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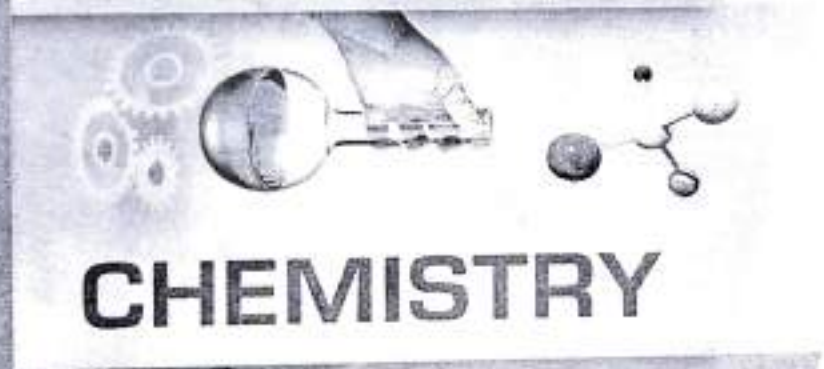

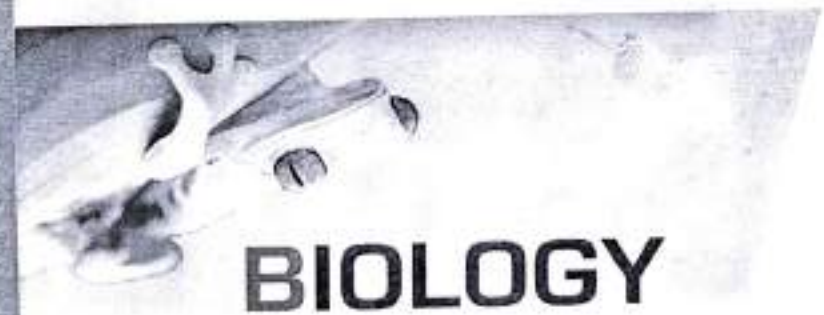

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Computational studies on transport property of Ni-dopped porphyrin-armchair graphene nanoribbon (AGNR) molecular nanojunction

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Abstract

By using a combination of density functional theory (DFT) and non-equilibrium Green's function (NEGF) method, we have investigated electronic transport properties of Ni-centered porphyrin-armchair graphene nanoribbon (AGNR), where a Ni-centered porphyrin molecule is connected with armchair graphene electrodes. Our results demonstrate that electric current gradually increases with increasing bias voltage irrespective of the polarity of bias voltage. The obtained I-V characteristics are explained with the help of transmission spectra at different bias voltage.

Keywords: *Density functional theory (DFT), AGNRs, Porphyrin, Transmission.*

1. Introduction

After the idea given by Aviram and Ratner [1] that a molecule can conduct current, ongoing research is trying to find a suitable device with remarkable conductivity. The preferred aim of modern nanotechnology is the fabrication of electronics devices using individual molecules. This goal can be achieved by knowing the factor controlling the electrical current through molecules embedded between two electrodes [2]. Recent studies have used organic molecules as building blocks of electronic and nanoelectronic devices such as rectifiers, organic photovoltaic solar cells, memory devices, sensor and molecular transistors due to their unique conductive nature. The majority of the organic molecules are made of carbon elements and they show unique chemical and physical property due to the presence of sp, sp^2 and sp^3 hybridized bonds. Among the organic molecules, the porphyrin and its derivatives have attained a great interest in present decades due to their rigid geometric configuration, highly conjugated structure and chemical stability [3]. In addition, one of the interesting features of porphyrin is that it can easily coordinate with simple metal ions which eventually modify the electron transport property thus can serve as a potential template for future nanoelectronics [4].

Understanding the mechanism controlling transport property through molecule is important in the field of molecular device application. One of the major challenges for designing this molecule-electrode nanojunction is to control the quality of junction because it arises mainly due to size mismatch between electrode and molecule. To overcome the limitations arising from traditional electrodes some new electrodes are required with extra flexibility [5]. Recently, electrodes based on carbon (e.g. graphene, carbon nanotubes, graphite) have been proposed, thus opening a new opportunity for fabricating electronics and nanoelectronic devices. Due to the presence of sp^2 bond, graphene has some advantages over traditional electrode as graphene has higher carrier mobility [6-7].

In this paper, we study the transport properties of Ni absorbed porphyrin molecule embedded between two armchair graphene nanoribbon (AGNR) within density functional theory method combined with non-equilibrium Greens function (NEGF) technique.

2. Computational Details

All the calculations have been performed using density functional theory (DFT) implemented in the Siesta code [8]. Generalized gradient approximation (GGA) with Perdew-Burke-Emzerhof (PBE) exchange-correlation function [9] are used. We have employed Double-zeta plus polar-

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पश्चिममेदिनीपुरम्, पश्चिमवङ्गः

विषयानुक्रमणिका

साहित्यशास्त्रे अभिधा-लक्षणा-व्यञ्जनातत्त्वविमर्शः

पदेन सह पदार्थस्य शाब्दबोधोपयोगिनः सम्बन्धः वृत्तिः इति गद्यते। भिन्नेषु शास्त्रेषु विशेषतः काव्यशास्त्रे तथा साहित्यशास्त्रे शब्दार्थयोः मूर्धन्यं स्थानं वर्तते। आलंकारिकाः पदेन सह पदार्थस्य सम्बन्धं वृत्तिः इति वदन्ति। अस्मिन् विषये दार्शनिकाः इमं एवं शब्दस्य प्रयोगः कुर्वन्ति। काव्यशास्त्रे अभिधालक्षणाव्यञ्जनाभेदेन सम्बन्धस्य समुपलब्धतो। अभिधा च लक्षणा च व्यञ्जना च इत्येषां इतरेतरद्वन्द्वसमासेन अभिधालक्षणाव्यञ्जनाः इति पदं जायते। तासां तत्त्वस्य विमर्शः इत्यनेन षष्ठीसमासेन अभिधालक्षणाव्यञ्जनातत्त्वविमर्श इति पदं भवति। "विमर्शः" इति पदेन विचारो बोध्यते। वि- पूर्वकात् मृश्-धातोः घञ्-प्रत्ययेन विमर्शः इति पदं निष्पद्यते। वि-इत्यनेन विशिष्टम्, मृश्-धातुना ज्ञानम्, घञ्-प्रत्ययेन भावश्च बोध्यते। तेन अत्र विमर्श इति पदेन विशिष्टज्ञानं बोध्यते। ज्ञानं सदैव सविषयकं भवति। अभिधालक्षणाव्यञ्जनातत्त्वमत्र विषयः। अत अभिधालक्षणाव्यञ्जनाविमर्शशब्दस्यार्थः अभिधालक्षणाव्यञ्जनाविषयकं विशिष्टज्ञानम्।

अभिधाशक्तिः

अभि-पूर्वकात् धा-धातोः अङ्-प्रत्ययेन अभिधा इति पदं जायते। "अभिधीयते सङ्केतितः अर्थः अनया इति अभिधा" इति अभिधाशब्दस्य व्युत्पत्तिः उपपद्यते। नैयायिकानां मते अभिधा शब्देन शक्तिः सङ्केतः समयो वेति बोध्यते। या अभिधा सा शक्तिरिति साहित्यदर्पणकारेण विश्वनाथेन मन्यते। अन्यत्र काव्यप्रकाशे अनेन शब्देन व्यापारः बोध्यते। अभिधा शब्देन वाच्यार्थस्य प्रतिपत्तिर्बोध्यते। अर्थस्य स्वरूपवर्णनायां प्रथमतः अभिधायाः स्वरूपं वर्णयितुमाह "वाच्योऽर्थोऽभिधया बोध्यः"[७५] इति। अत्र "अभिधया" इति तृतीयान्तेन अन्यत्वं सर्वत्र बोध्यते। तेन अभिधाजन्यबोधविषयत्वं वाच्यार्थत्वमिति फलितम्। अर्थबोधे शब्दस्य वृत्तीनां च कारणत्वस्य विषयविषयिणोरभेदोपचाराद्बोध्यमिति मतम्। वास्तवकारणं तु शब्दतद्वृत्तिज्ञानमेव भवति। शब्दस्य प्रकृतिप्रत्ययादेः शक्तयः अर्थबोधे सहकारिकारणानि भवन्ति। तासु शक्तिषु एका अभिधा इति भवति। अभिधया योऽर्थः अवगम्यते स अभिधेयार्थः। अनेन अभिधेयशब्देन सङ्केतितार्थः बोध्यते। अत्र सङ्केत इच्छाविशेषः तद्विषयः सङ्केतितः इति भवति। इच्छार्थकस्य सम्पूर्वककेतेर्यं कर्मणि निष्ठाविधानात् सङ्केतितार्थः बोध्यते। अत्र सङ्केत इच्छाविशेषः तद्विषयः सङ्केतितः इति भवति। इच्छार्थकस्य सम्पूर्वककेतेर्यं कर्मणि निष्ठाविधानात् तस्य च विषयत्वस्यैव कर्मत्वाच्च इति मन्यते। तेन इदं पदमिमर्थं बोधयितु इति, अस्माद् पदात् अयमर्थो बोद्धव्य इति वा इच्छा सङ्केतनया वृत्तिः इत्यर्थः। तया च वक्त्रा घटपदेन कम्बुग्रीवादिमान् अर्थः बोध्यते। काव्यप्रकाशे अभिधायाः लक्षणं लक्ष्यते "स मुख्योऽर्थस्तत्र मुख्यो व्यापारोऽभिधोच्यते।" साक्षात्सङ्केतितार्थः मुख्यार्थः इति मन्यते। साक्षात्सङ्केतितार्थस्य मुख्यव्यापारः अभिधा इति उच्यते। मुख्यार्थबोधकशक्तित्वमभिधात्वमिति लक्षणं पर्यवसितम्।

लक्षणाशक्तिः

"लक्ष्यते इति लक्षणा" अनेन व्युत्पत्त्या लक्ष्-धातोः भावे युच्-प्रत्ययेन टाप्-प्रत्ययेन च लक्षणा इति पदं जायते। साहित्यशास्त्रे लक्षणायाः स्वरूपं बहुधा दृश्यते। अभिधेयार्थस्य अन्वयानुपपत्तिग्रहे तात्पर्याविषयत्वे वा सति अनादिवृद्धव्यवहारप्रसिद्धेः रूढ्यादिशक्तिशब्दाद्वा यया वृत्त्या तेन मुख्यार्थेन येन केनचिद् प्रतीतेन सम्बन्धेन सम्बद्धः, मुख्यार्थतावच्छेदकातिरिक्तधर्मावच्छिन्नोऽर्थः प्रतीयते सा आरोपिता वृत्तिः लक्षणा इत्युच्यते। मुख्यार्थबाधः मुख्यार्थयोगः रूढिप्रयोजनान्यतरं चेति त्रयः लक्षणायाः हेतुः इति समुपलभ्यते। आद्ययोः कारणयोः दण्डचक्रादिन्यायेन मिलितयो एव कारणत्वं भूतम्। द्वितीयतः रूढिप्रयोजनयोः तु तृणारणिमणिन्यायेन प्रत्येकस्य पृथकतया कारणत्वमुपपद्यते। यथा "गङ्गायां घोषः" इत्यादौ गङ्गादिशब्देन जलमयादिरूपार्थः बोध्यते। किन्तु जलपदाद् घोषस्य उपस्थितिः न सम्भवति। अतः तात्पर्याविषयं अनङ्कितं सङ्केतितार्थं विहाय वृत्त्या स्वस्य अस्यार्थस्य सामीप्यादिसम्बन्धसम्बन्धी तटादिं बोध्यते, सा शब्दस्यार्पिता स्वभाविकेतरा ईश्वरानुद्भाविता वा वृत्तिः लक्षणा इति समुपलभ्यते। आचार्येण मम्मटेन लक्षणायाः लक्षणं लक्षितम्

"मुख्यार्थबाधे तद्योगे रूढितोऽथ प्रयोजनात्।
अन्योऽर्थः लक्ष्यते यत् सा लक्षणारोपिताक्रिया॥"[७६]

लक्षणायाः भेदः

काव्यशास्त्रे लक्षणायाः भेदविषये मतवैभिन्न्यं वर्तते। साहित्यदर्पणकारेण विश्वनाथेन लक्षणायाः अशीतिः विभागाः अनुमन्यन्ते। काव्यशास्त्रे स्वीकृतेषु लक्षणासु उपादानलक्षणा अन्यतमा। उपादीयते मुख्यार्थोऽपि अनया इति उपादानलक्षणा। वाक्यार्थे अन्वयसिद्धये यया वृत्त्या मुख्यार्थभिन्नस्य अन्यार्थस्य प्रतीतिः जायते, सा उपादानलक्षणा। उपादानलक्षणायाः रूढिमूलकत्वेन प्रयोजनमूलकत्वेन च विभागद्वयं स्वीक्रियते। यथा "कुन्ताः प्रविशन्ति" इत्यत्र कुन्तापदेन बल्लमः बोध्यते। अचेतनतः ते स्वधीनतया तेषां गमनक्रिया नास्ति। अतः लक्षणया कुन्तापदेन कुन्तावशिष्टजनः बोध्यते। "उपादानं लक्षणञ्च काव्यप्रकाशे न व्यक्तम्।"[७७] अन्यत्रापि वाक्यार्थे अर्थान्तरस्य अन्वयसिद्धये यया वृत्त्या मुख्यार्थस्य त्यागः जायते, सा लक्षणलक्षणा इति अवगम्यते। उपलक्षणहेतुत्वात् एषा लक्षणलक्षणा इति ज्ञायते।

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[७५] साहित्यदर्पणम् २.६
[७६] काव्यप्रकाशः २.४
[७७] साहित्यदर्पणम् पृ १४

ভারতীয় আধুনিক সংস্কৃতিতে
শ্রীমদ্ভগবদ্‌গীতার
দার্শনিক ও সামাজিক পর্যালোচনা

সম্পাদনা
মামনি মণ্ডল






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অধ্যাত্মময়ী সমাজকল্যাণময়ী চ গীতা

ডঃ সোমা মণ্ডল

গীতা সুগীতা কর্ত্তব্যা কিমন্যৈঃ শাস্ত্রবিস্তরৈঃ।
যা স্বয়ং পদ্মনাভস্য মুখপদ্মাদ্বিনিঃসৃতা।।

ভূমিকা :

শ্রীমদ্ভগবদ্গীতা "কৃষ্ণস্তু স্বয়ং ভগবান্ এতৎস্বরূপস্য শ্রীকৃষ্ণস্য মুখনিঃসৃত বাণী। জীবানাং ত্রিতাপজনিত দুঃখাৎ নিবৃত্তিলাভার্থং শ্রীকৃষ্ণস্য ভগবতঃ ঈদৃশী করুণাসঞ্জাতা বাণী অস্মাকং জীবনে সমাগতা। এতাদৃশী মহতী কৃপা অস্মাকং জীবনে অহৈতুকী কৃপা এব। ইয়ং গীতা সর্বেষাং শাস্ত্রাণাং শিরোভূষণস্বরূপা, সমভাবেন সর্বেণ সম্প্রদায়েন সমাদৃতা। শ্রীমদ্ভগবদ্গীতামাশ্রিত্য উপনিষদঃ অনুভূতং মহাসত্যং সামঞ্জস্যপূর্ণরূপেণ একসূত্রেণ আবদ্ধম্ কৃতং মহর্ষিব্যাসদেবেন। শ্রীমদ্ভগবদ্গীতা এব উপনিষৎ ইতি কথ্যতে। এতৎপ্রসঙ্গে শ্লোকমেকমস্তি গীতাধ্যানে--

সর্বোপনিষদো গাবো দোগ্ধা গোপালনন্দনঃ।
পার্থো বৎসঃ সুধীর্ভোক্তা দুগ্ধং গীতামৃতং মহৎ।।

গীতাধ্যান - ৪

শ্রীমদ্ভগবদ্গীতায়াম্ অষ্টাদশসংখ্যকাঃ অধ্যায়াঃ সন্তি, তন্মধ্যে সর্বেষাম্ অধ্যায়ানাং অন্তিমভাগে 'গীতাসূপনিষৎসু' উক্তিরিয়ং দৃশ্যতে। উপযুক্তে শ্লোকে গীতা উপনিষৎস্বরূপায়াঃ গোমাতুঃ দুগ্ধধারা এব। দুগ্ধপানার্থং মানবাঃ গাঃ পালয়ন্তি। তদ্রূপং সমগ্রোপনিষৎশাস্ত্রাণাং নির্যাসাস্বাদনম্ এব গীতায়াঃ অমৃতাস্বাদনমেব। এতস্য কৃতে শ্রীমদ্ভগবদ্গীতা তথা উপনিষৎ সমপর্যায়বাচক-শব্দৌ এব।

উপনিষদঃ বাণী চিরন্তনী শাশ্বতী চ। শ্রীমদ্ভগবদ্গীতায়াঃ উদ্দেশ্যং খলু বিমূঢ়বুদ্ধিঃ যথারূপেণ সত্যে কল্যাণমার্গে সংস্থাপিতা ভবিষ্যতি।

সমাজকল্যাণময়ীরূপেণ সংস্থাপিতা শ্রীমদ্ভগবদ্গীতা।।

* সহকারী অধ্যাপিকা, সংস্কৃত বিভাগ, নবদ্বীপ বিদ্যাসাগর কলেজ

Vision Towards Environmentally Sustainable Future

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Jayanta Kumar Biswas
Neera Sen Sarkar
and
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Department of Environmental Science and ENVIS RP,
MoEF & CC
University of Kalyani
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Preface

Environmental sustainability has become the buzzword and the key issue of the 21st century for humanity on local to global scale. Human being is an integral part of nature, and humanity's present progress and future fate both are absolutely linked with natural (biophysical) capital and planetary life support system embracing biodiversity and abiotic resources. During last few decades an unprecedented pace of industrialization, exponential human population growth, chemical intensive agricultural practices and modern consumerist culture have resulted in depletion and degradation of natural resources. Consequently we have been facing severe environmental crises and challenges in different domains of environment, such as biodiversity loss, health hazards, climate change, water and food insecurity, energy crisis, poverty, illiteracy, poor sanitation, gender inequality, and social inequality. People all over the globe are now searching for sustainable solutions to these environmental problems. Evidently, an imperative task of our generation is to build a sustainable future for the present and future generations based on triple bottom lines (TBL) of environmental protection, economic prosperity and social security.

In the above backdrop, the University of Kalyani organized the National Workshop on *"Vision towards Environmentally Sustainable Future"* in 2018 to provide a platform to researchers, academics, industry personnel and policy makers for sharing and hybridizing ideas on sustainability issues in an interdisciplinary approach. With resounding success it helped young researchers to formulate future research directions, and played a potential role in preparing a fertile field for "lab-to-land" technology transfer. The present book is a compendium of selected articles contributed by workshop participants, researchers and resource persons. It will be of immense

Cypermethrin Induced Mortality of the Freshwater Catfish *Heteropneustes fossilis* (Bloch): Role of Turbidity and Dietary Ascorbic Acid

Suchismita Chatterjee (Saha) and Anilava Kaviraj*

Abstract

Cypermethrin, a type II synthetic pyrethroid pesticide, is widely used in India to control agricultural crops. Although the pesticide has been found highly toxic to fish, there are records that its toxicity is influenced by several environmental factors. In the present study efforts were made to assess if lethal dose of cypermethrin on freshwater catfish *Heteropneustes fossilis* was influenced by turbidity of water and pre-exposure of the fish with dietary supplement of ascorbic acid. The results showed that susceptibility of *H. fossilis* to the lethal dose of cypermethrin (1.0 µg/L) increased with the increase in turbidity in water. On the other hand, pre-exposure of the fish to dietary supplement of ascorbic acid @ 30-100 mg/g body weight helped the fish to counter the stress of cypermethrin. It is concluded that toxicity of cypermethrin to fish depends on water quality of the receiving water as well as on the biochemical state of the fish.

Keywords: Pyrethroid; Cypermethrin; *H. fossilis*; Toxicity; Turbidity; Ascorbic acid

Introduction

Cypermethrin is a 4th generation pyrethroid, and is categorized as restricted use pesticide (RUP) by USEPA because of its high toxicity to fish (Bradbury and Coats, 1989; Saha and Kaviraj, 2008). Based on its toxicity, cypermethrin is categorized as type II pyrethroid (Nasuti *et al*., 2003). Cypermethrin is frequently used as a broad spectrum insecticide in agricultural fields in India. Agricultural run offs containing this insecticide often contaminate freshwater ponds, and render ecotoxicological risks to non-target freshwater

organisms. There are several reports which indicate cypermethrin as highly toxic to fish. Cypermethrin is lipophilic in nature and can access directly into the blood stream of fish through gill. Smith and Stratton, 1986). 24h LC50 of cypermethrin to freshwater catfish *Heteropneustes fossilis* was found as 0.96µg L with 95% confidence limit ranging between 0.9 to 1.0 µg L (Saha and Kaviraj, 2003). However, there are reports that toxicity of cypermethrin is influenced by environmental factors (Saha and Kaviraj, 2008). Previously it has also been determined that dietary supplement of ascorbic acid could help *H. fossilis* to counter stress of cypermethrin (Saha and Kaviraj, 2012).

The objective of this study was to evaluate if lethality of cypermethrin to *H. fossilis* changed with turbidity of water and dietary supplement of ascorbic acid. For this study 1.0 µg L cypermethrin was used, because 1.0 µg L was the upper limit of the 95% confidence limit of the LC50 value of cypermethrin reported for this fish (Saha and Kaviraj, 2003).

Materials and Methods

Fish and bioassay system

Adult specimens of *H. fossilis* (average length 14.10 ± 0.589 cm and average weight 6.83 ± 0.342 g), irrespective of sex, were used as test fish. Static bioassays were made in glass aquaria following the methods of APHA (1995). Each glass aquarium contained 3L of water and three acclimatized fish. The aquaria were arranged as per CRD design so that there were three replicates for each of the treatment (Gomez and Gomez, 1984).

Experiment of turbidity

This experiment was conducted at day light of 10 h. Turbidity of aquarium water was maintained by adding unpolluted finely ground dry soil. Six levels of turbidity (0, 10, 15, 20, 30, 35, 40 and 50 g L) were used. For each level of turbidity there were three

Carbon-Heteroatom Bond Formation for Medium Ring Heterocycles

Author(s): Bhaskar Chatterjee, Prateek Bhamboo, Dhananjoy Mondal and Smritilekha Bera

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Abstract

In major classes of natural products and pharmaceutical compounds, functional groups containing carbon-heteroatom bonds are present and often responsible for significant biological activities. Among them, medium-ring heterocycles are found in a wide range of drug candidates. While the synthesis of five- and six-membered ring systems is quite common, however, the formation of seven-, eight- and nine-membered heterocycles is not as abundant as entropy factors and transannular interactions often hinder the cyclization method. The ubiquitous presence and use of heteroatoms in both synthetic and naturally occurring pharmaceutical compounds support the review of carbon-heteroatom (particularly, C–N, C–O, C–S, C–S, C–Se, C–Te) bond-forming reactions reported in the literature. In general, the nucleophilic cyclization, organocatalyzed reactions, green synthesis, heterocycloaddition, ring-closing metathesis, radical cyclization, metal-mediated transition cycloaddition, macrolactonization are discussed as the most commonly used strategies for medium-ring construction. The ring expansion strategies, such as pericyclic and sigmatropic rearrangements, play an important role in the formation of C-X bonds. The challenges faced involving structural complexity and biological activities prompted us to review the literature for the synthesis of the heterocycles of the medium-ring size. This chapter is dedicated to recent developments for the construction of C–X bonds in seven-, eight- and nine-membered heterocycles.

Keywords: Green synthesis, Heterocycles, Medium ring, Metal catalysed cyclization, Nucleophilic cyclization.

CHAPTER 3

Carbon-Heteroatom Bond Formation for Medium Ring Heterocycles

Bhaskar Chatterjee[1], Prateek Bhamboo[2], Dhananjoy Mondal[2] and Smritilekha Bera[2,*]

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Abstract: In major classes of natural products and pharmaceutical compounds, functional groups containing carbon-heteroatom bonds are present and often responsible for significant biological activities. Among them, medium-ring heterocycles are found in a wide range of drug candidates. While the synthesis of five- and six-membered ring systems is quite common, however, the formation of seven-, eight- and nine-membered heterocycles is not as abundant as entropy factors and transannular interac common, , hinder the cyclization method. The ubiquitous presence and use of heteroatoms in both synthetic and naturally occurring pharmaceutical compounds support the review of carbon-heteroatom (particularly, C–N, C–O, C–S, C–S, C–Se, C–Te) bond-forming reactions reported in the literature. In general, the nucleophilic cyclization , organocatalyzed reactions, green synthesis, heterocyclo-addition, ring-closing metathesis, radical cyclization, metal-mediated transition cycloaddition, macrolactonization are discussed as the most commonly used strategies for medium-ring construction. The ring expansion strategies, such as pericyclic and sigmatropic rearrangements, play an important role in the formation of C-X bonds. The challenges faced involving structural complexity and biological activities prompted us to review the literature for the synthesis of the heterocycles of the medium-ring size. This chapter is dedicated to recent developments for the construction of C–X bonds in seven-, eight- and nine-membered heterocycles.

Keywords: Green synthesis, Heterocycles, Medium ring, Metal catalysed cyclization, Nucleophilic cyclization.

INTRODUCTION

Heterocycles have attracted much attention of chemists owing to their interesting architecture and profound bioactivities. These represent a privileged class of compounds of natural origin essential to life, such as nucleic acids, naturally occurring pigments, vitamins, hormones and antibiotics, and most hallucinogens. Their unique ability to be used as biomimetics as well as active pharmaco-core has rendered them valuable motifs in the arena of pharmaceuticals as low molecular weight lead compounds in drug design. Over the decades, these compo-

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Sequence Characterization of Glutamate Receptor Genes of Rat (Vertebrate) and Arabidopsis Thaliana (Plant)

Antara Sengupta, Pabitra Pal Choudhury, and Subhadip Chakraborty

Abstract iGluR gene family of a vertebrate (rat) and glutamate-like receptor (AtGLR) gene family of plant (Arabidopsis thaliana) by Darwin and Darwin (in The Power of Movement in Plants, 1880) perform few similar kind of functionalities in neurotransmission. These have been compared quantitatively depending upon the biochemical characteristics of 20 amino acids comprising the amino acid sequences of the aforesaid genes. 19 AtGLR genes and 16 iGluR genes have been taken as datasets. Thus, we detected the commonalities (conserved elements) which plants and animals have got from a common ancestor during the long evolution by Darwin and Darwin (in The Power of Movement in Plants, 1880). Eight different conserved regions have been found based on individual amino acids. Different conserved regions are also found, which are based on chemical groups of amino acids. We have tried to find out different possible patterns which are common throughout the dataset taken. Nine such patterns have been found with size varying from 3 to 5 amino acids at different regions in each primary protein sequence. Phylogenetic trees of AtGLR and iGluR families have also been constructed. This approach is likely to shed lights on the long course of evolution.

Keywords Glutamate receptors · Arabidopsis thaliana · Chemical properties · Directed graph · Phylogenetic tree

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मानवजीवनसंरक्षणाय अथर्ववेदस्य अवदानम्

डिम्पलबागदी*

सारसंक्षेप - विश्वसाहित्यस्य प्राचीनतमा गरिमा यदा सन्ति वेदा एव आदरणीयाः भवन्ति।संस्कृतसाहित्यं समृणं निबद्धा संस्कृतिम अनुसृत्यैव [illegible] विश्वस्य आभवम्।भारतीया संस्कृतिः विश्वस्य सर्वासु संस्कृतिषु प्राचीना यथा ते सर्वे [illegible] स्वीक्रियन्ते।आचार्ये कथितम मनुः-"सत्य अहिंसादि गुणैः श्रेष्ठा विश्ववन्द्यत्वं शिक्षिका। विश्व शान्ति सुखाधात्री भारतीया हि संस्कृतिः॥"संस्कृतेः मानव-अन्तःकरणस्य अज्ञान [illegible] ज्ञानलोक प्रकाशयति।आचार्य मनुना मतं-"एतद्देशप्रसूतस्य सकाशादग्रजन्मनः। स्वं स्वं चरित्रं शिक्षेरन् पृथिव्या सर्वमानवाः॥" संस्कृतेः विचारधारानुसारं सदाचारपालनं, धर्मपालनार्थं, दुष्कर्मदमनं पाप प्रतिकरणं, दुःखदहनं ज्ञानज्योतिप्रदानं, अविद्यातमोहरणं, सत्यसाधनं शान्तिप्रदानं च विश्वबन्धुत्वस्थापनं मनोमालीन्यं दूरीकरणं इत्यादयः दृश्यन्ते गुणाः विराजन्ते।समग्र जीवनस्य [illegible] सामाजिक-राजनीतिक-कला-स्वास्थ्य-शिक्षा-धर्मादिषु क्षेत्रेषु उन्नतिकारकः तत्र सर्वप्रकारकश्च चिन्तनव्यापारः संस्कृतेः वर्तते।कपिलमुनिना कथितम्-"संस्कृतेः संस्कृतिरस्ति संस्कृतेः सकला कला।संस्कृतेः सकलं ज्ञानं संस्कृते किञ्च विद्यते॥" अतः कपिलमुनिः कथितम्-"संस्कृतं सुसमस्तानां ज्ञानं भाजनमुच्यते।संस्कृतेन विना देशः केवलं चेष्टियोच्यते॥" संस्कृत भाषायाः वसुधैव कुटुम्बकम् भावना सम्बन्धाः श्लोकाः बहवः सन्ति।वैदिक कालात आरम्भ आधुनिक में स्कृतकालपर्यन्तं सर्वत्र कौटुम्बिकी भावना विलसन्तेव।वेदेषु यज्ञ-प्रक्रियायाः एवं महत्वं यत् तत्र स्वार्थं परिहाय परकं परार्थं साधनं शिक्ष्यते स्म।समाजे विश्वे यानि भूतानि सन्ति, तानि आत्मवत् भावयन्तु। विश्वस्य सर्वेऽपि प्राणिनः एकस्यैव परमपितापरमेश्वरस्य पुत्राः सन्ति। "यस्तु सर्वाणि भूतान्यात्मन्नेवानुपश्यति। सर्वभूतेषु चात्मानं ततो न विचिकित्सति॥[2] "पतञ्जलिना अहिंसा सत्यादि यमानां महत्वं प्रतिपाद्यते यत् यमास्ते गुणाः सन्ति ये सर्वधर्मैः स्वीक्रियन्ते।[3] आचार्य मनुः कथितम्-[4]

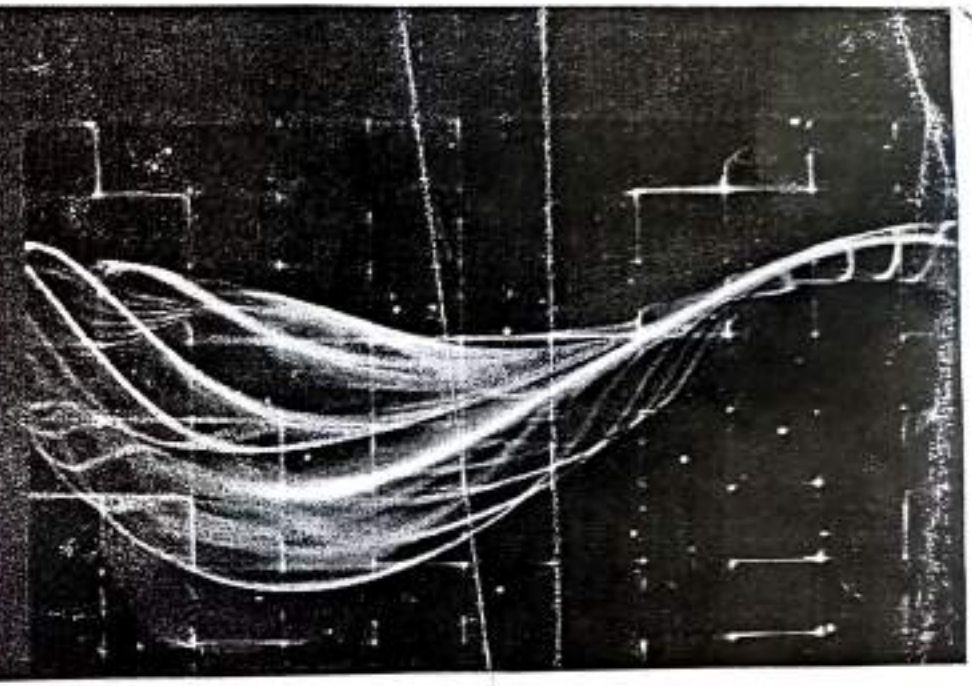
कूटशब्दः - संस्कृति,अहिंसा, वसुधैव कुटुम्बकम्, प्रकृति भावना, आत्मन्,स्वास्थ्यचिन्तन्

भूमिका-

'साहित्यं समाजस्य दर्पणं भवति' इत्यक्त्यनुसारेण अस्यां संहितायामुपरि तत्कालीनसमाजस्य विभिन्न अवस्थायां प्रतिबिम्बं स्पष्टतः दरीदृश्यते।ऋग्वेदिकसाहित्यानुशीलनेन वयं ज्ञानवन्तः यद् कथं सप्तसिन्धुप्रदेशे आर्याणां महनीया संस्कृतिः समाच्छादिता समुल्लासिता आसीत्, कथं गंगायमुनासरस्वतीप्रदेशाभिमुखं प्रसारः जातः , कथं तेषां धार्मिक-सामाजिक-राजनैतिक-अर्थनैतिक-संस्कृतिकः प्रभृतयः सर्वाङ्गिन् समृद्धि जातेः।ऋग्वेदस्य दशममण्डले पुरुषसूक्ते सर्वप्रथमं चतुरणां वर्णाना उत्पत्याः उल्लेखः दृश्यते[5]- मानवस्याखिलं कृत्यजातं कर्तव्याकर्तव्यं वा वेदेषु विशदतया निरूप्यते।अतएव वेदा आचारसंहितारूपेण प्रमाणीक्रियन्ते।अस्मिनसंसारे संस्कृतेः सभ्यताश्च कथमिव विकाशोऽभुदित्यर्थं वेदानुशीलनमनिवार्यमापद्यते।यथा यजुर्वेदे प्राप्यते-"सा प्रथमा संस्कृतिर्विश्ववारा"[6] भाषासु संस्कृतभाषा अतीव मधुरम्-'अमृतं मधुरं सम्यक् संस्कृतं हि ततोऽधिकम्। देवभाग्यमिदं यस्माद् देवभाषेति कथ्यते॥' इति। संस्कृतं हि भारतीयसंस्कृतेः आत्मा भवति।बालकस्य जननादारभ्य क्रियमाणाः जातकर्म-नामकरण-अन्नप्रासनादि षोडशसंस्काराः अनया एव भाषया विधीयन्ते।संस्कृति संस्कृताश्रया, यथा उक्तं कपिलेन-"संस्कृतं संस्कृतेर्मूलं ज्ञान-विज्ञानवारिधिः।वेदतत्त्वार्थसंजुष्टं लोकालोककरं शिवम्॥"एषा संस्कृतिः न केवलं भारतदेशस्य अपि तु समग्रविश्वस्य मुकुटायमानाऽस्ति।"सत्य अहिंसादि गुणैः श्रेष्ठा विश्ववन्द्यत्वशिक्षिका।विश्व शान्ति सुखाधात्री भारतीया भारतीया हि संस्कृतिः॥" भारतीयानामाचारव्यवहारसमाजराज्यव्यवस्था श्रुतिप्रामाण्यमूला विद्यते।ऐतरेयब्राह्मण दृश्यते-"ओं स्वस्ति। साम्राज्यं भौज्य-स्वाराज्यं वैराज्यं पारमेष्ठ्य राज्यं महाराज्यं आधिपत्यमयं समन्तपर्यायो स्यात्, सार्वभौमः सार्वायुषः आन्तादा परार्धात् पृथिये समुद्रपर्यन्ताया एकराड्" इति।संस्कृतभाषा अतीव वैज्ञानिकी विद्यते।भारतवर्षस्य समस्तमपि प्राचीनं वाङ्मयं संस्कृतभाषामाश्रित्यैव्यवतिष्ठते।अस्यामेवभाषायाम् उपनिबद्धाः वैदिक वाङ्मयं,रामायणं, महाभारतं , पुराणानि, स्मृतिग्रन्थाः, काव्यानि, महाकाव्यानि, दर्शनं, व्याकरणं,

* Nabadwip Vidyasagar College, Asst. Prof., Department of Sanskrit

The theory of entire functions is very important area of complex analysis. These functions have many interesting properties which mostly generated by the Cauchy formula. In the theory of functions of a complex variable, those functions which are characterize in the form of a power series or a Dirichlet series play an important role. Many mathematicians have obtained various results by considering Dirichlet series with complex exponents. However, in 1983, Indian mathematician B. L. Srivastava introduced a new class of Dirichlet series which is called vector valued Dirichlet series briefly known as VVDS. Later, he also studied some growth properties of analytic functions represented by VVDS and obtained the coefficient characterizations of their order and type. During the past decades, several authors made close survey on the growths of analytic functions represented by VVDS in some different direction. In the present book, the authors have tried to study some comparative growth rates of analytic functions represented by VVDS and obtained a number of significant results.



Tanmay Biswas
Chinmay Biswas

Some relative growth analysis of entire functions represented by VVDS

Relative growth analysis of entire functions represented by vector valued Dirichlet series

Dr. Tanmay Biswas is an independent Research Scientist. During his research career of more than 10 years, he has published more than 225 research papers including 52 research papers with single authorship. Dr. Chinmay Biswas is an Assistant Professor, Department of Mathematics, Nabadwip Vidyasagar College, West Bengal, India.

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ভারতীয় আধুনিক সংস্কৃতিতে শ্রীমদ্ভগবদ্‌গীতার দার্শনিক ও সামাজিক পর্যালোচনা

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'স্বে স্বে কর্মণ্যভিরতঃ সংসিদ্ধিং লভতে নরঃ' (গীতা-১৮/৪৫)

শ্রী বিপ্লব বাগদী

শ্রীমদ্ভগবদ্গীতাতে আমরা দেখতে পাই পরম নিয়ন্তা, নিয়ন্ত্রাধীন জীবসকল, নিখিলজগৎ, মহাকাল ও কর্ম—এইসব নিয়েই পূর্ণ পরম সত্তা বিরাজিত। এই পূর্ণ সত্তাকে বলা হয় পরমতত্ত্ব। এই পূর্ণসত্তা ও পরমতত্ত্ব হলেন পুরুষোত্তম ভগবান শ্রীকৃষ্ণ। নির্বিশেষ ব্রহ্ম হলেন সূর্যরশ্মির মতো। শ্রীমদ্ভগবদ্গীতাতে আমরা জানতে পারি যে, পুরুষোত্তম ভগবান হলেন নির্বিশেষ ব্রহ্ম ও পরমাত্মা উভয়েরই উর্দ্ধে। ব্রহ্মসংহিতার শুরুতেই বলা হয়েছে—

"ঈশ্বরঃ পরমঃ কৃষ্ণ সচ্চিদানন্দবিগ্রহঃ
অনাদিরাদির্গোবিন্দ সর্বকারণকারণম্।"[i]

পরমেশ্বর শ্রীকৃষ্ণ হচ্ছেন সর্বকারণের কারণ, অনাদির আদি গোবিন্দ এবং সৎ, চিৎ ও আনন্দের মূর্তবিগ্রহ। কঠোপনিষদে উক্ত হয়েছে—**'নি-ত্যা নিত্যানাং চেতনশ্চেতনানাম্'**।[ii] ভগবান অর্জুনকে উপদেশ দিয়েছেন—তাঁর বৃদ্ধ পিতামহ, শিক্ষক, আদি আত্মীয়-পরিজনের জন্য শোক না করতে। পক্ষান্তরে সেই কুরুক্ষেত্রের ধর্মযুদ্ধে প্রাণ ত্যাগ করার ফলে তাঁদের দেহগত কর্মফল জনিত সমস্ত পাপ থেকে তাঁরা মুক্ত হবেন বলে আনন্দিত হওয়া উচিৎ। কারণ অর্জুনকে শ্রীকৃষ্ণ বলেছেন—

"নৈনং ছিন্দন্তি শস্ত্রাণি নৈনং দহতি পাবকঃ।
ন চৈনং ক্লেদয়ন্ত্যাপো ন শোষয়তি মারুতঃ॥"[iii]
"অচ্ছেদ্যোঽয়মদাহ্যোঽয়মক্লেদ্যোঽশোষ্য এব চ।
নিত্যঃ সর্বগতঃ স্থাণুরচলোঽয়ং সনাতনঃ॥"[iv]

অর্থাৎ আত্মা অস্ত্রের দ্বারা কাটা যায় না, আগুনে পোড়ানো যায় না, জলেও ভেজানো যায় না, অথবা হাওয়াতেও শুকানো যায় না, এই আত্মা অচ্ছেদ্য, অদাহ্য, অক্লেদ্য এবং অশোষ্য, তিনি চিরস্থায়ী, সর্বব্যাপ্ত, অপরিবর্তনীয়, অচল এবং সনাতন। তিনি অব্যক্ত, অচিন্ত্য ও অবিকারী। চির-অপরিবর্তনীয় আত্মা চিরকালই বিভুচৈতন্য পরমাত্মার

* অধ্যাপক, নবদ্বীপ বিদ্যাসাগর কলেজ, সংস্কৃত বিভাগ

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विश्वबन्धुत्वं हि भारतीयसभ्यताया मूलम्

डॉ विप्लव बागची
सहकारी अध्यापक, संस्कृत विभाग
नवद्वीप विद्यासागर कलेज, पश्चिमबङ्ग।

शोधसारः

इदं जगत् सुख-दुःखात्मकम्। परिवर्तनशीलोऽयं संसारः। दुःख निरोधस्य एक एव उपायः विश्वे शान्तेः सद्भावस्य च संस्थापना वर्तते। संस्कृतभाषायां वसुधैवकुटुम्बकं भावना सम्बन्धाः श्लोकाः बहवः सन्ति। वैदिककालात् आरभ्य आधुनिकसंस्कृतकालपर्यन्तं सर्वत्र कौटुम्बिकी भावना विलसन्तेव। वेदेषु यज्ञ-प्रक्रियाया एतदेव महत्वं यत् स्व स्वार्थपरिहारपूर्वकं परार्थसाधनं शिक्ष्यते स्म। समाजे विश्वे यानि भुतानि सन्ति, तानि आत्मवत भावयन्तु।

"अयं निजः परो वेति गणना लघुचेतसाम्।
उदारचरितानान्तु वसुधैव कुटुम्बकम्॥
सर्वे भवन्तु सुखिनः सर्वे सन्तु निरामयाः।
सर्वे भद्राणि पश्यन्तु मा कश्चिद् दुःखमाप्नुयात्॥" [1]

विश्वस्य सर्वेऽपि प्राणिनः एकस्यैव परमपितापरमेश्वरस्य पुत्राः सन्ति।

"यस्तु सर्वाणि भुतान्यात्मन्नेवानुपश्यति।
सर्वभूतेषु चात्मानं ततो न विचिकित्सति॥" [2]

पतञ्जलिना अहिंसा सत्यादि यमानां महत्वं प्रतिपाद्यते यत यमास्ते गुणाः सन्ति ये सर्वधर्मैः स्वीक्रियन्ते।

"अहिंसा-सत्यास्तेय-ब्रह्मचर्यापरिग्रहा यमाः।
जाति-देश-काल-समयानवच्छिन्नाः सार्वभौमा महाव्रतम्।" [3]

आचार्यमनुः कथितम्- "सत्यं हि परमं धर्मं,धर्मविदो जनाः", 'सत्यमेव जयते' इति भारतवर्षस्य मूलशक्तिः भवेत्। आत्मदर्शनब्रह्मदर्शनदृष्टेव "ब्रह्म सत्यं जगत मिथ्या" इति भारतीयदर्शने अभिधीयते। भारतीयदर्शनानां मूलं विश्वस्मिन् विद्यमानानां त्रिविधदुःखात्यन्तनिवृत्तिरेवास्ति। उपनिषदि भावना यत-

"ईशावास्यमिदं सर्वम् यत किञ्च जगत्यां जगत।
तेन त्यक्तेन भुञ्जिथा मा गृधः कस्यस्विद्धनम्॥" इति,

अतः गीतायाम् उल्लिख्यते-

"कर्मण्येवाधिकारस्ते मा फलेषु कदाचन।
मा कर्मफलहेतुर्भुमा ते सङ्गोऽस्त्वकर्मणि॥" [5]

अतः भारतीय संस्कृतेभ्यः मानवतावादी उदारश्चेतनाः मूलमिति।

कूटशब्दाः – संस्कृति, दुःखम, धर्मः , अहिंसा, सत्यम, जगत, ब्रह्म, वसुधैवकुटुम्बकम।

उपोद्घातः

विश्वसाहित्यस्य प्राचीनतमाः ग्रन्थाः वेदाः सन्ति। विविधभाषागतप्राचीनग्रन्थेषु वेदः सर्वेभ्यः प्राचीनतम इति सर्वैरेव अङ्गीक्रियते। विविधभाषागतप्राचीनग्रन्थेषु वेदः सर्वेभ्यः प्राचीनतम इति सर्वैरेव अङ्गीक्रियते। आचार्य सायणः वेदस्य लक्षणकृते-"इष्टप्राप्तिनिष्टपरिहारयोर्लौकिकमुपायं यो ग्रन्थो वेदयति स वेदः"। सत्यं वद, धर्मं चर, यमनियमासन

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Integer Translation and Growth of Entire and Meromorphic Functions

The theory of entire and meromorphic functions is very important area of complex analysis. Finnish mathematician Rolf Nevanlinna (1926) initiated the value distribution theory for meromorphic functions which includes the theory of entire functions as a special case. In fact, this theory deals with the learning of the fact how an entire or meromorphic function assumes some values and the influence of assuming sure values in some explicit way on a function. Actually, the famous fundamental theorem of classical algebra is most likely the first value distribution theorem. The value distribution theory deals with the various features of the performance of entire and meromorphic functions, one of which is the study of comparative growth properties. On the other hand Serbian mathematician Jovan Karamata(1930) introduced the notion of a new class of functions called slowly increasing functions which have been applied in various fields of mathematics. In this book, the authors have tried to study some growth properties of integer translated composite entire and meromorphic functions with the effect of slowly increasing function and obtained a number of significant results.

Dr. T. Biswas is an Independent Research Scientist. During his research career of more than 12 years, he has published 2 books and more than 245 research papers. Dr. C. Biswas, Assistant Professor, Department of Mathematics, Nabadwip Vidyasagar College, India, has published 27 research papers and 2 books in collaborate with Dr. T. Biswas.

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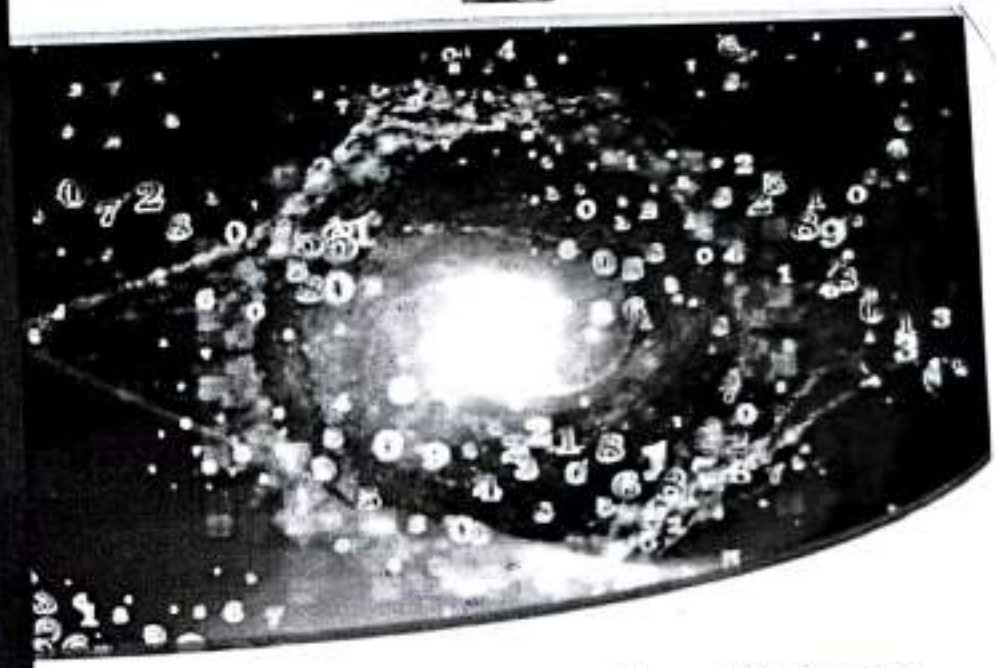

Tanmay Biswas · Chinmay Biswas

Integer Translation and Growth of Entire and Meromorphic Functions

Effect of Integer Translation on Growth of Composite Entire and Meromorphic Functions

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Some Remarks on the Growth Analysis of *p*-adic Entire Functions

The study of the theory of entire functions is well known on the complex analysis and was started about a hundred years ago. But if we consider an algebraically closed ultrametric field, the study of the theory of analytic functions was started in the 20-th century and now it is possible to obtain some new results. The present book deals with the study of some growth analysis of p-adic entire functions. This book is mainly focused on some growth properties of p-adic entire functions, which covers the important branch of non-Archimedean field. The main aim of the book is to extend and modify the order and type of growth of an entire function on non-Archimedean field to relative order of higher dimensions as done on complex field. Similarly to complex analysis, here in this book, we are trying to establish some the growth properties of entire functions on non-Archimedean field which have the same relations as in complex analysis.

Dr. T. Biswas is an Independent Research Scientist. He has published 3 books and more than 245 research papers. Dr. C. Biswas, Assistant Professor, Department of Mathematics, Nabadwip Vidyasagar College, West Bengal, India. Dr. B. Saha, Assistant Professor, Department of Mathematics, Muragachha Government General Degree College, West Bengal, India.

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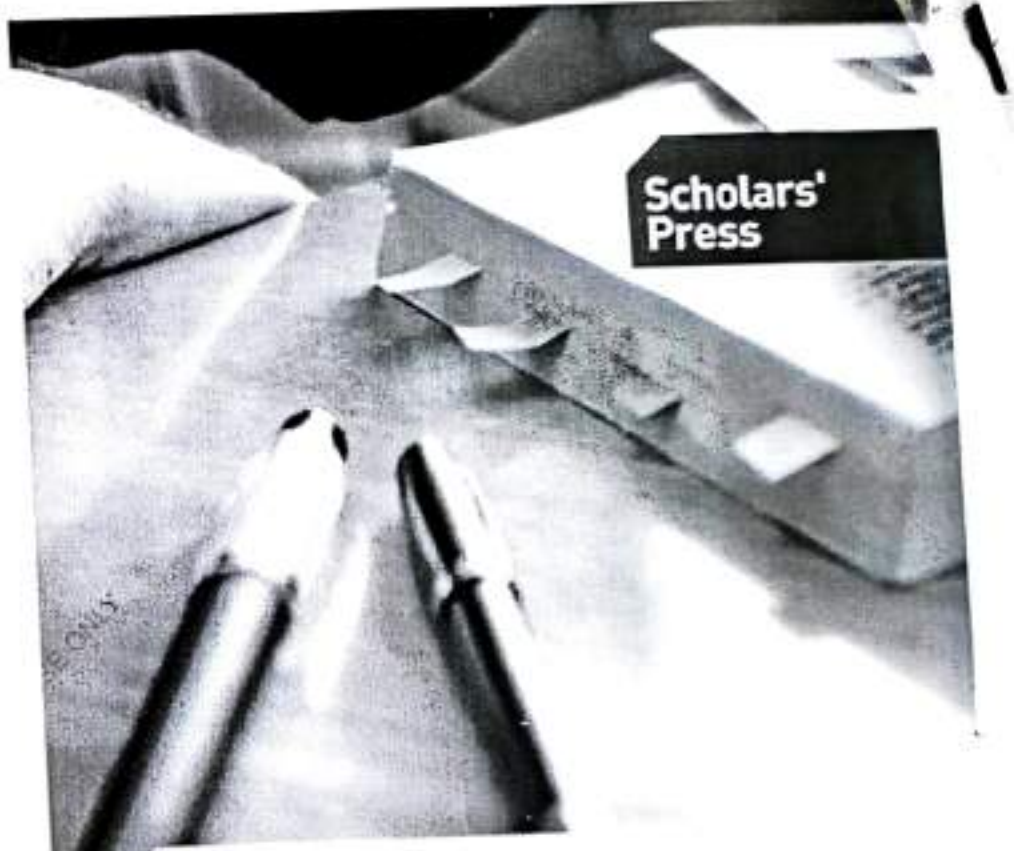

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Tanmay Biswas
Chinmay Biswas
Biswajit Saha

Some Remarks on the Growth Analysis of *p*-adic Entire Functions

On some growth analysis of composite entire functions on non-Archimedean field

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On the Growth Properties of Composite *p*-adic Entire Functions

The study of the theory of analytic functions in algebraically closed ultrametric field is very interesting which was started in the 20-th century. The study of some growth properties of composition of two *p*-adic entire functions is the main purpose of this book, which covers the essential branch of non-Archimedean field. The main target of the book is to widen and revise the ideas of order and type of growth of an entire function on non-Archimedean field to generalized order and generalized type of higher dimensions as done on complex field. Likewise to complex analysis, here in this book, we are trying to establish some the growth properties of composition of two *p*-adic entire functions on non-Archimedean field which have the same relations as in complex analysis.

Dr. T. Biswas is an Independent Research Scientist. During his research career of more than 13 years, he has published 4 books and more than 250 research papers. Dr. C. Biswas, Assistant Professor, Department of Mathematics, Nabadwip Vidyasagar College, India, has published 28 research papers and 4 books in collaborate with Dr. T. Biswas.

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On the Growth Properties of Composite *p*-adic Entire Functions

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Some Aspects of the Theory of *p*-adic Entire Functions

From 20-th century, the study of the theory of analytic functions in algebraically closed ultrametric field was started, which is a very interesting area under discussion. The main aim of the book is to revise and develop the ideas of order and type of growth of an entire function on non-Archimedean field to generalized order and generalized type of higher dimensions as done on complex field. Then we are trying to establish some results related to the growth properties of composite p-adic entire functions on non-Archimedean field which have the same relations as in the field of complex analysis.

Tanmay Biswas is an Independent Research Scientist. He has published 5 books and more than 250 research papers during his 13 years research career. Chinmay Biswas is an Assistant Professor of Mathematics, Nabadwip Vidyasagar College, India, who has published 29 research papers and 5 books with Tanmay Biswas.

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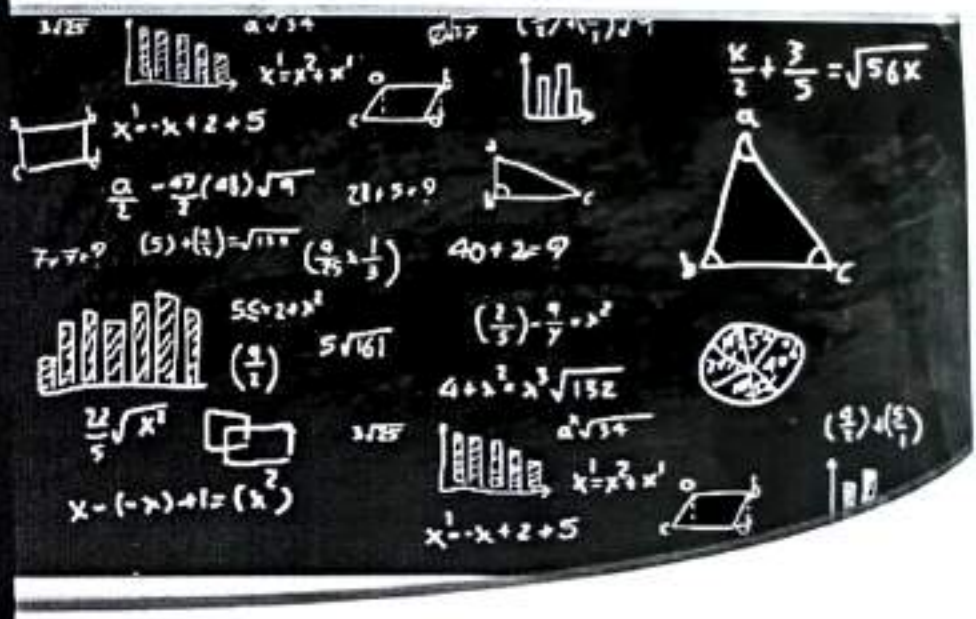

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Some Aspects of the Theory of *p*-adic Entire Functions

Various growth properties of composite *p*-adic entire functions under different conditions

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ENVIRONMENT & UNSUSTAINABLE HUMAN LIFE

(VOLUME-III)

DEGRADATION OF ENVIRONMENT-II

POLLUTION- LAND, SOIL & OTHER TYPES

Dr. M.Z.A. Khan
Dr. Sunil Kumar Verma

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Solid Waste and Its Management

Dr. Suchismita Chatterjee Saha

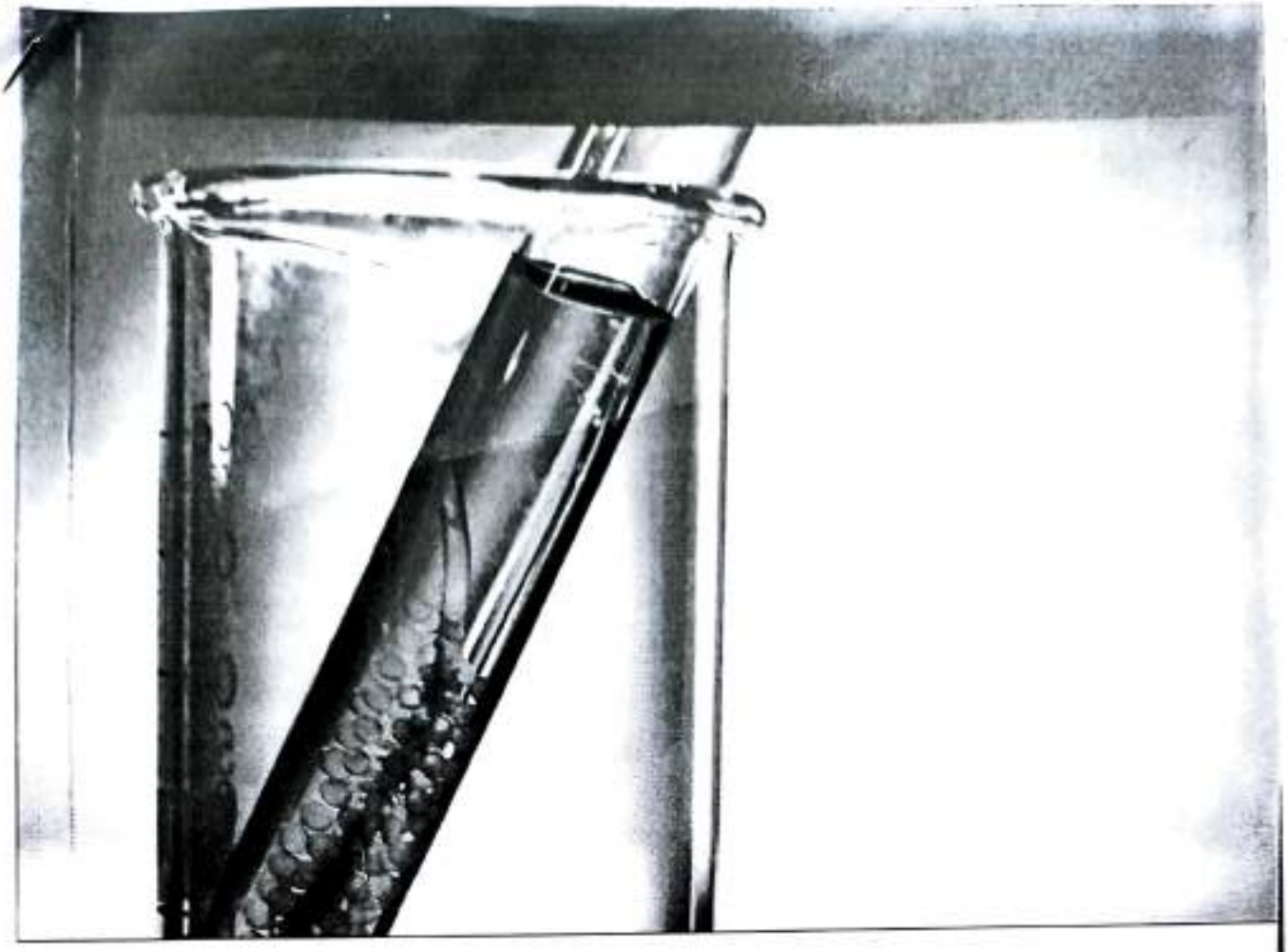
Abstract:

Waste is any material which is majorly generated by human activities and usually tend to pollute the environment. Solid waste is the type of waste which are physically solid, semi solid or sometimes maybe liquid. Solid waste is the most widespread category of waste generated. It is originated from the agricultural or industrial origin or it may be generated by the waste water or sewage treatment plant. Waste needs to be managed properly or else they might pose various health and environmental hazards. Therefore, we need a proper waste management system. With the increase in population throughout the country as well as the entire world waste management is becoming increasingly challenging day by day. India has seen a huge population surge in past few decades and the waste generated by the population has also increased exponentially. Not only has the amount of waste increased drastically over the decades but the complexity of the waste has also increased. If the increase in waste is not accounted with, we will face serious problems with maintaining proper sanitation and hygiene in the society. Thus, new methods of waste management need to be introduced frequently to cope with the problem of increasing waste in the society and increasing complexity of waste. We are going to discuss about the various method of waste management system that exist today in the modern world.

Keywords: *Waste, Types, Sources, Strategies, Management system.*

Introduction:

Solid waste may be defined as unwanted, useless solid materials produced from human activities in



Sukhendu Dey
Kamalesh Sen

Innovative Approaches on Environmental Sustainability and Toxicology

2021

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Chapter 6 Toxicological Effects of Emerging Contaminants: Pyrethroid pesticide (Cypermethrin) and Bisphenol A on Fish

SUCHISMITA CHATTERJEE SAHA

Abstract

Contaminants are physical, chemical or biological potentially undesirable human- made substances. These substances are very harmful in nature and sometimes cause molecular, biochemical or morphological changes. These substances are called pollutants and cause environmental pollution. These substances are produced both from natural processes and human activities. Recently the list of chemical pollutants is increasing due to gradual detection and identification of more and more new emerging pollutants. These emerging contaminants are newly discovered groups of unregulated contaminants which we found on the surface of groundwater. These pollutants are bioactive and bioaccumulated and multidisciplinary. The emergence of new types of effluents poses a serious question. If these new effluents are major pollutants, are they interfering with organisms in the biosphere in un-noticed ways, are these pollutants directly or indirectly affecting our bodies. We can answer these questions by studying effects and changes in organism which are in direct contact with these effluents for a large amount of time. Hence, we have focused our study to aquatic organisms primarily fishes. In this Chapter, two emerging contaminants which are Bisphenol A and Cypermethrin Pesticides have been discussed. These two compounds are highly toxic to non- target aquatic organisms specially fish species. Bisphenol A is mainly used in production of plastic material and production of epoxy resins. Recently the use of plastic material has increased so much, which cause harmful effects on fish either by environment or from food materials which are indiscriminately throw in to the aquatic environment. It causes endocrine disrupting effects, affect ovarian transcript. and affect yolk protein vitellogenesis, effect on fish reproduction, physiological responses and many other toxicological symptoms. Cypermethrin is pyrethroid pesticide. It is used in wide range of crops. Agricultural runoff enters in our derelict water bodies and cause potential harm to non- target organisms.

Hand Book of Agriculture & Plant Sciences

Edited by

Dwipayan Sinha

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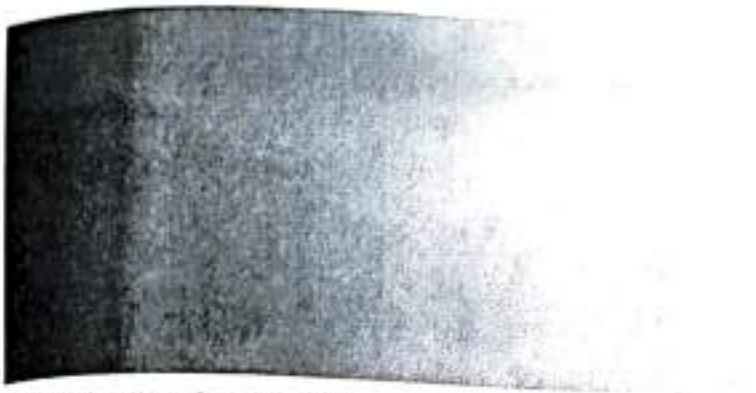

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Prospects of Agriculture in Near Future

*Suchismita Chatterjee Saha**

Department of Zoology, Nabadwip Vidyasagar College, Nabadwip, Nadia, West Bengal, India

*Corresponding Author :
Suchismita Chatterjee Saha
Department of Zoology, Nabadwip Vidyasagar College, Nabadwip ; Nadia; West Bengal; India.

Introduction

Agriculture has sustained the human society throughout the centuries. As the years have progressed, Agriculture has seen a sustainable development. Even today Agriculture is the primary source of energy and nutrition for the entire human population. Therefore, we need to make Agriculture more sustainable and efficient over the coming years and investigate various prospects to make agriculture better. The word Agriculture come from two Latin word "Agri" means land and "cultura" means cultivation. Agriculture has existed throughout human civilization. Records of Agriculture have been practiced for 1,00,000 years. Gradually agricultural activities spread throughout all major river valleys around the world. It brought the hunter gatherer humans

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A collection of essays on tribal issues and tribal folk culture

Edited by : Rabindranath Hansda
Guhiram Kisku
Tanushree Hansda

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भारतीयसंस्कृतौ वैदिकाचार-धर्मयोः उत्कर्षताविचारः?

सारसंक्षेपः

सम्-इत्युपसर्गपूर्वकं कृञ्धातोः 'स्त्रियां क्तिन्' प्रत्यये 'संस्कृतिः' इति शब्दः प्रतिपादितो भवति। संस्कृतिः संस्काराश्च इति शब्दौ एकार्थकौ भवतः।का नाम संस्कृतिः? मनसः आत्मनो वा संस्कारं करोति या सा संस्कृतिः नाम्ना अभिधायते।भारतीया संस्कृतिः विश्वस्य सर्वासु संस्कृतिषु प्राचीना श्रेष्ठा इति सर्वैः स्वीक्रियते। संस्कृतिः मानव-अन्तःकरणस्य अज्ञानं दूरीकरोति ज्ञानलोकं प्रकाशयति च। संस्कृतौ विचारस्वतन्त्रता, सदाचारपालनता, धर्मप्राधान्यता, दुर्भावदमनता, पाप-अपाकरणता, दुःखदहनता, ज्ञानज्योतिप्रदानता, अविद्यातमोपहरणता, सुखसाधनता, शान्तिप्रदानता, विश्वबन्धुत्वस्थापनता, मनोऽमलीकरणता इत्यादयः दुर्लभाः गुणाः विराजन्ते। कपिल-मुनिना कथितम्-"संस्कृतेः संस्कृतिर्ज्ञेया संस्कृतेः सकला कला।संस्कृतेः सकलं ज्ञानं संस्कृतेः किन्न विद्यते॥" अन्यत्र "संस्कृतेन सुसम्पन्नं भारतं भारतमुच्यते। संस्कृतं विना देशः केवलं चेण्डियोच्यते॥" इति कपिलः। संस्कृतभाषायाः वसुधैवकुटुम्बकम्-भावना सम्बन्धाः श्लोकाः बहवः सन्ति। आचार्य- मनुना कथितम्- "सत्यं हि परमं धर्म,धर्मविदो जनाः"। 'सत्यमेव जयते' इति भारतवर्षस्य मूलशक्तिः भवति। धर्मप्राधान्यात्मकसंस्कृतिः भारतीयसंस्कृतेः मूलम् अस्ति।'धारणाद् धर्मः' इत्याह धर्मो धारयते प्रजाः। यथोक्तम्-"धर्मो हि तेषामधिको विशेषो धर्मेण हीनाः पशुभिः समानाः"।पतञ्जलिना अहिंसा-सत्यादियमानां महत्वं प्रतिपाद्यते ।यमास्तेगुणाः सन्ति ये ते सार्वभौमधर्मरूपेण स्वीक्रियन्ते। उक्तम्-

"अहिंसा-सत्यास्तेय-ब्रह्मचर्यापरिग्रहा यमाः।

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বিশ শতকীয় বিপর্যয়ের এক জীবন্ত ভাষ্য 'ছেড়া তার'

রবীন্দ্রনাথ হাঁসদা
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বাংলা সাহিত্যে নানা সময়ে সংঘটিত বিপর্যয়ের চিত্র উঠে এসেছে। সেই আদ্যিকাল থেকে একের পর এক বিপর্যয় মানব জীবনকে ব্যতিব্যস্ত করে রেখেছে। কখনো তা বহিঃশত্রুর রূপ ধরে এসেছে। কখেনো বা প্রকৃতিই সংহারক মূর্তি ধারণ করেছে। সাহিত্যের সূত্র ধরেই আমরা জানতে পারি প্রাচীন যুগে একবার তুর্কি আক্রমণকালে সামাজিক ক্ষেত্রে বিপর্যয় নেমে এসেছিল। এমন বিপর্যয় যে অনুমান করা হয় এই সময়টিই সাহিত্য ক্ষেত্রে অন্ধকারময় যুগ বলে খ্যাত হয়ে রয়েছে। এই ভয়ঙ্কর সময় যে একদম কিছু রচিত হয় নি এমন নয়। হয়তো রচিত হয়েছিল তবে যেকোন কারণে পাওয়া যায় না। আর একবার মারণ যুদ্ধের সময় সামাজিক ক্ষেত্রে ভয়ানক বিপর্যয় ঘনিয়ে এসেছিল। সেই সময়ের ভয়াবহতার কথা সাহিত্য-সংস্কৃতির ক্ষেত্র হতে জানা যায়। বিশেষত বিশ্বযুদ্ধকালীন ও যুদ্ধ উত্তর বাংলা সাহিত্য থেকে এই সময়ের কথা আমরা জানতে পারি। আর আজ একবিংশ শতাব্দীতে এসে আমরা নতুন করে ধংসের মুখোমুখি হয়েছি। এই বিপর্যয়ের চিত্রেও আগামীতে সাহিত্যে- সংস্কৃতিতে প্রতিফলিত হয়ে উঠবে।

আমরা বিপর্যয় বলতে বুঝি—প্রকৃতি সৃষ্ট আর মনুষ্যকৃত এই দ্বিবিধকে। সংস্কারবাদীদের একাংশের মতে প্রকৃতি নানা কারণে একের পর এক বিপর্যয় হয়ে চলেছে। আর পরিবেশবিদদের মতে মাত্রাতিরিক্ত দূষণের কারণে ভূমিকম্প বন্যার পাশাপাশি মারণ ব্যাধি বেড়েই চলেছে। এভাবে চলতে থাকলে হয়তো একদিন জীবজগৎ বিপন্ন হয়ে যাবে। তখন আর কিছুই করার থাকবে না। সব শেষ হয়ে যাবে। যদিও সব শেষ হয়ে যায় না। শেষ থেকেই আবার ঘুরে দাঁড়াতে হয়। তুর্কি আক্রমণের ফলে বাংলার জনজীবন নেমে আসা বিপর্যয় যেভাবে আমরা আস্তে আস্তে কাটিয়ে উঠে ঘুরে দাঁড়িয়েছি । যা সামাজিক ক্ষেত্রে দৃষ্টান্ত হয়ে রয়ে গেছে। তারপর দু-দুটো বিশ্বযুদ্ধ এসে মানব সভ্যতাকে নাড়িয়ে দিয়ে গেছে। প্রতিনিয়ত মৃত্যুর হাতছানিকে উপেক্ষা করেও সমাজ -সংস্কৃতি নতুন

Chapter Book on

National Education Policy-2020
&
Gender Equality

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CHAPTER-14

NEW EDUCATION POLICY, 2020: A NEW HOPE

Dr. Suchismita Chatterjee Saha

ABSTRACT:

India's new education policy has been introduced in the year 2020. It offers much hope among students, educationist and others. The previous policy has been replaced by New Education Policy after a long back. Its main objectives are to make education a skilled based practical aspect rather than memorizing and testing theoretical knowledge. Great emphasis has been given to make education available in all languages so that language doesn't become a barrier to a student's future. Emphasis is also being given to make students free from the fear of examination and curriculum stress. Students must gain knowledge practically and develop a skill from fun skill-based activities and enjoy the learning process. Online platform is also crucial for both students and teachers, students can gain knowledge from any part of the world and the teacher must assist him/her in doing so thus removing the barrier of distance. The NEP also allows the students of high schools to choose any subject of their choice which they want to pursue in their future, thus removing the rigid limited system of science, commerce and humanities stream. Although it is a good initiative for our Government for introducing such nice education systems but still it has some constrains. We are optimistic for implementations of this new system to encourage skilled based education because in today's world skill is the only thing which drives a man through his professional life.

Keywords: National Education Policy (2020), implementation, regional languages, school based education, online education, subject choice, skill-based activity.

I. INTRODUCTION:

Outlines of India's new education system has been introduced as National Education policy 2020(NEP 2020) by Union Cabinet of India on 29th July 2020 (Nandini, ed. 29 July 2020). The previous one was implemented on 1986. The former education policy which was introduced on 1986 has been replaced by NEP 2020 under a committee under former Cabinet Secretary T.S.R. Subramanian (Chaturvedi, 30 July 2020; Times of India, 21 November 2019). Based on committee report in June 2017, draft NEP was submitted in 2019 by a panel led by former Indian Space Research Organization (ISRO) Chief Krishnaswamy Kasturirangan (Rohatgi, 7 August 2020). Later it was released by Ministry of Human Resource Development. The vision of the NEP 2020 implemented an India centric education system that Helps to transform our nation sustainably into an equitable and vibrant knowledge society by providing high quality education to all. NEP 2020 increase state expenditure on education from around 3% to 6% of the GDP as soon as possible (Livemint, 29 July 2020).

ROLE OF NSS IN

COVID-19 PANDEMIC IN INDIA

DR. ALAK KUMAR CHAKRABARTI

PROF. SUBRATA SAR

PROF. GOURAB DAS

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Chapter 10

NSS-Frontline Helpers of Society

Dr. Suchismita Chatterjee Saha

Abstract

Coronaviruses are one kind of RNA viruses that cause diseases in mammals and birds. In humans and birds, they show symptoms of mild illness, but in fatal and extreme cases they cause severe symptoms. Some of the lethal varieties may cause SARS, MERS and COVID-19. WHO declared COVID-19 as a public health emergency of international concern (PHEIC) on January 30, 2020 and a pandemic on March 11, 2020. It belongs to Subfamily Orthocoronavirinae, in the family Coronaviridae, order Nidovirales.The name Corona 'Corona' came from Latin word crown . They have RNA and covered by Envelope. They cause epidemic diseases, which is very infectious type. So, they are of high risk for Children, old age people, students and other human beings. So, to prevent the diseases several measures have been taken. Some of the measures are social distancing, use of mask, sanitizer etc. NSS has played a crucial role to combat the diseases when no vaccine has been discovered. Even if after Vaccination some measures has to be taken to combat this disease NSS plays crucial role for this. NSS members are the people who can actively participate in several Government led community service programme. They can provide mask, sanitizer and other essential products which are required to combat this disease.

Keywords: *Corona virus, types, diseases, NSS, preventive measures, personal level, community level*

Chapter 6
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Study on the Efficiency of Metal Modified Bio–Nanocomposite Bead for Removal via Retention of Some Anthraquinone Dye

Mitali Sarkar[1*], Dhiman Santra[1], Shanku Denrah[1], Swagatam Sarkar[1] and Pankaj Sarkar[1]

DOI: 10.9734/bpi/cacs/v3/11054D

ABSTRACT

In an aim to study the efficiency of metal modified bio–nanocomposite bead for removal via retention of anionic dye the batch adsorption tests were conducted with iron(III) loaded cellulose nanocomposite bead and alizarin red S, of different concentrations, from aqueous environment. The spectral and surface character of the bead was investigated. The process was optimized for variables (pH, contact time, initial dye concentration, adsorbent dose, temperature), employing response surface methodology following full factorial and central composite design. The maximum adsorption of 97% was observed at an optimum condition of pH 3.0, dose of 2.0 gdm^{-3} and shaking time of 45 mins corresponding to the dye concentration of 100 $mgdm^{-3}$ at 303 K. The influence of the significant variables was correlated with the extent of dye adsorption in a second order polynomial equation. The mutual interactions of the significant variables were presented by 3D response surface and 2D contour plots in the design space. The adsorption was better described by Langmuir isotherm and pseudo second order kinetics. The process was spontaneous (-ΔG°, 48.19 $kJmol^{-1}$), feasible (ΔS°, 0.284 $Jmol^{-1}K^{-1}$) and endothermic (ΔH°, 71.62 $kJmol^{-1}$). The adsorbent can be regenerated with NaOH ($10.0.10^{-2}$ M) and recycled for reuse, at least for five successive operations.

Keywords: Alizarin red S retention; optimization; iron-loaded cellulose nanocomposite bead; isotherm; kinetics; recycling.

1. INTRODUCTION

Dyes, particularly the synthetic ones, find versatile usage in leather, textile, paper, rubber, cosmetics, plastics, pharmaceuticals and food industries, due to their bright and lasting colors and resistance to the action of detergent [1]. Presently there are about 100,000 commercial dyes, having annual production rate of over 7.0×10^5 tons [2]. The dyes discharged to the water bodies and streams decrease the per capita availability of fresh water for human use (washing, bathing and drinking), pose human health ailments [3] (allergic reactions, dermatitis, skin irritation, cancer, mutations), inhibit sunlight penetration into water, restrict the biological degradation of water impurities/ bacteria and threaten the lives of aquatic habitats.

The anthraquinone dye, Alizarin red S (ARS), employed in textile, leather and paint industries [4], is highly toxic and stable towards heat, light and some chemical interactions [5]. It is necessary to remove it from aqueous environment, preferably following a sustainable approach. Adsorption, among the others, viz. co-precipitation, electro-coagulation, photo-catalytic degradation, electro-Fenton process, is one of the most popular removal techniques due to its simple operation, high efficiency, applicability to wide range of solute concentrations, availability of varieties of adsorbents with recycling ability [6]. The available techniques and different adsorbents for dyes removal from textile

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industries was reviewed by Hynes et al [7]. Removal of different cytotoxic aquatic pollutants viz., metal, dye etc. by nanocomposite-based sorbents was demonstrated by Srivastava et al [8].

The present report describes the efficiency of iron(III) loaded nanocomposite bead (FeCNB) for adsorptive removal of ARS from aqueous environment. FeCNB was characterized for its physicochemical and surface character. FeCNB was found to be of nano nature and thermally stable at least up to 200°C [9].

The statistical optimization of cooperative interactions of the operational variables was established following the response surface methodology in a two steps process and a mathematical model using Design-Expert 8.0 software.

The ARS-FeCNB interaction was best described by Langmuir adsorption isotherm and 2nd order kinetics. It was thermodynamically feasible (ΔG° = -48.19 $kJmol^{-1}$; ΔH°, 71.62 $kJmol^{-1}$; ΔS°, 0.284 $Jmol^{-1}K^{-1}$). FeCNB can be recycled, at least for five consecutive adsorption-desorption cycles, using $10.0.10^{-2}$ M NaOH. The knowledge gained may be extended for large-scale dye wastewater decontamination. FeCNB shows higher capacity compared to the similar reported adsorbents [10-15]

2. EXPERIMENTAL METHODS

All the chemicals and solvents used are of analytical grade. Cellulose powder was purchased from Loba Chemie, India and ARS from Merck, India.

2.1 Synthesis of Iron(III) Loaded Cellulose Nanocomposite Bead (FeCNB)

The cellulose nanocomposite bead (CNB) was synthesized by sol-gel transition [16] and FeCNB by impregnation of CNB using Fe(III) [10% $Fe(NO_3)_3$] [9].