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মাধৱ চৌধুৰী মহাবিদ্যালয়

ESTD. 1939

Supporting Documents

for NAAC Self Study Report (SSR)

(3rd Cycle) Period: 2017-2022

Criterion 3:	**Research, Innovations and Extension**
Key Indicator:3.3	**Research Publication and Awards**
Metric Number: 3.3.1	**Number of research papers published per teacher in the Journals notified on UGC care list during the last five years**

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3.3.1.1 Number of research papers published per teacher in the Journals notified on UGC care list during the year 2017-18:

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISBN/ ISSN	Annexure
Cu (II) complex of phenylthiosemicarbazone: An in situ catalyst for formation of C-N bond between different N-based neucleophiles with arylboronic acids at room temperature	Nibedita Gogoi, Geetika Borah, P. K. Gogoi	Chemistry	Heteroatom Chemistry	March, 2018	1042-7163	1
A brief study of female healthcare preparations used by the Koch-Rajbongshi tribals of Barpeta district of Assam	Dip Kumar Bhattacharjya	Botany	Sri JNPG College REVELATION	2018	2456-7698	2
Matrilateral Asymmetry- A Rural Urban Comparison in Guwahati Metro and Dobok Village of Kamrup Rural District Assam	Luna Goswami	Anthropology	NEICSSR	2018	0970-7913	3
Some generalized sequence spaces operated by a modulus function	Bipul Sarma	Mathematics	Invertis Journal of Science and Technology	2018	0973-8940	4
Gender Discrimination in Indian Perspective	Harihar Deka	Political Science	IJIRSSC	December, 2017	2395-4345	5

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Exploring Dance in the assertion of an Ethnic Identity: A Brief Overview of the Bodo Dance forms	Himani Ramchiary	Anthropology	JONER	April, 2018	2321-0583	6
Gunotsav at a glance for the quality improvement of primary education in Assam	Gobinda Brahma	Education	Research Journal of Social and Life Sciences	September, 2018	0973-3914	7
Primary Education Status of Provincialised Schools of BTAD in Assam	Gobinda Brahma	Education	Excellence International Journal of Education and Research	October, 2017	2349-8838	8
Right to Education Act (RTE), 2009 Accelerating in Baksa District of Assam, India.	Gobinda Brahma	Education	IJIRSSC	December, 2017	2455-2009	9
Role of IQAC in Ensuring Quality Higher Education in the Colleges of Assam	Champak Deuri	Education	EIJER	March, 2018	2349-8838	10
Present Legal Provision to Combat Child and Women Labour Problem	Champak Deuri	Education	IJIRSSC	June, 2018	2395-4345	11

3.3.1.1 Number of research papers published per teacher in the Journals notified on UGC care list during the year 2018-19:

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Ascorbic Acid as a highly efficient Organocatalyst for ipso-Hydroxylation of Arylboronic Acid	Sameeran Kr. Das, Prantika Bhattacharjee , Utpal Bora	Chemistry	Chemistry Select	2018	2365-6549	12
Physical Growth Progression among the Sarania Kachari Children of Baksa District, Assam	Sarat Chandra Bhuyan	Anthropology	AJANTA	2019	2277-5730	13
Determinants of Health among the Sarania Kacharis of Baksa and Odalguri (BTAD) Districts, Assam (India): A Synopsis	Sarat Chandra Bhuyan	Anthropology	IJRAR	2019	2348-1269	14
SOME HIGHER ORDER DIFFERENCE DOUBLE SEQUENCE SPACES DEFINED BY AN ORLICZ FUNCTION	Bipul Sarma	Mathematics	Journal of Scientific Perspectives	January , 2019	2587-3008	15
STUDY OF STRUCTURAL AND OPTICAL PROPERTIES OF ZnS NANO PARTICLES SYNTHESIZED BY CBD METHOD	Archana Das, Sanjib Karmakar	Physics	JETIR	2019	2349-5162	16
Right to Education Act (RTE), 2009: Accelerating in Baksa District of Assam	Jonali Chetia, Gobinda Brahma	Education	AJANTA	2019	2277-5730	17
Present Primary Education Development Status in Baksa District of Assam	Jonali Chetia, Gobinda Brahma	Education	Research Journal of Social and Life Sciences	2019	0973-3914	18

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3.3.1.1 Number of research papers published per teacher in the Journals notified on UGC care list during the year 2019-20:						
A note on the temporal and spatial distribution of Asian Woollyneck in Assam, India	Jaydev Mandal, Leons Mathew Abraham, Rupam Bhaduri	Zoology	SIS Conservation	2020	2710-1142	19
A Study on problems of provincialized Bodo medium elementary schools of BTAD (Bodoland Territorial area districts/BTR (Bodoland Territorial Region) with special reference to Baksa District of Assam.	Jonali Chetia, Gobinda Brahma	Education	Mukt Shabd	2020	2347-3150	20
Physical Growth and Nutritional Status of the Kalita Children of Kamrup (Rural) District, Assam (India) : a research proposal	Sarat Chandra Bhuyan	Anthropology	IJRAR	2020	2348-1269	21
Structural and optical properties of ZnO nanoparticles synthesized by CBD method using different precursors	Archana Das ,Sanjib Karmakar	Physics	AEGAEUM JOURNAL	2020	0776-3808	22

3.3.1.1 Number of research papers published per teacher in the Journals notified on UGC care list during the year 2020-21:						
Charge radii and leptonic decay constants of heavy light mesons in a potential model	Tapashi Das, D. K. Choudhury, K. K. Pathak, N. S. Bordoloi	Physics	Indian Journal of Physics	2021	0973-1458	23

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Repurposing fallen leaves to bio-based reaction medium for hydration,hydroxylation, carbon-carbon and carbon-nitrogen bond formation reactions	S. K. Das, K. Laskar, D. Konwar, A. Sahoo, B. K. Saikia	Chemistry	Sustainable Chemistry and Pharmacy	2020	2352-5541	24
Bio-based sustainable heterogeneous catalyst for ipso-hydroxylation of arylboronic acid	S. K. Das, M. Tahu, M. Gohain, D. Deka	Chemistry	Sustainable Chemistry and Pharmacy	2020	2352-5541	25
3.3.1.1 Number of research papers published per teacher in the Journals notified on UGC care list during the year 2021-22:						
Nucleophilicity and CO2 fixation ability of phosphorus, nitrogen and sulfur ylides: insights on stereoelectronic factors from DFT study	Dipanjali Pathak, Sanjib Deuri, Prodeep Phukan	Chemistry	Journal of Chemical Sciences	December, 2021	0973-7103	26
Nucleophilicity and CO2 fixation ability of phosphorus, nitrogen and sulfur ylides: insights on stereoelectronic factors from DFT study	Dipanjali Pathak, Sanjib Deuri, Prodeep Phukan	Chemistry	Journal of Chemical Sciences	December, 2021	0973-7103	26
Biogenic palladium nanostructures for Suzuki-Miyaura and Sonogashira cross-coupling reaction under mild reaction conditions	Sameeran Kumar Das, Anindita Dewan, Pangkita Deka, Rakhee Saikia, Sanjib Thakuria, R.C. Deka, Ashim J. Thakur, Utpal Bora	Chemistry	Current Research in Green and Sustainable Chemistry	2022	2666-0865	27

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Determination Of Minimum Quadrat Size For The Herbaceous Vegetation: A Case Study Of Durpang Reserve Forest, Arunachal Pradesh, India	M M Phukan, T Boruah	Botany	Natural volatiles & essential oils	December, 2021	2148-9637	28
A comprehensive review on phytoremediation of heavy metal contaminated soil with special reference to aromatic plants	MM Phukan, T Boruah	Botany	International Journal of Botany Studies	February, 2022	2455-541X	29
Rabindranath Tagore's Philosophy- An Analysis	Suman Deka	Philosophy	Rabindra Bharati Journal of Philosophy	2021	0973-0087	30
Microbial diversity on the leaf litter of Bhindi [Abelmoschus esculentus (L.) Moench] crop fields at the different growth stages of the plants in Barpeta district of Assam.	Eushah Ali	Botany	Journal of Mycopathological Research	June, 2021	0971-3719	31
A Study of Family Pattern among the Assamese Hindu Family of the Niz Baghbor village under Baghbor Circle of Barpeta District	Ajit Kumar Ojah	Anthropology	Anvesak	2021	0378-4568	32

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Repellent Activity of Citrus Essential Oils and Two Constituent Compound Against Aedes aegypti	K. Adhikari, Riju Sarma, B. Rabha, B. Khanikor	Zoology	Proc. Natl. Acad. Sci., India, Sect. B Biol. Sci.	April, 2022	0369-8203	33
In-silico interactions of eugenol and temephos with metabolic detoxifying enzymes of Aedes aegypti (Dipera: Culicidae)	K. Adhikari, Riju Sarma, B. Khonikor	Zoology	International Journal of Tropical Insect Science	January, 2022	1742-7584	34
Evaluation of efficacy of pinene compounds as mosquitocidal agent against Aedes aegypti Linn. (Diptera: culicidae)	Riju Sarma, K. Adhikari, B. Khanikor	Zoology	International Journal of Tropical Insect Science	April, 2022	1742-7584	35
A note on the avian diversity of Satajaan Wetland, Assam	R. Bhaduri, Jaydev Mandal, L. M. Abraham	Zoology	Zoo's print	February, 2022	0973-2551	36
Kerala Bird Atlas 2015-20: features, outcomes and implications of a citizen-science project	J. Praveen et al.	Zoology	Current Science	February, 2022	0011-3891	37
Persistent susceptibility of Aedes aegypti to eugenol	K. Adhikari, B. Khanikor, Riju Sarma	Zoology	Scientific Reports	2022	2045-2322	38
Primary Educational Development Status of Religious Minority Child in Mondia Block of Barpeta District of Asam	Gobinda Brahma	Education	Wesleyan Journal of Research	April, 2021	0975-1386	39

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Current Problems and Future Challenges of Primary Education in Baksa District of Assam	Jonali Chetia, Gobinda Brahma	Education	Anvesak	December, 2021	0378-4568	40
Versatility of magnetic Fe_3O_4 supported copper nanocomposite catalyst towards reduction of carbonyl and nitro compound	Nibedita Gogoi, Chimi Rekha Gogoi, Pradip K Gogoi, Geetika Borah	Chemistry	Indian Journal of Chemistry	January, 2021	0975-0975	41
Diversity of aeromycoflora in fruit and vegetable markets of Barpeta, Assam, India and their sustainable management	Eushah Ali, Dip Kr. Bhattacharjya	Botany	International Journal of Biosciences	March, 2022	2220-6655	42
Diversity of aeromycoflora in fruit and vegetable markets of Barpeta, Assam, India and their sustainable management	Eushah Ali, Dip Kr. Bhattacharjya	Botany	International Journal of Biosciences	March, 2022	2220-6655	42
Bacteriological quality of drinking water collected from different sources, seasons and areas of Barpeta district of Assam, India.	Eushah Ali	Botany	International Journal of Biosciences	November, 2021	2220-6655	43

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Annexure 1

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RESEARCH ARTICLE

WILEY Heteroatom Chemistry

Cu(II) complex of phenylthiosemicarbazone: An in situ catalyst for formation of C-N bond between different N-based neucleophiles with arylboronic acids at room temperature

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Abstract

We have reported here a new synthetic protocol for the formation of C-N bond catalyzed by a thiosemicarbazone complex of copper. This in situ complex has been found to be very effective for Chan-Lam C-N cross-coupling reaction of anilines and various imidazoles at room temperature. Pyrazole and 4-bromoindole were also activated for C-N bond formation by using this protocol at room temperature. This catalytic system gave good-to-excellent yield using a mixture of DMF and water as solvent in a 1:1 proportion.

1 | INTRODUCTION

Transition metals such as Pd- and Cu-mediated C-N bond formation can be categorized into three distinct different types, (a) regular cross-coupling, (b) oxidative cross-coupling, and (c) inverse or Umpolung cross-coupling. All these three types of cross-coupling can be performed effectively with the help of catalysts containing palladium and copper.[1] As initially reported by Chan and Lam, copper-mediated cross-coupling of arylboronic acids and nitrogen-based nucleophiles is an important strategy for C-N bond formation.[2] From their report, it is evident that the *N*-arylation of nitrogen-based nucleophiles by arylboronic acids can be carried out with the help of stoichiometric amount of Cu salt in presence of an external base/ligand. This methodology is very efficient with a wide range of substrate variety and applicable both in the liquid phase and on solid support. It has several advantages including mild reaction conditions, use of weak bases, low toxicity, high thermal stability, and structural diversity of arylboronic acid over the use of aryl halides and thus makes this process better than the classical Ullmann coupling[3] reaction and Pd-catalyzed Buchwald-Hartwig amination.[4] Recently, this has been modified by the use of various additives, such as 2,2,6,6-tetramethylpiperidin-1-yl)oxyl (TEMPO), pyridine-N-oxide, and molecular oxygen.[5] Some other works involving coupling reactions of imidazoles with arylboronic acid have been reported by various workers, for example synthesis of Cu(II)-tetramethylethylene diamine complex by Collman et al, synthesis of Cu(II)-salen type complex by Bora et al, and synthesis of chitosan anchored copper(II) Schiff base complexes by Anuradha et al[6] are significant. Similarly, Azam et al[7] also reported a new Cu(II) salen complex with propylene linkage for C-N bond formation between arylboronic acid and various N-heterocycles. To the best of our knowledge, there is no report on the use of Cu catalysts bearing thiosemicarbazone ligands in Chan-Lam cross-coupling reactions. The derivatives of thiosemicarbazone possess several characteristics such as (i) they can act as N,S donors and can form useful transition metal complexes having industrial applications,[8] (ii) they are also capable of acting as bi-or multidentate ligands through several donor atoms, (iii) the most important characteristics of these ligands are their capability of occupying different coordination sites available on the metal and thereby control the mode of coordination of the substrates with the metal influencing the selectivity and efficiency of the catalyst.[9] These characteristics of thiosemicarbazone make them suitable in the synthetic and catalysis

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Contract grant number: 2016-2021.

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Annexure 2

Sri JNPG College REVELATION : A Journal of Popular Science
Vol. II, No. 1 (2018), 32-36

A Brief Study of Female Healthcare Preparations Used by the Koch-Rajbanshi Tribals of Barpeta District of Assam

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Key words:
Assam, Barpeta, Ethnomedicine, Female Healthcare, Koch-Rajbanshi tribe.

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ABSTRACT

Barpeta district of Assam is rich in phytodiversity and the rural folk of the district are efficient practitioner of their traditional knowledge system, especially in connection with the use of phytomedicines. The present paper deals with the ethno-medicinal knowledge of Koch-Rajbanshi tribal people living in small settlements in the district of Barpeta with special reference to Female healthcare. This tribal group is among the ones with smallest population in Barpeta. Out of the 25 species belonging to 18 families documented here mostly are well known and used extensively by other tribes also.

Introduction

The seven sister states of North Eastern India are the store houses of one of the world's richest biodiversity. Thousands are plant species are still waiting for to be recognized and their ethnomedicinal usage explored. But before this we have to work upon a number of plant species which although are common but their medicinal uses are unknown. Our country with its rich cultural diversity has unexploited treasure of such medicines for thousands of years. At a time when the world faces a stagnation in the chemical medicines leave aside the harmful side effects, the ethnomedicines offer a safe method of repair, cure and strengthening of body with no or minimum side effects.

Assam, with its vast and endemic plant resources and its rich traditional ethno-botanical knowledge has huge potential and possibilities in the field of phytomedicine (Kalita & Phukan 2010). Some of these medicinal species have been extensively used in the ayurvedic, unani and other traditional alternative medicine systems since the time immemorial (Satyavati et al. 1987). Like all botanically rich regions of Assam, the district of Barpeta is also known for its substantial diversity of plant species. Barpeta district is located in between 26° 5' N to 26° 49' N latitude and 90° 39' E to 91° 17' E longitude and occupies an area of 3245 sq km. Barpeta town, the district headquarter, is located about 90 km North-west of the state capital Guwahati. Barpeta enjoys a sub-tropical climate with chilly winters and hot and humid summers. The district is the gateway to Manas National Park, one of the largest forest patches of Assam and one of the Tiger Reserves of India. The tribal inhabitants of the district include Koch-Rajbanshi, Rabha, Boro, Tea-tribe, Santhal etc. Among these, the Koch Rajbanshis were made the subjects of study because of their small population and rich ethnobotanical knowledge.

Many researchers, round the world have worked on the traditional knowledge of curing gynaecological disorders using phytomedicines. These include Lukhoba & Siboe (2008), Bone et al. (1990), Khan & Khan (2003), Panduranga et al. (2011) and Sahu (2011). In North East India workers like Barua & Kakati (1976), Sarma et al. (2001, 2002, 2006), Barua et al. (1999), Bhattacharjya & Borah (2006), Das et al. (2007), Borah & Bhattacharjya (2009), Kar & Bhattacharjya (2008), Das et al. (2009), Bhattacharjya et al. (2008, 2012), Sarkar & Das (2010, 1011), and Lepcha & Das (2011) have made valuable contributions towards enriching our knowledge regarding different diseases/ ailments and their treatment using different plant species in variety of formulations. However, studies on female healthcare in connection with the treatment with phytomedicines is

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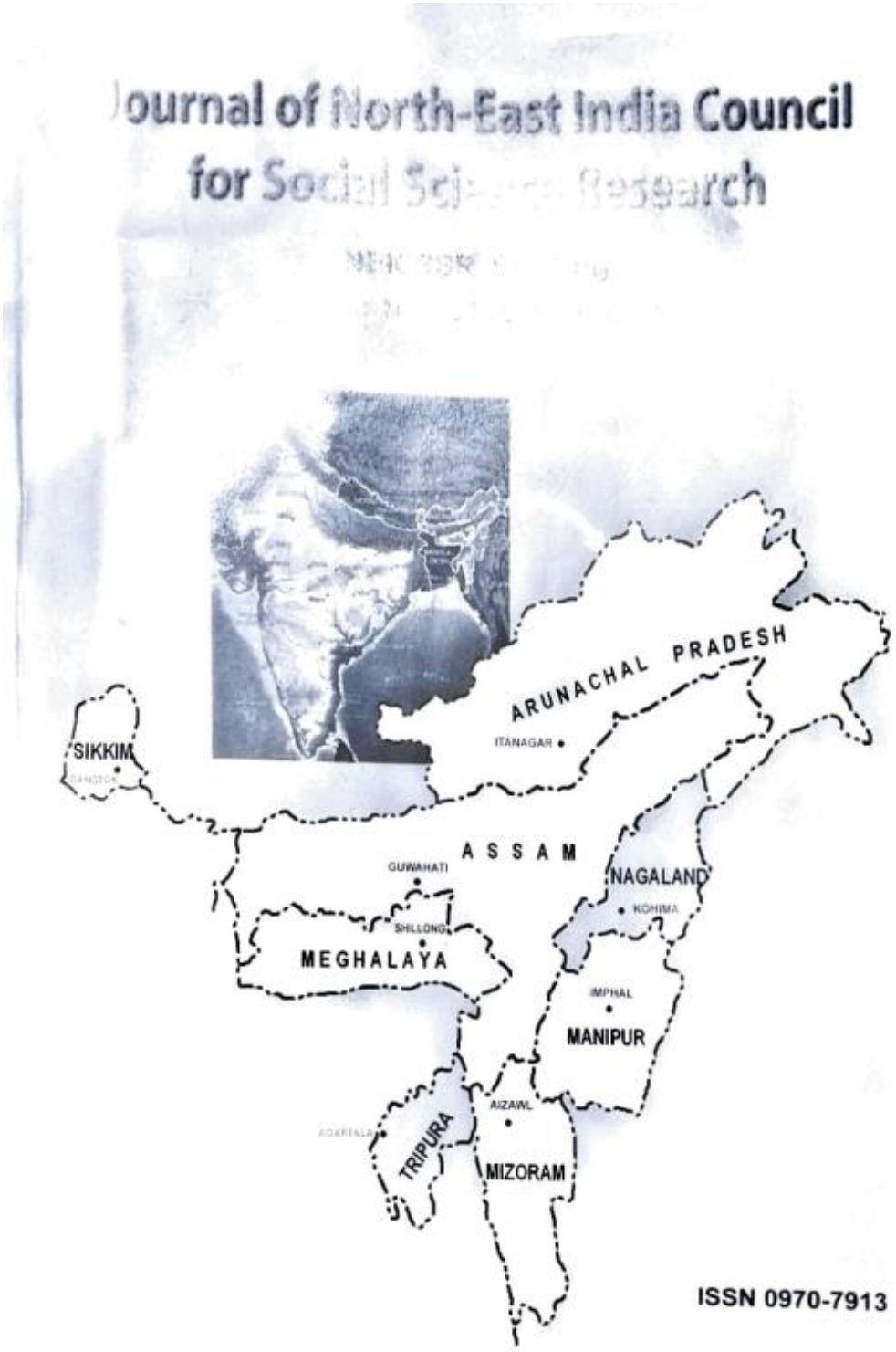
Annexure 3



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'Matrilateral Asymmetry'-A Rural Urban Comparison in Guwahati Metro and Dobok Village of Kamrup Rural District Assam

Luna Goswami*

Introduction

Many studies in Western societies have shown the growing tendency of matrilateral asymmetry in western families. This trend is observed in the newly industrialized societies which are predominantly patrilineal or patrilocal in nature. The term 'matrilateral asymmetry' is used to mean the increase interaction between the married daughters with her parental house which broadens the role of wife's kin's which is traditionally confined to be the role of husband's kins'. Thus there is a change in behavioral roles (Sweetser 1963, 1964, 1966, 1968, 1970). Researches in American and European societies revealed the fact. Studies conducted by Townsend (1957), Young and Wilmot (1957), Habenstein and Coult (1965), Susman (1965), Poggie and Pelto (1969) are worth mentioning. Matrilateral asymmetry can be observed in the patterns of aid provided, frequency of interaction, and feelings of closeness. According to Sweetser, this tendency is associated with man's decreasing role with his parents or brothers in joint enterprise (Vatuk, 1971; 287-307). Vatuk (1971) in his study of Kinship system in North India also found the same trend. There is an increasing bond between wife's kin's which is recognized and gradually accepted in society. Brown (1931) has found that both the paternal and maternal kins are universally recognized as a child is attached to both his father's and mother's family. But Fortes stated that the "bilateral filiations" does not carry the equal weightage for the two sets of kin groups in society (Fortes 1953, p.33).

With this idea at the backdrop of mind, number of visits to the wife' parental house and help or aid received by a couple is considered in the study.

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Annexure 4

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Some generalized sequence spaces operated by a modulus function

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Abstract

In this article we study different properties of the sequence space $m_F(f, \phi, p)$, $0 < p < 1$. Some inclusion results will be established among the introduced sequence spaces and existing sequence spaces. We study the property of solidity.

Key words : Modulus function, Monotone space, fuzzy sequence, completeness, solidity
AMS Classification No. 40A05, 46A45.

1. Introduction

The sequence space $m(\phi)$ was introduced by Sargent[15], who studied its different properties and obtained its relations with the spaces ℓ^p and ℓ^∞. Later on the notion was further investigated and linked with summability theory by Sarma[16], Tripathy and Sen[18] and many others.

Spaces of sequences of fuzzy numbers were studied by Matloka[9], Nuray and Savas[13] and many others.

The notion of modulus function was introduced by Nakano[11]. Later on different sequence spaces were defined by using modulus function and their different properties were investigated by Ruckle[14], Maddox[8], Bilgin[4] and many others.

Throughout the article w^F and $(\ell_\infty)_F$ denote the spaces of *all* and *bounded* sequences of fuzzy numbers, respectively.

Let P_s denote the class of all subsets of N, the set of natural numbers, those do not contain more than s elements. Throughout $\{\phi_n\}$ represents a non-decreasing sequence of real numbers such that $n\phi_{n+1} \leq (n+1)\ \phi_n$, for all $n \in N$.

The class of these sequences $\{\phi_n\}$ is denoted by Φ.

The sequence space $m(\phi)$ introduced by Sargent[15] is defined as :

$$m(\phi) = \{(x_k) \in w : \sup_{s\geq 1, \sigma\in P_s} \frac{1}{\varphi_s} \sum_{k\in\sigma} |x_k| < \infty\},$$

which becomes a Banach space, normed by

$$|x|_{m(\phi)} = \sup_{s\geq 1, \sigma\in P_s} \frac{1}{\varphi_s} \sum_{k\in\sigma} |x_k|.$$

Let D denote the set of all closed and bounded intervals $X = [a_1, a_2]$ on R, the real line. For $X, Y \in D$ we define

$$d(X, Y) = \max(|a_1 - b_1|, |a_2 - b_2|),$$

where $X = [a_1, a_2]$ and $Y = [b_1, b_2]$. It is known that (D, d) is a complete metric space.

A fuzzy real number X is a fuzzy set on R, *i.e.* a mapping $X: R \to I$ $(=[0, 1])$ associating each real number t with its grade of membership X(t).

A fuzzy real number X is called *convex* if $X(t) \geq X(s) \wedge X(r) = \min\{X(s), X(t)\}$, where $s<t<r$.

Annexure 5

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Gender Discrimination in Indian Perspective

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ABSTRACT : *There is a large ambiguity about the nature and status of women in Indian society. There are some sacred texts which give them a loftier status by saying them as mother goddess as Durga, Kali, Chandi etc. Women are envisaged as a symbol of power and they can evoke both fear and reverence. Woman can protect others and in different circumstances they can also wreak vengeance. If pleased, they can fulfill every wish and in contrast when annoyed they can unleash unprecedented displeasure. Some of their attributes are believed to be invested in every woman. On the other hand, there is another profile of woman which is sanctioned by the religious scriptures. Sometimes woman is believed to be fickle and fragile in nature. She is alleged to be sensuous, a temptress, given to falsehood, folly, greedy and a symbol of impurity and thoughtless action. She, in this way, is regarded as the root of all evils. These two images in respect of women are contradictory. This ideology of utmost subordination and ambiguity linked mainly to Hinduism is pervasive and it has affected the ethos of almost the entire Indian Society. The aim of this paper is to study the imbalances suffered by the women in India in different fields which are leading to the violation of their human rights.*

Keywords: *Constitution, Discrimination, Education, Girl-child, Marriage.*

I. Introduction:

An aspect of gender inequality that receives a great deal of attention from academics and policymakers is decision-making power within the household. A woman's say in household decisions is one aspect of her well-being and thus an end in itself, but the keen interest in female empowerment is in large part because it is believed to be a means of improving children's outcomes [1].The model in the background is of a non-unitary household, that is, a household as a collective of individuals with different preferences who vary in how much they influence the household's decisions [2]. The 20th century has been marked by a widespread movement towards gender equality.Though this has led to better opportunities for women, especially in industrialised countries, a sometimes shocking picture can be seen in a few developing countries where equality is still a faraway goal. The mortality rate for girls and women, for example, is much higher in South Asia and China in comparison to their male counterparts [3],[4].

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Annexure 6

Exploring Dance in the assertion of an Ethnic Identity: A Brief Overview of the Bodo Dance forms

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Introduction

Apart from the broad outlook that dance is a form of entertainment, we can find two opposing views in the dance forms of the Bodos. One outlook suggests thatdance is often used for political purposes and the other is that dance is a purely religious symbol without which certain traditional rituals cannot be performed. Glasser states that "Dance cannot be studied in isolation. It has to be understood in relation to a broad view of culture" (Glasser, 1991: 114). But again as defined by Tylor (1871), culture is not only a set of symbols, values or beliefs of people; rather it is also a response to circumstances. These circumstances are developed over time. An eminent anthropologist Radcliffe Brown (1994) defines dance as a cultural practice and as a social ritual. According to some anthropologists dance is an activity which is constructed to convey various aspects of culture. These aspects of culture also take into account the human behaviour, by the manner of dancing practices done (Brown and Raginald, 1994). As such it is apparent that one needs to work, towards the deeper understanding of various attributes which are related to dancing. This has to be done before interpreting any dances.

Certain terminologies are used in the paper as it is a challenging task to discuss dance in isolation. Dance is mostly related to other forms of "cultural expression" (Glasser, 1996). The traditional dance forms and music are very much inter-related to each other. The term 'traditional' is being used here to refer to those kinds of Bodo dances and music which have their origin in the rituals and customs of the Bodo tribal people. Some of the dance forms in the present time have undergone change due to interactions with other communities and also due to the emergence of modernisation.

Earlmann (1982) studied some of the dance forms (e.g: Marabi, Iscathamlya) of the South Africans and termed them as political. Earlmann's idea of "communicating ideologies and specific ideas" (Earlmann, 1982: 1) is used in the paper to understand dance as a political tool. But this aspect is only one of the many ways of looking at the particular dance forms. The dance forms also have their own functions like social bonding, recreation, enjoyment, rituals, entertainment and many more depending upon their place of performance and the space it receives.

The traditional dance forms of the Bodos are necessarily associated with cultural attire, and often the female body becomes the marker of dress and dance to define culture. In this study, using the dance forms of the Bodos, I plan to understand how the Bodos of Assam use dance as one of the tools in asserting their identity. The paper also traces how various dance forms were

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Gunotsav at a glance for the quality improvement of primary education in Assam

* Gobinda Brahma

Abstract- *Right to Education (RTE) Act, 2009 is clearly mentioned in article no. 21A of Indian constitution. According to this act, primary education is the birth right of every child aged between 6-14 years. Sarva Siksha Abhiyan of 2001 has taken various steps for the universalization of primary education of the country which is the largest primary education programme of the world.*

Key words: Quality, Improvement, Primary, Education

1. Introduction: Gunotsav is the primary education development programme which is adopted from the Gujrat state of India. The first phase of Gunotsav is introduced in Assam in 2017. Gunotsav is mainly observed for the quality improvement of elementary education in Assam. It tries to fulfil the mandate of RTE, 2009 where every children of India aged 6-14 years have the constitutional right to receive the quality of elementary education in the country. So, the Assam Government has already conducted three phases of Gunotsav programme in the state.

1.01: Objectives of Gunotsav:

- To provide quality of elementary in Assam.
- To fulfill the mandate of RTE, 2009.
- To indicate learning gapes and to design effective strategies to meet up these gapes.
- To ensure learning enhancement and achievement of learning outcomes by all children at elementary level.
- To assess the performance of schools on areas viz-Scholastic, co-scholastic, availability of infrastructure and community participation in schools.
- To ensure greater participation of all stake holders starting from teachers, students, administrators, communities and enhance accountability among them for quality education.
- To support the schools and education system to improve the quality of education and ensure better functioning of schools.
- Clarify the teachers regarding the philosophy of CCE (Child Care Education) and to implement the same in true spirit.

Holistic diagnosis of elementary schools for better performance.

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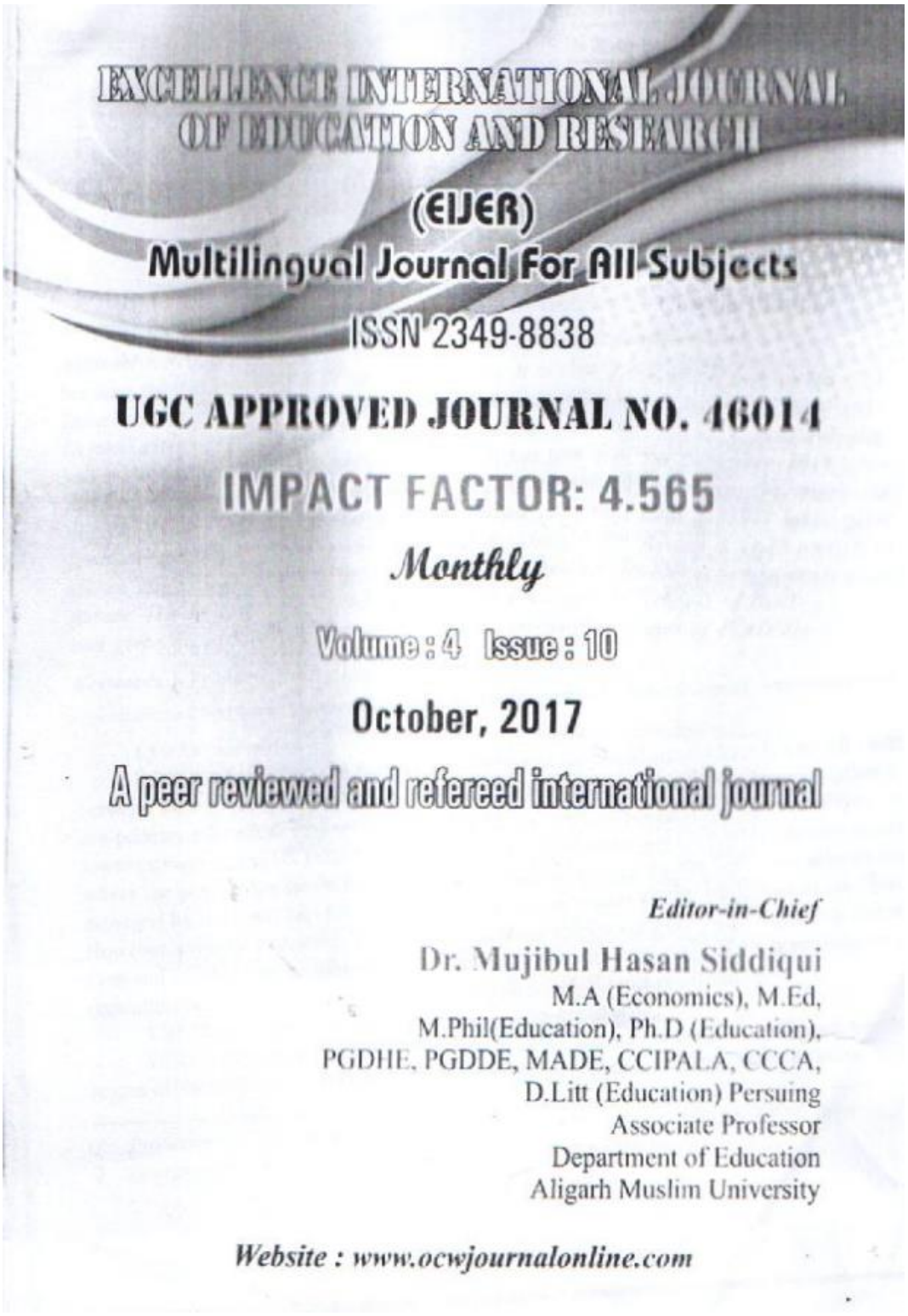

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Primary Education Status of Provincialised Schools of BTAD in Assam

Dr. Jonali Chetia[1]
Gobinda Brahma[2]

Abstract : *Primary Education is the first stage of formal education which is provided between the age group of 6-14 years of children. It is clearly mentioned Article No. 45 of India constitution. BTAD (Bodoland Territorial Area District) is the gateway to the beautiful North-Eastern region of Assam in India. BTAD is constituted in 7th December, 2013 under the 6th schedule of India constitution. It has four district i.e. Kokrajhar, Chirang, Baksa and Udalguri district. According to 2011 census, there is total 3131047 lakhs population and literacy percentage of BTAD is 67.12 where male literacy is 74.28 and female literacy is 59.70. Present study is dealt with the primary education development status, strength of teachers and enrolment of students in primary schools of BTAD in Assam. The study is also observed present primary education problems of BTAD areas and given qualitative suggestions to solve the problems.*

Keywords : *Primary, Education, Development, Problems.*

1.00 Introduction :

Primary education is the first step of entering in the word formal education which starts between the age group of 6-14 years of children. It is generally provided after completion of pre-primary education. Present primary education of India has classified into two stages i.e. lower primary stage (I-V) and two stages (VI-VIII). Provincialised Elementary School means where the post of the teachers and employees are undertaken by the Govt. but schools are managed by the SMC and the schools have to strictly follow all the guidelines of the Govt. However, primary education is the key to success both the secondary and higher education. Free and compulsory primary education to all children up to the age of 14 is constitutional commitment which is clearly mentioned in article no. 45 of India constitution.

1.01 Brief about the proposed study area (BTAD):

BTAD (Bodoland Territorial Area Districts) is a gateway to the beautiful North-Eastern region of Assam of India. BTAD is constituted in 7th December, 2003 under the 6th schedule of

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2. *Research Scholar, USTM, Meghalaya*

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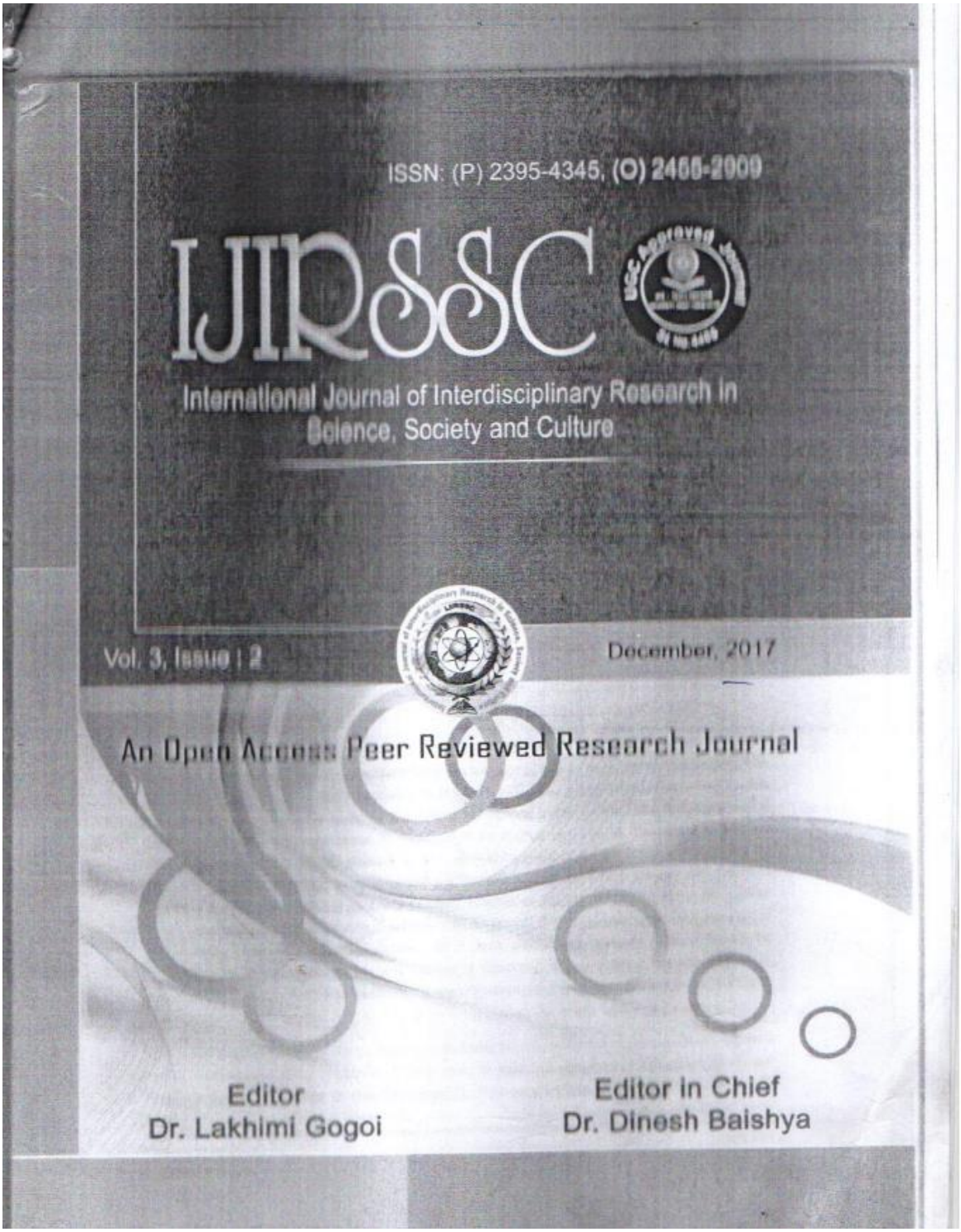

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Right to Education Act (RTE), 2009 : Accelerating in Baksa District of Assam,India.

Gubinda Brahma
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ABSTRACT : *The Right to Education Act (RTE) was passed in 2009 which is clearly mentioned in Article 21A of Indian Constitution. It is a holistic education approach of our country by which constitution of India has promised to provide free and compulsory primary education of all children between the age group of 6-14 years. Baksa District is one of the Socio-Economically backward area of Assam where elementary education is not yet been developed as compared to the other districts of Assam. The study is mainly observed about the economic status of guardians, infrastructure facilities and community participation in primary schools of the area. The investigator has given many suggestions for 100% universal retention, enrolment and provision of primary education for the children.*

Keywords: *Primary, Education, Children, Schools, Study.*

I. Introduction:

The Right to Education Act (RTE), 2009 is the mandate of India Constitution to provide free and compulsory primary education between the age group of 6-14 years of children. The RTE Act, 2009 is clearly mentioned in article no 21A of India constitution. According to this act, primary education should be the fundamental Right of every child. The act has envisaged that non-admitted children should be admitted at an appropriate age of children. The act has also mentioned that all those primary schools should be stopped which are not recognized by the Govt. The teacher-pupil ratio in primary school should be 1:30. The trained and qualified teachers should be appointed in every primary schools of the country. The act is also given more importance on neighboring school which means lower primary school should be established within the walking distance of 1 k.m and upper primary school should be established within the 3 k.m distance. The act is sincerely observed about the scholastic, co-scholastic, infrastructure and community participation in every elementary school of our country.

Till the nineteenth century, education in India wasan exclusive right available only to a small section of society [1].Under British rule, in spite of compulsory education laws, not much progress was made in this direction [2]. Post-independence, Article 45 of the newly

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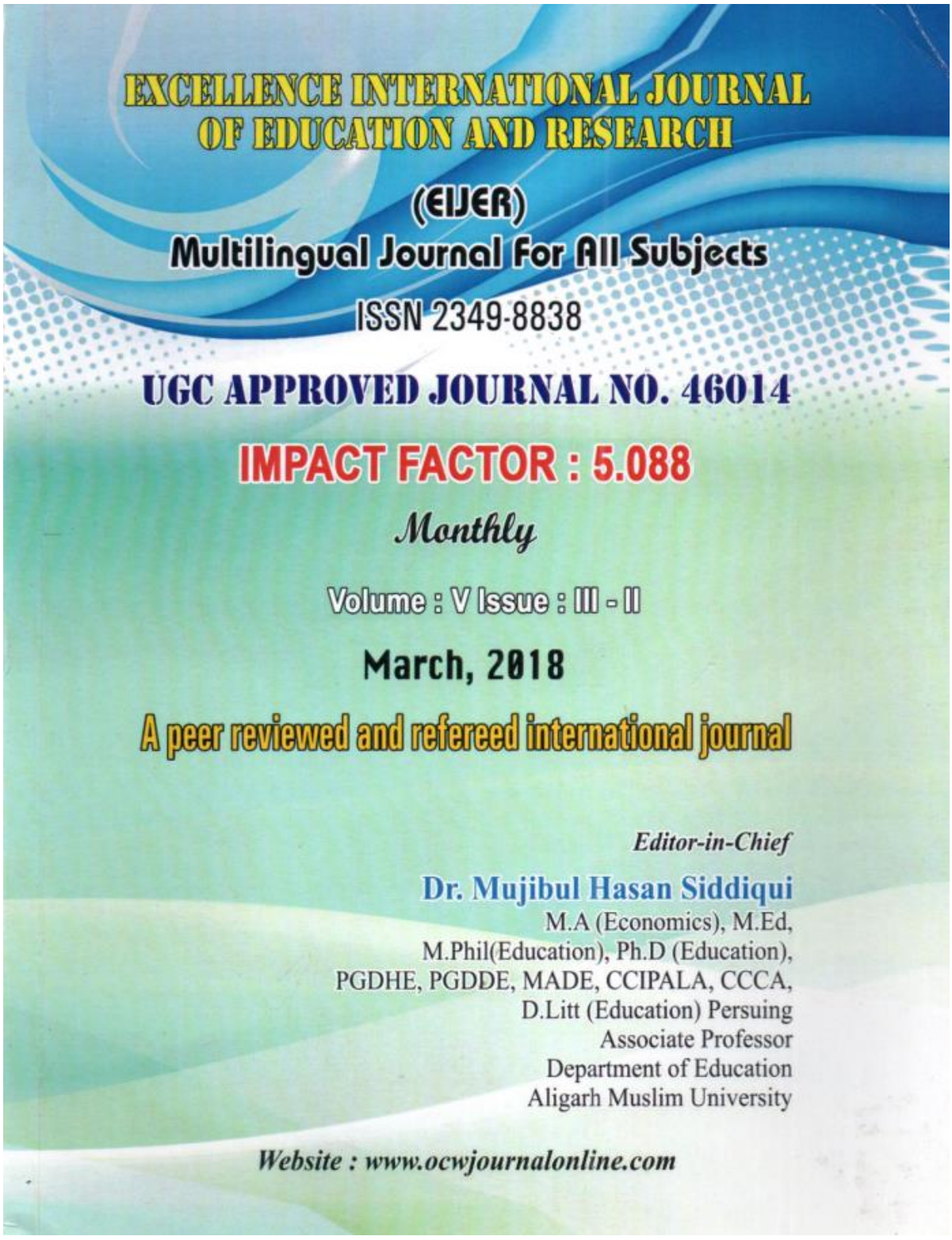

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Role of IQAC in Ensuring Quality Higher Education in the Colleges of Assam

Mr. Champak Deuri

Abstract : *The National Assessment and Accreditation Council (NAAC) proposed that every accredited institution should establish an Internal Quality Assurance Cell (IQAC) as a post-accreditation quality sustenance measure. Since quality enhancement is a continuous process, the IQAC will become a part of the institution towards achieving the goals of academic excellence and ensuring quality higher education in Assam. Its prime task is to develop a system for conscious, consistent and catalytic improvement in the performance of the institution and to make significant and meaningful contribution to the post accreditation quality initiatives of the institution.*

Key Words: *NAAC, IQAC, Quality Education, Higher Education, etc.*

I.Introduction :

Most of the colleges of Assam have undergone the assessment by National Assessment and Accreditation Council (NAAC) and as per requirement each and every colleges has formed the Internal Quality Assurance Cell (IQAC). The IQAC is supposed to look at the improvement of the quality of the college/institute in the coming years and accordingly prepared for the next assessment. Since quality enhancement is a continuous process, the IQAC will become a part of the institutions and work towards the goals of quality enhancement and ensuring quality education. The well defined parameters and guidelines provided by NAAC would facilitate the institutions in the creation and operation of the IQAC.

II. Composition of IQAC :

In the context of the pivotal role to be played by IQAC, NAAC has given very appropriate and clear guidelines so far as the composition of IQAC in an institution is concerned. As per these guidelines, the IQAC may be constituted in every institution of higher education under the chairmanship of head of the institution with heads of important academic and administrative units and a few teachers as well as a few distinguished educationist/representative of local committee. The composition of the IQAC may be as follows: -

- Chairperson: Head of the Institution
- A few senior administrative officers

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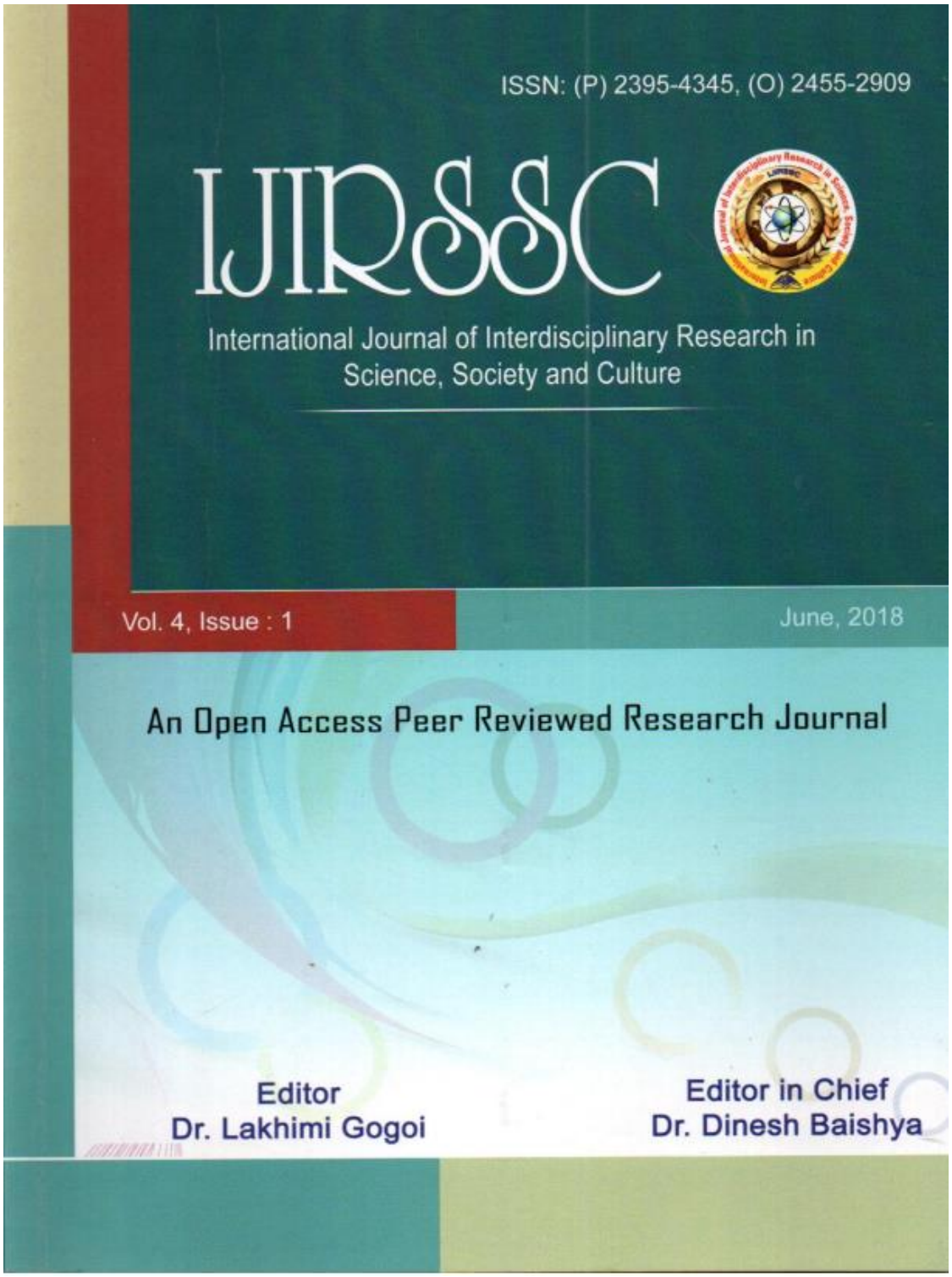

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Present Legal Provision to Combat Child and Women Labour Problem.

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ABSTRACT *: Today child labour as well as women labour is a global phenomenon and a harsh reality. Though the magnitude differs, the problem exists not only in under- developed and developing countries, but also in developed countries. More than 10 per cent of the world's 2.2 billion children are engaged in child labour, the majority of them working in agriculture, often with hazardous chemicals or machinery. About 10 million are trapped in slavery, trafficking, prostitution, and armed conflict. According to the census 2001, there are 12.5 million working children in the age group of 5-14 years as compared to the total child population of 252 million i.e. 4.96 percent of total children are child and women labour in India. The problem of child and women labour can be traced to the industrial revolution which emerged in the middle of 18th century in England and 19th century in India. It was around this time that the exploitation of labour began in order to maximize the profits. Viewing child and women labour as a social problem and the need to protect them came to fore front when exploitation of children became very common during this era. Overtime consciousness regarding labour rights evolved and legal measures was introduced both in developed and developing countries to curb this problem mainly to protect the employment and wages of adult workers. This paper will look into the major policy intervention as well as legal provisions for eradication of child and women labour. Firstly, history of child and women labour problem will be described then legal measures for protection of child and women labour in India will be discussed.*

Keywords: *Child and Women labour problem, Eradication, Legal provision, India.*

I. Introduction:

Throughout the centuries, the attitude of law towards children has been a fluctuating one. Prior to the 19th century children were not given separate legal recognition though the jurisprudential emphasis was on the child as property. Parents were not expected to maintain their children as a legal duty. The 19th century witnessed a series of developments which transformed the legal status of the child and women. This transformation was mainly due to the realization that the society cannot disown the responsibility of child-care and under the doctrine of "state protection" child came to occupy the centre of the legal stage. The

Catalysis

Ascorbic Acid as a Highly Efficient Organocatalyst for *ipso*-Hydroxylation of Arylboronic Acid

Sameeran Kumar Das, Prantika Bhattacharjee, and Utpal Bora*[a]

An effective organocatalyst, ascorbic acid has been successfully applied for the *ipso*-hydroxylation of arylboronic acid using 30% aqueous H_2O_2 as oxidant in water at ambient temperature. The methodology proceeds without using any metal catalyst or base and avoids harsh reaction conditions. The protocol is applicable to various electronically diverse arylboronic acid moieties with good to excellent yield.

Introduction

The synthesis of phenols, which are very important structural building blocks of different natural products[1,2] and pharmaceuticals,[3–7] attracts immense consideration of the researchers. Phenol has been used as a versatile intermediate for the synthesis of complex structural motifs.[8] Besides these, phenol and its derivatives find applications in medicinal chemistry as antioxidants, antiviral, cardioprotective and pro-oxidant.[3,9–12] Traditionally, phenols have been prepared via pyrolysis of sodium salt of benzene sulfonic acid, Dow's process, hydrolysis of arene diazonium salt etc.[13] For industrial scale preparation of phenol, cumene-phenol process (Hock's process) is used.[14] But this method shows very low efficacy for this transformation.[15] Besides, existing methods of using aryl halide as precursor for the phenol synthesis involve the use of harsh reaction conditions so as to activate the aryl halide precursor.[1] Thus, many efforts have been made towards the development of mild, environmentally benign and efficient methods for synthesis of phenol. In recent time, because of the versatile nature, structural diversity, greater stability, reactivity and lower toxic nature as compared to the aryl halides, arylboronic acids find widespread applications in various organic reactions.[16–18] Consequently, arylboronic acid has been proved to be an effective alternative precursor for the synthesis of phenol.

Many literatures have been reported for the *ipso*-hydroxylation of arylboronic acid utilising transition metal based catalytic systems such as $CuSO_4$-Phenanthroline,[19] CuNP,[20] $CuFe_2O_4$,[21] Montmorilonite-KSF entrapped $Cu(OH)_x$,[22] H_2O_2-$Cu_3(BTC)_2$,[23] H_2O_2-Cu_2O NP[24] etc. Some metal free procedures have also been reported using H_2O_2-complexes,[25,26] TBHP,[27] oxone,[28,29] *m*-CPBA,[30] NH_2OH,[31] H_2O_2-Amberlite IR-120,[32] H_2O_2-Acidic Al_2O_3,[33] H_2O_2-H_3BO_3,[34] H_2O_2-Lactic acid,[35] H_2O_2-biosilica,[36] quinone,[37] etc. Most of the reported methods have some shortcomings such as use of excess oxidizing agent, higher temperature, base, metal catalysts etc. Generally, metal catalysts are often air or moisture sensitive, expensive and can be a challenging task to remove. Thus, metal-free processes are much more preferred in the pharmaceutical industries from the practical viewpoint as metal impurity may become a serious issue with the additional expensive metal removal step.[38] Therefore, the development of more efficient, cost-effective, environment friendly transition metal-free processes have emerged as beneficial alternatives to the transition metal-catalyzed procedures.

In recent time, organocatalyst mediated transformations finds ample attention of the researchers as an alternative to transition metal catalysis. Organocatalysts, being easily available, inexpensive and economically sustainable; signify themselves important from the 'Green Chemistry' point of view.[39] Ascorbic acid, which is an environment friendly, non-toxic, safe and inexpensive organic compound has immense possibility of using as an organocatalyst in organic transformations.[40] Ascorbic acid, as a synthon, has been utilised for the synthesis of many intermediates and biologically active molecules.[41] It has been reported to act as an appropriate reducing agent for the generation of aryl radicals from arene diazonium salt in absence of any metal catalysts.[42]

Considering these aspects, we are trying to explore a simple, efficient and greener pathway for the *ipso*-hydroxylation of arylboronic acid mediated by ascorbic acid and H_2O_2 (30% aqueous) in water at room temperature. Herein, we used aqueous H_2O_2 as oxidant which is environmentally acceptable stoichiometric reagent that shows a high efficiency per weight of oxidant and relatively easy to handle under ligand, metal and base free conditions.[43]

Results and Discussion

Initially, for the current *ipso*-hydroxylation protocol, phenylboronic acid has been chosen as the model substrate to elucidate the effectiveness of H_2O_2 as an oxidant at ambient temperature. No catalyst and solvent were used at first. The reaction was performed with 1 mmol of phenylboronic acid and 0.5 mL H_2O_2. After 60 minutes, very less yield (< 10%) was obtained (Table 1, entry 1). Additionally, the reaction mixture

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28. Physical Growth Progression Among the Sarania Kachari Children of Baksa District, Assam

Sarat Ch. Bhuyan
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Abstract

A cross-sectional anthropogenic survey of 334 SaraniaKachari children (170 Boys and 174 girls) of ages ranging from 3 to 6 years was undertaked in order to observe the sex difference in growth. The anthropometric measurements considered have shown a general trend of gradual increase with advancing age.

Introduction :

Growth is a human characteristic and varies with sex and age as well as between different ethnic groups and different acculturation level is a natural phenomenon (Garn 1955, Norgman 1887). It is an exceeding regular process refers to the continuous addition in body dimension of an organism over a period of time. Assessment of growth pattern is the most powerful epidemiological tool for early identification of children who may not look apparently sick but who still have suboptimal health. In India over 40% of the population is constituted by the most vulnerable group i.e. infant and children (Gupta, 1997).

There is no gainsaying the fact that the future growth of the body of an adult person, largely depends upon the growth trends during childhood. In North-East India studies on growth are scarce and the growth studies during early childhood are scanty. In view of these, the present study has been conducted in order to study the growth trend of the Sarania Kachari children of Baksa district, Assam, from 3 to 6 years of age.

Material and Method :

The Sarania Kacharis are off-shoot of the greater Bodo Kachari tribe. They considerthemselves to be of higher social status than the other groups of Bodo Kacharis. This attainmentof Higher Social status may have been influenced by the process of Sanskritization. They have adopted Hindu religion and the cultural practices associated with it. The term Sarania was recognized by Britishers in1881 (Hakasam,2013).The material for the present study comprises a sample of 344 SaraniaKachari Children (170 boys and 174 girls) of ages 3 to 6 years. The study was conducted between November-December, 2018 from the village of Barpathar, Betna, Borigaon, Dolongdia, Goreswar ward no. 2, Malmura and Muharipara of Baksa district, Assam.

The exact date of birth of all the children was difficult to ascertain. However, special care was taken to obtain the actual age of the children under study. The exact date of birth of some of the children

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Determinants of Health Among the Sarania Kacharis of Baksa and Odalguri (BTAD) Districts, Assam(India): A Synopsis

Sarat Chandra Bhuyan

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ABSTRACT: Health is the only keynote to success in life. The term 'Health' is viewed differently by different scholars all over the world. Health is a multi-factorial entity and a host of determinants, background characteristics and public policies interact in a largely unknown fashion to determine health levels of community. WHO defines health as, "the state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". Whether people are healthy or not, is determined by their circumstances and environment. The range of personal, social, economic and environmental factors that influence health status are known as determinants of health. The present paper attempts to determine the various factors operating among the Sarania Kacharis of Baksa and Odalguri districts of Assam which evaluates their health status.

Key Words: Health, multi-factorial entity, determinants, wellbeing, infirmity, environment.

INTRODUCTION

Many factors combine together to affect the health of individuals and communities. To a large extent, factors such as where we live, the state of our environment, genetics, our income and education level, and our relationships with friends and family all have considerable impacts on health, whereas the more commonly considered factors such as access and use of health care services often have less of an impact (WHO, 2014).

"Health determinants predict the incidence of disease but do not specify the mechanism of disease causation" (Health Determinants, 2014).

The determinants of health include

- The social and economic environment.
- The physical environment and
- The person's individual characteristics and behaviours
- Income and social status – higher income and social status are linked to better health. The greater the gap between the richest and poorest people, the greater the differences in health.
- Education – low education levels are linked with poor health, more stress and lower self-confidence.

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Research Article

SOME HIGHER ORDER DIFFERENCE DOUBLE SEQUENCE SPACES DEFINED BY AN ORLICZ FUNCTION

***Bipul SARMA* ***

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ABSTRACT

In this article we introduce some kth order difference operator on some double sequences operated by an Orlicz function. We introduce some sequence spaces and study different properties of these spaces like completeness, solidity, symmetricity etc. We establish some inclusion results among them.

Keywords: *Orlicz function, difference space, completeness, solid space, symmetric space etc..*

2010 AMS Subject Classification: *40A05; 40B05; 46E30*

1. INTRODUCTION

Throughout, a double sequence is denoted by $A = \langle a_{ij} \rangle$. A double sequence is a double infinite array of elements $a_{ij} \in R$ for all $i, j \in N$ and $_2w$ will denote the class of all double sequences.

The initial works on double sequences is found in Bromwich [2]. Later on it was studied by Hardy [6], Moricz [12], Moricz and Rhoades [13], Tripathy [16], Tripathy and Sarma [17], Tripathy, Choudhury and Sarma [18], Basarir and Sonalcan [1] and many others. Hardy [6] introduced the notion of regular convergence for double sequences.

The concept of paranormed sequences was studied by Nakano [14] and Simmons [15] at the initial stage. Later on it was studied by many others.

The notion of difference sequence spaces (for single sequences) was introduced by

Kizmaz [8] as follows:

$$Z(\Delta) = \{ (x_k) \in w : (\Delta x_k) \in Z \}$$

for $Z = c, c_0$ and l_∞, where $\Delta x_k = x_k - x_{k+1}$ for all $k \in N$.

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STUDY OF STRUCTURAL AND OPTICAL PROPERTIES OF ZnS NANO PARTICLES SYNTHESIZED BY CBD METHOD

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[1]Assistant Professor, [2]Senior Scientific Officer
[1]Department of Physics, [2]Department of Instrumentation and USIC
[1]M C College, Barpeta, India.

Abstract: In this work we report the growth of ZnS nanoparticls embeded in polyvinyl alcohol (PVA) matrix. The nanoparticles have been synthesized by chemical bath deposition method at different P^H . The prepared nanoparticles have been characterized by X-ray diffraction(XRD),UV-Vis absorption, SEM and photoluminescence (PL) techniques. X-ray diffraction patterns indicate the formation of cubic phase of ZnS nanocrystals at all P^H.UV-vis results showed a blue shift.

Keywords: ZnS nanoparticle, XRD, Optical band gap, Thin film.

I. Introduction:

Nanostructured semiconductors have been extensively studied for their unique characteristics that can not be obtained from conventional macroscopic materials.ZnS is an important II-IV semiconductor having a wide direct band gap of 3.65 eV in the bulk.Among all semiconductor ,zinc sulphide (ZnS) is an interesting material with many applications in various fields such as optoelectronics, photocatalysis , solar energy conversion, projection television, fluorescence microscopy etc[1] . ZnS nanostructure in the form of thin film, powder and colloid prepared using various methods such as evaporation [2], sputtering[3], wet chemical[4,5], sol-ge[6,7], spray pyrolysis[8] were investigated in detail.Shayestch et al[9] have reported the effect of P^H on structural and optical properties of ZnS nanoparticles embedded in PVA matrix. Ben Nasr et al[10] have studied the effect of P^H on the properties of ZnS thin films.Borah et al[11] have reported the structural and optical properties of ZnS nanoparticlesembedded in polymeric matrix. Many researchers studied ZnS nanoparticles for their unique characteristics which is not possible to obtain from conventional macroscopic structures.

II. Experimental:

ZnS nanoparticles were synthesized using Polyvinyl alcohol (PVA) as a matrix by Chemical Bath Deposition method. PVA being good solute to multiple phase system and it provides uniform gaps that are very close to each other and distributes in the form of array. 2 wt% solution of PVA ,0.1M zinc acetate prepared by dissolving $(CH_3COO)_2Zn2H_2O$ in distilled water was added and stirring at 60ºC for 3h using magnetic stirrer . The sample under preparation at different P^H was kept for 12 hours for complete dissolution to get a transparent solution. To this solution 0.1M Na_2SxH_2O was added and stirred at room temperature. Finally the whole solution appears completely milky. The size of the particle is controlled by changing pH value of the whole solution. Similar procedure were used to prepare ZnS nano particles in powder form. To achieve powder form the precipitates were washed several times with distilled water to remove the impurities. After washing precipitates were dried at room temperature and grinded to obtain fine structure.

III. Characterization :

Powder X-ray diffraction (XRD) pattern of prepared ZnO nanoparticle is recorded by a Philips X-ray Diffractrometer (X'Pert Pro) with Cu $K_{\alpha1}$ radiation (λ=1.5406 Å). Before data collection the diffractometer is calibrated with a standard silicon sample. The instrumental broadening is corrected by Warren rule[12] .

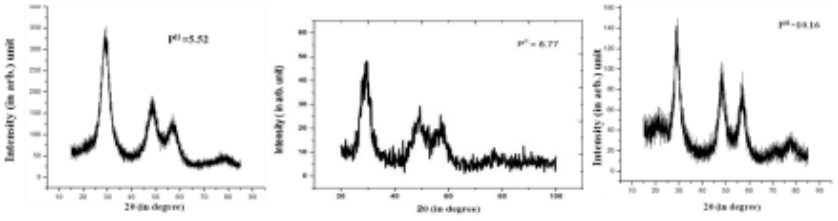

Fig.1. X-ray diffraction (XRD) patterns of the prepared ZnS nanoparticles (powder) at different P^H

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16. Right to Education Act (RTE), 2009 : Accelerating in Baksa District of Assam

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1. Professor & Dean of Faculty, PQH School of Education, USTM
2. Research Scholar, USTM

Abstract

The Right to Education Act (RTE) was passed in 2009 which is clearly mentioned in Article 21A of Indian Constitution. It is a holistic education approach of our country by which constitution of India has promised to provide free and compulsory primary education of all children between the age group of 6-14 years. Baksa District is one of the Socio-Economically backward area of Assam where elementary education is not yet been developed as compared to the other districts of Assam. The study is mainly observed about the economic status of guardians, infrastructure facilities and community participation in primary schools of the area. The investigator has given many suggestions for 100% universal retention, enrolment and provision of primary education for the children.

Keywords: Primary, Education, Children, Schools, Study.

Introduction :

The Right to Education Act (RTE), 2009 is the mandate of India Constitution to provide free and compulsory primary education between the age group of 6-14 years of children. The RTE Act, 2009 is clearly mentioned in article no 21A of India constitution. According to this act, primary education should be the fundamental Right of every children. The act has envisaged that non-admitted children should be admitted at an appropriate age of children. The act also mentioned that all those primary schools should be stopped which are not recognized by the Govt. The teacher-pupil ratio in primary school should be 1:30. The trained and qualified teachers should be appointed in every primary schools of the country. The act is also given more importance on neighboring school which means lower primary school should be established within the walking distance of 1 k.m and upper primary school should be established within the 3 k.m distance. The act is sincerely observed about the scholastic, co-scholastic, infrastructure and community participation in every elementary school of our country.

Proposed study area (Baksa District) :

The proposed study area is Baksa District of BTAD (Bodoland Territorial Area Districts) of Assam. The District is covered an area of 3056.89 sq. km. and Mushalpur is the administrative headquarter of the district. According to 2011 census, there is total 950075 lakhs population and literating percentage of the

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Vol - XXVIII, Eng -I, Year-14, June, 2019

Present primary education development status in Baksa district of Assam

* Jonali Chetia
** Gobinda Brahma

Abstract- *Primary Education is generally provided after completion of pre-primary education which is the key to success both the secondary and higher education of our country. It starts between the age group of 6-14 years of children, it is clearly mentioned in an article No.45 of Indian contribution. Proposed study area is Baksa district of BTAD (Bodo Territorial Area Districts) of Assam covering an area of 2400 sq.k.m and Mushalpur is the administrative headquarter of the district. According to 2011 census, the literacy percentage of the district is 70.53. Present study is dealt with the primary education development status in Baksa district of Assam. The study is also observed various primary education problems of the district and given various qualitative suggestions to overcome the problems.*

Key Words- Primary Education, Development, Problems, District.

1.00 Introduction: Primary education is provided after completion of pre-primary education which is provided between the age group of 6-14 years of children. Primary education is the key to success both the Secondary and higher education of our country. It emphasises physical, mental and social qualities development of children. The article No. 45 of Indian constitution is clearly mentioned about the free and compulsory primary education for all children of our country. Sarva Siksha Abhiyan (SSA) 2001 is one of the largest primary education development programme of our country which is looking for 100% universal primary education of children with schooling facilities in all habitations. Right to education Act (RTE) 2009 of 21A of Indian constitution is given more importance on universal enrolment, retention and provision of primary education for all children in our country. So SSA is adopted many primary education development programmes to fulfill the mandate of RTE, 2009.

1.01 Brief about the Proposed Study area (Baksa):

Proposed study area is Baksa district of BTAD (Bodo Territorial Area Districts) of Assam. The district is covering an area of 3056.89 sq.k.m and Mushalpur is the administrative headquarter of the district. According to 2011

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RESEARCH ARTICLE

A note on the temporal and spatial distribution of Asian Woollyneck in Assam, India

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Abstract Asian Woollyneck *Ciconia episcopus* is listed as a globally Vulnerable bird species and there is very little detailed information about its ecology, including basic aspects such as distribution and seasonal movements. In this paper, we assembled primary and secondary information on the species focusing on the Indian north-eastern state of Assam and provide a preliminary understanding of its movement, distribution and breeding in Assam. We collated our individual field observations from 2010 to 2020 in five districts, invited responses from experienced bird-watchers using a standard questionnaire, and downloaded available data provided by volunteers on online portals. Asian Woollynecks were seen in Assam largely in the months of November to April with comparatively fewer sightings in other months. Most observations were in Kaziranga National Park which is one of the most visited national parks by tourists and bird-watchers. No confirmed breeding record was available of the species in Assam. Observed flock sizes were mostly 1 – 2 birds, with a much higher average flock size in Sonitpur district. The collated data suggests that the Asian Woollyneck is a seasonal non-breeding migrant to Assam occurring largely during the winter months..

Keywords Asian Woollyneck, Assam, seasonal non-breeding migrant.

Introduction

Assam, a state in northeastern India, is a land of plains and river valleys with three principal physical regions: Brahmaputra Valley in the north, Barak Valley in the south, and the hill systems of the south-central region. The state is one of the hotspots for avian biodiversity in the country with 696 species recorded (Clements *et al*. 2019). Several wading birds are supported by this unique co-occurrence of biomes, including the Asian Woollyneck *Ciconia episcopus* (Chakdar *et al*. 2019; Grimmett *et al*. 1999; Ali and Ripley 1983). The species is widely distributed in south Asia with an extensive elevational range from the low plains to 1,800 mamsl in the Himalayas (Sundar 2006; Ghale and Karmacharya 2018; Gula *et al*. 2020). In Assam, there have not been any focused exploration of the Asian Woollynecks' ecology, habits and requirements despite its status as a globally "Vulnerable" species (BirdLife International 2020). In this paper, we evaluate the occurrence of the Asian Woollyneck in Assam using a combination of our personal observations, interviewing bird-watchers, and analysing the information uploaded by volunteer bird-watchers on the online portal eBird.org. Specifically, we seek to understand the status of the species in Assam in terms of its distribution and occurrence throughout the year. We also use our personal

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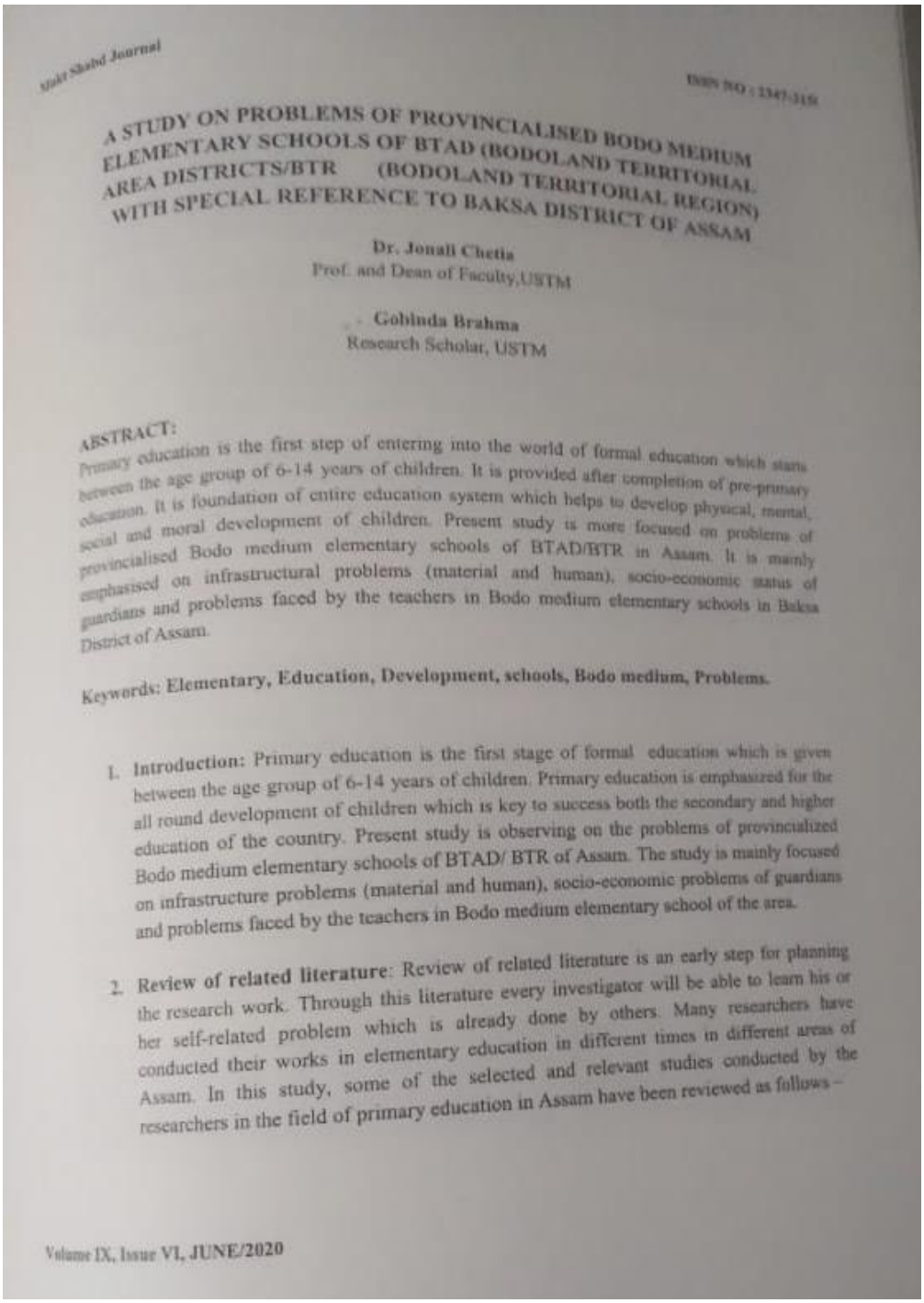

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A STUDY ON PROBLEMS OF PROVINCIALISED BODO MEDIUM ELEMENTARY SCHOOLS OF BTAD (BODOLAND TERRITORIAL AREA DISTRICTS/BTR (BODOLAND TERRITORIAL REGION) WITH SPECIAL REFERENCE TO BAKSA DISTRICT OF ASSAM

Dr. Jonali Chetia
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Gobinda Brahma
Research Scholar, USTM

ABSTRACT:
Primary education is the first step of entering into the world of formal education which starts between the age group of 6-14 years of children. It is provided after completion of pre-primary education. It is foundation of entire education system which helps to develop physical, mental, social and moral development of children. Present study is more focused on problems of provincialised Bodo medium elementary schools of BTAD/BTR in Assam. It is mainly emphasised on infrastructural problems (material and human), socio-economic status of guardians and problems faced by the teachers in Bodo medium elementary schools in Baksa District of Assam.

Keywords: **Elementary, Education, Development, schools, Bodo medium, Problems.**

1. **Introduction:** Primary education is the first stage of formal education which is given between the age group of 6-14 years of children. Primary education is emphasized for the all round development of children which is key to success both the secondary and higher education of the country. Present study is observing on the problems of provincialized Bodo medium elementary schools of BTAD/ BTR of Assam. The study is mainly focused on infrastructure problems (material and human), socio-economic problems of guardians and problems faced by the teachers in Bodo medium elementary school of the area.

2. **Review of related literature**: Review of related literature is an early step for planning the research work. Through this literature every investigator will be able to learn his or her self-related problem which is already done by others. Many researchers have conducted their works in elementary education in different times in different areas of Assam. In this study, some of the selected and relevant studies conducted by the researchers in the field of primary education in Assam have been reviewed as follows –

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Physical Growth and Nutritional Status of the Kalita Children of Kamrup (rural) District, Assam(India):a research proposal

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ABSTRACT: Growth means the increase in size of the various parts and organs of the body by multiplication of cells and intercellular components during the period commencing from fertilization to physical maturity. It can be taken as an important manifestation of the genetic, environmental and psychological well-being of a person. The nutritional assessment of a community is to map out the magnitude of malnutrition as a public health problem, to discover and analyse the ecological factors that are directly or indirectly responsible.

KeyWords: Growth,fertilization,maturity,nutritional assessment,malnutrition,

INTRODUCTION

The term growth, in general sense, is used as a synonym for development, but biologically it bears narrower and sub-ordinate implications of increase in size. The increase in body size is determined by the pre-established constitutional hereditary factors and at the same time it is influenced by the environmental factors, like climate, diet, living condition etc. (Tanner, 1978). Richards and Kavanagh (1945) writes, "growth is a fundamental attributes of living organisms, manifested by a change in the size of the individual, or in the number of organisms in a unit of environment." Montagu (1960) writes, "growth may be defined as increase in size, while development is to be understood increase in complexity." We restrict the term 'growth' to mean an increase in physical size of the whole or any of its parts, whereas 'development' is used to indicate an increase in skill and complexity of function.

The fundamental property of all living system is to change with age in their body size. Growth is a complex phenomenon with its intrinsic pattern genetically determined but subject to a modification by various environmental factors like climate, nutrition, physiological disturbance, socio-economic etc. (Tanner, 1962). Tanner (1962) explains that "The growth status of a child at a particular age is the result of the interaction of both genetical and environmental factors and the possibility exists of certain environments being favourable for a child with a certain set of genes and highly unfavourable for another."

In large areas of world today tackling malnutrition especially that affecting young children is one of the principal public health programmes. Malnutrition has been defined as a pathological state resulting from one or more essential nutrients – the state being clinically manifested or detected only by bio-chemical, anthropometric or physical tests and is distinguished in four forms.

a) Under nutrition due to consumption of inadequate quantity of food over an extended period of time leading to marasmus and inanition
b) Specific deficiency
c) Overnutrition, consumption of excess food for an extended period of time and
d) Imbalance, disproportion of essential nutrients (Schrimshaw and Behar, 1965).

The nutritional assessment of a community is to map out the magnitude and geographical distribution of malnutrition as a public health problem, to discover and analyse the ecological factors that are directly or indirectly responsible and guiding action intended to improve nutrition and health (Jelliffe, 1966).

Malnutrition is undoubtedly the biggest public health problem in our country. A number of nutrition and diet surveys carried out among adult of the country have confirmed the existence of widespread malnutrition among the proper sections of our population (Rao and Balakrishna, 1990;Wakhlu, 1972; Satyanarayana et al. 1980; Srikantia, 1986).

SIGNIFICANCE

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Structural and optical properties of ZnO nanoparticles synthesized by CBD method using different precursors

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Abstract: *In this work we report synthesis of ZnO nanoparticles by Chemical Bath Deposition method. Two samples were synthesized using two different precursors.PVA was used as capping agent. The prepared samples were characterised to study the structural and optical properties.XRD result shows the formation of nanostructured ZnO. Optical band gap was calculated utilizing UV-vis spectra. Room temperature PL spectra showed one near-band-edge emission peak and another broad defect related visible emission peak.*

Key words: ZnO nanoparticles, XRD, UV-Vis spectroscopy, PL, SEM

1. Introduction:

Nanomaterials play important role in different fields of technology because of their different structural, optical and electronic properties from their bulk counterparts. Out of many semiconductor nanomaterials, ZnO is an important II-VI wide band gap semiconductor nanomaterial as it has varity of applications like UV absorption, antibacterial treatment[1],UV light emitters[2], photocatalyst[3] and in different industrial products. ZnO nanomaterials have been synthsized by various methods such as thermal decomposition, sol-gel method, gas-reaction, hydrothermal synthesis and so on[4-8].Among these methods chemical bath deposition method is preferable because of its good control of morphology, composition, crystalinity and purity. Also it is low cost method for large scale production. In this work ZnO nanoparticles are prepared using two different precursors. Characterisations of the samples are done for studying structural and optical properties of prepared ZnO.

2. Experimental Details:

Two samples of ZnO nanoparticles are prepared through Chemical Bath Deposition method. For the synthesis of first sample (ZnO 1)100 ml of 0.2 mol $Zn(NO_3)_2.6H_2O$ solution is stirred continuously for 30 min at 60ºC (first solution). 2wt% of PVA is stirred continuously for 30 min at 60ºC (second solution). Now to the first solution NH_4OH is added drop by drop until the pH of the solution drops to the value of 7. Now a milky solution of ZnO is formed (third solution). Then second solution is added to the third solution and the mixture is stirred continuously for 1 hour at 60ºC. The whole solution is kept over night to settle down. Finally the precipitation is filtered and washed

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ORIGINAL PAPER

Charge radii and leptonic decay constants of heavy–light mesons in a potential model

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Abstract: We report the results for charge radii and decay constants of heavy–light D and B mesons in an improved QCD potential model. To enhance the effectiveness of short-range and long-range effect of the potential $V(r) = -\frac{4\alpha_s}{3r} + \mathrm{br}$ in the perturbative procedure a cutoff parameter r^P is introduced as an integration limit. Another cutoff r_0 is used for the polynomial approximation of the series expansion used in the Dalgarno's method of perturbation. The results obtained are found to be in agreement with other available data. The limitation of the approach is discussed in the manuscript.

Keywords: Quantum chromodynamics; Dalgarno's method; Form factor; Charge radius; Decay constant

1. Introduction

The potential model description in the non-relativistic regime of QCD [1] is found to be very successful for both qualitative and quantitative descriptions of hadron spectroscopy.

The Coulomb plus linear Cornell potential [2], $V(r) = -\frac{4\alpha_s}{3r} + \mathrm{br} + c$, is very useful to apply in the quantum mechanical perturbation theory in the study of heavy-flavored mesons. At short distance, linear term is effectively considered as perturbation, while at long distance Coulomb potential is considered as perturbation. Hence this potential is based on the two kinds of asymptotic behaviors: ultraviolet at short distance (Coulomb like) and infrared at large distance (linear confinement term). In the Cornell potential, $-\frac{4}{3}$ is due to the color factor, α_s is the strong coupling constant, r is the inter-quark distance, b is the confinement parameter, and 'c' is a constant scale factor which is a phenomenological constant and is introduced basically to reproduce correct masses of heavy–light meson bound state.

In the present work, we have considered the scaling factor $c = 0$ as is done in Ref. [3–5]. For the Cornell potential, a constant term 'c' should not affect the wave function of the system while applying the perturbation theory. In Ref. [4], while applying the Dalgarno's method of perturbation [6, 7] it is seen that the term 'c' always appears in the total wave function. This is inconsistent with the quantum mechanical idea that a constant term 'c' in the potential can at best shift the energy scale, but should not perturb the wave function. Thus, a Hamiltonian H with such a constant and another H' without it should give rise to the same wave functions.

In this work, we introduce a cutoff parameter r^P as an integration limit, since it is well known that at short distance Coulomb potential plays a more dominant role than the linear confinement of the potential and at large distance the confinement takes over the Coulomb effect. Therefore, the inter-quark separation 'r' can be roughly divided into two regions $0 < r < r^P$ for short distance and $r^P < r < r_0$ for long distance effectively, 'r^P' is the point where one of the potentials will dominate over the other. In such situation, confinement parameter (b) and the strong coupling parameter (α_s) can be considered as effective and appropriate small perturbative parameters. In this work we have tried to incorporate both the short-range and long-range

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Bio-based sustainable heterogeneous catalyst for *ipso*-hydroxylation of arylboronic acid

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ARTICLE INFO

Keywords:
ipso-hydroxylation
CBPA
30 % H_2O_2
H_2O

ABSTRACT

An effective and greener methodology has been developed for the *ipso*-hydroxylation of arylboronic acids utilising a heterogeneous agro-waste based catalyst Calcined Burnt Peel Ash (CBPA). The catalyst CBPA has been prepared from the peel of *Musa balbisiana Colla*. The protocol is efficient for different electronically diverse phenylboronic acid moieties under ambient conditions with green oxidant 30% hydrogen peroxide and provides excellent yields of phenols within short reaction time. The catalyst is recyclable up to 5th cycle without significant loss of catalytic activity.

1. Introduction

With the advent of the '*Green Chemistry*' principles (Anastas and Eghbali, 2010), efforts have been devoted towards the effective utilisation of the agro-waste based catalyst and reaction medium for various important organic transformations (Sarmah et al., 2017; Hooshmand et al., 2019). In this regard, the use of different bio-based ash water extracts such as water extract of papaya bark ash (WEPBA) (Sarmah et al., 2016), water extract of rice straw ash (WERSA) (Boruah et al., 2015; Saikia and Borah, 2015), water extract of pomegranate ash (WEPA) (Lakshmidevi et al., 2018), water extract of teak leaf ash (WET) (Das et al., 2020) etc have been very well explained in literatures for different organic reactions. The utilisation of agro-wastes has fulfilled the goal of waste minimisation thereby enhancing the pollution free environment. Usually, among the homogeneous and heterogeneous catalysts, the selectivity is more in case of homogeneous catalysts; but it confronts problems with its reuse and contamination when separating from the products. Consequently, heterogeneous catalysts are more promising than the homogeneous on these grounds.

Phenol has been considered as the versatile building block of various important pharmacological, agrochemical as well as biological products (Tyman, 1996; Poupon and Nay, 2011; Castro-Godoy et al., 2019). Natural phenolic compounds are directly isolated from natural resources like plants and herbs (Gupta et al., 2016). They can exhibit biological activity including antiviral, anti-inflammatory, antimicrobial, antitumor etc (Chatterjee and Goswami, 2015). Plant polyphenols shows a way to develop new anticancer agents and powerful natural product antioxidants (Quideau et al., 2011). Consequently, phenolic compounds are used in many medicinal drugs for various diseases (Fig. 1) (Muller et al., 2019; Mishra and Tiwari, 2011; Amorati and Valgimigli, 2012). Moreover there is an extensive use of phenol in the production of phenolic resins, aniline insecticides, surface active agents, dyes, synthetic detergents, wood preservatives, herbicides, pesticides, fungicides for preparation of wood and as a raw material for synthesizing drugs like aspirin (Rappoport, 2004). Conventionally arylchlorides (Anderson et al., 2006; Yu et al., 2012; Xia et al., 2016), arylamines (Cohen et al., 1977) and aldehydes or aryl ketones (Saikia and Borah, 2015; Bernini et al., 2005; Saikia et al., 2015a) are used as synthon for phenol; however harsh reaction conditions, long reaction time, basic reaction medium and use of expensive ligands (Tyman, 1996; Anderson et al., 2006) are considered as drawback associated with these routes for phenol. Consequently, non-toxic and environmentally benign arylboronic acids have been considered as effective greener precursor for synthesis of the phenols (Hao et al., 2019).

Various methodologies have been developed for *ipso*-hydroxylation of arylboronic acids utilising different metal based catalysts such as Pd-Chitosan-CNT/H_2O_2 (Shin et al., 2019a), biogenic Fe_2O_3@SiO_2 NPs (Saikia et al., 2017), montmorillonite K10 supported Ag NPs-H_2O_2 (Begum et al., 2015), $CuFe_2O_4$ magnetic NPs (Chutia and Chetia, 2019), $CuSO_4$-Phenanthroline (Xu et al., 2010), heterogeneous Cu_2O NPs-H_2O_2 (Borah et al., 2017), Cu NPs (Affrose et al., 2014), montmorillonite-KSF entrapped $Cu(OH)_x$ (Dar et al., 2013), $CuFe_2O_4$ (Yang et al., 2014),

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Repurposing fallen leaves to bio-based reaction medium for hydration, hydroxylation, carbon-carbon and carbon-nitrogen bond formation reactions

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ARTICLE INFO

Keywords:
WET
Hydration
Phenylboronic acid
ipso-hydroxylation
Knoevenagel condensation
Chan-Lam coupling

ABSTRACT

A green reaction medium has been developed from the Water Extract of Teak leaf (*Tectona grandis*) ash (WET). The alkaline nature of the WET was successfully applied towards hydration of nitriles, conversion of arylboronic acids to phenols with 30% aqueous H_2O_2, Knoevenagel condensation for benzylidenemalononitrile derivatives formation and Chan-Lam reaction of arylboronic acids with imidazole derivatives. In current protocols dual role of WET as reaction medium as well as base has been explored. A wide range of substrates with varying electronic natures is compatible under these WET mediated reaction conditions with excellent yields.

1. Introduction

Natural feedstock-based solvents/reaction mediums have been widely used for organic transformation in contemporary organic synthesis (Clarke et al., 2018). These solvents fulfilled the key goal of 'Green Chemistry' by minimising the environmental risk with their clean and organic waste free nature (Ivanković et al., 2017). In this context, several ash-water extracts (AWEs) obtained from agro-waste have been demonstrated by different groups as alternative greener media for organic synthesis as well as catalysis. WERSA (Godoi et al., 2019; Saikia et al., 2015b), WEB (Bagul et al., 2017; Boruah et al., 2015a; Leitemberger et al., 2019), WEPBA (Sarmah et al., 2016), AWEH (Sarmah et al., 2017), WEPA (Lakshmidevi et al., 2018), water extract of waste onion peel ash (Chia et al., 2018) etc are some examples of the AWEs which have been successfully utilised for organic reactions like Dakin reaction (Saikia et al., 2015a), Henry reaction (Surneni et al., 2016), Suzuki-Miyaura cross-coupling (Boruah et al., 2015b), synthesis of symmetrical disulfides (Leitemberger et al., 2019), peptide synthesis (Konwar et al., 2016), Sonogashira cross-coupling (Dewan et al., 2016), *ipso*-hydroxylation (Saikia et al., 2017), Ullmann (Lakshmidevi et al., 2018) etc. The pH of the extracts confirms their basic nature and they exhibit dual characters both as solvent as well as base. These extracts inherited the alkaline property due to the presence of sodium, potassium, carbonate ions, oxide ions etc (Boruah et al., 2015b). In recent years, effective utilization of different AWEs in organic transformation prompt us to investigate the use of Water Extract of Teak leaf ash (WET) as an alternative green reaction medium for organic transformation. Teak tree (*Tectona grandis*) is a native tree from tropical countries of Asia. It is classified in the division Magnoliophyta, (class: Magnoliopsida, order: Famiales, and family: Verbenaceae/Lamiaceae) (Flamini, n.d.; Lacret et al., 2012). Different parts of Teak tree have various applications in medicinal purpose (Nalvothula et al., n.d.). As reported earlier, extract obtained from Teak leaves has been applied for nanoparticle synthesis (Devadiga et al., 2015). Recently, our group has reported the application of calcined *Tectona grandis* leaves (CTGL) as an eco-friendly, renewable and cost effective heterogeneous base catalyst for biodiesel production and Knoevenagel condensation reaction (Gohain et al., 2020). But, so far, water extract of this leaf has not been evaluated for the application in organic transformations.

Functional group transformation is very important in organic synthesis. In this regard, conversion of nitriles to amides is a significant organic transformation (Larock, n.d.; Lee and Frost, 2012; Matsuoka et al., 2015; McMastsr and Langreck, 2019; Moorthy and Singhal, 2005; Murahashi et al., 1986; Snyder and Elston, 1954; Tomás-Mendivil et al.,

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REGULAR ARTICLE

Nucleophilicity and CO_2 fixation ability of phosphorus, nitrogen and sulfur ylides: insights on stereoelectronic factors from DFT study

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Abstract. Nucleophilicity and CO_2 fixation ability of the ylides of phosphorous, sulfur and nitrogen have been assessed using DFT calculations at M06-2X/6-311++G(d,p)//M06-2X/6-31+G(d) level. Nucleophilicity of 54 ylides and their CO_2 adducts have been evaluated using a theoretical nucleophilicity index (N) which shows good linear correlation ($R^2 = 0.87$) with Mayr's experimental nucleophilicity parameter for the S-ylides. Two key geometrical parameters, condensed Fukui function (f_k^-) and Gibbs free energy of reaction (ΔG_r) for the ylide-CO_2 adducts have also been calculated. In absence of steric effect around the ylidic C-atom and any other secondary interaction, binding energy of the CO_2-adducts of all the three types of ylides has a good linear correlation with the nucleophilicity. Nucleophilicity of a P-ylide increases when electron-donating groups are introduced as substituents on both P and the ylidic C-atom. An electron-withdrawing group on the same sites reduces nucleophilicity. Free ylides have higher nucleophilicity than their CO_2 adducts.

Keywords. Phosphorus ylide; sulfur ylide; nitrogen ylide; nucleophilicity index; CO_2 fixation; substituent effect.

1. Introduction

The level of CO_2 in the atmosphere is increasing steadily over the years;[1] in parallel, the search for efficient methods of sequestration, activation and catalytic conversion of CO_2 has also gained momentum.[2–6] Although CO_2 is an abundant, renewable and cheap source of carbon, it is thermodynamically stable and kinetically inert. Successful conversion of CO_2, therefore, demands drastic conditions such as high temperature, high pressure, highly reactive reagents and very efficient catalyst.[5] Activation of CO_2 is possible either by exploiting the electrophilic character of the C-center or nucleophilic character of the O-centers. Reports of using electron-rich systems such as Lewis bases and metals in low oxidation state to complex with CO_2 *via* the C-center are very much common in the literature;[7] alternatively, interaction through the O-centers using electron-deficient systems like metal ions in high oxidation state is also very much prevalent.[8,9] Three different modes of bonding are observed in the metal-CO_2 complexes: (i) involving the carbon and one of the oxygen atoms, (ii) through carbon (iii) through an oxygen atom (Figure 1).

Metal bound complexes and their role as catalytically active species have been substantially reported.[6] Recently, metal-free nucleophiles such as N-heterocyclic carbene (NHC),[10,11] N-heterocyclic olefin (NHO),[12] and phosphorus ylide[13] have attracted attention for their catalytic role in CO_2 sequestration and polymerization. NHC-CO_2 adducts have been employed as catalyst in a number of useful organic transformations such as the conversion of CO_2 into methanol, carboxylic acid, methane and cyclic carbonates.[10] Suresh and coworkers studied the

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Biogenic palladium nanostructures for Suzuki-Miyaura and Sonogashira cross-coupling reaction under mild reaction conditions

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ABSTRACT

Biogenic palladium nanostructures (NS) are synthesized by utilising pomegranate peels which are generally considered as agro-wastes. A simple methodology without the use of external reducing agent has been applied to achieve uniform flowerlike nanostructures (NS) with diameter around 45–60 nm. The nanostructures are characterized by p-XRD and HRTEM analyses. They exhibit excellent catalytic activity towards Suzuki-Miyaura and Sonogashira cross-coupling reaction avoiding harsh reaction conditions.

1. Introduction

In recent decades, due to the unique properties such as size, shape and morphology, metal nanoparticles have got immense attention. Several methodologies involving chemical, physical and biological techniques have been well explored for the synthesis of nanoparticles [1]. However, the conventional methodologies for the synthesis of nanomaterials suffer some drawbacks of usage of toxic chemicals and formation of hazardous by-products as well as other economical issues [2]. As such, it is the need of the hour to develop clean, non-toxic, and environment-friendly methodologies for the synthesis of nanomaterials. For this, use of alternative reducing agents, contrary to the conventional one, by concentrating on the '*Green Chemistry*' principles, is highly recommended nowadays. In this regard, biogenic or bio-based methods utilising microorganisms (fungi, bacteria, yeast, algae, etc) and plant resources have been explored for the synthesis of nanoparticles [3–5]. Of these, plant extracts have been considered better because of their easy handling, availability and cost effectiveness as well as its role as a good stabilizing or reducing agent during the synthesis process of nanoparticles [6]. Use of plant resources, however, exhibits major drawbacks of destruction of ecologically significant plants and their parts obstructing the natural ecosystem. Therefore, focus has been given towards the utilisation of agro-wastes in the synthesis of nanoparticles in the last decades. In this context, fruit peels produced in food processing industries as well as at the time of fresh consumption, which are mostly considered as agro-wastes, are generating more attention of the researchers in recent times [2,7]. So, it is a great challenge for food processing industries to manage such wastes [8]. It is the need of time to provide some methodologies for utilisation of these kinds of wastes to achieve a waste free environment. Efforts are being devoted for this purpose. Fruit peels generally contain biomolecules and as a result can eventually be used for nanoparticle synthesis [8(a), 9]. In this regard, Dewan et al. successfully applied papaya peel extract for the synthesis of Pd nanoparticles without using any reducing agents [10]. Literatures explain the implication of a variety of agricultural fruit wastes such as custard apple peels [11], banana peels [12], watermelon rind [13] etc for the synthesis of Pd nanoparticles. Thus, a new pathway emerges to be explored for the synthesis of nanomaterials utilising other fruit peels.

Pomegranate (*Punica granatum* L, family: Lythraceae) is one of the oldest appetizing fruits and is found to be widely grown in many tropical and subtropical countries [14]. Even the non-edible parts of pomegranate fruit and tree i.e. peels, seeds, flowers, bark, buds and leaves, though considered as wastes, possess high amounts of specific nutritionally valuable and biologically active components as compared to the edible fruit [15]. The pomegranate peel contains significant amounts of polyphenols such as ellagic tannins, ellagic acid and gallic acid [16]. This peel extract has been successfully employed for the synthesis of Ag [17], Au and ZnO [19] nanoparticles. Encouraged by these researches, a methodology has been developed in this work for the synthesis of Pd NS utilising the pomegranate peel extract.

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Determination Of Minimum Quadrat Size For The Herbaceous Vegetation: A Case Study Of Durpang Reserve Forest, Arunachal Pradesh, India

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Abstract

For the field vegetation survey, we used the Random sampling method which is an important approach. However, sampling survey in forest areas is difficult because determining an appropriate quadrat size that represents the unevenly distributed vegetation. In this study, we determined the minimum size of the quadrat only for herbaceous vegetation by applyingthe species area curved method which is an important method for the prediction of species richness in terms of habitat area. Using the species area curved method; we simulated random sampling and analyze minimum to maximum diversity. The size of the quadrat in which maximum diversity of species can be recorded is called the minimum size of quadrat for that area. Our result shows that 60×60 sq. cm size are the most representative for sampling survey of herbaceous vegetation in this location.

Keywords: quadrat, herbaceous, sampling, durpang

Introduction

Vegetation in a particular habitat means the different types of species growing in that particular habitat. The process to obtain a well-defined sample is called the sampling technique. The random sampling method is one of the best methods for conducting ecological research; it is widely used in studies of plant diversity, species association analysis, biomass estimation and other areas. Among sampling techniques quadrat method is one of the best ways for vegetation analysis in a particular habitat. A quadrat is a tool used to record the abundance or density of a particular species in a study area. In some instances, it may be possible to simply count the number of organisms of a particular species in an area. However, in most cases counting all of the organisms would not be practical and other sampling methods are necessary. Quadrats are often square, circular or rectangular areas, of appropriate sizes that are placed at random in the study area. The presence or absence of species, numbers of organisms, or the percentage cover of each species is generally calculated within the quadrat. Quadrats are used to

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A comprehensive review on phytoremediation of heavy metal contaminated soil with special reference to aromatic plants

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Abstract
Heavy metal pollution is a serious problem in today's industrialized world. To overcome this problem numerous biological methods have been previously developed and phytoremediation is one of the major techniques in this regard. This review broadly discusses the suitability of aromatic plant in phytoremediation of various heavy metal contaminated site. Throughout the study we have considered and identified Poaceae, Lamiaceae, Asteraceae, and Geraniaceae as some of the most proficient and potential family of plants for phytoremediation. Research conduct on such aromatic plants with high biomass reveals that aromatic plant can remove contaminants with least risk of food chain and increase the yield of essential oil with increasing heavy metal stress condition. Vetiver zizanioides, Lemon grass, Ocimum basillium, Lavender, Salvia scalarea, Palargonium, Rosmarinus officialslis, Mentha arvensis, Cymbopogon martini were found to be among the most efficient remover of heavy metal pollutants from the soil. Thus aromatic plant with high biomass is suggested to be among the essential candidates for effective and successful remediation technology in future.

Keywords: phytoextraction, multi-metal, pollutant, biomass, remediation

Introduction
Phytoremediation basically refers to a technique in which green plants and their associated soil microbes are used in order to treat or to control the risk of environmental contamination (Greipsson, 2011). It is in-situ method. The word "phytoremediation" was derived from Greek word 'phyton' meaning plants and Latin word 'remedium' which means to correct or remove an evil. Globally phytoremediation has gained increasing attention since few years to clean up of organic and inorganic contaminated site of the soil because of low cost method as compared to other traditional method such as ion-exchange and ultra-filtration. There are many remediation techniques for contaminated soil but only a few are fit to control soil contamination with heavy metal. It includes various methods like phytoextraction, rhizofiltration, phytovolatization, phytodegradation. Aim of these techniques are differs such as remediation, denitrification, leaching, filtration of contamination, and stabilization (Kamusoko and Jingura, 2017). From the beginning of phytoremediation till now different researchers has developed potential use of phytoremediation to reduce the risk of contaminated soil on different view. Some have studied the naturally occurring metal hyper-accumulators plants that have the potential to accumulate 10-500 times higher level of elements than crops and the others have studied the normal crops. The idea of phytoremediation was given by Chaney, 1983. Phytoremediationincudes the use of pant for phytoremediation of environments polluted with hazardous waste. There are certain plants which have the capacity to grow, survive and can also reproduce in heavy metal contaminated area. These plants have absorption capabilities and possess transport system that selectively uptake the pollutant and contaminants in their root zone without affecting the soil properties. And also root system of this plant support a zone of large microbial number which degrades the contaminants of soil. This type of plant is essential for phytoremediation technique to extract or remove the inactive metals from the soil. Ebbs *et al.*, (1997) tested about 30 species to identify the ability of plant to accumulate heavy metals. Books (1998) and Baker *et al.*, (2000) identified more than 400 species as hyperaccumulators.
Human life is totally difficult. To survive we need food for energy, medicine to maintain health and different personal care product to live luxurious life. Thus, medicinal and aromatic plant plays significant role in the healthcare of people around the world. Although modern science has developed different techniques where plant and plant material are tested to determine their different properties and use plant and plant extract for different purpose. However, different plant has unique properties. Some have the ability to produce and exude aromatic substances which are used in making perfumes, in cooking, in food pharmaceutical and liquor industries are the aromatic plants. Aromatic plants have been used in Middle-East about 5000 BC for their preservative and medicinal properties and also aromatic flavor of food. After the ban of antibiotic feed additives within European Union countries (2006), the use of herbs and spices (Aromatic plant) in animal nutrition increases. About 1500 species of aromatic plant are serves as a source of raw material for perfumery, out of these only 50 species are

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RABINDRANATH TAGORE'S PHILOSOPHY-AN ANALYSIS

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During 18th & 19th century, a new intellectual climate was evolved in Indian philosophical history. A group of intellectuals' thoughts and talents have given a new dimension to Indian philosophical thinking. These personalities have respect for traditional Indian philosophy and culture and they have persuaded a new comprehensive Indian thinking by assimilating scientific outlook and liberalism with traditional spiritualism. This new trend is called contemporary Indian philosophy as well as the philosophers are contemporary Indian philosophers. Rabindranath Tagore was a phrenic of this particular period. Basically Tagore was a poet, lyricist, novelist, short story writer, painter, playwright, musician, educator and social thinker. He was the author of some sixty collections of poetry and a large number of prose works including novels, short stories, essays, plays and a composer of almost two thousands songs. The peculiarity is that Tagore has a specific style of understanding the life and reality and this contributes an inherent melody to all his literary works which also enroots Indian philosophy.

Tagore was greatly influenced by Upanishads. In metaphysical point of view he is an abstract monist. He talks of formless reality i.e. the impersonal Absolute which is called 'Satyam', 'Anandam', 'Shivam' and 'Sundaram'. Here it appears that Tagore's view of absolute is similar with that of Samkara's Brahman. But the truth is that Tagore's position is fundamentally different from that of Samkara. Being a poet philosopher Tagore didn't laid out his understandings of reality in abstract and speculative way. He feels that man cannot be interested in anything with which he cannot have an inter-communion. He thinks that man cannot find an active and living interest in the abstract concept of Brahman since Brahman is unapproachable. So Tagore attempts to bring absolute nearer to man. For Tagore the declaration of 'That thou art' is not enough, the throb of 'That' must be felt within. Therefore under the influence of Vaishnavism and the teachings of Bhakti-Marga, Tagore reconciles the abstract and impersonal nature of the Upanishadic Brahman with the personal God of the devotees. This personal God is Tagore's 'Jivan Devata' (the deity of life). Tagore says that God can be realized only in a powerful experience i.e. in a positive concentration of our being. But absolute can be apprehended only negatively. The relationship of God and man is the relationship of intense love, which designates an all-comprehensive and all-powerful feeling of oneness. Such a relationship can be possible only if God and man are regarded as personal. Thus Tagore's God is God and man at the same time. In his own words, 'If this faith be blamed for being anthropocentric (anthropocentric = any view magnifying the importance of human beings in the cosmos, e.g. by seeing it as created for our benefit), then man has to be blamed for being man'. This implies that, for Tagore, 'personality' is the most important character of the 'Supreme man'. In case of man's sufferings he always feels the need of love, strength and consolation and for these he looks towards the supreme person. In this way God is man's last hope and this hope sustains man's life and gives human strength. Therefore Tagore lays great importance on the emotional bond between God i.e. the supreme person and man. This analysis shows that a religious synthesis of abstract monism and a particular type of theism is the basic ideology of Tagore's philosophy. From this point of view Tagore can be considered as an idealist or a spiritualist or he can be called a monist and a theist. In another way we may say that Tagore's philosophy is an attempt to revive the ancient ideals of life and they have been modified according to the needs of the people of human world. As Radhakrishnan says in 'The Philosophy of Rabindranath' that 'He (Tagore) gives us a human God, dismisses with contempt the concept of world illusion, praises action over much and promises fullness of life to the

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Microbial diversity on the leaf litter of Bhindi [*Abelmoschus esculentus* (L.) Moench] crop fields at the different growth stages of the plants in Barpeta, Assam

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The leaf litter microflora in Bhindi crop fields at the different growth stages of the plants was analyzed. The results showed that the greater abundance of microorganisms (bacteria and fungi) were found in the leaf litter of Mandia Bhindi crop field than Goreimari Bhindi crop field and the number of microflora in different days of decomposition of leaf litter differ at different growth stages of the plants. The maximum numbers of microorganism were recorded from the leaf litter in 45 days of decomposition at after harvesting stage.

A total of 24 different fungal types belonging to 17 genera were isolated qualitatively from the different days of decomposition of leaf litter at different growth stages of the plants in Mandia and Goreimari Bhindi crop fields. Some of the most important dominant fungal species isolated were *Aspergillus fumigatus, A. flavus, A. niger, Fusarium oxysporum, Mucor hiemalis, Penicillium chrysum, P. ocalicum, Rhizopus nigricans* and *Trichoderma viride*. It was found that the number of microorganisms increases with the increase in days of decomposition and the appearance of fungal types vary according to the stages of decomposition of leaf litter. The variation of the abundance of microflora between the two Bhindi crop fields may be due to the variation of the physico-chemical properties of the crop field soils. The experimental results revealed that the decomposition of leaf litter and nutrient recycling by a wide range of microorganisms which is useful in soil and manure formation, soil structure and improvement of any habitat.

Key words: Leaf litter, microfungi, bacteria, diversity, decomposition, Bhindi crop

INTRODUCTION

Bhindi [*Abelmoschus esculentus* (L.) Moench] is one of the most important vegetable crops of the world from its nutritional, medicinal and export point of view. It is a popular vegetable in India grown extensively all the year round. Bhindi or Okra, an herbaceous hairy annual plant of the mallow family (*Malvaceae*) of the world tropics and widely cultivated or naturalized in the tropical and sub-tropical countries. It is grown from seed in tropical and sub-tropical parts of the world. The cultivated Bhindi is old world origin. Bhindi or Okra or Gumbo is a half hardy plant introduced into the USA and the West Indies from Africa and cultivated for its fruit pods which are used in soups, stews, catsups and the like. The phylloplane or leaf surface represents an important terrestrial habitat that harbours a wide range of microorganisms. The leaf surface is a suitable environment for microbial growth because of a thin film of nutrients deposited on the leaf. The phylloplane microflora of Bhindi has been studied by Ogwu and Osawaru (2014) and they have reported a wide range of predominant microflora of the members *Rhodotorula, Mucor, Aspergillus* and *Penicillium* for the fungi while *Micrococcus, Staphylococcus* and *Serratia* for the bacteria. The phyllosphere and phylloplane microflora take active part in the decomposition of plant material after leaf fall. The decomposition of leaf litter is an extremely complex processes and is controlled by multitude of organisms which inhabiting in soil. Leaf plays a major role in the succession of microorganisms in soil and enhances the fertility in soil. The sequence

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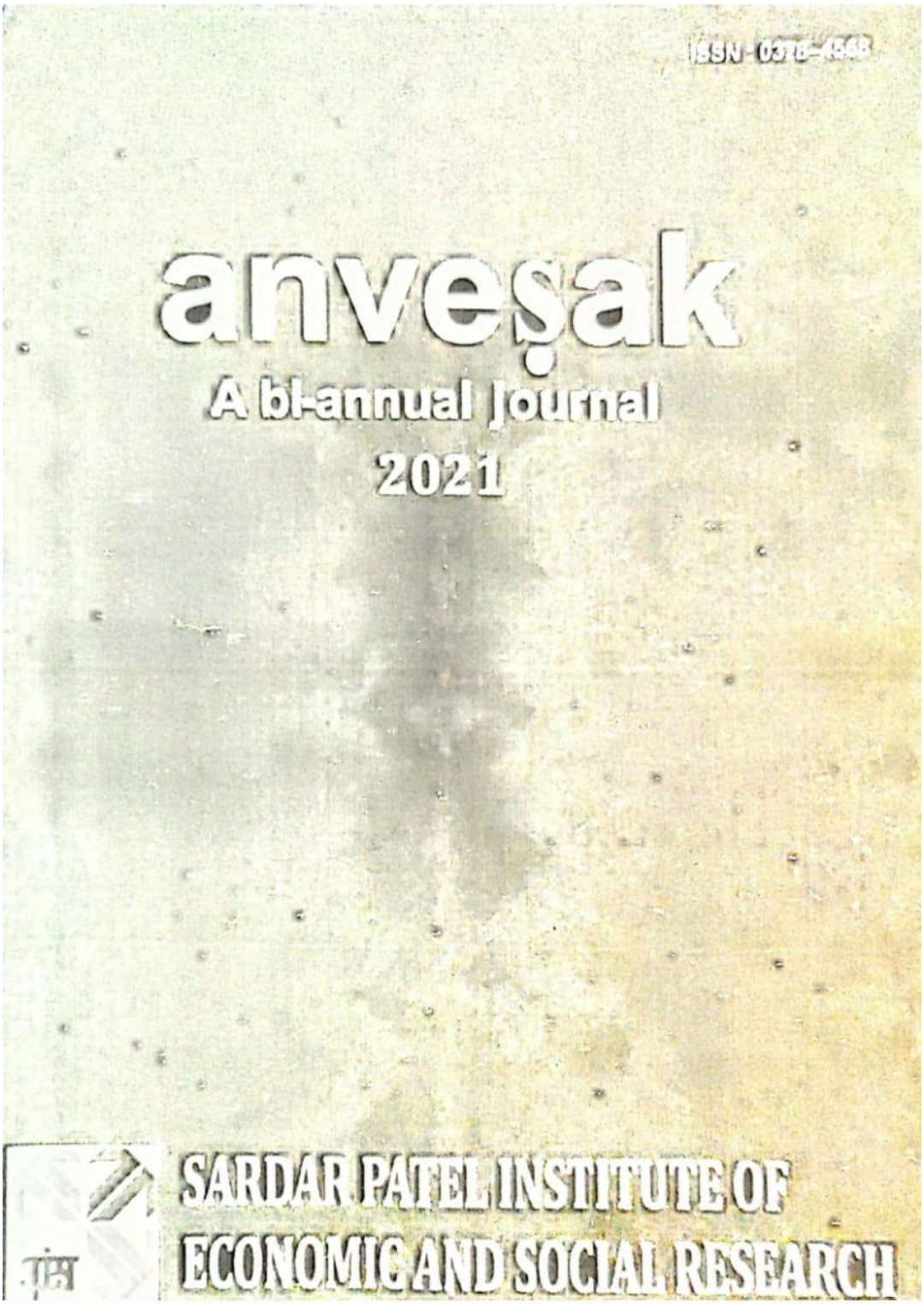

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A STUDY ON THE FAMILY PATTERN AMONG THE ASSAMESE HINDU FAMILY OF THE NIZ BAGHBOR VILLAGE UNDER BAGHBOR CIRCLE OF BARPETA DISTRICT, ASSAM

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Abstract
Family is the basic primary unit of the society. A society cannot survive without family. The family pattern of every society has unique nature. The behaviour and cultural heritage of a society is mostly depended on the family. The family pattern of Assamese Hindu Society has some unique characters. It has rural and urban differences also. The present study was conducted to know the family pattern of the Assamese Hindu society of the rural area. The other aims of the present study were to show the modern trend and impact of the other religion on the family pattern of the Assamese Hindu society situate in the Niz Baghbor village.
Key words: Family pattern, Assamese Hindu Society, rural area, modern trend, religious impact

Introduction

Family is the oldest social institution of mankind. It is the basic social unit. Wherever we see a community-rural or urban, primitive or civilized there is invariably the presence of family. The concept of the family has been found to exist since time immemorial. The family has two aspects – biological and social. Biologically all man belongs to a family. The social part of the family is also very important for existence of the society. It is the family which rears and up brings a child. Enculturation is the basic duty of the family. The existence and progress of a society is depended on the family pattern. Currently, the institution of family has become controversial. Though it is a universal social institution and is regarded fundamental, both for the individual and society as a whole, there are new perspectives which question many of the assumption of the more traditional view.

Aims and Objectives

The primary aim of the present paper is to show the family pattern of the Assamese Hindu society of the rural area. The other aims of the present study were to show the modern trend and impact of the other religion on the family pattern of the Assamese Hindu society situate in the Niz Baghbor village.

Methods and materials

The data of the present paper is primary. The data for the present study were collected from the Niz Baghbor village of Baghbor Circle under Barpeta district. The survey was conducted on the 43 Assamese Hindu families of Niz Baghbor village. The population pattern of the Niz Bhaghbor village is heterogeneous having Hindu and Muslim people. The Hindu peoples are of Assamese, Bodo and Bengali speaking. The other neighbouring area of the Niz Baghbor village is dominated by Muslim people.

Discussion

The Assamese Hindu Society of Niz Babhbor village called their family household as ghar or bari. They used the term ghar or bari to denote the residential and other domestic purpose. Here an attempt has been made to analyze the type, size, composition, economic basic etc. of the family inhabited

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RESEARCH ARTICLE

Repellent Activity of Citrus Essential Oils and Two Constituent Compounds Against *Aedes aegypti*

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Abstract Mosquitoes have already developed resistance toward most of the commercial synthetic repellents. Therefore, searching for new potential alternatives is the need of the hour. In the study, we evaluated the repellency of six citrus-derived essential oils against *Aedes aegypti* using the arm-in-cage method. The results showed more than 50 percent repellency up to 4 h exposure time at 1 mg/cm^2 area for three *Citrus spp.* with maximum repellency of 81 percent for *C. aurantifolia*. Therefore, two of the major constituents of *C. aurantifolia* EO, namely citral and limonene, were chosen further for the repellency test. The results showed higher efficacy of compounds than crude oil. EC50 for commercial standard repellent DEET was determined for comparison under the same experimental conditions. To understand the possible mode of action of citral, limonene and DEET, in-silico interactions of these compounds with odorant-binding proteins (OBP1 and OBP22) and acetylcholinesterase (AChE) enzymes were studied. The findings revealed positive docking of all of these compounds having affinity values in the range of − 6.0 to − 6.9 kcal/mol. Overall, the study demonstrated that limonene and essential oils of *Citrus aurantifolia* could be the best potential alternative for synthetic repellents.

Keywords *Aedes aegypti* · Repellency · Essential oil · OBP · Molecular docking

Significance statement Chemical repellent has posed serious health hazards on the environment and the target insects already developed resistance against the chemical repellent. This manuscript examines and proves the repellent property of Citrus essential oil and the main constituent terpene compounds of Citrus aurantifolia- citral and limonene against Aedes aegypti.

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Introduction

Aedes aegypti transmits dengue, for which there are no competent vaccines available. Controlling vectors or avoiding their bites is the only way to prevent disease transmission, as daytime feeder *Ae. aegypti* can be best avoided by repelling them. Generally, the use of synthetic repellents is in common practice. However, the frequent and injudicious use of synthetic repellents has already made the exposed mosquito populations resistant and thereby rendered these chemicals gradually ineffective for repelling mosquito at the recommended doses. Besides, the repeated uses of synthetic repellents resulted in numerous health issues like neurological problems, allergy and skin irritation, etc., in human being along with associated environmental hazards. DEET, which is considered as the gold standard repellent, has been reported to initiate seizures, bradycardia, nausea, vomiting, encephalopathy and anaphylaxis, especially in pregnant women and children after dermal application [1].

These negative effects of synthetic repellents have ignited the researchers to think for eco-friendly alternatives of which botanicals are getting much importance. The past few decades have witnessed extensive research on the exploration of plant products for implications in pest

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ORIGINAL RESEARCH ARTICLE

In-silico interactions of eugenol and temephos with metabolic detoxifying enzymes of *Aedes aegypti* (Diptera: Culicidae)

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Abstract
Metabolic resistance-associated enzymes primarily detoxify xenobiotics and endogenous substances. Insecticides that could inhibit these enzymes may potentiate their toxic effect on the targeted pest by hampering the metabolic detoxification pathways. In a recent investigation, we identified eugenol as a potential larvicide against *Aedes aegypti*. Therefore, the goal of this work was the in-silico study of eugenol with metabolic detoxification enzymes while using the organophosphate temephos as a control. Temephos is said to inhibit acetylcholinesterase (AChE), an important enzyme of the central nervous system. So, AChE was also used for docking study. Modeller9.21 software was used to create models of the said enzymes. Ligands were eugenol and temephos, and the receptors were detoxifying enzymes and AChE. Docking was performed using autodock vina software, and their binding interactions are presented using UCSF Chimera and ligplot. Results revealed good docking of both the compounds, with binding affinity values ranging from –5.4 to –6.9 kcal/mol for detoxifying enzymes, which appeared to be in a comparable range. Again, both the ligands docked well with the AChE enzyme with binding affinity value of –6.5 kcal/mol for eugenol and –7.9 kcal/mol for temephos. Since, ligands act by binding to receptors, it is thought that eugenol and temephos work in a similar way and might block metabolic detoxification enzymes. In light of the negative environmental consequences and side effects of temephos, eugenol, which has a comparable binding affinity for the metabolic enzymes studied, might be recommended as a viable alternative to temephos for use as a mosquito larvicide.

Keywords Eugenol · Metabolic resistant enzymes · Modelling · Molecular docking

Background

Aedes aegypti is an important vector that transmits major arboviral pathogens like dengue, chikungunya, yellow fever, and zika, which kill thousands of people each year. No specific treatments or vaccines are available against dengue, chikungunya and zika diseases (Viana-Medeiros et al. 2018). Avoiding mosquito bites by controlling their populations, either at the embryonic, larval, or adult stages, is the sole measure to avoid contact with these diseases. In this respect, lots of mosquito control measures have been developed. Synthetic pesticides have been shown to be the most effective measure. Among the synthetic insecticides, temephos is the most widely used insecticide worldwide for the control of *Aedes aegypti* at the larval stages (Viana-Medeiros et al. 2018). Temephos is an organophosphate insecticide that is placed under WHO hazard class "U", meaning it is not likely to cause an acute hazard under normal usage (WHO 2008). It is recommended for use in drinking water containers at ultralow concentration (1 mg/L) (WHO 2009). Considering its effectiveness, temephos is used widely and indiscriminately, that have resulted in the development of resistance in exposed mosquito populations (Prophiro et al. 2021). Our recent study have shown that the repeated exposure of temephos leads to resistance development in *Aedes aegypti* (Adhikari and Khanikor 2021). So, in order to repel/kill mosquitoes, the prescribed dose reported to be ineffective. Therefore, in order to develop an effective and competent alternative compound to temephos, plant essential oils, extracts, and constituent compounds have been studied for the last few decades. In the study, we have selected eugenol, a plant-based terpene compound present as a major constituent in basil and clove essential oils (Pattanayak et al. 2010) to test its in silico mode of action against *Aedes aegypti*. A handful of reports are available

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ORIGINAL RESEARCH ARTICLE

Evaluation of efficacy of pinene compounds as mosquitocidal agent against *Aedes aegypti* Linn. (Diptera: culicidae)

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Abstract
Pinene ($C_{10}H_{16}$) is a bicyclic terpene present in various plant essential oils mainly in coniferous and eucalyptus species. In the present study, biological activities of two isomers of pinene (α- pinene and β- pinene) against *Aedes aegypti* Linn. were assessed. The results revealed β- pinene as more effective against egg and larval stages with LC50 value of 21.02 ppm and 108.39 ppm respectively at 72-h exposure period than α-pinene while against adult stage of the insect α- pinene (LC50 value 73.30 ppm) was more effective than β- pinene (LC50 value 111.18 ppm). To understand the effects of the selected pinene on different resistant development associated enzymes namely cytP450 monooxygenase, esterases, glutathione- S- transferase (GST) and acetylcholine esterase (AchE), their activities were analyzed after treating with LC50 dose for 24 h in larval and adult stages of *Aedes aegypti*. Results revealed that in both stages, in response to pinene, the activity of cytP450 was markedly enhanced but the activities of GST, α- and β-esterases and acetylcholine esterase enzyme were decreased in both target stages in comparison to control. Therefore, compounds like pinene gain more importance to be further used in Aedes control programme to prevent the spread of Aedes borne diseases like dengue.

Keywords Pinene · Vector control · *Aedes aegypti* · Resistance · Enzymes

Introduction

Essential oil (EO)s are volatile isolates of aromatic plants with characteristic odor. It comprises of different volatile compounds generally accumulated in secretory cells, cavities, channels and epidermal cells of different parts of a plant. Although EOs are present both in angiosperms and gymnosperms they are most commonly found in the later one. Most of the aromatic plants in terms of production of EO belong to the family Lameaceae, Rutaceae, Umbelliferae, Myrtaceae etc. (Roger 1997).

Pinene is a bicyclic monoterpene compound with molecular formula $C_{10}H_{16}$. Predominant occurrence of pinene compound has been recorded from lots of coniferous trees and Eucalyptus species (Dev 1989) mostly in the EO of these plants. In recent decades, this EO based compound has been of great interest as their parent oil showed promising efficacy. Naturally pinene has two isomers- α and β- pinene which differs only in the arrangement of alkene bond. Terpene is a class of hydrocarbons and builds up from isoprene unit where 5 carbon atoms fused with 8 hydrogen molecules (Haagen-Smit 1953). According to the number of the isoprene unit, the terpenes are divided into various groups out of which monoterpenes (two isoprene units) and sesquiterpens (three monoterpenes unit) are the most representative molecules constituting 90% of EOs allowing a great variety of structures (acyclic, monocyclic, and bicyclic) with diverse functions (Tripathi et al. 2009; Pavela 2015). The precursors of these volatile terpenoids can be synthesized via two pathways, the mevalonate (MVA) and the methyl erythritol 4-phosphate (MEP) pathways localized in the cytosol and in plastids, respectively (Duodareva et al. 2004).

Terpenes are the principal constituent of EOs although some other components such as terpene derivatives and other miscellaneous compounds have also been documented (Ngoh et al. 1998). These chemicals are primarily secreted from the vegetative part when herbivores attack the particular plant tissue (Pare and Tumlinson 1999) and from the flowers to attract the pollinators (Reinhard et al. 2004). The occurrence and distribution of these volatile compounds have been properly documented after the advent of simple, sensitive and relatively

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Annexure 36

Bird-o-soar #110
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A note on the avian diversity of Satajaan Wetland, Assam

Inland wetlands are pristine water bodies inhabiting diverse species of flora and fauna. These wetlands act like reservoirs with a capacity to hold the flooded water (Acreman & Holden 2013). Wetlands also play a crucial role in groundwater recharge (Min et al. 2010), with its vegetation having the potential of bioremediation (Bhatia & Goyal 2013).

Every year, numerous species of waterfowl migrate from across the globe and most of them are accommodated in these wetlands. Satajaan, one such wetland situated in the north-Lakhimpur District of Assam, India, is at a distance of 8 km from Lakhimpur township. This wetland has remained under-research since its formation and was selected for the study of avian diversity. It is situated aside from the river Ranganadi covering an area of 39 acres. According to (Gogoi et al. 2019), the wetland is covered by rich vegetation with approximately 262 species of vascular plants. The climate of the area is mostly humid with temperatures ranging 7–31 ºC (NWAA 2010). The wetland which is claimed to have got created by the earthquake of 1950, is bifurcated by the railway crossing into two halves.

One segment of the wetland is enriched with water, aquatic and semi-aquatic vegetation, whereas, the other section is poorly managed with very little scope for accommodating birds. The swamp also resides adjacent to a roadway that traverses across the plains to meet the foothills of Arunachal Pradesh. We pursued a survey of this wetland on the 22 December 2019 from 0600–1400 h and 10 January 2021 from 0700–1200 h to record the diversity of birds visiting the study site in winter.

A survey was conducted by a group of five birders. A total of 71 and 68 species were recorded during the first and second surveys respectively. Around 87 species were recorded cumulatively from both surveys (Table 1). Thirty-four winter migratory species were observed of which eight were specifically waterfowls. Some of the local non-migratory water birds such as White-breasted Waterhen *Amaurornis phoenicurus*, Bronze-winged Jacana *Metopidius indicus*, Eurasian Moorhen *Gallinula chloropus*, and Grey-headed Swamphen *Porphyrio poliocephalus* were also recorded and are suspected to be present perennially.

In addition to the resident birds, migratory terrestrial birds such as Tickell's Leaf Warbler *Phylloscopus affinis*, Pallas's Grasshopper Warbler *Locustella certhiola*, Black-faced Bunting *Emberiza spodocephala*, and aquatic birds such as Gadwall *Mareca strepera* & Ferruginous Duck *Aythya nyroca* were also recorded. Lesser Whistling-Duck *Dendrocygna javanica* was the most abundant species present with an

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Annexure 37

Kerala Bird Atlas 2015–20: features, outcomes and implications of a citizen-science project

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Kerala Bird Atlas 2015–20: features, outcomes and implications of a citizen-science project

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Citizen-science driven exercises (e.g. bird surveys) and online platforms (e.g. eBird) provide voluminous data on bird occurrence. However, the semi-structured nature of their data collection makes it difficult to compare bird distribution across space and time. Bird atlases are based on standardized surveys and describe the distribution of bird species over a predefined region and have fewer biases, and thus are better suited for use in research. The recently concluded Kerala Bird Atlas (henceforth KBA) is Asia's largest bird atlas in terms of geographical extent, sampling effort and species coverage. The entire state of Kerala was systematically surveyed twice a year during 2015–20 and over 0.3 million records of 380 species from 25,000 checklists were aggregated. The dataset was filtered and various metrics were estimated. A total of 915 cells were laid out for systematic surveys, of which 888 were surveyed in either or both the seasons – dry season (January–March) and wet season (July–September); 27 cells could not be surveyed in either of the seasons due to logistical constraints. However, this variation in sampling effort had a minimal effect on survey completeness. The slope of the species accumulation curve suggested near-complete species sampling in over 70% of the cells. After eliminating nocturnal and pelagic species, data from 361 species were analysed. Species count was higher in the dry season than in the wet season. Species richness (count) and evenness were higher in the northern and central districts than in the southern districts. High elevation regions of the southern Western Ghats were the largest contiguous areas lacking sufficient sampling. We found that most of the endemics were concentrated in the Western Ghats, but threatened species were as likely to occur along the coasts as in the Ghats. The KBA dataset is a valuable resource for testing various ecological hypotheses and suggesting science-backed conservation measures. KBA model could be replicated for similar atlases in other states or biogeographic regions of India.

Keywords: Bird atlas, birdwatching, citizen-science, Indian ornithology, Kerala, Western Ghats.

DATA on the distribution of species and the factors governing the same are prerequisites for effective and efficient conservation efforts[1]. Such information is necessary to inform the selection of protected areas, to assess habitat associations and to predict the likely effects of future environmental changes[2]. Historically, data on bird species distribution were sourced from field guides, ornithological field notes by experts, and museum collections. The increasing popularity of recreational birdwatching has made available fine-scale distribution data in the form of global and regional data repositories such as eBird[3], Bird Count India (www.birdcount.in) and iNaturalist (www.inaturalist.org). eBird (http://ebird.org/) is the most widely used citizen-science platform that allows birdwatchers to share and manage their sightings on a globally accessible database[4]. Scientists have utilized eBird data to study the abundance and distribution of species in real-time, to prioritize conservation efforts and to test ecological hypotheses[5–7]. The data submission protocol in eBird is fairly simple and flexible. This leads to a large variation in efforts across checklists[8], and the spatial precision is low for any fine-scale (<1 sq. km) analysis[9]. There can be many sampling biases in such datasets like spatial, taxonomic, or temporal. Spatial bias refers to uneven sampling efforts across a region. Taxonomic bias can include over- or under-representation of certain species in the dataset. Temporal bias occurs when records are collected in one season only, or more often at certain times of the year, or when species have very specific environmental triggers for activity periods[10]. Such biases in the dataset can have a profound influence on the inferences made[11].

While the eBird platform is fairly new, globally available since 2010, the concept of citizen-science is not. Amateur birdwatchers have contributed to ornithology since the 1950s via bird atlas projects. Bird atlas projects collect occurrence or breeding data and rely largely on groups of volunteers for data collection[11]. A bird atlas describes the distribution of birds within a gridded framework over a predefined region based on systematic surveys[12]. The first ever bird atlas was prepared for the birds of Britain and Ireland in 1952 (ref. 13) and over the years several national bird atlases and annual breeding bird atlases have been prepared across the world[2,11,12]. Bird atlas data has multiple uses in the areas of conservation, ecological research and public outreach[11,14]. National and regional bird atlases can help managers in protection, conservation and management of local breeding and migratory populations by providing an accurate assessment of species' abundance and distribution[14].

Bird atlases can have similar biases as online citizen-science platforms, but these biases are small and can be

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Persistent susceptibility of *Aedes aegypti* to eugenol

Kamal Adhikari, Bulbuli Khanikor✉ & Riju Sarma

Botanical insecticides are preferred for their environment and user-friendly nature. Eugenol is a plant-based monoterpene having multifarious biocidal activities. To understand whether eugenol would persistently work against *Aedes aegypti*, we performed larvicidal bioassays on thirty successive generations and determined median lethal concentration (LC50) on each generation. Results showed no apparent differences between LC50 at F0 (63.48 ppm) and F30 (64.50 ppm) indicating no alteration of susceptibility toward eugenol. To analyze, if eugenol has any effect on metabolic detoxification-associated enzymes, we measured esterases (alpha and beta), cytochrome P450, and GST activities from the survived larvae exposed to LC50 concentration from F0–F30. Results revealed a decrease of esterases, GST, and cytochrome P450 activities at the initial 4–8 generations and then a gradual increase as the generations progressed. GST activity remained significantly below the control groups. Synergists (TPP, DEM, and PBO) were applied along with eugenol at F30 and LC50 concentration, and the said enzyme activities were recorded. Results showed a noticeable decrease in LC50 and enzyme activities indicating effective inhibitions of the respective enzymes. Overall, present results inferred that eugenol would effectively work as a larvicide for a longer period in successive generations without initiating rapid resistance and therefore could be advocated for controlling *A. aegypti*.

Aedes aegypti bears immense epidemiological importance as the females of this mosquito are the vector of dengue, Zika, yellow fever, and chikungunya. For dengue alone, billions of people are at risk of contracting, millions of people are infected, and thousands of people are losing their lives annually. No vaccines or specific treatments are available to date against dengue, Zika, and chikungunya diseases. Killing the vector mosquitoes at their larval stages is the best effective measure to reduce the population densities of adult mosquitoes, which impacts the transmission of the diseases. Synthetic pesticides are the most widely used and relied upon method of mosquito control. Initially, DDT (an organochlorine pesticide) was used to control mosquitoes. However, due to resistance development by mosquitoes and environmental concerns, DDT was replaced by other classes of pesticides such as carbamates, organophosphates, and pyrethroid[1]. Moreover, the extensive and long-term use of these insecticides has led to the accumulation of their residues in food, cow milk, water, soil, as well as other environmental components. There are also reports of hormonal alterations in persons engaged in spraying and using these insecticides[2].

Long-term studies with the organophosphates malathion and temephos and with the pyrethroid deltamethrin reported resistance development in insect pests[3–5]. Therefore, as an alternative, plant secondary metabolites (essential oils, extracts, and their phytochemical components) are increasingly being claimed to be effective as promising insecticides[6]. Among these metabolites, terpene compounds are extensively studied owing to their broad-spectrum applications[7]. All terpene compounds have a common precursor- isopentyl pyrophosphate. These compounds can be categorized into several groups based on the number of carbon atoms present; hemiterpene (5C), monoterpene (C10), sesquiterpene (C15), diterpene (C20), sesterpene (C25), triterpene (C30), tetraterpene (C40) and polyterpenes (C40 and above carbon units)[8]. Terpene compounds exert their toxic effects in several ways. The principal pathways include the cholinergic system[9], GABA system[10], mitochondrial system[11], and the octopaminergic system[12]. It can disturb the endocrinological balance and serves as an insect growth regulator[13]. It also affects respiration by blocking the spiracle of the larvae restricting their ability to breathe[14].

Here in the study, we selected eugenol, a monoterpene, the main constituent of basil and clove essential oil. It has been proven effective in controlling a wide range of pests, including mosquitoes[15–17]. Apart from that, eugenol has also been proven effective in numerous human applications such as dentistry[18], anticancer[19], antimicrobial[20], and antioxidant[21]. From the point of efficacy and user acceptability, eugenol is an attractive compound to be used as a mosquitocidal agent. However, with the introduction of a novel pesticide, there is always a possibility of resistance development by the target pest; thus, its long-term efficacy must be evaluated. Resistance is a complex phenomenon in which the recommended dose of insecticide is not able to kill the majority of insect populations at subsequent application. Insects can develop resistance through target-site insensitivity, metabolic resistance,

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Wesleyan Journal of Research, Vol 14 No 82 (April 2021) - Research article: (Education)

Primary Educational Development status of Religious Minority Child in Mondia Block of Barpeta District of Assam

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ABSTRACT: Barpeta is one of district of Assam where 60% population of the district belongs to religious minority i.e. Muslim. The rural female literacy of the district is 47% and the Muslim female literacy is only 36.2%. In concentration educational backwardness of Muslim population, the investigator has taken up the study to provide some valuable inputs to remove the hurdles of primary education of the female segment in general and those of minority group in particular.

Keywords: Barpeta, Dropout, Education, Muslim, Children, Primary.

Article History

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1. Introduction:

Primary education is the starting level for every child to enter into domain of formal education. It is meant, the education for children of 6-14 years of age group. This stage is called primary stage of education in the sense that the child formally introduce disciplinary rules of education that one socially recognized. The main aim of primary education is to fulfill the basic educational needs of children and starts their socialization keeping view on requirement of the society.

Elementary Education status of Girls children in India after Independence:

After independence the directive principal of Indian constitution has laid the provision for making available the opportunities for free and compulsory primary education up to age 14 years. Kothari commission of 1964-66 has suggested to make primary education free and compulsory for all. In 1986, it was National policy and education and programme of Action (1992) have recommended a number of schemes for qualities and quantitative development of primary education of country. It was Sarava Siksha Abhiyan a centrally sponsored schemes that launched in 2001-02 for achieving the goal of universalisation of elementary education through a time bound approach. The main objective of the scheme are to ensure education for all children

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CURRENT PROBLEMS AND FUTURE CHALLENGES OF PRIMARY EDUCATION IN BAKSA DISTRICT OF ASSAM

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Abstract

Primary education is generally provided after completion of pre-primary education. The Article no. 21A of Indian Constitution has clearly mentioned about the free and compulsory primary education between the age group of 6-14 years of children. The study is mainly focused on co-scholastic activities, economic status of guardians, infrastructure facilities and community participation in primary schools of Baksa district. The investigator has given some suggestions for the 100% of universal retention and provision of primary education for the children in the area.

Keywords: Primary, Education, Children, Schools, Study

Introduction:

Primary education is provided that after completion of Pre-Primary Education. The Article No. 21A of Indian Constitution has clearly mentioned about the free and compulsory primary education between the age group of 6-14 years of children. The Education commission (1964-66) considers primary education as a highly significant stage in natural reconstruction (Sarma, M.K. 2007, Pp.11). The primary education of Baksa district is not developed as compared to other districts of Assam. Many primary education programmes like DPEP (1994), OBB (1986), SSA (2001), RTE (2009) and Gunotsav(2017) have launched in Baksa district of Assam but problems of primary education in the district is remain same. However, the study is mainly focused on co-scholastic activities, economic status of guardians, infrastructure facilities and community participation in various school activities of the area.

About the proposed study area (Baksa District):

The proposed study area is Baksa District of BTAD (Bodoland Territorial Area Districts) of Assam. The district is covered an area of 3056.89 sq.km. and Mushalpur is the administrative headquarter of thedistrict. According to 2011 census, there is total 950075 lakhs population and literating percentage of the district is 70.53. The male literary percentage is 77.03 and female literary percentage is 61.27 respectively. In this district, Assamese, Bodo, Muslim, Bengali, Nepali, Garo, Rabha and few Hindi speaking people are inhabiting there. The boundary of Baksa district is bounded to the North stands Bhutan, East stands Udalguridistrict, West stands Chirang district and south stands Barpeta, Nalbari and Kamrup districts of Assam.

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Versatility of magnetic Fe_3O_4 supported copper nanocomposite catalyst towards reduction of carbonyl and nitro compound

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Ferrite supported copper nanocomposite catalyst has been synthesized and characterized by TEM, SEM-EDS mapping, XRD, XPS and ICP-AES analysis. This nanocomposite is found to be more efficient and versatile towards carbonyl and nitro reduction under mild reaction condition with very good yield and turn over number. The catalyst is magnetically recoverable and also reusable for a minimum of four catalytic cycles.

Keywords: Nanocomposite, Catalysis, Carbonyl/Nitro Reduction, Magnetic separation

Among the various important processes of organic synthesis, the processes involving the reduction of substrates such as azido, nitro and carbonyl compounds are one of the most important fundamental processes due to their significant role in the pharmaceuticals and biological synthesis[1]. Although a number of metal catalysts have been reported for hydrogenation reaction, yet they have lack of applicability due to their high cost[2].Nowadays, nanoparticles (NPs) especially iron nanoparticles (FeNPs), emerges as one of the important catalysts for this purpose due to their non-toxicity, economy and effectiveness[3]. This iron nanoparticle can also be used as precursors to seed, reduce and support another metal. Again, this nanparticle is magnetically recoverable which makes it unique for easy and environmental friendly recovery of the catalyst[4]. When FeNPs are used as precursor to another metal such as palladium nanoparticles, it results in hybrid nanoparticles which were proven to be active and recyclable catalysts for Suzuki coupling[5].

In this context, we report here a magnetically recyclable and versatile ferrite supported copper nanocomposites for reduction of carbonyl and nitro compound.

Materials and Methods

All chemical reagents like $FeCl_3.H_2O$, $FeSO_4.7H_2O$, $Cu(OAc)_2$, NaOH and KOH were purchased from Ranbaxy and solvents like EtOH, MeOH, ^{i}PrOH, Toluene *etc.* were obtained from Merck and used without further purification.

In our study, we have adopted a number of methodologies which are summarized as follows:

Preparation of Fe_3O_4 nanoparticles

5.41 g $FeCl_3.H_2O$ and 3.6 g urea were dissolved in water (200 mL) at 85 to 90 °C for 2 h and it turned to brown colour. Then it was cooled to room temperature. To this mixture, $FeSO_4.7H_2O$ (2.78 g) was added followed by the addition of 0.1 M NaOH solution until its pH becomes 10. Then it was ultrasonicated at 30-35 °C for 30 min. After aging for 5 h, we obtained black crystalline powder[6].

Preparation of Fe_3O_4-Cu nanocomposite

Fe_3O_4 (2 g) and $Cu(OAc)_2$(10 wt% of Cu on Fe_3O_4) were stirred at room temperature in aqueous solution for 1 h. pH was then adjusted to 12 by adding 0.5 M NaOH solution and stirred for 10-12 h. Then it was washed with distilled water and reduced by adding 0.2 M $NaBH_4$ solution dropwise under gentle stirring in an ice-water bath for 30 min until no bubble was observed in the solution. The resulting Fe_3O_4-Cu nanoparticle suspension was subjected to ultrasonication for 10 min and then washed with distilled water and subsequently with ethanol followed by centrifugation[6].

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RESEARCH PAPER OPEN ACCESS

Diversity of aeromycoflora in fruit and vegetable markets of Barpeta, Assam, India and their sustainable management

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Key words: Aeromycoflora, Seasonal variations, Post-harvest, Sustainable management, Barpeta

http://dx.doi.org/10.12692/ijb/20.3.172-181 Article published on March 30, 2022

Abstract

Air-borne fungi are responsible for producing several diseases in fruits and vegetables and allergic disorders in human beings. An aeromycological study of fruit and vegetable markets of Barpeta town and Sonkuchi Colony of Barpeta district, Assam was conducted from January to December, 2018 to analyze different fungal species exhibit in the environment using Culture Plate exposure method. A total of 30 different fungal species belonging to 19 genera were isolated from Barpeta town fruit and vegetable market, while 27 species belonging to 19 genera were from Sonkuchi Colony market. A total of 3609 and 2963 fungal spores were isolated from Barpeta town and Sonkuchi Colony market respectively throughout the year. The most and least dominating fungal species in Barpeta town market were recorded to be *Aspergillus niger* and *Drechslera* sp. respectively, while in the Sonkuchi Colony market, they were *Cladosporium herbarum* and *Botrytis* sp. respectively. The number and types of fungal species varied between the two markets. The maximum number of fungal spores was recorded in the month of August and the minimum was in January 2018. The growth of the fungal population is influenced by season and meteorological factors, which play a vital part in the composition and concentrations of aeromycoflora. There was a definite relationship found between the fungal spores and the markets. So, proper management of the waste is needed in the markets by the Municipality Board. The vegetable-market solid wastes can be used for preparing vermicomposting and biogas for minimizing environmental pollution and maintaining sustainable management.

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Bacteriological quality of drinking water collected from different sources, seasons and areas of Barpeta district of Assam, India

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Key words: Drinking water, Total plate count, Total coliform, Faecal coliform, *Escherichia coli*, *Salmonella*, Barpeta.

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Abstract

The drinking water quality with respect to bacteriological examination by quantitative determination of total coliform, faecal coliform count (M.P.N.), total plate count bacteria, *E. coli* and *Salmonella* bacteria were done for 180 numbers of samples collected from tube well, well, river, pond and P.H.E. supply water in summer, monsoon, and winter seasons from 26 different areas of Barpeta district has been analyzed. Out of 180 water samples analyzed, 93 samples were from tube well, which occupies 51.67% of the total percentage of the source of water, 63 from well (occupies 35.00%), 6 from rivers (occupies 3.33%), 9 each from ponds and P.H.E. supply water (each occupies 5.00%) of all the sources. Out of 180 samples tested, the total number of positive cases for Total Plate Count bacteria at 22°C and 37°C were 167 (92.78%) and 163 (90.56%), respectively. *Salmonella* bacteria were found positive for 57 (31.67%) samples, *E. coli* positive for 112 (62.22%) samples; 95 (52.78%) and 70 (38.89%) samples were found contaminated with Total coliform and Faecal coliform bacteria, respectively. The percentage of occurrence of bacterial populations was found maximum in the pond and river water followed by well water and the minimum was in P.H.E. supply water followed by tube well water. The minimum number of *Salmonella* bacteria was isolated from tube well water and the maximum was from pond water. The results also indicated that the bacterial population was found maximum in the monsoon season, followed by summer and winter. The present study indicates the presence of *E. coli*, Coliforms and *Salmonella* bacteria in different sources of drinking water itself is an indication of poor handling and unhygienic conditions. Proper doses of disinfectants should be used at regular intervals in different drinking water sources.

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