

Prospects and Constraints of Madhupur National Park Management, Tangail, Bangladesh

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The study was conducted in Madhupur National Park (MNP), which is very well known for its characteristics as deciduous forest. This study examined the constraints of park management, causes of deforestation and prospects of Madhupur Sal forests (Madhupur National Park) of Bangladesh. Data were collected from the Madhupur National Park authority and a study was done to have clear scenario of the park management and status of forest over time. It is evident from the study that due to various factors, like anthropogenic disturbances, political abuse, absence of proper rules and regulations, unwillingness of the authority, encroachment of forest by locals/local leaders, illegal cutting of sal trees, agro-forestry, and lack of adequate budget are main constraints for managing the National Park. The study also revealed that about 1-3% of the forest is depleted each year and about 50-80 year later, the forest will be completely vanished or scattered in somewhere. However, the Park will be a sustainable reserve forest for sal trees and other flora and fauna and also be a potential ecotourism spot, if it is properly managed. It is our belief that the study will help to identify the prospects and constraints of Madhupur National Park and also in other National Parks in Bangladesh which ultimately conserve the biodiversity and help to maintain natural balance.

KEYWORD

National Park, Prospects, Constraints, Management.

Cyclic Ageing Studies of Bromobutyl Rubber of Indian NBC Respiratory Mask Exposed to Various Environmental Conditions

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Major portion of nuclear biological and chemical respiratory mask is made up of BIIR. This study aimed at evaluation of degradation and stability of BIIR subjected to various cyclic exposures. A cyclic change in tensile strength and elongation observed in hypochlorite exposure and attributed to the initial curing of unreacted cross linking compounds. Highest increase in mass loading has been observed (40%) in samples subjected to hypochlorite exposure followed by autoclaved exposure (39%). There has been slight increase (6%) observed in case of water distillation. FT-IR, TGA and DSC studies did not indicate any significant degradation in the functional and chemical nature. The disinfectant and sterilisation cycles have to be in such a way not to degrade the base polymer as survival of personnel is involved.

Effect of Fluoride and Fertilizers on the Carbohydrate and Lipid Contents of Green Gram (*Phaseolus mungo*-Var. KM2)

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Influence of sodium fluoride on the carbohydrate and total lipid content present in the green gram (*Phaseolus mungo* Var. KM2) was studied. Plants were watered with different fluoride ion concentrations (0, 2.5, 5.0, 10.0 and 50.0 ppm) and fertilized with urea, superphosphate, potash and NPK complex with cow dung used as the control. Application of fluoride affected the carbohydrate and total lipid with increasing or decreasing fluoride ion concentration.

KEYWORD

Fluoride, *Phaseolus mungo*, endemic, FYM.

Production of Xylanase by *Aspergillus flavus* FPDN1 on Pearl millet bran : Optimization of Culture Conditions and Application in Bioethanol Production

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The production of extracellular xylanase by a locally isolated strain of *Aspergillus flavus* FPDN 1 was studied for optimization of cultural conditions and saccharification followed by bioethanol production. Among the various agro residues used pearl millet (bajara) bran was found to be the best for high activity of xylanase with poor cellulase production under solid state fermentation with compared to submerged fermentation. During optimization, influence of different cultural conditions, such as substrate concentration, incubation period, moisture level, inoculum size, pH, temperature, effect of carbon sources, organic and inorganic nitrogen sources were investigated. The production of the xylanase reached at maximum with substrate concentration (4g), incubation period (5 day), moisture level (45%), inoculum size (3×10^6 spore/mL), pH (6), temperature (25°C), carbon source (xylose), organic nitrogen source (yeast extract) and inorganic nitrogen source $[(\text{NH}_4)_2\text{SO}_4]$. Under optimized conditions enhanced xylanase production achieved was 1530 IU/gds/min. The hydrolysis study of birch wood xylan by TLC was yielded xylose and other xylooligosaccharides as an end product. Crude xylanase was further utilized for enzymatic saccharification of pearl millet bran followed by bioethanol production from saccharified sugars. It was further confirmed by GLC analysis.

KEYWORD

Xylanase, *Aspergillus flavus* FPDNI, Pearl millet bran, Optimization, Bioethanol.

Assessing Interseasonal and Intraseasonal changes in Vegetation Cover Over Southern Peninsular India During 1982-1995 Monsoon Period

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There are established studies and results referring to El-Nino and Indian summer monsoon tele-connections and hence influence on changes in rise in SST, global hydrological cycle, global vegetation cover, persistent droughts, planning tools for a sustainable development, drought risk assessment, etc., in this regard a study and the status of vegetation cover in terms of satellite derived product NOAA-AVHRR, in relation to standard precipitation index (SPI) over Southern India was considered with the following major objectives: (i) To provide a comprehensive idea of drought through interpretation of standardized precipitation index– A meteorological approach, (ii) to establish a regional characteristics of the NDVI-SPI relationship and (iii) to establish relationship of NDVI- SPI different time periods.

Extraction of Carotenoids From Spent Clay Obtained From Edible Oil Plant

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Carotenoid extraction was carried out with different solvent system. Tetrahydrofuran was found to be the most suitable solvent for the carotenoid extraction and 0.006 mg of carotenoid/ g of spent clay was extracted using this solvent. The parameters, such as temperature and time were optimized for the maximum extraction of carotenoid using the solvent tetrahydrofuran. The maximum extraction was achieved at 50°C for 150 min time duration. Desorption studies were examined and various models were incorporated into desorption kinetics. From this analysis parabolic diffusion model was fitted very well with the kinetic data with the coefficient of determination value as $R^2=0.987$.

KEYWORD

Carotenoid, Tetrahydrofuran, Desorption coefficient.

Remediation of Environmental Pollutants by Microorganisms

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Today, bioremediation biotechnology is a fast developing traditional discipline because of realization of its significance in effective environmental management in mining, metallurgical exploration, metal industries, agriculture, pharmaceutical concerns, public health, geological explorations, bioenergetics, etc., and as a mean to exploit new sources of non conventional resources useful for various purposes. Now, nations are striving hard to merge biotechnological operations into national development, building hardcore economics and seeking strategies for international co-operation, ties and treaties. This article basically designed to outline various important aspects of microbial variables and associated parameters of bioremediation biotechnology to be understood in its right perspective for effective environmental quality management. It envisages to put forward a clear understanding of microbial efficiencies and related potentials and its associated widening horizons. Such association of microbiology and technology would certainly be asset to practicing environmental managers, scientists, analytical chemists, environmental microbiologists, microbial biotechnologists, mining and metallurgical engineers and various researchers, etc., with primarily interest to understand their applications for solving environment problems that in turn, will be helpful to adopt suitable remediation technologies/ devises for meaningful pollution control strategy as a whole.

KEYWORD

Microorganisms, Industrial effluents, Hazardous pollutants, Heavy metals, Bioremediation, Environmental pollution control.

Kinetics of Arsenate and Arsenite Adsorption by Indian Soils

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A study on the kinetics of adsorption of arsenate and arsenite ions by 3 widely occurring and agriculturally important Indian soils was conducted by changing the various factors that influence the process of adsorption. Langmuir second order equation, Pseudo-second order equation, Elovich equation and fractional power model were used to test the adsorption kinetics. Possibility of intraparticle diffusion which can explain the anion adsorption behaviour was also explored. Applicability of different kinetic models was analyzed through their regression values in describing the kinetic behaviour of arsenic in soils.

KEYWORD

Adsorption, Kinetics, Arsenate, Arsenite, Pseudo-second order equation, Intraparticle diffusion.

Gas Heated Small Apparatus for Plastic Waste Management

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In order to reuse the plastic waste we have designed a small apparatus, which can be heated by a gas burner. It is double walled to avoid the wastage of heat by radiation. The plastic heating temperature of the apparatus can be controlled by controlling the gas flow. The plastic waste of all types can be melted out from a outlet on the side. It is poured in water to again change into solid form. The yield is more than 98 %. In this way the plastic can be stored in a small space which otherwise requires very large area. We are studying the effect on quality of roads when this recovered plastic is added to the coal tar. used for construction of roads, for water proofing, etc. We plan further to heat this recovered plastic to high temperature and convert into fuel oil.

KEYWORD

Plastic waste management, Plastic waste recycling.
