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Environment Epilogues

Disquiets and Panacea

Edited by : Pinakiranjan Chakrabarti
Sudeshna Ghoshal



Environment Epilogues- Disquiets And Panacea

**Editors: Pinakiranjan Chakrabarti
Sudeshna Ghoshal**

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Isolation and Characterization of Chromium (Vi) Tolerant Bacterial Strains from Tannery Effluent of Park Circus Area

Suvranil Mitra, Soumyajit Guha, Saswati Gayen

Department Of Microbiology, Vijaygarh Jyotish Ray College

Abstract

Heavy metals contamination is a global environmental concern because it is difficult to remove these contaminants from the environment unlike other pollutants. Chromium (Cr) is an important heavy metal widely used in various industries of which the tanning industry deserves special mention. There are more than 2500 tanneries in the country and nearly 80% of the tanneries are engaged in the chrome tanning process. More than 170,000 tone of Cr waste are discharged into the environment annually as a consequence of industrial and manufacturing activities. Cr, a highly reactive element with an oxidation state of 6 exhibits stability as Cr (III) and Cr (VI). But hexavalent chromium is more toxic to living organisms than the trivalent chromium. The Cr (VI) has also been classified as a group A carcinogen by USEPA based on its chronic effects. Strong exposure of Cr (VI) causes cancer in the digestive tract and lungs and many cause epigastric pain, nausea, vomiting, severe impacts on aquatic species. In the present study chromium (VI) tolerant bacterial strains were isolated from the tannery effluent of Park circus area. Most of the bacterial isolates were Gram negative while few were Gram positive. 6 bacterial strains were tested for their Cr tolerance capacity of which S6 showed maximum Cr tolerance of

Microbial Pigments as Natural Colorants and More: A Review

Soumyajit Guha , Saswati Gayen

Department Of Microbiology, Vijaygarh Jyotish Ray College

Abstract

Biological pigments or bio-chromes, are natural organic compounds produced by living organisms have recently been drawn great attention within the market because of their increasing acceptability as they replace synthetic colorants so as to fulfill consumer demands for more natural products. Synthetic pigments often cause serious environmental pollution and adverse toxicological side effects. While, microbial pigments have various advantageous biological activities over synthetic pigments and thus it is now becoming the choice for industrial usage with huge economic potential. In this review focuses has been given on the different pigment producing microorganisms (bacteria, fungi, algae, actinomycetes and yeast) and their wide range of industrial applications.

Introduction

Microorganisms are the most versatile creatures on this planet as these are responsible for the process of fermentation related products, be a source of food in the form of single cell proteins (SCP), therapeutics and food supplements in the form of pigments, vitamins, amino acids, enzymes and organic acids. The natural pigments extracted from microorganism are termed as “microbial

Avifaunal Diversity of Early Winter Migrant and Residents in Three Important Bird Areas (Ibas) of Central Asian-South Asian Flyway of Gujarat, India

Abhishek Chatterjee, Ipsita Maity,

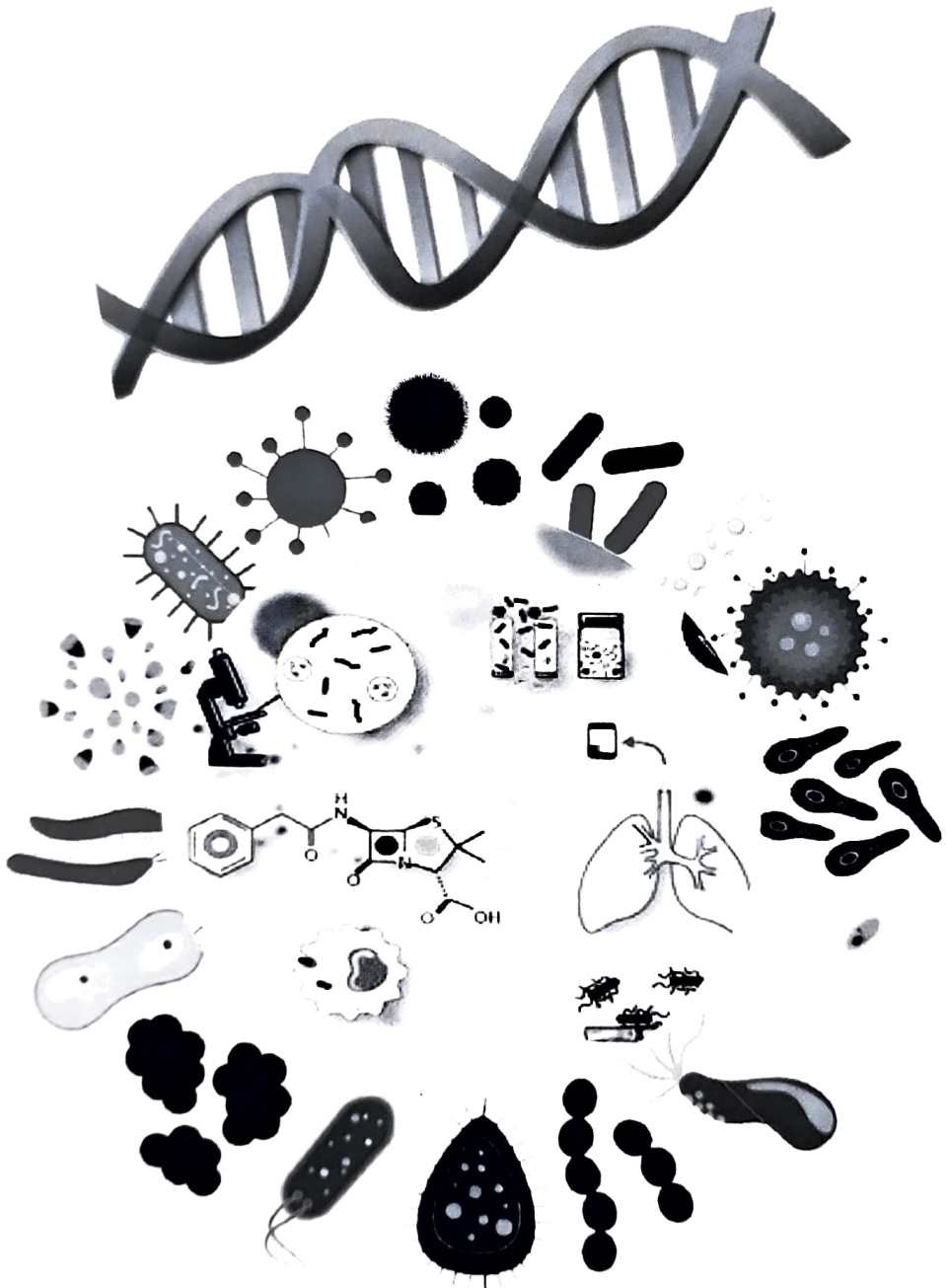
Sudeshna Ghoshal, Pinakiranjan Chakrabarti

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Abstract

Migratory birds visiting India for wintering purposes mostly follow the Central Asian-South Asian Flyway. The said flyway has a total of 1178 Important Bird Areas (IBAs) on its course. In this study, three such IBAs in the state of Gujarat, India have been considered based on their observed levels of anthropogenic interventions. These sites have been listed corresponding to the decreasing levels of disturbance, viz. Nal Sarovar Bird Sanctuary (NSBS); Wild Ass Wildlife Sanctuary, Tundi Camp (WAWS) and Positra Marine Sanctuary (PMS). The study was the first record for WAWS and PMS. The aim of the survey was to get a clear perspective about the diversity scenario of early winter migrants in the IBAs concerned. A total of 112 bird species belonging to 43 families and 83 genera have been recorded. Interestingly enough, WAWS was found to possess the maximum diversity for the birds, while NSBS exhibits the least diversity and PMS showed the most even distribution for them. Each site has its own repertoire of unique avian

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Quorum Sensing – Its Role In Bacterial Biofilm Formation

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Abstract : Quorum sensing (QS) is a bacterial gene regulatory mechanism through cell-cell communication system that has the ability to detect and respond to population density. Chemical signal molecules called autoinducers, such as acyl-homoserine lactone, play crucial gene regulatory roles in QS that leads to increase in cell density. Generally, autoinducers are species specific. However, auto inducer like AI-2, first identified from bioluminescent marine bacterium *Vibrio harveyi*, is also produced by many bacterial species and serves as a 'universal' signal molecule for inter-species communication. Beside controlling downstream production of virulence factors, autoinducers are also found to control biofilm formation which in turn contribute towards colonization in the host body by pathogenic organisms, leading to manifestation of diseases. Therefore, a thorough study is going on about different QS mechanisms and their role in biofilm

Pasteurized Milk – A Good Source of Nutrition- A review

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Milk has been the most widely consumed ideal liquid food source for humans since ancient times. The nutritional value of milk also is highly complex, and it contains almost every single nutrient that our body needs. The milk also contains various types of micro-organisms that may be harmful to humans. The consumption of raw milk reported several kinds of diseases like diphtheria, typhoid, tuberculosis, and brucellosis to human being so the raw milk needs to be Pasteurized before consumption. Pasteurization processes are specifically implemented to reduce the potential risk to consumers of illness due to pathogens that may be present in raw milk. But during the pasteurization process, the nutrition value has to be sacrificed at some level. Studies showed that this process deactivates the enzymes that are necessary for the human digestion of milk, kills off the good bacteria that may be beneficial to the human body, alters the calcium content and removes most of the vitamin C in raw milk. Studies also showed that some pathogenic microbes which have high risk of causing diseases are still present in Pasteurized milk.

Antimicrobial Activity of Some Common Plants

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Abstract : Antibiotics provide protection against microbial (bacterial and fungal) infections. There is an increased need to discover new antimicrobial compounds with diverse chemical structures and mechanisms of action. Another big concern is the development of drug resistance to human pathogenic bacteria all over the world.

Higher plants produce hundreds to thousands of Chemical compounds with different biological activities. Plants produce different antimicrobial compounds which are active against different pathogenic microorganisms. This review works have been done to see the antimicrobial effects of some common plants extracts.

Key Words : Antimicrobial activity, Phyllanthus Niruri, Phyllanthus Emblica, Aloe Vera, Medicago Falcata, Cinnamomum Cassia, Azadirachtaindica, Aegle Marmelos.

Isolation of Amylase Producing Organisms From Soil and its Whole Cell Immobilization

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Abstract : Amylase is an enzyme that hydrolyses starch into monomeric compounds, the smallest being glucose. Amylase has multiple applications in various industries like food, fermentation, textile, paper and pharmaceutical. Immobilization is the term that expresses something immobilized or fixed. The process involves the immobilized biocatalyst, enzymes or cells that are physically fixed in a defined region for catalysing a specific reaction with no loss of catalytic activity and with repeated use. Immobilization finds extensive use in food industry mainly for starch processing. Other than food industry, immobilization technique finds tremendous applications in pharmaceutical and biochemical

A Study on the Effect of Cigarette Smoking on Human Sperm Quality in Kolkata, West Bengal, India

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Abstract : Sexual reproduction is the only way to ascertain the persistence and propagation of a species. In humans, male factors contribute to almost 50% of infertile couples while remaining causes may be either due to female factors or a combination of both. Several reports have suggested that urban lifestyle features like cigarette smoking, stress level, aging etc. add up to the complications regarding fertility issues. The highest prevalence of smoking is observed in young males during their reproductive period and found to affect reproductive health more than consumption of caffeine or alcohol. In this study efforts have been made to explore the effects of smoking on the urban male fertility within this age group by semen analysis with additional emphasis on whether the parameters are age dependent or not. Male population sampling was performed in and about the city of Kolkata with specific

Analysis of Cellulolytic Activity of Heavy Metal Tolerant Bacteria Isolated from East Kolkata (Dhapa) Dumping Grounds

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Abstract : Organic carbonaceous materials in soils mainly include cellulose, hemicelluloses and lignin chiefly obtained from dead and decayed plant parts. Cellulose account between 30 to 60% of plant material (dry wt.), and its decomposition is of major importance to the biogeochemical cycling of carbon (C) and essential plant nutrients. Soil organisms in concert produce cellulolytic enzymes that degrade cellulosic polymers. The enzyme system, collectively known as cellulases, breaks down insoluble cellulose molecules into simple water-soluble mono- or disaccharides that can be transported into the cell. Once inside the cell, these simple sugars are oxidized to provide energy and to biosynthesize microbial biomass. Like various microbially regulated ecological process, cellulose

Community Genomic Analysis Dissimilatory Arsenate Reducing Bacteria in Aquifer Sediments of Bengal Delta Plain

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Abstract: Contamination of groundwater with geogenic arsenic poses a major health risk to millions of people throughout the world. Microbial communities in sediments have often been associated with release of arsenic from sediments into ground water. Among various group of microbes, dissimilatory arsenate reducing bacteria (DARB) are considered to be primarily responsible for arsenic mobilization in anaerobic environments of deep underground aquifer sediments. These group of microbes carries out enzyme catalyzed conversion of more immobilized and less toxic arsenate [As (V)] to more soluble and more toxic

Isolation of Zinc (Zn^{+2}) Resistant Bacteria from Tannery Effluent of Topsia

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Abstract : Heavy metal contamination by industrial waste is becoming a global issue as the heavy metals, present in high amount in industrial waste are very reactive in low concentration and causing a severe health problem. This study has focussed to the isolation of Zinc (Zn^{+2}) microorganism from tannery effluent of Topsia. Generally Zn^{+2} is a good nutrient at very low concentration. The result showed that at very low concentration Zn^{+2} enhanced the growth of the isolated microorganism, but at higher concentration of Zn^{+2} microbial growth was inhibited. Amount of Zn^{+2} absorption was measured. Biochemical characteristics of the isolated microorganism were also determined. The result of Zn^{+2} resistance of the isolated microorganism can explore the avenue of bioremediation against Zn^{+2} .

Key Words: Microorganism, Zinc, Bioremediation

Introduction :

Tannery waste water generally contains high concentration