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Collaborations

2022-23

Department of Assamese



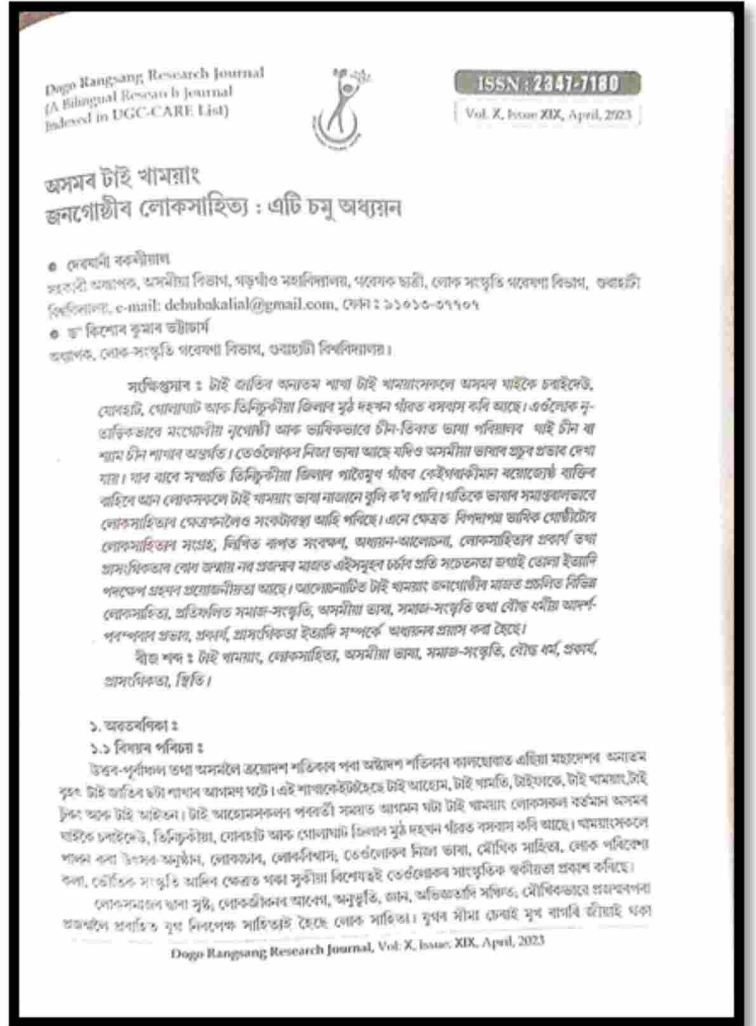
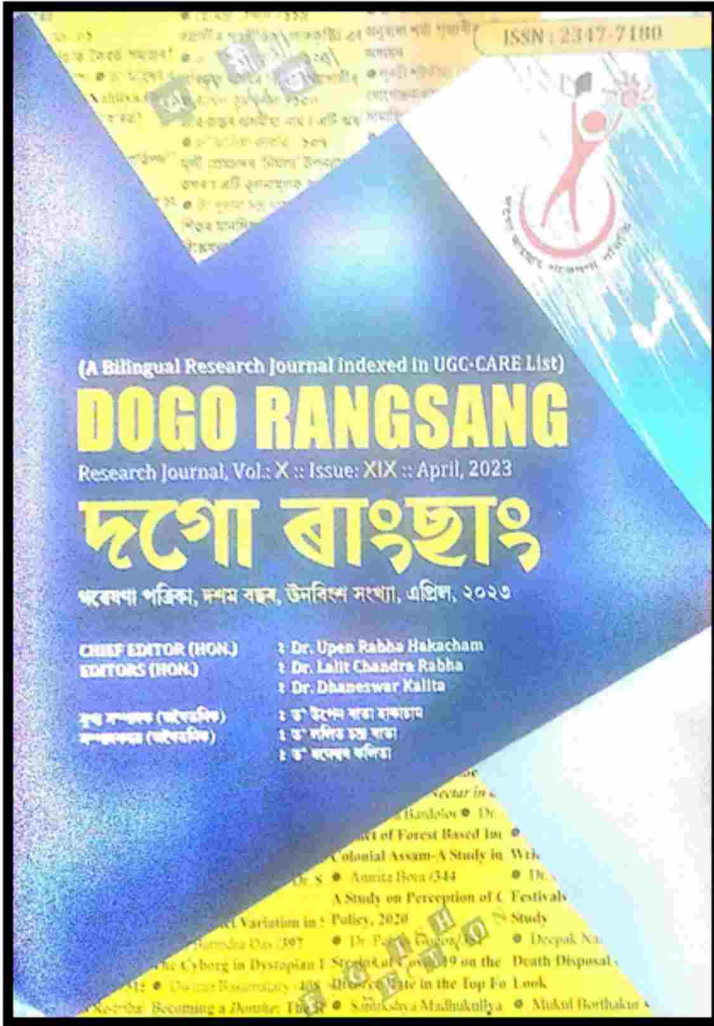
Collaborative Research Paper
Debojani Bokalia
Assistant Professor
Department of Assamese, Gargaon College

&
Dr. Kishor Kumar Bhattacharya

Department of Folk Culture & Research
, Gauhati University, Assam

Title of the Paper: **Asamar Tai Khamyang Janagosthir Lokasahitya: Eti adhyayan**

Name of the Journal: **Dogo Rangsang Research Journal**
ISSN: 2347-7180





Collaborative Seminar
Department of Assamese, Gargaon College
with
Dergaon Kamal Dowarah College, Golaghat, Assam
Title of the Seminar Program : **Asomiya Sahityar Burnji Aru Asomar Sanskriti: Adhyanar
Bhinna Matta**
Duration: **22nd to 23rd October, 2022**
Duration: **Two Days**
Resource Person : **Dr. Jyotirekha Hazarika, Associate Professor**
J.B.College, Jorhat, Assam
with
Dr. Karabi Gogoi, Associate Professor
CKB College, Jorhat, Assam
&
Lavanya Bora and Amal Chandra Das
DKD College, Golaghat, Assam



[Link to the Seminar](#)



Collaborative Seminar
Department of Assamese, Gargaon College
with
Dergaon Kamal Dowarah College, Golaghat, Assam
Title of the Seminar Program: **Gabeshana Pakalpa Prastutkaran: Pradhati Aru Koushal**

Duration: **4th and 5th April, 2023**

Duration: **Two Days**
Resource Person: **Dr. Pallavi Bora, Assistant Professor,**
Department of Folklore Research, Guwahati University

&
Dr. Swapna Bora
Assistant Professor, Teaching and Learning Centre,
Tezpur University



Day 1



Day 2



Department of Botany

Collaborative Research Paper

Sandeepa Agarwala

Assistant Professor

Department of Botany, Gargaon College

&

Dipika Rajput, L.R. Saikia, Munmi Borkataky

Department of Life Sciences

, Dibrugarh University, Assam

Title of the Paper: **Ageratum conyzoides L.: In vitro Antimicrobial, Antioxidant and Phytochemical**

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***Ageratum conyzoides* L.: In vitro antimicrobial, antioxidant and phytochemical study**

Dipika Rajput*, L.R. Saikia, Munmi Borkataky and Sandeepa Agarwalla

Department of Life Sciences, Dibrugarh University, Dibrugarh 786 004, Assam, India

(Received 17 December, 2021; Accepted 19 January, 2022)

ABSTRACT

Ageratum conyzoides L. (Asteraceae) is an aromatic weed. The weed has been known since time immemorial for its therapeutic properties and has been utilized for treatment of various ailments, such as burns and wounds, for antimicrobial properties, for many infectious conditions and bacterial infections, arthrosis, headaches and dyspnea, pneumonia, analgesic, anti-inflammatory, antiasthmatic, antispasmodic and haemostatic effects, stomach ailments, gynaecological diseases, leprosy and other skin diseases. A wide range of chemical compounds including alkaloids, coumarins, flavonoids, chromenes, benzofurans, sterols and terpenoids have been isolated from this species. Present study aimed at qualitative and quantitative phytochemical analysis of leaves of *A. conyzoides*. Phytochemical analysis revealed the presence of tannin, alkaloids, flavonoids, phenols, glycosides, cardiac glycosides, reducing sugar and saponin and absence of anthraquinone, carotenoids and free anthraquinone in all the extracts varying quantities. The plant extracts exhibited the presence of a high amount of phenolics and flavonoid content which might be the key candidates for the antioxidant potential of the extract. The antibacterial activity of *A. conyzoides* was tested against seven bacteria.

Key words : *Ageratum conyzoides*, Antimicrobial activity, Antioxidant Activity, Phytochemical screening, Total Flavonoids, Total Phenol

Introduction

India along with its rich cultural heritage is also known for its abundance knowledge in traditional herbal medicine. The traditional knowledge is based on necessities, requirements, observation, study, instincts or experiments and experience (Jain, 2004). Since the earliest days of civilization, mankind have been directly or indirectly depended on plant resources (Souza *et al.*, 2021). Even now most of the pharmaceutical industries depends on plants for the synthesis of many important drugs occupying a significant spot. Many of these plants are wild in na-

diseases but it is still out of reach for those leaving in remote areas. People of those areas depends on traditional healers and Ojha whom they trust more. Judicious use of medicinal plants can cure deadly diseases that have long defied synthetic drugs.

Plants are a source of many chemical ingredients. People have been using plants without having any knowledge about the active compounds. If the active ingredients of plants are known, then the mode of action of plants producing therapeutic effects can also be better investigated. The crude drug used contains some beneficial, some harmful and some toxic components, but all integrated under certain

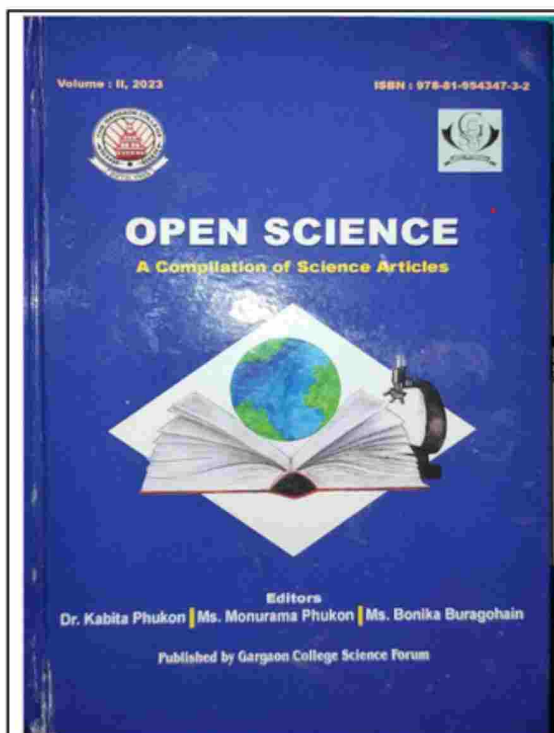
Collaborative Book Chapter
Sandeepa Agarwala
 Assistant Professor
 Department of Botany, Gargaon College



&
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OPEN SCIENCE

A compilation of Science Articles

ECOHYDROLOGY : A Review

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ABSTRACT

Water is one of the most important natural resources of our planet. However, due to urbanization and increase in demand of water due to growing population, this resource is being constantly exploited which has led to its depletion. The multidisciplinary science of "ecohydrology" aims to manage water sustainably while taking into consideration various aspects of the ecosystem. It prioritizes certain points like to slow down the flow of water from atmosphere to sea in order to reduce the impact of droughts and floods, to prevent the degradation of water, to modify ecosystem potential with societal needs, to explore some unexplored questions. In the present article, an attempt is made to have a brief idea about the topic of ecohdrology.

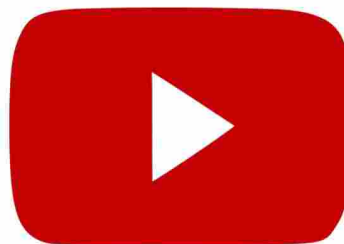
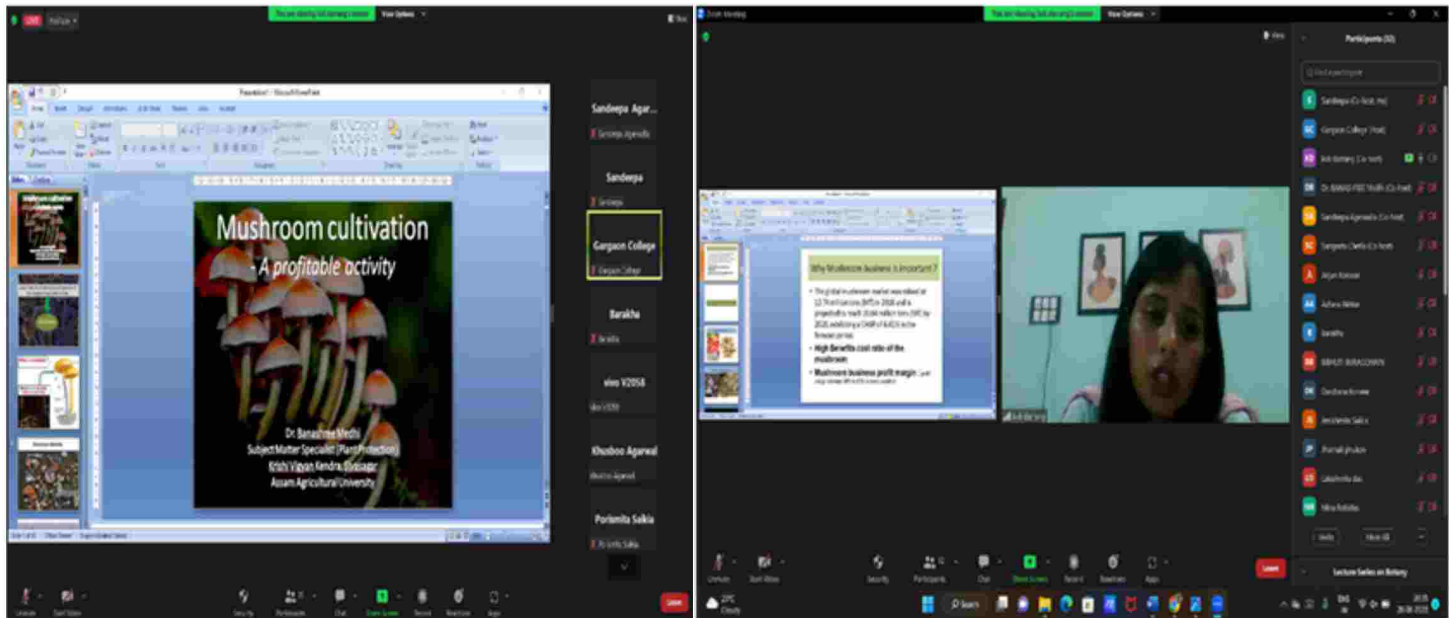
Keywords : ecohdrology, water, ecosystem

Collaborative Workshop (Online)
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Assistant Professor
Department of Botany, Gargaon College



&
Miss Banashree Medhi,
Subject Matter Specialist (Plant Protection), Krishi Vigyan Kendra,
Sivasagar, Assam (under Assam Agriculture University, Jorhat)
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Date: 20th June, 2023

Link of the Program
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Collaborative Research Paper

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Department of Chemistry, DKD College, Dergaon, Assam

Title of the Paper: **Structure and Stability of $(\text{CeO}_2)_n^{0,\pm 1}$ ($n=1-3$) Clusters towards the Adsorption and Co-adsorption of CO and H₂O from DFT Study**

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Structure and Stability of $(\text{CeO}_2)_n^{0,\pm 1}$ ($n=1-3$) Clusters towards the Adsorption and Co-adsorption of CO and H₂O from DFT Study

Partha Pratim Churi^{a,b}, Nishant Biswakarma^a, Dikshita Dowerah^a, Shilpa Neog^a, Plaban Jyoti Sarma^c, Nand Kishor Gour^{a,*}, Ramesh Chandra Deka^{a,*}

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ABSTRACT

Stability of $(\text{CeO}_2)_n^{0,\pm 1}$ ($n=1-3$) clusters and adsorption of CO and H₂O as well as co-adsorption of CO/H₂O species on the same clusters are studied using M06L/def2TZVPP level of theory. We have considered this study as this fundamental investigation may be a stepping stone for future investigation of water gas shift reaction (WGSR). Global/local reactivity descriptors and natural bonding orbital (NBO) analysis are also reported for all the clusters for understanding the nature of adsorption of CO and H₂O molecules. From theoretical analysis, we have explored all the possible outcomes for CO/H₂O adsorption and co-adsorption on $(\text{CeO}_2)_n^{0,\pm 1}$ ($n=1-3$) clusters.

1. Introduction

Over the past few decades, ceria has been considered as a fruitful catalyst for several important reactions due to its structural and electronic properties. One of the significant use of ceria is as the three-way catalysts (TWC) for the treatment of exhaust gas in automobiles which stimulates a strong research area in this field. It is used in the conversion of some poisonous gases like CO, SO₂ etc. to less poisonous gases like CO₂, SO₃ etc. [1,2]. It can also act as oxygen buffering by capturing and releasing oxygen in the redox reactions [3]. This capability is due to the rapid change in the oxidation state of cerium between +4 and +3 where the former one has been considered as the most stable state for Ce [4]. Clusters of ceria having Ce³⁺ are applicable in the catalysis field because Ce(III) has the configuration of 4f¹ which is more reactive than Ce configuration (4f²5d⁰6s²). Moreover, thermodynamic data indicates that cerium metal is unstable in presence of oxygen [5]. With high oxygen ion mobility and the ability to fluctuate the oxidation state between +4 and +3 together with the high oxidizing power of Ce⁴⁺, ceria always has a pronounced catalytic property. One of the main reactions where prominent catalytic properties of Ceria are used extensively is water gas shift reaction (WGSR).

The WGSR describes the reaction between carbon monoxide (CO) and water (H₂O) to form H₂ and CO₂ gases (i.e., CO + H₂O → CO₂ + H₂). An increase in the demand for H₂ as well as the need of CO removal has

led to the extensive use of WGSR. Ali Arab and co-workers investigated the WGSR mechanism on silver nanoclusters by using density functional theory [6]. It was observed that the minimum activation barrier is related to the CO₂ (ads) formation and the maximum activation barrier is related to the H₂O (ads) dissociation. Several catalysts have been prepared at the industrial level, where WGSR has been carried out both at high temperature (350-500°C) as well as at low temperature (180-250 °C) depending upon the catalyst used [7]. Till date mainly three different mechanisms have been proposed for the WGSR reaction namely redox, formate associative and carboxyl associative [8]. However, there is limited theoretical studies on the catalyst and the mechanism of WGSR. Previous studies were carried out on transition metal carbonyls specifically Fe(CO)₅ [9], Ru₃(CO)₁₂ [10] and Rh₄(CO)₁₆ [11]. Nishamol Kuriakose *et al* investigated all the steps of mechanistic pathway with Fe(CO)₅ through gas-phase quantum mechanical (QM) calculations using density functional theory (DFT) [9]. They have found that the binuclear mechanism leads to lower barriers in comparison to the mononuclear mechanism. Ling Guo and co-workers have studied the trinuclear carbonyl complexes-Ru₃(CO)₁₂ and mononuclear carbonyl complexes-Ru(CO)₅ with the help of DFT calculations [12]. They have found that Ru₃(CO)₁₂ is much more effective than mononuclear complexes as a catalyst for the WGSR. Even though there is much information available for the use of transition metal oxides towards WGSR, the investigation of f-block metal oxide clusters for the same is limited [13].

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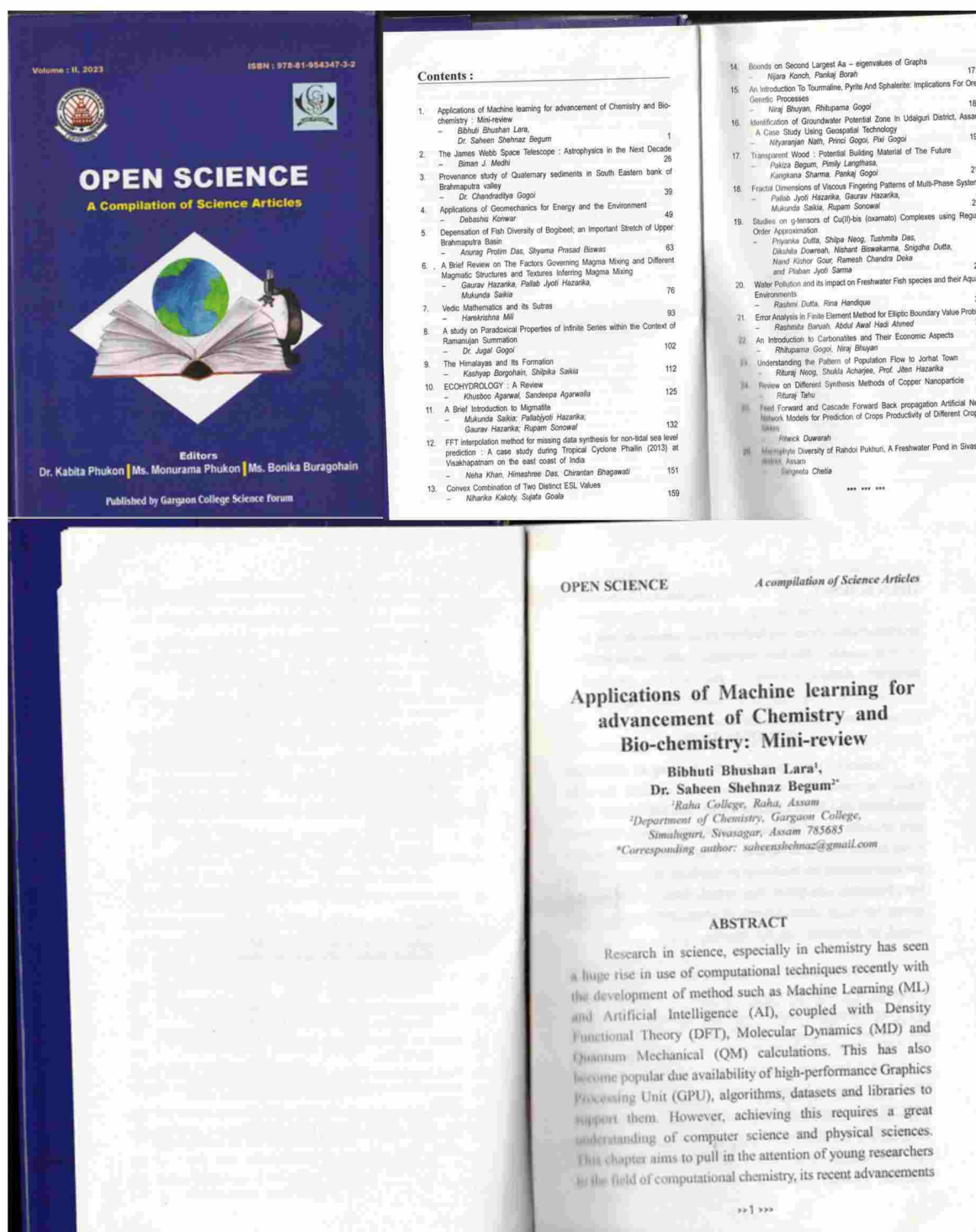
Collaborative Book Chapter
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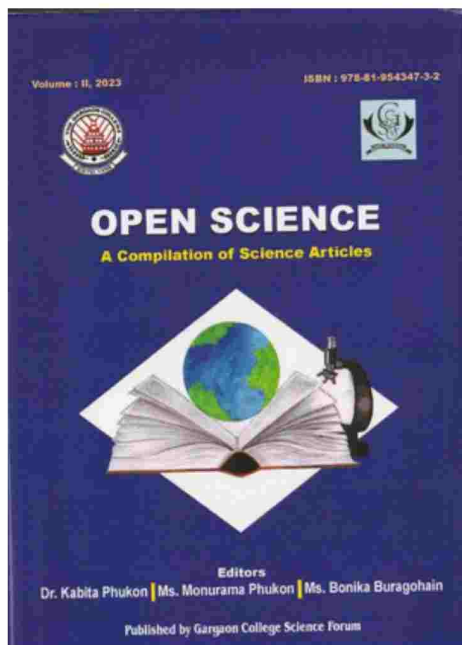
Collaborative Book Chapter
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 Department of Zoology, Demoria College, Kamrup, Assam
 with
Pankaj Gogoi
 Sipajhar College, Mangaldoi, Assam

Title of the Paper: **Transparent Wood: Potential Building Material of the Future**
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OPEN SCIENCE *A compilation of Science Articles*

Transparent Wood : Potential Building Material of The Future

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ABSTRACT

Transparent wood is considered a promising structural and light management material for energy-efficient engineering applications. This humble method of substituting the organic polymer lignin with a distinct blend of epoxides eliminates the coloring from wood and augments its strength. Though transparent wood may be looked upon simply as an innovative material, its practical benefits are massive. It is a type of a composite material that has the potential to revolutionise the fields of construction and the manufacturing of various products. Real-world usages comprise replacement of

» 210 «



Dikshita Dowerah, Mallikarjunachari VN Uppuladinne, Nishant Biswakarma,
Uddhaves B Sonavane, Rajendra R Joshi, Suvendra K Ray, Nima D Namsa,
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Article

Design of LNA Analogues Using a Combined Density Functional Theory and Molecular Dynamics Approach for RNA Therapeutics

Dikshita Dowerah, Mallikarjunachari V. N. Uppuladinne, Plaban J. Sarma, Nishant Biswakarma,
Uddhaves B. Sonavane, Rajendra R. Joshi, Suvendra K. Ray, Nima D. Namsa, and Ramesh Ch. Deka*

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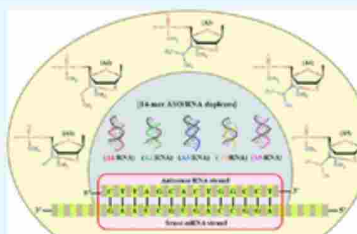
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Supporting Information

ABSTRACT: Antisense therapeutics treat a wide spectrum of diseases, many of which cannot be addressed with the current drug technologies. In the quest to design better antisense oligonucleotide drugs, we propose five novel LNA analogues (A1–A5) for modifying antisense oligonucleotides and establishing each with the five standard nucleic acids: adenine (A), guanine (G), cytosine (C), thymine (T), and uracil (U). Monomer nucleotides of these modifications were considered for a detailed Density Functional Theory (DFT)-based quantum chemical analysis to determine their molecular-level structural and electronic properties. A detailed MD simulation study was done on a 14-mer ASO (5'-CTTAG-CACTGGCCT-3') containing these modifications targeting PTEN mRNA. Results from both molecular- and oligomer-level analysis clearly depicted LNA-level stability of the modifications, the ASO/RNA duplexes maintaining stable *Watson–Crick* base pairing preferring RNA-mimicking *A-form* duplexes. Notably, monomer MO isosurfaces for both purines and pyrimidines were majorly distributed on the nucleobase region in modifications A1 and A2 and in the bridging unit in modifications A3, A4, and A5, suggesting that A3/RNA, A4/RNA, and A5/RNA duplexes interact more with the RNase H and solvent environment. Accordingly, solvation of A3/RNA, A4/RNA, and A5/RNA duplexes was higher compared to that of LNA/RNA, A1/RNA, and A2/RNA duplexes. This study has resulted in a successful archetype for creating advantageous nucleic acid modifications tailored for particular needs, fulfilling a useful purpose of designing novel antisense modifications, which may overcome the drawbacks and improve the pharmacokinetics of existing LNA antisense modifications.



1. INTRODUCTION

Using antisense-mRNA as a medicine is a fundamentally different approach compared to treating diseases using traditional pharmaceuticals.^{1–3} mRNA contains the set of instructions which direct cells in the human body to make proteins. Life depends on these proteins, as every function in the human body, both normal and disease-related, is carried out by one or many proteins in coordination. Human diseases are majorly the result of inappropriate protein production or disordered protein performance. Antisense-mRNA based drugs designed to bind sequence-specifically to their target mRNAs inhibit the production of disease-causing proteins and modulate their gene expressions. Unlike the small drug molecules and monoclonal antibodies, these synthetic antisense drugs are complementary to their sense-mRNAs, which take advantage of normal biological processes to suppress the production of disease-causing proteins and create a desired therapeutic effect.^{4–6}

Antisense medications are chemically modified antisense oligonucleotides (ASOs/AONs) complementary to their target mRNAs, which bind by *Watson–Crick* base pairing, forming ASO/RNA hybrid duplexes. mRNA bound by an ASO

activates the cellular endonuclease RNase H, which further cleaves the RNA strand selectively from the ASO/RNA hybrid duplexes.^{7,8} However, due to the confined stability in biological media, the ASOs undergo rapid degradation even before duplexing, and thus, to protect and enhance their binding affinity and cellular uptake, the existing ASOs need to undergo chemical modifications to impart a valid antisense response. In the early stages, the phosphodiester backbones of the nucleotides were modified by replacing one of the nonbridging oxygen atoms with sulfur.^{9,10} Briefly categorized under first-generation ASOs, methylphosphonates and phosphoramidates gained significant attention, yet phosphorothioates (PSs) were the most successful to induce the RNase H functions.^{11–13} The first antisense drug marketed under the brand name “Vitravene” (ISIS-2922) approved by the FDA in 1998 was a

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Collaborative Faculty Exchange Program
Department of Chemistry, Gargaon College
with
Department of Chemistry, Sibsagar Girl's College, Sivasagar

Occasion: World Environment Day

Date: **5th June, 2023**

Title of the Program: **Solution to Plastic Pollution**

Resource Person: **Dr. Arandao Narzary**

Assistant Professor, Gargaon College, Sivasagar

Duration: **One day**





Collaborative Faculty Exchange Program
Department of Chemistry, Gargaon College
with
Department of Chemistry, Sibsagar Girl's College, Sivasagar

Date: **7th February, 2023**
Title of the Program: **Carrier exploration and self building**
Resource Person: **Dr. Plaban Jyoti Sarma,**
Assistant Professor, Gargaon College, Sivasagar

Duration: **One day**



Department of Commerce



Collaborative Workshop
Department of Commerce, Gargaon College
with
The District Industries And Commerce Centre, Sivasagar
Title of the Program : **Entrepreneurial Ecosystem: Challenges and Opportunities**

Duration: **19th September, 2022**

Duration: **One day**
Resource Person : **Dr. Devi Baruah, Assistant Professor,**
Rajiv Gandhi University, Arunachal Pradesh



Gargaon College
Department of Commerce
in
Collaboration with DICC, Sivasagar
Presents
A
Workshop On

The Entrepreneurial Eco-System: Challenges and Opportunity



Inaugurator: Dr. Sabyasachi Mahanta
Principal, Gargaon College



Speaker: Dr. Devi Baruah
Department of Commerce
Rajiv Gandhi University

Registration link:

<https://forms.gle/LjZAvf8pSPJ6W86x9>

Date: 19 Sept 2022

Platform: Zoom

Time: 7:00 PM to 8:00 PM (IST)

Contact Details :

9101229718/9101038993/7002793079



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/Barcode
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Organizing Committee :

Advisor : Dr. Meghali Bora (HOD); Anil Tanti

Coordinators: Gautom Hazarika; Dr. Mintu Gogoi

Technical Coordinator : Nomami Dutta ; Dr. Mrinal Ghosh



Collaborative Field study/ Tour
Department of Commerce, Gargaon College
with
ASSAM STATE RURAL LIVELIHOOD MISSION (ASRLM), SIVASAGAR
&
Assam Start Up- The Nest, Guwahati

Title of the Program : Industrial Tour to ONGC, Nazira

Duration: 10th June, 2023

Duration: One day





Collaborative Faculty Exchange Program
Department of Commerce, Gargaon College
with

Department of Statistics, Nazira College, Sivasagar, Assam

Resource Person: **Mr. Purna Kanta Gogoi, Associate Professor,**
Department of Statistics, Nazira College

Duration: **6 Days (10th October to 19th October, 2022)**



Department of Economics

Collaborative Faculty Exchange Program
Department of Economics, Gargaon College
with

Department of Economics, Hem Chandra Dev Goswami College, Sivasagar



Date: **18 & 20th May, 2023**

Title of the Program: **Issues of Welfare Economics**

Resource Person: **Mr. Ronjit Khanikar,**
Assistant Professor, Department of Economics, HCDG College, Nitaipukhuri,
Sivasagar

Duration: **One day**

 গড়গাঁও মহাবিদ্যালয় 
GARGAON COLLEGE

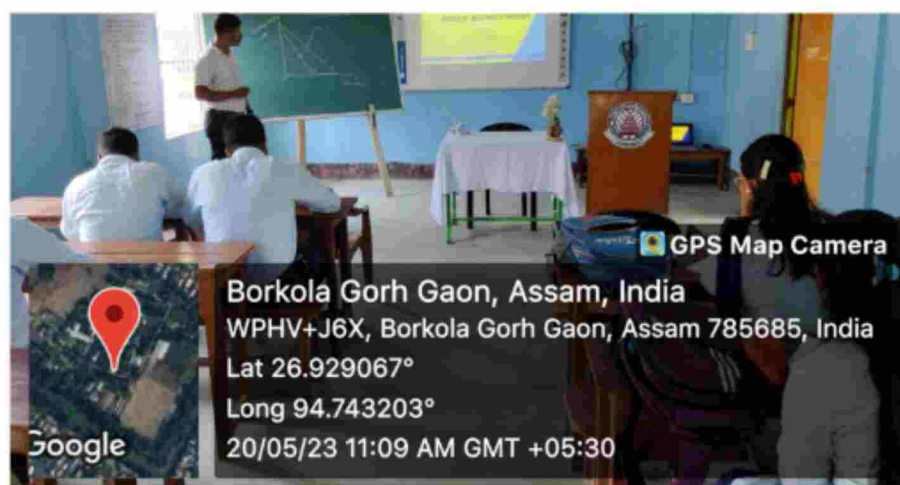
ISSUES OF WELFARE ECONOMICS

20th May, 2023

Resource Person
Mr. Ronjit Khanikar
Assistant Professor
Department of Economics
HCDG College, Nitaipukhuri, Sivasagar

Organized by
Department of Economics, Gargaon College
In Collaboration with
IQAC, Gargaon College

Time: 11:00 AM Venue: ICT Room, Department of Economics



Department of English



Collaborative Workshop

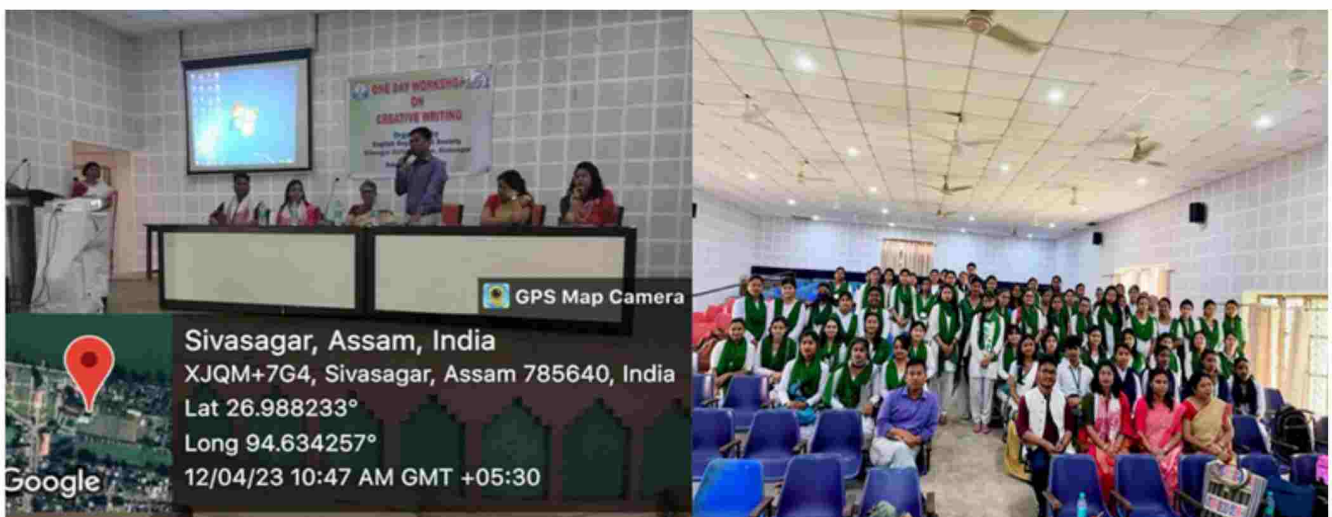
Name of the Faculty: **Dr. Shyamolima Saikia, Assistant Professor**

Title of the Program: **One Day Workshop on Creative Writing**

Organized by: **Department of English, Gargaon College**

Collaboration With : **Department of English, Sibsagar Girls College**

Date: **12 April, 2023**



Collaborative Research Paper
Dr. Rituraj Neog
Assistant Professor
Department of Geography, Gargaon College
&

Prof. Jiten Hazarika
Department of Statistics
, Dibrugarh University, Assam

Title of the Paper: **Thermal stress and urban heat island effect in Jorhat urban environment as a result of changing land use and land cover**

Name of the Journal: **Acta Geophysica**
ISSN: 1895-7455

Link to the Paper: <https://link.springer.com/article/10.1007/s11600-022-00927-z>

Acta Geophysica (2022) 70:2771–2783
<https://doi.org/10.1007/s11600-022-00927-z>

RESEARCH ARTICLE - ANTHROPOGENIC GEOHAZARDS



Thermal stress and urban heat island effect in Jorhat urban environment as a result of changing land use and land cover

Rituraj Neog¹  · Jiten Hazarika²

Received: 22 April 2022 / Accepted: 9 September 2022 / Published online: 30 September 2022
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Abstract

The objective of the study is to determine the impact of land use and land cover (LULC) change on land surface temperature (LST) and thermal stress at Jorhat from 2009 to 2021. The experiment used Landsat TM (Thematic Mapper) for 2009 and OLI (Operational Land Imager)/TIRS (Thermal Infrared Sensor) for 2021 from earth.explorer.usgs.gov. Landsat data were employed to calculate the LST and LULC changes. Utilizing UTFVI (urban thermal field variance index), thermal stress over the ground surface has been computed. Thermal discomfort is computed simultaneously using the relative strain index (RSI) and net effective temperature (NET) index. Jorhat evidenced significant rise in built-up land to 281.25 hectares with reduced vegetation cover of 480.96 hectares from 2009 to 2021. These modifications caused significant rises in LST of 4.28 °C, 2.33 °C and 3.01 °C in September, October and December from 2009 to 2021. According to UTFVI from 2009 to 2021, Jorhat experienced declining ecologically excellent area with a rising proportion of ecologically worse land. In September and October 2009, the Jorhat city had just 10 days of bioclimatic discomfort and 19 days of bioclimatic comfort, as opposed to 24 and 10 days in 2021, respectively. Similarly, NET estimated 21 very hot days in October 2021, as opposed to just 9 days in 2009. Compared to 2009, there are now 6 and 4 days in December 2021 that are classified as warm or slightly hot, respectively. This leads to the conclusion that Jorhat's thermal condition is significantly impacted by changes in land use and land cover.

Keywords Land use and land cover · LST · UTFVI · RSI and NET

Introduction

The global population is increasing very rapidly since industrialization. As per the estimate of united nation, global urban population is projected to become 68 percent from the current scenario of 55 percent with current pace of urbanization (United nation 2018). There is an increasing global pressure of population to expand its demand for more accommodations, food, agricultural production and shelter (Imran et al. 2021). Subsequently, land cover is changing rapidly in order to meet the demands of global population,

which ultimately replacing vegetation to impervious surface due to human activities and that finally contributing to climate change (Igun and Williams 2018; Nzoiwu et al. 2017). The change of land use and land cover is more noticeable over urban areas of the world. Change of land use and land cover plays a significant role on changing the regional climate (Jahan et al. 2021; Nagarajan and Basil 2014; Grimm et al. 2008). Conversion of natural green vegetation to urban built-up land is mainly responsible for change in regional climate (Argueso et al. 2013; Imran et al. 2018, 2019a, b). The urbanization induced concretization replace natural surface with impermeable concrete structure such as industrial and residential buildings, parking knots and impervious roads (Babalola and Akinsanola 2016; Patra et al. 2018). This urban conversion leads to lower albedo and higher absorption of heat ultimately leads to higher land surface temperature (LST) in urban areas. Thus, LST rises over the cities due to the effect of built environment and concrete structure (Neog 2022). The higher LST in the urban areas comparing to the nearby areas is known as urban heat island

Edited by Dr. Mehdi Abdolmaleki (ASSOCIATE EDITOR) / Prof. Savka Dineva (CO-EDITOR-IN-CHIEF).

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¹ Gargaon College, Sivasagar, India

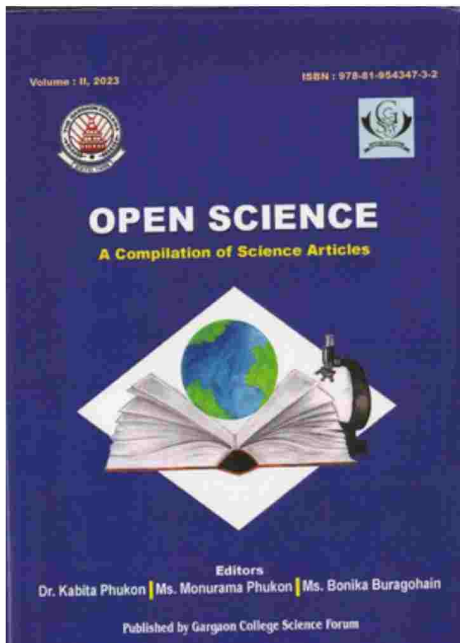
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Collaborative Book Chapter
Dr. Rituraj Neog
 Assistant Professor
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 with

Prof. Jiten Hazarika
 Department of Statistics
 , Dibrugarh University, Assam

&
Dr. Shukla Acharjee

Centre For studies in Geography, Dibrugarh University, Assam
 Title of the Paper: **Pattern of Population Flow to Jorhat Town**
 Title of the Book: **Open Science: A compilation of Science Articles**
ISBN: 978-81-954347-3-2



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Understanding the Pattern of Population Flow to Jorhat Town

Rituraj Neog¹, Shukla Acharjee², Prof. Jiten Hazarika³
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ABSTRACT

Population flow or migration is the common phenomenon that occurs in different parts of the world with varying intensity and degree. Jorhat town is the growing urban centers in the central part of Assam receiving migrants from different parts of the state. The movement of population or migrants is more prominent after 1995 with business and services are the prime cause of migration. Jorhat receives voluminous migrants from the adjacent districts of Sivasagar and Golaghat and nearby states of Bihar and Uttar Pradesh. Apart from the permanent shift or migration of population, Jorhat city also witnessed diurnal flow of population from different urban centers of Assam and Nagaland. Maximum inter-district flow has been observed from Golaghat, Dibrugarh and Guwahati while intra-district from Titabor, Teok and

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Maraini urban centers. The Gravity analysis also portrayed an almost high positive as well as significant correlation of 0.75 with actual flow validating the role of distance on volume of interaction between urban centers.

INTRODUCTION

Population flow or migration is an important component of population dynamics. Migration is considered as one of the important factors after fertility and mortality that influence the demographic changes in a country (Kumari, 2014). Migration is the permanent and semi permanent movement of population from one place of residence to other. Migration cannot be considered a mere shift of people from one place of residence to another, as it is most fundamental to the understanding of continuously changing space content and space relationship of an area (Gosal, 1961). It is a common phenomenon all throughout the world. The influence of immigration to one place cannot only be simply linked to social, cultural and economic transformation but also to urban growth and urbanization. Migration can be of different types such as rural to rural, rural to urban, urban to urban and urban to rural. But surprisingly rural to urban migration occupies second position by constituting 20 percent of total migration in India (Kumari, 2014). The most common form of migration i.e. rural to urban migration plays a significant role on urban growth and urbanization. As per the census

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Department of Geology

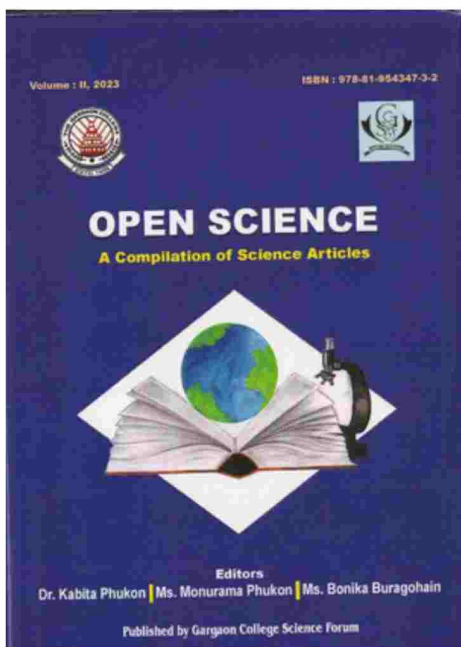
Collaborative Book Chapter
Dr. Chirantan Bhagwati
Assistant Professor
Department of Geology, Gargaon College
with

Neha Khan & Hamashree Das
Department of Applied Geology
, Dibrugarh University, Assam



Title of the Paper: **FFT interpolation method for missing data synthesis for non-tidal sea level prediction: A case study during Tropical Cyclone Phailin (2013) at Vishakhapatnam on the east coast of India**

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FFT interpolation method for missing data synthesis for non-tidal sea level prediction: A case study during Tropical Cyclone Phailin(2013) at Vishakhapatnam on the east coast of India

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1. INTRODUCTION

A suitable prediction scheme of non-tidal sea level variations due to storm surges is a prerequisite for proper planning and mitigation during the extreme events. The variation of sea level due to non-tidal forcing is often difficult to predict because of missing records in sea level signal as the tide gauge instruments often get damaged during the passage of Tropical Cyclones. Therefore, the present study endeavours at developing an empirical model for predicting the missing records of sea level data during extreme event viz. Tropical Cyclone Phailin of 2013 at Vishakhapatnam station (India)

Collaborative Research Paper
Dr. Raktim Patar
Assistant Professor
Department of History, Gargaon College
&

Dr. Rajshree Devi
Department of Hindi
Hendique Girls College, Guwahati

Title of the Paper: **Assam Ke Vir Nayak Maharaj Prithu**
Name of the Journal: **Gagnachal**
ISSN: **0971-1430**

Link of the publication: <https://www.iccr.gov.in/sites/default/files/2023-08/Gagnachal%20%28May%20-%20June%202023%29.pdf>



असम के वीर नायक महाराज पृथु

- डॉ. राजश्री देवी और डॉ. रक्तिम पाट्टर

“

राजा पृथु ने कामरूप की तत्कालीन राजनीति को एक नयी दिशा दी जिसके फलस्वरूप कामरूप पर हुए तीन में से दो आक्रमणों को सफलतापूर्वक प्रतिरोध कर कामरूप को विधर्मी शासन से बचाए रखने में वे सक्षम हुए। महाराजा पृथु जैसे भारत के इतिहास की कई महत्वपूर्ण व्यक्तित्व तथा घटनाएँ जनमानस से छुपाकर रखी गयीं। औपनिवेशिक इतिहासकारों ने भारत का इतिहास विकृत कर बहुत सी गलत व बनाबटी जानकारियों की सहायता से इसे केवल पराजय और गुलामी के इतिहास के रूप में प्रस्तुत किया। इसके विपरीत भारतीय राजाओं की महान गौरवशाली विजय गाथाओं को पाठ्यपुस्तकों में स्थान ही नहीं दिया गया। बख्तियार खिलजी के आक्रमण के विरुद्ध कामरूप के राजा पृथु द्वारा प्रदर्शित वीरता को छुपाकर रखना इसका ही एक बड़ा उदाहरण है।

”

बाहरी शताब्दी का भारतीय इतिहास विदेशी आक्रांताओं विशेषकर आफगानिस्तान से आनेवाले आक्रांताओं के संदर्भ में विशेष महत्व रखता है। इस दौरान भारतवर्ष पर कई आक्रमण हुए। उत्तर भारत के अस्थिर राजनीतिक वातावरण और मुसलमान आक्रांताओं के नरसंहार तथा उत्पीड़न के समय कामरूप में महाराज पृथु ने राज्य का शासनभार ग्रहण किया। इसी के साथ 12वीं शताब्दी में कामरूप की राजनीति में एक सशक्त और प्रभावशाली नाम जुड़ जाता है। किन्हीं इतिहासकारों के अनुसार राजा पृथु किरात जाति के व्यक्ति थे। यहां उल्लेखनीय है कि वर्तमान समय के असम के बोड़ो, राभा, कोच, डिमासा, तिवा, गारो आदि जनजातियों को ही उस समय किरात नाम से संबोधित किया जाता था। इतिहासकार सुनीति कुमार

चट्टोपाध्याय के अनुसार महाराज पृथु हिंदू बोड़ो जनजाति के व्यक्ति थे। यहाँ बोड़ो शब्द समग्र तिब्बत-बर्मी लोगों के लिये प्रयोग किया गया है। उन्होंने लिखा है - 'When Bakhtiyar Khalji the Turki leader who conquered western Bengal in 1203, came to Assam/Kamrupa with an invading army suffered defeat at the hands of the Assam's ruling house which was evidently a Hindu Boro house'. दूसरी ओर इतिहासकार राजमोहन नाथ के अनुसार राजा पृथु वैद्यदेव द्वारा स्थापित देव वंश के शासक थे। वैद्यदेव कामरूप के सिंहासन पर सन 1130 से सन 1150 तक अधिष्ठित थे। उनके परवर्ती राजाओं के क्रमानुसार नाम थे - राइदेव, भास्करदेव, बल्लवदेव और पृथुदेव।

इतिहासकार राजमोहन नाथ के अनुसार महाराज पृथु सन 1185 से सन 1227 तक के लंबे समय के लिये कामरूप की राजगद्दी पर विराजमान थे। उत्तर गुवाहाटी की बेतना नामक जगह पर उनकी राजधानी थी। महाराज पृथु के शासनकाल में कामरूप की सीमा पूर्व में वर्तमानके दरंग जिला और पश्चिम में वर्तमान के बांग्लादेश की दिनाजपुर नामक शहर तक विस्तृत थी। राजमोहन नाथ के इस मत का समर्थन नगेंद्र नारायण आचार्य भी करते हैं। आचार्य जी के अनुसार महाराज पृथु संभवतः वैद्यदेव अथवा बल्लवदेव के वंशज थे और 12वीं शताब्दी के अंतिम समय में उन्होंने कामरूप का शासनभार संभाला। हालाँकि विख्यात इतिहासकार कनकलाल बरुआ कहते हैं कि वैद्यदेव के साथ महाराज पृथु का कोई संबंध नहीं था और अनुमान है कि सन 1200 से सन 1228 के बीच वे कामरूप के राजा थे। इन दोनों ही मतों को ध्यान में रखें तो महाराज पृथु के वंश का विषय थोड़ा विवादास्पद भले ही हो, परंतु उनके शासनकाल को सभी इतिहासकार निर्विवाद रूप से स्वीकार करते हैं। उनके शासनकाल में कुल तीन बार कामरूप पर मुसलमानों ने आक्रमण किया था।

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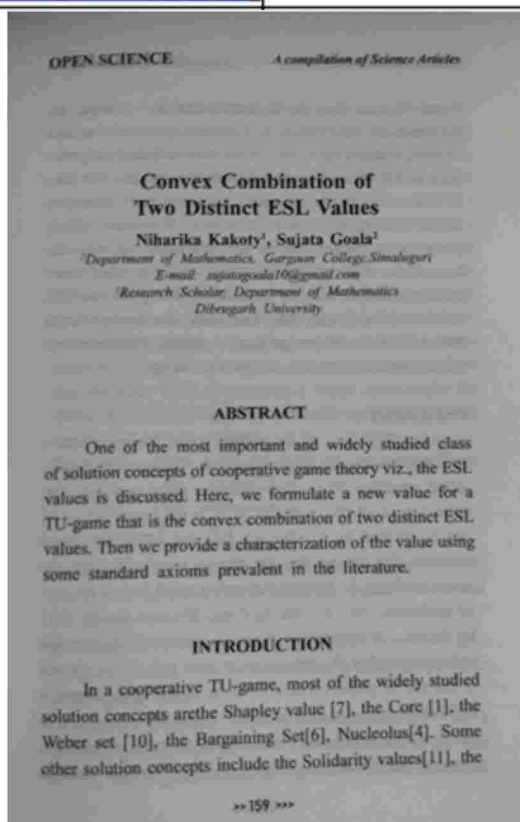
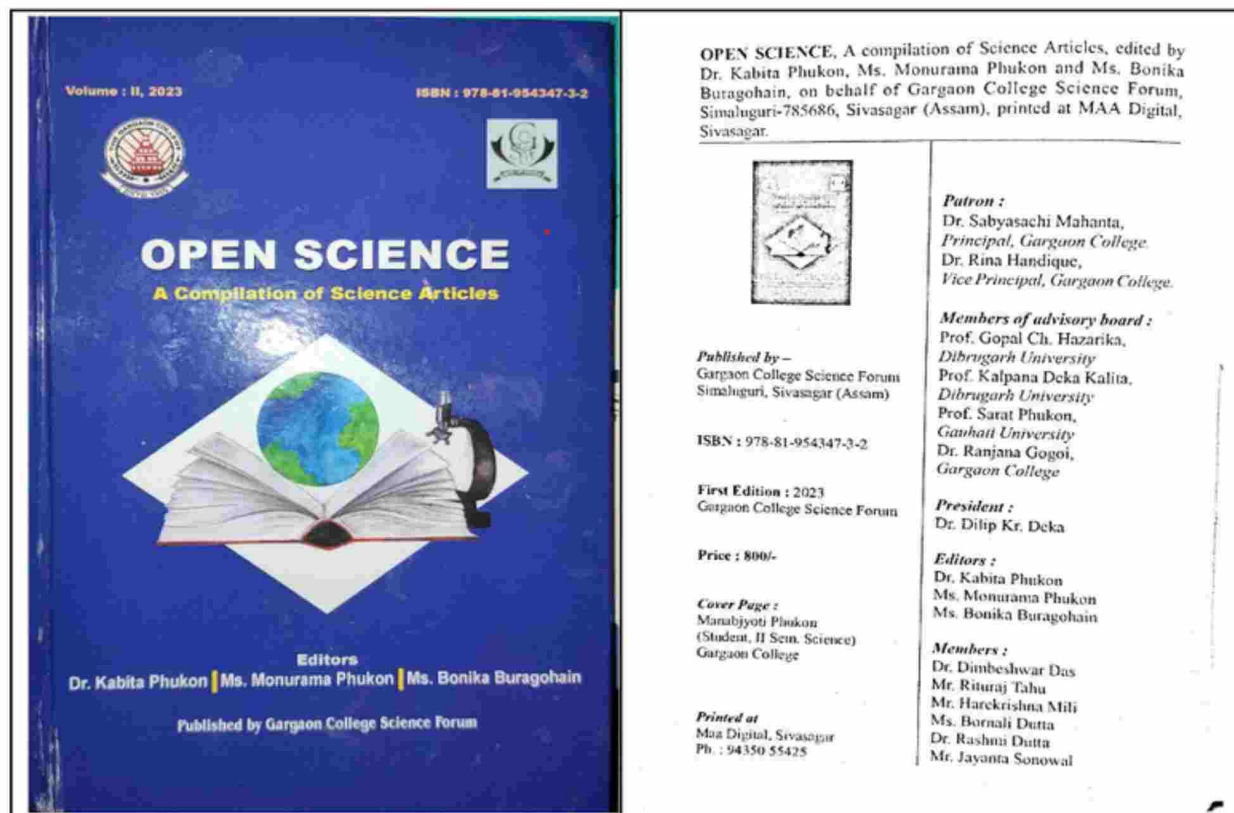


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Title of the Paper: **Convex Combination of the Solidarity Value and the ED Value**

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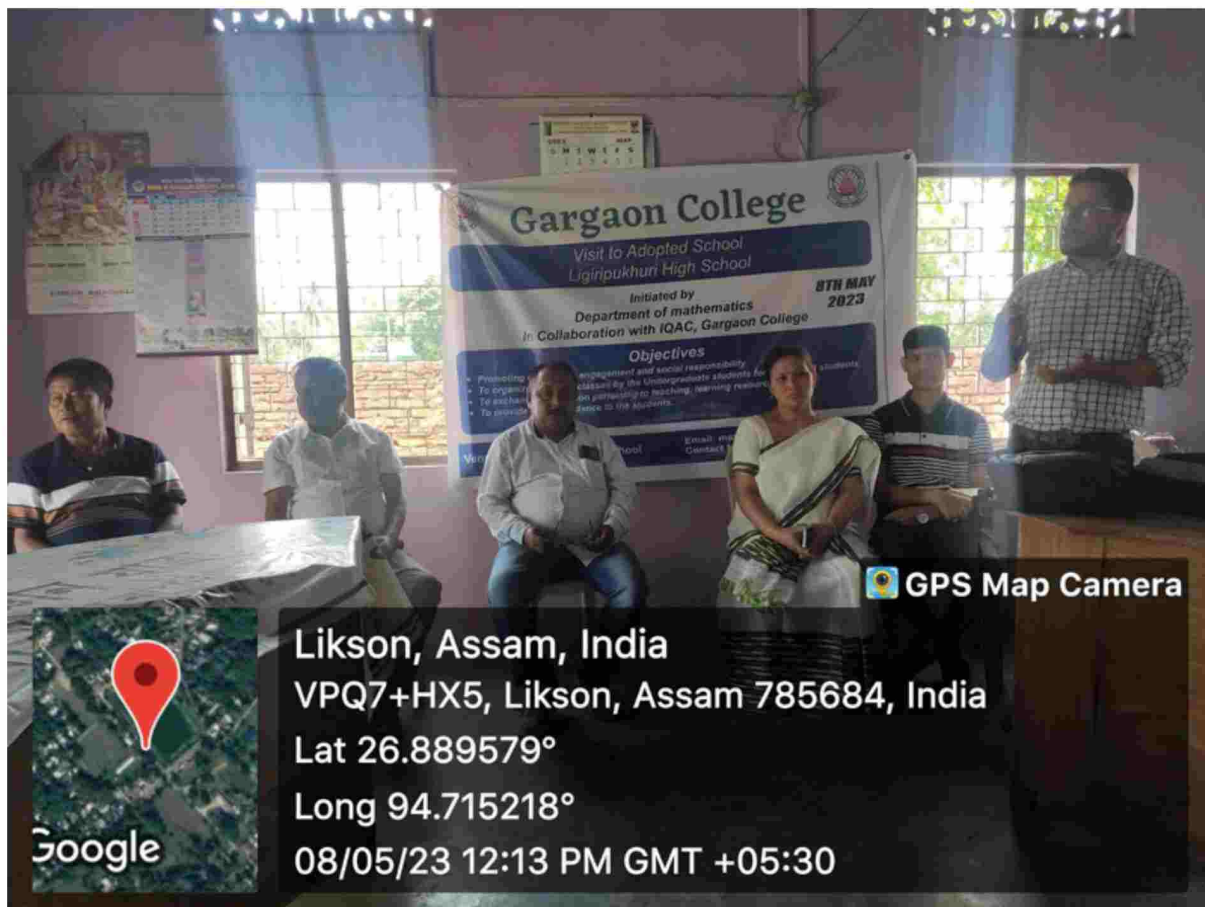




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with
Ligiri Pukuri high school
Nazira, Sivasagar

Title of the Program: **Under Gyanjatra initiative**
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Department of Physics


Collaborative Book Chapter
Jayanta Sonowal
Assistant Professor
Department of Physics, Gargaon College
with
Chandini Sonowal


Department of Economics
Jhanji Hemnath Sharma College


Title of the Paper: **Feminisation of Ageing in India**
Title of the Book: **Women's Well being: Inclusive and Sustainable Growth**
ISBN: 978-81-945305-1-0



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 Dr. Pakiza Begum is working as an Assistant Professor in the Department of Chemistry, Gargaon College, Sivasagar, Assam. She is gold medalist in Masters in Chemical Sciences program, Tezpur University. She completed her Ph. D degree availing DST-INSPIRE-JRF and SRF under Prof. Ramesh Ch. Deka. She was selected as JSPS-HOPE Fellow to attend Seventh HOPE Meeting in Tokyo, Japan. She has also worked as a Research Associate at IIT, Guwahati with Prof. Bhisma K. Patel. She has more than 20 publications in reputed National and International Journals. She worked with Prof. CRA Catlow as part of a collaboration project. Currently, she is working in the area of water quality assessment and analysis.

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WOMEN'S WELL-BEING
Inclusive and Sustainable Growth



EDITORS
Dr. Pakiza Begum
Ms. Pimily Langthasa
Dr. Priyanka Tamuli

WOMEN'S WELL-BEING: Inclusive and Sustainable Growth

A collection of bilingual research-based articles which is a multidisciplinary approach on "WOMEN'S WELL-BEING: Inclusive and Sustainable Growth" edited by Dr. Pakiza Begum, Ms. Pimily Langthasa and Dr. Priyanka Tamuli, on behalf of Women Cell, Gargaon College Teacher's Unit, published by Gargaon College Publication Cell, Gargaon College, Simaluguri, Sivasagar-785686, Assam



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Chapter - 27

Feminisation of Ageing in India

Jayanta Sonowal^{††} and Chandini Sonowal^{††}
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^{††}Assistant Professor, Department of Economics, Jhanji Hemnath Sarma College, Jhanji
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†Authors contributed equally.

ABSTRACT

The population in the world is ageing rapidly and is projected to be doubled by 2050 where 80% of them will be housed by the less developed nations. Due to the higher life expectancy of women compared to men the number of elderly women has a dominance over the elderly men which leads the world towards the feminization of ageing. India is not an exception, the census conducted has clearly shown the higher growth rate of elderly women compared to elderly men per decade. People in the elderly stage face many challenges physically, financially, socially and emotionally. The government and NGOs have taken many initiatives to uplift the health condition of the poor needy elderly in India and to promote social well-being for them. Despite their commendable efforts a substantial number of elders are still facing difficulty in many aspects, which urgently needs the attention of policymakers in this direction.

Keywords: Ageing, Elderly, Feminization.

INTRODUCTION

The growing ageing population is a distinguishing characteristic of the current century. According to the United Nations (UN) report on the world ageing population, 11% of Nations (UN) report on the world ageing population, 11% of

Women's Well-Being • 231

Department of Political Science

Collaborative Webinar



Department of Political Science, Gargaon College
with
Department of Political Science
Sonari College, Charaideo

Title of the Program: **Social Movement and its Impact on Democracy**
Resource Person: **Dr Borun Dey**, Assistant Professor of Political Science at
Dibrugarh University
Date: 20 April, 2023



Webinar on 'Social Movement and its Impact on Democracy'
OUR CORRESPONDENT

SIVASAGAR, April 21: "Understanding social movements is crucial for understanding the dynamics of politics". This was opined by Dr Borun Dey, Assistant Professor of Political Science, Dibrugarh University. Dr Dey was speaking at a State level webinar on "Social Movement and its Impact on Democracy", jointly organized by the Political Science Departments of Gargaon College and Sonari College in collaboration with the IQAC, Gargaon College on Thursday.

He conceptualized social movements as collective maneuvering towards social change. Dr Dey pointed out the modus operandi and intricate nuances of social movements and their relevance in a democratic society. He enthralled the audience with his erudition and thoughts over social movements.

Noted poet, writer, and academic, Dr Sabyasachi Mahanta, the Principal of Gargaon College, inaugurated the virtual event. In his welcome address, he spoke about the growing importance of social movements in present times. Dr Mahanta highlighted the potential that social movements have to bring about social transformation and cater to the needs of the masses. He also eulogized the efforts of the organisers in conducting the event. Dr Pobon Kumar Gogoi, Head of the Department of Political Science, offered a vote of thanks to everyone present at the end of the event. Yuvraj Gogoi, Assistant Professor of Political Science at Gargaon College, moderated the event.

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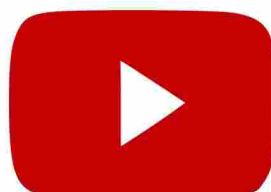
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Organised by
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Resource person	Chairperson and Inaugurator
	
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Assistant Professor, Department of Political Science, Dibrugarh University,
Assam
Title of the Program: **Global Politics**
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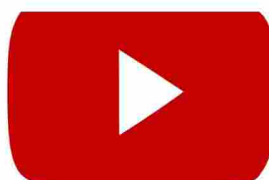
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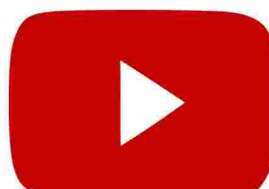
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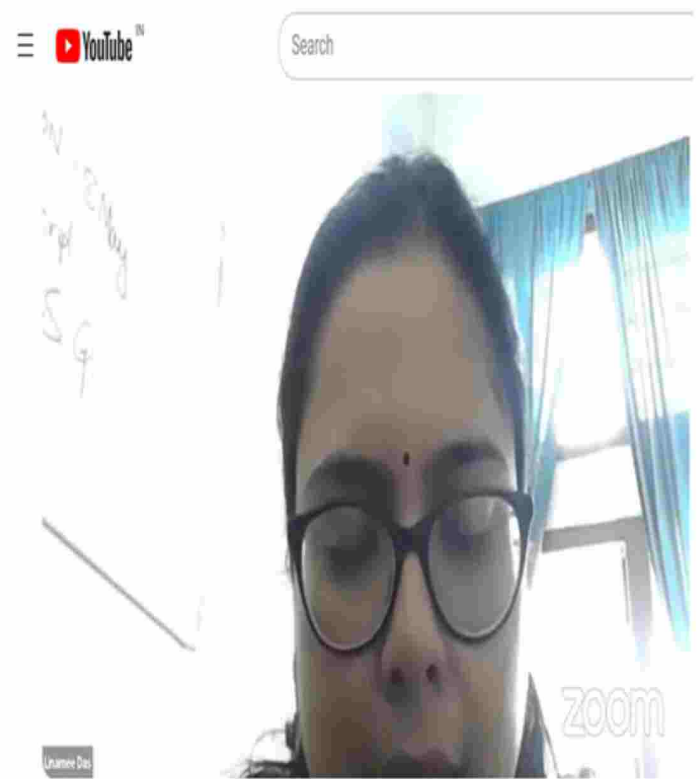
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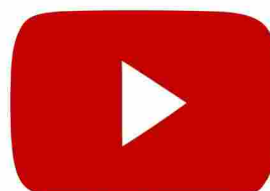
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Assistant Professor, Department of Political Science, Dibrugarh University,
Assam
Title of the Program: **Political Thought**
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Department of Zoology

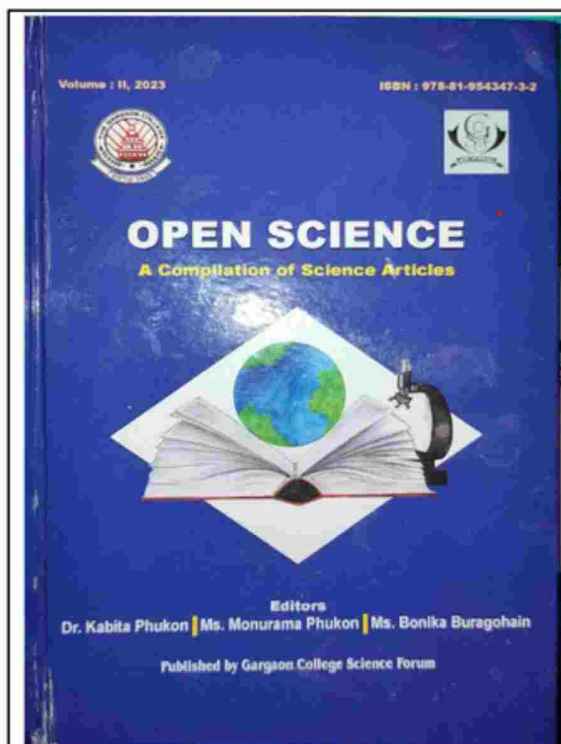


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Dr. Anurag Protim Das
Assistant Professor
Department of Zoology, Gargaon College

with
Dr. Shyama Prasad Biswas
Department of Life Science,
Dibrugarh University

Title of the Paper: **Dispensation of Fish Diversity of Bogibeel; an Important Stretch of Upper Brahmaputra Basin**

Title of the Book: **Open Science: A compilation of Science Articles**
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OPEN SCIENCE *A compilation of Science Articles*

Dispensation of Fish Diversity of Bogibeel; an Important Stretch of Upper Brahmaputra Basin

Anurag Protim Das¹

Shyama Prasad Biswas²

¹Department of Zoology, Gargaon College, Sivasagar
²Department of Life Sciences, Dibrugarh University, 786004
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ABSTRACT


The concept of ecotourism is relatively new concept which amalgamates conservation along with development in ecologically rich areas. Owing to the presence of mighty Brahmaputra the northeastern part of India is blessed with rich aquatic resources in the form of fast flowing rivers, stagnant wetlands, slow running streams and temporary ephemeral streams. Due to rapid urbanization Along with terrestrial counterparts aquatic habitats are facing tremendous anthropogenic threats. Recent assessment advocates rapid decline of aquatic biodiversity. Wetlands along with stretches of rivers are known to harbor rich diversity of native, endemic and rare fishes. The present study deals with inventorization of fish diversity of Bogibeel, an important


Collaborative Book Chapter
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 with
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Chapter - 31

Industrialization of Mulberry Silk Culture in North East India: Boost Women's Economic Empowerment

Darathi Borah Khound* and Anurag Protim Das*
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ABSTRACT

Mulberry cultivation has always been in high demand in Northeast India and abroad, and the silk extracted from it has unique properties such as high elasticity and durability. It also has significant antibacterial and non-flammable properties and can absorb UV rays from sunlight. Currently, many foreign fashion designers are working on dresses made of this Mulberry silk, which increases the demand for Mulberry silk abroad as well. Silk culture has ample potentiality to create many employment opportunities in Northeast India, especially for women who are the backbone of this sector. The government should focus on developing the indigenous silk industry in different parts of northeast India to strengthen the economic status of women, and provide them with low cost, low skilled women-friendly technologies.

Keywords: Mulberry, North East India, Silk industry, employment opportunities, Women empowerment.

INTRODUCTION

The word "sericulture" was derived from the word "seri" which means silk. Sericulture, the art and science of cultivating silkworms, food crops, rearing silkworms, and manufacturing silk, is basically an agribusiness and an economically rewarding enterprise that consists of several activities and plays a prominent role in shaping

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Collaborative Book Chapter
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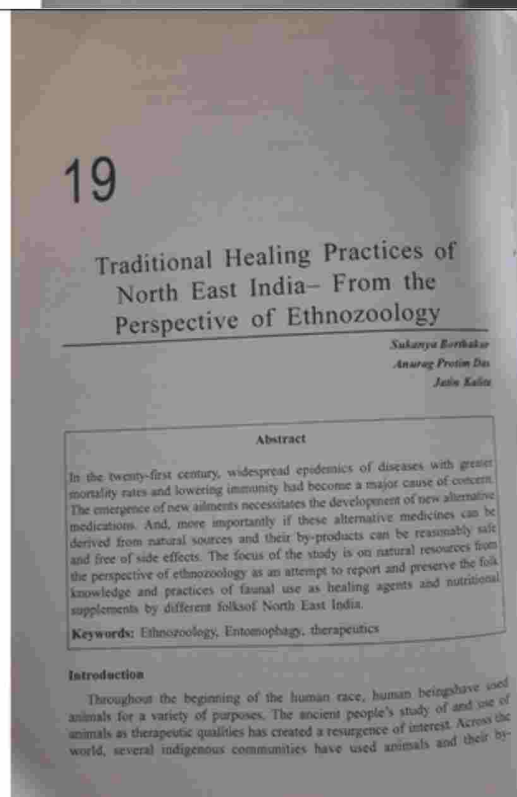
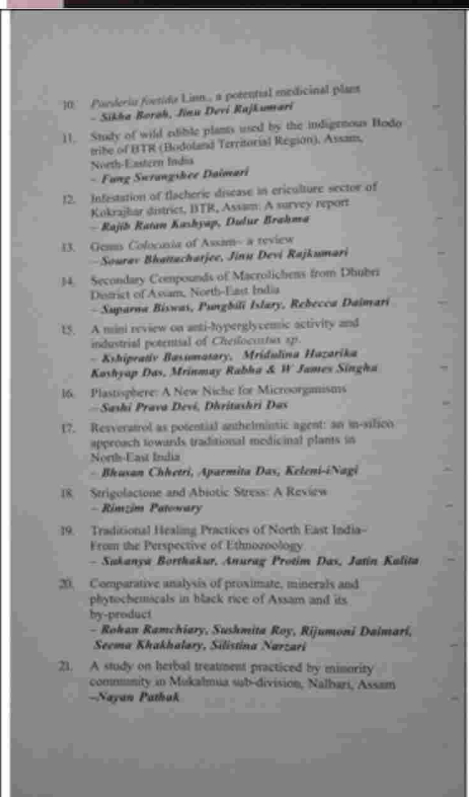
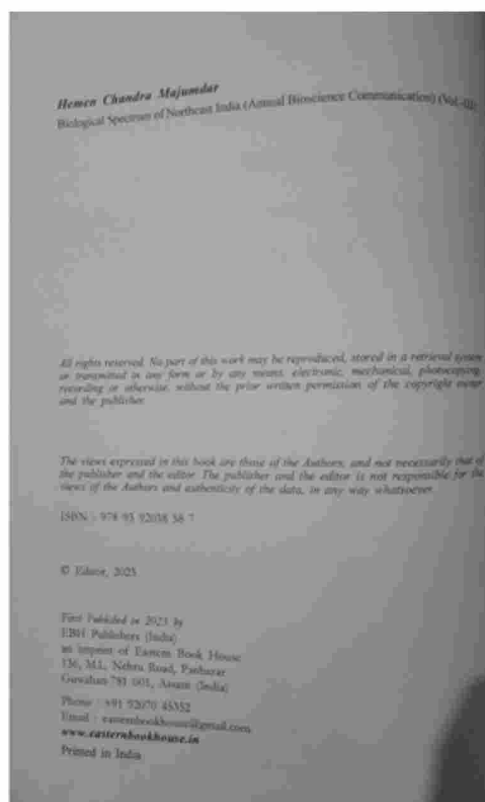
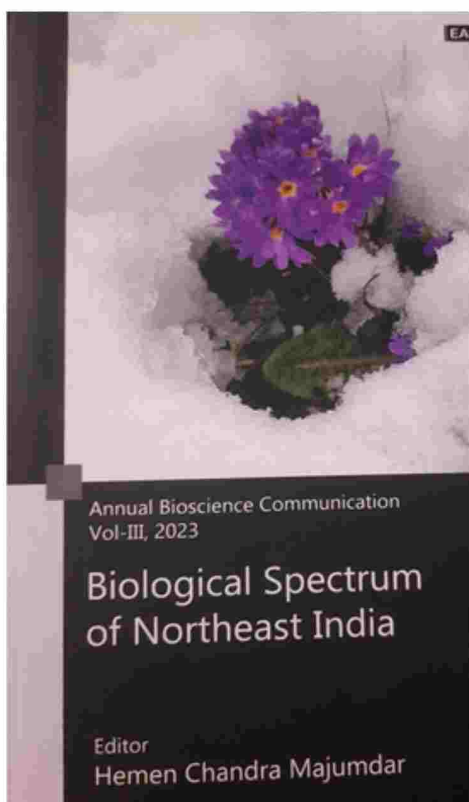
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Chapter - 18

Empowering Women through Edible Mushroom Industry

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ABSTRACT

Women folk contribute a greater portion to the economic growth of any country. Mushroom culture is a lucrative low invest agro-based startup which can augment financial stability to women folk. Globally mushrooms are well known for its nutritional and therapeutic properties. Mushroom cultivation is manually less demanding and across the globe there is huge demand for mushrooms. Due to its demand and being manually less demanding for cultivation, mushroom cultivation aids to making women economically healthy, thus aiding to the socio-economic development as a whole. The congenial agro-climatic conditions provide excellent environment for rapid and largescale production of mushroom varieties. The present study focuses on pragmatic approach of mushroom industry to empower women, through financial upliftment and as a whole to make a nation economically enrich.

INTRODUCTION

The fleshy, spore-bearing fruiting body of a fungus that normally grows above ground, on soil, or on its food source is known as a mushroom or toadstool. The term "mushroom" is most frequently used to refer to fungus (Basidiomycota, Agaricomycetes) that have a stem (stipe), a cap (pileus), and gills (lamellae, sing. lamella) on the underside of the cap (Karwa and Rai, 2005). The name "mushroom" is used to designate the fleshy fruiting bodies of several Ascomycota as well as a range of other gilled fungi, with or without

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