

Mapping, Assessment And Application Of Principal Component Analysis For The Study Of Physico-Chemical Parameters And Heavy Metals In Berrechid Groundwater Morocco

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This work is part of the study of the assessment and mapping of the Berrechid aquifer quality. Physico-chemical and heavy metal analyzes of seven wells are carried out. The water samples were taken on April 2018. The results of the analysis presented in this work showed that the pH values are relatively neutral. In fact, the values found in potassium, magnesium, calcium, chloride and iron ions meet the standards defined by the WHO while the recorded values of electrical conductivity, sodium, nickel and lead and especially nitrates remain high at certain measurement points and far exceed the value recommended by Moroccan standards and do not comply with the standards defined by the World Health Organization (WHO). The groundwater of Berrechid is, therefore, contaminated by these elements and especially nitrates. The application of the principal component analysis on these results, shows that we have two groups of wells: the first group of wells in the positive part of the F1 axis, with waters with high concentrations (Na^+ , Cl^- , Co and Ca^{2+} , Mg^{2+} , K^+) and high values of electrical conductivity, at the level of the wells P1 and P3. The second group of wells in the negative part of the F1 axis are characterized by water at high concentrations of iron at the wells (P5, P6). The correlation circle shows the axis I express 40.63% of the variance shows that SO_4^{2-} , Pb , NO_3^- and K^+ are closely related and evolve in the same direction and this axis opposes (SO_4^{2-} , Pb , NO_3^- and K^+) and iron. Finally, Ni and K^+ are opposite on axis II, which expresses (25.37%) of the variance.

KEYWORDS

Berrechid plain, Groundwater, Physico-chemical analyzes, Heavy metals, Water pollution, Principal component analysis

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Adsorption Of Lead From Aqueous Solution By Using Treated Old Newspapers As Low Cost Adsorbent

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In the present study, treated old newspapers (TONP) was used to remove Pb(II) from aqueous solution, using a batch experiment. Various adsorption parameters, such as pH, initial concentration of Pb(II), adsorbent dose, contact time, have been studied. The experimental data fitted well to Langmuir isotherm. The kinetic process of Pb(II) adsorption on treated old newspapers (TONP) was found to fit the pseudo-second order model. The result shows that treated old newspapers is a good low cost adsorbent as 81% removal of Pb(II) is achieved in the present study.

KEYWORDS

Old newspaper, Adsorption isotherm, Low cost adsorbent, Adsorption parameters

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Emission And Combustion Characterization Of Palm Biodiesel-Methanol Blends With Variable Compression Ratios

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In this study characterization of palm oil biodiesel methanol blends is carried by using performance, emissions and combustion parameters. Four different test fuels are prepared by taking pure palm oil biodiesel as base fuel and varying the methanol content by 5, 10 and 15% by volume. Experiments are carried out to find the emission and combustion parameter for biodiesel methanol blends in a variable compression ratio engine. On average, it is identified that the emissions, like CO, NO_x and smoke are reduced for blends by 16.16%, 19.37% and 49.86%, respectively when compared with pure palm oil biodiesel. The combustion characterization of the engine revealed that there is an increase of ignition delay with a rise of methanol concentrations in the blend.

KEYWORDS

Biodiesel, Methanol blends, VCR engine, Compression ratio, Combustion

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Experimental Studies On Properties Of Self-Compacting Concrete By Partial Replacement Of Cement By Industrial Waste Red Mud And Slag

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Red mud is one of the waste materials that derived from alumina refineries through the Bayer process. The particle size distribution of the red mud and slag is similar to cement. The potential use of the red mud alongwith slag as a pozzolanic material to replace cement in self-compacting concrete (SCC) is assessed by conducting a range of fresh and hardened properties test. The results show that the strength activity is optimum when red mud alongwith slag replacement. Meanwhile, with the use of the waste in SCC, the compressive strength is enhanced. Therefore, the feasibility of utilizing the waste byproducts in SCC is demonstrated. Thus by this method of utilizing the industrial waste in the manufacture of self compacting concrete decreases the possibility of pollution caused to the environment.

KEYWORDS

Alumina refineries, Bayer process red mud, Self-compacting concrete, Slag

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Determination Of Radioactive Radon Gas Concentrations And Some Radioactive Nuclei In Selected Samples Of Plant Fertilizers

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In the present work, the background radiation levels of some solid and liquid plant fertilizers in the local markets were investigated, by a quantitative and qualitative estimate of a number of radioactive elements by using the CR-39 technology and permissible limits identification. The samples had been selected as the most widely used in local markets, 28 different samples (solid-liquid) were taken and adopted the radon concentrations ²²²Rn in the air space (reaction chamber) C_a and within the sample C_s in units Bq/m³ as a basis for estimating quantitative and qualitative levels of radioactive nuclei per sample. Radiation background, which was 4 Tr/cm² and subtract from tracker numbers generated by alpha particle emits from radon gas for each sample studied and obtaining the net number of trackers generated, finally the radon concentration results were compared with permissible limits and it was found that the concentration of radon in the solid-liquid samples were within the permissible limits.

KEYWORDS

Radon concentration, CR-39 detector, Plant fertilizers

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Polyhydroxyalkanoate Production By *Bacillus horikoshii* Isolated From Dump Yard Soil

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Polyhydroxyalkanoate (PHA) is biodegradable polyesters synthesized by bacterial strains and is accumulated intracellularly as hydrolysable ester bonds. In the present study, two PHA producing bacterial strains were isolated from dump yard soil. Screening for PHA production was carried out by incubating the isolates in PHA production mineral salt medium among the two isolates *Bacillus horikoshii* were able to produce medium chain length (MCL) PHA using fatty acids as carbon source. This *Bacillus horikoshii* isolate accumulated PHA upto 48% cell dry mass when utilizing fatty acids as a carbon source. Due to their biological origin, it is an advantage of PHA to degrade naturally and completely dehydrogenated into carbon dioxide and water by the enzymatic activities of microbes. This study reports the isolation and screening of dump yard soil bacteria and subsequent PHA production by *Bacillus horikoshii* under laboratory conditions.

KEYWORDS

Polyhydroxyalkanoate, Fatty acids, Mineral salt medium

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Assessment Of Physico-Chemical Characteristics Of Kurnool-Cuddapah Canal Water In Kurnool City During Ganesh Idol Immersion-A Case Study

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Surface water is highly susceptible to pollution due to surface runoff during storm, joining of industrial effluents, domestic discharges, sewage water, immersion of idols during festivals. The present study involves investigation of physico-chemical properties of Kurnool-Cuddapah canal water in Kurnool city, Andhra Pradesh during Ganesh idol immersion, culmination of the Ganesh Chaturthi festival. Two locations has been chosen for assessment of water quality. One location is 100 m prior to the immersion site upstream and second location is 1 km from the immersion point down stream. Samples were collected 12 hr prior to the immersion of idols, during the immersion period, 12 hr, 24 hr, 5 days and 10 days after the immersion process is completed. The water quality parameters, such as pH, temperature, total hardness, total suspended solids (TSS), total dissolved solids (TDS), total solids (TS), dissolve oxygen (DO), biological oxygen demand (BOD), conductivity and turbidity have been investigated. The studies showed that there were significant variations in the physico-chemical parameters of water samples affecting the quality of water used for irrigation and for drinking purpose in the downstream.

KEYWORDS

Eco-friendly materials, Idol immersion, Kurnool-Cuddapah canal, Pollution, Physico-chemical parameter

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Noise And Emission Characteristics Of Biodiesel Used In Multi-Cylinder Diesel Engine

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Increasing the cost of petroleum products and engine emission has been a matter of great concern for India. Emission and noise pollution is a major problem for automobile designers. Vehicle experiment has been carried out on the chassis dynamometer to examine the energy conversion efficiency emissions of different blends (B50 and B100) of methyl ester of jatropha oil (MEOJ) and methyl ester of pongamia oil (MEOP) are compared to diesel. The experimental results show the brake thermal efficiency of all the blends is slightly lower when compared to diesel fuel. The sound is measured at the engine compartment, driver compartment and passenger compartment. The sound level is low for biodiesel operation than diesel mode operation. Increased NOx emission was observed.

KEYWORDS

Vehicle, Biodiesel, Noise, NOx emission, Diesel

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Potential Role Of Laccase Enzyme In The Decolourization Of The Dye Dimaren Blue HFRL

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This paper concentrates on the application of the fungus *Pleurotus ostreatus*, in decolourizing the azo dye Dimaren blue HFRL. The efficiency of purified laccase in biodegrading various textile dyes has been demonstrated using commercially used textile dye Dimaren blue HFRL in solid plate assay, liquid form and enzymatic degradation. In solid plate assay decolourization study it has been found that *P. ostreatus* is able to decolourize 93.67% Dimaren blue HFRL in 10 days. In liquid media (basal medium) decolourization study has shown that *P. ostreatus* is able to decolourize 85% Dimaren blue HFRL in 10 days. In enzymatic degradation parameters, such as temperature and pH concentrations have been optimized. The laccase enzyme has exhibited the highest decolourizing activity at an optimum temperature of 40°C and at an optimum pH of 5.0. Therefore, it has been proved that *P. ostreatus* is a potential candidate species in colour removal from textile dyeing industry effluent.

KEYWORDS

Pleurotus ostreatus, Laccase enzyme, Decolourization, Dimaren blue HFRL

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Assessment Of Public And Environmental Health Effects Of Wad Medani City Landfill, Gezira State, Sudan

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Wad Madani city produces about 300 tonnes of solid waste per day consisting of household, public streets, markets, factories and medical waste. These quantities of produced wastes used to be collected without any classification or segregation and transferred to be disposed of in the dumping site without any scientific treatment. The study was conducted in Wad Madani city landfill, Gezira State, Sudan to assess and analyze the expected public and environmental health effects resulting from the processing of the waste final disposal. The study adopted several scientific methods including laboratory analysis of soil and water samples in the landfill area, questionnaire, interviews and observation method. The statistical package for the social sciences programme (SPSS) was used in data analysis. Water samples were also taken from two sites near the landfill (drinking water tank and a farm well). Two soil samples were taken from the landfill area as well. A questionnaire designed targeting the people residing near the landfill (391 people). Water analysis showed the presence of *Escherichia coli* bacteria in the first water sample taken from the water tank. The results of soil analysis showed an excessive alkaline appearance in the soil of the landfill. The household wastes used to be mixed with biomedical wastes produced by hospitals, health centers and medical laboratories in the city. The study showed the presence of allergic and respiratory diseases among the residence due to the exposure to the emitted gases from the direct burning of wastes at the site. Finally, referring to our site visits, there was an intensive outbreak of many pests (rodents, cockroaches and house flies).

KEYWORDS

Solid waste, Landfill, SPSS, *E. coli*, Alkaline, Emitted gases, Pests

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Potential Metabolites Of *Bacillus subtilis* Strain Isolated From Rhizospheric Soils Of Revegetated Mine Spoil Dumps

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Identification of plant growth promoting rhizobacteria (PGPR) to be used as a bio-inoculum during the revegetation process of mine spoil dumps becomes necessary since they can aid in the successful establishment of the plants which leads to healthy plant microbe interaction in the rhizosphere. In this study, the potential metabolites produced by a predominant PGPR strain of *Bacillus subtilis* isolated from *Leucaena leucocephala* (C.N- Subabul family- Leguminales) from lignite mines of Neyveli, Tamil Nadu were assessed. In addition to the production of indole acetic acid (41 µg/mL) and gibberellic acid (75.15 µg/mL) in substantial amounts, the organism was able to produce phytochemical constituents, like phenols, proteins, amino acids and various other secondary metabolites as revealed by FTIR, HPLC and GC-MS analysis. The study of the contribution of rhizobacteria in stabilizing the plant microbe interaction can further lead to the development of biofertilizers to improve soil productivity in a disturbed ecosystem, like mine soil dumps.

KEYWORDS

Mine soil, Rhizosphere, Phytohormones, Phytochemicals, *Bacillus subtilis*

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Heavy Metals Concentrations In Drinking Water And Their Effect On Public Health Around Moth Block Of Jhansi District

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The heavy metals contamination is the main environmental problem in the aquatic system since few heavy metals are potentially toxic or harmful for human health. The present study assessed the concentrations of heavy metals in the groundwater and their effects on the human health of the resident around Moth block of Jhansi district, Uttar Pradesh. The total 40 groundwater samples were collected from the handpump for analyses of Al, As, Cd, Cr, Co, Cu, Fe Mn, Ni, Pb, Zn and the results compared with international and national standards as World Health Organization and Bureau of Indian Standard [1,2]. The results found that the maximum numbers of heavy metals of the study area were found in the acceptable limit except at few locations. The heavy metals concentration of Cr, Cd, Co, Ni, Pb of all groundwater samples are found within the acceptable limit while As, Cu, Zn and Mn are found below. The Fe and Al concentrations of the majority of the localities sample are in the range of acceptable limit whereas few indicate high concentration, that is carcinogenic, such as Mahluwa, Lohagad 2, Reb, Bamroli, Bangari and Ata. This result is corroborated with the poor health of the resident around Moth block.

KEYWORDS

Groundwater, Heavy metals, Health risk assessment, Drinking water

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E-Waste: Environmental Issues And Management - A Review

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Electronics has become an integral part of people's life. With upgrade taking place in the technology, the electronics undergoes change to a considerable level day by day. E-waste is obsolete materials from electrical and electronic goods. In many countries managing this e-waste has become a major problem. The e-waste has great economic value if recycled, but unfortunately, it's not recycled as per the different categories of waste. This paper attempts to provide a brief insight about e-waste, quantity generated, its causes, hazards and management of e-waste.

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Impact Of Winery Effluent On The Growth Of *Macrotyloma uniflorum* (Lam.) Verdc

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A study was carried out to investigate the impact of winery wastewater effluent on the growth of *Macrotyloma uniflorum* (Lam.) Verdc. seeds after characterizing the physico-chemical parameters of the winery effluent. Winery effluent collected was acidic with more EC value, having a high amount of dissolved and suspended solids with organic, inorganic, high BOD, COD and it also showed the presence of heavy metals in it, indicating more pollution load in the effluent. *Macrotyloma uniflorum* (Lam.) Verdc. seeds were surface sterilized, washed and grown with different concentrations of winery effluent made with tap water and the only tap water was used to grow the control seeds. Growth assessment was made on the 21st day, to evaluate the impact of effluent on the growth parameters of the seeds grown and the report showed a negative and suppressed effect on increasing the concentration of effluent than the control. So, properly treated effluent can be used for irrigation.

KEYWORDS

Effluent, *Macrotyloma uniflorum*, Physico-chemical, Winery

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Poverty Of Tribal Women Headed Households In Shervaroy Hills

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In patriarchal societies all over the world and in India, culturally the term 'head of the household' is confined to an elderly male member of the family. A male is symbolized as an authority of the household, whereas woman by and large is treated secondary to male. She is supposed to play diverse roles as mother, wife, sister and daughter. The male's role is limited only to taking care of the family by fulfilling the social, physical and integrative needs of the family unit. The place of women in Indian society is quite different from their counterparts across the globe. The lives of Indian women are deeply rooted in the household and family. The destiny of women is linked to that of household, they recognize themselves powerfully with its welfare and yet the panic of losing their family's security generates special vulnerabilities. Episodes like widowhood, separation, abandonment are distressing for women and bring drastic changes in their lives. Such female headed women are accorded the position of lesser esteem in a world of challenges. In the context of Tamil Nadu, there has been scanty attention pertaining to female headed households (FHHs) and hence, there is the absence of reliable data on poverty stricken state like Tamil Nadu characterized by illiteracy, wide-spread poverty, break-down of age-old values, FHHs present a dismal picture. It has been observed that several families in the pockets Salem, Namakkal and Erode districts of Tamil Nadu, run wholly by women, by their widows, divorcees, separated or whose husbands work at distant places. At this backdrop, it is imperative to study the socio-economic problems of FHHs in the district of Salem in the state of Tamil Nadu with special reference to Shervaroy hills. The selection of the study area is made purposively as it is the tribal belt of Salem district.

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