trammel net were employed in the lake but less common such as 2.38 and 2.00 cm mesh bar. Illegal fish lengths of *Tilapia* were caught by El-Kerba method, since the average lengths of fish were 10.78, 10.78 and 8.94 cm for *O. niloticus*, *O. aureus* and *T. zillii*, respectively. More than 50% of tilapia caught by trammel net from Lake Manzalah ranged from 11.2 to 14.5 cm in length, while more than 50% of that caught by El-kerba method ranged from 8.0 to 10.1 cm only. So, it is strongly recommended to prevent fishing by this method to conserve the fish stock and increase the annual fish yield from the lake. The species and size composition of fish caught by other fishing gears used in the lake, such as basket traps (Gawabi), spiral traps (Tahawet) and encircling gear (El-Tarra), were studied. It was found that the average lengths of fish caught by basket traps ranged from 9.68 to 11.24 cm, while the average lengths of *O. niloticus*, *O. aureus* and *T. zillii* caught by spiral traps were 8.78, 8.57 and 8.88, respectively. More than 50% of fish caught by El-Tarra were found to be of lengths 13.09, 12.2, 14.72 and 10.38 cm for *O. niloticus*, *O. auteus*, *S. galilaeus* and *T. zillii* in respective.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (12): Fish biology and Fisheries

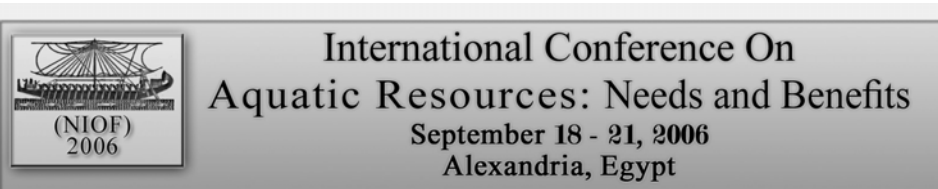
Oral Presentation

Growth, Survival Rate and Body Composition of Nile Tilapia (*Oreochromis Niloticus*) Reared in Fertilized Concrete Tanks at Different Densities.

Mohammed Hamed Bahnasawy

Zoology Department, Damietta Faculty of Science, Damietta, Egypt
E-mail: bahnasawymh@yahoo.com

Juvenile Nile tilapia, *Oreochromis niloticus*, were reared at four densities in fertilized concrete tanks to evaluate the effect of stocking density on their growth, survival rate and body composition. Fish of mean weight 108 g were stocked in 4.0 m³ concrete tanks containing 3.2 m³ of water at density rate of 15, 30, 45 and 60 fish/m³. Each tank was fertilized with inorganic fertilizers at a rate of 6.8 mg/L of premix super phosphate and urea. Fish were fed daily, six days per week with formulated feed of 30% crude protein for 180 days. At the onset of the experiment, feed was applied at 6% body weight, and gradually reduced to 3% when gained weight. Stocking densities had significant ($P < 0.05$) effects on growth, food conversion ratio and survival rate of the experimental fish. Weight gain and specific growth rate decreased significantly by increasing stocking density. The weight gain was calculated to be 68.30±1.1, 57.1±2.4, 45.27±1.65 and 36.3±2.3 for the above four stocking densities, respectively. The specific growth rate had attained its maximum value (2.04±0.01) at stocking density of 15 fish/m³, while its lowest value (1.7±0.04) was found in fish stocked at 60 fish/m³. Feed conversion ratio (FCR) increased significantly and survival rate decreased significantly with increasing the stocking density. The best values of feed conversion ratio (1.94±0.02) was achieved by stocking density of 15 fish/m³, in comparison with FCR value (3.73±0.09) of fish stocked at 60 fish/m³. The survival rate of fish decreased from 98.0%±2.0 to 61.5%±3.5 with increasing stocking densities from 15 to 60 fish/m³. Protein efficiency ratio (PER) decreased from 2.17±0.13 to 1.08±0.03 when stocking density increased from 15 to 60 fish/m³. The body composition of fish was not significantly affected by stocking density. The results showed that the best growth performance was achieved at 5 fish/m³.



Session (12): Fish biology and Fisheries

Oral Presentation

Selectivity Coefficient, Efficiency and Fisheries Management of Filament Basket Traps

Abdou Abd Allah Al-Sayes¹; Gamal Abd El-Raouf Madkour²; Said Mohamed Abd El-Hafez¹ and El-Azab El-Azab Badr El-Bokhty¹

¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Zoology Department, Faculty of Science, Tanta University, Egypt

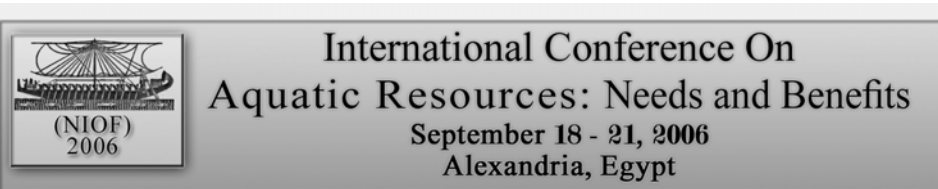
One of the problems of fisheries sustainable management today is to know how much fish can be taken from any water body. It is, therefore, necessary to understand the effect of removing large quantities of fish from a given natural ecosystem. The aim of the present experimental investigation is to evaluate the effect of mesh selection and to study the efficiency and selectivity of the nylon or filament basket traps for the different *Tilapia sp.* dominating Lake Manzalah. Comparative fishing experiments were carried out in Lake Manzalah during 2000-2001, with different meshes of basket traps. Baranov and Holt's methods of calculation have been adopted in the present study to calculate the selectivity coefficient of basket traps. According to the estimation of selectivity coefficient, it is recommended to allow the commercial fishing in the Egyptian lakes with basket traps of not less than 2.5 cm mesh size. At such mesh size, the highest mean selection length will be 15.24 cm for *O. niloticus*; 16.67 cm for *O. aureus*; 14.98 cm for *T. Zillii* and 17.57 cm for *S. galilaeus*. By this recommendation, the annual production could be increased by more than three times annually, assuming that the fish population is constant. But in fact, the annual production could be duplicated by more than the number since there will be more chances for breeding.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 13

Coral Reef Ecology



Session (13): Coral Reef Ecology

Oral Presentation

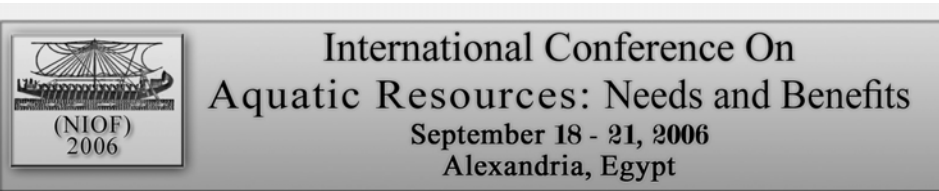
Lessons and Experiences from Establishment of Global Coral Reef Monitoring Network (GCRMN) Node in the Ropme Sea Area

P. Eghtesadi Araghi^{1,2*} and A. Maghsoudlou¹

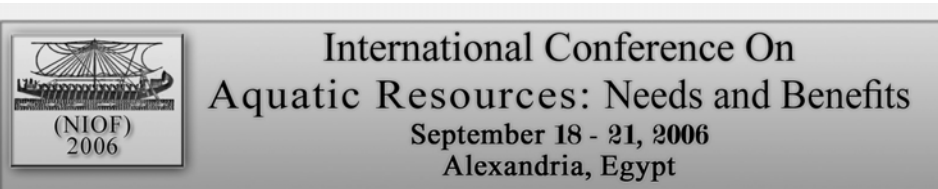
¹Iranian National Center for Oceanography (INCO), #9, Estemaadzadeh St., Fatemi Ave., Tehran, 1411813389, Iran

²Regional Coordinator of Global Coral Reef Monitoring Network (GCRMN) – ROPME Sea Area

Coral reefs are distributed throughout the tropical and sub-tropical waters of the world. According to one estimate, reef habitats provide humans with living resources and services, such as fish, tourism returns and coastal protection, worth about US\$ 375 billion each year. Global degradation of coral reef is caused by both natural and human-induced stresses. As a global partnership to conserve and manage coral reef and their related ecosystems, the International Coral Reef Initiative (ICRI) was formed in 1994. In 1995, the initial ICRI global workshop developed a "Call to Action" and "Framework for Action", which calls for the establishment of the Global Coral Reef Monitoring Network (GCRMN). The GCRMN acts as a network of independent Regional Nodes that will coordinate training, monitoring and database within participating countries and institutes in regions based on the UNEP Regional Seas Programme. To motivate coral reef conservation and management actions and the establishment of GCRMN regional node in the ROPME Sea Area (RSA) and during a regional workshop in Kish, Iran in December 2003, INCO was officially accepted as regional node of GCRMN in the RSA. Following the Kish workshop, a short-term program was produced during a regional expert meeting on coral reef program activities in the RSA to identify capacity gap and training needs as well as key stakeholders. To initiate short term program activities, the meeting urged the active participation and close collaboration among national institutions such as Environment, Fisheries, Tourism, Universities and other relevant scientific and research organizations in the region. In this paper we have stated issue about development of GCRMN in the region in relation to GCRMN principles



and its importance for development of a cost-effective plan for conservation and management of coral reef in the region with application of successful earlier experiences in this regard such as South East Asia node and ICRI Middle East Strategy.



Session (13): Coral Reef Ecology

Oral Presentation

Bio-Mineralization Processes and Heavy Metal Incorporations in the Scleractinian Corals Skeletons, Red Sea, Egypt

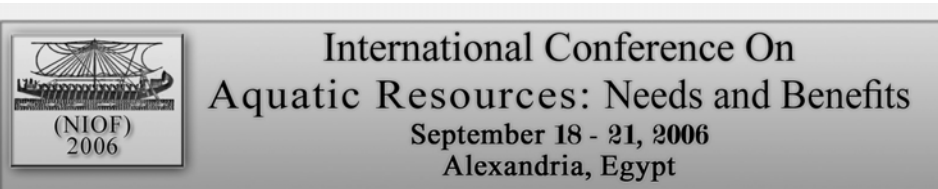
Mahmoud A. Dar¹ and Tarek A. Mohammed²

National Institute of Oceanography and Fisheries, Hurghada, Egypt

¹E-mail: mahmoud_rady@yahoo.com

²E-mail: tare_mote@yahoo.com

The bio-mineralization processes of the heavy metals in the skeleton frameworks were studied in eight living coral species belonging to three dominant forms; branching, massive and encrusting corals that were collected from three different natural and anthropogenic localities. The organic matrix of each specimen including; mucus, zooxanthellae and organic tissue was sequestered from the underlying aragonite skeleton in the laboratory. Subsequently, the metal contents in the organic matrices and the corals skeletons were measured separately. The heavy metals mineralization inside the skeletal framework of scleractinian corals is controlled essentially by the exposing surface area, the bulk density, the organic matrix thickness and the continuity of the supplying sources. Fe, Zn, Ni and Pb concentrations are pronouncedly high in the organic matrices; their occurrence in the tissues are a function of their contents in the underlying skeletons, which means that the metals increasing in tissue supervened by the same increasing in the skeletons. Mn, Cu and Cd are not belonging to this type. Their mineralization mechanism in the coral skeletons is from the surrounding seawater rather than through incorporation from the overlying organic matrix. T/S ratios illustrated distinctly the metal quantities that can mineralize in the skeletal framework of the corals. T/S ratios in the branching corals are higher than those in the massive and encrusting corals. The increasing ratio means that the incorporated metals in the organic matrices are much higher than the mineralized in the skeletal frameworks, subsequently, the excess metals are rejected back to the surrounding seawater according to the following sequence; Fe > Pb > Zn > Cu.



Session (13): Coral Reef Ecology

Oral Presentation

The Anthropogenic Effluents of the Human Activities on the Red Sea Coast at Hurghada Harbour

Hashem Abbas Madkour* and Mahmoud A. Dar

National Institute of Oceanography and Fisheries, Hurghada Research Station,
Red Sea Branch, Egypt

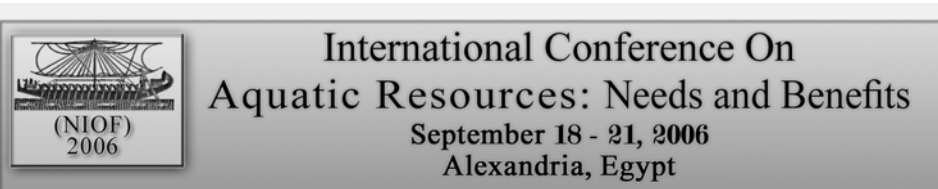
*E-mail: madkour_hashem@yahoo.com

The heavy metal accumulations in the sea water, coral reef and two effective fractions of underlying sediments ($< 0.125\text{mm}$ and $< 0.063\text{mm}$) were studied in the coastal and tidal flat zones at the main shipyard near Hurghada Harbor. The area of investigation, being a major outlet for both solid and liquid wastes of many human activities in/and surrounding the harbor, is highly polluted. The solid wastes are mainly remnants of construction materials, paint remains, iron pipe rusts, hydrocarbons, plastic bags, metal and wood remains as well as the artificially conglomerate stones that are thrown in the marine area. The liquid wastes include brine water draining continuously to the sea from a huge desalination plant (Capacity 5000 cubic meters of fresh water daily) and the bilge water of the boats' cooling engines in the mooring zone inside the shipyard marine area. The recorded concentrations of metals in both seawater and sediments decrease significantly seawards. The highest values of Fe, Mn, Zn, Cu, Pb, Ni and Cd in the seawater were recorded at the outlet point of the desalination plant pipeline while the highest values in the sediments were recorded at the beach zone, where the dumped materials were concentrated. The finest fraction sediments ($< 0.63\text{ mm}$) recorded high metal concentration of the toxic metals; Zn, Cu, Pb, Ni and Cd than the coarsest one. Pb in sediments recorded high reading in the boat mooring zone in the two sediment fractions relative to the beach zone and inside the sea. The recorded coral reefs are new generations (recruits) mostly of the massive forms. These corals were growing over conglomerate stones, rusted iron plates, plastic remains and car tires that have been dumped to the sea. The metal concentrations in these corals are high relative to their age and the recorded world standards. This study indicated that some coastal activities such as the shipyards and desalination plants are environmentally harmful and must be monitored



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

continuously in order to decrease their effluents to the sea. Also, it is obvious that the new coral generations are able to tolerate the inconvenient environmental conditions.



Session (13): Coral Reef Ecology

Oral Presentation

Sedimentological and Geochemical Studies on Some Island Sediments of the Red Sea, Egypt

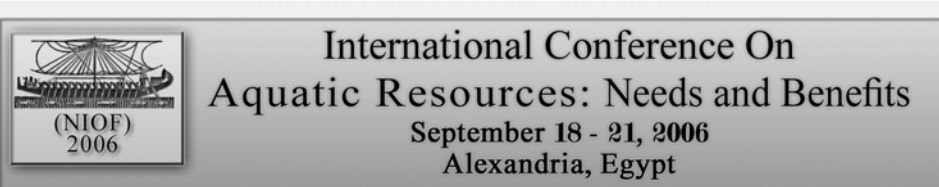
Abbas M. Mansour¹, Ahmed W. Mohamed², Mohamed R. Osman¹, Abo El-Hagag Naser El-Dien and Mohamed A. Tahoen

¹Faculty of Science, South Valley University

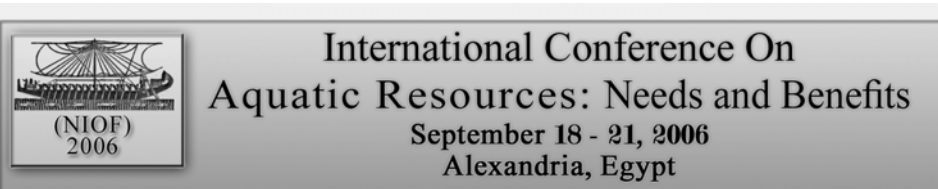
²National Institute of Oceanography and Fisheries, Red Sea Branch, Hurghada Station, Egypt

The islands' areas have suffered from a number of stresses caused by human activities that have caused observable deterioration of environmental quality. These stresses include pollution by oil and litters, coral reef damage, illegal fishing, buildings or camping on the islands and animal disturbing. Seventy six samples were collected in 2002 from the beach and intertidal zone of the three studied islands (Abu Minqar, Giftun and Wadi El-Gimal). Analyses of grain size, major and trace elements, total organic matter (TOM), organic carbon (OC) and carbonates have been carried out to identify the impacts of these activities on the islands' environment. Results of analyses indicate that the sediments of Abu Minqar Island have the highest clay content due to the occurrence of mangrove swamps and the nature of the island rocks. The island sediments of Wadi El-Gimal and Big Giftun have the highest carbonate contents, reflecting their biogenic origin from the rocky coral reef of the islands. High organic productivity in some areas due to seagrass and algae bottom facies is the reason for their high total organic matter and organic carbon contents in most samples of different islands. Tourist activities on the islands are the reason for their high total organic matter and organic carbon contents in some samples of these areas (Big Giftun and Abu Minqar islands). Also the increase of fine sediments is the reason for their high total organic matter and organic carbon contents in most samples in Abu Minqar Island. The sediments of Wadi El-Gimal Island have the highest Fe and Mn contents that are related to the source rock of the island. This may also be associated to the marine carbonate or due to the effects of Wadi El-Gimal. Most samples of Wadi El-Gimal island and some samples of Abu Minqar island indicate that the increase of Zn, Ni and Cu metal concentrations are related to the nature of the islands and the

ISSN: 1687-580X



type of source rock, bottom facies and the effect of Wadi El-Gimal. Also most samples of Abu Minqar Island and some samples of Wadi El-Gimal Island have high concentration of Pb probably due to Motor boats. Nearly all samples of Big Giftun Island have high concentrations of Cd that may be related to the biogenic origin or Motor boats and bottom facies. Findings of this study will help the Egyptian Environmental authorities and policy markers to asses the risk to the region's resources and to human health, besides addressing coastal management and related policy issues in these areas.



Session (13): Coral Reef Ecology

Oral Presentation

Inter replay of Texture and Geochemistry of Sediments of Coastal Lagoons Along the Egyptian Red Sea Coast

Ahmed W. Mohamed and Hashem Abbas Madkour*

National Institute of Oceanography and Fisheries, Hurghada Research Station,
Red Sea Branch, Egypt

*E-mail: madkour_hashem@yahoo.com

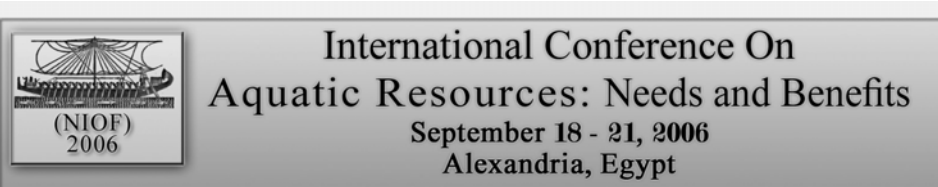
The present study provides information about the sediments, bottom facies and natural resources of some coastal lagoons along the Red Sea coast of Egypt. It also provides some management recommendations of these lagoons. The distribution of the grain size parameters, carbonate, total phosphorus, organic carbon and total organic matter has been assessed for the lagoon sediments. The mud content recorded high values in Umm Al-Huwaytat and Marsa Shuni lagoons as compared to the other lagoons. This is due to high contribution of terrigenous materials by wadis and from some human activities, especially near Umm Al-Huwaytat lagoon such as shipment activities in Abu-Tartour Harbor. The sediments of Abu-Galawa lagoon have the highest carbonate contents due to the dominance of biogenic sediments from surrounding coral reef and the absence of terrigenous influx. The sediments of Umm Al-Huwaytat lagoon have the lowest carbonates content inspite of the presence of coral reef, terrigenous influx by Wadi Safaga and the phosphate shipment in Abu-Tartour Harbor. The sediments of Marsa Shuni lagoon have the highest total organic matter (TOM) and organic carbon (OC) content as compared to the other three lagoons. The high rate of sedimentation due to increasing the input of sediment from the wadis, landfilling and dredging are probably the main reason for their high content in Abu Shaar, Umm Al-Huwaytat and Marsa Shuni lagoons. On the other hand, high organic productivity in some samples due to seagrass bottom facies is the reason for the high TOM and OC content in all studied lagoons.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 14

Hydrobiology



Session (14): Hydrobiology

Oral Presentation

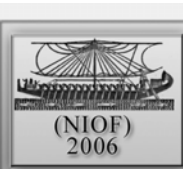
Zooplankton Community in the Eastern Harbor of Alexandria, Egypt

Howida Y. Zakaria

National Institute of Oceanography and Fisheries, (NIOF) Kayet Bey,
Alexandria, Egypt
E-mail: howaidazakaria@hotmail.com

The Eastern Harbor of Alexandria (EHA) is a semi-enclosed bay covering an area of about 2.53 km² with an average depth of 6 m. The harbor is connected to the Mediterranean Sea through El-Boughaz and El-Silsila openings. Monthly studies on zooplankton community were performed in EHA for one year from October 2004 to October 2005. Nine stations were selected to represent the different habitats in the study area.

The average standing stock of zooplankton in the Eastern Harbor was 42.728 x 10³ org/m³ higher than that of the open sea station (17.284 x 10³ org/m³). Seasonal variations of the numerical density of the total zooplankton show that spring season was the most productive season, with an average of 83.083 x 10³ org/m³, constituting 48.61% to the total zooplankton counts. Based on the numerical density; Protozoa, Copepoda and Rotifera dominated the zooplankton community in the harbor, forming 49.78%, 27% and 10.23% to the total zooplankton stock respectively. Protozoa dominated in all seasons, except in autumn, where Copepoda was the most dominant group. The zooplankton community in the study area was represented by 85 taxa, out of them 53 protozoan species, 17 crustaceans (13 copepods, 3 cladocerans and one species of ostracods), 7 rotifers. Besides, 2 species of cnidarian group, 2 polychaetes, 3 appendicularians and one species of Chaetognatha. Free living nematodes and meroplanktonic larvae of polychaetes, cirripeds, decapods, mollusks, echinoderms and ascidians were also recorded.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (14): Hydrobiology

Oral Presentation

Effect of the Maritime Activities and Nile Discharge on Ecological and Biological Characteristics of Damietta Harbor, Egypt

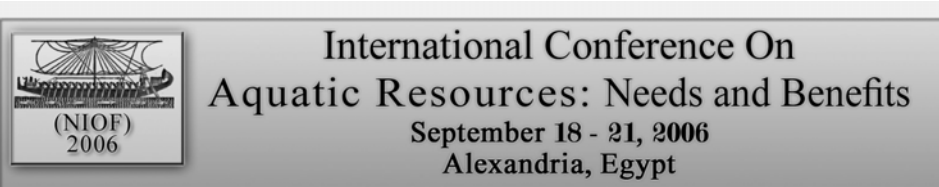
Ahmed E. El-Ghobashy¹, Nagwa E. Abdel-Aziz², Mohamed M. Dorgham³
and Wael S. El-Tohamy¹

¹Zoology Department, Faculty of Science (Damietta), Mansoura University, Egypt

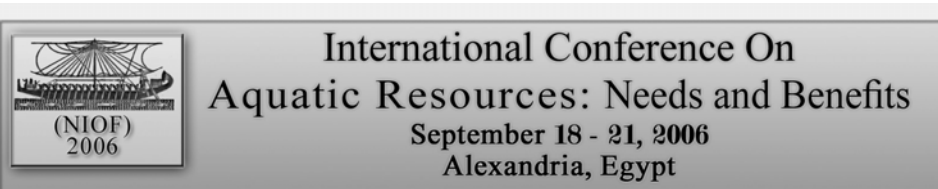
²National Institute of Oceanography and Fisheries, Kayed Bey, Alexandria, Egypt

³Oceanography Department, Faculty of Science, Alexandria University, Egypt

The Damietta Harbor was constructed in 1987 as a semiclosed basin on the Egyptian Mediterranean Coast, west to the estuary of the Damietta branch of the River Nile. The harbor is used for import and export of different materials such as agricultural crops, animal fodder, chemical fertilizers, manufactured and raw cement and iron, natural gas, textiles, cotton and flax fibers, grains, flour, food oil, fish powder, fruits, frozen fish, meat and chicken. On storage in great heaps on quays as well as during loading/unloading processes some of these materials fall down in the water, which beside the other maritime activities and Nile discharge cause physical and chemical changes to the water quality in the harbor. These changes were reflected on some biological characteristics of the harbor, particularly the phytoplankton and zooplankton. The present research could be considered as the first study to be conducted on the harbor's ecosystem since its opening for international maritime trade. It deal with some water properties, phytoplankton biomass and zooplankton abundance throughout a complete annual cycle. The concerned parameters were measured monthly from May 2003 to April 2004 at several stations representing different ecological entities in the harbor. The result demonstrated marked changes in ecological and biological characteristics as compared to other Egyptian Coastal Mediterranean waters out of the allochthonous stress. The effect of the River Nile discharge was clearly shown in the pronounced seasonal and spatial variations of salinity (33.8 and 39.4 psu), with annual average of 35.8 psu. Relative to these variations the pH experienced wide fluctuations (7.7-8.4). The values of dissolved oxygen (7.4-9.4 mg/l) indicated well aeration of the surface



water, but the Secchi disc readings (111-218 cm) reported chronic conditions of low transparency all the year round, pointing to large amount of living and nonliving suspended particles. The harbor water appeared to be characterized by abnormally high phytoplankton biomass, whereas the concentrations of chlorophyll a varied within a range of 1.2-19.6 $\mu\text{g/l}$. Such values means that the harbor became highly eutrophic basin, due to great supply of nutrients through both the Nile discharge and maritime activities. Consequently, Zooplankton provided great abundance, having an annual average of 82×10^3 individuals/ m^3 , but it showed clear seasonal fluctuation ($11 \times 10^3 - 223 \times 10^3$ individuals/ m^3). It is also to be expected that the eutrophication problem will increase with time and could lead to deterioration of water quality and the whole system. Such problem requires full attention, continued monitoring and more serious management.



Session (14): Hydrobiology

Oral Presentation

New Records of Errant Polychaetes from Mediterranean Coastal Waters Off Alexandria, Egypt

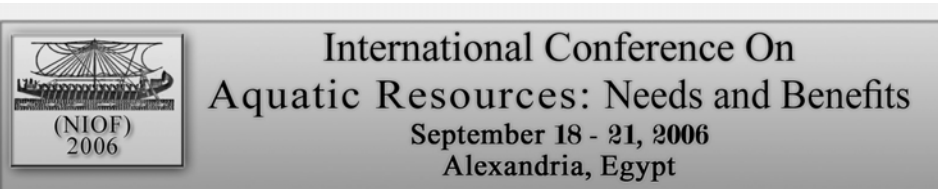
Samia A. Selim¹, Fayza Abdel Naby¹, All A.-F. A. Gab-Alla², Abdel Fattah A. Ghobashy³

¹National Institute of Oceanography and Fisheries, Kayed Bey, Alexandria, Egypt

²Marine science Department, Suez Canal University, Ismailia, Egypt

³Zoology Department, Suez Canal University, Ismailia, Egypt

Twenty-five newly recorded errant polychaete species belonging to eight families and 17 genera were reported from the coastal waters of Alexandria. All records were identified to species level except one worm to generic name (*Phyllodoce* sp.) and another unidentified. In order to achieve this study, fouling attachments were scraped from five sites representing different hard substrates during two years sampling program in 2000-2001. A summary of the main taxonomic characters and distribution of each species are dealt with. The geographic distribution of the new records classifies them into different faunal forms: the Atlantic-Mediterranean species (nine species), cosmopolitan or circumtropical species (four species), form with species restricted to one ocean (two species), species reported from the Mediterranean Sea (two species), and species disappeared from one of the major oceans and known from the Mediterranean Sea (three species). The remaining species were of irregular appearance. It has been concluded that Alexandria errant polychaete fauna is similar to that known from the Mediterranean Sea in general. The presence of *Ophiodromus agilis* at highly polluted areas may interpret its ability to withstand different stresses of pollution. So, it could be considered as environmental indicator.



Session (14): Hydrobiology

Oral Presentation

New Records of Sedentary Polychaetes from the Mediterranean Coastal Waters of Alexandria, Egypt

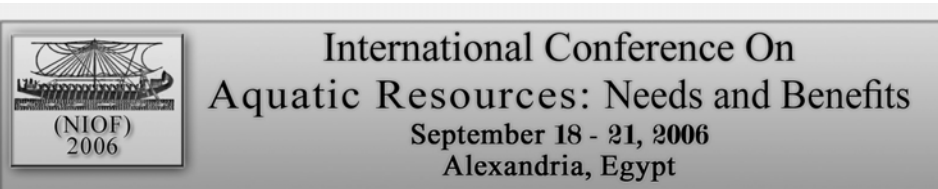
Samia A. Selim¹, Fayza Abdel Naby¹, Ali A.-F. A. Gab-Alla², Abdel Fattah A. Ghobashy³

¹National Institute of Oceanography and Fisheries, Kayed Bey, Alexandria, Egypt

²Marine science Department, Suez Canal University, Ismailia, Egypt

³Zoology Department, Suez Canal University, Ismailia, Egypt

Seventeen sedentary polychaete species, not previously recorded in the Egyptian water, were identified to species level. Among them only one species was identified to its generic name (*Hydroides* sp.). The main taxonomic characters and distribution of each species are dealt with. Investigated samples were collected from five sites of different habitats among fouling aggregations scattered along the Mediterranean waters off Alexandria. The geographic distribution of the recorded species showed that; most of them belong to the Atlantic-Mediterranean faunal form. Only one species is circumtropical (*Hypsicomus phaeotaenia*), and another is cosmopolitan (*Sabellaria spinulosa*).



Session (14): Hydrobiology

Oral Presentation

Comparative Study on the Plant Diversity of the Egyptian Northern Lakes

Kamal H. Shaltout¹ and Tarek M. Galal²

¹Botany Department, Faculty of Science, Tanta University

²Botany Department, Faculty of Science, Helwan University

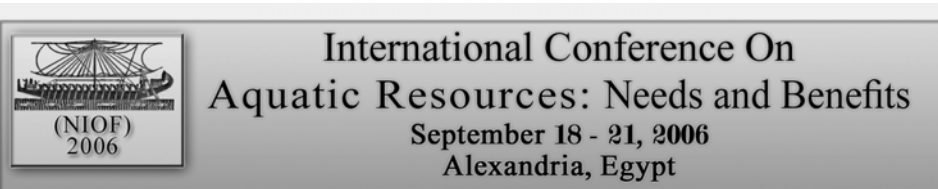
Five wetland lakes of global importance for the migratory birds, extend along the Egyptian Mediterranean coast: Mariut (63 km²) on the western coast, Edku (126 km²), Burollus (410 km²) and Manzala (1200 km²) on the Deltaic coast and Bardwell (650 km²) on the Sinai coast. The current status of the vegetation of these lakes was studied on the light of severe human impacts in this region. All these lakes, except Bardwell, receive excessive amounts of agricultural and industrial drainage water that is loaded with different pollutants; in addition to over-fishing, over-grazing and over-cutting. Some 402 plant species (approx. 19% of the whole Egyptian flora), categorized into 32 plant communities, were identified in these lakes. Seven of these species are endemics. Lake Bardwell is still characterized by pristine conditions, followed by Lake Burollus; both are declared as Ramsar sites for the conservation of the migratory birds. On the other hand, Lake Mariut is subjected to severe human impact including habitat destruction and modification. This paper focuses also on the Egyptian efforts for the conservation and management of these wetlands, which include declaring the whole Lake Burollus, part of Lake Manzala (i.e. Ashtum Al-Gamil) and part of Lake Bardwell (i.e. Zaranik) as managed protected areas. Formal management plans, based on the ecosystem approach, are applied in Lakes Burollus and Zaranik protected areas.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 15

Coral Reef Ecology (*continued*)



Session (15): Coral Reef Ecology (*continued*)

Oral Presentation

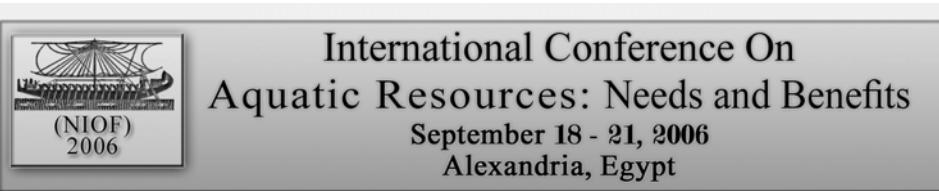
Recycling and Retention of Some Trace Metals in the Mangrove Sediments, Red Sea, Egypt

Mahmoud A. Dar¹ and Abeer A. El-Saharty²

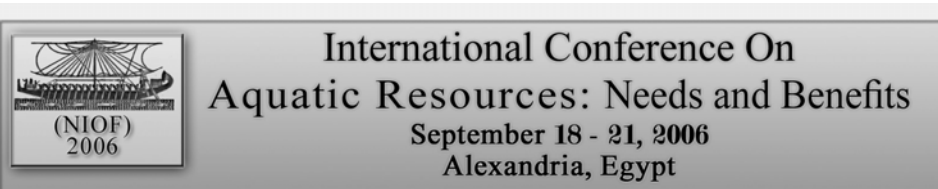
¹National Institute of Oceanography and Fisheries, Hurghada, Red Sea, Egypt

²National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

The recycling and retention of; Fe, Mn, Cu, Zn, Pb and Cd were studied in the fine fraction sediments (ϕ_3 , ϕ_4 and ϕ_5) of three mangrove forests representing different natural and anthropogenic settings in the district between Hurghada and Qusier cities. The average total percentage of these fractions is fluctuating between 36.92% at Abu Minqar Island and 55.24% at Abu Hamra Downstream from the total sediment percentages. In the different localities, iron content shows subequal values in the three fractions, the total average varied between 2489.49 ppm at Safaga Island and 3076.07 ppm at Abu Hamra Downstream. Mn, Zn, Cu and Pb are mainly concentrated in ϕ_5 , which means that the trace metals occurrence is related to the finest sediments much more than the coarsest. Abu Hamra Downstream recorded the highest total average Mn (574.88 ppm) followed by Abu Minqar (479.62 ppm). Safaga Island recorded the highest total average contents of; Cu (67.49 ppm), Zn (49.54 ppm) and Pb (28.36 ppm) due to the presence of continuous supply of anthropogenic sources restricted to the navigation activities, shipping operations and the shipyards. Cd was insignificant in different localities, it recorded very low concentrations (< 1 ppm). Metal retention in the mangrove sediments is probably controlled by finest sediment accumulation, iron and manganese concentrations and the organic matter decomposition. In the anoxic conditions, sulphate and hydroxides reduction produce metal sulfides which are the more stable forms. Conversely, metal recycling in these ecosystems is attributed to oxic conditions providing. The burrowing operations by the living organisms and the tidal duration as well as the mangrove roots are oxygenating the surrounding sediment bed; subsequently large amounts of sedimentary sulphides are converting to metal mobile forms. The present study indicates that the mangrove forests



in Egypt are not threatened by the heavy metal pollutions. The recorded concentrations are mostly less than those recorded in many mangrove localities around the world.



Session (15): Coral Reef Ecology (*continued*)

Oral Presentation

Possible Causes, Consequences of Changes and Future of Coral Reef in Dahab, Gulf of Aqaba, Red Sea, Egypt

Mohammed S. A. Ammar^{1*}, Jessica Boumeester², Bernhard Riegl³,
Jacque Hausser², Alexander Keck⁴

¹National Institute of Oceanography and Fisheries, Suez, P.O.B: 182, Egypt

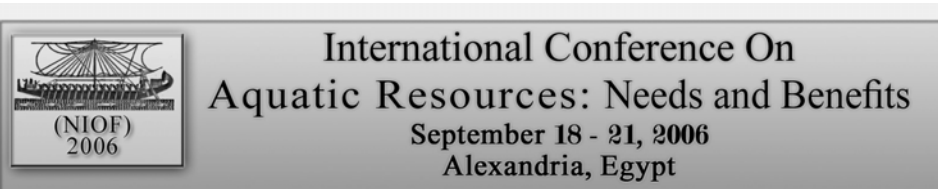
²Department of Ecology and Evolution, University De Lausanne, Switzerland

³National Coral Reef Institute Oceanographic Center, Florida, USA

⁴Dahab Associated for Environmental Development Co Dive In Dahab, Egypt

*E-mail: shokry_1@yahoo.com

The possible causes and consequences of changes to the coral reef in different sites of Dahab, South Sinai, Egypt have been studied during the months October to December 2004. A total of 126 species of corals were identified, 107 of which were hard corals. No significant correlation was found between the number of divers (or snorklers) and each of diversity indices or percent dead corals. The percent cover of live corals was significantly lower at Laguna, compared to all the other sites and this is attributed to the effect of crown-of-thorns. Although the dive site of Mashraba is proximate to the flood zone, no impact due to excessive sedimentation or reduced salinity has been detected. Soft corals tended to increase with the flood distance and dead corals tended to decrease, but the correlation of both of them with the distance of the annual floods was not significant. Lighthouse is the most commonly used reef in Dahab as it is closer to most diving centers. Dahab is becoming more and more popular for tourism; number of divers per site exceeds the diver carrying capacity (DCC). Construction of hotels, roads and beach cafes all pose potential threats. Damage is present and needs to be slowed down if we want to conserve these unique ecosystems for future generations. Coral reefs generate numerous benefits, defined as ecosystem services that has been also impacted and needs innovative government policies and effective monitoring to be restored.



Session (15): Coral Reef Ecology (*continued*)

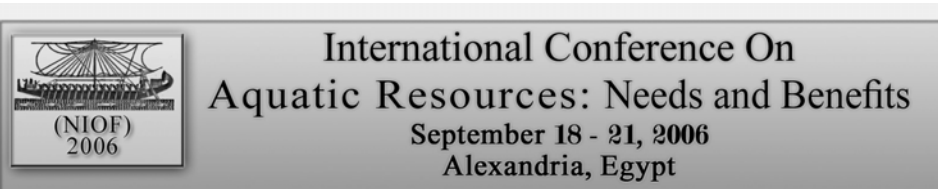
Oral Presentation

Effect of Water Quality Deterioration on Coral Community Structure in the Northern Red Sea

Abdel-Hamid A. M. Ali and Mohamed A. Hamed

National Institute of Oceanography and Fisheries, Suez, Egypt

Fifteen water quality parameters and nine coral community variables were assessed in eight reef sites along the Red Sea Coast of Egypt. Corals and reef environments are under stress from increased anthropogenic activities, particularly in the vicinity of heavily populated and tourism-popular areas such as Hurghada, El-Ain Al-Sukhna and Sharm El-Sheikh. Increased terrestrial runoff of sediments, nutrients, organic matter and other pollutants are the main causes of water quality deterioration in the investigated reef sites. The results showed that bioerosion of corals by sea urchins, and enhanced abundance of macroalgae and consequent competitive overgrowth of corals were the major causes of coral damage observed in the area of study. Population density of sea urchins exhibited significant and positive correlations with the majority of eutrophication parameters. Salinity was significantly and negatively correlated with live hard coral cover. Exceeding levels of DIN and TSM above the threshold concentrations for eutrophication indirectly and adversely affecting coral reef through stimulating the growth of macroalgae, enhancing sea urchin density and reducing water transparency. The results support the predictions of bottom-up hypothesis that confirm the critical role of eutrophication in structure of coral community.



Session (15): Coral Reef Ecology (*continued*)

Oral Presentation

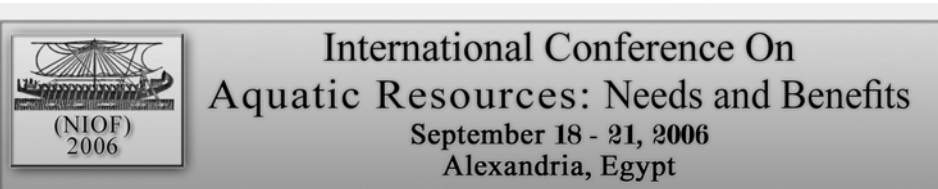
Pigments and Iodine Contents in Seagrasses in the Egyptian Red Sea Waters

Adel Amer* and Y. Genid

National Institute of Oceanography and Fisheries, Suez, Egypt

*E-mail: aa682000@yahoo.com

Pigments (chlorophyll *a*, chlorophyll *b* and β -carotene) and iodine concentrations were determined in five species of seagrasses (*Halophila stipulacea*, *Halodule uninervis*, *Halophila ovalis*, *Thalassodendron ciliatum* and *Thalassia hemprichii*) collected from sixteen sites along the Red Sea proper, Gulf of Aqaba and Gulf of Suez. Chlorophyll *a* has the highest average concentration of pigments (5.066 mg/100 gm), while very low contents of β -carotene with an average of 0.0004 mg/100 gm were recorded. The minimum concentrations of chlorophyll *a*, chlorophyll *b* and β -carotene were recognized at Ras Abu Somah site, while the maximum concentration of chlorophyll *a* was found at El-Kafrawy project (12.158 mg/100 gm). *H. stipulacea* possess the lowest and highest values of chlorophyll *a*. *H. uninervis* had the highest concentration of Chlorophyll *b* (10.918 mg/100 gm). High significant correlation was found between chlorophyll *a* and chlorophyll *b* ($r = 0.779$). Low iodine contents were found in the investigated seagrass species that ranged from 0.021 for *T. ciliatum* to 0.038 g/100 gm for *H. uninervis*, with an average value of 0.031 g/100 gm. The highest mean of iodine contents within seagrass species was recorded with *T. hemprichii*, while the lowest mean was recognized with *T. ciliatum*. Except the maximum reading of *T. ciliatum* (0.026 g/100 gm) at Ras Burkha; all the minimum and maximum values of iodine in the studied seagrasses were found in the Red Sea proper.



Session (15): Coral Reef Ecology (*continued*)

Oral Presentation

Evaluation, Distribution and the Coral Diversity in Some Coastal Lagoons, Red Sea, Egypt

Tarek Abd El-Aziz A. Mohammed

National Institute of Oceanography and Fisheries, Marine Biology Station,
Hurghada, Egypt
E-mail: tare_mote@yahoo.com

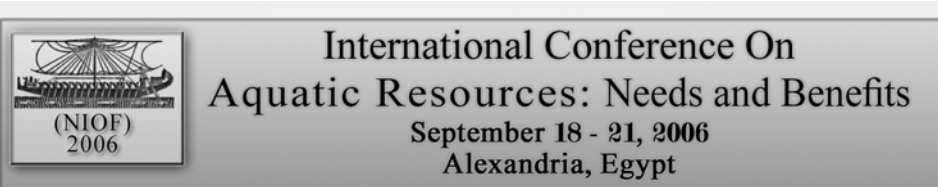
Coral reef and the factors that affect their biodiversity and richness, as well as the human impact on their biological structure were studied in four coastal lagoons along the Red Sea. These lagoons represent different natural and human stresses such as; land filling, boat mooring, overfishing and navigation activities. Line Intercept Transect (LIT) method was applied in the coral reef evaluation. The highest coral cover was recorded at Safaga Beach and Mersa Shuni lagoons (71.57% and 71.18% respectively), while the lowest coral cover (44.45%) was recorded at Abu-Shaar lagoons. Mersa Shuni lagoon shows high coral diversity, richness, evenness index, number of species and number of colonies (3.4, 7.08, 0.96, 34 and 106 respectively). Obviously, this is due to the absence of human stresses. Strong positive relationships were observed between the coral diversity, number of species and evenness index in the different lagoons. The environmental characteristics variations and biological interaction between benthos, the anthropogenic activities, lagoon surface area, bottom topography and geomorphology, number of water inlets are major factors controlling the coral distribution.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 16

Environmental Evaluation



Session (16): Environmental Evaluation

Oral Presentations

Sustainable Development Concept of Ecotourism in Egypt

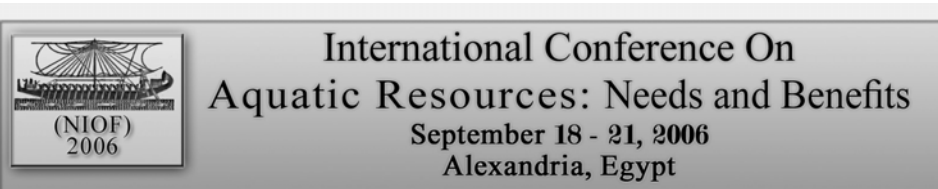
Ali M. A. Abd Allah^{1*}, Eman Siam² and Ahmed M. Ibrahim¹

¹National Institute of Oceanography and Fisheries, Kayet Bey, Alexandria, Egypt

²Arab Academy of Science and Technology & Maritime transport

*E-mail: Abdallah@wwwsol.com

Ecotourism in Egypt has witnessed rapid growth during the last decade. With a share of around 25% of the Middle East ecotourism market, Egypt has witnessed a tourism growth rate of 10%, which is higher than the world average (7%). In 2002, international tourist arrivals to Egypt reached 5.5 million, with a growth rate of 14.8% from 2000. This growth is reflected by an increase in international tourist nights, international tourist receipts, hotel occupancy levels and hotel decrease in 2001 because of the political conflict in the region and the September 11th events. Egypt attracts tourists for a range of purposes, mainly recreational, to a variety of destinations, and from a variety of countries, particularly from Europe. As a database, almost all international visitors (approximately 80% of the total arrivals count in 2004) use air transport to travel to Egypt's tourism regions. Nevertheless, World Travel and Tourism Council (WTTC 2004) estimates are generally positive for Egypt, suggesting that the country will succeed in its steady effort to maintain its overall Travel and Tourism global ranking. Demand for Egyptian Travel and Tourism goods and services are expected to total US\$ 16.0 billion in 2005 and US\$ 30.3 billion in 2015. This will allow Egypt to maintain its current position in the overall ranking. Egypt's Travel and Tourism Economy is expected to account for (directly and indirectly) 3.3 million jobs in 2005, representing 13 percent of the country's total employment. By 2015, this should increase to 4.1 million jobs or a share of 0.3 percentage points higher, permitting Egypt to retain its 12th position in the global ranking.



Session (16): Environmental Evaluation

Oral Presentations

Overview of the National Parks in Egypt

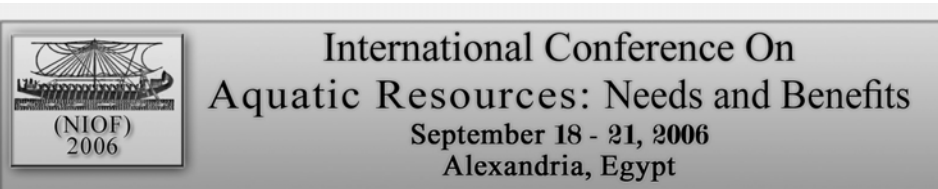
Ali M. A. Abd Allah^{1*}, M. A. El-Sabrouti² and Aly I. Beltagy¹

¹National Institute of Oceanography and Fisheries, Kayet Bey, Alexandria, Egypt

²Oceanography Department, Faculty of Science, Alexandria University, Egypt

*E-mail: Abdallah@wwwsol.com

By issuing the Egyptian law No. 102 for 1983, concerning the establishment of Protected Areas, 24 Protected Areas have been declared in Egypt, of a total area of 75,000 km², or 9.5% of the countries total land area, and representing several of the country's main natural regions. Protected Areas are administrated by the Nature Conservation Section of the Egyptian Environmental Affairs Agency (EEAA). Hunting and trade in wildlife resources are problems which have received considerable attention by EEAA in recent years, with a fair amount of success that had been achieved. Nature conservation efforts in Egypt have focused primarily on establishing Protected Areas, with the objective of protecting the countries best known sites of outstanding biodiversity/natural value. This is with the aim to maintain the diversity and viability of the various components of Egypt's biodiversity, and to ensure their sustainable utilization.



Session (16): Environmental Evaluation

Oral Presentations

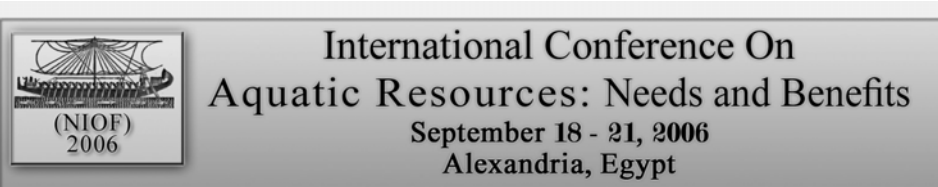
Combined Use of Satellite Imagery and Field Data for Interpretation of Pollution Pattern in Abu Qir Bay, SE Mediterranean, Egypt

Wahid M. Moufaddal

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey,
Alexandria, Egypt

E-mail: wahid_moufaddal@gawab.com

Among other environmental problems along the Egyptian Mediterranean coast, pollution of the coastal waters is of greatest concern because of its adverse effects on human health and negative impacts in ecology, and ecosystems. This problem is very alarming, particularly, in Abu Qir Bay, which was selected by the MED POL programme as a high priority "Hot Spot" area that needs urgent remedial actions. Although, there has been a great deal of multidisciplinary research directed towards problem of pollution of the coastal waters of the Egyptian Mediterranean coast, contributed of remote sensing to this issue in this area is still very weak, indeed. The present study attempts to show potentially of satellite imagery for revealing the state of pollution and pollutants' types in a very important urban area such as Abu Qir Bay. Through utilization of 8 images from the Landsat ETM+ and MODIS sensors, it was possible to reveal the spatial distribution of the dominant pollutants in one of the most heavily polluted coastal areas in the southeastern Mediterranean. Results of remote sensing were integrated with available field data on hydrodynamic and coastal processes so as to interpret sources and distribution pattern of the prevailing pollutants. Examples provided in this study, show that satellite images can provide very important information, not only on location and sources of marine pollutants and effluents but also, on the spatial pattern of contaminants throughout the coastal waters.



Session (16): Environmental Evaluation

Oral Presentations

Impacts of unsustainable tourism on the Egyptian coastal ecosystem: A Remote Sensing Assessment to Some Case Studies from the Egyptian Red Sea Coast

Wahid M. Moufaddal

National Institute of Oceanography & Fisheries, El-Anfoushy, Kayet Bey,
Alexandria, Egypt

E-mail: wahid_moufaddal@gawab.com

The Egyptian Red Sea Coastal zone, particularly, at Hurghada and Sharm El-Shiekh, represents one of the most attractive and important sectors along the entire Red Sea. Unfortunately, the coastal ecosystem of this unique zone is being subjected to great pressures from various developmental activities, particularly, coastal tourism development and recreational activities. Resort development and tourism activities along the Egyptian sector of the Red Sea are ongoing actively and rapidly since the early eighties. Regrettably, most of this development was rapid, uncontrolled and not environmentally sound. Enforcement and surveillance of the environmental laws and legislation was also weak and ineffective in the region. In response to this, signs of environmental degradation have appeared and the state of coastal habitats has demonstrated such degradation to unprecedented levels in many locations along the Egyptian Red Sea. In order to protect the coastal ecosystem, managers and decision makers need accurate figures and information on source, type and volume of activity which may deteriorate or damage the coastal environment. In this respect, remote sensing can provide very important information on the prevailing activities and their impacts on the coastal environment. In this study, some case studies from the Egyptian Red Sea coast at Hurghada and Sharm El-Shiekh have been demonstrated so as to show how the improper management of activities prevailing at these two areas are damaging the coastal ecosystem and the associated habitats. The approach which has been followed to reveal these impacts was based on remote sensing analysis to multivariate Landsat (TM and ETM+) data covering both areas. Through application of some of the most effective change detection techniques, it was possible to depict some of human infringements in both areas and to provide, in some cases,



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

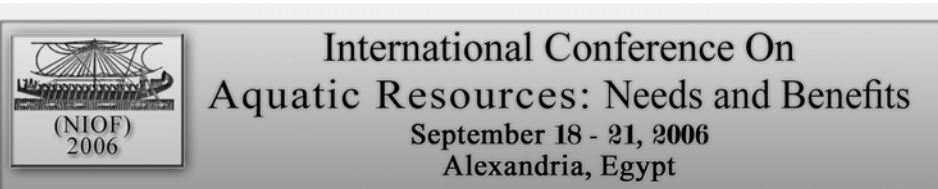
exclusive evidences for the damaging effect of some improper tourism practices. The experiences gained from this study may provide practical lessons for proper management of coastal zone of Hurghada and Sharm El-Shiekh, as well as for better planning of the other prestine on the Egyptian Red Sea coast.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 17

Hydrobiology (*continued*)



Session (17): Hydrobiology (*continued*)

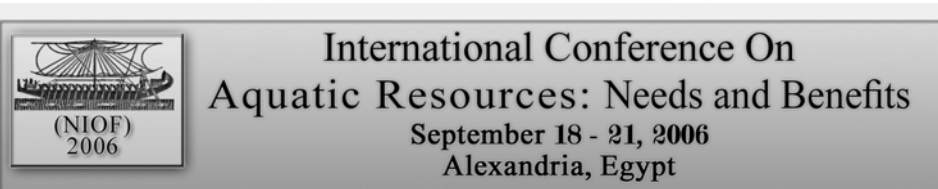
Oral Presentation

Using Multivariate Analyses to Inferring if Salinity or Other Chemical Characters Regulate Benthic Algal Distribution in Hypersaline Mediterranean Lagoon (Bardwell Lagoon, Egypt)

Mohamed S. Abdel-Karim Mohamed H. H. Ali and Mohsen F. Sayed

National Institute of Oceanography and Fisheries, Egypt

The distribution of benthic algal communities in relation to salinity and some chemical conditions in addition to some heavy metals were studied in the sediments of Bardwell Lagoon from January to December 2004. The lagoon's sediments are generally poorly in organic matter and phosphate content, accompanied with high carbonate values. The sediments are slightly enriched with exchangeable nitrogen salts. The sediments of two artificial inlets (Boughaz I and II) have higher nitrate and orthophosphate values in antagonistic manner for ammonia and silicate. The recorded heavy metals values still lower than the standard permissible levels. 214 species belonging to 3 classes were identified. Diatoms group was the most dominant; it was represented by 164 species. On the other hand, cyanophytes group was the most abundant, with annual average percentage abundance of 80.7%. The two groups were more abundant at Boughaz II compared to Boughaz I. Diatoms were more abundant in the eastern area of the lake, while the cyanophytes were almost similar at both areas Canonical Correspondence Analysis (CCA) indicated that chemical parameters have marginal effects in algal groups distribution, while a slight confidence effects on some species distribution was observed. Clear effects were observed for weather conditions and salinity on both groups and species.



Session (17): Hydrobiology (*continued*)

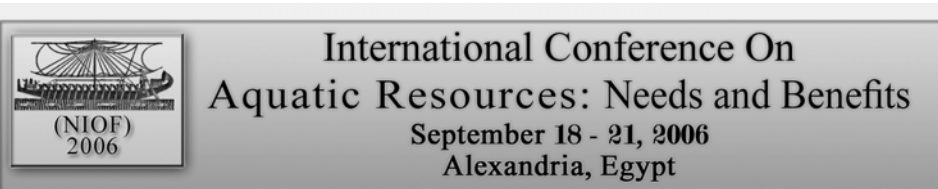
Oral Presentation

Effect of Some Macrophytes Extracts on Growth of *Aspergillus Parasiticus*

Amany Mohamed Haroon

National Institute of Oceanography and Fisheries, Cairo, Egypt

The present study was undertaken to evaluate the effect of methanol extracts of some common and widely distributed macrophytes namely: *Potamogeton pectinatus* L., *Ceratophyllum demersum* L., *Eichhornia crassipes* (C. Mart.) Solms, *Saccharum spontaneum* L., *Polygonum tomentosum* L. (Leaves and stems), collected from Lake Manzalah on the growth of toxigenic strain of *Aspergillus parasiticus* in a chemically defined media. Results revealed that, all tested plants extracts showed an inhibitory effects on growth of *Aspergillus parasiticus* as compared to the control. The inhibitory effects of those extracts increased with increasing their concentrations (20, 30 and 40 mg/ml). The maximum values of inhibitions for all tested plants varied from 76.13% of the control value for *Polygonum tomentosum* leaves to 88.05% of the control value for *Potamogeton pectinatus* at a concentration of 40 mg/ml. The minimum values varied from 35.44% of the control value for *Polygonum tomentosum*, to 45.01% of the control value for *Saccharum spontaneum* at a concentration of 20 mg/ml. The phytochemical screening for some active and important substances (Tannins, Flavonoids, Saponins, Terpenes, Alkaloids and Glycosids) were carried out in the methanol extracts of all the tested plants. The results revealed the presence of alkaloids, flavonoids and glycosids in all studied plants. While saponins were absent from *Eichhornia crassipes*, terpenes were absent from *Potamogeton pectinatus* and tannins were absent from *Eichhornia crassipes*, *Saccharum spontaneum* and *Polygonum tomentosum*.



Session (17): Hydrobiology (*continued*)

Oral Presentation

Effect of El-Nasr Tanneries Wastewater on the Growth and Some Metabolic Activities of *Navicula Cancellata* (Donkin) Isolated from Alexandria Coastal Water

Hanan M. Khairy

National Institute of Oceanography and Fisheries, Egypt

El-Nasr leather tanneries dispose of about 2000 m³/day of untreated wastewaters that are discharged directly into the shore area of El-Mex Bay near Alexandria. Diatom *Navicula Cancellata* (Donkin) was isolated from Alexandria coastal water, and by using some experimental design methodology an optimized medium for the species was developed. Results of Plackett-Burman design showed that the effect of most studied elements tested within a range of high and low concentrations were significant. Results of the 2⁸⁻⁴ fractional factorial design applied at three steps showed that Na; Sr; Fe; Co; Cu; SiO₃; Br and F are the most effective elements for its growth. By using the steepest ascent methodology, the growth of the tested species on its optimized media attained 2904 x 10³ cell/ml at the beginning of stationary phase. The effect of different concentrations of crude leather tanning wastewater on *Navicula Cancellata* showed stimulatory effect at low concentrations (7%). This was accompanied with elevation of pigment contents, carbohydrate content, total soluble protein content and nucleic acids contents. On the other hand, inhibition of all studied parameters was observed when the culture was treated with higher wastewater concentration (20%); its external frustule was changed, and the epitheca was damaged.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session (17): Hydrobiology (*continued*)

Oral Presentation

Assessment of Eutrophication in Lake Timsah, Suez Canal, Egypt

Fedekar F. Madkour*, Maher A. Aamer and Mohsen M. El Sherbiny

Department of Marine Science, Suez Canal University, Ismailia, Egypt

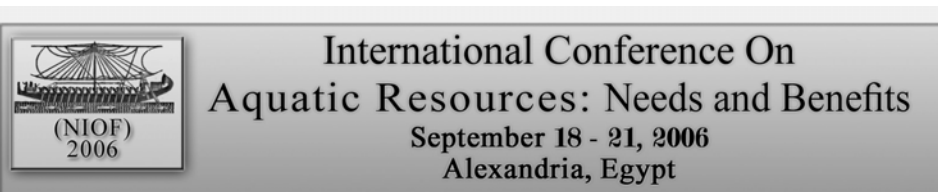
*E-mail: fedekarmadkour@yahoo.com

Lake Timsah is one of a series of lakes through which the passes the Suez Canal. It receives sewage and agricultural wastewaters from a shallow western lagoon. These discharges play an important role in determining water quality and affect the eutrophication level of the lake. To assess the trophic status of the lake, seasonal distribution of physico-chemical parameters and phytoplankton biomass were carried and studied during the period between autumn 2005 and summer 2006. Ten stations were chosen; one is located in the western lagoon, three in the navigational route and the rest distributed throughout the lake to cover all the localities that represent the impact of the different human activities in the lake. The results indicated the presence of different habitats in the study area. The fresh water habitat at western lagoon with salinity that did not exceed 1 psu, high turbidity (maximum Secchi disc reading was 50 cm) and high levels of nutrients with maximum values of 6.43 $\mu\text{-at/l}$ for phosphate, 42.17 $\mu\text{g-at/l}$ for nitrate, 1.21 $\mu\text{-at/l}$ for nitrite and 36.45 $\mu\text{g-at/l}$ for silicate. The brackish water habitat was restricted to the surface layer of the lake, particularly the western side with surface salinity that ranged between 5 and 26psu. This habitat exhibited wide ranges of nutrient concentrations (0.43-5.33 $\mu\text{g-at/l}$ for phosphate, 2.77-36.68 $\mu\text{g-at/l}$ for nitrate, 0.09-0.65 $\mu\text{g-at/l}$ for nitrite and 2.68-21.52 $\mu\text{g-at/l}$ for silicare). The marine water habitat in the eastern side and in the navigational rout showed salinities that ranged between 37 and 40psu at the surface and more than 39psu at the bottom. This habitat is characterized by higher water transparency, with maximum Secchi-disc reading of 270 cm and low levels of nutrients. The effects of various physico-chemical quality parameters on the seasonal distribution of phytoplankton biomass, as well as the interrelation with eutrophication are discussed.



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Session 18
Poster Presentation



Session (18): Poster Presentation

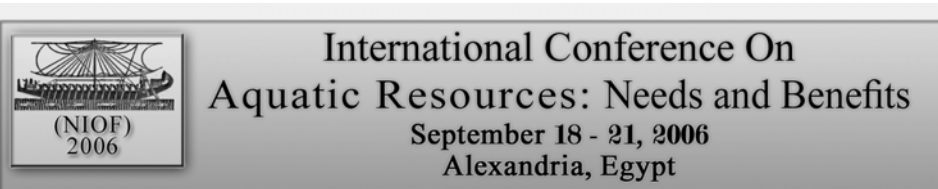
Contents and Sources of Polycyclic Aromatic Hydrocarbons and Organochlorine Pesticides in Surface Sediments of Ain El-Sokhna, Gulf of Suez, Red Sea

Azza Khaled, Ahmed El Nemr*, Tarek O. Said and Amany El-Sikaily

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

We investigated contents, distribution and possible sources of PAHs and organochlorine pesticides (OCPs) in 30 surface sediment samples from Ain El-Sokhna area in the Gulf of Suez, Red Sea. The results indicated that the contents of PAHs (16 US EPA priority PAHs) range from 0.52 to 31.71 mg/kg and the pollution extent is classified as a low level as compared to other investigations and sediment quality standards. In addition, the grain size analysis for the collected sediments was investigated. The ratios of methylphenanthrenes to phenanthrene (MP/P), anthracene to anthracene plus phenanthrene, benz[a]anthracene to benz[a]anthracene plus chrysene, indeno[1,2,3-cd]pyrene to indeno[1,2,3-cd]pyrene plus benzo[ghi]perylene (In/In + BP) suggest that the sources of PAHs in the sediment samples are mixed, with a dominant contribution from petroleum and combustion of fossil fuel. The correlation analysis shows that the PAHs contents are significantly related to total organic carbon contents (TOC) in the sediment samples. Dichlorodiphenyltrichloroethane and metabolites (DDTs) and hexachlorocyclohexanes and metabolites (HCHs) account largely for the contaminants of OCPs. The concentrations of DDTs are less than their metabolites, suggesting that DDT contamination is originating from old activities. The concentrations of PAHs and OCPs are generally much lower than the permissible levels, showing that the studied locations were relatively unpolluted.



Session (18): Poster Presentation

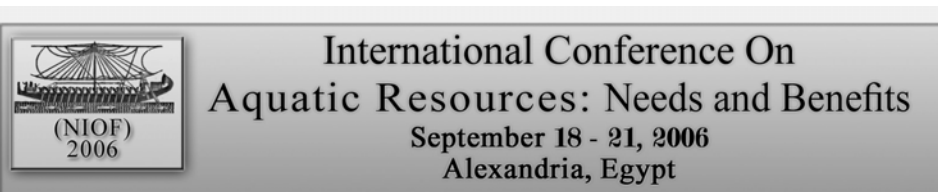
Heavy Metals in Some Fish Species and Bivalves from the Mediterranean Coast of Egypt

Mohamed A. Shreadah*, L. A. Mohamed* and M. A. Fahmy

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: m_shreadah@yahoo.com

Biota samples were collected seasonally during three consecutive years (1993 – 1995) from the Egyptian coastal region along the Mediterranean Sea for analysis of Zn, Cu, Cd, Pb and Hg. In addition to *Donax*, seven commercially important species of fish were examined to provide a comprehensive assessment of the concentrations of these heavy metals in the Mediterranean coastal region of Egypt. Despite of the presence of several land-based sources of contamination, particularly at El-Mex Bey and El-Maadiya, results showed very weak increases in the concentrations of copper, lead and mercury revealing no accumulation of these metals in the biological samples, even in non-migrant species such as *Donax*. However, an increase in the concentrations of zinc and cadmium in fish tissues was measured from 1993 to 1995. Regardless of the fish species, no significant differences were observed in concentrations of most metals between different locations and from season to season. Regarding concentrations of most metals, no interspecies differences could be measured in either fish tissue or *Donax*. The study indicated that the concentrations of these heavy metals were well below the documented toxic levels for human consumption and represent baseline levels, against which possible future heavy metal contamination can be measured.



Session (18): Poster Presentation

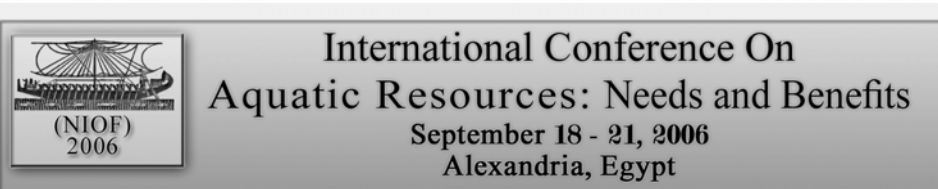
Development of Low-Cost Activated Carbon from Agricultural Waste Materials and its Application for Adsorption of Direct Dye from Artificial Textile Dye Effluent

Azza Khaled, Ahmed El Nemr*, Amany El-Sikaily and Ola Abdelwehab

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

The purpose of this study is to suggest as efficient process, which does not require a huge investment for the removal of direct dye from wastewater. Activated carbons developed from agricultural waste materials were characterized and utilized for the removal of Direct Navy Blue 106 (DNB-106) from wastewater. Systematic studies on DNB-106 adsorption equilibrium and kinetics by low-cost activated carbons were carried out. Adsorption studies were carried out at different initial concentrations of DNB-106 (50, 75, 100, 125 and 150 mg/l), contact time (5 to 180 min.), pH (2.0, 3.0, 4.7, 6.3, 7.2, 8.0, 10.3 and 12.7) and adsorbent doses (2.0, 4.0 and 6.0 g/l). Both Langmuir and Freundlich models fitted the adsorption data quite reasonably ($R^2 > 97$). The results indicated that the Langmuir adsorption isotherm model fits the data better as compared to the Freundlich adsorption isotherm model. The maximum removal capacity was 92% for 150 mg/l of DNB-106 concentration and 6 g/l carbon concentration. Various mechanisms were established for DNB-106 adsorption on developed adsorbents. The kinetic studies were conducted to delineate the effect of initial adsorbate concentration, contact time and solid to liquid ratio. On the basis of these studies, various parameters such as effective diffusion coefficient, activation energy and entropy of activation were evaluated to establish the mechanisms. The developed carbon might be successfully used for the removal of DNB-106 from liquid industrial wastes.



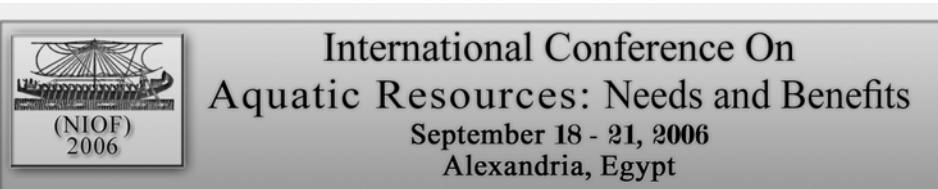
Session (18): Poster Presentation

Common Forms of Atresia in the Ovary of some Red Sea Fishes during Reproductive Cycle

Amal M. Ramadan and Magdy M. El-Halfawy

National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

Four economic fish species were collected monthly from commercial catch land at El-Attaka fish landing (*Saurida undosquamis*, *Rhabdosargus haffara*, *Nemiplerus japonicus* and *Liza carinata*). Histological examination of ovaries of these species indicated that presence of atretic oocytes (oocyte retention) as a natural phenomenon in fishes. Atretic oocytes classified into two main types depends on histological descriptions a) non bursting b) bursting. In this study, frequency of degenerating oocytes affected by the gonad maturation. In the early stages the frequency is very low increased gradually reaching its maximum ratio in spent stage about 50%. There is a significance difference between the atretic oocytes and gonad maturation ($P < 0.05$). Also, atresia affected by spawning season (Long or short). All examined ovaries in the multiple spawners (*S. undosquamis*) were atretic ovaries. But in (*N. japonicus*, *R. haffara* and *L. carinata*) about 30% - 35% which having a limited spawning season.



Session (18): Poster Presentation

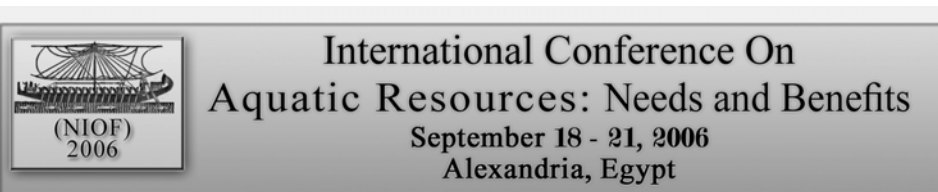
Nutritional studies on Monosex Hybrid Tilapia (*Oreochromis Niloticus X O. Aureus*)

Elham A. Wassef^{1*}, M. M. Abdella², A. K. Hammady² and M. E. Wafa¹

¹National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

²Faculty of Agriculture, Benha University, Egypt

Nowadays, culture of monosex hybrid tilapia (*Oreochromis niloticus X O. aureus*) becomes popular in Egypt. Information about dietary specifications of fish, particularly for intensification, is still required. Two-factorial design feeding trials were conducted in El-Kanater El-Khairya Experimental Fish Farm. For each trial, 12 experimental diets were evaluated for hybrid tilapia (IW, 41.34 & 39.14 g/fish for 1st and 2nd trials) reared in outdoor concrete ponds (10 m³ each) for 18 and 22 weeks respectively. The first feeding trial aimed to study the interactions between two dietary protein levels (25 or 30 %, P₂₅ & P₃₀) with three proteins to energy ratios (80, 100 & 120, E₈₀, E₁₀₀, E₁₂₀ mg P/Kcal ME) and two major lipid sources (beef tallow, BT or sunflower oil, SO). Diet contained 30% CP with 100 P/ME ratio and sunflower oil (P₃₀ E₁₀₀ SO) was recommended for monosex hybrid tilapia. For the second feeding trial, only a single diet (30% CP, 3000 kcal/ME/Kg) was used and mixed feeding schedules were applied by altering the presentation of ration size (2, 4 or 6% /d, R₂, R₄, R₆) with two feeding frequencies (2 or 3 feedings/d, F₂, F₃) at two stocking densities (25 or 50 fish/m³, D₂₅ & D₅₀). Growth of hybrid tilapia was little affected by higher stocking density and performance was significantly (P < 0.05) improved by the increase of daily feed ration. However, the optimum feed ration and frequency were 4% of biomass given as two meals per day. Effect on fish composition was also described.



Session (18): Poster Presentation

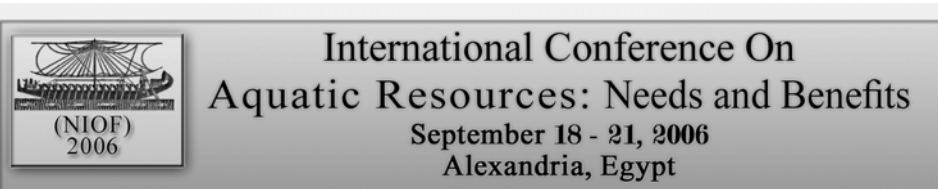
Spatial Variability of Total Mercury-load and its Relationship with methyl Mercury Content in Adjoining Water Bodies of Integrated Steel Plant in India

Shamsh Pervez* and Anubhuti Koshle

School of Studies in Chemistry, Pt. Ravishanka Shukla University, Raipur
Chhattisgarh, 492010, India

*E-mail: shamshp@yahoo.co.in, Tel.: 91-9425242455

Coal burning in steel industry is the chief source of mercury presence in the surrounding environment. The steel industry located in the study area is producing 6 million tones of saleable steel and consuming 0.414 tonnes of coal/tonne of steel. The iron and steel industry, the single largest source of huge quantities of particulates, was reported to contain mercury as high as 0.95-1.02 ppm in dust fall out and 40-72 ppm in surface soils. About 20 water store ponds and three water streams passes from adjoining areas. Symptoms of mercury poisoning have been diagnosed in many of the hospital admissions. Measurements of mercury level in various environmental matrices around this industrial area started in the early 80's. During 80's to 90's few samples have been analyzed for mercury content, but from 1995 comprehensive assessment of mercury-load along with other toxic metals in various environmental matrices is being carried out.. The presented work is focused on spatial variability and correlation of total mercury content with methylmercury fraction. The identified sites of water bodies in study design very well explain the up and down wind patterns. Water and sediment samples of pond and natural streams located near to identified sites have been collected and analyzed for total mercury content using ICP-AES. Frequently was 12 sets (one set in each month through out the sampling year). Each set consists of 5 samples from selected points of each matrix. In case of industrial outlet effluent streams, samples of water and sediments of effluent streams, at confluence point with natural water streams and also in up and down streams, were collected. Methylmercury was analyzed by GC-MS using reported protocol. Data were statistically analyzed (descriptive statistics, variance and regression) and documented. Water Methylmercury concentrations have shown strong positive correlations with sediment mercury in cases of ponds. High spatial variability in Hg levels has been obtained.



Session (18): Poster Presentation

Alexandria's Treatment Plants Efficiency and Proposed Approach for Mitigation

Ali M. A. Abd Allah^{1*}, Osman A. El-Rayis², Mahmoud M. Abbas³ and Mohammed S. El-Adawi³

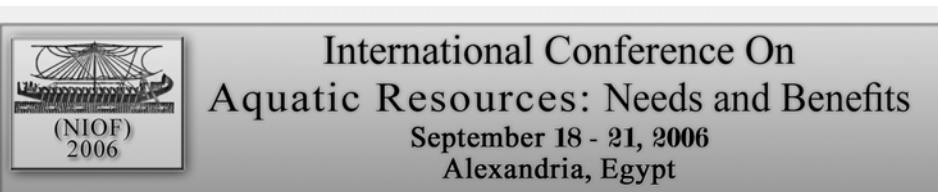
¹National Institute of Oceanography and Fisheries, Kayet Bey, Alexandria, Egypt

²Oceanography Department, Faculty of Science, Alexandria University, Egypt

³Civil Engineering Dept., Faculty of Engineering, Alexandria University, Egypt.

*E-mail: abdallah@wwwsol.com

In 1993, Alexandria Organization for Salinity Drainage (AOSD) has erected two waste treatment plants to deal primary with both sewage and industrial effluents before discharging into Lake Maryout (Main basin, important fishing area, 6000 feddans). This is in order to reduce their impacts exerted on the ecosystem of this vital basin. Today, these plants are currently able to reduce the organic and TSS loads by only 48% of their corresponding initial loads in the raw wastes in their inlets. Unfortunately, capacity and other water quality parameter still over those corresponding permissible levels, recommended by the Egyptian Environmental Affairs Agency. To reach such permissible levels, more advanced treatment technique like secondary treatment processes, are urgently needed. In the mean time, the current effluent from the treatment plants must be either diverted or being diluted enough prior to its discharge into the lake. Urgently, restoration, rehabilitation and sustainable development concept to lake Maryout is needed. Besides the plans that exist in the national waste water sector plans, at least two waste water treatment plants must be established in the area west of Alexandria to serve the area from El-Mex and El-Agami and to complete the sewer system to cover all areas with this service. Privatization of industrial sector may transfer industrial waste water treatment to the new owners in the near future.



Session (18): Poster Presentation

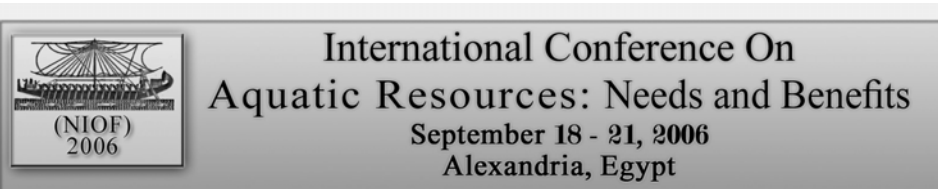
Removal of Basic Dye (Methylene Blue) from Simulated Textile Dye Effluent by Activated Carbon Developed from Rice Husk

Amany El-Sikaily, Ahmed El Nemr*, Azza Khaled and Ola Abdelwehab

Department of Pollution, Environmental Division, National Institute of Oceanography and Fisheries, El-Anfoushy, Kayet Bey, Alexandria, Egypt

*E-mail: ahmedmoustafaelnemr@yahoo.com

Wastewater from industrial activities contain pigments and dye that can cause serious water pollution problems in the form of reduced light penetration and photosynthesis, and toxicity from the heavy metals associated with these pigments and dyes. Laboratory investigations of the potential use of activated carbon developed from rice husk as an adsorbent for the removal of basic dye methylene blue from aqueous solution were conducted. Two methods of activated carbon were used in this study. A series of experiments were undertaken in an agitated batch adsorber to assess the effect of the system variables, i.e. sorbent dosage (1.0, 2.0, 3.0, 4.0 and 5.0 g/l), pH (1.3, 2.0, 3.1, 6.3, 7.1, 8.5 and 10.2), initial dye concentrations (50, 75, 100 and 125 mg/l) and contact time (5 min to 180 min). The results showed that as the amount of activated carbon increased, the percentage of dye adsorption increased accordingly. At pH~1, the removal of dye was slightly favorable (88%), while the removal at other pHs (3.0-4.0) was remarkable (99%). There was a significant difference in the dye concentration remaining when the pH was increased from 4 to 11.0. The removal time of the dye was influenced by the initial dye concentration, and the process followed the pseudo second order rate kinetics ($R^2 > 98$). The isotherm equilibrium data were fitted well by the Langmuir and Freundlich models ($R^2 > 96$). The adsorption capacity of this adsorbent for methylene blue removal is found to be comparable to the commercial activated carbon.



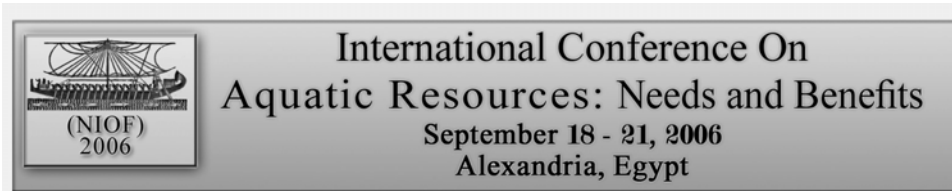
Session (18): Poster Presentation

Le Littoral Ivoirien: L'Analyse des Avantages et des Contraintes en Vue de Définir une Strategie de Gestion Durable

Sankare Yacouba

Center de Recherches Océanologiques, 29 Rue des Pêcheurs BPV 18 Abidjan (Côte d'Ivoire)

Avec 4 millions d'habitants soit un quart de la population ivoirienne, le littoral ivoirien est un environnement varié et diversifié. Long de 566 km, il est sableux entre le Ghana et Fresco et présente des falaises entre Fresco et le Libéria. Il présente par ailleurs plusieurs paysages à savoir des dunes, des forêts, des savanes, des milieux lagunaires, des mangroves, des marécages, des parcs et des forêts classées d'importance internationale etc. Le littoral regorge de Presque toutes les activités économiques du pays: deux ports, voies de communication, industries agro-alimentaires, tourisme etc. A côté de ses avantages qui devaient mettre en valeur le littoral. Il existe de nombreuses contraintes qui freinent le développement durable de celui-ci: Pollution et nuisances, érosion côtière, conflits fonciers, mauvaise valorization du patrimoine, insuffisance de réglementation, insuffisance de politique et d'outils de gestion et pratiques et comportement peu responsables. Devant ce tableau et enfin de promouvoir un changement de comportement et de pratiques. Le centre National de Gestion de L'Information et des Données Océanographiques de Côte d'Ivoire (CNDO-CI) a opté pour sa contributions dans la estion intégrée et durable du littoral de mettre l'accent sur la realization de produits documentaires d'information et de sensibilisation comme les bulletins d'information, les fiches techniques, les cartes ou tableaux de marée, les calendriers éducatifs.



Keynote Speaker: Mr. Aly Adam Aly Hassan

Prospects of Marine Fish Breeding



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Round Table Discussion
Operational Oceanography and National
Security



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Announcement

2nd International Conference on Aquatic Resources: Integrated Management and Sustainable Development (November 2007)

Objectives:

- (i) To introduce and share experience in the field of resource management, its basic elements and essential requirements;
- (ii) To present and discuss the principles for, and practical approaches to the wise use and sustainable development of the marine environment, the coastal areas and the associated ecosystems, such as coastal lagoons, estuaries, river basins, and wetlands;
- (iii) To provide an updated overview of sustainable fisheries and aquaculture for marine and freshwater species;
- (iv) To review the state of the marine environment in selected marine and coastal areas, with particular attention to “hot spots”, and with special reference to the impact of the land-based activities on these areas;
- (v) To introduce international experience in the field of integrated coastal zone management (ICZM) and sustainable development.

Expected Outcome:

By bringing together scientists, academia professionals, stakeholders, and decision-makers involved in the different fields addressed by the conference, The Conference is expected to:

- (i) to promote, encourage and establish a forum for effective communication that would facilitate the exchange of experience and expertise between participants from different regions/countries;
- (ii) to examine the current and emerging issues and problems facing the aquatic environment locally, regionally and globally, and discuss the best ways and means to achieve the



**International Conference On
Aquatic Resources: Needs and Benefits**
September 18 - 21, 2006
Alexandria, Egypt

- required ecological balance and better protection for the natural ecosystems through identifying the problems and sources of pollution and suggesting suitable remedial measures;
- (iii) to present modern methodologies and latest technologies used in laboratory, experimental and field work in the different areas of aquatic research.

The above outcome is likely to result from either technical workshops or a series of round table discussions, addressing these specific issues, which will be organized on the margins of the Conference.

Main Themes:

1. Marine pollution monitoring, assessment, waste treatment and control.
2. Land-Based Activities affecting the marine environment, coastal areas, and associated watersheds.
3. Aquaculture problems and potentials.
4. Integrated Coastal Zone Management (ICZM).
5. Sustainable Fisheries.
6. Numerical and ecosystem modeling, and ecosystem analysis in semi-enclosed seas and lagoons.
7. Management and protection of coastal ecosystems (coral reefs and mangroves).
8. Socio-economic analysis of sustainable development of aquatic resources.
9. Protection of the biological diversity of the aquatic environment.
10. Advances in marine technologies and their applications.
11. Metal corrosion in marine environment.

Target Audience:

The Conference, with its objectives, themes, technical workshops and round table discussions is designed to stimulate the interest and attract the attention of a wide range of audience, including marine scientists, engineers, academia, research students, professionals, managers and decision-makers in the public and private sectors.



**International Conference On
Aquatic Resources: Needs and Benefits**
September 18 - 21, 2006
Alexandria, Egypt

Being “international” in scope, the Conference welcomes the participation of interested experts from all friendly countries, as well as representatives from regional, international and non-governmental organizations.



Author Index

A

A. Abo El-Soud	80,82,106
Adel Amer	35,138
A. Baghvand	73
A. Çiçek	103
A. K. Hammady	156
A. M. Abdel Halim	82,106
A. M. Nour	94
A. Maghsoudlou	118
A. Ocak	103
A. S. Koparal	103
A.O. Ogunfowokan	61
Abbas M. Mansour	123
Abd El-Hakim E. El-Gamal	26
Abd El-Hamid A. M. Ali	38
Abd El-Latif Berraho	110
Abdel Fattah A. Ghobashy	130,131
Abdel-Hamid A. M. Ali	137
Abdou Abd Allah Al-Sayes	116
Abdulwahid Al-Hajjaj	19
Abeer A. El-Saharty	32,134
Abir A. Saad	36
Abo El-Hagag Naser El-Dien	123
Ahmed E. El-Ghobashy	128
Ahmed El Nemr	16,17,54,55,56,58,70, 85,86,152,154,159
Ahmed F. El-Shaieb	97
Ahmed M. Abd El-Halim	80, 76
Ahmed M. Ibrahim	141
Ahmed W. Mohamed	125,123
Aida B. Tadros	78
Aida Farag	90
Alaa M. Younis	65
Alexander Keck	136
Ali A.-F. A. Gab-Alla	131
Ali M. A. Abd Allah	18,71,72,107,141,142,158



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Alia B. Munshi	14
Ali A.-F. A. Gab-Alla	130
Aly I. Beltagy	142
Aly Y. El Sayed	27
Amaal Eid Abbas	78
Amal M. H. Morsy	18,74,112
Amal M. Ramadan	27,155
Amany El-Sikaily	16,17,36,54,55,56,58, 70,85,86,152,154,159
Amany Mohamed Haroon	148
Amina El-Mansy	96
Aml Mohamed Ramadan	24
Amr M. Helal	93,99
Anubhuti Koshle	157
Aziz H. Al-Hlifi	19
Azza A. El-Ganainy	111
Azza Khaled	16,17,54,55,56,58,70, 85,86,152,154,159

B

Bachra Chemmam	154,159
Bachra Chemman Abd El-Kader	46
Bernhard Riegl	136
Boumaiza Moneef	40

E

E. A. Omar	94
E. Abd El-Mola	80,82
E. M. Abo El-Khair	80,82,106
El- Kh. M. Moselhy	15
El-Azab E. B. El-Bokhty	114
El-Azab El-Azab Badr El-Bokhty	116
Elham A. Wassef	156

F

Eman Siam	141
Fatma Aly Abd El-Razek	21,22,23,49



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

F. Aflaki	105
Fadhila Maamouri	41
Fathy T. Tayel	72,74,112
Fatma A. Zaghloul	78
Fayyaz A Ansari	14
Fayza Abdel Naby	130,131
Fedekar F. Madkour	150

G

G. R. Nabil	73
Gamal Abd El-Raouf Madkour	116
Gamal M. El-Shabrawy	28
Guezzi Youssef	40

H

H. A. Mabrouk	94
H. A. Omar	22
H. Abd El-Azim	15,35
H. Assem	108
H. Ghafourian	73,105
H. Riahi	73
Haïam M. Aboul-Ela	36
Hamza A. Kadhim	19
Hanan M. Khairy	149
Hashem Abbas Madkour	121,125
Hayat M. Faragallah	31
Hermine R. Zaki	78
Hina A Siddiqi	14
Hoda Abd El-Azim	38
Hoda H. H. Ahdy	69,72,107
Hoda Roushdy Guendy	57,87
Hossain Ghafourian	84
Howida Y. Zakaria	127

I

Ibrahim A. Maiyza	62,63
-------------------	-------



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

J

Jacque Hausser	136
Jamila Ben Souissi	42
Jeanne Zaouali	42
Jessica Boumeester	136

K

Kamal Fathy El-Boray	24,27
Kamal H. Shaltout	132
Kariman A. Sh. Shalloof	114
Kelly Barrington	92
Khaled M. El-Moselhy	30

L

L. A. Mohamed	153
Lamia Gargouri Ben Abd Allah	41
Lamiaa I. Mohamedein	30
Le Penne Marcel	40
Lucija Foglar	52

M

M. A. Ahmed Faghih	73
M. A. El-Sabrouti	142
M. A. Essa	94
M. A. Fahmy	80,82,106,153
Mohamed A. Shreadah	65,66,80,82,106,153
M. A. Zaki	94
M. and Shindy	80
M. E. Wafa	156
M. Ebrahimi, H. Ghafourian	105
M. El Salhia	108
M. M. Abdella	156
M. S. Akanni	61
M. Shindy	82
M. H. Sahafipour	105
Magdy Gh. Farag	89



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Magdy M. El-Halfawy	27,155
Maged M. A. M. Hussain	64
Maha A. Abd Allah	71
Maher A. Aamer	150
Mahmoud A. Dar	32,120,121,134
Mahmoud M. Abbas	158
Mamdouh S. Masoud	77
Ma'moun M. Kandeel	78
Manal I. El-Barbary	97
Manal M. A. El-Naggar	59,76,88,89
Mary Guendy Ghobrial	101
Massoud A. H. Saad	69
Meseda M. El-Gharabawy	47
Michael Wowchuk	92
Mohamed A. El-Shenawy	76
Mohamed A. Essa	93
Mohamed A. Hamed	38,137
Mohamed A. Okbah	31
Mohamed A. Tahoen	123
Mohamed Ben Salem	42
Mohamed E. F. Toufeek	104
Mohamed El-Shenawy	90
Mohamed H. Abdo	34
Mohamed H. El Naggar	66
Mohamed H. Yassien	111
Mohamed Kamal Z. El Deeb	66
Mohamed M. Dorgham	128
Mohamed R. Osman	123
Mohamed S. A.-K. M. H. H. Ali	147
Mohamed Saah Mahjoub	42
Mohamed, E. Gohar	28
Mohamed, H. Hassan	111
Mohammed Hamed Bahnasawy	115
Mohammed Ramdani	12,110
Mohammed S. A. Ammar	136
Mohammed S. El-Adawi	158
Mohsen F. Sayed	147
Mohsen M. El Sherbiny	150
Mona A. Abo El-Wafa	93
Mostafa A. Korium	104
Moustafa El-Shenawy	90



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

N

N. El-Agroudy	15	
N. A El Shimy		22
Nagwa E. Abdel-Aziz	128	
Nayrah A. Shaltout	77	
Neil Ridler	92	
Nenad Bolf	52	
Nermeen A. El Sersy	23	
Nevine M. A. Shabana	99	

O

O. R. Ajibola	61	
Ola Abdelwehab	54,55,56,58,85,86,154,159	
Osman A. El-Rayis	158	

P

P. Eghtesadi Araghi	118	
Parisa Tajer Mohammad Ghazvini	84	

R

R. Dabbagh	73,105	
R. Jalali-Rad	105	
Rabie S. Farag	65	
Radwan G. Abd Ellah	63,64	
Rania F. Ismail	47	
Roger Flower	110	

S

S. Abo Hegab	108	
S. H. Abdel Rahman	22	
S. M. Abdel Rahman	80,82,106	
S. M. Aboul-Ezz	94	
S. M. Taha	21	



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Saad Z. Mohammad	30
Saeid Ghorbanzadeh Mashkani	84
Said Mohamed Abd El-Hafez	116
Samia A. Selim	130,131
Samira S. Assem	47
Sankare Yacouba	160
Scander Ben Salem	46
Shamsh Pervez	157
Shawn Robinson	92
Somaya M. Taha	23
Soufia Ezzeddine	44,46
Soumaya Khaldi	41

T

Taha Zaghloul	36
Tarek A. Mohammed	107,120
Tarek Abd El-Aziz A. Mohammed	139
Tarek M. El-Geziry	62,63
Tarek M. Galal	132
Tarek O. Said	15,16,17,59,65,66,152
Thanaa H. Mahmoud	76,77
Thierry Chopin	92
Trigul El-Menif Najoua	40

V

Vladimir G. Koutitonsky	9
-------------------------	---

W

Wael S. El-Tohamy	128
Wafaa S. Sallam	30
Waheed F. Mohmoud	27
Wahid M. Moufaddal	143,144

Y

Y. Genid	138
Y. Soliman	15



International Conference On
Aquatic Resources: Needs and Benefits
September 18 - 21, 2006
Alexandria, Egypt

Yasser Mostafa Thabet

49

Z

Z. M. El-Sherif

94