International Conference - المؤتمر الدولي حول

on

Oceanography and Sustainable Marine Production:
A Challenge of Managing Marine Resources under Climate Change

ICOSMaP – 2013

Kuantan - Malaysia, 28-30 October 2013

PROGRAM & ABSTRACTS

INOC / IIUM - NOVEMBER 2012
**International Conference**

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Ecology and Biodiversity of Marine Algae

Øjvind Moestrup

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Abstract

The marine environment is under pressure, due to human activities. Enormous masses of green seaweeds are causing problems in China, and harmful plankton algae result in fish kills and human poisonings in many parts of the world. Considering that on the global level the human population continues to increase and, perhaps just as serious, that the standard of living increases in many parts of the world, increased human pressure on all ecosystems can be expected, including the marine environment. The number of fish caught in the wild has been decreasing for some time and at the same time the amount of fish produced in aquaculture plants continues to rise steadily in many parts of the world. In aquaculture plants in nature, this causes release of nutrients to the environment (phosphorus and nitrogen), which are readily taken up by algae and result in increased algal biomass. As some but not all of the algae produce powerful toxins that kill fish or poison humans, the problems have to be addressed and solved. An alternative to aquaculture plants in streams and in the seas land-based aquaculture plants but we have recently, in Denmark, experienced unexpected fish kills caused by dinoflagellates in recirculation plants.

I will in the talk address some of these problems and discuss whether the problems can be kept under control and prevented from increasing, following increased human pressure on the environment in the foreseeable future.
Dato' Dr. Azizan Bin Hj Abu Samah
Fish Assemblages Recorded In Underwater Visual Census in Japanese Coastal Waters: Global Warming, Thermal Discharge from A Power Station, And Recovery from the Tsunami Disaster

Reiji Masuda

Maizuru Fisheries Research Station, Kyoto University

Abstract

The goal of this study was to accumulate information of fish assemblages under different environmental conditions, especially water temperature, through underwater visual census. For this purpose three projects have been conducted in parallel: (i) long-time monitoring of fish assemblages in shallow coastal reef, (ii) observation near the thermal discharge from an atomic power station, (iii) recording the recovery process after the tsunami disaster. Twice-a-month visual census has been conducted in Maizuru, Sea of Japan, since January 2002. Over the 11 years of data revealed that the fish assemblage shows a consistent seasonal change in abundance and species richness, although population of each species fluctuated interannually. Certain species originating from tropical waters have increased for the last 11 years. Comparison of the recent records to those of 1970s’ revealed a significant shift of fish assemblages from cold to warm water species. Underwater observation near an atomic power station revealed that tropical fish species had settled and over-wintered in this specific area. Suspension of the power station, however, induced a collapse of this peculiar fish assemblage. Underwater observation has also been conducted in northeast Japan once in two months since May 2011 to reveal recovery process of fish assemblage after the disturbance by tsunami. Fish abundance and species richness increased from the second year after the tsunami, although some tropical species that had never recorded there were found during this observation. Overall fish assemblage is highly dependent on water temperature, and visual census can be an efficient tool to monitor any temperature-mediated impact.
Potential applications of marine seaweeds and the therapeutic effects of their metabolites: A review

A. Chouikhi

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Abstract

There has been a long tradition in Asian area of consuming seaweeds as vegetable, and use as health remedies, fodder and fertilizers. However during these last decades, the main use of seaweeds through the world was directed towards the source of phycocolloïdes (alginate, carrageenan, and agar) and compounds having nutritional interests due to the presence of many categories of components (fibers, proteins and minerals.). These macrophytes also contain important secondary metabolites of therapeutic interest for the field of pharmacology with antioxidant properties, including carotenoids, phenolic compounds, tannins, acetogenins (fatty acids, prostaglandins, macrolides, aromatic polyacétates, and flavonoids), sulphate polysaccharides, phycobilins pigments, vitamins. Others important activities are attributed to seaweeds as anti-fungicidal, anticoagulant, antibacterial, anthelmintic, antidiabetic, anti-inflammatory, antimalarial, anti-ulcerative, antifouling, antiplatelet, antiprotozoal, antituberculosis and antiviral, affecting the cardiovascular, immune and nervous and other systems various mechanisms of action. These properties are due to the presence of various chemical compounds such as Terpenoids, (monoterpenes, sesquiterpenes, diterpenes and triterpenes, steroids, tetraterpenes and carotenoids), alkaloids with one or more atoms of nitrogen heterocyclic, amino acid derivatives, and compounds characterized by the presence of halogen atoms in their chemical structures... Recently, algae are used in bioremediation of pollution in the marine ecosystems and in biotechnology. (Genetic, alga-refinery for biodiesel production).

In the present paper, recent progresses of the major compounds or extracted metabolites biologically active of seaweeds are reviewed. Their chemical structure, biological evaluation, pharmacological bioactivity is considered.

Keywords: marine seaweeds, metabolites, nutrition, therapeutic activities, review.
Theme 1: Oceanography, Coastal Processes & Geomorphology
Detection change analysis of the shoreline using numerical aerials photographs, satellite image and GIS: A case study of Algiers coast, Algeria.

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Abstract

The aim of this study is to detect, to map and analysis the historical shoreline changes of the Algiers coast. The nets rates of shoreline position changes were obtained from, corrected aerials photographs from different missions (1959, 1972, 1980, 1984, 2003), the Quick-Bird data acquired in 2007 and 2008. The collected information was downloaded into designed GIS environment, which allows rapid display, re-projection, digitization and geospatial analysis of multi-temporal data.

The results of this study showed that the Algiers coast exhibited a tendency toward generalized recession; the net rate of receding recorded between 1959 and 2008 varied between -0.062 m / year and -1.68 m / year with an average value of -0.19 m / year. Importantly, the large difference between these two values denoted a longitudinal sediment transport that occurs along this coast. The negative net rates obtained reveal the existence of important sedimentary losses toward the large.

The causes of this recession may be due to both natural and anthropogenic factors. Natural causes of erosion are mainly due to repeated and cumulative effects of storms, and sea level rise. Anthropogenic causes may be due to massive and arbitrary extraction of important quantities of sand required for urban growth experienced by the wilaya of Algiers since the early 1970s. To meet this demand several sand extraction site were opened along the west coast of Algiers. These extractions have touched rivers beds, beaches and dunes located at Beni Messous river mouth, which was completely destroyed.

Keywords: Detection change, shoreline, Aerials photographs, Satellite image, GIS, Coast, Algiers
Assessment of sediment and carbon fluxes to the Indus Delta

Ali Rashid Tabrez* and Asif Inam

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Abstract

Most countries in the South Asia region such as Bangladesh, India, Pakistan and Sri Lanka are engaged in the collection of data on water quality, from both off-shore and inland water bodies such as rivers, large reservoirs and lagoons. Studies on sediment dynamics and nutrient analysis as well as ecology of the coastal regions have also been carried out in most countries. These studies have been carried out by the respective national oceanographic or marine research institutions as well as by university researchers. The fluxes of nutrients and organic matter from the river system are very significant in the global context. An assessment of these fluxes is necessary for the understanding coastal processes related to the stability of the deltaic system. The focus of this paper is to integrate and analyse information and results for the better understanding of coastal processes. The objectives of the paper are to identify, assess and share existing studies (methodologies and results) related to material fluxes, their origins and impacts on the critical functions of coastal systems. The Indus delta, as a result of upstream water abstraction, has inadequate sediment and water flow to maintain the natural ecosystems. The status of the delta's natural ecosystems has already become critical, and the sediment starvation will deteriorate the situation even further. Whatever sediment the River Indus has carried to the delta limits itself within the Khobar creek till the event of flood that flushes out the unconsolidated sediment to the Arabian Sea. Though there was substantial variation in the salinity with the diurnal variation in tide no apparent change was observed in the suspended sediment concentration as turbidity is influenced by the strong tidal flux which reverses its direction during ebbing and flooding. The River Indus bed sediments have relatively low values of calcium carbonate (< 10%). Low Values of the C (< 1%) were obtained for the bed samples of the River Indus.
Modeling of Submarine tailings by a copper mine in the deep anoxic zone of the Black Sea

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Abstract

Deep sea discharge system of Çayeli Bakır Company, located at North East region of Turkey, is evaluated. Seasonal and temporal distribution of the tailings is analyzed for the receiving environment and a mathematical modeled is applied to sea distribution. Besides that, environmental impact of discharge is investigated.

Seven stations were selected and measurements were done at surface, 75 m, 150 m, 200 m, and 320 m at every station. Temperature, salinity, conductivity, pH, were measured and dissolved Oxygen, alkalinity, hydrogen sulphide, copper, zinc, iron, cadmium, mercury, arsenic, and Manganese were analyzed for each sample. During studied period, temperature dissolve oxygen, pH and salinity were found: 7.94-27.33°C, 6.90-11.18 mg/L, 7.90-8.40 and %16.74-18.24 respectively at surface water. Maximum values of As, Hg, Pb, Cd, Mn, Fe, Cu and Zn were 7.32 µg/L, 1.36 µg/L, 17.83 µg/L, 0.80 µg/L, 571.60 µg/L, 44.49 µg/L, 11.55 µg/L, 112.27 µg/L respectively at the studied zone. These results show that, none of the findings were above the general sea water quality standard as stated in regulations.

Copper mine tailings discharged to the Black Sea at 250m depth were modeled. Four different scenarios were used to model plumes. Calculations for different discharge rates and dilutions show that plumes rises approximately 91m above the discharge depth. This means that tail remains in the anoxic zone below the permanent pycnocline at about 150m depth.

Keywords: Deep sea discharge, heavy metal pollution, Black sea, Çayeli Bakır Company, Tailings, waste water.
A qualitative study on meiobenthos organisms with the emphasis on efficient sorting methods in the Persian Gulf

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Abstract

During the Persian Gulf and Oman Sea Oceanographic study (PG-GOOS) in autumn 2012 meiofaunal samples were collected from 31 stations in two replications. Different methods were used for sorting the organisms from sediment. Among three methods (i.e. agitation and decantation, Flotation, sugar method), agitation and decantation methods were the most efficient in sorting meiobenthic organisms. During a qualitative study nematodes were the dominant group. Afterwards, foraminiferans, Copepods, Polychaetes and oligochaetes were dominant respectively. The particularly rich and diversified meiobenthic communities found in the present study suggest that they can suitable be used in future programs of environmental monitoring, marine pollution assessment and food chain studies.

Keywords: Meiofauna, Meiobenthose, Nematodes, Persian Gulf
Variability of western boundary current in the South China Sea – A remote sensing perspective

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Abstract

The western boundary currents plays an important role in oceanic and atmospheric circulation through enhanced air-sea exchange processes. The present study analyses the mean and seasonal variability of western boundary currents of South China Sea and determines its influence on marine environment. High resolution Eulerian velocity field is derived by combining the available satellite tracked surface drifter data with satellite altimetry and ocean surface winds. The drifter data used in this study comes from the Global Drifter Program and the satellite altimeter data used are Maps of Sea Level Anomaly (MSLA) produced by the Collect Localisation Satellites (CLS), France for the period 1993-2012. The Maps were produced every seven days since 1992 August with a resolution of 1/3° in both Latitude and Longitude. The weekly ocean surface mean wind fields derived from the scatterometers onboard ERS 1 / 2 and Quikscat have been employed. The derived mean velocity field exhibits strong western boundary currents in South China Sea and maximum current speed is along east off Vietnam. But, the anomalous field is quite strong in the southern part. Seasonal fields clearly depict the monsoonal circulation. The distribution of heat content anomaly and Chl-a in the western boundary current region are also analyzed using satellite observations. The spatial and temporal distribution of eddy kinetic energy is also determined.
A Web based information and support system to simulate coastal marine waters: The Sardinian case study

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Abstract

Portals provide useful data access functionalities, computational services and procedures for multiple applications and databases. We have developed a GIS oriented Collaborative Support and Information System on the web, that exposes applications based on a oceanographic model and a satellite data. The system exploits a High Performance Computing (HPC) cluster and is optimised for data management and the report production mechanism. The General Estuarine Transport Model module (GETM), a 3D numerical hydrodynamic model is used operationally from the web based technological framework to expose applications particularly addressing coastal zone dynamics. The model is run operationally for a forecasted period of 6 days and results for the sea currents, temperature and salinity are presented automatically using the web-based user-friendly graphical interface. A Lagrangian oil spill module is also exposed on the web application for operational use. As an example, we show the application of the interface to several study sites around the Sardinian island (Italy). The oceanographic model is initialised with data gathered from MyOcean and the meteorological forcing includes the forecasted air temperature, humidity, pressure, winds and clouds from the Global Forecasting System (GFS) model at resolution 0.5°. Automatic procedures that can be applied to any area around the globe download the necessary data and perform an interpolation in the zones of interest preparing the initial and boundary conditions for the model simulations.
Transboundary dust input into the Southeast Asia region: Elucidate the monsoon effects by atmospheric and marine samples

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Abstract

Marine environments receive continuous terrestrial input via lateral and atmospheric transports. Dust is among those terrestrial materials that export from various sources globally to other locations. The central desert of China is one of the most important sources of dust export to neighboring location as well as far in the western part of the United States of America. One of the neighboring locations that receive extensive input of exported dust from China is the Southeast Asia countries including large continental shelf basin. The huge continental shelf basin namely South China Sea is boarded by many countries such as Malaysia, Indonesia, Thailand, Vietnam, Singapore, Philippine, Brunei, Cambodia and Laos. Dust is transport from surface of deserts to other region and represents the existing situation of an ecosystem. Thus, significant changes over time period will be identified throughout the chronological studies with accomplishment of parallel studies. This chronological study includes sedimentary records of a marine ecosystem and the environmental compartment that represent such an effect like coral reefs and climate change. Coral reefs and sedimentary drilling studies, and looking at the Ca compositions define the changes of climate or monsoon over past period of time. The chemical compositions with the signature of organic materials identify the origin and sources of these transported materials. The objectives of this research are (1) Investigate the chemical composition of recent (surficial) deposited dust into the marine environment of the South China Sea, (2) Analyses the chemical composition of the transported materials that transfer via atmosphere, (3) Predicts the changes of chemical composition over time in chronological record of sedimentary environment, and (4) Effects of these changes on the historical profiles of coral reefs. However the major expected outcomes of the study are (1) The trend of changes in chemical composition of the sediment over time, (2) The effect of dust input on the life cycle of the corals, (3) Atmospheric transport of dust, source identification and origins appointment, and (4) The role of climate change on variation of the oceanographic data. The preliminary data and research finding will be present and discuss in the workshop.
New algorithms for monitoring suspended particulate matter (spm) developed from Landsat 7 Etm+ and sediment transport models: A case study of Pahang River Estuary, Pahang, Malaysia

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Abstract

Conventional field methods for monitoring SPM are time consuming and expensive. One of the alternative methods is using remote sensing techniques to retrieve SPM concentrations from satellite image. However, in-situ and imagery data accessibility often not synchronize due various factors which highly variable in natural environment. Hence, it is difficult to develop new SPM model algorithms. This study aims the potential of using numerical model to deal with remote sensing data accessibility problems and to produce new SPM algorithm for Pahang River Estuary. SPM concentrations in Pahang River Estuary have been analyzed using two different methods: Landsat 7 ETM+ image analysis for SPM retrieval and 2-dimensional real time sediment transport model. Period of modelling was during highest high tide and lowest low tide in Northeast Monsoon (December 2010) and Southwest Monsoon (July 2011). SPM data from Landsat 7 ETM+ have been compared with proxy in-situ SPM data from model simulation. As results, new SPM algorithms for two different monsoon circumstances in Pahang River Estuary have been developed using regression analysis. Additionally, a true representative of estuary system projected by verified model also has been utilized to understand the transport and dynamics. Thus, this study have provided alternative method in managing and monitoring SPM and sediment transport problems for better integrated coastal zone management plans.
A Study on exhaust emission from a Patrol Ship of Malaysian maritime enforcement agency

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Abstract

The marine travel is the most important part in transportation systems for economic operation in Malaysia. Emissions from ports are considered to be major sources of oxides of nitrogen ($\text{NO}_x$) and carbon monoxide (CO). It is important to stress the significant of the damage from exhaust emissions to human health and environment. This study purpose is to quantify air pollutants-associated engine operating that released into the atmosphere such as CO and NO$_x$ that calculated as nitric oxide (NO). The paper presents a mixture measurement; the onboard measurement and using combustion equation solution. The shipboard test is conducted at a patrol ship known as Kapal Maritim Kukup (KM Kukup). Emissions test will be performed at different operations of engines load: patrol cruise, and maneuvering. The important parameters such as gas concentration is measured using flue gas analyzer at exhaust platform and for ambient parameters and air flow near duct suction are measured at engine room using Kestrel 4500 pocket weather tracker. The exhaust system is considered as control volume while the mass flow into inlet air equal to mass flow out from exhaust funnel. Emissions are calculated by dividing the gas mass flow rate with shaft horsepower, gram per kilowatt-hour. The CO emission shown high concentration at higher speed which indicates insufficiency of old engine operation as an incomplete combustion is occurred in this ship. After comparing with permissible exposure limit to human and ambient air quality it is clear that, this ship emitted large amount of CO and NO that danger for human respiratory system and environment. Through this, we are able to understand and manage the air pollutant emissions exhausted from ship of current port operations.
Hydrodynamics & ecology of Vembanad Backwaters (Ramsar Site) impacted by flood control structures

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Abstract

The wetland in Kerala (S. India) does not experience severe floods, but occurrence of floods is becoming more frequent. The flood-prone areas include; Kuttanad region around Vembanad Lake. Flooding occurs every year during the southwest and northeast monsoon seasons. The aerial extent and associated damages are controlled by drainage channels and land use pattern. The thirty reservoirs constructed across major rivers and wetlands including backwaters, estuaries and brackish water lakes act as natural flood moderators. The human intervention altering basin characteristics and contributing to flood problems are principally in the form of reclamation of wetlands and water bodies, embankment construction and change in land cover/landuse pattern and these activities continue unabated. One of the largest flood control works is the Thottappali spillway to protect the Kuttanad area from the heavy floods, but functioning with an insufficient drainage capacity. The largest mud regulator in India (Thannermukkom salt water barrier) was constructed to prevent tidal action and intrusion of salt water during the dry season into the Kuttanad low-lands across Vembanad Lake to bolster paddy cultivation. The Barrage too continues to be a point of controversy. A comprehensive study explaining the characteristics and functions of this estuary was undertaken to understand varies processes in the lake to develop an ecosystem model. The tides in the estuary are of mixed semi-diurnal ($M_2$), which progressively attenuated towards upper reaches. However, an unusual amplification of tides in the south estuary when the hydraulic barrier (Thannermukkom) was closed and a similar amplification of the fortnightly constituent ($M_{sf}$) in the south estuary when the barrier was open were examined. It was also found that, Vembanad Lake is very sensitive to meteorological events (winds and fresh water flow) and Lake Hydrology has at least three different zones (North, Central and South). The net movement of water has strong implication on dispersion of materials, which in turn, have a direct bearing on the ecology of the estuary. This is a very important finding implying that biochemical activities of these zones should be considered separately while developing an ecosystem model. Harmonic analysis of tidal data showing an amplification of $M_{sf}$ constituent in the southern estuary is attributed to bottom frictional effects. The currents are generally dominated by semi-diurnal tides, which result in more swift currents than diurnal tides and play an important role in bed-load sediment transport. These currents are strongly rectilinear with a slack water at each reversal of direction. This slack water has important implications in the estuary, as settling of the finest fractions of sediments takes place at mid-tide. Tidal circulation in the estuary was studied using a 2D hydrodynamic model. The predicted tides and currents showed very good agreement with measured tides ($\text{RMS} < 0.06 \text{ m}$) and currents ($\text{RMS} < 0.07 \text{ ms}^{-1}$). The particle trajectories and residual currents computed from the model have been used to classify the study region into three zones: northern estuary, central estuary and southern estuary. The central estuary is dynamic, whereas the other two zones are relatively weak. An amplification of measured tides in the south estuary during March indicates the presence of standing waves caused by the hydraulic barrier at Thanneermukkom. The model results suggest that northern and southern zones showing flow restrictions are sensitive to environmental pollution. The concept of different zones in the estuary will be useful to planners in protecting the vulnerable regions of this productive ecosystem from human interventions.
Interannual variations of water and air temperatures in Lebanese coastal water, 2000-2012

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Abstract

The global climate of the Lebanese coast is thermo –Mediterranean humid with a sub-tropical tendency in the south. Lebanese coastal waters are subject to the effect of weather and climate factors in the region. Lebanon presents two main seasons: a dry hot season and a cold rainy season. Water temperature is a function of atmospheric temperature. The present work focuses on the Interannual variations of monthly sea surface water temperature in relation to air temperature over 13 years between 2000 & 2012 from a fixed site in marine area of North-Central Lebanon (N 34°14.856 and E 35°36.067) with notes to extreme climate events.

Results indicated that during the period of investigation the average monthly air temperature follows its normal annual Mediterranean cycle and presented a minimum on January 2008 (10°C) and a maximum on September 2006 (30.6°C); the monthly mean (+ SD) was 20.174 (+ 5.44°C) and the range was 20.6°C; while 2000 was the coldest year (mean =19.4°C) and 2010 was the warmest year (mean=22.48). Annual mean from 2000 to 2009 was 19.91 (+ 0.25°C) while for the whole period, the annual mean and the SD were higher (20.26 + 0.86°C). The sea surface temperature presented a minimum on March 2004 (16.9°C) and a maximum on August (30.5°C); the monthly mean (+ SD) was 23.30°C (+4.28) and the range was 13.6°C. The year 2005 was the coldest one (mean =22.95+ 4.61°C) while the warmest year was also 2010 (mean 24.31 + 4.06°C). Statistical analysis did not show significant differences between years for both parameters. Extreme events and cycle variability during the period of investigation will be discussed in details.

Keywords: Air temperature; Water temperature; time-series; Lebanese coast; Eastern Mediterranean.
Assessment of climate change effects on the Persian Gulf coral reefs ecosystems, using by Pastakia Analytical Model

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Abstract

The Persian Gulf is a semi enclosed shallow continental sea. This marginal sea surrounded by landmasses and is located in the subtropical northwest of the Indian Ocean region measuring 1000 km in length and varying in width from a maximum of 340 km to minimum of 60 km in the Strait of Hormoz. The average depth is about 35m and maximum is 100m (Iranian coast). In this report, the coral reefs status and distribution of corals in Iranian waters of the Persian Gulf, from northwest to Hormoz strait reviewed and different effects of climate change will be categorized by PASTAKIA model. Also discussed based on the obtained results and information after seven years of field surveys (2005–2012) in two types of coral reefs structure including: patch corals, and fringing coral reefs surround all the 17 main islands of the Persian Gulf (Iranian side) with a width of about 1 to 2 km, and extending from 1 meter below the mean low tide mark to a depth of 15-20 meters. Coral reef ecosystems are threatened on a worldwide basis, with overfishing, diseases, eutrophication, hurricanes, overpopulation, and global climate change all contributing to recent declines in reef-forming corals or phase shifts in community structure on time scales not observed previously. These changes are in contrast to recent periods of long-term stability in coral reef communities over geological time scales of thousands of years. Base of the results of this research project, threats of coral reefs ecosystems are under affected of two main groups which including human and natural. The most important of natural threats is effect of climate change and global warming leads to coral mortality at a rapid rate. According to the present study, 70 species belonging to 9 families and 20 genera of hard corals and 3 soft coral species were identify and reported from studied areas. \textit{Porites} and \textit{Acropora} corals are the dominant corals of the Persian Gulf. The result of PASTAKIA analytical model was show that Iranian side of the Persian Gulf can be divided to 5 zone with weak similarity. Also, It is possible each of area have overlapped with neighboring zones.
Marine fishery database in Syrian Seawaters

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Abstract

The Levantine Basin of the Eastern Mediterranean, including the Syrian seawaters, is highly oligotrophic with low nutrient concentrations, showing high salinity and temperature averages. The fish resources are not as high as in western Mediterranean region. However the ongoing management of fishery and the awareness on the marine biodiversity conservation create certain hope to develop the fishery industry.

Database of fishery in Syrian seawaters is underway within the frame of the new management regulations. These databases may include information on Ichthyofauna with focus on the main commercial species and the most available on the fish market. In addition to this, we have available a list of most fish resources including algae, invertebrates and fish exploited in fishery. Furthermore the amount fish landing is statistically estimated along with fishing efforts and the number of fishing boats and fishermen. The most important fish resources and fish available on the fish market are also considered in these databases.

224 fish species found in Syrian seawaters belong to 18 order, 75 families and 155 genera. Out of them, there are 37 Lessepsian migrants of Indo-Pacific and Eritrean origin and 14 species indicators of Atlantic and western Mediterranean. All of those exotic invading species have settled stable populations, and many overcame in abundance some native species. The major fish families of economic importance are: Sparidae forming 9.82% of total landing and including 22 species; Blennidae 13 species, Gobiidae 10, Carangidae 10, Serranidae 10 with 4.45% of total fishing yield, Labridae 10, Scombridae 9, Triglidae 7, Mugilidae 7, Clupeidae 7. The most important fish encountered on the fish market belong to families: Engraulidae, Sparidae, Blastidae, Carangidae, Centracantidae, Clupeidae, Coryphaenidae, Hemiramphidae, Merlucciidae, Soleidae, Scaridae, Synodontidae, Sphyraenidae, Holocentridae, Serranidae, Labridae, Xiphiidae, Scombridae, Mugilidae, Mullidae, Siganidae. The number of fishing boats actively working on the Syrian coast is about 1850 of 6-12 m. length, distributed in 6 fishing ports, including Erouad Island, and equipped with diesel engines of 15-40 hp with 12000 manpower fishermen. The annual fishing landing varies between 4000 and 5000 metric tons, whereas the freshwater aquaculture from 10 governmental fish farms, produce about 7000 tons/year of Carp and Tilapia. In addition to this, there are several private freshwater fish farms, which produce 100-200 metric tons/year.

Unfortunately, although the marine fishery is still mostly artisanal, there is a managerial plan to develop and install marine aquaculture farms in the near future to fill the gap of fishery production.

Keywords: Syrian waters. Fishery. Databases. Fish resources. Fishing efforts. Fish landing.
First Global assessment of three pillars of sustainability in the United Nations World Ocean Assessment

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Abstract

For decades, environmental concerns have been reminded by scientists to be considered by different managing sectors of human activities in the oceans. However it has been has proven to be not sufficient enough due to lack of significant approach to economical and social aspects in ocean assessments. In 2002, the World Summit on Sustainable Development, heads of states, decided in Johannesburg to review oceans permanently and UN named it "World Ocean Assessment". The 21 member "Group of Experts", selected by the UN to help with the technical scientific tasks, estimates that between 1500 to 2000 experts will be needed to properly conduct the assessment and the subsequent peer review till 2015. In spite of being global, there will be data, functional and geographical gaps. But on the other hand, this assessment will include "people, profit and plant" as three pillars of sustainability, reserving the opportunity for the first ocean sustainability assessment at global level. In addition, capacity building in developing countries in context of ocean assessment has been assigned as one of the strategic goals. The credibility, relevance and applicability of the assessment, will depend on the contribution of marine scientific community in developing countries to become familiar and engaged with this ongoing process, especially in practical improvement of capacity building mechanisms.
Coral Reef Records of Past Climate Change from the Red Sea

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Abstract

Massive-growing corals are important archives of past climate variability in low latitudes, especially for times that go beyond the period of instrumental climate observations. These corals live in the surface-ocean mixed layer and grow continuously at rates of several millimeters to centimeters per year. During growth they incorporate isotopic species into their aragonite skeleton. Their annual growth bands allow the reconstruction of accurate chronologies. The oxygen isotopic composition ($\delta^{18}$O) of coral skeletons have been widely used for high-resolution paleoclimatic reconstructions of sea surface temperatures and/or sea surface salinity variability. The carbon isotopic composition ($\delta^{13}$C) is more complex and difficult to interpret because it is heavily influenced by metabolic processes. However, coral skeletal $\delta^{13}$C may vary due to changes in the isotopic composition of dissolved inorganic carbon (DIC) of seawater. In the present study, we have investigated the skeletal $\delta^{18}$O and $\delta^{13}$C signatures of Porites coral colonies from the Gulf of Aqaba, Red Sea. Our results demonstrated that coral $\delta^{18}$O is a reliable recorder of temperature variations, and the $\delta^{13}$C records seem to be suited to provide information on long-term world-wide changes in atmospheric CO$_2$. 
Simulation of the ecological model in the coastal solar Saltern (Sfax, Tunisia)

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Abstract

The wetland particularly, the solar saltern is a demanding area to model realistically, therefore, numerical models, namely ecological ones, need to be implemented. Ecological models may be considered as the synthesis of knowledges about the ecosystem behaviour. Most dynamic aquatic ecosystem models were developed in order to describe the dynamics of temperate lake or marine ecosystem. Furthermore, the model is used to explore the effect in terms of biogeochemical functioning of a scenario describing possible future changes in the solar saltern of Sfax concerning global changes. We describe an ecological model for estimating primary production of phytoplankton. Data from an enriched pond of the solar saltern of Sfax were used to train, validate and test the model. The application of this biogeochemical model was tested by scenario which describes future changes in this hydrosystem. This study was conducted in the solar saltern of Sfax located on the central eastern coast of Sfax (Tunisia, 34° 39’ 0.1” N and 10° 42’ 35” E). It is an artificial system consisting of interconnecting ponds which extend over 1500 ha and a distance of 12 km. One pond of mean salinity ranging from (42.6 ± 2.3PSU) to (45.2 ± 5.3PSU) was sampled (48 dates from January 2000 to December 2003). The temporal dynamics of phytoplankton and nutrients in the pond A1 of the solar saltern of Sfax are described by the following equations (1), (2) and (3):

\[
\frac{d \text{Phyt}}{dt} = (C_p - M_p) \cdot \text{Phyt} - C_{zoo} + Ech(\text{Phyt})_{in} - Ech(\text{Phyt})_{out} \quad (1)
\]

\[
\frac{d \text{PT}}{dt} = \alpha_p (M_p - C_p) \cdot \text{Phyt} + Ech(\text{PT})_{in} - Ech(\text{PT})_{out} \quad (2)
\]

\[
\frac{d \text{NT}}{dt} = \alpha_N (M_p - C_p) \cdot \text{Phyt} + Ech(\text{NT})_{in} - Ech(\text{NT})_{out} \quad (3)
\]

The first application of this model to this ecosystem is described and validated with the data acquired by the monthly surveys of plankton abundance in the pond A1 during the years 2000 to 2003. Biogeochemical modelling, as used here, refers to modelling the biological and chemical processes affecting nutrients (usually nitrogen and phosphorus) and primary production. It contains three variables: Phytoplankton, Total Nitrogen and Total Phosphorus. Based on hypothesis, a scenario was tested to predict the evolution of phytoplankton biomass dynamic. The hypothetic scenario takes into consideration global changes, especially temperature increase. The result of this test shows a considerable variation into phytoplankton biomass dynamic. Moreover, two peaks of important phytoplankton biomass are observed.
Red Sea coastal lagoons: Their changing environment and dynamics

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Abstract

In the recent years the environmental conditions in the coastal area of the Red Sea have changed due to the increasing activities along the coast. The interaction between sea and land has gained importance due to the industrial, commercial activities, oil refineries and desalination plants thus affecting the environment of these lagoons. The Presidency of Meteorology and Environment (PME) of Saudi Arabia with the help of International Union for Conservation of Nature and Natural Resources (IUCN) has marked sensitive sites along the Red Sea coastal area of Saudi Arabia. Average flushing time of the lagoons varies from few days to about a month. Observations showed that the flushing time varies from spring and neap tidal cycle also during the summer and the winter. Due to the increase in temperature and salinity, the productivity of arid zone lagoons is under stress. However, the flushing time scale of these lagoons suggests that the water is replaced within few days time to about a month, thus minimizing the stress, but the changing environment of these lagoons should be continuously monitored.
Urban planning of coastal cities compatible with climate

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Abstract

The coastal zones are most productive and dynamics from ecological and bio resources point of view. This area including residential and urban that have become one of the most sensitive areas of the world. Following increase in population and improper construction in these areas, cause adverse environmental effects including; climate change, coastal habitat destruction, water contamination and health risk resulting from inadequate waste disposal and sewage systems, that is causing instability in the region. With respect to the issue sustainable urban planning and compatible with the environment can be the right strategies for reduce these problems. This study designed by utilization of the physical and environmental component of stability with the help of Analytical Hierarchy Process (AHP). The evaluation stability of the Chahbahar port that it is located in Sistan & Baluchestan province – Oman Sea coast and its weather is hot and humid (Indian Ocean Monsoon zone). Then, to provide local solutions for sustainable in consistent with the city needs. This research method is descriptive - analytic study and the results show that the area was unsuitable and strategies for this regard will be effective step.
Relations between climate variability and the heat flux at the air-sea interface in the Mediterranean Sea.

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Abstract

Generally, the atmospheric forcing on the ocean basins produces anomaly surface temperature (SST) through the turbulent flow of heat stress or abnormal wind. Alternatively, the ocean contributes to the dynamics of the atmosphere by the influence of SST anomalies can generate and subsequently, a persistent thermal forcing on the atmosphere. Using the technique of simple correlation can distort the examination of causal order results in highly associated as ocean-atmosphere system.

In this study, we introduced the concept of Granger causality to examine the possibility of whether or not their relationships and causal order between the net heat fluxes at the air-sea interface in the Mediterranean and the modes low-frequency variability of the global climate. Granger causality is based on the notion of predictability. In a coupled system involving two fields that cross-interact, the Granger causality test statistically whether the previous values of the first field to provide more information about the second field. Variability in the first field is indicated as the cause of variability in the second field. Climate variability on a global scale is characterized by the index of the Arctic Oscillation (AO), the Quasi-Biennial Oscillation (QBO) and El-Nino-Southern Oscillation (ENSO).

The results show that the influence of each climate index from previous seasons on the net heat flux winter is spatially limited and significant causal relationships are weak and persistent. The relative change in each climate index spring can increase the explanatory power of changes in net flows following winter 10 to 15% in medium heat.

The winter anomaly of the net heat flux in the southern Algerian basin and the Gulf of Lion is mainly caused by the Arctic Oscillation. The ENSO index influences much the North Algerian basin and the northern Ionian. The QBO only affects the Alboran Sea and the Tyrrhenian Sea. For cons, the Adriatic and the Levantine basin are affected by any climate index.

These results are in agreement with those of the correlation analysis. However, the Granger causality is a more rigorous test for the causal order in a coupled system. Although these results are based on statistics and are limited by the pattern of approach, these three climate indices in particular, AO and QBO can be used as proxy (predictors) to improve the prediction of winter flow anomaly heat in parts of the Mediterranean.

Keywords: Mediterranean winter net heat flux, climate index, causal analysis.
Assessment of climatic and anthropogenic stresses on the Indus River and its possible impact on the deltaic and adjacent coastal areas

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Abstract

The Indus was formed shortly after the collision between the Indian and then Eurasian Plates prior to 45 million years ago. During, the Holocene, the Indus has formed a vast deltaic complex in southern Sindh, most of which has been abandoned due to frequent natural channel avulsions. The Indus Delta was formed under arid climatic conditions with highly variable river discharge, a moderate tidal range, extremely high wave energy, and a strong monsoonal wind system. Abandoned Indus delta channels have been reworked by tides all along the coast into dendritic tidal creeks. The tidal creek network appears to be most extensive and mature east of the present mouth of the Indus. The deltaic coast from Karachi to the river mouths exhibits a dense less mature tidal channel network. A stronger wave influence along this part of the coast compared to conditions further east is suggested by the frequent occurrence of drumstick-shaped barrier islands, characteristic of island systems significantly influenced by both waves and tides. The construction of the barrages and canals has, over the years, led to a systematic removal of water from the Indus. According to several early estimates, construction of dams, barrages, and linked canals has reduced the annual freshwater flow downstream. Engineering structures across the river have also reduced the sediment load travelling down the Indus. Consequently only the Khobar Creek now transfers water from the main river to the sea. The near absence of riverine freshwater downstream of Kotri, coupled with strong seawater intrusion, has destroyed large areas of prime agricultural land and submerged several coastal villages. This in turn has caused desertification and displacement of several hundred thousand local residents living there for many generations. The coastal zone of Indus Delta is also under stress due to sporadic events of flash floods causing extensive damages to the property. The frequency of these events has increased many fold during last couple of decades. Recent data showed that a cyclonic event in 1999 had a negative impact on the Left Bank Outfall Drain (LBOD), a man made drainage system on the left bank of Indus River. Breaches have occurred in the tidal link, resulting in major geomorphic and ecological changes due to sea water intrusion (Inam et al., 2004). Ground investigation and the interpretation of satellite imageries indicate momentous erosion of coastal islands in the vicinity of Indus Delta. The accelerated hydrodynamic changes have occurred probably due to deepening and widening of the approach channels of Port Bin Qasim resulting in destabilization of sediments in older Indus Delta. The aim of this paper is to have a holistic assessment of geological and oceanographic setup that may have a potential to trigger a natural disaster. The basic purpose is to develop awareness in the scientific community as well as to all concerned. The wellbeing of the delta requires a realistic assessment of the minimum volume of river water and sediment needed round the years to prevent the near-disappearance of the Indus Delta.
Menace or opportunity: consent granting to foreign marine scientific research activities in the marine areas of I.R. IRAN from international and internal law of the sea perspectives

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Abstract

The significance of developing coastal and marine areas is nowadays clear to every state. However realization of such goal calls upon a number of prerequisites among which taking marine scientific research (MSR) into account is of much importance. Conduct of MSR could both be shouldered by internal MSR researchers and institutions as well as foreign and international ones. Today, one may merely find a country/state with no experience of receiving foreign applications for conduct of MSR activities. Grant of consent to foreign MSR activities in the marine areas of states necessitates fulfillment of a particular procedure normally set forth in both internal legal instruments as well as international law of the sea ones the by the requesting state. However, the question needs to be answered is that whether such consent by the coastal state to the foreign MSR activities should be deemed as a threat to the coastal states benefit or as an opportunity to develop coastal and marine areas of the said states. The article tends to use the outcomes of the research in the I.R. Iran surrounding marine areas namely Persian Gulf and Oman Sea.

Keywords: Law of the Sea, International Law, Marine Scientific Research, Legal Regime, Operational Oceanography
Long-term variations in the observed sea level in the south-eastern Mediterranean Sea: A new approach of investigation

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Abstract:

The principal lunar tidal constituent is the key player in the observed sea level variations. It depends mainly on the lunar cycle (2 cycles/month) and hence, it will be more reasonably (convenient) to base the investigation research on the changes in the sea level on the Hijry calendar. The present paper can be considered as an initial fair trial to proceed for this investigation, and meanwhile using the Arabic as manuscript language in this field.

Using 34 Hijry years (1394-1427) of hourly sea-level data, the present paper draws the trend of long term variation in the sea-level off Alexandria; representing the South-eastern Mediterranean Sea. Both linear and quadratic model equations describing the rate of variation in the mean monthly (0.19 cm/year) and in the mean monthly anomaly (0.17 cm/year) of sea-level are produced.

The long term variations in the mean monthly and mean monthly sea-level anomaly reflect very weak cyclic trends in the change of the sea-level. This is in contrast to the cyclic behaviour previously concluded for oceanographic parameters (sea surface temperature and salinity), air temperature and fish catch for the same region.
Izmir Bay Coastal Observatory

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Abstract

Izmir Bay Coastal Observatory has been established to observe and predict bay's response to natural and anthropogenic forcing within the framework of the “Izmir Bay Marine Research Project” supported by Izmir Metropolitan Municipality. The observatory consists of observing system and physical dynamical model. The observing system is composed of four stations which includes meteorological unit, coastal temperature, salinity, sea-level unit and bottom mounted Acoustic Doppler Current Profiler (ADCP). Each station is connected to central unit through the GPRS and transmits data at every 10 minutes. Received data are processed and quality controlled at this central unit before using in the model developed for the İzmir Bay. Furthermore, processed data are transferred to commons like city ferry piers for informing public.

The Izmir Bay (western Turkey) is extensively impacted by anthropogenic activities. Chemical and microbiological pollution increasing maritime transport and climate change are key pressure causing eutrophication in the bay. Especially domestic discharge “produced” by city of Izmir and coastal erosion leading to transport of the sediments to the bay are among the major problems. Besides the real-time use of the data the constructed time series will allow definition of the seasonal cycle, its inter-annual variability and quantification of the extreme events. The system is started to operate in November 2012 and active till now. The first use of the data is to understand how topography affecting the circulation in the bay.
Variations of sediments characteristics in coastal hot spots of the Lebanese marine area

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Abstract

The Lebanese coast is exposed to several anthropogenic stresses, mainly the domestic and industrial wastewaters that modify its structure, change the quality of its surrounding water and create additional risks against human health and marine environment.

In the context of the Lebanese-Italian project “CANA”, this study aims to evaluate the state of environment of three coastal marine hot spots, Selaata (North of Lebanon), Raouchy (Beirut) and Ramlet-el-Bayda, and to compare them with Tyre reserve marine area (South of Lebanon).

In June 2012 sediment samples were collected from 3 coastal marine points at Selaata (ST1, ST2 & ST3), one point at Raouchy (Bey) and one point at Tyre (Tyre).

The grain size analysis showed that the fine sand dominated with more than 50% the other fractions in the 4 studied areas. The sediment of Selaata was loaded with phosphate (5146 µg.g⁻¹) and that of Tyre showed the lowest concentration of 356 µg.g⁻¹. The maximum content of organic matter was found in the sediment of Raouchy (1.05%) and the minimum in the sediment of Ramlet-el-Bayda (0.31). Minimum concentration of chlorophyll-a was measured at Ramlet-el-Bayda (5.4 µg.g⁻¹) and maximum concentration at Tyre (55.5 µg.g⁻¹).

The concentrations of Pb ranged between 4 µg.g⁻¹ in Tyre’s sediment and 12.2 µg.g⁻¹ in Selaata’s sediment, those of Cd ranged between 0.04 µg.g⁻¹ in Tyre’s sediment and 0.34 µg.g⁻¹ in Selaata’s sediment, and those of Cu ranged between 1.9 µg.g⁻¹ in Tyre’s sediment and 16.9 µg.g⁻¹ in Raouchy’s sediment.

The sediments presented a reliable tool in understanding and estimating the state of environment of the studies zones. Selaata marine area was clearly impacted by the activity of the fertilizers’ plant while that of Raouchy was strongly affected by the domestic discharges. Despite the presence of domestic discharges the public beach of Ramlet-el-Bayda showed less signs of pollution. The reserve of Tyre is a clean marine area and may be adopted as a reference zone and its results as background ones.

Keywords: Eastern Mediterranean, Lebanon, domestic pollution, industrial pollution, sediment
Monthly averaged hydrokinetic energy in the Persian Gulf : An appraisal using numerical model

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Abstract:

As the demand for clean renewable energy is rising, hydrokinetic energy is receiving more and more attention from politicians, industrialists, and academics. In this article, monthly and depth averaged potential of current flow as energy resource in the Persian Gulf is reviewed. Current speed and direction data have been prepared using a 3D Numerical model for ocean circulation and power density of the current stream energy has been calculated for each cell in the model domain, and then averaged in depth and time. Results show that mean power density of currents in the southern coast of the gulf is more than its northern one. The maximum values of these monthly averaged power densities distinguished during the Indian Ocean monsoon periods. The maximum magnitude of the current speed in the study area was about 1 m/s and the related power density was 517 w.m$^2$.

Keywords: Persian Gulf, Renewable energy, Numerical model.
Depollution reinforcement of Taparura Northern coastal zone of Sfax city, Tunisia: Enhancement of water system management

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Abstract

This work diagnoses the environmental impact of polluted water emanating from the rain water open air channel of Wadi Ezzit located in the northern coastal area of Sfax city in Tunisia. This channel still undergoes different sources of contamination namely the contaminated urban and industrial solid wastes and sediments carried by the rain water flow, the wild discharge of industrial waste water in the channel and the infiltration of polluted water from the water table contaminated by the surrounding sanitation absorbing wells. All these factors generate a negative effect on the ecosystem in the northern coast of Sfax city. For this reason, we carried out a chemical analysis to samples of water and sediments extracted from different locations in the channel and the neighbouring sea zone. The results of chemical characterization of the samples prove the existence of a large content of heavy metals, especially mercury as compared to the limits fixed by the Tunisian standard. Moreover, an investigation of the fauna and flora in the area under consideration has been carried out in order to better understand the effect of pollution on its ecosystem. The suggested curative procedure is included within the Taparura coastal management project intended to solve the pollution problem in the northern coastal zone of the city of Sfax and the creation of a new urban park along an area of 420 ha and 6 km of reclaimed beaches. An action plan was implemented in order to improve the environmental quality in the zone by reducing the contamination sources and limiting their impacts. The necessary environmental remediation measures are to excavate the polluted sediment in the mouth of the Wadi Ezzit channel, improve the civil engineering conception of the channel so as to make it watertight, construct a coffer dam near the mouth of the channel.
Sedimentological characteristics and metallic trace element contents in surficial sediments off Kemaman coast, Terengganu, South China Sea

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Abstract

A total of forty-three (43) surficial sediment samples were collected on board DISCOVERY I by using Smith McIntyre grab at Kemaman coast, Terengganu, South China Sea. These sediments were analyzed in order to obtain geochemical information on sedimentological characteristics, sediment texture and metallic trace elements concentration. Lazer diffraction method using particle size analyzer (PSA) was used to determine the sedimentological characteristics and sediment texture. Teflon bomb digestion method was used for the determination of metallic trace elements concentration. Results showed that the study area was dominated with sand particles (60.47%) followed by loamy sand (20.93%), sandy clay (16.28%) and silt loam (2.33%). On the other hand, the average concentrations of each metallic trace element was 0.12 μg/g for Cd, 36.6 μg/g for Cr, 9.51 μg/g for Cu, 11.6 μg/g for Ni, 41.5 μg/g for Zn and 29.3 μg/g for Pb. Furthermore, normalization and enrichment factor were used in the assessment of pollution status in the study area. Based on the EF classification, the enrichment of metallic trace elements ranked in the following order: Pb>Cd>Zn>Cu>Ni>Cr. The significant enrichment of Pb and moderate enrichment of Cd and Zn indicated that there are anthropogenic inputs while the rest of the metals can be considered from natural sources although there are effects of anthropogenic inputs in some sampling location.
Beach morphodynamic and sediment characteristic along Teluk Chempedak to Kuala Pahang

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Abstract

The dynamic of sandy coastal profile of Pahang during post-monsoon season was studied in order to describe its morphological evolution. A series of surveys together with samples collection were carried out for determining the modification evolved and sediment constituent of the study area. Several location were selected comprising 12 different station comprehended from Teluk Chempedak to Kuala Pahang. The stations were established at random intervals taking into account the morphological factors such as headland and estuary. Samplings and data collection were conducted monthly for 1-year period from February 2012 to February 2013. Topographic beach profile data shows no drastic changes at the dune and high-tide area. However, alternate process of deposition and erosion took place at most stations that could be noticed at the mid-tide level and some extent of low-tide area. The monsoon activity has transported the sediment away from the stations causing most stations experienced erosion during monsoon and post-monsoon season. Sediment analyses postulate that sediment size dominated by medium sand classes to fine sand classes where most of the sediments are consists of quartz sand.
Sea bottom characteristics and sediment transport patterns on the coastal shelf of Istanbul, Turkey

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Abstract

Coastal sediment transport takes place due to the motions of waves and currents, resulting in the formation of characteristic coastal landforms such as beaches, barrier islands, and capes. In coastal management an understanding of the present-day fluxes of sediment in near-shore environments is of crucial importance. In coastal engineering measuring or quantifying sediment transport or erosion is important in order to solve many environmental, geotechnical and geological problems. Spatial variations in grain-size parameters, for example, contain information on sediment transport patterns.

The southern approaches of the Strait of Istanbul (Bosphorus), located in the Sea of Marmara region of Turkey, consists of a sand ridge which is slightly oblique to the coastline. In front of a swale it extends from the Ahirkapi headland of Istanbul. The water masses in the region are mainly under the control of a jet stream flowing through the N-S oriented narrow strait channel, as well as associated secondary current circulations and waves. In order to infer net sediment transport paths in the region, bottom sediment samples were collected at 45 stations on the shelf area during 2012 summer. In this study textural characteristics of the region will be given. The spatial-changes in grain-size parameters will be analyzed by different methodologies based on analytic geometry and vector analysis. The uncertainties which may arise due to sampling, grain-size analysis and modeling methodologies will be examined. Some acceptable results will be discussed together with the hydrographic characteristics of this geographic junction and also with the orientation of actual sedimentary deposits deduced from seismic data.
Assessment of climate change impacts on the Caspian Sea Iranian coastal wetlands, using by GIS

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Abstract

Iranian and Southern part of the Caspian Sea including: three provinces as name Gillan (west), Mazandaran (middle) and Golestan (east) with 890 km coastline length. Mentioned area has diverse ecosystems and unique habitats with special characteristics, ecological landforms which are an important environmental and geographical role in the process of assuming the coastal areas. Biodiversity and habitat, distribution patterns of fauna and flora communities, biological and non-biological resources and valuable marine – coastal living stocks get affected by the Caspian Sea climate seasonally and annual fluctuation. Firstly, data and information about environment, ecology, geomorphology, diversity and distribution of species were collected, and different scale of topographic maps studied. Then, GIS maps based on field visits and coastal cruise prepared with emphasis on location and position of the Ramsar International Wetlands. These wetlands are Anzali, Kiyahshahr and Amir Kelaye in Gillan province, Lapo, Palangan and Shirkhan in Mazanderan, and Alagol, Ajigol, Almagol, Gomishan, Miyankale peninsula and Gorgan Bay in Golestan province, respectively from west to east. The results were showed that climate change; sea level fluctuations of the Caspian Sea have negative direct and indirect impacts on the ecological status of wetlands. The most important consequences are increase of sedimentation capacity and develop of sediment cells, remove of merged and sub merged aquatics plants, destroy of fish habitats and migration cluttering of Anadromus and Catadromus species.
The economic effects of climate change on aquaculture in developing and developed countries
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Abstract

Climate change is a global phenomenon which needs the participation of all countries to control and decrease it. Although all countries are involved in causes and consequences but developed countries and developing countries don't have the same share in gas emission. In addition the effect of climate change is not the same for these two sets of countries. Among the marine activates, aquaculture is very important for developing countries and it assumes that climate change should damage this sector more than the other marine economic activities. This sector is vital via two aspects. One of them is the role of it in employment and the other one is food security. In this paper we are going to compare the role of developed countries compare to developing countries in aquaculture production and business and analyze the amount of economic loss that this sector have done through climate change in these countries. In the following chart the share of CO₂ emission for three level of income are shown.
Biomonitoring study of heavy metals in coastal zone of South Eastern coast of Mediterranean Sea, Egypt

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Abstract

Water, Sediments and biota of El-Mex Bay estuary, on the southern Mediterranean Sea northern Egypt, have been analyzed for heavy metals (Cd, Co, Cr, Cu, Zn, Pb, Mn and Fe). The Bay present’s higher metal concentrations in aqueous Cd and Co are above the chronic freshwater quality criteria for aquatic life. The levels of Cu, Co, Zn, Mn and Fe in the macroalgae, Ulva lactuca, Enteromorpha lenza (green algae) and Pterocladia capillacea (red algae), recorded high concentrations except for Cd. Moreover, Fe was the most predominant metal in the seaweed. El-Mex Bay having the high metals concentration in sediments as their order of abundance were Fe> Zn> Mn> Pb>Cu> Cd> Co. Nevertheless, a high variability in the metal levels occurs among the studied algae.
Toxicity of Mercury from beach plastic litter to crustacean *Portunus Pelagicus*, in the marine environment

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Abstract

Plastic materials disposed along the seacoast from drain outfalls and those cast from fishing boats, ships and beach visitors, has witnessed a surge in pollution over the recent years. Our findings revealed total mercury (T-Hg) in plastic litter causing toxic effect to marine lives. Unlike common methods and instrumentation that indicated analytical limitations, precise and reproducible results were achieved by employing a direct mercury analyzer (DMA-80) with the least detection limits of 0.0015ng.g⁻¹. In the experimental set-up, the inclusion of common beach plastic litter to crustacean *Portunus pelagicus* revealed significant T-Hg concentrations as well as bioaccumulation factor (BAF)>1 when they were exposed for 180d besides the significant role of T-Hg concentration from plastic litter. Thus, this study (a) facilitates environmentalists to undertake appropriate measures to prevent plastics litter in recreational beaches, (b) deduce the permissible toxic concentration of T-Hg in marine organisms, (c) curb human consumption of contaminated seafood, (d) facilitate possible monitoring of T-Hg concentrations in plastic materials that apportion in beaches and its transportation elsewhere the globe.
Seasonal variation of physicochemical properties of seawater in coral reef of Hengam Island, Persian Gulf

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Abstract

In the Persian Gulf, reef building corals live in the most extreme environment with regard to high summer and low winter temperatures (about 16-36 °C) (Kleypas et al. 1999; Sheppard et al. 2010; Riegl et al. 2011). Hence, plus to their local importance, they currently play an important role in studies concerning effects of global warming on coral reefs. Nevertheless there is still lack of underwater temperature data for many coral reefs of the Persian Gulf. Here we studied under water temperature, dissolved oxygen, salinity, pH, alkalinity and nutrient contents of the coral reef of Hengam Island in the Persian Gulf during 2012. Our result showed that the water temperature sequentially decrease (down to 5 °C) during large high tides from early June to late October. In mid-August, during a period of small tides and relatively constant high water temperature, many minor scleractinian corals bleached around the study sites. This was in agreement with the idea that temperature anomalies leading to coral bleaching are mostly the result of the local heating. Although post-bleaching observations showed that this was a reversible phenomenon but the bleaching could account for the thermal sensitivity of involved species. Diurnal variation of pH, salinity, dissolved oxygen and alkalinity were measured and according to obtained results aragonite saturation factor was calculated for winter and summertime.

Keywords: Persian Gulf, Hengam Island, Coral reef, tidal cooling, alkalinity, dissolved oxygen, bleaching
Assessment of land use and its impact on climate change in coasts of rivers – Khouzestan Province, Iran

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Abstract

Assessment of climate change and its relationship by land use types is important in identification of the coastal microclimate. Temperature is one of the most important parameters that are influenced by environmental conditions and it is considered as one of quality indices of environment. In this paper, issues is the impact of main land use on climate change and categorize these issues, then considered to heat islands on the coast of the examples for changing climate. Aim of this research and analysis is related to land use and climate change on the coast and according to studies performed, changes in coastal areas, especially the location and type of land uses that affect the rapid changes in main climate parameters such as temperature, wind, atmospheric precipitation, humidity inside the city as a result of climate change and the heat island effect in the city of Ahvaz (Capital of Khuzestan province) south east of Iran GIS. Expert Also, Choice software have also been used, examined and the findings suggest that the accumulation of industrial users in the city and wasteland surrounded by high population and installations, such as rail, main applications affecting climate change and urban heat islands have a direct connection.
Excess of $^{210}$Po in the coastal atmosphere of southern asian region

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Abstract

The distribution and behavior of the alpha-emitter natural radionuclide polonium-210 in the coastal atmosphere environment has been studied to its enhanced accumulation in the coastal air column. Atmospheric aerosols in the surface air in the form of PM$_{10}$ at Mersing Meteorological Station were collected using a high volume air sampler for obtaining the activity levels of $^{210}$Pb and $^{210}$Po. The mean activity concentrations of $^{210}$Pb and $^{210}$Po in the aerosol samples were $347 \pm 170$ µBq/m$^3$ and $318 \pm 202$ µBq/m$^3$, respectively. While $^{210}$Pb activity is comparable to the global ranges, we have observed excess of $^{210}$Po in aerosols of the coastal atmosphere at eastern Johor. The $^{210}$Po/$^{210}$Pb activity ratios were significantly higher (0.5 to 2.3) than the most common environment (~0.1) (Poet et al. 1972; Moore et al. 1973). The excess of $^{210}$Po in this study has reached up to 130% especially during the dry season. The unique feature of $^{210}$Po in our data is indicative to interesting aerosol chemical and physical properties. The sporadic haze episodes in the region due to forest and biomass fires as well as long range continental dust transport have been suspected to be the main factors. Therefore, $^{210}$Po may play significant role in the atmosphere-coastal biogeochemical cycle in this region as $^{210}$Po has similar behavior to the nutrients and bio-active elements.
Rare earth elements in rocky shore organisms from the coastal areas of Malacca and Negeri Sembilan

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Abstract

Interspecies, inter-tissue and interspatial variations of Rare Earth Elements (REEs) in soft tissue of Thais clavigera, Nerita chameleon and Saccostrea cucullata along coastal area of Malacca and Negeri Sembilan were determined. They were chosen to be evaluated based on their ability to be good bioindicator for REEs. Significant positive correlations (p<0.01) were found among all REEs concentration. Samples were digested using Teflon Bomb method followed by detection by using Inductive Couple Plasma-Mass Spectrometry (ICP-MS). The gastropods (T. clavigera and N. chameleon) and bivalve (S. cucullata) have high concentration of REEs at Tanjung Bidara site. Locations with relatively high concentrations of REEs seem to relate to their close proximity to industrial and urban sites. LREEs (Light REEs) were found more abundance compare to HREEs (Heavy REEs) for all location.
Benthic habitat mapping, Qeshm Island, Persian Gulf

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Abstract

The goal of this study is mapping benthic organisms and selecting suitable sites for marine protected areas in Qeshm Island by GIS. Species richness patterns for 27 intertidal locations of different habitats (rocky, sandy, mud flats and mangrove forests) and different taxonomic groups were assessed during rapid surveys of biodiversity conducted during 2007-2010. Landform map was made by satellite images and checked by field survey. A total of 14 macrobenthic taxa were identified. Spatial pattern of each taxon was mapped by ArcGIS 10. Conservation value of each site was calculated based on landform map and macrobenthic biodiversity. The highest biodiversity was observed in Southeastern part of the Qeshm Island. This finding appears contrary to the study that assessing sensibility of coastal areas of Qeshm Island based on habitat type and assemblage of vertebrates. These result implied that integrated results for MPA studies are extracted at least from three different data (biodiversity of invertebrate & vertebrate, landform & vulnerability indices). And if we make decision based on one of them, our result will not be accurate.

Keywords: Habitat mapping, benthic organisms, intertidal, Qeshm Island, biodiversity.
Toxic metals in water of Kuantan river, Kuantan, Pahang

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Abstract

The water quality of the Kuantan River had been studied with reference to toxic metals during post-monsoon (May, June and July 2012) and post-monsoon (August, September and October 2012) seasons. The metal analyzed includes arsenic, mercury, cadmium, chromium and lead. River water samples were collected from the surface and bottom layers in a grid of 9 stations towards the upstream of Kuantan River during high tide and low tide. The dissolved metals were extracted and preconcentrated using Chelex-100 in Teflon tubing after filtration of water samples to remove the saline matrix. The particulate metals were digested using Teflon bomb and trace metals were analyzed using ICP-MS and validated against Certified Reference Material 1646a Estuarine Sediment. The concentration of dissolved metals during post-monsoon and pre-monsoon were in the range of 2.67 – 37.05 μg/L and 4.75 – 47.80 μg/L for As, 0.02 - 2.53 μg/L and 0.55 - 4.37 μg/L for Cd, 0.12 - 2.47 μg/L and 0.15 - 1.59 μg/L for Cr, 0.02 - 0.34 μg/L and 0.03 - 0.80 μg/L for Hg, 0.10 - 11.19 μg/L and 0.18 - 10.59 μg/L for Pb respectively. The present measurements were to provide baseline data for any future comparison of trace metals distribution in the Kuantan River.
Assessing the impact of climate change in sustainable urban development in Anzali port, Iran – Caspian Sea

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Abstract

The climate change issue has created new opportunities and capacities in the world. Also, climate change poses a significant challenge on the path to sustainable development. In other words, it is necessary for sustainable urban development that not only world public opinion have been notified the negative effects of climate change, but also different experts in related field to deal with this problem. Therefore, the role of urban planners cannot be ignored. This group believes that solution is sustainable urban development. Sustainable urban development has many dimensions and components. But what is the main purpose of this study, is to obtain more effective criteria on climate change and to formulate a model based on them. Anzali Port which located in Gillan province (the Caspian Sea coast) on the same basis and by using the Analytic Hierarchy Process (AHP) has been analyzed. Also the software of Expert Choice has been used. Finally some operational strategies presented in order to promote sustainable development in Anzali Port which lead to the prevention of future unpleasant climate change.
POSTERS : Theme 1

Oceanography, Coastal Processes & Geomorphology
Spatio-temporal variations of the surface temperature in the Mediterranean Sea

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Abstract

Achieving long-term climatology and analysis of spatial and temporal variations of surface temperatures of the Mediterranean Sea are the main objectives of this work. For the purposes of this study, we used the in situ data MEDATLAS 2002 containing measures collected during the period 1889-2000. The techniques used allowed us to restore complete sets of in situ temperature data to the surface of the Mediterranean Sea, over a period of 45 years (1955-1999). In addition, the reconstructed field climatologists are in good ranges compared to climatology the most recognized worldwide.

The spatio-temporal analysis of different ways fields shows:
- The north-south gradient is lower than the east-west gradient of surface temperatures;
- The highest spatial and temporal variations are sharper in areas of formation of deep water than anywhere else;
- The SST in the Mediterranean following a marked seasonal pattern visible;
- The summer-winter temperature contrasts strongly reflect forcing induces the thermohaline circulation in the Mediterranean;
- The evolution of annual anomalies of this field reflects droughts and wet periods observed in the Mediterranean region.

Climatology thus made can provide more for:
- Improved analysis of variations in air-sea interactions on long ladders;
- Understanding the mechanisms underlying the Interannual variations in deep water formation in the Mediterranean;
- Improved constraints for numerical weather prediction models;
- A better understanding of inter-annual climate variations in the last 50 years of the 2nd millennium to the countries bordering the Mediterranean Sea.

The average seasonal variation in surface temperature is around 14 ° C. The summer heat and the winter field are completely mixed. The summer-winter temperature contrast clearly reflected forcing induces the thermohaline circulation in the Mediterranean. The surface temperature field in the Mediterranean following a highly visible marked seasonal cycle and evolution of annual anomalies of this field reflects the drought and wet observed in the Mediterranean region.

Keywords: Mediterranean Sea, surface temperature, spatiotemporal variations
Environmental effect of Oil spill from an aftermath accident around
planned oil rigs at the Black Sea

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Abstract

The Black Sea presently faces strong ecological disequilibria owing to eutrophication and pollution arising from many contaminants injected principally from rivers discharging into the basin, atmospheric deposition, direct discharges from point and non-point coastal sources and occasional accidents at sea. Major contaminants include oil residues, pesticides, hydrocarbons, nutrients and heavy metals. Accidental spills of the contaminants pose a very high level of risk for the marine environment and coastline, as the Black Sea is essentially a closed basin and thus very sensitive to continued high fluxes of contamination. The simulation code GNOME™ version 1.3.3 was utilized to generate the oil spill scenarios. Scenarios were run for 5 coordinates at the Black Sea. All simulations were running for 10 days.
Seasonal variations of fatty acid compositions in coral reefs of Hengam Island, Persian Gulf

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Abstract

Seasonal variations of fatty acids in coral reefs of Hengam Island were investigated in relation to the changes in total fatty acids contents, the ratio of polyunsaturated fatty acids to saturated fatty acids (P/S), and that of n-3 fatty acids to n-6 fatty acids (n-3/n-6). A distinct seasonal pattern was found in total lipid contents with maximal values (1.54 mg/Cm²) in winter. The percentage of polyunsaturated fatty acids and saturated fatty acids were the lowest in the summer and winter, respectively. In summer months, the proportion of polyunsaturated fatty acids decreased while that of saturated fatty acids increased. The major contributing factor to the seasonal variation of polyunsaturated fatty acids was n-3 fatty acids. These results led to the lowest levels of P/S and n-3/n-6 in summer.

Keywords: Fatty acids, Hengam Island, Persian Gulf, Seasonal variation
Assessment of marine pollution in the waters and sediments of the Algiers coast: A mathematical modeling approach

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Abstract:

All bodies emit and reflect the flow of energy in the form of electromagnetic radiation. The relative variation of the energy reflected or emitted as a function of wavelength, is the spectral signature of the object considered in a given state. The spectrum can be used to identify and determine its status. For a satellite, making measurements in a number of spectral bands, the spectral signature of an object will correspond to different levels of radioactivity recorded in each of them. The principle of remote sensing is the detection of electromagnetic radiation that carries information from the soil-atmosphere either by reflection or by transmission from a radiometer on board the satellite. The signal received by the radiometer is the result of physical, biological and geometrical objects on the ground. For a better use of satellite measurements, we must answer the following questions: At what point on the earth's surface so far is it? What is the value of measuring that? Answering these questions requires the definition: What exactly are the physical quantities measured by the measurement system? What disturbs the measurement system does what it is supposed to measure? Which model can you describe the disturbances? How does one characterize the quality of measurement?

In the first part, we simulate the measurement achieved by the captor of our pure water (from the sea far from any pollution). In the second part we using the imagery treatment, we determine the real value evaluated by the satellite for a deep sea water. We use a both the simulated value and the real value to calculated the calibration factor for each channel. We take the image and we transform the digital account into radiance by linear relation. For each channel, we use the reverse model to calculate the reflectance for each pixel.

The substances which determine the optical properties of water surfaces, and then influence their reflectivity, may be classified in three categories: i) the alive phytoplankton and the detritus which come with it; ii) the suspended particles; iii) the dissolved organic matter. The phytoplankton and the biogenic detritus which are associated with it have generally the same color. In most oceanic waters and in some coastal waters where terrigenous supplies are little, the influence of the phytoplankton is dominant. In natural conditions; it is very difficult to dissociate the effects of the phytoplankton and those of the biogenic detritus on the coefficient of absorption for which only global estimations are made. The phytoplankton cells and the particles correspond to the biogenic detritus causing a Mie diffusion of the light which does not much depended on the wavelength. Therefore, the color of water gradually takes a green shade with the increase of the phytoplankton concentration.

This piece of work showed us the possibility of estimating certain pollutants on the basis of the satellite images which can be used to monitor the coastal zones pollution. Indeed, the image reveals a global and instantaneous vision of the state of the environment and makes it possible to locate the sample in its environment. The models permits the determination of the pollution indicators based on the satellites.

Keywords: models, reflectance, satellite, assessment, marine pollution.
The importance of the coastal current system of the Izmir Bay related to ICZM

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Abstract

The current system of Izmir Bay has a crucial importance for the governmental and local authorities and decision makers who are interested in planning related to the building coastal structures near the coastal zone of Izmir region. The dominant circulation pattern of the Izmir Bay by the Aegean Sea coast of Turkey is studied under the influence of wind and thermohaline forces. The wind from the northerly directions that blows most of the year is a constant feature of the Izmir Bay area. There are also thermohaline forces due to the existence of water masses of different densities. The effects of those winds and thermohaline forces are studied with their seasonal variations and the current induced gyres within the Izmir Bay are discussed by subdividing the bay into outer, middle and inner areas. Instead of the two-layered current system prevailing during summer, a horizontally shared current system exists in winter. The analysis of this current system enables the determination of the processes effective in both chemical and biological environments. The patterns of gyres are discussed along with the forcing effects and the relevant mathematical parameters. The numerical method used is applied with the input data obtained through the measurements made by the research vessel K. Piri Reis.
Assessment of radioactive contamination in marine sediments of the bay of Algiers: 2nd campaign

Evaluation de la contamination radioactive dans les sédiments marins de la baie d’Alger: 2ème campagne

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Abstract

The future of radionuclides in marine environment is primarily related to the physico-chemical form in which they are. Indeed, the soluble forms are more favorable to dispersion than the particulate forms, those present better conditions to fixing. The radionuclides are fixed on the fine sediments and offer a large surface area of adsorption. This fixation is often preferential on the fine fraction of sediment explains that artificial radionuclides are in general more important in areas with calm hydrodynamics like bays and estuaries.

The objective of this project is to approach the evolution of radioactive pollution in the surface sediment according to bathymetry and in the deep layers of the sediment of Algiers bay. The radionuclides will estimate the sedimentation rate and access the history and the chronology of the sediment contaminants.

Résumé

Le devenir des radionucléides dans le milieu marin est essentiellement lié à la forme physico-chemique sous laquelle ils se trouvent. En effet, les formes solubles sont beaucoup plus favorables à la dispersion que les formes particulières ; celles-ci présentent de meilleures conditions à la fixation. Les radionucléides se fixent sur les sédiments fins, et offrent une plus grande surface d’adsorption. Cette fixation souvent préférentielle sur la fraction fine des sédiments explique que les dépôts de radionucléides artificiels soient en général plus importants dans les régions avec une hydrodynamique calme comme les baies et estuaires, ou les vases ont tendance à s’accumuler.

Particulate organic matter in Kagoshima Bay, Japan

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Abstract

Suspended particles in seawater include detritus, fecal pellets, various organisms, and inorganic particles. Microscopic particles are also produced from dissolved matter by physical process. Macroscopic particles (marine snow) originate from aggregation of various small particles. Kagoshima Bay is located in the southernmost of Kyushu, Japan. The northern area of Kagoshima Bay is faced to active volcano, Mt. Sakurajima. One of the characteristics observed in Kagoshima Bay is that the marine snow particles occurring in water column often contain volcanic ashes originated from Mt. Sakurajima. In the present study, we describe the characteristics of particulate organic matter in Kagoshima Bay and its possible significance in the biological oceanographic processes in the marine ecosystem. Seawater samples were collected from 12 different depths down to 200 m depth with water bottles attached to a CTD system of the research ship Nansei-Maru, Kagoshima University. Large particles (marine snow) were directly collected by scuba diving from 10 m depth. The suspended particles in seawater samples were collected on glass fiber filters and analyzed particulate organic carbon (POC) with elemental analyzer. It was clear that seasonal variation of POC standing stock was marked. The integrated POC in the water column showed maximum in May and minimum in November. POC concentrations were always higher in surface waters and the concentration rapidly decreased with increasing depth. The seasonal and vertical variations of POC had closely relation with phytoplankton standing stock in the euphotic layer. Laboratory observations showed that marine snow particles contained variety of living and non-living particles. It is probable that rapid sinking marine snow significantly contributes for the vertical transport of organic matter to the sea floor.
Modification of a turbulence model to analyze oscillatory boundary layers on a rough surface

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Abstract

An accurate prediction of sediment transport in coastal environments requires detailed analysis of coastal bottom boundary layers in changing field conditions with oscillatory motion. Nowadays, powerful computing facilities at affordable costs encourage practicing engineers to use numerical models for this purpose. During the past three decades a large number of turbulence models have been proposed mainly to analyze steady boundary layers. Previous reviews on the application of some popular turbulence models described the shortcomings of some of the existing models. Based on the recommendations by previous researchers a turbulence model was developed for smooth oscillatory boundary layers. However, in order to study the problem of coastal erosion in the field, it is necessary to enhance the capabilities of this model to include the effect of roughness. In order to include the effect of roughness in two-equation turbulence models, generally wall functions are used which have proved to be effective in case of steady boundary layers. Some researchers have used the wall functions for oscillatory boundary layers as well, but it is not possible to justify the use of such a method for time-dependent flows. In the present study, a roughness viscosity has been introduced to include the effect of roughness of the boundaries. The relationship of the roughness viscosity has been found from the available experimental data. It has been found that the proposed model of roughness viscosity can be effectively used for steady as well as unsteady boundary layers on smooth and rough surfaces.
Trace metal concentrations in the green-lipped mussel *Perna Viridis* (Linnaeus, 1758) collected from Maheshkhali channel, Cox’s Bazar, Bangladesh

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Abstract

The green-lipped mussel *Perna viridis* (L.) were collected from four sampling locations of Maheshkhali channel, Cox’s Bazar, Bangladesh to determine the concentration level of zinc (Zn), copper (Cu), cadmium (Cd) and lead (Pb). The concentrations (µg/g dry weight) of these trace metals ranged from 28.12 to 33.82 for Zn, 7.26 to 8.81 for Cu, 0.04 to 0.08 for Cd and 0.19 to 0.75 for Pb. The concentration level of trace metals in mussel tissue were found at lowers than the permissible limits for human consumption. In addition, these metal concentrations are also considered to be low when compared with regional data using *P. viridis* as a bio-monitoring agent.
Analytical study on use of public transport for reduce the impact of climate change (Anzali port –Caspian Sea)

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Abstract

The cities which located in developing countries are faced with a growing population. According to the results and information in various reports till 2030, 60 percent of the world population, or 5 billion people will live and residence in cities. The other hand, the transportation sector, is accounted for about one-quarter of the world's greenhouse gas output. This amount is increasing mainly due to cars and trucks. If this is not mentioned, it will be almost impossible to avoid the sharp rise in global warming. The present study is an attempt to analyze the Anzal Port (Gillan province, the Caspian Sea coast), to show and plane a typical of the pattern of urban development. This study focused on walking and public transportation, as these coastal cities, have natural and visual resources and the beauty of its own that cannot be ignored in the environmental development of city. This analysis was based on method of checklist of criteria and GIS and Expert Choice software have also been used. Finally, some development strategies for environmentally friendly urban transport system are provided.
The properties of ceramic materials as artificial substrate for coral rehabilitation and restoration

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Abstract

Artificial substrate made from ceramic are a non-toxic, pH neutral, and eco-safe material that is ideal for the settlement of corals and other invertebrates. Unlike artificial substrate made from concrete, metal or other discarded materials, ceramic materials deliver many of the biological, ecological and physical conditions necessary for normal reef ecosystem function. The substrate was made from customized ceramic formulation in a shape a fish bone using slip casting technique and fired at several temperatures. The fired bodies were analysed in order to determine physical and chemical properties in order to select suitable properties to be used as artificial coral substrate. The selected artificial substrate was installed at field test site at Pasir Akar, Pulau Redang Marine Park, Terengganu and monitored within specific interval duration in order to observe its suitability and effectiveness for coral growth. Identification of coral species and algae growing on the artificial coral substrate was done in order to find out the growth selectivity of coral species on the artificial ceramic substrate.
Theme 2: Marine Ecology & Biodiversity
Population Structure of *Lagocephalus sceleratus* (Osteichthyes, Tetrodontidae) in the Lebano-Syrian marine waters

*Structure de population de Lagocephalus sceleratus (Osteichtiens, Tetrodontidae) dans le milieu marin Libano-Syrien*

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Abstract

*Lagocephalus sceleratus* (Gmelin, 1789) is a Lessepsian invasive species of Indo-Pacific origin that has established an increasing population over the past decade in the Levantine basin of the Mediterranean. Besides its toxicity due to the accumulation of tetrodotoxin in its body, it is causing damages to fishing gears and fishermen’s catches.

This study aims to provide data on the population structure of this species in the eastern basin of the Mediterranean.

A total of 214 individuals were collected in the coastal marine waters of Lebanon and Syria, between April 2012 and June 2013 by means of different types of lines and nets, on different bottoms, at depths ranging from 20 to 175 meters.

Total length (TL) of the samples varies between 10 and 75 cm. The most common size class, represented by 130 individuals, is the one between 15 and 30 cm TL, with a bulge at the 25-30 cm TL size class, represented by 65 individuals. The average TL of males is 36.1 cm (SD = 13.07), 29.3 cm (SD = 13.15) for females. The weight of the specimens ranges between 14 and 4603 g with an average value of 607.5 g (SD = 933.1). The sex ratio (M/F) is 0.37 with a total number of 54 males, 149 females and 11 unidentified individuals. The Condition Factor (K) is 1.3 for all samples. The weight-length relationship (*W = aLᵇ*) shows an isometric growth with *b* = 3.007 and *R*² = 0.9699.

The results obtained in this study could provide a baseline for further specific studies on the biology and ecology of *L. sceleratus*, invasive species in the Eastern Mediterranean.

Keywords: *Lagocephalus sceleratus*, invasive species, population structure, Eastern Mediterranean.

Résumé

*Lagocephalus sceleratus* (Gmelin, 1789) est une espèce lessepsienne invasive d’origine indopacifique qui s’est développée d’une façon spectaculaire ces dix dernières années dans le bassin levantin de la Méditerranée. A part sa toxicité, due à l’accumulation de la tétrodotoxine dans son organisme, elle est dévastatrice et cause des dégâts aux filets et aux prises des pêcheurs.

Cette étude vise à apporter des données sur la structure de population de cette espèce dans le bassin Est de la Méditerranée.

Un total de 214 individus a été collecté, dans les eaux marines côtières du Liban et de la Syrie, entre avril 2012 et juin 2013. Les captures étaient faites avec différents types de lignes et de filets, sur différents types de fond, à des profondeurs allant de 20 à 175 mètres.

La longueur des individus varie entre 10 et 75 cm. La marge de taille la plus fréquente, représentée par 130 individus, est entre 15 et 30 cm, avec une abondance la plus élevée, 65 individus, pour la classe de taille 25-30 cm. La longueur moyenne des mâles est de 36.1 (SD = 13.07) celle des femelles est de 29.3 (SD = 13.15). Le sexe-ratio est 0.37, le nombre total de mâles est de 54, de femelles 149 et les indéterminés 11 individus. L’application de la formule *W = aLᵇ* pour le calcul du rapport poids-taille a montré une croissance isométrique avec *b* = 3.007 et *R*² = 0.9699.

Les résultats obtenus dans cette étude pourraient constituer une base de données pour des études spécifiques ultérieures sur la biologie et l’écologie de *L. sceleratus* invasive dans l’Est de la Méditerranée.

Distribution of subtidal molluscs in Chabahar Bay and surrounding waters, Iran: with emphasis on effect of environmental factors

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Abstract

To investigate the distribution of subtidal molluscs in Chabahar Bay and surrounding waters, two samplings were undertaken on April and December 2012. Nine sites were sampled from Pozm to Ramin by throwing Van Veen grab. Two sampling periods considered as replicates. Species diversity of sampling sites was studied. The differences in mollusc abundance among sites were investigated by non-parametric Kruskal-Wallis test since normality of data could not be obtained. In this study, the environmental factor affecting mollusc distribution the most was also surveyed. The most number of molluscs were observed in Pozm (P1). Ramin (R1) has the least number of species and individuals. The site situated in the mouth of the bay (D) had the highest Shannon and Simpson indices of diversity and also Margalef index of richness. Kruskal-Wallis test yielded significant differences in mollusc abundance among different sites but not among different sampling periods. No significant correlation was observed between environmental factors and mollusc structure, while the results of CCA showed the most affecting factors on mollusc distribution.

Keywords: Subtidal, Mollusca, Biodiversity, Environmental factors, Chabahar Bay, Oman Sea
Temperature, salinity, pH, and nutrient ratios regulate phytoplankton diversity in Alexandria Mediterranean waters

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Abstract

Species diversity is a key concept in ecology, yet the mechanisms regulating diversity in most systems are not completely understood. To address this issue, we analyzed the relationship between phytoplankton diversity, and the limiting resources temperature, salinity, pH, and nutrient ratios in Alexandria Mediterranean region during a 2 survey in 2004-2005, and 2011. For better understanding, temperature records are divided in to three categories, < 15°C, 15-20°C, and >20°C.

Diversity was highly variable along temporal scale. Temperature below 15°C, and salinity as well were strongly correlated with diversity. We found the highest diversity to occur when nutrient ratios were limiting at 15-20°C, it was inversely correlated with S/N ratio, confirming nutrient availability largely determines the diversity of primary producers. The lowest diversity accompanied temperature exceeds 20°C. Diversity was regulated in part by pH variability. A significant positive relationship was found between productivity and diversity. The mono-specific diatom bloom in winter seems to have limited effect on diversity. The increased temperature by 2.5°C in late spring represents a crucial environmental factor triggering the regular spring bloom, the massive occurrence of Skeletonema costatum reduced diversity to minimum. During summer and fall, several phytoplankton outbreaks occurred, with different frequencies of the causative species. The raised pH with the dinoflagellates blooms to higher values (8.27 and 9.1) can be a major determinant in maintaining diversity, which fall down to minimum during the bloom periods.

This result tentatively supports a conclusion that the measured physical parameters and resource competition among phytoplankton are mechanism regulate diversity.
Invasive marine species of the Libyan coast

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Abstract

Twenty-five invasive fish species representing 18 families have been found along the Libyan coast. Of them twenty-one fish species as Lessepsian, 21 of the immigrants were found in eastern part of the Libyan coast, 10 fish species in the middle and east regions, and 12 were restricted to the western part of the Libyan coast, also some of invasive marine invertebrates have been recorded. Some of these species have successfully adapted to the different topography and environments of Libyan coast. 28% were commercially valuable, contributing to the Libyan fish market.
Touristic managements of the Moroccan Mediterranean coastal areas and the concept application to the ICZM

Les aménagements touristiques sur les zones côtières Méditerranéennes du Maroc et l’application du concept de la GIZC

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Abstract

Morocco’s tourism vision 2020 aims to establish an integrated approach for sustainable development with the objective to positioning the country among the destinations models with sustainable development in the Mediterranean. In this context, the Moroccan Mediterranean coast is currently subject for the development of several major tourism projects. Three projects are underway next three marine protected areas (MPA). These touristic projects have been approached by ICZM concept that is a dynamic process that brings together government, society and scientists as well as public and private decision makers in the preparation and execution of a plan protection and development of coastal resources and systems of marine protected areas by also using a legal framework as environmental impact studies.

Our paper will present new challenges and opportunities of the territory to answer the concept of sustainable tourism including the actions to be implemented in the coastal tourist sites to preserve the environment, for social equity and to ensure economic efficiency generating prosperity at different levels and ensuring long-term viability of tourism businesses and tourism activities on a very fragile coastal zone.

Résumé

Au Maroc, la vision 2020 vise à mettre en place une démarche intégrée de développement durable avec l'objectif de positionner le pays parmi les destinations modèles en matière de développement durable du pourtour méditerranéen. Dans ce cadre, la côte méditerranéenne marocaine fait l’objet actuellement de développement de plusieurs projets touristiques de grande envergure. Trois projets sont en cours de réalisation à côté de trois aires marines protégées (AMP). Ces projets ont fait l’objet d’une approche GIZC qui est un processus dynamique réunissant gouvernement, société et scientifiques ainsi que les décideurs publics et privés en vue de préparer et d’exécuter un plan de protection et de développement des systèmes et ressources côtières des aires marines protégées tout en faisant appel à un cadre juridique qui est celui des études d’impact à l’environnement.

Notre communication présentera les nouveaux défis et opportunités de la zone Marocaine-Méditerranéenne qui devra répondre au concept du Tourisme durable notamment les actions à mettre en place dans ces sites touristiques côtiers pour la préservation de l’environnement, pour assurer l’équité sociale et une efficacité économique générant la prospérité à différents niveaux, assurant ainsi à long terme la viabilité des entreprises touristiques et des activités touristiques sur une zone côtière très fragile.
Release of municipal and industrial waste into sea and its impact on marine environment

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Abstract

The marine environment along Karachi coast has deteriorated considerably over the past decades. The large amount of effluent discharge through Lyari and Malir rivers causes severe marine pollution along the coast. These two main sewer systems dump approximately 450 million gallons per day of raw municipal as well as industrial effluents into Karachi harbor estuary and Gizri creek area.

Flushing processes of pollutants at the mouths of rivers and surrounding region are greatly influenced by tidal volume and geomorphology of the area. The Karachi harbor estuary and Gizri creek are relatively good flushers as the length of the Karachi harbor and Gizri creek are much shorter than the tidal cycle. In this study, the flushing time, residence time and other time scale parameters are estimated for the Karachi harbor and Gizri creek area. The estimated replacing time of water masses in the Karachi harbor and Gizri creek is about 2-10 days.

Due to rapid industrialization and increase in population of Karachi, the sewage waters discharge through Lyari and Malir rivers causing damage to marine ecosystem and human health. Therefore, submarine outfall constructions are often an effective and sustainable way to improve the quality of life in the coastal areas. With the help of sea outfalls, wastewater is transported away from the coastline and discharges at locations where diffusion, dispersion and dilution are enhanced. Therefore when sewage effluent is discharged through a submarine outfall diffuser; it undergoes different stages of turbulent mixing in the large volume of offshore sea water under the influence of tides, ocean currents and wave action. In this study, careful consideration has been taken and a model is used to find out the proper dumping sites through outfalls. The other outfall parameters are also estimated by using mathematical model as well as the ocean-atmosphere data collected from the area under study. The probable impact of waste water discharge on the water quality and marine ecosystem at the suggested outfall sites has also been studied.
New record of some protozoan parasites heavily infects copepods and rotifers in marine and brackish water Southern Iraq

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Abstract

The present study was focused on the infections of zooplankton with ecto and endo parasites in Iraqi marine and estuarine brackish water. Many type of parasites were recorded parasitic on copepods and other zooplankton in the study area, these are: Ellobiopsis chattoni, Ellobiopsis sp., Thalassomyces sp., Blastodinium sp., Zoothaminium sp., dinoflagellates, peritrich ciliates. These parasites recorded for the first time in Iraqi marine and brackish water and the Arabian Gulf except for Ellobiopsis chattoni, and Thalassomyces sp., which recorded in Kuwaiti waters before.

The highest percentage of infections of all copepods was counted 35.7% in winter at station 4, while the lowest value was 0.73% at stations 2 during autumn. The highest percentage of infections in other zooplankton (Rotifers) was 9.42% at station 1 during autumn, while the lowest percentage of infection was 0.15 % recorded at station 3 during winter. The highest intensity of the infected copepods was 12.03 at station 1 during summer, while the lowest value was 1.05 in the same station during autumn. The highest intensity of the infected copepods and Rotifer was 6.3 at station 2 during summer, while the lowest value was 0.8 recorded in the same station during autumn. Scanning Electron Microscope (SEM) analysis was used in this study for identification of some ecto parasites on copepods.
Change in number of Loggerhead turtle landings at selected sandy beaches in Japan

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Abstract

Loggerhead turtle is an endangered marine species. The major landing beaches in Northern Pacific Ocean are concentrated in south part of Japan. Protection activities have been conducted since 1950’s in Hiwasa beach. It seems that the number of landing, which can apply an estimation of adult turtle number, is increasing, recently, however character of change in the number of landings for several decades is not clarified in detail. This paper describes character of change in loggerhead landing at some major turtle beaches in southern Japan. Then, to see a long term character of landings at different beaches in Japan, landing index is introduced as shown in eq.(1). Then, average landing index AL is calculated as shown in eq.(2), too.

\[ L_i = \frac{L_{an,i}}{\text{max}(L_{an})} \]  
\[ AL = \frac{1}{n} \sum L_i \]

Where, \( L_i \) = Landing index at \( i^{th} \) beach, \( L_{an,i} \) = number of annual landings at \( i^{th} \) beach, and \( \text{max}(L_{an}) \) = maximum number of annual landings at \( i^{th} \) beach.

This total landing index clearly shows a periodic change of the landings. The maximum peaks can be seen at years of 1961, 1993, and 2005 and minimum peaks are in the years of 1980 and 1998. In addition, the later maximum peak is higher than former peaks. Total landing index AL is compared with other parameters such as the position of Kuroshio, amount of jellyfish, number of typhoons, and etc. Typhoon is not a cause of change in the landings, however the landing numbers of loggerhead turtles and typhoons shows reasonably good correlation (R=0.66). This means that much hatching sites and hatched eggs will be affected during high typhoon years if hatched sites (nests) and hatched eggs are not properly protected. It is concluded that site specific protection activities are important, as well as understanding of natural mechanism to cause a periodic change in the landing numbers such as the regime shift in the ocean. In addition, coastal engineers can assist to protect a hatching beach against beach erosion.
Water quality analysis on coral reefs ecosystem with statistical approach in Biawak Island, Indramayu, Indonesia

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Abstract

Biawak Island has an uncovered an untouched biodiversity by human activity. Waters quality analysis in Biawak Island waters must be assessed continuously so the condition is can be safe and stable. It is also the objective of the study where the method used is a statistical approach on several parameters at eight stations in the waters of the coral reef ecosystem. Level percentage coral cover observed directly by using LIT (Line Intercept Transect) at a depth of three meters and seven meters. At a depth of three meters percentage cover of live coral reefs including the category of moderate to very good (45.40% - 75.02%), whereas at a depth of seven meters of coral cover conditions included into the category of bad to good (20.76% - 63.18%). The measurement results show the water flow speed parameter ranges 0.28 m/s at the surface layer of 0.5 meters. From that velocity of current, resulted level of dominance in Coral Massive type of Coral Reefs. Other biophysical parameters, like salinity waters have an average value of 30.5°/oo, sea surface temperature 28.6 ° C, pH 7.88 and dissolved oxygen 5.2 mg / l. Results of correlation analysis of several parameters between observations stations showed that there were different levels of dominance held by each station. The analysis is carried out with the statistical approach PCA (Principal Component Analysis). Correlation between parameter is showed by changing of each station observation on their waters environment. Some observation stations each have certain dominance value characteristics. At the station 1 and 3, three parameters dominate the station site, while in station 5 and 8 the waters condition is influenced by the high of turbidity and sea surface temperature. And then, for dissolved oxygen and salinity the result is much on station 4 and 7.
The Effects of dust storm on the phytoplankton community in Iranian waters of the Persian Gulf

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Abstract

Phytoplankton is an important as the produce of energy in waters resources that its community changed relate to environmental conditions. According to global warming and increasing of desertification especially in the Persian Gulf, storms and other atmospheric phenomena increase in the recent years that each time a high amount of mineral particles increase in the waters. The dust storm produced in deserts, especially by the soils in the Tigris and Euphrates basin, is transported by northwesterly, Shamal, winds to the Persian Gulf and further to the Arabian Sea. There were dry periods in 2000 and 2008 were associated with dense large-particle aerosols and followed by phytoplankton blooms. Anomalously high Chlorophyll -a was observed in both northern and southern Gulf regions in summer 2000, when Chlorophyll exceeded the climatic concentration by a factor of 1.5 and in winter 2008–2009 in southern of Persian Gulf, where Chlorophyll-a was higher than normal and sometimes causes red tide. Both years 2000 and 2008 were characterized by very low precipitation and high concentration of large aerosols. Due to the increased efficiency of human activity on the ecosystem and water resources, research and study on affected factors have a main rule in the management actions in order to decrease of losses and damages caused by these phenomena in our area.
Effect of seawater circulation in coastal unconfined aquifer for developing submarine Groundwater-Fed Transparent aqua habitat

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Abstract

At the southernmost habitat of Coccophora langsdorfii, Tanoura bay, Kaminoseki-cho, Japan, the blown algae species grows on pebbles, which are fist to head size, in the several meter depth of sea. According to our preliminary observations, the root part of C. langsdorfii and hall part of coexisting crustose coralline algae are buried (<10cm) into or covered by the coarse sand in many cases. At the habitat, surfaration was observed only for thin surface layer of the sand, and the seawater had better transparency and cooler (in summer) than neighboring sea water body. The habitat had disturbance regime that pebbles turn upside down when storms come, where it could be assumed that these species have shade tolerance in between they enjoy sufficient light condition. Besides, how the surfaration has prevented? Based on the prior information, a research question was stated on submarine groundwater discharge in regarding with aeration process of the bottom sediment, transparent, and cooler seawater of the habitat in summer. Accordingly, hand driven piezometer and lee-type seepage meters were applied for the groundwater sampling and salinity and oxidation-redox potential were measured as indicators of water quality criteria. As the results, the fringe of fresh water lens was observed around 80m off shore, and several scores cm/day submarine ground water discharge (up to 38cm) was measured from sea bottom, especially for C. langsdorfii habitat. The salinity of the discharging water was same with seawater. The results indicated that 1) the submarine groundwater discharge was originated from circulating saline groundwater in coastal aquifer by tidal effect, 2) oxidation-redox potential indicated the saline water oxidized, 3) improvement of the transparency and temperature stability would be explained by sand filtration process. It can be point out the unique character of the local transparent aquatic habitat by submarine groundwater discharge that contributes to local biodiversity and also to develop refuge habitat against local and global aqua environmental impact.
Food habits and temporal variation of stomach contents of fish larvae (Perciformes: Blenniidae) in the seagrass-mangrove ecosystem of Johore Strait, Malaysia

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Abstract

Stomach contents of the fish larvae (family Blenniidae) were investigated in the seagrass-mangrove ecosystem of Johore Strait, Malaysia from October 2007 to September 2008. Specimens of fish larvae were collected from the different five stations by subsurface towing of a bongo net. Stomach sacs were removed and examined from a total of 267 Blenniidae specimens during the study period. The stomach content data showed 24 important food items belonging to 6 major groups viz. phytoplankton, zooplankton, algae, plant-like matter, debris and unidentified matters. Among them, phytoplankton (62.45%) was the most dominant diet components in the stomach of Blenniidae larvae. This was followed by zooplanktons (18.24%), algae (5.56%), plant-like matters (5.75%), debris (4.22%) and unidentified materials (2.03%). In situ environmental parameters were also recorded during the sampling cruises. The water temperature was recorded in the range of 26.61 to 30.97°C; dissolved oxygen ranged from 4.47 to 6.05 mgL−1; pH ranged from 7.56 to 7.99 and the salinity fluctuation was between 25.74 and 32.48 ppt. There is a strong and significant correlation between phytoplankton and salinity (r = 0.658, P < 0.05) and also conductivity (r = 0.635, P < 0.05). However, negative significant correlation (r = 0.681, P < 0.05) was observed between salinity and zooplanktons. Based on the stomach content analysis, it can be concluded that Blenniidae larvae are mainly omnivorous.
Blooms of the colonial green algae, *Botryococcus braunii* Kützing associated with massive fish mortality in Nozha Lake, Alexandria, Egypt


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Abstract

The fishpond (Lake Nozha) applies a controlled fertilizer program to increase its productivity as a natural food source of fishes; the lake is a site of recurrent algal blooms, mainly of blue-green algae. Irregular sampling was operated for six months (January to June 2012) at five selected stations. The dramatic change in species composition in 2012 revealed the predominance of the green algae, *B. braunii* and its responsibility to form dense blooms at intermittent periods. The green-yellow water, turned to brown covered the entire lake during the calm periods in January, the species contributed the sole constituent of the phytoplankton community (maximum 55.3x10^3 colonies/L), causing massive fish mortality of Mullet, Tilapia, Bayad, Carp, and Catfish (loss at about 3000 US $ d^-1); it is the first reported harmful bloom of *B. braunii* in Nozha Lake. The measured high alkalinity (300-420 mg l^-1) might explain the existence of this mono-specific bloom by damaging the phytoplankton diversity. The bloom peaks maintained a wide temperature range (14-23°C), salinity (400-1900 mg l^-1), and pH between 7.8 and 9, raising the dissolved oxygen content to 10.6-11.6 mg l^-1. Nitrate for its wide fluctuations (0.03-0.9 mg l^-1) seems un-limiting factor while, phosphate (0.04-0.1 mg l^-1) and silicate (0.1-4 mg l^-1) were of more importance. The knowledge of how *B. braunii* can gain and maintain dominance is useful to those who intend to grow ponds of it as a fuel crop.
Ecological Survey of some environmental parameters and water discharge of the Shatt Al-Arab Estuary 1977-2012

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Abstract

An ecological survey to determine the variances in some physico-chemical characteristics of the water in the Shatt Al-Arab River for the period 1977-2012 has been conducted. The highest values of the parameters were chosen. Air temperatures ranging between 30.4 and 49 ºC during 1977 and 2004 respectively, the water temperatures were ranging between 28 and 40 ºC during the same years respectively. The salinity was fluctuated during the study period and show gradual increasing from 1.04‰ during 1977 up to 11.8‰ during 2009. Values of pH were mostly on the basic side ranging between 7.7 and 10.8 during 2001 and 2004 respectively. Dissolved oxygen was 4.09 and 14.3 mg/l during 1999 and 1982 respectively. BOD5 were 3.0 and 6.1 mg/l during 2001 and 2010 respectively. Total Alkalinity was 126 and 308 mg/l during 2001 and 1977. Transparency was 156 and 11 cm during 1977 and 2001 respectively. Total hardness was 640 and 2600 mg/l during 2001 and 2009 respectively. TSS was 12.8 and 24 mg/l during 2001 and 1985 respectively. There are some environmental factors which were investigated in few studies such as COD which reported values of 20 and 40 mg/l during 2001 and 2004 respectively, carbon dioxide which reported 6.3 and 15 mg/l during 2001 and 1977 respectively, and Calcium which reported 140 and 621 mg/l during 2001 and 2009 respectively. The study revealed that Shatt Al-Arab waters were infected heavily by different factors among which are: (1) municipal pollution due to untreated waste water, (2) irrigation water from mid lands of Iraq, (3)Shortage of water discharge which were decreased from 626 m³/s during (1997-1998) to 246 m³/s during 2008 and (4) saline water from the Arabian Gulf.

Keywords: Ecology, Shatt Al-Arab, Water, Physico-Chemical, Characterizations, Water Discharge
Gastrointestinal endoparasites and ectoparasites ecology of Mudskipper (Periophthalmus waltoni) in coastal waters of Hormozgan province

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Abstract

The present study was conducted to investigate the ecology of the ectoparasites and gastrointestinal parasites of Mudskipper fish in coastal waters of Hormozgan (Bandar- Abbas and Bandar- Khamir) from late December 2011 to June 2012. In total, 104 specimens of Mudskipper fish (Periophthalmus waltoni) were studied. The isolated parasites were fixed in 4% formalin and preserved in 70% ethanol. Three species of endoparasites (Quadrigyrus (Acanthogyrus) persicus (Acanthocephala), Trematoda indet Trypanorhyncha indet. (Cestoda)) and one species of Protozoa (Trichodina sp.) were separated from intestine and gill of hosts, respectively. The results indicated that the highest average intensity and abundance of Trematoda indet and Trypanorhyncha indet were observed in March and April. A positive correlation was obtained between the Trematoda indet and Trypanorhyncha indet abundance and the host’s total length. There was also a significant difference in abundance of parasites between two stations. This study showed that a variety of factors, such as seasonal variation, total length of the host, host diet and habitat have an effect on the abundance and intensity of gastrointestinal parasites.

Keywords: Parasite Ecology, Mudskippers, P. waltoni, Iran.
Baseline study of contaminants in King Fahd industrial port, Saudi Arabia

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Abstract

King Fahd Industrial Port is considered a vital industrial port for Jubail Industrial City in the Eastern Provence, Saudi Arabia. The port is mainly used to receive shipped raw materials and equipment to be used in various industries, and export chemical fertilizers, steel, crude oil, petrochemicals and refined oil products to various destinations worldwide. Therefore baseline studies for various polycyclic aromatic hydrocarbons (PAHs) such as fluoranthene, fluorene, pyrene, naphthalene, 2-methylnaphthalene, phenanthrene, anthracene and trace elements (Co, Cr, Cu, Fe, Mn, Ni, Pb, Ti, V, and Zn) have been carried out at a series of stations in this industrial port. Sediment and seawater samples from eight stations at this port were analyzed. Fluoranthene, fluorene, and pyrene were not found in any of the sediment and sea water samples. However, maximum concentrations of naphthalene, 2-methylnaphthalene, phenanthrene, and anthracene were found in sediment samples of sites 3, 2, 2, and 6, with values of 6.8, 1.9, 2.1 and 0.8 ng/g. When mean levels of detected PAHs (naphthalene, 2-methylnaphthalene, phenanthrene, and anthracene) at King Fahd Industrial Port were compared with those reported in Ukraine, Russian Federation and Turkey sites, they were found to be lower and within the environmentally acceptable level.

The highest concentrations of Co, Cr, Cu, Fe, Mn, Ni, Pb, Ti, V, and Zn in sediments were found at site 2, with value of 1.6, 14.9, 27, 4144, 74.4, 16.3, 5.9, 99.3, 16.1 and 24.8 ng/g respectively. Sediments from station 2 show high concentrations of trace elements, 2-methylnaphthalene, and phenanthrene.

In general mean trace element concentrations in sediments from King Fahd Industrial Port were found to be comparable and within the range of values reported for different Gulf countries. The elevated iron concentration in sediment is believed to be associated with shipping activities at this important industrial port.
Population characteristics of a Malaysian anchovy *Stolephorus Indicus* (Van Hasselt, 1823) from the Marudu Bay, Sabah, Malaysia

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**Abstract**

Marudu Bay is located at the northern part of Borneo Island and the fisheries of the Marudu Bay are very rich and diversified due to having coral reef, mangrove area, creeks and seagrass bed. Anchovy is a very important fishery of the Marudu Bay, but the population characteristics of anchovy species are less studied from this coastal area. Population structure, recruitment size, length-weight and length-length relationships of a common anchovy *S. indicus* were studied from the Marudu Bay, Sabah. Samples were collected from October 2012 to April 2013 by a traditional fishing gear “Bagang net” using light trap method. The mean (±SD) length of this population was recorded 5.29±2.24 cm, where the Maximum and Minimum total length were found 12.4 and 2.2 cm. The recruitment size of *S. indicus* population was observed 2.5 cm. The logarithmic form of length-weight relationship of *S. indicus* was log \( W = 3.203 \log TL - 2.347 \), which indicated the hyperallometric growth (\( b > 3 \)) of this species from the Marudu Bay. The value of regression co-efficient (\( r^2 \)) estimated for the species was 0.995 (p < 0.01). The total body lengths (TL) vs. standard length (SL) relationship was TL = 1.188 SL – 0.055 \( (r^2 = 0.995) \). As far of our concern, this study presented the first reference of LWR and LLR of *S. indicus* from the Marudu Bay, Sabah and the population characteristics of this species would be helpful for the sustainable management of anchovy fishery in that area.
Coral growth of *Acropora Formosa* between natural reef habitats and *in situ* coral nurseries

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**Abstract**

Being a common reef building coral in Malaysian waters, growth of *Acropora formosa* in natural reef habitat and coral nursery condition had been studied in aspects of extension growth, survival and proto-branch generation. The study sites took place at two separate islands with different environment condition. In this study, *A. formosa* samples of natural reefs at Pangkor Island turbid waters recorded better growth in average extension rate (0.75 ±0.52 cm/month) and higher proto-branch generation rate (up to 52% after 8 months) than Tioman Island samples (0.42 ±0.41 cm/month, highest 17% after 6 months). However, Tioman Island natural reef samples maintained 100% survival throughout the study period. Then, branch fragments or nubbins of *A. formosa* were transplanted into two coral nursery sites at Tioman Island. Among these two coral nurseries, the Tekek site had better growth in all three aspects than Air Batang site. This was believed due to Tekek nursery had been setup with nubbins for more than 6 months before Air Batang nursery, thus the Tekek samples were conditioned long enough for growing in the coral nursery environment. Parameter measurements of sea water temperature, photosynthetic yield (ΔF/Fm’), PAR light intensity and Secchi disk visibility were recorded and discussed together with the coral growth data. The results of this study documented the growth of this particular coral species in two islands of Peninsular Malaysia, and demonstrated the potential application of *A. formosa* for coral transplant, *in situ* nursery and active reef restoration.
Population dynamic and distribution of the Ark Clam *Barbatia Decussata* (Bivalvia: Arcidae) on a rocky intertidal shore in northern Persian Gulf (Iran)

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Abstract

The Ark clam, *Barbatia decussata* (Sowerby, 1833) (Bivalvia: Arcidae), is a member of the invertebrate communities occurring at rocky shores in the northern Persian Gulf. Distribution and population parameters for *B. decussata* including asymptotic length (L∞), growth coefficient (K), natural mortality rate (m), growth performance index (φ') and recruitment pattern were explored using length–frequency data from August 2011 to September 2012 on a rocky intertidal shore in northern Persian Gulf. The results showed that the Ark clam mostly occurred in the middle followed by lower intertidal zones and its distribution was associated with substrate morphology mostly occurring in the beneath of boulders and cobbles followed by in crevices. Total shell length for 7230 individuals of ark clams ranged from 2.21 to 53.93 mm. The growth parameters for Von Bertalanffy function were L∞ = 58.5 mm, K = 0.0.47 year⁻¹, and t0 = -0.29 year. The growth performance index (φ') was calculated about 3.2. Natural mortality was estimated at 0.91 year⁻¹. The exponent ‘b’ value was 3.149, indicating that this clam bears a positive allometric growth pattern. The recruitment pattern was continuous with 2 major peaks. The sex ratio did not deviate from 1:1. The longevity of the species was approximately 6.3 years. According to the shell length-total live weight relationship, asymptotic weight (W∞) was 40.38 g. The shell length-total live weight relationship, the shell length-wet weight relationship, the shell length-dry weight relationship, and the shell length-ash free dry weight relationship were TLW = 0.00011×SL ³.149, WW = 0.000015SL ³.36, DW = 0.000009SL ³.049 and AFDW = 0.000009SL ³.028 respectively.
Short-term study of phytoplankton, ciliate and zooplankton exotic species in Kerkennah Island and Bougrara lagoon from the gulf of Gabes (Tunisia, Eastern Mediterranean Sea) during winter cruise (January 2009)

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Abstract

Phytoplankton, ciliate and zooplankton composition governs the structure of pelagic food webs is essential to understanding the structure and dynamics of the marine ecosystem (Furuya et al., 2003). For this raison we have interested to study the spatial distribution of exotic species of phytoplankton, ciliate and zooplankton communities in Kerkennah Island and Bougrara lagoon of the gulf of Gabes (Tunisia, Eastern Mediterranean Sea) coupled with environmental factors during a summer cruise during winter cruise (January 2009). The water sample for planktonic estimation was collected from 16 stations. We have showed that the phytoplankton was composed of 68 different taxa were identified belonging to 5 different groups such as diatoms, dinoflagellates, cyanobacteriae, euglenophyceae, and dictyochophyceae among which diatoms, was the dominant group representing 81.41%. All phytoplankton taxa identified in this study was cosmopolitan species which characterized the marine and temperate and tropical areas. For the ciliate community 22 different taxa were identified among which Uronema marinum was the dominant species representing 70.92% of total ciliate abundance. All ciliate species identified in this study was also cosmopolite. For the zooplankton community, 36 taxa were identified belonging to 12 groups among which copepod was dominated also in kerkennah Island and Bougrara lagoon representing 72% and 99% of total zooplankton abundance respectively. Our result show that just three copepod species identified were exotic such as Acartia granis, Acartia italica and Tisbe batalyea derived respectively from the coast of Norway, south Adriatic sea and the antartic-artic-south of Africa areas. These three species counting near to 0.5% of total copepod abundance. This preliminary result concerning the exotic species in the gulf of Gabes can causes some ecological perturbation in the composition and the structure of pelagic food webs and not can be explain the decrease of fisheries productivity in gulf of Gabes.

Keywords: Gulf of Gabes, Phytoplankton, ciliate, zooplankton, exotic species
Spatio-temporal variation of Scleractinian coral recruitment on Terra-Cotta Tiles and artificial live rock in Tioman Island, Malaysia

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Abstract

Coral recruitment is a vital natural process in shaping the overall dynamic and spatio-temporal patchiness in coral assemblages. Spatio-temporal coral recruitment pattern on terra-cotta tiles and artificial live rock settlement plates were investigated between April 2012 and September 2012 at four locations in Tioman Island, Malaysia namely Kg Genting, Pulau Renggis, Teluk Teduh and Teluk Juara. Coral recruits were categorized as Acropora, Montipora, Pocillopora, Stylophora and Fungia respectively. A total of 879 coral recruits were recorded and Acropora dominated with 69.7%, followed by Pocillopora (17.3%), Stylophora (10.7%), Montipora (2.2%) and Fungia (0.01%). Kruskal-Wallis ANOVA was used to examine differences in coral recruitment among sites and types of settlement plates. There were significant differences in the abundance of Acropora, Montipora and Pocillopora recruits among sites (p < 0.05). However, significant differences were observed only in Pocillopora and Stylophora recruits among types of settlement plates used.
Dissolved dispersed petroleum hydrocarbons in the coastal water of Alexandria

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Abstract

The present research investigation was aimed at monitoring the levels of dissolved dispersed petroleum hydrocarbons in the coastal water of Alexandria. Seawater samples were collected from Mex Bay, Eastern harbor and coastal waters east of Alexandria during the four seasons of 1995 and analyzed for petroleum hydrocarbons using ROPME oil and chrysene as standards. Water density (ôt) of study area showed temporal variations for surface and bottom waters during the four seasons of 1995 as well as spatial changes for Mex Bay 17, 25.4, Qayet Bay 23.7, 25.9 and area east of Alexandria 23.9, 25.2 reflecting the discharge of fresh water from Mex pumping station to Mex Bay. Concentrations of petroleum hydrocarbons showed temporal changes from maximum values 3.6-48.7 µg/l, mean 14.6±12.6 µg/l during winter to minimum values 2.6-20.9 µg/l, mean 6.4±5.3 µg/l in spring, showing moderate concentrations in summer and Autumn.

Surface water reveals higher petroleum level than the bottom water by 30%.

Linear regression equation was found between petroleum hydrocarbons and salinity according to the equation:

Petroleum hydrocarbons = 62.7 – 1.44 S‰, r = -0.44, P<0.01, n =34

The major source of petroleum hydrocarbons from Mex Bay was estimated at 25.7 ton/year, while for Qayet Bay was only 12% the value of Mex Bay.
Composition and structure of community zooplankton in waters strait Bangka

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ABSTRACT

As the initial producer, Phytoplankton served or feeding zooplankton. So that the position of zooplankton commonly referred as first consumer or second producer, a food source for small pelagic fishes and other biotas. This study aims to determine the composition and abundance of zooplankton in the waters of the Strait of Bangka and analyze the structure of community zooplankton in the waters of the Strait of Bangka. The research was conducted in August 2011 in the Bangka Strait. 34 sampling stations were selected. Composition of zooplankton in the waters of the Strait of Bangka there are 24 species of nine classes, Acantharia, Aciculata, Actinopterygii Foraminifera, Gastropoda, Leptolida, Malacostraca, Maxillopoda, and oligotrichia. Abundance of zooplankton in the waters of the Strait of Bangka at each station, which ranged between 10-95 ind / l. Diversity index values at all observation stations in Bangka Strait peraian values obtained ranged between 1.00 - 3.88, while the uniformity index value at all observation stations ranged between 0.85 – 1.00 and for the dominance index values obtained ranged from 0.07 to 0.50.

Keywords: Composition. Community structure, Zooplankton, Bangka Strait
Distribution and composition of marine litter during the fishing seasons on the Eastern Black Sea coasts of Turkey

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Abstract

Surveys were conducted to determine the composition and density of marine litter on the Eastern Black Sea coasts and trawl areas of Turkey. To determine the beach litter, 9 beaches were selected in the region from which further 30-70m long transects for each beach was randomly chosen and 5 trawls were taken in the trawling area. It was observed that the plastics are the most abundant litter item as addressed on the other studies all over the world.
Climate change inducing “Tropicalization” of the East Mediterranean, enhancing invasion of tropical species

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Abstract

Hundreds of Indo-Pacific species, from benthic and pelagic environments, have migrated or were introduced from the Red Sea into the Levantine Basin (East Mediterranean) since the opening of Suez Canal in 1869. Most of those have established permanent populations along the Levantine Basin coast. During the last 50 years, after the construction of Aswan High Dam in 1965, certain hydrological changes have occurred in the entire Levantine Basin traduced by small rising of seawater temperature and salinity. These hydrological changes are due not only to the anthropogenic activity, but also to climate change inducing global warming. They enhanced increasing invasion of Indo-Pacific species into the Mediterranean Sea. Out of 350 fish species so far recorded in the Lebanese coast, 60 exotic species were introduced in the area where they established permanent populations. From 240 benthic macroalgae present along the Lebanese coast, 20 tropical species have invaded the Levantine coast competing with local native species. About 15% from 400 phytoplankton species and 20% from about 1200 zooplankton are introduced in the Mediterranean. After four decades of survey (1970-2010) on the biodiversity of the Lebanese sector, we recorded more aliens and invaders of tropical species. This phenomenon of biological invasion reflects certain “Tropicalization” of the Eastern Mediterranean. Most of the introduced species have established populations in the new marine environment. The establishment of these exotic species in the area may have a negative impact on the biodiversity of the native species populations in forming ecological niches competing with them and affecting the whole ecosystem.

Keywords: Biological Invasion. East Mediterranean. Tropicalization. Climate change. Global warming.
Determination of the level of contamination in Khuzestan coastal waters (Northern Persian Gulf) by using an ecological risk index.

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Abstract

The aims of the present study were to investigate the metal contents of sediments of several creeks that discharged into coastal waters using the Risk index. This study was carried out in eight creeks in Mahshahr coastal waters in the Northwest of Persian Gulf from October 2005 to November 2006. Superficial sediments were collected seasonally by Peterson grab, and the concentrations of heavy metals were measured by using a voltametric polarographic method. The range and the mean concentrations obtained in ppm were 15.03-35.16 (27.01) for Cu, 65.57-171.41 (102.67) for Ni, 4.63-20.06 (13.22) for Co, 0.093-0.78 (0.22) for Hg, 65.07-379 (113.70) for Zn, 0.27-1.00 (0.56) for Cd and 7.09-29.72 (14.66) for Pb. To evaluate the levels of sediment contamination, the background values of the different heavy metals were calculated, and the contamination factor for each metal and the degree of contamination for each creek were determined as well. The results show that some elements such as Hg, Zn, and Ni are at risk level, and all of the studied creeks are classified as undergoing a moderate degree of pollution except for Ghannam that showed a considerable degree of contamination. According to the Risk index values, based on sedimentological toxic factors (S(t)) of each metal and the BIO Production Index (BPI) in the studied area, the creeks were classified as considerable and with a very high level of ecological risk.
Macrobenthic species diversity in Sajafi- Bahrekan estuary (Persian Gulf)


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Abstract

The major goal of the present study is to estimate the role of the environmental parameters on the species diversity of macroinvertebrates in Sajafi-Bahrakan estuary this vast muddy intertidal zone in the north-western Persian Gulf. The results of the studies performed under the supervision of the author in recent indicates that this area contains a relatively high macrobenthic species diversity (H′= 3 to 4 or more) compared to some similar muddy intertidal zones in NW Persian Gulf. Availability of food materials entering in the area from the Zohreh-River could be an important factor in this respect.

Keywords: Macrobenthic, Species diversity, Diversity indices, Sajafi-Bahrakan Estuary, Persian Gulf
The identity of coolia-toxin producing species

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Abstract

In the literature, C. monotis was reported in 1995 to produce cooliatoxin, but subsequent studies have shown that identification of the species is likely to be incorrect. The present study was conducted to clarify which species was responsible for cooliatoxin production by re-examination of the material used in the report of cooliatoxin and of other cultures of C. tropicalis collected from different sites including the type locality. LSU rDNA was carried out to support the morphological results. Based on morphology the description of C. tropicalis is emended. A phylogenetic analysis supported the contention that C. tropicalis is a distinct species within the genus Coolia. The identity of the species responsible for cooliatoxin production was finally revealed. The study clarifies some of the taxonomic problems related to benthic dinoflagellates, particularly the genus Coolia.
Coral reefs bleaching due to global warming and climate changes

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Abstract

Increasing in greenhouse gases and the effects of global warming are the serious concern about the natural environments and ecosystems. Many scenarios were established about the effects of global warming on biotic and abiotic portions of the different ecosystems. For example rising the sea levels because of the heat capacity of their water and melting of the ices and glaciers in the poles and the land, increasing the mean temperature of the atmosphere, degradation of the ozone layer and increasing in UV absorption by the earth and etc. all these changes were dangerous for the corals life, and because of the importance of the corals in primary and secondary production in the sea, were dangerous also for the other levels of life in marine environments. Bleaching in coral reefs was occurred because of the increasing or decreasing in water temperature, turbidity that made by the hurricanes (El Nino, La Nina, marine tornado’s, etc.), decreasing in water salinity (made by glaciers melting) and increasing in incoming UV radiation. In this paper we will review the short- and long term ecological impacts of coral bleaching on reef ecosystems, and quantitatively synthesize recovery data worldwide.
Composition and distribution of meiobenthos off Pudimadaka, East coast of India

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Abstract

A base line study on the taxonomy and community structure of meiobenthic fauna was undertaken during three cruises (June, 2008, October, 2008 and March 2009) were made covering 10 stations (depth 10-40m) off Pudimadaka in Visakhapatnam District (Lat.17°29′12"N and Long. 83°00′09"), east coast of India. At each location (replicate) samples were collected using a van Veen grab (0.1m²) and data on sediment texture, organic content, ambient salinity and dissolved oxygen obtained synchronously according to standard protocols. As many as 69 species that represented 3 major (meiofaunal) taxa namely foraminifera (2) copepoda (9) and nematoda (58) were encountered. Overall, meiofaunal (mean) abundance ranged from a mere 2 numbers (st.5, June 2008) to 63 nos. 10cm⁻²(st.1, October 2008) with mean being 24.3 nos. 10cm⁻². Over-all biomass (mg.10cm⁻²) varied between 0.135 mg.10cm⁻² (st.5) and 0.48 mg.10cm⁻² (st.8) with mean being 0.27±0.12. On the whole, nematodes constituted an overwhelming 73.62% of the total meiofauna in terms of numerical abundance. Shannon –Wiener index ranged between 2.053±0.64 (June, 2008), 2.477±0.177 (October 2008) and 2.2815±0.24 (March 2009). The evenness component (J) varied in conformity with H’. Multivariate analyses were used to define assemblages named after the most important (determining) taxon. Three nematode associations could be recognized off Pudimadaka coast, namely Laimella longicaudata, Euchromodora vulgaris and Sabatieria elongata assemblage (June, 2008); Catanema sp. and Leptosomatum sp. assemblage (October 2008) assemblage; Sabatieria sp. and Setosabatieria sp. assemblage (March 2009). Canonical correspondence analysis (CCA) showed that temperature, organic matter, silt and mean particle diameter (MPD) were important in controlling nematode community structure.
The study of Methylmercury accumulation in *Epinephelus coioides* brain from Mahshahr Creeks of Persian Gulf as well as waterborne samples

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**Abstract**

*Epinephelus coioides* (orange spotted grouper) fish were preyed from 6 different stations of Mahshahr Creeks in the Persian Gulf and their brains were dissected for further analysis. The first investigation was to seek the amount of accumulation of Methylmercury in the cerebellum and whole brain (minus cerebellum) of these fish. In addition the amounts of methylmercury accumulated in the water and sediments of these stations were estimated using GC-MS (Gas Chromatography- Mass Spectrometry) technique. Moreover exposure studies were conducted by exposing cultivated orange spotted grouper fish from Fisheries to different concentrations of Methylmercury chloride. The concentrations of Methylmercury chloride induced into water were 0, 10, 20, 40 and 80µg/L and various times of exposure of day 0, 7, 14 and 30 were considered for each concentration. In addition Depuration studies for 7 and 14 days were performed and the amount of accumulation of methylmercury was calculated in the brain of these fish using GC-MS analysis.

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Abstract

In this study, the population genetic structure of amplified fragment length polymorphism (AFLP) of Javelin Grunter, *Pomadasys kaakan* in the Persian Gulf was investigated. Six primer combinations were used to study the genetic variation among 39 individuals in three populations (Abadan, Bushehr and Bandar Abbas) of the *Pomadasys kaakan*. A total of 410 putative loci were detected by the 6 primer combinations, of which 88 (21.46%) were polymorphic. The proportion of polymorphic loci among three populations varied from 68.18% (Bandar Abbas) to 88.64% (Abadan). Average of heterozygosity in the Abadan (0.330) was higher than Bandar Abbas (0.222), which may be correlated with the environmental and ecological conditions of these stations. Pairwise $F_{ST}$ and average expected heterozygosity ranged from 0.0862 to 0.2756 and from 0.222 to 0.330, respectively. The UPGMA tree showed the significant geographic structure in this species. Pattern of isolation by distance was observed in this species, showing that significant genetic differentiation among localities of *P. kaakan* was mainly due to the geographic distance. The results of this study revealed a relatively moderate level of genetic variation within and between Javelin Grunter populations.

**Keywords:** Genetic Structure, Javelin Grunter, *Pomadasys kaakan*, Persian Gulf, AFLP.
Overview of ceramic concrete artificial reefs suitability as habitat restoration at Pulau Perhentian, Terengganu

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Abstract

This project was carried out to establish the increase of fish assembly using 8 units of ceramic-concrete artificial coral deployed at Pulau Perhentian, Terengganu in 2011. A monitoring project was carried twice in 2012 and 2013 to assess the assemblage of benthics community around the artificial reefs. The monitoring was carried out by scanning the seabed bottom using and echo-sounder and the fish surveys were conducted based on Bohnsack-Benerot method with few modifications. The benthic assemblages were assessed using a photogrammetric. Within less than 2 years of deployment, the results recorded a total of 20 species of invertebrates and 11 species of fish around the artificial reefs and this indicates that the ceramic concrete artificial reefs is important as the management tools for aggregating fishes and has potential for the enhancement of recruitment to benthic communities.
POSTERS

Theme 2 : Marine Ecology & Biodiversity
Acute toxicity of Basrah regular crude oil to two species of Garmat Ali River invertebrates: *Viviparus bengalensis* & *Parhyale basrensis*

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**Abstract**

Adults and juveniles of two invertebrates species; *P. basrensis*, (Amphipod) and *V. engalensis*, (Gastropod) from Garmat Ali Shatt Al Arab River were exposed to different concentrations of Basrah crude oil.

Mortality percentage rates for the adults and juveniles for both male and female were estimated. LC/EC from 1-99% was estimated to predicate exposing concentrations to both adult tow species male and female using different technique. It was found that there was a redaction in the median lethal time with the increasing of crud oil concentration for the same species. The shortest time of exposure to crude oil caused to a total mortality of 100% at lower concentrations of crude oil was 39h. for the adults.

Female and male of *P. basrensis* and 42h. for the juveniles of the same species, whereas the longest time for exposure causing 100% mortality at low concentrations of crude oil was (63,51)h. for adults and juveniles of the species *V. bengalensis*, respectively.
Investigation on Hormuz Strait’s phytoplankton with an emphasis on Harmful Algal Bloom (HAB) species

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Abstract

Blooms of phytoplankton are increasingly common in coastal waters around the world and are collectively grouped as harmful algal blooms (HABs). Among the most important marine organisms, dinoflagellates are one of the most important constituents. Dinoflagellates can be important indicators of environmental conditions. So in this survey the abundance, distribution and Species composition of phytoplankton were investigated at 11 stations around the Strait of Hormuz at Aug, 2010. In this study 41 phytoplankton species belonged to 7 main groups of Bacillariophyceae, Alpha-Proteobacteria, Dinoflagellae, Cyanophyceae, Prymnesiophyceae, Fragilariophyceae and Craspedophyceae, were identified. The dominant groups were Dinoflagellae and Bacillariophyceae, respectively. Results showed no significant (p>0.05) correlation coefficient between concentration of chlorophyll a and the phytoplankton abundance. The non-parametric Kruskal-wallis analysis showed that there was no significant difference in the abundance of phytoplankton in stations. Our results demonstrated that Eastern South of Qeshm and Western North of Larak Islands had higher distribution of phytoplankton than other sampling areas. Also in 2010 a bloom of Cochlodinium polykrikoides began in June 2009 and lasted for 2 months along the south coast of Iran, Heterocapsa species were also related with this bloom. Most phytoplankton species causing harmful algal blooms are belongs to dinoflagellates of the genus Alexandrium and or diatoms of the genus Pseudo-nitzschia.

Keywords: Phytoplankton, Harmful Algal Bloom, HAB, chlorophyll a Strait of Hormuz
ECOPATH model of the Persian Gulf coastal ecosystem

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Abstract

Feeding ecology and trophic relationships of some of the main fish species (Sillaginidae, Haemulidae, Carangidae, Scombridae, Psettodidae, Drepaneidae, Lutjanidae, Lethrinidae, Sciaenidae, and Sparidae) were studied in the coastal waters of Hormozgan Province (Persian Gulf). We examined the stomachs of 2480 fish caught between November 2009 and December 2011. A preliminary trophic model is presented of the Persian Gulf ecosystem, based on information on the main fisheries in the area. A multispecific ecosystem-based approach on trophic relationships and their possible variations was built using the ECOPATH software system (ver. 6.3) so that input and output for all groups in the system are balanced. Results show that demersal species (Otolithes ruber, Pomadasys kaakan, Acanthopagrus latus, Psettodes erumei) due to change the magnitude, number, and temporal arrangement of benthos organisms in ecosystem, because they feed on low trophic level.

Keywords: ECOPATH; stomach contents; trophic level; feeding relationships; Persian Gulf
The Persian Gulf sensitive marine coastal ecosystems, challenges and solutions

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Abstract

Location of the Persian Gulf in warm and raid region its shallowness (mean depth of 35m) and long residence time (3-5 year) of water masses entering through the Strait of Hormuz resulted in a high sensitivity of the coastal ecosystems. Existing of valuable and sensitive ecosystems such as coral reefs and mangrove forests in the Persian Gulf are some of the reasons that have made this semi-enclosed ecosystem as an important sea area from environmental point of view. At the same time the existence of oil and gas resources resulted in development of oil and gas well as petrochemical industries. According to the available data more than 60% of the world fuel oil transported from the region through the Strait of Hormuz. In the last decades the Persian Gulf has received high environmental pressures as a result of human activities such as oil pollution, land reclamation, unsustainable uses and brine discharges of desalination plants. In the recent years environmentally sound structures such as floating piers, restaurants, water fronts and even airports have been designed to reduce negative effects of human activities in the marine environments. These techniques have been used instead of land reclamations that still uses in the coastal areas of the member's states surrounded the Persian Gulf region. Creation of waste water treatment for coastal industries and also to comply with regulations and standards is another solution in this respect. Activation and the executive of Kuwait convention protocols and other world conventions can result in reduction of pollution load and rescue the marine environment ecosystems.

Keywords: Persian Gulf, Coastal Ecosystem, Solutions, Environment
Population genetic structure of three epinephelus species: *E. aeneus*, *E. costae* and *E. marginatus* in the Mediterranean Sea


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Abstract

Groupers of the genus *Epinephelus* have great commercial value. However, some of these species are overfished or in danger as in the case of *E. marginatus* with slow growth and late maturity. Cytochrome b gene of mitochondrial DNA was analyzed to assess genetic variability and phylogenetic relationships of these three species of groupers in the Mediterranean. Low genetic diversity was detected for *E. marginatus* and *E. aeneus* which makes them more vulnerable to exploitation accessible.
Effect of temperature and NaCl concentration on the diversity of marine bacteria

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Abstract

In the present work, we have studied the dynamics and ecology of marine bacteria. The evaluation of the number of marine microorganisms is performed on nutrient agar in the presence of increasing concentrations of NaCl (10 to 40 g/L), after incubation at 30°C, 40°C and 55°C. After screening, 27 bacterial strains were isolated. All marine bacteria have been characterized and studied extensively. Study of the resistance against antimicrobial agents (antibiotics and mercury chloride) is also performed. Results obtained showed that the number of microorganisms is relatively important at the temperature 30°C. We have also distinguished that the number increases with the increase of the concentration of NaCl up to 35 g/l. Growth of the marine bacteria in presence of NaCl is very variable. The growth rate is of the order of 77.80% over the concentration range of 15 g/L to 35 g/L, 14.80% for 40 g/L and 7.40% for only 10 g/L. Depending on the temperature of incubation, the growth of most strains is well at 30°C (70.40%), with 25.90% at 40°C and 3.70% at 55°C.

Results obtained from resistance to antibiotics study indicated that all strains were susceptible to ampicillin and gentamycin unlike lincomycin and anlidixic acid. 29.62% of marine isolates were susceptible to penicillin, but only 3.70% for pipemidic acid. A very high resistance to mercury is observed for two marine bacteria (100 ug/ml). However, seven strains are insensitive to 5 ug/ml only of the toxic metal.
The role of some ecological factors in stimulating growth of the some dinoflagellates in North West Arabian Gulf

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Abstract

The present work takes in consideration the role of some ecological factors in flourishing the naissance algal species in Khor Al-Zubair lagoon/ NW Arabian Gulf. Three stations were selected for sample collections. Results deduced that the sudden rise in concentrations of nitrate and phosphates, in addition to the suitable temperature and calm weather played a substantial role to enhance proper growth of phytoplankton in particular dinoflagellates of which Ceratium furca and Dinophysis caudata where the most dominant species in the lagoon. Their contribution in number revealed noticeable increase during September 2008. The study showed a rise in water salinity assigning the lagoon to be hyper-saline one and giving chance to some marine species, belong to dinoflagellates, to penetrate. It is worth mentioning that those species was not reported earlier in the investigated location. Eight species belong to Fife genera were identified in this study.
Composition, abundance and distribution of zooplankton in the Iraqi marine and brackish waters

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Abstract

Zooplankton composition and abundance of marine and brackish water, Southern Iraq were studied seasonally from winter to autumn 2010. Five stations were chosen: Shatt Al-Basrah, Khor Al-Zubair, Al-Fao and Iraqi marine and coastal water. Samples were collected by plankton net (120 µm mesh size). Some physical and chemical parameters of the water were measured. Quantitative and qualitative studies of zooplankton were carried out. Sixty taxa of zooplankton were identified in the present study. 35 taxa were belonging to copepods, while 25 taxa were belonging to other zooplankton. The more abundant copepods and other zooplankton at all stations were, Paracalanus aculeatus, Parvocalanus crassirostris, Acartia pacifica(Odontacartia), Bestiolina arabica, Polychaets; adults and larvae, cirripedes larvae, planktonic bivalves, planktonic gastropods and fish eggs and larvae. Copepod is the major group of zooplankton in the study area, while calanoid copepod was the most dominant order followed by cyclopoid, harpacticoid and poecilostomatoid. Seven taxa of copepods were recorded for the first time in the study area. The total number of zooplankton at all stations was 194266 ind/m³ recorded in autumn at station 1, while the lowest number was 6804 ind/m³ reported during winter at station 3.
Contribution to study the fishing of the “Ouzef” in Gabores Region (South Tunisia, South Mediterranean Sea)

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Abstract

The «Tilla» or beach senne with cod-end is an artisanal fishing gear used in the governorate of Gabes (South Tunisia) as the south resident’s alimentary habits who consume the small fish dried called locally «Ouzef». This gear is used to catch small fish in shallow waters (1 to 3 meters depth).

In this work, we try to evaluate the impact of this gear on the marine environment and on the fish fauna. To reach this objective, we made some interviews with fishermen and investigations in the sea and on the beach concerning this activity. The treated biological material comes from the different landing points of “Ouzef”. 48 fish species were observed during this work, the main species landed were: European anchovy (Engraulis encrasicolus), striped seabream (Lithognathus mormyrus), garfish (Belone belone) and African halfbeak (Hyporhamphus picarti). The quantitative study shows the seasonal variation of the caught species by the “Tilla” in number and in mass. The demographic structure of the principal species shows that the majority of caught specimen has not attained the length of the first sexual maturity.
Dissolved labile and non-labile trace metal in El-Mex Bay and the Eastern harbor, Alexandria, Egypt


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Abstract

The present work is an attempt to study the effect of pollution on the trace metals (Fe and Cu) in their dissolved labile and non-labile forms in the surface and bottom waters collected from two areas, EL-Mex Bay (subjected to effluents from Umum agricultural drain) and the eastern harbor (subjected to waste water from the sewer of Alexandria at Kayet Bay). The determination of the respective labile and non-labile forms was made using chelating cation exchange resin (chelex-100) and total dissolved metals. Some of hydrographical parameters as (hydrogen ion concentration, salinity, dissolved oxygen and total phosphorus) were also studied. The relation between these parameters and labile and non-labile forms were investigated. The results revealed that the non-labile form of the two metals is more abundance than that the labile one in the two areas.
Assessment of antibiotic resistance of coliform isolates recovered from the mussel *Mytilus galloprovincialis*.

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Aquatic environments are subject to anthropogenic inputs which may carry antimicrobial agents and antibiotic-resistant bacteria. *Mytilus galloprovincialis* is a bioaccumulative, which may be, through food, vectors of infectious agents, marine biotoxins and toxic chemicals. The aim of the present work was the evaluation of antibiotic resistance in 30 coliforms isolated, on March 2011, from *Mytilus galloprovincialis* of marine farm and wild environment. Microbiological analysis showed that these mussels were safe to consummation. The identification of coliforms by API 20E system showed the presence of *Escherichia coli* \((n=24)\), *Enterobacter cloacae* \((n=4)\) and *Klebsiella pneumoniae* \((n=2)\). The assessment of antibiotic resistance showed a high rates of resistance to amoxicillin \((53.3\%)\), tetracycline \((46.6\%)\), sulfonamides \((30\%)\), trimethoprim \((30\%)\), trimethoprim/sulfamethoxazole \((30\%)\), kanamycin \((23.3\%)\) and nalidixic acid \((23.3\%)\), medium levels of resistance to fluoroquinolones \((ciprofloxacin: 13.3\%, pefloxacin: 6.6\%)\), cephalosporines \((ceftazidine: 10\%, cefoxitin: 10\%, aztreonam: 6.6\%)\) and chloramphenicol \((3.3\%)\) and a susceptibility to others beta-lactams \((cefotaxime, cefepime, ceftipime, imipenem)\) and gentamicin. A synergy between cephalosporins and clavulanic acid was observed for 2 strains \((1 E. coli \text{ and } 1 K. pneumoniae)\), indicative of production of extended spectrum beta-lactamases.

The antibiogram analysis showed the presence of nine different profiles of antibiotic resistance at each site with multidrug resistance up to 9 antibiotics. This study showed the presence of resistant bacteria in mussels and suggests that this latter may be considered as a reservoir of anthropogenic antibiotic-resistant bacteria that can be transferred to humans through the food chain.

Key-words: antibiotic resistance, coliforms, *Mytilus galloprovincialis*. 
An exceptional parasitism: the Amphibdellatidae (Monogenea, platyhelmintes) a gill parasites of Torpedinidae (Elasmobranches) from Algerian coasts

Un parasitisme exceptionnel : les Amphibdellatidae (Monogenea, plathelminthes) parasites branchiaux des Torpedinidae (élasmobranche) d’Algérie

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Abstract

Among the Monogenea Carus, 1863, Amphibdellatidae Bychowsky, 1957 a gill parasites of Torpedinidae Bonaparte, 1838 from Algeria, we listed seven species, three of the genus Amphibdella Chatin, 1874: A. torpedinis Chatin, 1874; A. Flavolineata MacCallum, 1916; A. paronaperugiae Llewellyn, 1960 and four of the genus Amphibdelloides Price, 1937: A. maccallumi (Jonhston & Tiegs, 1922); A. vallei Llewellyn, 1960; A. kechemirae Tazerouti, Neifar & Euzet, 2006 and A. benhassinae Tazerouti, Neifar & Euzet, 2006. These gill parasites can be distinguished by the morphology and size of the haptorial hooks and of the accessory sclerite of the male copulatory organ. Study of all these Amphibdellids allows us to propose an amended diagnosis of the genus Amphibdelloides including characters “ovary lopping right intestine caecum” and “vas deferens lopping left intestine caecum”.

In the Mediterranean, the Amphibdellids parasites of Torpedo are characterized by oioxenic specificity and each species of host Torpedo is parasitized by one species of Amphibdella and one or two species of Amphibdelloides: an original parasitism.

Keywords: Monogenea, Amphibdellids, Amphibdella, Amphibdelloides, Torpedinidae, Mediterranean, Algeria.

Résumé

Diversity and density of the Nereididae and Syllidae families in the rocky intertidal area of the Bushehr province

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Abstract

The aim of this study was to identify and assess the diversity and density of the Nereididae and Syllidae families in the rocky intertidal area of the Bushehr province in 3 station in Bushehr, Dayer and cape of Nayband. Sample collected in summer and winter 2011, by the quadrate 0.5 × 0.5 square meters at low tide at the time. Environmental factors such as temperature and salinity were measured. In this study, eight species and genera of the family Syllidae including Typosyllis sp., Syllisspongicola, Pionosyllis sp., Opistosyllis sp., Odontosyllisgravelyi, Syllisgracillis, syllis sp. and Syllisalternata and 6 species and genera of the family Nereididae including Nereissucciei, Nereisplagica, Nereis sp., Platynereisuniseris, Platynereisdumerilii and Prenereis sp. were observed. In summer, 14 species were identified, that Nereissucciei was dominant with 56% of the relative abundance of the species and in winter 7 species were identified that Typosyllis sp. was dominant with 37 % relative abundance. Shannon diversity index ranges in summer was between 0.57 - 1.53 that the maximum and minimum value belong to high tidal of Nayband and midtide of Bushehr, and in winter the Shannon diversity index between 0.65- 1.17 of the maximum and minimum value belong to the lowtide of Bushehris and lowtide of Nayband.

Keywords: Bushehr province, Nereididae, Syllidae, Persian Gulf,
Heavy metal concentration (Pb and Fe) on east side of river estuary
Banyuasin, South Sumatra, Indonesia

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Abstract

Pb and Fe are two different kinds of heavy metals and the nature of its usefulness to the organism's body that eventually they will have accumulated an excessive amount in the body. The aim of this research was to analyze the concentration of heavy metals Pb and Fe in waters and sediments on east side of Banyuasin Estuary. This study is part of the initial monitoring presence of heavy metals in the estuary region of Banyuasin. The study was conducted in September 2012 with three stations by using three different depths, the surface, water column and base. Water and sediment samples were analyzed Pb and Fe content using flame-AAS method. The results showed that the metals Pb, both in the waters and sediments, has exceeded the threshold (0055-0851 mg/l), while Fe remained below threshold (0016-7694 mg /l)

Keywords: metals Pb and Fe, waters, sediments, estuary Banyuasin
Benzo (a) pyrene stress evaluation in Yellowfin Seabream, *Acanthopagrus latus*, using circulating thyroid hormone indices

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**Abstract**

Thyroid hormones may be considered as a biomarker due to their importance in metabolism, homeostasis, and high sensitivity to pollutants. The present research was conducted to study the effect of Benzo alpha pyrene (BaP) on the plasma levels of thyroxin (T₄), triiodothyronine (T₃) hormones, and T₃/T₄ ratio in Yellowfin Seabream, *Acanthopagrus latus*. Therefore, peritoneal injection of BaP dissolved in vegetable oil (50mg/kg body weight in 2μl/g oil according to their body weight) was performed on a group of fish. The control group received only 2μl/g vegetable oil based upon their body weight. Blood sample was taken from both groups after three hours. In order to study its long-term effects, an implant of 10μl/g vegetable oil, containing 50mg/kg BaP according to body weight, was used. For the control-group fish, a peritoneal implant with oil in amount of 10μl/g was performed. Blood sample was taken 72 hours after implantation. Results showed that plasma T₄ levels in *Acanthopagrus latus* decreased in both short and long-term stresses with BaP exposure. However, T₃ hormone levels and T₃/T₄ ratio showed a significant difference just after the chronic stress. By directly affecting on synthesis, secretion, deiodination and changes in the gene expression pattern of thyroid hormones or releasing thyroid hormones, BaP may have decreased them in plasma. Reduction in thyroid hormones may cause an imbalance in the endocrine system and energy drop in fish, decreasing their survival.

**Keywords:** Polycyclic Aromatic Hydrocarbon, Thyroxin, Triiodothyronine, Ecophysiology
Quantification of Polyaromatic Hydrocarbons in marine sediments of Algiers’ coastline

Abstract

The spilled hydrocarbons at sea threaten organisms and resources situated in the immediate vicinity, and all ecosystems as well as the coastline. The damages caused to the ecosystem depend on the quality and the type of the hydrocarbons, the place where they are widespread and the time of year. Their effects can be direct or indirect. However, in assessing the degree of contamination of our coastline by Polycyclic Aromatic Hydrocarbons (PAHs), two bays were studied, the bay of Algiers and the bay of Bou-Ismail, and since these compounds are generally concentrated in the marine sediment, we were therefore interested in the extraction of this family of chemical pollutants from surface marine sediments and their quantitative analysis by UV fluorescence spectroscopy.

The results obtained from this study on six different stations in the bay of Algiers and eight other stations in the bay of Bou-Ismail, revealed a non-uniform distribution of PAHs, marked by a minimum estimated at 0.55μg / g and a maximum of 12.77 μg / g of dry matter. Indeed, the capture and storage of these hydrocarbons in marine sediment, obey to several factors that are related not only to the physicochemical properties of these contaminants, but to many other additional factors.

Keywords: Bay of Algiers, bay of Bou-Ismail, polycyclic aromatic hydrocarbons, sediment, UV fluorescence spectroscopy.

Résumé

Les hydrocarbures répandus en mer menacent les organismes et ressources situées à proximité immédiate, ainsi que l’ensemble de l’écosystème. Ils menacent par ailleurs notre littoral. Les dommages causés à l’écosystème dépendent entre autres de la qualité et du type d’hydrocarbure, du lieu où ces hydrocarbures sont répandus et de la période de l’année. Leurs effets peuvent être directs ou indirects. Cependant, dans le cadre de l’évaluation du degré de contamination de notre littoral par les hydrocarbures aromatiques polycycliques (HAP), deux baies ont été étudiées ; la baie d’Alger et la baie de Bou-Ismail, et vu que ces composés se concentrent généralement dans le sédiment marin, nous nous sommes donc intéressés à l’extraction de cette famille de polluants chimiques à partir des sédiments marins superficiels, et à leur analyse quantitative par spectrofluorimétrie UV.

Les résultats obtenus à l’issue de l’étude réalisée sur six stations différentes dans la baie d’Alger et huit autres stations dans la baie de Bou-Ismail, ont révélé une répartition de HAP non uniforme, marquée par un minimum évalué à 0,55μg/g et un maximum de 12,77 μg/g de matière sèche. En effet, la fixation et le stockage de ces hydrocarbures dans le sédiment marin, obéissent à plusieurs facteurs qui sont liés non seulement aux propriétés physicochimiques de ces contaminant, mais à beaucoup d’autres facteurs supplémentaires.
Heavy metals accumulation in the mantis shrimp *Erugosquilla massavensis* of Abu-Qir bay, the eastern coast of Alexandria, Egypt

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Abstract

The accumulation of heavy metals: Fe, Zn, Cu, Pb, and Cd in muscle tissue and gonads of marine commercial (edible) crustacean *Erugosquilla massavensis*, has been studied. Samples were collected seasonally between April 2010 to January 2011 from El-Maadia. The average levels of those metals Fe (5.80 – 76.41 ppm, mean 22.00 ± 18.07 ppm), Zn (17.41-117.80 ppm, mean 28.89 ± 14.22 ppm), Pb (0.13-5.11 ppm, mean 1.97 ± 1.20 ppm) and Cd (0.10 – 5.90 ppm, mean 1.41 ± 1.34 ppm) are higher in females than in males Fe (5.90 – 41.18 ppm, mean 17.99 ± 8.58 ppm), Zn (0.44- 42.69 ppm, mean 25.09 ± 7.70 ppm), Pb (0.16-8.27 ppm, mean 1.62 ± 1.80 ppm) and Cd (0.15 – 4.78 ppm, mean 0.97 ± 0.87 ppm). The muscle accumulated low concentrations of heavy metals than in gonads. The average levels of metals in all studied muscle samples are: Fe (5.80 – 76.41 ppm, mean 20.13 ± 14.51 ppm), Zn (0.44 – 117.80 ppm, mean 27.12 ± 11.73 ppm), Cu (3.98 – 48.92 ppm, mean 13.23 ± 7.84 ppm), Pb (0.13- 8.27 ppm, mean 1.81 ± 1.51 ppm) and Cd (0.10 – 5.90 ppm, mean 1.20 ± 1.16 ppm).
Diet of common stingray, *Dasyatis pastinaca* (Linnaeus, 1758) in the Gulf of Gabès (South-Central Mediterranean)

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**Abstract**

The diet and feeding habits of the common stingray, *Dasyatis pastinaca*, in the Gulf of Gabès were studied from examination of 314 Stomach contents. In the laboratory, stomach contents was analyzed using the percentage frequency of occurrence (F %), numerical percentage (N %), percentage by weight (W %), the index of relative importance (IRI), and percent of IRI (IRI %) for each prey type. Of the 314 stomach contents of *Dasyatis pastinaca* examined, 266 are full (83, 37%) and 48 are empty (16, 27%). Prey items was identified in stomachs belong five major groups: Crustaceans, Teleosts, Molluscs, Annelida and Echinoderms. Crustaceans were the dominant prey items (IRI%= 72, 91), followed by Teleosts (IRI%=25, 18). Molluscs, annelid and echinoderms were occasional preys. Changes in diet were observed and related to size of specimens. With increasing size, crustaceans decreased in importance, whereas teleosts and molluscs increased.

**Keywords:** Diet, *Dasyatis pastinaca*, Gulf of Gabès, South-Central Mediterranean
Assessment of antibiotic and heavy metals resistance of *Pseudomonas* isolates recovered at inflow and outflow of a wastewater treatment plant of a seaside city in Algeria.

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Abstract

Aquatic environments are receptacles of anthropogenic input which exert a selection pressure leading to the emergence of antibiotic-resistant bacteria. The wastewater treatment stations (WWTP) are considered as hot spots of antibiotic resistance, because they constitute sites of concentration of pollutants and, in addition, studies have shown an increase in antibiotic resistance after treatment. This study explored the level of antibiotic resistance in *Pseudomonas* isolates from raw and treated sewage of an activated sludge WWTP of a seaside town in Algeria.

A total of 73 *Pseudomonas* isolates were isolated, 44 isolates from raw water at input of the station and 30 isolates from treated water at output of the station. Isolates were identified as *P. aeruginosa* (n=27, 36.9%), *P. fluorescens* (n=15, 20.5%), *P. mendocina* (n=5, 6.8%), *P. putida* (n=5, 6.8%), *P. alcaligenes* (n=2, 2.7%), *P. stutzeri* (n=1, 1.3%), *P. pickettii* (n=1, 1.3%) and *Pseudomonas sp* (n=17, 23.2%). Rates of resistance to heavy metals were 58.9% for Cu, 34.2% for Cd and 21.9% for Hg. No significant difference was observed between rates of resistance of isolates from wastewater and treated water. The evaluation of susceptibility of isolates against 22 antibiotics showed that the majority had a marked resistance to trimethoprim (84.9%), chloramphenicol (76.7%), tetracycline (67.1%), trimethoprim + sulfonamides (65.7%), ticarcillin (50.6%) and cefsulodin (43.8%). Lower resistance rates were observed for cefotaxime (24.6%), ceftriaxone (12.3%), sulfonamides (10.9%), rifampicin (20.5%) and kanamycin (20.5%). By cons, very low or zero rates of resistance were noted for piperacillin (0%), piperacillin-tazobactam (0%), nalidixic acid (6.8%), pefloxacin (2.7%), ciprofloxacin (0%), ceftazidime (2.7%) cefepime (1.3%), imipenem (1.3%), cefoperazone (0%), amikacin (1.3%), tobramycin (1.3%) and gentamycin (1.3%). As for heavy metals, overall there was no significant difference in the level of resistance between isolates of wastewater and treated water.

Isolates from raw waters contained more multi-drug-resistant (MDR), they were grouped into 18 antibiotic resistance patterns ranging up to 11 antibiotics. Thirteen antibiotic resistance profiles with a maximum of 12 antibiotics were observed in treated water. Antibiogram results highlighted five probable mechanisms of resistance to beta-lactams: wild-type, efflux system, derepressed cephalosporinase, cephalosporinase + efflux, efflux + cephalosporinase + OprD loss. Analysis of the plasmid content of 33 MDR isolates showed a scarcity of plasmids and conjugation transfer of resistance to beta-lactams performed on seven isolates was negative.

Treatment in classic activated sludge treatment plants is not enough to eliminate resistant bacteria and the release of these effluents contribute to spread into natural ecosystems of bacteria with multidrug resistance at least equal to that of raw sewage.

**Keywords:** antibiotic resistance, heavy metal resistance, *Pseudomonas*, WWTP
Contribution à l’étude des communautés macrozoobenthiques de la baie de Skhira (Golfe de Gabès, Tunisie)

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Abstract:

La baie de Skhira, située sur le littoral du Golfe de Gabès entre les deux parallèles 34°17’N et 34°15’E, est soumise depuis plusieurs décennies aux rejets d’un ensemble d’industries chimiques implanté aux abords de la frange littorale. Par ailleurs, l’utilisation d’engins de pêche non sélectifs dans cette zone a entrainé une dégradation des habitats naturels tels que l’herbier de posidonie.

Integrated management of the coastal areas between constraints and sustainable development: case Atlantic Central area of Morocco (Casablanca South)


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Abstract

The coast of the Central Atlantic area is a space complex, diverse, in profound transition and perpetual transformation. It occupies a privileged place from its position between Casablanca and El-Jadida and its opening on the Atlantic Ocean and its considerable and diverse natural resources. The damage generated in this coast is very considerable: very deep socio-economic change, of the environmental destruction of the potentials. With this increased pressure, the study area coastline now represents an unstable physical environment, the ecosystem is based on a fragile balance.

The preoperative objective is the resolution of the negative impacts taking into account the complexity of the coastline, both physical (land-sea interface) level of governance and Management integrated coastal areas.

Keywords: G.I.Z.C, Central Atlantic, sustainable development, assented mutation, impact, environment, governance.
Reproduction and spawning time of *Scorpaena scrofa* Linnaeus, 1758 in the western part of the Libyan coast

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Abstract

A total of 394 of red Scorpion fish *Scorpaena scrofa* were monthly collected from fishermen in the Western region of Libya (Tripoli) during the period from February 2010 to January 2011. Those samples were freshly transferred to laboratory at the Department of Zoology, Faculty of Science, University of Tripoli. Some measurements have taken to investigate spawning season in this area. This study found that the sex-ratio in both species did not differ significantly from 1:1 between size classes or months. The spawning season has extended from July to September in the area of study. This study showed some important information on *S. scrofa* in Libyan waters that can provide a contribution to other studies such as fish stocks, as well as giving some biological information to the researchers and specialists at the local, regional and international.
The followed offshore fishery activity of the Royal shrimp *Melicertus kerathurus* in Sfax governorate-Tunisia

*Suivi de l’activité de la pêche hauturière de la Crevette royale *Melicertus kerathurus* dans le gouvernorat de Sfax*

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**Abstract**

Tunisia occupies a strategic position in the sector of the fishing in Mediterranean. Certainly, the region of Sfax is considered among the most productive zone in Tunisia. The port of Sfax was a site of fishing offshore units that attracts a number important of benthic trawl. This work represents a contribution to the study of the offshore fishing activity in the governorate of Sfax during the four seasons. It is to realize, through surveys conducted at the port, two types of analyzes: a quantitative analysis to determine the average seasonal landings of the Royal shrimp by fishing offshore units and qualitative analysis to determine the demographic structure of this species in the region. The analysis of demographic structures of the landings showed that during the four seasons the majority of captured males are mature, with the existence of a relatively weak proportion of immature individuals that doesn't exceed 17%, detected during the spring. The distribution of sizes at females during the four seasons, reveal that the mature individual percentage exceed the 87% of individuals captured, and that the summery period is most remarkable of which 96% of individuals are mature and the rate of fecundity reaches 97%. Whereas the winter period was characterized by a weak fecundity rate that doesn't exceed 33%.

**Résumé**

La Tunisie occupe une position stratégique dans le secteur de la pêche en méditerranée. En effet, la région de Sfax est considérée comme une zone parmi les plus productives en Tunisie. Le port hauturier de Sfax est un site d’activité de la pêche hauturière qui attire un nombre important des chalutiers benthiques. Ce travail représente une contribution à l’étude de l'activité de pêche hauturière de la Crevette royale dans le gouvernorat de Sfax durant quatre saisons successives. Il consiste à réaliser, grâce à des enquêtes menées au port, deux types d'analyses: une analyse quantitative afin de déterminer les débarquements saisonniers moyens de la Crevette royale débarquée par la pêche hauturière et une analyse qualitative pour établir la structure démographique de cette espèce dans la région. L’analyse des structures démographiques des apports à montré que durant les quatre saisons la majorité des mâles capturés sont matures, avec l’existence d’une proportion relativement faible d’individus immatures qui ne dépassent pas 17%, détecté pendant le printemps. La distribution des tailles chez les femelles durant les quatre saisons, révèle que le pourcentage des individus matures dépasse les 87% des individus capturés, et que la période estivale est la plus remarquable dont 96% des individus sont matures et le taux de fécondité atteint 97%. Alors que la période hivernale est caractérisé par le taux de fécondité le plus faible qui ne dépasse pas 33%.
Litter pollution on the coastal cities of the Eastern Black Sea

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Abstract

Technological development and the increase of the production were resulted by a large amount of waste and environmental pollutions. A significant portion of the pollution at river basins and coastal zones consist of solid waste which includes the packaging waste products. In some cities and villages of the Eastern Black Sea, a large portion of the solid waste generated on a daily basis are dumped to hillside, river beds, sea shores without being subjected to any processing. Then, the accumulated garbage on slopes or stream beds, carried to the Black Sea via the rivers. An important part of wastes settles to the sea bottom and, floatable waste is transported to the offshore by current and wave while some others moved to accumulate close to the coast. In this study, land based solid waste accumulation on the coast of coastal cities was qualitatively and quantitatively analyzed in 2010. Total 119 km of 10 cities coastline was scanned. The deposited litters found on the coasts are of 31.417 tons which consisted of 56% plastic, 14% metal, 7% glass and 23% textiles. Amount of solid waste per square meter was as follows: Trabzon Central district 5.83 g, Akçaabat 1.11 g, Araklı 1.46 g, Arsin 1.23 g, Beşikdüzü 2.56 g, Çarşibaşı 3.13 g, Of 3.85 g, Sürmene 2.09 g, Vakıfkebir 0.87 g, and Yomra 2.55 g. It could be concluded that solid waste pollution was effective along all the coast and maximum at Central district and minimum at the Vakıfkebir coast. According to these results, public and environmental health, aquatic ecosystem of the coast are under threat of anthropogenic solid waste pollution. It has been shown that it’s a major problem in the region.

Keywords: Black Sea, Litter, Coastal pollution, urbanization
Variations of the epidemiologic index of *Balistes capriscus* (teleostei: balistidae) of the Gulf of Gabes (tunisia)

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Abstract

*Balistes capriscus* (Gmelin, 1789) is an amphi-Atlantic Fish widely found in tropical and temperate waters (Sazonov and Galaktionova 1987). This species is common in the southern Mediterranean (Aggrey-Fynn, 2009) and appears to have extended its distribution area northwards due to global warming (Garrabou *et al.*, 2003). Several studies have been carried out on the parasites of *B. capriscus*, captured from the Atlantic Ocean (Linton 1907, Hanson 1950, Hargis 1955, Saunders 1959, Sogandares-Bernal, 1959, Overstreet 1969, Ho and Rokicki, 1987, Alves *et al.*, 2005). However, there has been no information reported on the parasites of the Mediterranean *B. capriscus*.

Parasites are considered as good biological indicators and they can be used as an effective tool to solve the problems related to the environment and the life cycle of their host. In fact, the abundance of the parasites depends strongly on the distribution, migration paths and biology of the host populations (Klimpel *et al.*, 2010). It also appears that these organisms can be used as bioindicators of pollution (Sures and Siddall, 2003) and as bioindicators of climate change (Harvell *et al.*, 2002).

Hence, this work provides the first data on the parasite fauna of *B. capriscus* and the analysis of their biodiversity.
Strengthening the system of marine & coastal protected areas of Turkey: 
To date results

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Abstract

The major outcome of the United Nations Conference on Sustainable Development (Rio+20) “The Future We Want” document stressed “the importance of the conservation and sustainable use of the oceans and seas and of their resources for sustainable development”, and the article 177 dictated that the “importance of area-based conservation measures, including marine protected areas”, and noted that “decision X/2 of the tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity, that by 2020 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, [were] to be conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures”. In this context, within the marine areas bordering Turkey’s lengthy coastline is found an abundant, highly diverse and globally significant biodiversity endowment. As a baseline in 2009 about 2.8% of Turkey’s territorial waters was protected. Turkey’s system of MPAs consists of 10 Special Environmental Protection Areas (SEPA), 3 National Parks, 1 Nature Park, about 40 fisheries restricted areas. The proposed long-term solution for marine biodiversity conservation in Turkey’s marine areas is a reconfigured Marine and Coastal Protected Areas (MCPA) network designed to protect biodiversity while optimizing its ecological service functions – under effective and sustainable adaptive management. Working together with its partners, the GEF project, started in 2009, and is supporting the development of responsible institutions able to prioritize the establishment of new MCPAs and more effectively manage existing MCPAs. The project is also facilitating adequate levels of revenue generation and cost-effective management through the development of an MCPA management system. Finally the project promotes Inter-agency coordination mechanisms to regulate and manage economic activities within multiple use areas of the MCPAs. To date, there are major achievements under capacity building, financial sustainability and coordination outcomes. To maintain the sustainability MCPA Training and Implementation Centre was established in Akyaka, Muğla, and the curriculum for the centre is under preparation together with NOAA and WWF Mediterranean Program Office. The cabinet decree, which declares Gulf of Saros (Çanakkale) - covering approximately 75,000 ha.-as SEPA, entered into force. With the same legislation, the Gökova SEPA’s (Mugla) borders were also extended (50,000 ha.) in December 2010. Gökova and Foça SEPA Management Plans were prepared. National MCPA Strategy and Action Plan document is prepared and is awaiting final inputs from relevant stakeholders. The Business Development Unit as the Permits and Management Branch Directorate of General Directorate for Protection of Natural Assets was established and income generated from respective MCPAs reached to 16% of total institutional budget from 10% baseline figure. The valuation of eco-system services for six project sites were calculated at 410 million USD, and shared with public, this was the first national level initiative for marine eco-system services. Ten No Fishing Zones were established in the Gökova and Datça-Bozburun SEPAs in 2010 and 2012 respectively. The preparation and development phase for the establishment of the 6 NFZs in Gökova SEPA were achieved under GEF-SGP funded project by the Underwater Research Society - Ecology Group.

The main outcomes of the project achieved and contribution of it to “the State of Mediterranean Marine and Coastal Environment Report” will be shared with the key actors of Barcelona Convention at its COP meeting in December 2013 in Istanbul. This will also serve as the best practice and lessons learnt examples for Least Developed Countries.
Biological and ecological characteristics of the *Cochlodinium Polikricoides*,
the Persian Gulf red tide agent

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Abstract

Red tide is a common phenomenon in aquatic ecosystems like seas and oceans. This phenomenon always happened under suitable situation of light, temperature and nutrients, and in relation of phytoplankton species and environmental characteristics of the ecosystem, it caused different but always undesirable effects. In Persian Gulf like any other marine ecosystems, every year some different types of red tides were happened, but the red tide of the 2008 which began from around of port Jask and speared throughout the whole Persian Gulf very fast, was one of the biggest and longest red tides of the Persian gulf. This red tide caused by a dinoflagellate, *Cochlodinium polikricoides*, which in idea of many scientists is an invasive species. As importance of the knowing the biological and ecological characteristics of such harmful species for suitable challenges, present paper will discuss the characteristics of this dinoflagellate species.
Shading and grazing effects on seagrass *Cymodocea Serrulata* and *Thalassia Hemperichii* in port Dickson, Malaysia

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Abstract

The morphological variations and grazing evidence for two seagrass *Cymodocea serrulata* and *Thalassia hemprichii* were investigated in Port Dickson, Malaysia. Comparatively, the leaves of *C. serrulata* and *T. hemprichii* beneath the shading of macroalgae were found longer than those without shading. The uncovered rhizome internodes lengths of seagrass were found longer (t-test, p<0.05) than the covered rhizomes by sediments. Marine animals in this coastal area grazed seagrass leaves continuously. About, 16-22% of leaf blades for both species *C. serrulata* and *T. hemprichii* have had at least grazing evidence. Observation found that the most of the grazing evidence was located at the heavily epiphytes tips of both the seagrasses.
Diversity of Nereididae polychaetes species in Asian estuaries

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Abstract

One of the ecologically important taxa in Asian estuarine ecosystem is Nereididae polychaetes, dominating in brackish-water intertidal flats with a large biomass, and constituting a major part of the diet of many demersal fishes and migratory shorebirds. The major estuarine Nereididae species belong to the following four groups in Eastern and South-eastern Asia; Hediste spp., Tylorrhynchus spp., Neanthes glandicincta species group, and Composetia spp. All of them are composed of morphologically similar several species (i.e., sibling species group). Here, recent topics on their taxonomical studies are reviewed. The cryptic speciations of 4 species in N. glandicincta species group and 2 species of Composetia spp. were revealed. Obvious differences in some adult morphology and/or early development could be detected among them. The high species diversity is shown around Malaysia and Thailand. Some of the cryptic species (undescribed species at present) seem to be threatened by anthropogenic habitat loss or damage.
Study on suspended sediment and ammonia distribution pattern in Tioman Island

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Abstract

A study on suspended sediment and ammonia distribution pattern was conducted in Tioman Island, Pahang for 3 months started from August to October 2012. This study aims to determine the sedimentation rates and ammonia concentrations in Tioman. The study area was divided into 14 stations that represent the whole Island. Samples of suspended sediment were collected using sediment trap deployed at 4 locations namely Genting, Renggis, Teduh and Benuang. Water samples for ammonia analysis were collected using the siphon technique at all sampling stations. The result of this study showed that sedimentation rates and ammonia concentration level were higher in the developed area compared to the undeveloped area. The sedimentation rate was higher at Genting (1.908 mg.cm\(^{-2}\).day\(^{-1}\)) followed by Renggis Island (1.737 mg.cm\(^{-2}\).day\(^{-1}\)). Whereas in Teduh and Benuang the sedimentation rates were slightly lower with 1.395 mg.cm\(^{-2}\).day\(^{-1}\) and 1.453 mg.cm\(^{-2}\).day\(^{-1}\) respectively. Ammonia concentration showed the highest at Juara (2.74 ± 0.29 µM/L) followed by Renggis Island (2.00 ± 0.95 µM/L). Statistical analysis was proved that there was a significant difference between sedimentation rates and sites. The highest nutrient level of ammonia was 2.74µM/L but, the concentration levels were still in the permissible limit. Nevertheless, continuous monitoring should be carried out in order to ensure the nutrient levels are still at the safe level.
Study on coral diversity and distribution at four selected areas in Tioman Island, Malaysia

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Abstract

Diversity and distribution of corals were investigated in Teluk Benuang, Kampung Genting, Pulau Renggis and Teluk Teduh, Tioman Island. The diversity and distribution of corals in all sampling stations were observed and recorded using Coral Video Transect (CVT) method. The captured images were analyzed using Coral Point Count extension (CPCe) software. The physicochemical parameters were also measured. A total of 32 genera of corals belong to 16 families were recorded. Genus of Acropora and Montipora from family Acroporidae, and Favites from family Faviidae were found dominant. Tlk. Benuang and Tlk. Teduh have shown the highest number of coral genera among the study locations. The Shannon diversity index (H’) and evenness index (\(E_H\)) of coral genera at Tlk. Benuang were 2.40 and 0.78, respectively while the Shannon diversity index (H’) and evenness index (\(E_H\)) of coral genera at Tlk. Teduh were 2.33 and 0.77 respectively. As for the depth, 10m depth has shown the highest number of coral genera compared to 5m depth. The Shannon diversity index (H’) and evenness index (\(E_H\)) of coral genera at 10m depth were 2.75 and 0.80, respectively while the Shannon diversity index (H’) and evenness index (\(E_H\)) of coral genera at 5m depth were 2.47 and 0.79 respectively. The geographical, morphological and depth were the factors that influence the establishment of corals. Chi-square analysis had shown that genus of Acropora, Hydnophora, Plerogyra, Cycloseris, and Ctenactis were not significant differences with locations and depths (p>0.05) meanwhile, the other coral genera were found highly significance with location and depths (p<0.01). Other physicochemical parameters were not shown clearly relationship between coral diversity and distribution.
Diversity and distribution of marine benthic phytoplankton on two species of seagrasses in Sungai Pulai, Johor

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Abstract

The diversity and distribution of three main types of marine benthic phytoplankton: diatoms, dinoflagellates and blue-green algae were studied based on their substrate preference. Marine benthic phytoplankton from two species of seagrasses (*Halophila ovalis* and *Halophila spinulosa*) was studied for twelve-months in Sungai Pulai, Johor. Simultaneously, physicochemical factors which are temperature, pH, percentage of dissolved oxygen and salinity were recorded. Twenty genera of phytoplankton have been identified and diatoms were the most abundant phytoplankton with the two most common species being *Thalassiothrix elongata* and *Diploneis elliptica* in which *Halophila spinulosa* was the better colonized seagrass compared to *Halophila ovalis*. 
New record of *Cochlodinium* Sp. in Perak coastal water of peninsular Malaysia

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Abstract

*Cochlodinium* sp. has been reported to cause fish mortally around the world. In Malaysia this species has been recorded in Kota Kinabalu, Sabah, East of Malaysia. In Peninsular Malaysia several harmful algal bloom (HAB) species viz. *Alexandrium* spp., *Pyrodinium bahamense* var *compressum* and *Gymnodinium catenatum* have been recorded. To date no record of *Cochlodinium* sp. has been reported in this area. This study aim is to identify the present of *Cochlodinium* sp. in Peninsular Malaysia particularly in Perak coastal water. Samples were collected from 9 stations and *Cochlodinium* sp. was identified and enumerated under light microscopy. Nutrients i.e. nitrate, phosphate, silicate and ammonia were determined and physico-chemical parameters (pH, temperature, salinity) were recorded *in-situ*. Result showed the present of *Cochlodinium* sp. at the cell density of $4.5 \times 10^3$ cells/L. Salinity ranged from 17.82 to 30.71 pss, pH ranged from 7.21 to 8.4, temperature ranged from 30.80 to 32.08 °C. Nutrients determined at this area showed a high concentration. This identification of *Cochlodinium* sp in Perak coastal waters indicates that Peninsular Malaysia will have problem related to *Cochlodinium* sp. in the future.
Biological Study, distribution and biomass of the Arabian Scad *Trachurus Indicus* (Nekarsov, 1966) in the Arabian Sea coast of Oman

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Abstract

Arabian scad (*Trachurus indicus*) distribution, biomass and biology were studied based on the samples collected during demersal fish survey conducted by RV Al Mustaqla I in the Arabian Sea coast of Oman between September 2007 and September 2008. This species was occurred in depths of 20 to 250 m with total length range of 3.5 – 38.6 cm (mean 16.37±5.11 cm, n= 6477), and weight range of 1.0-825.0 g (mean 75.93±55.27 g). The majority of catch was found on depths of 20-100 m and most commonly encountered at size of 13 and 27 cm TL. Differences in size between males (range: 6.6-35.3 cm; mean 18.18±5.02 cm, S.E. 0.10, n = 2592) and females (9.0-38.6 cm; mean 18.38±4.56 cm, S.E 0.09, n = 2417) were recorded. Length-Weight relationship was $W = 0.0077 L^{3.1833}$ for males and $W = 0.0069 L^{3.2192}$ for females indicating positive allometric growth. Males were outnumbered females during the whole surveys where the overall male to female ratio was 1: 0.93. The biomass and catch rate of the Arabian scad according to depth and season were estimated. By using the mean monthly changes in Gonado-somatic Index (GSI) and condition factor (Kn), it was found that the spawning season of the Arabian scad may extends from August to November, with maximum activity in September and October.
The impact of climate change on population trends of marine birds in Libya.

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Abstract

The coastline of Libyan is characterized by different wetlands that are used as roosting areas for many migratory marine birds. They provide shelter, food and nesting ground for many birds’ species during their migration from their home to wintering grounds. Climate change considered as the greatest threat to natural communities in many the world’s ecosystems. It is already affecting birds in different ways. Precipitation and moisture are critically important climate variables to birds. Marine (sea) birds are highly dependent on precipitation to sustain their wetland habitats. Data on wintering birds in Libya were collected through the years 2005 - 2013 and analyzed in order to investigate their relationships with some climatic factors. This study found that precipitation reductions and drought in critical stopover areas have negative implications for marine birds wintering in Libya. However, the decrease and increase in bird numbers were related to the rate of rainfall.

Keywords: Coastline, migratory, precipitation and wintering birds.
Macrobenthos community distribution in center of Persian Gulf

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Abstract

During the Persian Gulf and Oman Sea Oceanographic study (PG-GOOS) in autumn 2012, sampling of macrobenthos organisms was undertaken in 31 stations in the Persian Gulf waters. Using Van Veen grab, three samples were taken from each site. A total of 5677 individuals of macrobenthos were counted being represented by 8 taxa (i.e. Gastropods, Bivalves, Polychaetes, Crustaceans, Scaphopods, Echinoderms, Sipunculids, Fish larva). The highest average number of macrobenthos was belonged to Gastropods (Mean±SE, 52.67±18.94). The result of ANOVA analysis showed significant difference in average abundance of different groups (P<0.05). ArcGIS software was used to map macrobenthos distributions in study area. Based on CCA analysis, depth significantly affect on macrobenthos.

Keywords: Macrobenthos, Environmental factors, Distribution, Persian Gulf
Seasonal variations of the *Alburnus alburnus*’ sexual stages (Cyprinid) and their relationship with the environmental parameters in Keddara dam Algeria

Variations saisonnières des stades sexuelles chez *Alburnus alburnus* (Cyprinidé) et leurs relations avec les paramètres environnementaux dans le lac de barrage de Keddara-Algérie.

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Abstract

The study of the spawning period and sexual maturity of *Alburnus alburnus* was performed for the first time in Algeria. This species has been newly introduced in the dam Keddara following the seeding operations of imported Cyprinid from Hungary. This study was realized over a period of four years (from May 2008 to February 2012).

The seasonal sexual stages usually shows a predominance of stage III of males during all seasons with a recorded maximum of 89% (spring 2011) and stage IV of female during the spring and summer (≥ 50 %). We have noticed the abundance of stage II and III during the autumn and winter of the two sexes. For stage I, it is common in autumn and summer for females (≥ 19%), autumn for males (35%) and stage V for females; it is abundant in summer (28%). We have noticed heterogeneity in the frequency distribution of sexual stages in two sexes during the four years of study. For this we have attempted to explain these results in relation with physico-chemical parameters of the water dam and the temperature of the air of the dam using the canonical correspondence analysis (CCA). In general, the ACC (78.69%) allows us to view the seasonal scale of different stages of two sexes. We found that the stage I, is correlated with pH, salinity and conductivity of the water. It’s the same for stage II of two sexes and stage III of females which corresponded the advanced maturity and are marked by the winter season.

Stage IV (males) and V (female) that represent the post-spawning stages are correlated to temperatures of air and water, and the water transparency, during the summer and winter in general

Keywords: Fish, sexual stages, dams, canonical correspondence analysis.

Résumé

L'étude de la période de ponte et de la maturité sexuelle d’*Alburnus alburnus* a été réalisée pour la première fois en Algérie. Cette espèce a été nouvellement introduite dans le barrage de Keddara suite aux opérations d’ensemencement des carpes importé de la Hongrie. Elle a été réalisée sur une période de cinq ans (de mai 2008 à février 2012). Le suivi des stades sexuels par saison montre en général une dominance du stade III chez les mâles durant toutes les saisons avec un maximum enregistré de 89% (printemps 2011) et le stade IV chez la femelle pendant le printemps et l’été (≥50%). Nous avons remarqué l’abondance des stades II et III durant l’automne et l’hiver chez les deux sexes. Pour le stade I, il est fréquent en automne et l’été chez femelles (≥19%), en automne chez les mâles (35%). Et pour le stade V chez les femelles, il est abondant en été (28%). Une hétérogénéité dans la distribution des fréquences des stades sexuels chez les deux sexes durant les cinq années d’étude.

Pour cela nous avons tenté d’expliquer ces résultats par rapport aux paramètres physico-chimiques de l’eau du barrage et la température de l’air du barrage à l’aide de l’analyse canonique des correspondances (ACC). L’objectif visé de cette analyse est de déterminer les variables environnementales influençant la structure saisonnière des stades sexuels chez les deux sexes et de préciser la saison de chaque stade. En général, l’ACC (78.69%) nous a permis de visualiser l’échelle saisonnier des différents stades chez les deux sexes. Nous avons constaté que le stade I chez les deux sexes qui correspondent au début de l’évolution est marqué par la saison automnale, il est corrélat aux pH, salinité et conductivité de l’eau. De même pour les stades II chez les deux sexes et le stade III chez les femelles qui correspondent à une maturité avancée et qui sont marqués par la saison hivernale. Ils sont positivement corrélés à ces paramètres et négativement corrélés aux températures de l’air et de l’eau, l’oxygène dissous et l’oxygène de saturation. Les stades III (chez les mâles) et IV (chez les femelles) pendant la saison printanière en général, qui correspondent au stade de ponte sont fortement corrélés à l’oxygène dissous et à l’oxygène saturé et ceci par rapport à l’axe I, et sont négativement corrélés aux températures de l’air et de l’eau, au pH, salinité et conductivité. Les stades IV (chez les mâles) et V (chez les femelles) qui représentent les stades post ponte, sont corrélés à la température de l’air et de l’eau et la transparence de l’eau, et ceci durant l’été et l’hiver en général.
Dissolved trace metals in the waters of three distinguished parts of Abu-Kir Bay, Alexandria, Egypt.

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Abstract

Abu-Kir Bay (AKB), is one of the Mediterranean coastal bays, lying just west side of Rosetta estuary, between Rosetta mouth and Abu-Kir Head-land. It is semi-circular bay, shallow (mean depth 12m), and lies 36 km east of Alexandria City. Study of dissolved trace metals, zinc (Zn), copper (Cu), cadmium (Cd), manganese (Mn) and iron (Fe) in Abu-Kir Bay revealed that this Bay is occupied with three well distinguished water bodies, one at the southwest (off Tabia pumping station, effluents mainly industrial), off lake Edku outlet (Maadia opening, mainly agricultural drainage water) and off the River Nile (Rosetta) branch outlet (mainly river water mixed with agricultural drainage water). The environmental conditions (DO and salinity) studied in these areas reflect such findings. The contribution of the land based sources with these trace meals to the sea was estimated and presented and reflected that Tabia effluent is the main contribution for trace meals to AKB.
Dynamics of the nitrogen and phosphorus flows in a SFAX solar saltern in an arid AREA (Sfax, Tunisia)

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Abstract

The fluctuations in total nitrogen and phosphorus concentrations, N/P ratio in terms of mass, were measured at the entry and exit of the solar saltern (Tunisia) and the oxygen and the water inflow and outflow was also assessed throughout an annual cycle. The Sfax solar saltern located on central eastern coast of Tunisia, about 34°39’N and 10°42’E, is the largest salt resource in Tunisia. This is an artificial system consisting of interconnecting ponds (reservoir, evaporation and crystallization). While the water inflow varied between 14.4 and 15.5 × 10^6 m^3 (Mean ± S.D. = 14.7 ± 0.4 10^6 m^3), the water outflow ranged between 1.6 and 1.7 10^6 m^3 (Mean ± S.D. = 1.6 ± 0.04 10^6 m^6). No significance difference was recorded between the seasons for both the water inflow and outflow (P > 0.05). Moreover, the results obtained showed that the highest N and P inputs was recorded in summer and autumn of 5.5 (3.4 ± 1.13 Kg. month^{-1}) and 90 Kg. month^{-1} (28 ± 24.6 Kg. month^{-1}), respectively. This is may be explained by the bacterial degradation of the generated organic matter by phytoplankton in the reservoir. Furthermore, the oxygen values were low not exceeding 4 mg. l^{-1}. The oxygen was correlated (P > 0.05) positively with total nitrogen (r = 0.17; N = 12) but negatively with total phosphorus (r = -0.02; N = 12) in the reservoir. However, the N and P flow in the evaporated ponds decreased drastically reaching 0.6 ± 0.7 and 1.8 ± 1.4 Kg. month^{-1}, respectively, over the year. The N and P output were low reaching 0.6 ± 0.4 (Max = 1.7 Kg. month^{-1} in July) and 1.5 ± 0.7 Kg. month^{-1} (Max = 2.8 Kg. month^{-1} in February), respectively. The NT and PT concentrations were significantly similar between the evaporated and the crystalliser ponds (ANOVA, P > 0.05). However, they varied significantly from the reservoir to the crystalliser ponds (P< 0.001). Furthermore, the NT/PT ratio values in the water column were low. They varied from 0.04 (0.27 ± 0.26) to 2.67 (0.67 ± 0.74) in the reservoir and crystalliser ponds, respectively. This effect may be due to the consumption of nitrogen by the Chlorophyceae Dunaliella salina which dominates the evaporated pond on one hand and to the sedimentation of NT and PT in both the evaporated and the crystalliser ponds of the saltern on the other hand.

Keywords: solar saltern, nutrient dynamics, nutrient flows, nitrogen, phosphorus, N/P ratio.
Theme 3: Biotechnology & Marine Natural Products
Bioactive molecules from sea organisms: a new hope for human health

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Abstract

Drug discovery represents one of the most promising and highly visible outcomes of marine biotechnology research. Molecules produced by marine invertebrates, algae and bacteria, are very different from those related terrestrial organisms and thus offer great potential as new classes of medicines. To date, examples of marine-derived drugs include an antibiotic from fungi, two closely related compounds from a sponge that treat cancer and the herpes virus, and a neurotoxin from a snail that has painkiller properties making it 10,000 times more potent than morphine without the side effects. However, there are several more marine-derived compounds currently in clinical trials and it is likely that many more will advance to the clinic as more scientists look to the sea for these biotechnological uses. In addition to new medicines, other uses for marine-derived compounds include: cosmetics (algae, crustacean and sea fan compounds), nutritional supplements (algae and fish compounds), artificial bone (corals), and industrial applications (fluorescent compounds from jellyfish, novel glues from mussels, and heat resistant enzymes from deep-sea bacteria).

The field of marine natural products is passing its discovery phase and moving to the second phase where understanding relationships and processes is driving the research towards novel drugs from the sea. Marine plants, animals and microorganisms will be the basis of new products and services important to technology in the future. With rich biodiversity and vast marine resources along the coast, in the form of estuaries, creeks, deep seas and continental shelf, the opportunities for research in the area of marine drug development are endless. An overview of these applications will be presented and steps and challenges discussed.
Fermentation of seaweed meal using *Rhodovulum Sulfidophilum* as aquaculture feed supplement

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Abstract

Seaweed meal of *Kappaphycus* and *Halimeda* were used in fermentation with purple non-sulfur bacterium *Rhodovulum sulfidophilum* with an aims to developed seaweed based product and to evaluate the suitability of fermented product as aquaculture feed supplement. Fermentation was carried out in Borneo Marine Research Institute laboratory in two liters glass bottle with 48-h culture of *Rhodovulum sulfidophilum* for the period of 7 days. Proximate composition of fermented *Kappaphycus* and *Halimeda* meal and their products derived after fermentation with *R. sulfidophilum* were analyzed. The harvested biomasses of seaweed based products were used in preliminary feeding trial with Red Tilapia, *Oreochromis niloticus* larvae. The growth in length (mm) and survival (%) of the larvae were monitored for the period of 15 days. The crude protein content in the product derived from *Kappaphycus* and *Halimeda* with the use *R. sulfidophilum* were increased to 68% and 42% respectively. At the end of fermentation with the use of *Rhodovulum sulfidophilum* the crude fiber were reduced to 12% and 11% in *Kappaphycus* and *Halimeda* respectively. In feeding trial the highest growth in length of 15.4mm and survival of 70% were significantly higher (p<0.05) in tilapia larvae while fed with the product derived from fermented *Kappaphycus* meal with *R. sulfidophilum* than the larvae fed with the product derived from fermented *Kappaphycus* meal derived from *Halimeda* meal fermented without *R. sulfidophilum*. The poorest growth of 11.2mm and survival of 46% in larvae were obtained with the control diet, which was the product derived after fermentation of *Halimeda* seaweed meal without using *R. sulfidophilum*. Seaweed meal of *Kappaphycus* fermented with phototrophic bacterium *Rhodovulum sulfidophilum* has potentiality to be used as aquaculture feed supplement in rearing finfish larvae.
Determination of different methods of alginate extraction from
Persian Gulf’s *Sargassum Polycystum* algae

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Abstract

Alginate extraction from brown algae *Sargassum polycystum* (were collected on January and February 2011 at coastal of Bushehr) were done at Biology laboratory at university. Alginate yield and the ratio of M/G (The quality of alginate extracted) among 3 methods of extractions (Neutral, Alkaline and acidic extractions) were investigated. Based on the result, choosing a suitable extraction method has an essential role in alginate acid extraction. In addition, different methods of alginate extraction have different effect on alginate yield and the ratio of M/G. Furthermore, Fourier transform infrared spectroscopy (FT-IR) and H1-nuclear magnetic resonance (NMR) analyses were used for analyzing the alginate and the spectra revealed that the alkaline extraction is the best method of alginate extraction due to the higher amount of alginate yield and highest M/G ratio too.
Biofuel potential within *Chaetoceros* species (Bacillariophyceae) from coastal water of Pahang, Malaysia

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Abstract

Several marine diatoms have been known for their high lipid content. *Chaetoceros* is probably the largest genus of marine planktonic diatoms with approximately 400 species described. Lipid is important as primary storage for nutrient and essential for cell’s growth and function. Nowadays, there are increasing in demands for alternative source of fuel with several attempts have been conducted to find the best ways for fatty acid collection and algae have been listed as potential sources for lipid. This study was aimed to analyze the production of fatty acids from marine algae under Genus *Chaetoceros*. The results showed three species had been identified as *Chaetoceros baculites*, *Chaetoceros anastomosans* and *Chaetoceros affinis var. willei*. *Chaetoceros baculites* had higher growth rate compared to other species mention earlier. All species had more than 40% of total lipid detected during exponential phase of their growth. Based on accumulation, *Chaetoceros baculites* had higher lipid percentage than other species followed by *Chaetoceros affinis var. willei* and lastly *Chaetoceros anastomosans*. This indicates that Genus *Chaetoceros* can be treated as potential sources for bio-fuel industry in Malaysia.
Scientific explorations on Horseshoe crabs - Current status and future prospects


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Abstract

In recent decades, the dwindling population size of extant xiphosurans (Horseshoe crabs) has triggered the marine scientists and conservation biologists to protect their natural stock size by 1. Implementing restrictive fishery practice on wild stock, 2. by improving the number of sanctuaries and 3. by enhancing its sea ranching programs. At present, the blue blood from the horseshoe crabs is proven to be the sole source of Pyrogen test in biomedical industry. Though, many attempts were made to develop biosensor to quantify the endotoxin level in liquid biological samples and intravenous drugs, their application is directly or indirectly depend on LAL/TAL from the natural source. It is noteworthy to mention that out of four extant species of horseshoe crabs (Limulus polyphemus, Tachypleus gigas, T.tridentatus, Carcinoscorpius rotundicauda), later three are inhabiting in Malaysian coastline. However, the scientific explorations on these wild stocks are still shallow. Hence, the present paper was aimed to show the different field specific research on horseshoe crabs and its present status in light with future dimensions. The paper was also aimed to show the importance of horseshoe crab research in Malaysia in order to break the monopoly being played by few countries on endotoxin detection kits development.
POSTERS

Theme 3: Biotechnology & Marine Natural Products
Cytotoxic effect of the extracts of *Sarpa sarpa* organs on cell culture correlation under toxic phytoplankton proliferation

Effet cytotoxique des extraits des organes de la saupe sur le modèle cellulaire en relation avec la prolifération de phytoplanctons toxiques

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Abstract

The present study aimed to assess the cytotoxic effects of not-yet identified compounds present in organ extracts of *Sarpa salpa*, collected in autumn, the period with a peak in health problems. In addition, we studied the cytotoxicity of epiphytes extracts found in the stomach content of *S. salpa* collected in summer and of epiphytes collected from the sea in the Sfax area at the end of spring. We tested these fractions in two human hepatic cell lines: HepG2 and WRL68. We observed a significant loss of viable cells when HepG2 cells were exposed for 72 h to acetone extracts of livers of *S. salpa* at a concentration of 2.5 mg/ml protein. Proteins extracted from brain or muscle did not significantly induce cell death at the studied concentrations (≤10 mg/ml). Extracts of epiphytes collected in late spring showed a cytotoxic effect in a concentration dependent manner. Moreover, we observed a significantly decreased cell viability of HepG2 at a dilution (1/40) of epiphyte extracts from stomach contents of two fish we had collected. The cytotoxic effect of the observed epiphyte extracts confirms the transfer of toxins originating from toxic dinoflagellates which live in epiphyte on the *Posidonia oceanica* leaves to fish organs by grazing. Hence, the liver of this fish can cause a threat to human health and consumption should for this reason be dissuaded.

Keywords: *Sarpa salpa*, Organ extract, Epiphyte extract, HepG2.

Résumé

Le présent travail a pour objectif d’évaluer sur cultures cellulaires les effets cytotoxiques présents dans les extraits d’organes de *Sarpa salpa* collectés dans le golfe de Gabès en automne. De même, nous allons évaluer sur le même modèle cellulaire la toxicité des épiphytes ingérés par la saupe en été et aussi des épiphytes collectés auprès de la mer de la région de Sfax à la fin du printemps. Il s’agit donc d’une contribution à l’évaluation du risque pour l’homme que représentent les toxines phytoplanctoniques à effet neurotoxique, présentes dans la saupe en se basant spécifiquement sur l’analyse de viabilité de modèles cellulaires HepG2 et WRL68.

Nos résultats ont montré que les extraits de la chair, du cerveau ou de foie soient dissous dans le DMSO ou le PBS, ont un effet cytotoxique sur la viabilité et la croissance des cellules hépatiques HepG2. L’effet cytotoxique a été observé surtout pour la fraction dissoute dans le PBS.

L’effet cytotoxique de différentes concentrations des extraits d’épiphytes est confirmé en particulier pour les stations 1 et 2. Ces dernières stations sont des stations plus proches de la côte de Sfax et se situent à des profondeurs de 5 à 7m. Sfax est la plus importante ville industrielle et commerciale du Sud Tunisien. Le courant de marée ramène les polluants rejetés vers la côte, rendant les stations 1 et 2 extrêmement vulnérables à la pollution. Tandis que les stations 4 et 6 sont des stations plus éloignées de la côte de Sfax et se situent dans l’île de Kerkennah.
Seasonal variation of some antioxidant and minerals content of three common seaweeds collected from the rocky site near Boughaz El-Maadya, Abu-Qir- Bay, Alexandria- Egypt

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Abstract

In the present investigation three common seaweeds (Ulva lactuca Linnaeus (Chlorophyta), Jania rubens (Linnaeus) J.V.Lamouroux and Pterocladia capillacea (S.G.Gmelin) Bornet http://www.algaebase.org/search/species/detail/?species_id=387(Rhodophyta) were evaluated through the antioxidant activity and elemental analysis. The antioxidant activity was measured with β-carotene, total phenols content and DPPH (2,2-diphenyl-1-picrylhydrazyl). The three common seaweeds were collected from spring to autumn 2010 from the rocky site near Boughaz El-Maadya Abu-Qir Bay of Alexandria, Egypt. The results showed that, the maximum increase of β-carotene was observed in Pterocladia capillacea during summer. The highest total phenolic content and scavenging activity on DPPH was found in Jania rubens and Pterocladia capillacea, respectively during summer seasons, and the scavenging activity was increase by increasing concentrations. Mineral content was abundant in all samples and was higher than in common food and vegetables. The Na/K ratios ranged between 0.78–2.4, which is a favorable value. Trace metals all exceeded the recommended doses by Reference Nutrient Intake (RNI). The maximum Cu and Cr values (2.02±0.13 and 0.46±0.14 mg/100g, respectively) were presented in the green alga Ulva lactuca during summer. Except ferric (18.37±0.5mg/100g) which acceptable concentrations was present in Pterocladia capillacea during summer. The studied species, was rich in carotenoids, phenolic compounds, possesses antioxidant and mineral contents, therefore they can used as a potential health food in human diets and may be of use to the food industry.
Genetically study of Iranian giant freshwater prawn  
(*Macrobrachium rosenbergii*)

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**Abstract**

In order to primary research on population genetic and determination of probable polymorphism in Giant Freshwater prawn of IRAN samples of muscle texture of this prawn in order to determination of the whole protein separated and transferred to biotechnology laboratory of Khuzestan research center. This laboratory by the method of electrophoresis samples (Laemmli -SDS/Polyacrylamide Gel Electrophoresis) went under analysis stage. It is necessary to said that in these experiments utilized from acrylamid gel by 12% and of the average samples were 10% of population of each center. As electrophoresis comparison shows population this prawn in IRAN is uniform and needs to impose a similar genetic management through the country. According to calculated covariance table and also path way method of determining inbreeding coefficient (88.8%), inbreeding level (in the 10th generation) in which is as strange reason in alleviation of efficiency of this prawn in IRAN and danger sign for this society of prawns and with do attention reproduction of 10 generation research center in Iran and adaptation with climatic and ecological circumstances in the country, should said *Iranian Giant Freshwater Prawn*. We have to call this society as Giant Freshwater prawn and by imposing exhibitive genetic reaction measures at is possible after for controlled generation and evaluation of results and also by calculation and controlling amount of inbreeding in the level of 3% discover the most hybrid of this naturalized species with foreign improved species and by culturing relationship of superior generation prevent from causing inbreeding problems during next year.

**Keywords**: *Macrobrachium rosenbergii*, Inbreeding coefficient, Ne.
Toxicity of purified chitinases produced from Scorpion fish against a pest of leguminous plants

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Abstract

Global fish and aquaculture production was estimated at 144 million tons; a significant amount about being processed and used for human consumption. Despite of their intrinsic quantities may often don’t subject to any specific treatment and are released directly into the environment causing contamination problems. However, it can become co products which are defined as the non-usable and recoverable in the traditional production operations. It valorization is considered as an alternative sources for the food substances production. Algeria, despite of the fishing industry weakness, the exploitation of marine resources must be held to allow active substances production such as chitinases. In our study we have interested on the production of chitinases due to their specific activity towards chitin, highly selective and non-toxic to higher vertebrates and to evaluate it biocidal action as well as it effectiveness toward stored product insects \textit{Callosobruchus maculatus}. The biocidal effect at different doses ranging from 1 to 3\% and at different times taken from 1 to 72h shown a high significant mortality at the treated population compared to the untreated control. The efficiency obtained by chitinases purified revealed that 3\% of the dose is more effective causing 100\% mortality after only 1 hour

\textit{Keywords:} chitinases, Marine biomass, Scorpion fish, Insecticidal, \textit{Callosobruchus maculatus}
Treatment heavy metals of industrial wastewater with two microalgae
*(Chlorella vulgaris and Nannochloropsis oculata*)

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**Abstract**

Recent world events have focused attention on the use and disposal of heavy metals, and prompted research into novel processes for accumulation and recovery of such elements at their sources before discharge into environment. There are many processes that can be used for the removal of metals from wastewater including chemical precipitation, coagulation, and ion exchange. Most of these, furthermore, are based on physical displacement or chemical replacement, generating yet another problem in the form of toxic sludge and undesirable for the environment and costs are prohibitive. In addition, these treatments are often specific for one ion and not very efficient for the others. Efficient and environment-friendly technologies are, thus, needed to be developed to reduce heavy metal content in wastewater at discharge to acceptable level at affordable cost (Aktar *et al.*, 2004). Microalgae have been proposed as an alternative biological treatment to remove heavy metals from industrial wastewater and polluted waters. The algae have many features that make them ideal candidates for the selective removal and concentration of heavy metals, which include high tolerance to heavy metals, ability to grow both autotrophically and heterotrophically, large surface area/volume ratios, phototaxy, phytochelatin expression and potential for genetic manipulation (Ravi Shankar).

In this project, we studied treatment heavy metals (Pb, Cd and Ni) of industrial wastewater with two microalgae strain *(Chlorella vulgaris and Nannochloropsis oculata)*. Wastewater was dispensed in 9 flasks (3lit). Each microalgae was separately seeded into the wastewater (6 flasks) and another three flasks used as control (wastewater without microalgae) for the bioassay. All the flasks incubated at temperature (23-25°C) and light 1000 Lux for 9 days before and during the incubation period 150ml samples were collected from each treatment at days 0, 1, 3, 5, 7 and 9 for analysis heavy metals. Samples were centrifuged to remove the algal cells and supernatant fluid used for determination of heavy metals. Data was analyzed by one way analysis of variance (ANOVA, P<0.05). Results showed during experiment two treatments with algae decrees contaminant of heavy metals. But control treatment doesn’t show decreasing of heavy metals. And the highest removal for three heavy metals showed in first day. Rate of decrease Pb and Cd followed: *C.vulgaris* > *N.oculata* > Control and for Ni followed: *C.vulgaris* = *N.oculata* > Control.

**Keywords:** Microalgae, *Chlorella vulgaris*, *Nannochloropsis oculata*, industrial wastewater, Heavy metals, Treatment.
Theme 4: Aquaculture & Fisheries
Fatty Acids and Nutritional Components of *Padina tenuis* from Qeshm Island in the Persian Gulf

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Abstract

Cultivation of saltwater fish, shellfish, and algae, is being increasingly recognized as an important method of food (FAO 2010). In addition to valuable fatty acids such as omega 3 and 6, algae are potentially good sources of dozens of valuable compounds, such as glycolipids, phenols, carbohydrates, nutrients, minerals, fibers and especially protein which makes them appropriate animal husbandry feeding source. Several studies showed anti-inflammatory and anti-coagulant properties of omega-3 fats helps prevent obesity-related chronic diseases such as diabetes and heart disease in people who have higher intake of omega 3’s fatty acids from marine sources. The content of highly unsaturated fatty acids (HUFA), in particular eicosapentaenoic acid (20:5n-3, EPA), arachidonic acid (20:4n-6, ARA), and docosahexaenoic acid (22:6n-3, DHA), is of major importance in the evaluation of the nutritional composition of an algal species to be used as food for marine organisms. Macroalgae have different industrial and agricultural applications.

In this investigation, the valuable compounds of marine macroalgae *Padina tenuis*, and also its nutritional values as feed source for livestock was evaluated. *Padina* was sampled from Qeshm Island in the Persian Gulf, in spring 2011. The algae was washed, weighted, then deep frozen and lyophilized and again weighted to determine the water content. The major fatty acids and different nutritional parameters in macroalgae *Padina* were investigated. The lipid content in the algae was extracted by methanol solvents using Soxhlet (6h). Fatty acids were analyzed by GC-MS.

The results revealed that the ranking of detected fatty acids were as follow: Palmitic acid > Stearic acid > Oleic, α-Linoleic, Linoleic, Arachidonic, Palmitoleic, Myristic and Archidic acids. There were 0.02 mg g⁻¹d.w (0.0025 mg g⁻¹w.w) omega 3 and 0.017 mg g⁻¹d.w (0.0021 mg g⁻¹w.w) omega 6 in the lipids of *Padina* macroalgae and also other parameters were consisted of 7.7 % crude protein (CP), 7.6% crude fiber (CF) and 2206 Kcal/Kg gross energy (GE). *Padina sp.* can be a valuable source for livestock feeding. However it needs more investigation to introduce the exact and appropriate portion of *Padina*, which can be added to provender and also its exact grain depot situation.

**Key words:** Fatty acids, Omega 3 and 6, *Padina* algae, Qeshm, Animal feed.
Eating habits of Pikeperch (Sander lucioperca L., 1758) in Ghrib dam - Algeria

Habitudes alimentaires du Sandre (Sander lucioperca L., 1758) dans le barrage Ghrib, Algérie

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Abstract
The diet has been studied in Ghrib dam (Algeria) in relation with the size of individuals and the hydrological seasons. Thereby, 167 specimens of Sander lucioperca (Linnaeus, 1785) were sampled monthly during one year. The overall length is between 30 and 75 cm and a total weight ranging from 126 to 4530 g. The emptiness coefficient variations according to fish size and seasons highlight the continuity and intensity of feeding activity of the pikeperch.

It appears that the species is omnivorous given to fish-eating trend. Three prey groups were identified: crustaceans, insects (Chironomidae) and fish. Sander lucioperca feeds mainly on fish (Scardinius erythrophthalmus and Rutilus rutilus). The proportions ingested vary with the size of fish, which is probably related to the changes in energy needs and the development of a more sophisticated strategy of predation among large individuals. Furthermore, Sander lucioperca adapts its diet based on hydrological seasons in relation to the availability and accessibility of prey.

Keywords: Diet, Sander lucioperca, hydrological seasons, Ghrib dam.

Résumé
Le régime alimentaire a été étudié dans le barrage Ghrib (Algérie) en fonction de la taille des individus et des saisons hydrologiques. Ainsi 167 spécimens de Sander lucioperca (Linne, 1785) ont été échantillonnés sur 12 prélèvements mensuels. La longueur totale est comprise entre 30 et 75 cm et le poids total varie entre 126 et 4530g. Les variations du coefficient de vacuité en fonction de la taille des poissons et des saisons mettent en évidence la continuité et l’intensité de l’activité trophique du sandre.

Il apparaît que l’espèce indiquée est omnivore à tendance ichtyophage. Trois groupes de proies ont été identifiés: crustacés, insectes (Chironomes) et poissons. Sander lucioperca se nourrit principalement de poissons (Scardinius erythrophthalmus et Rutilus rutilus). Les proportions ingérées changent avec la taille des poissons, ce qui est probablement lié aux changements des besoins énergétiques et à la mise en place d’une stratégie de prédation plus élaborée chez les individus de grande taille. Par ailleurs, Sander lucioperca adapte son régime alimentaire en fonction des saisons hydrologiques en relation avec la disponibilité et l’accessibilité des proies.

Mots clés : Régime alimentaire, Sander lucioperca, saisons hydrologiques, barrage Ghrib.
Impacts of global climate change on the coastal fisheries resources of Bangladesh

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Abstract

Study was carried out in the Sundarban Mangrove Forest, Khulna, Bangladesh since 1980 to date. Observation and monitoring were done by manually driven wooden boats locally called ‘Tapuria’ and mechanical vessels along the bank of rivers and canals in the Forest areas. Direct transects were made inside the forest land and water of neck depth with arm guards against tiger.

The Sundarban is the largest Mangrove forests in the world consisting of 6100km2 and declared as Ramsar Site, World Heritage Site and three Wildlife Sanctuaries. The Bengal tiger (Panthera tigris) is the biggest predator and at tropic level in the Sundarbans ecosystem and is Critically Endangered nationally and Endangered globally under IUCN Threatened Criteria. Spotted deer (Axis axis), wild boar (Sus scrofa), Rhesus macaque (Macaca mulata) and fish are the stable prey food of tiger and cubs.

Kachikhali, Katka-Jamtoli, Dublar char, Hiron-Point, Rashmela of Alurkol are the important grassland areas in the Sundarbans where deer, wild boars and monkey graze and feed and the tiger mostly hunt there. Prey species use the grasslands as grazing, feeding, resting and breeding habitats and. tiger for hunting and sheltering. Besides, Salt water crocodile, Ring monitor lizard, King cobra, White-bellied Sea Eagle, Pallas and Grey headed Fishing Eagles, Red jungle fowl, swamp francolin, Button quails, Green bee eater, doves, etc. feed and breed in the grassland areas.

Recent climate change causes sea level rise and threats the inundation of the grassland and forest cover habitats in the Sundarbans. If these habitats are inundated permanently, there will be a great catastrophe for the tiger, prey, other biodiversity and the Sundarbans ecosystem as whole. They would be in great danger and extinct forever. For climate adaptation needs immediate field survey with GPS and sophisticated equipment to assess the consequences of sea level rise and grassland habitats. A management action plan would be developed and implemented to an early date to save them from extinction. Government, national and international relevant agencies should come forward in this regards.

Key Words: Tiger, Grassland, Spotted deer, Climate change, Sea level rise, Ecosystem
Spirulina presence in fish diet affecting ornamental fish, Tomato Clownfish 
(*Amphiprion Frenatus*) appetite

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Abstract

Considering fish appetite is essential in a successful feeding process of demanded trading fish such as ornamental fish. Less care in this area might affect and reduced the fish body nutrient if necessary diet is not taken sufficiently by the fish. Objective of this study is to observe and identify the appetite of fish towards different diet that have been mixed with spirulina in different concentration. Three different feed were prepared for this experiment. Each feed have different percentage of spirulina presence in it. The feed were given for 10-15days to 9 pairs of tomato clownfish (broodstock). The experiment was done in 3 replicate. Based on the observation during feeding session, it shows that spirulina presence in feed do really affect the fish appetite. Data collections also show difference between each feed with different percentage of spirulina presence. As a conclusion, fish might show different appetite according to feed given and this study could help making understanding fish appetite better. Further research can be done to determine other factors that might affecting fish appetite, and hopefully this study can help lead for more research done after this.
Fishery and fishes of the south Mediterranean Sea (Libyan coast)

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Abstract

The paper presents a brief description of the longtime traditionally practiced artisanal fisheries in Libya, fishery activity and local highly esteemed commercial fish species are briefly outlined, main fishing harbors and fish landing sites together with numbers of fishing vessels normally anchor in them are given. Such fishing gears are named and classified according to size and effort, while fishing methods and techniques typically used to catch fish along the west, middle and east Libyan coast line are also given, finally, the scientific, common name and the local names of Chondrichthyes fishes are tabulated, whereas small pelagic and benthic bony fish species are illustrated together with a fairly recent annual fish catch in Libya
Sex-ratio, sexual maturity and spawning of *Plotosus Canius* (Hamilton, 1822) in the coastal waters of port Dickson, peninsular Malaysia

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**Abstract**

*Plotosus canius* (Hamilton, 1822) is a catfish of commercial importance found in the coastal waters of Malaysia and is locally called “Sembilang or Semilang.” This fish could be a potential aquaculture candidate, but recent times; it is evident that the landing of this fish is drastically decreasing. And information regarding basic aspects of its biology is extremely scarce and such information is greatly important for its conservation and management. Samples of the fish from Kg. Telok in Port Dickson, Malaysia were collected during the full moon for a period of twelve months from the local fishermen to examine the sex ratio, size at first maturity and spawning season of the fish. This was done by internal examination of the gonads and assessing their stage of maturity. The overall sex ratio between males and females was 1: 0.98 and did not deviate significantly from the expected ratio 1:1 throughout the sampling period; the size at first maturity was found to be at 50 cm length. Furthermore, the fish was found to have a long spawning period, from February to August. This could be very useful in the management, conservation and breeding program of this fish.
Effect of microbial infection and aeration on egg hatchability of Horseshoe crabs; *Tachypleus Gigas* and *Carcinoscorpius Rotundicauda*

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Abstract

In the world, the four remaining species of horseshoe crab are *Carcinoscorpius rotundicauda*, *Tachypleus tridentatus*, *Tachypleus gigas* and *Limulus polyphemus*. All are classified as data deficient and nearly threatened. Thus, this study was conducted to identify different microbial agents affecting the development of horseshoe crabs egg and to determine the effect of aeration on egg development. *Tachypleus gigas* and *Carcinoscorpius rotundicauda* egg used in this study were incubated using a conventional culture system. Samples with signs of infection were examined under a compound microscope and photographed. Egg inoculations were prepared and cultured on Sabaraud dextrose salt agar for fungal isolation and Trypticase Soy Broth (TSB) for bacterial isolation. Identification of different disease agents was conducted based on the morphology of fresh and stained mounts as well as the biochemical characters of the isolated fungi and bacteria. This study was also conducted to determine the effect of aeration on the hatching rate and development of *T. gigas* egg. Egg incubation in water medium was carried out in two treatments; with and without aeration. The results revealed that eggs of *T. gigas* were infected with *Aspergillus* species and *Aspergillus niger* fungi, while for *C. rotundicauda*, the eggs were infected with *A. niger*, *Penicillium* and *Gliocladium* species. Regarding the bacterial infection, eggs of *T. gigas* were infected with *Corynebacterium* sp. and *Enterococcus faecalis*, while *C. rotundicauda* eggs were infected with *E. faecalis* and *Shewanella putrefaciens*. On the other hand, hatching rate was found to be significantly lower (P<0.05) for *T. gigas* eggs incubated with aeration (11±2.52%) as compared to those without aeration (28.67±2.19%). It could be concluded that *S. putrefaciens* and *A. niger* were the most prevalent microbial agents, infecting the eggs of *T. gigas* and *C. rotundicauda* under laboratory culture and aeration is not needed for egg hatching of this fossil crustacean.
Isolation and characterization of potential probiotics from gastrointestinal tract of Asian Seabass (*Lates Calcarifer*, Bloch)

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Abstract

The gastrointestinal (GI) tract of fish consists higher number of beneficial bacteria. Asian seabass, *Lates calcarifer* was brought for isolation and characterization of potential probiotic from its GI tract. Gastrointestinal tract is divided into three parts namely, anterior, middle and posterior, which was cultured in Marine Agar (MA) for the growth of bacterial colony (CFU). Posterior parts shows the highest CFU [(1.97×10⁶) ± (9.58×10⁵) cfu/g] of bacteria followed by the middle [(1.17×10⁶) ± (5.55×10⁵) cfu/g] and anterior part [(2.13×10⁵) ± (3.51×10⁴) cfu/g]. Different colony formed on the plate was selected and purified before screening it for antagonistic test against three fish pathogen listed, *Aeromonas hydrophilla*, *Vibrio parahaemolyticus* and *Vibrio alginolyticus*. Thirty three (33) strains of bacteria were purified from the GI tract where 24 species were Gram positive and 9 were Gram negative. The strains those shows antagonistic activity by disc diffusion method was selected for potential probiotics. Based on the analysis, one strain was selected as potential probiotics which could inhibit the growth of *A. hydrophila* (5.3 mm) and *V. parahaemolyticus* (5.8 mm), and identified as *Enterobacter ludwigii*, EN119 with 97% homology after sequencing by 1st Base, Malaysia. In haemolytic test, *E. ludwigii*, EN119 showed gamma (γ) hemolysis on Columbia agar with 5% sheep blood. Further studies especially in-vivo test is required to confirmed their potential use as probiotics in aquaculture industry specially on brackish-water fish.
Coastal and marine fisheries resources of Bangladesh: Challenges and development potentials


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Abstract

Bangladesh is endowed with vast marine and coastal waters having an area of about 1.5 times more than that of her total land mass. The environment is under the dynamic interface between terrestrial systems and marine systems dominated by wave actions and tidal currents from the Bay of Bengal. The countries exclusive economic zone (EEZ) spans 164,000 sq. km and the shelf area covers roughly 66,440 sq. km. It consists of 710 km long coastline and almost 19 districts out of 64 are in the coastal zone. This marine and associated coastal zone is characterized by sprawling estuaries, dense mangrove forest, Coral Reef Island and the world’s longest sea beach. The geographical position and climatic condition of Bangladesh have made her coastal regions one of the highly productive areas of the world. Recent surveys gave an estimate of demersal standing stock between 150,000 and 160,000 mt. within the exploited 10-100 meter shelf area. Eight species of tuna and Skipjack, and a number of potential species of Mackerels, Shark, Ray, Sardines, Anchovies, Shad and cephalopods, soles and flat-fish, lobster etc. are available in Bangladesh waters. Land use in the coastal areas is quite diverse (including mainly crop farming, shrimp/ prawn/ fish farming, forestry and salt production) and very competitive. The coastal and marine fisheries have been playing considerable roles not only in the social and economic development of the country but also in the regional ecological balance. The key challenges, due to human-induced and changed environmental factors, in line with coastal and marine fisheries of Bangladesh are- promotion of environment-friendly shrimp farming protocol as well as introduction of commercially important finfish species, conservation of aquatic bio-diversity and ecosystems, livelihood sustenance of the primary stakeholders, rehabilitation of degraded habitats, institutional capacity building for marine stock assessment and exploitation. On the other hand implementation of food safety issues, establishment of early warning and communication systems, adoption of climate resilient aquaculture technologies, up-gradation of sector policy and regulations, etc are also equally challenging issues. To address the prevailing and forthcoming challenges of coastal and marine fisheries resources, different socio-eco-friendly interventions have been implementing by complying national and international policy guidelines and regulations. This paper highlighted the probable challenges and development potentials in the coastal and marine fisheries resources of Bangladesh.
Optimum light conditions for eggs incubation and larval rearing of brown-marbled grouper Epinephelus fuscoguttatus

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Abstract

Optimum light condition is important factor to reduce fish stress and to increase growth rate under cultivating conditions. There are many studies about light intensities for larval rearing. However, there are only few studies about light wavelengths and light intensities for egg incubation and larval rearing. Brown-marbled grouper, Epinephelus fuscoguttatus is an important fish species for aquaculture in Southeast Asia. This study was conducted to examine the optimum light wavelength and intensity for brown-marbled grouper using light emitting diode (LED) lamps. Brown-marbled grouper eggs were obtained from the IIUM hatchery. The eggs were incubated in 40L aquarium in dark rooms, using broad spectrum white light (430-460<λ<500-630 nm) as a control, blue light (450-485 nm), green light (500-560 nm), yellow light (580-605 nm) and red light (610-650 nm). The eggs were incubated under 0.38, 1.7 and 8.7 µmoles/m²/s for each wavelength. Each condition was conducted in triplicate. The temperature was maintained at 27.5-28.5°C. The larval rearing experiments were also conducted under the same conditions. Larvae were sampled to examine the survival rate and growth rate. Nannochlropsis were added from 0 days after hatching (density; 1million cells/ml). Feeding was started at one day old. Results showed that hatching rates had higher tendency under short wavelength lights (blue and green) and survival rates of larval rearing also had higher tendency under short wavelength lights.
Visual adaptation of longtooth grouper with growth

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Abstract

The visual systems of aquatic animals adapt to various light environments, depending on the habitat. The longtooth grouper is a large reef-associated fish. We investigated the visual functions of this species by using molecular biology and electrophysiological techniques to identify its visual adaptations to the light environment of its habitat with growth. Retinal samples were obtained from egg, larvae and eyes of juvenile (0–70 dph and 1 year aged) of longtooth groupers and were used for total RNA extraction. Opsin visual pigment gene expression was observed by reverse transcriptase-polymerase chain reaction (RT-PCR) using an extracted RNA. Electroretinograms (ERGs) were recorded to assess spectral sensitivity in light- and dark-adapted young fish (ca. 1 year old; SL, 123–166 mm). Monochromatic light stimuli were provided from a xenon bulb through a monochrometer and neutral-density filters for ERG and were adjusted as equal quanta at $1 \times 10^{15}$ and $6 \times 10^{11}$ photons·cm$^{-2}$·s$^{-1}$ for light- and dark-adapted fish, respectively. The fish used in this study were full-cycle cultured at Kinki University. Opsin gene fragments were expressed after 1 dph fish: Rh1 (rhodopsin), SWS1 (ultraviolet [UV]-violet light sensitive), SWS2a (blue light sensitive, type a), Rh2 (green light sensitive), and LWS (yellow-red light sensitive). However, the SWS1 opsin gene was not obtained in 1 year aged fish. ERG recordings for the eyes of the young light-adapted fish showed multiple peak sensitivity wavelengths, that is, at approximately 580, 500, 400, and 360 nm. Maximum spectral sensitivity was observed at approximately 580 nm. In dark-adapted fish, maximum spectral sensitivity was observed at approximately 500 nm. Our results suggest that the vision of the longtooth grouper is sensitive to the spectrum extending from violet through yellow-red light. Decrement of SWS1 opsin gene expression, after 1 year aged fish, possibly relate with changing habitat depth with growth. Thus, UV vision is possibly important for larvae and juvenile longtooth grouper.
Two-stage bile preparation with acetone for recovery of fluorescent aromatic compounds (FACS)

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Abstract

Accurate methods of pollutant monitoring are required to address increasing concerns about the adverse effects of xenobiotics discharge into aquatic environments. As a result, different methods have been developed for preparation of fish bile samples prior to detection of fluorescent aromatic compounds (FACs) through high-performance liquid chromatography with fluorescent detection (HPLC/FL). The most applied methods involve addition of organic solvents or liquid–liquid extractions (L–LEs). In this study we sought to optimize recovery of FACs from the bile of African catfish (*Clarias gariepinus*) injected with 10 mg/kg benzo[a]pyrene (BaP). Fractions of pooled bile were hydrolyzed, combined with ten volumes of methanol, ethanol, acetonitrile, or acetone, centrifuged and supernatants were analyzed by HPLC/FL. As well, to test whether FACs were being lost in solids from the centrifugation, pellets were resuspended, hydrolyzed and mixed with six volumes of the organic solvent that produced best FAC recovery from the supernatant, and subjected to HPLC/FL. Highest FAC concentrations were obtained with 2000 μl and 1250 μl acetone for supernatants and resuspended pellets respectively. Acetone is a good protein precipitant; however, to our knowledge the hydrolyzed bile sample has never been diluted with acetone. FACs concentrations were negatively correlated with biliary protein content but were unaffected by addition of bovine serum albumin (BSA) followed by no incubation indicating that the presence of proteins in the biliary mixture does not simply interfere with detection of FACs. The strong negative correlation between protein content and biliary FACs suggested potential prohibitive function of proteins during FACs detection. In another experiment, efficiency of acetone addition was compared to two different L–LEs. Acetone additions provided significantly higher biliary FACs than the L–LE methods. The new two-stage bile preparation with acetone is an efficient, inexpensive and easily performed method.
POSTERS

Theme 4: Aquaculture & Fisheries
Shellfish aquaculture in Algeria: current situation and development prospects

La conchyliculture en Algérie Situation actuelle et Perspectives de développement

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Abstract

In Algeria, the shellfish is ancient practice: it was started in 1880 by oyster tests conducted at Mars-El-Kebir (Oran) and Oued Sebao (Tizi-Ouzou). In 1921, an experimental station for aquaculture and fisheries is built in Bou Ismail to develop the best production techniques and identify suitable sites for shellfish. As part of cooperation with FAO, shellfish aquaculture on tables is done at Lake El Mellah (El-Kala) in the 70s, with encouraging results until the late 80s. In 1991, the shellfish aquaculture in sea starts and currently, two Algerian professionals are in the production phase. The production of bivalves is represented mainly by mussels (45 tons/year) and oysters (374 kg/year). This low production is probably due to the supplying of spat, a major problem that hinders the development of the shellfish aquaculture. This work presents the current situation of shellfish farming in Algeria, the problems hindering the development of the sector and the prospects for development.

Keywords: Shellfish, mussels, oysters, suspension culture, Algeria.

Résumé

En Algérie, la conchyliculture est de pratique ancienne : elle a démarré en 1880 par des essais d'ostréicultures menée à Mars El-Kabîr (W. Oran) et à oued Sebao (W. Tizi Ouzou). En 1921, une station expérimentale pour l'aquaculture et la pêche est construite à Bou Ismail afin de mettre en place les meilleures techniques de production et identifier les sites favorables à la conchyliculture. Dans le cadre d'une coopération avec la FAO, l'élevage sur tables conchylicoles est réalisé au lac El Mellah (El-Kala) dans les années 70, avec des résultats encourageant obtenus jusqu'à la fin des années 80. A partir de 1991, la conchyliculture en mer ouverte démarre et actuellement deux professionnels algériens, sont en phase de production. Néanmoins, la production de bivalves, représentée essentiellement par celle des moules, est faible et reste inférieure à 45 tonnes/an. Quant à la production d'huitres, elle est inférieure à 374 kg/an. Cette faible production est probablement due à l'approvisionnement en naissain, problème majeur qui freine le développement de la filière conchylicole et notamment ostréicole. Ce travail a pour objectif de présenter la situation actuelle de la conchyliculture en Algérie, les problèmes empêchant le développement de la filière ainsi que les perspectives de développement.

Mots clés : Conchyliculture, mytiliculture, ostréiculture, élevage en suspension, Algérie.
Fecundity study on *Diplodus vulgaris* (Teleost, Sparidae) from the Gulf of GABES

*Etude de la fécondité de Diplodus vulgaris (Télèostéen, Sparidae) du Golfe de Gabes*

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**Abstract**

The general biology study of species requires a full treatment of reproduction and its features via the determination of sex with different stages of maturity, duration of the spawning season, size at first sexual maturity, strategy of reproduction and the estimation of fecundity. Absolute fecundity, fertility or on individual as well as reproductive capacity have been the subject of this study, based on a sample of 67 females in advanced stage of maturity of two banded seabream, *Diplodus vulgaris* (E. Geoffroy St. Hillaire, 1817) collected in the southern Tunisian coasts, sizes (LT) between 14.2 and 25.4 cm. The diameter of oocytes was determined in order to study the distribution of their size frequency in the ovary. The number of oocytes per ovary was then determined by calculate the relative fertility per gram of fish gonads. *D. vulgaris* has an average absolute fecundity of $15437 \pm 1126$ eggs, a relative fecundity of 162 eggs per gram of fresh fish and 3441 eggs per gram of gonads.

**Keywords:** Sparidae, *Diplodus vulgaris*, Fecundity, Gulf of Gabes, Tunisia.

**Résumé**

L’étude de la biologie générale d’une espèce donnée nécessite un traitement intégral de la reproduction et ses particularités via la détermination du sexe avec les différents stades de maturité, durée de la période de ponte, taille à la première maturité sexuelle, mode de reproduction et enfin l’estimation de la fécondité. La fécondité absolue, la fécondité relative ou individuelle ainsi que la capacité de reproduction ont fait l’objet de cette étude, basée sur un échantillonnage de 67 femelles en stade de maturité avancé du sar à tête noire, *Diplodus vulgaris* (E. Geoffroy St.-Hilaire, 1817) récoltées sur les côtes sud tunisiennes de tailles (LT) comprises entre 14,2 et 25,4 cm. Nous avons mesuré le diamètre des ovocytes afin d’étudier la distribution de leur fréquence de taille dans l’ovaire. Le nombre d’ovocytes par ovaire a été ensuite déterminé pour calculer la fécondité relative par gramme de poisson et par gramme de gonades. *D. vulgaris* présente une fécondité absolue moyenne de $15437 \pm 1126$ ovocytes soit une fécondité relative de 162 ovocytes par gramme de poisson frais et 3441 ovocytes par gramme de gonades.

**Mots clés :** Sparidae, *Diplodus vulgaris*, Fécondité, golfe de Gabès, Tunisie.
Temporal and spatial distribution of fish assemblage in the Marudu Bay, Sabah, Malaysia

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Abstract

The spatio-temporal variation and assemblage composition of fish species caught by gill net in Marudu Bay, Kota Marudu, Sabah, Malaysia were investigated between October 2012 and March 2013. A total of 40 fish species were identified from the investigated areas. From these, 26 species are occurred in station 1, 31 species in station 2, 20 species in station 3, 21 species in station 4 and 32 species in station 5. Overall 5 species (> 5%) were the top dominant during the study period. The most abundant species was Sardinella melanura (41.52%). This was followed by Gerres oyena (16.18%), Leiognathus equulus (9.16%), Atule mate (6.99%) and Sillago sihama (4.82%). The overall numerical abundance of all fish species caught by gill net was the highest in February 2013 (35.97%) and the lowest in October 2012 (1.4%). The highest catches (37 kg/net/h) were found during the month of December 2012 in Station 2 while the lowest catches (0.26 Kg/net/h) were found during the month of October 2012 in Station 5. The present study will provide some valuable information about the exploiting status of the commercially important fish species and recommend their management option for stock enhancement in the Marudu Bay.
Morphological characterization and determination of fatty-acid profile of the Artemia populations from Algerian saltworks

Caractérisation morphologique et détermination du profil d’acide gras des populations d’Artemia des milieux salins Algériens

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Abstract

The study of the morphological characters associated with a discriminatory or multivariate analysis applied to Algerian Artemia populations raised in standards conditions, it has allowed differentiating between species and stocks. Bisexual species A. salina (L., 1758) was found in four saltworks (Rélizane, Mélghir, Ezzamoule and Garaet-el-Taref). The parthenogenetic stock appears in diploid and tetraploid forms.

The diploid parthenogenetic forms are found in seven biotopes (Rélizane, Bethioua, Oran, Sétif, Ezzamoule, Adrar and Mélghir), on the other hand the tetraploid forms are identified in only four biotopes (Rélizane, Bethioua, El Goléa and Sétif). The fatty-acids profile of the Algerian Artemia populations has made it possible to appreciate the food value of these populations from various origins. Thus the analysis of the contents of fatty-acids in Artemia cysts reveals variability between the various populations and within same population from one period to other.

According to the classification established by WATANABE and al., 1978a, Bethioua population corresponds to marine type criteria, Mélghir and Adrar populations are of the fresh type, finally the group composed of El Goléa, Ezzamoule and Rélizane populations presents a mixed fatty-acids profile, rich in acid eicosapentaenoic and Linoleic acid. Qualitative point of view, the food value of the Algerian populations is comparable with the marketed Artemia species.

Keywords: Artemia salina, Artemia parthenogenesis, Fatty-acids, EPA, LNA

Résumé

L’étude des caractères morphologiques associés à une analyse discriminatoire ou multivariée appliquée aux populations d’Artemia algériennes élevées en conditions standards, ont permis de différencier des espèces et des souches. L’espèce sexuée A. salina (L., 1758) a été trouvée dans quatre milieux salés (Rélizane, Mélghir, Ezzamoule et Garaet-el-Taref). La souche parthénogénétique apparait sous les formes diploïdes et tétraploïdes. Les formes parthénogénétiques diploïdes se retrouvent dans sept biotopes (Rélizane, Bethioua, Oran, Sétif, Ezzamoule, Adrar et Mélghir), par contre les formes tétraploïdes sont identifiées dans seulement quatre biotopes (Rélizane, Bethioua, El Goléa et Sétif).

La détermination du profil d’acides gras des cystes d’Artemia des populations algériennes a permis d’apprécier la valeur nutritive de ces populations de différentes origines. Ainsi l’analyse du contenu en acides gras des cystes d’Artemia révèle une variabilité entre les différentes populations et au sein de la même population d’une période à autre.

Selon la classification établie par WATANABE et al., 1978a, la population de Bethioua répond aux critères du type marin, les populations de Mélghir et Adrar sont du type dulçaquicoile, enfin le groupe composé des populations d’El Goléa, Ezzamoule et Rélizane, présente un profil d’acides gras mixte riche en acide eicosapenténoïque et en acide linoléique. Du point de vue qualitatif, la valeur nutritive des populations algériennes est comparable aux espèces d’Artemia commercialisées.
Land based Abalone culture in re-circulating systems using a recycled freezer container

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Abstract

To minimize environmental problems associated with aquaculture, we wanted to develop abalone culture approach in small scale re-circulating aquaculture system housed in an air-conditioned recycled freezer container. Protein skimmer (PS) removes organic matter from the water before it breaks down into nitrogenous waste. The aim of this study was to elucidate the effects of PS, shelter and feeding interval on water quality, bacteria count and feed intake, feces excretion, growth and FCR of hybrid abalone (*Haliotis discus hannai* x *H. sieboldii*) in a small scale re-circulating system. A frozen container (4.3x1.9x1.9m) was used to maintain optimum water temperature at 19.2 ± 0.8°C for abalone growth for 87 days. Each system consisted of two bio-filters (100 and 200L) and two abalone culture tanks (each 200L) containing three plastic baskets (50x34x6cm, with 12mm mesh). The abalone stocking density was 20 individuals (5.3 ± 0.8g). PS increased feed intake and shell growth of abalone. Shelter increased abalone growth and FCR. Feed intake was highest at a pattern of 2 days feeding after 1 day none feeding. Results indicate re-circulating abalone culture systems with PS housed in an air-conditioned recycle frozen container may provide a viable alternative to land based, flow through systems.
Growth of Pikeperch (*Sander lucioperca* L., 1758) of the northern Algerian dams

**Abstract**

The study of the growth of pikeperch, *Sander lucioperca* (L., 1758) in the Algerian dam lakes was carried out by scale reading. It focused on a sample of 100 individuals captured by fishermen during the period from June 2010 to May 2011. Regression obtained between fish length (L<sub>t</sub> in mm) and the radius of the shell (R in mm) for both sexes, including sizes ranging from 28 cm to 75 cm, has afforded a correlation coefficient (R) close to unity with 0.92. These two variables are correlated.

The allometric equations between the two variables, length in mm (L<sub>t</sub>) and the total weight in grams (W<sub>t</sub>) show a significantly allometric upper bound indicating that the weight believes proportionately faster than the length. The application of the Von Bertalanffy, yielded the parameters of the average grows thin length and mass of the species for the two sexes. This model applies well to the growth of the fish that the theoretical values estimated lengths are very close to those determined by the retro-calculation.

**Key words:** Sander lucioperca, Algerian dams, growth, scale

**Résumé**


La régression obtenue entre la longueur du poisson (L<sub>t</sub> en mm) et la longueur du rayon de l’écaille (R en mm) pour les deux sexes confondus, dont des tailles allant de 28 cm à 75 cm, a permis d’obtenir un coefficient de corrélation (R) proche de l’unité avec 0,92. Ces deux variables sont bien corrélées entre elles.

Les équations d’allométrie entre les deux variables ; longueur totale en mm (L<sub>t</sub>) et le poids total en grammes (W<sub>t</sub>) mettent en évidence une allométrie significativement majorante ce qui indique que le poids croit proportionnellement plus vite que la longueur. L’application du modèle de Von Bertalanffy, a permis d’obtenir les paramètres de la croissance moyenne en longueur et en masse de l’espèce pour les 2 sexes confondus. Ce modèle s’applique bien à la croissance de ce poisson du fait que les valeurs des longueurs théoriques estimées sont très voisines de celles déterminées par le retro-calculation.

**Mots clés :** Sander lucioperca, barrages algériens, croissance, scalimétrie.
Comparison of wild and cultured gilthead sea bream (*Sparus aurata*): chemical composition and sensory properties.

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**Abstract**

This study describes the comparison between the cultured gilthead sea bream (*Sparus aurata*) produced in the aquaculture farm of Azzafoun and the wild fish purchased on local market at Algiers (Algeria). Chemical and sensory characteristics were performed on 20 samples of every type. Fifteen samples were selected to evaluate the sensory properties of sea bream. Sensory criteria chosen of sea bream related to the appearance, odor, flavor and texture. The crude protein was estimated by multiplying the total nitrogen content (%N) by the factor 6.25, determined according Kjeldahl method.

**Keywords:** Sea bream; Chemical composition; Sensory evaluation.
Rearing of grouper juveniles using a demand feeding system with an infrared light sensor

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Abstract

Demand feeding is a new feeding method that fish can feed themselves. Fish switch on the feeding device when they require food. This method has several advantages because the fish can eat when they are most motivated to feed. The system can thus minimize feed loss and reduce water pollution. In this study, brown-marbled grouper *Epinephelus fuscoguttatus* and orange-spotted grouper *Epinephelus coioides* juveniles were reared using demand feeding devices which were the commercialized and own developed demand feeders.

Ten juveniles of each species were kept in a 500 L round polyethylene tank respectively (nine tanks, 90 fish). The tanks had water running system with water change (90%) every morning. Throughout the experiment, fish were exposed to natural photoperiod. Water temperature was 28.0 – 31.5 °C and salinity was 27-28 ppt. During rearing experiment, the fish were fed with pellets (Otohime EP3, Marubeni Nisshin Feed Co. Ltd.). Three experimental groups, pendulum demand feeder group (PDF, FH221, Aquatic Eco-Systems, Inc.), infrared sensor demand feeder group (IRDF) and automatic feeder group (AF) were set with three replicates. The IRDF consisted of an infrared sensor (infrared light 860 nm) ending in a red pellet-like knob with food container. Both demand feeders (PDF and IRDF) were set to dispense 10-15 pellets when fish activated the trigger (pendulum rod and infrared sensor respectively) located 2 cm below the water surface. We checked the fish circadian rhythm to determine the feeding time for the automatic feeder. The automatic feeder (AF) was set to dispense 150-170 pellets at 08:00 and 17:00 h. The experiment lasted for 25 days. Fish growth rates; total length (TL), and body weight (BW) were compared.

Results of brown-marbled grouper juvenile experiments showed TL growth rates of IRDF group were significantly higher than that of PDF group (P<0.05), however, BW growth rates were similar among three groups. Results of orange-spotted grouper juvenile experiments showed no significant differences in TL and BW growth rates among three groups, but TL and BW of IRDF group showed higher tendency than that of AF and PDF groups.
Growth of *Rutilus rutilus* (Linnaeus, 1758) a cyprinid fish from an Algerian dam lake

La croissance de *Rutilus rutilus* (Linnaeus, 1758) (cyprinidé) dans un système lacustre algérien.

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Abstract

This work is a survey on the Roach *Rutilus rutilus* (Linnaeus, 1758) growth, taken from the dam Ghrib belonging to a semi-arid bioclimatic zone with a mild winter; It is situated at 150 km from Algiers, on longitude 02° 35’ 14 00’’ East and latitude 36º 07’ 52 90’’ North. The study focused on 221 specimens. Roach were caught using nylon monofilament nets with 20 mm mesh. The nets placed perpendicular to the bank, were laid at dusk and removed the following day.

Analyses of physicochemical parameters, revealed that water of the Ghrib have thermic amplitude ranging from 8 to 36 °C, the level of dissolved oxygen ranging between 3 and 9 mg/l, a low alkalinity with a pH ranging between 5 and 9, and a high mineralization between 1800 and 3500 µS/cm. Pollution parameters indicated that the water was generally of poor quality.

The dam lake has fish fauna belonging to the family of Cyprinidae represented by the Roach *Rutilus rutilus*. This latter could adapt to the local conditions of the dam lake, its abundance varies according to the climatic conditions, trophic, behavioral and fishing conditions. The age, the total length and the weight of the samples increased respectively from 1 to 5 years, 15,1 to 26,6 centimeters and 26 to 295g. The factor of condition was 0.014±0.001).

Keywords: Dam Lake, growth, *Rutilus rutilus*, fish, physicochemical parameters

Résumé

Le présent travail consiste en une étude de la croissance du gardon *Rutilus rutilus* (Linnaeus, 1758), prélevés sur le barrage de Ghrib. Ce dernier est situé à 150 km d’Alger, à une longitude de 02° 35’ 14 00’’ Est et à une latitude de 36º 07’ 52 90’’ Nord.. Il appartient à l’étage bioclimatique semi-aride à hiver tempéré.

L’étude a porté sur 221 spécimens. Les gardons ont été prélevés à l’aide de filets en nylon mono filament de maille de 18 mm. Les filets placés perpendiculairement à la rive, étaient posés au crépuscule et relevés le lendemain.

Les analyses des paramètres physicochimiques, nous ont révélé que les eaux du barrage Ghrib présentent une amplitude thermique allant de 8 à 36 °C, un taux d’oxygène dissous compris entre 3 et 9 mg/l, une faible alcalinité avec un pH compris entre 5 et 9 et une minéralisation élevée allant de 1800 à 3500 µS/cm. Les paramètres de pollution indiquent que les eaux du barrage sont généralement de mauvaise qualité.

Le lac du barrage de Ghrib présente une faune ichthyologique appartenant à la famille du cyprinidé représenté par le gardon *Rutilus rutilus*. Ce dernier a pu s’adapter aux conditions locales du lac de barrage, son abondance varie suivant les conditions climatiques, trophique, comportementale et les conditions de pêche. L’âge, la longueur totale et le poids des échantillons se sont étendus respectivement de 1 à 6 ans, 15,1 à 26,6 centimètres et 26 à 295g. L’âge varie de un an à 5 ans. Le facteur de condition était (0,014±0,001).
Water quality of the Rhiou dams catchment area and its impact on fish’s repopulation

Qualité des eaux du bassin versant de la région d’Oued Rhiou et son impact sur les repeuplements des poissons

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Abstract

The Gargar dam located 5 Km from the town of Oued Rhiou, wilaya of Rélizane, is part of the watershed of the region which extends over a surface of 2900 km². This site was undergone with a fry fishes of carp repopulation between 2001 and 2012 with 2.800.000 species. The annual fishing production amount to the end of 2012 was of 594 Tons. A water sampling operation carried out during the year 2012 has allowed checking the quality of the water. These samples taken during the months of January, February, March and April gave an overview on the quality of water for two seasons. In addition this distribution allows to assess the impact of agricultural activities and influence ongoing discharges during periods of high water and rated so their impact on the growth of the species. Various physicochemical and bacteriological parameters have been studied; the analysis of pH, TSS, turbidity, salinity, NO₃, NO₂, NH₄, PO₄, MO, COD and BOD; the bacteriological analysis has brought on the enumeration of coliforms, Streptococcus, sulfite-reducing and the mesophilic. With regard to the results obtained from the analysis, it appears that water samples are in the set of good quality for PO₄, NO₃, NO₂, and MO parameters. However measurements of parameters of turbidity and suspended matter show poor quality, this situation can be correlated with spills of Oued Chef during heavy rains. As regards bacteriological analyses there is actually a contamination of fecal origin linked index likely discharges of wastewater spills.

Keywords: physicochemical & bacteriological parameters, Gargar dam, basin of irrigation.

Résumé

Le barrage de Gargar situé à 5 Km de la ville d’Oued Rhiou Wilaya de Relizane, fait partie du bassin versant de la région qui s’étend sur une surface de 2900 km². Ce site a subit un repeuplement entre 2001 et 2012 avec 2.800.000 d’alevins de différente espèces de carpe, la production annelle de pêche s’élève à 594 Tonnes en fin 2012.

Une campagne de prélèvements d’eau réalisée au cours de l’année 2012 a permit de vérifier la qualité de l’eau. Ces prélèvements réalisés pendant les mois de Janvier, Février, Mars et avril ont donnés un aperçu sur la qualité de l’eau pour deux saisons. En outre cette répartition permet d’apprécier l’impact des activités agricoles et l’influence des rejets permanents lors des périodes de fortes eaux et d’évaluer ainsi leurs l’impacte sur la croissance des espèces. Différents paramètres physico-chimiques et bactériologiques ont été étudiés : l’analyse du pH, MES, Turbidité, salinité, NO₃, NO₂, NH₄, PO₄, MO, DCO et DBO, dénombrement des coliforms, les streptococques, des sulfito-réducteurs et des mésophiles. Au regard des résultats obtenus des analyses, il ressort que les échantillons d’eau sont dans l’ensemble d’une bonne qualité pour les paramètres PO₄, NO₃, NO₂ et MO. Par contre les mesures des paramètres de turbidité et MES démontrent une mauvaise qualité, cette situation peut être corrélée avec les déversements d’oued Chelif lors des fortes pluies. Pour ce qui est des analyses bacteriologique il existe effectivement un indice de contamination d’origine fécale liée for probablement aux déversements des rejets d’eau usée.
Fish milt and sperm morphological study of chemical variables *Barbus xanthopterus* (Heckel, 1847)

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**Abstract**

The current study has considered and investigated the process of brood stocks of 17 *Barbus xanthopterus*; presumably a rare economic native fish, taken place in the Institute of Aquaculture in South of country and the Native fishery reproduction center of Dashte Azadegan. According to live collected samples: the average weight was 25/1±559/3g., the average length 45/9±4/001cm, the average fork length 49/1±4/2cm, with the average of total length of 53/5±4/9cm. In the present investigation, the average duration of milt motility was reported as: 309/2±64/5 second, means milt density 47/5±16/3, with the PH average of semen 7/6±0/9, and the average percent of milt atrocity 45/2±15/8%. In addition the average glucose, cholesterol, and the total protein semen in sequence are as follow; 23/3±1/0, 51/76±28/8, and 1/1±0/9mg/DL. Furthermore, the average of sodium, potassium, magnesium, calcium and phosphorus levels of semen has been reported for the first time in Iran and the world respectively, which are reported as follows: 432/4±79/22, 108/8±20/26, 2/7±0/6, 0/7±0/2, and 15/8±3/1mm/l. Additionally, the milt head length was 1/3±0/3 micron, the average length of agella 2/3±0/7micron, with the average of total length of milt 3/7±1/0. In general, results from this study have provided necessary information to illustrate that *Barbus xanthopterus* fish milt cryopreservation is successful at the time of milt motility and milt concentration.

**Keywords**: Native fish, milt, seminal plasma, *B. xanthopterus* (HECKEL, 1843)
Selection of Lactobacilli from the intestine of Nile tilapia (*Oreochromis niloticus*) providing new probiotic strains in aquaculture.

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Abstract

The potential probiotic acid lactic bacteria isolated from the intestine of Nile tilapia (*Oreochromis niloticus*) was tested for fish farming. In our collection, 10 *Lactobacillus* strains were targeted to confront a series of antibiotics in order to draw their resistance profile, and to test their degree of inhibitory on four pathogenic bacteria, *Staphylococcus aureus*, *Escherichia coli*, *Streptococcus* sp. and *Pseudomonas* sp. The power of acidification and tolerance was tested. Overall, our results show that strains BLT31 and BLT21 are fully susceptible and resistant to the tested antibiotics. Strains BLT3, BLT20, BLT21 and BLT23 have a good antagonistic effect against pathogenic bacteria which caused the highest damage in aquaculture. For acid lactic production, strains BLT3, BLT26, BLT27, BLT28, and BLT31 are considered fast since $\Delta \text{pH} \geq 4$ in less than three hours. As for the resistance to pH and bile salts, two strains BLT3 and BLT31 showed significant power which gives them acceptable probiotic potential.

Keywords: Probiotic, antibiotics, aquaculture, the Nile Tilapia, inhibitory activities, lactobacilli.
Prohatschekia Mediterraneus N.Sp (Copepoda: Hatschekiidae) A new parasitic species on Scorpaenid fish of Algeria

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Abstract

The copepod parasite fauna of Algerian coastal fishes is poorly known. The only general survey, by Rose & Vaissière (1952), reported 30 species belonging to 15 genera, but this represents only a small proportion of the total number of 226 species of parasitic copepods belonging to 88 genera and 20 families reported from the entire Mediterranean Sea (Raibaut et al., 1998). During a survey of parasitic copepods from marine fishes off Algeria, a species of Hatschekiid was recovered from the gills of the slender rockfish Scorpaena elongata (Cadenat). The family Hatschekiidae Kabata, 1979 is currently represented in the Mediterranean by eight species of Hatschekia Poche, 1902 and by a single species of Congericola van Beneden, 1854. The parasite Prohatschekia mediterranea found on S. elongata, belonging to Prohatschekia Nunes-Ruivo, 1954 is a new species. This is the tenth Hatschekiid to be reported from the Mediterranean and the first record of this genus from the region. The geographical distribution of Prohatschekia species indicates a concentration of species in the Northern Pacific, with four species reported from Japanese waters. One species is known from Australia, one from western Africa and one from the Mediterranean coast of North Africa. A key is provided to distinguish the new species from other members of the genus.

Prohatschekia species occur on five different host families: the dominant host family is the Scorpaenidae, which serves as host for three species (P. cremouxi, P. sebastisci and the new species, P. mediterranea). The remaining host families serve as hosts for a single species each: P. antennalis is found on a goosefish (Lophiidae), P. awatati on a cusk eel (Ophidiidae), P. laguncula on a lanternbelly (Acropomatidae) and P. stocki on a ghost flathead (Hoplarchtidae).
Growth, condition factor, maturity, gonadal development and spawning of fork-tail Threadfin Bream (*Nemipterus Furcosus*) in the coastal water of Pahang

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Abstract

Fork-tail threadfin bream (*Nemipterus furcosus*) is an economically important food fish in Malaysia but the capture production of this fish is decreasing gradually in the Malaysian water. However, nothing is known about the population of this species in the Malaysian water especially in the coastal of Pahang. Therefore, this research aimed to understand some important characteristics of fork-tail threadfin bream population in the coastal water of Pahang. For this study, monthly samples were collected from commercial fishing trawlers for a period of one year (August 2012 - July 2013). A total of 1531 threadfin bream specimens were studied in this research. The results showed that male threadfin bream was significantly more than female ($\chi^2 = 108.05; p<0.05$) in the population of Pahang coastal water. Length-weight relationship of each month was significant ($p<0.05$) with all coefficients of determination ($R^2$) values being higher than 0.73. The growth coefficient (b value) varied between 2.307 (May) and 3.1731 (October). A negative allometric growth of threadfin bream was observed in all months except October when a positive allometric growth was observed. The growth coefficients were very low in September for female and in May for male compared to other months. The significantly ($P<0.05$) lowest mean condition factor was found in May (2.7004) and the highest in January (2.9054) and August (2.9249). Overall higher mean condition factor was observed in smaller fish of both sexes. The overall mean condition factor of female was better than male. Gonadosomatic index of female threadfin bream was highest in June while male in November. Gonadosomatic index of female rapidly increased after December and reached at peak in June and decline after June. The peak spawning season of threadfin bream in Kuantan coastal water was from January to August. The results of the proposed study will help the management of juvenile and breeding fork-tail threadfin bream stock in order to maintain sustainable exploitation in the coastal water of Pahang.
Temporal variation in growth, condition factor and Gonadosomatic Index of Asian seabass (Lates calcarifer) in the coastal water of Pahang

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Abstract

Asian seabass (Lates calcarifer) is a very important target species for fisherman because it enjoys very high consumer preference and market price. Presently, the total capture production of this fish is decreasing day by day in Malaysia due to decreasing wild stock. However, necessary information about Asian seabass population in Malaysian water is lacking for the proper management of this fish. Therefore, a study was conducted to understand some basic characteristics (growth, condition factor and spawning) of Asian seabass population in the Pahang coastal water. Fish samples were collected from commercial landing site (LKIM, Kuantan) for a period of one year. The growth coefficient was calculated by regression analysis using the logarithmic transformed equation log\(W = \log a + b \log L\) derived from \(W = aL^b\) (where, \(W\) = body weight; \(L\) = total length). The condition factor was calculated for each individual fish according to the formula \(K = \left(\frac{W}{L^3}\right) \times 100\). The gonadosomatic index (GSI) was calculated using the formula, \(GSI (\%) = \left(\frac{GW}{W}\right) \times 100\) (where, \(GW\) = gonad weight). The results showed that the growth coefficient varied from 1.6034 (end of July) and 3.4264 (November). Negative allometric growth was observed in Asian seabass in all samplings except in November and in the middle of July. An isometric growth of Asian seabass was observed in the middle of July \((W = 0.0139L^{2.9962}, R^2 = 0.9979, P<0.01)\) and a positive allometric growth was observed in November \((W = 0.002L^{3.4264}, R^2 = 0.9974, P<0.05)\). The condition factor of Asian seabass ranged from 1.195 to 1.505. The significantly lowest mean condition factor was found in the November and the highest was observed in the August. Overall high value of condition factor was observed in smaller fish (less than 46 cm total length) while low value of condition factor was observed in medium size fish (56-70 cm total length). The lowest gonadosomatic index of Asian seabass was observed in October and November. Overall gonadosomatic index of Asian seabass was higher from May to August with a very few exception. Based on this study, the spawning season of Asian seabass in Pahang coastal water might be from May to August. The spawning season of Asian seabass in Pahang coastal water may fall between September and March but more research is needed to confirm this. The information of this study would be used for both applied and basic use for the management of wild Asian seabass stock. This data can be specifically used to impose adequate regulations for sustainable fishery management in the coastal water of Pahang.
Population dynamics of grey mullet *Mugil Cephalus* Associated with seagrass community in Bardawil Lagoon, Northern Sinai, Egypt

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Abstract

The evaluation and management of fisheries resources requires knowledge of spatial and temporal changes in the habitat-associations of fishes. However, most studies concerning habitat associations of fishes in the shallow areas have been limited to daytime sampling strategies. The striped mullet, *Mugil cephalus* is one of the most important and high valued species in Bardawil lagoon, Egypt. Long term commercial catch statistics show a significant decrease in the commercial landings of grey mullet in Bardawil lagoon since 1995. By learning more about this species and protecting the habitat upon which it depends, we can ensure that this important valuable fish remains abundant. Population dynamics of grey mullet *Mugil cephalus* associated with seagrass community were examined. Age was determined based on scale’s readings of fish collected in April 2010 to December 2012. Growth parameters, mortality rates, exploitation level as well as the distribution according to seagrass community were studied. The results suggest that differences in fish species richness and abundance are primarily related to habitat structure, the ecological importance and need for protection of such shallow habitats for their crucial role as nurseries for many fish species, as well as the mullet fishery in Bardawil lagoon is heavily exploited and management measures must be applied to sustain and optimize its yield.
Stock assessment of threadfin bream *Nemipterus Zysron* (Bleeker, 1857) in the Sea of Oman, Sultanate of Oman

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Abstract

The assessment of threadfin bream (*Nemipterus zysron*) stock was conducted based on the samples collected from the Sea of Oman off Oman coasts during the demersal survey covered a period of three years from 2008-2011 and updated during 2012 from commercial catch. Population parameters of threadfin bream were studied using 450 specimens. Age was estimated by examining sagittal otoliths and it was found out that the age composition varied from 0 to IV age classes for both sexes. Mean lengths and weights were calculated as 24.9±4.18 cm; 157.35±77.52 g for males and 23.63±4.68 cm; 139.05±78.67 g for females, while average length and weight for sexes combined were calculated as 24.11±4.16 cm and 146.2±72.1 g. Although males were observed as bigger in size in comparison to females, there was no gender dependent statistical difference in von Bertalanffy growth parameters and the growth curves were not significantly different between the observed and calculated length (p > 0.05). Von Bertalanffy growth equation for both sexes was derived as \(L_t = 36.91 (1-e^{-0.499(t+0.58)})\). Instantaneous total mortality, natural mortality and fishing mortality rates were also estimated. Based on exploitation rate and yield per recruit analysis, the fisheries status of *N. zysron* in the Sea of Oman was appraised and came to conclude that the present fishing effort in the Sea of Oman can be increased to achieve a higher catch of threadfin bream. With the shortage of information and data on the whole ecosystem, such an increase in fishing effort may adversely affect the other commercial stocks in the area and their habitat so a multispecies stock assessment is highly recommended and an ecosystem based management should be implemented.
Growth performance of the pacific oyster *Crassostrea gigas* (Thunberg), Algeria: Preliminary results

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Abstract

Introduced in many countries, *Crassostrea gigas* is currently one of the most cultivated species in the world. In Algeria, the shellfish aquaculture has existed since 1990 but the oyster culture is a relatively recent activity. Only two shellfish farms, located in the center of the Algerian coast are currently operational. The shellfish is represented mainly by mussels’ production, that doesn’t exceed 45 tons / year (Fig. 1). Production of oysters is still very low and varies between 80 and 374 kg / year. Currently, spat procurement problems are hindering the development of the sector. This study is interested in monitoring the growth and quality of *Crassostrea gigas*, put in suspension culture in April 2011 in Ain Tagourait (located 50 km West of Algiers). The sampling is done monthly but in this work, the results are grouped into seasons. Initially, the oysters had an average weight of 3.414 g and a length of 34.994 mm. Measures of temperature and salinity are done in situ using a multi-parameter toolkit, nutritional capacity of the middle was estimated by measuring chlorophyll a by the fluorimetric method. Different size measurements were made using a Vernier caliper with a precision of 1/100th cm and weightings using an analytical balance of 0.001 g as precision. To estimate the quality of the oysters cultivation, some indices were measured as index flesh (flesh fresh weight x 100/ total weight), the shape index (length + Thickness / Width), the rate of material dried (dry weight x 100/ Flesh weight drained) and the index Polydora ((0 x P0) + (0.25 x P1) + (0.5 x P2) + (0.75 x P3) + (1 x P4) where P0 to P4 are the percentage of oysters in classes of increasing infestation by the worm). Mortality is estimated by counting the oysters alive at the end of the study period (spring 2012). The Kruskal-Walis is used to compare the different averages over the period of study. Results of this work are new and show that oysters grow successfully. This is probably related to the culture environment including physical, chemical and trophic environment.

Keywords: *Crassostrea gigas*, Growth performance, Oyster culture, Suspension culture.
Study on the Morphological Features of Milt and some Chemical Parameters of Seminal plasma in *Barbubs barbulus* (Heckel, 1847)

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Abstract

Aquaculture Research Institute study in southern and central plains of native fish reproduction study on 13 male prisoners with a *Barbubs barbulus* that of the native fishes of Khuzestan Province Economic and despite a good size, is rare. In the living collection: average weight of 1433±85.73 gr, mean standard length 45.12 ± 1.39 cm, the mean fork length 47.42 ± 1.19 cm and the average total length of 51.85 ± 1.55 cm were measured. Average duration of milt motility in this study 332.31 ± 126.37 seconds, the average milt concentration 126.69 ± 53.22 x 10⁹, the average Head sprm length 0.66 ± 0.13 microns, the average length of flagella 2.04 ± 0.29 microns, the average total length of milt 2/71 ± 0/32 microns, the average pH of semen 7.78 ± 0.06 and miltatocrit average of 66% was reported for the first time in Iran and the world.

**Keywords:** native fish, milt, *Barbubs barbulus*, morphological.
Carcass and meat quality related to the morphological characterization of four commercial farmed Carp species in Khuzestan province - Iran

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Abstract

In order to evaluate new traits of cultured fish for fillet traits improvement and visceral lipid number of 120 carp species were randomly collected. Total and slaughter weight of grass carp were higher and lower respectively. Moreover, carcass weight was higher in Grass carp and lower silver carp. Total length in silver carp and common carp were significantly higher (p<0.05). Furthermore, fork length was highest in big head and lowest in silver carp. Body diameter of common carp was significantly higher than others. Although head weight in big head and silver carp were significantly higher (p<0.05), however, tract weight was higher in grass carp and lower in big head (p<0.05). Gill weight and was highest in grass carp and lowest in common carp while highest and lowest fin weight recorded in big head and grass carp respectively.

Keywords: Big Head Carp, Common Carp, Grass Carp, Silver Carp, Carcass quality, Freshwater fish
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