

Bioconversion of Jackfruit Seed Waste to Fungal Biomass Protein by Submerged Fermentation

Ankita Chakraborty¹ · Jayati Bhowal¹

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Abstract

The bioconversion of jackfruit seed into a valuable product like Single-Cell Protein (SCP) was carried out using Generally Recognized As Safe (GRAS), five filamentous fungi such as *Penicillium expansum*, *Aspergillus niger*, *Aspergillus oryzae*, *Rhizopus microsporus*, and *Candida intermedia* by submerged fermentation. Data obtained from the study showed that supplementation of jackfruit seed extracts with inorganic nitrogen sources and glucose as a carbon source enhanced fungal biomass and SCP production. Among the various fungal strains, *A. niger* gave the highest biomass and protein yield of 4.01 ± 0.07 g/l and 1.82 ± 0.03 g/l, respectively, on the 9th day of fermentation followed by *P. expansum* (3.65 ± 0.04 g/l and 1.68 ± 0.03 g/l, respectively). *C. intermedia* growth was not recorded in all the experimental media. The present study revealed that fungal biomass has shown low crude fat, crude fiber, and total genomic DNA content ranged from 1.10 ± 0.20 to $4.95 \pm 0.40\%$. *A. niger* and *P. expansum* were the most efficient in the conversion of sugar ($55.83 \pm 0.3\%$ and $54.71 \pm 0.4\%$, respectively) to yield biomass in sugar supplementation media. *P. expansum* and *A. niger* were the most promising fungal strains to produce fungal biomass protein using inexpensive agro-waste materials.

Keywords SCP · Filamentous fungi · GRAS · Jackfruit seed · Supplementation · Bioconversion

Introduction

The explosive rate of population growth particularly in the developing countries led to an increase in animal and human food supply. The growing shortage of proteins and other protein-rich foods led to the search for attractive alternative protein sources to supplement the conventional protein sources. Single-cell protein (SCP) is one of the important steps for this goal for being an alternative protein source as the preventive protein deficiency supply. SCP or microbial protein refers to dead, dried cells of microorganisms such as algae, fungi, and bacteria [1]. Huge production of fruits and vegetables due to efficient agricultural

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ORIGINAL ARTICLE

Evaluation of fungal single cell protein as aqua feed on carcass analysis and growth performance of *Cirrhinus reba* fingerlingsAnkita Chakraborty¹ | Baidya Nath Paul² | Dipak Kumar Bhattacharyya¹ | Jayati Bhowal¹¹School of Community Science and Technology, Indian Institute of Engineering Science and Technology, Howrah, West Bengal, India²Regional Research Center, ICAR-Central Institute of Freshwater Aquaculture, Kolkata, West Bengal, India

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Abstract

Single-cell protein (SCP) is an affordable and non-conventional source of protein, with a good blend of amino acids. This alternative protein source was used as a protein replacer of fish feed to bring down the feed manufacturing cost without compromising the nutritive values. SCP was used to formulate fish feed to observe the improvement in carcass composition and growth performance of fingerlings. In this present study, SCP was produced by filamentous fungi *Aspergillus niger* in glucose supplemented whey media (GWM) by submerged fermentation. Three isonitrogenous (30% protein) diets were formulated: C_{0A} Basal control diet, Ex₁- experimental diet 1, replacing 10% protein of basal control diet by SCP and Ex₂- experimental diet 2, replacing 20% protein of basal control diet by SCP. After 60 days of feeding trial on *Cirrhinus reba* fingerlings, an improvement of growth performance (Net weight gain, specific growth rate, feed conversion ratio, protein efficiency ratio, percentage survival rate) was observed between the experimental fingerlings. Analysis of fish carcass revealed that SCP fed fingerlings had a balanced amino acid and fatty acid profile, some essential vitamins and minerals. Thus, the protein part of aquafeed successfully replaced up to 20% by SCP, without any adverse effect on the carcass.

KEYWORDS

Aspergillus niger, carcass quality, *Cirrhinus reba*, growth, single cell protein

1 | INTRODUCTION

Aquaculture is now becoming a fast-growing industry in order to meet the increasing demand (Alriksson et al., 2014) for formulating and processing suitable and sustainable aqua feeds. Fish meal is extensively used in aquaculture. Because of the scarce availability of high quality fish meal, increase in fish meal price, and a huge gap in its demand, and supply, there is a need to find an alternative, locally available protein source to replace fish meal partially or completely to bring down the cost of the fish feed (Karim et al., 2018). Additionally, the use of fish meal in feed formulations of minor carp is restricted for sustainable health benefits of these farmed fish (AQUAMAX Project 2006–2010; Naylor et al., 2000), and thus, the feed formulations are based on

vegetable protein sources (Paul et al., 2017). Rice bran oil cake is the most widely used aqua feed in India, which is not a high quality fish feed based on nutrition. Thus, the supply of high quality fish feed becomes one of the major barriers in aqua culture industry which tends to increase the production price of aqua feed. Searching for an inexpensive alternative protein source to fish meals with efficient growth performance and nutrient utilization properties has gained much attention in recent years. An interesting alternative is SCP (Tlustý et al., 2017) that consists of mainly yeast, algae, bacteria or fungi. SCPs are rich in essential nutrients like desirable protein content with a good blend of amino acids, minerals, vitamins and fatty acids. Thus with excellent nutritive value and capacity to be mass produced SCP has proved to be very promising in the evolution of aqua diets.

Phytochemical screening and antioxidant and antimicrobial activities of crude extracts of different filamentous fungi

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Abstract

Five filamentous fungal strains that grew in different whey-based media under submerged fermentation were investigated for antioxidant properties and phytochemicals. Phytochemical analysis revealed the presence of alkaloids, tannin, flavonoids, glycosides, phenols, saponins, and terpenes in the crude intra- and extracellular ethyl acetate extracts of different strains. All fungal extracts exhibited effective antioxidant activities in terms of TPC, TPC, DPPH, FRAP, ABTS, reducing power, and metal chelating capacity. The activities of intracellular extracts were higher than the extracellular metabolites. Fermentation media with sugar and salt supplementation significantly influenced antioxidant production. *Aspergillus niger* in glucose-supplemented whey medium was found to exhibit the highest antioxidant properties. The antimicrobial activity of *A. niger* and *Femisia sp.* extracts by microtiter plate assay showed a promising result against some pathogenic bacterial strains. Chromatographic analysis of the fungal extracts revealed the presence of chlorogenic acid, trans-cinnamic acid, ferulic acid, quercetin, myricetin, kaempferol, and catechin which are known for their antioxidant properties. Accumulation of nutrients in fungal biomass under constraint environment produces secondary metabolites which has demonstrated efficacy towards alleviation of several degenerative diseases. The antioxidative enriched phytochemicals present in these five different fungal strains will provide a breakthrough in the utilisation of whey as inexpensive source of substrate for the growth of these fungi. Moreover, phytochemicals could be utilized as therapeutic agents in a cost-effective and environmentally friendly manner.

Keywords Antioxidants · Filamentous fungi · Whey · Submerged fermentation · Phytochemicals · Phenolic compounds

Introduction

Free radicals are reactive oxygen and nitrogen species produced *in vitro* during normal cellular metabolism, which in higher concentration cause oxidative damage to cellular components and can promote pathological conditions in living organisms (Hameed et al. 2017). Endogenous antioxidants inhibit cellular damage by protecting the body against ROS toxicity by playing a crucial role as free radical scavengers, quenchers of singlet oxygen, or as reducing agents (Girindappa et al. 2013). However, during the

excessive production of ROS, the endogenous antioxidants fail to counteract the overproduction of ROS, the balance of the oxidation–reduction status of the body has been lost and leads to a serious health problem known as “oxidative stress”. In that case, the exogenous antioxidants would be useful to fulfill the required level of antioxidants to avoid oxidative stress and to maintain the redox status of the body. Dietary sources such as fruits, seeds, vegetables, herbs, spices, tea, and herbal extracts have been recognized as conventional rich sources of natural antioxidants (Shan et al. 2019).

It is already known that phenolic compounds the secondary metabolites present in these food ingredients act as a potent antioxidants and free radical scavengers and thus exert health benefits (Kurbekar 2017). Due to the harmful and carcinogenic effect of synthetic antioxidants on living organisms, uses of these compounds such as butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT), propyl gallate (PG), and tertiary butyl hydroquinone (TBHQ) have been restricted. Due to recent advancements in biotechnology, researchers have

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Evaluation of water quality and toxicity after exposure of lead nitrate in fresh water fish, major source of water pollution

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ABSTRACT

The present study was conducted to investigate the water quality, gross pathology, histopathological changes in the gill, liver and kidney of common carp, *Cyprinus carpio*, after exposure to lead nitrate. The fishes were divided into six groups and were treated with different concentrations of lead nitrate. After 96 hrs, the gill, liver and kidney tissue samples were collected and histological analysis was carried out. Water samples were analysed after 96 hrs of treatment. The main histopathological changes observed were disintegration of lamellae, hepatocytes and enlarged space of Bowman's capsule. The results revealed that the percentage of necrotic lesions increased significantly with the increase of the dose. Our findings suggest that common carp exposed to lead nitrate develop gross pathology. Hence, long term exposure to higher concentrations of lead nitrate could seriously affect the health status of fish. The results clearly illustrate that the lead nitrate affected not only *Cyprinus carpio* but also the quality of water.

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Introduction

Industrial effluents contain suspended solids, pesticides, organic, inorganic and various toxic metal compounds (Pati et al., 2007; Sankar et al., 2009) which are major source of water pollution. The unregulated release of agricultural chemicals into water bodies has caused environmental problems to all classes of organisms in the aquatic habitat (Singh et al., 2011; Chakraborty et al., 2017). The aquatic ecosystem has a great importance in the Indian economy. Fishes serve as a bio-indicator of aquatic ecosystem. Aquatic organisms accumulate both directly and indirectly the pollutant from water and food chain. Hence, the disposal of pollutants in water poses adverse effect on the fish health and other aquatic organisms. As a result, fish production is generally unimpaired and fishermen face great economic loss. To minimise the adverse effects and to provide safeguards to public health, it is necessary to monitor and understand pathophysiology of pollutants.

Globally, aquatic bodies are mostly contaminated by heavy metals, which are not destroyed through biological degradation. Heavy metals damage the ecological balance by affecting various

physiological, biochemical and cellular processes (Jaisankar et al., 2007). The toxic effects of various heavy metals may hinder the growth rate, physiological functions, mortality and reproduction in fish (Chakraborty and Chakraborty, 2011). Several studies suggested that fish exposed to metals showed immune system malfunction and thus had a greater mortality risk (Sankar, 2009). Heavy metals also enhance genotoxicity either directly or indirectly by inducing toxicity of other chemical agents (Bhattacharjee et al., 2019).

Heavy metals create severe risks for many aquatic organisms, thereby affecting the quality of water (Dasgupta et al., 2011). Lead (Pb) is a heavy metal known to cause detrimental effects on aquatic organisms (Bhattacharjee et al., 2017). It enters the aquatic environment through natural events as well as various anthropogenic activities (Singh, 1997).

Worldwide great attention is given to the studies of toxicity of heavy metals in fish with the increase of pollution in aquatic bodies and pisciculture. The toxicity of lead nitrate in fish has been reported by several authors (Khan and Hossain, 2004; Paul and Sankar, 2007; Sankar et al., 2008). However, there is a lack of study in the field of gross pathological manifestations and assessment of water quality in lead nitrate-exposed fish. The present work investigates the toxic effect of lead nitrate in freshwater fish *Cyprinus carpio*. On the other hand, water quality is an important factor, which directly affects the growth rate, fish's health, survival

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and economic as well as public health. Therefore, we analysed also the changes in water quality of lead nitrate-exposed fish after 96 hrs. The results of our study may help appropriate authority to reduce the detrimental effect of lead nitrate by avoiding use of such chemical in the industry or to avoid its direct discharge into the environment.

Materials and methods

Fish and acclimatization conditions

Cyprinus carpio (Linnaeus, 1758) is an exotic fish in India, grown

point: 50–55 °C). After that by using a microtome the sagittal sections (5–10 mm thickness) were cut and mounted on glass slides. Then the sections were deparaffinised in xylene and hydrated through downgraded alcohol. Subsequently haematoxylin and eosin (H&E) were used for staining and were dehydrated through upgraded alcohol. Photomicrographs of the stained sections were taken using a light microscope. After the treatment of lead nitrate, changes in the gills, kidney and liver tissues were photographed and analysed using a digital camera at a total magnification of 400X.

Micronutrient analysis (MNA)



Mobile view

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Evaluation of Nutrient Content of Some Advance Lines of Sesame Seeds

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Abstract

Harvested fresh seeds of twenty-one (21) advance lines of sesame along with their eight (8) parents were subjected to analysis for estimation of its different mineral constituents viz. calcium (Ca), phosphorus (P), manganese (Mn), zinc (Zn), copper (Cu) and iron (Fe). The results depicted that the highest amount of Ca and P found in deep coloured seeds. The advance lines showing better performance were mostly selected as the segregants of the crosses involving at least one high performance parent. All the constituents studied were estimated in fewer amounts in all the parents and advance lines with white/light coloured seeds in comparison to the genotypes with deep coloured seeds.

Keywords

Mineral constituents, sesame seed, parents and advance lines, macronutrients, micronutrients.

INTRODUCTION

Food insecurity is a global subject of concern especially in developing countries like India (1), where the number of undernourished people is increasing day by day (2). So, it is prime essential to reduce the risk of malnutrition (3). Some indigenous plant species contains high proteins, essential minerals and trace elements with high nutrient values (4). One of such potential plant is sesame which can solve the problem regarding micro-nutrient deficiencies in modern day nutrition. Sesame (*Sesamum indicum* L.) is one of the most ancient oilseed crops grown in India (5). It is also one of the important multi-season and multipurpose oilseed crops grown throughout tropics and sub tropic (6). Recently this crop has been neglected

which resulted into germplasm loss and reduction in variation (6). The total worldwide production of sesame seeds in 2014 was 6,235,530 t, whereas, approx. 25% of the total production was in Africa and about 70% in Asia (7). Sesame oil has various uses in industrial and cultivars. Not only for the production of oil, are some seeds also used for various purposes such as in making sweets, and oil cake as cattle feeding (8). Approx. 35% of the annual production is used for food and 65% is processed to produce oil (9). For that reason, an insight into the estimation of seed mineral nutrient constituents in the existing variation is required. The wide range of variability for various chemical constituents has already been reported by several workers (10,11), but it is necessary to check the mineral constituents in



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Selection criteria of some advance lines of sesame by the study of correlation and path coefficient analysis

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Abstract

Sesame (*Sesamum indicum* L.) is one of the major oil yielding plant in India, but the production of sesame seed is very low. Now it is necessary to establish the selection criteria that directly or indirectly increase the seed yield per sesame plant. In this study, freshly harvested seeds of 21 stable advance lines of sesame and their 8 parents such as R-9, B-14, B-9, B-67, T-12, IDP-51, IET-2, HT-1 were taken to evaluate the selection criteria for higher seed yield. The results indicated that number of branches/plant, number of capsule/plant, number of seeds/capsule and 100 seed weight were strongly related with sesame yield. Thus, selection of advance lines of sesame, that have higher seed yield, can be done on the basis of number of branches/plant, number of seeds/capsule, 100 seed weight and harvest index. Moreover, these traits may be employed as the selection criteria for the betterment of sesame seed yield in future agricultural system.

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Keywords: Sesame, selection criteria, genotypic correlation, phenotypic correlation, path coefficient analysis

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Introduction

Economic yield of a crop, being the most complex parameter, is generally observed to be associated with different component characters. Each of which is inter-related among themselves. Knowledge on different attributes related to yield of a plant which can effectively be utilized for selection of desired improvement in seed yield.

The various uses of sesame (*Sesamum indicum* L., family: Pedaliaceae) seeds in India

country are very popular from ancient time. Though India is one of the major sesame producers in the world, the production of sesame seed is very low (1). In this background, we need to focus on the breeding efforts in sesame as well as good agronomic practices for increased production.

Sesame seeds for its high quality oil, protein, minerals and antioxidants (2, 3) used as raw food and also used to produce sweets in confectionery and bakery products (4). Sesame



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যতীন্দ্রনাথ সেনগুপ্তের কবিতায় বিদ্রোহ

ড. কৃষ্ণা বুদ্ধী

রবীন্দ্র পরবর্তীকালে রবীন্দ্রপ্রভাব মুক্ত বাংলা কবিতায় যে সকল কবিদের লেখনীতে নতুন সুর, রীতি ও ছন্দের প্রকাশ ঘটেছিল, তাঁদের মধ্যে অন্যতম হলেন যতীন্দ্রনাথ সেনগুপ্ত। রবীন্দ্র অনুসারী হলেও রবীন্দ্রমেরুর বিপরীত দিকেই তাঁর অবস্থান। রবীন্দ্র দৃষ্টির সঙ্গে যতীন্দ্রনাথের পার্থক্য ছিল স্পষ্ট। যতীন্দ্রনাথ ব্যতীত এই ধারার আরও দুজন স্বনামধন্য কবি হলেন নজরুল ইসলাম এবং মোহিতলাল মজুমদার। রবীন্দ্রকাব্যের মুক্ত পাঠক বিস্ময়ে এই কবি ত্রয়ীর কাব্য গ্রহণ করেছিল। নজরুলের বিদ্রোহীসত্তা যেমন দেশ-কালের প্রেক্ষিতে গ্রহণযোগ্য ছিল, ঠিক তেমনি কবিতায় মায়া অঞ্জনের মুক্ততা কাটিয়ে অতীন্দ্রিয় স্বর্গীয়প্রেম সৌরভের পাশে বাস্তব ভোগবাদকে প্রতিষ্ঠা করলেন মোহিতলাল, আবার যতীন্দ্রনাথের কাব্যের মূলসুর এলো নেতিবাদ, দুঃখবাদ- এই সবকিছুই রবীন্দ্রভাবনার বিপরীতে, যেখানে আনন্দ উপলব্ধি ছিল রবীন্দ্র কবিতার মূল ভাবনা।

যতীন্দ্রনাথের প্রথম কাব্যগ্রন্থ ‘মরীচিকা’র কবিতাগুলি যখন লিখিত হয়েছিল সেইসময় রবীন্দ্রনাথের কবিতায় ছিল উপনিষদীয় ও আধ্যাত্মিক ভাবনা, সেই সঙ্গে মিশে ছিল রোমান্টিক ভাবনাও। গীতাঞ্জলি-গীতিমাল্যের যুগে রোমান্টিকতার অন্তরালে যুগজীবনের যে হতাশা-আকাঙ্ক্ষা-বিক্ষোভের ফলগুধারা চলেছিল, তা বিশ শতকীয় জীবন জিজ্ঞাসায় তীব্র হয়ে উঠল। উনিশ শতকের জীবনে যে সৌন্দর্যচেতনা ও আশাবাদের আলো সঞ্চারিত হয়েছিল, তা বিশ শতকের জনমানসে অবিশ্বাস ও অতৃপ্তি এনেছিল। সেইসঙ্গে এসেছিল একটা প্রচ্ছন্ন সন্দেহ ও বিদ্রোহের সুর। পূর্বসূরীদের ভাবনা থেকে দূরে সরে এসেছিলেন কবি দল। অতীন্দ্রিয় প্রেম, সৌন্দর্যচেতনা ও রোমান্টিক ভাবনার পরিবর্তে বাস্তববাদী চিন্তার এক বলিষ্ঠ রূপের প্রকাশ পরিলক্ষিত হল। রোমান্টিকতার প্রতি তৈরি হল এক অনীহা, প্রকৃতির বিরুদ্ধাচারণ, নেতিবাচক মনোভাব এবং ঈশ্বরে অবিশ্বাস। উনিশ শতকীয় রোমান্টিক কল্পনা এবং ভাবনার অবসান শুরু হল। রবীন্দ্র কবিতার আনন্দবাদে উৎসাহী না হয়ে যুগ ও জীবনের সংকটময় কঠিন বাস্তবের মুখোমুখি হল মানুষ। এই যুগভাবনায় রবীন্দ্রচেতনার বিপরীতে আবির্ভাব ঘটল যতীন্দ্রনাথের। শুধুমাত্র যতীন্দ্রনাথ নন, মোহিতলাল এবং

শঙ্খ ঘোষের ছড়া সমগ্রে শিশুর জগৎ

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আধুনিক বাংলা সাহিত্যে শিশুদের জন্য লেখা কবিতাগুলি অন্যান্য শাখার মতই সমগুরুত্বপূর্ণ। শৈশব জীবনের আনন্দ স্মৃতি, চিন্তা, ভাবনা শিশু মনোজগতে যে বিচিত্রভাব জাগিয়ে তোলে, কবিরা তাদের অপরিণত সেই মনের সন্ধানে রত হন। শিশুর খেয়ালী মন ছুটে চলে কল্পনা জগতের সেই রঙিন দেশে, যেখানে বাস্তবের উল্টোপথে চলে সবকিছু। নির্মল আনন্দ দান শিশুসাহিত্যের প্রধান উদ্দেশ্য হলেও কিছু ক্ষেত্রে সেইসাথে শিক্ষামূলক বিভিন্ন ক্ষেত্রও যুক্ত হয়। প্রয়োজন সাধন অপেক্ষা অপরিণত কোমল শিশুমনের নির্ভেজাল আনন্দদানে বিশ্বাসী ছিলেন স্বয়ং রবীন্দ্রনাথ। পরবর্তীকালে শিশুসাহিত্যের দিকপাল হিসাবে আমরা পেয়েছি উপেন্দ্রকিশোর রায়চৌধুরী, যোগীন্দ্রনাথ সরকার, অবনীন্দ্রনাথ ঠাকুর, সুকুমার রায় প্রমুখ সাহিত্যিকদের। উপেন্দ্রকিশোরের ‘টুনটুনির বই’, যোগীন্দ্রনাথ সরকারের ‘হাসিখুশি’, দক্ষিণাচরণ মিত্র মজুমদারের ‘ঠাকুরমার ঝুলি’ শিশুসাহিত্যের অনন্য নিদর্শন। এছাড়া বিভিন্ন বিখ্যাত শিশুকিশোর সাহিত্য পত্রিকার মধ্যে উল্লেখযোগ্য ‘মুকুল’, ‘সন্দেশ’, ‘সখা’ প্রভৃতি। এইসব পত্র পত্রিকায় থাকত শিশু মনজগতের উপযোগী বিচিত্র ধরনের ছড়া ও আকর্ষণীয় নজরকাড়া ছবি। শিশুর মন সহজেই জয় করে নিয়েছিল এই সকল পত্রিকাগুলি। লোকসাহিত্যে, ‘ছেলে ভুলানো ছড়ায়’ রবীন্দ্রনাথ বলেছেন -

“ভালো করিয়া দেখিতে গেলে শিশুর মতো পুরাতন আর কিছুই নাই। দেশ কাল শিক্ষা প্রথা অনুসারে বয়স্ক মানুষের কত নূতন পরিবর্তন হইয়াছে, কিন্তু শিশু শত সহস্রবৎসর পূর্বে যেমন ছিল আজও তেমনি আছে। সেই অপরিবর্তনীয় পুরাতন বারংবার মানবের ঘরে শিশু মূর্তি ধরিয়া জন্মগ্রহণ করিতেছে অথচ সর্বপ্রথম দিন সে যেমন নবীন, যেমন সুকুমার, যেমন মৃৎ, যেমন মধুর ছিল আজও ঠিক তেমনি আছে।”

বর্তমান সমাজ ব্যবস্থায় শিশুর মন আজ দ্বিধাগ্রস্ত। তাদের শৈশব আজ হারিয়ে যেতে বসেছে। শঙ্খ ঘোষের শিশুরা শহুরে এবং বর্তমান সমাজের। আধুনিক দ্বন্দ্ব জটিল জীবনে শিশুর মানসিক গঠন, চাহিদা চিন্তাভাবনা স্বতন্ত্র। যুগের সঙ্গে তাল মিলিয়ে ইঁদুর দৌড়ে তাদের ছোট থেকেই অভ্যস্ত করার চেষ্টা চলেছে। সেকালের শিশুদের মত সহজ সরল জীবন যাপন বা পারিবারিক পরিকাঠামো, আজকের শিশুদের

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বাংলা নাট্য জগতের ইতিহাসে রামনারায়ণ তর্করত্ন এক উল্লেখযোগ্য ব্যক্তিত্ব। ঊনবিংশ শতকের সমাজ সমস্যার বাস্তব চিত্রের প্রতিফলন তাঁর “কুলীন কুলসর্বস্ব” নাটকে উপস্থাপিত হয়েছে। কৌলিন্যপ্রথা ও সমাজে তার কুপ্রভাব এখানে প্রধান হয়ে উঠলেও সেই সঙ্গে কুল ও ধর্ম রক্ষাহেতু, কন্যা পাত্রস্থ করতে গিয়ে পিতা-মাতার করুণ অসহায় অবস্থাও চিত্রিত হয়েছে। অষ্টাদশ শতকে কুলীন ব্রাহ্মণদের নিকট বিবাহ ব্যবসা মাথাচাড়া দিলেও পরবর্তীকালে ঊনবিংশ শতকে তা আরো বেশি প্রকট হয়ে ওঠে। ঊনবিংশ শতকের প্রথমার্ধে এই প্রথার বিরুদ্ধে সেইভাবে গণআন্দোলন বা জনমত গড়ে ওঠে নি। বিভিন্ন সাময়িক পত্রে এসম্পর্কে বেশ কিছু তথ্য মিলে। সেইসময় খ্রিস্টান মিশনারী ও ডিরোজিওপন্থী ইয়ং বেঙ্গল দল বিভিন্ন পত্রপত্রিকায় এই বিষয়টির বিরুদ্ধে মতামত জানিয়েছিল। এছাড়া রামমোহন প্রতিষ্ঠিত “আর্যীয় সভা”য় এই কৌলিন্য প্রথা ও বহুবিবাহ নিয়ে আলোকপাত হয়েছিল। তবে সেই অর্থে কোন বৃহৎ আন্দোলন দেখা যায়নি। সমাজ সংস্কারক দেবেন্দ্রনাথ ঠাকুর, কিশোরী চাঁদ মিত্র, রাসবিহারী মুখোপাধ্যায় এবং বিদ্যাসাগর এই প্রথা বিলোপের জন্য সোচ্চার হয়েছিলেন। সরকারের কাছে পরবর্তীকালে আবেদন এবং আন্দোলন শুরু হয়। “সোমপ্রকাশ” সহ বিভিন্ন পত্রে এ বিষয়টি আলোচিত হয়। ১৮৫৭ সালে সিপাহী বিদ্রোহের ফলে সরকার ধর্মীয় ও সামাজিক ক্ষেত্রে পদক্ষেপ গ্রহণ করতে পিছপা হয়। সমাজে সর্বব্যাপী এই কৌলিন্য প্রথার কুফল উপলব্ধি হলেও এই বিষয়ে আইন প্রণয়ন করা খুব কঠিন ছিল। স্বয়ং বিদ্যাসাগর মহাশয়ও “বহুবিবাহ রহিত হওয়া উচিত কিনা এতদ্বিষয়ক বিচার” নামে গ্রন্থ রচনা করেন। সমাজে বিভিন্ন স্তরে এই কৌলিন্যপ্রথা ও বহুবিবাহ নিয়ে প্রতিক্রিয়া শুরু হলেও ঘনবদ্ধ আন্দোলন

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‘পুরুবিক্রম’ নাটকের সংলাপে অভিনবত্ব ড. কৃষ্ণা বুদ্ধী

নাটকের প্রাণ হলো সংলাপ। নাটকের ঘটনা ও কুশীলবদের সংলাপের মাধ্যমে নাট্যকার নিজে অদৃশ্য থেকে সব কথাই বলেন। পরিবেশ ও ঘটনা অনুযায়ী পাত্র-পাত্রীর সংলাপ নির্বাচন করেন নাট্যকার। সার্থক সংলাপ নাটককে আরো বেশি সার্থক ও শিল্পমন্ডিত করে তোলে। নাটকের অগ্রগতি, চরিত্রের পরিস্ফুটন- এই সবকিছুই সংলাপের মধ্য দিয়ে হয়ে থাকে। নাটকের নেপথ্যে থাকা নাট্যকার তাই অত্যন্ত সচেতন ও দায়িত্বপূর্বক পাত্র-পাত্রীর সংলাপ নির্বাচন করে থাকেন। কাহিনীর মধ্যে বক্তব্য বিষয় যথচিত ভাবে অঙ্কন করেন তিনি। সংলাপের উদ্দেশ্যই হলো চরিত্রানুযায়ী সংলাপ সৃষ্টি এবং ঘটনার অগ্রগতি ও পরিণতি সাধন। নাটকের কথোপকথন সহজবোধ্য ও স্বাভাবিক হলে নাটক হয়ে ওঠে প্রাণবন্ত। পরিস্থিতি অনুযায়ী ভাব ও ভাষা বিনিময় নাটককে আকর্ষণীয় করে তোলে। বিশেষ গুণ যথা অগ্রসরতা, পরিচয় স্থাপনা, উচিত্য, স্বাভাবিকত্ব ও চালনাশক্তি নাটককে কৌতুহলী ও জনপ্রিয় করে তোলে।

নাটকের সংলাপ তার গোত্র বা শ্রেণীর উপরেও অনেকাংশে নির্ভরশীল। সামাজিক নাটক, ভক্তিরসমূলক পৌরাণিক নাটক, ঐতিহাসিক নাটক প্রভৃতি বিভিন্ন শ্রেণীর নাটকের পাত্র-পাত্রীদের সংলাপ ভিন্ন হয়ে থাকে। সংলাপ যথাযথ ও বিষয়ানুযায়ী হলে নাট্যরস অঙ্কুর থাকে। দেশাত্মবোধক ও ঐতিহাসিক নাটকের আবেগ ও মেজাজ দক্ষতার সঙ্গে নাটকে পরিবেশিত হয়। ঊনবিংশ শতকের মধ্যভাগে নাটকের সূচনালগ্নে সমাজ সংস্কার সচেতনতাই প্রধান হয়ে উঠেছিল। পরবর্তীকালে পরাধীন ভারতের জনসমাজের চেতনায় ধীরে ধীরে জাতীয়তাবোধের জাগরণ ঘটতে থাকে। পাশ্চাত্য জ্ঞান-বিজ্ঞানের জ্যোতিষ্কটায় বাঙালি চেতনায় এক অখণ্ড সার্বভৌম জাতীয়তাবাদের উন্মেষ ঘটে। বাঙালির পূর্ব গৌরব পুনরুদ্ধারের জন্য নাট্য সাহিত্যে সেই বীর্যপূর্ণ গৌরবগাথার

WHAT DEMOGRAPHIC TRANSMUTATION REAPS IN INDIA - DIVIDEND OR DISASTER

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ABSTRACT

Demographic transition has been experienced by every country. Demographic dividend not only depends on changing age structure but also on human capital. With more people in the labour force and fewer children to support, a country has a window of opportunity for economic growth if the right social and economic investments and policies are made in health, education, governance and the economy. Indian economy has been experiencing a steady economic growth rate for the last two decades (though in recent times it shows a declining trend). The most significant feature of this growth phenomenon is that it has been service sector led growth and there has been marked changes in employment pattern. More skilful, technically sound, computer literate, vocationally trained human resources are required to achieve faster economic growth. Though the higher education system in India has undergone massive expansion in the post independence period with a national resolution to establish several universities, technical institutes, research institutions professional and non-professional colleges across the country, India still confronts a shortage of skill manpower. After independence the Government of India laid stress on Primary Health Care and India has put in sustained efforts to better the health care system across the country. But Indian higher education system has certain limitations such as inadequate physical infrastructure, lack of quality and excellence & dearth of quality faculty members etc. The government initiatives have not been enough to meet the demands of a growing population be it in primary, secondary or tertiary health care. The present study tries to highlight whether India would be able to transform her favourable demographic structure into demographic dividend or will face a disaster.

Keywords: Demographic structure, Demographic Dividend, Economic Growth, Education, Healthcare.

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Skill India Initiatives: A Remedy To Growing Unemployment Among Educated Youth In India?

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Abstract

India is a young nation with a huge demographic potential as India is experiencing a substantial growth in the working age population. Post independence various initiatives have been taken for the expansion of primary to higher education. The gross enrolment rate for primary as well as higher education has been showing a rising trend over the years. Higher education attainment not only leads to an increase in the labour force participation rate in the formal sector but also enhances the quality of the labour force. But the growing unemployment among educated youth is a cause of concern in India. Employment generation has also been a priority since independence. But India has experienced a slow growth in employment generation since independence. Though different skill development initiatives have been taken by the government to enhance skill formation among labourers and reduce the unemployment problem, simultaneously, shortage of skilled labour force lowers the employability as well as economic growth. The growing skill mismatch in the labour market during the post economic reform period has been a serious threat in India's progress towards sustainable development. The present study tries to highlight whether rising higher education attainment level and the skill formation programmes in India are compatible enough to reduce skill shortage and create more employable work force, necessary for reducing unemployment and grabbing the benefit of growing working age population.

Keywords: Working Age Population, Higher Education, Unemployment, Skill Development programmes, Skill shortage

Introduction

Skill is crucial for prosperity. Skill contributes not only for economic growth but also for socio-economic development. Skill impacts economic growth both direct and indirect ways. Besides raising productivity, skill helps a nation to create greater capacity among workers and thus encourages firms to adopt new technology and spur innovation. On the other hand, shortage of skill lowers the growth and employment potentials. Skill also improves the lives of workers. It is well documented that upskilling of workers increases productivity and wage, reduces unemployment and wastage of resources (ILO 2016). Skill development has been a major policy agenda in several countries and there is a lot of emphasis on the promotion of vocational education and training (VET) programmes. In India post-independence, one of the various important goals, taken by policy makers to build the nation was to spread education for masses. Needs for expanding elementary education and secondary education were given special attention. Various necessary steps were also taken to extend technical and vocational education and to promote and improve higher education. Since 2018 India's working age population has grown larger than the dependent population, i.e. children aged 14 years or below as well as people above 65 years of age. Thus, India has become a comparatively young nation. India has emerged as one of the most important job markets as many of the world's large companies try to reduce costs in the wake of the global recession. IT, ITES, aviation, retail, banking and finance, healthcare, insurance etc sectors would provide the



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Plausibility Of India's Prospect As An Emerging Knowledge-Based Economy.

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Abstract

Education has been highly valued in India from ancient times. It is well documented fact that becoming a knowledge-based economy is highly dependent on human capital and thus education (precisely higher education) plays an important role not only for creating human resources for a country but also a prerequisite to become a knowledge-based economy. Higher education helps to shape a nation that is enlightened, socially conscious, ethical, knowledgeable, and skilled in devising and implementing effective solutions to its problems. The 'University Grant Commission'(UGC) was established in 1954 and it has taken various steps to promote and improve higher education in India till date. Allotment of funds in different Five-Year Plans for educational expenditure has risen, especially in 12th Plan which allotted around 13% of total plan outlay on education (it is the highest allotment in education since independence). In spite of this expansion, insufficient investment in education, educated unemployment, uneven growth, gender inequality in higher education have been regarded as the impediments of overall progression of the Indian economy. There have been enactment of different policies and procedures to address these issues. However, in the present existence too, these issues have been causes of concern for India. The present study tries to highlight given this present scenario whether it is plausible for India to be an emerging knowledge-hub despite the rising higher education enrolment.

Keywords: Knowledge-based Economy, Higher Education enrolment, Human capital, Gender inequality.

Introduction

The history of the world proves that education has been the main cause of any social, cultural and economic change. Education is 'Fundamental Rights' of the nation. Education develops the knowledge, skill, innovation, creativity. Availability of a good education system and human capital (ie. educated, skilled workforce) are prerequisites for a knowledge-based economy. The world conference on Higher Education, organised by UNESCO in October 1998 in Paris & represented by 128 nations, emphasised that higher education must promote development of the whole person and generate trained and uniformed citizens who could be able to form a better society, besides its traditional functioning such as teaching, training, study and research. India has a long tradition in learning. In ancient India the system of 'Gurukul' was the pivot of higher education. In the pre-independence period, the British also looked at initiatives to spread education for the masses. The modern system of education in India actually started with the establishment of three universities, Calcutta Bombay and Madras in 1857. Later in 1887 Allahabad and Punjab (in Lahore) were set up. Post-independence, one of the various important goals, taken by policy makers to build the nation was to spread education for masses. Needs for expanding elementary education and diversifying secondary education were given special attention. Various necessary steps were also taken to extend technical and vocational education and to promote and improve higher education. In 1948 The University Education Commission was set up under the chairmanship of Dr.S. Radhakrishnan. It also gave a direction to the developments of higher education in India. Different articles of 'Different Constitution' emphasise the value of education and place it as a fundamental right of all Indian citizens. The 'University Grant Commission'(UGC) was established in 1954 and it has taken various steps to



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FINANCIAL PERFORMANCE OF SELECTED PSUs: AN EMPIRICAL STUDY

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ABSTRACT

Restructuring of PSUs through disinvestment is an important policy of the government in order to earn a sizeable amount of revenue. Hence measuring financial performance of PSUs is an important issue in the present era. In this study for measuring the long-term financial performance some PSUs have been selected and two types of ratios: Profitability ratio and Activity ratio have been considered. This paper seeks to examine the joint influence of the selected ratios relating to asset management on the profitability. The present study is divided into two parts. In the first part different tests have been applied to prepare the data in usable form for analysis, and multi-collinearity test, normality test, heteroscedasticity test have been applied to judge whether the model is good fit or not. In the 2nd part we have used panel data regression analysis to find out the relationship between profitability and efficiency of the firm.

1.1. INTRODUCTION

The word 'Performance' is derived from the word 'performen', which means 'to do', 'to carry out' or 'to render'. It defines the act of performing, execution, accomplishment, fulfilment etc. Hence in broader sense performance defines that accomplishment of a given task measured against some predetermined standard of accuracy, completeness, cost and speed. It also defines the degree to which an achievement is being or has been accomplished. Similarly the term financial performance refers to the act of performing financial activity. In other terms it defines the degree to which financial objectives have been accomplished. Financial performance evaluation is the process of measuring the result of a firm's policies and operations in monetary terms. Financial performance evaluation mainly depends upon the financial statement. The financial statement refers to two basic statements i.e., Balance Sheet and Income Statement. These statements do not reveal all the information related to the financial operation of a firm but financial statement shows some extremely useful information, like profitability, liquidity, and asset utilisation position and capital structure position. Long term performance evaluation is a very useful technique to know the financial position of a firm. Long term analysis is very much needed to draw any idea regarding performance of an organisation because figure of a single year is not enough for the purpose of analysis.

Ratio analysis technique has been applied for measuring the financial performance in long-term analysis. For measuring the financial health of the organisation ratios are the best tool. It can diagnose the relationship between profitability and management efficiency of a firm. In this study for measuring the long-term financial performance of some selected PSUs profitability ratio and activity ratio have been considered. In order to know the long-term financial position of some selected PSUs here we consider 2001 to 2016 as the study period.

1.2. OBJECTIVE OF THE STUDY:

The present study seeks to examine the performance of divested PSUs. Restructuring of PSUs through the disinvestment is an important policy of the government in order to earn a sizeable amount of revenue. This will ease the stringency of fund. Changes in liquidity, profitability, efficiency and capital structure are also required to be examined. The PSUs are generally criticized due to their poor performance in terms of low rate of return of fund. But PSUs have not been established with the objective of profit making. These undertakings have been set up with the main objective of promoting economic development as a whole.

With this broad objective some sub-objectives have been formulated for the study. The sub-objectives of the study are as follows:

1. To analyze the financial performance of some divested companies
2. To measure the relationship among profitability and efficiency of the PSUs.
3. To examine the joint influence of the selected ratios relating to asset management on the profitability.

1.3. LITERATURE REVIEW:

Joshi (2000) has attempted to analyze the impact of change in the ownership on financial performance of public sector enterprises in general and Bharat Heavy Electricals Limited in particular. He has used various financial ratios, in measuring the financial performance of BHEL in pre- and post disinvestment period. He also used T-Test analysis for justifying the selection of BHEL for his study. Joshi concluded in his study that for the

EXPLORING DRIVING FORCES FOR THE PROSPECTS OF FMCG BRANDS

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ABSTRACT

Purpose: FMCG Industry is one of the fastest emergent sectors in Indian economy. The FMCG sector contributes around 15% to the overall GDP in India. Owing to rapid changing customer profile, tough competition, erratic brand loyalty and the rising expectation of the customers, marketing of FMCGs has become a high hill task. To survive in such a competitive environment, the understanding of relevant factors which influence the customer most need to be assessed. So the present study intends to assess the factors which persuade the prospective customers more towards the FMCG factors.

Methodology: For this research, an empirical study was carried out on pan West Bengal with 500 respondents. For this study we had selected only cosmetics and toiletries segment of FMCG products. Four product categories (Fairness Cream, Shampoo, Deodorant and Soap) were identified under this segment. Convenience sampling technique was resorted to for selecting the respondents of different areas.

Findings: This study would help to provide empirical evidence and extract several useful findings on the factors that prospect of FMCG brands is always on a look out for. This study has extracted four influencing factors: Retailers and Shop Display, Advertisement & Celebrity Endorsement, Pack Size and Availability. These promotional tools need to employ diligently considering the customers' insight to reap rich dividend in the business.

Practical Implication: By utilizing these factors, promotional tools can be developed by the marketers craftily to persuade the customers more towards the specific FMCG products. It is also an option for the marketers to make the potential customers knowledgeable about the product. This study will definitely help the marketers to survive in such a competitive atmosphere since it provides the opportunity to grab a definite knowledge of customers' insight which is always worthy to frame an immaculate promotional strategy.

Keywords: Promotional strategies, Driving factors, Prospects, Competitive advantage, Marketing Communication

INTRODUCTION

Fast moving consumer goods (FMCG) are also regarded as consumer packaged goods and these goods are generally purchased in quick succession and cover a major portion of the customer's budget. The FMCG market is highly concentrated in the urban areas. The increase in the income of the middle-income group is one of the major factors for the growth of the Indian FMCG market. In spite of its immense demand, consumers do not pay heed on the matter like technical specification of the product. This study intends to assess the motivating factors which have a positive influence over the prospective customers. So to get the success in Indian market, companies engaged in FMCG products have to set favourable promotional strategies depending on those factors which have an inert contribution to the psychology of buyers of FMCG products. Besides getting an edge over the competitor, these factors would give a definite option to grow, stabilize and excel in business performance.

LITERATURE REVIEW

The literature review establishes how marketing communication establishes a strong bond between potential customers and the product. Moreover, it relates how marketing communication by disseminating messages helps to evolve as brand.

Ying Zhao (1994) argued that retailers also play a key role behind the selection of FMCG product. He emphasized that retailers influence the customers in obtaining the FMCG product by highlighting them about the same.

Mariotti (1999) considered a few factors that help to evolve as a brand. The respondents pay heed to both price and quality of the product. The buyers even regarded convenience and ease of availability are the two determining factors for the FMCG product. He also even stressed the factor like satisfaction, service and guarantee and warranty.

Nagaraja (2004) investigated there is a definite impact of socio-economic influences on FMCG products. The respondents give emphasis on value for money while selecting FMCG products. The buyers also give emphasis to ease of availability, Price and Quality while making a choice for the product.



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Reduce The Handoff Failure By Implementing Two-WLAN In Handoff Region

Debabrata Sarddar, Noor Hassan, Pinaki Das, Rajat Pandit

Abstract: The problem of wireless communication is the handoff. That problem mainly shows in the urban area because limited number of Access Point (AP) and the Base Station (BS). Main problem occur when the Mobile Node (MN) are goes to out of the coverage area the MN need to make handoff because the current or old Base Station (BS) does not gives the supports. Effect of this problem is call disconnection or data loss. IEEE802.11 based wireless local area network (WLAN) are widely use to give the supports of personal or commercial basis. In the proposed work the WLAN are placed on the two adjacent cell and they are crossly connected to the BS. This WLAN are used as an AP and that AP are enhanced the signal strength of the region of handoff and increased the area of BS. This WLAN gives the services for the time of degradation until find the new channel in the new BS or the inside of WLAN area. For this cause the failure of handoff are minimized.

Index Terms: WLAN, IEEE 802.11, Handoff, Degradation Delay.

I. INTRODUCTION

Now a days the various wireless technique like GSM, GPRS, UMTS, CDMA2000 or wireless area network (like IEEE 802.11a/b/g, HiperLAN) are used in the world. That is the basically in heterogeneous network and used various type of radio signal and communication protocol [1]. The real pattern is to coordinate integral remote advancements with covering inclusion to give the normal omnipresent inclusion and to accomplish the Always Best Connected (ABC) idea [2]. The IEEE 802.11b based WLAN device is the very cheap, popular and user friendly. But this device has same as the problem of coverage area [3].

WLAN: Two or more devices are connected with the help of WLAN and using of spread spectrum. The benefit of this interconnected WLAN is the mobility power of MN under the local signal coverage area [4]. Basically the WLAN are propagating the radio signal in certain area and boost up the signal strength for the better communication of the MN.

The WLAN are the signal enhancer of the BS and the typical BS are connected with the wired Ethernet. Basically the clients or MNs are identified by the medium access control (MAC) and the MNs or clients are connected with AP by wireless. **Distribution of Channel:** In IEEE 802.11b and IEEE 802.11g are operate in the frequency 2.4 GHz and use the 11 out of 14 channel because the same frequency channel [5].

The channel spacing is 5MHz and the bandwidth is 22MHz and 1MHz under and upper of the channel. The width of the guard band is 1MHz then the transmitter sends the frequency from 2.401GHz to 2.423 GHz and so on. The figure 1 shows the distribution

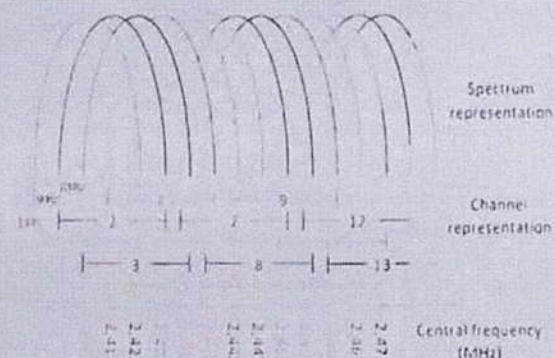


Figure 1: Distribution of Channel

Maximum AP are operate the channel no 1,6 and 11 because that channel are not overlapped

A. Handoff and there types: The MN are moved from a BS and goes toward the new BS the MN find the Ping-Pong position and after that, MN try to make the new connection on the new BS using the handoff process. The time delay of this handoff is known as handoff latency. The handoff is basically two types

1) Hard Handoff: The term is known "Break Before Make", in hard handoff the connection between old BS and MN are break then MN find the new available channel or connection from new BS, if channel is free the new BS allocate this channel to the MN as drawback of this handoff is the large handoff delay time and loss of packet of data and if the delay time is very large then call can be dropped [6]. Hard handoff is shows in Figure2

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Minimize the Cost in Mobile Communication by the Help of Circular Check Manager Method.

Debabrata Sarddar, Pinaki Das, Rajat Pandit

Abstract: The mobile nodes are always moveable inside a cell or from one cell to another cell or from one sub-cell to another sub-cell. This mobility management are based on cell channel, radio frequency, handover, channel allocation and binding updates. The multiple mobile node are connected in a cell or sub-cell, the costing for the mobile node are being change due to the number of mobile node and distance from cell tower or sub-cell tower. The cells are divided in to multiple sub-cells for enhancing the service. In busy hours the main cell and sub-cell both are working but in idle time only the main cell are activated for give the service. In check manager method the time are dynamic for active phrase or idle phrase. In active phrase the main cell and sub-cell both gives the service and idle phrase only the main cell gives the services because that time the no of node are minimum. The circular check manager method the in active phrase, if the main cell are free then the sub-cell are send the authentication to the main cell for allocate the new channel and established the connection.

Index Terms: Channel Allocation, Check Manager, Handover, Radio Frequency.

1. INTRODUCTION

The mobile node are moved from one cell to another cell in active phrase and not moved in idle phrase. In active phrase the cell are mostly busy mobile node are frequently change the cell or sub-cell [1]. The maximum cost of the cell used in active phrase. The costs are increase due to the channel allocation, binding cost, handover, authentication checking, and frequency resources.

The MN changes a cell or sub-cell then make the handover or handoff. Nearest two BTS/BS send the radio frequency to the MN then MN check the power level of two frequencies. If power level of new BTS/BS is cross the Ping Pong point then MN send a request to new BTS/BS for allocate the new channel for make the handover. Then new BTS check all the necessary condition to make the handover.

If all the condition is satisfy then make the handover and MN are connected to new BTS/BS [2][3]

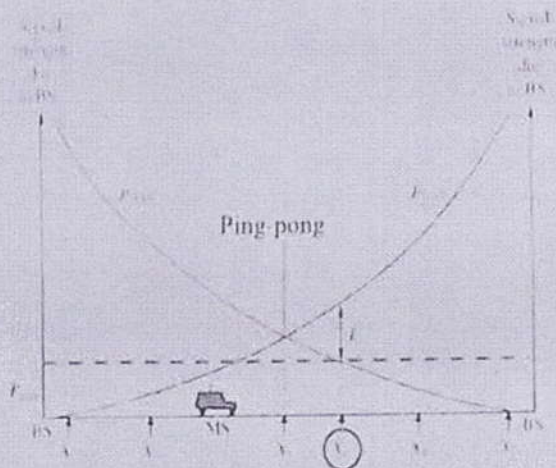


Fig: Ping-Pong point

The hand off or handover are 4types.

A. Intra-cell handover: This hand over used to optimize the load of BTS or balancing the load of cell. In this hand over the MN are moved inside a cell, only change the carrying frequency [4].

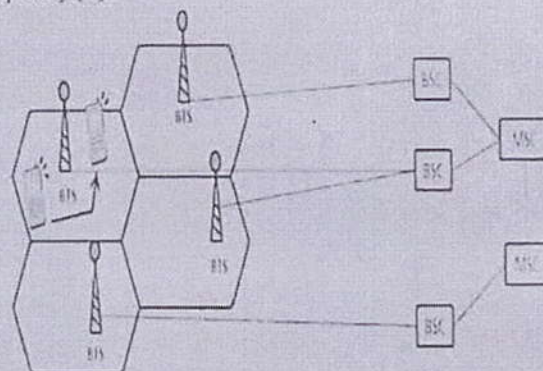


Fig: Intra - BTS Handover.

B. Intra - BSC Handover: This handover perform one BTS to another BTS on a single BSC. If a MN are moved from one BTS to another BTS, the MN request new BTS to allocate the channel for new connection and those BTSs are belonging to a single BSC then make this handover[5].

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Review Paper

Fluoride contamination in groundwater, soil and cultivated foodstuffs of India and its associated health risks: A review

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Abstract

Around 200 million people of 29 countries including India are severely affected due to fluoride pollution. Ingestion of fluoride beyond the World Health Organization recommended maximum permissible level (1.5 mg/l) is associated with dental and skeletal fluorosis and other toxic responses while lacking of fluoride intake is associated with dental caries. Minerals like apatite, fluorite, fluorapatite, topaz and mica get weathered naturally and provide fluoride to soils. In site-specific cases some industries (mainly phosphorous fertilizer plants, steel, aluminum, zinc, smelting industries, glass and ceramic industries, etc.) are also responsible for fluoride contamination of soils. Irrigation with fluoride contaminated water transfers fluoride to crops, vegetables and fruits. This bioaccumulation contributes further fluoride to the food chain in addition to the drinking water route, and thus it is causing larger risk to the already fluoride-contaminated affected population. Moreover, this new avenue of fluoride highly endangers the most susceptible infants and children towards dental fluorosis. The 'Nalgonda' and 'activated alumina' processes are the most commonly used defluoridation techniques of drinking water. But, a suitable, efficient, user-friendly and cost-effective technique for defluoridation is yet to be developed. Equal emphases are to be given on creation of awareness in people regarding fluorosis and restriction of usage of fluoride-contaminated irrigation water.

Keywords: Fluorosis, fluoride pollution, fluoride bioaccumulation, fluoride in food chain.

Introduction

Moderate to high fluoride pollution in groundwater is reported as one of the major environmental issues of Algeria, Brazil, Canada, China, Ethiopia, Ghana, India, Iran, Italy, Japan, Jordan, Kenya, Korea, Malawi, Mexico, Norway, Pakistan, Sri Lanka, Thailand, Turkey, and the US^{1,2} threatening an estimated 200 million people³. Fluoride can be found in different environmental components originated from mineral sources, atmospheric sources, and geothermal sources. After its dissolution from weathered rock it becomes mobile, and it enters soil, groundwater, cultivated crops, fruits and vegetables depending on the prevailing geological agents. The natural dissolution of fluorite, apatite, and topaz from bedrocks leads to rich content of fluoride in groundwater⁴. Moreover, different anthropogenic influences like usage of phosphate fertilizers and insecticides, discharge of sewage and sludge, overuses of groundwater in agriculture, etc., increase groundwater contamination with fluoride^{5,6}. Fluoride in groundwater is mostly of geological origin. Intake of fluoride in excess amounts, mostly via drinking water (other sources are food, industrial gas and excessive use of toothpaste), causes fluorosis, affecting the teeth and bones⁷. Mild fluoride intake induces dental effects while long-term exposure to high concentration of fluoride results severe skeletal and other

adverse illness. The associated human health risks from fluoride can be broadly categorized as dental effects, skeletal effects, reproductive effects, developmental effects, renal effects, neurological effects, endocrine effects, and carcinogenic effects. Interestingly consumption of fluoride at modest level prevents dental caries. Thus, the most vital step to control fluorosis is to ensure permissible fluoride concentration in drinking water. The World Health Organization (WHO) has recommended 1.5 mg/l as the maximum permissible limit for fluoride in drinking water⁸.

Endemic fluorosis has been reported from 20 (out of total 29) Indian states, spreading over 65% of the total rural habitations of the country⁹. More than 65 million Indians including 6 million children are at risk due to the presence of fluoride beyond the desirable 1.5 mg/l level in drinking water^{9,10}. High concentration of fluoride in groundwater has been mainly reported from different regions of Assam, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Telangana, Uttar Pradesh and West Bengal^{11,12,13,14,15,16,17,18,19,20}. The present review focuses on the assimilation of relevant data and information on past and present status of fluoride contamination in India, mobility of fluoride in ecosystems, and the related human health issues.





Variety-specific arsenic accumulation in 44 different rice cultivars (*O. sativa* L.) and human health risks due to co-exposure of arsenic-contaminated rice and drinking water

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ABSTRACT

Arsenic (carcinogenic) is a global health concern due to its presence in groundwater and subsequent accumulation in cultivated-rice via irrigation. The present work focused on the evaluation of arsenic concentration in groundwater, different cultivated-rice varieties (studied together for the first-time) and related health-risks. Arsenic in groundwater (0.26–0.73 mg/L) exceeded the World Health Organization limit for drinking water (0.01 mg/L). Arsenic concentration in rice-grains was found in the range: < 0.0003–2.6 mg/kg dry-weights, where 42 rice varieties (out of total 44) exceeded the Codex Alimentarius Commission limit of polished-rice (0.2 mg/kg). The variety-specific differential response of arsenic accumulation was observed (first-time report), where high yielding rice varieties (HYV) were more prone to accumulate arsenic in comparison to local varieties (LV), however, 'Radhuni' (an aromatic LV) exhibited as a moderate arsenic-accumulator (BCF = 2.8). The cumulative estimated-daily-intakes (EDI_{Cumulative}) of arsenic in central-tendency-exposure were observed to be 0.029, 0.031 and 0.04 mg/kg-day among children, teenagers and adults, respectively. The EDI_{Cumulative} for possible reasonable maximum exposure among the above-mentioned subpopulation was 0.038, 0.04 and 0.05 mg/kg-day, respectively. The evaluated Cumulative Hazard Index and Individual Excess Lifetime Cancer Risk values suggested that the studied population is under extremely severe cancerous and noncancerous risks to arsenic co-exposures via drinking water and rice.

1. Introduction

The toxic and carcinogenic effects of arsenic are currently responsible for the suffering of > 200 million people worldwide (WHO, 2018). The concentration of inorganic as well as organic arsenic species was reported to decrease significantly with increase in redox potential (Eh) of soil implying that mobility of arsenic species increase in lower Eh soil environments (Fitzpatrick et al., 2018; Saha et al., 2018). Climate change induced sea level rise was projected to influence the release of arsenic from contaminated coastal soils by changing redox conditions (Fitzpatrick et al., 2018).

The elevated concentrations of arsenic in groundwater, irrigation water, agricultural soil, related cultivated crops (pulses and vegetables) and in different components of ecosystems in fourteen out of total twenty-three districts of West Bengal have been reported since the early 1990s (Biswas et al., 2018; Samal et al., 2018; Santra et al., 2018; Santra et al., 2019; Santra et al., 2020; Santra et al., 2021; Santra et al., 2022; Santra et al., 2023; Santra et al., 2024; Santra et al., 2025; Santra et al., 2026; Santra et al., 2027; Santra et al., 2028; Santra et al., 2029; Santra et al., 2030). The occurrence of endemic arsenicosis in West Bengal was found to be increasing due to altered rainfall patterns, lack of adequate nutrition, exponential increase in the use of groundwater and lowering of the groundwater tables (Biswas et al., 2018; Samal et al., 2018; Santra et al., 2018; Santra et al., 2019; Santra et al., 2020; Santra et al., 2021; Santra et al., 2022; Santra et al., 2023; Santra et al., 2024; Santra et al., 2025; Santra et al., 2026; Santra et al., 2027; Santra et al., 2028; Santra et al., 2029; Santra et al., 2030). In many parts of the world, the

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Evaluation of water quality and toxicity after exposure of lead nitrate in fresh water fish, major source of water pollution

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ABSTRACT

The present study was conducted to investigate the water quality, genotoxicity, histopathological changes in the gill, liver and kidney of common carp, *Cyprinus carpio*, after exposure to lead nitrate. The fishes were divided into six groups and were treated with different concentrations of lead nitrate. After 96 hrs, the gill, liver and kidney tissue samples were collected and histological analysis was carried out. Water samples were analysed after 96 hrs of treatment. The main histopathological changes observed were swollen gill, degeneration of lamella, hepatocytes and enlarged space of Bowman's capsule. The result revealed that the percentage of micronuclei frequencies increased significantly with the increase of the doses. Our findings suggest that common carp exposed to lead nitrate develop genotoxicity. Hence, long-term exposure to higher concentrations of lead nitrate could seriously affect the health status of fish. The results clearly illustrate that the lead nitrate affected not only *Cyprinus carpio* but also the quality of water.

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Introduction

Industrial effluents contain suspended solids, pesticides, organic, inorganic and various toxic metal compounds (Pb, Cu, Cd, Cr, Ni, Hg, etc.) which are major source of water pollution. The unregulated release of agricultural chemicals into water bodies has caused environmental problems to all classes of organisms in the aquatic habitat (Datta et al., 2012; Chak et al., 2013). The aquatic ecosystem has a great importance in the Indian economy. Fishes serve as a bio-indicator of aquatic ecosystem. Aquatic organisms accumulate both directly and indirectly the pollutant from water and food chain. Hence, the disposal of pollutants in water poses adverse effect on the fish health and other aquatic organisms. As a result, fish production is generally encumbered and fishermen face great economic loss. To minimise the adverse effects and to provide safeguards to public health, it is necessary to monitor and understand pathophysiology of pollutants.

Globally, aquatic bodies are mostly contaminated by heavy metals, which are not destroyed through biological degradation. Heavy metals damage the ecological balance by affecting various

physiological, biochemical and cellular processes (Farombi et al., 2007). The toxic effects of various heavy metals may hinder the growth rates, physiological functions, mortality and reproduction in fish (Ebrahimi and Taherianfar, 2011). Several studies suggested that fish exposed to metals showed immune system malfunction and thus had a greater mortality risk (Al-Weher, 2008). Heavy metals also enhance genotoxicity either directly or indirectly by inducing toxicity of other chemical agents (Biswas et al., 1999).

Heavy metals create severe risks for many aquatic organisms, thereby affecting the quality of water (Hassan et al., 2001). Lead (Pb) is a heavy metal known to cause detrimental effects on aquatic organisms (Nordberg et al., 2002). It enters the aquatic environment through natural events as well as various anthropogenic activities (Heath, 1987).

Worldwide great attention is given to the studies of toxicity of heavy metals in fish with the increase of pollution in aquatic bodies and pisciculture. The toxicity of lead nitrate in fish has been reported by several authors (Khair and Mekawy, 2008; Devi and Banerjee, 2007; Osman et al., 2008). However, there is a lack of study in the field of genotoxicological manifestation and assessment of water quality in lead nitrate-exposed fish. The present work investigates the toxic effect of lead nitrate on freshwater fish *Cyprinus carpio*. On the other hand, water quality is an important factor, which directly affects the growth rate, fish's health, survival

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“PROFITABILITY AND LIQUIDITY ANALYSIS OF RAMSARUP INDUSTRIES LIMITED” - A CASE STUDY

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ABSTRACT:

Ramsarup Industries Ltd. is one of the largest manufacturers of steel wire and leading player in TMT manufacturing in Eastern India. It has been observed that the Ramsarup Industries Ltd. is facing a negative trend of profitability over the years. To find out the cause of adverse profitability the researchers have used several ratios for liquidity and profitability analysis and also tried to find out whether is there any significant relation between liquidity and profitability used Motaal Comprehensive Test and Spearman Rank Co-relation as statistical tools and also. The researchers have found a positive relation between liquidity and profitability. They also found negative ROA and ROCE which indicates the earning capacity of the assets and capital employed is negative and needed to be improved. They suggest to make effort for increasing turnover to strengthen the profitability and liquidity position.

Key Words: Profitability, Liquidity, Motaal Comprehensive Test, Ratios, Spearman Rank Correlation.

INTRODUCTION:

Being a developing country India needs a huge development in its infrastructure sector as it is the primary vehicle to develop the economy of a country. To achieve the goals India needs a rapid growth in industrialization. For the development of infrastructure and industrializations, a large number of iron and steel is required as Iron and steel are the basic requirements for all types of construction and manufacturing activities. Ramsarup Industries Ltd. producing iron and steel products, wire products wire, pig iron, sponge iron, TMT bars, galvanized and black wires and thus is playing a key role in this regard. Over the last four decades Ramsarup Group of Companies which is the combination of two companies (viz. Ramsarup Industries Ltd. and Ramsarup Vyapaar Ltd.) had made a remarkable growth by exceeding annual turnover of Rs. 2000 Crores and net worth of Rs. 4500 Crores. It is one of the largest manufacturers of steel wire and a leading player in TMT manufacturing in Eastern India. But

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A COMPARATIVE RISK MANAGEMENT EFFICIENCY ANALYSIS OF SELECTED SCHEDULED URBAN CO-OPERATIVE BANKS (SUCBS) IN INDIA

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Abstract

SUCBs help in providing credit facilities at reasonable rates for the development of small and medium scale enterprises in urban areas. The failure of some good UCBs in recent times has made people aware of their savings and investments in the safest way. In this background, the researchers have selected 13 SUCBs of India for analyzing the risk management capability of the SUCBs. Different accounting ratios have been used for analysis. Student's t-test has been used as a statistical tool to test the hypotheses. It has been found that NAMCO and GUCB banks could not maintain GNPA in lower boundary. DER for SARASWAT bank has been observed to be very high. The funding risk for PMC Bank is significantly higher as to meet the depositors' claim in a panic situation. Time test results for SVC, SARASWAT and RNS Bank show poor performances. The risk of failure in the form of bank run for these SUCBs could not be wiped out at all. The researchers have suggested some preventive measures for improving the risk management ability.

Keywords: UCBs, Risk management, Solvency, Liquidity



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Sulfate improves cadmium tolerance by limiting cadmium accumulation, modulation of sulfur metabolism and antioxidant defense system in maize

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ARTICLE INFO

Keywords:

Antioxidant
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Maize
Phytochelatin
ROS
Sulfate

ABSTRACT

Cadmium (Cd) contamination of agricultural soil has become a serious threat to global food security. The present study highlights the role of added sulfate (SO_4^{2-}) in modulating sulfur metabolism and antioxidant defense system conferring tolerance against Cd stress in maize. Expression patterns of antioxidant genes, transporters involved in SO_4^{2-} and Cd accumulation, antioxidant enzyme activity, membrane damage, *in vivo* reactive oxygen species (ROS) detection and hydrogen peroxide (H_2O_2) accumulation under Cd stress in presence (T_2) or absence (T_1) of excess SO_4^{2-} were studied to get an overview of cellular manoeuvring in conquering Cd induced oxidative stress damages. Moreover, dynamic correlations between miR398a, miR395d, miR408a and their target genes under Cd exposure were validated through qRT-PCR. Supplementation of the $\frac{1}{4}$ Murashige and Skoog (MS) media with excess sulfate [600 μM (NH_4) $_2\text{SO}_4$] markedly restored the shoot biomass under Cd stress (100 μM CdCl_2). Presence of excess SO_4^{2-} in the nutrient media significantly reduced Cd uptake as well as tissue Cd accumulation in T_2 plants. Foliar dark blue and deep brown spots revealed after histochemical staining with nitroblue tetrazolium (NBT) and 3,3'-diaminobenzidine (DAB) respectively indicated severe oxidative burst in T_1 plants under Cd treatment. The chloromethyl derivative of 2',7'-Dichlorofluorescein diacetate (CM-H2DCFDA) and dihydroethidium (DHE) staining further supported enhanced ROS formation in roots of Cd challenged T_1 plants. Enhanced reduced glutathione (GSH) level both in root and above ground part of T_2 plants might be responsible for their better performance under Cd stressed condition as evident from non-significant increase in superoxide anion ($\text{O}_2^{\cdot -}$), low H_2O_2 and thiobarbituric acid reactive substances (TBARS) levels as compared to T_1 plants. Taken together, our findings indicate that fine adaptation of sulfate uptake and assimilation in sulfate supplemented maize plants (T_2) might satisfy two contrasting needs: (a) maintaining high GSH pool essential for sustaining balanced redox status under stress condition; (b) alleviating Cd stress effects by means of GSH mediated detoxification pathways.

1. Introduction

Growing demand for chemical fertilizers, insecticides and pesticides to boost agricultural production has led to an increase in soil and water contamination with heavy metals. Soil cadmium (Cd) toxicity has become a serious threat to the crop productivity and human health. Zinc smelting, coal burning, and toxic by-products released by power stations, metal industries, and cement factories are the major contributors of Cd pollution (Santità di Toppo and Gabbriellini, 1999; Pál et al., 2006).

Despite being a non-essential and toxic metal even at very low concentration, Cd is readily absorbed by plant roots and mostly

transported to above-ground parts due to its high mobility in phloem. Most of the Cd taken up by plant is accumulated in the roots and only a small amount is transported to shoots (Kurtyka et al., 2008). Unlike other heavy metals, entry of Cd^{2+} is mediated through non-specific transporters that are primarily involved in uptake of essential elements such as Zn^{2+} , Fe^{2+} , and Ca^{2+} (Weich and Noryail, 1999; Perfus-Barbeoch et al., 2002). Once Cd ions enter the cell, it alters normal cellular functions by replacing Ca^{2+} , Zn^{2+} , and Fe^{2+} from proteins, as these elements display chemical similarity to Cd (Verbruggen et al., 2009). Moreover, Cd^{2+} causes enzyme inactivation upon binding with protein sulfhydryl groups of proteins (Nocito et al., 2007). All these

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Evaluation of subculture ages on organogenic response from root callus and SPAR based genetic fidelity assessment in the regenerants of *Hibiscus sabdariffa* L.

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ARTICLE INFO

Keywords:

Hibiscus sabdariffa L.
Root explant
Organogenesis
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SPAR

ABSTRACT

The efficacy of an organogenesis based regeneration protocol and the occurrence of somaclonal variation has been studied up-to eighth subculture of *Hibiscus sabdariffa* L. var. HS4288. Initially, the induction of organogenic calli from 83.33% root explants was standardized in 2.26 μ M 2, 4-Dichlorophenoxyacetic acid (2, 4-D) and 4.65 μ M kinetin (KIN) supplemented Driver-Kuniyuki Walnut (DKW) basal medium. The calli were maintained up to the eighth subculture (each with 6-weeks duration) in the same basal medium along with 1.13 μ M 2, 4-D and 4.65 μ M KIN. The highest regenerative efficiency of the root-derived calli was found in 1.08 μ M α -Naphthaleneacetic acid (NAA) and 8.88 μ M 6-Benzyladenine (BA) containing DKW medium. This particular medium produced 14.30 ± 0.47 numbers of visible shoots (> 10 mm in length) at the first subculture from 425 ± 35 mg of callus through the process of organogenesis. The morpho-histological study confirmed the organogenic mode of regeneration. With the gradual increase of culture passage, the frequency of shoots was steadily declined. The genetic polymorphism of the regenerated plants from eight successive sub-cultures was assessed using three different single primer amplification reaction (SPAR) methods; viz. Random amplified polymorphic DNA (RAPD), Direct amplification of minisatellite DNA (DAMD) and Inter simple sequence repeat (ISSR) markers. The SPAR analysis revealed that up to fifth subculture all the three types of primers produced the monomorphic banding pattern among the regenerated plants with that of their mother plant. From the sixth subculture onwards there were some alterations in banding profiles both in RAPD and ISSR markers but DAMD marker did not show any polymorphism up to eighth subculture. In the present work, the highest polymorphism percentage was recorded among the plants of eighth subculture by using both RAPD (41.61%) and ISSR (31.65%) markers. The SPAR method ensured that the present protocol may be used for true to type plant production up-to five consecutive subcultures.

1. Introduction

Hibiscus sabdariffa L. (Malvaceae), popularly known as Roselle, is an industrially important plant for its comprehensive use in textile, food and phytochemical industries. The different parts of the plant are applied as diuretic, digestive and also to treat hypertension (Paraji and Tarkhani, 1999), liver disorders, atherosclerosis (Chen et al., 2003) etc. Now-a-days hibiscus tea or Roselle tea made as an infusion from thick, red, fleshy, cup shaped calices of its flower is becoming very popular as

healthy drinks throughout the world (Ali et al., 2008). Furthermore, the presence of high content of anthocyanin pigments in their sepal makes them useful as natural coloring agent in different food products like jam, jelly, liquor etc. (Akinkunmi and Olukeye, 2003). The multifaceted uses of Roselle make it as an important industrial crop, but much work was not carried out for the genetic improvement of this plant. Sylvere Sio et al. (2010) rightly pointed out that the Roselle plants are highly susceptible to various fungal pathogens but the resistance germplasm were not identified in the nature. The main reason

Abbreviations: PGRs, plant growth regulators; DKW, Driver and Kuniyuki Walnut (1984); 2,4-D, 2,4 dichlorophenoxyacetic acid; KIN, kinetin; BA, 6-benzyladenine; TDZ, thidiazuron; NAA, α -naphthalene acetic acid; SPAR, single primer amplification reaction; RAPD, random amplified polymorphic DNA; ISSR, inter simple sequence repeat; DAMD, direct amplification of minisatellite DNA

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RESEARCH ARTICLE

Regeneration of plantlets through somatic embryogenesis from root derived calli of *Hibiscus sabdariffa* L. (Roselle) and assessment of genetic stability by flow cytometry and ISSR analysis

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Data Availability Statement: All relevant data are within the paper.

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Competing Interests: The authors have declared that no competing interests exist.

Abbreviations: PGRs, Plant growth regulators; MS, Murashige and Skoog (1962); DKW, Driver and

Abstract

Induction of somatic embryogenesis and complete plantlet regeneration from callus culture of *Hibiscus sabdariffa* L. var. HS4288 has been made. Leaf and root explants were cultured on Murashige and Skoog (MS) and Driver–Kuniyuki Walnut (DKW) basal media supplemented with different concentrations of synthetic auxins and cytokinins. Root explants on DKW medium supplemented with 2.26 µM 2, 4-Dichlorophenoxyacetic acid (2, 4-D) and 4.65 µM kinetin (KIN) induced highest percentage (70%) of embryogenic calli. Average number of globular embryos per root derived callus produced within 6 weeks of culture initiation on MS media with different plant growth regulators (PGRs) ranged from 2.27±0.12 to 8.80±0.17 and that of cotyledonary embryos ranged from 0.00 to 2.53±0.20. On DKW medium comparatively more globular embryos (2.70±0.15 to 14.53±0.23) and cotyledonary embryos (0.00 to 8.90±0.17) were produced than that of MS medium. Regeneration of complete plantlets was highest (76.67%) when embryogenic calli with mature somatic embryos were grown on DKW medium containing 2.32 µM KIN and 2.22 µM 6-Benzyladenine (BA). Plants were primarily hardened in humidity, temperature and light controlled chamber and finally in a greenhouse showed 70% survival ability. Different stages of somatic embryogenesis process in the root derived embryogenic calli were elaborated in detail by morphological, histological and SEM study. The data were statistically analyzed by Duncan Multiple range test ($p < 0.05$) and Principal component analysis (PCA). Flow cytometry and Inter-simple sequence repeats (ISSR) marker analysis confirmed that there was no genetic variation within the regenerated plants.



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NANDARĀMA'S KĀRIKĀS ON MĪMĀMSĀ: AN UNPUBLISHED TEXT

Somnath Sarker*

Abstract: *Sādhārṇanākārikā* (SDKā) is yet an unpublished text on philosophy, the manuscript of which is available in the Acharya Jogesh Chandra Purakriti Bhawan or Bankura District Museum, Bishnupur, Bankura, West Bengal, bearing the accession number 867. The whole manuscript consists of 11 folios and is written in Sanskrit language, in Mediaeval Bengali script on handmade paper. The size of the ms. is 35×11 cm. The SDKā is a complete ms., there is no missing folio in it and the condition is fair. Usually each folio of the ms. of SDKā contains 8 lines; but in folio no. 1, 2 and 3 exceptions are noted; there are seven lines and the last folio no. 11b contains 9 lines. In the colophon no date and scribe's name are mentioned. The text contains brief account of philosophical discourses on the six standard systems of Indian Philosophy in *kārikā* forms. There are 259 *kārikās* in total along with 3 half verses, which explain the discourses of Nyāya-Vaiśeṣika-Mīmāṃsā-Vedānta-Sāṃkhya and *Pātañjalayoga*. In this present article the researcher would like to concentrate only the Mīmāṃsā portion of the text. The research article will furnish the higher-criticism of the text along with the *editio princeps* of the *Mīmāṃsākārikā* and also the lower-criticism part. The journey of the manuscript, the journey of the text and author will be presented as far as practicable.

Key Words: Manuscripts, Manuscriptology, Higher-criticism, Lower-criticism, *Editio princeps*, *Āstika* Philosophy, Colophon.

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Jñānaprabodhamāñjarī: AN UNPUBLISHED ADVAITA VEDĀNTA TEXT

Somnath Sarkar*

Abstract: The growth of literature on *Advaita-Vedānta* can be treated in relation to the following periods — ancient, mediæval and the late mediæval and the present one. Of these the former extends upto the times of Śrī Śaṅkarācārya and his contemporaries. The late mediæval period is the high time of the composition of the primary texts of *Vedānta* and the *prakaraṇa-grantha*. A *prakaraṇa* type of texts or works aims at expounding and illustrating a section of particular *śāstra* or scientific literature of the subject, as it has been so explained by the experts. In this research article one of such *prakaraṇa* text that is edited critically. The text is *Jñānaprabodhamāñjarī* sometimes ascribed to Śaṅkarācārya.

Keywords: *Advaita-Vedānta*, Primary texts, *Prakarana-text*, Critical edition, Higher criticism, Critical apparatus.

Advaita-Vedānta is the pinnacle of Indian thought and Sanskrit texts dealing with *Advaita-Vedānta* are the crest jewel of Sanskrit literature. *Advaita-Vedānta*, according to many scholars, is the most logical system of Indian Philosophy. It has a long history beginning with *Gauḍapādakārikā* (7th century) and ending with Madhusūdana-Sarasvatī's *Advaitasiddhi*. The *Advaita* literature is vast. Some books are expository, some are polemic and some others are answers to the opponents' criticisms. Besides these important texts there are so many so called minor texts of *Advaita-Vedānta*. Since *Vedānta* philosophy is ultimately rooted in the *Upaniṣads*, so the minor texts are also related to the nectar of the *Upaniṣad* and arguments which conform to these texts. The text on *Advaita-Vedānta* theories and epistemology in Sanskrit is called *Prakarana Grantha*. A *prakaraṇa*

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Nandarāma's *Kārikās* on *Nyāya-Vaiśeṣika*: An Unpublished Text

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1.1. The Manuscript

Śaddarśanakārikā (SDKā) is a yet unpublished text on philosophy, the manuscript of which is available in the Acharya Jogesh Chandra Purakriti Bhawan or Bankura District Museum, Bishnupur, Bankura, West Bengal, bearing the accession number 867. The whole manuscript consists of 11 folios and is written in Sanskrit language, in Mediaeval Bengali script on handmade paper. The size of the ms. is 35 × 11 cm. The SDKā is a complete ms., there is no missing folio in it and the condition is fair. Usually each folio of the ms. of SDKā contains 8 lines; but in folio no. 1, 2 and 3 exceptions are noted; there are seven lines and the last folio no. 11b contains 9 lines. In the colophon no date and scribe's name are mentioned. The text contains brief account of philosophical discourses on the six standard systems of Indian philosophy in *kārikā* forms. There are 259 *kārikās* in total along with 3 half verses, which explain the discourses of *Nyāya*, *Vaiśeṣika*, *Mīmāṃsā*, *Vedānta*, *Sāṃkhya* and *Pātāñjalayoga*. Intermediate colophon of each section is as follows:

- Nyāya* => iti śrīnandarāmeṇa gotamarṣi-matānugā /
kārikā saṃdhitā sadbhīr ādaro 'tra vi dhīyatām // (verse 1.48)
- Vaiśeṣika* => kenāpi nandarāmeṇa kanādarṣimatānugā /
kārikā saṃdhitā sadbhīr ādaro 'tra vi dhīyatām // (verse 2.48)
- Mīmāṃsā* => kenāpi nandarāmeṇa jaiminer matabodhikā /
kārikā saṃdhitā sadbhīr ādaro 'tra vi dhīyatām // (verse 3.47)
- Vedānta* => kenāpi nandarāmeṇa vedavyāsānubhāvitā /
kārikā saṃdhitā sadbhīr ādaro 'tra vi dhīyatām // (verse 4.26)

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The Unpublished Kārikas of Nandārāma on Sāṅkhya and Yoga with Extracts of Jagannātha Tarkānāthakāra's Commentary on them

Somnath Sarkar

1.0 Bengal has been a melting pot of various cultures since historic times. The area is notable for its rich cultural heritage in the form of temples, traditional arts and crafts, festivals, rituals and so on. In Bengal from ancient times, knowledge systems were passed down to the succeeding generations through a rich oral tradition. With the gradual deterioration of oral transmission and the development of scripts and writing materials, these came to be written down on different materials such as birch, copper plates, birch bark, palm leaves and handmade paper. The treasure of the wisdom, containing the ancient knowledge system has come to us in the form of manuscripts. Composed in different languages and scripts, these manuscripts are spread all over the country in different institutions, libraries, monasteries, museums, mosques and temples. There are so many historical repositories in Bengal, where the national treasures are well preserved. One of the most important repositories is Bankura District Museum, known as Acharya Jogesh Chandra Purakriti Bhawan, located in Bishnupur town of Bankura district. There are thousands of manuscripts on Grammar, *Āyurveda*, Literature, Philosophy, *Procedury*, *Dinamitry*, *Purāṇa* etc. in Sanskrit and Mediaeval Bengali languages in different scripts. *Siddhāntaśāstra* (SDKs) is one of the most important manuscripts of that repository.

1.1 The Manuscripts

Siddhāntaśāstra (SDKs) is an yet unpublished treatise on philosophy, the manuscript of which is available in the Acharya Jogesh Chandra Purakriti Bhawan

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ETHNICITIES AS MENTIONED IN THE
MAHABHARATA: TRANSFORMATION OF POPULAR
CULTURE THROUGH NARRATIVES

The *Mahābhārata*, one of the most widely read literary work of the world, is also known for teachings on the Indian Knowledge systems. One of the most striking features of the *Mahābhārata*, textual tradition is the fact that it has come down in more than a dozen different languages of India. This happens because before the 18th century, that is, before the introduction of printing in India, *Mahābhārata*, was rendered into local vernacular languages in a number of local scripts. Thus, in the *Mahābhārata*, textual tradition the concomitance between script and version has, in many instances, been considered a traditional feature of its evolution. This present paper applies a two-fold approach to the study of Mediaeval Bengali *Mahābhārata*, texts of popular type. Those texts are the specimen of multi-dimensional literary form with its contemporary historio-cultural illustration and also for the popular Culture.

The *Mahābhārata*, corpus, as it has come down to us, has evolved, absorbed and incorporated many traditions across the centuries, particularly during the period between the 2nd century BCE and the 2nd century CE when it was mainly compiled. As it developed from *Jaya* to *Bhārata* to *Mahābhārata*, it became the story of the people of all India. Indeed, the *Mahābhārata*, is a great assemblage of peoples. The *Mahābhārata*, probably the first comprehensive ethnography of India, has been explored as such by scholars, particularly historians, who have generally applied the colonial concept of tribe to describe the people or jana. Certainly the *Mahābhārata*, presents a picture of a mixed society with people, particularly rulers, marrying across social groups, speaking differ-



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Optimal replenishment policy and preservation technology investment for a non-instantaneous deteriorating item with stock-dependent demand

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Abstract An inventory model with stock-dependent demand and non-instantaneous deterioration is developed in this paper. It is assumed that the item starts deteriorating at a constant rate after a certain period of time from the instant of receiving the delivery by the retailer. The retailer can reduce the rate of deterioration by investing in preservation technology. Depending on the fact that the on-hand stock may be finished before or after deterioration starts, two different inventory scenarios have been considered and analyzed. Optimal length of an inventory cycle as well as investment in preservation technology have been obtained in both the scenarios. Certain conditions have also been derived to identify situations where the retailer should or should not invest in preservation technology. The proposed model is illustrated with a numerical example.

Keywords Inventory · Stock-dependent demand · Deterioration · Preservation technology

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अपनी भाषाओं के द्वारा ज्ञान और रोजगार पर कभी माकूल ध्यान दिया ही नहीं। शिक्षा और संस्कृति कभी सरकारी नीतियों की प्रधान एजेंडा रही ही नहीं। हिंदी को लेकर खोखला प्रेम व्यक्त करने वाले भाषा को दिखावे के लिए ओढ़ते जरूर हैं किंतु उसे सामान्य जरूरी सम्प्रेषण का माध्यम नहीं बनने देते। यहाँ तक कि राजभाषा हिंदी के नाम पर जो धन खर्च होता है उसका भाषाई, सांस्कृतिक, अकादमिक और प्रशासनिक प्रतिफल बहुत कम मिला है। माध्यम के रूप में हिंदी, शिक्षा के क्षेत्र में बच्चों की प्राथमिकताओं में सबसे नीचे है। सूचना क्रांति के बावजूद हिंदी में पढ़े-लिखे लोग यूनीकोड फॉन्ट मगल को नहीं जानते। नाम जानते भी हैं तो टंकण की कला से वंचित हैं। हिंदी में पठन-पाठन का स्तर गिरा है। राजकाज में हिंदी मात्र अनुवाद की भाषा होकर रह गई है।

अतः अब आवश्यक है कि हिंदी में विज्ञान, समाजशास्त्र, राजनीति, अर्थशास्त्र, भूगोल के साथ अन्य विश्व साहित्य को पेश किया जाए और उसमें विविध विधाओं में पर्याप्त सामग्री हो। एम वी ए, आई आई एम, आई टी जैसे क्षेत्रों में हिंदी, बंगाली, गुजराती आदि भाषाओं का भी माइयूल होना चाहिए।

इसके लिए हिंदी के साथ क्षेत्रीय भाषाओं की जानकारी भी होनी चाहिए। दुखद है कि शिक्षण संस्थानों द्वारा इसे नकारा जा रहा है।

लेखकों के द्वारा हिंदी में अधिकाधिक बाल-साहित्य का निर्माण किया जाना चाहिए। हिंदी को अंग्रेजी समेत अन्य भाषाओं के शब्दों के द्वारा मजबूत और समृद्ध बनाया जाना चाहिए। हिंदी में पारिभाषिक शब्दावली को शुद्धतावाद की ओर न ले जाकर लोकप्रिय चलताऊ शब्दों का इस्तेमाल किया जाना चाहिए।

भाषा का सम्बन्ध उसकी लिपि से होता है अतः हिंदी का रोमन नहीं बल्कि देवनागरी लिपि में प्रचार-प्रसार किया जाना चाहिए।

शिक्षा के माध्यम के रूप में उसी हिंदी का प्रसार संभव है जो अकारण तत्सम प्रधान न हो। उसमें स्थानीय शब्दों का प्रयोग कर उसे सहज बनाया जाए। उसमें शिक्षा के साथ रोजगार और व्यापार की सुविधा हो। जनता को ई साक्षर बनाया जाए। भाषा के साथ आत्मविश्वास को जोड़ा जाए।

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हिन्दी के बढ़ते कदम और चुनौतियाँ

डॉ. सुनीता मंडल

14 सितम्बर 1949 ई. को भारत की संविधान सभा ने सर्वसम्मति से संविधान के भाषा सम्बन्धी प्रावधानों को स्वीकार किया और हिंदी को भारत संघ की राजभाषा की गरिमा प्रदान की। मुंशी-अयंगर (कन्हैयालाल माणिकलाल मुंशी तथा गोपाल स्वामी अयंगर) सूत्र के पारित हो जाने पर संविधान सभा के अध्यक्ष देशरत्न डॉ. राजेन्द्र प्रसाद ने सदन को बधाई देते हुए कहा था

“हमारे सम्पूर्ण देश के निर्माण में भाषा-विषयक अध्याय का सुदूरवर्ती प्रभाव होने वाला है। आज पहली बार हम अपने संविधान में एक भाषा को स्वीकार कर रहे हैं कि जो भारत संघ के प्रशासन की भाषा होगी और जिसे समय के साथ अपने आपको ढालना और विकसित करना

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सबाल्टर्न साहित्य और किन्नर विमर्श: समाज के परित्यक्त वर्ग की व्यथा कथा

डॉ सुनीता मंडल

साहित्य हमेशा से समाज में फैली हुई कुरीतियों, पाण्डों, अपविधायों, अत्याचारों के खिलाफ अपनी आवाज बुलंद करता आया है लेकिन जैसे ही बात किन्नर वर्ग की दुख एवं पीड़ा की आती है तो इस विषय पर साहित्य रचना अंगुलियों पर गिनी जा सकती है अर्थात् इस पर बहुत कम लिखा मिलता है। किन्नर की पीड़ा को व्यक्त करता यह आलेख न केवल उनका परिचय कराता है बल्कि उनके मनुष्य होने, उन्हें अधिकार दिलाने, एवं उन्हें सम्मान पूर्वक जीने देने की राह सबाल्टर्न साहित्य के माध्यम से दिखाने का एक प्रयास है।

उत्तर। 16वीं शताब्दी से व्यवहृत सबाल्टर्न शब्द लैटिन शब्द सबाल्टर्नस शब्द का परिवर्तित रूप है। सबाल्टर्न शब्द लैटिन के 'सब' और 'अल्टर्नस' शब्द से मिलकर बना है। सब का अर्थ है अगला नीचेवाला और अल्टर्नस का अर्थ हर दूसरा है। यानी हर वो व्यक्ति जो पहला नहीं हर दूसरे के बाद है, दूसरा है और उसकी स्थिति निम्न है। सबाल्टर्न शब्द का प्रयोग ब्रिटिश सेना में निचले ओहदे के अधिकारियों के लिए किया जाता रहा। लेकिन बाद में इतावली विद्वान अंतोनियो ग्रामशी ने अपनी प्रसिद्ध रचना प्रिजनबुक्स में पहली बार 'सबाल्टर्न' शब्द का प्रयोग समाज के उपेक्षित, दलित और गौण वर्गों के लिए किया जो बाद में इतिहास अध्ययन की एक पद्धति के रूप में प्रसिद्ध हुई।

रंजीत गुहा ने, सबाल्टर्न स्टडीज वन की भूमिका में लिखा— "The word 'Subaltern' in the title stands for the meaning as given in the Concise Oxford Dictionary, that is 'of inferior rank'. It will be used in these pages as a name for the general attribute of subordination in South Asian Society whether this is expressed in terms of class, caste, age gender in office or in any other way." अतः जब लिंग के संदर्भ में भी अधीनता की बात सबाल्टर्न के संदर्भ में की गई है तो भला किन्नर समाज किस तरह सबाल्टर्न से बाहर हो सकता है क्योंकि समाज में हाशिये की स्थिति का कारण भी उसका लैंगिक दोष ही है। किन्नरों की स्थिति समाज में हाशिये के भी हाशिये पर है। उन्हें तो सामान्य मनुष्य तक नहीं समझा जाता। सबाल्टर्न अध्ययन पद्धति आम लोगों एवं उपेक्षित एवं पीड़ितों के जनजीवन से इतिहास को देखने की कोशिश करता है मगर किन्नरों के संदर्भ में तो उनका वर्तमान भी तथाकथित सभ्य समाज से अछूता है। किन्नरों की वर्तमान स्थिति क्या है, उसकी पीड़ा क्या है, उनकी समस्याएँ क्या हैं, आदि के सम्बंध में किरण ग्रावर लिखती हैं— "किन्नरों का भी अपना एक समाज है, अपनी संस्कृति है। जिनके बारे में हम नहीं सोचते और न जानने की कोशिश करते हैं कि मानव समाज की उपेक्षा, उपहास और संत्रास का देश झेलते हुए किन्नर अपने अंदर क्या महसूस करते हैं। इनके मन की गहराईयों में क्या भावनाएँ हिलों लेती हैं।" जो उनके वर्तमान रीति रिवाज एवं परम्परा नहीं समझना चाहते, वे उनकी परम्पराओं का इतिहास क्या लिखेंगे? कहने का तात्पर्य यह है कि किन्नर समाज सबाल्टर्न समाज का वह हिस्सा है जो सभ्य समाज में या तथाकथित सभ्य समाज के लोगों के लिए exist ही नहीं करते। फिर उनके इतिहास की बात कौन करे। आज जरूरी है कि हमें उनकी बात करनी होगी उनके विषय में सोचना होगा, गहराई से चिंतन करना होगा। तभी मानवता सधेगी।

• जब कभी किसी के परिवार में कोई खुशी का अवसर होता है, तो हम देखते हैं कि एक लैंगिक दृष्टि से विवादित समाज के लोग जो प्रायः हिजड़े (अथवा वर्तमान में प्रचलित नाम किन्नर, हालाँकि किन्नर शब्द हिमाचल प्रदेश के किन्नोर निवासियों हेतु प्रयुक्त होता था, जिसे अब हिजड़ों के संदर्भ में व्यवहृत किया जाने लगा है) होते हैं, आ जाते हैं और बधाइयाँ गाकर, आशीर्वाद देकर कुछ रुपए लेकर विदा हो जाते हैं। इसके बाद हम भी अपनी सामान्य गतिविधियों में व्यस्त हो जाते हैं और दोबारा कभी इनके बारे में नहीं सोचते। हम कभी यह जानने का प्रयास नहीं करते कि ये किन्नर कौन हैं, कहाँ से आये हैं, इनकी समस्याएँ क्या हैं और वे कौन से कारण हैं, जिनकी वजह से इन्हें किन्नर बनकर एक प्रकार की भिक्षावृत्ति से जीवन-यापन करने को विवश होना पड़ता है।

किन्नर या हिजड़ों से अभिप्राय उन लोगों से है, जिनके जन्मनाम पूरी तरह विकसित न हो पाए हों अथवा पुरुष होकर भी स्त्री स्वभाव के लोग, जिन्हें पुरुषों की जगह स्त्रियों के बीच रहने में सहजता महसूस होती है। जैसे हिजड़ों को चार वर्गों में विभक्त किया जा सकता है—बुचरा, नीलिमा, मनसा और हंसा। वास्तविक हिजड़े तो बुचरा ही होते हैं क्योंकि ये जन्मजात 'न पुरुष न स्त्री' होते हैं, नीलिमा किसी कारणवश स्वयं को हिजड़ा बनने के लिए समर्पित कर देते हैं, मनसा तन के स्थान पर मानसिक तौर पर स्वयं को विपरीत लिंग अथवा अक्सर स्त्रीलिंग के अधिक निकट महसूस करते हैं और हंसा शारीरिक कमी यथा नपुंसकता आदि यौन न्यूनताओं के कारण बने हिजड़े होते हैं। नकली हिजड़ों को अबुआ कहा जाता है जो वास्तव में पुरुष होते हैं किन्तु धन के लोभ में हिजड़े का स्वाग रख लेते हैं। जबतन बनाए गए हिजड़े छिबरा कहलाते हैं, परिवार से रजिस्ट्रार के कारण इनका लिंगोच्छेदन कर इन्हें हिजड़ा बनाया जाता है। भारत की सन 2011 की जनगणना के अनुसार पूरे भारत में लगभग 49 लाख किन्नर हैं, जिनमें से एक लाख 37 हजार उत्तर प्रदेश में हैं। इसी जनगणना के मुताबिक सामान्य जनसंख्या में शिक्षित लोगों की संख्या 74 फीसदी है जबकि यही संख्या किन्नरों में महज 46 फीसदी ही है। इनमें आधे से अधिक नकली स्वाग करने वाले हिजड़े हैं। आश्चर्य की बात यह है कि शेष दो लाख असली हिजड़ों में से भी सिर्फ ४०० जन्मजात हिजड़े या बुचरा हैं, शेष हिजड़े स्त्री स्वभाव के कारण हिजड़ों में परिगणित किए जानेवाले मनसा या हंसा हिजड़े हैं, और इससे भी बड़े आश्चर्य की बात यह कि इन दो लाख हिजड़ों में से लगभग सतर हजार हिजड़े ऐसे हैं, जिन्हें एक छोटे से ऑपरेशन के बाद लिंगपरिवर्तन करने के पश्चात् पुरुष या स्त्री बनाया जा सकता है लेकिन दुःख की बात है कि इस ओर किसी का ध्यान नहीं है।

सम्पूर्ण हिजड़े समुदाय को सामाजिक सरचना की दृष्टि से सात समाज या

Analysis and assessment of Dharma: Sadharana Dharma and Svadharma

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Abstract: Dharma is one of the basic concept of Indian morality. Although dharma is held to be something universally known or acknowledged, yet it is not the same thing which everyone preaches or practices. As a matter of fact, the exact meaning of Dharma is still shrouded in mystery. There are different opinions regarding Dharma in Indian philosophy. Dharma is not religion, although the former may pave, may actually paves, the way for the latter. Dharma consist in a harmony or unity between what one says and what one does. There are five properties at least need to be cultivated in order that one attain Dharma. In Indian morality, Dharma is classified as generic or Sadharana Dharma and specific or Svadharma. Sadharana Dharma stands for universal code of conduct and strengthens social relation on the solid basis of humanitarianism. Svadharma are specific duties to be discharged by specific class and specific stage of life.

Index Terms: Dharma, religion, Sadharana dharma, Svadharma, Indian morality.

ANALYSIS AND ASSESSMENT OF DHARMA: SADHARANA DHARMA AND SVADHARMA

First, I would like to focus on the concept of Dharma which is one of the basic concept of Indian morality, then on Sadharana Dharma and Svadharma. 'Dharma' is considered as 'an absolute moral duty' but the meaning of Dharma is not easy to capture. Our reverend Sastrakaras realise that "Dharmasya Tattvan Nihitan Guhayam" i.e. the exact significance of dharma is shrouded in mystery and revealed only to those who are concentrating their minds in the scheduled place of a cave being detached from the dim and bustles of life.

'Dharma' is a word whose meaning spans from the apauruseya rta to faith of the races and thereby to mean religion from the inexorable cosmic order to relative duties of caturvarna and caturasrama from the nature of objects (vastudharma) to regulative principles of social and moral conduct etc. So, it is bound to be elusive. In spite of these numerous senses the concept of dharma is used as ethical and moral duties in Indian morality. To use the concept of Dharma in ethical sense makes the concept value oriented and secondly, it marks an important distinction between religion and morality, both of which are intricately intermixed in Indian tradition.

There are various opinions regarding Dharma in Indian Philosophical schools. For example, the good desires are dharma in the opinion of Bauddhas. According to Jainas, Dharma is pudgala which is the subtle producer of effect. For Nyaya- Vaishesikas, dharma is a quality residing in soul substances. The modifications of citta are looked upon as dharma in Sankhya philosophy. In the opinion of Prabhakara, Dharma is apurva which arises out of sacrifice and lasts till the phalos is received. For Bhatta, Dharma means different rituals and sacrifice prescribed by the sastras. Be that as it may, the meaning of dharma is not easy to grasp.

Dharma is not religion. It is true that property of fire is to produce burning but we never said that the religion of fire is to produce burning. It means that Dharma can never be replaced by the term 'religion'. Religion is not an English equivalent of Dharma. Religion stands for particular behaviour pattern, certain attitudes to life, only in the case of conscious human being. There is nothing in this world which is bereft of Dharma. In other words not only conscious animate objects but also inanimate unconscious objects do have dharma for their origination and sustenance. Again, religion is a kind of opinion (matam), though the opinion is the opinion of the seer, a revered person. But, dharma is neither opinion nor even sacred opinion; it stands at best for property, essence intrinsic nature, inhering quality and the like. This is why, religion is always associated with 'ism', but dharma is not 'ism' of any kind.

As the etymology suggest (dhr+man), dharma is that which holds or which sustains. It is that property in the absence of which man becomes a man and in the absence of which man is not a man i.e., cannot be called a man. Sri Ramakrishna, the spiritual designer and moulder of Swami Vivekananda used to say; mon mukh ek karai dharma. That is, to say, to do one thing and think another is not dharma. Dharma on the contrary consists in a harmony or unity between what one says and what one does. To the insightful vision Sri Ramakrishna: a man is one who is conscious of his own standard, his own ideal- man samparke hums manus.

The most important and striking point is that in the Mahabharata one of the greatest epic, it is claimed that the meaning of Dharma goes on changing in respect of time and clime, i.e., what is Dharma in the Satyayuga may not be dharma in Dvapara or in Kaliyuga and same will be said in the concept of Dvapara and Kaliyuga. But, this claim has a dangerous implication. Firstly, to accept the alternate implication of the concept of dharma makes the great concept being lost in straightforward relativism on the one hand and on the other hand due to supposedly different senses which the term dharma expresses in different yugas, we have no rational ground for judging respect to what was dharma and what was adharma in ancient times. It means there would be no criterion for making moral judgements.



[Signature]
Principal

*Gandhiji's concept of Non-Violence: It's relevance in
Present society

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1. Abstract

Non-violence or Ahimsa is one of the cardinal virtue. It is the harmless to self and others under every condition. Truth and non-violence are the cornerstone of Gandhian Philosophy. Non-violence is specially the principal of searching for the truth. Man as animal is violent, but as spirit he is non-violent, the moment he awakes to the spirit within, he cannot remain violent. Non-violence has 'active' and 'activists' elements, in that believers accept the need for non-violence as a means to achieve political and social change. For example, Mahatma Gandhi leading a successful decades long non-violent struggle against British rule in India. Martin Luther king's and James Bevel's adoption of Gandhi's non-violent methods in their campaigns to win civil rights for African Americans and Cesar Chavez's campaigns of non-violence in the 1960s to protest the treatment of farm workers in California. The 1989 'Velvet Revolution' in Czechoslovakia that saw the overthrow of the communist government is considered one of the most important of the largely non-violent Revolution 1989. Truly speaking today we see violence everywhere, in the family, in the community, in the state and also in international sphere. In this scenario does non-violence carry any sense? Yes it is possible. Violence never solves any problems, rather it creates new problems and sows the seeds of future violence. But by practicing non-violence we can save our world. In this paper I want to explain the concept of non-violence and the relevance of Gandhi in present society.

Keywords: Non-violence, Truth, Conflict, Destruction, Inconsistent

The term 'Ahimsa or non-violence' is an important tenet of Jainism, Hinduism, and Buddhism. 'Ahimsa' means 'not to injure' and compassion and refer to a key virtue in Indian religion. The word is derived from the Sanskrit root hims - to strike, himsa is injury or harm, a himsa is the opposite of this, i.e., cause no injury, do no harm. Non-violence refers specially to the absence of violence and is always the choice to do no harm or the least harm and passively is the choice to do nothing. Non-violence signifies a typical religious and ethical world view and philosophy of life and culture. The norms of non-violence began to emerge in the later stage of the Vedic traditions (1500-900 BC) as a reaction against the practice of ritual sacrifices sanctioned in the early Vedic text. The rudiments of the ethics of non-violence began to take shape by the time of the Upanishads. With the growth of Buddhism and Jainism in India, the ethics on non-violence passed from a purely personal, idealistic and moral plane of acceptance to the collective way of life of people. It is true that non-violence is not a new concept which Gandhiji invented as he said, "I have nothing new to teach the world. Truth and non-violence are as old as hill." According to Gandhiji ahimsa in theory no one

knows. It is as indefinable as God. But in its working we get glimpse of the Almighty in his working amongst us and through us.¹ His non-violence is a principle. "I believe, he says, 'in the principle of non-violence.'² Truth and non-violence are the main pillars on which rested the entire framework of the magnificent edifice of Gandhiji's glorious life and work. Non-violence is the means and truth is the end. We have no means of realising truth in human relationships except through practice of non-violence.³

Non-violence and truth he wrote "are so closely entwined that it is practically impossible to untangle them and separate them from each other." They are like the two faces of a single medal, or rather of a smooth and unmarked metal disc, who can say which the front is and which is the back?⁴

In his concept of ahimsa or non-violence Gandhiji was greatly influenced by Tolstoy, according to whom non-violence involved not only the negative attitude of freedom from anger or hate but also the positive attitude of love for all men. According to Gandhiji, 'Ahimsa in its negative aspect involves doing no injury to any being either physically or mentally. I also mean I must do no

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অনিবার্য অধ্যয়ন এবং ১৩ পৃ. অধ্যয়ন।

এবং মল্লয়া

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)

২২ তম বর্ষ, ১২৮ (ক) সংখ্যা, ডিসেম্বর - ২০২০

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বাংলা উপন্যাস ও নাটকে দেশ ভাগ :

প্রতিক্রিয়া ও প্রতিফলন

অমরেশ মিত্র

প্রধানত ধর্মীয় অসহিষ্ণুতা ও রাজনৈতিক ক্ষমতা লাভের অভিপ্রায়, এক শ্রেণী-মুষ্টিমের মানুষের সীমাহীন উন্মত্ততার প্রত্যক্ষ ফল দেশ ভাগ। শাসক যখন তার পেশি শক্তির বলে, তাদের লোভ-আকাঙ্ক্ষাকে চরিতার্থ করতে গিয়ে তাদের অত্যাচারের মাত্রা বাড়িয়ে দেয়, যখন তারা মনে করে সমস্ত শাসিতকে তারা সার্বিকভাবে নিয়ন্ত্রণ করে ফেলেছে, তখনই শাসিতের মনের ক্রোধ অগ্নিরূপে সহস্র শ্মূলিঙ্গের আকারে হিংসা অথবা অহিংসার পথে শাসকের বিরুদ্ধে সম্ভবত্বভাবে সোচ্চার হয়ে ওঠে। আবার, দীর্ঘদিনের বঞ্চনা, শোষণ, নির্যাতন ও উপবাস, পরস্পর বিচ্ছিন্ন শাসিতের মধ্যে সমস্ত ভেদাভেদের অদৃশ্য প্রাচীর ভেঙে বৃহত্তর স্বার্থের জন্য তারা ঐক্যবদ্ধ হয়েছে, এই ইতিহাস আমাদের অজানা নয়।

ইতিহাস বলে, পৃথিবীতে বিভিন্ন সময় বিভিন্ন কারণে রক্ষমতা, আধিপত্য ও অর্থনীতি বিভিন্ন দেশ বিভক্ত হয়েছে, কিন্তু ধর্মকে হাতিয়ার করে দেশ ভাগ, পৃথিবীর ইতিহাসে বিরল ঘটনা। আর এই ধর্মকে সামনে রেখে, ১৯৪৭ সালে স্বাধীনতা লাভের অনেক আগেই ভারতবর্ষের ডানা ছটার পরিকল্পনা হয়, আর ১৫-ই আগস্টে জন্ম নেয় দুই ভারতবর্ষ।

প্রায় দীর্ঘ আটশো বছর হিন্দু ও মুসলমান উভয় ধর্মের মানুষ পাশাপাশি বাস করে আসছে। তাদের মধ্যে সংঘাত বাধেনি, এমন নয়। সময়ের অনিবার্য প্রবাহে, সম্প্রীতির মিলন হাওয়ায় প্রাকৃতিক ও মানবিক বিপজ্জর্য থেকে রক্ষা পাওয়ার জন্য উভয় ধর্মের মানুষ পারস্পরিক বিশ্বাস ও ভরসার হাত ধরে, পাশাপাশি বাস করতে থাকে। বিশেষ করে গ্রাম ও মফঃসল অঞ্চলে এই বিশ্বাস ও ভরসার ভিত্তি ছিল অনেক গভীর। রবীন্দ্রনাথ ঠাকুর তার কালান্তর প্রবন্ধ গ্রন্থের অন্তর্গত রাজনৈতিক প্রবন্ধে লেখেন যে, হিন্দু ও মুসলমান এই দুই ধর্মের মানুষ দীর্ঘকাল পাশাপাশি বাস করলেও তারা পরস্পর একাঘ হতে পারেনি। তার কারণস্বরূপ তিনি বলেছেন যে, হিন্দু ধর্ম, ধর্মের ব্যাপারে উদার হলেও মুসলমান ধর্মের ব্যাপারে রক্ষণশীল। আর মুসলমান, আচার বিষয়ে উদার হলেও, হিন্দু ধর্ম আচার সর্বত্র। হিন্দু ধর্মের যে দিকটা খোলা

এবং মহত্ব - ডিসেম্বর, ২০২০ । । ।

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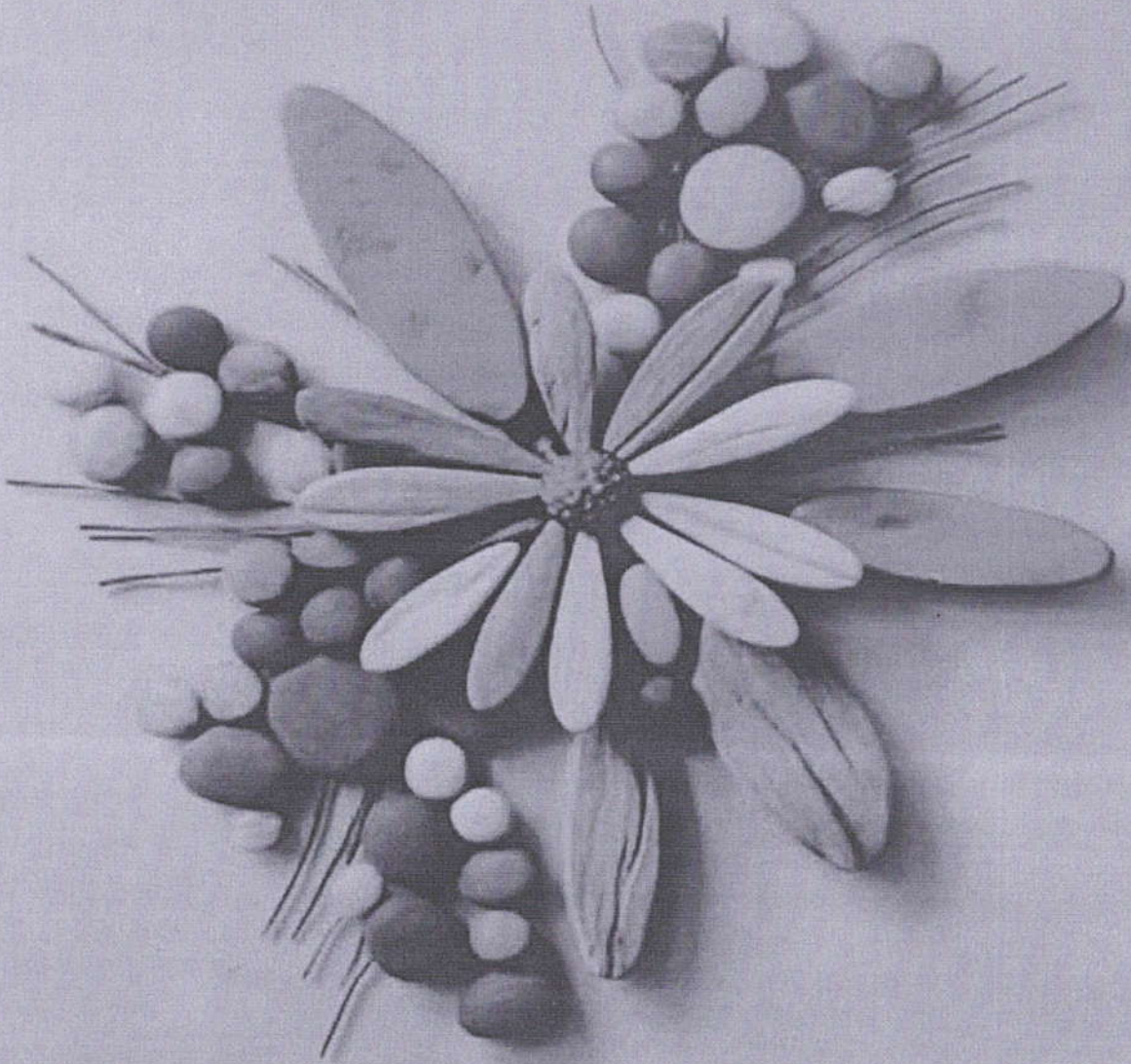
এবং অহুয়া - বিশ্ববিদ্যালয় মঞ্জুরী আয়োগ (U.G.C.-CARE List-I 2021)

অনুমোদিত তালিকার অন্তর্ভুক্ত। ২০২১ সালে প্রকাশিত
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এবং অহুয়া

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)

২০২১ সাল ১৪১ (বিশেষ) সংখ্যা নং ১০২১



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রবীন্দ্র ছোটগল্পে দুই পাখি,

তত্ত্বে ও তথ্যে

অমরেশ মিত্র

রবীন্দ্রনাথ ঠাকুর তাঁর সৃষ্টির আশায়, বিশ্ববাসীর অন্তরের চিরন্তন ভাষায়, ও অন্তর থেকে অনুভূত উদার ভালোবাসায় যে মানস প্রতিমা গড়ে তুললেন, সমস্ত জীবন জুড়ে ও সমস্ত সৃষ্টির মধ্যে যে মানস প্রতিমার সন্ধান, তাকেই তাঁর সাহিত্য সৃষ্টির বিচিত্র পথের বাঁকে, কখন জীবন দেবতা, কখন রূপ-অরূপ, কখনো জীবাত্মা-পরমাত্মা, কখনো বা সীমা ও সীমাতীতের ভাবনা, তাঁর সাহিত্যকে নিত্য নতুন নবায়মান করেছে। আর তাঁর সাহিত্য সমুদ্রে অবগাহন করে আমরা যে অমৃতের স্বাদ আস্বাদ করি, তা আমাদের মনের আশ্রয় ও আত্মার আনন্দ।

রবীন্দ্রনাথ, বাংলা সাহিত্যসূর্য, যদিকে তাঁর সৃষ্টির আলো ফেলেছেন, সেদিকটাই হয়ে উঠেছে -সুন্দরের তীর্থক্ষেত্র। আর এই তীর্থক্ষেত্রে কালের আবর্তনে দাঁড়িয়ে, সূর্যের রথচক্রের সপ্ত রশ্মির মত আমাদের উপহার দিলেন তাঁর সাহিত্য সৃষ্টির সপ্তম শাখা। এই সপ্তম শাখার অন্যতম সৃষ্টি বাংলা ছোটগল্প।

রবীন্দ্রনাথ ঠাকুর বাংলা ছোট গল্পের জনক। তিনি বাংলা ছোট গল্পকে নিজের হৃদয়ে ধারণ করেন। নিজ ভাবনায় লালন করে নিজের হাতে পালন করেছেন। তিনি তাঁর ছোট গল্পের সৃষ্টির এক একটি ফুলে গোঁথে তুললেন গল্পগুচ্ছের মালা। তাঁর ছোট গল্পের বিষয় বৈচিত্রের বহুমুখীনতা, ভাবনার বিশালতা, ঋষিসুলভ দৃষ্টির উন্মুক্ততা, দার্শনিক ভাবনার ব্যাপকতা ও বাজনার ইঙ্গিতময়তা। আমাদের বিস্মিত করে। বলা হয় ঈশ্বরের সৃষ্টির কোন পুনরুক্তি নেই, সাহিত্য সৃষ্টির ক্ষেত্রে রবীন্দ্রনাথ সেই ঈশ্বরের প্রতিদ্বন্দী। “অপরূপকে

১৪৩ ।।। এবং মহায়া - নভেম্বর, ২০২১



এবং মজুয়া' বিবেচনায় প্রযুক্তি আন্দোলন (U.G.C.- CARE LINE) অনুমোদিত

আদিকার অধীনে। ২০২০ সালে প্রকাশিত ৮৩ পৃ.

আদিকার ৬০ পৃ. এবং ৮৫ পৃ. উল্লিখিত।

এবং মজুয়া

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)

২৩ তম বর্ষ, ১৩৪ সংখ্যা, জুন, ২০২১



সম্পাদক

ডা. যদনমোহন বেরা

কে.কে. প্রকাশন

গোলকুন্ডাচক, মেদিনীপুর, প.বঙ্গ।

Principal

Kanchrapara College
P.O.- Kanchrapara, Dist.- 24 Pgs. (N)



ভারতে এবং ইউরোপে মানবাধিকারের উদ্ভব : ঐতিহাসিক পেঞ্চাপট

ড. বিমলেন্দু ঘোষ

সংক্ষিপ্তসার :

মানব অধিকারের উদ্ভব এই পৃথিবীতে মানুষের আকিঞ্চনের সমসাময়িক। তবে 'মানব অধিকার' এই শব্দ বা এই ধারণার উদ্ভব অনেক পরে হয়েছে। আরও মিলিয়ে করে বললে 'মানব অধিকার' শব্দের উদ্ভব হয়েছে আধুনিক কালে। সূত্ররূপে মানব অধিকার শব্দটি দীর্ঘ বিবর্তনের ফল। প্রাচীন যুগ, মধ্যযুগ এবং আধুনিক যুগ ধরে মানুষের অধিকারের ধারণাটি বিবর্তিত হয়েছে এবং বর্তমানের রূপ পরিগ্রহ করেছে। মানুষের অধিকারের ধারণার দীর্ঘ ইতিহাস যেমন ভারতে রয়েছে তেমনি ইউরোপের দেশগুলিতেও প্রত্যক্ষ করা যায়। এই পেঞ্চাপটে আমার এই প্রবন্ধ ভারত ও ইউরোপে মানব অধিকারের ধারণা কিভাবে বিবর্তিত হল তার উপর আলোকপাত করবে। সাথে সাথে আমার এই প্রবন্ধ ভারত ও ইউরোপের মানবাধিকারের ধারণা কিভাবে এবং কি করে একসূত্রে গচ্ছিত হল তা নিয়ে আলোচনা করবে।

মূলক শব্দ :

রাজনীতি, শোষণ, বঞ্চনা, বিদ্রোহ, অর্থনৈতিক ব্যবস্থা।

প্রতিপাদ্য বিষয় :

ভূমিকা :

মানুষ জন্মগ্রহণ করে স্বাধীনভাবে তাই জন্মসূত্রে সব মানুষই মর্যাদা ও অধিকারের নিকট দাঁড়ায়। এ হল এমন এক অধিকার যা কেড়ে নেওয়া যায় না এবং কেড়ে নেওয়া উচিত নয়। আজ যাকে মানবাধিকার বলা হয় তা এই সব অধিকার হিসাবে স্বীকৃতি পায় করেছে জাতীয় ও আন্তর্জাতিক আইন প্রণয়নের মাধ্যমে। এই সমস্ত আইনের ভিত্তি হল জন্মগতের সম্যকি অথবা জন্মগতের ইচ্ছার উপর এই অধিকার তৈরি ও স্বীকৃতি ও বাস্তবায়ন হয়েছে।

মানব জাতির অসংখ্যক সকলের মর্যাদা ও নামের মূল্যবোধ যা আজ মানবাধিকার বলে পরিচিত তার অন্তর্গত অনেক আগে অনেক মূল নীতির মতোই তার সমস্ত লক্ষ্যের ও সভ্যতার এবং ধর্মীয় ও মানবিক ঐতিহ্যের মতোই দেখতে লাগত। তারে মানব জাতির সমস্ত ইতিহাস পর্যালোচনা করলে দেখা যায় মানুষের জীবন



মহারা-জুন, ২০২১।।।

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P. Bera
Principal

Kanchrapara College
P.O. - Kanchrapara, Dist. - 24 Pgs. (M)

‘এবং মজ্জা’-বিশ্ববিদ্যালয় মঞ্জুরী আয়োগ (U.G.C.- CARE List) অন্তর্ভুক্ত।

ডালিকার অন্তর্ভুক্ত। ২০২০ সালে প্রকাশিত ৮৬ পৃ.

ডালিকার ৬০ পৃ. এবং ৮৪ পৃ. উল্লেখিত।

এবং মজ্জা

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)

২০ তম বর্ষ, ১৩১ সংখ্যা, মার্চ, ২০২১

সম্পাদক

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ভারতের উত্তরদিকে দেখো নীতি :

সম্ভাবনা ও সমস্যা

ড. বিমলেন্দু ঘোষ

সংক্ষিপ্তসার :

ভারতের বিদেশনীতির অন্যতম নীতি হল উত্তরদিকে দেখো নীতি। ভারতের পূর্বদিকে দেখো নীতি যেমন ভারতের পূর্বে অবস্থিত দেশ গুলি: মায়ানমার, ইন্দোনেশিয়া, লাওস, ভিয়েতনাম, কাম্বোডিয়া, থাইল্যান্ড প্রভৃতি দেশ গুলির সঙ্গে আর্থ-সামাজিক উন্নতির জন্য নিবিড় সম্পর্কে আবদ্ধ হতে চায় তেমনি উত্তরদিকে দেখো নীতি ভারতের উত্তর ও উত্তর-পশ্চিমে অবস্থিত দেশ গুলি: কাজাকাস্তান, কিরগীজস্তান, তাজিকিস্তান, উজবেকিস্তান, তুর্কমিনিস্তান প্রভৃতি দেশ গুলির সঙ্গে আর্থ-সামাজিক উন্নতির জন্য নিবিড় সম্পর্কে আবদ্ধ হতে চায়। এই উত্তরদিকে দেখো নীতিটি গ্রহণ করেছিলেন তৎকালীন প্রধানমন্ত্রী পি.ভি. নরসিমা রাও এবং তারপর পরবর্তী প্রধানমন্ত্রীগণ উত্তরদিকে দেখো নীতিটির আরো সফল করে তুলার উদ্যোগ গ্রহণ করেছেন এবং আজও উত্তরদিকে দেখো নীতিটি কে গুরুত্ব সহকারে অনুসরণ করা হচ্ছে। তাজিকিস্তানে ভারতের বাইরে প্রথম বায়ুসেনা ঘাঁটি নির্মাণ, সাংহাই কো-আপারেশন অরগানাইজেশনের সদস্য পদ লাভ, ইরানে চাবাহার বন্দর নির্মাণে অংশীদার হওয়া, মুম্বাই-মস্কো করিডোর সূচনা প্রভৃতি উত্তরদিকে দেখো নীতির অঙ্গ। আমার এই প্রবন্ধটি ভারতের উত্তরদিকে দেখো নীতিটি গ্রহণের ফলে আর্থ-সামাজিক ক্ষেত্রে কি কি নতুন সম্ভাবনা আছে তা আলোচনা করবে এবং কৌশলগত দিক থেকে কোন সুবিধা হবে কিনা তাও আলোচনা করবে। অন্তিমপর্বে আমার এ প্রবন্ধ উত্তরদিকে দেখো নীতির সমস্যার দিকগুলির প্রতি আলোকপাত করবে।

সূচক শব্দ : সহযোগিতা, নিরাপত্তা, সন্ত্রাসবাদ, জ্বালানি, গণতন্ত্র

প্রতিপাদ্য বিষয়:

ভূমিকা :

একটি দেশের বিদেশ নীতি সময়ের প্রেক্ষিতে নিখারিত হয়। তবে দেশের অর্থনীতি, ভৌগোলিক অবস্থান, জনসংখ্যা, প্রাকৃতিক সম্পদ ও ইতিহাস প্রভৃতি



Shanghai Cooperation Organization (SCO) and Peace

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ABSTRACT

The Shanghai Cooperation Organisation (SCO) is a Eurasian political, economic, and security organisation, the creation of which was announced on 15 June 2001 in Shanghai, China by the leaders of Russia, China, Kazakhstan, Tajikistan, Kyrgyzstan and Uzbekistan. It is the successor of the 'Shanghai Five'. These countries, except for Uzbekistan, had been members of the 'Shanghai Five' founded on 26 April 1996 in Shanghai, China. India and Pakistan joined SCO as full members on 9 June 2017 at a summit in Astana, Kazakhstan. The SCO occupies territory from the Arctic to the Indian Ocean and from Kaliningrad to Shanghai, its eight full members account for 60 per cent of the land mass of Eurasia & South Asia and its population is a third of the world. If the observer countries are included with this organisation and then half of gross population of the world would live here and take in a stretch of Eurasia from the South China Sea to the Baltic Sea and from the Persian Gulf to the Bay of Bengal and hence from the geostrategic point of view this region is important. On the other hand the idea of peace is probably as old as humanity. But there is no consensus about the definition of peace. The scholars, philosopher, political thinkers view it differently. My paper will discuss what SCO is and what is peace? The SCO from its emergence period takes several initiatives which are directly or indirectly related to peace in the Eurasian region. Therefore, my paper will also discuss the SCO's initiatives towards peace in the Eurasian region.

Keywords: Conflict, Cooperation, Interdependence, Terrorism, Corruption

The Shanghai Cooperation Organisation (SCO) is a Eurasian political, economic, and security organisation, the creation of which was announced on 15 June 2001 in Shanghai, China by the leaders of Russia, China, Kazakhstan, Tajikistan, Kyrgyzstan and Uzbekistan. (Kumar: 2010:15) These countries, except for Uzbekistan, had been members of the Shanghai Five group, founded on 26 April 1996 in Shanghai. The SCO is successor to the 'Shanghai Five'. India and Pakistan joined SCO as full members on 9 June 2017 in Astana, Kazakhstan. (eng.secsco.org:2017) It is notable that SCO is the first international organization named after a Chinese city. Its working languages are Chinese and Russian. The Shanghai Cooperation Organisation Charter was signed in June 2002 and entered into force on 19 September 2003. (Thomas: 2009: 129)

The observer states are Mongolia, Iran, Belarus and Afghanistan. The SCO has six dialogue partners, namely the Republic of Azerbaijan, the Republic of Armenia, the Kingdom of Cambodia, the Federal Democratic Republic of Nepal, the Republic of Turkey, and the Democratic Socialist Republic of Sri Lanka. The guest attendances are ASEAN (Association of South-East Asian Nations), the Commonwealth of Independent States (CIS) and the UN. Turkmenistan has also begun attending the SCO Heads of state meeting as a guest.

The SCO occupies territory from the Arctic to the Indian Ocean and from Kaliningrad to Shanghai, its eight full members account for 60 per cent of the land mass of Eurasia & South Asia and its population is a third of the world. If the observer countries are included with this organisation and then half of gross population of the world would live here and take in a stretch of Eurasia from the South China Sea to the Baltic Sea and from the Persian Gulf to the Bay of Bengal and hence from the geostrategic point of view this region is important. (Tishenhyar: 2012:106) Another equation is that the SCO covers totalling 30.17 million square kilometres and total gross domestic product surpasses US\$ 1 billion. (McMillan:2009: 102) Russia, China, India and Pakistan bring together in the SCO four



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Contemporary Issues of International Relations



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THE STATUS OF CENTRAL ASIAN WOMEN : A STUDY FROM THE SOCIO- ECONOMIC PERSPECTIVE

BIMALENDU GHOSH

Abstract

Central Asian states namely Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan are emerged as independence states due to the disintegration of the USSR in 1990s. Central Asia is a mixture of great cultures and civilizations. In the task of state building in independent Central Asia, several issues have been given priority and women are one of them. Women constitute half of the total population of Central Asia and they are highly educated. They contribute significantly in economy, education, agriculture, society as well as politics. But they are also facing some problems from traditional culture, religion and patriarchy. In addition, in recent decades, challenges and opportunities consequential from transitions to a market economy increased gender imbalances in labor markets and opportunity structures of the region. Having constitutional arrangement in all Central Asian republics, women are not in position as expected. My article is critically analyzing the women problems in the region and also discusses the status of women in Central Asia. Finally, my paper will shed light on possibilities of improving the status of women in Central Asian republics.

Key words : Exploitation, trafficking, deprivation, corruption, economy

The current world population is 7.8 billion as of October 2020 according to the most recent United Nations estimates elaborated by World meters and nearly half of the population are women. The term 'World Population' refers to the human population (the total number of humans currently) of the world (Current World population, <https://www.worldometers.info/world-population/#ref-1>. Accessed on: 23/10/2020) The most populous continent is Asia and least populous continent is Oceania. The Central Asian republics are located

Abstract: Lawesson's reagent is a classic example of a compound having a remarkable construction and also a distinctive chemical behaviour that can challenge stereotype conceptual explanations. At the very beginning, it was mainly known for its use in the thionation of various types of carbonyl groups. However, over the last few years chemists reported some appealing examples which can nurture the chemistry community to perceive innovative ideas. These

include the construction of valuable heterocycles, important coupling reactions, and the decoration of metal-based attractive cores. Several important reports provided comprehensive theoretical studies regarding mechanistic classification. This article gives an overview of the recent insights and synthetic applications of this famous reagent from 2013 to 2019.

1. Introduction

Lawesson's reagent is basically a diaryl substituted phosphorous and sulfur containing four membered heterocycle (2,4-bis(4-methoxyphenyl)-1,3,2,4-dithiadiphosphetane-2,4-dithione, LR (1), Figure 1). The reagent sets a hallmark synthetic route for the conversion of C=O to C=S with eye catching tolerance of functionality. Beside this it has been also known to furnish unique organic frameworks which were highlighted by Ozturk et al. in their extended review in 2007.^[1] In 2017 Saeed et al. reviewed application of this reagent in the synthesis of valuable alkaloids which mainly included the thionation of carbonyl.^[2] But to the best of our knowledge a recent compact review is due on this topic considering insight vision about the nature of this reagent and diverse range of applications. Henceforth we concentrated our focus on reports from 2013 and we carry forward our aim to be up to date as far as we can while writing this review. In this article we tried to emphasize the outstanding achievements that chemists explored regarding the development of various synthetic platforms as well as the features related with computational chemistry. Some boosts in the use of LR analogue were also highlighted. Mechanistic proposals in various cases were considered to patronize the balance between theoretical and experimental facts. We either kept aside or went through just mentioning the methodologies related with thionation of carbonyl and alcohol since they are well known except in few cases where it led to interesting observations and results.

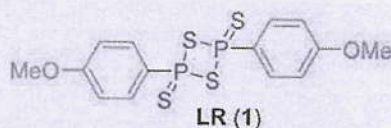


Figure 1. Structure of Lawesson's reagent.

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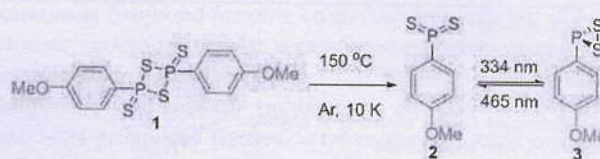
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2. Recent Computational Studies to get Insight into the Behavior of LR

Some computational analyses shed some splendor light to visualize the intrinsic nature of 1 in different circumstances so that chemists can get comparatively clear picture to design their plans in synthetic methodology. Very recently for the first time Mardyukov and coworkers identified and characterized 4-methoxy-phenylphosphine disulfide (2) which was generally speculated as the active monomeric part of LR.^[3] They successfully synthesized and trapped 2 from 1 via evaporation into the gas phase at 150 °C in an argon matrix (Scheme 1). During their extensive computational study they predicted the notable stretching vibrations related with C=C, C=O, and C-P in infrared spectrum which were further emphasized from the results obtained with *d* counterpart of 1 and 2. The authors also clarified good correlation between theoretical findings and matrix isolated 2 considering UV/Vis spectrum and noticed desired absorption band. During computational study large energy gap between singlet and triplet states was observed for 2 highlighting its existence mainly in the singlet ground state. The NBO (Natural Bond Orbital analysis) charges at the phosphorus and sulfur atoms in 2 indicated symmetric charge distribution rather than an ylide-type structure though several research groups envisioned the presence of ylide nature during their mechanistic proposal which are discussed later.

The authors found that compound 2 provided interesting result under photoirradiation at $\lambda = 334$ nm giving rise to another unusual phosphorus and sulfur based 3-membered rearranged product 3. Computational study revealed the presence of unsymmetrical P-S bond distances in 3 where the difference is nearly 0.01 Å. Photoreversion at $\lambda = 465$ nm clearly exposed that 2 and 3 exist in a stationary equilibrium (Scheme 1).

Clyburne groups successfully isolated and characterized the adducts of 2 with *N*-heterocyclic carbenes [1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene (4, adduct 5) and 1,3-bis(2,6-diisopropylphenyl)imidazolidin-2-ylidene (adduct 6)] (Scheme 2).^[4] In



Scheme 1. Formation of the monomer 2 and rearranged product 3.

Supramolecular Chemistry

Recent Advances in Tris-Primary Amine Based Organic Imine Cages and Related Amine Macrocycles

Krishnanka Shekhar Gayen,^[a] Titiksha Das,^[b] and Nirbhik Chatterjee^{*[b]}

Abstract: Molecules bearing three primary amine groups are ubiquitous substances in various fields of synthetic chemistry. Some of them are commercially available and the rests are emerged from the designed protocols of synthetic chemists. It has been observed that such aliphatic as well as aromatic triamines are excellent precursors for the design and synthesis of various cage molecules of which organic imine cages (OICs) and

related amine macrocycles belong to the category of special interest. These compounds possess unique architectures and already made their marks in the field of supramolecular chemistry, synthetic methodology, and material science. In this review we aimed to consider recent reports that highlighted the syntheses, special features, and applications of primary triamine based OICs and related amine macrocycles.

1. Introduction

Organic imine cages (OICs) and related amine macrocycles already received attention in the field of synthetic organic chemistry owing to their majestic decoration and valuable applications. At the very beginning stage it was considered that such motifs could be obtained via simple condensation reaction between amine and aldehyde precursors. Extensive curiosities revealed that properly designed starting materials with self-sorting along with electronic, steric, and solvent effects have profound role on the construction of desired architectures having notable features. Long time ago Stoddart et al. highlighted the features of dynamic imine chemistry in their outstanding tutorial review.^[1] Later several reviews including the encapsulation capabilities, recognition properties of OICs/cryptands,^[2–5] hemicryptophanes^[6] and self-sorting/self-selection for the formation of OICs and their applications^[7] have been published. We noticed in recent years some unique primary triamine based OICs and their saturated counterparts have been constructed and many of them caught the eye with widespread applications. To the best of our knowledge particularly on this field a review is due recognizing those examples. Therefore, we aimed to amalgamate these molecules under the same roof in simplified manners so that it can provide valuable ideas about the construction of novel supramolecular hosts or other motifs from commercially available and designed triamines. Henceforth in this review we considered the reports in between 2016–2020

and focused our attitude only on those which are mostly uncommon with previous reviews. Since it is very difficult to cover all examples in a short review we contemplated some selective examples according to our perception and did not consider the studies which were particularly based on extensive computational screening and predictions to perceive admirable ideas regarding the formation of nested cage complex, and organic cage pots.^[8,9] But we considered few worthy reports rooted on both experimental and computational calculations. Since the field of metal organic frameworks (MOFs) is vast, we considered only a few examples where OICs and related amine macrocycles were involved to interact with metal ions in post synthesis.

2. Aliphatic Triamine Based OICs: Syntheses, Special Features, and Applications

The most common simple aliphatic triamine that has been widely used is tris(2-aminoethyl)amine (**1**, also known as tren). Li and co-workers decorated three kinetically and thermodynamically favorable tetrahedral OIC frameworks via 1:1 condensation of **1** with triformyl precursors **2a–c** (Scheme 1).^[10] They sorted out some valuable information regarding the structures of the cages. The dihedral angles between aromatic moieties were larger for **2b** and **2c** compared to **2a** which might be attributed to greater steric interaction because of the presence of *ortho* -Et and -Me groups. Energetically favorable CH- π interaction was confirmed from solution phases NMR and single crystal X ray diffraction (XRD) analyses which were also justified by DFT calculations. Several common solvents along with white phosphorus were taken to judge the template effect for cage formation and they found preferable result for P₄ in certain cases. XRD analysis of P₄⊂**3b** complex revealed shorter P-P bond length than elemental state and each P atom was pointed towards phenyl ring indicating possible overlapping of orbitals of P atoms and aromatic cores (Scheme 1).

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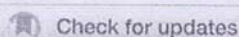
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Catalytic I₂-moist DMSO-mediated synthesis of valuable α -amidohydroxyketones and unsymmetrical *gem*-bisamides from benzimidates†

Shobhon Aich,^a Rajesh Nandi,^a Nirbhik Chatterjee,^b Krishnanka S. Gayen,^c Subhasis Pal^a and Dilip K. Maiti^{b,*}

We developed an efficient and straightforward I₂-catalyzed strategy for the synthesis of functionalized α -amidohydroxyketones and symmetrical and unsymmetrical bisamides using incipient benzimidate scaffolds as starting materials and moist-DMSO as a reagent and solvent. The developed method proceeds through chemoselective intermolecular N–C-bond formation of benzimidates and the α -C(sp³)–H bond of acetophenone moieties. The key advantages of these design approaches include broad substrate scope and moderate yields. High-resolution mass spectrometry of the reaction progress and labeling experiments provided suitable evidence regarding the possible mechanism. ¹H nuclear magnetic resonance titration revealed notable interaction between the synthesized α -amidohydroxyketones and some anions as well as biologically important molecules, which revealed a promising recognition property of these valuable motifs.

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Introduction

Decoration of valuable structural motifs from easily available starting materials is a challenging task in synthetic organic chemistry. α -Amidoketone¹ is used proficiently as a synthetic equivalent for the development of N-heterocyclic scaffolds such as oxazoles,^{2a} imidazoles,^{2b} and thiazoles.^{2c} Likewise, symmetrical and unsymmetrical *N,N'*-alkylidenebisamide scaffolds are important fragments of peptidomimetics and pharmaceutically active drug molecules, including the anti-cancer and antidepressant agents leuconoxine (B) and scholarisine G (A), antioxidant and antimicrobial agent JBIR-94, and drugs to counteract high blood pressure.^{3,4} Several methods have been developed for the construction of α -amidoketone derivatives. The major concerns arising from these methodologies are the utilization of expensive catalysts, harsh reaction conditions, and low atom economy. Notably, Wu *et al.* developed the synthesis of α -ketoimides through the reaction

between aryl methyl ketones and benzamidine hydrochloride in the presence of low-cost molecular iodine and DMSO.⁵ Few reports of methylene bisamide^{6–9} derivatives include: the reaction of nitriles and formaldehyde in the presence of strong sulfuric acid solution;⁶ construction of switched *N,N'*-oxydimethylenebisalkanamide derivatives from the reaction of simple alkanamide and polymeric formaldehyde;^{7a} an operationally modest method to provide methylene bisamides under heating conditions^{7b} and ammonium persulfate-activated DMSO as a source of onè carbon synthon.⁸ In recent times, one of our major research foci has been imidate chemistry.¹⁰ⁱ Imidate (or imino-ether) frameworks have garnered considerable interest in synthetic organic chemistry. In general, imidate scaffolds are quite distinctive compared with stereotypical functional groups in that they can be electrophiles and nucleophiles. Hence, they can cover a wide range of strategies to provide homo atomic and hetero atomic couplings.^{10–12} Based on this fundamental science, recently synthetic chemists have reported interesting breakthroughs regarding some biologically important molecules.^{13,14} Herein, we describe a highly proficient synthetic protocol for the simultaneous two bond-forming cross-coupling reaction of benzimidate skeletons (1) with acetophenone analogues to provide α -amidohydroxyketones (3, eqn (2), Scheme 1). Wu and colleagues⁵ stated that the product was an imide moiety where the –NH group was flanked between two carbonyl cores (eqn (1), Scheme 1). However, in our work, by merely using benzimidate rather than benzamidine hydrochloride and moist DMSO,

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†Electronic supplementary information (ESI) available: Details experimental procedures and full spectroscopic data of all the new synthesised compounds are provided. CCDC 2152756. For ESI and crystallographic data in CIF or other electronic format see DOI: <https://doi.org/10.1039/d3ob00165b>



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1,n-dicarbonyls are one of the most fascinating chemical feedstocks finding abundant usage in the field of pharmaceuticals. Besides, they are utilized in a plethora of synthesis in general synthetic organic chemistry. A number of 'conventional' methods are available for their synthesis, such as the Stetter reaction, Baker-Venkatraman rearrangement, oxidation of vicinal diols, and oxidation of deoxybenzoins, synonymous with unfriendly reagents and conditions. In the last 15 years or so, photocatalysis has taken the world of synthetic organic chemistry by a remarkable renaissance. It is fair to say now that

everybody loves the light and photoredox chemistry has opened a new gateway to organic chemists towards milder, more simpler alternatives to the previously available methods, allowing access to many sensitive reactions and products. In this review, we present the readers with the photochemical synthesis of a variety of 1,n-dicarbonyls. Diverse photocatalytic pathways to these fascinating molecules have been discussed, placing special emphasis on the mechanisms, giving the reader an opportunity to find all these significant developments in one place.

1. Introduction

1,n-dicarbonyls are one of the most sought-after structures and rightly so, due to their immense pharmaceutical and biological attributes.^[1] Not only that, they are quite valuable synthons in general synthetic organic chemistry. For example, one of the most popular routes to synthesize 5-membered heterocycles furans, pyrroles and thiophenes, the Paal-Knorr synthesis, involves 1,4-diketones as key components as well as having immense potential to form building blocks of many pharmacophores. As a whole, homologous dicarbonyls and its derivatives are found extensively in a vast number of complex reactions.^[2] Several examples exist, such as the famous 1,2-dicarbonyl benzil can be converted to the drug trifluoromethyl, a potent platelet aggregation inhibitor,^[3] or the synthesis of CFTR activators and DHPS inhibitors from α -ketoesters.^[4] Some of the well-known conventional techniques for the synthesis of 1,n-dicarbonyls are Stetter reaction, Baker-Venkatraman rearrangement, oxidation of vicinal diols, and oxidation of deoxybenzoins, to name a few.^[5] However, most of the conventional processes are associated with harsh conditions and hazardous reagents which are not well-tolerated by sensitive substrates. Due to these reasons, methods which are mild and efficient at the same time are highly welcome. Photocatalysis couples mildness and efficiency together, providing synthetic chemists the golden key, opening alternative paths to valuable molecules. Since the last 15 years, photocatalysis has been making giant strides and is now a mainstay in synthetic organic chemistry. Hence, the time is high as well as justified to bring forth the developments that photocatalysis has made in the synthesis of 1,n-dicarbonyls. So, we aimed to construct a concise review on this topic so that it can provide very recent up-to-date progress in this field. In this review we have tried to connect the threads of the transition from conventional methods to photocatalytic methods in a systematic and easy way for the readers. Here, dealing with the diverse photocatalytic methods for the synthesis of

1,n-dicarbonyls discussing the detailed mechanistic proposal with typical substrate scope to illustrate the methods in general. This review will give the readers an insight into the aforementioned topic within a concise space and make it easier for researchers planning further forays into working with these moieties by providing the important details in one place.

2. Synthesis of 1,n-Dicarbonyls

Visible-light mediated photocatalysis has been a major revelation in synthetic organic chemistry. Many problems posed by conventional reactions such as extreme conditions and harsh reagents, find their answers in photocatalysis. The field has been on an exponential upward curve for quite some time, providing unprecedented results with high efficiency. In addition to mild reaction conditions, photocatalysis has the ability to generate extremely reactive intermediates in the reaction medium, that too, via multiple pathways, granting an unmatched versatility to reactivity. While there are reviews on discrete classes of dicarbonyls separately, especially the 1,4 types,^[6] till date there is none which provides a detailed overview of the ability to access all categories of these systems. This review is a clear demonstration of photocatalysis as an all-powerful tool, granting us access to all the types of dicarbonyls with relative ease and facile routes of synthesis starting from the very basic 1,2 systems, all the way to the distant ones such as 1,7 and 1,8. We have divided the entirety of our review into 6 categories, each depicting the synthesis of one particular type of system. We have tried to show how photocatalysis simplifies the synthesis of 1,n-dicarbonyls by simply changing the coupling partners paired with a particular reactive intermediate, to generate a systematic homologous series of these systems (Scheme 1).

We begin with the 1,2-dicarbonyls, the incorporation of atmospheric oxygen onto unsaturated systems (alkynes and alkenes) being the predominant theme. The two modes of oxygen incorporation,^[7] via the singlet oxygen pathway as well as the superoxide radical anion pathway, both achieved photochemically, have been discussed. This is followed by a brief stint with 1,3-dicarbonyls, including an interesting example of iron photoredox catalysis.

Next, the synthesis of the most important and well-known class of dicarbonyls, the 1,4-systems is discussed in ample detail (Ad, Ba, Bb, Bc combinations). This class is of special

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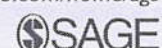
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Economic Growth and Rural Crisis in India: Imagining Cooperatives as a Viable Solution

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Abstract

Despite sustained high growth in India over the past three decades or so, barring the recent turn of events, structural transformation has been characterized by deepening agrarian crisis, high unemployment, and a lack of remunerative and good quality jobs. These are the major contributors to the problem of burgeoning inequality in India. In this article, using various macro-level data sets, secondary case study reports, and one primary survey, it is argued that the neoliberal model of development cannot solve the ongoing rural crisis in India. This, in turn, calls for looking beyond this paradigm. Considering that agrarian (or broadly speaking, rural) distress has its own class dynamics, which lead to disproportionate suffering among the class of marginal farmers/tenants, agricultural workers, and others, it is argued that cooperativism presents itself as an alternative model for remedying India's ongoing rural

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Is Growth Pro-poor Among the States of India? A Poverty Decomposition Exercise During the 2000s

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Abstract

Economic growth is considered to be the most important factor for achieving a lower level of poverty, but burgeoning inequality could affect poverty reduction adversely. This article decomposes the change in both rural and urban poverty into what can be termed as 'growth effect' and 'distribution effect' for twenty major Indian states during India's highest growth episode (2004–2011). It further examines the pro-poorness of the growth in these states. One of our key findings is that while income growth plays a key role in rural poverty reduction, rising inequality appears to be a major hindrance with respect to urban poverty. Our investigation also suggests that higher growth is not necessarily pro-poor. If the growth process itself is iniquitous, it might reduce the poverty elasticity of income and, in turn, result in slower poverty reduction despite high growth. This being specifically relevant for urban India and with urban poverty increasingly becoming a serious concern, economic policymakers should adopt a policy paradigm ensuring a more inclusive urban growth instead of considering growth as a panacea.

Keywords Poverty · Growth effect · Distribution effect · Pro-poor growth · Inequality · Indian states

1 Introduction

The issue of poverty has always been a major concern in development economics as well as for policy practitioners. Reducing the rate of poverty at a considerable rate, especially in developing countries, is one of the key targets of Sustainable Development Goals (SDGs). In the Indian context, the introduction of market-oriented reforms in 1991 was justified on many grounds, among which the potential for rapid decline in poverty was perhaps the most crucial one. It is in this regard that higher growth, which is supposedly the norm under free-market economy, is considered to be a panacea for poverty reduction (Bhagwati

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Conservation of Biodiversity Using Ethnic Adaptive Folk Beliefs: a Case Study in Purulia District, West Bengal, India

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KEYWORDS

Ecology, Folk Tradition, Ethnic Communities, Folk Belief, Ecological Sustainability

ABSTRACT

The world is degrading daily due to the overuse of natural resources, urbanization, and industrialization. When humans abuse natural resources, causing ecology to become unbalanced, the relationship between nature and man switches from symbiotic to predatory. Because belief systems substantially impact environmental behavior, ethnic adaptive folk traditions have played an important role in appraising many socio-ecological challenges. The ethnic communities throughout their territory have accumulated information over time, which in normal conditions sets them up to get by in counterbalance to their current situation, and so encourages them to counteract with the characteristic traits for their job. The main aim of the present study is the interaction between ethnic societies' adaptive traditional beliefs and the environment, which can sustain ecosystems. The present empirical study in the Purulia district of West Bengal, India has investigated and documented ethnic communities' traditional belief systems that can aid to conserve and preserve biodiversity.

Introduction

The world has been disintegrating day by day Because of urbanization, industrialization, overexploitation of natural resources, and creativity progress (Loreau, 2001). These human activities are the principal cause of environmental pollution (e.g., rising global temperatures, climate change, biodiversity loss, and species extinction) and degradation (i.e., anthropogenic behaviors and natural hazards). Biodiversity is the most fundamental and primitive key to reducing pollution and degradation in the ecosystem, but it is the least valued resource (Wilson, 1999). Bushfires, removing mature trees and the haphazard collecting of fuel forests all substantially impact biodiversity. The close interaction that tribal peoples have with the environment is an important and unique feature of the human social structure and biodiversity. The ethnic people protect biodiversity for food, medicine, other purposes, and environmental services (Dudley *et al.*, 2005). The ethnic people's everyday demands and desires (natural, physical, and social) are to protect and preserve natural resources (Bodding, 1925). The practice of worshipping the sun, wind, soil, trees, plants, and water, which frames the entire concept of human resilience, demonstrates that religious activity is an old strategy of safeguarding and nourishing nature (Merriam, 2004). Respect and protection for faunal and floral creatures such as elephant, tortoise, tiger, peacock, and snake and other animals are also an important component of our social identity, as passed down through old religious scriptures and oral traditions such as myths, legends, and stories (Forest, 2002).

Nature has been worshipped in India for thousands of years. To protect the environment, the prehistoric people of India implemented numerous precautionary measures, which demonstrate the

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Ethnomedicinal plants and associated traditional wisdom of Garo community of Rongram, West Garo Hills District, Meghalaya, India

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KEYWORDS

Ethnomedicine, Garo community, Rongram, Ethnomedicinal plants, Traditional healer, Traditional wisdom, Diagnosis, and treatment

ABSTRACT

The study of ethno medicine concerning any community is a complex or convoluted method in and of itself. The present study recounts the Garo community's traditional knowledge of medicinal plants, which they employ in some secluded enclaves of northeast India. The current investigation, which was conducted using standardized anthropological methods and conversations with the local people and traditional healers, resulted in the documentation of sixty-one therapeutic plant species which are used to manage the primary health care practice of the Garo community at the Rongram Community and Rural Development Block (C & RD) of West Garo Hills District of Meghalaya, India. The Garo people used various underground plant forms as medicine, including roots, leaves, rhizomes, and barks. The study emphasizes the value of ethnobotanical research and the importance of documenting traditional wisdom related to therapeutic plant consumption for the more comprehensive welfare of humankind.

Introduction

Tribal communities live in harmony with nature and have a deep interaction with the natural world. According to the World Health Organization, up to 80% of people in developing countries still rely on local medicinal plants for their primary health care (WHO, 2002). Up to 90% of the population in some African countries still uses plants as their sole source of medication (Hostettmann *et al.*, 2000:873-1010). Plants are the source of an estimated 25% of prescribed pharmaceuticals and 11% of WHO essential drugs. Many synthetic drugs are made from precursor molecules derived from plants (Rates, 2001:603-613). The Indian subcontinent is home to more than 53.8 million tribal people who live in 5,000 forest-dominated tribal communities that cover 15% of the total geographical area of Indian landmasses, making it one of the wealthiest emporia of ethnobotanical wealth (Chowdhury, 2000). Despite Meghalaya's growing recognition of traditional medicine, local knowledge of conventional medication is not well documented (Kayang *et al.*, 2005:75-80). Ethnobotanical knowledge must be preserved for biodiversity conservation as part of live cultural knowledge and practice between communities and the environment (Hostettmann *et al.*, 2000:873-1010). The Mongoloid racial stock is represented by Garos. They communicate in a Tibeto-Chinese language family. They have maintained the matriarchal family system since its inception, with no signs of deterioration. As a result of this practice, the mother is the family's head, and the father is relieved of the need to take a substantial role in society. They reside in the West Garo Hills in the eastern Himalayas, surrounded by nature. Garo religion is based on animism. The idea of animism coexists with the concept of 'souls' as the 'elixir of life.' They are seen as indestructible, unsubstantial human pictures. They are nature worshippers and believe in spirits who live in nature and natural surroundings and maybe benevolent or malevolent for their life and livelihood. Nature is deeply rooted in the culture and

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Folk Belief as a Potential Measure of the Ecological Sustainability: A Case Study of Ranibandh Block of Bankura District, India

Shilpa Biswas & Worrel Kumar Bain

Abstract

Due to overexploitation of natural resources, urbanization, industrialization, the environment has been degraded day by day. When human inclined towards the overuse of natural resources, the bond between nature and man moved from symbiotic to predatory and caused ecological unbalance. It is high time to ponder how to conserve or protect our environment from all the unsustainable human exercises which are deteriorating the environment. Folk belief can play a crucial role in this regard. Folk practices have, over the decades, impersonated a remarkable role in determining diverse significant socio-ecological predicaments. Belief systems have an essential impact on environmental attitudes and can, therefore, speak to a compelling part of ecological conservation practices. The ethnic populace everywhere throughout the world has gathered knowledge with times, which in conventional set up prepares them to get by in offset with their environment, and this urges them to balance with the natural resources for their livelihood. This is about the Man-Environment relationship. Man and environment are foreseen to be the heading of sustenance. The present study has been carried out among the ethnic communities of Ranibandh Block of Bankura district, West Bengal. This empirical study focuses on indigenous management and safeguards the ecology through the protection and preservation of plant and animal species as well as sacred places. The paper probes how the ecological balance can be maintained through the traditional belief system of the communities.

Keywords: Nature, Conservation, Bankura, Ranibandh Block, Ethnic communities, Folk belief, Ecological sustainability

Introduction

The environment is the complex of chemical, physical, and biotic factors that follow up on a creature or a natural network and, at last, decide its structure

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Intersecting Knowledge with Landscape: Traditional Wisdom and Environmental Sustainability- A Case Study of Santal Community of Purulia District of West Bengal

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KEYWORDS

Globalization, Santal community, Environmental equilibrium, Traditional Ecological Knowledge, Sustainability

ABSTRACT

Climate change already has environmental effects and contributes significantly to the present crisis in biodiversity. The indigenous people are sensitive to climate-based changes because of their close link to and dependence on local, sometimes fragile ecosystems. Identifying climate-related disturbances and implementing appropriate adaptation measures will be crucial for increasing indigenous communities' long-term resilience in the face of climate change. Due to several issues, such as globalization, poverty as a capacity deficiency, and the exclusion of certain groups from education and other facilities, new environmental concerns have been a concern. Ascertaining environmental equilibrium in natural resource management necessitates adopting a concept called "Traditional Ecological Knowledge" (TEK). This empirical study aims to understand the role of indigenous ecological knowledge in ecological sustainability among the Santal community of the Purulia district of West Bengal.

Introduction

All human populations interact with the environment around them in some way. These relationships require management, whether hunting and rearing available animals and flora, agriculture, or non-renewable resources. Those who live on the land and gather its resources thoroughly understand resource distribution, ecosystem functioning, relationships, and culture. The ecosystem is supported by environmental activities. Many ethnic communities have lived for millennia in their natural settings (and many still do). Their ability to accommodate themselves to harsh environments, like deserts and the Arctic, has gone hand in hand with defeating colonialism and other forms of harshness and dealing with increasingly frequent environmental shocks. The current state of ecological deterioration highlights the significance of restoration efforts. Ecological restoration has become obvious, and effective cooperation is needed between science and traditional environmental knowledge. The present study shows how Traditional Ecological Knowledge (TEK) contributes to environmental sustainability. Like many others based on ethnic peoples' traditional knowledge, this discovery emphasizes the vital role traditional ecological knowledge plays in our collective understanding and management of the environment (Bhagwat and Rutte, 2006). Climate change already has environmental effects and contributes significantly to the present crisis in biodiversity. Indigenous peoples are sensitive to climate-based changes because of their intimate link to and dependence on local, sometimes fragile ecosystems. Identifying climate-related disturbances and implementing appropriate adaptation measures will be crucial for increasing indigenous communities' long-term resilience in the face of climate change. A strong case is to be made for using TEK to increase climate resilience (Garibaldi and Turner, 2004). Traditional farmers conserve biodiversity by engaging in environmental processes that modify, manage, and use nature. The ethnic people sustainably use natural

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