A new class of fuzzy sequences related to the $\ell_p$ space defined by Orlicz function

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Abstract. In this paper we introduce the new classes of sequences $C_p^0(M, A, \phi, \Delta)$, $\ell_p(M, A, \phi, \Delta)$ and $C_p^0(M, A, \phi, \Delta)$ of fuzzy numbers defined by Orlicz function. We study their different properties and established some inclusion relations involving these classes of sequences.

AMS Mathematics Subject Classification: 40A05, 40D05, 46A45, 46E30

Keywords and phrases: Sequence space, Orlicz function, generalized difference

1. Introduction and definitions

The concept of fuzzy sets and fuzzy numbers was first introduced by L. A. Zadeh in 1965. Subsequently the concept has been applied to almost all the branches of science. In mathematics the notion has successfully been applied to study fuzzy topological spaces, fuzzy linear programming, fuzzy group theory, fuzzy ring theory, etc. Recently different classes of sequences of fuzzy numbers have been introduced and investigated from different aspects by Esi (11, 3–6), Esi and Acikgoz [7], Esi and Caublas [8], Maita [11], Savaş [15], Tripathy and Basu [16], Tripathy and Borogolain [17], Tripathy and Dutta [18–20], Tripathy and Sarma [22] and many others. In this paper we introduce a new class of sequences of fuzzy numbers defined by Orlicz function in terms of generalized differences by matrix methods.

Let $D$ denote the set of all bounded intervals $A = [\overline{A}, \overline{A}]$ on the real line $R$. For $A, B \in D$ define

$$A \leq B \text{ if and only if } \overline{A} \leq \overline{B} \text{ and } \overline{A} \leq \overline{B} \text{ where }$$

$$d(A, B) = \max \{ A - B, B - A \}.$$ 

It is well known that $(D, d)$ is a complete metric space. Also “$\leq$” is a partial order on $D$. A fuzzy number is a fuzzy subset of real line $R$ which is bounded, convex and normal. Let $L(R)$ denote the set of all fuzzy numbers those are upper-semi-continuous and have compact support. In other words, if $X \in L(R)$ then for any $\alpha \in [0, 1]$, $X^\alpha$ is compact, where

$$X^\alpha = \begin{cases} \{ t \in R : X(t) \geq \alpha \} & \text{for } 0 < \alpha \leq 1 \\ \{ t \in R : X(t) > 0 \} & \text{for } \alpha = 0. \end{cases}$$

For each $0 < \alpha \leq 1$ the $\alpha$-level set $X^\alpha$ is a non-empty compact subset of $R$. The linear structure of $L(R)$ with respect to addition $X + Y$ and scalar multiplication $\lambda X$ in terms of $\alpha$-level sets and defined by

$$[X + Y]^\alpha = [X]^\alpha + [Y]^\alpha$$

$$[\lambda X]^\alpha = \lambda [X]^\alpha \text{ for each } 0 < \alpha \leq 1.$$ 

Define the mapping $\delta : L(R) \times L(R) \rightarrow R$ defined by
On pointwise statistical convergence of order α of sequences of fuzzy mappings

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ABSTRACT

In this paper, we introduce the concept of pointwise statistical convergence of order α of sequences of fuzzy mappings. Furthermore we give the concept of $\alpha$-statistically Cauchy sequence for sequences of fuzzy mappings and prove that it is equivalent to pointwise statistical convergence of order $\alpha$ of sequences of fuzzy mappings. Also some relations between $S^0(\alpha)$-statistical convergence and strong $w^\alpha(\alpha)$-summability are given.

Keywords: Cesàro summability; pointwise statistical convergence; sequences of fuzzy mappings.

AMS Subject Classification: 40A05, 40C05, 46A45, 03E72.

INTRODUCTION

The idea of statistical convergence was given by Zygmund (1979) in the first edition of his monograph published in Warsaw in 1935. The concept of statistical convergence was introduced by Steinhaus (1938) and Fast (1951) and later reintroduced by Schoenberg (1959) independently. Over the years and under different names statistical convergence has been discussed in the theory of Fourier analysis, Ergodic theory, Number theory, Measure theory, Trigonometric series, Turnpike theory and Banach spaces. Later on it was further investigated from the sequence space point of view and linked with Summability theory by Connor (1988); Et & Nuray (2001); Et (2003); Et et al. (2006); Fridy (1985); Gökhan & Gürgör (2002); Gürgör et al. (2004); Işık (2011); Rath & Tripathy (1994); Salat (1980); Tripathy (1997) and many others.

The existing literature on statistical convergence appears to have been restricted to real or complex sequences, but Altun et al. (2006,2007); Altin et al. (2007); Altunok et al. (2009); Burgin (2000); Colak et al. (2009); Gökhan et al.
Statistically pre-Cauchy Fuzzy real-valued sequences defined by Orlicz function

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Abstract

In this article we have defined statistically pre-Cauchy sequence of fuzzy real numbers defined by Orlicz function. We have proved a necessary and sufficient condition for a sequence \( X = (X_k) \) of fuzzy real numbers to be statistically pre-Cauchy. We have also established some other results.

KEY WORDS: Statistically pre-Cauchy, statistically convergence, Orlicz function; fuzzy real numbers.

AMS CLASSIFICATION: 40A05; 46A45; 46E30.
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ON LACUNARY p-ABSOLUTELY SUMMABLE FUZZY REAL-VALUED DOUBLE SEQUENCE SPACE

Abstract. In this article, we introduce the class of p-absolutely summable fuzzy real valued double sequence $(x_{rn})^p$. We have studied some algebraic properties like solid, symmetric, convergence free, sequence algebra. Further, we establish some relation with the class of p-Cesàro summable double sequences and some other important inclusion results.

1. Introduction

A lacunary sequence is an increasing sequence $\theta = (k_r) (r = 0, 1, 2, 3, \ldots)$ of positive integers such that $h_r = k_r - k_{r-1} \to \infty$ as $r \to \infty$ with $k_0 = 0$. The interval determined by $\theta$ is given by $I_{k_r} = (k_{r-1}, k_r]$ and the ratio $\frac{k_r}{h_r}$ is denoted by $q_r$.

By a double lacunary we mean an increasing sequence $\theta_{r,s} = \{(k_r, k_s)\}$ of positive integers such that

$$k_r - k_{r-1} = h_r \to \infty \text{ as } r \to \infty \text{ with } k_0 = 0,$$

and

$$k_s - k_{s-1} = h_s \to \infty \text{ as } s \to \infty \text{ with } k_0 = 0.$$

The interval determined by $\theta_{r,s}$ is represented by $I_{r,s} = \{(k, \ell) : k_{r-1} \leq k \leq k_r, \ell_{s-1} \leq \ell \leq \ell_s\}$ and $k_{r,s} = k_{r,s}^1, h_{r,s} = h_{r,s}^1$. The ratios $\frac{k_r}{h_r}$, $\frac{k_s}{h_s}$ are denoted by $q_r$, $q_s$, respectively and $q_r q_s = q_{r,s}$.

Different classes of lacunary sequences have been studied by some renowned researchers in the recent past. Altin [1], Gokhan et al. [4], Savas [7, 8] and Savas and Patterson [9], Savas and Mursaleen [10], Subramanian and Esi [11], Esi [3], Tripathy and Dutta [16], Tripathy and Mahanta [17] are some of them.

2010 Mathematics Subject Classification: 40A05; 40A25; 40A30; 40C05.

Key words and phrases: double lacunary; fuzzy real number; solid; symmetric; convergence free; Cesàro sequence.

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Regular matrix of interval numbers based on Fibonacci numbers

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Abstract The main purpose of this paper is to introduce the criterion for the regularity of a matrix whose elements are interval numbers and define a regular matrix $F$ of interval numbers using Fibonacci numbers and to introduce some new sequence spaces $c_0(F)$, $c(F)$, $\ell_2(F)$ based on the newly defined regular matrix of interval numbers $F$ and investigate some relations related to these spaces.

Keywords Regular matrix · Interval number · Fibonacci number · Sequence space

Mathematics Subject Classification 11B39 · 46B45 · 40C05

1 Introduction

Interval arithmetic was first suggested by Dwyer [17] in 1951. Development of interval arithmetic as a formal system and evidence of its value as a computational device was provided by Moore [20] in 1959 and Moore and Yang [21] in 1962. Furthermore, Moore and others [18], [19], [22] and [25] have developed applications to differential equations.

Chiao in 2002, [14] introduced sequence of interval numbers and defined usual convergence of sequences of interval number. Recently, Esi [1–11], Şengüzel and Eryilmaz [16], Debnath et al. [23] introduced and studied some sequence spaces of interval numbers.

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Phosphoric acid modified montmorillonite clay: A new heterogeneous catalyst for nitration of arenes

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Abstract

The easily available montmorillonite clay is treated with phosphoric acid and 10 wt.% is found to be the optimum concentration of phosphoric acid that can be adsorbed chemically on the surface of the clay. Activity of this phosphoric acid treated montmorillonite clay (PMM) is determined by volumetric as well as potentiometric nitrination and characterized. Catalytic efficacy of PMM in nitration of various aromatic compounds is reported.

Keywords: Heterogeneous catalysis Montmorillonite Phosphoric acid Nitration

1. Introduction

Heterogeneous catalysis is receiving significant interest over homogeneous counterpart due to advantages like a) good dispersion of active sites, b) easier and safer handling, c) easier separation from the reaction mixture, and d) reusability [1]. Among heterogeneous catalysts, solid acids, prepared by adsorbing mineral acids onto a solid surface, are introduced mainly to replace highly corrosive mineral acids in the reaction medium and used in many important large-scale industrial processes [2]. In this regard, nitration of organic compounds is one of the most important industrial reactions and nitro-compounds are extensively utilized as a chemical feedstock for wide range of useful materials [3]. However, nitration of organic compounds is still being done by using fuming nitric and concentrated sulfuric acids in the industry. Hence, development of an efficient and eco-friendly protocol for nitration of organic compounds without using sulfuric acid is still desirable. Very recently, advances in sulfuric acid free toluene nitration are briefly reviewed [4]. Although a large number of reagents and catalysts are known [4–14], they suffer from limitations like longer reaction time, tedious work-up procedure and involvement of huge expenses for cleaning up. In an effort to develop environmentally benign catalyst for nitration reactions, solid acids are found to be more promising. Several solid acid catalysts such as sulfonated polyethersulfone [15], acidic resins [16], zeolites [17] and supported sulfuric acids [18] are used in nitration reactions. Regioselectivity in nitration reaction is observed while using polyoxometalates (POMs) or heteropolyacids [19–22]. Modification of solid oxides such as TiO2, SiO2 and MoO3 with phosphoric acids was reported [23–25] and the modified MOO3 in the presence of silica support was applied for toluene nitration [25]. Also, phosphate impregnated silica or alumina catalyst was prepared and found to be efficient in nitration of various organic compounds [26–29]. Many acidic zeolites have been used for non-selective vapor phase nitration of toluene. In order to achieve efficient and selective process zeolites are modified, for instance, ZSM-5 was modified with phosphoric acid and found to be highly selective for vapor phase nitration of toluene [30]. The impact of modification of ZSM-5 with phosphoric acid was also studied [31]. Also, there was no change in the hydrothermal stability of the zeolite, variation on the Brebner acid site was observed which is responsible for the efficient catalytic activity [31]. Pero-selectivity in nitration of toluene was also achieved by using montmorillonite clay as catalyst [32]. The clay minerals have been modified with acid as well as other reagents and applied in various organic transformations [33,34]. However, to the best of our knowledge, no report related to modification of montmorillonite clay with phosphoric acid and its application is available. Herein, the modification of montmorillonite clay with phosphoric acid and its efficacy in catalytic nitration of various aromatic compounds are reported.
O-Arylation with nitroarenes: metal-catalyzed and metal-free methodologies

Manoj Mondal, Saitanya K. Bharadwaj, and Utpal Bora

In this article, we focus on the introduction of nitroarene as an alternative electrophile for C-O cross-coupling chemistry in polar aprotic solvents and in the presence of a base at elevated temperature. Nitroarene undergoes cross-coupling with aryboronic acids or phenols under metal- or metal-free reaction conditions. Compared to the conventional aryl halides, nitroarene provides highly attractive and environmentally friendly options for the synthesis of arylethylanilines.

1. Introduction

Transition metal-catalyzed cross-coupling reaction has become a significant methodology for the formation of carbon-heteroatom and carbon-carbon bonds via the connection of electrophilic and nucleophilic fragments.1 In this domain, the development of Ullmann chemistry for the synthesis of diaryl ether has received extensive attention. Conventionally, the term “O-arylation chemistry” is mentioned, the prime consideration is the use of aryl halides as electrophiles in the presence of stoichiometric or catalytic amounts of either the copper,2 the palladium,3 or the iron4 based catalyst (Scheme 1, eqn [1]). However, aryl halides are

generally environmental pollutants, and the by-product generated from their coupling often hampers the isolation and purification processes of the desired products. Additionally, irrespective of their reactivity (Cl < Br < I), their availability (I < Br < Cl) and cost limit widespread applications. Consequently, numerous novel electron-rich ligands and related metal complexes were developed as catalysts which have led to the successful coupling of even less reactive though abundant and inexpensive aryl chlorides under mild conditions.5 Although plethora of electronically and structurally diverse aryl halides are available today, some of the structurally targeted substrates required for multistep synthesis may not be easily accessible. Moreover, very few methods for O-arylation with activated aryl halides in the absence of metal are available in the literature6 (Scheme 1, eqn [2]). Thus, the exploration of efficient alternative electrophiles is getting considerable attention not only due to academic interest but also to provide additional options when a particular application is under consideration.

Manoj Mondal was born in Arunchal Pradesh, India, in 1986. He received his BE from Digboi College (2007) and his MSc in organic chemistry from Dibrugarh University (2010). He is currently a PhD scholar in the group of Dr Utpal Bora, where he works on the development of transition-metal based catalytic systems and their applications in carbon-carbon and carbon-oxygen bond formation reactions.

Saitanya K. Bharadwaj received his MSc from Gauhati University, Assam, in 2003 and PhD from Indian Institute of Technology, Gauhati, India, in 2009. After postdoctoral study at the University of Mississippi, USA, and Technical University of Munich, Germany, he joined Prayagshri College as Assistant Professor. He was a recipient of the Eli Lilly and Company Asia outstanding Thesis award in 2010. His research interest include organometallic and green chemistry.
A Small Insulinomimetic Molecule Also Improves Insulin Sensitivity in Diabetic Mice

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Abstract

Dramatic increase of diabetes over the globe is in tandem with the increase in insulin requirement. This is because destruction and dysfunction of pancreatic β-cells are of common occurrence in both Type1 diabetes and Type2 diabetes, and insulin injection becomes a compulsion. Because of several problems associated with insulin injection, orally active insulin mimetic compounds would be ideal substitute. Here we report a small molecule, a peroxynitrite compound i.e. DmpzH(V=O)O2H(dmpzH), henceforth referred as dmpz, which specifically binds to insulin receptor with considerable affinity (KD-1.17µM) thus activating insulin receptor tyrosine kinase and its downstream signaling molecules resulting increased uptake of [14C]2-Deoxy-glucose. Oral administration of dmpz to streptozotocin treated BALB/c mice lowers blood glucose level and markedly stimulates glucose and fatty acid uptake by skeletal muscle and adipose tissue respectively. In db/db mice, it greatly improves insulin sensitivity through excess expression of PPARγ and its target genes i.e. adiponectin, CD36 and aP2. Study on the underlying mechanism demonstrated that excess expression of Wnt3a decreased PPARγ whereas dmpz suppression of Wnt3a gene increased PPARγ expression which subsequently augmented adiponectin. Increased production of adiponectin in db/db mice due to dmpz affected lowering of circulatory TG and FFA levels, activates AMPK in skeletal muscle and this stimulates mitochondrial biogenesis and bioenergetics. Decrease of lipid load along with increased mitochondrial activity greatly improves energy homeostasis which has been found to be correlated with the increased insulin sensitivity. The results obtained with dmpz, therefore, strongly indicate that dmpz could be a potential candidate for insulin replacement therapy.
Surfactant free synthesis of gold nanoparticles within meso-channels of non-functionalized SBA-15 for its promising catalytic activity

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ABSTRACT

This work reports surfactant-free synthesis of monodispersed gold (1-2 nm) particles confined within the pore channels of ordered hexagonal mesoporous silica SBA-15 (Au-SBA-15), by a modified wetness impregnation method. The synthesized Au-SBA-15 composite showed excellent catalytic activity towards the reduction of different wastewater organic pollutants as well as their mixture under ambient conditions. The composite was also investigated for the reduction of 4-nitrophenol (4-NP) to 4-aminophenol (4-AP), 3-N, UV-GIX-ray, spectrophotometry, HPLC, absorption spectrophotometry, GC-MS, FT-IR spectroscopy, and TEM were employed to characterize the catalyst samples. The wetness impregnation method followed by a washing step with dilute aqueous NaOH was found to be an effective route to synthesize stable and highly dispersed small gold nanoparticles (Au NPs) within the meso-channels of SBA-15. All the catalytic reactions followed pseudo-first-order kinetics and catalytic efficiency of the composite was found almost constant up to five cycles.

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1. Introduction

Although gold, in the bulk state, had long been regarded as inactive for catalytic applications due to its inert nature, it exhibits an astonishingly high activity for several reactions, both in the liquid and in the gas phase when it is well dispersed on different supports [1-4]. Haruta first discovered a remarkable activity of supported gold nanoparticles (Au NPs) in CO oxidation and since then, different preparation methods have been developed to obtain highly active gold catalysts, and several potential application fields have been explored [5,6]. In general, supported Au NPs in the ultra-fine particle size range (2-4 nm) are highly reactive, although the particles sized between 10 and 50 nm have also been reported to exhibit certain reactivity [6]. Nevertheless, the catalytic activity seems to depend critically on the size of Au particles (high activity for size of 2 nm) when they are attached on "active" supports such as silica and alumina. Therefore, it is crucial to gradually reduce the particle size of gold until reaching the optimum size over the "active" support for the possible improved activity [7]. Up to now, various methods have been employed to prepare supported Au NPs. As per literature report, impregnation (IMP) is the first method to synthesize supported gold catalysts. However, this method with the most common gold precursor HAuCl 4 customarily produces large Au particles after thermal treatment and hence catalytically less active [8,9]. For this reason, IMP has been considered as the unsuitable route to obtain highly active catalysts since long time. As an example, Kumar et al. recently demonstrated that IMP is practically inferior to other methods such as Homogeneous Deposition-Precipitation (HPDP) and Micro Emulsion (ME) for the formation of smaller Au NPs on SBA-15 [10]. Their study showed that conversion of benzyl alcohol to benzaldehyde increased with decrease in the size of Au particles. Smaller Au particles with higher percentage of dispersion on the support SBA-15 had a beneficial effect on the catalytic conversion. In an another recent study, Wang et al. prepared Cu-SBA-15 catalysts by three different methods, namely, IMP, DP, and HPDP. The Cu-SBA-15 catalyst prepared by the HPDP method was found to be the most efficient for methyl acrylate hydrogneration due to highly dispersed smaller (4.5 nm) Cu particles and the synergistic effect between Cu and SBA-15 species. In contrast, the other two methods, IMP and DP produced Cu particles of size 85 nm and 54 nm, respectively, and limited catalytic activity was observed [11]. Since the late eighties, several other preparation methods have been developed in order to achieve active Au catalysts. Among them, deposition-precipitation (DP) method was demonstrated to be the most successful way for the synthesis of well dispersed, ultra-small Au particles on oxide substrates having high activity for various transformation reactions [2,4]. Noteworthy that this method is not suitable for silica supports as under alkaline condition, deposition of Au on silica leads to the loss of silica's structural properties [2,12,13]. Moreover, the weak interaction between gold and silica support caused complicacy in achieving a finest particle size range of gold. In such cases, mesoporous silica with well-defined pore size seems to be appropriate support for the confinement of Au NPs because these materials could produce

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Problems and Prospects of Spiritual Tourism Development in and around Greater Guwahati

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ABSTRACT: Being a fast growing industry and inexhaustible industry potentialities, it has several positive sides like income generation, foreign exchange, employment opportunity. Among the different facets of tourism, spiritual tourism is one of the chief modes for attracting a large number of tourists. The state of Assam has numerous temples and other religious institutions. The capital city of Guwahati itself is a hub of many temples. Though it seems like religious yet it has different social positive effects in the form of spiritual tourism. Here an attempt has been made in this paper to bring into light the potentiality of spiritual tourism in near future and the other associated benefits that the locale can get out of it. Attempts have also been made to trace out the drawbacks of the temples and to overcome those.

Keywords: Dependency, People, Pilgrimage, Sanctuary, Tourism.

1. Introduction:

Spirituality has recently become an important subject of research in social and business areas [1]. Spiritual tourism is an important component of Indian tourism industry as India is a land of spirituality endowed with many places of worships, pilgrim centres and religious monuments [2]. In spite of being numerous tourist destinations for tourism to develop, the industry is still struggling in the Country in general and the state of Assam in particular. The pathetic condition for such poor condition of tourism is due to the lack of proper planning mechanisms. Proper maintenance, inadequate infrastructure, mismanagement are some of the important causes for the contemptible development of tourism in the state of Assam [3]. So here is the question how to develop the industry in the state with proper planning and strategies for excellence. Tourism in Assam is still in infancy. However the capital city of Guwahati along with its surrounding has a good numbers of temples which have enormous potentiality for the spiritual tourism to proliferate in the region. So
Asymptotically Equivalent Generalized Difference Sequences of Fuzzy Real Numbers Defined by Orlicz Function

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Abstract: The aim of this article is to introduce the classes of strong $\Delta^m$-lacunary asymptotically equivalent, $\Delta^m$-lacunary asymptotically statistically equivalent, strong $\Delta^m$-lacunary asymptotically equivalent sequences of fuzzy real numbers in terms of Orlicz function. We have established some relations between the classes of the sequences.

Keywords: asymptotically equivalent; lacunary; statistically convergent; fuzzy real number; Cesaro summable; Orlicz function.

2010 Mathematics Subject Classification: 40A05; 40C05; 46A22.

1 Introduction and Preliminaries


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GFR-ESTIMATING IN PATIENTS WITH CHRONIC KIDNEY DISEASE: A CASE STUDY

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Abstract

Chronic kidney disease (CKD) is emerging to be an important chronic disease globally and India is likely to pose for this major problem and this increase of CKD leads to the decline of Glomerular filtration rate (GFR). GFR is routinely used to assess kidney function. Research studies and clinical populations with measured GFR were done from March 2017 to December 2017 and 52 patients were interacted. GFR was measured from standardized creatinine levels, sex, race, and age.

Keywords: Chronic Kidney Disease, Glomerular Filtration Rate, Body Mass Index.
EVALUATING UREA AND CREATININE LEVELS IN CHRONIC RENAL FAILURE: A PROSPECTIVE STUDY

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ABSTRACT

Chronic kidney disease (CKD) is emerging to be an important chronic disease globally and India is likely to pose for this major problem. Chronic renal failure induces a slow and progressive decline of kidney function and results in serious medical condition. The survey shows that CKD is more common in male then in female with people ranging in between 41 to 50 years. The reason may be attributable to hypertension, diabetes or some other age related changes. Molecular basis of this relationship need to be evaluated to find out possible solution.

Keywords: Chronic Kidney Disease, Glomerular Filtration Rate, Blood Serum, Haemoglobin, Creatinine and Urea Profiles.

Introduction

Chronic kidney disease (CKD) is emerging to be an important chronic disease globally (Kroegern et al. 2001). In India, given its population >1 billion, the rising incidence of CKD is likely to pose major problems for both healthcare and the economy in future years. Indeed, it has been recently estimated that the age-adjusted incidence rate of ESRD in India is 229 per million population (perp) (Mody and Jha, 2005). It is estimated that in the next years, the weight of CKD will increase, and over two million persons are expected to be receiving renal replacement therapy (dialysis or kidney transplant) by 2020 (Nisha et al. 2017).

Chronic renal failure induces a slow and progressive decline of kidney function. It is usually a result of complications from another serious medical condition. Unlike acute renal failure, which happens quickly and suddenly, chronic renal failure happens gradually - over a period of weeks, months, or years - as the kidneys slowly stop working, leading to end-stage renal disease (ESRD) (Eduardo et al. 2015).

In chronic renal failure there is a steady and continued decrease in renal clearance or glomerular filtration rate (GFR), which leads to the gathering of urea, creatinine and other chemicals in the blood. According to the Kidney Disease Improving Global Outcomes (KDIGO) declaration GFR of less than 60 ml/minute/1.73 m² is the indication of CKD (Eduardo et al. 2015). KDIGO additionally classified the CKD in different stages which are: GFR 30 to 60 ml/minute as stage three; GFR 15 to 30 ml/minute as stage four; and GFR less than 15 ml/minute as stage five of CKD (Levey et al. 2005).

CREATININE IS PRODUCED IN THE MUSCLES BY THE NON-ENZYMATIC CHANGES OF CREATINE AND PHOSPHOCREATINE. THE LIVER HAS A MONUMENTAL ROLE IN THE ASSEMBLY OF CREATININE THROUGH METHYLATION OF GUANIDINE AMINOACETIC ACID (Eduardo et al. 2015). THE NORMAL SERUM CREATININE LEVEL IS 0.5 TO 1.0 mg/dL, ACCORDING TO GENDER AND RACE VARIATIONS, PREGNANCY, AND DIET (Hamilton et al. 1972).

Materials and Methods

Data was collected from the Department of Nephrology, Guwahati Medical College & Hospital, Guwahati between March 2017 and December 2017, 80 patients were included after providing informed consent. Creatinine was estimated by the Jaffe reaction, Urea was measured by diazotization colorimetric method and Berthelot reaction.

Results and Discussion

A total of 80 patients were analyzed (Fig. 1). These patients were randomly selected and their serum urea level, serum creatinine level and haemoglobin level were checked. Age and gender wise distribution was not to find the association between dialysis and gender and age although male between 41 - 50 age group are highly affected whereas in case of female the age group was found to be 31 - 40, may be due to physical status of patients (Eduardo et al. 2015).
Status of Ericulture in Kamrup District, Assam: A Case Study of Bhanubhakta and Salbari areas under Boko Subdivision

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ABSTRACT
Ericulture, an agro-based customary activity plays an important role in generating income and livelihood sustainability for the rural mass in most of the people of Assam, India. It is ideal, as it requires low capital and labor intensive thus creates jobs and it is commercially attractive. This type of sericulture has shown significant promise, after mori culture, which has been the leading source of world silk. Ericulture has recently aroused interest among some silkworm farmers and is gradually gaining popularity due to its ease of rearing when compared to B. mori silkworm. This paper therefore focuses on the state of Ericulture by looking into the regions practicing this form of sericulture and the rearing practices in Kamrup district of Assam particularly Bhanubhakta and Salbari areas under Boko Subdivision.

KEYWORDS: Ericulture, agro-based, income generation, silk rearing

Introduction
The term development implies to a set of multifaceted aspects. In terms of productive livelihood it is the maximization of employment and increasing income generation with improvement in the quality of life for all (Singh, 1989). India has the unique distinction of being the only country in the world, culturing all the four varieties of silk i.e., Mulberry silkworm Bombyx mori, Oak tasar silkworm Antheraea pernyi, Muga silkworm Antheraea assamensis and Eri silkworm Samia ricini for commercial purpose. Ericulture provides employment to most of the rural population of India, especially to the tribal sections of the society (Anonymous, 1995). Ericulture is an important avocation for economic development of rural areas because of high employment orientation, low capital investment and remunerative production (Meenal and Ranjan, 2000; Odor et al., 2010). Socio-economic surveys have affirmed that ericulture can act as additional profitable business as compared to agricultural crops (Ramana, 1987).

The NE Region of India is rich in Sericulture biodiversity and has been practised since the time immemorial (Sagari et al., 1994). Out of all, the ericulture dominate amongst sericulture in tradition as well as in culture (Chowdhury, 1982, 1994). The ethno origin of this region uses Eri pupae as one of their traditional dish (Samah, 2011). For the tribal in northeastern India, the ehi chrysae (gr. pa) is a delicacy and the cocoon is more or less a byproduct. Similarly, Tectia and Bagjoy (Tectia and Bagjoy, 2002) found that rearing of Eri silkworm is almost a household affair among the Bodo Community. Eri rearing is conducted not only for its silk but also for eating preparation of pupae as one of the delicacies (Odor et al., 2010). The survey was designed to study the current status of ericulture in Kamrup district specially in Bhanubhakta, Salbari area under Boko subdivision to enhance the popularity and development in the area.

Materials and methods
The Bhanubhakta, Salbari areas under Boko subdivision of Kamrup (Rural) District of the State of Assam has been selected as the study area. Within the area ericulture exhaustive farmers were interacted for the study. The farmers were selected based on the intensity of Sericulture practiced. The qualitative and quantitative data were collected through observation method, case study and informal interview. The informal interviews were conducted both on the individual and group level. The information consisted of various categories of people, young and old, men and women, labourers, local leaders, extension staff and government officials. The data concerned a wide range of topics touching upon the various...
Where do Women Stand in Assam of North East India? Examining Socio-Economic Status of Tribal and Non-Tribal Women in Assamese Societies

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Abstract

A detailed examination of women’s status in a specific location is necessary to have adequate and correct information for effective planning and implementation of government policies. The paper intends to examine and compare the socio-economic status of tribal and non-tribal women of different communities in Assam of North East India. It is found from the study that the status of women in Assam is somewhat better in terms of fulfilling strategic gender needs like participation in decision making process, control over own body etc. In tribal societies, women are even in better position in terms of participation in decision making process in the society. However, the socio-economic status of women of Assam in respect of fulfilling practical gender needs like women workforce participation, health status etc. is not at all better than the all India average. The paper concludes with the view that women should be aware of their rights and responsibilities to make a change in the society as well as for upliftment of the status of women in the society.

Keywords: Status of women, strategic gender needs, practical gender needs, tribal and non-tribal women.

Introduction

Women constitute nearly half of the world population. But, one of the greatest challenges of 21st Century is that women are still not treated equally around the world. The socio-economic status of women is not equal vis-à-vis that of men in the society.

The ‘Status of Women’ can be defined as the position of women in society in relation to men in the same society, or among women in another society or sub-culture. ‘Women’s status’ is a multidimensional entity. The various components of status may move in different directions in a given time period. Status may be viewed in its relative context also. According to Ruth B. Dixon (in Strategies for Development in South Asia, 1978), the concept ‘women’s status’ should focus on “the degree of women’s access to (and control over) material resources (including food, income, land, and other forms of wealth) and to social resources (including knowledge, power, and prestige) within the family, in the community, and in the society at large” [1].
समकालीन हिंदी नाटक विधा में वदनते जीवनमूल्य

अतिशी संपादक
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हिंदी तथा असमीया नाटक : विंग्ड डंस से अवलोकन

नंदिता राजेंद्री
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ट्रिस रेस्ट में मंगी और माहित्य परिपक्व होते हैं नहीं नाटक का प्रचार भी संभव है। आज के बैठक में मंगी और माहित्य तंत्र नहीं है। अतः नाटक रचना आज की विद्वत थी। संकुचित माहित्य की नाटक परमगोष्ठी ब्रह्मगुप्त के नामांकन के मूल अन्वेषण समूह है जो अपने हंसकर्सियों की वित्तकर्मी की दाय के रूप में हिंदी तथा असमीया नाटकों का प्रचार हुआ।

परमगोष्ठ भारतीय नोकराधम और विद्वत

लोक नाटक परमगोष्ठ का निकास क्रम में नाटक परमगोष्ठी के समाधि ही नाटकीय है। भाषा निकास के साथ ही मंगी की निकास हुआ और परमगोष्ठी क्रम से लोक नाटक का निकास हुआ। लोक नाटक के रूप में मंगीकीय, नाटकीय तथा अन्य नमूने निकास है। असमीया लोक नाटक परमगोष्ठ भारतीय नाटक समाधि के अन्तर्गत सम्पन्न है। असमीया लोक नाटक सम्मानित असमीया नाटक का उपचार उपलब्ध है। असम के उत्तर पूर्व में अविश्वसनीय एक राह है। इन पात्र के भौगोलिक, प्राकृतिक, वास्तुकृतिक निर्माण के कारण लोक नाटक परमगोष्ठ तासी नाटक नहीं समाप्त है। लोक नाटक से जुड़ा माहित्य नाटक

विंग्ड डंस निकास हुआ। इसका निकास

1. महानेवाण पर आधारित है “सीताहरण”, “राक्षस वध” आदि;
2. वीरस्वार व्याख्या “चंद्र गोरेर”, “चौदा पलट चंदे” आदि,
3. ब्रह्मचर्य व्याख्या “कुमार कृष्ण साधु”, “जीर्णमहाराज साधु” आदि,
4. अधिशासिक व्याख्या “जपसेरी ज्ञानवी” आदि,
5. सामाजिक व्याख्या “राम नगरी” आदि,
6. सार्वजनिक प्रशासन “रिंगिन भारतीय” आदि

असम के लोक संगीत के मुख्य नागदुबारों में जोगालिनी, कुटिया गुड़, पुलिला गृह(puppet dance), पहनी, कुशान आदि विशेष उल्लेखनीय है।

अन्यतः एक प्राचीन नागदुबारों में है। असमीया लोक माहित्य के अन्तर्गत विंग्ड डंस का विशेष महत्व है। नंदिता राजेंद्री के अन्मन में से लोकार्चित के अर्थ भाषा के कई क्रियाओं को उद्धार हुए जिन्होंने पापनीया और आजाद नामक महाकाव्य समाप्त किया। इस समाधि की दो पापनीया में विभिन्न क्रियाओं का संग्रह है। एक नाटक या पापनीया का प्रशासन व्याख्या और दूसरा नामांकन, महाभारत, पुराण आदि के संरचित।

विंग्ड डंसशील के बारे में भी रचना रीति दृष्टि के एक है। इसके इस जोगालिनी के साथ ही लिखा गया है। जोगालिनी में एक जोगालिनी (ज्योति नरको), जीत पाल(जापानी तरीक़े) के साथों से गीत, हार्दिक के सुंदर, मायूर्षी और अंसी चंतहीं के द्वारा रचना करते हैं। काव्य शरीर के साथ ही जोगालिनी का नाम हार्दिक के माध्यम से सामाजिक के सामने प्रविष्ट करते हैं। जोगालिनी का जोगालिनी कविता महानाटक पंड का समाप्त है। नातककार: जिनी चंद्र का संरचित अवस्था,
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Monazite and xenotime U–Th–Pb\textsubscript{total} ages from basement rocks of the (central) Shillong–Meghalaya Gneissic Complex, Northeast India

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Monazite and xenotime are the two most useful and commonly used geochronometers for deciphering ages from metamorphic rocks. The low analytical cost involved in electron probe micro-analysers chemical dating, ease of sample preparation and abundance in metamorphic rocks of wide P–T conditions make monazite and xenotime dating most widely used technique for age determination amongst metamorphic petrologists. This contribution presents age comparisons between coexisting monazite and xenotime in the basement metapelite rocks of the central part of the Shillong–Meghalaya Gneissic Complex (SMGC). Thermobarometric estimates in the studied samples indicate granulite facies conditions of metamorphism with peak P–T conditions of ~6.5 kbar and ~750°C. Results indicate that xenotime in the basement rocks in the central SMGC formed in four discrete geological events while monazite either formed only in the latest Pan-African granulite grade metamorphic event or recrystallised during this event. Monazite in the studied samples yielded a single ubiquitous age of ca. 500 Ma. Xenotime in the study area, although found in only one sample, preserves four distinct ages at 1153 ± 29, 830 ± 36, 823 ± 41 and 496 ± 11 Ma. Preservation of Grenvillian ages in xenotime from central SMGC marks the eastward extension of Rodinia amalgamation front in the Indian Shield. The Neoproterozoic ages in xenotime from central SMGC suggest that the ca. 820 Ma high-grade metamorphism in the Eastern Indian Tectonic Zone had a wider impact in the SMGC than perceived previously.

Keywords. Monazite; xenotime; U–Th–Pb\textsubscript{total} dating; Shillong–Meghalaya.

1. Introduction

Monazite [(\text{LREE})\text{PO}_4] and xenotime [(\text{Y, LREE})\text{PO}_4] are relatively common accessory minerals in both magmatic and metamorphic rocks and have significant concentrations of Th, U and Pb. The occurrence of insignificant amount of common Pb relative to radiogenic Pb produced by the decay of Th and U in monazite and xenotime makes them ideal for retrieving age information using electron probe micro-analysers (EPMA) U–Th Pb\textsubscript{total} dating method (Suzuki and Adachi

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Facile Access to Cyclopentadienes via Catalytic Intramolecular Palladium-Ene Reaction of 2,4-Pentadienyl Acetates

Saitanya K. Bhuradnavet al.
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Abstract We have recently disclosed a palladium-catalyzed Trofimov-type allylstannylation reaction of 2,4-pentadienyl acetate with a formyl group containing a 2,4-pentadienyl acetate. However, the palladium-catalyzed allylstannylation reaction of 2,4-pentadienyl acetate with a formyl group containing a 2,4-pentadienyl acetate is an efficient method for synthesizing cyclopentadienes.

Key words Trofimov reaction, metal-stable reaction, metal-stable reaction, natural products, applications, cyclopentadienes

The Trofimov reaction (TR) is a highly versatile carbon-carbon and carbon-heteroatom bond-forming reaction (Scheme 1). A typical TR reaction involves the coupling of electrophilic (allyl) halides with a wide range of nucleophiles, such as active methylene enolates, amides, and amines. By this means, the TR reaction was employed as an efficient method to synthesize many biologically important and pharmaceutically significant compounds.

Scheme 1. Palladium-catalyzed Trofimov-type allyl alkylation reactions.

In an analogous manner, Pd-catalyzed allyl alkylation reactions of 2,4-pentadienyl acetates or carbonates was also studied (Scheme 2). However, the scope of this reaction...
Arsenic Stress Responses and Tolerance in Rice: Physiological, Cellular and Molecular Approaches

Jyotirmay Kalita, Amit Kumar Pradhan, Zina Moni Shandilya, Bhaben Tanti

Abstract: Arsenic (As), a potentially toxic metalloid released in the soil environment as a result of natural as well as anthropogenic processes, is subsequently taken up by crop plants. In rice grains, As has been reported in Asia, North America and Europe, suggesting a future threat to food security and crop production. As by dint of its availability, mobility and phytotoxicity, is the most harmful species of As for the rice crop. Specific transporters mediate the transport of different species of As from roots to the aboveground parts of the plant body. Accumulation of As leads to toxic reactions in plants, affecting its growth and productivity. Increase in As uptake leads to oxidative stress and production of antioxidants to counteract this stress. Cultivars tolerant to As stress are efficient in antioxidant metabolism compared to sensitive ones, iron and selenium are found to have ameliorating effect on the oxidative stress caused by As. Microbes, even many indigenous ones, in the plant rhizospheres are also capable of utilizing As in their metabolism, both independently and in association. Some of these microbes impart tolerance to As-stress in plants grown in As contaminated sites.

Key words: arsenic; rice; phytotoxicity; hyperaccumulator; phytochelatin; antioxidant; mitigation

Arsenic (As), a potentially toxic metalloid, is a naturally occurring element ubiquitous to all soils (Smedley and Kinniburgh, 2002; William et al., 2005). It is the 20th most common element in the earth’s crust (Mandal and Suzuki, 2002). Soil contains 1.5-3.0 mg/kg of As. As is present in inorganic forms in various minerals in soil, the important ones being arsenite, arsenate, etc. Arsenic in both inorganic and organic forms, gets mobilized due to natural and human activities, and becomes more readily available to living organisms.

Among the natural sources of mobilization of As, weathering of As-containing minerals (Woolson, 1977; Smedley, 2006) and the activities of microorganisms (Bentley and Chasten, 2002; Turpeinen et al., 2002) are prominent. On methylation by microbes, As is released as monomethyl arsenate (MMA) or dimethyl arsenate (DMA) (Bentley and Chasten, 2002). Some microbes utilize As in their metabolism, and release the toxic trimethyl arsenic oxide (TMAO) gas which is subsequently released to the atmosphere (Mandal and Suzuki, 2002).

Human activities that release more As in bioavailable forms include application of As pesticides, use of As in paints to be subsequently released by molds and bacteria, mining of metals and heavy extraction of groundwater. Insecticides (calcium arsenate (Ca3As2O6) and lead arsenate (Pb3As2O6)), herbicide [sodium arsenite (Na2HAsO3)], rodenticides arsenous oxide (As2O3) and sodium arsenite (Na2AsO3) contain As (ICAR, 2009). Their residues remain in the soil, get dissolved in the groundwater and become easily available to living organisms. As-containing wallpaper paints, fed upon by molds and bacteria, led to release of the ‘Gasio’ gas, which was identified to be trimethyl arsenic (Woolson, 1977). Metall mining,

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Gold-manganese oxide nanocomposite suppresses hypoxia and augments pro-inflammatory cytokines in tumor associated macrophages


ABSTRACT

The tumor microenvironment, essentially hypoxic, is sustained by the hypoxia inducing factor (HIF), released from the pro-tumorigenic tumor associated macrophages (TAMs), functionally identical to the M2 phenotype macrophage. Stability of HIF mainly depends on molecular oxygen and an iron-dependent enzyme prolyl hydroxylase, while its activity may be inhibited by high levels of reactive oxygen species and nitric oxide. The present work shows a novel approach utilizing the anti-tumorigenic potential of a gold-manganese oxide nanocomposite material in the tumor microenvironment that affects tumor hypoxia, exploiting the possibility of restoring the immunomodulatory nature of TAMs from their pro-tumorigenic state. Along with the biochemical markers, ELISA and FCM analysis have also confirmed the potential of these nanoparticles in reverting both the M1 phenotype of TAMs to their classically activated M1 phenotype.

1. Introduction

Macrophages and monocytes are key components of the host response to tumor cells. Together with other immune cells, they influence tumor development in a positive as well as a negative way [1,2]. M1 are the subsets of macrophages, activated through classical pathway through intercellular gamma-dependent activation and are cytotoxic in nature whereas, the M2 type of macrophages, activated alternatively through limiting interleukin-15 and 4, promote cell survival in fragile environment like infections or in the tumor microenvironment [7,8]. This M2 phenotype is practically similar to tumor-associated macrophages (TAM) which promote anti-inflammatory and pro-tumorigenic properties [1,2].

For this study, we have preferred to use a modified two-stage carcinogenic model, where a single subcutaneous dose (0.5 mg/20 g mouse) of the carcinogen 3-methylcholanthrene (MCA) was administered followed by multiple subcutaneous doses of the promoter phorbol myristate acetate (PMA) [8]. MCA-induced tumors in mice, especially sarcoma, have been a preferred model for tumor immunology because of their antigenic properties [7] and the discovery of immunomodulating cytokines signify complemented the immunological influences of these tumor models [8].

Optimum oxygen level is a prerequisite for any tissue environment to grow or sustain normally. But under certain physiological conditions like in embryonic development and when muscles are under stress, a condition of hypoxia can be observed, which can be explained as a condition of low oxygen availability to the tissue environment. On the contrary, hypoxia can also be noticed in some pathophysiological instances that include inflammation and solid tumor formation [9]. In fact, the hypoxic condition is essential for the solid tumor to survive and grow as this low oxygen level triggers cascades of events that eventually support the growth of tumors. Angiogenesis, cell proliferation, DNA replication are some of the events that are mainly stimulated by hypoxia and hence push the tumor towards malignancy, making the tissue resistant to radiotherapy and chemotherapy [10-12]. Hypoxia-inducible factor (HIF) through its signaling pathways maintains the hypoxia and simulates the pro-tumorigenic events [13-15]. HIF is a heterodimer with an α subunit and a constitutively expressed β subunit [16,17]. Among the three types of HIFs, the role of HIF-1α is still not clear, whereas, HIF-2α is tissue-restricted but HIF-1α is widely expressed in different tissues [18,19]. Under normoxia (normal O2 level) conditions, the HIF-1α subunit is ubiquitinated and subjected to proteasomal degradation, catalyzed by O2 and iron-dependent enzymes prolyl hydroxylases (PHD) [20,21]. But in hypoxic condition, PHDs become inactive, thereby allowing the accumulation of HIF-1α in the microenvironment [22]. Hypoxia can cause the
A new type of difference class of interval numbers

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Abstract

In this article we introduce the notation difference operator $\Delta_m$ ($m \geq 0$ be an integer) for studying some properties defined with interval numbers. We introduced the classes of sequence $c(p)(\Delta_m)c(p)(\Delta_m)$ and $c(p)(\Delta_m)$ and investigate different algebraic properties like completeness, solvability, continuity, free etc.

Key Words: Interval number, Completeness, Solvability, Continuity, Free.

AMS Subject Classification: 40C05, 40J05, 46A15.
Health Expectancy Under Dynamic Set Up for India and its Selected States

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ABSTRACT

The quality of life is usually measured in terms of health expectancy. It is vital to know that whether an increase in life expectancy leads to a similar increase in years spent in reasonable health. Further, increases in life expectancy due to the gradual decline in mortality lead to the concept of dynamic life table. In this context, this paper proposes a new method to measure the health expectancy under dynamic approach and consequently access the pattern of changing mortality scenario, resulting in a longer life with good health. In other words, the dynamic healthy life expectancy is the aggregate average number of years that a person lives in a healthy state with continuous changing mortality scenario. The usefulness of the proposed indicator is demonstrated for India and some of its major states for the year 2011. The result showed that, for both sexes, the health life expectancy at birth were more under dynamic consideration as compared to usual consideration.

Keywords: Healthy expectancy, Dynamic, India.

INTRODUCTION

The life expectancy is the most widely used measure of health, although it only takes into account the length of people’s life and not their quality of life. In almost all the world, improvements in health care, development in medical technologies and also improvement in sanitation facilities are enabling people to live longer. As people live longer and mortality rates have been declining, several health related questions arise about the quality of years lived. To answer these questions efforts have been made to develop a summary measure of population health that takes into account both current mortality and morbidity levels of a population. This concept is well known as health expectancy. More specifically, health expectancy is defined as the number of remaining years at a particular age that an individual can expect to live in a healthy state (however way health may be defined) if current mortality and morbidity prevalents. In most of the countries, today, health expectancy has been used as the central summary indicator of population health status.

Further, in a period life table the assumption of a constant mortality rates prevails over the years and does not allow for the changes in mortality probabilities. However, the past records in both developed and developing countries showed a gradual decline in mortality and a continuous increase in life expectancies. In such case, an extension of the period life table has been proposed by Demeny and Spencer (2011) which would explicitly allow for the possibility of further changes in mortality. This extension has been named as ‘dynamic’ extension of the period table that draws out the implications, for survivorship and life expectancy, of observed rates of change of death. The concept of dynamic life table is also extensively used in the context of Indian data by Sharma et al., (2017) to demonstrate a more accurate picture of the mortality scenario.

Health expectancy is preferred to life expectancy as an indicator for population health status because it is based not just on mortality, but also on morbidity. Moreover, the continuous changes in mortality, in a developing country like India, are largely the resultant of improved health care facilities and medical advances. Since the expected changes in mortality over time can be examined by using dynamic life table. Similarly, one might be keen interest to calculate the health expectancy when both the mortality and morbidity are likely to change over time. Thus, in the present paper we try to develop an indicator, namely, dynamic health expectancy which would reflect the effects of improving morbidity on mortality.
INTRODUCTION

Drying is one of the most commonly practiced methods of fish preservation in Assam and in other traditional and primitive preservation methods. It is one of the world's oldest known preservation methods (Gilani, 1965; Paul et al., 2016 & Sarmah et al., 2016). Several narratives are also providing in this locality reflecting the edible aspects of the folk life of the people living in Jagirhaar area. One such narrative is this: once a wise man lost everything including his wealth and family. One day, he was sitting at the bank of a river. Suddenly, he saw some fishermen. He went to them and requested them to take him to their village. Out of pity, the fishermen gave him shelter in their village. The wise man taught them how to dry fish and he could be preserved for future and for a long time. The fishermen listened to what he advised and started the process of drying fish in this Jagirhaar locality (Rathodaridhe, et al., 2009). Thus, this area acquires a special identity in respect of both social and economic aspects.

Dried fish is as important as fresh in terms of protein consumption as the crude protein levels are likely to be almost twice those of fresh fish in terms of quantity, if not quality (Murray & Little, 2000). This is especially the case for the poor for whom dried fish represents the most cost-effective animal protein source. Dried fish has ten times longer shelf life and is a great source of protein, essential fatty acids, and many minerals (Baird et al., 2016). It is consumed all over the world for its nutritional value, taste and aroma. It is also considered as an important exportable fishery product (Hassan, 2007). Dried fish of Jagirhaar Dry Fish Market like Channa punctatus, Anabas testudineus, Puntius spp., Rohu spp., Labeo rohita are available in the market areas near riverbank accounting highway. Different species of dried fish are imported from Kapsa & Bilhar to fulfill the ever-increasing demand (Singh et al., 2012). These dried fishes are assembled at Jagirhaar Market and after selling in local, they were further dried and sorted out quality wise to different parts of North Eastern Region and even to Neighbouring countries like Nepal (Pradhan et al., 2017). Complete information of diversity of dried fish products available in jagirhaar market and its marketing system is lacking. Therefore, this survey is meant to deal with bio-chemical and quantitative analysis, its quality as well as consumer's preference for dry fish products in Jagirhaar Dry Fish Market.

MATERIALS AND METHODS

Study Area: The study was carried out at Jagirhaar Dry Fish Market during June 2016 to January 2017. At the survey site, individual fish retailers were questioned. The surveyors canvassed interviewing 70 fishermen of the whole sale market. Market intermediaries and other functionaries were conveniently selected out of total market sample. In all, wholesale markets were surveyed. The assessor visualizes interviewing the fishermen, Market conciliators and other functionaries were also conveniently selected out of total market sample.

Analytical Techniques: Descriptive statistics such as frequency distribution and percentage were used to
BRAHMAPUTRA RIVER POLLUTION AND ITS EFFECT ON CHANNA PUNCTUTAS IN TERMS ENERGY CALCULATION

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Abstract

River pollution is one of the major problems which not only affect human life but also the aquatic animals living in it. The study was conducted in the Brahmaputra River system at Guwahati where River Bharalu (one of the most polluted river) joins the system. Waters were collected from two points a & b, point a 10 meter before the junction and point b, 10 meter after the junction point and pond water was taken as control (c). 36 numbers of Channa punctutas were collected from local fisheries and were divided into three groups and reared in 3 aquariums having waters from a, b and c. Total energy content of the entire fish was determined by bomb calorimetry after the specimens were thawed and weighed. Energy values of dry mass, ash-free dry mass, and wet mass were calculated.

Keywords: River pollution, Brahmaputra River, Channa punctutas, energy calculation