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II. INTERNATIONAL CONFERENCE ON
ENVIRONMENTAL SCIENCE AND TECHNOLOGY

BOOK OF ABSTRACTS 2016

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Supported by

II. International Conference on Environmental Science and Technology

ISBN: 978-605-66262-9-6

BOOK OF ABSTRACTS OF THE II. INTERNATIONAL CONFERENCE ON ENVIRONMENTAL SCIENCE AND TECHNOLOGY - BELGRADE 2016

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Published, 2016

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On behalf of the organizing committee, we are pleased to announce that the II International Conference on Environmental Science and Technology is held from September 28 to October 2, 2016 in Belgrade, Serbia. ICOEST 2016 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Environmental Science and Technology. The conference seeks to contribute to presenting novel research results in all aspects of Environmental Science and Technology.

The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Environmental Science and Technology. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in al lareas of Environmental Science and Technology. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world.

ICOEST 2016 is the oncoming event of the successful conference series focusing on Environmental Science and Technology. The scientific program focuses on current advances in th eresearch, production and use of Environmental Engineering and Sciences with particular focus on their role in maintaining academic level in Science and Technology and elevating the science level such as: Water and waste water treatment, sludge handling and management, Solid waste and management, Surface water quality monitoring, Noise pollution and control, Air pollution and control, Ecology and ecosystem management, Environmental data analysis and modeling, Environmental education, Environmental planning, management and policies for cities and regions, Green energy and sustainability, Water resources and river basin management.

The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in environmental science and engineering experiments.

Best regards,

Prof. Dr.Özer ÇINAR

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WASHING WATER TREATMENT IN ALKALI-CATALYZED BIODIESEL PRODUCTION

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Abstract:

Biodiesel, an alternative fuel for petroleum diesel is generally produced by alkali catalyzed transesterification method, and the product, crude biodiesel must be purified to be used in diesel engines. The traditional purification process, wet washing with water is one of the most used techniques by biodiesel producers because of its practical applicability and high efficiency. In recent years, biodiesel production has fairly increased, and it is strongly estimated that this increment level will go on increasingly, and higher biodiesel wastewater that must be treated to protect environment from its pollutant contents (unconverted mono-di glycerides, catalyst, soaps, organic etc.) will be formed. Thus, new and innovative methods about biodiesel wastewater treatment have been investigated and improved by many researchers. This study aims to represent a review on comparison of different treatment processes of waste washing water formed by alkali-catalyzed biodiesel production such as physico-chemical, electrochemical, biological, advanced oxidation and various coupled forms of these mentioned methods.

Keywords: Biodiesel, Alkali Catalysts, Wet Washing, Waste Water Treatment

BIODIESEL PRODUCTION USING WET AND DRY PURIFICATION METHODS

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Abstract:

In biodiesel production via transesterification, after removing glycerol from crude biodiesel, purification process must be performed before using biodiesel as a fuel that meets the EN 14214 standard. In the literature, various processes are presented for purification of biodiesel however; dry and wet washing methods are mostly recommended because of their higher efficiencies and easier applicabilities. In this study, methyl esters (biodiesel) derived from waste frying oil (WFO) and sunflower oil were generated using transesterification technique in the presence of KOH and methanol in a novel microwave assisted biodiesel reactor. For purification of crude biodiesel, two different methods; washing with distilled water as wet washing, and with magnesol as dry washing were carried out and compared. According to the results, dry washing method improved biodiesel yield and ester content, it also reduced the purification process time considerably.

Keywords: Biodiesel, Transesterification, Purification Techniques

UTILIZATION OF OLIVE CAKE IN BIOFUEL INDUSTRY AS PELLET AND BRIQUETTE FUELS

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Abstract:

In recent years, the concerns about fossil fuel reserves and global warming by greenhouse gases increase the interests on renewable energy and alternative fuels. Pellets and briquettes, one of the most used biomass form as biofuel, are generally obtained from compressed biological wastes such as saw dust, municipal solid waste, agricultural wastes in lower costs compared to charcoal, firewood, gas, coal etc. conventional fuels to be used in domestic and industrial fields. In an average olive oil production, 35wt% of olive is formed to olive cake as a waste product in continuous-process oil mills (two or three phases). In this work, the studies about production methods, fuel properties and characteristics, and utilization areas of olive cake pellets and briquettes are reviewed. Besides, in respect to the data obtained from Turkish Statistical Institute (2005-15), the annual production of olive, olive oil and olive cake for Turkey was examined. It is observed that in Turkey, a major olive producer in Mediterranean region, annually an average of 378962.5 tons of olive cake can be extracted from 1082750 tons of olive; therefore, a huge energy source exists to able to produce olive cake pellets and briquettes as a biofuel that can result in reduction of dependency on imported energy.

Keywords: Olive Cake, Pellet, Briquette

CARBON STORAGE AND NUTRIENT STOCKS DISTRIBUTIONS OF THREE ADJACENT LAND USE PATTERNS IN LAKE DANAO NATIONAL PARK, ORMOC, LEYTE, PHILIPPINES

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Abstract:

The Lake Danao National Park is one of the forest reserves in the Philippines. The country experienced drastic decrease of forest cover due to land use conversion, cutting of trees and doing agriculture to support food security. Secondary forests are important component of land cover in the tropics, and when transformed or converted into another land-use, it is believed to have negative effects on some soil properties and forest ecosystem in general. A paired-area/space-for-time substitution approach was conducted to determine the changes in carbon storage: soil organic carbon (SOC) and total above ground biomass (TAGB), soil nutrient stocks and fertility status due to land use change. The study was conducted in Lake Danao National Park, Ormoc City, Leyte, Philippines. Adjacent to secondary forest (< 1 km away) grassland and forest plantation land uses were chosen and sampled for possible changes on SOC, TAGB and nutrient stocks due to land use change. Soil physical and chemical properties were characterized to assess changes brought by secondary forest transformation.

Results showed that conversion of forest to grassland and forest plantation decreased the organic carbon, exchangeable aluminum, exchangeable acidity, CECeff, TAGB while pH in H2O, exchangeable magnesium and CECpot increased when forest was converted to grassland and forest. Additionally, available P, base saturation, Ca, K, and Na increased while total N, and SOC stocks decreased when forest was converted to grassland and forest plantation. Results indicate that conversion of forest to grassland and forest plantation had greatly affected the SOC stocks, TAGB, soils nutrient stocks and fertility status. However, contrary to common knowledge, improvement of some soil properties could also be observed. The study revealed that changes in soil properties largely depended upon the land use.

Keywords: Andisol, Organic Carbon, Total Aboveground Biomass, Secondary Forest, Nutrient Stocks, Fertility Status, Adjacent Land Use

HAY YIELD PERFORMANCE OF SOYBEAN GENOTYPES FROM DIVERSE ORIGINS

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Abstract:

Soybean [Glycine max (L.) Merr.] is a productive, high-quality summer forage legume for hay, silage or green manure. In this study, 70 biodiverse collections of soybean including local types and check cultivars were evaluated for high hay yield and yield components. The experiment was conducted in 2013 for main crop and double crop conditions at the experimental field of Uludag University, Bursa, Turkey.

A 70 soybean collections were grown in augmented design with five standard checks replicated in five blocks, 3 m long rows spaced 70 cm. Seeding rate was 60 seeds per row. Seeding was made on 30 April 2013 for main crop and 16 July 2013 for double crop.

Variance analysis the study showed that significant effect ($P<0.01$ and $P<0.05$) of check cultivars and the genotypes on dry matter yield, plant constituents and all characteristics measured in both main and double crop conditions. Flowering time, plant height, branching, dry matter yield, plant parts percentages, crude protein contents of the genotypes varied greatly between the genotypes. The dry matter were positively and significantly associated with plant height (0.82** and 0.76**) and days to flower (0.60** and 0.46**) in main and double crop conditions, respectively.

*This study was supported by TUBITAK-Tovag, Project No: 112O149

Keywords: Soybean, Glycine Max (L.) Merr., Forage Legume, Yield Components

BIOFUEL PRODUCTIN FROM CO2 IN POLLUTED AREAS BY ISOLATION OF SYNECHOCOCCUS ELONGATUS FROM A LAKE IN TURKEY

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Abstract:

In recent years the CO2 concentration in the atmosphere increase significantly. The authoritie dediceted that the CO2 emmisions should be reduced to 450 ppm in the atmosphere in year 2050. The reduction of CO2 levels it is necessary to prevent the world warming and pollution. Among the CO2 trapping methods CO2 fixation by the atmosphere using Synechococcus elongatus from cyanobacteria is very important since the CO2 was transformed to 1-butanol which can be used as fuel in the cars and can be an economic alternative to the gasoline. In this study, it was aimed to produce 1-butanol from CO2 by using Synechococcus elongatus as cheap fuel source. In the frame work of this study the isolation of Synechococcus elongatus from a lake by using some biochemical tests (dimensions, ammonia, nitrite, nitrate and urea utilizion, protein production) were investigated under purified CO2 conditions from the atmosphere. The CO2 in the atmosphere was purified using Nitrosomonas sp. and Azotobacter sp. for O2 and N gases eliminations. The effects of retention-period, pH and temperature variations, sulphate and NaCl concentrations, different redox potential levels (anoxic, aerobic and anaerobic conditions), light power, dissolved O2 and pAM2991 plasmid additions were researched in this study. The maximum 1-butanol production was 9.15 mg/L at 30°C temperature, at pH 7.1, under 60 W light power at a retention time of 30 days. The maximum yield of 1-butanolproduced/CO2utilized efficiency is 51.6% for the conditions given above. During the 1-butanol metabolization the activities of 3-hidroxybutyryl-CoA dehydrogenase (Hbd), trans-2-enoyl-CoA reductase (Ter) and aldehyde/alcohol dehydrogenase (AdhE2) enzymes were measured as 6x10-3 cell number/ml, 0,7x10-3 and 1,1x10-3 cell number/ml, respectively. The cost of this proces was only 0,026 Euro/L1-butanol compared to commercial gasoline (1.6 Euro).

Keywords: Biofuels, 1-Butanol, Synechococcus Elongatus, Cyanobacteria, Carbon Dioxide

CONTAMINATION OF CLAY LAYERS WITH DNAPL WASTES AND IMPACT OF CRACKS ON CONTAMINANT ACCUMULATION

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Abstract:

Chlorinated solvents like trichloroethylene (TCE) and tetrachloroethylene (PCE) are prevalent groundwater contaminants being detected more than half of the Superfund Sites. They are introduced into the subsurface due to improper disposal of hazardous wastes containing these chlorinated dense non-aqueous phase liquids (DNAPL). DNAPL wastes sink in the subsurface and form pools on clay layers. Further transport into the underlying clay layer is dominated by diffusion due to the low permeability of these soils and results in accumulation of contaminants therein overtime through diffusion. However, field evidence reported that mass storage of solvents in such zones was higher than what can be attributed to simple diffusion. To evaluate this finding, mass storage of TCE in a hypothetical aquitard after 30 years of diffusion was calculated. The diffusion coefficient reported in the field study resulted in mass storage of 62 g in this hypothetical aquitard whereas the mass calculated using the measured diffusion coefficient of TCE from pure solvent into water-saturated clayey soil was only half of it (29 g). The calculated mass storage was even lower (3.7 g) if the measured diffusion coefficient of TCE from DNAPL waste into waste-contacted soil was used. So, mass of TCE accumulated through sole diffusion was not able to explain the one observed in the field. This excess mass in the field might be the mass of DNAPL entered into the cracks which were reported to form in clay layers as a result of the direct contact between water saturated clay and DNAPL waste. Mass of TCE in the cracks was calculated using reported average crack size and an assumed crack depth, and it appeared that cracks filled with DNAPL could increase the stored mass up to 94 g which could easily account for the enhanced mass storage observed in the field.

Keywords: Tce, Hazardous Waste, Diffusion, Clay Layer, Contamination,

ECOTOXICOLOGICAL INVESTIGATION OF THREE NANO-METAL OXIDES (HFO2 ,SIO2, ZNO) ON FOUR TROPHIC LEVELS (BACTERIA, YEAST, MOLD AND ALGAE) AND THEIR BIODEGRADABILITIES

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Abstract:

Nano-metal oxides (NMOs) are used in very large scale in industrial applications, in electronics, in textiles and in water treatment technologies. This results with accumulation of these NMOs in the nature and cause to toxicity in the ecosystem. Knowledge of potential toxicity of nanoparticles to organisms is limited. To determine the toxicological effects of nano-HfO2 ; nano-SiO2 ; nano-ZnO to anaerobic methane Archae from bacteria, to Candida albicans from yeast, to Aspergillus niger from mold, to Chlorella sp. from blue-green algae ; some toxicity analyses were performed to detect the EC50 values (nanoparticle concentration inhibiting 50 % of the organisms). These values were calculated from the inhibitions of NMOs versus exposure time (24, 48 and 72 hours). Anaerobic Toxicity Assay (ATA) tests were perfomed based on the methane gas production in sealed-closed assay bottles for each nanoparticle and from the comparison with the control bottle without NMOs. Also, their biodegradabilty tests were determined in an aquatic environment during 28 days based on the soluble COD concentrations. Among the nanaparticles, the most toxic NMO was found to be nano-HfO2 to anaerobic methane Archae bacteria because of the low EC50 values after 48 hours contacting time (13,55 mg/l). Candida albicans and Aspergillus niger were sensitive to nano-ZnO even at low concentrations due to low EC50 values (48-h EC50=2,9 mg/l for Candida albicans ; 48-h EC50=13,9 mg/l for Aspergillus niger). Chlorella sp. is very sensitive to all NMOs (nano-HfO2 EC50= 2,4 mg/l ; nano-SiO2 EC50= 0,86 mg/l and nano-ZnO EC50=0,55 mg/l) due to entrapping of NMOs by the algal cells resulting in inhibitions. From the 28 days biodegradabilty tests of NMOs it was found that the percantage of removal efficiencies are 19,01 % , 34,34 % and 6,43 % for nano-HfO2, nano-SiO2 and nano-ZnO, respectively after 28 days.

Keywords: Nano-Metal Oxides, Trophic Levels, Acute Toxicity, Biodegradability.

EVALUATION OF THE STRUCTURAL AND PLANT LANDSCAPE DESIGNS OF THE EUROPEAN TOWN SQUARES

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Abstract:

Urban squares are urban public places which have become an important component of the city life with different functions and forms from the formation of the city until to today. The people of the city gathered in these places and social culture had the opportunity to express themselves in here. From this point of squares are a landmark that reflects the city's culture and identity. Squares carry different identity and form according to the area they are located in and socio-cultural structure of the community. Also physical value of the square and qualifications of the elements have played an important role in the constituation of the square in terms of the place design and as active character in the environment. In this study, visual and functional effects of the squares on the formation of the urban texture; priority use of the structure, plant and water elements forming the structural design of the squrae and effects of these items on the form and use were examined. Obtaining common data and information related to the design preferences of the squraes selected from various European cities is the aim of the work. Selected samples squares have been examined via of the layout plans of the area, photographs and photos obtained from the Google Earth website. Freehand drawing techniques, AutoCAD 2014, Photoshop CS5, SketchUp and Lumion software was used to draw of the design and to visualize three dimensional in the work as method. The spatial analyses of the squraes have been made via of these data. It is concluded that facades of the buildings that make up the square, structural and plant design, urban reinforcement, monumental elements and other landscape elements are important criterion in determining of the formal qualifications of the squre and so they affect the use of the area.

Keywords: Square, Urban Public Place, Landscape Design, Europe.

A SPECTROSCOPIC STUDY: PREPARATION AND CHARACTERIZATION OF BIODEGRADABLE NON-TOXIC CELLULOSE-BASED AEROGEL CROSSLINKED WITH CITRIC ACID

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Abstract:

Aerogels, which are among the lightest solid materials, are one of the finest insulation materials available. Traditional aerogels are mainly made of silica, which is not environmentally-friendly. In Contrast, Cellulose is a major component of wood, the most abundant, low cost naturally occurring polymer of glucose and attracts a lot of interest for producing novel materials. Besides thin films, sponges and fibres, functional materials with high added value, such as cellulose nanocrystals, nanofibres, hydrogels and aerogels can be made from cellulose. Cellulose based aerogels have several unique features, some of which are super absorbent and heat insulating.

In order to obtain cellulose aerogel from hydrogels, cellulose hydrogels can be prepared from a cellulose solution through physical cross-linking because cellulose has many hydroxyl groups that can easily form hydrogen bonding linked networks. Some chemicals such aldehyde-based reagents, urea derivatives and multifunctional carboxylic acids are the most widely used crosslinkers for cellulose. However, some reagents are highly toxic in their unreacted state. Although unreacted chemicals are usually eliminated after crosslinking through extensive washing in distilled water, as a rule toxic crosslinkers should be avoided, in order to preserve the biocompatibility of the final hydrogel, as well as to ensure an environmentally sustainable production process. Novel cellulose-based hydrogels crosslinked with citric acid have been recently reported, which combine good swelling properties with biodegradability and absolute safety of the production process. In this purpose, this work is focused on the preparation and spectroscopic characterization of new environmentally friendly and biocompatible cellulose based aerogels crosslinked with citric acid.

Keywords: Aerogel, Bio-Polymer, Cellulose, Composite

PROTECTIVE ROLE OF HUMIC ACID IN LETTUCE (LACTUCA SATIVA L.) SUBJECTED TO UV-B RADIATION

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Abstract:

Ultraviolet B (UV-B) radiation as an environmental stress has damaging effect on plants and its overexposure can potentially interfere with growth and development. Humic acid (HA) is a suspension, based on potassium humates, which can be applied as a plant growth stimulant.

The objective of this study was to investigate whether exogenous HA would alleviate the adverse effect of UV-B stress on lettuce (Lactuca sativa). Various concentrations of HA (HA1: 10, HA2: 20, HA3: 30 mg/L) or H2O (control) were applied to 30 days old seedlings. After 20 days lettuce plants were exposed to UV-B radiation for 12 h by using UV-B lamp at an irradiance of 3.3 Wm-2.

UV-B stress resulted in remarkable decrease in chlorophyll content, with a significant increase in malondialdehyde (MDA) content, hydrogen peroxide (H2O2) level, and superoxide radical (O2-.) production, superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX) activity. In humic acid-treated UV-B stressed plants, the MDA, H2O2, O2-. contents decreased and chlorophyll content, antioxidant enzyme activities, ascorbic acid level and the gene expression level of phenylalanine ammonia lyase (PAL) and γ-tocopherol methyltransferase (γ-TMT) increased when compared with UV-B stressed plants without HA. These results suggested that HA could alleviate the detrimental effect of UV-B on lettuce and alleviation mainly related with the increase in antioxidant enzyme activity, decrease in reactive oxygen species and up regulation of key genes such as PAL and γ-TMT.

Keywords: Antioxidant Enzymes, Lettuce, Humic Acid, Phenylalanine Ammonia Lyase (Pal), Γ-Tocopherol Methyltransferase, Ultraviolet-B

ECOLOGICAL AND SOCIO-ECONOMIC EFFECTS OF INVASIVE SPECIES RAPANA VENOSA IN THE BLACK SEA ECOSYSTEM.

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Abstract:

Rapa whelk, Rapana venosa, is one of the most successful invasive species in the world. The rapa whelk moved to Black Sea, Mediterranean Sea, North and South Atlantic waters and North Sea from Asia waters via ballast water of the ships since 1946. It has been caused negative ecological and positive socio-economic effects. The most important ecological challenge is the reduction of the native biodiversity. Another one is the socio-economic effect. This species started to catch by dredges and became a very important income source for the small scale fisheries in this region since the 1980s. There is no domestic consumption in Turkey and it's exported to Asia countries as a frozen meat and provide foreign currency about 15 million USD. This paper gives information on ecological and economic impacts of this invasive species in the Black Sea ecosystem.

Keywords: Rapana Venosa, Ecological Effects, Socio-Economic Impacts, Black Sea

EUTROPHIC STATE OF THE EASTERN BASIN OF IZMIT BAY (THE MARMARA SEA) IN AUTUMN 2014

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Abstract:

Monitoring coastal eutrophication parameters in semi-enclosed marine systems like Izmit Bay is crucial. In-situ measurements of temperature, salinity, pH, chlorophyll-a, turbidity, dissolved oxygen and phytoplankton sampling were done in 5 different sampling points in November 2014 in the Eastern Basin of Izmit Bay. Also nutrient (NO2-N, NO3-N, NH3-N, PO4, SiO2) analyzes were performed for every sampling points. Higher salinity values in lower layers shows stratification in the bay. Mean values for NO2-N, NO3-N, NH3-N, PO4, SiO2 are 0.01 mg/L, 0.05 mg/L, 0.05 mg/L, 0.12 mg/L, 0.15 mg/L and 0.61 mg/L respectively. Nutrient and water quality values shows consistency with earlier studies. TRIX values for every sampling points were calculated according to Vollenweider et. al. (1998) and results are 6.29, 5.88, 6.23, 6.83, 6.54 for sampling point 1, 2, 3, 4 and 5 respectively. TRIX values shows that the majority of İzmit Bay is eutrophic and under heavy risk of eutrophication. During the study total of 21 Taxa from 3 algal classes (ie., Bacillariophyceae, Dinophyceae, Dictyochophyceae) were determined. Among the species typical phytoplankton which is known for their connection to eutrophical conditions (ie., Noctiluca sincillitans, Prorocentrum micans). The dominant group was Dinophyceae in terms of species numbers (47%) and abundance. Maximum chlorophyll-a value were measured as 4.41 µg/L in sampling point 4.

This study was funded by the Kocaeli University Scientific Research Projects Unit (Grant No: KOU-BAPB 2014/022).

Keywords: Izmit Bay, Trix, Phytoplankton, Nutrient, Sea Of Marmara

REMEDIATION OF SELENIUM (IV) BY METHANE-OXIDISING BACTERIA

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Abstract:

Methane oxidising bacteria are a diverse group of bacteria that can utilize methane as their sole source of carbon and energy. These ubiquitous bacteria are well known for their role in the global methane cycle and their potential for bioremediating a wide range of hydrocarbon and chlorinated hydrocarbon pollution. In recent years it has also emerged that these bacteria influence the speciation and bioavailability of metals in the environment. Here we report what we believe to be the first study of the interaction of methane-oxidising bacteria with selenium-containing chemical species. In this study, the ability of the well characterized model strains of methane oxidising bacteria, Methylococcus capsulatus (Bath) and Methylosinus trichosporium OB3b, to reduce SeO32- was investigated under laboratory conditions. Both strains are able to reduce SeO32- to non-toxic nanoparticulate Se0. This was indicated visually by the red colouration of the cultures. The resulting selenium nanoparticles were characterized by using TEM-EDX, HAADF-STEM, and X-ray absorption spectroscopy. Subsequently, volatile selenium-containing species were detected from the M. capulatus (though not M. trichosporium) cultures, concomitant with the loss of red colour due to Se0. In addition, the decrease in SeO32- concentration in the cultures was determined by using HPLC-ICP-MS. These findings suggest that methane-oxidising bacteria can be exploited for Se-bioremediation and suggest possible uses in the production of selenium nanoparticles for biotechnology.

Keywords: Selenite, Elemental Selenium, Methane Oxidising Bacteria, Bioremediation.

EVALUATION OF PCDD/F POLLUTION IN THE MUSSEL (MYTILUS GALLOPRVINCIALIS) TISSUE IN IZMIT BAY

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Abstract:

This study evaluates PCDD/F pollution in the mussel (Mytilus galloprvincialis) tissue from Izmit Bay (Turkey). The bay is known as one of the most polluted semi enclosed basin of Turkey. Samples were collected seasonally from three different stations which are represents western, central and eastern basins of the bay. The results showed that concentrations of toxic PCDD/F congeners in mussel soft tissue varied between 0.87 and 43.47 pg WHO-TEQ/g wet weight. PCDD/F concentrations significantly increase in winter season, whereas the lowest concentration was determined in summer season. The highest ∑PCDD/F value (i.e., 14.58 pg WHO-TEQ/g wet weight in spring, and 2.8 pg WHO-TEQ/g wet weight on average) was determined in Hereke station where located closest to heavy industry facilities in the central basin of Izmit Bay. A previous study shows that the most polluted sediment in terms of PCDD/F accumulation was reported from same basin of the bay. These concentrations are higher than those reported from France and Spain coasts as well as the highest acceptable concentrations for Turkish Fisheries Regulations (i.e., 4 pg WHO-TEQ/g) in mussel tissue. On the other hand the lowest ∑PCDD/F concentrations (i.e., 0.62 pg WHO-TEQ/g wet weight) was determined in Sekapark station where located in front of former paper mill which is decommissioned in 2005. The area is using for recreational activities nowadays and the station does not meet industrial discharges anymore while domestic discharges already present.

Keywords: Pcdd/Fs, Izmit Bay, Mytilus Galloprvincialis.

PRODUCTION OF BIO-PELLETS DERIVED FROM SAWDUST AND CRUDE GLYCEROL

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Abstract:

Biomass has a significant proportion among all of the renewable energy sources. Bio-pellets produced by pelletization of bulky biomass materials are widely favoured for combustion applications because of the improvements over biomass (sawdust, agricultural residues etc.) resulting in enable to utilize and store the biofuels. In recent researches it is stated that using crude glycerol (by-product of biodiesel production) can increase the calorific value of pellets and minimize the disposal problem of crude glycerol in biodiesel industry. In this study, the crude glycerol produced from the transesterification of sunflower oil was blended in different ratios (wt %) with the sawdust of Scots pine which is commonly used in Eurasian region. Moreover, maize starch was used to examine its additive effect in drop tests. According to the optimization study, 150 MPa pelletizing pressure with 7.5% glycerol- 92.5% sawdust ratios gave the optimum results and maize starch almost didn't improve the strength of pellets. It was measured that 7.5% glycerol pellets had 95.88% drop test resistance, 89.55% volatility, 10.06% moisture content and 0.75% ash content while pure sawdust pellet had 95.54% drop test resistance, 89.63% volatility, 10.03% moisture content and 0.43% ash content. Also, 7.5% glycerol addition to the sawdust as a raw material did not affect the net calorific value of the bio-pellets (≈0.97%). As a result, it is expected that using crude glycerol directly in bio-pellet production contributes solving the disposal problem of biodiesel by-product and decreases the cost of biodiesel production.

Keywords: Biodiesel, Biomass, Bio-Pellet, Crude Glycerol, Sawdust.

INVESTIGATION OF DEGREDABILITY OF IBUPROFEN FROM WASTEWATER BY USING ADVANCED OXIDATION PROCESS

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Abstract:

Pharmaceuticals in natural waters could be an environmental problem because of their potential toxicological risk on living organisims. Conventional wastewater treatment plans are not enough to remove pharmaceuticals therefore advanced oxidation process have become an emerging solution. Ibuprofen (IBF), a non-steroidal anti-inflammatory drug (NSAID), is a most widely used medicine in almost every part of world. In present study, under laboratory conditions, coagulation followed by advance oxidation, using H2O2 and FeSO4 (fenton process) is used to degrade the concentrations of ibuprofen from water were conducted. Fenton process is known to be most effective and common methods for the treatment of such wastewaters. In the present study H2O2 was used with FeSO4 for the treatment ıbuprofen and effects of H2O2, FeSO4 concentrations COD and TOC removals. Experiments with optimal concentrations of H2O2 and FeSO4 were carried out by chancing pH, temperature, stirring and residence time of solution (2-6), room temperature, (10,20,30 min) and (30,60,90 min) respectively. Concentration of FeSO4 and H2O2 were selected as (30,75,150 mg/L). After processing, 150 ml of samples taken out from the upper layers of sample COD and TOC tests were conducted.

Keywords: Ibuprofen, Pharmaceuticals, Fenton Process, Water, Wastewater

ENDEMIC TAXA OF THE GENUS MUSCARI MILL. IN TURKEY, THREATENED CATEGORIES AND CONSERVATION STATUS ASSESSMENTS

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Abstract:

Genus Muscari Mill. (Asparagaceae) is represented by about 50 taxa from all over the World. These taxa are distributed in Europe, Caucasus, Africa, and North-Western and South-Western Asia, The genus comprises 35 species in Turkey. Among them 25 species are endemic to Turkey. Some of these endemics are widespread, while remainings are restricted in to small areas. According to The Red Data Book of Turkish Plants the threatened categories of these 14 taxa are Muscari adilii (CR), M. anatolicum (LC), M. aucheri (LC), M. azureum (LC), M. bourgaei (LC), M. coeleste (LC), M. discolor (LC), M. latifolium (LC), M. massayanum (NT), M. macbeathianum (EN), M. microstomum (VU), M. mirum (EN), M. racemosum (VU), M. sandrasicum (EN).

All species were collected between 2014-2016. Population statues and distribution areas were observed during the field studies. Threat categories of 25 endemic plant taxa belonging to genus Muscari were rearranged according to IUCN criteria. Their distribution maps were given and also photos of them were presented.

At and of the study newly represented species to scientific world and their threatened categories are M. erdalii (VU), M. babachii (CR), M. sivrihisardaghlarensis (VU), M. serpentinicum (VU), M. tuzgoluensis (CR), M. turcicum (EN), M. vuralii (CR), M. atillae (VU), M. elmasii (VU), M. ufukii (LC), M. artvinense (VU)

Keywords: Endemic, Iucn Categories, Muscari, Turkey.

RELATIONSHIPS BETWEEN NANOPARTICLE TIO2 AND DAPHNIA MAGNA POPULATION DYNAMICS

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Abstract:

Engineered nanoparticles are used widely in many commercially available products and their use is increasing rapidly in the world. Exposure of the organisms and the environment to these materials is therefore increasing, yet the environmental impacts of such exposure are not clear. There have not been sufficient studies on behaviour and toxicity of nanoparticles through a food chain. Nanoparticle titanium dioxide (npTiO2) is widely used in water treatments, yet their influences on other contaminants in the water are not well studied.

There were a lot of toxicological test on D. magna on literatures. On the other hand a few studies have relationship between nanoparticles accumulation within D. magna and its population structure due to lifetable parameters. It is an important indicator that its tolerance level to nanoparticles on laboratory condition is reflected its replace and behaviour in the ecosystem. Furthermore daphnids are largely disturbed in freshwater ecosystem and present through a wide range of habitats in Turkey.

D. magna, experiments were initiated with neonates obtained from the same bulk culture (laboratory condition is 24 ± 1 °C; 16: 8 h photoperiod). Experiments were carried out in glass beakers (five groups per treatment) containing 50 mL of test solutions. D. magna individuals were exposed to different npTiO2 concentrations for 21 days; 30 animals (randomly divided six animals) were used per control and per npTiO2 concentration (0.5, 1.0, 1.5, and 2.0 mgL-1).

The differences between nanoparticles concentration and population life table parameters (survivorship rate, growth rate, net reproductive rate, and total progeny of each npTiO2 concentration) were evaluating using Tukey's test followed by Pos Hoc comparison.

Consequently, as npTiO2 concentration increased, mortality rate and development period were increased; total progeny and net reproductive rate were decreased. These effects on its own were produced a reduction in population growth rate during 21 days.

Keywords: Daphnia Magna, Tolerance, Survive, Life Table, Nanoparticle, Population, Titanium Dioxide

DEEP SEA OUTFALL OF NATURAL GAS FIRED COMBINED CYCLE POWER PLANT COOLING WATER APPLICATION AND MODELING

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Abstract:

Combined Cycle Power Plants are in wide demand throughout the world, because they are characterized by short construction times, low investment costs, high operating efficiencies and low exhaust emissions. This type of power plants can reach fuel to electricity conversion efficiencies of 60%, at the same time have minimal environmental impacts.The most important reason for this is the use of natural gas, which is a very clean fuel containing little or no sulfur, particulate matter and other unwanted ingredients.

This study was investigated the effect of cooling water from natural gas combined power plant to Black Sea region of Turkey.The parameters, which affect the marine ecosystem, were determined and in addition temperature,suspended solid, COD values were measured.Modelling of these measured values was performed throughout discharge line with the CORMIX-2 software developed by EPA (Environmental Protection Agency) as environmentally purpose.

Keywords: Natural Gas, Power Plant, Deep Sea Outfall, Model

INVESTIGATION OF DOMESTIC WASTEWATER DISCHARGE PERFORMANCE OF SUBMARINE OUTFALLS IN RIZE PROVINCE AND ALTERNATIVE PROPOSALS

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Abstract:

Domestic wastewater discharges to marine environment by submarine outfall systems are the most commonly used method of wastewater disposal in coastal regions. The aim of this study is to investigate the submarine outfalls in Rize, Turkey. In order to analyze the negative effects of marine ecosystems, the submarine outfalls performance should be given to monitoring of all them. We investigated the dilution of domestic wastewater around Rize and measured sea water for water quality conditions (pH, conductivity, oil-grease, BOI5 , AKM, KOI, Kjieldahl Nitrogen (TKN), total nitrogen, total phosphorus, total coliform, fecal coliform). The effects of pre-treatment to dilution were investigated by analyzing of the input sewarage wastewater. We have identified the different treatment scenarios it is important to evaluate the results of the study with discharge system. Design should not be overlooked in the sea outfall of the special features of the Black Sea have emerged requirements.

Keywords: Submarine Outfall, Domestic Wastewater Discharge, Marine Pollution

BENCHMARKING EFFECTS OF ORGANIC AND CONVENTIONAL FARMING APPLICATIONS AT HAZELNUT ORCHARDS IN DRYLAND

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Abstract:

In this study, it was proposed to investigate how hazelnut trees (Corylus avellana L.) were affected by organic and conventional farming application under dryland conditions. Therefore, it was studied to measure of leaf water potential (LWP), stomatal conductance (gs) and photosynthetically active radiation (PAR) on hazelnut trees under organic and conventional managements in dryland conditions. To measure effects of organic and conventional farming applications, soil water content (SWC) and atmospheric stress (i.e. air vapor deficit – VPD) were analyzed against those parameters. Evapotranspiration (ET) and yield were slightly higher in organic application than conventional application but lower SWC. Moreover, conventional hazelnut trees had slightly higher LWP and gs values but lower VPD values than organic application. Organic hazelnut trees were generally unnoticeable higher LWP, PAR, and gs responses to SWC and VPD than conventional hazelnut trees. ET, yield, SWC, and VPD values were mostly parallel with the results obtained plant canopy measurements. Both hazelnut orchards were influenced by precipitation during the year. However it could be stated that hazelnut tress needed to be irrigated during dry days to have higher yields and to avoid summer water stress. In conclusion, it can be concluded that organic farming seemed a good alternative for hazelnut orchards in dryland.

Keywords: Water Consumption, Physiology, Vapor Pressure, Hazelnut, Düzce

POTENTIAL ECOLOGICAL RISK ASSESSMENT OF HEAVY METAL AT SEDIMENT

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Abstract:

Sediments have an important role as a habitat for aquatic organisms to grow, evolve and establish in the ecological system. Sediment contamination is one of indicators for the prediction of potential ecological risks in aquatic systems. Heavy metals are among the most persistent of pollutants in the ecosystem such as water, sediments and biota because of their resistance to decomposition in natural condition. Toxicity appears after exceeding level of indispensability.Heavy metals become toxic when they are not metabolized by the body and accumulate in the soft tissues. Metals have low solubility in water, get adsorbed and accumulated on bottom sediments.Spreading heavy metals in the water column may subsequently be accumulated in sediment because of low solubility then become sensitivity indicator for aquatic organism. Ecological risk is assessed through the heavy metals concentration in the sediment. This research was undertaken in order to determine and analyze various heavy metals present in sediments taken from mid-Black Sea coast. Five heavy metals: cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), and zinc (Zn) were determined by Perkin Elmer Optima 4300DV Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES). Potential ecological risk indexes(Er) were used to study the pollution status of heavy metals in sediments and assess their potential ecological risk to the environment. Considering the potential ecological risk coefficient (Er) results calculated in accordance with the highest result metals Cr 0.068 , Cu 0,122, Zn 0,0146 , Cd 132 , Pb 0.037. According to this four heavy metals (Cr, Cu, Zn, Pb) under investigation in sediments reflected a low ecological risk to mid-Black Sea coast, but for Cd considerable ecological risk for the water body. The cause of pollution in mid-Black Sea could be associated with industrial and human activities. Strategies will be proposed that can be applied in order to prevent accumulation of heavy metals.

Keywords: Ecological Risk Assessment, Heavy Metals, Sediment.

ENERGY LITERACY IN SOUTHEAST EUROPE

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Abstract:

Standard definitions of literacy have become obsolete not just with the advances of technology but also with the rise of sustainable awareness. While US and Canada are increasingly advocating such educational standard in the long-term energy policy, Southeast Europe is still bound by the EU's funding normative, i.e. the national energy strategy (such as The Green Paper for Croatia) or, for countries not in EU, the level of 'harmonization.' Such educational standard should be implemented because it not only fosters better understanding of energy process and energy informed decisions, but also the trust of public opinion in national strategic choices; at the same time it improves the industry's competitiveness and innovation. The last section is devoted to the link between such strategy and the decrease of the 'brain drain.'

Keywords: Energy, Literacy, Sustainable, Eu, Industry

INVESTIGATION OF OPTIMUM TREATABILITY OF PAPER INDUSTRY WASTEWATER WITH INNOVATIVE APPLICATION BY USING FENTON AND PHOTO-FENTON ENHANCED ULTRAFILTRATION

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Abstract:

In the present study, an integrated process with Fenton and photo-Fenton oxidation and ultrafiltration membrane was employed in treatment of real paper industry wastewater. Fenton and photo-Fenton processes were not only significantly improved the effluent quality, but also remarkable enhanced membrane efficiency in the reactor.

The aim of this work is to determine the optimum operating conditions of innovational AOP/sumberged UF hybrid system and the removal efficiency of organic substances with the consideration of its permeate flux.

Individual and overall performances of the coupled processes were experimentally examined using Taguchi's L32 orthogonal array for paper mill wastewater having characteristics of pH: 6.8, COD: 1520 mg/L, TOC: 520 mg/L, Ei: 1995 mS/cm, TDS: 1006 mg/L, $SO42^-$: 483 mg/L and Cl^-: 86 mg/L characteristic. The influences of process variables comprising type (UVC-254 and UVA-365) and intensity (10-40 W) of UV light in photo-Fenton/UF process in addition to process time (15-60 min), temperature (25-40 ºC), pH (3-6), H2O2/TOC (6-30 g/g), H2O2/Fe+2 (3-15 g/g), airflow rate (1-4 L/min), water withdrawal rate (55-100 rpm), membrane type (UP005, UP020, UH050, UV150) in Fenton/UF process on the performances were determined using response surface methodology. Paper wastewaters optimum standards in the hybrid system were upgraded to 64% TOC and 74.9% COD within 56 minutes by organic expense performances with the Fenton process, 66.5% TOC and 76.1% COD within 42 minutes by photo-Fenton process (UVA-365) and 66.5% TOC and 76.1% COD within 44 minutes by photo-Fenton (UVC-254).

In conclusion, this study proved that without producing any membrane concentrate, the developed process can be successfully used as innovative technology for zero/near-zero discharge of paper industry wastewater with low chemical consumptions whereby more water recovery from its effluent by subsequent membrane could be provided along with concentrate minimization.

Authors thanks the TUBITAK for financial support. (project no: 113Y369)

Keywords: Paper Industry Wastewater, Advanced Oxidation Process, Fenton, Photo-Fenton

A NEW STUDY PROMISING PET REMOVAL: MICROBIAL MONOMER DEGRADATION

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Abstract:

Today, many industrial products used in daily life are produced from PET plastics. Large percentage of PET products is used in food consumption area that directly and/or indirectly contact with foods and beverages. Besides advantages of using these plastics, there are many disadvantages for environment and human health. Some studies have revealed that monomers of plastics may be toxic and responsible for disruption of endocrine system in human. With widely using, it is clearly known that PET plastics have no self-degradation in nature and many times required to be removed. In order to overcome these negative effects, biological workers could be the best option for PET removal from the environmental systems.

Methods. Degradative microorganisms were isolated from PAH and TPA acclimated sludge and crude oil samples from petrochemical industry piled wastes. Degradation cases and selection of microorganism were carried out in 50 ml Bushnell Haas Yeast medium with target PET monomer (Bis(2-hydroxyethyl) terephthalate (BHET)) as 10 and 20 mg/L at 30C°, 200 rpm in rotary shaker. Degradation was observed with HPLC. Mobile phase was as 70% - 30% (plus 0.1% Formic acid) Acetonitrile-dH2O. Standard curve was constituted and degradation activities were observed. Selection and purification of microorganisms and their Gram reactions, catalase, oxidase, protease and lipase activity tests were carried out.

Results. HPLC data were indicated the degradation of BHET for the CT-3 with 10 mg/L, CT-3 with 20 mg/L, CT-2 10 mg/L and CT-2 20 mg/L were 14, 17, 17 and 21 days, respectively. All isolates were rod shaped and gave the various characteristics on Gram reactions, catalase, oxidase, protease and lipase activity tests.

Conclusion. In this study, we declare new perspective to successfully eliminate main PET monomer via newly isolated microorganisms in minimum 14 days. These results could pave the way to different studies in same area.

Keywords: Pet, Bhet, Biodegradation

BIOHYDROGEN PRODUCTION FROM MOLASSES: EFFECT OF PHOTOOXIDATION TO MOLASSES

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Abstract:

Hydrogen can be produced through fermenting sugars in a mixed microbial population under anaerobic conditions. In this study, sucrose and the carbohydrate-rich molasses were selected as sugars. Kinetics of hydrogen production from sucrose, untreated and treated molasses in batch cultures was investigated, and the modified Gompertz model was used to describe the hydrogen producing process. The maximum rate of hydrogen production (Rmax, ml H2/min) values were 13,55 , 3,68 and 3,23 for sucrose, untreated and treated molasses. Pre-treatment step of photooxidation not affected Rmax, however lag time decreases from 282 to 213 min. Also, the hydrogen content in the gas increases from 3,5% to 4,5%. Results indicated that effect of pretreatment on biohydrogen production was insignificant.

Keywords: Dark Fermentation, Gompertz Equation, Hydrogen Production, Molasses, Photooxidation

EFFECTS OF USING ECO-FRIENDLY LUBRICANTS IN PUMP BEARINGS INSTEAD OF TRADITIONAL LUBRICANTS

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Abstract:

Green production, green maintanence is must for sustainable future. Pumping systems account for nearly 20% of the world's electrical energy, therefore pumps are one of the most important equipment for industry, agriculture and municipality. Every operating equipments have environment pollution potential during operation and maintanence. In pumping systems, lubricants have soil and water pollution potential by possible leakages. Therefore using eco-friendly lubricants in pumping systems could be a good prevention for sustainable future.

Pumps need lubrication for bearing as any rotating equipment, and they have an oil sump for lubrication filling. Usually mineral or synthetic oil are used for bearing lubrication. In case of oil leakage in sealing system of pump; soil or water could contamined with oil. In last decades eco-friendly lubricants have enlarged usage are because of their excellent lubricity, biodegradability, good viscosity–temperature characteristics, and low evaporation loss. This study focused on the effects of using eco-friendly lubricants instead of mineral oil in pumping system bearings. Mineral oil, canola and cotton seed oil was experimented and bearing damage and failure analysis was compared for each lubricants. This study aims to reduce the contamination of water and soil by pump lubrication system leakages.

Keywords: Pump, Lubricant, Eco-Friendly, Bearing

CARBON NANOTUBE BLENDED MIXED MATRIX MEMBRANES FOR DESALINATION

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Abstract:

Pressure driven and concentration driven membrane operations are quite similar because both operations are based on a difference in concentration or activity of the permeating component across the membrane. Chemical activity of the feed is increased by pressure in pressure driven membrane operations. In concentration driven membrane operations, chemical activity of the feed remains the same, but permeate chemical activity is reduced. The most important concentration driven membrane operations are dialysis, hemodialysis, pervaporation, and liquid membranes.

In this study, carbon nanotube (CNT) reinforced polysulfone membranes were initially prepared by the phase inversion method. Then, the polyamide active layer of the mixed matrix membranes was prepared using interfacial polymerization method. Several analytical methods were used to characterize the membranes including Fourier transform infrared spectroscopy (FTIR), water contact angle, porosity, and mechanical strength tests. In addition, the desalination performances of the membranes were determined by forward osmosis tests.

FTIR results revealed that the CNTs were successfully doped in the structure of the membranes. CNT addition to the polysulfone membranes increased the hydrophilicity and permeate fluxes, but reduced the membrane porosity. While CNT doped mixed matrix membranes exhibited similar water flux compared to pure membranes (no CNT addition), they provided higher salt removals.

Acknowledgement: This research was supported by a grant (111R012) from the Scientific and Technological Research Council of Turkey (TÜBİTAK).

Keywords: Carbon Nanotube, Desalination, Mixed Matrix Membranes

BIODEGRADATION OF PTA WASTEWATER BY TWO-STAGE ANAEROBIC REACTOR SYSTEMS

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Abstract:

Purified terephthalic acid (PTA) wastewater contains terephthalate (TA) as the main component which is one of the top 50 chemicals produced worldwide. During its production, additionally to TA, some aromatic pollutants (p-toluic acid, 4-carboxybenzaldehyde and benzoic acid) containing wastewater is generated with a ratio of 3-10m3 wastewater per ton of PTA manufactured. PTA is an important raw material widely used in petrochemical industry to make different products such as terephthalate bottles, polyester textile fiber, polyester films, pesticides, etc.

In this study, two stage upflow anaerobic sludge bioreactor (UASB) was developed to treat purified terephthalic acid (PTA) wastewater. Sequentially connected two different UASB reactors were used to enhance the biodegredation of major PTA wastewater pollutants. Performance of the ractor and microbial community profiles were studied during 225 days at mesophilic conditions. For microbial community analysis, molecular methods (Denaturation gradient gel electrophoresis and Quantitative PCR) were used. General bacteria, Archea and methanogenic group spesific primer and probe sets (Methanobacteriales, Methanomicrobiales and Methanosarcinales) were used. For DGGE analysis, GC-clamps were added to the 5'-ends of forward primers. Q-PCR analysis were applied with TaqMan probe systems.

The anaerobic process achieved a total COD removal of 80%. Benzoic acid was completely degraded in the first stage reactor, whereas terephthalate and p-toluic acid degredation ratios were 90% and 47% in the second stage ,respectiveley. Methane contents of the second stage reactor was determined as 74% by GC analysis. Microbial community analysis (Real-time PCR and DGGE) indicated that the members of Methanobacteriales, Methanosarcinales and β-Proteobacteria seemed to be most abundance groups but also Methanomicrobiales members were present.

This is the first study of two-stage UASB systems applied to the PTA wastewater. This sequential anaerobic bioprocess configuration is proven to be better than its aerobic counterpart in terms of better degradation efficiency and methane production potential.

We acknowledge TUBİTAK (Project no. 113Y002), EBILTEM (Project no. 2014-BİL-007) and Ege University Scientific Research Project (2013 FEN 08) for their supports.

Keywords: Pta, Biodegredation, UASB, DGGE, Quantitative-PCR

INTEGRATION OF PHOTOCATALYTIC AND MEMBRANE DISTILLATION HYBRID PROCESSES FOR TEXTILE WASTEWATER TREATMENT

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Abstract:

In this study, the degradation of textile industry wastewater was investigated for using innovative integrated process of photocatalytic and membrane distillation processes. Photocatalytic oxidation was conducted with semiconductor ZnO catalysts (1 g/L) under UVA irradiation. For the next stage, hybrid design of membrane distillation and photocatalytic processes was performed sequentially. Initially the photocatalytic process was conducted for three hours at initial values of 140 mg/L COD and 1 g/L ZnO catalyst loading under UVA irradiation and then treated solution was run through the distillation module at 35 oC temperature and 665 mL/min flow rates. PVDF 0.22 µm membrane was used in the module. The result showed that decolorization of textile wastewater was carried out successfully at integrated system.

Keywords: Photocatalytic Membrane Distilation, Textile Wastewater Treatment, Zno Catalyst, Pvdf Membrane

BIODEGRADATION OF TEREPHTHALIC ACID BY SOME MICROORGANISMS ISOLATED FROM ACTIVATED SLUDGE

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Abstract:

Terephthalic acid (TA) which is a significant source of pollution is industrial chemical. Its production tons of wastewater, biodegradation of terephthalic acid by microorganisms were researched in this studied. It carried out the isolation, identification and determination of biodegradation efficiencies of the microorganisms that have abilities to degrade terephthalic acid from the samples taken from the waste water treatment unit of petrochemical wastewater plant.

The bacteria were isolated by inoculating wastewater that contains the autoclaved Bushnell – Hass Broth supplemented with single hydrocarbon compound as sole carbon source (100 mg /L TA) . The flask was kept on rotary shaker at 150 rpm. At every seven day, 2,5 ml of enriched effluent was transferred in 50 ml fresh effluent sample, containing 100mg/L TA as additional carbon source. Such four transfers were carried out. Thus, bacterial population was acclimated and adapted to sole hydrocarbon. During every inoculation, 1 ml aged inoculum was inoculated to Plate Count Agar (PCA) with pouring plate method to be able to see the colonial variations. After 3 inoculations, mainly 4 bacteria which are able to utilize selected TFA as a sole carbon source were isolated. For the identification of isolated bacterial cultures, genomic DNA was extracted and DNA regions that encode the 16S rRNA fragments.

The biodegradation efficiencies of the isolates which has identified as Arthrobacter nicotinae, Chrysobacterium sp. Burkholderia cepacia and Pseudomonas putida were determinated by HPLC analysis. It was showed that the degradation ratios of terephthalic acidis; %100. Degradation that was finished in 3 days if the initial terephthalic acid concentration was 100mg/L. Specially, Pseudomonas putida was degradation of TA in 8 hours.

Acknowledgements

This work was funded by the research project SANTEZ-00639 STZ 2010-2 of Republic of Turkey, Ministry of Science, Industry of Technology

Keywords: Terephthalic Acid, Biodegradation, Hplc, Microorganism

DETERMINATION OF APPROPRIATE TECHNOLOGY FROM PAPER INDUSTRY WASTEWATER FOR REUSE

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Abstract:

In industries which has intensive water consumption, as well as use of water, treatment of the consisting waste water is also an important problem. In this study, It aimed to determine the most appropriate hybrid treatment technology for the reuse of paper wastewater. In Step 1, Advanced Oxidation (AOP)/Ultrafiltration (UF) process has been applied and UF filtrate water obtained from step 1 was performed with different membrane filtration processes in step 2. Paper wastewater obtained from primary settling out, has been treated with applying Fenton process with UF membrane and to this UF effluent, Nanofiltration (NF tight), Reverse Osmosis (RO), NF loose + RO, RO + Membrane Distillation (MD) and MD processes has been applied separately. If this process is considered in the total process efficiency through the removal of organic matter and water flux, the highest removal efficiencies is provided by AOP/UF→RO/MD and AOP/UF→MD processes. In AOP/UF→RO/MD process, RO and MD process was operated 80% and 50% concentrate ratio respectively. MD effluent total organic carbon (TOC), chemical oxygen demand (COD), total dissolved solid (TDS) removal efficiency and water flux value was found 95.72%, 96.43%, 98.92% and 17.77 L/m2h respectively. AOP/UF→MD process TOC, COD and TDS removal efficiency and water flux value of 50% concentrate rate; 90.22%, 88.49%, 98.17%, and 20.83 L/m2h while at concentrating rate of 80%; 89.35%, 87.33%, 97.91% and 17.31 L/m2h was found respectively. According to organic material efficiency it was seen the most efficient process AOP/UF→RO/MD, although with a realistic approach to water reuseing, when compared water flux values AOP/UF→MD process has been identified as the most applicable process with 31,67 mg/L TOC and 104,45 mg/L COD values. Acknowledgements: Authors thanks the Scientific and Technological Research Council of Turkey, TUBITAK due to financial support provided for the experimental investigations by a national project (no: 113Y369).

Keywords: Advanced Oxidation, Membrane Filtration, Paper Wastewater, Water Reuse

CATALYTIC GASIFICATION OF GALACTURONIC ACID AS A MODEL COMPOUND FOR HEMICELLULOSES

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Abstract:

Production of Hydrogen and Methane which are used as clean energy sources by hydrothermal gasification from the lignocellulosic biomasses is a novel and developing technology. Biomass is mainly composed of cellulose, hemicellulose, lignin, and extractives and the compositions vary depending on the source of the biomass. Hemicellulose is chained and amorphous biopolymer composed of the primary monomer constituents, hexoses (glucose, galactose, mannose, glucuronic acid and galacturonic acid), pentoses (xylose, arabinose). Cellulose, lignin, hemicelluloses, and extractive substances show different attitudes in hydrothermal gasification. For this reason, significant varieties are observed in the gasification yields and product distributions. From this point, in this study galacturonic acid as model compounds for the hemicellulose was studied. The catalyst decomposition of galacturonic acid was examined in supercritical water for temperature from 300 to 600°C. Experiments were performed in the absence and presence of metal impregnated activated carbons (Ni/AC) and (Ru/AC) with a reaction time of 1h. The yields of gas, liquid, and solid products were identified with the analyses using gas chromatography (GC), high performance liquid chromatography (HPLC), total organic carbon analyzer (TOC), and solid sample module (SSM). The effect of the reaction temperature, and catalyst were investigated to reach the maximum yields of H2 and CH4. The highest H2 yield and the highest CH4 yield were obtained at the highest reaction temperature by using Ru/AC and Ni/AC, respectively.

Keywords: Biomass, Galacturonic Acid, Supercritical Water, Gasification, Hydrogen

PYROLYSIS OF IMPREGNATED DECOR PAPERS

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Abstract:

This study aims evaluation of pyrolysis of the impregnated papers (decorative papers), containing urea-formaldehyde (UF) and melamine-formaldehyde (MF) resin. Since casting away the impregnated paper wastes cause pollution, and re-use of them can lead to quality issues, pyrolysis is taken as an alternative to utilize these wastes. Within the scope of this study, energy potentials of the pyrolytic oil is determined. The productivity feasibility of pyrolysis processes with various thermal treatments and reaction conditions is carried out in a locally designed and produced test reactor system. Calorific value of the pyrolysis oil is analysed. It's determined that temperature and inert gas flow rate effects product (Char – Oil – Gas) percentages an calorific values. The results showed that pyrolysis oil percentage and the calorific value increases with the temperature under the conditions tested. This study may be described as a prestudy of overall analysis of impregnated paper pyrolysis and the existing results are encouraging for further experiments.

Keywords: Pyrolysis, Impregnated Decor Paper, Urea-Melamine Formaldehyde,

ELECTROOXIDATION OF PRETREATED TRANSPORT CONTAINER WASHING WASTEWATER

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Abstract:

Electrooxidation process was studied on pretreated transport container washing wastewater by electrooxidation. The wastewater used in this study has been collected from a recycling plant in Kocaeli, Turkey. Transport container washing wastewaters are generated by washing them after they're used to transport chemical fluids.

In previous study, wastewater had been treated by electrocoagulation and soluble chemical oxygen demand (sCOD) was removed with 82% efficiency as a result 2256±2% mg/L. In this study, it is aimed to increase the sCOD removal efficiency by electrooxidation. The process was carried out by using a boron doped diamond (BDD) anode and two iron cathodes. The electrooxidation experiments were studied for pH between 3 and 7, current density between 250-500 A/m2 and operation time between 60-300 min. to find the optimum operation conditions. The optimum electrooxidation conditions were found as pH 3, 250 A/m2 current density and 60 minutes. The maximum sCOD removal efficiency was achieved 84% at optimum conditions with EC+EO processes. Color removal efficiency was detected at three wavelength: 436 nm, 525 nm and 620 nm as 95%, 95% and 98% respectively. It was found that during the electrooxidation process the removal efficiency of sCOD was increasing with the increasing of process time while the color removal efficiency was decreasing due to the formation of different kinds of compounds. The energy consumption of the electrooxidation process for treatment of the pretreated transport container washing wastewater was calculated as 37,07 kWh/kg CODremoved.

Keywords: Electrocoagulation, Electrooxidation, Container Washing Wastewater, Bdd

ISOTHERM AND KINETIC MODELLING OF AZO DYES ADSORPTION

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Abstract:

Textile and dye industries' wastewaters are one of the major problem in the water pollution. This wastewater causes serious environmental pollution, because of non-biodegradable and toxic dye molecules. Azo dyes are widely used in the textile industry. In the anaerobic condition azo dyestuff decompose to toxic byproducts. The aim of this work is to understand the adsorption mechanisms of various azo dyestuff adsorbed by domestic wastewater treatment plant inactivated sludge. To determine the adsorption mechanisms, various isotherms and kinetics were used and constants of each isotherms and kinetics were calculated for each dyestuff. In this study, Reactive Black 5 (RB5), Reactive Blue 21 (RB21), Acid Brown 283 (AB283) and Basic Violete 3 (BV3) azo dyestuff adsorption data were used for isotherms and kinetics calculations. The results of this study showed that, the best isotherm which describe the adsorption process was Freundlich. Freundlich isotherm model assumes that heterogeneous sorption occurs on adsorbent surface, stated in other words adsorption power varies at every sorption point. The best kinetic model which describe the adsorption process was pseudo-second-order kinetic model. This kinetic model assumes that adsorption rate dependent to adsorbent material quantities and contact time.

Keywords: Azo Dyes, Dyestuff Adsorption, Equilibrium Isotherms, Kinetic Models

GLOBAL WARMING AND RELATED CLIMATE CHANGES

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Abstract:

Global warming and related climate changes are likely to significantly increase the weather-related risks facing human settlements, including floods, water and power supply failures and associated economic collapse into "failed cities". Action to help poor urban communities adapt to become more resilient to possible change must therefore be initiated, although to date attention has focused on mitigation rather than adaptation. This paper considers the physical and financial implications for urban areas of the potential impacts of climate variability and change on water resources, illustrated by examples from sub-Saharan Africa, which is likely to be one of the most vulnerable and most affected regions. Water management, which will be particularly affected by climate change, could provide an opportunity to initiate structured adaptation responses. Adaptation costs in the sub-Saharan urban water sector are estimated at between 10 and 20 per cent of current overseas development assistance to the region. This paper suggests that additional funding should be made available in terms of the "polluter pays" principle, and should be channelled through government budgets rather than ring-fenced climate funds. This would help ensure that "climate proofing" is mainstreamed and would be in keeping with current trends in overseas development assistance reflected in the 2005 Paris Declaration on Aid Effectiveness.

Keywords: Adaptation, Aid Effectiveness, Climate Change, Dams, Hydrology, Sub-Saharan Africa, Water

COMPARISON OF PERFORMANCE OF CONVENTIONAL MEMBRANE BIOREACTOR WITH DYNAMIC MEMBRANE BIOREACTOR

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Abstract:

The purpose of this study is about comparison of non-woven and 0,45 µm pore size real membrane placed in one aerobic tank and under same conditions. Comparison has been made between dynamic membrane bioreactors (DMBR) and Membrane bioreactor (MBR), which have been employed in a widespread manner, to develop a convenient solution of high membrane cost handicap.

Both membrane types operated under same aerobic conditions, volume, LMH and SADm. However, they have been fed with synthetic municipal wastewater and operated periodically to hinder membrane fouling. At the end of approximate one month adaptation time course, bioreactors, which have reached stable conditions, have been operated to gather the data throughout 60 days. COD removal rates and turbidity results have been compared and non-woven dynamic membrane results have shown similar results to real membrane in terms of efficiency. Furthermore, dynamic membrane has exposed air back wash and pressure changes examined.

While average COD removal is determined 93% for non-woven dynamic membrane and 95% for 0,45 µm pore size real membrane, turbidity values have obtained 1,5 NTU and 0,7 NTU for non-woven and 0,45 µm real membrane, respectively.

Keywords: Dynamic Membrane, Membrane Bioreactors,

IRRIGATION PURPOSED DAMS AS A SOURCE OF MINI HYDROPOWER IN AFYONKARAHISAR

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Abstract:

Water and energy is alienable source for human beings. Because of the undeniably negative effects of burning fossil fuels, renewable energy sources such as wind and solar power have attracted ever-increasing attention, despite still being slightly more expensive than the conventional energies Hence, the utilization of economical hydroelectric energy potentials to their full capacities is also important from this aspect. Dams are engineering structures that store water to supply needs of human and living beings. Although the average annual inflow is greater than the annual irrigation release, there is a contradiction in monthly inflow and irrigation demand patterns, which is drastically pronounced in semi-arid regions like Turkey. Water captured in active storage during winter and spring months is used to compensate for the deficiencies between the irrigation demands and natural inflows of dry summer months. For high total irrigation releases close to 90 % regulation, the active storage may need to be large enough to store necessary carry-over deficiencies because of long-duration low-flow periods.

In this study, available water potential of the Kestel Dam's watershed will be calculated using meteorological and river run off data which will be obtained DMİ and DSİ observation stations. Hydroelectrically energy production capacity of the Kestel dam which was constructed only for irrigation and domestic water supply will be investigated. Required water and energy production amount will be calculated if a mini hydropower plant is constructed in the bottom outlet of the dam. Therefore, the water amount discharged from the Kestel dam spillway structure will be calculated to use it for the energy production.

Keywords: Irrigation Dams, Mini Hydropower, Renewable Energy, Electricity

INVESTIGATION ON THE CHARACTERISTICS AND MANAGEMENT OF DENTAL WASTEWATER IN TEHRAN, IRAN

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Abstract:

The objective of this study was to identify the components, composition, generation rate and management of dental wastewater in Tehran, Iran. Five dental centers in district 6 of Tehran selected from twenty-eight centers using Kukran random sampling formula. Three samples were taken from each center daily and sent to laboratory for relevant analyses. The mean value for pH, COD, EC, TDS, TSS, temperature and turbidity was 6.72±0.009, 241.25±75.87 mg/l, 1593.75±75.11 µs/cm, 1282.25±53.64 mg/l, 220±77.45 mg/l, 17.15±0.69 ºc and 39±11.69 FTU. The qualitative analyzes declares that the mean concentration of dissolved silver is higher than other metals while tin has the minimum concentration. The mean dissolved concentration for Mercury, Silver, Zinc, Tin and cooper was 25.74±3.79, 44.22±32.59, 10.12±5.93, and 0.20±0.05 and 0.84±0.09 µg/l, respectively. According to previous studies dental clinics mostly do not use amalgam filtration and pre-treatment systems, so a significant amount of heavy metals discharge to municipal wastewater both in the form if dissolved or particle elements. The quantitative analyze shows that the mean generated wastewater in units using water suction machine is much higher than the respective amount generated in units with surgery suction machine. Due to the lack of the filtration unit and amalgam separator a high concentration of mercury observed which can be reduced by 90% using filtration unit. Based on the discharge standards and destructive effects of this type of wastewater on environment and food chain, it is suggested that dental wastewaters should be treated before entering the municipal wastewater collection systems.

Keywords: Amalgam, Dental Wastewater, Mercury Pollution, Metals, Wastewater Treatment Plants

PULP AND PAPER WASTEWATER TREATMENT BY USING CHEMICAL AND BIOLOGICAL PROCESSES: CHEMICAL COAGULATION FOLLOWED BY INNOVATIVELY DESIGNED CSTR

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Abstract:

The aim of this study is to determine the performance of color-containing pulp and paper wastewater treatment by using chemical and biological processes that include chemical coagulation followed by innovatively designed CSTR. The influent pulp and paper wastewater, with the average values of colour and COD being 52330 PtCo and 25675.6 mg/L, respectively, was used for the CSTR obtained from a real scale treatment plant. Before biological treatment, type and dose of coagulant, optimum pH, stirring speed and waiting period were examined. Determination of optimum pH for coagulation was performed with various pH values (4 to 8) with jar testing. The results for the two selected types of coagulants demonstrate the optimum pH value to be at 5.5. Initially, the most commonly used coagulant Alum (Al2(SO4)3.14.H2O) was selected. However, Alum failed to produce any effect whatsoever on the coagulation with range of 5 mg /L-2500 mg/L, though optimum conditions were provided. Then, FeCl3 was tried at different dosage and the optimum dosage value was determined of 1500 mg/L under the same conditions. The obtained results demonstrated that chemical coagulation processes with FeCl3 are superior for the removal of both color and organic compounds from real textile wastewater. The colour and COD decreased from average 52330 PtCo and 25675.6 mg/L to (89.6% and 47.22% removal), respectively, with chemical treatment. Despite these results being satisfying in respect to percentage of yield, the results were not sufficient for discharge standards. So, we applied biological treatment with innovatively designed CSTR with an HRT value of 5 days. The biological treatment demonstrated excellent results, with the removal of colour and COD being on average 90.70% and 96.40%, respectively, when combined with chemical treatment.

Keywords: Chemical And Biological Treatment, Cstr, Pulp And Paper Wastewater

BIOGAS EFFICIENCY, LEACHATE QUALITY AND WASTE STABILIZATION IN ANAEROBIC LANDFILL BIOREACTORS

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Abstract:

Landfills cause various problems for local authorities, such as the contamination of soil and water with toxins, the formation of leachate and the release of landfill gases. More economical and applicable innovative methods will be an opportunity for local authorities. The two biggest problems that the local authorities face during operating of landfills are; cost of leachate treatment due to high energy consumption and the problems faced during landfill gas management. In this study, it is intended, in laboratory scale anaerobic bioreactor, to improve the biogas efficiency, leachate quality and waste stabilization by using lab-scale landfill bioreactor. To simulate landfill bioreactor, the lab-scale reactor was constructed at 1 m height and 30 cm diameter by using opaque PVC pipe. In this simulated lab-scale landfill bioreactor, leachate recirculation twice a week was applied to investigate the effect of landfill bioreactor on biogas efficiency, leachate quality and waste stabilization. Chemical oxygen demand (COD), Biological oxygen demand (BOD5), pH, volatile fatty acids (VFA), oxidation reduction potential (ORP) and other parameters in leachate samples were regularly monitored. Biogas amount and settlement in the reactor due to waste stabilization were also measured regularly. After 180 days of anaerobic incubation, total biogas produced was 938,6 L, waste settlement in the reactor was 7% and COD and BOD5 removal rates were 84% and 77%, respectively.

Keywords: Municipal Solid Waste (Msw), Landfill Bioreactor (Lbr) , Anaerobic Biodegradation , Leachate Recirculation , Landfilling

EFFECT OF THE ANODE ELECTRODE ON PARACETAMOL REMOVAL IN THE ELECTROOXIDATION-ULTRASOUND HYBRID PROCESS

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Abstract:

In the recent years, the excessive use of pharmaceutical products have led to the contaminated of soil, ground, and surface waters. Also, these toxic compounds cause the formation of antibiotic resistance bacteria. Paracetamol (PCT) is a common analgesic/anti-inflammatory drug and have been in the wastewater as micro-pollutant. The removal of PCT from water is a difficult process due to refractory properties.

Advanced treatment methods have been successfully applied to destruction many toxic and bio-recalcitrant pharmaceuticals. The most usual technique is effective electrochemical treatments. In these study, electrochemical oxidation (EO) and ultrasound (US) techniques have been used together. Both oxidation process creates hydroxyl radical and breaks up the bonds of the PCT.

The aim of this study is to examine the effect of different electrodes by electrooxidation-ultrasound hybrid process remove of PCT from wastewater. These electrodes were Ti/PbO2, Ti/Pt and Boron doped diamond (BDD). The results show that BDD anode has effective than the other anodes for quicker oxidation of PCT. While Ti/PbO2 and Ti/Pt as the anode was removed approximately 82% and 70% of PCT, respectively, BDD anode removed 92% in the hybrid process.

Keywords: Electrooxidation, Ultrasound, Paracetamol, Bdd, Pharmaceutical

PHOTOCATALYTIC DEGRADATION OF REACTIVE RED 180 DYE SOLUTION ENHANCED BY HYDRODYNAMIC CAVITATION

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Abstract:

Non-biodegradable synthetic products and wastes have been increasing with developing industrial activities and have caused heavy pollution in recent years. Textile sector is the leading industry which has great importance in environmental pollution control due to high water consumption and the sector discharges large volumes of wastewater to receiving media. On the other hand, dye containing wastewater of textile industries causes aesthetic problems besides their toxic effect due to complex organic pollutants. Conventional treatment methods have not been efficient to remove pollutants from textile wastewaters at desired levels for discharge regulations. Therefore industries have been tending to more efficient water management approach as a result of increasing costs because of influent process water supply and disposal of wastewater. Hence, the novel wastewater treatment alternatives are required to develop advanced treatment technologies. In recent years advanced oxidation processes have been developed and investigated as integrated hybrid processes. In this study, synergic effects of hydrodynamic cavitation and photocatalytic oxidation processes on the degradation of synthetic dye solutions were investigated. Reactive Red 180 (RR180) azo dye was selected as one of the synthetic textile dye chemical and was prepared in 100 mg/L as initial concentration. ZnO as semi-conductor powder catalyst and UVA light emission are used for photocatalytic oxidation process. Orifice pipe for hydrodynamic cavitation was integrated in a pilot plant photo-reactor for photocatalytic degradation of RR180 dye solution. The reactor was operated at 5 bar and 10 L/min flowrate.

Keywords: Hydrodynamic Cavitation, Photocatalytic Oxidation, Advanced Oxidation Processes, Reactive Red 180, Azo Dye

OUTDOOR AIR POLLUTION INCREASED WITH URBAN TRANSFORMATION IN ISTANBUL ANATOLIAN SIDE

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Abstract:

Urban transformation has important impacts on degradation of air quality, while providing the urban growth. Deterioration of air quality not only affects human health but also changes to whole surrounded ecosytems. Many air pollutants are responsible for the degradation of outdoor air quality. Major air pollutants are gasses, chemicals and particulate matters that comes from the burning of fossil fuels. Efforts to improve air quality and reduction of air pollution are important to protect public health. From Marmara Clean Air Centre in Istanbul, air quality parameters affected by urban transformation are evaluated in this study. Measurement values in Istanbul are investigated comparing with thresold limit values of Turkey and World. In 2013 and 2014, PM10, PM2.5, SO2, NO2 outdoor values in Uskudar and Umraniye are analyzed especially related to growing impacts of urban transformation on the Anatolian side. Data over the period March 1, 2013 - December 1, 2014 is analyzed related to public health. Suggestions are made for improving air quality.

Keywords: Outdoor Air Quality, So2, No2, Particulate Matter

FLOOD RISK ANALYSIS OF AKARCAY RIVER ON THE UYDUKENT SETTLEMENT PLACE

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Abstract:

Floods causing loss of life and property are the one of the main hazards in Turkey. Floods cause huge damages to the structures and infrastructures of settlement areas. Flood simulations are also important to study structure and infrastructure systems affected by the floods either at the time of flooding or after flooding. In this study, flood risk of the Akarcay river, flowing through Afyonkarahisar city center and giving also its name to its watershed, for the Orhangazi and Yesilyurt districts called also Uydu kent settlement area is studied. Akarcay river is almost 150 km long and important stream discharging into the lakes Eber and Akşehir after starting from the Sinanpasa sub watershed and flowing through Afyonkarahisar city center. Akarcay river is made like a pool at the Uydu kent settlement place for a recreational purpose after construction of a concrete channel with 5000 m length which is controlled by the gates constructed by DSİ. Using this way, the river water is stored in the concrete channel in summers and winters.

In the study, using HECRAS software, flood analysis of the region was established. Required data such as topography for running flood simulation was entered into model to benefit from the satellite images for this study. HECRAS software was run according to the different flood period values for steady state flow condition. So, along the channel, flood levels and velocities were obtained. In addition, flood area was determined. Moreover, by the way of different scenarios, results of the flood simulation were evaluated. Finally, flood levels in the channel were calculated as varying between 0.13 m 1.92 m.

Keywords: Flood, Hecras, Simulation, Infrastructure

HEAVY METALS ANALYSIS IN IRRIGATION WATER AND SUGAR BEET (BETA VULGARIS L.) IN ERGENE BASIN, TURKEY

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Abstract:

The Ergene River in the Ergene Basin is one of the major surface irrigation water sources in the Thrace Region in Turkey. The river has been used for irrigation. The main crops that are irrigated from the river are corn and sugar beet. The annual total rainfall in the region is about 600 mm, which is not sufficient for the crops. Therefore, the Ergene River is a crucial irrigation water source. However, industrial development in the region has increased gradually since 1980. Along with the industrial development, the population of the Ergene Basin has increased as well. Currently, the river suffers from the contamination discharged from heavy industrial facilities. In this study, water and beet samples from 13 different locations in the Ergene Basin were collected and heavy metal contents, which included Cd, Cu, Fe, Mn, Ni, Pb, and Zn in the samples was determined. Results showed that Cd (0.4864 mg L-1), Fe (5.439 mg L-1), Mn (1.034 mg L-1), Pb (1.034 mg L-1), and Ni (0.832 mg L-1) were above the regulations limits while Zn (1.566 mg L-1), and Cu (0.980 mg L-1) were under the limits in irrigation water. The other results indicated that Cd (8.025 mg kg-1), Cu (81.756 mg kg-1), Pb (3.9 mg kg-1), and Zn (113.649 mg kg-1) were above the limits while Fe (359, 252 mg kg-1) and Mn (33.865 mg kg-1), Ni (4.2 mg kg-1) were under the limits in beet.

Keywords: Sugar Beet, Heavy Metals, Ergene Basin

SOME TURKISH LOW RANK COALS AND HEALTH AND ENVIRONMENTAL EFFECTS

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Abstract:

Air pollution which is becoming a great environmental concern in Turkey is due to the combustion of fossil fuels and biomass resources. Turkey's natural energy resources are quite different; mainly coal, crude oil, natural gas, hydroelectric power, geothermal, biomass, solar, and wind are produced and consumed. Although Turkey's oil and natural gas reserves are very limited, especially low rank coal reserves are quite abundant. So, coal is a primary energy source for Turkey and is used mainly for electric power, steel industry, and cement production. Turkish coal reserves are estimated to be in the order of 8.3 Gt lignite/subbituminous and 1.4 Gt bituminous coal. Lignite bearing units are extent all over the country especially western Anatolia. Increased coal consumption in large coal-fired power plants and growing population of Turkey implies increased greenhouse effect, air pollution, sulfur emissions, and acid rains. Health and environmental impacts from coal are mainly associated with inhalation of airborne particulates created by coal mining/combustion, or ingestion of ground or surface waters that contact coal or its waste products. Some trace elements As, Be, Cd, Hg, V and U emitted by coal-fired power plants and by domestic and industrial coal combustion in cities have known toxic responses for environment. Coal mining has a explicit influence on the environment, affecting land and causing subsidence, as well as producing mine waste. The main emissions from coal combustion are sulfur dioxide, nitrogen oxides, particulates, and carbon dioxide. SO2 concentrations in the fuel gas of some lignite-fired power stations are extremely high and differ notably between power plants, owing to the variation of the sulfur content of the fuels. Although the NOx emissions are lower than SO2 emissions in Turkey, they have likewise increased rapidly, following the growth of energy requirements.

Keywords: Air Pollution, Coal, Lignite, Turkey, Fossil Fuel, Greenhouse Effect

GENOPROTECTIVE POTENTIAL OF ROSA CANINA L. FRUIT WATER EXTRACT ON DNA DAMAGE INDUCED BY EMS IN SOMATIC CELLS OF DROSOPHILA MELANOGASTER

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Abstract:

In this study, the possible genotoxic effects of ethyl methanesulfonate (EMS) which are one of alkylating agent and genoprotective effects of Rosa canina L. fruit water extract (RCwtr) was studied with Drosophila wing somatic mutation and recombination test (SMART). Recessive flare (flr3) and multiple wing hair (mwh) marker genes for SMART were used. In our study, concentrations of EMS and RCwtr were determined by carrying out preliminary studies. Then, sets of experiments containing five different application groups were prepared (distilled water control group, 1 mM EMS, 1 mM EMS+1% RCwtr, 1 mM EMS+3% RCwtr and 1 mM EMS+5 % RCwtr). flr3 virgin female and mwh males of mutant strains were crossbred, and eggs were collected in periods of 8h. The transheterozygous larvae obtained from these eggs after 72±4h were placed in application tubes containing EMS and EMS+RCwtr and Drosophila instant medium. The larvae were kept inside this feed lot until they matured. The mature specimens were collected and their wing slides were prepaired. The wing slides were examined under light microscope (400X) and mutant clones detected were recorded. For statistical calculations, multiple-decision procedure was used to detemine whether the result was positive, negative or incoclusive.

The total clon frequency obtained from distilled water control group, 1 mM EMS, 1 mM EMS+1% RCwtr, 1 mM EMS+3% RCwtr and 1 mM EMS+5 % RCwtr application groups for the normal wings (mwh/flr3) phenotypes were detected as 0.15, 3.55, 2.58, 2.78 and 2.20, respectively. The difference between distilled water control group and 1 mM EMS application group is statistically significant ($P<0.05$). According to the resuts obtained from RCwtr application groups, each group's total clon frequency decreased, depending on the concentration of RCwtr. It was found that the differences between the 1mM EMS and RCwtr. application groups were statistically important too ($P<0.05$).

The findings demonstrate that the constituents of Rosa canina L. have great potential as a natural genoprotective products for D.melanogaster management.

Keywords: Rosa Canina, Smart, Drosophila Melanogaster, Ethyl Methanesulfonate, Genoprotective

ANALYSIS OF IN VIVO GENOTOXICITY OF THE SYNTHETIC PYRETHROID INSECTICIDE "PERMETHRIN" IN HUMAN PERIPHERAL LYMPHOCYTES BY SISTER CHROMATID EXCHANGE (SCE) ASSAY

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Abstract:

The insecticides which are the subgroup of pesticides are used against various endo and ecto parasites to protect public health. The insecticides are classified according to their organic compound contents, namely, organochlorides, organophosphates, carbamates, pyrethroides and neonicotinoids. Pyrethroids are similar to the natural pyrethrines. They are used commonly for control of house pests. As a result, the exposure of these insecticides on humans is inevitable.Permethrin(PER), is a wide spectrum and potent insecticide which is widely used in food production, livestock farming and public health. In this study, the probable genotoxic effects of PER were evaluated by Sister.Chromatide.Exchange.(SCE) test in human peripheral lymphocytes.

We determined four different PER application groups(50,100,250and500ppm) in this study. The chromosome medium containing 5bromo-deoxyuridine(BrdU) was used to prepare cell cultures. We added0.25ml blood and different doses of PER into this medium. After72hours of incubation, smears were prepared and stained by Giemsa technique. The preparations were examined by light microscopewith10x100magnification.

The SCEnumbers of the application groups were compared with the control groups.Distilled water and the solvent of PER, dimethylsulphoxide(DMSO), were used as the negative control and ethylmetansulphate(EMS) is used.as.the positive control. The mean SCE frequency was3.60±0.02and3.70±0.01 for distilled water and DMSO, respectively, without any statistically significant difference($p<0.05$). This parameter for EMS was found to be32.61±0.01 andthere was a statistically significant difference between EMS and distilled water($p<0.05$).

The SCEs after application of50,100,250and500ppm PER were observed to be3.97±0.03;4.56±0.02;5.82±0.03and6.15±0.02, respectively. The comparison of all of these results with DMSO yielded a statistically significant difference($p<0.05$). Additionally, the replication index(RI) was calculated in PER application groups. The RI was2.24±0.07 in DMSO and decreased to1.95±0.05;1.88±0.07;2.03±0.04and2.02±0.05 in PER treated groups, respectively, the difference of these values with DMSO was insignificant($p>0.05$).

According to these results, DNA damage was observed in all PER application groups. However, DNA repair mechanisms were detected not.to.be inhibited.

Keywords: Insecticide, Permethrin, Sister Chromatide Exchange, Genotoxicity

THE MYTILUS PROJECT: MONITORING PESTICIDES, TRIBUTLYTIN AND DETECTION OF PARASITE AND VIRAL ACCUMULATION IN MYTILUS GALLOPROVINCIALIS IN EASTERN AEGEAN COASTAL WATERS (IZMIR BAY)

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Abstract:

Organic and inorganic materials as well as infectious agents resulted from rapid and irregular urbanization have roles in pollution of seas. Due to their ability to filter water and accumulate organic and inorganic materials in their tissues, mussels have been used as bioindicators of marine pollution.

The number of studies investigating tributyltin and food borne pathogens in mussels of our country are limited. In order to fill the knowledge gap about this issue, two different national projects were conducted about amounts of chemical (organochlorine pesticides and tributyltin) and biological (parasites and viruses) pollutants in mussels of Izmir Bay.

Study areas were inner, middle, and outer regions of Izmir Bay, Gediz River basin and Mersin Bay near to Izmir Bay. Eight sites were monitored in two years time, once every season. Investigated organochlorinated pesticides were hexachlorobenzene, hexachlorosiklohexane, heptachlor, aldrin, 1,1-bis (p-chlorophenyl)-2,2dichoro etilen, p,p'-dichloro diphenyl trichloro ethane, dieldrin, endrin, dichloro diphenyl dichloro ethane and endosulphan sulphate. Molecular methods were used to investigate biological pollutants and gas chromatography was used to investigate chemical pollutants.

According to the results of the studies inner, middle, and outer regions of Izmir Bay have viral pollution load. HAV and NoV positivities in the mussel samples were 26.7% and 30% accordingly. The mussels were negative for Microsporidium but positive for Giardia. Giardia was detected in one of the stations in two different seasons; winter and spring.

These results indicates that the biological contamination of seafood in our seas might threaten our health.

Organochlorine pesticides and tributyltin levels in Izmir Bay were found as not yet hazardous for public health. However it is engrossing that chronic effect of tributyltin levels on human health is not known.

Detailed studies are needed to determine affects of all these pollutants on human health and ecosystem.

Keywords: Izmir Bay, Mussel, Microsporidium, Giardia, Hav, Nov, Pesticide, Tributyltin.

STRUCTURE OF BACTERIAL COMMUNITY AFTER REVEGETATION OF AN ANTHROPIZED SOIL IN TERGA SANDPIT (ALGERIA)

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Abstract:

Our study focuses on the effect of anthropization and revegetation on bacterial community structures' evolution. We followed on temporal scale in anthropized soil used in the region of Ain Témouchent, Terga, located in the west of Oran (Algeria). This site has been newly replanted by the introduction of two tree species (Schinus terebinthefolius and Tetraclinis articulata) associated or not with two leguminous (Retama monosperma and Lotus creticus). The rhizosphere soil of each test is taken to investigate about the evolution of bacterial communities structure at time = 0 (early planting) after 12 months and 18 months. Bacterial community structure was studied by using metagenomic approach. After purification, DNA samples were amplified in the IGS region. Then, amplicons were characterized by molecular fingerprinting methods: RISA (Ribosomal intergenic Spacer Analysis). Results were analyzed statistically by BCA using R software. Plants effect on bacterial population differs depending to plants species. Thus, it has been demonstrated, from the beginning of planting, Tetraclinis articulata effect on bacterial communities. In fact, bacterial community structure of rhizospheric soil is different from those of bare soil. After 6 months, evolution of rhizospheric bacterial communities continues but there would also be an evolution of bare soil which would be very useful for the rapid restoration of these sites. The evolution continues after 12 months to stabilize at 18 months. Bacterial community structure of bare soil also evolves over time that suggests that plant introduction has also an impact on bacterial community structure of bare soil. However, Schinus terebinthifoliusi had no significant effect on the evolution of bacterial community structure whatever the kind of soil. These results indicate the importance of revegetation on bacterial community structure and demonstrate the utility to follow their evolution to guide the selection of plant species / microorganisms that improve soil biological quality.

Keywords: Baterial Community ; Métagénomique ; Pcr ; Risa ; Pca

STRUCTURE OF BACTERIAL COMMUNITY AFTER REVEGETATION EFFORTS OF AN ANTHROPIZED SOIL IN A SANDPIT OF TERGA (ALGERIA)

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Abstract:

Our study focuses on the effect of anthropization and revegetation on bacterial community structures' evolution. We followed on temporal scale in anthropized soil used in the region of Ain Témouchent, Terga, located in the west of Oran (Algeria). This site has been newly replanted by the introduction of two tree species (Schinus terebinthefolius and Tetraclinis articulata) associated or not with two leguminous (Retama monosperma and Lotus creticus). The rhizosphere soil of each test is taken to investigate about the evolution of bacterial communities structure at time = 0 (early planting) after 12 months and 18 months. Bacterial community structure was studied by using metagenomic approach. After purification, DNA samples were amplified in the IGS region. Then, amplicons were characterized by molecular fingerprinting methods: RISA (Ribosomal intergenic Spacer Analysis). Results were analyzed statistically by BCA using R software. Plants effect on bacterial population differs depending to plants species. Thus, it has been demonstrated, from the beginning of planting, Tetraclinis articulata effect on bacterial communities. In fact, bacterial community structure of rhizospheric soil is different from those of bare soil. After 6 months, evolution of rhizospheric bacterial communities continues but there would also be an evolution of bare soil which would be very useful for the rapid restoration of these sites. The evolution continues after 12 months to stabilize at 18 months. Bacterial community structure of bare soil also evolves over time that suggests that plant introduction has also an impact on bacterial community structure of bare soil. However, Schinus terebinthifoliusi had no significant effect on the evolution of bacterial community structure whatever the kind of soil. These results indicate the importance of revegetation on bacterial community structure and demonstrate the utility to follow their evolution to guide the selection of plant species / microorganisms that improve soil biological quality.

Keywords: Bacterial Community ; Métagénomique ; Pcr ; Risa ; Pca

ATRIPLEX HALIMUS IN VITRO MICROPROPAGATION

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Abstract:

Progresses in industry, town planning and agricultural techniques fields were generally done with the environmentdetriment and ecosystemsbalance. Thus, several plant species on which any future progress depends are in disappearanceprocess. Biodiversityconservationandplant resourcessafeguarding, in particular those adapted to arid and semi-arid Mediterranean regionsoil is necessary for their rehabilitation. Atriplexhalimusis a native halophyte, species which can contribute to the geomorphological and ecological restoration of these grounds affected primarily by the salinization and desertification. It's in vitro propagation by biotechnology techniques is an alternative of choice which facilitates this species quick multiplication thus enabling arid zones wide surfaces revegetalisation programs application. For this purpose axillary buds taken from greenhouse grown plants, are cultivated in vitro on Murashige and Skoog (MS) (1962) medium added or not with growth regulators. Results showed that on half strength MS medium without adding exogenous plant hormones, 60% of the nodes showed shoots formation followed by full strength MS medium auditioned with BAP (44, 6%) and NAA/BAP (44%). Spontaneous rhizogenesisis observed on MS devoided of hormones. Data showed that higher shoots number is obtained when nodes are cultivated on full strength MS medium added with ANA/ BAP.

This study showed that Atriplex halimus in vitro micropropagation can be achieved on half strength MS medium based on only endogenous hormones

Keywords: Biodiversity, Atriplex Halimus, In Vitro Micropropagation, Shoots Formation

ISOLATION OF MICROBIAL AMYLASE FROM VARIOUS AGRICULTURAL WASTES WITH SOLID STATE FERMENTATION (SSF)

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Abstract:

Nowadays, hundreds of enzymes used in industry, as well as many biotechnological processes and products. Amylases which have a large margin in the world enzyme trade and have been used in various industrial areas such as food, beverage, textile, detergent and medicine. In this study, α-amylase enzymes were obtained from various valueless wastes by solid state fermentation (SSF) using Aspergillus niger ATCC 16404 and Bacillus subtilis ATCC 6633. Amylases which were produced from bacteria and fungi by studying various parameters and optimum production conditions were determined. For this purpose, production of bacterial amylase was determined and the best substrate supply was banana husk, incubation time 72 hours, incubation temperature 37 °C, medium pH 7.0, inoculum volume 3 ml, moisture content was found to be 10%. The maximum activity of bacterial amylase was found as 60 °C and pH 6.5. Whereas, the production of fungal amylase was determined and the best substrate supply was rice husk, incubation time 48 hours, incubation temperature 30 °C, medium pH 5.0, inoculum volume 2 ml, moisture content was found to be 60%. The maximum activity of fungal amylase was 40 °C and pH 6.5. Bacterial and fungal amylase enzymes were purified by ammonium sulphate precipitation, dialysis and DEAE-column chromatography. After, their approximate molecular weights were calculated. Accordingly, bacterial and fungal amylases were determined as ~40 kDa and ~44 kDa, respectively. Conclusion of this study revealed that it will enable the amylase production using wastes which were carrying no economic value and provide industrial benefits in many areas.

Keywords: Amylase, Solid State Fermentation (Ssf), Aspergillus Niger, Bacillus Subtilis, Purification

COMPARISON OF THE FENNELLIA NIVEA POWDER AND ACTIVATED CHARCOAL ON BIOREMOVAL OF REACTIVE BLUE 24 DYE

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Abstract:

Synthetic dyes are mostly used in several industrial sectors such as textile, cosmetic, pharmaceutical and leather. The discharge of untreated effluents containing dyes cause environmental and water pollution. Physical and chemical methods are generally used for the treatment of textile effluents. Among the treatment options, adsorption has become one of the most effective and low cost method for the decolorization processes. Different adsorbents such as perlite, lignite, silica gel and activated charcoal are used for removal of dyes from aqueous solutions. Beside these many bacteria and fungi can be used for adsorption processes. The aim of this study is to decolorize Reactive Blue 24 dye using powder of dried Fennelia nivea pellets and compare the decolorization ability between activated charcoal.

Fennelia nivea was isolated from İzmit (Turkey). The culture medium composed of 10 g glucose and 5 g yeast extract per liter. In order to obtain F. nivea powder, culture liquid was separated from biomass through filtration. After filtration biomass was left to dry (4 days 30°C). Dried pellet was homogenized with homogenizer. In further process biomass was sieved (≤0,015 mm). Obtained powder used for decolorization. The decolorization percentage determined spectrophotometrically at 613 nm. In this study, different parameters such as pH(3-10), temperature(20-60°C) and dye concentration(50-250ppm) were tested and decolorization ability at optimum condition was compare with activated charcoal.

The present work demonstrates that powder of F. nivea has highest bioremoval yield (96%) at optimum conditions. When activated charcoal examined, the results showed that it has lower bioremoval yield(75%). Our results also showed that fungal powder could decolorize Reactive Blue 24 effectively at wide pH(3-10) and temperature(20-60°C) range. Consequently, it can be concluded that Fennellia nivea powder could be a more efficient biosorbent than activated charcoal for treatment of wastes containing Reactive Blue 24.

Keywords: Decolorization, Biosorption, Reactive Blue 24, Fennellia Nivea, Activated Charcoal

PHYTOCHEMICAL INVESTIGATION AND ANTI-ACETYLCHOLINESTERASE ACTIVITY OF LEAF EXTRACTS FROM RHAMNUS OLEOIDES L.

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Abstract:

Rhamnus (Rhamnaceae) species have been used for treatment of several diseases (constipation, hepatic diseases and eczema)[1-3]. Inhibition of acetylcholinesterase (AChE, EC 3.1.1.7), the key enzyme in the breakdown of acetylcholine, is considered as a promising strategy for the treatment of neurological disorders such as Alzheimer's disease, senile dementia, ataxia and myasthenia gravis[4]. The phytochemical composition and in vitro anti-acetylcholinesterase activity of several extracts from R. oleoides L. were evaluated by TLC and spectrophometric assays. The best anti-acetylcholinesterase activity results were observed for anthraquinones and alkaloids extracts with IC50 values of 152.63 ± 3.64; 155.17 ± 3.69 µg/mL, respectively. Galanthamine was used as a positive control (IC50 = 0.29 ± 0.0036 µg/ml). Preliminary phytochemical investigation of extracts from R. oleoides L. showed the presence of flavonoids, phenolic acids, anthraquinones, saponins, and alkaloids. Flavonoids, and anthraquinones were abundant in ethyl acetate extract. The anthraquinones extract was investigated by HPLC-DAD-UV and HPLC-API-ES-MS, and was found to contain flavonoids: taxifolin, eriodictyol, quercetin, luteolin, kaempferol, isorhamnetin, rhamnetin, rhamnocitrin, and anthraquinones: emodin, chrysophanol, emodinanthrone, physcion, and other unidentified anthraquinones.

Keywords: Rhamnus Oleoides L., Anti-Acetylcholinesterase, Hplc-Api-Es-Ms, Anthraquinones, Flavonoids

COMPARATIVE STUDY OF ANTIOXIDATIVE ACTIVITY AND PHYTOCHEMICAL COMPOSITION OF TWO SEAWEEDS ULVA LACTUCA (GREEN ALGAE) AND DICTYOPTERIS POLYPODIOIDES (BROWN ALGAE)

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Abstract:

The objective of this study was to compare the antioxidative potential and phytochemical composition of two seaweeds: green algae Ulva lactuca and brown algae Dictyopteris polypodioides, in vitro collected from Bousfer beach (Oran, Algeria).

For this, from the two algae powder three extracts (aqueous, ethanolic and methanolic) were prepared by maceration 24h, at room temperature.

The polyphenols concentration was measured by the Folin-Ciocalteu method and their antioxidative capacity by the DPPH radical scavenging and the iron reduction (FRAP) tests. The phytochemical screening of the different extracts was determined by colorimetric and fluorescence reactions.

The results showed that polyphenols concentrations were variable, the greater was found in brown alga methanolic extract which was a 5-times greater than that found in green algae, while the highest concentration for the green algae was noted in the aqueous extract.

The results of DPPH radical scavenging showed that the antioxidative power was noted in the ethanolic extract for both algae. The lowest value was observed in Ulva lactuca aqueous extract being greater than 15% in Dictyopteris polypodioides. Furthermore, the iron reduction test (FRAP) showed similar abilities between the extracts and the control for the both algae.

The phytochemical screening of the different extracts revealed the presence of certain secondary metabolites (phenolic compounds, coumarin, sterols, triterpenes and mucilage) in both species of algae.

In conclusion, thanks to their composition and antioxidative properties, both seaweeds, in particular the brown one, could prevent oxidative stress-related pathologies.

Keywords: Green Algae, Brown Algae, Ulva Lactuca, Dictyopteris Polypodioides, Polyphenols, Antioxidant, Dpph, Frap, Phytochemical Screenin

COMPARATIVE STUDY OF ANTIOXIDATIVE ACTIVITY AND PHYTOCHEMICAL COMPOSITION OF TWO SEAWEEDS ULVA LACTUCA (GREEN ALGAE) AND HALOPITHYS INCURVA (RED ALGAE)

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Abstract:

The aim of this work was to compare the antioxidative potential as well as the phytochemical composition of two seaweeds, red algae Halopithys incurva and green algae Ulva lactuca collected from the Mediterranean coast in west of Oran (Bousfer Sea).

From the algae powder, aqueous, methanolic and ethanolic extracts were prepared. The polyphenols quantification was realized by Folin-Ciocalteu method. The antioxidative activity was evaluated by DPPH scavenging test and ferric ion reducing power (FRAP). The phytochemical study was determined by colorimetric and fluorescent methods.

The results showed that phenolic compounds concentrations were 3.39-fold higher in red algae compared to green algae in aqueous extract while this content was 0.44-fold lower in red algae compared to green algae in ethanolic extract. Furthermore, phenolic compounds in methanolic and ethanolic extracts of the two algae decreased compared to aqueous extract.

The antioxidative power by the DPPH test revealed that two algae extracts showed antiradical activity significantly lower compared to the standard. Moreover, the both algae aqueous extract had a low DPPH scavenging capacity compared to the other extracts. This capacity of red algae aqueous extract was 1.45-fold higher compared to that of green algae. The reducing power by FRAP test in the all extracts and for both algae did not vary significantly and approximates to that of gallic acid (standard antioxidant). The phytochemical study for all samples revealed the presence of some chemicals compounds as phenolic compounds, saponosides, coumarins, and sterols and triterpenes

In conclusion, these seaweeds, particularly the red one, were considered as an important source of biologically active compounds which can be used in health, especially in mitigating oxidative stress associated with certain pathologies.

Keywords: Ulva Lactuca, Halopithys Incurva, Anti-Radical Activity, Phytochemical Screening, Polyphenols, Dpph Test, Frap Test, Oxidative S

FOSTERING INDUSTRIAL SYMBIOSIS FOR A SUSTAINABLE RESOURCE INTENSIVE INDUSTRY ACROSS THE EXTENDED CONSTRUCTION VALUE CHAIN

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Abstract:

The overall objective of FISSAC project is to develop and demonstrate a new paradigm built on an innovative industrial symbiosis model towards a zero waste approach in the resource intensive industries of the construction value chain, tackling harmonized technological and non technological requirements, leading to material closed-loop processes and moving to a circular economy. A methodology and a software platform will be developed in order to implement the innovative industrial symbiosis model in a feasible scenario of industrial symbiosis synergies between industries (steel, aluminium, natural stone, chemical and demolition and construction sectors) and stakeholders in the extended construction value chain. It will guide how to overcome technical barriers and non technical barriers, as well as standardisation concerns to implement and replicate industrial symbiosis in a local/regional dimension. The ambition of the model will be to be replicated in other regions and other value chains symbiosis scenarios. The model will be applied based on the three sustainability pillars. FISSAC will demonstrate the applicability of the model as well as the effectiveness of the innovative processes, services and products at different levels:

- Manufacturing processes: with demonstration of closed loop recycling processes to transform waste into valuable secondary raw materials, and manufacturing processes of the novel products at industrial scale

- Product validation: with demonstration of the eco-design of eco-innovative construction products (new Eco-Cement and Green Concrete, innovative ceramic tiles and Rubber Wood Plastic Composites) in pre-industrial processes under a life cycle approach, and demonstration at real scale in different case studies of the application and the technical performance of the products

- FISSAC model, with the demonstration of the software platform and replicability assessment of the model through living lab concept

Keywords: Waste Management, Industrial Waste, Waste Recycling

USE OF DINUCLEAR METAL COMPLEXES FOR THE REMOVAL OF METHYLENE BLUE

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Abstract:

Synthetic dyes are mainly used in cosmetics, food and textile industry. Especially, textile waste waters contain high amount of dyes, which forms a barricade for light to pass underwater resulting in the decrease in photosynthetic levels. This blocking causes the depletion of oxygen affecting the life underwater negatively. Methylene blue meets all negative effects of dyes when used for industrial purposes, beside its extensive use in biology, chemistry, medicine and agriculture. The waste water removal of methylene blue becomes vital due to its negative effects. However, this study focuses on the dye removal capacity of metal complexes than the type of dye.

In this study, we investigated the dye removal capacity of dinuclear metal complexes. For this purpose previously synthesized and characterized Cu(II)-Co(II), Cu(II)-Cu(II) and Cu(II)-Mn(II) complexes of diimine-dioxime ligand are used to remove methylene blue as a cationic dye. The method primarily based on the Fenton reaction which comprises the oxidation of dye by H2O2 in the presence of metal ions. Three dinuclear metal complexes are compared in their efficiency to remove methylene blue in varying conditions like time and temperature. The effect of dye concentration on the removal percentage is also investigated.

Keywords: Decolorization, Dye Removal, Dinuclear Metal Complexes, Methylene Blue

USING ENTOMOPATHOGENIC FUNGI FOR CONTROL OF BIODIVERSITY

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Abstract:

Biodiversity keeps ecosystems in balance and maintains the life. Turkey has got high rate of biodiversity because of its location, geographical formations and agroecologic zones. The protection of biodiversity in agricultural areas is an important issue. Pests which cause damage on agricultural products effect biodiversity negatively. The pests which their effect on crop losses under the economic threshold keep the biodiversity. Using chemical pesticide for pests control have a negative effects on ecosystems, and human health. For these reasons biological control is significant. Especially, entomopathogenic fungi are particularly part of the biological control. Beauveria bassiana ability to infected lots of pests. B. bassiana most common entomopathogenic fungi in nature.

In this study 6 different B. bassiana strains and their 3 different concentrations (1x107, 1x106, 1x105 conidia/ml) were applied to larva of agricultural pests which names are Leptinotarsa decemlineata and Tenebrio molitor. To prepare the spore solutions, B. bassiana cultivated SDAY medium and incubated 2 weeks at 28C.

Obtained data were analysed using SPSS 16 program. As a result of this study, three different concentrations of six different fungi strains have been successfully applied on the Tenebrio molitor and Leptinotarsa decemlineata. Each insect species tested on fungi strains showed different effects. Considering the LT50 and LD50 values, it was found out that KVL 03129 and Bolu strains were more effective for T. molitor, and L. decemlineata was more effective for the KVL 03129 strain. When the average death times of B. bassiana strains experimented on different concentrations were compared, it was found out that the highest concentration of each strain was the most effective. Considering B. bassiana spores can be used widely the control of the biological diversity.

Keywords: Entomopathogenic Fungi, Beauveria Bassiana, Biodiversity Protection

INVESTIGATION OF SOME CULTURAL CONDITION ON BIOLOGICAL DECOLORIZATION OF BASIC RED 46 BY SPIRULINA PLATENSIS

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Abstract:

Due to rapid industrialization and urbanization a lot of chemicals, including dyes are manufactured and used in daily life. Wastewater from textile industries creates a great pollution problem due to the dye content.

The objective of this study was to investigate the decolorization capacity of Spirulina platensis. The study was performed in Zarrouk media and as dye material an azo-dye, Basic Red 46 was used. After 240 hour of incubation, the decolorization rate was estimated as %96.48. Optimum cultural conditions for decolorization, such as incubation period, media pH, inoculum amount, dye concentration, static or rotational incubation, were investigated. The decolorization of Basic Red 46 was determined spectrophotometrically at 545 nm wave length. The following equation was used to calculate the percentage of decolorization:

(%) = [(ODi – ODf) / ODi] ×100]

All experiments were carried out for 240 hours. While the optimal pH value for color remover was detected as 9.0, in the 96th hour of the incubation period and at 40°C, the decolorization rate was 96.7%. For Basic Red 46 color remover, static incubation was more effective when compared to rotational conditions. In this study, it was also determined that, an increase in the dye concentration caused a decrease in decolorization. When initial dye concentration was 50 ppm, 97.2% decolorization at the 240th hour of incubation was observed and in the similar experiment period with 75, 100, 125 ve 150 ppm of dye concentrations, decolorization effetiveness was recorded as %93.05, %34.1, %32.4 and %3 respectively.

As a final result, it was detected that decolorization of Basic Red 46, with Spirulina platensis, increased when the incubation was performed under optimal conditions.

Keywords: Microalgae, Dye Decolorization, Spirulina Platensis, Basic Red 46

ZOOPLANKTON STUDIES IN THE BOKA KOTORSKA BAY (SOUTHERN ADRIATIC) – LARVAE

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Abstract:

Data presented in this paper are results of a study performed in period January-December 2010 in Boka Kotorska Bay. During that period, hydrographic parameters and zooplankton were intensively sampled at seven fixed stations. Three of these stations were placed in the shallow part of the Bay near the shellfish farm, and four in the middle parts of each smaller bay that are part of Bokokotorski Bay. The program and locality of stations in the study were purposefully chosen to enable a thorough study, yielding new data on hydrographic conditions and zooplankton biocenosis. The results are based on the yearly cycle of monthly series of zooplankton sampling, as well as the data on physical-chemical conditions of the sea. Boka Kotorska Bay is a relatively closed part of the sea, with specific features such as the pronounced influence of surrounding land and an immense influx of fresh water. The impact of the open sea is strongest in Hercegnovski Bay, while toward the inner waters of Boka Kotorska Bay it gradually decreases. The special ecological conditions in Boka Kotorska Bay are reflected on taxonomic structure, distribution and abundance, both of individual species and the zooplankton as a whole. Results of this research include the biological monitoring at the Bay, based on following certain species within the zooplankton and the functional attributes of the ecosystem, plankton diversity and communities of zooplankton species. The combination of collected data were used to define the ecosystem of the Bay and to determine the degree of anthropogenic degradation within it. In this paper we present the hydrographic data of Boka Kotorska Bay, together with data on presence, abundance and distribution of the larvae: decapoda, ophiurida, echinida, cirripedia, bivalvia, bipinaria, tornaria, auricularia, mitraria, nauplius larvae and pisces larvae.

Keywords: Adriatic Sea, Boka Kotorska Bay, Zooplankton, Larvae

SOME PHYSIOLOGICAL RESPONSES OF HAZELNUT TREES UNDER DRY CONDITIONS

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Abstract:

This study conducted to search some physiological responses such as leaf water potential (LWP), stomatal conductance (gs) and photosynthetically active radiation (PAR) of hazelnut trees (Corylus avellana L.) under dry conditions in 2013 and 2014. At the same time, possible effects of those physiological responses on hazelnut trees vs. soil water content (SWC) was investigated. Results showed that yearly ET of hazelnut trees was higher in 2014 than 2013 while seasonal ET of hazelnut trees was higher in 2013 than 2014. Yield, LWP and gs were higher in 2014 than 2013 while PAR and SWC were mostly higher in 2013 than 2014. The relationships of linear regression of LWP, gs and PAR, and SWC effect on LWP, gs and PAR were very slightly. These differences could be due to climate variability such as precipitation and temperature during the studied years. Therfore, it can be stated that hazelnut trees may be required supplement irrigation in dry summer such as in the year of 2013. As a result, it can be finalized that hazelnut trees can be grown well, even give normal yield, in areas where 950 mm precipitation have.

Keywords: Leaf Water Potential, Stomatal Conductance, Dry Conditions, Hazelnut, Black Sea

FIXED-BED-COLUMN STUDIES FOR METHYLENE BLUE REMOVAL AND RECOVERY BY UNTREATED COFFEE RESIDUES

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Abstract:

This paper contributes to the Industrial Ecology concept by using a common urban solid waste, i.e., coffee residues, to clean industrial wastewaters polluted by basic dyes, e.g., Methylene Blue. For the data from the continuous fixed-bed column system, two common models, namely (a) Bohart and Adams and (b) Clark, were implemented. The Bohart and Adams capacity was up to N = 46166 mg L-1 or q0 = 104.5 mg g-1 for bed-depth 15 cm, initial dye concentration 800 mg L-1 and flow rate 20 mL min-1. The results revealed that the Methylene Blue is fairly adsorbed on coffee residues. Consequently, this process can be applied as a low cost technique for cleaning basic dyes from the aquatic environment.

Keywords: Adsorption, Desorption, Column, Methylene Blue, Coffee Residues, Wastewaters

MEIOFAUNA AS AN ENVIRONMENTAL BIO-INDICATOR IN MARINE ECOSYSTEMS

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Abstract:

Metazooan meiofauna are defined by their body size (44-1000 µm) and are the most diversified element of the marine biota. The use of meiofauna as a biological indicator is a more recent development than the utilization of macrofauna in the assessment and monitoring of aquatic ecosystems. The advantages of the former are numerous and strongly emphasized by many scientists, while some of the arguments traditionally advanced against their use underline difficulties in identification, the high rate of sampling frequency and the microscopic size of these organisms. However, new technologies and tools, such as standardized methodologies, electronic identification keys, molecular approaches and the creation of new indices, currently allow for and promote the use of meiofauna in ecological studies. Whilst less is currently known about meiofaunal responses to pollutants, they have certain inherent advantages over the macrofauna in the determination of the biological effects of pollutants at the community level. Meiofaunal communities are inherently more stable, both qualitatively and quantitatlvely, on a seasonal and year-to-year basis, than those of the macrofauna, and it is obviously easier to monitor temporal changes in community structure from a stable rather than a fluctuating baseline. The meiofauna are abundant and diverse even in habitats, such as estuaries, which are subjected to considerable natural physical and chemical stress and where only a small numbers of macrofauna species occurs. This work has been supported by bilateral meiobenthos project (TÜBİTAK-The Scientific and Technological Research Council of Turkey and MoS-Ministry of Science of Montenegro, project number 114Y376).

Keywords: Meiobenthos, Bio-Indicator, Black Sea

RELATION OF BUILT AND NATURAL ENVIRONMENT'S EFFECTS ON PUBLIC HEALTH

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Abstract:

Living beings interacted with each other and benefit from natural resources in earth. In life beings; What is human beings main needs after respiration? We can classify as three parts for human needs:

- Food and Drink needs,
- Shelter needs,
- Wearing needs.

One of the basic needs of humanity with the housing needs of the industrial revolution and the decrease as a result of the need for manpower with mechanization, emerged urban concept with the emigration of rural areas and cities is planned in an irregular manner as part of nature -without harming the very nature instead of designing nature- designed in need of shelter and the city has become the axis it consists of dense building blocks. Density of the built environment in the city turned into a concrete jungle with population growth by completing development continues to grow vertically with the technological advances in production systems. This text reference to the ecological cycle is necessary for living things, it emphasized the importance of the natural environment. The damage caused to the environment of man-made destruction of nature is devoted to diseases classified and could lead to damage human health because of the concretion in terms of the destruction of natural environment and increasing the built environment effects human health. In this paper; the relations between ecologic cycle and life, built environment and life will research according to relation of built environment and ecology and built environment will evaluate with effects of human health. As a method, literature review and discourse analysis method will use. The example of İstanbul will evaluate according to changing built environment and ecology ratio and effects of built environment on public health will be state.

Keywords: Keywords: Public Health, Built Environment, Human, Ecology, Concretion.

TREATMENT OF BEVERAGES INDUSTRY WASTEWATER BY ELECTROCOAGULATION PROCESS

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Abstract:

This study aimed to develop an easy and economic technique for beverages wastewater treatment in order to obtain high quality treated effluent. A batch electrocoagulation study was conducted using iron and aluminum electrodes. The studies were conducted to investigate the effect of various operational parameters on the treatment efficiency. Fe-Fe, Al-Al, Fe-Al, Al-Fe electrode were used as anode and cathode. Al-Al provided maximum COD removal efficiency. Applied voltage of 12.5 V, spacing of 2 cm at a pH of 7.0, a maximum soluble COD removal efficiency of 60.5% Al-Al electrode was obtained after a reaction time of 120 min.

Keywords: Electrocoagulation, Beverages Industry Wastewater

ADVANCED ELECTRODES FOR VANADIUM REDOX FLOW CELLS BASED ON MODIFIED CARBON NANOWALLS

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Abstract:

An advanced electrode, designed for vanadium redox flow cells, with improved wettability, was obtained by PECVD, in mixed plasma (Ar, H2 and C2H2) on carbon paper (Toray). The plasma deposition, driven in certain condition, conduct to vertical aligned carbon nanowalls, which are further modified using nitrogen or oxygen plasma. The resulting carbon structure contains pyrrole derivates, when nitrogen plasma is involved, respectively oxygen derivates, such as hydroxyl, carbonyl and carboxyl (XPS measurements), with a higher wettability then unmodified carbon nanowalls structures. The measurement of wettability was performed via contact angle technique, using a self made device based on a microscope CCD camera.

Also, information regarding the ratio of the wettable specific surface was given by electrochemical measurements such as EIS, cyclic voltammetry and chronoamperometry, with good results. Electrochemical measurements were carried out in 3M H2SO4 + 1.5M (VO)SO4 electrolyte at room temperature. The measurement cell consists in two compartments separated by a proton exchange membrane (PEM). The current collectors were made from carbon felt, placed in contact with PEM and the electrolyte flow was assured by two independent peristaltic pumps. The results indicated that the electrochemical activity shown better result for the samples exposed to nitrogen plasma, compared with those which were modified by exposing on oxygen plasma and with those unmodified.

Keywords: Carbon Nanowalls, Vanadium Redox Flow Battery, Eis, Wettability, Plasma Modified Electrode

INVESTIGATION OF MICROBIAL QUALITY AND TOXICITY OF INDUSTRIAL WASTEWATER TREATED WITH MEMBRANE FILTRATION

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Abstract:

In this study, the microbial quality and toxicity of inlet and effluent water of MBR treated wastewater was investigated. Also, post-treated MBR effluents by nanofiltration (NF) and reverse osmosis (RO) were monitored.

Plate Count Agar method was used for counting total aerobic mesophilic bacteria in water samples. The results are evaluated in accordance with the range of 30-300 bacteria count and given as cfu/mL. Multiple-tube fermentation test was used for total coliforms, total fecal coliforms, fecal streptococcus and Clostridium sp. analysis. The results obtained were interpreted in accordance with Most Probably Number (MPN) method. Microtox (Vibrio fischeri) was used for toxicity analyses.

Average results for MBR inlet (S1), MBR effluent (S2), MBR+NF effluent (S3), mixture of MBR + RO effluents (S4) were as follows:

1. Total aerobic mesophilic bacteria; 1.0×107(S1), 2.3×103 (S2), 1.0×103 (S3), 6.8×103 (S4) (cfu/mL)

2. Total coliforms; 3.4×106 (S1), 2.8×103 (S2), 4.7×100 (S3), 4.0×102 (S4) (mpn/100 mL)

3. Fecal total coliforms; 7.6×105(S1), 3.6×102 (S2), 1.0×100 (S3), 1.5×101 (S4) (mpn/100mL)

4. Fecal streptococcus; 9.3×105(S1), 1.1×102 (S2), 0 (S3), 7.7×100 (S4) (mpn/100mL)

5. Clostridium sp. 2.4×105 (S1), 7.7×101 (S2), 0 (S3), 0 (S4) (mpn/100mL)

The treatment of wastewater by various membrane processes affect its microbial quality and toxicity. Such evaluation is needed if the treated water will be considered for reuse in irrigation.

Acknowledgement: We acknowledge TUBİTAK (Project no. 114Y500) and ITOB-OSB for their supports.

Keywords: Membrane Bioreactor, Microbial Quality, Toxicity, Wastewater Treatment

FLUORIDE TOXICITY ON HEMATOLOGICAL PARAMETERS IN NIL FISH (OREOCHROMIS NILOTICUS)

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Abstract:

Fluoride is highly mobile and non-metallic toxic element of aquatic systems. The hematologic parameters (WBC, RBC, Hb and Hct) of Nil fish (Oreochromis niloticus) were investigated. In this experiment, fish were exposed sublethal fluoride concentrations (1 and 10 mg/L) for 24–48–72 h. The hematologic parameters (WBC, RBC, Hb and Hct) were analyzed by spectrophotometric methods. In this study, white blood cells (WBC), red blood cells (RBC) and hematocrit values (Hct) shown a decrease in 10 mg/L fluoride concentration ($p < 0.01$) for 24, 48 and 72 h. The most decrease of these has been the white blood cells (WBC) in 10 mg/L at 72 h.

Keywords: Fluoride, Blood, Oreochromis Niloticus, Toxicity

EFFECT OF DRYING TECHNIQUES ON VIABILITY AND BIODEGRADATION ACTIVITY OF PSEUDOMONAS SP.

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Abstract:

Pseudomonas sp. which used hydrocarbon biodegradation of wastewater was isolated active sludge of waste water treatment unit of petrochemical wastewater plant. Freeze-drying is a commonly used method to preserve bacteria, in research as well as in industry. This studied was comparative effect of different protective agents and lyophilization techniques on Pseudomanas sp. viability and biodegradation activity after lyophilization .

Pseudomonas sp was cultured with 50ml Nutrient Broth medium in 250 ml conical flask at 27 ºC and 150 rpm. The bacterial cells harvested by centrifugation (10000 rpm 3 min) and were added in lyophilization vials with sterile protective agents: skim milk, sucrose, silica individually and in combination. Vials were kept 24 hours at -80 ºC for freeze drying method , +4ºC for liquid drying methods. After overnight storage in the freezer, samples were desiccated in an Labconco FreeZone 6 freze dryer at a condenser temperature -40 ºC, and at a chamber pressure <0.1 mbar for 48 h. After lyophilization the samples (1.-3.-5.-15.-30. weeks) were brought to their original volume with sterile Phosphate-Buffered Saline (PBS) and incubated at room temperature for 15 min.Serial dilutions were plated on Plate Count Agar (PCA) and measured biodegradation activity of HPLC. The bacteria was supplemented with single hydrocarbon compound as sole carbon source (100 mg /L TA) in Bushnell – Hass Broth and measured biodegradation activity of HPLC.

The initial concentration used was $2x10^8$ cfu/ ml.Bacterial survival rates showed that Pseudomonas sp. with skim milk as protective medium could still reach 1,5x 10 6 at 4ºC after 30 week .

Biodegradation activity of Pseudomonas sp. remained same before and after lyophilization. It was showed that the degradation ratios of terephthalic acid that is the initial concentration of 100mg/L was 100 % after 7 hours.

Acknowledgements : This work was funded by the research project SANTEZ-00719 STZ 2014 of Republic of Turkey, Ministry of Science, Industry of Technology

Keywords: Freeze Drying,Liquid Drying, Protective Agents, Biodegradation, Pseudomonas Sp.

OBTAINING STABILIZED INOCULATION CULTURE FOR PETROCHEMICAL INDUSTRY WASTEWATER TREATMENT

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Abstract:

Biological wastewater treatment has been used on a large scale since the 19th century. However, the demands and requirements imposed on a wastewater treatment system have broadened significantly over the years from pathogen removal, reduction of organic carbon, removal of inorganic nitrogen and phosphorous compounds to the degradation of recalcitrant xenobiotic compounds. The establishment of a microbial community capable of effective xenobiotic removal is often impaired by slow or lacking adaptation of an existing sludge to the compound, accompanied by breakdown of N-, P-, and C-removal and loss of settleability. Bioaugmentation, the introduction of new metabolic functions by the addition of bacteria or genetic information, is a possible way to overcome these problems. A major obstacle to successful bioaugmentation is the often insufficient establishment of the desired functions within the community.

In this study, microorganisms which have high capacity of degrading various hydrocarbons such as terephthalic acid, p-Toluic acid, 4-cba were isolated from sludge which taken from PETKIM Petrochemical Holding Inc. In order to identify the microorganisms 16srDNA PCR was carried out. Biodegredation capacity of microorganisms was measured in HPLC by creating standart curve graphs for each chemical. In order to long term preservation of microorganisms, liquid drying and freeze drying lyophylization methods were performed. Results obtained after one week and a month, number of viable microorganisms was in desirable range . By the end of this study we aim to preserve more stable, active micrıoorganisms with high capacity and long shelf life.

Acknowledgements:
This work was funded by the research project SANTEZ-00719 STZ 2014-of Republic of Turkey, Ministry of Science, Industry of Technology.

Keywords: PTA, Biodegredation, Wastewater Treatment, Sludge, Bioaugmentation, Hydrocarbons, Lyophylization

CONSUMER BEHAVIOR IN THE RECYCLING OF ELECTRICAL AND ELECTRONIC WASTE: THE CASE OF SIVAS

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Abstract:

In recent years, as an inevitable consequence of the technological advances has increased electrical and electronic equipment consumption in the world. And this waste electrical and electronic (e-waste) equipment problems have been come together.

The e-wastes contain certain heavy metals such as mercury, lead, cadmium, chromium etc. and CFC, PCB, PVC, halogenated compounds, asbestos and arsenic. They require substantial precautions in disposal stage. E-waste problem becomes even greater when we consider that large space they occupy and the toxic substances in them. Today, collecting e-waste to recycle and to recover heavy metals in them under healthy conditions is also important for environment and human health. However, at this point, both the manufacturers' and end-users' should be more sensitive.

This study was conducted on the basis of end users' awareness of e-waste with a survey conducted in the Sivas. Face to face survey technique was applied to individuals. It was worked with a total of 100 people in the central of Sivas. Survey work was made in the street with 23%, at home with 42%, in the workplace with 35% of individuals.

At the result of survey which is applied to learn consumption tendency related to the electronic and electrical equipment's and waste in Sivas. We saw that consumers haven't a sufficient information about electronic and electrical equipments. If we make informed to the users about subject, they will contribute highly to the electronic and electric equipment's recycling. And as a result of this, it is thought that important addition will be gained to save natural resources and national wealth. It appears that as a result, in the city center of Sivas not reached the desired level of electronic and electrical equipment's recycling and recovering activities yet. Only 15% of the individuals give to the relevant places to recycle e- wastes.

Keywords: Waste Management, Electrical And Electronic Waste, Recovery/Recycling

COMPARATIVE STUDY REGARDING POWER DENSITY IN REDOX FLOW CELL VERSUS ELECTROLYTE COMPOSITION

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Abstract:

A study regarding increasing power density in redox flow cell via enhancing the solubility of (VO)SO4 using different additions in form of ionic electrolyte, was performed for standard vanadium redox flow using electrochemical methods (electrochemical impedance spectroscopy-EIS, cyclic voltammetry, chronoamperometry) in full cell configuration. The measurement cell consists in two compartments separated by a proton exchange membrane (PEM). The current collectors were made from carbon felt, placed in contact with PEM and the electrolyte flow was assured by two independent peristaltic pumps. The electrochemical measurements were conducted to establish the optimal proportion between the components of the electrolyte and the influence of hydrochloric acid over the intrinsic performance of the cell, compared with standard (VO)SO4, sulfuric acid and water. Also, electrochemical measurements aim to establish the long term influence of hydrochloric acid over membrane properties, in order to trade between these two electrolytes for certain application.

From the comparative study regarding the electrolyte composition, the best result was obtained from 3M H2SO4 and 3M HCl, in which the solubility of (VO)SO4 increased from 1.5M up to 2.5M.

Using this improved electrolyte, the power density increased from 20W/l up to 53W/l.

The long term influence of the hydrochloric acid over the membrane properties is still subject of experimental study.

Keywords: Power Density; Vanadium Redox Flow; Electrolyte Composition; Proton Exchange Membrane; Vanadyl Sulfate Solubility

STUDY REGARDING PROTON EXCHANGE MEMBRANE EFFICIENCY IN VANADIUM REDOX FLOW CELL

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Abstract:

A procedure for proton exchange membrane (PEM), based of fluorinated polymers activation and chronoamperometric and EIS measurement in a dedicated vanadium redox flow cell is described. In order to activate PEM, different procedures were applied, starting from dried polymer, up to fully prepared material. The activation procedure has two major steps, starting from dried polymer, which are, membrane hydration, sulfation using a mixture of pure sulfuric acid and oxygenated water, at boiling temperature. The study aim to establish the best activation procedure in order to fulfill the condition regarding proton exchange capacity related to (VO)SO4 based electrolytes. The measurement cell consists in two compartments separated by a proton exchange membrane (PEM). The current collectors were made from carbon felt, placed in contact with PEM and the electrolyte flow was assured by two independent peristaltic pumps. The electrochemical measurements are conducted so to establish the membrane dynamic electrical resistance as part of total internal electrical resistance of the flow cell, to allow further use of collected data in calculus of industrial devices. Also these measurements aim establish the maximum surface current density and to evaluate the PEM degradation versus time and give a lifetime prediction. The long term degradation of the protonic conductivity is still subject of experimental study.

Keywords: Proton Exchange Membrane; Redox Flow Cell, Membrane Activation, Vanadyl Sulfate

A SOCIAL ECOLOGICAL COLLABORATION: CYCLING GROUPS

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Abstract:

In the last decade, the meaning of cycling has been changed by cycling groups.While the bicycle was used as a transportation vehicle or for sports, nowadays cyclists groups in the cities use it as a social tool. Not only the bicycle is beneficial for the nature, but also has started to serve The Social Ecology Theory of Murray Bookchin. His main idea was that the environmental problems which we have been facing after the industrial evolution can be solved by being allied. In addition,this is why Murray Bookchin calls this alliance social ecology. So in this paper, relationships and similarities between social ecology and cycling groups will be examined.

Purpose of this paper is to pose that cycling is one of the first steps, that provides solutions for healing the nature. Another important objective is, emphasizing that collaborating for our nature is actually as unlaboured as cycling together. Having said that, the main purpose is acknowledging that cycling groups has just started to save the nature by their collaboration as mentioned in the theory.

In order to conduct the research, chosen methods consist of literature research and case study. As the literature research will provide some general information about The Theory Of Social Ecology, bicycle and cycling groups, the case studies will consist of a questionnaire that will be done with cyclists and examining the known cycling group "Critical Mass". The questionnaire will measure environmental awareness and knowledge level of what cyclists theirselves do. In addition, by examining the Critical Mass, relationships and similarities between the main ideas of Critical Mass and the theory of social ecology will be scrutinized. After completing all the research steps, personal opinions will be provided and possible questions will be elucidated.

Keywords: Social Ecology, Cycling Groups, Cyclists, Bicycle, Environment

DETERMINATION OF SOME TRITICALE VARIETIES FOR PHOSPHORUS AND PROTEIN CONTENTS IN SIIRT PROVINCE

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Abstract:

This study was carried out to determine the phosphorus and protein contents of 7 different triticale varieties (Egeyıldızı, Alperbey, Mikham 2002, Karma 2000, Tatlıcak-97, Ümran Hanım and Melez 2001) in Siirt ecological conditions in 2014-2015 growing season. The study was conducted in a split plot experimental design with three replications.

In the study phosphorus and protein values of seeds were investigated. According to the results, statistically significant differences were observed among triticale varieties in properties analyzed. In the study phosphorus and protein contents changed between respectively 0.107-0.287 % and 10.2-12.1 %. The highest protein content was founded as 12.1 % in Karma 2000 variety and the lowest was founded as 10.2 % in Alperbey variety. And also the highest phosphorus content was obtained as 0.287 % in Karma 2000 and the lowest was founded as 0.107 % in Mikham-2002 varieties.

According to results, both the highest phosphorus and protein contents were found in Karma 2000 variety. Karma 2000 variety could be considered a hopeful triticale variety in Siirt province for phosphorus and protein contents.

Keywords: Cereal, Triticale, Phosphorus, Protein

PHYTOREMEDIATION CAPACITY OF WOOD SPECIES ON URBAN ROADSIDE IN VAN PROVINCE

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Abstract:

Phytoremediation is recognized an innovative biological technique to reclaim land contaminated by heavy metals and other pollutants.

The researches in this field are generally conducted using hyper accumulator plants. In this study heavy metal pollution due to traffic in the leaves of four tree species (Thuja orientalis, Platanus orientalis, Robinia pseudoacacia Umbracuifera and Cupressus arizonica) growing on urban roadside was investigated. Leaf samples of the tree species were taken from the roadside area affected heavy metal pollution due to intensive motorrized traffic and from coastal areas far away from the intensive traffic.

Zinc, nickel, lead, cadmium concentrations were determined in leaf samples. The significant differences ($p<0.01$) among the plant species were found according to Zn, Ni, Pb and Cd contents of leaves. There were also significant differences ($p<0.01$) among locations for Zn, Ni, Pb and Cd contents of leaves. Interactions between locations and tree species were also significant ($p<0.01$).

The highest Zn, Ni and Pb contents were obtained as 44.36 mg kg-1, 6.33 mg kg-1 and 4.76 mg kg-1 in Robinia pseudoacacia Umbracuifera.

The highest Cd contents were found as 0.52 mg kg-1, 0.51 mg kg-1 and 0.50 mg kg-1. In Thuja orientalis, Robinia pseudoacacia Umbracuifera and Cupressus arizonica respectively.

The heavy metal contents of leave belong to tree species in roadsideswere higher than those in coastal area far away from intensive traffic.

Keywords: Accumulation, Heavy Metals, Phytoremediation, Tree Species

CLEAN ENERGY PRODUCTION USING MICROBIAL FUEL CELLS (MFC) AND WHITE ROT FUNGI

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Abstract:

Nowadays, the growing need for energy with developing technology has caused to the rapid exhaustion of natural energy sources. This problem have led to the search for alternative energy sources. One of these alternative energy sources is Microbial Fuel Cells (MFC). MFC is a system capable of converting chemical energy directly into electrical energy with the help of microorganisms in the organic wastes. MFC's which work depending on electrochemical reactions usually consist of a membrane and anode-cathode compartments. In this study, organic matter removal and power generation are provided from synthetic waste water with two-chamber reactor. Carbon paper was used as the anode and cathode portion of the electrode when anion exchange membrane (Nafion 117) was used as a membrane. The bacteria used for the anode compartment were obtained by passaging from samples taken under the ground and food waste and synthetic waste water is formed in an anode compartment. Nitrogen gas was given with a pump to provide anaerobic conditions in the anode compartment and it was allowed to stir continuously. Trametes versicolor used in the cathode chamber is produced in Complete Yeast Medium agar and then mycelium forms were obtained in minimal agar. These mycelium were placed on the cathode compartment and oxygen has been supplied. This MFC system was attached to a flow meter (Fluke 289 TrueRMS Multimeter) using 1Ω external resistor and electrical efficiency analysis was made with a software program. According to the results, it was obtained approximately 15 mV energy with this system. In this study, it was clearly seen that when the COD (Chemical oxygen demand) concentration of system has increased, voltage production has also increased. Although MFC reactor is small by volume, it is thought that the same size of the electrode and membrane surface area has affected electricity production performance positively.

Keywords: Microbial Fuel Cells, Trametes Versicolor, Clean Energy Production

THE EFFECTS OF NITRITE ON HEMATOLOGICAL PARAMETERS OF NIL TILAPIA (OREOCHROMIS NILOTICUS LINNAEUS, 1758)

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Abstract:

The main objective of this study is to determine the effects of hematological parameters of nitrite concentrations on Oreochromis niloticus. Fish were exposed to acute nitrite (0.1, 1.0 and 5.0 mg/L) at 24 hours and 96 hours, respectively. Blood samples from fish were analyzed in order to identify and evaluate changes in the hematological parameters (Hct, Hb, RBC and WBC). Autoanalyser spectrophotometric methods were used in determining all blood parameters. When compared to control fish, the most increase in hematological parameters was found in Hct and WBCc of all nitrite concentrations at 24 hours and 96 hours, but Hb and RBCc decreased in all concentrations. In our study, blood parameters indicated that O. niloticus were sensitive to the distribution of nitrite on aquatic systems.

This study was supported by a research project from the University of Çukurova, Scientific Research Projects Department (Project Number: FBA-2014-2722)

Keywords: Hematology Parameters, Orochromis Niloticus, Nitrite

EFFECTS OF SALT, IONIC AND OSMOTIC STRESS ON GERMINATION AND PHYSIOLOGICAL PARAMETERS OF TRANSGENIC TOBACCO PLANTS CARRYING TANAC69-1 GENE

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Abstract:

Environmental stresses such as drought and salinity greatly affect plant production leading to reduction in yield and quality. Stress tolerant plants can be rapidly produced by transferring stress related genes or transcription factors to crop plants. In this study, salt and osmotic stress response of transgenic tobacco plants carrying TaNAC69-1 gene were examined by using some physiological assays.

Seeds of wild type and transgenic tobacco plants were germinated on medium containing 250 mM NaCl for salt stress, 300 mM mannitol for osmotic and 100 mM LiCl for ionic stress. Germination and survival rates of plantles were recorded after 7 and 14 days respectively. For control, MS media was used. Plantles germinated on control media were transferred to control, NaCl, LiCl and mannitol including medium. After 30 days, root and shoot lengths, and fresh weights were measured. For root and shoot dry weight measurements, root and shoot of plantlets were kept in an oven at 60 C for 2 days.

Germination and survival rates of transgenic tobacco seeds were significantly higher than wild type seeds when subjected to NaCl and LiCl treatment. Root and shoot lengths, fresh and dry weights of transgenic plants significantly increased when compared to wild type plants with application of NaCl and LiCl. On the other hand there was no difference between growth parameters of wild type and transgenic lines with mannitol treatment.

According to physiological analysis, overexpression of TaNAC69-1 gene increased salt and ionic stress tolerance of transgenic tobacco plants.

Keywords: Tanac69-1, Transgenic Tobacco, Abiotic Stress, Germination, Plant Physiology

SHORT-TERM EFFECT OF NANOPARTICLES ZNO AND TIO2 ON DAPHNIA MAGNA

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Abstract:

It is estimated that among inorganic nanomaterials the highest production is characteristic of npZnO and npTiO2. The growing scale of production of NPs involves the risk of their release into the environment. As primary consumers, zooplankton plays a key role in aquatic ecosystems. D. magna, being sensitive to pollutants, are excellent aquatic models and being widespread in lakes is easy to culture.

Acute assays were performed 50 mL of test solutions. Randomly six individuals-neonates (<24 h-old) were divided per groups of npTiO2 (0.1, 1, 5, 10 and 50 mgL-1), npZnO (0.1, 1, 5, 10 and 50 mgL-1), cocktail concentration (25 ml of 0.1, 1, 5, 10 and 50 mgL-1 npTiO2 and same volume and same concentration of npZnO in glass beakers) and control. Three replicates experiments were performed for each concentration and control groups. D. magna were not fed for the duration of the acute experiments. Survivorship (lx) data were evaluated between different groups of cocktail, npTiO2 and npZnO.

In this study, tolerance capacities to change nanoparticles zinc oxide (npZnO) and titanium dioxide (npTiO2) levels of D. magna species is very important to reflect possible changes occurring in the ecosystem. The aim of this study is to present the current state of knowledge regarding the effects of nanoparticle on life parameters of the freshwater crustaceans, Daphnia magna. The differences between npTiO2 and npZnO concentrations and survivorship rate of D. magna were evaluating using Tukey's test.

Consequently, as npTiO2, npZnO and mixture concentration increased, mortality rates were increased. Only, individuals in control and 0.1 groups lived end of the 4th day. These effects on its own were produced a reduction in population growth rate during short-term.

Keywords: Acute, Daphnia Magna, Nanoparticle, Titanium Dioxide, Tolerance, Zinc Oxide

SEASONAL DISTRUBITION OF FISH SPECIES IN A RECENT INDUSTRIAL FISHING BAN AREA

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Abstract:

A total of 26 different fish species identified during the study. Highest values for both indexes were calculated for 2014 fall and 2015 Intense algal blooms occurred on both April of 2014 and November of 2015 in The İzmit Bay. Also several fish deaths were reported from different places among the coast of İzmit Bay after the algal bloom on November 2015. Therefore, low values in diversity indexes from 2014 spring and 2015 fall sampling periods are most likely connected to the algal blooms which happened in the region in winter sampling periods. Lowest index values and also lowest Evenness (E) values were calculated for 2014 spring and 2015 fall.

Keywords: Izmit Bay, Fish, Biodiversity, Shannon-Wiener Index, Sipmson Index

DECOLORIZATON OF INDUSTRIAL TEXTILE DYES BY PHANEROCHAETE CHRYSOSPORIUM

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Abstract:

Industrial colourful wastewaters cause serious environmental pollution in many parts of the world. Synthetic azo dyes are extensively used in textile industry and are not easily degraded into the environment due to their complex structure.

Colour in waste water is highly visible and affects esthetics, water transparency and gas solubility in water bodies, and especially because many dyes are made from known carcinogens , dye wastewaters have to be treated. Furthermore, photosynthetic activity also adversely affected.

Dye wastewater is usually treated by phsical and chemical treatment processes. However, these technologies are usually ineficcient in the removal of colour, costly and little adaptable to a wide range of dye wastewaters.

In recent years, a number of studies have focused on some microorganisms(fungi, algae, bacteria) which are biodegrade and biosorb dyes in wastewaters. Water treatment with biological methods is more effective as well as being economic.

In this study , decolourization of Reactive Black 5 , Reactive Green, Reactive Brown and Solochrome Black are investigated by using Phanerochacaete chrysosporium. As a result of the comparison of decolorization percentage, Reactive Black 5 had the highest rate as 92,5%. So, investigations were proceeded with Reactive Black 5. Optimum physiological conditions were investigated with 3-days old cultures for decolorization occurs in 3 days.High percentages were achieved in glucose, xylose and starch as carbon resource. Microorganisms decolorize with using NaNO3, yeast and nitrogen-free in the percentage of 95% , %96 and 98% as a nitrogen resource. In addition to determine the optimum pH is 4,5 , decolorization is not effected from low temperature, and however decreased decolorization rate was observed when the temperature increased over 40 C.

This study is focused on the fungal decolorization of azo dyes.

Keywords: Microorganisms, Textile Dyes, Phanerocheate Chrysosporium

EFFECTS OF LONG-CHAIN POLYUNSATURATED ω3 AND CONJUGATED LINOLEIC ACID ON INSULIN RESISTANCE, HYPERTENSION AND KIDNEY OXIDATIVE STRESS IN FRUCTOSE-FED RATS

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Abstract:

The aim of the study was to explore the capacity of ω3 or CLA supplementation to improve insulin resistance, hypertension and kidney oxidative stress in animal model of metabolic syndrome induced by a high fructose diet (64%).

Twenty four female Wistar rats were exposed to diets containing either 64% (w/w) starch and 5% sunflower oil(C) or 64% fructose (F), 64% fructose enriched by 1.6% polyunsaturated fatty acids ω3 (F-ω3), or 64% fructose enriched by 1.6% conjugated linoleic acids (F-CLA) during 2 months. Fasting glucose, insulin, lipids, glucose tolerance test and kidney oxidative parameters were measured.

Fructose diet led to the development of obesity, hypertension and glucose tolerance deterioration, despite a decrease in food and caloric intake caused by high leptinemia. An increase in HbA1C, plasma TG, TC, urea, creatinine and kidney TBARS and hydroperoxides and a decrease in NO, SOD and CAT ere wobserved in F rats. Administration of ω3 improved the insulin resistance, decreased plasma glucose, HbA1C, TG and TC followed by decreasing weight gain, food intake and leptinemia. The CLA supplementation induced glucose intolerance, low HbA1C and high HOMA-IR. The ω3 or CLA treatment decreased blood pressure, plasma urea and creatinine, kidney TBARS and hydroperoxides and enhanced NO levels and SOD and CAT activities.

In conclusion, supplementation of w3 or CLA exerts favorable effects in correcting the abnormalities associated to metabolic syndrome such as improving blood pressure, lipid profile, and oxidative stress, suggesting that these bioactive lipids might be able to be used as nutraceutical nutrients in the prevention and/or treatment of metabolic syndrome.

Keywords: Metabolic Syndrome, Fructose, Rats, ω3 Fatty Acids, Conjugated Linoleic Acids, Lipids, Oxidative Stress, Plasma, Tissue

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II. International Conference on Environmental Science and Technology

ISBN: 978-605-66262-9-6