

Development of Co-cultured Bacterial System for the Removal of Endocrine Disruptor: Bisphenol-A From Synthetic Wastewater

Bandana Sahoo¹, Rupa Kumari¹, Anitha J.¹, Habeeb Ahmed¹, V. Subha², S. Renganathan², and Sangeetha Subramanian¹

1. VIT University, School of Bio Sciences and Technology, Vellore-632 014

2. Anna University, Centre for Biotechnology, ACT Campus, Chennai- 600 025

Toxic organic pollutant and the products manufactured out of it are becoming an increasing concern due to their persistency and slower degradation rate. One such compound is bisphenol-A which is used for plastic production and causes endocrine disruption. To develop a biological removal process, we have isolated two bacterial strains (VIT_P1 and VIT_W1) which have a capability to remove bisphenol-A. Co-culturing of these two isolated strains showed a higher removal (80% removal in 72 hr) compared to individual strain's removal efficiency. Classical optimization on different parameters (bisphenol-A concentration, time, pH, glucose concentration and NaCl concentration) was examined for the co-culture system. The most significant parameter that affects bioremoval was identified as bisphenol-A concentration by the Plackett-Burman design with the positive effect. Study on process optimization by both classical and statistical method showed glucose as carbon source demonstrated insignificant effect on bioremoval. The co-cultured system thus exhibited capability to utilize bisphenol-A as the sole carbon source and this potential could be investigated to advance the treatment process for waste-water with multiple endocrine disruptors.

KEYWORD

Bisphenol-A, Endocrine disruptors, Co-culture, Plackett-Burman design, Bioremoval.

AUTHOR

1. Bandana Sahoo, B.Tech. Student, School of Bio Sciences and Technology, VIT University, Vellore - 632 014.

2. Rupa Kumari, B.Tech. Student, School of Bio Sciences and Technology, VIT University, Vellore - 632 014.

3. Anitha J., Research Scholar, School of Bio Sciences and Technology, VIT University, Vellore - 632 014.

4. Habeeb Ahmed, Research Scholar, School of Bio Sciences and Technology, VIT University Vellore - 632 014.

5. V. Subha, Research Scholar, Centre for Biotechnology, Anna University, Chennai-600 025.

6*. Dr. S. Renganathan, Professor, Centre for Biotechnology, Anna University, Chennai-600 025.

7. Sangeetha Subramanian, Associate Professor, School of Bio-Sciences and Technology, Vellore - 632 014.

Modeling of the Contribution of the Road Traffic in the Air Pollution of the Greater Casablanca Region Morocco

Hader Khadija¹ and Bahi Lahcen²

1. *Mohammadia School of Engineers (EMI), Research Laboratory for the Quality of Air and the Water, Section of Environment, Agdal, Rabat, Morocco*

2. *Mohammadia School of Engineers (EMI), Doctoral Centre Studies, Applied Geophysics, The Engineering Geology and the Environment Laboratory, Agdal, Rabat, Morocco.*

The transport sector is an essential link in the development of national and regional economy (Andriani *et al.*, 2011). However, this sector weighs heavily on the overall assessment of the emissions of substances involved in air pollution. In the Greater Casablanca Region, road transport is the second largest emissions source of gaseous pollutants and particles after the industry (Akay and Yildiz, 2007). The emitters are mobile and include different categories of vehicles in circulation, in the road network of the region (Costabile and Allegrini, 2008). Air emissions from road transport considered in this study are the exhaust emissions from combustion of fuel during vehicle movement. This is mainly SO₂ (sulphur dioxide), nitrogen oxides (NO_x) and carbon monoxide (CO) (Darcy *et al.*, 2007). These emissions depend mainly on the technology of the vehicle (type, fuel, engine size and age), the vehicle speed, the engine temperature and ambient temperature (Becker, *et al.*, 1993).

KEYWORD

Atmospheric pollution, Road traffic, Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), Carbon monoxide (CO).

AUTHOR

1*. Mrs. Hader Khadija, Research Laboratory for the Quality of Air and the Water, Section of Environment, Mohammadia School of Engineers (EMI), Agdal, Rabat, Morocco.

2. Dr. Bahi Lahcen, Applied Geophysics Laboratory, The Engineering Geology and the Environment, Mohammadia School of Engineers (EMI), Agdal, Rabat, Morocco.

Evaluation of Physico-chemical Parameters of River Rushikulya, Berhampur, Odisha

S. Hota¹ and B.B. Kar²

1. *Gandhi Institute for Technology, Department of Chemistry, Bhubaneswar*

2. *KIIT University, School of Applied Sciences, Bhubaneswar*

In the present study, the physico-chemical parameters of various water samples of river Rushikulya, Berhampur has been studied extensively. The samples were collected from three different season's pre-monsoon, monsoon, post-monsoon. The result revealed that drastic variation in almost all the parameters have been observed with the change in season. The total hardness of water is found to be high throughout pre-monsoon season and lowest in monsoon. Some of the specific nutrients and chemical are found to be high during post-monsoon season. The pH, hardness, total dissolved solids (TDS), total suspended solid (TSS), electrical conductivity of the water sample varies from place to place depending on the point and non-point sources. Nitrate, sulphate and fluoride contaminations are found to be acute in many of the non-point sources.

KEYWORD

Fluoride, Sulphate, Nitrate, Physico-chemical, Total dissolved solids (TDS), Total suspended solid (TSS), Hardness, pH, Monsoon, Point source, Non-point source.

Stabilization of Expansive Subgrade Soil With Bagasse Ash and Geosynthetic Reinforcement

C. Rajakumar¹, S.P. Jeyapriya² and T. Meenambal³

1. Karpagam University, Department of Civil Engineering, Coimbatore-641 021

2 and 3. Government College of Technology, Department of Civil Engineering, Coimbatore-641 013

Expansive soil deposits are problematic to structures built over them because of their tendency to swell on wetting and shrink on drying. To overcome this, properties of soil must be improved by artificial means known as 'soil stabilization'. Soil stabilization with the objective of improving or controlling its volume stability, strength and durability is needed. The project is proceeded with an objective to study the effect on replacement of clay with bagasse ash as stabilizing agent in varying proportions and to determine the optimum content of the same. In this phase, the engineering properties of clay, such as particle size distribution, Atterberg's limits, optimum moisture content, maximum dry density, unconfined compressive strength and California bearing ratio are determined. Based on the results, the clay is classified as clay of high compressibility (CH) as per BIS. Bagasse ash was added to clay in varying proportions from 0% to 20% and all the geotechnical properties are studied. The study highlights the significant increase in properties of clay obtained at 10% replacement of bagasse ash.

KEYWORD

Expansive subgrade, Waste bagasse ash, Atterbergs limit, Optimum moisture content, Maximum dry density, Unconfined compressive strength, California bearing ratio.

AUTHOR

1. Dr. C. Rajakumar, Assistant Professor, Department of Civil Engineering, Karpagam University, Coimbatore – 641 021

2. Dr. S.P. Jeyapriya, Associate Professor, Department of Civil Engineering, Government College of Technology, Coimbatore–641 013

3*. Dr. T. Meenambal, Professor, Department of Civil Engineering, Government College of Technology, Coimbatore – 641 013

Groundwater Quality Status and Management Strategies in an Atoll Island-A Case Study

N.B. Narasimha Prasad

Centre for Water Resources Development and Management (CWRDM), Kozhikode - 673 571

Salinity, total hardness and coliforms are the critical water quality parameters found to be exceeding the desirable and permissible limits of drinking water standards in Kiltan Island. To control further deterioration of the groundwater quality and to improve the availability of fresh water to meet the increasing drinking water demand, groundwater conservation and management techniques have been suggested. Kiltan is one of the 10 inhabited Atoll islands, situated in the Union Territory of Lakshadweep, India. The major problem experienced by the Islanders is the acute scarcity of fresh drinking water. Groundwater is the only source of fresh water and the availability of the same is very restricted due to peculiar hydrologic, geologic, geomorphic and demographic features. A proper understanding of the groundwater quality, with reference to temporal and spatial variations, is very important to meet the increasing demand and also to formulate future strategies for groundwater conservation and management. All the available information on water quality, present groundwater usage pattern, etc., are collected and analyzed. Spatial variation diagrams of salinity and hardness have been prepared for different seasons. The severity of the problem depends on the nearness of the well from the sea and the season. Water quality is also getting deteriorated by the bacteriological contamination mainly due to lack of proper sanitation facilities. Combination of groundwater conservation through wise-use, controlled pumping, roof-top rainwater harvesting, etc., are expected to help the Islanders to overcome the shortage of fresh water on a sustainable basis.

KEYWORD

Island hydrology, Groundwater management, Water resources conservation, Water quality, India.

AUTHOR

1*. Dr. N.B. Narasimha Prasad, Former Chief Scientist, Centre for Water Resources Development and Management (CWRDM), Kozhikode - 673 571.

Variation of Specific Absorption Rate in Human Head due to Cylindrical Wave-Front From Vertical Antenna of Base Transceiver Station

Rahul Kaushik¹, Vijay Kumar², Pradeep Teotia³ and P.P. Pathak¹

1. Gurukula Kangri University, Department of Physics, Haridwar – 249 404

2. Graphic Era Hill University, Department of Physics, Dehradun

3. Bharat Sanchar Nigam Limited, Switching Planning Division, Ghaziabad

The specific absorption rate (SAR) of the human head is calculated considering cylindrical wave front radiated from vertically installed base transceiver station (BTS) near inhibited multi-story building. The calculated value of specific absorption rate is compared with the safe exposure limit for humans defined by various international agencies. On the basis of calculated values, a correlation is recognized between frequencies of radiation, electrical conductivity, relative permittivity and distance from base transceiver station with specific absorption rate. It is concluded that for the higher frequency of radiation at very short distances from base transceiver station, the harmfulness of electromagnetic waves may increase.

KEYWORD

Electromagnetic fields, Cylindrical wave-front, Specific absorption rate, Radiation hazards.

AUTHOR

1*. Mr. Rahul Kaushik, Research Scholar, Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar-249 404.

2. Dr. Vijay Kumar, Head, Department of Physics, Graphic Era Hill University, Dehradun.

3. Dr. Pradeep Kumar Teotia, Assistant Director, Switching Planning Division, Bharat Sanchar Nigam Ltd., (BSNL), Meerut.

4. Prof. P.P. Pathak, Head, Department of Physics, Gurukula Kangri Viswavidyalaya, Haridwar-249 404.

Experimental Study on Glass Fibre Reinforced Pervious Concrete

Manoj Nallanathel, Ramesh Bhaskhar, Erlapati Santosh Kumar and Kuruba Karthik Saveetha

Saveetha University, Department of Civil Engineering, Saveetha School of Engineering, Chennai - 602 105

Pervious concrete is a light-weight concrete which is prepared by eliminating the fine aggregate from conventional concrete, also known as 'no fine concrete' or 'porous concrete'. It is combination of graded coarse aggregates, cement materials, water. Now-a-days we are very much interested in sustainable and eco-friendly means of construction. Particularly in a country, like India where flooding and water logging problems are the major environmental issues. Various means are being implemented to these problems where pervious concrete is one of them. For the better performance we have added glass fibre to pervious concrete which is abundantly available in the site. In this study our main aim is to analyse the hydrological and structural properties of pervious concrete which is reinforced with glass fiber in various ratios (0.5%, 1%, 1.5% by weight of cement). Compressive strength and flexural strength obtained is compared with the normal pervious concrete.

KEYWORD

Pervious concrete, Porous, Hydrological, Compressive strength, etc.

AUTHOR

- 1*. Manoj Nallanathel, Assistant Professor, Department of Civil Engineering, Saveetha School of Engineering, Saveetha University, Chennai - 602 105.
2. Ramesh Bhaskar, Professor, Department of Civil Engineering, Saveetha School of Engineering, Saveetha University, Chennai - 602 105.
3. Erlapati Santhosh Kumar, Graduate Student, Department of Civil Engineering, Saveetha School of Engineering, Saveetha University, Chennai - 602 105.
4. Kuruba karthik, Graduate Student, Department of Civil Engineering, Saveetha School of Engineering, Saveetha University, Chennai - 602 105.

Earthquake Prediction Using Teleseismometers via Wireless Sensor Networks

K. Hema¹ and Muralidharan²

1. *AMET University, Department of Electrical and Electronics Engineering (Marine), Chennai -603 112*

2. *Mepco Schlenk Engineering College, Sivakasi*

In environment currently suffering some multiple issues due to change in nature, like global warming, natural disasters, like tsunami, earthquake, floods, volcanic eruptions, etc. To predict before a disaster is challenging task where the scientist invents devices to get simultaneous data regarding environment changes with the help of sensors. A device is designed with tele-seismometers to sense vibration on the earth surface and get readings via wireless sensor networks (WSN). Tele-seismometers draw frequency figures on the device that value is later then derived and forwarded to National Oceanic and Atmospheric Administration centers to handle those data sets, analyze readings and calculate prediction via surface detection algorithm (SDA). Here, surface detection algorithm algorithm manipulated with devices to convert analog signals of figures into digital reading, which is then forwarded to NOAA by substations. Where sub stations analyze those data in seismometer and the calculated data will be sent to NOAA for comparative analysis of other substation data in a tele-seismometer. Finally, analysis data predict the damage percentage and area of particular regions with point out values.

KEYWORD

Natural disaster, Earthquake, Tele-seism-ometer, National Oceanic and Atmospheric Administration, Surface detection algorithm (SDA).

AUTHOR

1*. K. Hema, Research Scholar, Department of Electrical and Electronics Engineering (Marine), AMET University, Chennai - 603 112.

2. Dr. Muralidharan, Mepco Schelnk Engineering College, Sivakasi.

Trends on Groundwater Quality in Cuddalore District

Sivakumar Krishnamoorthy¹, A. Murugesan² and Rajesh Babu³

1. Bharathiar University, Research and Development Centre, Coimbatore - 641 046

2. Government Arts College, Research Department of Chemistry, Ariyalur - 621 713

3. Indira Institute of Engineering and Technology, Research Department of Chemistry, Pandur - 631 203

The major objective of the present study hydrochemical trends of groundwater from Cuddalore district and sub-urban areas. 64 water samples with different seasons, like pre-monsoon, monsoon and post-monsoon have been chosen for the investigation in the period from March 2016 to February 2017. The water quality parameters, such as pH, EC, TDS, Ca²⁺, Mg²⁺, Na⁺, K⁺, Cl⁻, HCO₃⁻, CO₃²⁻, SO₄²⁻ were analyzed using standard recommended procedures and it was compared with BIS and WHO standards. From the analytical results, the water quality trends were significantly varied with samples and locations. This might be influenced by hydrogeological pattern and anthropogenic activities. The ionic distribution trend in groundwater indicates that the quality is continuously varied with unsuitability.

KEYWORD

Groundwater quality trends, Hydrogeochemical process, Ionic distribution.

AUTHOR

1. Sivakumar Krishnamoorthy, Research and Development Centre, Bharathiar University, coimbatore - 641 046.

2*. Athimoolam Murugesan, Research Department of Chemistry, Government Arts College, Ariyalur - 621 713.

3. Rajesh Babu, Research Department of Chemistry, Indira Institute of Engineering and Technology, Pandur - 631 203.

Cremation of Body Through Cow Dung Cakes : A Case Study of an Effective Waste Management and Disposal Strategy

Deepmala Singh

Motilal Nehru National Institute of Technology, SMS Department, Allahabad - 211 004

As Hindus trust that soul of a dead person must be completely detached from the body and the materialistic world, so as to enable mankind to get closer to God through the medium of various events that occur from birth to death, Hindu Dharma has framed various religious 'samskârs'. Among them, the post-death rite is the final samskâr. This final samskar is known as 'Antyeshti Samskara', final reincarnation and the cremation ground is called Shmashana (in Sanskrit) and traditionally it is located near a river, if not on the river bank itself. Covered in a white covering, the body of a man is surrounded in flames a top a considerable pile of wood, the insatiable fire agitating out ashes for hours. In many countries, cremation is usually done in a crematorium but some countries, such as India and Nepal, prefer different methods, such as open-air cremation. Special sacred places, like Kashi (Varanasi), Haridwar, Allahabad, Rameshwaram, Brahmaputra are famous to complete this rite of immersion of ashes into water. Recently Varanasi administration under the National Mission for Clean Ganga (NMCG) started cremating the body in specially designed moulds that reduce the burning time as well as pollution by using cow dung cakes. This paper deals with a new and positive viewpoint on the use of a novel and environment friendly method of cremating bodies by using cow dung cakes.

KEYWORD

National Mission for Clean Ganga (NMCG), Samskar, Antyeshti, Nagpur Municipal Corporation (NMC), Briquettes.

AUTHOR

1*. Dr. Deepmala Singh, Guest Faculty, SMS Department, Motilal Nehru National Institute of Technology, Allahabad - 211 004.

Assessment of Godavari River Water Pertaining to its Physico-chemical Properties and Biological Variables During Pre-Monsoon and Post-Monsoon Season

Vasant B. Kadam, Pravin M. Nalawade and Archana B. Bagul

K.T.H. M. College, Department of Environmental Science, Nashik – 422 002

The present study work has its main focus on the changes noticed in the physico-chemical and biological properties of the Godavari river water during pre-monsoon and post-monsoon season in the year 2016. For this study, the water samples have been collected from the designated nine sites. The samples were collected after specific time intervals so that the proper comparative analysis can be possible. It has been identified that there is a lot of seasonal variation occurred in the physico-chemical and biological properties of Godavari river water during the selected time span at the selected sites. During the selected time span significant amount of changes were noticed in the water quality of the Godavari river, especially in the zooplanktons. The growth of zooplanktons, such as protozoa, cladocera, copepoda, larvae and nematoda was high in the month of May, whereas it was significantly reduced when the monsoon started. Not only this, the values of BOD, DO and COD were extremely high at Odha which was close to thermal power plant as well as near Nasardi-Godavari confluence and at Tapovan due to human activities, industrial discharges in the water body and sewage treatment plant.

KEYWORD

Godavari river, Physico-chemical and biological properties, Pre-monsoon and post-monsoon season, Seasonal variation in water quality.

AUTHOR

1. Dr. Vasant B. Kadam, Associate Professor, Department of Botony, K.T.H. M. College, Nashik-422 002.
2. Dr. Pravin M. Nalawade, Assistant Professor and Head, Environmental Science Research Center, Department of Environmental Science, K.T.H.M. College, Nashik-422 002.
- 3*. Ms. Archana B. Bagul, Research Scholar, Department of Environmental Science, K.T.H.M. College, Nashik-422 002.